BERGEN COMMUNITY COLLEGE
400 PARAMUS ROAD
PARAMUS, NEW JERSEY 07652
REQUEST FOR BIDS
One-Stop Expansion
PUBLIC BID NO. P-2309

NOTICE TO BIDDERS

PUBLIC NOTICE is hereby given that SEALED BIDS for **One-Stop Expansion** will be received at the Office of the Director of Purchasing and Services, Bergen Community College, Pitkin Education Center, 400 Paramus Road, Paramus, New Jersey until **11:30 a.m. local time, Friday, January 10, 2020, Room # C-325,** at which time they will be publicly opened and read aloud.

A complete set of Bid Documents may be obtained by registering on the Bergen Community College website at http://www.bergen.edu/community/purchasing/current-vendor-opportunities. A PRE-BID CONFERENCE will be held in **Room L-145,** Bergen Community College, Pitkin Education Center, 400 Paramus Road, Paramus, NJ on **Tuesday**, **December 3, 2019 at 10 a.m. Attendance is STRONGLY RECOMMENDED.**

Bid Bond: Bid security, in the amount of 10% of the bid, must accompany each bid that is submitted. At the option of the bidder, the bid security may be in the form of a certified check, cashier's check or Bid Bond payable to Bergen Community College (the "College"). If a Bid Bond is submitted, it shall be in substantially the form set forth in Section C of the Request for Bids, Form 00600. The Bid Bond shall be obtained from a surety company that is authorized to do business in the State of New Jersey, that satisfies the requirements set forth in N.J.S.A. 2A:44-143 a.(1)(b), and that is listed in the United States Treasury Department Circular 570. Such Bid Bond shall not contain any conditions to the obligations of the surety company issuing the Bid Bond. Bid Bonds signed by an Attorney-in-Fact shall be accompanied by an executed and certified Power-of-Attorney.

Consent of Surety: Bidders shall provide a certificate from a surety company stating that the surety will provide a Performance Bond in the full amount of the contract price if Bidder is awarded a contract. If Bidder intends to submit a Performance Letter of Credit in lieu of a Performance Bond, Bidder shall provide a certificate from a bank or financial institution, as the case may be, stating that the bank or financial institution, as the case may be, will provide a Performance Letter of Credit in the full amount of the contract price if the Bidder is awarded a contract. The certificate from the surety shall be in the form set forth in Form 00610. The certificate from the surety, bank or financial institution, as the case may be, shall not contain any conditions to the obligation of the surety company, bank or financial institution.

BIDDER IS REQUIRED TO COMPLY WITH THE REQUIREMENTS OF N.J.S.A. 10:5-31 et seq. AND N.J.A.C. 17:27-1 et seq., AND MUST SUBMIT WITH ITS BID FORM NO. 00810D, "Equal Employment Opportunities Response Sheet for Construction." BIDDER MUST ALSO COMPLY WITH PUBLIC WORKS CONTRACTOR REGISTRATION ACT, N.J.S.A. 34:11-56.48 et seq.), AND MUST SUBMIT WITH ITS BID A COPY OF ITS CURRENT CONTRACTOR REGISTRATION CERTIFICATE. BIDDER MUST ALSO SUBMIT A COPY OF ITS BUSINESS REGISTRATION CERTIFICATE ISSUED BY NEW JERSEY DEPARTMENT OF TREASURY PURSUANT TO N.J.S.A. 52:32-44. ALL BUSINESS ORGANIZATIONS THAT CONDUCT BUSINESS WITH A NEW JERSEY GOVERNMENT AGENCY ARE REQUIRED TO BE

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REGISTERED WITH THE NEW JERSEY DEPARTMENT OF TREASURY. THEREFORE, BIDDER MUST SUBMIT THE BUSINESS REGISTRATION CERTIFICATE FOR ITSELF AND ITS SUBCONTRACTORS, AT THE TIME OF THE BID SUBMISSION AS PROOF THAT, AT THE TIME OF THE BID, IT AND ITS SUBCONTRACTORS WERE REGISTERED WITH THE NEW JERSEY DEPARTMENT OF TREASURY, DIVISION OF REVENUE.

Bids must be made upon and in accordance with the forms provided in the Bid Documents. No bids will be received after the time and date specified above, and no bidder may withdraw its bid within sixty (60) days after bid opening.

The College reserves the right, pursuant to applicable law, to waive any informalities or to reject any or all bids.

Bid envelopes must be marked on the outside with “Bid No. P-2309” and indicate "Sealed Bid" in the lower left-hand corner.

DATE: November 22, 2019

For Bergen Community College
B. Golden, Director, Purchasing and Services

SECTION 00001 - TABLE OF CONTENTS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Use of premises.
4. Owner's occupancy requirements.
5. Work restrictions.
6. Specification formats and conventions.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: 1883 – BCC One-Stop Expansion

B. Owner: Bergen County Community College, 400 Paramus Road, Paramus, New Jersey

C. Architect: Arcari & Iovino Architects, P.C., One Katherine Street, Little Ferry, New Jersey

D. The Work consists of but is not limited to the following:
1. The Work includes the removal of existing walls, finishes and fixtures from the existing space. New construction will consist of walls, finishes and fixtures including new fire rated storefront and storefront with insulating glass. Existing mechanical and fire protection systems shall be modified for new layout. Data wiring, including fiber-optic cable is part of the work. An access control system is part of the work. The work includes alternates for furniture and replacement of atrium flooring.

1.4 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.5 USE OF PREMISES

A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Owner Occupancy: Allow for Owner occupancy of Project site and use by the public.
2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, the public, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
a. Schedule deliveries to minimize use of driveways and entrances.

b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Use of Existing Building: Contractor is not permitted to use the elevator or other areas of the existing building. Limited access to existing will be allowed for new plumbing and electric installations. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1.6 OWNER'S OCCUPANCY REQUIREMENTS

A. Owner Occupancy: Owner will occupy the premises during the construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits, unless otherwise indicated.
1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Owner not less than three (3) days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.
1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Contingency allowances.

C. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.

1. Contractor’s overhead shall be limited to 8% of the value of the work to which it is applied.
2. Contractor’s profit shall be limited to 5% of the value of the work to which it is applied.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Contingency Allowance: Include a contingency allowance of $300,000.00 for use according to Owner's written instructions.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other Work of the Contract.

C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1.

1. Base Bid: Do not provide furniture as shown on drawings F.101, F102, and F.103.
2. Alternate: Provide new furniture as shown on drawings F.101, F102, and F.103.

B. Alternate No. 2.

1. Base Bid: Existing brick flooring in atrium to remain.
2. Alternate: Provide new terrazzo tile flooring in atrium, including transitions at all doors and cross-corridors.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Document 002300 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
2. Section 012100 "Allowances" for products selected under an allowance.
3. Section 012300 "Alternates" for products selected under an alternate.
4. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to Architect.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. 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.
c. 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.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

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

1.7 SUBSTITUTIONS

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

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

   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.

B. Substitutions for Convenience: Not allowed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 MINOR CHANGES IN THE WORK

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

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request 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. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. 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.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to 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 Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
6. Contractor’s overhead shall be limited to 8% of the value of the work to which it is applied.
7. Contractor’s profit shall be limited to 5% of the value of the work to which it is applied
8. Contractor’s bonding cost shall be limited to 1% of the value of the work to which it is applied

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.5 CHANGE ORDER PROCEDURES

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
a. Application for Payment forms with continuation sheets.
b. Submittal schedule.
c. Items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
a. Project name and location.
b. Contractor's name and address.
c. Date of submittal.
2. Arrange schedule of values consistent with format of AIA Document G703.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
6. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
7. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
   1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
   1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
   2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
   3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
   4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

E. Stored Materials: Owner will not pay for materials stored but not installed.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit conditional final or full waivers.
   3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
   4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
   1. List of subcontractors.
   2. Schedule of values.
   3. Contractor's construction schedule (preliminary if not final).
   4. Products list (preliminary if not final).
   5. Schedule of unit prices.
   6. Submittal schedule (preliminary if not final).
   7. Copies of building permits.
   8. Certificates of insurance and insurance policies.
   9. Performance and payment bonds.
   10. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
   3. Updated final statement, accounting for final changes to the Contract Sum.
   4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
   5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
   6. AIA Document G707, “Consent of Surety to Final Payment.”
   7. Evidence that claims have been settled.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. BIM: Building Information Modeling.

B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and in prominent location in work area. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.
g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:

    a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire-Protection System: Show the following:

    a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

C. Coordination Drawing Process: Prepare coordination drawings in the following manner:

1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
4. Fire Sprinkler Installer will locate piping and equipment, using red color. Fire Sprinkler Installer shall forward drawing files to Electrical Installer.
5. Electrical Installer will indicate service and feeder conduit runs and equipment in green color. Electrical Installer shall forward drawing files to Communications and Electronic Safety and Security Installer.
6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment in purple color. Communications and Electronic Safety and Security Installer shall forward completed drawing files to Contractor.
7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.

1.7 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Owner name.
3. Owner's Project number.
4. Name of Architect.
5. Architect's Project number.
6. Date.
7. Name of Contractor.
8. RFI number, numbered sequentially.
9. RFI subject.
10. Specification Section number and title and related paragraphs, as appropriate.
11. Drawing number and detail references, as appropriate.
12. Field dimensions and conditions, as appropriate.
13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.

14. Contractor's signature.
15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: AIA Document G716.

1. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at each project meeting.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number, including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's CAD drawings may be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Digital Drawing Software Program: Contract Drawings are available in AutoCAD
4. Contractor shall execute a data licensing agreement in the form of agreement provided by Architect.

a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of agreement provided by Architect.

B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Phasing.
d. Critical work sequencing and long lead items.
e. Designation of key personnel and their duties.
f. Lines of communications.

g. Use of web-based Project software.
h. Procedures for processing field decisions and Change Orders.
i. Procedures for RFIs.
j. Procedures for testing and inspecting.
k. Procedures for processing Applications for Payment.
l. Distribution of the Contract Documents.
m. Submittal procedures.
n. Sustainable design requirements.
o. Preparation of Record Documents.
p. Use of the premises and existing building.
q. Work restrictions.
r. Working hours.
s. Owner's occupancy requirements.
t. Responsibility for temporary facilities and controls.
u. Procedures for moisture and mold control.
v. Procedures for disruptions and shutdowns.
w. Construction waste management and recycling.
x. Parking availability.
y. Office, work, and storage areas.
z. Equipment deliveries and priorities.
aa. First aid.
bb. Security.
cc. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Sustainable design requirements.
i. Review of mockups.
j. Possible conflicts.
k. Compatibility requirements.
l. Time schedules.
m. Weather limitations.
n. Manufacturer's written instructions.
o. Warranty requirements.
p. Compatibility of materials.
q. Acceptability of substrates.
r. Temporary facilities and controls.
s. Space and access limitations.
t. Regulations of authorities having jurisdiction.
u. Testing and inspecting requirements.

v. Installation procedures.
w. Coordination with other work.
x. Required performance results.
y. Protection of adjacent work.
z. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of Record Documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
c. Procedures for completing and archiving web-based Project software site data files.
d. Submittal of written warranties.
e. Requirements for completing sustainable design documentation.
f. Requirements for preparing operations and maintenance data.
g. Requirements for delivery of material samples, attic stock, and spare parts.
h. Requirements for demonstration and training.
i. Preparation of Contractor's punch list.
j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
k. Submittal procedures.
l. Coordination of separate contracts.
m. Owner's partial occupancy requirements.
n. Installation of Owner's furniture, fixtures, and equipment.
o. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Resolution of BIM component conflicts.
4) Status of submittals.
5) Status of sustainable design documentation.
6) Deliveries.
7) Off-site fabrication.
8) Access.
9) Site use.
10) Temporary facilities and controls.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) Status of RFIs.
16) Status of Proposal Requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Preliminary Construction Schedule.
   2. Submittals Schedule.

B. Related Sections include the following:
   1. Division 1 Section "Payment Procedures" for submitting the Schedule of Values.
   2. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
   3. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 SUBMITTALS

A. Submittals Schedule: Submit five copies of schedule. Arrange the following information in a tabular format:
   1. Scheduled date for first submittal.
   2. Specification Section number and title.
   3. Submittal category (action or informational).
   4. Name of subcontractor.
   5. Description of the Work covered.
   6. Scheduled date for Architect's final release or approval.

B. Preliminary Construction Schedule: Submit five printed copies.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
   1. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 20 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.

PART 3 - EXECUTION

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections include the following:
1. Division 1 Section "Payment Procedures" for submitting Applications for Payment.
2. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
3. Division 1 Section "Quality Requirements" for submitting test and inspection reports.
4. Division 1 Section "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings will **not** be provided by Architect for Contractor's use in preparing submittals.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of complete submittal.
   1. Initial and Subsequent Reviews: Allow 10 business days for initial review of each submittal. If submittal requires engineering consultant review, then allow 20 business days. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
   2. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is required, allow 15 days for initial review of each submittal.
   3. Insert list of submittals below requiring concurrent review, or delete and identify submittals in the Sections where they are specified. Structural, mechanical, plumbing, and electrical components are examples of the Work that often require concurrent review.
   4. If intermediate submittal is necessary, process it in same manner as initial submittal.
   5. Allow 10 days for processing each resubmittal.
   6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

E. Identification: Place a permanent label or title block on each submittal for identification.
   1. Indicate name of firm or entity that prepared each submittal on label or title block.
   2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
   3. Include the following information on label for processing and recording action taken:
      a. Project name.
      b. Date.
      c. Name and address of Architect.
      d. Name and address of Contractor.
      e. Name and address of subcontractor.
      f. Other necessary identification.

F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, discard submittals received from sources other than Contractor.
   1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
   2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
   3. Transmittal Form: Provide locations on form for the following information:
      a. Project name.
      b. Date.
      c. Names of subcontractor, manufacturer, and supplier.
      d. Category and type of submittal.
      e. Submittal purpose and description.
      f. Submittal and transmittal distribution record.
      g. Signature of transmitter.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Number of Copies: Submit 7 copies of each submittal, unless otherwise indicated. Architect, will return 5 copies. Mark up and retain one returned copy as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's product specifications.
   b. Compliance with recognized trade association standards.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Include the following information, as applicable:
   a. Dimensions.
   b. Fabrication and installation drawings.
   c. Compliance with specified standards.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
3. Number of Copies: Submit 5 blue- or black-line prints of each submittal, unless prints are required for operation and maintenance manuals. Submit 5 prints where prints are required for operation and maintenance manuals. Architect will retain three prints; remainder will be returned.

D. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

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

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.
1. Number of Copies: Submit three copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

C. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. NO EXCEPTION: No exceptions taken, Shop Drawings accepted.
2. EXCEPTIONS AS NOTED: Resubmit for record, Shop Drawing accepted as noted.
3. RESUBMIT: Revise and resubmit, do not fabricate.
4. REJECTED: Do not resubmit, do not fabricate.

Any notations by the Architect shall not be construed as relieving the Contractor from responsibility for compliance with the Contract Documents. The Contractor is responsible for all details and their accuracy, for confirming and correlating all dimensions and quantities, for coordination with other Prime Contractors, for selection of fabrication process, for techniques of assembly and for executing the installation in a safe manner. The review of a specific item shall not imply the review of an entire assembly of which the item is a component unless the whole assembly is submitted and reviewed.

C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

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

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.

1.4 SUBMITTALS

A. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Description of the Work and test and inspection method.
6. Identification of product and Specification Section.
7. Complete test or inspection data.
8. Test and inspection results and an interpretation of test results.
9. Ambient conditions at time of sample taking and testing and inspecting.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

1.6 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
   2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor**,** and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
   1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
      a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
   2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
   3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.
1. Testing agency will notify Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and reinspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections include the following:
   1. Division 1 Section "Summary" for limitations on utility interruptions and other work restrictions.
   2. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
   3. Division 1 Section "Execution Requirements" for progress cleaning requirements.

1.3 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. Storage and Fabrication Sheds: Contractor’s option.
   1. Store combustible materials apart from building.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

D. Sanitary Facilities: Use of Owners sanitary facilities will be permitted.

E. Electric Power Service: Use of Owner's existing electric power service will be permitted.

F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.2 SUPPORT FACILITIES INSTALLATION

A. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

B. Police vehicles are to have access to site. Maintain clear drive aisle at all times.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Comply with work restrictions specified in Division 1 Section "Summary."

B. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
   1. Prohibit smoking in hazardous fire-exposure areas.
   2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
   3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.4 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. Related Sections include the following:
1. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
2. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
   1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
   2. Form: Tabulate information for each product under the following column headings:
      a. Specification Section number and title.
      b. Generic name used in the Contract Documents.
      c. Proprietary name, model number, and similar designations.
      d. Manufacturer's name and address.
      e. Supplier's name and address.
      f. Installer's name and address.
      g. Projected delivery date or time span of delivery period.
      h. Identification of items that require early submittal approval for scheduled delivery date.
   3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
      a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
   4. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
   5. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified material or product cannot be provided.
      b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      e. Samples, where applicable or requested.
      f. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
      g. Cost information, including a proposal of change, if any, in the Contract Sum.
      h. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
      i. 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.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
   a. Form of Acceptance: Change Order.
   b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
   a. Form of Approval: As specified in Division 1 Section "Submittal Procedures."
   b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.

D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:
1. Store materials in a manner that will not endanger Project structure.
2. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
3. Store cementitious products and materials on elevated platforms.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
7. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
8. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
    a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

2.2 PRODUCT SUBSTITUTIONS

A. 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:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution is compatible with other portions of the Work.
7. Requested substitution has been coordinated with other portions of the Work.
8. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

A. Conditions: Architect will consider Contractor's request for comparable product 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:
   1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents, and will produce the indicated results, and that it is compatible with other portions of the Work.
   2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
   3. Evidence that proposed product provides specified warranty.
   4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
   5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Installation of the Work.
3. Cutting and patching.
4. Coordination of Owner's portion of the Work.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for coordination of Owner-furnished products, and limits on use of Project site.
2. Section 013300 "Submittal Procedures" for submitting surveys.
3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
5. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

    a. Primary operational systems and equipment.
    b. Fire separation assemblies.
    c. Air or smoke barriers.
    d. Fire-suppression systems.
    e. Plumbing piping systems.
    f. Mechanical systems piping and ducts.
    g. Control systems.
    h. Communication systems.
    i. Fire-detection and -alarm systems.
    j. Conveying systems.
    k. Electrical wiring systems.
    l. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

    a. Water, moisture, or vapor barriers.
    b. Membranes and flashings.
    c. Exterior curtain-wall construction.
    d. Sprayed fire-resistive material.
    e. Equipment supports.
    f. Piping, ductwork, vessels, and equipment.
    g. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings. If discrepancies are discovered, notify Architect promptly.

3.4 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb, and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces, unless otherwise indicated on Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.5 CUTTING AND PATCHING

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of Work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, 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 chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. 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 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.
6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: 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.

a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 COORDINATION OF OWNER'S PORTION OF THE WORK

A. Site Access: Provide access to Project site for Owner's construction personnel.

1. Provide temporary facilities required for Owner-furnished, Contractor-installed and Owner-furnished, Owner-installed products.
2. Refer to Section 011000 "Summary" for other requirements for Owner-furnished, Contractor-installed and Owner-furnished, Owner-installed products

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

A. Clean work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

B. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

C. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

F. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

I. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

D. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Inspection procedures.
   2. Warranties.
   3. Final cleaning.

B. Related Sections include the following:
   1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
   2. Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
   3. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
   4. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   4. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
   5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
   6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
   7. Compete startup testing of systems.
   8. Complete final cleaning requirements, including touchup painting.
   9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
   2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   2. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Contractor.
      e. Page number.

1.6 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
   a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
   c. Remove labels that are not permanent.
   d. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
   e. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.
   f. Replace parts subject to unusual operating conditions.
   g. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
   h. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
   i. Clean ducts, blowers, and coils if units were operated without filters during construction.
   j. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
   k. Leave project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Requirements:

1. Section 017700 "Closeout Procedures" for general closeout procedures.
2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

E. Reports: Submit written report at each progress meeting indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

a. Project name.

b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

B. Format: Submit record specifications as annotated PDF electronic file.

1.6 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

C. Format: Submit Record Product Data as annotated PDF electronic file.

1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017839

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Demolition and removal of selected site elements.

B. Related Requirements:
1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

C. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for dust control and for noise control. Indicate proposed locations and construction of barriers.

B. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before Work begins.

C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

D. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
1. Before selective demolition, Owner will remove the following items:
   a. Furnishing deemed reusable to Owner.
   b. Equipment deemed reusable to Owner.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

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

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. 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 selective building demolition operations.
   1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings.
   1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
   2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
      a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
      b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
      c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
      d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

f. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
3. Cover and protect furniture, furnishings, and equipment that have not been removed.
4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's Recommended Work Practices for the Removal of Resilient Floor Coverings. Do not use methods requiring solvent-based adhesive strippers.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

3.8 CLEANING

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

END OF SECTION 024119

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Wood blocking.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:
1. Fire-retardant-treated wood.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
   1. Treatment shall not promote corrosion of metal fasteners.
   2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
   3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664 and design value adjustment factors shall be calculated according to ASTM D6841.

C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
   1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.

F. Application: Treat all rough carpentry unless otherwise indicated

2.3 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking and nailers: Utility, Construction or Stud grade lumber of any species.

B. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.4 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
   1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fastener with hot-dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Provide blocking as indicated and as required to support facing materials, fixtures, specialty items, and trim.

D. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
2. ICC-ES evaluation report for fastener.

F. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 PROTECTION

A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 064116 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad architectural cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-clad architectural cabinets that are not concealed within other construction.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.
2. Section 123661.16 "Solid Surfacing Countertops."

1.3 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

B. Hardware Coordination: Distribute copies of approved hardware schedule specified on finish plan drawing; coordinate Shop Drawings and fabrication with hardware requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.

C. Samples: For each exposed product and for each color and texture specified, in manufacturer's or manufacturer's standard size.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

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

1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

B. Architectural Woodwork Standards Grade: Custom.

C. Type of Construction: Frameless.

D. Drawer-Front Style: Flush overlay.

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.

1. Basis of Design Manufacturer: Wilsonart or approved equal.

F. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.
2. Postformed Surfaces: Grade HGP.
3. Vertical Surfaces: Grade HGS.
4. Edges: Grade HGS.
5. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.

G. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.

a. Edges of Plastic-Laminate Shelves: PVC tape, 0.018-inch (0.460-mm) minimum thickness, matching laminate in color, pattern, and finish.

2. Drawer Sides and Backs: Solid-hardwood lumber.
3. Drawer Bottoms: Hardwood plywood.

H. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.

I. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

J. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners.

K. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As selected by Architect from laminate manufacturer's full range.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

1. Use treated materials that comply with requirements of referenced quality standard. Do not use materials that are warped, discolored, or otherwise defective.

2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

B. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested according to ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Kiln-dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.
2. For items indicated to receive a stained or natural finish, use organic resin chemical formulation.
3. Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking shop certified by testing and inspecting agency.
4. Mill lumber before treatment and implement procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of architectural cabinets.

2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.

B. Wire Pulls: As indicated on finish plan drawing.

C. Drawer Slides: ANSI/BHMA A156.9.

1. Grade 1 and Grade 2: Side mounted and extending under bottom edge of drawer.

a. Type: Full extension.
b. Material: Zinc-plated steel with polymer rollers.

2. Grade 1HD-100: Side mounted; full-extension type; zinc-plated-steel ball-bearing slides.

D. Drawer Silencers: ANSI/BHMA A156.16, L03011.

E. Grommets for Cable Passage: 2-inch (51-mm) OD, molded-plastic grommets and matching plastic caps with slot for wire passage.

1. Color: Black.

F. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.

1. Satin Stainless Steel: ANSI/BHMA 630.

G. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.

D. Adhesive for Bonding Edges: Adhesive specified above for faces.

2.6 FABRICATION

A. Fabricate architectural cabinets to dimensions, profiles, and details indicated.

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

1. Notify Architect seven days in advance of the dates and times architectural cabinet fabrication will be complete.
2. Trial fit assemblies at manufacturer's shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

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

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.

B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.

1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

3.3 ADJUSTING AND CLEANING

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

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION 064116

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Penetrations in fire-resistance-rated walls.

B. Related Requirements:
1. Section 078442 "Joint Firestopping" for joints in or between fire-resistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approval according to FM Approval 4991, "Approval Standard for Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:
1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
1) UL in its "Fire Resistance Directory"

2.2 PENETRATION FIRESTOPPING SYSTEMS

A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. Grace Construction Products.
2. Johns Manville
3. Tremco, Inc.; Tremco Fire Protection Systems Group
4. USG Corporation
5. Or approved equal.

B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.

D. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration

firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

1. Permanent forming/damming/backing materials.
2. Substrate primers.
3. Collars.
4. Steel sleeves.

2.3 FILL MATERIALS

A. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

B. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

C. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.

D. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.

E. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

F. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

G. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.

H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

2.4 MIXING

A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
   1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.

C. Install fill materials by proven techniques to produce the following results:
   1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items to achieve required fire-resistance ratings.
   2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
   3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
   1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.

B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
   2. Contractor's name, address, and phone number.
   3. Designation of applicable testing and inspecting agency.
   4. Date of installation.
   5. Manufacturer's name.
   6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.

B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

3.7 PENETRATION FIRESTOPPING SYSTEM SCHEDULE

A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHEZ.

B. Penetration Firestopping Systems for Metallic Pipes, Conduit, or Tubing:
   1. UL-Classified Systems: W-J-1089.
   2. F-Rating: 1 hour.
   3. T-Rating: 0 hour.
   4. W-Rating: No leakage of water at completion of water leakage testing.
   5. Type of Fill Materials: As required to achieve rating.

C. Penetration Firestopping Systems for Nonmetallic Pipe, Conduit, or Tubing:
   1. UL-Classified Systems: W-J-2005.
   2. F-Rating: 1 hour.
   3. T-Rating: 1 hour.
   4. W-Rating: No leakage of water at completion of water leakage testing.

5. Type of Fill Materials: As required to achieve rating.

D. Penetration Firestopping Systems for Electrical Cables:
1. UL-Classified Systems: W-J-3024.
2. F-Rating: 1 hour.
3. T-Rating: 3/4 hour.
4. W-Rating: No leakage of water at completion of water leakage testing.
5. Type of Fill Materials: As required to achieve rating.

E. Penetration Firestopping Systems for Insulated Pipes:
1. UL-Classified Systems: W-J-5013.
2. F-Rating: 1 hour.
3. T-Rating: 1 hour.
4. W-Rating: No leakage of water at completion of water leakage testing.
5. Type of Fill Materials: As required to achieve rating.

F. Penetration Firestopping Systems for Miscellaneous Mechanical Penetrants:
1. UL-Classified Systems: W-J-7009.
2. F-Rating: 1 hour.
3. T-Rating: 0 hour.
4. W-Rating: No leakage of water at completion of water leakage testing.
5. Type of Fill Materials: As required to achieve rating.

END OF SECTION 078413

SECTION 078443 - JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Joints in or between fire-resistance-rated constructions.

B. Related Requirements:
1. Section 078413 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers and for wall identification.
2. Section 092216 "Non-Structural Metal Framing" for firestop tracks for metal-framed partition heads.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each joint firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.

B. Coordinate sizing of joints to accommodate joint firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:
1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
1) UL in its "Fire Resistance Directory."

2.2 JOINT FIRESTOPPING SYSTEMS

A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.
1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.

C. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.

D. Accessories: Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
   1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
   2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
   1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
   2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
   3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2393.

B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.

C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.5 CLEANING AND PROTECTION

A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.

B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

3.6 JOINT FIRESTOPPING SYSTEM SCHEDULE

A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN.

B. Head-of-Wall, Fire-Resistive Joint Firestopping Systems:
1. UL-Classified Systems: HW-D-0337.
2. Assembly Rating: 1 hour.
3. Nominal Joint Width: As indicated.

C. Bottom-of-Wall, Joint Firestopping Systems:
1. UL-Classified Systems: BW-S-0001.
2. Assembly Rating: 1 hour.
3. Nominal Joint Width: As indicated.

D. Wall-to-Wall, Joint Firestopping Systems:
1. UL-Classified Systems: WW-D-0040.
2. Assembly Rating: 1 hour.
3. Nominal Joint Width: As indicated.

END OF SECTION 078443

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Silicone joint sealants.
2. Latex joint sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples for Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

C. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.
1. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.

1.6 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
   1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.
   1. Basis of design by: Sika Corporation or approved equal.

2.3 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

1. Basis of design by: Pecora Corpoation or approved equal.

2.4 JOINT-SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C1330, Type C closed-cell material with a surface skin, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   a. Masonry.
3. Remove laitance and form-release agents from concrete.

4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.
   c. Masonry

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.
   4. Provide flush joint profile at according to Figure 8B in ASTM C1193.
   5. Provide recessed joint configuration of recess depth according to Figure 8C in ASTM C1193.
      a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Interior standard steel doors and frames.

B. Related Requirements:
1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.

7. Details of anchorages, joints, field splices, and connections.
8. Details of accessories.
9. Details of moldings, removable stops, and glazing.

C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly, windborne-debris impact resistance door and thermally rated door assemblies for tests performed by a qualified testing agency indicating compliance with performance requirements.

1.7 CLOSEOUT SUBMITTALS

A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.2 INTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm).
c. Face: Uncoated steel sheet, minimum thickness of 0.042 inch (1.0 mm).
d. Edge Construction: Model 1, Full Flush.
e. Edge Bevel: Bevel lock edge 1/8 inch in 2 inches (3.2 mm in 51 mm).
f. Fire-Rated Core: Manufacturer's standard core for fire-rated doors.

2. Frames:

a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
b. Construction: Slip-on drywall and Face welded.

3. Exposed Finish: Prime.

2.3 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized according to ASTM A153/A153M, Class B.

2.4 MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.

D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

E. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

F. Glazing: Comply with requirements in Section 088000 "Glazing."

2.5 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.6 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

    a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.

2. Fire-Rated Openings: Install frames according to NFPA 80.
3. Floor Anchors: Secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

4. Solidly pack mineral-fiber insulation inside frames.
5. In Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
6. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
2. Smoke-Control Doors: Install doors according to NFPA 105.

3.3 REPAIR

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Five-ply flush wood veneer-faced doors for transparent finish.
2. Factory finishing flush wood doors.
3. Factory machining for hardware.

B. Related Requirements:
1. Section 088000 – "Glazing" for glass view panels in flush wood doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:
1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Factory-machining criteria.
5. Factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:
1. Door schedule indicating door location, type, size, and swing.
2. Door elevations, dimension and locations of hardware, lite cutouts, and glazing thicknesses.
3. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
4. Dimensions and locations of blocking for hardware attachment.
5. Dimensions and locations of mortises and holes for hardware.
6. Clearances and undercuts.
7. Requirements for veneer matching.
8. Doors to be factory finished and application requirements.

C. Samples for Selection: For factory-finished doors.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Special warranties.

B. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Delamination of veneer.
      b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
      c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
   2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
   3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain flush wood doors and wood paneling from single manufacturer.

2.2 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Doors:
   1. Basis of Design: Mohawk Doors. Provide doors by basis of design manufacturer or approved equal.
   2. Performance Grade: ANSI/WDMA I.S. 1A Heavy Duty.
   3. ANSI/WDMA I.S. 1A Grade: Custom.
   4. Faces: Single-ply wood veneer not less than 1/50 inch thick.
      a. Species: As selected by Architect from Manufacturer’s full range.

b. Veneer Cut and Match: As selected by Architect from Manufacturer's full range.

5. Exposed Vertical and Top Edges: Same species as faces or a compatible species - Architectural Woodwork Standards edge Type A.
   a. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
      1) Screw-Holding Capability: 475 lbf in accordance with WDMA T.M. 10.
6. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.3 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated.
   1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied.
   1. Locate hardware to comply with DHI-WDHS-3.
   2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
   3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
   4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.

C. Openings: Factory cut and trim openings through doors.
   1. Light Openings: Trim openings with moldings of material and profile indicated.
   2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 – "Glazing."

2.4 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.
   1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   2. Finish faces, all four edges, edges of cutouts, and mortises.
   3. Stains and fillers may be omitted on edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:
   1. ANSI/WDMA I.S. 1A Grade: Custom.
   2. Staining and Finish: Match existing wood doors at Library.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.
   1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.

2. Reject doors with defects.

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

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Install frames level, plumb, true, and straight.
1. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
2. Anchor frames to anchors or blocking built in or directly attached to substrates.
   a. Secure with countersunk, concealed fasteners and blind nailing.
   b. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork.
      1) For factory-finished items, use filler matching finish of items being installed.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

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

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 083313 - COILING COUNTER DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Counter door assemblies.

B. Related Requirements:

1. Section 099123 "Interior Painting" for finish painting of factory-primed doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of coiling counter door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
3. Include description of automatic closing device and testing and resetting instructions.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Show locations of controls, locking devices and other accessories.
5. Include diagrams for power, signal, and control wiring.

C. Samples for Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For coiling counter doors to include in maintenance manuals.

B. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain coiling counter doors from single source from single manufacturer.

1. Obtain operators and controls from coiling counter door manufacturer.

2.2 COUNTER DOOR ASSEMBLY

A. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.

1. Basis of Design Product: C.H.I. Overhead Doors, Model 6544 or approved equal.

B. Operation Cycles: Door components and operators capable of operating for not less than 20,000 cycles. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1. Include tamperproof cycle counter.

C. Door Curtain Material: Aluminum.

D. Door Curtain Slats: Flat profile slats of 1-1/2-inch (38-mm) center-to-center height.

E. Bottom Bar: Manufacturer's standard continuous channel or tubular shape, fabricated aluminum extrusion and finished to match door.

F. Curtain Jamb Guides: Aluminum with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.

G. Hood: Match curtain material and finish.

1. Shape: Square.
2. Mounting: Face of wall.

H. Sill Configuration: No sill.

I. Locking Devices: Equip door with locking device assembly.

1. Locking Device Assembly: Cylinder lock, operable from inside and outside with cylinders.

J. Electric Door Operator:

1. Usage Classification: Light duty, up to 10 cycles per hour.
2. Operator Location: Internally mounted in barrel.
3. Motor Exposure: Interior.
4. Motor Electrical Characteristics:

a. Horsepower: 1/4 hp.
b. Voltage:

1) 115-V ac, single phase, 60 Hz.

5. Emergency Manual Operation: Push-up type.
6. Obstruction-Detection Device: Automatic pneumatic sensor edge on bottom bar; self-monitoring type.

a. Sensor Edge Bulb Color: Black.

7. Control Station(s): Interior-side mounted.

K. Curtain Accessories: Equip door with push/pull handles.

L. Door Finish:

1. Aluminum Finish: Clear anodized.
2. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face

2.3 MATERIALS, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 DOOR CURTAIN MATERIALS AND FABRICATION

A. Door Curtains: Fabricate coiling counter door curtain of interlocking metal slats in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
1. Aluminum Door Curtain Slats: ASTM B221 (ASTM B221M) extrusions, alloy and temper standard with manufacturer for type of use and finish indicated; thickness of 0.050 inch (1.27 mm); and as required.

B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.5 HOODS

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb

mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

1. Aluminum: 0.040-inch- (1.02-mm-) thick aluminum sheet complying with ASTM B209 (ASTM B209M), of alloy and temper recommended by manufacturer and finisher for type of use and finish indicated.

2.6 LOCKING DEVICES

A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

1. Lock Cylinders: As specified in Section 087100 "Door Hardware"and keyed to building keying system.
2. Keys: Three for each cylinder.

B. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.7 CURTAIN ACCESSORIES

A. Astragal: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.

B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

2.8 COUNTERBALANCE MECHANISM

A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, seamless or welded carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.

C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.

D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.

E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.9 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-

prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Comply with NFPA 70.
2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door Operator Location(s): Operator location indicated for each door.

1. Internally mounted in barrel.

D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated for each door assembly.

1. Electrical Characteristics: Minimum as indicated for each door assembly. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
3. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.

E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

F. Obstruction-Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.

1. Electric Sensor Edge: Automatic safety sensor edge, located within astragal mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.

a. Self-Monitoring Type: Four-wire-configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.

G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."

1. Type: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).

I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from

floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

2.10 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.11 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

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

3.2 INSTALLATION, GENERAL

A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Install coiling counter doors, hoods, controls, and operators at the mounting locations indicated for each door.

3.3 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. After electrical circuitry has been energized, operate doors to confirm proper motor rotation and door performance.
3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

3.5 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of coiling-door Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Perform maintenance, including emergency callback service, during normal working hours.
2. Include 24-hour-per-day, seven-day-per-week, emergency callback service.

3.6 DEMONSTRATION

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

END OF SECTION 083313

SECTION 084113 - ALUMINUM-FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Aluminum-framed storefront systems.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For aluminum-framed storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed storefronts, showing the following:

a. Joinery, including concealed welds.
b. Anchorage.
c. Expansion provisions.
d. Glazing.

C. Samples: For each type of exposed finish required, in manufacturer's standard sizes.

D. Product Test Reports: For aluminum-framed storefronts, for tests performed by a qualified testing agency.

E. Quality-Control Program: Developed specifically for Project, including fabrication and installation, according to recommendations in ASTM C1401. Include periodic quality-control reports.

F. Source quality-control reports.

G. Field quality-control reports.

H. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-framed storefronts to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified according to ASTM E699 for testing indicated and accredited by the International Accreditation Service or the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement as complying with ISO/IEC 17025 and acceptable to Owner and Architect.

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including, but not limited to, excessive deflection.
b. Noise or vibration created by wind and thermal and structural movements.
c. Deterioration of metals and other materials beyond normal weathering.
d. Water penetration through fixed glazing and framing areas.
e. Failure of operating components.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Warranty Period: Two-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Kawneer Company, Inc., Trifab 400 center glazed.

B. Source Limitations: Obtain all components of aluminum-framed storefront system, including framing and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

   a. Thermal stresses transferring to building structure.
   b. Glass breakage.
   c. Noise or vibration created by wind and thermal and structural movements.
   d. Loosening or weakening of fasteners, attachments, and other components.
   e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

C. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to an amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).

   a. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units.

3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:

D. Structural: Test according to ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies do not evidence deflection exceeding specified limits.

2.3 STOREFRONT SYSTEMS

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Framing Construction: Non-thermally broken.
2. Glazing System: Retained mechanically with gaskets on two sides and structural sealant on two sides.
3. Glazing Plane: Center.

4. Finish: Clear anodic finish.
5. Fabrication Method: Field-fabricated stick system.
6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
7. Steel Reinforcement: As required by manufacturer.

B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.4 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: Comply with Section 088000 "Glazing."

D. Structural Glazing Sealants: ASTM C1184 chemically curing silicone formulation that is compatible with system components with which it comes in contact; specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in storefront system indicated.

1. Color: As selected by Architect from manufacturer's full range of colors.

2.5 MATERIALS

A. Sheet and Plate: ASTM B209 (ASTM B209M).

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221 (ASTM B221M).

C. Extruded Structural Pipe and Tubes: ASTM B429/B429M.

D. Structural Profiles: ASTM B308/B308M.

E. Steel Reinforcement (if required):

1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

F. Steel Reinforcement Primer (if required): Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

2.6 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.

C. Concealed Flashing: Dead-soft, 0.018-inch- (0.457-mm-) thick stainless steel, complying with ASTM A240/A240M, of type recommended by manufacturer.

D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

F. Storefront Framing: Fabricate components for assembly using manufacturer's standard installation instructions.

G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.9 SOURCE QUALITY CONTROL

A. Structural Sealant: Perform quality-control procedures complying with ASTM C1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Install joint filler behind sealant as recommended by sealant manufacturer.

I. Install components plumb and true in alignment with established lines and grades.

3.3 INSTALLATION OF GLAZING

A. Install glazing as specified in Section 088000 "Glazing."

3.4 INSTALLATION OF STRUCTURAL GLAZING

A. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

B. Set glazing into framing according to sealant manufacturer and framing manufacturer's written instructions and standard practice. Use a spacer or backer as recommended by manufacturer.

C. Hold glazing in place using temporary retainers of type and spacing recommended by manufacturer, until structural sealant joint has cured.

D. Apply structural sealant to completely fill cavity, according to sealant manufacturer and framing manufacturer's written instructions and in compliance with local codes.

E. Apply structural sealant at temperatures indicated by sealant manufacturer for type of sealant.

F. Allow structural sealant to cure according to manufacturer's written instructions.

G. Clean and protect glass as indicated in Section 088000 "Glazing."

3.5 ERECTION TOLERANCES

A. Install aluminum-framed storefronts to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
3. Alignment:
    a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
    b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
    c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).
4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

END OF SECTION 084113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

2. Cylinders for door hardware specified in other Sections.
3. Electrified door hardware.

B. Related Requirements:

1. Section 064116 "Plastic-Laminate Clad Architectural Cabinets" for cabinet door hardware provided with cabinets.
2. Section 087113 "Automatic Door Operators" for low-energy power operators and low-energy power-assist operators.
3. Section 16000 "Electrical" for connections to building fire-alarm system.
4. Section 281300 “Security Access Control System” for card readers, wiring harnesses, request-to-exit detectors, and door contacts.

1.3 COORDINATION

A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation and Keying Conference: Conduct conference at Project site.

1. Conference participants shall include Installer's Architectural Hardware Consultant and Owner's security consultant.

2. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:

    a. Flow of traffic and degree of security required.
    b. Requirements for key control system.
    c. Requirements for access control.
    d. Address for delivery of keys.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For electrified door hardware.

1. Include diagrams for power, signal, and control wiring.
2. Include details of interface of electrified door hardware and building safety and security systems.

C. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant. Coordinate door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Submittal Sequence: Submit door hardware schedule after or concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
2. Format: Use same scheduling sequence and format and use same door numbers as in door hardware schedule in the Contract Documents.
3. Content: Include the following information:

    a. Identification number, location, hand, fire rating, size, and material of each door and frame.
    b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
    d. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
    e. Fastenings and other installation information.
    f. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
    g. Mounting locations for door hardware.
    h. List of related door devices specified in other Sections for each door and frame.

D. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Architectural Hardware Consultant.

B. Product Certificates: For each type of electrified door hardware.

1. Certify that door hardware for use on each type and size of labeled fire-rated doors complies with listed fire-rated door assemblies.

C. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals.

B. Schedules: Final door hardware and keying schedule.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedule.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as an Architectural Hardware Consultant (AHC) and an Electrified Hardware Consultant (EHC).

1.9 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to Owner by registered mail or overnight package service.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Structural failures including excessive deflection, cracking, or breakage.
   b. Faulty operation of doors and door hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:
   a. Exit Devices: Two years from date of Substantial Completion.
   b. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of door hardware from single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 Pa) of water.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
2. Comply with the following maximum opening-force requirements:

   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
   b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.

4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.
5. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.3 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

1. Basis of Design Product: As indicated on drawings, or approved equal.

2.4 CONTINUOUS HINGES

A. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.

1. Basis of Design Product: As indicated on drawings, or approved equal.

2.5 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in door hardware schedule.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Bored Locks: Minimum 1/2-inch (13-mm) latchbolt throw.
2. Mortise Locks: Minimum 3/4-inch (19-mm) latchbolt throw.

C. Lock Backset: 2-3/4 inches (70 mm) unless otherwise indicated.

D. Lock Trim:

1. Description: As indicated on Drawings.
2. Levers: [Wrought] [Forged] [Cast].
3. Escutcheons (Roses): [Wrought] [Forged] [Cast].

E. Strikes: On doors not equipped with electric strikes, provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

F. Bored Locks: BHMA A156.2; Grade 1; Series 4000.

1. Product: As indicated on drawings, no substitutions will be accepted

G. Mortise Locks: BHMA A156.13; [Operational Grade 1] [Security Grade 1]; stamped steel case with steel or brass parts; Series 1000.

1. Product: As indicated on drawings, no substitutions will be accepted

2.6 ELECTRIC STRIKES

A. Electric Strikes: BHMA A156.31; Grade 1; with faceplate to suit lock and frame.

1. Product: As indicated on drawings, no substitutions will be accepted

2.7 ELECTROMECHANICAL LOCKS

A. Electromechanical Locks: BHMA A156.25; Grade 1; motor or solenoid driven; with strike that suits frame.

1. Product: As indicated on drawings, no substitutions will be accepted

2.8 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Product: As indicated on drawings, no substitutions will be accepted

2.9 LOCK CYLINDERS

A. Standard Lock Cylinders: BHMA A156.5; Grade 1 permanent cores; face finished to match lockset.

1. Core Type: Interchangeable.
2. Product: As indicated on drawings, no substitutions will be accepted

B. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.10 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying conference.

B. Keys: Nickel silver or Brass.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: "DO NOT DUPLICATE."

2.11 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Product: As indicated on drawings, no substitutions will be accepted

2.12 MECHANICAL STOPS AND HOLDERS

A. Wall-Mounted Stops: BHMA A156.16.

1. Basis of Design Product: As indicated on drawings, or approved equal.

2.13 ELECTROMAGNETIC STOPS AND HOLDERS

A. Electromagnetic Door Holders: BHMA A156.15, Grade 1; wall-mounted electromagnetic single unit with strike plate attached to swinging door; coordinated with fire detectors and interface with fire-alarm system for labeled fire-rated door assemblies.

1. Basis of Design Product: As indicated on drawings, or approved equal.

2.14 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Basis of Design Product: As indicated on drawings, or approved equal.

2.15 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Basis of Design Product: As indicated on drawings, or approved equal.

B. Maximum Air Leakage: When tested according to ASTM E283 with tested pressure differential of 0.3-inch wg (75 Pa), as follows:

1. Smoke-Rated Gasketing: 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) of door opening.
2. Gasketing on Double Doors: 0.50 cfm per foot (0.000774 cu. m/s per m) of door opening.

2.16 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Basis of Design Product: As indicated on drawings, or approved equal.

2.17 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fire-Rated Applications:

a. Wood or Machine Screws: For the following:

1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors.
2) Strike plates to frames.
3) Closers to doors and frames.

b. Steel Through Bolts: For the following unless door blocking is provided:

1) Closers to doors and frames.
2) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.18 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.2 PREPARATION

A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with door and hardware manufacturers' written instructions.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying schedule.

E. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings.

1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

F. Thresholds: Set thresholds indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch perimeter gasketing to install other surface-applied hardware.

H. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

I. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
2. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 70 degrees and so that closing time complies with accessibility requirements of authorities having jurisdiction.
3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.8 DEMONSTRATION

A. Engage Installer to train Owner's maintenance personnel to adjust, operate, and maintain door hardware.

END OF SECTION 087100

SECTION 087113 - AUTOMATIC SWINGING DOOR OPERATORS

Part 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install automatic swing door equipment as indicated on drawings and specifications.

B. Related work specified elsewhere.
(See note to Specifier*)

C. Electrical Supply: Section

1.2 REFERENCES

A. American Association of Automatic Door Manufacturers (AAADM) - www.aaadm.com

B. American National Standards Institute (ANSI) - www.ansi.org

C. Builders' Hardware Manufacturers Association (BHMA) - www.buildershardware.com

D. Underwriters Laboratory, Inc. (UL) - www.ul.com

E. Canadian Standards Association (CSA) - www.csa.ca

F. National Fire Protection Association (NFPA) - www.nfpa.org

G. International Code Council (ICC) - www.iccsafe.org

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer to have at least (5) five years experience in the fabrication of automatic and manual entrance systems.

B. Installer's Qualifications: Products specified shall be represented by a factory authorized and trained distributor. Distributor shall be AAADM Certified, maintain a parts inventory and have trained service personnel with experience installing and maintaining units indicated for this project.

C. All automatic equipment to comply with UL325 (USA and Canada).

D. All automatic equipment to comply with ANSI A156.19.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product and complete installation data for all materials covered in this section.

B. Shop Drawings: Submit complete elevations, details and methods of anchorage to location; installation of hardware; size, shape, joints and connections; and details of joining with other construction.

C. Templates and Diagrams: As needed shall be furnished to fabricators and installers of related work for coordination of swinging door system with concrete work, electrical work, and other related work.

D. A copy of appropriate manual shall be provided to owner / contractor upon completion of installation.

1.5 SUBSTITUTIONS

A. Gyro Tech equipment as manufactured by NABCO ENTRANCES, INC. has been specified and shall be quoted as the base bid. Proposals for substitution products may be submitted by the bidding contractors a minimum of 10 days prior to bid due date. The proposed substitution shall meet the quality and performance standards described in this specification.

1.6 JOB SITE CONDITIONS

A. Site Survey: Verify site conditions including, but not limited to the following; opening sizes, floor conditions, plumb and level mounting surfaces (substrates shall be of proper dimension and material).

B. Coordinate installation with glass, glazing, hardware and electrical to avoid construction delays.

1.7 WARRANTY

A. Warranted materials shall be free of defects in material and workmanship for a period of one year from date of substantial completion. During the warranty period the Owner shall request NABCO factory-trained technicians to perform service. Warranty repairs are provided during normal business hours. Owner to receive warranty after completion of installation.

1.8 COMPLIANCE

A. A completed American Association of Automatic Door Manufacturers (AAADM) compliance form shall be submitted as proof of compliance with ANSI 156.19 Standard for power operated pedestrian doors. Door(s) shall be inspected and a form shall be signed by an AAADM certified inspector prior to placing door(s) in operation.

Part 2-PRODUCTS

2.1 APPROVED MANUFACTURER

A. Automatic equipment and controls shall be manufactured by: NABCO ENTRANCES INC.
S82 W18717 Gemini Drive
Muskego, WI 53150
Phone: (877) 622-2694
Fax: (888) 679-3319

2.2 AUTOMATIC SWING DOOR SYSTEM– LOW ENERGY – SURFACE APPLIED

A. Model GT710, GT8310 or GT8710 Side Load Swing Door System as indicated on door schedule and details.

B. Mode of Operation: Hydraulic Close operator shall open door by energizing motor and shall stop door by electrically reducing voltage and stalling motor against mechanical stop. Door shall close slowly by means of an adjustable hydraulic closer independent of the motor and electric control. Closing speed shall be fully adjustable. Manual door operation shall require less than 15 pounds of force applied to door stile. System shall also operate as a manual door in event of a power failure. Hold open time shall be adjustable from 1-60 seconds.

C. Components:
1. Operator Housing
2. Gyro Tech GT710 (C.U.), GT8310 (OHC) & GT8710 (C.U.) Swing Door Operator
3. Microprocessor Control
4. Connecting Hardware

1a) Operator Housing for the GT710 shall be 5 3/4" (146mm) deep by 6" (152mm) high aluminum extrusion with finished end caps and shall be prepared for mounting to new or existing door frames. Housing cover shall be removable to provide service access. Plastic covers shall not be acceptable.
1b) Operator Housing for the GT8310 & GT8710 shall be 5 1/2" (140mm) deep by 6" (152mm) high aluminum extrusion with finished end caps and shall be prepared for mounting to new or existing door frames. Hinged housing cover shall be able to be raised and secured or removed to provide

service access. Plastic covers shall not be acceptable.

1c) All structural sections shall have a minimum thickness of .166" (4mm) and shall be fabricated of 6063-T5 aluminum alloys. Housing cover shall be removable to provide service access and shall be extruded from 6063- T5 aluminum alloys to a minimum thickness of .100" (3mm). Plastic covers shall not be acceptable.
1d) Finish: Aluminum shall have a standard finish of AA-M12-C22-A31 (204R1, clear) or AA-M12-C22-A44 (dark bronze). Black and special finishes are available upon request.

2) Power Operator completely assembled unit shall include silent bevel gear and roller chain transmission. Gears and chain coated with a special lubricant for extreme temperature conditions. Closer to be an adjustable self- contained, sealed, spring/hydraulic unit. Attached to the transmission system shall be a DC permanent magnet motor. Motor shall operate from electronic control and require less than 3 amps at full power stall. Complete unit shall be mounted with provisions for easy replacement without removing door from pivots or frame.

3) Electrical Control: Shall be a solid-state microprocessor unit. The microprocessor control shall allow the opening speed, closing speed, back check and latch check speed each to be adjusted separately and independently from each other to meet specific site conditions. Adjustable opening and closing speeds shall be set in accordance with ANSI A156.19. Control shall include time delay, Push-N-Go functionality and sequential mode operation. All adjustments shall be specific and reproducible.

4) Connecting Hardware: Conversion Unit (C.U.) outswing doors shall be connected to operator by a two piece drive arm with self aligning rod ends and connecting door bracket for push-type operation. Inswing drive arm with a urethane covered roller, shall ride in a track fabricated of 6061-T6 or A380 aluminum alloy attached to the door rail where required for pull-type operation. Overhead Concealed (OHC) power operator drive arm to door with a pin linkage rotating in a self lubricated bearing, within a self adjusting slide block, traveling in an interconnected steel track and top door pivot assembly. The (OHC) unit will independently support the door on heavy-duty steel top and bottom door pivots. To allow for durability and easy serviceability, the door shall not pivot on shaft of operator.

2.3 ACTIVATING DEVICES

A. Wall Switches: 6", 4-1/2" diameter stainless steel surface or flush mounted, engraved or plain, as provided by NABCO ENTRANCES INC.

B. Optional activators and safety sensors are available - See Product Catalog.

PART 3- EXECUTION

3.1 INSTALLATION

A. Automatic door equipment shall be installed by AAADM Certified, factory-trained installers in compliance with ANSI A156.19, manufacturer's recommendations and approved shop drawings.

3.2 CLEANING AND PROTECTION

A. After installation, clean framing members as recommended by the manufacturer. Aluminum surfaces in contact with masonry, concrete or steel shall be protected from contact by use of neoprene gaskets, where indicated, or a coat of bituminous paint to prevent galvanic or corrosive action. Advise general contractor to protect unit from damage during subsequent construction activities.

END OF SECTION 087113

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Glass for doors and storefront framing.
2. Glazing sealants and accessories.

B. Related Requirements:
1. Section 088810 "Fire-Rated Glass and Framing."

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C1036.

C. IBC: International Building Code.

D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For glass.

C. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.10 WARRANTY

A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: Vitro Architectural Glass or approved equal.

B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

1. Minimum Glass Thickness for Exterior Lites: 6 mm.

E. Strength: Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E2190.

1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction.
3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.6 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks:
1. Type recommended by sealant or glass manufacturer.

D. Spacers:
1. Type recommended by sealant or glass manufacturer.

E. Edge Blocks:
1. Type recommended by sealant or glass manufacturer.

F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

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

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 MONOLITHIC GLASS SCHEDULE

A. Glass Type GL-1: Clear fully tempered float glass.

1. Minimum Thickness: 6 mm.

2. Safety glazing required.

3.9 INSULATING GLASS SCHEDULE

A. Glass Type GL-2: Clear insulating glass.

1. Basis-of-Design Product: Vitro Architectural glass.
2. Overall Unit Thickness: 1 inch (25 mm).
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Fully tempered float glass.
5. Interspace Content: Air.
6. Indoor Lite: Fully tempered float glass.
7. Safety glazing required.

END OF SECTION 088000

SECTION 088810: FIRE RATED GLASS & FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Fire resistive framing system.
   1. SaftiFirst GPX Architectural Series Framing fire resistive, temperature rise, framing system with aluminum or decorative cladding for 60 minute interior applications.
   2. Applications of fire rated framing includes:
      a. Full vision fire rated doors and transparent walls with fire rating requirement as specified.

B. Related Sections:
   1. Section 013300: Submittal Procedures.
   2. Section 084113: Aluminum-Framed Entrances and Storefronts.
   3. Section 087100: Finish Hardware.
   4. Section 088000: Glazing.
   5. Section 088810: Fire-Rated Glass and Framing

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM E119 Methods for Fire Tests of Building Construction and Materials.
   2. ASTM E152 Methods of Fire Tests of Door Assemblies.
   3. ASTM E163 Methods for Fire Tests of Window Assemblies.
   4. ASTM E2074: Standard Test Method for Fire Tests of Door Assemblies, including Positive Pressure Testing of Side-hinged and Pivoted Swinging Door Assemblies.
   5. ASTM E2110-1: Standard Test for Positive Pressure of Fire Tests of Window Assemblies.
   6. ASTM E331-00: Standard Test Method for Metal Curtain Walls and Doors by Uniform Static Air Pressure Difference.

B. National Fire Protection Association (NFPA):
   1. NFPA 80: Fire Doors and Windows.
   2. NFPA 251: Fire Tests of Building Construction and Materials.
   3. NFPA 252: Fire Tests of Door Assemblies.
   4. NFPA 257: Fire Tests of Window Assemblies.

C. Underwriters Laboratories, Inc. (UL):
   1. UL 9: Standard for Safety of Fire Tests of Window Assemblies.
   2. UL 10B: Standard for Safety of Fire Tests of Door Assemblies.
   3. UL 10C: Standard for Safety of Positive Pressure Fire Tests of Door Assemblies.
   4. UL 263: Fire Tests of Building Construction and Materials.

E. Consumer Product Safety Commission (CPSC):
   1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials.

F. American National Standards Institute (ANSI):
   1. ANSI Z97.1: Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

G. Glass Association of North America (GANA)
   1. GANA – Glazing Manual.
   2. FGMA – Sealant Manual.

H. National Fenestration Rating Council (NFRC)
   1. NFRC 100: Procedure for Determining Fenestration Product U-Factors.

2. NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements:
1. Fire Rating: must meet 60 minutes as specified.
2. Fire Resistive Wall Assembly Certifications: must meet 60 minute fire resistive wall assemblies tested in accordance with ASTM E119, NFPA 251, UL 263 and ULC-S101.
3. Fire Resistive, Temperature Rise Door Assembly Certifications: must meet 60 minute fire resistive temperature rise door assemblies tested in accordance with NFPA 252, UL 10B, UL 10C and CAN4 S104. Must meet 250 degrees F/450 degrees F temperature rise door requirements.
4. Testing Laboratory: Fire test must be conducted by a nationally recognized independent testing laboratory.
5. Max. Door Opening Sizes: must meet up to 4'0" wide x 9'0" high for single doors and 8'0" wide by 9'0" high in pair doors. No intermediate rails required.

B. Listings and Labels:
1. Fire resistive, temperature rise framing system shall be under current follow-up service by a nationally recognized independent laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

C. Appearance:
1. Fire rated wall/door assembly shall have a neat finished appearance with minimum joints at decorative cover intersections.

1.4 SUBMITTALS

A. Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedure Section.
1. Shop Drawings: Submit shop drawings showing layout, profiles and product components.
2. Samples: Submit samples for finishes, colors and textures.
3. Technical Information: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

A. General: Comply with Division1 Product Requirements Sections.

B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials to specified destinations in manufacturer's or distributor's packaging undamaged, complete with installation instructions.

D. Storage and Protection: Store off ground, under cover, protected from weather and construction activities and at temperature conditions recommended by manufacturer.

1.6 FABRICATION DIMENSIONS

A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.7 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is not intended to limit other rights that the Owner may have under the Contract Documents.

1. Warranty Period: 5 years from date of shipping.

PART 2 - PRODUCTS

2. 1 MANUFACTURERS – FIRE RATED (DOOR) (OPENING) (WALL ASSEMBLY)

A. Manufacturer of Framing System: GPX Architectural Series Framing as manufactured and distributed by SAFTI *FIRST* Fire Rated Glazing Solutions.
1. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653.3333; Fax 888.653.4444; email info@safti.com; Web site www.safti.com

B. Manufacturer of Glazing Material: SuperLite II-XL 60 as manufactured and distributed by SAFTI *FIRST* Fire Rated Glazing Solutions.
1. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653.3333; Fax 888.653.4444; email info@safti.com; Web site www.safti.com

C. Fire rated glass and framing must be provided by a single-source, US manufacturer. Distributors of fire rated glass and framing are not to be considered as manufacturers. Materials for the project should be shipped together in the same shipment on the same truck.

D. Substitutions: No substitutions allowed.

2.2 MATERIALS – FRAMING

A. Fire resistive, temperature rise framing system rated for 20 to 120 minutes.

Properties:
1. Wall Frame thickness: 4". Door profile thickness: 5".
2. Fire resistive aluminum door capable of accommodating concealed hardware.
3. Internal framing: Internal tube steel framing shall conform to ASTM A501. Formed steel retainers shall be galvanized conforming to ASTM A527.
4. Insulation: The framing system shall insulate against the effects of fire, smoke and heat transfer from either side. The perimeter of the framing system to the rough opening shall be firmly packed with mineral wool fire stop insulation or appropriately rated intumescent sealant.
1. Fasteners: Type recommended by manufacturer. No exposed fasteners allowed.
2. Glazing accessories: The glazing material perimeter shall be separated from the perimeter framing system with approved flame retardant glazing tape. The SuperLite glazing panel shall be caulked continuously around the edge to the tube steel frame utilizing neutral cure silicone. Silicone setting blocks recommended.

2.3 MATERIALS – GLASS

A. Assemblies shall be glazed with SuperLite II-XL 60 glazing. Assembly is required to meet ASTM E 119/UL 263/ULC-S101.

B. Properties:
1. Individual Lites shall be permanently identified with a listing mark.
2. Glazing material installed in "Hazardous Locations" (subject to human impact) shall be certified to meet the applicable requirements for fire rated assemblies referenced in ANSI Z97.1 Standard for Safety Glazing Materials Used In Buildings and/or CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
3. Temperature rise on the unexposed side of glazing material shall be limited to 250 degrees Fahrenheit when required.
4. Visible daylight transmission: Varies by glazing type. Must meet:

SuperLite II-XL 60	0.856

5. STC/OITC rating: Varies by glazing type. Must meet:

Product	STC	OITC
SuperLite II-XL 60	42	39

6. Pressure glazing is acceptable.

C. Logo: Each piece of fire rated glazing shall be labeled with a permanent logo.

2.4 FABRICATION

A. Assemblies shall be furnished [knocked down for field assembly and will be glazed in the field] [assembled (should configurations and job site conditions allow)] [unitized (should configurations and job site conditions allow)] .

B. Door assemblies shall be factory prepared for field mounting of hardware.

C. Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions within required tolerance. Obtain approved shop drawings prior to fabrication.

2.5 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Covers shall be chemically cleaned and pretreated; then, finished with (choose one):
1. High Performance Coraflon Fluoropolymer Finish by PPG. Solid color to be selected from SAFTI's Standard Color Chart. Mica, XL, Gloss & Exotics are available at an additional charge.
2. Clear, Bronze or Black Anodized.

C. Protect finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.

D. Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.6 DOOR HARDWARE FOR SINGLE AND PAIRED DOORS

A. Hardware shall be supplied with the fire door. Hardware selection shall be from door manufacturer's standard recommended hardware groups as specified below. Please call manufacturer for custom hardware.

B. Standard operating hardware for single and pair doors.

Quantity	Item	Description	Manufacturer	Finish
1	Hinges	Heavy-duty Continuous Geared OKC	Pemko	Anodized
1	Panic Device	Modern Touchbar with Surface Vertical Rods	Von Duprin 9827F w/ 996 L-trim	US26D
1	Closing Device	Heavy-duty Surface Applied Closer	LCN 4040xp	Aluminum
1	Auto Door Bottoms	420APKL	Pemko	

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data including product technical bulletins and installation instructions.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, have been previously installed under other sections, and are acceptable for product installation in accordance with manufacturer's instructions. Openings shall be plumb, square and within allowable tolerances. The Architect/Engineer shall be notified of any conditions that jeopardize the integrity of the proposed fire wall/door framing system. Do not proceed until such conditions are corrected.

3.3 INSTALLATION

A. Fire wall/door installation shall be by a licensed contractor and in strict accordance with the approved shop drawings.

3.4 CLEANING AND PROTECTION

A. Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.

B. Wash glass on both faces not more than four days prior to date schedule for inspections intended to establish date of Substantial Completion. Wash glass by method recommended by glass manufacturer.

C. Remove temporary coverings and protection of adjacent work areas.

D. Remove construction debris from project site and legally dispose of debris.

END OF SECTION 088810

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Non-load-bearing steel framing systems for interior partitions.

B. Related Requirements:
1. Section 092900 "Gypsum Board"

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

1.5 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

C. Horizontal Deflection: For non-composite wall assemblies, limited to L/240 of the wall height based on horizontal loading of 5 lbf/sq. ft.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C754 for conditions indicated.
   1. Steel Sheet Components: Comply with ASTM C645 requirements for steel unless otherwise indicated.
   2. Protective Coating: ASTM A653/A653M, G40, hot-dip galvanized unless otherwise indicated.

B. Studs and Tracks: ASTM C645. Use either conventional steel studs and tracks or embossed, high-strength steel studs and tracks.
   1. Embossed, High Strength Steel Studs and Tracks: Roll-formed and embossed with surface deformations to stiffen the framing members so that they are structurally comparable to conventional ASTM C645 steel studs and tracks.
      a. Basis of Design by: ClarkDietrich ProSTUD or approved equal.
      b. Minimum Base-Steel Thickness: As required to meet deflection and fire-rating requirements.
      c. Depth: As indicated on Drawings.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.
   1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
   2. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

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

3.2 INSTALLATION, GENERAL

A. Installation Standard: ASTM C754.
   1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
   1. Single-Layer Application: 16 inches o.c. or unless otherwise indicated.

A. Install sill sealer gasket to form continuous seal between bottom track and slab.

B. Install studs so flanges within framing system point in same direction.

C. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
   1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
   2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
      a. Install two studs at each jamb unless otherwise indicated.
      b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
      c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
   3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
   4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
      a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
   5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

D. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Interior gypsum board.

B. Related Requirements:
1. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

A. Qualifications of Installers:
1. Use only skilled and experienced gypsum board installer laying up the gypsum board, fastening, taping, and finishing.
2. Helpers and apprentices used for such work shall be under full and constant supervision at all times by thoroughly skilled gypsum board installers.

B. Manufacturer's Recommendations: The manufacturer's recommended methods of installation, when approved by the Owner's representative shall be the basis for acceptance or rejection of actual installation methods used in this work.

C. Fire Resistance Ratings: where gypsum board systems are indicated for fire-resistance ratings, including those required to comply with governing regulations, provide materials and installations identical with applicable assemblies which have been tested and listed by recognized authorities.

D. Industry Standards: comply with applicable requirements of "Application and Finishing of Gypsum Board" by the Gypsum Association.

1.5 DELIVERY, STORAGE AND HANDLING

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

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. Low Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services “Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers”.

2.2 GYPSUM BOARD, GENERAL

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

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C1396/C1396M.
1. Basis of design by: USG Corporation or approved equal.
a. Sheetrock Brand Mold Tough Abuse-Resistant VHI Firecode X Panels (for Walls)
2. Thickness: 5/8 inch.
3. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.
1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
2. Shapes:
a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
1. Basis of design by: FryReglet or approved equal

a. Drywall reveal model # DRML-1250
b. Drywall reveal model # DRMZ-50-75

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.
3. Finish: Chemical conversion coating, white.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:
1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

C. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

D. Acoustical Sealant: As specified in Section 079219 "Acoustical Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C840.

B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

C. Locate edge and end joints over supports. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

D. Form control and expansion joints with space between edges of adjoining gypsum panels.

E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

G. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Single-Layer Application:
1. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners.
2. LC-Bead: Use at exposed panel edges.

C. Aluminum Trim: Install in locations indicated on Drawings.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
   a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095123 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Acoustical tiles for interior ceilings.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Ceiling suspension-system members.
2. Structural members to which suspension systems will be attached.
3. Method of attaching hangers to building structure.
a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
5. Size and location of initial access modules for acoustical tile.
6. Items penetrating finished ceiling and ceiling-mounted items including the following:
a. Lighting fixtures.
b. Diffusers.
c. Grilles.
7. Minimum Drawing Scale: 1/4 inch = 1 foot.

B. Product Test Reports: For each acoustical tile ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

C. Evaluation Reports: For each acoustical tile ceiling suspension system and anchor and fastener type, from ICC-ES.

D. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Acoustical Ceiling Units: Full-size tiles equal to 2 percent of quantity installed.
   2. Suspension-System Components: Quantity of each concealed grid and exposed component equal to 2 percent of quantity installed.

1.7 QUALITY ASSURANCE

A. Seismic Standard: Comply with the following:
   1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E580.
   2. CISCA's Recommendations for Acoustical Ceilings: Comply with CISCA's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings-Seismic Zones
   3. CISCA's Guidelines for Systems Requiring Seismic Restraint: Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies-Seismic Zones 3 & 4".
   4. UBC Standard 25-2, "Metal Suspension Systems for Acoustical Tile and for Lay-in Panel Ceilings".
   5. ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads".

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical tiles, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations:
   1. Suspended Acoustical Tile Ceilings: Obtain each type of acoustical ceiling tile and its suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Suspended ceilings shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: Class A according to ASTM E1264.
2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL TILES

A. Basis of design product: Subject to compliance with requirements, provide the following:
1. USG Interiors, Inc.: Subsidiary of USG Corporation
a. Mars Acoustical Panels #86985HRC
2. Or approved equal.

B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E1264 classifications as designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Classification: Provide tiles as follows:
1. Type and Form: Type IV, Form 1 and 2
2. Pattern: E, G.

D. Color: Flat White (050).

E. Light Reflectance (LR): Not less than 0.90.

F. Ceiling Attenuation Class (CAC): Not less than 35.

G. Noise Reduction Coefficient (NRC): Not less than 0.70.

H. Edge/Joint Detail: FLB per manufacturer.

I. Thickness: 3/4 inch.

J. Modular Size: 24 inch by 24 inch.

K. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273, ASTM D3274, or ASTM G21 and evaluated according to ASTM D3274 or ASTM G21.

2.4 METAL SUSPENSION SYSTEM

A. Basis of design product: Subject to compliance with requirements, provide product by the following:
1. USG Interiors, Inc.; Subsidiary of USG Corporation
a. USG Centricitee DXT 9/16”
2. Or approved equal

B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, fully concealed, metal suspension system and accessories of type, structural classification, and finish indicated that complies with applicable requirements in ASTM C635/C635M.
   1. High-Humidity Finish: Where indicated, provide coating tested and classified for "severe environment performance" according to ASTM C635/C635M.

C. Direct-Hung, Double-Web Suspension System: Main and cross runners roll formed from and capped with cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation.
   1. Structural Classification: Intermediate duty system.
   2. Access: Upward, with initial access openings of size indicated below and located throughout ceiling within each module formed by main and cross runners, with additional access available by progressively removing remaining acoustical tiles.
      a. Initial Access Opening: In each module, 24 by 24 inches.

2.5 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
   1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E488/E488M or ASTM E1512 as applicable, conducted by a qualified testing and inspecting agency.
      a. Type: Postinstalled expansion anchors.
      b. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B633, Class SC 1 (mild) service condition.
      c. Corrosion Protection: Stainless-steel components complying with ASTM F593 and ASTM F594, Group 1 Alloy 304 or 316.
   2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E1190, conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:
   1. Stainless-Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
   2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch diameter wire.

C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.

F. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

G. Seismic Struts: Manufacturer's standard compression struts designed to accommodate lateral forces.

H. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustical tiles in-place during a seismic event.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.

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

3.2 PREPARATION

A. Testing Substrates: Before adhesively bonding tiles to wet-placed substrates such as cast-in-place concrete or plaster, test and verify that moisture level is below tile manufacturer's recommended limits.

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

C. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

A. Install suspended acoustical tile ceilings according to ASTM C636/C636M, seismic design requirements, and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a

manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical tiles.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Arrange directionally patterned acoustical tiles as follows:
1. As indicated on reflected ceiling plans.
2. Install tiles with pattern running in one direction parallel to long axis of space.
3. Install tiles in a basket-weave pattern.

G. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges of tiles so tile-to-tile joints are interlocked.
1. Fit adjoining tiles to form flush, tight joints. Scribe and cut tiles for accurate fit at borders and around penetrations through ceiling.
2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tiles and moldings, spaced 12 inches o.c.
3. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
   1. Periodic inspection during the installation of suspended ceiling grids according to ASCE/SEI 7.

B. Perform the following tests and inspections of completed installations of acoustical tile ceiling hangers and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 20 percent completion, but no tiles have been installed. Do not proceed with installations of acoustical tile ceiling hangers for the next area until test results for previously completed installations of acoustical tile ceiling hangers show compliance with requirements.
   1. Within each test area, testing agency will select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf of tension.
   2. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

C. Acoustical tile ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.6 ADJUSTING

A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Vinyl base.
2. Vinyl molding accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

C. Product Schedule: For resilient base and accessory products.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL BASE FOR CARPET

A. Basis of design product: Subject to compliance with requirements, provide the following:
1. Johnsonite Tightlock Carpet Base

B. Product Standard: ASTM F1861, Type TV (vinyl, thermoplastic).
1. Group: I (solid, homogeneous).

C. Minimum Thickness: 0.25 inches.

D. Height: 4-1/2 inches.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Preformed.

G. Inside Corners: Preformed.

H. Colors and Patterns: As selected by Architect from manufacturer standard colors.

2.2 VINYL BASE FOR LVT

A. Basis of design product: Subject to compliance with requirements, provide the following:
1. Johnsonite Tightlock Resilient Base

B. Product Standard: ASTM F1861, Type TV (vinyl, thermoplastic).
1. Group: I (solid, homogeneous).

C. Nominal Thickness: 0.25 inches.

D. Height: 4-3/8 inches.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Preformed.

G. Inside Corners: Preformed.

H. Colors and Patterns: As selected by Architect from manufacturer standard colors.

2.3 VINYL MOLDING ACCESSORY

A. Description: Vinyl reducer strip for resilient floor covering, joiner for tile and carpet and transition strips.

B. Profile and Dimensions: As indicated.

C. Locations: Provide vinyl molding accessories in areas indicated by Architect.

D. Colors and Patterns: As selected by Architect from manufacturer standard colors.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
   1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:
1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Printed Solid Vinyl Plank.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of resilient floor tile.
1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
2. Show details of special patterns.

C. Samples for Selection / Confirmation: For each type of floor tile indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

B. Warranty: 10 year limited wear warranty.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 SOLID VINYL FLOOR TILE

A. Tile Standard: ASTM F 1700.
1. Class: Class III, Printed Vinyl Plank.
2. Type: B, Embossed Surface.

B. Thickness: 4.5mm (0.18in).

C. Size: 18 inches by 36 inches.

D. Colors and Patterns: As indicated on Drawings.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

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

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
   1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
   1. Lay tiles square with room axis.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:
1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096613 - PORTLAND CEMENT TERRAZZO FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Precast terrazzo units.

B. Related Requirements:

1. Section 079200 "Joint Sealants" for sealants installed with terrazzo.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include terrazzo installation requirements. Include plans, sections, component details, and relationship to other work. Show layout of the following:

1. Precast terrazzo jointing and edge configurations.
2. Terrazzo patterns.

C. Samples: For each exposed product and for each color and texture specified, 6 inches (150 mm) in size.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Material Certificates: For each type of terrazzo material or product.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For terrazzo to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An installer who is a contractor member of NTMA.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name, and lot number if any.

B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Maintain interior ambient temperature above 50 deg F (10 deg C) for 48 hours before and during terrazzo installation.

B. Weather Limitations: Proceed with rustic terrazzo installation only when forecasted weather conditions permit work to be performed according to NTMA's written recommendations and when temperatures remain above 45 deg F (7.2 deg C).

C. Field Measurements: Verify actual dimensions of construction contiguous with precast terrazzo by field measurements before fabrication.

D. Provide permanent interior lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

E. Close spaces to traffic during terrazzo installation and for not less than 24 hours after installation unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of granular materials from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

A. NTMA Standards: Comply with NTMA's written recommendations for terrazzo type indicated unless more stringent requirements are specified.

2.3 PRECAST TERRAZZO

A. Basis of Design Product: Wausau 16”x16”x5/8”t hick polished portland cement terrazzo unit in colors and pattern to match existing.

B. Precast Terrazzo Base: Minimum 4”x16”x1/2” thick, polished, portland cement terrazzo units in colors and pattern to match existing. Comply with NTMA's written recommendations for fabricating precast terrazzo base units in sizes and profiles indicated.

2.4 MISCELLANEOUS ACCESSORIES

A. Standard Dry-Set Mortar (Thinset): ANSI A118.1; white, unless otherwise indicated.

B. High-Performance Tile Grout: ANSI A118.7.

1. Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.

C. Sealer: Slip- and stain-resistant, penetrating-type sealer that is chemically neutral; does not affect terrazzo color or physical properties; is recommended by sealer manufacturer; and complies with NTMA's written recommendations for terrazzo type indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

3.2 PREPARATION

A. Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.

1. Roughen concrete substrates before installing terrazzo system according to NTMA's written recommendations.

B. Protect other work from water and dust generated by grinding operations. Control water and dust to comply with environmental protection regulations.

1. Erect and maintain temporary enclosures and other suitable methods to limit water damage and dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

3.3 INSTALLATION, GENERAL

A. Comply with NTMA's written recommendations for terrazzo and accessory installation.

B. Installation Tolerance: Limit variation in terrazzo surface from level to 1/4 inch in 10 feet (6.4 mm in 3 m); noncumulative.

3.4 PRECAST TERRAZZO INSTALLATION

A. Install precast terrazzo units using method recommended in writing by NTMA and manufacturer unless otherwise indicated.

B. Do not install units that are chipped, cracked, discolored, or improperly finished.

C. Seal joints between units with joint sealant.

3.5 CLEANING AND PROTECTION

A. Terrazzo Cleaning:

1. Remove grinding dust from installation and adjacent areas.
2. Wash surfaces with cleaner immediately after final cleaning of terrazzo flooring according to both NTMA's and manufacturer's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow them to dry thoroughly.

B. Sealing:

1. Seal surfaces according to NTMA's written recommendations.
2. Apply sealer according to sealer manufacturer's written instructions.

C. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION 096613

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Modular carpet tile.

B. Related Requirements:
   1. Section 024119 "Selective Demolition" for removing existing floor coverings.
   2. Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
   2. Include manufacturer's written installation recommendations for each type of substrate.

B. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
   1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
   2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with the Carpet and Rug Institute's CRI 104.

1.9 FIELD CONDITIONS

A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

1.10 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, the following:
      a. More than 10 percent edge raveling, snags, and runs.
      b. Dimensional instability.
      c. Excess static discharge.
      d. Loss of tuft-bind strength.
      e. Loss of face fiber.
      f. Delamination.
   3. Warranty Period: Lifetime commercial limited.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Basis of Design: As indicated on drawings

B. Size: 36 by 36 inches.

C. Applied Treatments:
   1. Soil-Resistance Treatment: Manufacturer's standard treatment.
   2. Antimicrobial Treatment: Manufacturer's standard treatment that protects carpet tiles as follows:
      a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

D. Performance Characteristics:
   1. Appearance Retention Rating: Heavy traffic, 3.0 minimum according to ASTM D7330.

2. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.
3. Dry Breaking Strength: Not less than 100 lbf according to ASTM D2646.
4. Tuft Bind: Not less than 5 lbf according to ASTM D1335.
5. Delamination: Not less than 3.5 lbf/in. according to ASTM D3936.
6. Dimensional Tolerance: Within 1/32 inch of specified size dimensions, as determined by physical measurement.
7. Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).
8. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.
9. Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) according to AATCC 16, Option E.

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

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

3.2 PREPARATION

A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.

B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.

C. Maintain dye-lot integrity. Do not mix dye lots in same area.

D. Maintain pile-direction patterns indicated on Drawings.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

H. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:
1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Concrete and concrete masonry units (CMUs).
2. Steel and iron.
3. Gypsum board.

1.3 DEFINITIONS

A. MPI Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.

B. MPI Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Indicate VOC content.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Label each Sample for location and application area.

C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Subject to compliance with requirements, provide the following: PPG or approved equal.

B. Products: Subject to compliance with requirements, provide product listed in the Interior Painting Schedule for the paint category indicated or approved equal.

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Provide low-odor / low-VOC paints as indicated in schedule

D. Colors: As selected by Architect from manufacturer's full range.

1. Twenty 20 percent of surface area will be painted with deep tones.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete and Masonry: 12 percent.
2. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Previously Painted CMU and Concrete Substrates:

1. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer sealer, interior, institutional low odor/VOC.

1) PPG Paints: 17-921 Seal Grip 100 Percent Acrylic Universal Primer.

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3).

1) PPG Paints: 9-300XI Series Pure Performance Interior Latex Eggshell.

B. New CMU Substrates:

1. Institutional Low-Odor/VOC Latex System:

a. Block Filler: Block filler, latex, interior/exterior.

1) PPG Paints: 6-15XI SpeedHide Interior/Exterior Acrylic Masonry Block Filler.

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3).

1) PPG Paints: 9-300XI Series Pure Performance Interior Latex Eggshell.

C. Steel Substrates:

1. Institutional Low-Odor/VOC Acrylic System:

a. Prime Coat: Primer, rust inhibitive, water based.

1) PPG Paints: 4020 Pitt-Tech Plus Primer/Finish.

b. Intermediate Coat: Acrylic, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Acrylic, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5).

1) PPG Paints:4216 Pitt-Tech Plus HD Waterborne Enamel Semi-Gloss.

D. New Gypsum Board Substrates:

1. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer sealer, interior, institutional low odor/VOC.

1) PPG Paints: 9-900 Series Pure Performance Interior Latex Primer.

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3).

1) PPG Paints: 9-300XI Series Pure Performance Interior Latex Eggshell.

END OF SECTION 099123

SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cast dimensional characters.

1.3 COORDINATION

A. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show typestyles, graphic elements, and layout for each sign.

C. Samples: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.7 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 DIMENSIONAL CHARACTERS

A. Cast Characters: Characters with uniform faces, sharp corners, and precisely formed lines and profiles, and as follows:

1. Character Material: Cast aluminum.
2. Character Height: As indicated on Drawings.
3. Thickness: As indicated on Drawings.
4. Finishes:
   a. Baked Enamel or Powder-Coat Finish: Manufacturer's standard, in color as selected by Architect from manufacturer's full range.
5. Mounting: Concealed studs.
6. Typeface: Arial.

2.2 DIMENSIONAL CHARACTER MATERIALS

A. Aluminum Castings: ASTM B26/B26M, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.

2.3 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors.

2. Sign Mounting Fasteners:

   a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.

2.4 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
5. Internally brace dimensional characters for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
6. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
7. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.5 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

2.6 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

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

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.

2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
   a. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101419

SECTION 104413 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Fire-protection cabinets for the following:
      a. Portable fire extinguisher.

B. Related Requirements:
   1. Section 104416 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing semirecessed-mounting method and relationships of box and trim to surrounding construction.
   2. Show location of knockouts for hose valves.

B. Shop Drawings: For fire-protection cabinets.
   1. Include plans, elevations, sections, details, and attachments to other work.

C. Product Schedule: For fire-protection cabinets. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.5 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

2.3 FIRE PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.
1. Basis of Design: As listed on drawings.

B. Cabinet Construction: Non fire rated.

C. Cabinet Material: Cold-rolled steel sheet.
1. Shelf: Same metal and finish as cabinet.

D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).
1. Rolled-Edge Trim: 2-1/2-inch backbend depth.

E. Cabinet Trim Material: Steel sheet.

F. Door Material: Steel sheet.

G. Door Style: Vertical duo panel with frame.

H. Door Glazing: Acrylic sheet.
1. Acrylic Sheet Color: Clear transparent acrylic sheet.

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
1. Provide projecting door pull and friction latch.
2. Provide manufacturer's standard hinge, permitting door to open 180 degrees.

J. Accessories:
1. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.
a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
1) Location: Applied to cabinet door.
2) Application Process: Pressure-sensitive vinyl letters.
3) Lettering Color: Black.
4) Orientation: Vertical.

K. Materials:
1. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.
a. Finish: Baked enamel, TGIC polyester powder coat, HAA polyester powder coat, epoxy powder coat, or polyester/epoxy hybrid powder coat, complying with AAMA 2603.

b. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
c. Color: As selected by Architect from manufacturer's full range.

2. Transparent Acrylic Sheet: ASTM D4802, Category A-1 (cell-cast sheet), 3 mm thick, with Finish 1 (smooth or polished).

2.4 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
1. Weld joints and grind smooth.
2. Miter corners and grind smooth.
3. Provide factory-drilled mounting holes.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.
1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
2. Fabricate door frames of one-piece construction with edges flanged.
3. Miter and weld perimeter door frames and grind smooth.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

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

3.2 PREPARATION

A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
   1. Provide semirecessed fire-protection cabinets.
   2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

C. Identification:
   1. Apply vinyl lettering at locations indicated.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104413

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes portable, hand-carried fire extinguishers.

B. Related Requirements:
1. Section 104413 "Fire Protection Cabinets."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher.

B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
b. Faulty operation of valves or release levers.
2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet indicated.
1. Basis of Design: As listed on the drawings.
2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
3. Valves: Manufacturer's standard.
4. Handles and Levers: Manufacturer's standard.
5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type: UL rated 2-A:10-B:C, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.
1. Remove and replace damaged, defective, or undercharged fire extinguishers.

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

3.2 INSTALLATION

A. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION 104416

SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid surface material countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.
4. Solid surface material apron fronts.

1.3 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.

C. Samples for Selection: For each type of material exposed to view.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

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

B. Installer Qualifications: Fabricator of countertops.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements before countertop fabrication is complete.

1.8 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID-SURFACE COUNTERTOP MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.

1. Basis of Design Product: Wilsonart Solid Surface or approved equal.
2. Type: Provide Standard type.
3. Colors and Patterns: As selected by Architect from manufacturer's full range.

B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 COUNTERTOP FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

1. Grade: Custom.

B. Configuration:

1. Front: Straight, slightly eased at top.
2. Backsplash: Straight, slightly eased at corner.
3. End Splash: Matching backsplash.

C. Countertops: 1/2-inch- (12.7-mm-) thick, solid surface material with front edge built up with same material.

D. Backsplashes: 1/2-inch- (12.7-mm-).

E. Fabricate tops with shop-applied edges and backsplashes unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

F. Joints: Fabricate countertops without joints.

G. Joints: Fabricate countertops in sections for joining in field.

1. Joint Locations: Not within 18 inches (450 mm) of a sink or cooktop and not where a countertop section less than 36 inches (900 mm) long would result, unless unavoidable.
2. Splined Joints: Accurately cut kerfs in edges at joints for insertion of metal splines to maintain alignment of surfaces at joints. Make width of cuts slightly more than thickness of splines to provide snug fit. Provide at least three splines in each joint.

2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

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

3.2 INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m), 1/4 inch (6 mm) maximum. Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.

B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

G. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.16

DIVISION 15300- SPRINKLER SYSTEM

1. GENERAL

A. The requirements of the General and Supplementary Conditions of the Contract of these Specifications and Drawings are hereby made a part of this Section.

2. WORK INCLUDED

A. The work includes all labor, materials, appliances and services and performing all operations required to furnish, deliver and install all the sprinkler work and related work, complete, in accordance with the applicable codes and as specified herein. In general, the work includes but is not restricted to the following items of work:

1. Contractor shall provide upright sprinkler heads where there is no drop ceiling.

2. Provide all new sprinkler heads, piping and valves.

3. Provide inserts, hangers, and other supports for pipe and equipment.

4. Provide ladders, sprinkler head guards and other accessories.

5. Provide spare sprinkler heads in cabinet.

6. Preparation of all detailed sprinkler drawings coordinated with mechanical, structural, electrical and architectural plans.

7. Filing and obtaining approvals from Local Fire and Building Departments, and Building Owner's Underwriter.

8. Testing and Flushing.

3. QUALITY ASSURANCE

A. The design, materials, equipment, installation, inspection, and testing of the automatic sprinkler system shall be in strict accordance with the required and advisory provisions of NFPA 13, 14, 20, 231, and 231C. Exception to NFPA Fire Codes are as follows:

B. Base Hydraulic calculations on the following criteria and in accordance with NFPA 13.

C. All piping shall be run as high as possible.

D. Hydraulic Calculations: No more than 90 percent of the available pressure at the connection to the standpipe and/or sprinkler riser shall be used.

E. The modification of the existing system shall be accomplished by a licensed sprinkler contractor, who is now or has been engaged in the installation of automatic sprinkler systems for the past three years.

F. Conceal all piping, except pipe in stairwells and rooms without ceilings.

G. All devices and equipment shall be UL Listed of FM Approved.

H. Cutout disks, which are created by cutting holes in the walls of pipe for flow switches and non-

threaded pipe connections, shall be wired near to the pipe where they originated. They shall be displayed for 6 months after the sprinkler system is completed.

I. For each sprinkler zone provide a control valve, flow switch and a test and drain assembly with pressure gauge.

4. APPLICABLE PUBLICATIONS

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

B. National Fire Protection Association (NFPA):

1. 13–91 Installation of Sprinkler Systems

2. 13R–91 Sprinkler Systems for Residential Occupancies up to and including Four Stories

3. 14–90 Installation of Standpipe and Hose Systems

4. 25–91 Inspection, Testing and Maintenance of Water Based Fire Protection Systems

5. 72H–88 Testing Procedures for Local, Auxiliary, Remote Station, and Proprietary Protective Signaling Systems

6. 178–86 Standard Symbols for Fire Fighting Operations

7. 231–90 General Storage

8. 231C–91 Rack Storage of Materials

C. Underwriters Laboratories, Inc. (UL):

1. 199–90 Automatic Sprinklers for Fire – Protection Service

D. Factory Mutual Engineering Corporation (FM):

1. Approved Guide – 1989

E. American Society for Testing and Materials (ASTM):

5. COMPLIANCE WITH REGULATIONS

A. Sprinkler system installation shall comply with all
Local, State and Federal rules and regulations having jurisdiction and also with the standards of the National Fire Protection Association.

B. The sprinkler contractor shall have all his work approved by the Owner's Insurer.

6. DESIGN

A. The Contractor shall accept responsibility for the flow, pressure and design of the system including the flow and hydrant tests to demonstrate compliance with the requirements of all authorities having jurisdiction.

7. SPRINKLER PLANS

A. The Contractor shall be solely responsible for taking his own measurements and installing the work to fit the conditions encountered. Everything necessary for a complete and satisfactory installation shall be furnished and installed by the Contractor performing work under this contract, whether or not specifically shown or specified.

8. DEVIATIONS

A. No deviations from the Plans and Specifications shall be made without the full knowledge and consent of the Owner and/or Tenant.

9. MATERIALS

A. All materials shall be UL approved, where such approval is applicable or required by the agencies having jurisdiction over the sprinkler work.

10. DAMAGE BY EMPLOYEES

A. The Contractor will be held responsible for any damage to the building or the public resulting from the carelessness or negligence of his Subcontractors or their employees, or his own employees, and shall no hold the Owner responsible for the loss of tools, equipment, or materials.

11. PERMITS, LICENSES, AND INSURANCE

A. The Contractor shall obtain and pay for all permits, licenses, fees, etc., required for his work.

B. The Contractor shall defend all suits or claims for infringements of any patent rights and shall have saved the Owner from loss on account thereof.

12. CLEANING

A. Piping system lines shall be cleaned by flushing system under pressure sufficiently until water runs clear.

B. During the progress of the work, the Contractor shall keep the premises reasonably clean as regards to trash, debris, etc., caused by his materials and workmen. After all work has been completed and prior to final inspection, all equipment shall be thoroughly cleaned and all trash and debris removed from the job site.

13. TESTING

A. All piping shall be tested for leaks prior to being placed in service.

14. SHOP DRAWINGS AND EQUIPMENT SUBMITTALS

A. The Contractor shall prepare shop drawings with hydraulic calculations of his proposed work, submit them to the authority having jurisdiction, obtain stamped approved plans and/or letter of approval, and then submit the approved drawings and/or letter of approval to the Architect for his approval. Approval of plans must also be obtained from the local fire marshall and the owners insurance underwriter. If the local authority requires the hydraulic calculations stamped by a professional engineer than this must be done at the contractor's cost. No sprinkler work shall be done prior to all the above approvals.

B. The Contractor shall submit equipment submittals of all materials he proposes to use in his work, giving name of manufacturer, trade name, catalog number, and all information hereinafter requested. Any material or equipment rejected shall be removed from the premises within 24 hours after notification.

C. The Contractor shall furnish for approval seven (7) sets of equipment drawings, certified prints, and performance data as listed below. The Contractor shall obtain approval on all the above before any equipment is purchased or any materials installed.

D. The Contractor shall check to see that the equipment proposed will fit into the available space considering space for maintenance, etc. Capacities shall be stated in the terms specified or and any auxiliary equipment or features specified shall be listed with the submittals.

15. GUARANTEE

A. The Contractor shall furnish a guarantee covering all labor and materials for a period of one year from date of acceptance of his work which shall include an agreement to repair, replace, and make good, at his expense, any and all defects which may appear in his work or materials during that time, which in the judgment of the Architect arise from defective workmanship, imperfect or inferior materials.

16. VALVES AND ACCESSORIES

A. Cutoff valves shall be equal to Crane No. 467 UL flanged pattern outside screw and yoke wedge gate valves. Cutoff valves up to 2" to be bronze No. 259 cutoff valves; 2-1/2 and 3" to be No. 467-1/2.

B. Inspector's Test Outlet Valve: Ball type, bronze body, Type 316 stainless steel ball and stem, teflon seats and stem packing, 400 psi WOG. Valve shall have padlocking feature in both the open and closed position.

17. PIPE AND FITTING, INTERIOR

A. All piping inside of building shall be Schedule 40 (standard weight) black steel pipe, with 175 pound sprinkler service cast iron sprinkler fittings, screwed or flanged as required. All joints shall be made up with approved pipe joint compound applied to male threads only. Ream ends of all pipes after cutting. All piping shall run concealed in wall and above ceilings.

18. HANGERS, SUPPORTS, AND SLEEVES

A. All piping shall be supported with UL approved hangers, types and sizes required, Grinnell or equal. Hangers shall be attached to structural steel work by clamping or other approved methods, except that structural work shall not be drilled or punched. Wherever necessary, furnish, install, and securely anchor to or between building members suitable angle iron or other steel members to support sprinkler work.

19. SPRINKLERS

A. UL Listed; quick-response sprinklers shall be standard type tested in accordance with UL – 199 and UL – 1626, except as noted below. The maximum distance from the deflector to finished ceiling shall be 1 – 7/8 inches for pendent sprinklers, except as noted below. At the specified locations, provide the following type of sprinklers (All sprinklers to have ½ inch orifice):

LOCATION	TYPE
Exposed Ceiling	Quick Response, Upright White Pendent, (135 Degrees F.)
Suspended Ceiling	Quick Response, Concealed White Pendent, (135 Degrees F.)

20. SPRINKLER HEADS, EXTRA SPRINKLER CABINET

A. Sprinkler heads shall be the proper types, ratings, and spacings for the areas involved. All sprinkler heads to be type indicated on drawings. Provide one sprinkler cabinet with 12 extra sprinkler heads and sprinkler wrench for emergency use in valve room.

B. Provide On/Off 165 F heads in Electrical Equipment Rooms.

21.. DRAIN VALVES and SELF-CONTAINED TEST AND DRAIN ASSEMBLY:

A. Provide drain valves as required. Threaded bronze angle, globe, ball or butterfly, 150 pound WOG.

B. Ductile iron body with bronze "Drain" and "Test" valve bonnets. Acrylic sight glass for viewing test flow. Various sized orifice inserts to simulate flow through 17/32 – inch, ½ - inch, 7/16 – inch, and 3/8 – inch diameter sprinkler heads, 1 – ¼ inch female threaded outlets or 1 – ¼ inch one-quarter turn locking lug outlets for plain end pipe (end preparation to be in accordance with manufacturer's recommendation). Alarm test module must be UL Listed or FM Approved in accordance with NFPA 13 for the specified service.

C. UL Listed, bronze body, with chrome plated bronze ball, brass stem, steel handle, Teflon seat and site glasses. Provide valve with three position indicator plate (off, test and drain), ¼ - inch tapping for pressure gauge and various sized orifice inserts to simulate flow through 3/8 – inch, 7/16 – inch, ½ - inch, and 17/32 – inch diameter sprinkler heads.

22. TESTING, STERILIZING, AND FLUSHING

A. All piping in the sprinkler system, both inside and outside of the building, shall be tested at water pressure of 200 psi for a period of not less than two hours. All bracing shall be in place and all air shall be removed from the system through drain valves, etc., before the test pressure is applied. No apparent leaks will be permitted.

END OF SECTION

DIVISION 15400 - PLUMBING

1. GENERAL CONDITIONS

A. The Contractor shall examine the drawings and specifications for the other trades to better familiarize himself with the character of construction, and the Contractor shall include in his bid all plumbing work as specified or required.

B. Where the word "furnish" or "provide" occurs in the specifications or drawings, this shall mean to "furnish, install and connect complete in working order."

2. SCOPE OF WORK

A. Storm System – Remove and relocate existing storm leader. Contractor shall saw cut, excavate, back fill, rough patch and make final piping connections.

B. All equipment, Material etc. removed under this contract and not intended for final use in the final installation shall be removed from the premises and turned over to, or disposed of, as directed by the owner.

C. All new and existing piping shall be supported from the structure.

D. All plumbing systems shall be tested as specified in the 2015 NATIONAL STANDARD PLUMBING CODE CHAPTER 15, PARAGRAPHS 15.1 through 15.8.

3. EXAMINATION OF PLANS

A. Before submitting his bid, Contractor shall examine the plans and shall determine for himself the conditions that may affect his work. No allowance will be made if the Contractor fails to make such examination.

4. RULES AND REGULATIONS

A. All work shall be installed in accordance with local Building Department, State and Local Plumbing Code, National Plumbing Code, Local Fire Marshall, latest adopted edition of the National Electric Code, and the requirements of the Fire Underwriters, NFPA, OSHA, AGA, Local Water Company, Local Electric Company.

5. PERMITS, INSPECTIONS AND FEES

A. Contractor shall file all plans and pay for all applications, tap fees, permits, inspections and approvals as required.

B. At the completion of the work he shall secure and deliver to the Architect "Certificate of Approval" from the various local City, Town, County, State Bureaus, Local Fire Marshall, Fire Underwriters, Local Electric Company, Local Health Department, Local Building Department, and all Departments having jurisdiction for the construction.

6. EXAMINATION OF GENERAL CONSTRUCTION, HVAC, ELECTRICAL PLANS AND SPECIFICATIONS

A. The Contractor shall examine the General Construction, Plumbing, HVAC, and Electrical Plans and

Specifications insofar as labor and materials and type of construction, etc. that may affect his work. The submission of a proposal shall be construed as evidence that such examination has been made, and no later claims for extra labor, equipment or materials, which could have been foreseen by examination, will be recognized.

7. APPROVALS AND SHOP DRAWINGS

A. Contractor shall submit to the Architect for approval, complete shop drawings, list of materials and detailed data of equipment giving the manufacturer's name, catalog numbers, size, capacity, dimensions and construction, etc., covering each item which he proposes to install. No equipment or materials shall be installed without obtaining approved shop drawings.

B. Shop Drawing Submittals - Submit the following items for approval:

1. Plumbing Fixtures
2. Piping Material
3. Cleanouts and Drains
4. Certificates of Approval from Local and State
5. Operation and Maintenance Manuals

8. MATERIAL AND WORKMANSHIP

A. All material shall be new and of the best quality, and shall bear the approved Fire Underwriter's label where required. The "Label of Approval" shall be of the type for the intended application.

B. The work throughout shall be executed in the best and most thorough manner, under the direction, and to the satisfaction of the Architect who will interpret the meaning of the drawings and specifications, and the Architect shall have the power to reject any work and material, which in his opinion is not in full accordance therewith.

9. ACCESSIBILITY

A. All valves, traps, cleanouts, motors, etc., and other work shall be installed so as to be readily accessible for operation, maintenance and repair.

B. Furnish access doors.

10. MODIFICATIONS

A. The drawings indicate and the specifications describe the general arrangement and location, equipment, piping, etc. The Contractor shall without extra cost to the Owner, make all reasonable modifications in work as may be required to prevent conflict with the work of other trades, or for the proper installation of the work.

11. OCCUPATIONAL SAFETY AND HEALTH ACT

A. All plumbing equipment and work shall comply with the Occupational Safety and Health Act. The performance of this agreement by the Contractor is subject to all applicable provisions of the Federal Occupational Safety & Health Act.

12. CUTTING AND PATCHING

A. The Plumbing Contractor shall do all cutting and patching of work that may be required to make its several parts come together properly as shown or reasonably implied by the drawings and specifications for the complete structure, or as directed by the Architect.

B. The Contractor shall not endanger any work by cutting, digging, and shall not cut or alter the work of any other Contractor without the consent of the Architect.

C. Any cost caused by defective or ill-timed work shall be borne by the party responsible for it.

13. SLEEVES AND ESCUTCHEONS

A. All pipes passing through walls, partitions or floors shall be fitted with #20 gauge galvanized steel sleeves with flanges properly secured to construction.

B. All exposed piping passing through walls, partitions or floors shall be fitted with approved type escutcheons. Escutcheons shall be chromium plated brass and those at ceiling shall have set screws.

14. PIPING INSTALLATION

A. Furnish all drainage and water piping promptly after excavation, or cutting for it has been done so those openings may be closed as quickly as possible. No piping shall be permanently closed up, furred or covered before testing, examination and approval by all Local Authorities.

B. All water lines shall be run level, free of traps with clearances for the other trade's work. Piping shall be graded and drain valves installed at low points for drainage.

C. Unless otherwise noted on drawings, all storm, sanitary, gas, and water piping shall be installed concealed in furrings, ceilings, wall chases or below floor.

D. All piping shall be kept high as possible and shall be installed concealed through or tight to joist or slab wherever necessary to maintain maximum headroom. All piping shall be offset as required to clear work of other trades.

E., All hot water lines shall be provided with swing joints for expansion and contraction. Swing joints shall be installed on all connections from hot water mains.

F. Furnish J.R. Smith Hydrotrol, or equal as approved, water hammer arresters air chambers on all new hot and cold water branches to each individual fixture or for a group of fixtures. The Hydrotrol Unit shall be sized in accordance with the manufacturer's recommendations.

G. The soil, waste and water supply connections to plumbing and other fixtures and equipment shall be as indicated on the drawings.

15. PIPE AND FITTINGS

A. Soil, waste, and vent piping: All underground piping shall be service weight cast iron with neoprene compression gaskets. Above ground sanitary piping shall be the same as underground except no-hub type with stainless steel couplings.

B. Cold and hot water piping shall be type "L" copper tubing with wrought copper or cast brass sweat fittings. Furnish cast brass screw to sweat adapters where required. Solder shall be 100% lead free.

Cold and hot water piping, located in ECM & Tank farm, shall be Schedule 80 CPVC.

C. All exposed piping and fittings in toilets, Service Area and Apparatus Room shall be chrome-plated brass.

D. Contractor shall furnish all roughing and make final connection to all fixtures and equipment including fixtures furnished by General Contractor and/or Owner.

16. FIXTURES

A. Provide fixtures as indicated on drawings.

17. HANGERS AND SUPPORTS

A. All horizontal piping shall be supported so as to prevent sagging. Hangers on cast iron pipe shall be spaced so as to provide support at each joint. Hangers on water piping shall be not more than 8 feet apart for piping 13" and larger, 7 ft. for 1", 6 ft. for 3/4", and 5 ft. for 2" piping. Vent piping shall be supported at every joint.

B. Hangers shall be adjustable clevis type for single pipes or trapeze type for parallel runs of pipe. Hangers shall be of same material as pipe, or covered with insulation to prevent reaction between pipe and hanger. Furnish blocking to support pipe and prevent cutting or damage to insulation. Hangers shall be sized to include pipe and insulation.

C. All gas piping shall be supported with seismic restraints as per latest adopted edition of the International Building Code and per SMCA guidelines for seismic restraints of mechanical systems.

18. VALVES

A. All water connections to equipment and all branches, etc. to fixtures shall be valved. Valves on water lines 2" and smaller shall be Stockham #B-110 bronze with thread ends, class 125. Check valves 3" and smaller shall be bronze with bronze disc, threaded ends, Stockham B-319. Valves on water lines 3" and larger shall be Stockham #G620 and G623 gate valve IBBM OS&Y, 125 PSIG WSP, 200 PSIG OWG, iron body and bronze trim. Acceptable valves (screwed and flanged ends).

B. Approved manufacturers: Stockham, Crane, Walworth, Nibco, Hammond.

19. INSULATION

A. All cold and hot water lines up to 1 ¼" shall be covered with 1" thick fiberglass pipe insulation with ASJ jacket 1 ½" for all larger pipes.

B. All exposed cold and hot water piping and waste piping including the "P" trap located under handicapped lavatories shall be insulated with Truebro "Handi-Guard" pipe insulation kit.

C. Furnish molded fiberglass pipe fittings, or the Contractor shall have the option of furnishing 1" thick fiberglass blanket insulation wired on with copper clad steel wire and then a white vinyl snap on molded pipe fitting installed over same to provide a smooth finished surface.

D. Unions shall not be insulated. The insulation shall be neatly terminated at unions and ends properly sealed and finished.

E. All insulation shall bear labels indicating manufacturer, insulation thickness, and product nomenclature for easy identification.

F. Approved Manufacturers: Owens Corning, Certain-Teed, PPG, Manville.

20. CLEANOUTS AND DRAINS

A. Cleanout deckplates shall be J.R. Smith #4026 series with scoriated nickel bronze top, or equal Zurn, Josam, Wade.

B. Floor drains shall be as indicated on drawings.

C. Cleanout wall plate: Round, stainless steel or polished chrome plated bronze cover plate with vandal resistant fastener to secure to cleanout plug. Acceptable Manufacturer: JR Smith "FACE OF WALL" Series 4436-U.

21. ACCESS DOORS

A. Furnish access doors for all concealed valves, cleanouts, etc. and to all other concealed parts of system that requires accessibility for proper operation and maintenance. All doors shall be of proper size and located in such a position that the units to be serviced are easily reached. Access doors for concealed valves shall be minimum 12" x 12". The valves, etc., located in difficult to reach space above ceiling furnish 24" x 24" access doors. Where access to concealed equipment can be easily obtained by removing lay-in ceiling tiles, then no access doors are required at such locations.

B. Access doors shall be Inland Steel Milcor Type, Larp, or equal as approved, to receive plaster, acoustical tile, etc.

22. OPERATING AND MAINTENANCE INSTRUCTIONS

A. The Contractor shall furnish to the Architect two (2) complete sets of detailed data indicating operating and maintenance instructions covering plumbing fixtures, valves, gas fired hot water storage heater, thermostatic mixing valve, PRV, backflow preventer, drains, etc. Also furnish complete descriptive data on all equipment. The instructions and data shall be enclosed in separate folders, properly identified and then bound in a large plastic covered loose-leaf book, all as approved by the Architect.

B. Approved Operating and Maintenance Instructions and Record Drawings shall be furnished and in the hand of the Owner before instruction period and acceptance of installation. The Contractor shall instruct Owner's representative in all phases of operation of plumbing equipment.

C. Contractor shall submit to the Architect a letter indicating the names of the persons instructed, the equipment explained and demonstrated and the date of said instruction.

23. TESTS

A. Tests of the various systems and equipment shall be performed in the presence of the Architect, and sufficient advance notice shall be given to permit proper arrangements to be made. Tests shall be as follows.

1. Drainage and vent system shall be subjected to a hydrostatic water test by plugging all outlets and filling the piping system to a height of 5' above the highest fixture and left for a

period of 4 hours. After all the fixtures have been set, a smoke test shall be applied.

24. DISSIMILAR PIPE JOINTS

A. Between Cast Iron and Threaded Pipe: Use a half coupling screwed onto the threaded pipe to form a spigot end and calk into the cast iron pipe, as specified for cast iron joints.

B. Between Cast Iron and Lead Pipe: Use a 4 inch long extra heavy cast brass ferrule, wiped onto the lead pipe and calk into the cast iron pipe, as specified for cast iron pipe.

C. Between Lead and Threaded Pipe: Use a 4 inch long extra heavy cast brass ferrule, screwed into threaded pipe fitting and wiped onto the lead pipe.

D. Between Galvanized steel and brass, copper pipe or tubing domestic water piping use a dielectric connector.

E. Between Threaded Brass and Type TP Threadless Copper Pipe: Use a suitable brazing adapter.

F. Between Threaded Pipe and Types K, L or M Copper Tubing or Welded Brass Water Tube: Use suitable cast bronze soldering adapter.

G. Between Cast Iron and Type TP Threadless Copper Pipe: Use an approved flanged adapter.

H. Between Cast Iron Soil Pipe and Type DWV Copper Tubing or Welded Brass Drainage Tube: Use a suitable copper to soil pipe adapter and calk into the cast iron pipe, as specified for cast iron soil pipe.

I. Between Hubless Cast Iron pipe and Other Types of Pipe Joints, Pipe Fittings and Pipe Materials: Use adapter fittings, hubless fittings and joint couplings, as furnished by manufacturer.

J. Between Cast Iron and Ductile Iron Pipe, with Rubber Ring Gasketed Joints, and Other Types of Pipe Joints, Fittings and Materials: Use adapter fittings of material and type as required for the particular application.

K. All dissimilar materials being jointed together shall have a dielectric connector.

25. DEMOLITION,REMOVALS,MODIFICATIONS AND RECONNECTIONS

A. This contractor shall include demolition, removal or relocation of existing equipment, materials, appurtenances, etc. as required to accommodate the renovation. This contractor shall visit the site prior to bid to ascertain work required. Include all costs in the bid price to accomplish this work.

B. Where equipment and piping are removed or piping networks interrupted or broken, provide the required relocation, reconnection or rearrangement to restore to service all items, outlets, etc. not made obsolete by this work.

C. This contractor's attention is called to the that it is a prerequisite that he examine the specifications and drawings and also visit the site of work in order to become thoroughly acquainted with the extent and requirements of the work, as well as the actual conditions under which the work is specified is to be performed. Claims for extra compensation will not be allowed for ay work that may be caused by existing conditions, which condition should have been subsequent to job site visit.

END OF SECTION

DIVISION 15500 - HVAC

1. GENERAL CONDITIONS

A. The General Conditions are a part of these Specifications whether attached or not, and their requirements shall be binding on the Contractor.

B. The Contractor shall examine the Drawings and Specifications for other trades, to better familiarize him/her with the character of construction and the contractor shall include in his bid all HVAC work as required.

C. Where the word "furnish" or "provide" occurs in the Specifications or Drawings this shall mean to "furnish, install, and connect complete in working order."

2. SCOPE OF WORK

A. The modifications to the heating and ventilation system shall consist ductwork, registers, diffusers, dampers, insulation, etc.

B. Provide all fire ratings as required.

C. After ceiling is exposed contractor shall verify ceiling clearances and adjust ductwork.

D. Contractor shall submit sheet metal drawings that are coordinated with reflective ceiling plan, sprinkler piping, bar joists, mezzanine area and any unknown conditions that are exposed when existing ceiling is removed.

E. Contractor shall hire a certified testing and balancing contractor who shall test pre-construction measurements and perform a final balancing of the system at the completion of this work.

F. Contractor is responsible for all sleeving, coring, cutting, chopping and patching for his/her work.

G. New filters shall be provided after completion of project. HVAC equipment shall not run during construction unless filters are installed.

H. Coordinate duct work with existing structural.

I. All equipment. Material etc. removed under this contract and not intended for final use in the final installation shall be removed from the premises and turned over to, or disposed of, as directed by the owner.

3. EXAMINATION OF PLANS

A. Before submitting his bid, the Contractor shall examine the plans and shall determine for himself the conditions that may affect his work. No allowance will be made if the Contractor fails to make such examination, or fails to identify problem areas pertinent to his bid or to the system operation, prior to his acceptance of the work.

4. RULES AND REGULATIONS

A. All work shall be installed in full accordance with requirements of the local municipality, Uniform Construction Code, State of NJ, and all other agencies having jurisdiction over this project.

B. All work shall be installed in accordance with the 2014 National Electric Code, with the requirements of the Fire Underwriters, National Fire Protection Association, local Building Department, local Fire Marshal, OSHA and the local Electric Company.

5. PERMITS, INSPECTIONS AND FEES

A. Contractor shall file all plans and pay for all permits, inspections and approvals as required.

B. At the completion of the work, he shall secure and deliver to the Architect "Certificate of Approval" from the various Local Village, Town, County and State Bureaus, Fire Underwriters and all Departments having jurisdiction.

6. EXAMINATION OF GENERAL CONSTRUCTION, PLUMBING AND ELECTRICAL PLANS AND SPECIFICATIONS

A. The Contractor shall examine the General Construction and Electrical Plans and Specifications insofar as labor and materials and type of construction, etc., that may affect his work. The submission of a proposal shall be construed as evidence that such examination has been made, no later claims for extra labor, equipment or material, which could have been foreseen by examination will be recognized. In the event of a conflict the Contractor is to bid the higher prices interpretation.

7. APPROVALS AND SHOP DRAWINGS

A. Contractor shall submit to the Architect for approval, complete shop drawings, sheet metal drawings, list of materials and detailed data of equipment, giving the manufacturer's name, catalog numbers, size capacity, dimensions, etc., covering each item which he proposes to install. No equipment or materials shall be installed without obtaining approved shop drawings. Sheet metal and piping drawings shall have 3/8"=1'-0" scale and shall indicate all interfering conduit, piping, lighting, fixtures and structural members.

B. Shop Drawing Submittals: Submit the following item for approval:

1. HVAC Shop Drawing Layout – Piping and Duct
2. Hangers and Supports
3. Ductless AC Unit
4. Dampers
5. Record Drawings
6. Maintenance and Operation Instruction Manuals
7. Certificate of Approval from Local and State Agencies having Jurisdiction

8. MATERIAL AND WORKMANSHIP

A. All material shall be new and of the best quality, and shall bear the Fire Underwriter's Label. The "Label of Approval" shall be the type for the intended application.

B. The work throughout shall be executed in the best and most thorough manner, under the direction of, and to the satisfaction of the Architect who will interpret the meaning of the Drawings and Specifications, and the Architect shall have the power to reject any work and materials, which in his opinion, are not in full accordance therewith.

9. ACCESSIBILITY

A. All valves, dampers, motors, etc., and other equipment requiring maintenance shall be installed as to be readily accessible for operation, maintenance and repair. Access doors shall be sized to permit access to valves, controls, and equipment even if installed many feet above the actual hung ceiling construction.

10. MODIFICATIONS

A. The Drawings indicate and the Specifications describe the general arrangement and location of equipment, piping, ductwork, etc. The Contractor shall, without extra cost to the Owner make all reasonable modifications as may be required to prevent conflict with the work of other trades or for the proper installation of work.

11. OCCUPATIONAL SAFETY AND HEALTH ACT

A. All HVAC equipment and work shall comply with the Federal Occupational Safety and Health Act. The performance of this agreement by the Contractor is subject to all applicable provisions of the Federal Occupational Safety and Health Act.

12. CUTTING AND PATCHING

A. The HVAC Contractor shall do all cutting and patching of work that may be required to make its several parts come together properly as shown or reasonably implied by the Drawings and Specifications of the complete structure, or as directed by the Architect.

B. The Contractor shall not endanger any work by cutting, digging, and shall no cut or alter the work of any other Contractor without the consent of the Architect.

C. Any cost caused by defective or ill timed work shall be borne by the party responsible for same.

13. SHEET METAL WORK

A. All ductwork shall be galvanized steel, construction, gauge and bracing in accordance with SMACNA 1ST EDITION 1985 Handbook, except as otherwise specified.

B. Ductwork and auto dampers connection to louvers shall be secured to 2" x 2" x 3/16" galvanized angle iron frame and made airtight with cement and covered with glass tape secured with adhesive.

C. Ducts up to 24 inches wide shall be supported by 1" x 16 gauge galvanized steel strap hangers 4 ft. on centers. Hangers shall be secured to structural steel beams, joists, etc. Hangers shall be secured to sheet metal with sheet metal screws. Vertical ducts shall be securely braced and supported by angle irons.

14. FIRE DAMPERS

A. Furnish fire dampers in ducts and ceiling/floor fire rated construction as required by Fire Underwriters and local codes. Dampers shall be in accordance with NFPA Pamphlet #90A. All ducts piercing fire walls and/or first floor shall be furnished with fire dampers and access doors. Where FD is indicated on drawings this shall mean fire damper and access door.

B. Dampers shall be Safe-Air, Ruskin, Air Balance Inc., Phillips Aire, or Architect approved equal.

15. FLEXIBLE CONNECTIONS

A. Furnish neoprene flexible cloth connection in supply and return connections to air handling unit. Flexible connections shall be 4 inches long and shall be secured with angles or bands to equipment and ducts.

16. DAMPERS

A. Furnish volume and splitter dampers for balancing of each system. Furnish movable splitter dampers on all supply branches. Dampers shall be constructed of #20 gauge galvanized iron and provided with teflon non-corrosive bearings and galvanized quadrant, handle and locking device.

17. REGISTERS

A. Exhaust Registers (ER): Provide as indicated on drawings.

B. Transfer Grille (TG): Provide as indicated on drawings.

C. All registers shall be provided with opposed blade dampers.

D. Approved Manufacturers: Nailor, Carnes, Titus, Anemostat, Grillmaster.

18. DUCTWORK INSULATION

A. All supply ductwork and outside air ductwork shall be insulated with 1 ½" Johns-Manville fiberglass insulation blanket with aluminum foil facing.

B. All return ductwork located in unconditioned spaces and attics shall be insulated with 1 ½" Johns-Manville rigid fiberglass insulation with a vapor barrier. Contractor has the option to internally line the exposed ductwork in lieu of external insulation.

C. Exterior insulation shall be by Johns Manville model Fiber Glass Duct and Equipment Insulation type 817, 2" thick. All seams shall be sealed with manufactures recommend tape. Weather proofing by Foster Weatherite Mastic 46-50, apply a tack coat at a thickness of 1/32". Embed Foster Mast-A-Fab white membrane into wet coat. Smooth membrane to avoid wrinkles and overlap seams at least 2" . Apply a finish coat of Mastic at a minimum of thickness of 3/32". The finish coat shall be applied no later than ½ hour after the tack coat and shall completely cover the membrane. Apply primer and adhesive before Mastic is applied.

D. All supply and return ductwork 25 feet downstream of all HVAC and Rooftop Units shall be internally lined with 1" Johns-Manville acoustical duct lining. This includes all branch ductwork within the 25 feet.

E. All insulation shall be installed in a neat and workmanlike manner as approved by the Architect.

F. Submit manufacturer's catalog data sheets and samples of each type of insulation to the Engineer for approval.

19. ACCESS DOORS

A. Furnish access doors for all fire dampers, concealed motors, valves, dampers, auto controls, and to all other concealed parts of systems that require accessibility for proper operation and maintenance. Where "FD" is indicated on the drawings this shall mean fire damper and access door. All doors shall be of proper size and located in such a position that the units to be serviced are easily reached. Access doors for concealed valves and dampers shall be minimum 12" x 12".

B. Where depth of ceiling requires larger access door for access to equipment, access doors shall be 24" x 24".

C. Where access to equipment in hung ceiling may be accomplished by lifting up lay-in-ceiling tiles, access doors shall not be required.

D. Access doors shall be Inland Steel Milcor Type to receive plaster or acoustical tile. All access doors for HVAC equipment shall be furnished by Contractor. Contractor shall coordinate the installation of access doors with the General Contractor.

20. RECORD DRAWINGS

A. During the course of construction the Contractor shall keep and record all deviations and changes of work as indicated on the Drawings and its actual installation. Contractor shall have a separate set of plans in field for indicating revisions.

B. After installation is complete the Contractor shall prepare and deliver to the Architect Record Drawings and computer drawing files of work as actually installed. Sepia reproduction tracings with corrections shall be used. All cost of reproduction and two (2) sets of blue on white prints and Sepia originals shall be paid for by the Contractor and delivered to the Architect.

21. OPERATING AND MAINTENANCE INSTRUCTIONS

A. The Contractor shall furnish to the Architect two (2) complete sets of detailed data indicating operating and maintenance instructions covering all equipment including package rooftop units, auto temperature controls, electric heat, exhaust fans, etc. The instructions and data shall be enclosed in separate folders, properly identified and then bound in a large plastic loose leaf book, all as approved by the Architect.

B. Approved Operating and Maintenance Instructions and Record Drawings shall be furnished and in the hands of the Owner before instructions period and acceptance of installation. The Contractor shall instruct Owner's representative in all phases of operation of HVAC systems.

C. Contractor shall submit to the Architect a letter indicating the names of the persons instructed, the system explained, and the data of said instructions.

22. TESTS AND ADJUSTMENTS

A. All heating, air conditioning, ventilating systems, and radiation shall be tested under actual operating conditions. Contractor shall make all necessary adjustments to systems until each system performs up to contract requirements, all to the satisfaction of the Architect. Contractor shall adjust the fan RPM until each fan unit delivers the quantity of air required for each inlet and outlet. Contractor shall adjust all dampers for required CFM for comfort conditions. Contractor shall check auto temperature controls to determine that thermostats are controlling heating and air conditioning equipment to maintain required space conditions.

END OF SECTION

DIVISION 16000 - ELECTRICAL

1. SCOPE OF WORK

A. Work under this contract comprises providing all labor, material, equipment, transportation, scaffolding, rigging, tools, and related items and subcontract work for a complete electrical system in accordance with the Drawings and/or Specifications, Instruction to Bidders, General Conditions and Special Conditions for Mechanical and Electrical Contracts.

B. All work shall be done in strict conformance with the 2014 National Electrical Code, ADA and The IBC – 2015 New Jersey Edition.

C. The extent of the work shall include but not be limited to the following principle items of work:

- Obtaining all permits and approvals from authorities having jurisdiction, and paying all fees required.
- Temporary light and power.
- Empty conduit for systems.
- Raceways.
- Branch circuit wiring.
- Power wiring.
- Wire and cable.
- Outlet boxes.
- Wiring devices and plates.
- Lighting fixtures and lamps.
- Connections to equipment furnished by others.
- Guarantees.
- Tests.
- Grounding.

2. RELATED WORK SPECIFIED ELSEWHERE

A. Finished painting.

B. Voice/Data wiring/jacks

3. REVIEW OF MATERIALS

A. Submit for review prior to fabrication or purchase, shop drawings for the following equipment:

1. Lighting fixtures and controls.

2. Fire alarm system.

3. Panel boards.

4. Transformer.

5. Floor boxes.

6. Electrical devices.

7.

B. Lighting fixture submission shall be submitted in individual brochures. All specified types shall be included in brochure.

4. TEMPORARY LIGHT AND POWER

A. Temporary light and power shall be provided and maintained by this Contractor and shall be removed when temporary is no longer required.

B. Make all arrangements with the utility company for temporary service and pay all charges for service.

C. Power consumed will be paid for by the general contractor.

D. Provide lighting outlets in work areas but generally not less than one outlet per 400 square feet, evenly spaced, and not less than one outlet per area. Provide power outlets in each work area.

E. Lighting outlets shall be Hubbell No. 311 weatherproof lamp holder with guard containing a 150 watt lamp. Power outlets shall be Hubbell No. GFP-201 portable ground fault receptacles.

F. It is specifically noted that any contractor requiring electric power beyond the 120 volt, single phase supply will be required to pay for same on a cost plus 10% basis. However, a temporary electric distribution system shall be provided such that it shall not be necessary for the other trades to pay for a line over 125 feet in length.

G. All temporary wiring shall be in accordance with all applicable safety standards and prevailing governmental regulations.

H. Temporary light and power shall be provided to accommodate ALL trades, during their normal working hours. Temporary maintenance (standby electrician for electric welding, etc.) will be paid for by the trade requiring such standby electrician.

5. PAINTING

A. The Contractor shall include in his work the cost of painting and retouching of items listed below, unless otherwise specified:

1. Switchgear, panelboards

2. Switches

3. Wireways

B. All other items to be field painted shall be properly cleaned by the Contractor for painting under other sections.

6. TESTS

A. All wiring installed under this contract prior to the turning over of the work as a complete unit shall be tested for proper connections, short circuits and grounds. These tests shall be conducted with the aid of suitable testing instruments and where directed, in the presence of the Architect or his duly appointed representative.

7. CLEANING

A. Thoroughly clean all work. Remove all dirt, rust, grease, or other foreign matter prior to concealing or painting. Clean and wash all transparent surfaces on both sides.

8. SUBSTITUTIONS

A. Any proposed substitution of material for any item named in these documents, must be submitted to the Architect seven (7) days prior to bid. The material shall be of equal to the specified item insofar as engineering design, quality of construction, ease of maintenance, safety, appearance, operating characteristics, and actual operating history in other installations are concerned. Lighting fixtures must be accompanied by certified photometric test reports of an independent testing laboratory. If the Architect so requests, samples of both the specified item and the proposed substitution shall be delivered simultaneously to the Architect's office for side-by-side comparison. The Architects decision will be final in determining whether or not any substitution will be permitted.

B. The Contractor shall assume full responsibility for the installation and performance of the substituted item.

9. CUTTING & PATCHING

A. The Contractor shall be responsible for all cutting and patching necessary to accommodate all electric and system work.

10. GUARANTEES

A. The Contractor shall furnish guarantees for all labor and materials for a period of one (1) year from date of final acceptance of work by the Architect which shall include any agreement to repair and make good, (at Contractor's expense) any and all defects which may appear in his work or materials during that time, which in the judgement of the Architect arise from defective workmanship, imperfect or inferior materials. This is in addition to guarantee and warranty supplied by the manufacturer.

11. BASIC MATERIALS AND METHODS

A. Drawings are diagrammatic in that they only indicate approximate locations of outlets and equipment. All outlets and equipment shall be completely wired and connected.

B. Examine and study all Architectural, Mechanical and Structural drawings; particularly note all

construction and become thoroughly acquainted with conditions affecting installation of all raceways, wiring and other electrical work.

C. Exact locations of all equipment and materials are subject to the approval of the Owner, the Owner reserves the right to make any reasonable changes in the location indicated without extra cost.

D. Concealed raceways shall be run in a direct line with long sweep bends and offsets. Exposed raceways shall be installed with runs parallel or perpendicular to walls and ceiling, have right turns consisting of either symmetrical bends or cadmium or zinc coated cast fittings.

E. All raceways and wire shall be mechanically joined together and installed from and between all points of origin, to and between all various classes of outlets or apparatus of every description.

F. All bends and offsets shall be avoided where possible but when same are made, an approved "hickey" or other conduit bending machine shall be used. Conduit bends and offsets shall have long sweeps and easy curvatures, with radius not less than corresponding standard elbows and without kinks or buckles.

G. The Contractor shall layout and install all raceways so as to avoid proximity to hot water pipes. Generally raceways shall not be run within three inches (3") of such pipes, except where crossings are unavoidable. Then the raceway shall be kept at least one (1") from the covering of the pipe.

H. Provide protection for exposed armored cables where subject to damage.

I. Support armored cables above accessible ceilings; do not rest on ceiling tiles. Use spring metal clips or metal cable ties to support cables from structure. Include bridle rings or drive rings.

12. LOCATION OF OUTLETS

A. Drawings are diagrammatic in that they only indicate approximate locations of outlets and equipment. Check with Architect for exact locations prior to roughing.

B. Before installing outlet boxes for switches, check swing of all doors and locate all outlet boxes on "strike" side of doors.

C. Where switches are indicated closely grouped, install in gang boxes, with gang plates.

D. Prior to installation, heights and locations must be coordinated with work of other trades, checked against special requirements of drawings and verified with Architect. If for any reason these conditions cannot be met consult Architect's representative before proceeding.

E. Where ceilings are noted on Architectural drawings to be treated with acoustical panels of tiles, set outlets in center of the tile block; set outlets flush and support independently from ceiling tiles or raceway systems.

F. In general, install switch and receptacle outlets with their long dimension vertical.

G. Unless otherwise indicated, all outlets shall be located with their centers above the finished floors as follows:

(1)	Switches	(a)	4'-0"
(2)	Receptacles	(a)	1'-6"

(3)	Fire alarm signals	(a)	80” min to bottom of lens
(4)	Fire alarm pull stations	(a)	4’-0” to centerline

13. RACEWAYS

A. All raceways where they enter steel boxes or steel cabinets shall be secured in place by galvanized locknuts and bushings. Provide double locknuts and insulating bushings on all conduits 1" and over. The ends of all threaded conduits and the holes in all fittings shall be threaded and all burrs and sharp edges removed. All temporary ends of raceways shall be immediately capped after installation.

B. Where raceways enter steel boxes or cabinets in wet locations they shall be secured in place with PVC gasketed, sealing locknuts.

C. The Contractor shall see that all raceways are dry and clean prior to installation of conductors.

D. Raceways shall be supported on approved types of wall brackets, ceiling trapeze, strap hangers or pipe straps, secured by means of toggle bolts or hollow masonry units, rawl plugs in concrete or brick, machine screws on metal surfaces, and wood screws on construction. Nails are not permitted. No raceway shall be supported from another raceway or piping of mechanical system.

E. Only mechanical means approved for the purpose shall be used in pulling conductors in raceways and only U.L. approved lubricant will be permitted.

F. Generally all raceways, armored cable and outlet boxes, are to be installed concealed unless otherwise indicated.

G. Cutting of chases in unplastered concrete block or masonry partitions are not permitted. Install vertical conduit runs in voids of blocks, walls and special built-up chases where provided. Cooperate with Contractor for General Construction to accomplish this method of construction. Ascertain exact locations of all chases prior to installation of conduit.

H. The type of raceway shall be as follows for all feeder/branch circuits or systems unless otherwise specified:

	Application		Type of Conduit
(1)	Exposed (indoor) Unfinished areas	(a)	Electric Metallic Tubing (EMT)
(2)	Exposed (outdoor)	(a) (b)	Rigid Aluminum, Intermediate Metal (IMC)
(3)	In concrete or in concrete fill	(a) (b)	Intermediate Metal (IMC) PVC (SCHED.80)
(4)	Within block wall Tubing (EMT)	(a)	Electric Metallic
(5)	In furred wall spaces; wood and metal stud	(a)	Electric Metallic Tubing (EMT)

	partitions. Concealed above ceilings	(b)	Flexible Armored Cable Type MC-90 Metal clad with 90deg. Conductors.
(6)	Final connections to recessed lighting fixtures	(a) (b)	Flexible Metal Metal clad MC-90

I. Unless noted otherwise, minimum size raceway shall be 3/4" in diameter.

J. Intermediate Metal Conduit (IMC): Electrogalvanized, mild steel pipe, zinc coated threads with an outer coating of zinc bichromate as manufactured by Triangle, Republic, Wheatland or approved equal.

K. Aluminum Conduit: Full weight aluminum pipe, threaded as manufactured by Alcoa, or approved equal.

L. Rigid non-metallic (PVC): Polyvinyl chloride, schedule 40 or 80, 90 Deg. C., U.L. rated, as manufactured by Carlon or accepted equal.

M. Flexible Metal: Mild steel strip, hot dipped galvanized, zinc coated, as manufactured by Triangle or approved equal.

N. Liquid-tight flexible steel conduit: Galvanized steel strip interlocked construction, extruded polyvinyl jacket over a steel core, as manufactured by Anaconda, or approved equal.

O. Intermediate grade metal (IMC): Electro-galvanized threaded, thin wall mild steel tube, zinc coated, as manufactured by Triangle, or accepted equal.

P. Electric metallic tubing (EMT): Electro-galvanized thread-less, thin wall mild steel tube, zinc coated, as manufactured by Triangle or accepted equal.

Q. Raceway Fittings:

(1) IMC conduit: Bushings insulated type, Thomas & Betts 1200 series or approved equal. Grounding bushings - Thomas & Betts 3800 series or approved equal.

(2) EMT: Insulated compression type or insulated "socks", Thomas & Betts or accepted equal. Set screw type is unacceptable.

(3) Rigid non-metallic (PVC): Solvent welded, per manufacturer recommendations, Carlon or accepted equal.

(4) Flexible Conduit: Insulated type, Thomas & Betts "Tite-Bite" or accepted equal.

(5) Liquid Tight Flexible Conduit: Insulated type, with "O" rings, Thomas & Betts series 5231 or accepted equal. For sized 3/4" and larger use grounding liquid tight connectors O.Z. Gedney series "4Q".

(6) Conduit Outlet Bodies: Malleable iron fittings, Crouse-Hinds "condulets" or accepted equal.

14. OUTLET PULL AND JUNCTION BOXES

A. Outlet boxes shall be made of stamped galvanized steel of proper size and type for the purpose intended. All steel boxes shall be Steel City or accepted equal.

B. Where buried concrete, provide boxes of type which will prevent intrusion of concrete slurry into conduit system.

C. Provide blank plates on outlet boxes in which no wiring device is installed.

D. Install cast weatherproof galvanized type FS or FD outlet boxes outside of building and in wet locations.

E. Where required, provide galvanized pull boxes or junction boxes. Each box shall be made of the proper size and gauge for the purpose for which it is to be used. Boxes shall be complete with screw covers.

F. Pull and junction boxes installed in earth shall be cast iron NEMA 4 construction as manufactured by Appleton, "WOC" series or equal by O.Z./Gedney.

G. Each box shall contain a green grounding screw or ground lug.

15. WIRE, CABLE AND WIRE SPLICES

A. Unless noted conductors shall be copper, with THWN(Wet location),THHN(Dry location),insulation. Final connections to lighting fixture connections shall be type THHN. Conductors No. 10 and smaller to be solid; No. 8 and larger to be stranded. Minimum size wire for light and power circuiting to be No. 12 gauge; control for systems wiring as required by equipment manufacturer or as noted elsewhere. Provide specialized insulation where required by code.

B. Conductors shall be continuous from origin to panel or equipment without splices. Where tap splices are necessary and accepted, they shall be made in accepted splice boxes with suitable connectors as noted herein. All terminals and tap splices shall be made secure with accepted solder-less pressure type connectors as manufactured by Burndy or Dossert Mfg. Co. Tap splices shall be wrapped with insulating plastic tape in a manner accepted for circuit voltage. Lighting and receptacle branch circuit connectors shall be Minnesota Mining Co., "Skotchlok", pre-insulated connectors types Y, R, G, and B, "Pigtail" type PT 1, PT 2 or PT 3.

C. Wire and cable shall be manufactured by Triangle or accepted equal.

D. Metal clad cable (MC-90)shall have positive interlocked galvanized steel armor, copper conductors with 600 v. 90 C insulation and a separate insulated equipment ground conductor as manufactured by AFC or accepted equal.

16. WIRING DEVICES AND PLATES

A. Provide, install and wire the devices specified below for all outlets. Where several devices are to be installed in one location, devices shall be ganged under one plate.

1.	Single pole, two pole, 3-way, 4-way switches	Hubbell 1221, 1222, 1223, 1224
2.	Single pole occupancy sensor switch	Sensor Switch WSX-PDT-WH

3.	Ceiling Occupancy Sensor	Hubbell ADT 200C/CU300A
4.	Duplex receptacle	Hubbell 5362
5.	Duplex receptacle-Ground fault interrupter type	Hubbell GF 5362
6.	W.P. cover for ground fault receptacle	Hubbell WP26 or WPFS 26

B. Wiring devices as manufactured by Pass & Seymour, Arrow Hart or G.E. are accepted equals.

C. Wiring devices of the same manufacturer shall be used throughout the project.

D. Plates shall be plastic. Color as selected by the architect. Plates on exposed boxes in unfinished areas shall be stamped steel with rounded edges.

17. COLOR CODING

A. All secondary service, feeder and branch circuit conductors throughout the secondary electrical system of the project shall be color coded in accordance with NEC standards.

B. All branch circuit conductors Nos. 12 and 10 shall be solid color compound, solid color coating or colored fibrous covering. All sizes of conductors used for neutrals and equipment grounds shall be solid compound or solid color coating white and green respectively, except neutrals with colored strips shall be used where required by the NEC. All phase conductors No. 8 and larger with stripes, bands or hash marks shall have a background color other than white or green.

C. The solid color coating, stripes, bands or hash marks shall be a strongly adherent paint or dye not injurious to the insulation which will not be obliterated by pulling into raceway. The stripes, bands, or hash marks shall be sufficiently wide and clear to be readily distinguishable after installation.

18. DIRECTORIES

A. Provide typewritten directories for panels, indicating use of each branch circuit and clearly designating spare circuits. Handwritten directories are not acceptable.

19. MISCELLANEOUS METAL

A. Contractor shall furnish and install all supports, hangers and miscellaneous metals such as galvanized iron pipe stanchions, racks, fittings, etc., required for proper installations of the work. All miscellaneous racks and fittings shall be galvanized and shall be manufactured by Channel or accepted equal.

20. NAMEPLATES

A. Provide nameplates for all control equipment, special control switches, special outlets or devices, disconnect switches and motor starters.

B. Nameplates shall be engraved "Lamacoid" sheets with white letters, not less than 1/2" high. Color of lamacoid shall be black or grey, cemented in place.

21. SLEEVES

A. The contractor shall furnish and install all sleeves (minimum #16 gauge steel) in floors, beams, walls, etc., needed for installation of his work. The setting of sleeves in concrete, masonry, etc., shall be properly coordinated with respective trades.

22. GROUNDING

A. Grounding shall conform to applicable requirements of the 2002 National Electrical Code, the National Electrical Safety Code, and the further requirements specified herein and/or shown and noted on the contract drawings.

B. Grounding cable shall be stranded copper with type THWN insulation of the AWG size indicated on the contract drawings. Where ground cable is required by code, but not shown on the drawings, it shall be provided and installed of the size required by the National Electric Code. Grounding cables shall be identified.

C. When rigid non-metallic conduit is used, a separate insulated green ground wire shall be utilized.

23. LIGHTING FIXTURES AND BALLASTS

A. Lighting fixtures shall be so supported that the fixture support shall be capable of carrying the unit supported thereon, plus a substantial additional (safety factor) load. Where installation is sample tested and does not meet the requirements, all such suspensions shall be removed and re-hung in an acceptable manner. Fixtures shall be installed true, plumb and left clean and free from all grease and fingerprints.

B. For lighting fixtures and lamps, refer to schedule on the drawings.

C. All lighting fixtures shall be complete with necessary mounting or hanging hardware.

D. All fixtures shall be complete with drivers and other necessary equipment.

E. All fixtures shall bear the label of the Underwriters' Laboratories.

F. The contractor shall check with the architect in the field to verify the ceiling type to be installed. Order fixtures with frames and mounting hardware that will be compatible with the ceiling in which they are installed.

24. DEMOLITION, REMOVALS, MODIFICATIONS AND RECONNECTIONS

A. This contractor shall include demolition, removal or relocation of existing equipment, materials, appurtenances, etc. as required to accommodate the renovation. This contractor shall visit the site prior to bid to ascertain work required. Include all costs in the bid price to accomplish this work.

B. Where outlets are removed or circuits interrupted or broken, provide the required relocation, reconnection or rearrangement to restore to service all items, outlets, etc. not made obsolete by this work.

C. There shall be no interruptions of service to existing electrical systems without written consent of the owner. Such interruptions shall be kept to a minimum and shall be scheduled with the owner. Any cost for the work that must be scheduled on an overtime basis to accommodate the owner's requirements for interruption shall be included in the bid price. The fire alarm system shall be kept in operation at all times.

D. This contractor's attention is called to the fact that it is a prerequisite that he examine the specifications and drawings and also visit the site of work in order to become thoroughly acquainted with the extent and requirements of the work, as well as the actual conditions under which the work is specified is to be performed. Claims for extra compensation will not be allowed for any work that may be caused by existing conditions, which condition should have been foreseen subsequent to job site visit.

E. Any existing condition found which will affect this contract shall be brought to the attention of the architect in writing, five (5) days prior to bid.

END OF SECTION

SECTION 271100 – COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Telecommunications mounting elements.
   2. Telecommunications equipment racks and cabinets.
   3. Telecommunications service entrance pathways.
   4. Grounding.
B. Related Sections:
   1. Division 27 Section 271200 "Network Wiring"

1.3 DEFINITIONS

A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.
B. BICSI: Building Industry Consulting Service International.
C. Channel Cable Tray: A fabricated structure consisting of a one-piece, ventilated-bottom or solid-bottom channel not exceeding 6 inches in width.
D. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).
E. LAN: Local area network.
F. RCDD: Registered Communications Distribution Designer.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for equipment racks and cabinets. Include rated capacities, operating characteristics, and furnished specialties and accessories. characteristics,
B. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
   3. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
   1. Layout Responsibility: Preparation of Shop Drawings shall be under the direct supervision of <Contractor name>.

2. Installation Supervision: Installation shall be under the direct supervision of Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
3. Field Inspector: Currently registered by BICSI as Commercial Installer, Level 2 to perform the on-site inspection.

B. System Warranty shall provide a complete system warranty to guarantee end-to-end high performance cabling systems that meet application requirements. The guarantee shall include copper connectivity components. The system shall be warranted for a period of at least 25 years. A current Manufacturer Certified Installer Certificate must be provided with bid at time of bid submission.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

E. Grounding: Comply with ANSI-J-STD-607-A.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install equipment frames and cable trays until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and work above ceilings is complete.

1.7 COORDINATION

A. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment and service suppliers.
   a. Meet jointly with telecommunications and LAN equipment suppliers, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
   b. Record agreements reached in meetings and distribute them to other participants.
   c. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.
   d. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in the equipment room.

B. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

PART 2 – PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.
   1. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
   2. Support brackets with cable tie slots for fastening cable ties to brackets.
   3. Lacing bars, spools, J-hooks, and D-rings.
   4. Straps and other devices.

C. Conduit and Boxes: Comply with requirements in Division 26 Section “Raceway and Boxes for Electrical Systems.”.
   1. Outlet boxes shall be no smaller than 4 inches wide, 4 inches high, and 2-½ inches deep.

2.2 EQUIPMENT FRAMES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work are limited to, the following:
   1. Campus Requirement / Basis of Design: Panduit

B. General Frame Requirements:
   1. Distribution Frames: Freestanding modular-aluminum units designed for telecommunications terminal support and coordinated with the dimensions of units to be supported.
   2. Module Dimension: Width compatible with EIA 310 standard, 19-inch panel mounting.
   3. Finish: Manufacturer's standard, baked-polyester powder coat.

C. Floor Mounted Racks:
   1. Two post, 84"Hx19"Wx3"D floor mounted rack with 45U of mounting space with EIA universal mounting hole spacing and 15"x20" floor mounting frame.
   2. Baked-polyester powder coat finish.
   3. Campus Requirement / Basis of Design: Panduit Model R2P

D. Cable Management for Equipment Frames:
   1. Metal, with integral wire retaining fingers
   2. Baked-polyester powered coat finish.
   3. Horizontal cable management panels shall have 3-½" deep front and rear D-Rings mounted to 19" mounting panel. Campus Requirement Panduit CMPH2. Provide 2x 2U horizontal cable management for each 2U of patch panel location.
   4. Vertical cable management shall include 84"Hx6"Wx16"D vertical cable management with bend radius fingers at each rack unit support. Campus Requirement Panduit Model PRV6. Provide Vertical wire management on one side of each rack and for each location 1 additional to ensure the outside edge is covered.

2.3 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work shall be one of the following:
   1. Basis of Design: General Cable/Genspeed 6000 Enhanced

2.4 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Owner's IT group will provide specifics on acceptable manufacturers and part numbers for basis of design.

B. B. Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.
   1. Rack mounted patch enclosures designed for armored fiber optic cables to fit standard 19" data rack. The panel shall accept snap-in adapter plates and shall provide front and rear removable covers and cable management.
   2. Provide snap-in adapter plates with SFP connectors for 12-fiber. Communication Cabling Riser & Details for fiber counts and connections.

C. Cable Connecting Hardware:
   1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-B.3.

END OF SECTION 271100

SECTION 271200 - NETWORK WIRING

A. All installed network cabling must adhere to the following guidelines:
   i. TIA/EIA-569-A
   ii. Cable Support: Support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
      1. Support brackets with cable tie slots for fastening cable ties to brackets.
      2. Lacing bars, spools, J-hooks, and D-rings.
      3. Straps and other devices.
   iii. UTP CABLE
      1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, shall be limited to the following:
         a. Campus Preference / Basis of Design:
            i. General Cable/Genspeed 6000 Enhanced
         b. Acceptable Manufacturers:
            i. Berk-Tek
            ii. Mohawk Cable
            iii. Panduit TX Cable
            iv. Tyco Electronics/AMP Netconnect
      2. Description: UTP cable, 4-pair, 23 AWG solid copper conductors, covered with Teflon FEP insulation and a plenum rated jacket.
         a. Comply with TIA/EIA-568-B.2, Category 6 performance specifications.
         b. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
            i. a. Communications, Plenum Rated: Type CMP, complying with NFPA 262
      3. Jacket color: Provide the following jacket colors depending on cable use:
         a. General Network Access Port: Yellow Jacket
         b. Audio Visual Network: Blue Jacket

B. General Requirements for Cable Connecting Hardware:
   i. Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Modules:
   i. Category 6, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-B.1. Termination shall be accomplished by use of a forward motion termination cap and shall not require the use of a punchdown tool. The termination cap shall provide strain relief on the cable jacket, ensure cable twists are maintained to within 1/8” (3.18 mm) and include a wiring scheme label. The wiring scheme label shall be available with both T568A and T568B wiring schemes. All terminations for this project shall use the T568B (B) wiring scheme. The modules shall terminate 4 pair 23 100-ohm solid unshielded twisted pair cable. The modules shall be universal in design, including complying with the intermateability standard IEC 60603-7 for backward compatibility. Category 6 modules shall have UL and CSA approval. The modules shall have ETL verified Category 6 performance and ISO Class E performance (as defined in ISO/IEC

11801) in both the basic and channel links. They shall be universal in design, accepting 2, 3, or 4 pair modular plugs without damage to the outer jack contacts. The modules shall be able to be re-terminated a minimum of 10 times and be available in 11 standard colors for color-coding purposes. Panduit MINI-COM TX-6G Series

D. Workstation Outlets: Four-port-connector assemblies mounted in single faceplate. Panduit MINI-COM Ultimate ID Series

ii. Faceplate: faceplate with minimum of 4 module spaces.

iii. For use with snap-in jacks flush mounted jacks accommodating any combination of UTP, optical fiber, and coaxial work area cords.

iv. Workstation outlet color shall match cable color indicated above depending on the particular service. Provide white blank cover to fill in unused module spaces.

II. BERGEN COMMUNITY COLLEGE NETWORK WIRING EXECUTION

A. WIRING METHODS

i. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters. Conceal raceway and cables except in unfinished spaces.

1. Install plenum rated cable in all environmental air spaces, including plenum ceilings.
2. Cabling above suspended acoustical ceiling: Install cabling within cable tray to the extent feasible and where pre-existing. For cabling between cable tray and device or where cable tray is not available, provide J-hooks or D-hooks as required for proper support of cable. Where multiple cables are installed in hooks, provide removable Velcro straps in a neat manner.
3. Cabling within communication closets: Support all horizontal cabling within cable tray between vertical riser locations and equipment racks. For vertical cabling within closets, secure the cables to the vertical cable tray to provide required support. Refer to drawings for horizontal and vertical cable management within the racks. Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.

B. INSTALLATION OF CABLES

i. Comply with NECA 1.

ii. General Requirements for Cabling:

1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Coordinate with Bergen Community College IT Project Manager for coordinating installation of cables to locations with existing runs to determine if the runs will be installed in the existing chase with a new faceplate or as a new chase with its own box and faceplate.
4. Terminate conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.

6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
10. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

iii. UTP Cable Installation:
1. Comply with TIA/EIA-568-B.2. 2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

iv. Open Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

v. Group connecting hardware for cables into separate logical fields.

vi. Separation from EMI Sources:
1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.

C. FIELD QUALITY CONTROL

i. Perform tests and inspections.

ii. Tests and Inspections:
1. Visually inspect UTP cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA- 568-B.1.
2. Visually confirm Category 6, marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test cables after termination but not cross-connection.
a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

5. UTP Performance Tests:
    a. Test for each outlet. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:
        i. Wire map.
        ii. Length (physical vs. electrical, and length requirements).
        iii. Insertion loss.
        iv. Near-end crosstalk (NEXT) loss.
        v. Power sum near-end crosstalk (PSNEXT) loss.
        vi. Equal-level far-end crosstalk (ELFEXT).
        vii. Power sum equal-level far-end crosstalk (PSELFEXT).
        viii. Return loss.
        ix. Propagation delay.
        x. Delay skew.
6. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
7. End-to-end cabling will be considered defective if it does not pass tests and inspections.
8. Prepare test and inspection reports.

SECTION 281300 – SECURITY ACCESS CONTROL SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The furnishing, installation, and connection of a complete and functional security access control system.

1.2 SCOPE OF WORK

A. The security access control system shall communicate with the existing campus-wide system as manufactured by CBORD no substitutions. All components shall be by CBORD and all, accessories, cabling, raceways, enclosures, and power supplies shall comply with CBORD requirements.

B. CBORD shall provide a Project Manager for this project.

1.3 QUALITY ASSURANCE

A. All materials and components shall be new, of current manufacture, and shall not have been in prior service except as required for factory testing. There shall be one-source responsibility for warranty, parts, and service through a local representative with factory-trained service personnel.

B. Installation and materials shall comply with the following standards:

1. NFPA
2. National Electrical Code.
3. UL.

C. Contractor performing the work shall be a CBORD certified firm who regularly performs the type of work as specified.

D. Warranty period: CBORD standard warranty, but not less than one year from date of substantial completion.

1.4 COORDINATION

A. Coordinate system head-end locations with Owner's IT Department prior to installation.

B. The drawings show the general arrangement and extent of the work. Coordinate card access equipment with Electric door hardware provided, door frames, and field conditions.

1.5 SUMMARY

A. Without intending to limit and/or restrict the scope of work required by this specification and all applicable drawings and solely for the convenience of the Contractor the work to be performed in general consists the following

1. Mounting all door position contacts, electronic control devices, request-to-exit devices, and related field materials supplied by Security Contractor for the complete installation of the access control system. The CBORD enclosures are to be mounted by the Contractor in

customer defined rooms as shown on the drawings.

2. Terminations of all wiring and cables as required for the complete installation and operation of the access system including all hardware.
3. Hardware mounting is to be per manufacturer's instructions and all applicable codes and laws.
4. Material: All materials shall be new and be shipped to the project site and stored in original manufactures containers until installed.

B. Requirements of Regulatory Agencies: All exit devices must be listed under 'Panic Hardware' in Accident Equipment List of Underwriters' Laboratories. Where labeled fire doors are used as exits, they must be equipped with labeled fire exit hardware.

C. Access-controlled egress doors shall comply with >insert name< Building Code and operate as so listed in the *UL Online Certifications Directory.*

D. The security card access system shall interface with the University campus-wide security system.

1.6 SHOP DRAWINGS/SUBMITTALS

A. Provide the following information:

1. A completely itemized hardware schedule and complete CBORD Electronics part's list.
2. Shop Drawings
3. Wiring diagrams.
4. Installation instructions

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Security equipment shall consist of the appropriate configuration of CBORD equipment to accomplish the intended functions. It is the responsibility of this contractor to coordinate all necessary hardware/software with CBORD. This shall consist of all equipment; hardware and software to meet the intended objectives.

B. Should items of hardware not specified be required for completion of the work, furnish such items of types and quantities suitable for the service required and comparable to adjacent or similar hardware. All equipment shall be the latest available version of the manufacturer.

C. Should it be determined that specified hardware for any location, because of detail or size of member to which the hardware is to be applied, is unsuitable, provide hardware of the proper type. Such hardware will be similar in operation to types specified and not of lesser quality.

2.2 MANUFACTURER

A. CBORD.

2.3 ELECTRONIC ACCESS CONTROL

A. The security access control system shall have the following features:

1. Modular: Uses expansion boards.

2. Stand-alone or networked.
3. Microprocessor based.
4. Digital Transmission.
5. Encryption.
6. Local operating program.
7. Multiple reader technologies.
8. Resident application library.
9. UL Listed: 294, 1076, Grade AA.
10. Relay outputs.
11. 16,000 user capacity.

2.4 NETWORK CONTROLLER

A. CBOARD network controller shall have the following features:

1. 32-bit 100Mhz RISC processor running Linux Operating System.
2. 8 MB on-board flash memory allowing program updates to be downloaded through the network; 16 and 32 MB expansions available.
3. 32 MB SDRAM and 256k SRAM.
4. Communications via standard TCP/IP via 10/100 Mbps Ethernet and RJ-45 connector.
5. Stores a complete access control and configuration database for up to thirty-two (32) Door/Reader interfaces.
6. The V-1000EVO interfaces with combinations of devices having a maximum of 32 door/reader interfaces.
7. Connects Interfaces via two (2) independent RS-485 networks, each having two (2) sets of input connections.
8. Reports supervised input/alarms.
9. Allows local connection of laptop PC for diagnostics and confirmation.
10. Connects to the host and other devices on a TCP/IP network.
11. Receives and processes real time commands from the host software application.
12. Reports all activity to the host.
13. Controls and communicates with all connected devices.
14. Buffers online transactions and uploads to the host when communication is restored.
15. UL 294 and UL 1076 recognized components.
16. Quick disconnect screw terminals.
17. Four (4) RS-485 connections to interfaces.
18. Two (2) supervised analog inputs for general purpose applications.
19. Two (2) non-latching output relays for local alarm and annunciation.
20. AC fail monitor.
21. Battery fail monitor.

2.5 BOARD ENCLOSURES

A. Squadron 12 Board Enclosure:

1. Squadron, Trove 12-Board Enclosure w/ two 6-board Panels installed w/ Magnetic Wiring kit and ties
2. Tamper Switch
3. Key lockable

4. Dimensions (H x W x D): 27.25” x 21.5” x 6.5” (692.15mm x 546.1mm x 165.1mm)

B. Squadron 4 Board Enclosure:

1. Squadron, Trove 4-Board Enclosure w/ Magnetic Wiring kit and ties
2. Tamper Switch
3. Key Lockable
4. Dimensions (H x W x D): 18” x 14.5” x 4.625” (457.2mm x 368.3mm x 117.47mm)

2.6 INTERFACE MODULES

A. V200 Input Monitor Interface:

1. On-board flash memory allowing program updates to be downloaded through the network.
2. Reports supervised or unsupervised alarm circuits.
3. Off-normal condition programmable for each input point (NO or NC alarm devices may be used).
4. Connects to V1000 Network Controller via two-wire RS-485.
5. Receives and processes real time commands from the V1000.
6. Reports all activity to the V1000.
7. Allows complex input/output linking when used with V1000 and V300 Output Control Interface.
8. Polycarbonate enclosure.
9. All connections and indicators fully identified by silk-screened nomenclature on the cover.
10. UL 294 and UL 1076 recognized components.
11. Quick disconnect screw terminals.
12. Rotary address switch.
13. Sixteen (16) input circuits.
14. AC fail monitor
15. Battery fail monitor
16. Battery fail monitor.
17. Basic I/O linking using inputs 1 and 2, auxiliary outputs 1 and 2.
18. Mounts within locking Squadron Trove enclosure.

B. V300 Output Control Interface:

1. On-board flash memory allowing program updates to be downloaded through the network.
2. Off-normal condition programmable for each input point (NO or NC alarm devices may be used).
3. Twelve (12) latching Form-C relays, contacts rated at 2A @30VDC.
4. Connects to V1000 Network Controller via two-wire RS-485.
5. Receives and processes real time commands from the V1000.
6. Reports all activity to the V1000.
7. Allows complex input/output linking when used with V1000 and V200 Input Monitor Interface.
8. Polycarbonate enclosure.
9. All connections and indicators fully identified by silk-screened nomenclature on the cover.

10. UL 294 and UL 1076 recognized components.
11. Quick disconnect screw terminals.
12. Rotary address switch.
13. Twelve (12) latching output circuits for relay controllable devices.
14. Two (2) auxiliary input circuits.
15. Basic I/O linking using inputs 1 and 2, auxiliary outputs 1 and 2.
16. Mounts within locking Squadron Trove enclosure.

C. V100 Door/Reader Interface:

1. On-board flash memory allowing program updates to be downloaded through the network.
2. Reports supervised inputs.
3. Connects to V1000 Network Controller via two-wire RS-485.
4. Receives and processes real time commands from the V1000.
5. Processes off-line access control decisions based on facility code.
6. Reports all activity to the V1000.
7. Polycarbonate enclosure.
8. All connections and indicators fully identified by silk-screened nomenclature on the cover.
9. UL 294 and UL 1076 recognized components.
10. Quick disconnect screw terminals.
11. Rotary address switch.
12. Two (2) reader inputs.
13. Two (2) door monitor switches.
14. Two (2) Request-to-Exit switches.
15. AC fail monitor.
16. Battery fail monitor.
17. Two (2) non-latching relay outputs configurable for door strikes.
18. Two (2) non-latching relay outputs for auxiliary devices: door held/forced alarm, alarm shunt, host off-line (comms down), or general purpose.
19. Mounts within locking Squadron Trove enclosure.

2.7 DOOR COMPONENTS

A. Card Reader: CBORD >Schlage MT series<

1. Reader shall be weatherproof where indicated on the drawings.

B. Request-to-Exit Detector:

1. Single or double door use.
2. Wall or ceiling mountable.
3. Internal vertical point ability.
4. Wrap-around coverage pattern.
5. Selectable relay trigger mode.
6. Selectable fail safe/fail secure mode.
7. Bosch #DS160 Series, or equal.

C. Door Position Switch:

1. Hermetically sealed magnetic reed switch, potted in a polyurethane based contact housing.
2. Snap-lock insulation bushing designed for tight fit in steel doors.
3. ABS plastic housing colored off-white, gray or brown to match each door location.
4. Sentrol 1078/78C, or equal.

D. Door Prop Alarm Sounder:

1. Wave, or equal.
2. ATW Doberman or approved equal.

2.8 SOFTWARE

A. CBORD CS Gold Version 6, compatible with Microsoft Windows operating system, Oracle 11g database, and the latest 64-bit technology including modular features and options for:

1. Datacard, IDWorks, and CS CardLink.
2. CS access.
3. CS meal plans.
4. CS stored value and credit.
5. CS action and response management.
6. CS entitlements.
7. CBORD MangeMyID and NetCardManager.
8. CS Gold WebCard Center.
9. CS Gold AdminWeb.
10. CBORD off-campus commerce.
11. NiceVision DVR.

B. CS locations v6 with one-hundred extra locations.

2.9 POWER SUPPLIES

A. Altronix Maximal Series, or approved equal. All such devices shall be listed for access control use and be consistent with the access control system manufacturer's installation instructions and listing.

1. Supplied with 4 hour battery backup.
2. Supply power supplies for the initial load plus 30% spare capacity including batteries.
3. Coordinate power supply parameters with manufacturers of equipment being supplied.
4. Supplied with UL listed fused outputs.
5. Supplied with tamper switches.

B. Power supplies shall be installed next to equipment enclosure it serves.

2.10 WIRE AND CABLE

A. Provide cable as recommended by equipment manufacturer. Cable shall be plenum rated.

B. Typical Card Reader, Keypad, and Biometric: 8-Conductor #18AWG, stranded, foil shield with drain. No stripe. Black/Red/White/Green/Brown/Blue/Orange/Yellow.

C. Request-to-Exit (REX) and Horn: 6-conductor #18AWG, stranded, no shield. Black stripe, Black/Red/White/Green/Brown/Blue.

D. Electric Hardware (lock power and lock position): 4-conductor #16AWG, stranded, no shield. Orange stripe. Black/Red/White/Green.

E. Door Position Switch (DPS) and Switch: 4-conductor #22AWG, stranded, no shield. Red stripe. Black/Red/White/Green.

F. Hybrid (Composite Cable): 4-element composite cable with overwrap.

PART 3 EXECUTION

3.1 INSTALLATION

A. Coordinate installation of head-end equipment, card access controller, and card access modules with the >Insert Name<Facilities prior to installation.

B. Materials and Equipment: Receive equipment from supplier and inspect for damage. Store and protect equipment and components from damage, water, and rust until installed.

C. General: Arrange work to obtain coordinated installation with proper clearances and systems neatly spaced.

D. Install all equipment in accordance with manufacturer's instructions and best trade practices.

E. Examine field conditions and adjust locations of equipment and enclosures so they won't be susceptible to damage after installation and while in service.

F. Close unused openings of conduits, boxes, cabinets, outlets, and equipment to prevent entry of foreign matter.

G. Install cable in conduit.

H. All shield and grounds must be properly installed and terminated separately from all other grounds, as specified by manufacturer's instructions..

I. Provide an Ethernet connection from building IT system to controller.

J. Provide a method for labeling cables to allow for easier maintenance. Coordinate labeling method with >insert name<Facilities.

K. Label all cabinets and enclosures. Coordinate with Engineer and Owner.

3.2 COMMISSIONING

A. Clean and Adjust: Repair or replace damaged work to Owner's satisfaction. Touch-up marred or scratched enclosures.

B. A factory-certified individual shall complete the initial programming of the system to comply with Owner's needs and to make system completely functional. Software shall be upgraded to the latest available version at time of acceptance

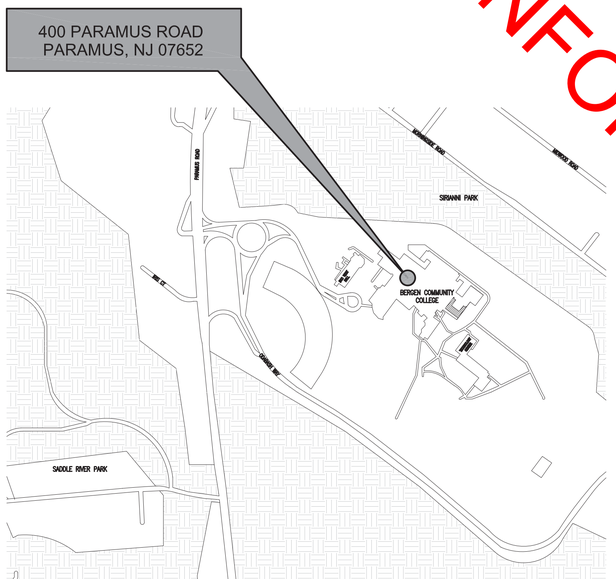
C. Testing: An authorized factory representative shall test the system in accordance with manufacturer's standard testing procedures. Provide a 72 hour notice to Architect/Engineer/Owner prior to test schedule. Provide a copy of test reports for each Operations and Maintenance manual.

D. Provide complete as-built drawings including wiring diagrams of head-end equipment and locations of all equipment.

END OF SECTION 281300

BERGEN COMMUNITY COLLEGE
ONE STOP EXPANSION

400 PARAMUS ROAD
PARAMUS, NJ 07652



1 LOCATION MAP
N.T.S.

NORTH

AFF	Above Finished Floor	ID	Inside Diameter
ACT	Acoustic Ceiling Tile	INSUL	Insulation
ADJ	Adjustable	INT	Interior
ALUM	Aluminum	INCL	Include (d)(ing)
&	And	INV	Invert
∠	Angle		
APPROX	Approximate	JT	Joint
ARCH	Architect(ural)	J-BOX	Junction Box
@	At		
AUX	Auxiliary	LBS	Pounds
		LLV	Long Leg Vertical
BET	Between	LT	Light
BM	Beam	LAM	Laminate
BLDG	Building		
BLK	Block	MAS	Masonry
BLKG	Blocking	MATL	Material
BD	Board	MTL	Metal
BOT	Bottom	MIN	Minimum
B.O.	Bottom of	MAX	Maximum
		MFR	Manufacturer
CAB	Cabinet	MTD	Mounted
CAT	Catalog		
CLG	Ceiling	NIC	Not In Contract
CJ	Control Joint	NTS	Not To Scale
C/L / ℄	Center Line	No./#	Number
C.O.	Clean Out	NOM	Nominal
CLO	Closet		
CLR	Clear	OC	On Center
CMU	Concrete Masonry Unit	OPG	Opening
CONC	Concrete	OD	Outside Diameter
COORD	Coordinate	OPP SIM	Opposite Similar
CORR	Corridor	OPP HND	Opposite Handed
CW	Cold Water		
COL	Column	PNL	Panel
CONST	Construction	PTD	Painted
CONT	Continuous	PLYWD/PLWD	Plywood
CONTR	Contractor	P LAM	Plastic Laminate
CER	Ceramic	PREP	Preparation
		PSI	Pounds Per Square Inch
D	Deep	PSF	Pounds Per Square Foot
DN	Down	R	Riser
DET	Detail/Detector	RD	Roof Drain
DIA/ø	Diameter	REC	Recessed/Reception
DIM	Dimension	RCP	Reflected Ceiling Plan
DWG	Drawing	REINF	Reinforce(d) (ing)
DIAG	Diagonal	RELOC	Relocate
DISP	Dispenser	REQ/REQD	Required
		RES	Resilient
E	East	RM	Room
ELEC	Electric, Electrical	RO	Rough Opening
EL	Elevation (Feet & Inches)		
ELEV	Elevator	SCH	Schedule
EQUIP	Equipment	SEP	Separate
EQ	Equal	SIM	Similar
EA	Each	SPEC	Specification
EXT	Exterior	SF	Square Feet
EXTG	Existing	ST. STL	Stainless Steel
EJ	Expansion Joint	STL	Steel
EXT	Exterior	STR	Structural, Structure
EIFS	Exterior Insulation Finish System	SW	Switch
		SQ	Square
FA	Fire Alarm	SUSP	Suspended
FE	Fire Extinguisher	SYN	Synthetic
FT	Fin Tube		
FOB	Face of Block/Brick	THK	Thick
FOW	Face of Wall	T.O.	Top Of
FI	Finish, Finished	T	Tread
FIX	Fixture	TYP	Typical
FH	Full Height	TEMP	Tempered
FP	Fireproof, Fireproofing		
FR	Fire Rated	UNO	Unless Noted Otherwise
FL/FLR	Floor	UL	Underwriter's Laboratories
FD	Floor Drain		
FOUND	Foundation	VERT	Vertical
FTG	Footing	VIF	Verify In Field
		VCT	Vinyl Composite Tile
G	Gas		
GA	Gauge	W	Wide
GC	General Contractor	WWF	Welded Wire Fabric
GEN	General	W/, W/O	With, Without
GL	Glass	WD	Wood
GR	Grade	WP	Work Point
GWB/GYP BD	Gypsum Wall Board		
GFCI	Ground Fault Current Interrupt		
HC	Handicapped		
HDWR	Hardware		
HDWD	Hardwood		
HVAC	Heating,Ventilation & Air Conditioning		
H/HT	Height		
HM	Hollow Metal		
HR	Hour		
HOR/HORIZ	Horizontal		
HTR	Heater		

2 ABBREVIATIONS
N.T.S.

EXISTING CONSTRUCTION TO BE DEMOLISHED

EXISTING WALL TO REMAIN

NEW WALL CONSTRUCTION

+8'-2" TOS — CEILING HEIGHT ABOVE TOP OF SLAB

+0'-0" — SPOT ELEVATION TAG

TOP 0'-0"AFF — ELEVATION DATUM TAG

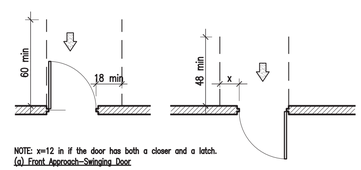
EXISTING DOOR TO BE REMOVED

NEW DOOR

X/X — ELEVATION KEY

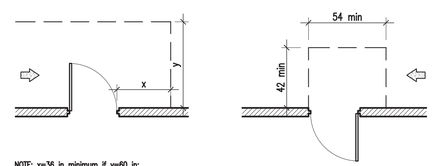
X/X — SECTION KEY

3 DRAWING SYMBOLS
N.T.S.



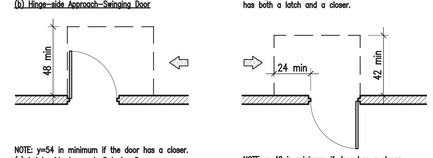
NOTE: x=12 in if the door has both a closer and a latch.
(a) Front Approach–Swinging Door

NOTE: All doors in alcoves shall comply with the clearances for front approaches.



NOTE: x=36 in minimum if y=60 in;
x=42 in minimum if y=54 in.
(b) Hinge–side Approach–Swinging Door

NOTE: y=48 in minimum if door has both a latch and a closer.



NOTE: y=54 in minimum if the door has a closer.
(c) Latch–side Approach–Swinging Door

NOTE: y=48 in minimum if door has a closer.

4 DOOR MANEUVERING CLEARANCES
N.T.S.

ARCHITECTURAL

G.001	LOCATION MAP, SYMBOLS, DOOR MANEUVERING CLEARANCES, ABBREVIATIONS, DRAWING LIST
G.002	EGRESS AND FIRE PROTECTION PLANS
D.101	DEMOLITION PLAN
A.101	CONSTRUCTION PLAN
A.111	REFLECTED CEILING PLAN
A.211	BUILDING SECTIONS
A.221	WALL SECTIONS
A.222	WALL SECTIONS
A.301	PLAN DETAILS, CASEWORK DETAIL
A.41	INTERIOR ELEVATIONS
A.42	PARTITION TYPES AND DETAILS
A.501	DOOR SCHEDULE, HARDWARE SPEC & DETAILS
A.502	STOREFRONT SCHEDULE, ELEVATIONS, DETAILS AND SPECIFICATIONS
A.601	FIRST FLOOR FINISH PLAN
A.611	FIRST FLOOR POWER/DATA PLAN
A.612	DATA AND ACCESS CONTROL SYSTEMS
EE-1	ENCLOSURE 1 ELEVATION
WE-1	WIRING ENCLOSURE 1–12P
EE-2	ENCLOSURE 2 ELEVATION
WE-2	WIRING ENCLOSURE 2–12P

FURNITURE

F-101	PART FURNITURE PLAN AND SCHEDULE
F-102	PART FURNITURE PLAN AND SCHEDULE
F-103	PART FURNITURE PLAN AND SCHEDULE

MECHANICAL

M-101	NOTES, SYMBOLS & ABBREVIATIONS MECHANICAL
MD-101	DEMOLITION PLAN MECHANICAL
M-201	NEW WORK PLAN MECHANICAL
M-301	SCHEDULES AND DETAILS MECHANICAL
M-401	DETAILS MECHANICAL
M-501	CONTROL DIAGRAMS MECHANICAL

ELECTRICAL

E-101	NOTES, SYMBOLS & ABBREVIATIONS ELECTRICAL
ED-101	DEMOLITION PLAN ELECTRICAL
ED-201	DEMOLITION PLAN LIGHTING
ED-202	DEMOLITION EQUIPMENT POWER PLAN ELECTRICAL
E-201	NEW WORK PLAN ELECTRICAL
E-202	NEW WORK EQUIPMENT POWER PLAN ELECTRICAL
E-301	NEW WORK LIGHTING PLAN ELECTRICAL
E-401	RISER DIAGRAM ELECTRICAL
E-402	RISER DIAGRAM ELECTRICAL
E-403	PANEL SCHEDULES ELECTRICAL
E-501	DETAILS ELECTRICAL
E-502	IDF ROOM GROUNDING DETAILS ELECTRICAL
E-503	ACCESS CONTROL DOOR DETAILS ELECTRICAL

FIRE ALARM

FA-101	NOTES, SYMBOLS & ABBREVIATIONS FIRE ALARM
DFA-201	DEMOLITION PLAN FIRE ALARM
FA-201	NEW WORK PLAN FIRE ALARM

PLUMBING

P-101	NOTES, SYMBOLS, ABBREVIATIONS AND PART PLANS PLUMBING

FIRE PROTECTION

SPR-101	NOTES, SYMBOLS & ABBREVIATIONS SPRINKLER
SPR-201	NEW WORK PLAN SPRINKLER

5 DRAWING LIST
N.T.S.

SCOPE OF WORK

ALL ITEMS NOTED ON DRAWINGS ARE NEW, TO BE PROVIDED AS PART OF THE WORK OF THIS CONTRACT UNLESS SPECIFICALLY INDICATED AS EXISTING, RELOCATED OR REMOVED.

ALTERNATES

ALTERNATE #1 - PROVIDE ALL FURNITURE AS SHOWN ON DRAWINGS F.101, F.102, AND F.103.

ALTERNATE #2 - PROVIDE NEW TERRAZZO TILE FLOORING IN ATRIUM ADJACENT TO ONE-STOP.

SEE SPEC. SECTION 012300 - "ALTERNATES" FOR ADDITIONAL INFORMATION.

11.21.19 FOR BIDDING

BERGEN COMMUNITY COLLEGE
ONE STOP EXPANSION

400 PARAMUS ROAD PARAMUS, NJ

arcari + iovino ARCHITECTS PC
ONE KATHERINE STREET
LITTLE FERRY, NJ 07643
201 641 0600, FAX 201 641 0626
WWW.AIARCHS.COM

EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

LOCATION MAP, SYMBOLS, ABBREVIATIONS AND DRAWING LIST

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\ G.001

G.001

CODE REVIEW

Project Name: Bergen Community College
One Stop Expansion

Location: 400 Paramus Road
Paramus, NJ 07652

Architects: Arcari & Iovino Architects
One Katherine Street
Little Ferry, NJ 07643
201.641.0600

Applicable Codes: NJAC 5:23-6, Rehabilitation Subcode
2015 International Building Code, NJ Ed.
2009 ICC/ANSI A117-1
NJAC 5:23-7, Barrier Free Subcode
2015 International Mechanical Code
2015 International Fuel Gas Code
2013 ASHRAE 90.1
2015 National Standard Plumbing Code
2014 National Electrical Code
2015 International Fire Code

Description of Project: The project is an alteration the student services offices at the first floor of the existing building. The total area of alterations is 14,280 SF. The project also includes renovation of the existing adjacent corridor as an alternate. The total area of renovations is 3,920 SF.

IBC 2015, NJ EDITION

CHAPTER 3 - USE AND OCCUPANCY CLASSIFICATION

304.1 Use Group B
ExistingConstruction Type 2-B (Fully Sprinklered)

CHAPTER 4 - SPECIAL DETAILED REQUIREMENTS

404.6 Enclosure of Atriums: Atriums shall be separated from adjacent spaces by a 1-hour fire barrier.

CHAPTER 7 - FIRE RESISTANT MATERIALS AND CONSTRUCTION

707 Fire Barriers
707.5 Continuity
-Extend from top of Floor/Ceiling Assembly below to underside floor or roof deck above and be securely attached there to.
-Make continuous through concealed spaces
707.6 Openings
Openings in Fire Barrier shall be protected in accordance with Section 715
707.7 Penetrations
Penetrations of Fire Barriers shall comply with Section 713
707.8 Joints
Joints made in or between Fire Barriers shall comply with Section 714
713.4 Fire Resistance Rating
Shaft enclosure shall have Fire-Resistance Rating of not less than 1 Hour where connecting less than 4 stories
708 Fire Partitions
Table 1018.1 Corridor Fire-Resistance Rating with Sprinkler System
709 Smoke Barrier - Not Required
716 Opening Protectives
Table 716.5 Fire Door and Shutter Fire Protection Ratings

	Wall Rating	Door Rating
Fire Barriers	2 HR	90 min
Fire Barriers	1 HR	45 min

CHAPTER 8 - Interior Finishes

Table 803.11 - Interior Wall Ceiling Finish Req. by OCC. (B use, Sprink)

Exit Enclosure/ Exit Passageway	Class B
Corridors	Class C
Rooms/ Enclosed Spaces	Class C

CHAPTER 9 - FIRE PROTECTION SYSTEMS

903 Automatic Sprinkler System
Required: Yes
Provided: Yes

905 Standpipe System
Required: No
Provided: Yes

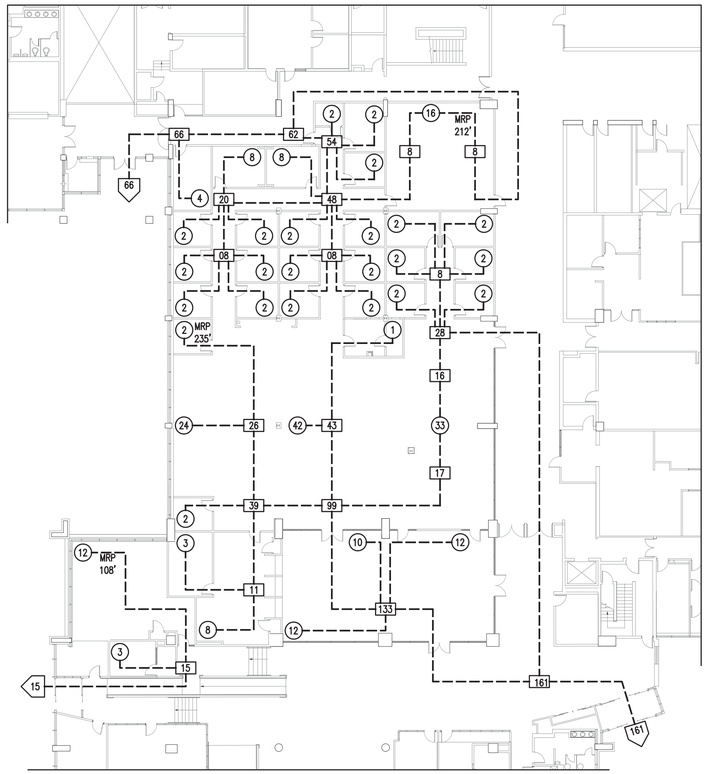
906 Fire Extinguishers
Required: Yes
Provided: Yes

		Required	Provided
Table 906.3(1)	Min. Extinguisher Rating:	2-A	2-A
	Max. Floor Area per Unit A:	1,500 sf	1,393 sf
	Max. Travel Distance to Extinguisher:	75 ft	73 ft

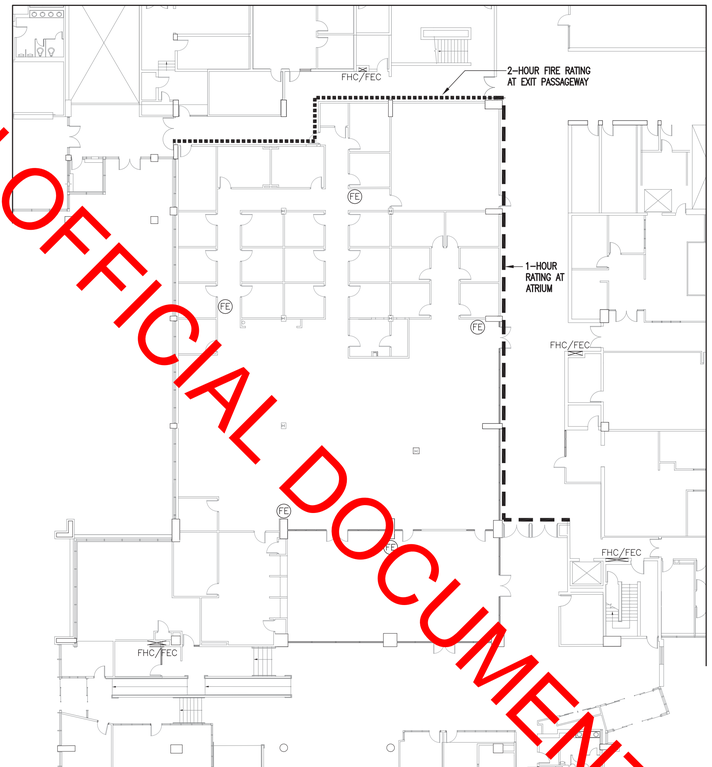
CHAPTER 10 - MEANS OF EGRESS

1004 Occupant Load
Total Table 1004.1.2
248 Occ

		Required	Provided
1005	Egress Width		
	1005.3,		
	Stairways	.3" Min	Complies
	Other Egress Components	.2" Min	Complies
1006	Number of Exits/ Continuity		
	Table 1006.3.1 (1-500 occupants)	Min 2 exits/flr	5 exits
1006.2.1	Common path of egress travel, Group B, Fully sprinklered	100 ft Max	74 ft
1017	Exit Access Travel Distance Table 1017.2 (with sprinkler)	300 ft Max	235 ft
1020	Corridors		
	Table 1020.1 Fire-Resistance Rating	0 hr	0 hr
	1020.2 Corridor Width	44" Min	99"
1020.4	Dead end corridors, Group B, Fully Sprinklered	50 ft Max	22 ft
1024.3	Exit Passageways shall have the same rating as connecting interior exit stairways and shall be constructed as fire barriers.	2 hours	2 hours



1 PARTIAL EGRESS PLAN
NOT TO SCALE



2 PARTIAL FIRE PROTECTION PLAN
NOT TO SCALE

EGRESS AND FIRE PROTECTION LEGEND

XX — OCCUPANCY LOAD OF ROOM/AREA
MAXIMUM PATH TRAVELED
XX — SUBTOTAL OCC. EGRESS
XX — TOTAL OCCUPANT EGRESS
ROOM / AREA — OCCUPANCY TYPE; TOTAL OCCUPANCY OF AREA; OCCUPANCY RATE, FLOOR AREA IN SQ. FT. PER PERSON
DESCRIBED AREAS
1 HR FIRE RATED ASSEMBLY
2 HR FIRE RATED ASSEMBLY
FE — NEW FIRE EXTINGUISHER AND CABINET
FHC/FEC — EXISTING FIRE HOUSE CABINET WITH FIRE EXTINGUISHER

11.21.19 FOR BIDDING

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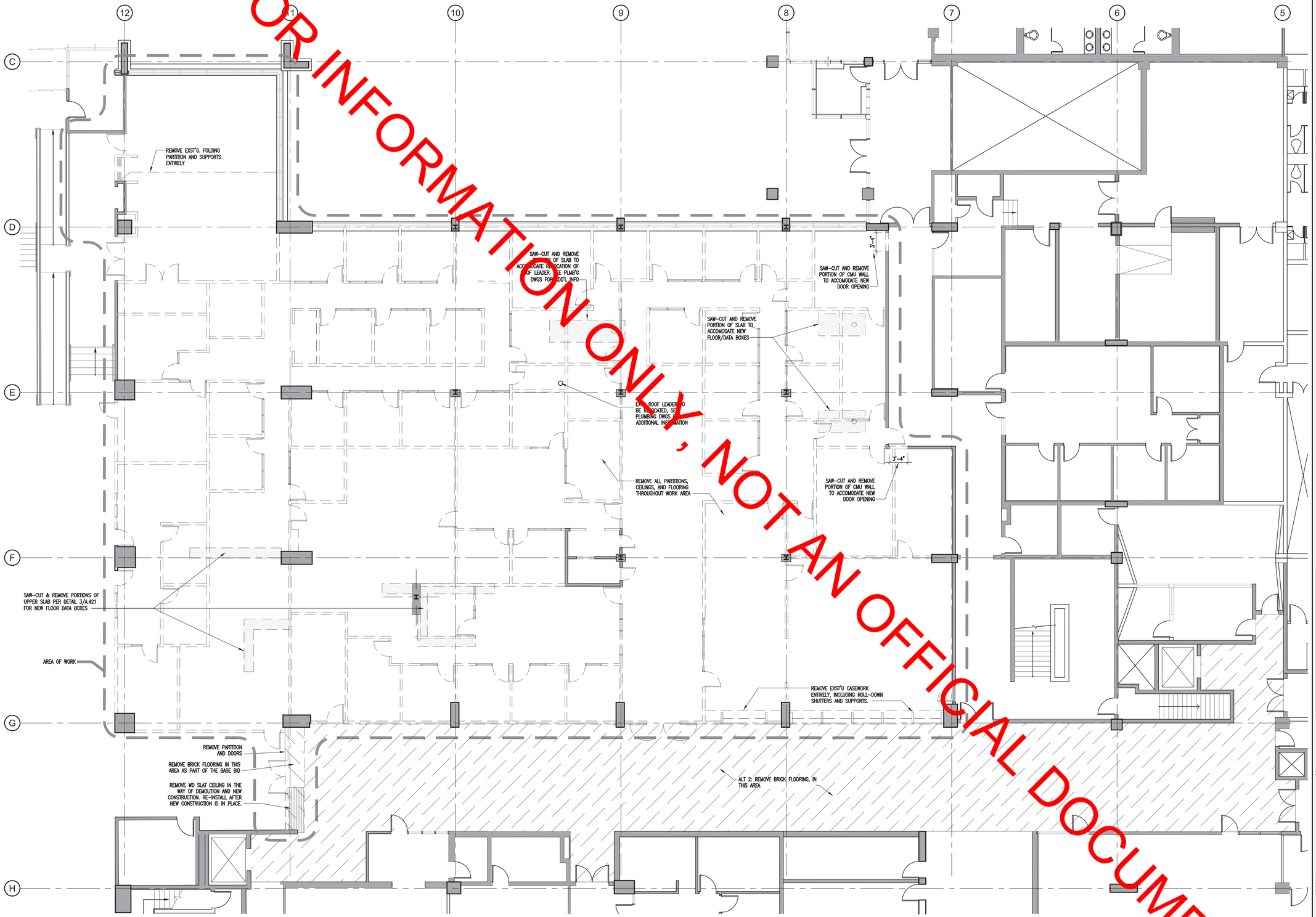
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

CODE REVIEW, EGRESS AND FIRE PROTECTION PLANS

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\ XXXXXXXXXXXXXX

G.002



1 DEMOLITION PLAN
1/8" = 1'-0"

NORTH

LEGEND

- EXISTING STRUCTURE TO REMAIN
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING DOOR & FRAME TO BE REMOVED

DEMOLITION NOTES

1. DEMOLITION PLAN IS INTENDED TO INDICATE MINIMUM DEMOLITION WORK. COMPARE THE PLANS WITH THE EXISTING CONDITIONS TO DETERMINE THE AMOUNT OF WORK AFFECTED.

2. CONTRACTOR SHALL REPAIR OR REPLACE AT THE DIRECTION OF THE ARCHITECT, ANY AND ALL EQUIPMENT, APPARATUS, PARTS OF THE BUILDING, PROPERTY OF THE OWNER NOT SPECIFIED TO BE DEMOLISHED, AND NOT SPECIFIED TO BE REMOVED, BUT WHICH ARE DAMAGED DURING THE PROGRESS OF, AND AS A RESULT OF, THE WORK OF THIS SECTION. MAKE ANY AND ALL SUCH REPAIRS, REPLACEMENTS, AND RECTIFICATION TO RESTORE THE DAMAGED PORTIONS OR ITEMS TO AT LEAST THEIR ORIGINAL CONDITION AT THE TIME OF DAMAGE, AND WITHOUT EXTRA COST.

3. CONTRACTOR SHALL FURNISH AND MAINTAIN TEMPORARY TYPES OF PROTECTION (FENCES, SIGNS, BARRICADES, ETC.) AS NECESSARY TO ADEQUATELY PROTECT AND PREVENT ACCIDENTAL INJURY TO THE PUBLIC AND OWNER'S PERSONNEL. CONTRACTOR SHALL KEEP TRESPASSERS OFF WORK AREAS. PROPERLY SECURE WORK AREAS FROM ENTRY WHEN WORK IS NOT IN PROGRESS.

4. REMOVE, RELOCATE, RE-ROUTE, TERMINATE OR CAP AS REQUIRED ALL PLUMBING, MECHANICAL, ELECTRICAL, OR OTHER ENGINEERED WORK LOCATED IN EXISTING WALLS, PARTITIONS, FLOORS OR CEILINGS TO BE REMOVED AND WHERE NEW OPENINGS ARE TO BE CUT. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF DEMOLITION BETWEEN DRAWINGS.

5. TEMPORARY PARTITIONS SHALL BE CONSTRUCTED AS REQUIRED TO KEEP DUST AND DIRT FROM ADJOINING SPACES AND HVAC DUCTS.

6. ALL EMERGENCY EXITS SHALL BE KEPT CLEAR AND ACCESSIBLE AT ALL TIMES.

7. UNLESS NOTED OTHERWISE ON DRAWINGS OR SPECIFICATIONS, ALL EXISTING WORK DISTURBED BY THE REMOVAL, RELOCATION, OR NEW INSTALLATION OF PLUMBING, ELECTRICAL, MECHANICAL OR STRUCTURAL WORK SHALL BE PATCHED TO MATCH ORIGINAL WORK.

8. UNLESS NOTED OTHERWISE ON DRAWINGS OR SPECIFICATIONS, CONTRACTOR SHALL REMOVE EXISTING APPLIED FLOOR AND WALL FINISHES WHERE NEW FLOOR AND WALL FINISHES ARE NOTED ON THE FINISH DRAWINGS.

9. WHERE WALLS ARE REMOVED, CONTRACTOR SHALL INSURE THAT ALL FINISHED SURFACES ARE LEVEL WITH ADJACENT SURFACES.

10. ALL DEMOLITION WORK, WHICH CREATES DISTURBING NOISE, SHALL BE PERFORMED AS PER THE OWNER'S INSTRUCTIONS. THE REMOVAL OF DEBRIS AND EQUIPMENT MUST BE ARRANGED TO AVOID ANY INCONVENIENCE TO OWNER.

11. ALL MATERIAL DEBRIS AND RUBBISH RESULTING FROM DEMOLITION WORK; SHALL BE CLEANED UP AND REMOVED FROM BUILDING AND SITE AND LEGALLY DISPOSED OF. LEAVE ALL AREAS OF WORK IN "BROOM CLEAN" CONDITION.

12. CONTRACTOR SHALL SCHEDULE WORK SO AS TO IMPOSE A MINIMUM OF HARDSHIP ON THE PRESENT OPERATION OF THE FACILITIES AND THE PERFORMANCE OF THE WORK OF THE OTHER TRADES.

13. CONTRACTOR SHALL EXECUTE THE DEMOLITION IN A CAREFUL AND ORDERLY MANNER WITH THE LEAST POSSIBLE DISTURBANCE TO THE PUBLIC, AS MUTUALLY AGREED UPON WITH THE OWNER.

14. ALL DOOR LOCKS AND DOOR OPERATORS THAT ARE SCHEDULED FOR DEMOLITION SHALL BE SALVAGED AND TURNED OVER TO THE OWNER.

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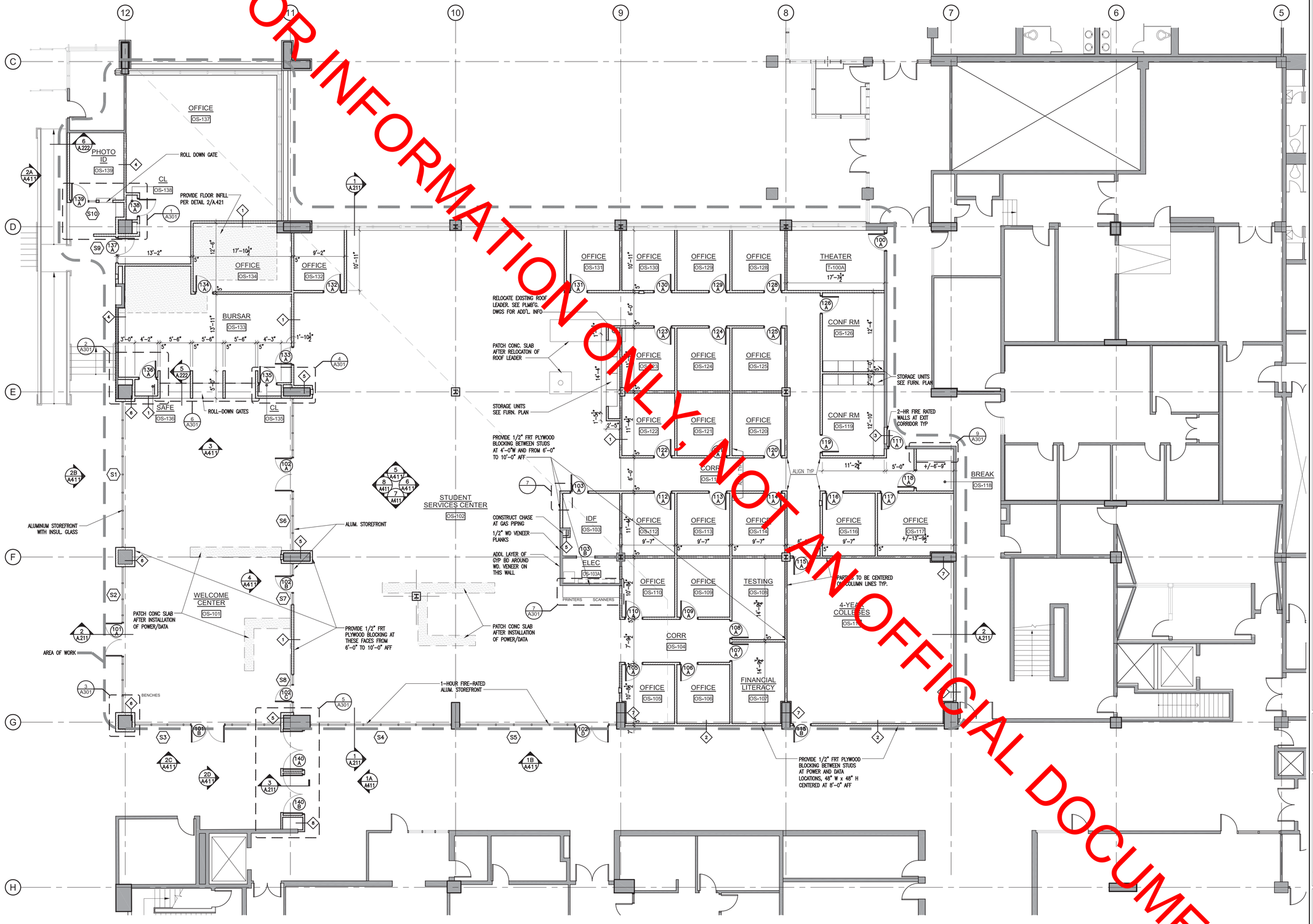
DEMOLITION PLAN
FIRST FLOOR

SCALE: AS NOTED	D.101
DATE: 08.30.19	
FILE: 1883\	



1 CONSTRUCTION PLAN
1/8" = 1'-0"

NORTH

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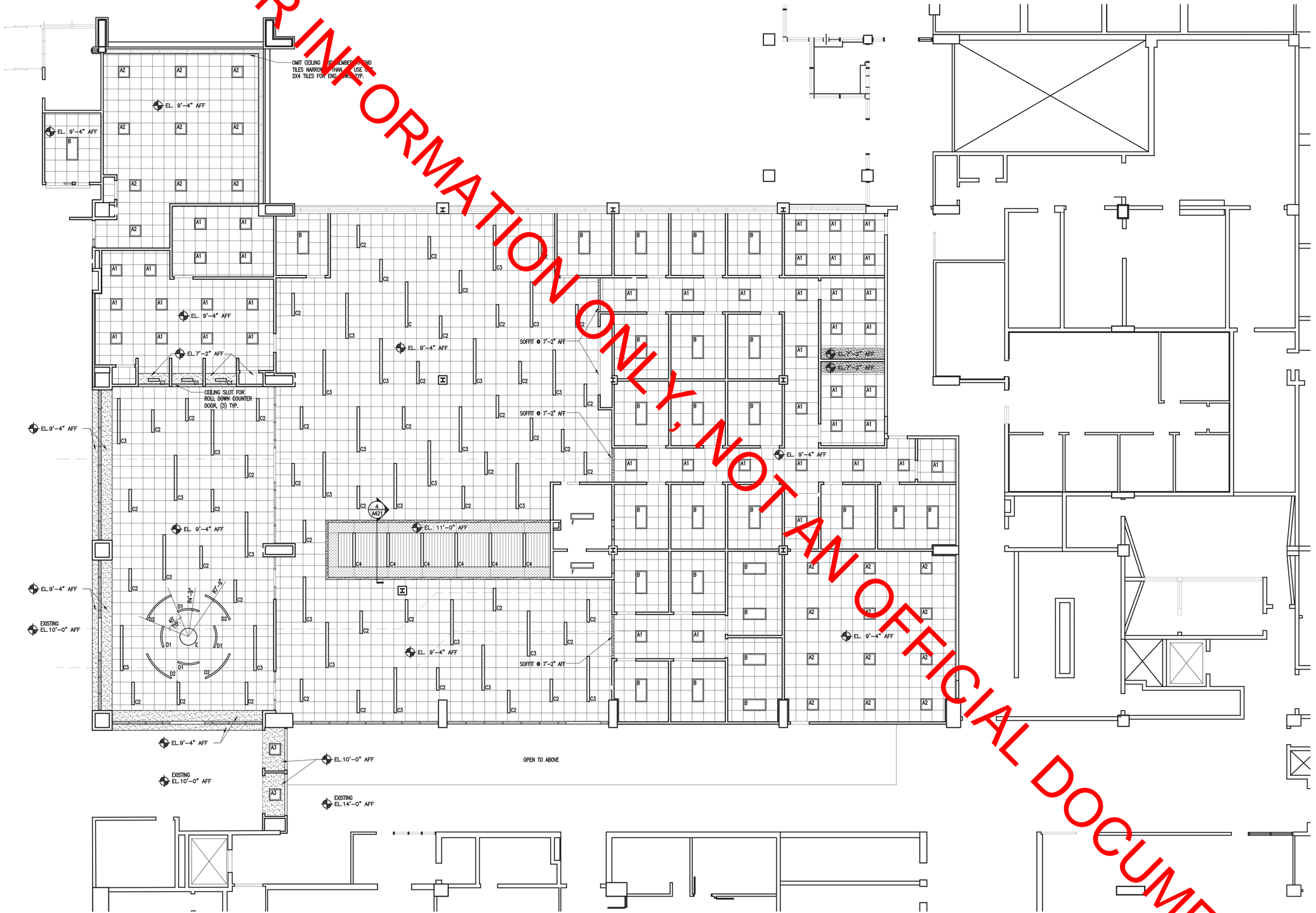
CONSTRUCTION PLAN
FIRST FLOOR

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

A.101



1 REFLECTED CEILING PLAN
1/8" = 1'-0"

CEILING LEGEND

- ANGLED TEGULAR CEILING TILE IN 15/16" SUSPENDED GRID. GRID TO BE CENTERED IN ROOM UNLESS OTHERWISE NOTED.
- WOOD SLATS MOUNTED ON GYP BD
- FABRIC PANELS MOUNTED ON GYP BD
- PAINTED GYPSUM BOARD
- A1 — 2'x2' RECESSED LED STANDARD OUTPUT GRID CEILING
- A2 — 2'x2' RECESSED LED HIGH OUTPUT GRID CEILING
- A3 — 2'x2' RECESSED LED STANDARD OUTPUT GYP BD CEILING
- B — 2'x4' RECESSED LED GRID CEILING
- C1 — 2' RECESSED LINEAR LED GYP BD CEILING
- C2 — 4' RECESSED LINEAR LED GRID CEILING
- C3 — 8' RECESSED LINEAR LED GRID CEILING
- C4 — 6' RECESSED LINEAR LED GYP BD CEILING
- D1 — SUSPENDED CURVED LED, SMALL RADIUS GRID CEILING
- D2 — SUSPENDED CURVED LED, LARGE RADIUS GRID CEILING
- E — 3' DIA LED PENDANT GRID CEILING
- F — 4' CHAIN HUNG UTILITY LED

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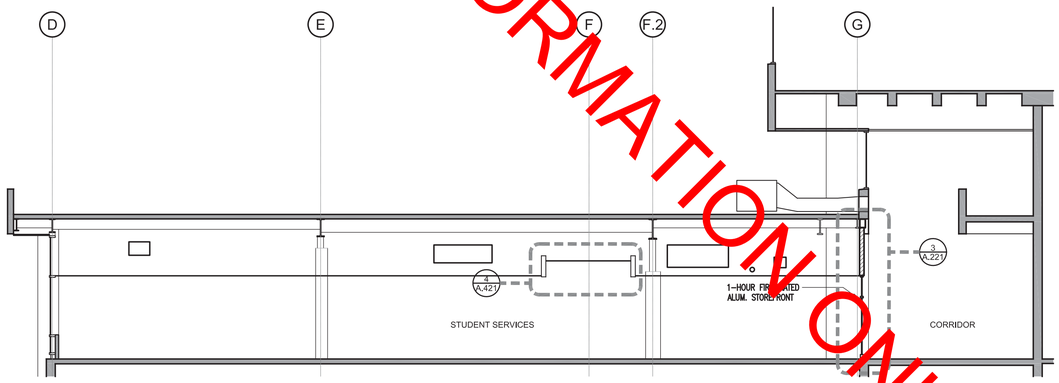
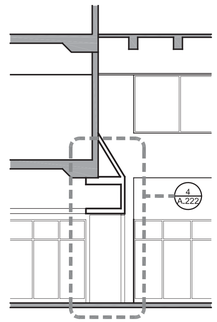
REFLECTED CEILING PLAN
FIRST FLOOR

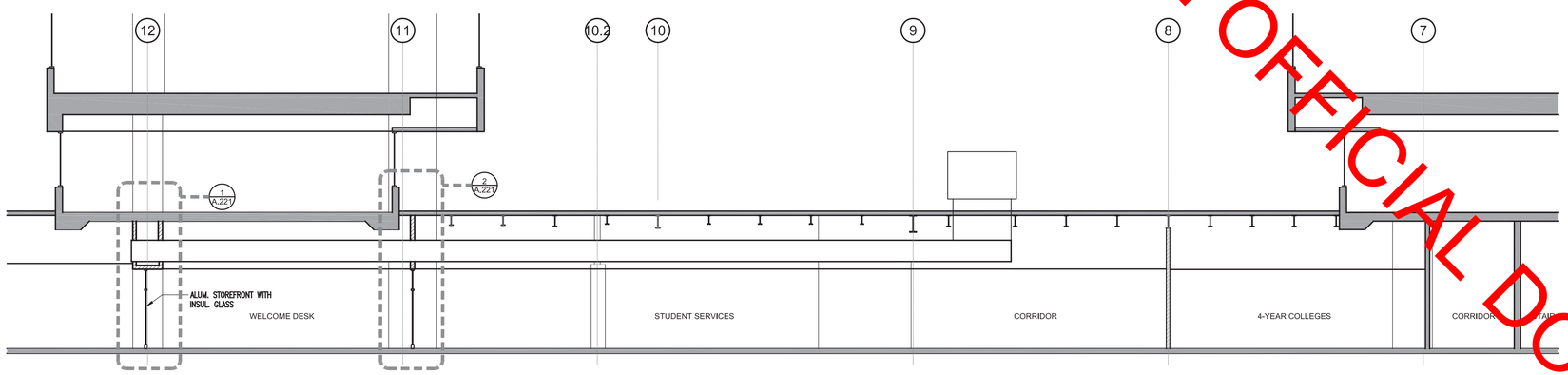
SCALE: AS NOTED	A.111
DATE: 08.30.19	
FILE: 1883\	



1 SECTION
1/8" = 1'–0"



3 SECTION
1/8" = 1'–0"



2 SECTION
1/8" = 1'–0"

LEGEND

EXISTING CONSTRUCTION

NEW CONSTRUCTION

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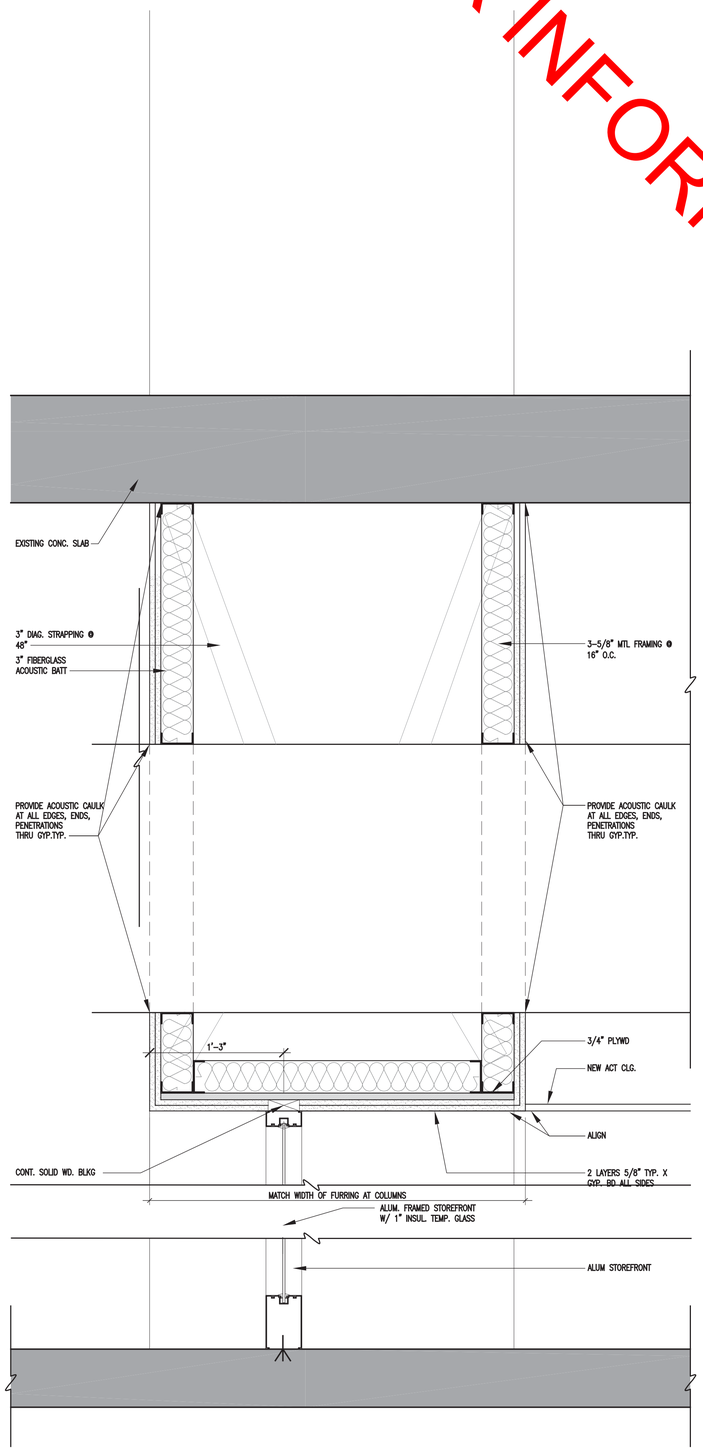
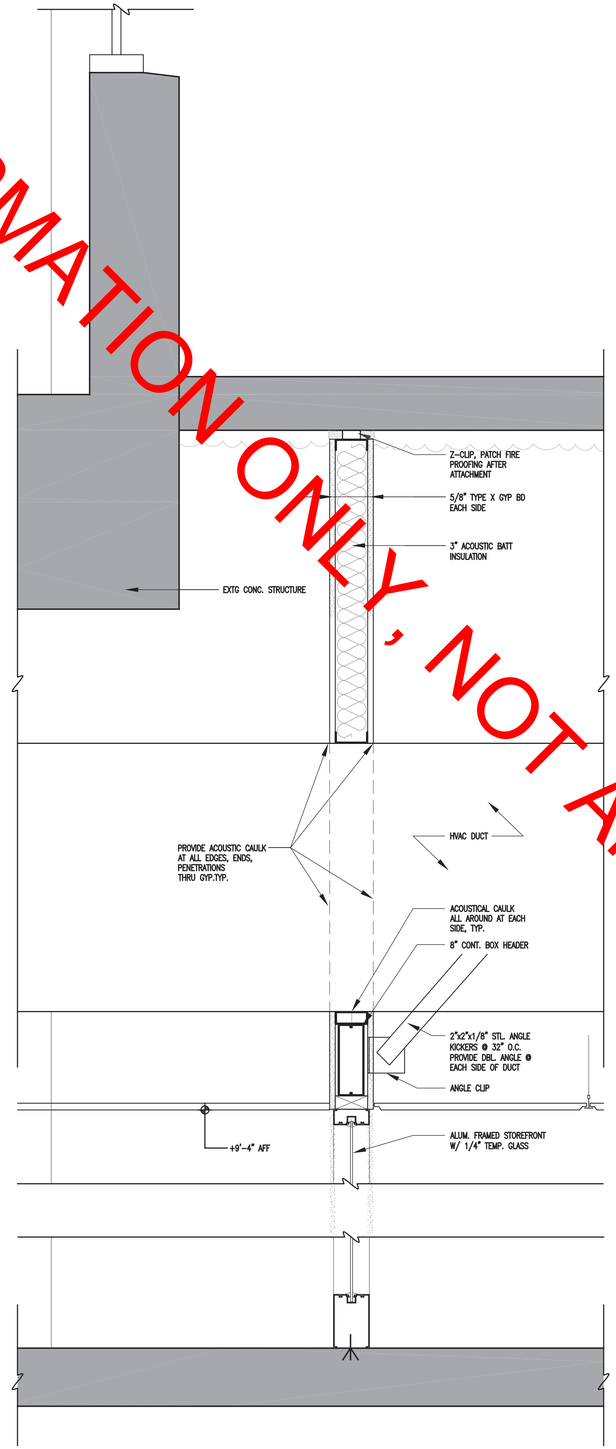
BUILDING SECTIONS

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

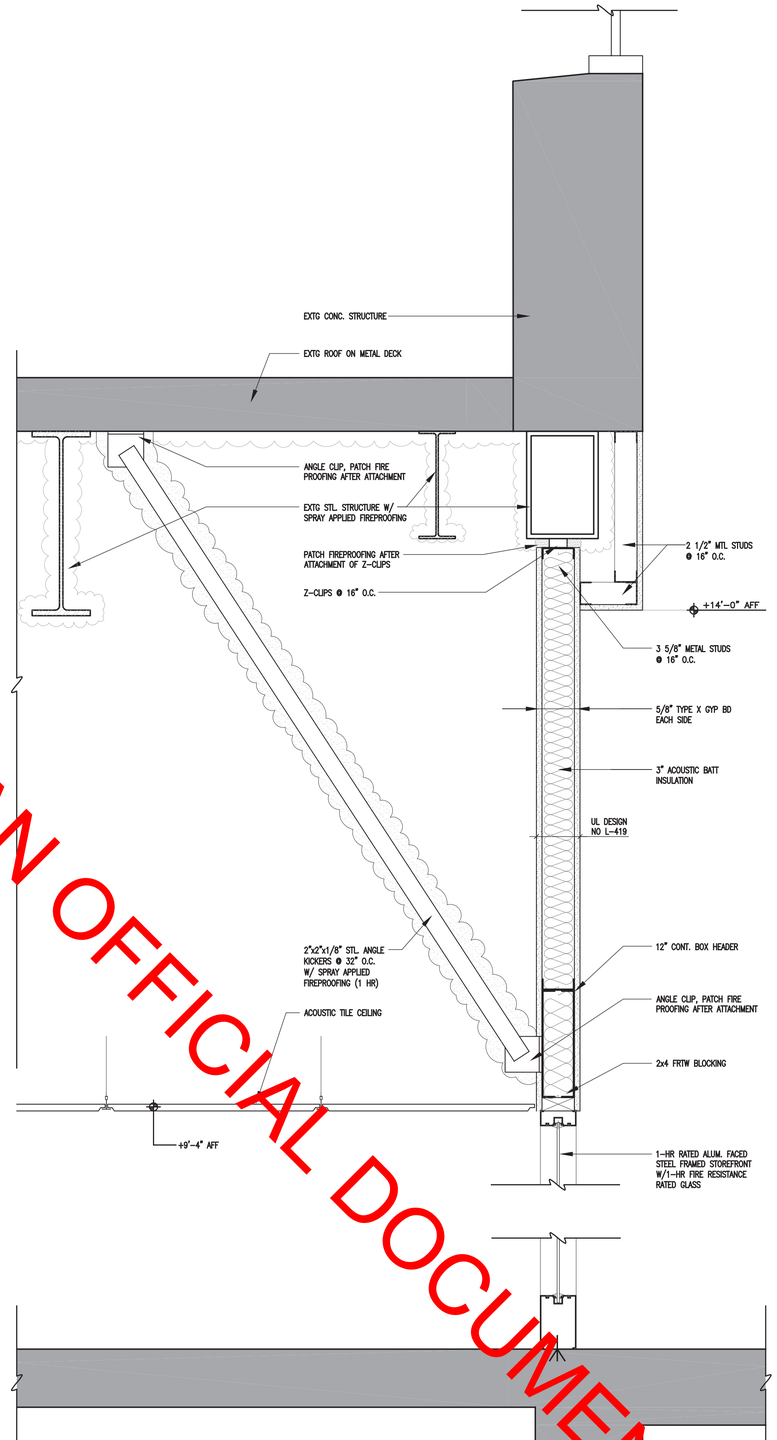
A.211



1 WALL SECTION @ SOUND CONTROL STOREFRONT
1-1/2" = 1'-0"



2 WALL SECTION @ INTERIOR STOREFRONT
1-1/2" = 1'-0"



3 WALL SECTION @ F.R. STOREFRONT
1-1/2" = 1'-0"

LEGEND

EXISTING CONSTRUCTION

NEW CONSTRUCTION

11.21.19 FOR BIDDING

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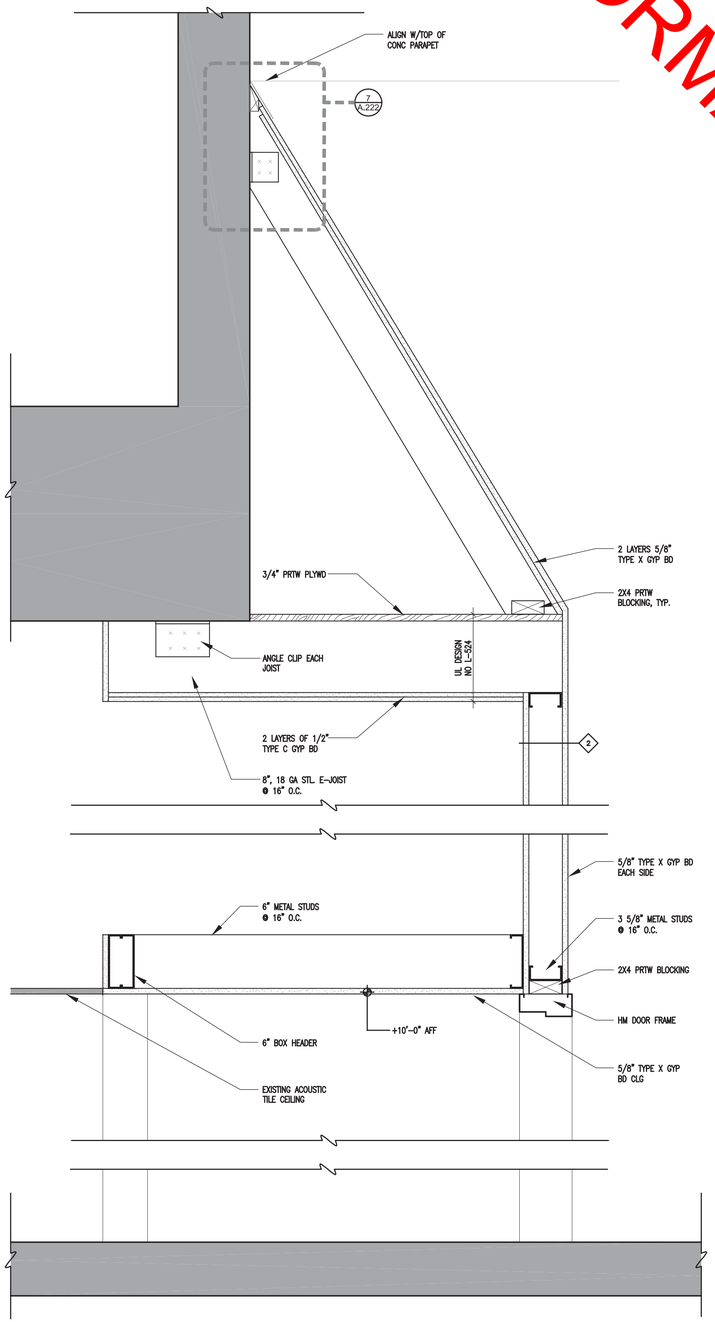
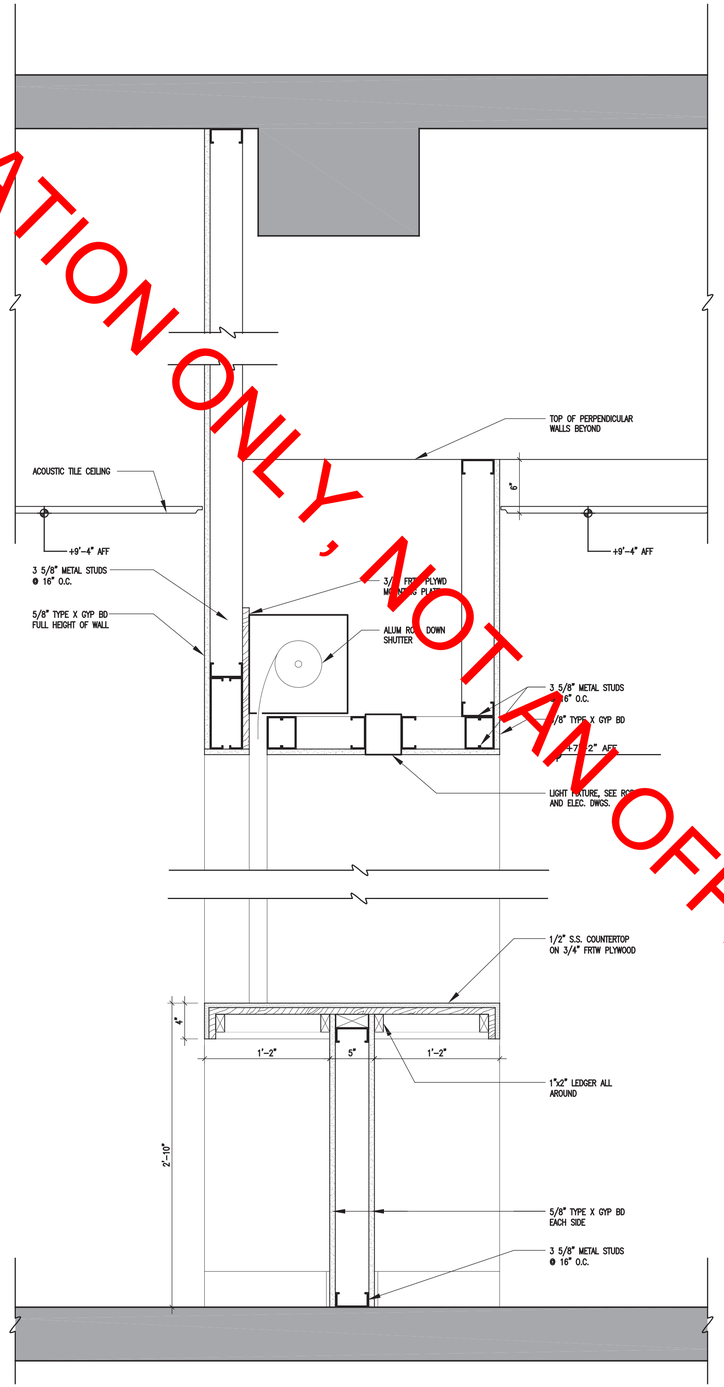
WALL SECTIONS

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

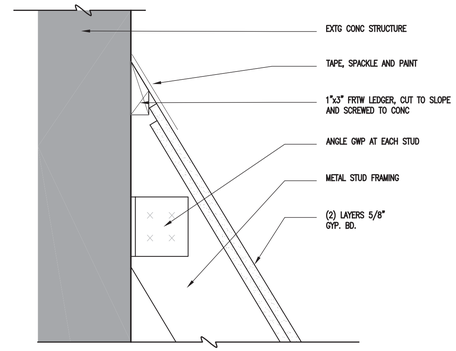
A.221



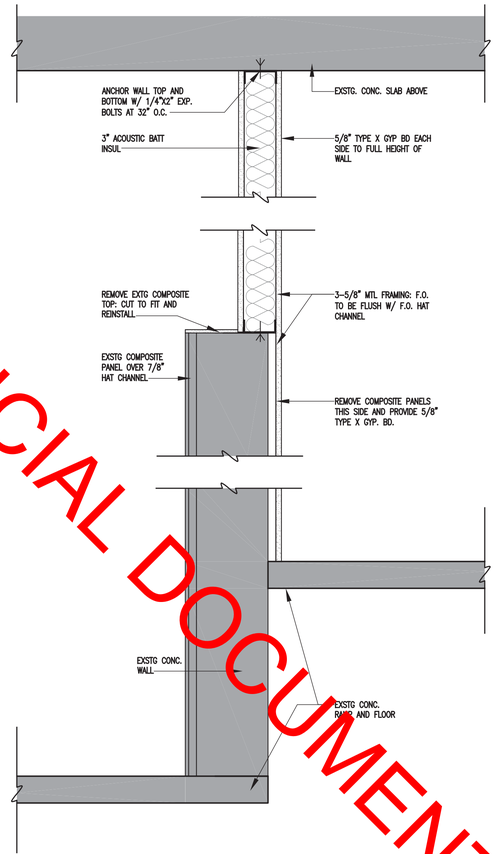
4 WALL SECTION @ ATRIUM FIRE DOORS
1-1/2" = 1'-0"



5 WALL SECTION @ BURSAR WINDOWS
1-1/2" = 1'-0"



7 GYP BD/CONC JOINT DETAIL ABOVE ATRIUM DOORS
3" = 1'-0"



6 WALL SECTION @ PHOTO ID OFFICE
1-1/2" = 1'-0"

LEGEND

EXISTING CONSTRUCTION

NEW CONSTRUCTION

11.21.19 FOR BIDDING

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WALL SECTIONS

SCALE: AS NOTED
DATE: 08.30.19
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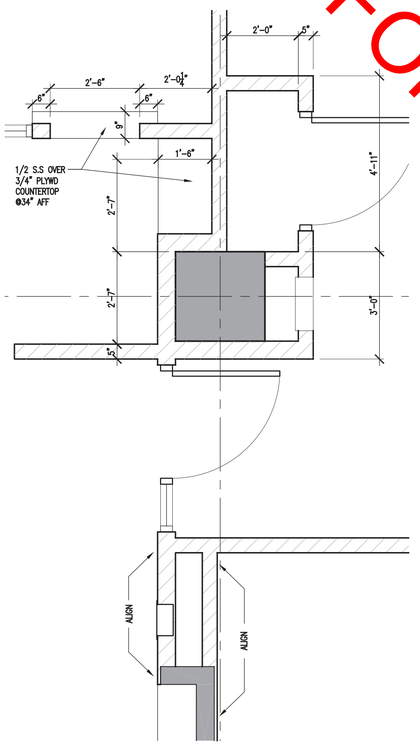
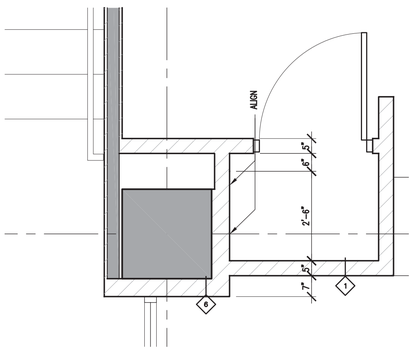
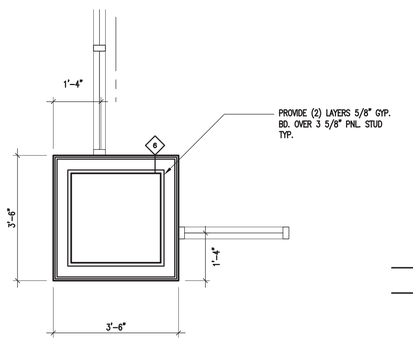
A.222



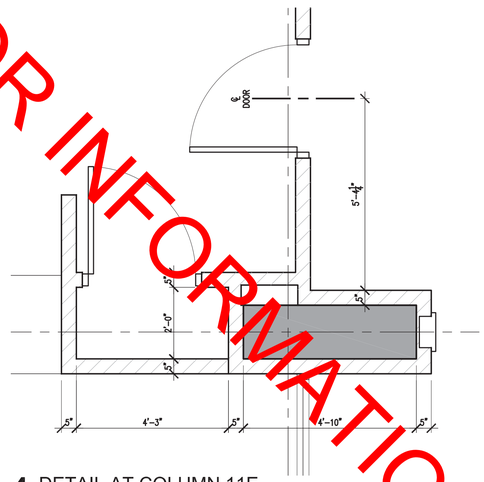
1 PLAN DETAIL AT COLUMN 12D
1/2" = 1'



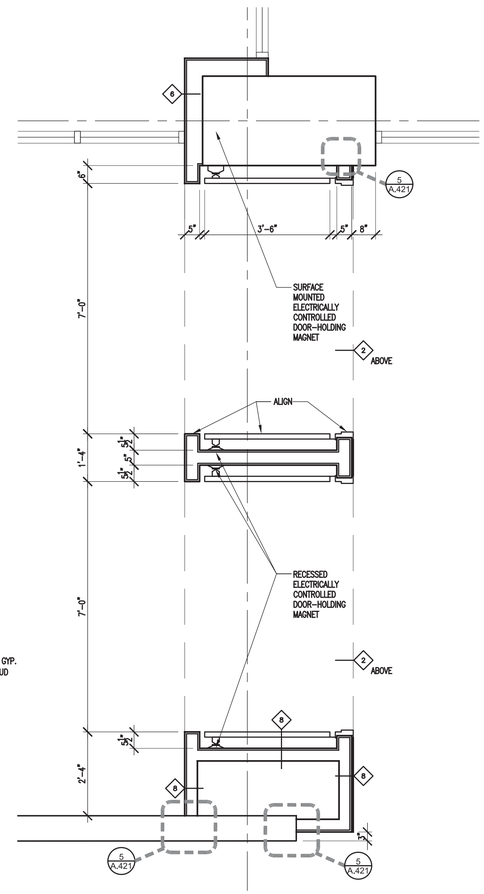
2 PLAN DETAIL AT COLUMN 12E
1/2" = 1'



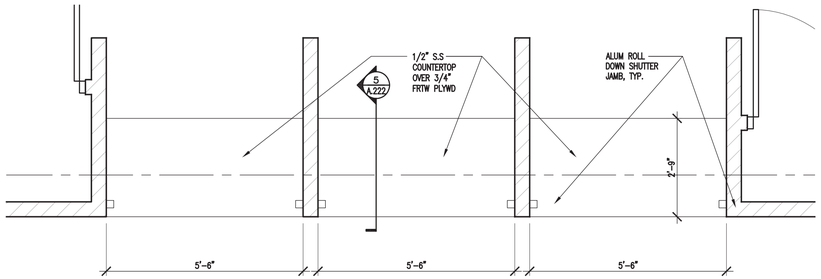
3 PLAN DETAIL AT COLUMN 12G
1/2" = 1'



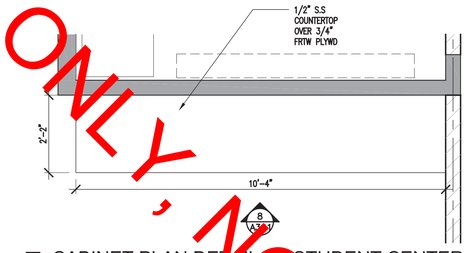
4 DETAIL AT COLUMN 11E
1/2" = 1'



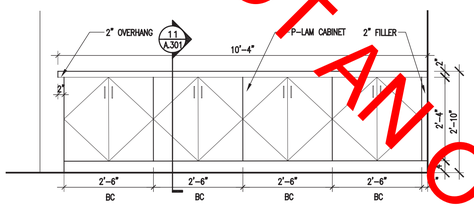
5 PLAN DETAIL AT FIRE DOOR
1/2" = 1'



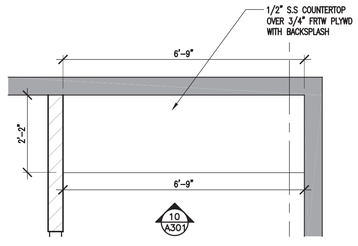
6 PLAN DETAIL AT
1/2" = 1'



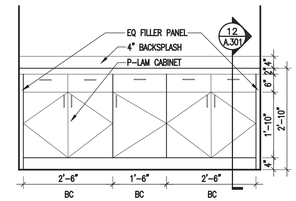
7 CABINET PLAN DETAIL AT STUDENT CENTER
1/2" = 1'



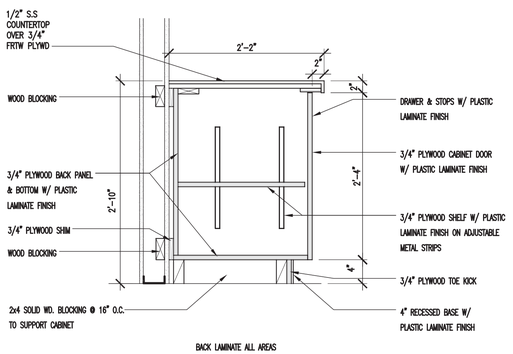
8 CABINET ELEVATION AT STUDENT CENTER
1/2" = 1'



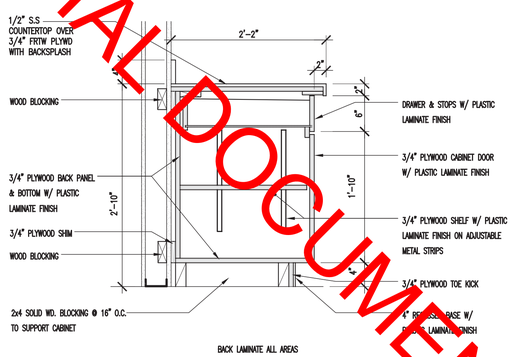
9 PLAN DETAIL AT BREAK ROOM
1/2" = 1'



10 CABINET ELEVATION AT BREAK ROOM
1/2" = 1'



11 SECTION THRU BASE CABINET
1/2" = 1'



12 SECTION THRU BASE CABINET
1/2" = 1'

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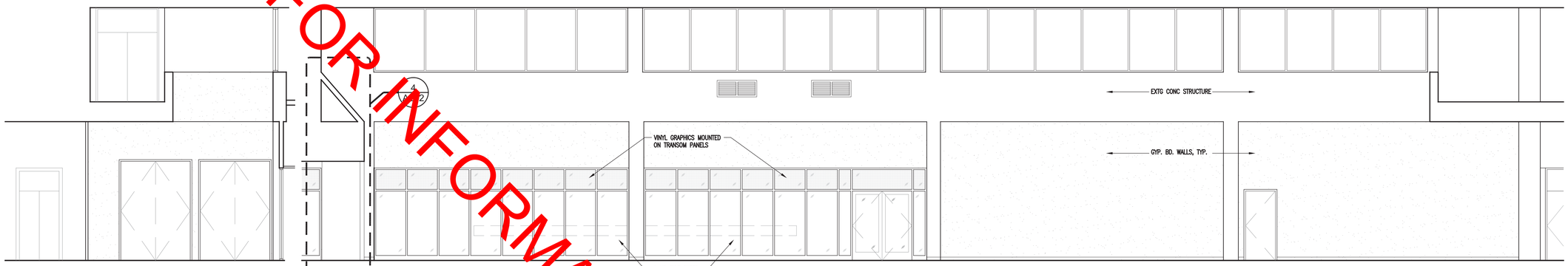
PLAN DETAILS, CASEWORK DETAILS

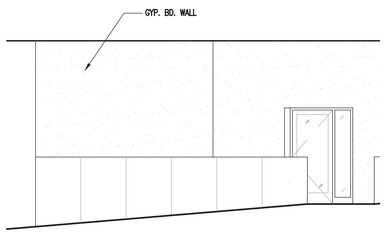
SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

A.301

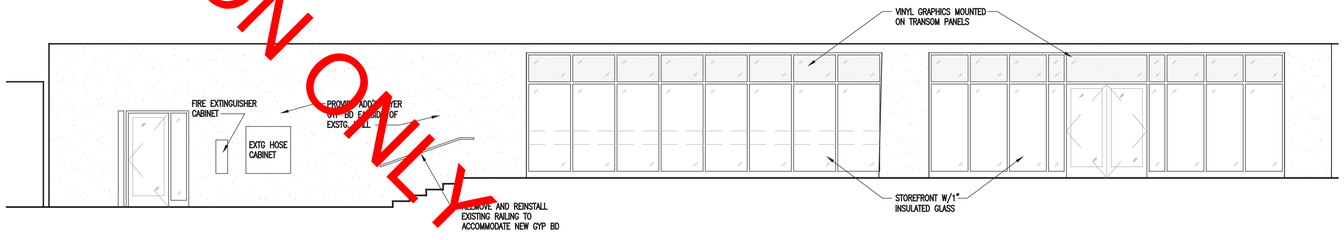


1A ELEVATION AT CORRIDOR
3/16"=1'-0"

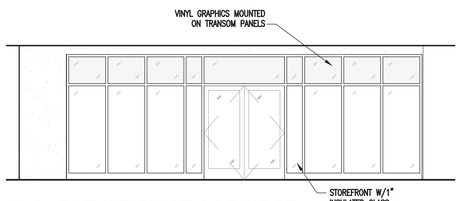
1B ELEVATION AT CORRIDOR
3/16"=1'-0"



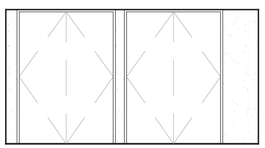
2A ELEVATION AT CORRIDOR
3/16"=1'-0"



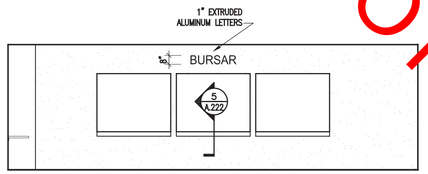
2B ELEVATION AT CORRIDOR
3/16"=1'-0"



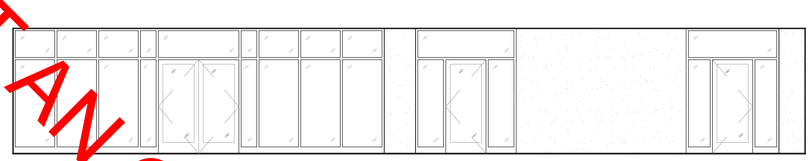
2C ELEVATION AT CORRIDOR
3/16"=1'-0"



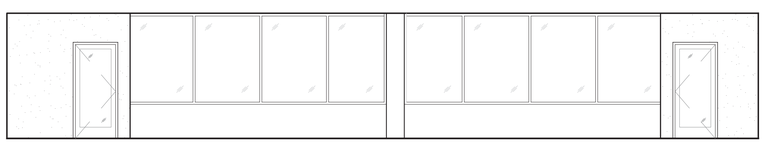
2D ELEVATION AT CORRIDOR
3/16"=1'-0"



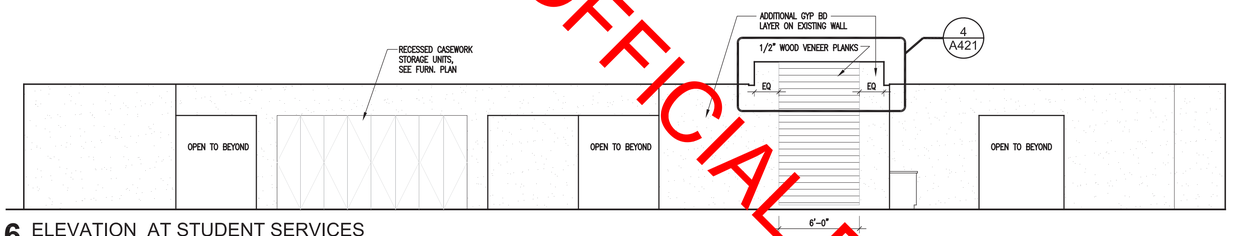
3 ELEVATION AT BURSAR
3/16"=1'-0"



4 ELEVATION AT WELCOME DESK
3/16"=1'-0"

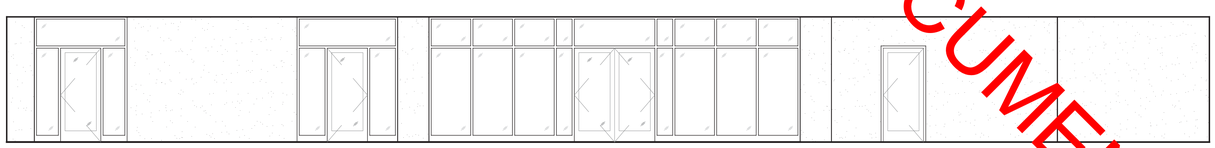


5 ELEVATION AT STUDENT SERVICES
3/16"=1'-0"



6 ELEVATION AT STUDENT SERVICES
3/16"=1'-0"

7 ELEVATION AT STUDENT SERVICES
3/16"=1'-0"



8 ELEVATION AT STUDENT SERVICES
3/16"=1'-0"

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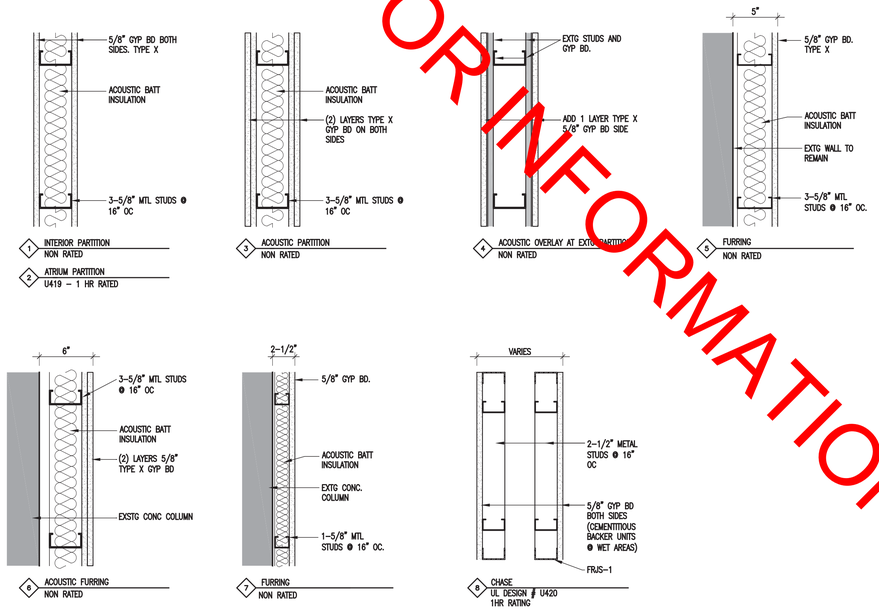
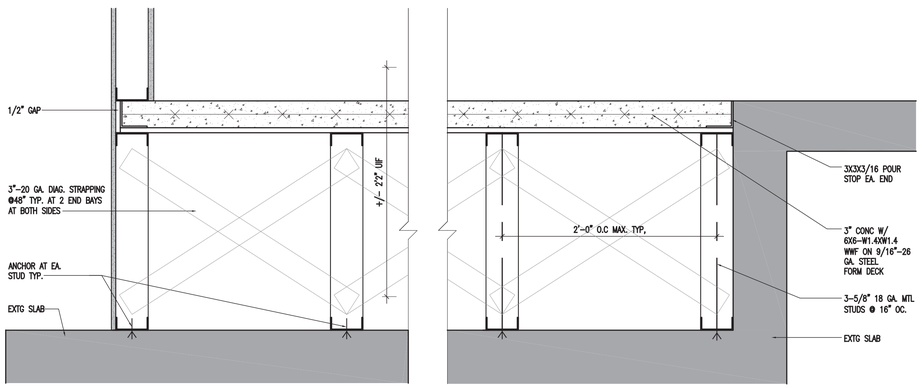
INTERIOR ELEVATIONS

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

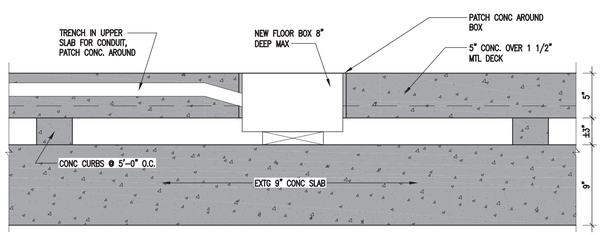
A.411



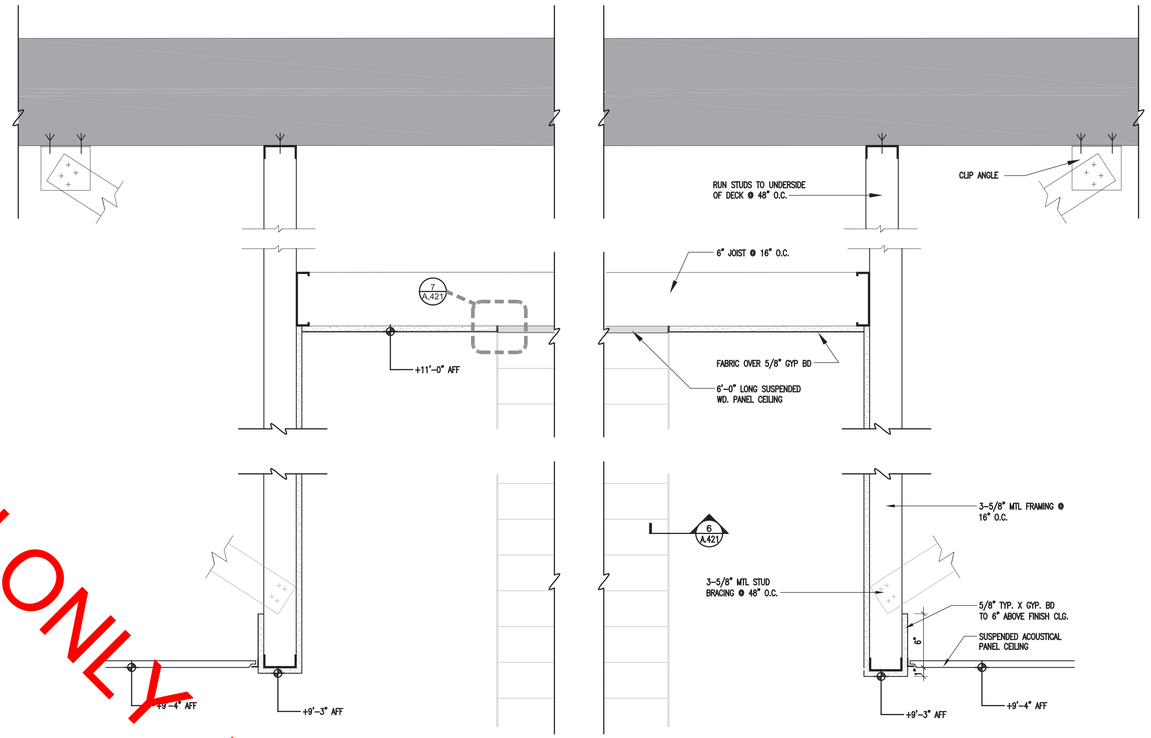
1 PARTITION TYPES
1-1/2" = 1'-0"



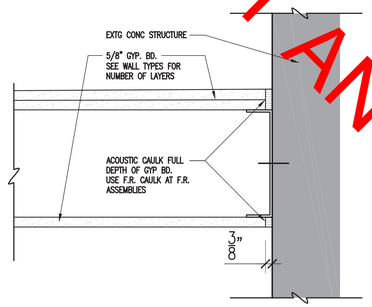
2 FLOOR INFILL DETAIL
1-1/2" = 1'-0"



3 SECTION @ FLOOR BOXES
1-1/2" = 1'-0"



4 DETAIL AT GYP. BD SOFFIT
1-1/2" = 1'-0"



5 TYP GYP. BD./ CONC JOINT DETAIL
3" = 1'-0"

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PARTITION TYPES AND CONSTRUCTION DETAILS

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

A.421

DOOR SCHEDULE

NO.	LOCATION FROM	LOCATION TO	DOOR EXTERIOR	DOOR INTERIOR	DOOR SINGLE	DOOR PAIR	DOOR SWING	DOOR TYPE	DOOR MAT'L	GLAZING MAT'L	GLAZING MARK/ RATING	DOOR THK.	DOOR WIDTH (LEAF)	DOOR HEIGHT (LEAF)	FRAME TYPE	FRAME MAT'L	FRAME WALL MTG	FRAME DEPTH	DETAILS HEAD	DETAILS JAMB	DETAILS SILL	FIRE RATING	HARDWARE MECHANICAL LOCK FUNCTION	HINGES	LOCKSET	EXIT DEVICE	CLOSER	SEALS	SILENCERS	DOOR STOP	HARDWARE ELECTRICAL CARD READER	STRIKE	HARNESS	EXIT DEVICE	CONTACT	OPERATOR	MAGNETIC HOLD	REMARKS	NO.
100A	CORR	100	–	○	○	–	RH	B	HM	G4	DHW90	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	6B	90MIN	A	A	B	–	B	A	–	A	B	A	–	B	–	A	A	–	COORDINATE FRAME AND DOOR SIZES WITH PLANS.	100A
101A	CORR	101	–	○	–	○	RHR/LHR	D2	AL/GL	G2	–	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE							–	–	A	B	–	–	B	–	–	B	–	A	A	A	A	–	COORD OPERATOR W/ STRIKE	101A
101B	CORR	101	–	–	○	–	RHR/LHR	D2	AL/GL	G2	–	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE							–	–	A	B	–	–	–	B	–	–	B	–	–	A	A	A	–	COORD OPERATOR W/ STRIKE	101B
102A	101	102	–	○	–	○	RHR/LHR	D2	AL/GL	G1	–	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE						6B	–	–	A	B	–	–	–	–	A	–	B	–	A	A	A	A	–	COORD OPERATOR W/ STRIKE	102A
102B	101	102	–	○	○	–	LHR	D1	AL/GL	G1	–	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE						6B	–	–	A	B	–	B	A	–	A	B	B	C	–	–	A	–	–		102B
102C	101	102	–	○	○	–	RHR	D1	AL/GL	G1	–	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE						6B	–	–	A	B	–	B	A	–	A	B	B	C	–	–	A	–	–		102C
102D	CORR	102	–	○	–	○	RHR/LHR	D2	AL/GL	G3	DH	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE						6B	60MIN	A	B	–	–	–	A	–	–	B	–	A	A	A	–	–		102D
103A	102	103	–	○	○	–	RHR	A1	WD	–	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	6B	–	C	A	A	–	–	–	A	B	A	A	–	–	A	–	–		103A
105A	104	105	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		105A
106A	104	106	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		106A
107A	104	107	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		107A
108A	104	108	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		108A
109A	104	109	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		109A
110A	104	110	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		110A
111A	CORR	111	–	○	○	–	RHR	A	HM	G4	DHW90	1–3/4"	3'–0"	7'–0"	A	HM	GYP	7–1/8"	4B	5B	6B	90MIN	A	A	A	A	A	–	A	A	B	–	–	A	–	–		111A
112A	111	112	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		112A
113A	111	113	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		113A
114A	111	114	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		114A
115A	111	115	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		115A
115B	CORR	115	–	○	○	–	LHR	A	HM	G3	DH	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	6B	60MIN	A	A	–	A	–	–	B	A	B	–	–	A	–	–		115B
116A	111	116	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		116A
117A	111	117	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		117A
118A	111	118	–	○	○	–	RHR	A1	WD	–	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	D	A	A	–	–	–	A	A	A	–	–	–	–	–	–		118A
119A	111	119	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		119A
120A	111	120	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		120A
121A	111	121	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		121A
122A	111	122	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		122A
123A	111	123	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		123A
124A	111	124	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		124A
125A	111	125	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		125A
126A	111	126	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		126A
128A	111	128	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		128A
129A	111	129	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		129A
130A	111	130	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		130A
131A	102	131	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		131A
132A	102	132	–	○	○	–	RH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		132A
133A	102	133	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	A	A	A	–	B	–	A	B	A	A	–	–	A	–	–		133A
134A	133	134	–	○	○	–	LH	C	WD	G1	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	B	A	A	–	–	–	A	A	A	A	–	–	A	–	–		134A
135A	133	135	–	○	○	–	RHR	A1	WD	–	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	D	A	A	–	–	–	A	B	–	–	–	–	–	–	–		135A
136A	133	136	–	○	○	–	LHR	A1	WD	–	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	C	A	A	–	–	–	A	B	–	–	–	–	–	–	–		136A
137A	CORR	137	–	○	○	–	LH	D1	AL/GL	G2	–	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE						6B	–	A	B	B	–	B	B	–	A	B	B	–	–	A	–	–		
138A	137	138	–	○	○	–	RHR	A1	WD	–	–	1–3/4"	3'–0"	7'–0"	A	HM	GYP	5–7/8"	4A	5A	–	–	D	A	A	–	–	–	A	B	–	–	–	–	–	–	–		138A
139A	CORR	139	–	○	○	–	LH	D1	AL/GL	G2	–	1–3/4"	3'–0"	7'–0"	PER STOREFRONT SCHEDULE						6B	–	A	B	B	–	B	B	–	A	B	B	–	–	A	–	–		139A
140A	CORR	140	–	–	–	○	RHR/LHR	A2	HM	–	–	1–3/4"	3'–6"	9'–10"	A	HM	GYP	5–7/8"	4C	4C	–	60MIN	D	A	–	C	A	A	–	–	–	–	–	–	–	B/A	SEE DETAIL 5/A301	140A
140B	CORR	140	–	–	–	○	RHR/LHR	A2	HM	–	–	1–3/4"	3'–6"	9'–10"	A	HM	GYP	5–7/8"	4C	4C	–	60MIN	D	A	–	C	A	A	–	–	–	–	–	–	–	A/B	SEE DETAIL 5/A301	140B

1 DOOR SCHEDULE
NTS

MECHANICAL DOOR HARDWARE

LOCK FUNCTION
A ENTRY / OFFICE LOCK

B CLASSROOM LOCK

C STOREROOM LOCK

D PASSAGE LATCH

HINGES
A IVES 5BB1HW HEAVY DUTY BALL BEARING FIVE KNUCKLE FULL MORTISE HINGES. (3) PER LEAF

B IVES 112HD CONTINUOUS FULL MORTISE ALUMINUM GEAR HINGE

LOCKSET
A SCHLAGE ND SERIES CYLINDER LOCKSET, LEVER, US26D

B SCHLAGE L9000 SERIES MORTISE LOCKSET, LEVER, US26D

LOCKS SHALL HAVE UNCOMBINATED SFIC H KEYWAY CORES PROVIDE (2) UNCUT KEYS PER CORE

EXIT DEVICE
A VON DUPRIN 9975L–F MORTISE PANIC HARDWARE WITH LEVER AND KEYED AT EXTERIOR

B VON DUPRIN 99L RIM PANIC HARDWARE WITH LEVER AND KEYED AT EXTERIOR

C VON DUPRIN 9547L–F RECESSED CONCEALED TOP ROD PANIC HARDWARE WITH LEVER AT EXTERIOR

LOCKS SHALL HAVE UNCOMBINATED SFIC H KEYWAY CORES PROVIDE (2) UNCUT KEYS PER CORE

CLOSER
A LCN 4000 SERIES PUSH SIDE CLOSER, ALUMINUM

B LCN 4000 SERIES PULL SIDE CLOSER, ALUMINUM

SEALS
A ZERO INTERNATIONAL 188FS SMOKE SEALS

B ZERO INTERNATIONAL PAIRS SEALING SYSTEM CONSISTING OF: 369 AUTOMATIC DBL SEAL DOOR BOTTOM, 770 HEAD AND JAMB SEAL 55/555 MTG STILE

SILENCERS
A IVES SR64 SILENCERS

DOOR STOP
A IVES WS402CCV WALL BUMPER

B GLYNN–JOHNSON 90 SERIES OVERHEAD STOP

ELECTRICAL DOOR HARDWARE

CARD READER
A SCHLAGE MULLION READER

B SCHLAGE SINGLE GANG READER

STRIKE
A ELECTRIC STRIKE FOR CYLINDER LOCK

B ELECTRIC STRIKE FOR MORTISE LOCK

C ELECTRIC STRIKE FOR RIM DEVICE

HARNESS
A WIRING HARNESS TO DOOR LEAF

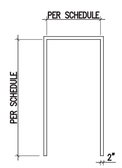
EXIT DEVICE
A VON DUPRIN EL9947L CONCEALED VERTICAL ROD PANIC HARDWARE WITH LEVER AND KEYED AT EXTERIOR

LOCKS SHALL HAVE UNCOMBINATED SFIC H KEYWAY CORES PROVIDE (2) UNCUT KEYS PER CORE

CONTACT
A SENTROL 1078/78C SERIES MAGNETIC CONTACT, (1) PER LEAF

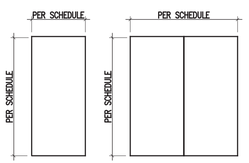
OPERATOR
A GYRO–TECH GT710/8710 LOW–ENERGY ADA SWING DOOR OPERATOR, OPMAN CONFIGURATION, ALUMINUM

MAGNETIC HOLD
A LCN SEM 7800 SERIES, RECESSED MOUNT
B LCN SEM 7800 SERIES, SURFACE MOUNT



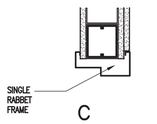
A

2 DOOR FRAMES
1/4"=1'–0"



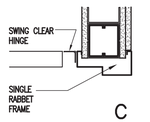
A A2 B NOT USED C D1 D2

3 DOOR TYPES
1/4"=1'–0"



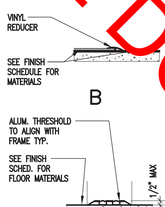
C B A

4 DOOR HEAD DETAILS
1 1/2"=1'–0"



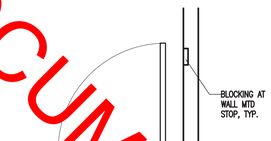
C B A

5 DOOR JAMB DETAILS
1 1/2"=1'–0"



B A

6 SILL DETAILS
1 1/2"=1'–0"



7 STD DOOR LOCATION DETAIL
NTS

NOTES:

1) PROVIDE SMOKE SEALS AT ALL RATED DOOR ASSEMBLIES.
2) PROVIDE FIRE RATED HARDWARE, DOOR CLOSERS, PANIC DEVICES, DOORS, AND DOOR FRAMES, AT ALL RATED OPENINGS TYP. REFER TO HARDWARE SCHEDULE FOR ADDITIONAL REQUIREMENTS.

11.21.19 FOR BIDDING

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DOOR SCHEDULE, HARDWARE SPECIFICATIONS AND DETAILS

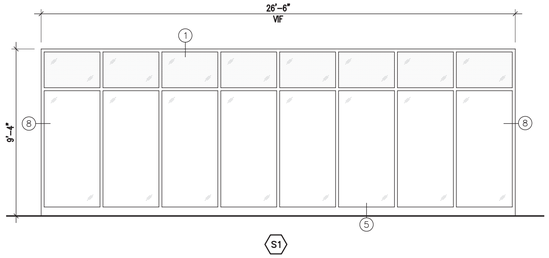
SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

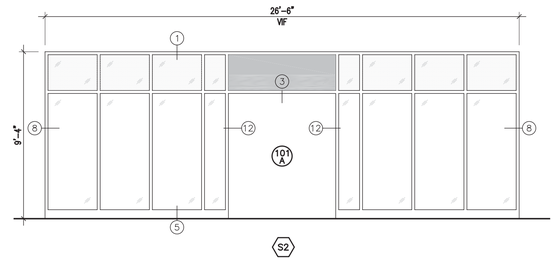
A.501

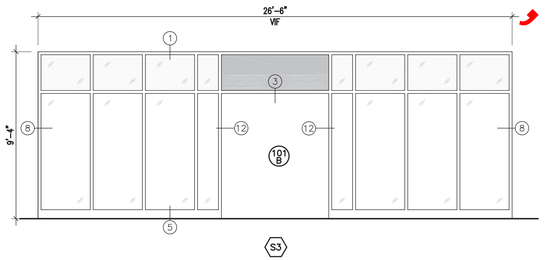
STOREFRONT SCHEDULE

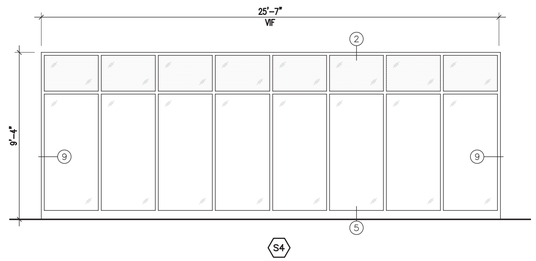
NO.	TYPE	QUANTITY	INTERIOR/ EXTERIOR	GLASS TYPE	SIZE WIDTH V.I.F.	SIZE HEIGHT V.I.F.	REMARKS	NO.
S1	SOUND CONTROL	1	INT	GL-2	26'-6"	9'-4"		S1
S2	SOUND CONTROL	1	INT	GL-2	26'-6"	9'-4"		S2
S3	SOUND CONTROL	1	INT	GL-2	26'-6"	9'-4"		S3
S4	60 MIN FIRE RATED	1	INT	GL-3	25'-7"	9'-4"		S4
S5	60 MIN FIRE RATED	1	INT	GL-3	28'-6"	9'-4"		S5
S6	STANDARD	1	INT	GL-1	27'-8"	9'-4"		S6
S7	STANDARD	1	INT	GL-1	7'-6"	9'-4"		S7
S8	STANDARD	1	INT	GL-1	6'-11"	9'-4"		S8
S9	SOUND CONTROL	1	INT	GL-2	4'-8"	7'-2"		S9
S10	SOUND CONTROL	1	INT	GL-2	4'-8"	7'-2"		S10

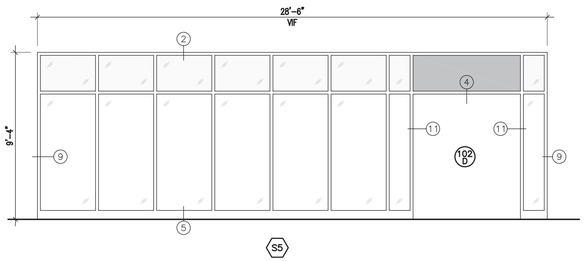
1 STOREFRONT SCHEDULE
NTS

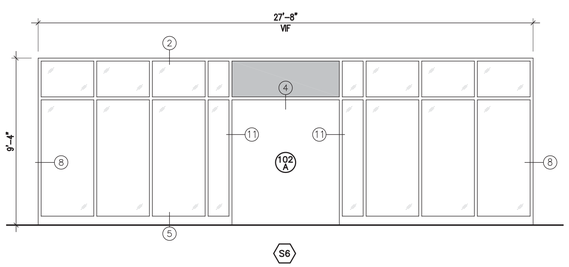


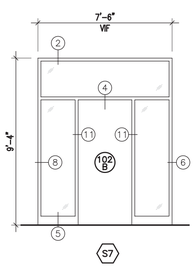


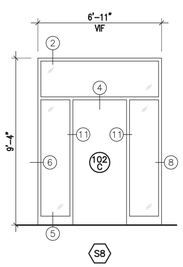


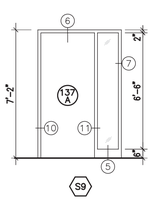


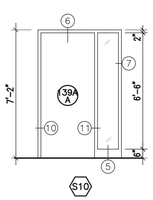




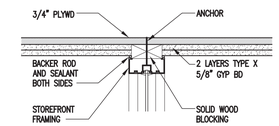


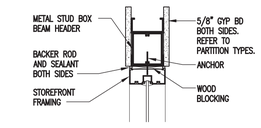




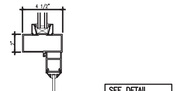


2 STOREFRONT ELEVATIONS
1/4"=1'-0"





SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.



SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.

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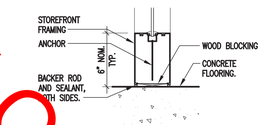
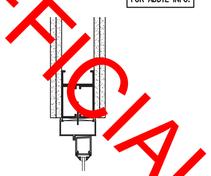
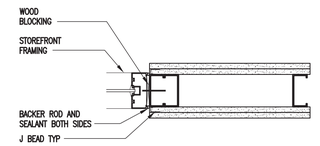


SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.



SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.



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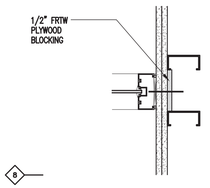
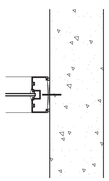


SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.



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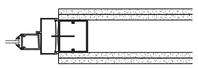


SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.

SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.

SEE DETAIL 3(1)/A.502 FOR ADDTL INFO.

STOREFRONT

SOUND CONTROL AND STANDARD STOREFRONT
FRAMING: KAWNEER TRIFAB 400, WITH 1-3/4"x4" PROFILE.
DOORS: KAWNEER 500 TUFFLINE WIDE-STILE ENTRANCE DOORS, WITH 5" PROFILE.

FIRE-RATED STOREFRONT
FRAMING: SAFTIFIRST GPX ARCHITECTURAL SERIES, 60 MINUTE FIRE-RATED, WITH 2-1/2"x4" PROFILE.
DOORS: SAFTIFIRST 500 SERIES, 60 MINUTE FIRE RATED, WITH 5" PROFILE.

GLAZING

GL-1
1/4" TEMPERED GLASS

GL-2
1" INSULATED TEMPERED GLASS

GL-3
SAFTI FIRST SUPERLITE 2-XL, 1-1/8" 60 MINUTE FIRE-RESISTIVE SAFETY GLASS

GL-4
SAFTIFIRST SUPERLITE X-90
3/4" FIRE PROTECTIVE SAFETY GLASS

NOTES:

1) PROVIDE SMOKE SEALS AT ALL RATED DOOR ASSEMBLIES.

2) PROVIDE FIRE RATED HARDWARE, DOOR CLOSERS, PANIC DEVICES, DOORS, AND DOOR FRAMES, AT ALL RATED OPENINGS TYP. REFER TO HARDWARE SCHEDULE FOR ADDITIONAL REQUIREMENTS.

11.21.19 FOR BIDDING

BERGEN COMMUNITY COLLEGE
ONE STOP EXPANSION

400 PARAMUS ROAD PARAMUS, NJ

arcari + iovino ARCHITECTS PC

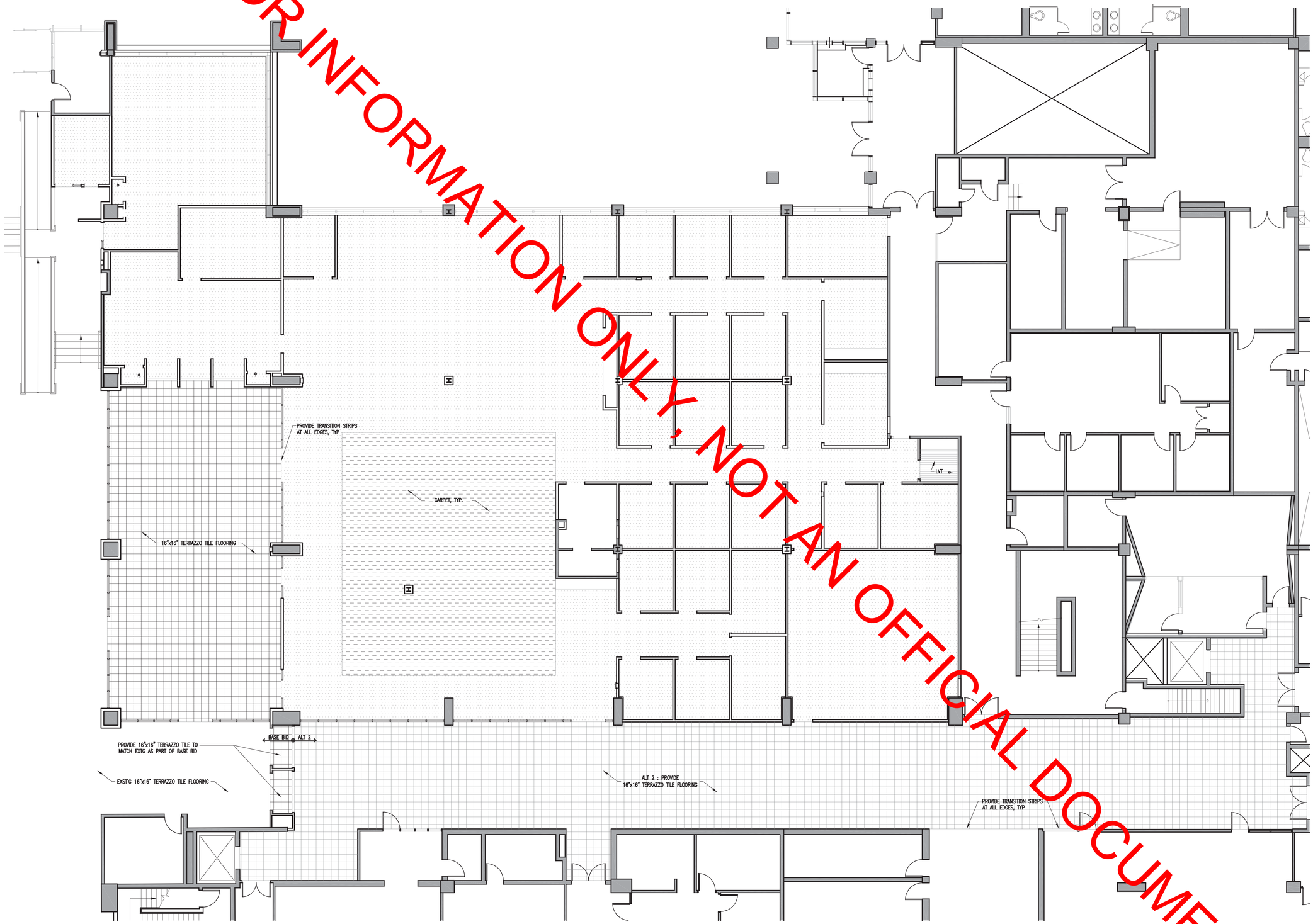
ONE KATHERINE STREET
LITTLE FERRY, NJ 07643
201 641 0600, FAX 201 641 0626
WWW.AIARCHS.COM

EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

STOREFRONT SCHEDULE,
STOREFRONT ELEVATIONS,
DETAILS AND SPECIFICATIONS

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\

A.502



1 FINISH PLAN
1/8" = 1'-0"

FLOOR FINISHES

CARPET C-1

CARPET C-2

TERRAZZO TILE

VINYL PLANK

CARPET C-1
MILLIKEN REMIX 2.0
TEMPO-MODULAR TILE, DJ W/STAR FRUIT
MONOLITHIC INSTALLATION

PROVIDE 4"x1/8" VINYL COVE BASE

CARPET C-2
MILLIKEN REMIX 2.0
FREESTYLE MODULAR TILE, SNARE W/STAR FRUIT
MONOLITHIC INSTALLATION

PROVIDE 4"x1/8" VINYL COVE BASE

TERRAZZO TILE:
WAUSAU 16"x16"x5/8" POLISHED

PROVIDE 4"x16"x1/2" TERRAZZO TILE BASE

VINYL PLANK:
MILLIKEN ABSTRACT/STONE/SERPEGGIANTE
12"x24"
SER108

PROVIDE 4"x1/8" VINYL COVE BASE

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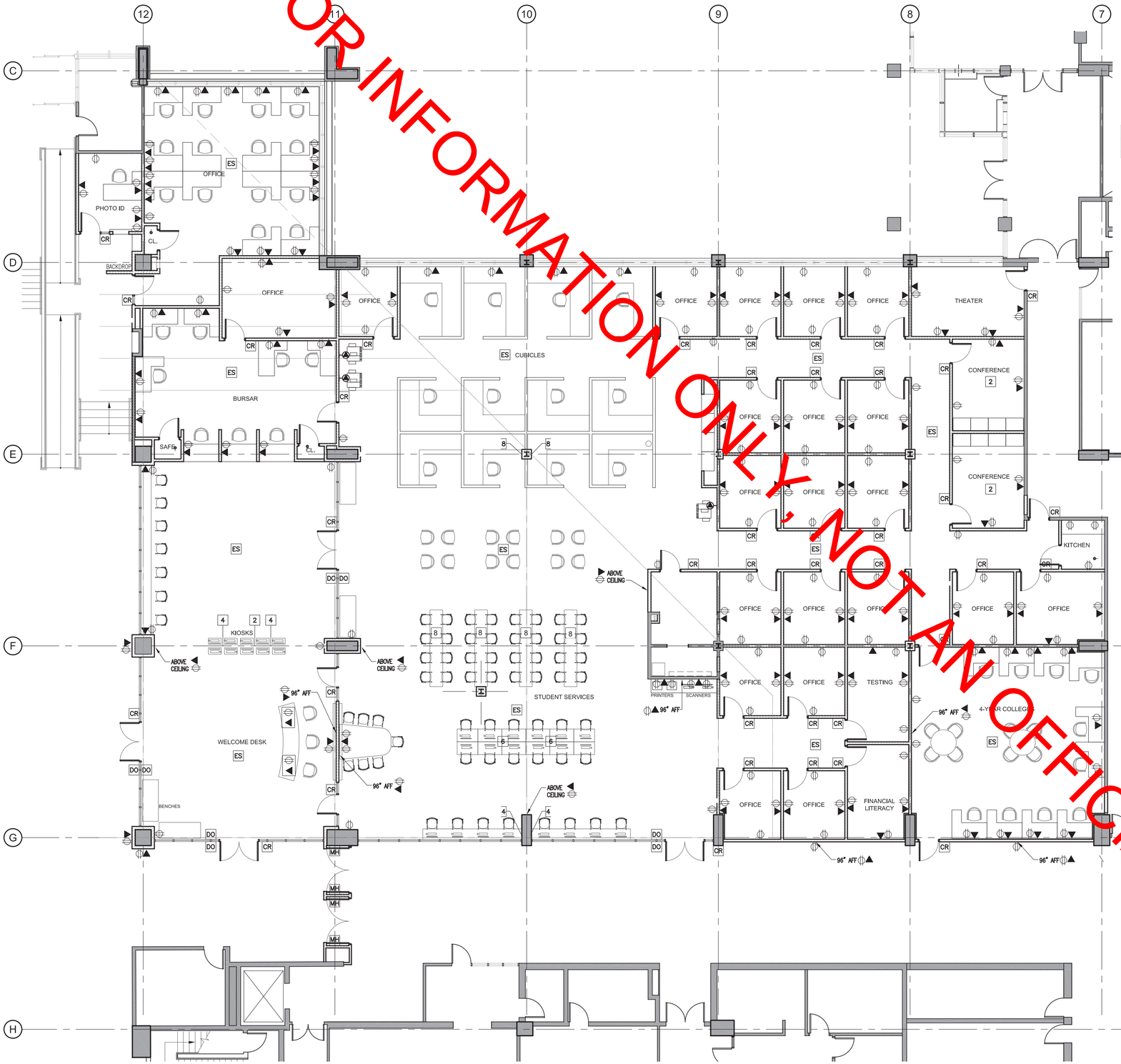
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

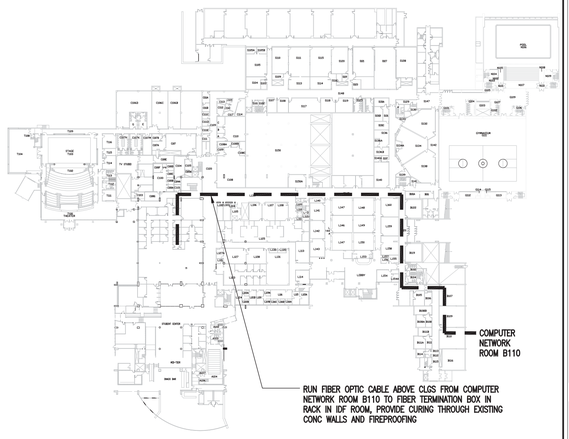
FINISH PLAN
FIRST FLOOR

SCALE: AS NOTED	A.601
DATE: 08.30.19	
FILE: 1883\	



1 POWER AND DATA PLAN
1/8" = 1'-0"

NORTH



RUN FIBER OPTIC CABLE ABOVE CLGS FROM COMPUTER NETWORK ROOM B110 TO FIBER TERMINATION BOX IN RACK IN IDF ROOM. PROVIDE CURING THROUGH EXISTING CONC WALLS AND FIREPROOFING

2 FIBER OPTIC CABLE
NTS

ELECTRICAL LEGEND

- WALL MOUNTED DUPLEX OUTLET
- FLOOR MOUNTED DUPLEX OUTLET
- SPECIAL PURPOSE OUTLET (COPIER)
- WALL MOUNTED DATA JACK
- FLOOR MOUNTED POWER/ DATA OUTLET. SEE DATA CABLING SCOPE
- WALL MOUNTED MULTIPLE POWER/ DATA OUTLET. # INDICATES NUMBER OF OUTLETS AND JACKS EACH. SEE DATA CABLING SCOPE
- FLOOR MOUNTED MULTIPLE POWER/ DATA OUTLET. # INDICATES NUMBER OF OUTLETS AND JACKS EACH. SEE DATA CABLING SCOPE
- ES — EMERGENCY SPEAKER 2x2 CEILING TILE DROP-IN WAHSEGA INFORMACAST SPEAKER PROVIDE 2 PORTS AT EACH LOCATION
- CR — CARD READER. SEE A.612 FOR DOOR ACCESS CONTROL SYSTEM.
- DO — DOOR OPERATOR. SEE A.612 FOR DOOR ACCESS CONTROL SYSTEM.
- MH — MAGNETIC HOLD-OPEN

DATA CABLING SCOPE

1) AT EACH DATA OUTLET SHOWN HERE AND ON THE ELECTRICAL DRAWINGS, PROVIDE A CATEGORY 6 HOMERUN TO THE IDF ROOM PUNCH-DOWN BLOCK. SEE SPECIFICATION SECTION 271200 FOR ADDITIONAL INFORMATION ON THE CABLING.

2) FIBER OPTIC CABLE SHALL BE 6 PAIRS (12 STRANDS) SINGLE MODE FIBER W/LC CONNECTORS AT BOTH ENDS

GENERAL NOTES:

1. FINAL LOCATIONS OF ALL POWER AND DATA OUTLETS ARE TO BE DETERMINED IN FIELD WITH OWNER AND ARCHITECT PRIOR TO INSTALLATION.

11.21.19 FOR BIDDING

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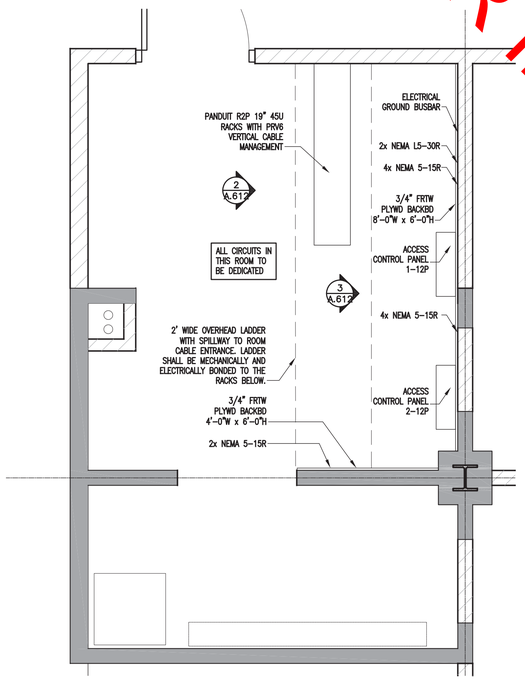
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

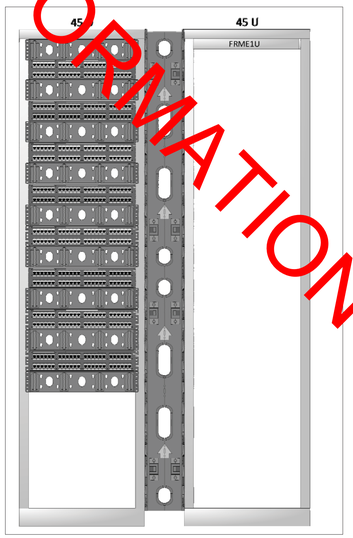
POWER AND DATA PLAN
FIRST FLOOR

SCALE: AS NOTED	A.611
DATE: 08.30.19	
FILE: 1883\	

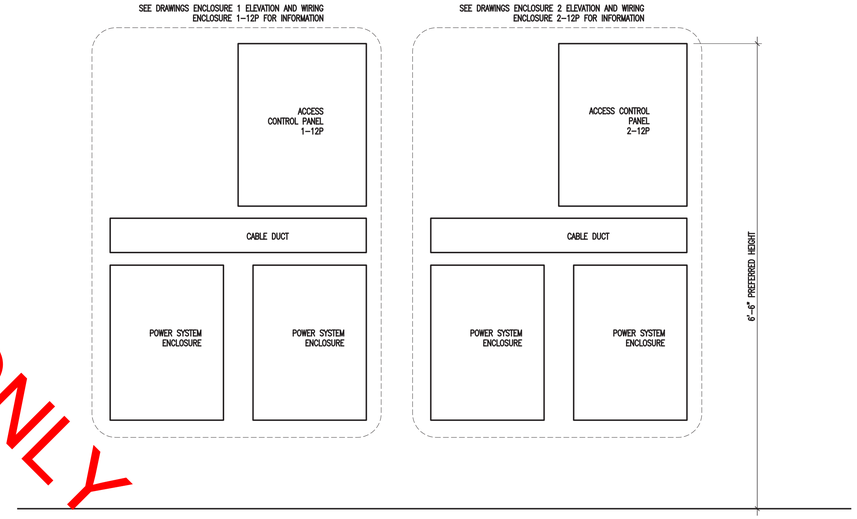


1 ENLARGED IDF ROOM PLAN
1/2" = 1'-0"

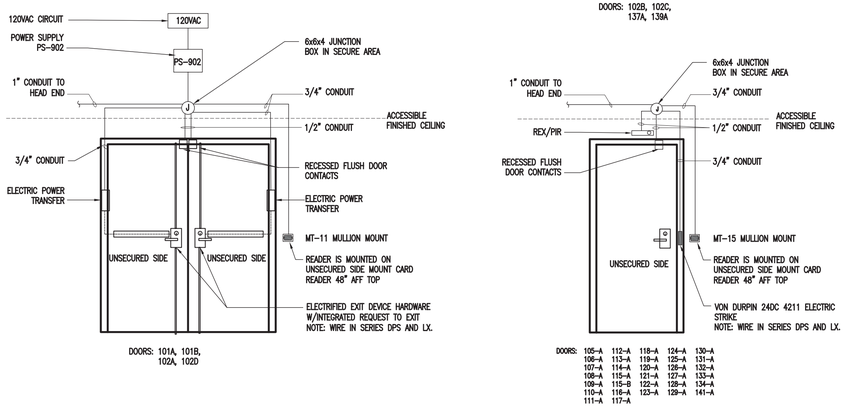
SERVER RACK EQUIPMENT LIST	
QUANTITY	EQUIPMENT
2	PANDUIT R2P 45U RACK
1	PANDUIT PRV6 CABLE MANAGER
8	PANDUIT DPKR486688TG PATCH PANEL
1	PANDUIT CMPH2 HORIZONTAL CABLE MANAGER
1	PANDUIT FRME1U FIBER TERMINATION BOX W/ PORTS FOR FIBER TRUNK CABLE



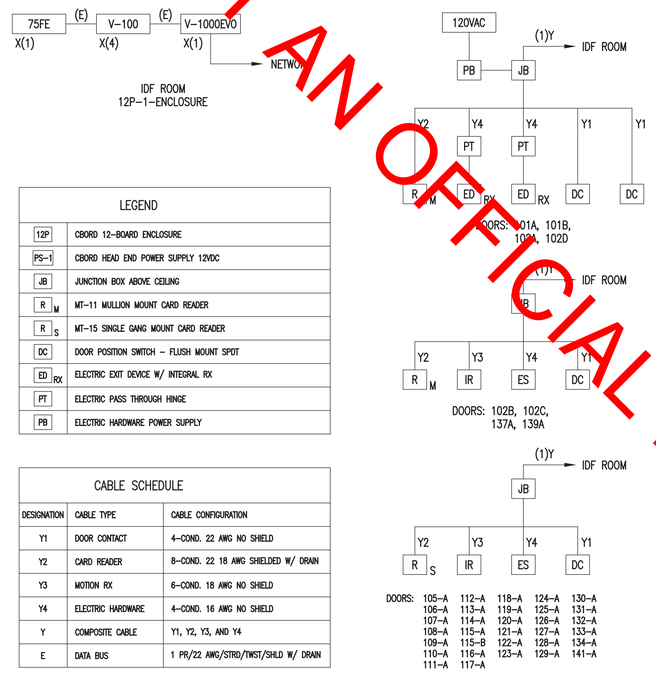
2 DATA RACK ELEVATION
1" = 1'-0"



3 ELEVATION AT ACCESS CONTROL PANELS
NTS



4 ACCESS CONTROL SYSTEM DOOR ELEVATIONS
NTS



LEGEND	
12P	CBORD 12-BOARD ENCLOSURE
PS-1	CBORD HEAD END POWER SUPPLY 12VDC
JB	JUNCTION BOX ABOVE CEILING
R M	MT-11 MULLION MOUNT CARD READER
R S	MT-15 SINGLE GANG MOUNT CARD READER
DC	DOOR POSITION SWITCH - FLUSH MOUNT SPDT
ED RX	ELECTRIC EXIT DEVICE W/ INTEGRAL RX
PT	ELECTRIC PASS THROUGH HINGE
PB	ELECTRIC HARDWARE POWER SUPPLY

CABLE SCHEDULE		
DESIGNATION	CABLE TYPE	CABLE CONFIGURATION
Y1	DOOR CONTACT	4-COND. 22 AWG NO SHIELD
Y2	CARD READER	8-COND. 22 18 AWG SHIELDED W/ DRAIN
Y3	MOTION RX	6-COND. 18 AWG NO SHIELD
Y4	ELECTRIC HARDWARE	4-COND. 16 AWG NO SHIELD
Y	COMPOSITE CABLE	Y1, Y2, Y3, AND Y4
E	DATA BUS	1 PR/22 AWG/STRD/TWST/SHILD W/ DRAIN

5 ACCESS CONTROL SYSTEM RISER DIAGRAMS
NTS

11.21.19 FOR BIDDING

BERGEN COMMUNITY COLLEGE
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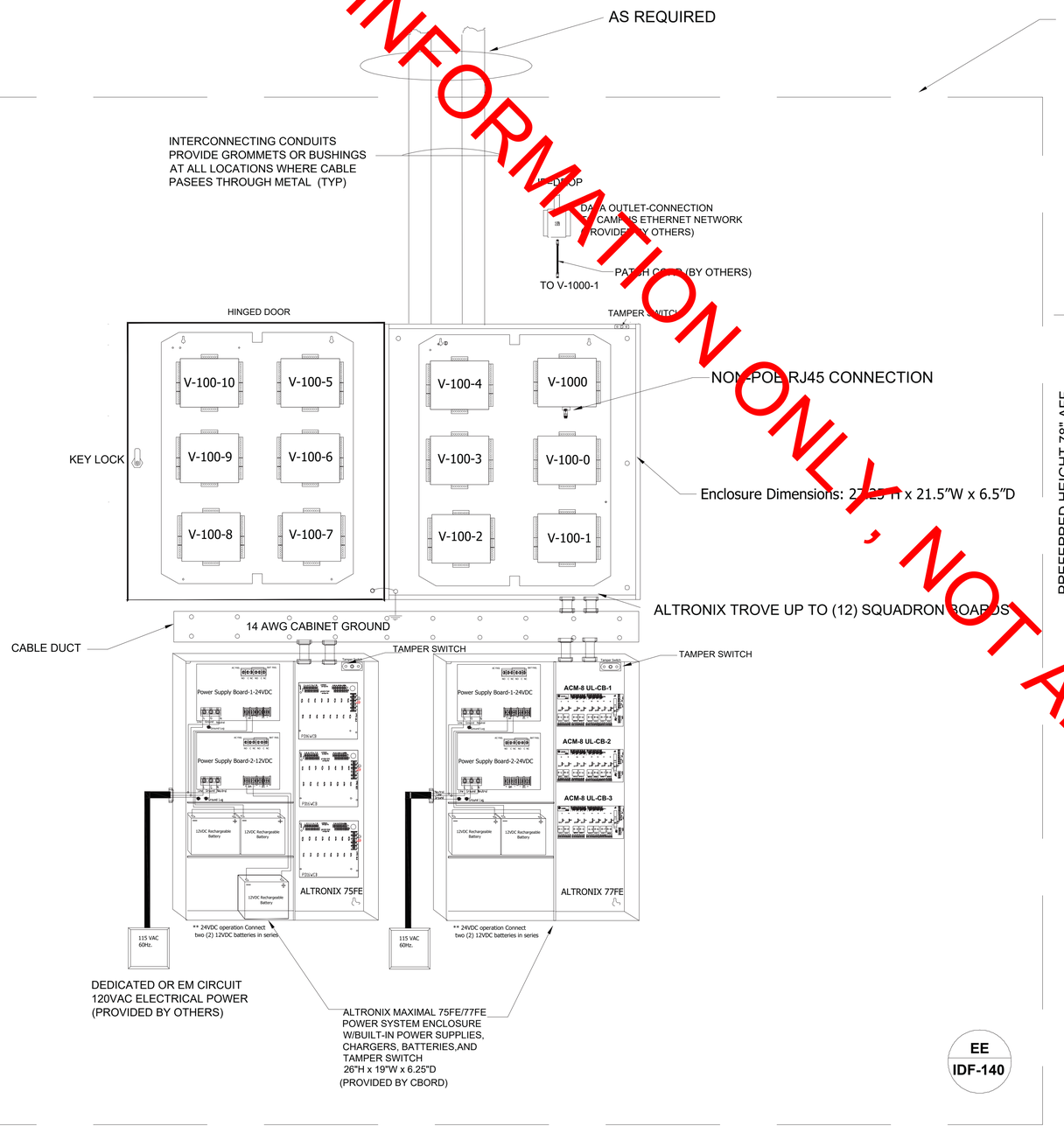
DATA AND ACCESS CONTROL

SCALE: AS NOTED
DATE: 08.30.19
FILE: 1883\
A.612



EE
IDF-140

ALTRONIX 75E
SQUAD/REX

PD-16-1-12VDC

F1-V1000EVO	
F2-V-100-0	F10 V-100-8
F3 V-100-1	F11 V-100-9
F4 V-100-2	F12 V-100-10
F5 V-100-3	F13 SPARE
F6 V-100-4	F14 SPARE
F7 V-100-5	F15 SPARE
F8 V-100-6	F16 SPARE
F9 V-100-7	

PD-16-2-24VDC

F1- REX-101A	F9-REX-105A
F2-REX-101B	F10-REX-106A
F3-REX-102A	F11-REX-107A
F4-REX-102B	F12-REX-108A
F5-REX-102C	F13-REX-109A
F6-REX-102D	F14-REX-110A
F7-REX-137A	F15-REX-111A
F8-REX-139A	F16-REX-112A

PD-16-3-24VDC

F1- REX-113A	F9-SPARE
F2-REX-114A	F10-SPARE
F3-REX-115A	F11-SPARE
F4-REX-115B	F12-SPARE
F5-REX-116A	F13-SPARE
F6-REX-117A	F14-SPARE
F7-SPARE	F15-SPARE
F8-SPARE	F16-SPARE

ALTRONIX 77E
ELECTRIC HARDWARE

ACM-8 CB-1-24VDC

F1-101A	F5-102C
F2-101B	F6-102D
F3-102A	F7-137A
F4-102B	F8-139A

ACM-8 CB-2-24VDC

F9-105A	F13-109A
F10-106A	F14-110A
F11-107A	F15-111A
F12-108A	F16-112A

ACM-8 CB-3-24VDC

F17-113A	F21-116A
F18-114A	F22-117A
F19-115A	F7-SPARE
F20-115B	F8-SPARE

GENERAL NOTES

"TYPICAL" BACKBOARD ARRANGEMENT IS SHOWN, AND MAY VARY DEPENDING ON EXISTING CONDITIONS AND ACTUAL SPACE AVAILABLE AT EACH BACKBOARD LOCATION.

"TYPICAL" SQUADRON ARRANGEMENT IS SHOWN AND MAY VARY DEPENIDNG ON APPLICATION.

1. CBORD ACCESS POWER SUPPLIES AND CONTROL PANELS ARE TO BE INSTALLED AT BACKBOARD LOCATION UNLESS OTHERWISE SPECIFIED.

2. PROVIDE 120 VAC POWER WIRING CONNECTIONS TO POWER SUPPLIES AS SHOWN.

3. DOOR HARDWARE POWER SUPPLIES TO BE LOCATED IN HEAD END

General Notes

Revision/Issue	Date

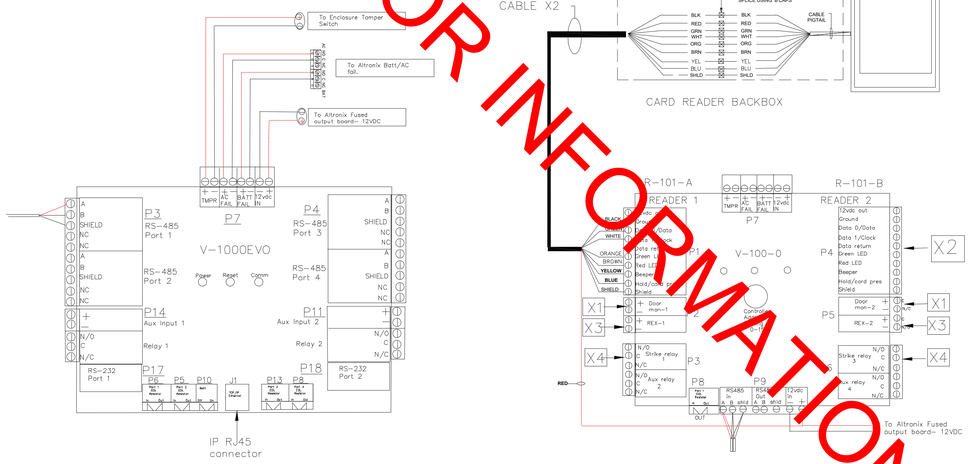
Firm Name and Address

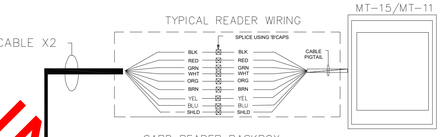
THE CBORD GROUP
16386 BURCHAM ROAD
LOGAN, OH 43138
740.385.2459
dtw@cbord.com

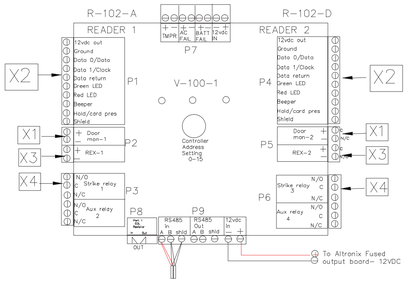
Project name and Address

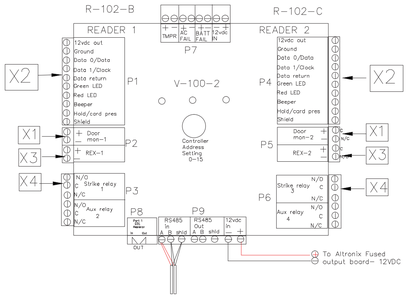
Bergen Community College
Student One
Enclosure Elevation1

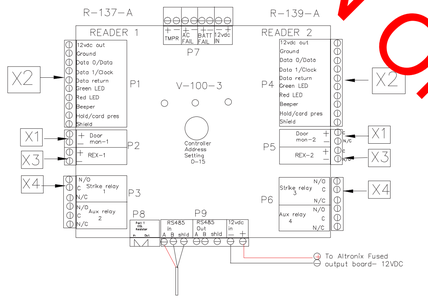
DATE	Sheet
10-17-2019	
Scale: NONE	BCC-STUD1-EE-1

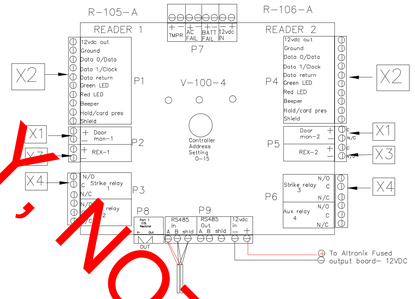


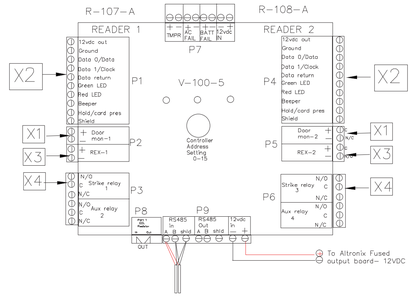


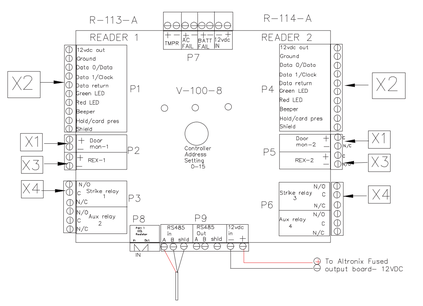


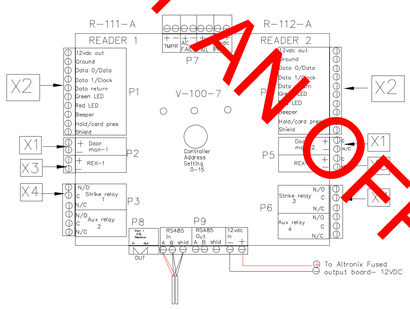


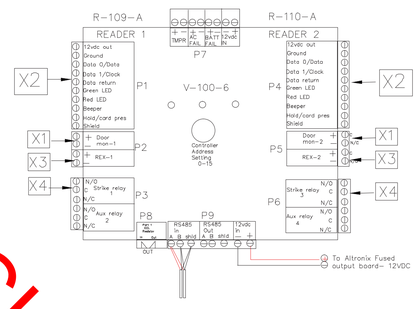


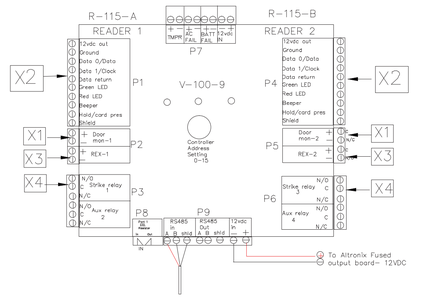


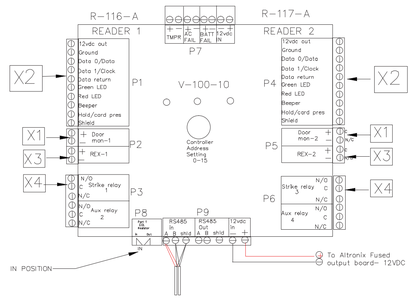












PROJECT:

Bergen CC STUDENT ONE STOP

CBORD ACCESS CONTROL

LEGEND

DCP	CBORD V-1000EVO
2-RC	CBORD V-100-TWO READER CONT.
PS	HEAD END POWER SUPPLY 12VDC.
R	CARD READER
DC	DOOR POSITION SWITCH-FLUSH MOUNT SPDT.
IR	PIR REQUEST TO EXIT
RX	RX SWITCH IN ELECTRIC HARDWARE
LX	LX SWITCH IN ELECTRIC HARDWARE
E	INTERFACE TO ELECTRIC LEVER PROVIDED BY HARDWARE SUPPLIER.
ES	INTERFACE TO ELECTRIC STRIKE PROVIDED BY HARDWARE SUPPLIER.
EP	INTERFACE TO ELECTRIC PANIC DEVICE PROVIDED BY HARDWARE SUPPLIER
ET	INTERFACE TO ELECTRIC TRIM PANIC DEVICE PROVIDED BY HARDWARE SUPPLIER
EO	INTERFACE TO EXIT ONLY PANIC DEVICE PROVIDED BY HARDWARE SUPPLIER
DO	ADA-PUSH PLATE
PT	INTERFACE TO POWER TRANSFER PROVIDED BY HARDWARE SUPPLIER.
PB	EXIT DEVICE POWER SUPPLY
DM	DOOR MANGEMENT SYSTEM/HORN
AI	AUTOMATIC DOOR INTERFACE FOR READER CONTROL.
KB	FIRE DEPARTMENT KNOX BOX.

Firm Name and Address

The Cbord Group
16386 Burcham Road
Logan, OH 43138
740.385.2459
dtw@cbord.com

CABLE TYPES

CABLE DESCRIPTION	PART NUMBER
A – 2 COND/18 AWG/STRD/TWST	WCW#442360-S-PL
B – 4 COND/18 AWG/STRD/TWST	WCW#442380-S-PL
C – 2 PR/24 AWG/STRD/TWST/SHLD w/DRAIN	WCW#442003-S-PL
D – 6 COND/22 AWG/STRD/TWST/SHLD w/DRAIN	WCW#444351-03S-PL
E – 1 PR/22 AWG/STRD/TWST/SHLD w/DRAIN	WCW#043106AL-S-PL
F – 2 COND/16 AWG/STRD/TWST	WCW#441367-S-PL
G – RG-59U COAX	WCW#659211-S-PL
H – CATEGORY 6 LAN CABLE	WCW#655619-S-PL
I – 4 COND/18 AWG/STRD/TWST/SHLD w/DRAIN	WCW#160100-S-PL
J – 2 PR/22AWG/STRD/TWST/SHLD w/DRAIN	WCW#4150102-S-PL
K – 8 COND/18AWG/STRD/SHLD w/DRAIN	WCW#714510-WQ-PL
L – 4 COND/18AWG PARALLEL MD-CAP	WCW#762380-S-PL
M – 2 COND/22AWG/STRD/TWST	WCW#444366-S-PL
N – 2-COND/12AWG/STRD	
O – 3 PR/18AWG/STRD/TWST/SHLD w/DRAIN	WCW#4160201
X – WCW COMPOSITE CABLE *SPECIFY RISER OR PLENUM	WCW Composite Cable Pn# Cbord-A-AC-EXT-PL
X1 – 4-Conductor #22 AWG/STRD/NO SHIELD	
X2 – 8-Conductor #18 AWG/STRD/SHLD/w/DRAIN	
X3 – 6-Conductor #16 AWG/STRD/NO SHIELD	
X4 – 4-Conductor #18 AWG/STRD/NO SHIELD	

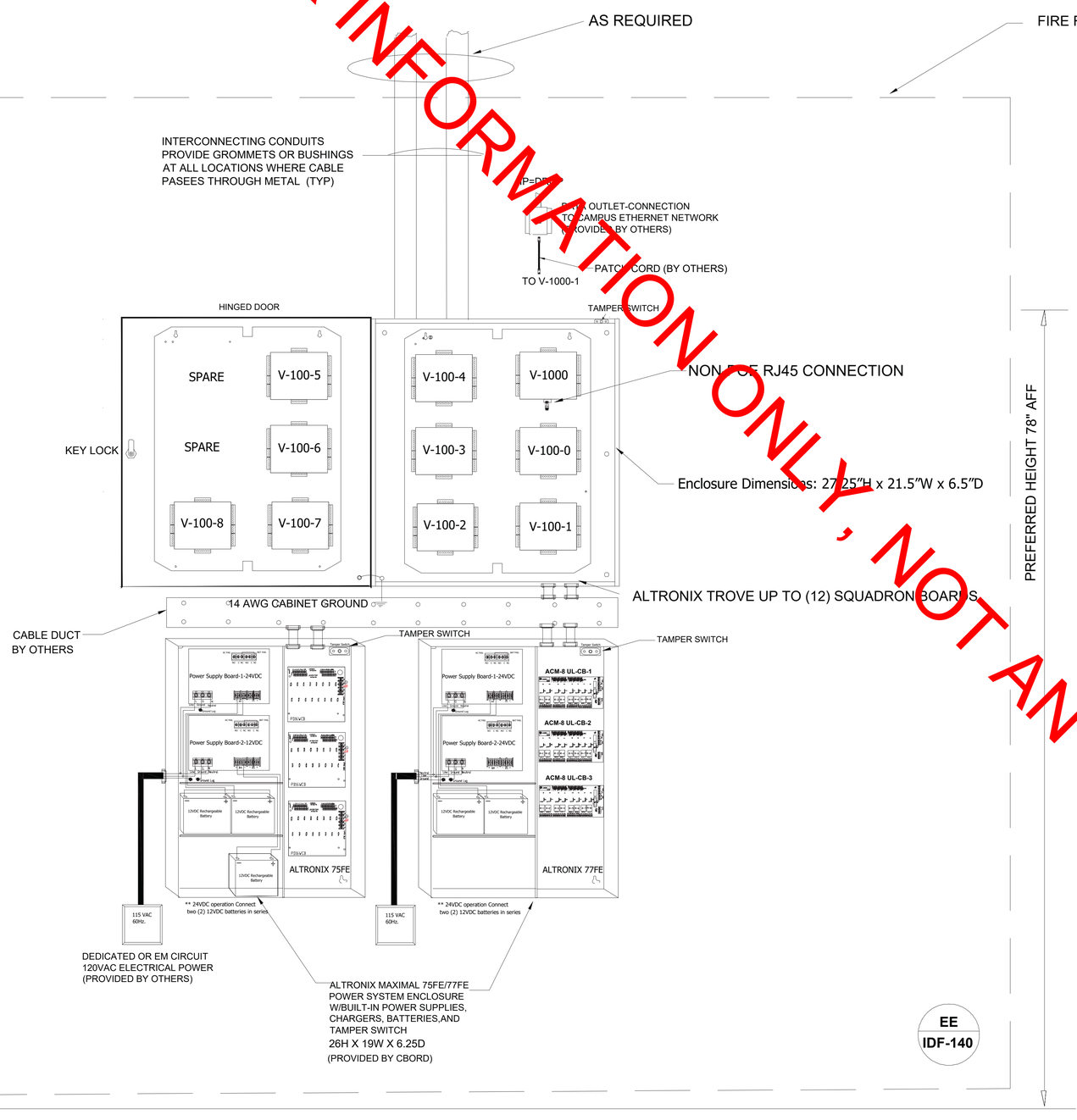
COND – CONDUCTOR
PR – PAIR
STRD – STRANDED
PL–PLENUM RATED

TWST – TWISTED
SHLD – SHIELDED
AWG – WIRE GUAGE

NO.	DATE	ISSUE OR REVISION

Bergen CC
Student One Stop
WIRING
ENCLOSURE 1–12P
IDF 140

SCALE: NONE	DATE: 10–14–2019
DRAWN BY: DTW	PROJECT NO.
DRAWING NO.	



ALTRONIX 75E
SQUAD/REX

PD-16-1-12VDC

F1-V1000EVO	
F2-V-100-0	F10 V-100-8
F3 V-100-1	F11 SPARE
F4 V-100-2	F12 SPARE
F5 V-100-3	F13 SPARE
F6 V-100-4	F14 SPARE
F7 V-100-5	F15 SPARE
F8 V-100-6	F16 SPARE
F9 V-100-7	

PD-16-2-24VDC

F1- REX-118A	F9-REX-126A
F2-REX-119A	F10-REX-127A
F3-REX-120A	F11-REX-128A
F4-REX-121A	F12-REX-129A
F5-REX-122A	F13-REX-130A
F6-REX-123A	F14-REX-131A
F7-REX-124A	F15-REX-132A
F8-REX-125A	F16-REX-133A

PD-16-3-24VDC

F1-REX-134A	F9-SPARE
F2-REX-141A	F10-SPARE
F3-SPARE	F11-SPARE
F4-SPARE	F12-SPARE
F5-SPARE	F13-SPARE
F6-SPARE	F14-SPARE
F7-SPARE	F15-SPARE
F8-SPARE	F16-SPARE

ALTRONIX 77E
ELECTRIC HARDWARE

ACM-8 CB-1-24VDC

F1-118A	F5-122A
F2-119A	F6-123A
F3-120A	F7-124A
F4-121A	F8-125A

ACM-8 CB-2-24VDC

F1-126A	F5-130A
F2-127A	F6-131A
F3-128A	F7-132A
F4-129A	F8-133A

ACM-8 CB-3-24VDC

F1-134A	F5-SPARE
F2-141A	F6-SPARE
F3-SPARE	F7-SPARE
F4-SPARE	F8-SPARE

GENERAL NOTES

"TYPICAL" BACKBOARD ARRANGEMENT IS SHOWN, AND MAY VARY DEPENDING ON EXISTING CONDITIONS AND ACTUAL SPACE AVAILABLE AT EACH BACKBOARD LOCATION.

"TYPICAL" SQUADRON ARRANGEMENT IS SHOWN AND MAY VARY DEPENDING ON APPLICATION.

1. CBORD ACCESS POWER SUPPLIES AND CONTROL PANELS ARE TO BE INSTALLED AT BACKBOARD LOCATION UNLESS OTHERWISE SPECIFIED.

2. PROVIDE 120 VAC POWER WIRING CONNECTIONS TO POWER SUPPLIES AS SHOWN.

3. DOOR HARDWARE POWER SUPPLIES TO BE LOCATED IN HEAD END

General Notes

Revision/Issue	Date

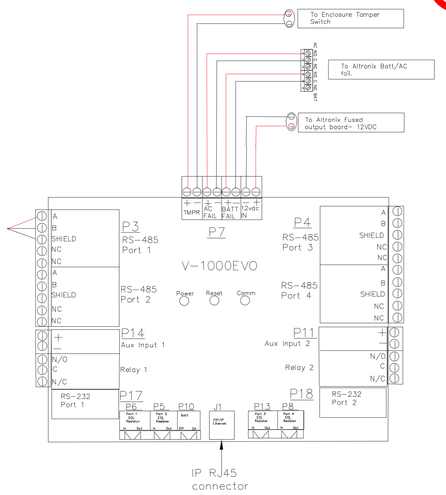
Firm Name and Address

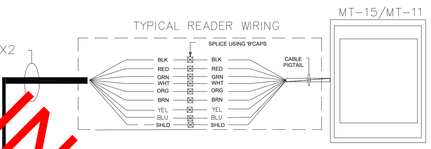
THE CBORD GROUP
16386 BURCHAM ROAD
LOGAN, OH 43138
740.385.2459
dtw@cbord.com

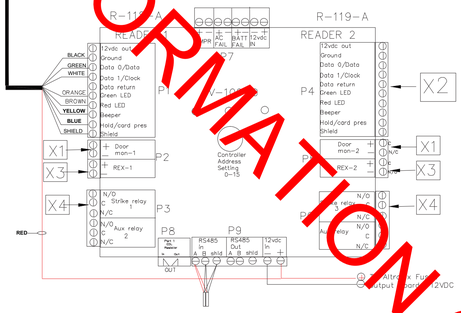
Project name and Address

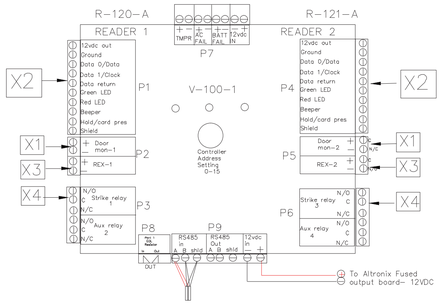
Bergen Community College
Student One
Enclosure Elevation 2

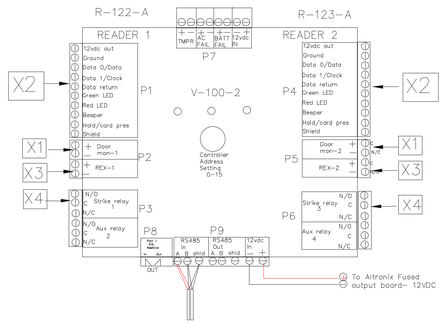
DATE	Sheet
10-17-2019	
Scale: NONE	BCC-STUD1-EE-2

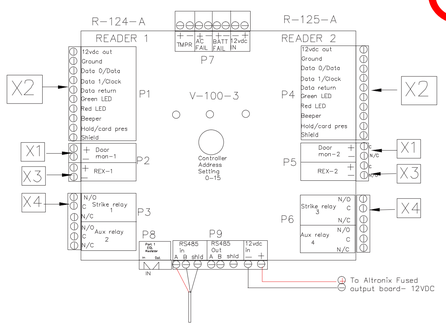


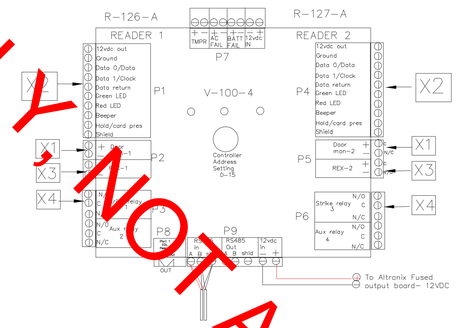


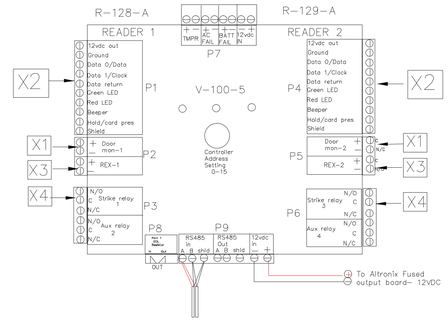


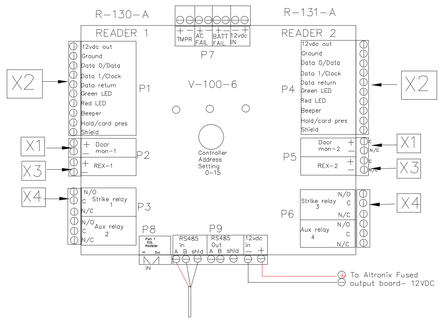


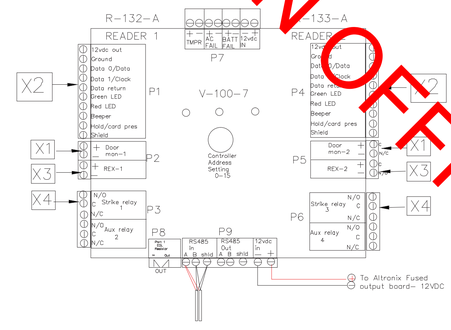


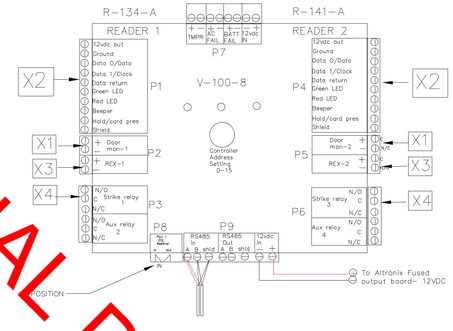












PROJECT:

Bergen CC STUDENT ONE STOP

CBORD ACCESS CONTROL

LEGEND

DGP	CBORD V-1000EVO
2-RC	CBORD V-100-TWO READER CONT.
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EP	INTERFACE TO ELECTRIC PANIC DEVICE PROVIDED BY HARDWARE SUPPLIER
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D – 6 COND/22 AWG/STRD/TWST/SHLD w/DRAIN	WCW#444351-03S-PL
E – 1 PR/22 AWG/STRD/TWST/SHLD w/DRAIN	WCW#043106AL-S-PL
F – 2 COND/16 AWG/STRD/TWST	WCW#441367-S-PL
G – RG-59U COAX	WCW#659211-S-PL
H – CATEGORY 6 LAN CABLE	WCW#655619-S-PL
I – 4 COND/18 AWG/STRD/TWST/SHLD w/DRAIN	WCW#160100-S-PL
J – 2 PR/22AWG/STRD/TWST/SHLD w/DRAIN	WCW#4150102-S-PL
K – 8 COND/18AWG/STRD/SHLD w/DRAIN	WCW#714510-VNQ-PL
L – 4 COND/18AWG PARALLEL MID-CAP	WCW#782380-S-PL
M – 2 COND/22AWG/STRD/TWST	WCW#444366-S -PL
N – 2-COND/12AWG/STRD	
O – 3 PR/18AWG/STRD/TWST/SHLD w/DRAIN	WCW#4160201
X – WCW COMPOSITE CABLE *SPECIFY RISER OR PLENUM	WCW Composite Cable P'N# Cbord-A-AC-EXT-PL
X1 – 4-Conductor #22 AWG/STRD/NO SHIELD	
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COND – CONDUCTOR
PR – PAIR
STRD – STRANDED
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TWST – TWISTED
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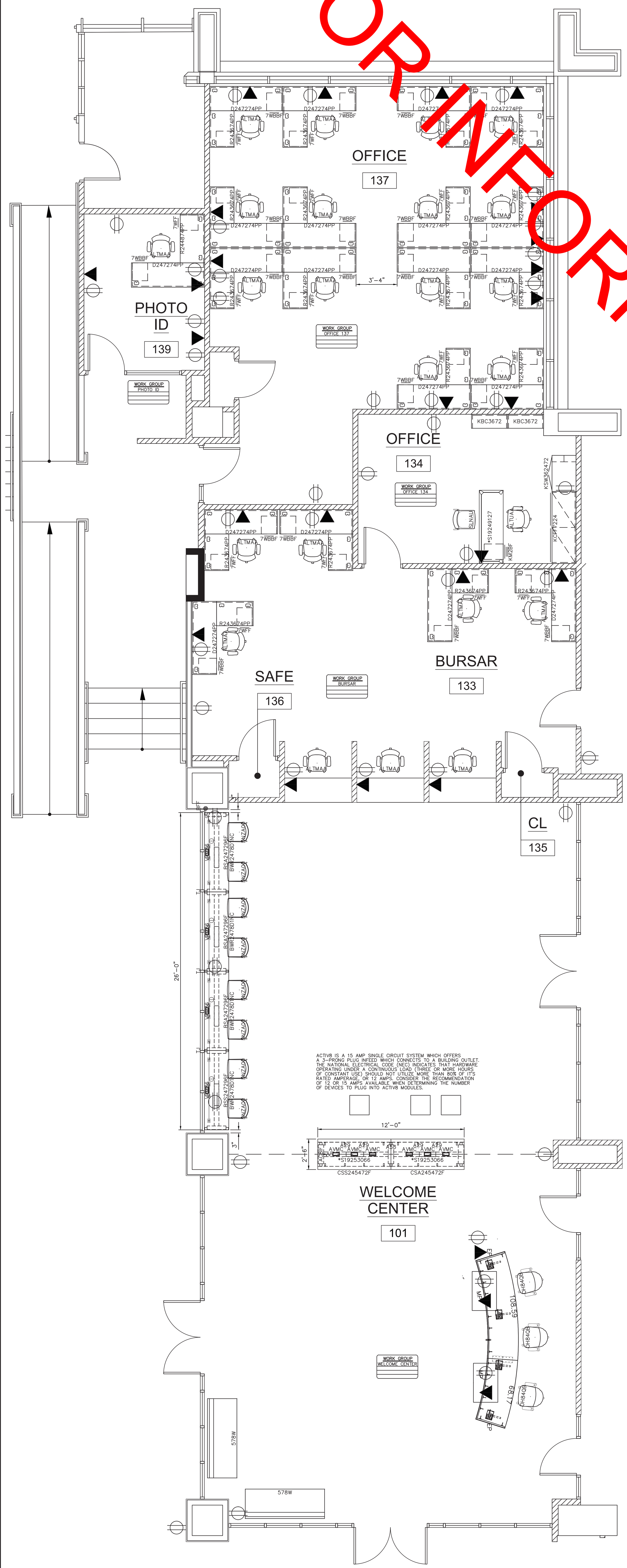
AWG – WIRE GUAGE

NO.	DATE	ISSUE OR REVISION

Bergen CC
Student One Stop
WIRING
ENCLOSURE 2–12P
IDF 140

SCALE: NONE	DATE: 10–14–2019
DRAWN BY: DTW	PROJECT NO.
DRAWING NO.	



WORKGROUP–PHOTO ID

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	1	7D/D2472–74P–P:G	D247274PP	700 SERIES DESK,PARTIAL MODESTY PANEL,74P EDGE,24X72"W
2	1	7D/R2448–74P–P:G	R244874PP	700 SERIES DESK,RETURN,PARTIAL MODESTY PANEL,74P EDGE,24X48"W
3	1	ALTMAA	ALTMAA	ALTUS MESH CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
4	1	S7P/1520WBBF	7WBBF	700 SERIES FILES SUPPORTING PED–BOX/BOX/FILE–20" NOMINAL DEPTH
5	1	S7P/1520WFF	7WFF	700 SERIES FILES SUPPORTING PED–FILE/FILE–20" NOMINAL DEPTH

10–24–2019 05:01 PM

WORKGROUP–OFFICE 134

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	1	ALTUAA	ALTUAA	ALTUS FABRIC CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
2	2	KBC3672.H	KBC3672	ARISTOTLE BOOKCASE,4 ADJ SHELVES 1 FIXED,36X14X72"H
[illegible]	1	KCFF7224.H	KCFF7224	ARISTOTLE DOUBLE LATERAL FILE CREDENZA,72X24"
4	1	KM2BF.H	KM2BF	ARISTOTLE MOBILE PEDESTAL,BOX/BOX/FILE,15.5X19X27.75"
5	1	KRAL6024EM.H	*S19249127	*CUSTOM ARISTOTLE RETURN,ALUM WAVE PROFILE,W/ACRYLIC 72"X24"
6	[illegible]	KSW362472.H	KSW362472	ARISTOTLE STORAGE & WARDROBE TOWER,36X24X72"H
7	1	S[illegible]NAU	SLNAU	STRIVE FOUR–LEG ARMLESS CHAIR,UPH SEAT

"*" [illegible]NDICATES [illegible]USTOM PRODUCT 10–24–2019 05:02 PM

WORKGROUP–OFFICE 137

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	14	7D/D247[illegible]74P–P:G	D247274PP	700 SERIES DESK,PARTIAL MODESTY PANEL,74P EDGE,24X72"W
2	14	7D/R24[illegible]–74P–P:G	R243674PP	700 SERIES DESK,RETURN,PARTIAL MODESTY PANEL,74P EDGE,24X36"W
3	14	ALTMAA	ALTMAA	ALTUS MESH CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
4	14	S7P/1520WBBF	7WBBF	700 SERIES FILES SUPPORTING PED–BOX/BOX/FILE–20" NOMINAL DEPTH
5	14	S7P/1520WFF	7WFF	700 SERIES FILES SUPPORTING PED–FILE/FILE–20" NOMINAL DEPTH

10–24–2019 05:02 PM

WORKGROUP–BURSAR

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	5	7D/D2472–74P–P:G	D247[illegible]74PP	700 SERIES DESK,PARTIAL MODESTY PANEL,74P EDGE,24X72"W
2	5	7D/R2436–74P–P:G	R243[illegible]4PP	700 SERIES DESK,RETURN,PARTIAL MODESTY PANEL,74P EDGE,24X36"W
3	8	ALTMAA	ALT[illegible]A	ALTUS MESH CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
4	5	S7P/1520WBBF	7[illegible]BF	700 SERIES FILES SUPPORTING PED–BOX/BOX/FILE–20" NOMINAL DEPTH
5	5	S7P/1520WFF	7WFF	700 SERIES FILES SUPPORTING PED–FILE/FILE–20" NOMINAL DEPTH

10–24–2019 05:02 PM

WORKGRO[illegible]ELCOME CENTER

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	4	14.3263.36	VPM36	VILLA POWER W/USB AND DATA MODULE,36"L 3–PRONG CORD
2	4	46.2880.1.BL		15[illegible]AMP DUPLEX RECEPTACLE FOR RACEWAY USE: 6 CIRCUIT,CIRCUIT 1
3	2	578W	578W	[illegible]URV BENCH W/WOOD BACK,29"D X 78"W,NON–CONTRAST
4	1	AC8IF.108	AC8IF	ACTIV8 INFEED
5	4	AC8JP.29	A29	ACTIV8 [illegible] 29" LONG
6	1	AC8JP.53	A53	ACTIV[illegible] JUMPER [illegible]3" LONG
7	6	AC8VMC	AVMC	ACTI[illegible] VILLA PW[illegible] MODULE W/CVER
8	1	CZBCSA245472/F	CSA245472F	CZ 2[illegible]" SINGLE[illegible]SIDE[illegible] & TEAMING ADDER TELESCOPIC BEAM FRAME 54–72", FIXED,[illegible]HEIGHT
9	1	CZBCSS245472/F	CSS245472F	CZ 24" SINGLE–[illegible]ED & [illegible]AMING STANDALONE/STARTER TELESCOPIC BEAM FRAME 54–72"[illegible]XED,CAFE HEIGHT 42" HIGH
10	2	CZBCWR4272TMP–74P:LCR	*S19253066	*CUSTOM CZ [illegible]0" DEE[illegible] WO[illegible]RFACE, CAFE HEIGHT,30"X72"
11	1	CZBFF	BFF	CZ STANDARD HEIGHT BA[illegible] INFE[illegible]D 10–WIRE,96"
12	3	CZBJP.TJ	TJ	810 JUMPER 18–1/2" [illegible] TOP USE
13	3	CZBSA247296/F	BSA247296F	CZ 24" SINGLE–SIDED ADDER [illegible]TELES[illegible]OPIC BEAM FRAME 72–96",FIXED, STANDARD HEIGHT
14	1	CZBSS247296/F	BSS247296F	CZ 24" SINGLE–SIDED STANDAL[illegible]NE/[illegible] TELESCOPIC BEAM FRAME 72–96",FIXED,STANDARD HEI[illegible]
15	4	CZBWR2478D1NM–74P:C	BWR2478D1NC	CZ 24" DEEP RECTILINEAR WORKS[illegible]RFACE,SIN[illegible]LE–SIDED,STANDARD HEIGHT, POWERED,NO–MODESTY PANEL,24X[illegible]8,74P EDG[illegible]
16	8	DNZA00	DNZA00	DONI WIRE TOWER BASE ARMLESS [illegible]AIR,POLY,T[illegible]–TONE
17	3	OH84QB	OH84QB	OATH TASK ARM CHAIR

"*" INDICATES CUSTOM PRODUCT [illegible]24–2019 05:02 PM

KI
Drawn using Encompass®

FIELD VERIFICATION
This Plan incorporates building information compiled from various sources associated with this project and deemed as reliable. Conditions directly affecting the product or its installation must be field verified.

CODE REQUIREMENTS
KI typically creates Plans based upon KI's interpretation of applicable sections of the 2012 International Building Code (IBC). However, due to matters beyond KI's control (such as contrary instructions and/or incomplete information from Owner/Architect/Contractor), this Plan may not be IBC compliant. As a result and notwithstanding anything to the contrary now or hereafter stated in any contract to which KI is a party, KI disclaims any responsibility or liability to insure that this Plan comply with federal, state or local statute, regulation or code section (including, but not limited to, the IBC) applicable to the Project, Project Site, or KI's Work, regardless of whether KI may be advised of the same. Approval of this Plan shall include agreement to the foregoing.

KI recommends that these Plans and the resulting layouts be reviewed with a local fire inspector to verify compliance with all local building codes. KI disclaims responsibility for any such review and any claim or liability that may result from non–compliance with local building codes.

THIS PLAN IS NOT INTENDED
TO BE USED FOR BUILDING CONSTRUCTION

DRAWING REVIEW
These Plans are intended to comply with with the contract. As such, these Plans must be reviewed by the Owner/Architect/Contractor, or other appropriate representative. If KI is to proceed with product installation in accordance with these Plans, mark the "Approved as Noted" box below, execute and complete the information at the bottom of this page and return this document to KI. If these Plans are to be corrected, mark the "Revise and Resubmit" box below, execute and complete the information at the bottom of this page and return this document to KI. Authorized signature indicates review of these Plans. Below signature print name, title, company or affiliation, and date. Manufacture of product shown is not scheduled until drawing review is complete and authorized signature is received.

It is the Owner/Architect/Contractor's responsibility to notify KI if site conditions have changed or are not depicted on our drawing that would impact our furniture layout after completed field verified dimensions have been obtained.

APPROVED AS NOTED: ☐
REVISE AND RESUBMIT: ☐

SIGNATURE: ____
PRINT: ____
COMPANY: ____
DATE: ____

KI WALL DEPT USE ONLY
☐ FINISH APPROVAL
☐ DRAWING APPROVAL
☐ VFD'S/HOLD DIMS
☐ AUDIT COMPLETE

PROJECT TITLE:
BERGEN COMM. COLLEGE
400 PARAMUS ROAD
PARAMUS, NEW JERSEY

FLOOR/AREA:
ONE STOP EXPANSION

PRODUCT LINE:
Unite
Aristotle
Loose Tables
Loose Seating

REPRESENTATIVE:
CASALE

DEALER:

ORDER NUMBER:

SFDC:
448914

DATE:
08/28/2019

REVISIONS:

NO.	DATE	BY	DESCRIPTION
2	09/11/2019	CJ	NEW BUILDING SHELL
3	10/03/2019	TLC	UPDATED CZ BENCHING
4	10/07/2019	CJ	UPDATE FLOOR PLAN
5	10/10/2019	CJ	REVISED WELCOME CENTER
6	10/18/2019	CJ	REVISED PER 10/17/19 E–MAIL
			CSR AUDIT

DRAWN BY: TLC
SCALE: 1/4" = 1'–0"

DRAWING No.:
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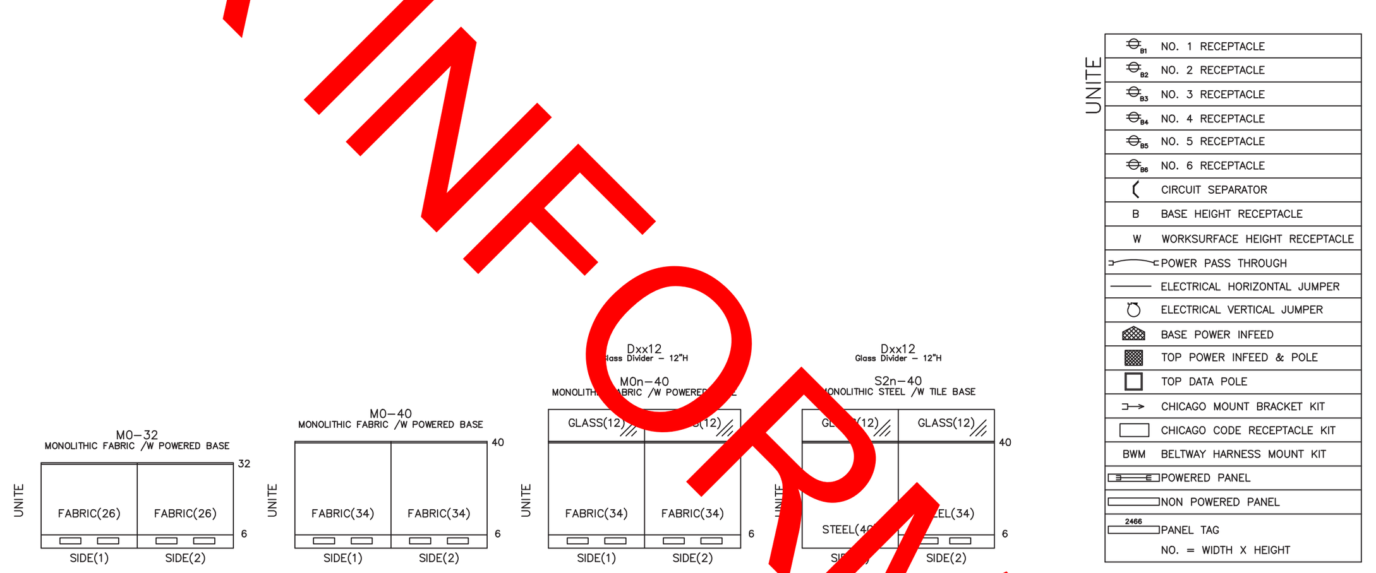

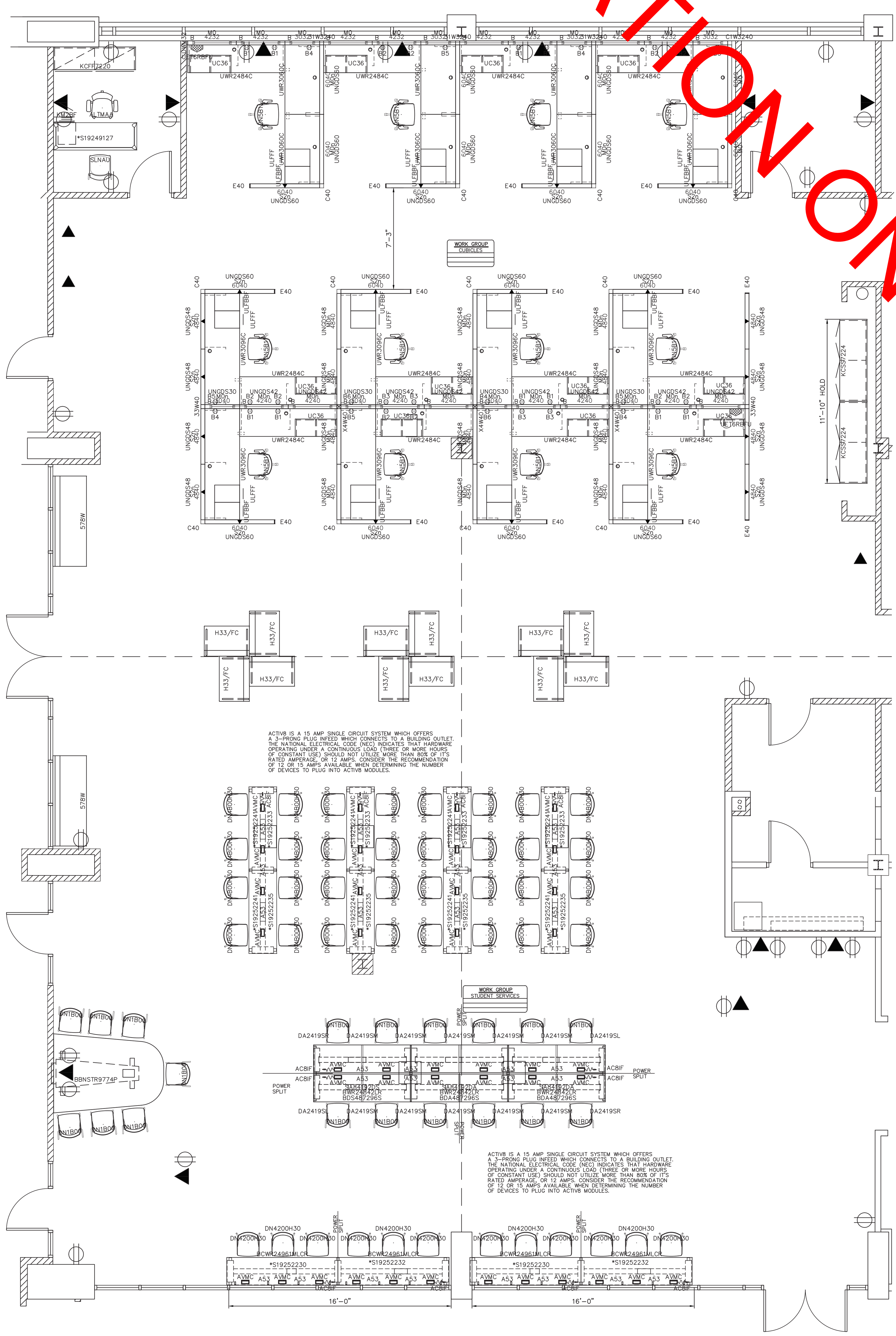

WORKGROUP–CUBICLES

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	12	DN5B11	DN5B11	DONI TASK CANTILEVER ARMCHAIR,UPH SEAT,TWO–TONE
2	1	U2W901W3240:F	C1W3240	UNITE 2–WAY 90 DEG "L" CORNER,32–40"H
3	12	U2W9040:F	C40	UNITE 2–WAY 90 DEG "L" CORNER,40"H
4	3	U3W901W3240:F	31W3240	UNITE 3–WAY 90 DEG "T" CORNER,TRIM 1 SIDE,32–40"H
5	2	U3W9040:F	33W40	UNITE 3–WAY 90 DEG "T" CORNER,40"H
6	3	U4W9040:F	X4W40	UNITE 4–WAY "X" INTERSECTION,40"H
7	12	UC36	UC36	U–SERIES FREESTANDING CREDENZA,36"WIDE
8	4	UCANTD12.L		UNITE WORKSURFACE BRACKET FOR WORKSURFACE ONLY,LEFT
9	4	UCANTD12.R		UNITE WORKSURFACE BRACKET FOR WORKSURFACE ONLY,RIGHT
10	44	UCANTST.L		UNITE STANDARD CANTILEVER BRACKET,LEFT
11	24	UCANTST.R		UNITE STANDARD CANTILEVER BRACKET,RIGHT
12	14	UEOR40	E40	UNITE END–OF–RUN CONDITION,40"H
13	16	UET6PJINL		UNITE INLINE PANEL JUMPER,6 CIRCUIT,12"L
14	6	UET6PJINT		UNITE INTERSECTION PANEL JUMPER,6 CIRCUIT,15–1/2"L
15	2	UET6RBFU	UET6RBFU	UNITE BASE INFEED W/BEZEL,STANDARD BASE,6 CIRCUIT
16	10	UET6RRC.1		UNITE 15 AMP DUPLX RECEPTACLE W/BEZEL,RACEWY,6 CIRCUIT,CIR 1
17	10	UET6RRC.2		UNITE 15 AMP DUPLX RECEPTACLE W/BEZEL,RACEWY,6 CIRCUIT,CIR 2
18	4	UET6RRC.3		UNITE 15 AMP DUPLX RECEPTACLE W/BEZEL,RACEWY,6 CIRCUIT,CIR 3
19	5	UET6RRC.4I		UNITE 15 AMP DUPLX RECEPTACLE W/BEZEL,RACEWY,6 CIRCUIT,CIR 4
20	5	UET6RRC.5I		UNITE 15 AMP DUPLX RECEPTACLE W/BEZEL,RACEWY,6 CIRCUIT,CIR 5
21	2	UET6RRC.6I		UNITE 15 AMP DUPLX RECEPTACLE W/BEZEL,RACEWY,6 CIRCUIT,CIR 6
22	8	UET6WW.30		UNITE RIGID WIREWAY,10–WIRE SYSTEM,6 CIRCUIT,30"W PANEL
23	16	UET6WW.42		UNITE RIGID WIREWAY,10–WIRE SYSTEM,6 CIRCUIT,42"W PANEL
24	12	ULP24FBBF	ULFBBF	U–SERIES FREESTANDING PEDESTAL,BOX/BOX/FILE,24" NOMINAL DEPTH
25	12	ULP24FFF	ULFFF	U–SERIES FREESTANDING PEDESTAL,FILE/FILE,24" NOMINAL DEPTH
26	[illegible]	UMFR3032:F:DP	M0 3032	UNITE MONO FABRIC PANEL,STANDARD BASE RACEWAY,30WX32"H
27	4	UMFR3040:N:DP	M0n 3040	UNITE MONO FABRIC PANEL,STANDARD BASE RACEWAY,30WX40"H
28	8	UMFR4232:F:DP	M0 4232	UNITE MONO FABRIC PANEL,STANDARD BASE RACEWAY,42WX32"H
29	8	UMFR4240:N:DP	M0n 4240	UNITE MONO FABRIC PANEL,STANDARD BASE RACEWAY,42WX40"H
30	[illegible]	UMFR4840:N:DP	M0n 4840	UNITE MONO FABRIC PANEL,STANDARD BASE RACEWAY,48WX40"H
31	2	UMFR6040:F:DP	M0 6040	UNITE MONO FABRIC PANEL,STANDARD BASE RACEWAY,60WX40"H
32	6	UMFR6040:N:DP	M0n 6040	UNITE MONO FABRIC PANEL,STANDARD BASE RACEWAY,60WX40"H
33	8	UMST4840:N:DP	S2n 4840	UNITE MONO STEEL PANEL,TILE–TO–FLOOR,48WX40"H
34	12	UMST6040:N:DP	S2n 6040	UNITE MONO STEEL PANEL,TILE–TO–FLOOR,60WX40"H
35	4	UNGDS30	UNGDS30	UNITE GLASS DIVIDER SCREEN,30WX12"H
36	8	UNGDS42	UNGDS42	UNITE GLASS DIVIDER SCREEN,42WX12"H
37	20	UNGDS48	UNGDS48	UNITE GLASS DIVIDER SCREEN,48WX12"H
38	18	UNGDS60	UNGDS60	UNITE GLASS DIVIDER SCREEN,60WX12"H
39	1	UNWM32	UWM32	UNITE ADJUST WALL MOUNT,32"
40	16	USPLPL		UNITE SPLICE PLATE,FOR 24 & 30" DEEP WORKSURFACES
41	12	UWR2484–74P:C	UWR2484C	UNITE RECTANGULAR WORKSURFACE,74P EDGE,24X84"W
42	8	UWR3060–74P:C	UWR3060C	UNITE RECTANGULAR WORKSURFACE,74P EDGE,30X60"W
43	8	UWR3096–74P:C	UWR3096C	UNITE RECTANGULAR WORKSURFACE,74P EDGE,30X96"W

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WORKGROUP–STUDENT SERVICES

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	2	578W	578W	KURV BENCH W/WOOD BACK,29"D X 78"W,NON–CONTRAST
2	12	AC8IF.108	AC8IF	ACTIV8 INFEED
3	28	AC8JP.53	A53	ACTIV8 JUMPER 53" LONG
4	40	AC8VMC	AVMC	ACTIV8 VILLA PWR MODULE W/CVER
5	1	BBNSTR97–74P:EX8	BBNSTR97 P	BACKBONE,STATIONARY,72" BASE LENGTH,74P EDGE,68"WX97"L RADIUS
6	4	CZBCSA245472/F	*S192522[illegible]	*CUST CZ 24" SG–SD ADDER TLSCPC BM FRAME 54–72" 36" HEIGHT
7	2	CZBCSA247896/F	*S192522[illegible]	*CUST CZ 24" TEAMING ADDER BEAM FRAME 78–96",36" HIGH
8	4	CZBCSS245472/F	*S1925223[illegible]	*CUST CZ 24" SNGL–SD START BEAM FRM 54–72",FXD,CAFE HHT 36"
9	2	CZBCSS247896/F	*S19252232	*CUST CZ 24" TMING STARTER BEAM FRAME 78–96", 36" HIGH
10	4	CZBCWR24961MP–74P:LCR	BCWR24961MLCR	CZ 24" DEEP RECTILINEAR WORKSURFACE,SINGLE–SIDED,CAFE HEIGHT, NO–POWER/W MODESTY PANEL,24X96,74P EDGE
11	2	CZBDA487296/S	BDA487296S	CZ 48" DUAL–SIDED ADDER TELESCOPIC BEAM FRAME 72–96",SLIDER
12	1	CZBDS487296/S	BDS487296S	CZ 48" DUAL–SIDED STANDALONE/STARTER TELESCOPIC BEAM FRAME 72–96",SLIDER
13	2	CZBDSA2419/1:SLE:74P	DA2419SL	CZ WORKSURFACE DIVIDER SCREEN,19"HX24"W,ACRYLIC,NO INTERSECTION
14	10	CZBDSA2419/1:SMI:74P	DA2419SM	CZ WORKSURFACE DIVIDER SCREEN,19"HX24"W,ACRYLIC,NO INTERSECTION
15	2	CZBDSA2419/1:SRE:74P	DA2419SR	CZ WORKSURFACE DIVIDER SCREEN,19"HX24"W,ACRYLIC,NO INTERSECTION
16	2	CZBPSA8419/2:DAD	SA84192DA	CZ WORKSURFACE PRIVACY SCREEN,19"HX84"W,ACRYLIC,CENTER INTERSECTION
17	1	CZBPSA8419/2:DST	SA84192DS	CZ WORKSURFACE PRIVACY SCREEN,19"HX84"W,ACRYLIC,CENTER INTERSECTION
18	8	CZBWR24721NM–74P:LR	*S19252241	*CUSTOM CZ 24" DP RECT WKSRFC,SNGL–SD,STND HGT,NO–POWER,NO–
19	3	CZBWR24842–74P:LR	BWR24842LR	CZ 24" DEEP RECTILINEAR WORKSURFACE,DUAL–SIDED,STANDARD HEIGHT, NO–POWER,24X84,74P EDGE
20	19	DN1B00	DN1B00	DONI FOUR–LEG ARMLESS CHAIR,UPH SEAT,TWO–TONE
21	12	DN4200H30:30	DN4200H30	DONI FOUR–LEG ARMLESS 30" STOOL,UPH SEAT,SOLID COLOR
22	32	DN4B00H30:30	DN4B00H30	DONI FOUR–LEG ARMLESS 30" STOOL,UPH SEAT,TWO–TONE
23	12	H33/FC:NPSA	H33/FC	HUB ARMLESS LOUNGE,CONTRAST,26X39
24	2	KCSS7224.H	KCSS7224	ARISTOTLE DOUBLE STORAGE DOOR CREDENZA,72X24"

"*" INDICATES CUSTOM PRODUCT

10–24–2019 05:04 PM

Drawn using Encompass®

FIELD VERIFICATION
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APPROVED AS NOTED: ☐
REVISE AND RESUBMIT: ☐
SIGNATURE: ____
PRINT: ____
COMPANY: ____
DATE: ____

KI WALL DEPT USE ONLY
☐ FINISH APPROVAL
☐ DRAWING APPROVAL
☐ VFD'S/HOLD DIMS
☐ AUDIT COMPLETE

PROJECT TITLE:
BERGEN COMM. COLLEGE
400 PARAMUS ROAD
PARAMUS, NEW JERSEY

FLOOR/AREA:
ONE STOP EXPANSION

PRODUCT LINE:
Unite
Aristotle
Loose Tables
Loose Seating

REPRESENTATIVE:
CASALE

DEALER:

ORDER NUMBER:

SFDC:
448914

DATE:
08/28/2019

REVISIONS:

NO.	DATE	BY	DESCRIPTION
2	09/11/2019	CJ	NEW BUILDING SHELL
3	10/03/2019	TLC	UPDATED CZ BENCHING
4	10/07/2019	CJ	UPDATE FLOOR PLAN
5	10/10/2019	CJ	REVISED WELCOME CENTER
6	10/18/2019	CJ	REVISED PER 10/17/19 E–MAIL

CSR AUDIT

DRAWN BY: TLC
SCALE: 1/4" = 1'–0"

DRAWING No.:
D448914_00_00_L0_S
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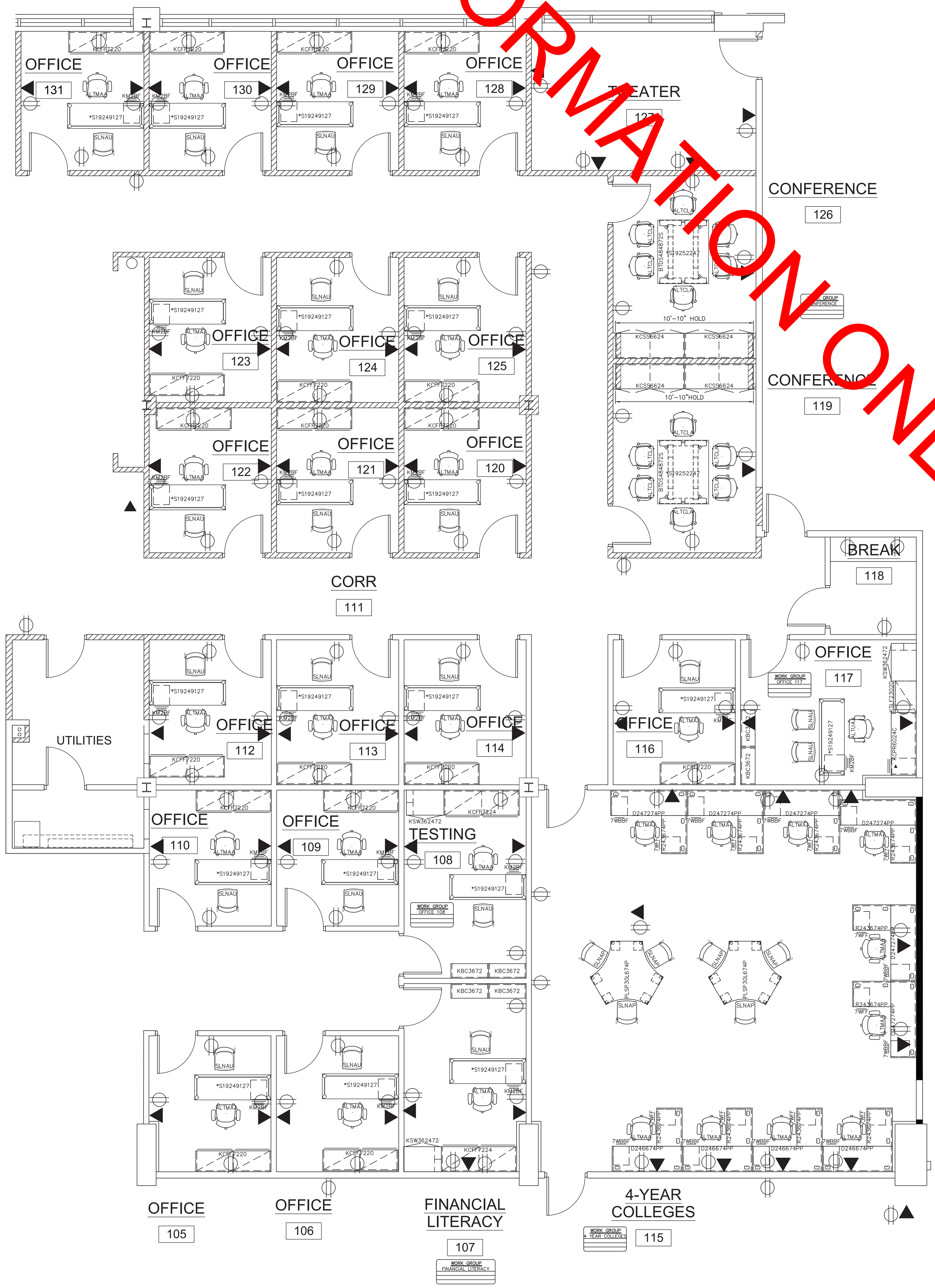

WORKGROUP–TYPICAL OFFICE

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	17	ALTMAA	ALTMAA	ALTUS MESH CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
2	19	KCFF7220.H	KCFF7220	ARISTOTLE DOUBLE LATERAL FILE CREDENZA,72X20"
3	19	KM2BF.H	KM2BF	ARISTOTLE MOBILE PEDESTAL,BOX/BOX/FILE,15.5X19X27.75"
4	19	KRAL6024EM.H	*S19249127	*CUSTOM ARISTOTLE RETURN,ALUM WAVE PROFILE,W/ACRYLIC 72"X24"
5	19	SLNAU	SLNAU	STRIVE FOUR-LEG ARMLESS CHAIR,UPH SEAT

"*" INDICATES CUSTOM PRODUCT 10-24-2019 05:05 PM

WORKGROUP–CONFERENCE

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	12	ALTCLA	ALTCLA	ALTUS CONFERENCE CHAIR,LOOP ARMS,UPHOLSTERED
2	2	CZBTDS484872/S	BTDS484872S	CZ 48" DUAL-SIDED WOOD LEG STANDALONE/STARTER TELESCOPIC STEEL BEAM FRAME 48-72", SLIDER
3	2	CZBTWR24602-74P:N	*S19252247	*CUST CZ WRKSRFC WOOD LEG; UP TO TWO CUTOUTS,NO POWER,24"D
4	4	KCSS6624.H	KCSS6624	ARISTOTLE DOUBLE STORAGE DOOR CREDENZA,66X24"

"*" INDICATES CUSTOM PRODUCT 10-24-2019 05:06 PM

WORKGROUP–FINANCIAL LITERACY

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	1	ALTMAA	ALTMAA	ALTUS MESH CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
2	2	KBC3672.H	KBC3672	ARISTOTLE BOOKCASE,4 ADJ SHELVES 1 FIXED,36X14X72"H
3	1	KCFF7224.H	KCFF7224	ARISTOTLE DOUBLE LATERAL FILE CREDENZA,72X24"
4	1	KM2BF.H	KM2BF	ARISTOTLE MOBILE PEDESTAL,BOX/BOX/FILE,15.5X19X27.75"
5	1	KRAL6024EM.H	*S19249127	*CUSTOM ARISTOTLE RETURN,ALUM WAVE PROFILE,W/ACRYLIC 72"X24"
6	1	KSW362472.H	KSW362472	ARISTOTLE STORAGE & WARDROBE TOWER,36X24X72"H
7	1	SLNAU	SLNAU	STRIVE FOUR-LEG ARMLESS CHAIR,UPH SEAT

"*" INDICATES CUSTOM PRODUCT 10-24-2019 05:07 PM

WORKGROUP–4 YEAR COLLEGES

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	4	7D/D2466-74P-P:G	D246674PP	700 SERIES DESK,PARTIAL MODESTY PANEL,74P EDGE,24X66"W
2	6	7D/D2472-74P-P:G	D247274PP	700 SERIES DESK,PARTIAL MODESTY PANEL,74P EDGE,24X72"W
3	10	7D/R2436-74P-P:G	R243674PP	700 SERIES DESK,RETURN,PARTIAL MODESTY PANEL,74P EDGE,24X36"W
[illegible]	10	ALTMAA	ALTMAA	ALTUS MESH CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
5	2	PLSP30L6-74P:NNN	PLSP30L674P	PILLAR TABLE,POST LEG,SPROCKET,30",29"H,74P EDGE
[illegible]	10	S7P/1520WBBF	7WBBF	700 SERIES FILES SUPPORTING PED-BOX/BOX/FILE-20" NOMINAL DEPTH
7	1	S7P/1520WFF	7WFF	700 SERIES FILES SUPPORTING PED-FILE/FILE-20" NOMINAL DEPTH
8	[illegible]	SLNAP	SLNAP	STRIVE FOUR-LEG ARMLESS CHAIR,POLY

10-24-2019 05:07 PM

WORKGROUP–OFFICE 108

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	1	ALTMAA	ALTMAA	ALTUS MESH CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
2	2	KBC3672.H	KBC3672	ARISTOTLE BOOKCASE,4 ADJ SHELVES 1 FIXED,36X14X72"H
3	1	KCFF7224.H	KCFF7224	ARISTOTLE DOUBLE LATERAL FILE CREDENZA,72X24"
4	1	KM2BF.H	KM2BF	ARISTOTLE MOBILE PEDESTAL,BOX/BOX/FILE,15.5X19X27.75"
5	1	KRAL6024EM.H	*S19249127	*CUSTOM ARISTOTLE RETURN,ALUM WAVE PROFILE,W/ACRYLIC 72"X24"
6	1	KSW362472.H	KSW362472	ARISTOTLE STORAGE & WARDROBE TOWER,36X24X72"H
7	1	SLNAU	SLNAU	STRIVE FOUR-LEG ARMLESS CHAIR,UPH SEAT

"*" INDICATES CUSTOM PRODUCT 10-24-2019 05:07 PM

WORKGROUP–OFFICE 117

ITEM	QTY	PART NUMBER	TAG	DESCRIPTION
1	1	ALTUAA	ALTUAA	ALTUS FABRIC CHAIR,ADJUSTABLE ARMS,UPHOLSTERED
2	2	KBC3672.H	KBC3672	ARISTOTLE BOOKCASE,4 ADJ SHELVES 1 FIXED,36X14X72"H
3	1	KCPR6024C.H:FULL	KCPR6024C	ARISTOTLE SINGLE PED CREDENZA,RIGHT,FF PED,60X24"
4	1	KM2BF.H	KM2BF	ARISTOTLE MOBILE PEDESTAL,BOX/BOX/FILE,15.5X19X27.75"
5	1	KRAL6024EM.H	*S19249127	*CUSTOM ARISTOTLE RETURN,ALUM WAVE PROFILE,W/ACRYLIC 72"X24"
6	1	KSLF23020.H	KSLF23020	ARISTOTLE LATERAL FILE,2 DRAWER,FREESTANDING,30X20X30"
7	1	KSW362472.H	KSW362472	ARISTOTLE STORAGE & WARDROBE TOWER,36X24X72"H
8	2	SLNAU	SLNAU	STRIVE FOUR-LEG ARMLESS CHAIR,UPH SEAT

"*" INDICATES CUSTOM PRODUCT 10-24-2019 05:06 PM

KI
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PROJECT TITLE:
BERGEN COMM. COLLEGE
400 PARAMUS ROAD
PARAMUS, NEW JERSEY

FLOOR/AREA:
ONE STOP EXPANSION

PRODUCT LINE:
Unite
Aristotle
Loose Tables
Loose Seating

REPRESENTATIVE:
CASALE

DEALER:

ORDER NUMBER:

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DRAWN BY: TLC

SCALE: 1/4" = 1'-0"

DRAWING No.:
D448914_00_00_L0_S
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HVAC ABBREVIATIONS

IDENTIFIER	DESCRIPTION	IDENTIFIER	DESCRIPTION
A.P.D.	AIR PRESSURE DROP	FD	FIRE DAMPER
BTU	BRITISH THERMAL UNITS	FPM	FEET PER MINUTE
CD	CEILING DIFFUSER	LAT	LEAVING AIR TEMPERATURE
CFM	CUBIC FEET PER MINUTE	MBH	THOUSAND BTU PER HOUR
CH	CABINET HEATER	OA	OUTSIDE AIR
COND	CONDENSATE	OAI	OUTSIDE AIR INTAKE
CU	CONDENSATE UNIT	OPNG	OPENING
DB	DRY BULB	RR	RETURN REGISTER
EAT	ENTERING AIR TEMPERATURE	SR	SUPPLY REGISTER
EDB	ENTERING DRY BULB	T	THERMOSTAT
EER	ENERGY EFFICIENCY RATIO	TG	TRANSFER GRILLE
ESP	EXTERNAL STATIC PRESSURE	WG	WATER GAUGE
EWB	ENTERING WET BULB	VIC	VIBRATION ISOLATION CONNECTION
EF	EXHAUST FAN	WB	WET BULB
FAI	FRESH AIR INTAKE	W.C.	WATER COLUMN

GENERAL ABBREVIATIONS

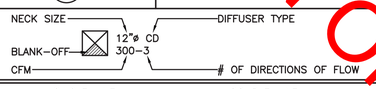
IDENTIFIER	DESCRIPTION	IDENTIFIER	DESCRIPTION
AFF	ABOVE FINISHED FLOOR	MH	MOUNTING HEIGHT
AFG	ABOVE FINISHED GRADE	MIN	MINIMUM
BFG	BELOW FINISHED GRADE	MOD	MOTOR OPERATED DAMPER
BLDG	BUILDING	MTD	MOUNTED
CLG	CEILING	NIC	NOT IN CONTRACT
CO	COMPANY	NTS	NOT TO SCALE
DN	DOWN	OC	ON CENTER
DSD	DUCT SMOKE DETECTOR	PC	PLUMBING CONTRACTOR
DWG(S)	DRAWING(S)	PSI	POUNDS PER SQUARE INCH
EC	ELECTRICAL CONTRACTOR	R	EXISTING EQUIPMENT TO BE REMOVED
EM	EMERGENCY	RC	REFRIGERATION CONTRACTOR
EQUIP	EQUIPMENT	RE	EXISTING EQUIPMENT TO BE RELOCATED
ETR	EXISTING TO REMAIN	RLA	RUNNING LOAD AMPS
EX	EXISTING	RPM	REVOLUTIONS PER MINUTE
FLA	FULL LOAD AMPS	S/C	SELF CONTAINED
FS	FLOW SWITCH	SQ. FT.	SQUARE FEET
GC	GENERAL CONTRACTOR	TYP	TYPICAL
HP	HORSEPOWER	UC	UNDERCUT DOOR
MAX	MAXIMUM	UON	UNLESS OTHERWISE NOTED
MC	MECHANICAL CONTRACTOR	V.I.F.	VERIFY IN FIELD
MCA	MINIMUM CIRCUIT AMPS	VSD	VARIABLE SPEED DRIVE
MFR	MANUFACTURER	WP	WEATHERPROOF

DIFFUSER/REGISTER SCHEDULE

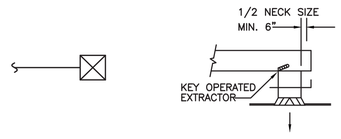
MANUFACTURER	UNIT ID	MODEL NUMBER	DESCRIPTION
NAILOR	CD	UNI	CEILING DIFFUSER, ROUND NECK, SQUARE PLAQUE, FULL FLOW DIFFUSER MOUNTED DAMPER WITH EQUALIZING GRID, STEEL CONST
NAILOR	RR	6145H–O	SINGLE DEFLECTION RETURN REGISTER WITH STEEL OPPOSED BLADE DAMPER, STEEL CONST. PROVIDED WITH LIGHT SHIELD PAINTED BLACK

HVAC SYMBOL LIST

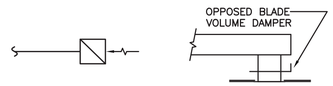
IDENTIFIER	DESCRIPTION
	HOT WATER SUPPLY
	HOT WATER RETURN
	DIRECTION OF FLOW
	AIR VENT
	GATE VALVE
	GLOBE VALVE
	BALANCING VALVE
	CHECK VALVE
	UNION
	CAPPED PIPE
	NEW DUCT WORK WITH 1" ACOUSTICAL LINING
	EXISTING DUCT WORK OR PIPING TO REMAIN
	VOLUME DAMPER
FD	FIRE DAMPER AND ACCESS DOOR
SD	SMOKE DAMPER AND ACCESS DOOR
M	MOTOR OPERATED DAMPER
T	THERMOSTAT
	CONNECT NEW TO EXISTING
	SUPPLY AIR FLOW
	EXHAUST AIR
U	UNDERCUT DOOR
DSD	DUCT SMOKE DETECTOR
	EXHAUST FAN



SINGLE LINE / DOUBLE LINE



SUPPLY DIFFUSER AT END OF DUCT RUN

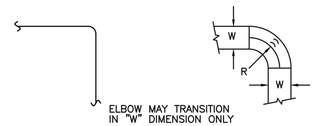


RETURN REGISTER AT END OF DUCT RUN

NOTES:

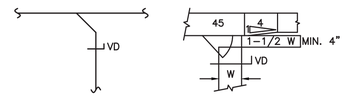
1. DIFFUSERS, REGISTERS, GRILLES AND DUCT SIZES ARE SHOWN ON FLOOR PLANS OR IN SCHEDULES.
2. DUCT SIZES ARE GIVEN AS INTERNAL DIMENSIONS. INTERNALLY LINED DUCTS SHALL BE INCREASED IN SIZE TO MAINTAIN THE SAME INTERNAL SIZE.

SINGLE LINE / DOUBLE LINE

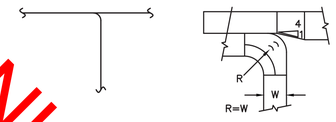


SUPPLY, RETURN OR EXHAUST ROUND ELBOW

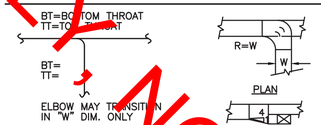
SUPPLY, RETURN OR EXHAUST SQUARE ELBOW



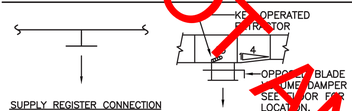
SUPPLY, RETURN OR EXHAUST DUCT BRANCH



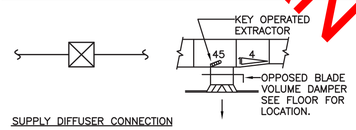
SUPPLY DUCT SPLIT



SUPPLY DUCT SPLIT



SUPPLY REGISTER CONNECTION



SUPPLY DIFFUSER CONNECTION

SYMBOL LIST NOTES:

1. SYMBOL LIST SHOWN IS FOR GENERAL REFERENCE ONLY. THE PRESENCE OF A SYMBOL DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR SPECIFIC SYMBOLS USED.

MECHANICAL NOTES

1. ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH ALL NATIONAL, NEW JERSEY STATE CODES AND REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL HVAC WORK IS PROVIDED AND INSTALLED IN STRICT ACCORDANCE WITH SEISMIC REQUIREMENTS.
2. DO NOT SCALE FROM THESE DRAWINGS.
3. THE CONTRACTOR SHALL PREPARE AND FILE ALL REQUIRED PLANS AND PERMITS WITH THE LOCAL BUILDING DEPARTMENT AND SHALL PAY ALL FILING FEES AS REQUIRED. HE SHALL OBTAIN ALL AUTHORITIES AND SHALL PAY ALL WORK PERMITS, INSPECTIONS AND WRITE–OFFS AS REQUIRED TO EXECUTE THIS WORK IN A MANNER IN CONFORMANCE WITH THE CODES AND AUTHORITIES HAVING JURISDICTION.
4. ALL REMOVALS PERFORMED UNDER THIS CONTRACT SHALL INCLUDE REMOVAL OF ALL DEBRIS AND DISPOSAL AT AN APPROPRIATE SITE.
5. THE EXACT MOUNTING HEIGHTS AND LOCATIONS OF ALL HVAC EQUIPMENT SHALL BE FIELD VERIFIED AND COORDINATED WITH ALL OTHER MECHANICAL, ELECTRICAL, ARCHITECTURAL, PLUMBING, SPRINKLER, AND STRUCTURAL SYSTEMS.
6. THE FINISH AND COLOR OF THE AIR DEVICES, AND ALL OTHER EXPOSED HVAC EQUIPMENT SHALL BE COORDINATED WITH THE ARCHITECT.
7. VERIFY ALL EQUIPMENT VOLTAGES WITH THE ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.
8. PROVIDE DISCONNECT SWITCHES FOR ALL HVAC EQUIPMENT.
9. THE FINAL LOCATION OF AIR DEVICES MUST BE COORDINATED WITH THE REFLECTED CEILING PLAN AND ALL OTHER MECHANICAL, ELECTRICAL, SPRINKLER, AND ARCHITECTURAL.
10. FINAL LOCATION OF THERMOSTATS MUST BE REVIEWED WITH ARCHITECT AND TENANT PRIOR TO ROUGH–IN.
11. DUCT WORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET STEEL IN STRICT COMPLIANCE WITH THE LATEST EDITION OF THE ASHRAE, NFPA, AND SMACNA GUIDE RECOMMENDATIONS. ALL DUCTS TO HAVE PITTSBURGH TYPE LOCK FOR LONGITUDINAL SEAMS AND DRIVE SLIP / "S" SLIP FOR TRANSVERSE JOINTS. "DUCT–MATE" JOINT SYSTEM IS ACCEPTABLE IN LIEU OF PRIOR SEAM SYSTEMS. SIZES AS SHOWN INDICATE INSIDE CLEAR DIMENSIONS OF THE AIR PASSAGE. DUCT WORK SHALL BE FULLY INSULATED AS PER APPLICABLE CODES AND WRITTEN SPECIFICATIONS.
12. DUCT SIZES MUST BE VERIFIED FOR CLEARANCES AT THE JOB SITE PRIOR TO FABRICATION. DIMENSIONS MAY BE CHANGED TO ACCOMMODATE CONSTRUCTION AS LONG AS EFFECTIVE CROSS–SECTIONAL AREA IS MAINTAINED. DUCT TRANSITIONS SHALL BE CONSTRUCTED WITH A SLOPE OF 1" TO 4". ALL DEVIATIONS FROM ORIGINAL CONTRACT DRAWINGS SHALL BE REVIEWED BY ENGINEER DURING THE SHOP DRAWING PROCESS.
13. PROVIDE ELBOWS OR TEES WITH TURNING VANES FOR ALL CHANGES OF DUCT DIRECTION. PROVIDE SPLITTER DAMPERS WITH LOCKING QUADRANTS IN ALL TEES.
14. PROVIDE MANUAL BALANCING DAMPERS AS REQUIRED TO PROPERLY BALANCE EACH INDIVIDUAL AIR DISTRIBUTION SYSTEM. IF THE LOCATION OF THE BALANCING DAMPER IS NOT DEFINED ON THE DRAWINGS, THE FOLLOWING MINIMUMS STANDARDS SHALL GOVERN. ALL SUPPLY, RETURN, AND EXHAUST MAIN BRANCHES FROM TRUNKS, EACH SPLIT AND ALL SUB–BRANCHES FROM MAINS SHALL INCORPORATE BALANCING DAMPERS.
15. PROVIDE FLEXIBLE CONNECTORS AT ALL DUCT CONNECTIONS TO VIBRATING EQUIPMENT. THESE CONNECTORS SHALL BE INSTALLED IN CLOSE PROXIMITY TO SUCH EQUIPMENT.
16. ALL ACCESS DOORS REQUIRED IN GENERAL CONSTRUCTION ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE HVAC CONTRACTOR TO IDENTIFY SIZE, TYPE AND LOCATION OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED HVAC EQUIPMENT, VALVES AND OTHER RELATED EQUIPMENT. THE HVAC CONTRACTOR SHALL IDENTIFY THESE REQUIREMENTS ON A COORDINATED SHOP DRAWING PRIOR TO SYSTEM FABRICATION AND INSTALLATION.
17. ALL CEILING MOUNTED EQUIPMENT MUST BE SUPPORTED DIRECTLY FROM BUILDING STRUCTURE WITH COMBINATION SPRING AND NEOPRENE–IN–SHEAR HANGERS AND ROD. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED TO ADEQUATELY SUPPORT THE LOAD.
18. SYSTEM BALANCING SHALL BE PERFORMED IN STRICT COMPLIANCE WITH ALL APPLICABLE CODES, REGULATIONS, PLANS AND WRITTEN SPECIFICATIONS BY A CERTIFIED BALANCING COMPANY.
19. ALL FLEXIBLE DUCTWORK SHALL BE THERMAFLEX M–KE INSULATED DOUBLE AIR SEAL FLEXIBLE AIR DUCT FOR LOW AND MEDIUM PRESSURE AIR SYSTEMS. 1" THICK INSULATION, COMPLYING WITH UL–181 FOR CLASS 0 OR CLASS 1 FLEXIBLE CONNECTORS AND SHALL BE SO IDENTIFIED, AND THE INTERNATIONAL MECHANICAL CODE. FLEXIBLE DUCTWORK FROM HARD DUCT TO CEILING DIFFUSERS SHALL BE LIMITED IN LENGTH TO 5 FEET.
20. ALL SUPPLY AND RETURN DUCTWORK 15 FEET DOWNSTREAM OF THE HVAC UNIT SHALL BE INTERNALLY LINED WITH 1" SCHULLER ACOUSTICAL DUCT LINING.
21. ALL SUPPLY, OUTSIDE AIR AND RETURN DUCTWORK SHALL BE INSULATED WITH 1–1/2" (MIN. R–6) JOHNS MANVILLE FIBERGLASS INSULATION BLANKET WITH ALUMINUM FOIL FACING. ALL EXPOSED DUCTWORK SHALL BE INTERNALLY LINED WITH 1" SCHULLER ACOUSTICAL DUCT LINING.
22. ALL REFRIGERANT PIPING/TUBING IS TO BE INSULATED WITH INSULATION. 1/2" THICK INSULATION FOR ALL PIPING/TUBING UP TO 1", 1" THICK INSULATION FOR ALL LARGER PIPES.
23. CONDENSATE PIPING TO BE SCHEDULE 40 CPVC AND INSULATED WITH 1/2" INSULATION.
24. NEW FILTERS SHALL BE PROVIDED AFTER COMPLETION OF PROJECT. HVAC EQUIPMENT SHALL NOT RUN DURING CONSTRUCTION UNLESS FILTERS ARE INSTALLED.
25. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND LABOR FOR ONE YEAR FROM THE FINAL ACCEPTANCE DATE OF THE OWNER. THE CONTRACTOR SHALL INCLUDE ALL MAINTENANCE AND ADJUSTMENTS FOR THE FIRST YEAR.
26. CONTRACTOR TO PROVIDE COORDINATION DRAWINGS FOR ALL TRADES.

EXISTING SERVICE CONTRACTOR

1. FOR TIE BACK TO BUILDING BMS SYSTEM UTILIZE BUILDING CONTROL CONTRACTOR – MARK SNIDER @ TRANE (973–244–7570).

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

SHINE ENGINEERING, P.A.
16 RENSHAW DRIVE, MONTVILLE, NJ 07045
Tel: (973) 402-2125 Fax: (973) 402-2126
Email: john@shineengineering.com

JOHN M. SHINE, P.E. GE 42867

BERGEN COMMUNITY COLLEGE
ONE STOP CENTER RENOVATION

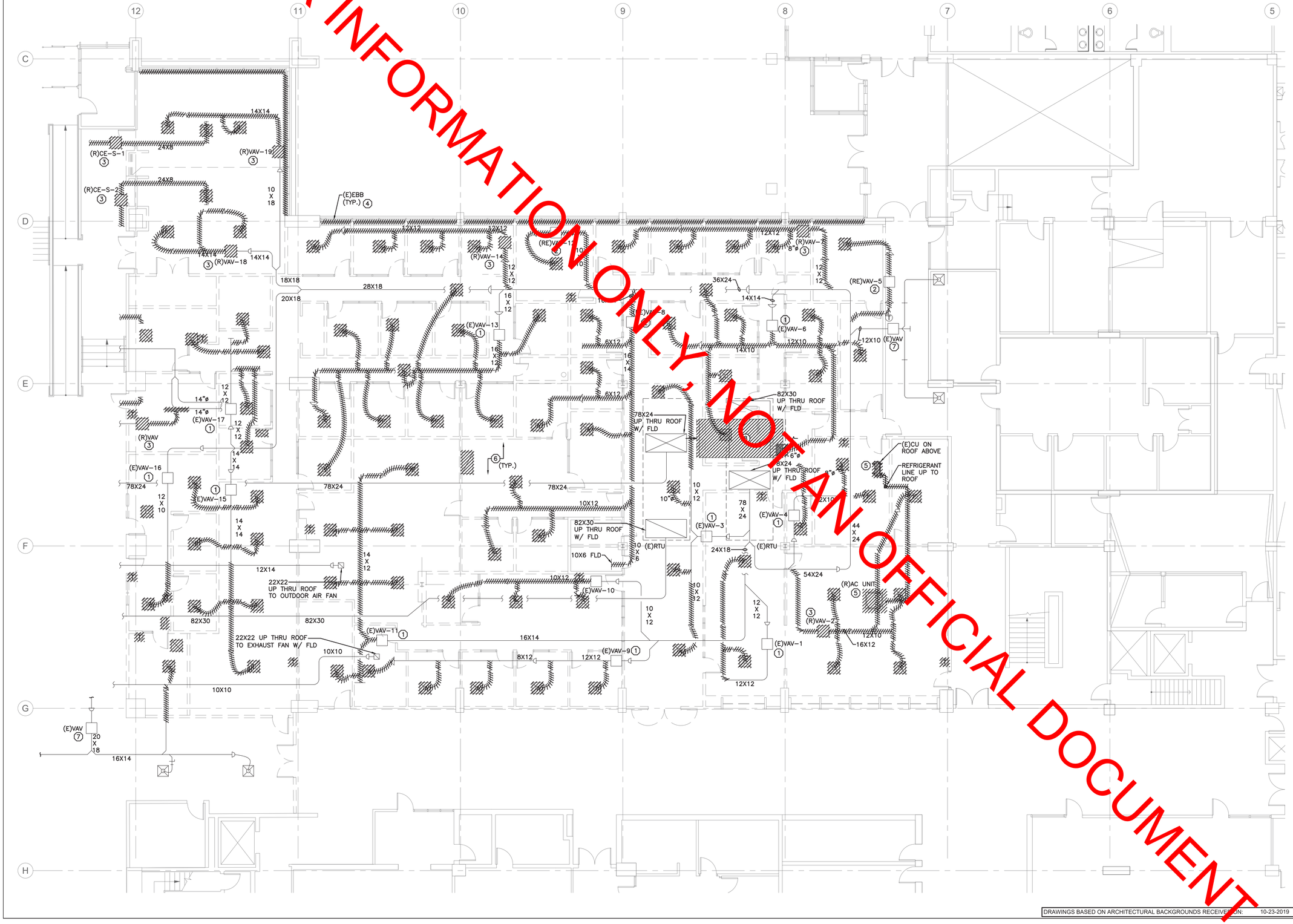
400 PARAMUS ROAD PARAMUS, NJ

arcari + iovino ARCHITECTS PC
ONE KATHERINE STREET
LITTLE FERRY, NJ 07643
201 641 0600, FAX 201 641 0626
WWW.AIARCHS.COM

EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

NOTES, SYMBOLS & ABBREVIATIONS MECHANICAL

SCALE: AS NOTED	M-101
DATE: 08.22.2019	
FILE: 19003 MECHANICAL.DWG	



DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

DEMOLITION KEYNOTES:

1. EXISTING VAV BOX TO REMAIN. CONTRACTOR TO MODIFY ASSOCIATED DUCTWORK. REFER TO NEW WORK PLAN FOR ADDITIONAL INFORMATION.
2. EXISTING VAV BOX TO BE RELOCATED. REFER TO NEW WORK PLAN FOR ADDITIONAL INFORMATION.
3. EXISTING VAV BOX TO BE REMOVED. RETURN TO OWNER.
4. EXISTING ELECTRIC BASEBOARD PERIMETER HEAT TO BE REMOVED.
5. EXISTING AC/CONDENSER UNIT AND ASSOCIATED PIPING TO BE REMOVED. CONTRACTOR TO CAP EXISTING PIPE PORTAL ON ROOF ABOVE AS REQUIRED.
6. CONTRACTOR TO REMOVE ALL EXISTING DIFFUSERS & T-STATS AS SHOWN. PROVIDE ALL NEW AS SHOWN ON NEW WORK PLAN.
7. EXISTING VAV SERVING ADJACENT SPACES TO REMAIN. CONTRACTOR TO MODIFY AS SHOWN. MAINTAIN ALL REQUIRED FIRE RATINGS.
8. EXISTING RETURN DUCTWORK TO BE REMOVED. EXISTING RETURN DROP TO REMAIN. REFER TO NEW WORK PLAN FOR NEW RETURN DUCTWORK.

11.21.19 FOR BIDDING

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16 RENSHAW DRIVE, MONTVILLE, NJ 07045
Tel: (973) 402-2125 Fax: (973) 402-2126
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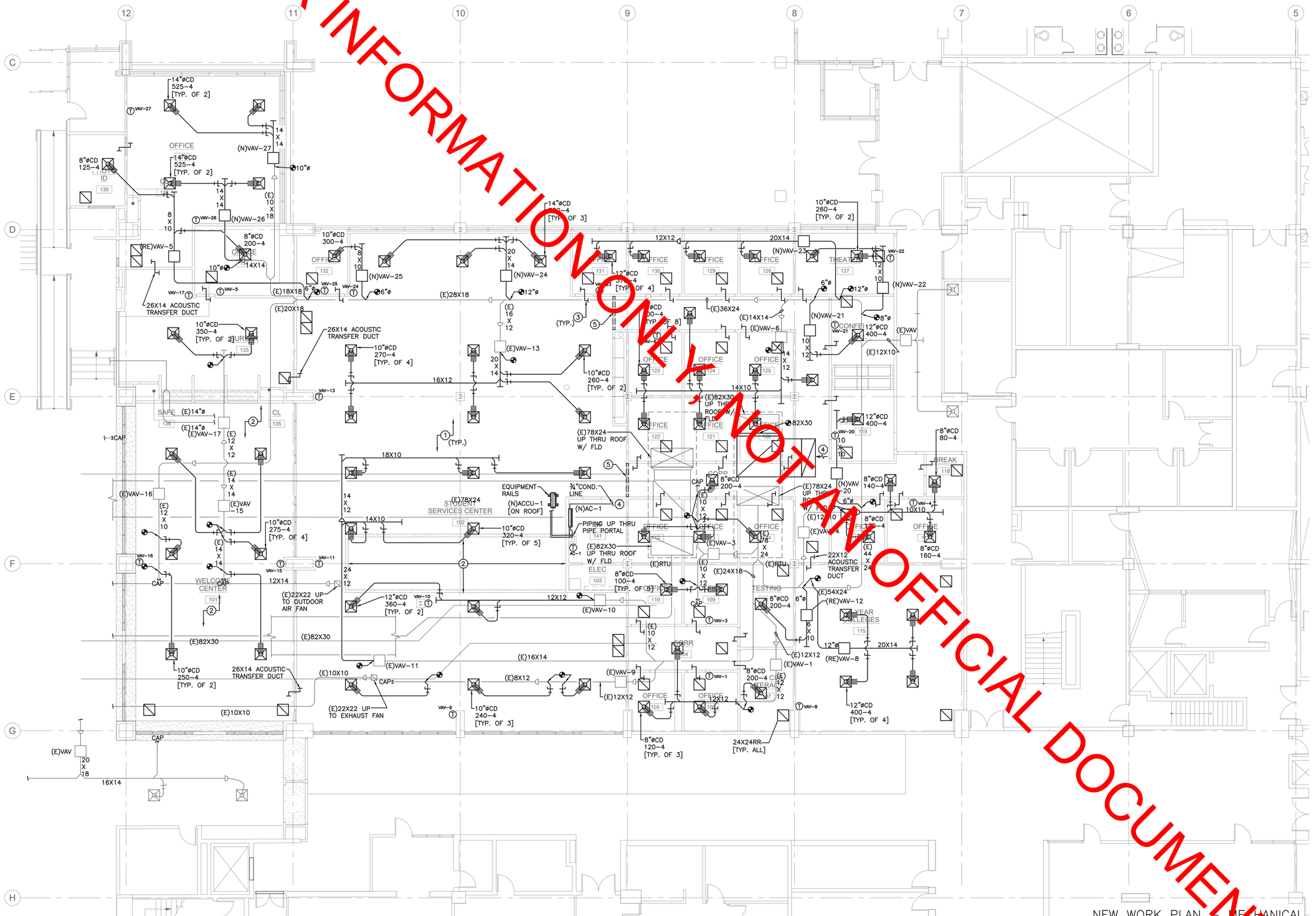
DEMOLITION PLAN
MECHANICAL

SCALE: AS NOTED	MD-101
DATE: 08.22.2019	
FILE: 19003 MECHANICAL.DWG	



NEW WORK PLAN - MECHANICAL
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

NEW WORK KEYNOTES:

1. CONTRACTOR TO PROVIDE INSULATION WRAP ON ALL EXISTING & NEW SUPPLY DUCTWORK.
2. CONTRACTOR TO VERIFY EXISTING CONDITIONS AND COORDINATE NEW DUCTWORK RUNS WITH NEW HIGH CEILING AREAS. NOTIFY ARCHITECT OF ANY EXISTING CONDITIONS WHICH MAY CAUSE A CONFLICT WITH THE PROPOSED NEW CEILING HEIGHTS.
3. CONTRACTOR TO PROVIDE ACOUSTICAL TRANSFER DUCTS AT ALL FULL HEIGHT PARTITIONS. REFER TO TRANSFER DUCT SIZING CHART BELOW FOR ADDITIONAL SIZING INFORMATION.
4. CONTRACTOR TO ROUTE NEW CONDENSATE LINE TO DISCHARGE LOCATION OF PREVIOUSLY DEMO'D SPLIT SYSTEM CONDENSATE. VERIFY IN FIELD.
5. CONTRACTOR TO PROVIDE 82"X30" ELBOW UP WITH 1"X1" WIRE MESH SCREEN.
6. CONTRACTOR TO VERIFY NEW SOFFIT IS OPEN IN PLENUM AREA ABOVE TO ENSURE RETURN AIR FLOW BACK TO ROOFTOP UNIT. CONTRACTOR TO REMOVE EXISTING GYP. BD. IF EXISTING. V.I.F.

NOTES:

1. 'E' DENOTES EXISTING TO REMAIN
2. 'RE' DENOTES EXISTING TO BE RELOCATED
3. 'N' DENOTES NEW

TRANSFER DUCT (TRD) SIZING CHART

ALL SIZES ARE CLEAR INSIDE DIMENSIONS OF LINED DUCTS

CFM	SIZE (IN)
UP TO 100	8 X 6
101 – 200	14X6, 12X8, 10X10
201 – 300	18X8, 14X10, 12X12
301 – 400	20X10, 16X12, 14X14
401 – 500	24X10, 20X12, 18X14, 16X16
501 – 600	28X10, 24X12, 20X14, 18X16
GREATER THAN 600	SEE FLOOR PLAN
	(SEE TYPICAL DETAIL)

NOTES:
1. PROVIDE FOR ALL WALLS THAT GO UP TO SLAB THAT BLOCK RETURN AIR PATH.
2. INTERNALLY INSULATE DUCTS W/ 1" ACOUSTICAL LINING.
3. MAXIMUM VELOCITY TO BE AT 300 FPM.

11.21.19 FOR BIDDING

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Tel: (973) 402-2125 Fax: (973) 402-2126
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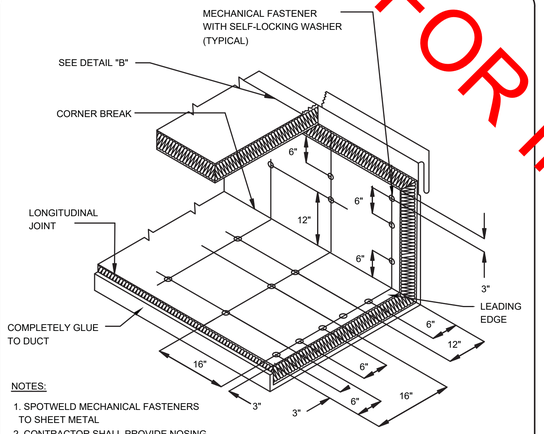
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

NEW WORK PLAN
MECHANICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 MECHANICAL.DWG

M-201

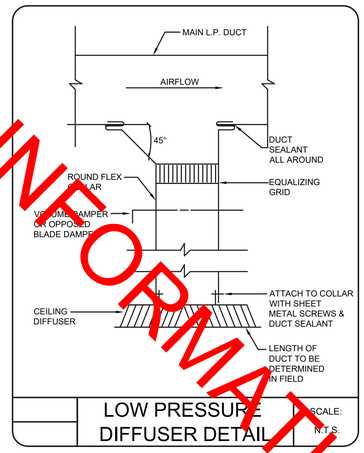


NOTES:

1. SPOTWELD MECHANICAL FASTENERS TO SHEET METAL
2. CONTRACTOR SHALL PROVIDE NOSING AT THE LEADING EDGE OF LINED DUCTWORK

ACOUSTICAL LINING DETAIL

SCALE: N.T.S.



LOW PRESSURE DIFFUSER DETAIL

SCALE: N.T.S.

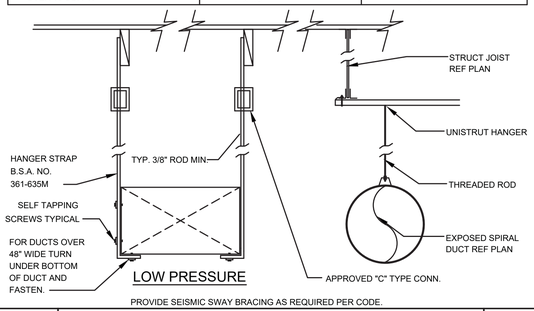
NEW VAV DAMPER BOX SCHEDULE

MARK	VAV-20	VAV-21	VAV-22	VAV-23	VAV-24	VAV-25	VAV-26	VAV-27
MANUFACTURER	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL NUMBER	VCCF06	VCCF06	VCEF08	VCEF12	VCEF12	VCEF06	VCEF10	VCEF10
INLET SIZE	6"Ø	6"Ø	8"Ø	12"Ø	12"Ø	6"Ø	10"Ø	10"Ø
DESIGN CFM	400	400	520	1500	1500	300	1050	1050
MINIMUM CFM	120	120	155	450	450	90	315	315
PRESSURE DROP (IN.)	0.14	0.14	0.04	0.04	0.04	0.08	0.03	0.03
RADIAL (NC)	20	20	24	30	30	24	29	29
DISCHARGE (NC)	21	21	25	26	26	19	29	29
ELECTRIC HEAT								
KW	-	-	2.5	7.0	7.0	1.5	5.0	5.0
HEATING CFM	-	-	260	750	750	150	525	525
STAGES	-	-	-	-	-	-	-	-
VOLTAGE	277/1	277/1	277/1	480/3	480/3	277/1	277/1	277/1
FLA	-	-	9.03	8.42	8.42	5.42	18.05	18.05
MCA	-	-	11.28	10.52	10.52	6.77	22.56	22.56
MOCP	-	-	15	15	15	15	25	25
NOTES	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4

1. PROVIDE WITH 24V CONTROLS TRANSFORMER, FACTORY INSTALLED BAC-NET CONTROLS AND DISCONNECT SWITCH.
2. VERIFY LEFT-HAND OR RIGHT-HAND CONTROLS IN FIELD.
3. PROVIDE TRANE MODEL #VV550 PROGRAMMABLE VAV BOX CONTROLLER, TRANE MODEL #BAYSENSE-074A WALL SENSOR WITH ADJUSTED SETPOINT.
4. FOR TIE BACK TO BUILDING BMS SYSTEM UTILIZE BUILDING CONTROL CONTRACTOR - TRANE 973-244-7570.

DUCT HANGING SUPPORT SCHEDULE

DUCT SIZE	HANGER SIZE	MAX. SPACING
UP THRU 2 SQ. FT.	1" x 1/16"	8'-0"
2 THRU 4 SQ. FT.	1" x 1/8"	8'-0"
4 THRU 10 SQ. FT.	1" x 1/8"	6'-0"
OVER 10 SQ. FT.	1" x 1/8"	4'-0"

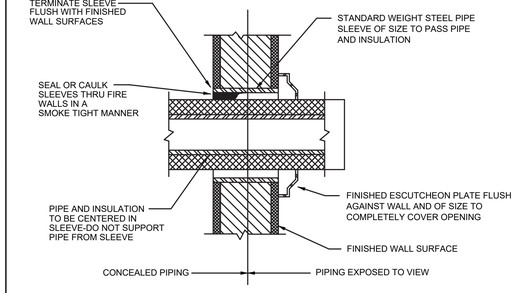


LOW PRESSURE

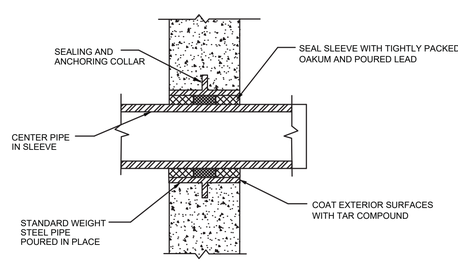
PROVIDE SEISMIC SWAY BRACING AS REQUIRED PER CODE.

DUCT HANGING DETAIL

SCALE: N.T.S.



INTERIOR WALLS

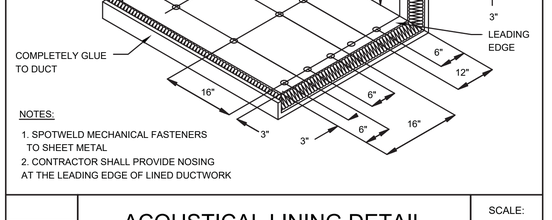


EXTERIOR WALLS

PLD-011

WALL SLEEVE DETAILS

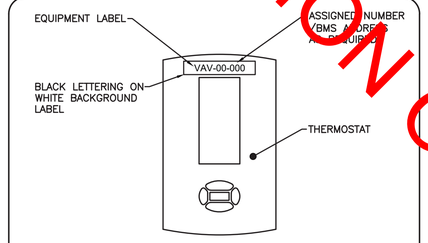
SCALE: N.T.S.



1. THE OPERATION OF VARIABLE VOLUME TERMINAL UNITS ARE AFFECTED BY EXCESSIVE TURBULENCE ON THE ENTERING SIDE OF EACH TERMINAL UNIT THERFORE, TERMINAL UNITS MUST NOT BE INSTALLED TOO CLOSE TO TO MAIN DUCTS, ELBOWS AND FITTINGS.
2. WHEN MINIMUM UPSTREAM STRAIGHT DUCT CONNECTION TO TERMINALS AS INDICATED ABOVE CANNOT BE MAINTAINED, PROVIDE ORIFICE PLATE, STRAIGHTENING VANES OR OTHER DEVICES AS RECOMMENDED BY TERMINAL UNIT MANUFACTURER AND SUBMIT TO ENGINEER FOR REVIEW PRIOR TO INSTALLALTION.
3. MANUFACTURER OF TERMINAL UNIT SHALL PROVIDE CONTROLS ON LEFT OR RIGHT SIDE AS REQUIRED BY FIELD CONDITIONS.
4. ARRANGE ACCESS TO PERMIT EASY FIELD BALANCE AND MAINTAINANCE OF TERMINAL UNIT.

VARIABLE AIR VOLUME BOX DETAIL

SCALE: N.T.S.



TYPICAL THERMOSTAT DETAIL

SCALE: N.T.S.

EXISTING VAV DAMPER BOX SCHEDULE

MARK	(E)VAV-1	(E)VAV-3	(E)VAV-4	(RE)VAV-5	(E)VAV-6	(RE)VAV-8	(E)VAV-9	(E)VAV-10	(E)VAV-11	(RE)VAV-12	(E)VAV-13	(E)VAV-15	(E)VAV-16	(E)VAV-17
MANUFACTURER	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
MODEL NUMBER	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
INLET SIZE	8"Ø	10"Ø	7"Ø	6"Ø	10"Ø	12"Ø	8"Ø	8"Ø	12"Ø	6"Ø	12"Ø	10"Ø	7"Ø	8"Ø
DESIGN CFM	560	700	500	325	800	1600	720	720	1600	200	1600	1100	500	700
MINIMUM CFM	170	210	150	100	240	480	220	220	480	60	480	330	150	210
PRESSURE DROP (IN.)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
RADIAL (NC)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
DISCHARGE (NC)	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
VOLTAGE	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NOTES	1	1	1	2	1	2	1	1	1	2	1	2	2	2

1. EXISTING VAV BOX TO REMAIN. REPAIR/REPLACE ALL COMPONENTS AS REQUIRED FOR A COMPLETE AND OPERATIONAL UNIT. CONTRACTOR SHALL ADJUST TO MEET PERFORMANCE VALUES AS INDICATED ON SCHEDULE. PROVIDE TRANE MODEL #BAYSENSE-074A WALL SENSOR WITH ADJUSTED SETPOINT.
2. EXISTING VAV BOX TO BE RELOCATED REPAIR/REPLACE ALL COMPONENTS AS REQUIRED FOR A COMPLETE AND OPERATIONAL UNIT. CONTRACTOR SHALL ADJUST TO MEET PERFORMANCE VALUES AS INDICATED ON SCHEDULE. PROVIDE TRANE MODEL #BAYSENSE-074A WALL SENSOR WITH ADJUSTED SETPOINT.

REFURBISHING NOTES:

1. INTENT IS TO BRING ALL EXISTING TO REMAIN EQUIPMENT TO LIKE NEW CONDITION.
2. CONTRACTOR SHALL VACUUM CLEAN ALL DUCTWORK AND FIX, REPAIR AND/OR REPLACE ANY SECTIONS WITH CRACKS, LEAKS OR UNLESS OTHERWISE NOTED ACCEPTABLE.
3. THE VAV BOX SHALL BE BROUGHT TO LIKE NEW CONDITION. CONTRACTOR SHALL
   - FIX, REPAIR OR REPLACE FLEXIBLE CONNECTIONS FROM DUCT TO UNIT IN THE EVENT OF ANY TEARS, RIPS OR OPENINGS CAUSING LEAKAGE.
   - VERIFY CONDITION OF CONTROL WIRING AND PROVIDE NEW AS REQUIRED.
   - CHECK ALL POWER AND CONTROL CONNECTIONS TO UNIT AND TIGHTEN OR REPLACE AS REQUIRED.
5. PATCH, REPAIR OR REPLACE ANY DUCTWORK INSULATION THAT IS RIPPED, TORN, SAGGING, MISSING, ETC.

GENERAL NOTES:

1. PRIOR TO START OF WORK, CONTRACTOR SHALL FIELD VERIFY EXTENT OF AIR DISTRIBUTION FROM EXISTING VAV BOXES INCLUDING DISTRIBUTION TO ADJACENT SPACE. CONTRACTOR SHALL DOCUMENT EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO DUCT SIZES, ROUTING, AIR DEVICE SIZES, NECK SIZE, ETC. COORDINATE SURVEY WITH BUILDING OWNER'S REPRESENTATIVE. SUBMIT TO ENGINEER FOR REVIEW.
2. VAV BOXES SHALL REMAIN IN OPERATION WITH MINIMAL NORMAL OFFICE HOUR DISRUPTION (MON–FRI 8AM–5PM, CONFIRM) DURING CONSTRUCTION TO ENSURE SPACE BEING SERVED BY VAV BOXES MAINTAINS CONDITIONED ENVIRONMENT. SEAL ALL OPENINGS AIR TIGHT
3. CONTRACTOR SHALL TAKE AIRFLOW MEASUREMENTS OF EXISTING VAV BOX SUPPLY AND RETURN AS WELL AS DUCTWORK AND AIR DEVICES LOCATED IN ADJACENT SPACE. BALANCE AIR IN ADJACENT SPACES TO PRE–CONSTRUCTION CFM. SUBMIT TO ARCHITECT AS SHOP DRAWING FOR REVIEW.
4. CONTRACTOR SHALL WRAP, ENCASE OR REMOVE ALL COMBUSTIBLES ABOVE THE CEILING. MAINTAIN APPROPRIATE FIRE RATINGS AS REQUIRED. FIELD VERIFY.

DUCTLESS SPLIT SYSTEM HVAC UNIT SCHEDULE

MARK	AC-1	-
MANUFACTURER	MITSUBISHI	-
MODEL NUMBER	PKA-A18HAL	-
EER	15.3	-
INDOOR UNIT		
CFM	380	-
FAN MOTOR FLA	0.33	-
MINIMUM CIRCUIT AMPS	1	-
MAXIMUM OVERCURRENT PROTECTION	-	-
VOLTAGE	208/1/60	-
COOLING DATA		
TOTAL COOLING CAPACITY (BTU/HR) (BASED ON 95 F AMBIENT AIR TEMPERATURE)	18,000	-
SENSIBLE COOLING CAPACITY (BTU/HR)	-	-
ENTERING AIR TEMPERATURE (DB/WBF)	80/67	-
HEATING DATA(REVERSE CYCLE)		
CAPACITY (BTU/HR)	-	-
COP	-	-
ELECTRIC RESISTANCE HEATING	-	-
CAPACITY (BTU/HR)	-	-
CAPACITY (WATTS)	-	-
CONDENSING UNIT		
MARK	ACCU-1	-
MODEL NUMBER	PUY-A18NHA3	
COMPRESSOR RLA	-	-
CONDENSER FAN FLA	0.35	-
MINIMUM CIRCUIT AMPS	13	-
MAXIMUM OVERCURRENT PROTECTION AMPS	15	-
VOLTAGE	208/1/60	-
UNIT WEIGHT (LBS.)		
INDOOR UNIT	29	-
CONDENSING UNIT	97	-
NOTES	1,2,3,4,5,6	-

1. PROVIDE BLUE DIAMOND MODEL 'RESERVOIR' CONDENSATE PUMP AND 1/2" DRAIN LINE ROUTE TO EXISTING LOCATION OF PREVIOUSLY DEMO'D SPLIT UNIT. VERIFY IN FIELD.
2. PROVIDE MODEL PAC-UKE-COM01-CN BMS INTERFACE MODULE. COORDINATE/PROVIDE CONNECTION TO BMS.
3. PROVIDE WIND BAFFLE ON CONDENSING UNIT.
4. PROVIDE 18" EQUIPMENT RAILS.
5. PROVIDE WALL MOUNTED HARD WIRED THERMOSTAT. COORDINATE LOCATION WITH OWNER IN FIELD.
6. SIZE REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS.

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

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16 RENSHAW DRIVE, MONTVILLE, NJ 07045
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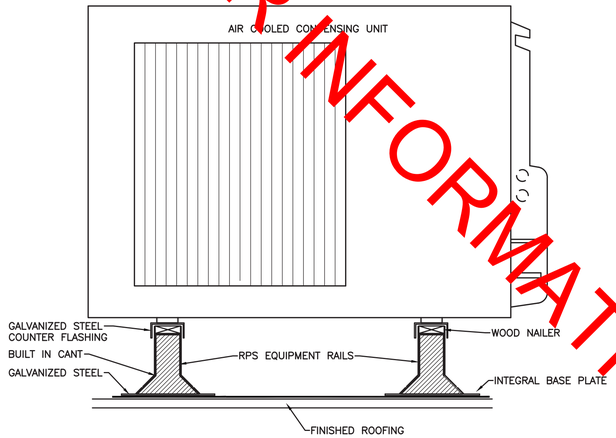
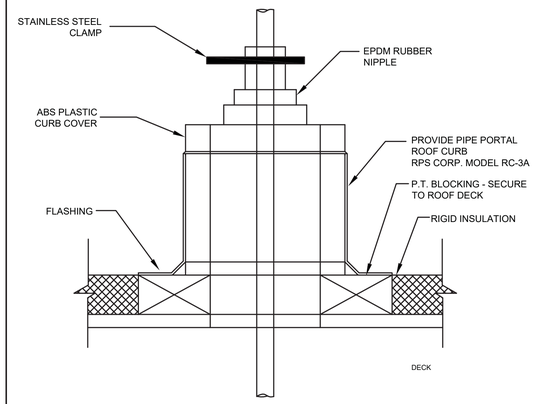
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

SCHEDULES & DETAILS MECHANICAL

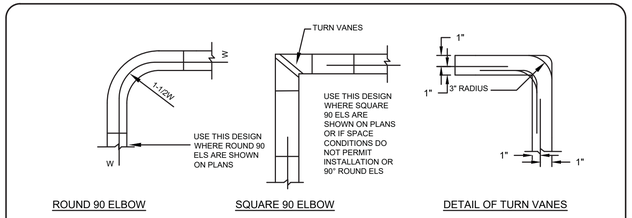
SCALE: AS NOTED	M-301
DATE: 08.22.2019	
FILE: 19003 MECHANICAL.DWG	



EQUIPMENT RAIL DETAIL — SCALE: N.T.S.

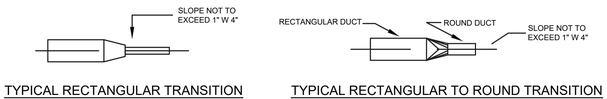


TYPICAL PIPE PORTAL DETAIL — SCALE: N.T.S.

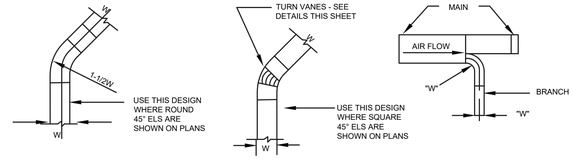


ROUND 90 ELBOW — SQUARE 90 ELBOW — DETAIL OF TURN VANES

CONSTRUCTION OF 90° ELBOWS

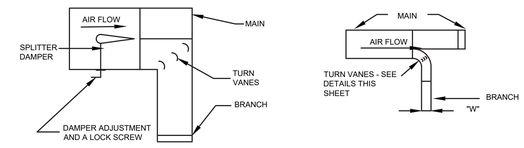


TYPICAL RECTANGULAR TRANSITION — TYPICAL RECTANGULAR TO ROUND TRANSITION



ROUND 45° ELBOW — SQUARE 45° ELBOW — ROUND BRANCH TAKEOFF

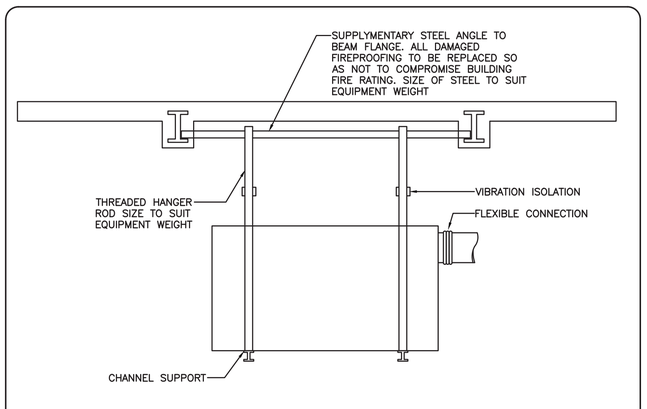
CONSTRUCTION OF 45° ELBOWS



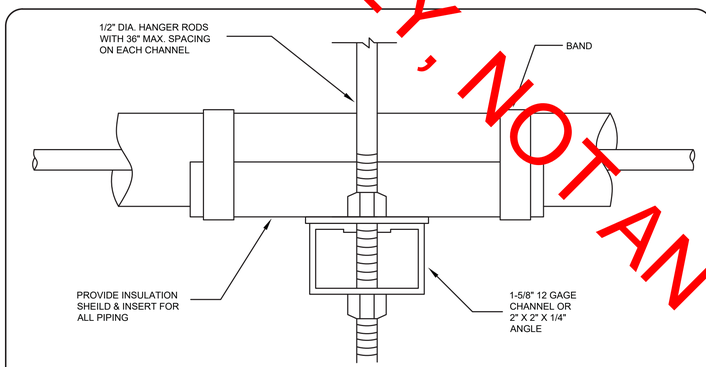
TYPICAL SPLITTER DAMPER — SQUARE BRANCH TAKEOFF

CONSTRUCTION OF BRANCH TAKEOFFS FROM MAIN

LOW PRESSURE DUCT DETAIL — SCALE: N.T.S.



HVAC EQUIPMENT HANGING DETAIL — SCALE: N.T.S.



MAXIMUM HORIZONTAL PIPE/TUBING SUPPORT SPACING, FEET

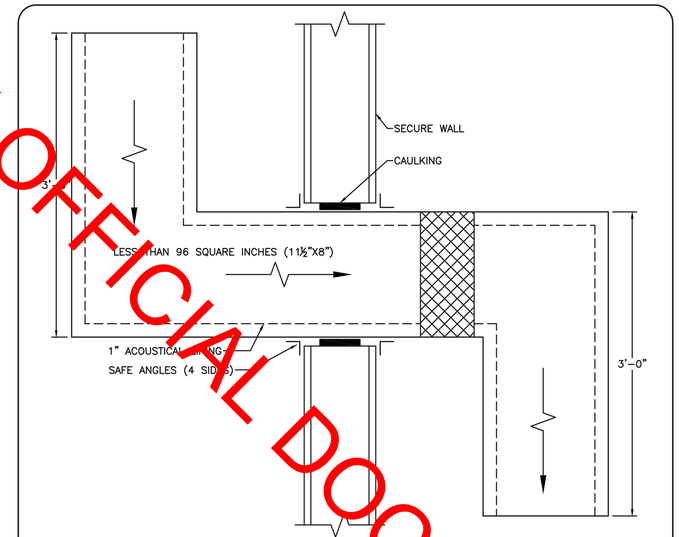
NOM. SIZE	THRU 3/4"	1	1-1/4"	1-1/2"	2	2-1/2"	3	4	5	6	8
STEEL PIPE	10 FEET	12	12	12	12	12	12	12	12	12	12
COPPER TUBING	6 FEET	6	6	10	10	10	10	10	10	10	10
PVC	2 FEET	2	3	3	3	3	3	4	4	4	4

NOTE: FOR TRAPEZE HANGER TAKE SMALLEST SIZE ON TRAPEZE

MAXIMUM VERTICAL PIPE/TUBING SUPPORT SPACING, FEET

NOM. SIZE	THRU 3/4"	1	1-1/4"	1-1/2"	2	2-1/2"	3	4	5	6	8
STEEL PIPE	15 FEET	15	15	15	15	15	15	15	15	15	15
COPPER TUBING	10 FEET	10	10	10	10	10	10	10	10	10	10
PVC	10 FEET	10	10	10	10	10	10	10	10	10	10

PIPE HANGER DETAIL — SCALE: N.T.S.



ACOUSTIC TRANSFER DUCT DETAIL — SCALE: N.T.S.

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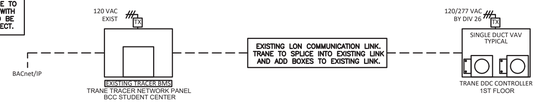
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

DETAILS
MECHANICAL

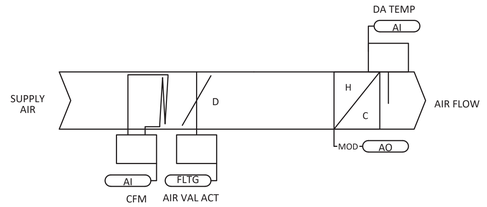
SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 MECHANICAL.DWG

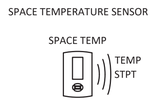
M-401

NEW VAV BOXES TO BE PROVIDED WITH FACTORY MOUNTED LON DDC CONTROLLERS. NEW BOXES TO BE INTEGRATED TO THE EXISTING TRANE TRACER BMS. PLEASE CONTACT TRANE N.J. ALL DEMO IS TO BE BY THE MECHANICAL CONTRACTOR. TRANE TO PROVIDE MC WITH ASSISTANCE WITH THE CONTROL COMPONENTS TO BE PRESERVED DURING THIS PROJECT.



BAS RISER DIAGRAM
NOT TO SCALE





VARIBLE AIR VOLUME CONTROL DIAGRAM
NOT TO SCALE

VAV SEQUENCE OF OPERATIONS

Building Management System Interface:
The Building Management System (BMS) shall send the controller Occupied and Unoccupied commands. The BMS may also send a Heat/Cool mode, priority shutdown commands, space temperature and/or space temperature setpoint. If communication is lost with the BMS, the VAV controller shall operate using its local setpoints.

Occupancy Mode:
The occupancy mode shall be communicated or hardwired to the VAV via a binary input. Valid Occupancy modes for the VAV shall be:

Occupied:
Normal operating mode for occupied spaces or daytime operation. When the unit is in the occupied mode the VAV shall maintain the space temperature at the active occupied heating or cooling setpoint. Applicable ventilation and airflow setpoints shall be enforced. The occupied mode shall be the default mode of the VAV.

Unoccupied:
Normal operating mode for unoccupied spaces or nighttime operation. When the unit is in unoccupied mode the VAV controller shall maintain the space temperature at the stored unoccupied heating or cooling setpoint regardless of the presence of a hardwired or communicated setpoint. When the space temperature exceeds the active unoccupied setpoint the VAV shall modulate fully closed.

Occupied Bypass:
Mode used to temporarily place the unit into the occupied operation. Occupants shall be able to override the unoccupied mode from the space sensor. The override shall last for a maximum of 4 hours (adj.). The occupants shall be able to cancel the override from the space sensor at any time. During the override the unit shall operate in occupied mode.

Heat/Cool Mode:
The Heat/Cool mode shall be set by a communicated value or automatically by the VAV. In standalone or auto mode the VAV shall compare the primary air temperature with the configured auto changeover setpoint to determine if the air is "hot" or "cold". Heating mode it implies the primary air temperature is hot. Cooling mode it implies the primary air temperature is cold.

Heat/Cool Setpoint:
The space temperature setpoint shall be determined either by a local (e.g., thumbwheel) setpoint, the VAV default setpoint or a communicated value. The VAV shall use the locally stored default setpoints when neither a local setpoint nor communicated setpoint is present. If both a local setpoint and communicated setpoint exist, the VAV shall use the communicated value.

Cooling Mode:
When the unit is in cooling mode, the VAV controller shall maintain the space temperature at the active cooling setpoint by modulating the airflow between the active cooling minimum airflow setpoint to the maximum cooling airflow setpoint. Based on the VAV controller occupancy mode, the active cooling setpoint shall be one of the following:

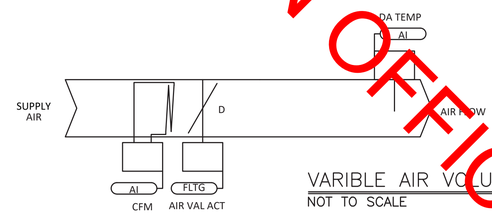
Setpoint Default Value	
Occupied Cooling Setpoint	74.0 deg. F
Unoccupied Cooling Setpoint	85.0 deg. F
Occupied Standby Cooling Setpoint	78.0 deg. F
Occupied Min Cooling Airflow Setpoint	See VAV Schedule
Occupied Max Cooling Airflow Setpoint	See VAV Schedule

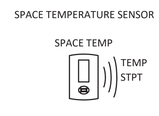
The VAV shall use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs will be controlled based on the unit configuration and the requested cooling capacity.

Heating Mode:
When the unit is in heating mode, the VAV controller shall maintain the space temperature at the active heating setpoint by modulating the airflow down to the minimum occupied airflow setpoint. Based on the VAV controller occupancy mode, the active heating setpoint shall be one of the following:

Setpoint Default Value	
Occupied Heating Setpoint	71.0 deg. F
Unoccupied Heating Setpoint	60.0 deg. F
Occupied Standby Heating Setpoint	67.0 deg. F
Occupied Min Airflow Setpoint	See VAV Schedule
Occupied Max Airflow Setpoint	See VAV Schedule

Space Sensor Failure:
If there is a fault with the operation of the zone sensor an alarm shall be annunciated at the BMS. Space sensor failure shall cause the VAV to drive the damper to minimum air flow if the VAV is in the occupied mode, or drive it closed if the VAV is in the unoccupied mode.





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CONTROL DIAGRAMS
MECHANICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 MECHANICAL.DWG

M-501

LIGHTING CONTROL GENERAL NOTES:

1. START-UP, PROGRAMMING, COMMISSIONING AND TRAINING OF THE LIGHTING CONTROL SYSTEM SHALL BE PROVIDED BY THE MANUFACTURER.
2. ALL SENSOR LOCATIONS ARE APPROXIMATE. REFER TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION.
3. IF ANY QUESTIONS ARISE REGARDING SENSOR PLACEMENT, WIRING OF DEVICES, ETC. CONTACT DIVERSIFIED AT 973-439-1524 PRIOR TO INSTALLATION TO SCHEDULE A FIELD VISIT.
4. CEILING MOUNTED SENSORS REQUIRE TO BE LOCATED NO CLOSER THAN 6-8' FROM AIR SUPPLY/RETURN REGISTERS.
5. ROOM CONTROLLERS ARE SHOWN FOR ZONING PURPOSES ONLY. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL LOCATION, TYPE AND CIRCUITING.
6. MAXIMUM NUMBER OF SENSORS THAT CAN BE WIRED IN PARALLEL TO A SINGLE ROOM CONTROLLER DEPENDS ON SENSOR MODEL (REFER TO MANUFACTURER'S LITERATURE FOR LIMITATIONS).
7. ALL CAT5 CABLE AND SYSTEM COMPONENTS SHALL BE PLENUM RATED.
8. PER THE REQUIREMENTS OF THE ELECTRICAL CODE, AREAS LABELED AS "MECHANICAL" OR "ELECTRICAL" WHERE WORK MAY OCCUR ARE NOT TO BE CONTROLLED BY AUTOMATED LIGHTING CONTROLS ALONE.
9. TURN OFF ANY POWER AT THE CIRCUIT BREAKER BEFORE WIRING ANY PRODUCT.
10. COORDINATE FINAL LOCATION OF SWITCH WITH ARCHITECT AND PRIOR TO ELECTRICAL ROUGH-IN.
11. SEE ARCHITECTURAL DRAWINGS FOR FIXTURE SCHEDULE.
12. LIGHTING CIRCUITS SHOWN FOR GROUPING PURPOSES ONLY AND NOT INTENDED POLES. CONTRACTOR SHALL RE-USE EXISTING CIRCUITS SERVING THE AREA AS VERIFIED IN FILED.
13. PROVIDE A COMPLETE AND FUNCTIONAL LIGHTING CONTROL SYSTEM.

LIGHTING CONTROL LEGEND

$_{W}$	120/277 VAC, 50/60 Hz	DUAL TECHNOLOGY WALL SWITCH SENSOR HUBBELL #LHMTS1-N-WH
$_{W2}$	120/277 VAC, 50/60 Hz	DUAL TECHNOLOGY DUAL RELAY WALL SWITCH SENSOR HUBBELL #LHMTD2-N-WH
$_{PH}$	120/277 VAC, 50/60 Hz	INFRARED TECHNOLOGY WALL DIMMING SWITCH WITH INTEGRAL PHOTOCELL HUBBELL #LHD-IRS3-N-WH
T_S	120/277 VAC, 50/60 Hz	DIGITAL TIME SWITCH HUBBELL #TD300-W
R1	120/277 VAC	1-RELAY ON/OFF ROOM CONTROLLER HUBBEL #NXRC-1R-UNV
R2	120/277 VAC	2-RELAY ON/OFF ROOM CONTROLLER HUBBELL #NXRC-2R-UNV
DIM R1	120/277 VAC	1-RELAY DIMMING ROOM CONTROLLER HUBBELL #NXRC-1RD-UNV
DIM R2	120/277 VAC	2-RELAY DIMMING ROOM CONTROLLER HUBBELL #NXRC-2RD-UNV
$_{RL}$	24VDC, 5mA	4-BUTTON ON-OFF-RAISE-LOWER DIGITAL WALL DIMMING SWITCH HUBBELL #NXSW-ORLO
$_{00}$	24VDC, 5mA	2-BUTTON ON/OFF DIGITAL WALL SWITCH HUBBELL # NX-SW-00
$_{SS}$	24VDC, 5mA	6-BUTTON (4 SCENE) ON-OFF-RAISE-LOWER DIGITAL WALL DIMMING SWITCH HUBBELL #NXSW-SS
$_{2000}$	24VDC, 20mA	DUAL TECHNOLOGY CEILING MOUNT SENSOR HUBBELL MODEL #NXOS-OMDT2
$_{1000}$	24VDC, 20mA	DUAL TECHNOLOGY CEILING MOUNT SENSOR HUBBELL MODEL #NXOS-OMDT1
$_{500}$	24VDC, 20mA	DUAL TECHNOLOGY CEILING MOUNT SENSOR HUBBELL MODEL #NXOS-OMDT5
	24VDC, 20mA	DUAL TECHNOLOGY WALL MOUNT SENSOR HUBBELL #NXOS-LODT
$_{FI}$	24VDC, 5mA	WALL SWITCH STATION HUBBELL NXSW SERIES (NUMBER INDICATES BUTTONS)
	24VDC, 7mA	SINGLE ZONE CEILING MOUNTED PHOTOSENSOR HUBBELL #NXDS
AC	120/277 VAC, 50/60 Hz	DIGITAL AREA CONTROLLER HUBBELL #NXAC120
BR	24 VDC, 50mA	NETWORK BRIDGE MODULE HUBBELL #NXHBNB2

ELECTRICAL NOTES

ELECTRICAL NOTES:

1. ALL WORK SHALL BE IN STRICT CONFORMANCE WITH THE 2014 NATIONAL ELECTRIC CODE AND APPLICABLE STATE CODES.
2. OBTAIN AND PAY ALL FEES FOR PERMITS AND OBTAIN APPROVALS FROM AUTHORITIES HAVING JURISDICTION.
3. PROVIDE ALL TEMPORARY LIGHT AND POWER, REMOVE ALL TEMPORARY WHEN NO LONGER NEEDED.
4. GUARANTEE ALL MATERIALS AND LABOR FOR ONE YEAR FROM THE FINAL ACCEPTANCE DATE OF THE OWNER.
5. PROVIDE ALL NECESSARY CUTTING, PATCHING, EXCAVATING AND BACK FILL TO ACCOMMODATE ELECTRIC WORK. FIRE SEAL ALL WALL AND FLOOR PENETRATIONS WITH A UL LISTED FOAM SEALANT.
6. PROVIDE AT LEAST (4) COPIES OF SHOP DRAWINGS FOR APPROVAL FOR THE LIGHTING FIXTURES, PANELS, CONTACTORS, FLOOR BOXES, FIRE ALARM SYSTEM, TVSS.
7. UNLESS OTHERWISE NOTED, LOCATE THE FOLLOWING ITEMS AT HEIGHTS LISTED BELOW:
   a) SWITCHES AND CONTROLS +4'-0" AFF TO THE TOP OF DEVICE.
   b) RECEPTACLES: +18" TO CENTERLINE
   c) FIRE ALARM SIGNALS: +80" TO BOTTOM OF STROBE LENS.
   d) FIRE ALARM STATIONS +4'-0" AFF TO THE TOP OF DEVICE
8. WIRE SHALL BE INSTALLED AS FOLLOWS:
   a) EXPOSED UNFINISHED AREAS (INDOORS): EMT WITH COMPRESSION FITTINGS. USE WIREMOLD IN FINISHED AREAS WHERE IT IS IMPOSSIBLE TO CONCEAL WORK.
   b) CONCEALED ABOVE CEILING OR IN STUD WALL: EMT; TYPE MC CABLE (METAL CLAD).
   c) FINAL CONNECTIONS TO MOTORS (INDOORS): FLEXIBLE METAL
   d) FINAL CONNECTIONS TO MOTORS (OUTDOORS): LIQUID TIGHT FLEX.
   e) EXPOSED OUTDOORS: INTERMEDIATE METAL CONDUIT (IMC).
   f) BURIED IN EARTH: PVC SCHEDULE 40.
   g) UNDERGROUND PRIMARY ELECTRIC SERVICE CONDUITS: PER UTILITY COMPANY REQ'S.
9. GENERALLY ALL WORK IN FINISHED AREAS SHALL BE CONCEALED. CONSULT ARCHITECT FOR DIRECTION WHERE WORK CANNOT BE CONCEALED.
10. PROVIDE ALL LIGHTING FIXTURES AND LAMPS. SEE ARCHITECTURAL DRAWINGS FOR SPECIFICATIONS.
11. OUTLET BOXES CONCEALED SHALL BE STAMPED STEEL. OUTLET BOXES EXPOSED TO THE WEATHER SHALL BE CAST ALUMINUM.
12. ALL WIRE SHALL BE TYPE THWN (WET LOCATIONS), THHN (DRY LOCATIONS), #12 GAUGE COPPER, MINIMUM SIZE. USE TYPES THWN, THHN OR XHHW FOR FEEDERS AND TYPES THWN/THHN FOR BRANCH CIRCUITS #10 AND SMALLER.
13. WIRE DEVICES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY HUBBELL OR EQUAL BE LEVITON, EAGLE, OR ARROW HART.
14. PLATES ON CONCEALED OUTLETS SHALL BE PLASTIC, COLOR TO BE SELECTED BY THE ARCHITECT.
15. GROUNDING SHALL CONFORM TO THE 2014 NATIONAL ELECTRICAL CODE.
16. SAFETY SWITCHES SHALL BE HEAVY DUTY, SQUARE D OR EQUAL BY G.E. OR ITE.
17. FUSES SHALL BE AS MANUFACTURED BY BUSSMAN.
18. ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS OF MECHANICAL, PLUMBING AND OWNER SUPPLIED EQUIPMENT PRIOR TO ORDERING AND RUNNING CIRCUITING.
19. CABLE TV, VOICE, DATA, SECURITY, SOUND SYSTEM WORK TO BE DONE UNDER SEPARATE CONTRACTS WITH THE OWNER.
20. PROVIDE A PULL WIRE IN ALL EMPTY CONDUITS.
21. ALL EMERGENCY AND EXIT LIGHTS SHALL BE CONNECTED TO THE CIRCUIT SERVING THE AREA AHEAD OF ANY SWITCHING
22. ALL ACCESS DOORS REQUIRED IN GENERAL CONSTRUCTION ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO IDENTIFY SIZE, TYPE AND LOCATION OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED ELECTRICAL EQUIPMENT, JUNCTION BOXES AND OTHER RELATED ITEMS. THE ELECTRICAL CONTRACTOR SHALL IDENTIFY THESE REQUIREMENTS ON A COORDINATED SHOP DRAWING.
23. BEFORE CORE DRILLING FLOOR SLAB, X-RAY SLABS AND HAVE THE LOCATIONS APPROVED BY THE LANDLORD IN WRITING. ANY EXISTING BUILDING SERVICE DAMAGED BY CORE DRILLING SHALL BE REPAIRED IMMEDIATELY AT NO COST TO LANDLORD OR TENANT. FLOOR DRILLING TO BE PERFORMED AFTER NORMAL WORKING HOURS AND AT A TIME ACCEPTABLE TO LANDLORD AND ALLOWANCES FOR THIS WORK SHALL BE INCLUDED IN BID PRICE SUBMITTED. ALL ELECTRICAL CONDUCTORS AND INFORMATION TECHNOLOGY WORK INSTALLED IN THE CEILING OF ANOTHER TENANT SPACE SHALL BE IN CONDUIT. ARMORED CABLING AND USE OF EXPOSED PLENUM IT CABLING SHALL NOT BE PERMITTED.

DEMOLITION AND MODIFICATIONS TO EXISTING BUILDING SYSTEMS:

24. THIS CONTRACTOR SHALL INCLUDE DEMOLITION, REMOVAL OR RELOCATION OF EXISTING EQUIPMENT, MATERIALS, APPURTENANCES, ETC. AS REQUIRED TO ACCOMMODATE THE PROPOSED RENOVATION AND NEW CONSTRUCTION. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID TO ASCERTAIN WORK REQUIRED.
25. EXISTING CONDUITS, OUTLETS AND CIRCUITS MAY BE REUSED WHERE APPLICABLE TO THE PROPOSED WORK, WHERE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND WHERE GUARANTEED BY THE CONTRACTOR.
26. REMOVE ALL ABANDONED BOXES, ARMORED CABLES, SYSTEM CABLES, CONDUCTORS, LIGHT FIXTURES AND ACCESSIBLE BOXES AND RACEWAYS.
27. WHERE OUTLETS ARE REMOVED OR CIRCUITS INTERRUPTED OR BROKEN, PROVIDE THE REQUIRED RELOCATION, RECONNECTION OR REARRANGEMENT TO RESTORE TO SERVICE ALL ITEMS, OUTLETS, ETC. NOT MADE OBSOLETE BY THIS WORK.
28. REFER TO DRAWINGS FOR EXISTING AREAS IN WHICH EQUIPMENT SHALL REMAIN.
29. THERE SHALL BE NO INTERRUPTIONS OF SERVICE TO EXISTING ELECTRICAL SYSTEMS WITHOUT WRITTEN CONSENT OF THE OWNER. SUCH INTERRUPTIONS SHALL BE KEPT TO A MINIMUM AND SHALL BE SCHEDULED WITH THE OWNER. ANY COST FOR THE WORK THAT MUST BE SCHEDULED ON AN OVERTIME BASIS TO ACCOMMODATE THE OWNER'S REQUIREMENTS FOR INTERRUPTION SHALL BE INCLUDED IN THE BID PRICE.
30. THIS CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT IT IS A PREREQUISITE THAT HE EXAMINE THE SPECIFICATIONS AND DRAWINGS AND ALSO VISIT THE SITE OF WORK IN ORDER TO BECOME THOROUGHLY ACQUAINTED WITH THE EXTENT AND REQUIREMENTS OF THE WORK, AS WELL AS THE ACTUAL CONDITIONS UNDER WHICH THE WORK IS SPECIFIED IS TO BE PERFORMED. CLAIMS FOR EXTRA COMPENSATION WILL NOT BE ALLOWED FOR ANY WORK THAT MAY BE CAUSED BY EXISTING CONDITIONS, WHICH CONDITION SHOULD HAVE BEEN FORESEEN SUBSEQUENT TO JOB SITE VISIT.
31. ANY EXISTING CONDITION FOUND WHICH WILL AFFECT THIS CONTRACT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN WRITING, FIVE (5) DAYS PRIOR TO BID.
32. REPLACE ALL EXISTING DEVICES TO REMAIN WITH NEW DEVICES AND PLATES. COLOR OF DEVICES AND PLATES TO BE SELECTED BY THE ARCHITECT. FIELD CHECK QUANTITIES PRIOR TO BID.
33. CONTRACTOR TO PROVIDE COORDINATION DRAWINGS FOR ALL TRADES.

ELECTRICAL ABBREVIATIONS

IDENTIFIER	DESCRIPTION	IDENTIFIER	DESCRIPTION
AFF	ABOVE FINISH FLOOR	MDP	MAIN DISTRIBUTION PANEL
AWG	AMERICAN WIRE GAUGE	MDS	MAIN DISTRIBUTION SWITCHBOARD
C	CONDUIT	MLO	MAIN LUGS ONLY
EC	ELECTRICAL CONTRACTOR	N	NEUTRAL (GROUNDED CIRCUIT CONDUCTOR)
EF	EXHAUST FAN	OS	OCCUPANCY SENSOR
EMT	ELECTRICAL METALLIC TUBING	PVC	POLYVINYL CHLORIDE
GFI	GROUND FAULT INTERRUPTER	RGS	RIGID GALVANIZED STEEL
GR	GROUND	SWBD	SWITCHBOARD
IG	ISOLATED GROUND	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
MC	METAL CLAD CABLE	U.O.N.	UNLESS OTHERWISE NOTED
MCB	MAIN CIRCUIT BREAKER	V.I.F.	VERIFY IN FIELD
MCM	THOUSAND CIRCULAR MILL	WP	WEATHER PROOF

ELECTRICAL SYMBOLS

	EXIT LIGHT, DUAL LITE LX SERIES
	COMBINATION EXIT / EMERGENCY LIGHT, DUAL LITE LT SERIES
$	SINGLE POLE TOGGLE SWITCH
$3	3-WAY TOGGLE SWITCH
$O	DUAL TECHNOLOGY PASSIVE AND INFRARED WALL MOUNT OCCUPANCY SENSOR, SENSOR SWITCH #WSX-PDT-WH OR EQUAL
	CEILING MOUNT DUAL TECHNOLOGY OCCUPANCY SENSOR PASSIVE & INFRARED WITH POWER PACK, SENSOR SWITCH CMR PDT 9
$D	DIMMER CONTROL SWITCH
$a	TOGGLE SWITCH, LETTER INDICATES LIGHTING FIXTURE BEING CONTROLLED
$T	SINGLE POLE SWITCH WITH THERMAL OVERLOADS
J	SAFETY DISCONNECT SWITCH - UNFUSED - NUMBER IS SUITABLE SIZE
J	COMBINATION MOTOR/STARTER WITH DISCONNECT SWITCH
FJ	SAFETY DISCONNECT SWITCH - FUSED - SIZE OF SWITCH AND FUSE AS NOTED ON PLANS
J	JUNCTION BOX
T	TRANSFORMER
	DUPLEX RECEPTACLE, 20A-2P-3W 125VOLTS
	DUPLEX RECEPTACLE ON DEDICATED CIRCUIT, 20A-2P-3W 125VOLTS
GFI	DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER 20A-2P-3W 125VOLTS
	DOUBLE DUPLEX RECEPTACLE, MOUNT CENTERLINE 18"AFF. U.O.N.
	SINGLE RECEPTACLE AMPERAGE AS NOTED
FR	FIRE RATED FLUSH POKE-THRU
	FLUSH MOUNTED FLOOR BOX, WIREMOLD EVOLUTION SERIES WITH (2) DUPLEX RECEPTACLES, (4) DATA OUTLETS. PROVIDE ¾"C FOR POWER & 1¼"C FOR DATA UP TO HUNG CEILING
	POWER & DATA CONNECTION TO MODULAR FURNITURE. PROVIDE (4) CIRCUITS UNLESS OTHERWISE NOTED. PROVIDE 1¼"C UP TO HUNG CEILING FOR DATA
WM	SURFACE RACEWAY, WIREMOLD
D	DATA OUTLET - 2 GANG BOX WITH COVER & 1¼"C UP TO HUNG CEILING
T	TELEPHONE OUTLET - 1 GANG BOX WITH COVER & 1¼"c up to hung ceiling
TV	CATV OUTLET, 1 GANG BOX WITH COVER & 1¼"C UP TO HUNG CEILING
	MOTOR
	PANEL BOARD - SURFACE MOUNTED
	PANEL BOARD - FLUSH MOUNTED
	HOME RUN WIRING TO PANEL
	BRANCH CIRCUIT WIRING
	BRANCH CIRCUIT WIRING BELOW FLOOR
	EMERGENCY BATTERY PACK LIGHTING UNIT, DUAL LITE E2-2R
ER	REMOTE NEMA 3R EMERGENCY FIXTURE, DUAL LITE OCR SERIES
EB	EMERGENCY BATTERY PACK WITHOUT LAMPS, DUAL LITE LG2S SERIES
CR	2 GANG BOX FOR CARD READER & 1¼"C UP TO HUNG CEILING. MOUNT 48" TO TOP OF DEVICE
ES	2X2 EMERGENCY SPEAKER WAHSEGA LABS MODEL # WL-SPKR-22
RE	DEVICE WITH AN "RE" IS AN EXISTING DEVICE TO BE RELOCATED
DE	DEVICE WITH AN "E" IS AN EXISTING DEVICE TO REMAIN
	SYMBOL HATCHED IS A DEVICE TO BE REMOVED. REMOVE BRANCH CIRCUITRY/SYSTEM WIRING BACK TO SOURCE

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

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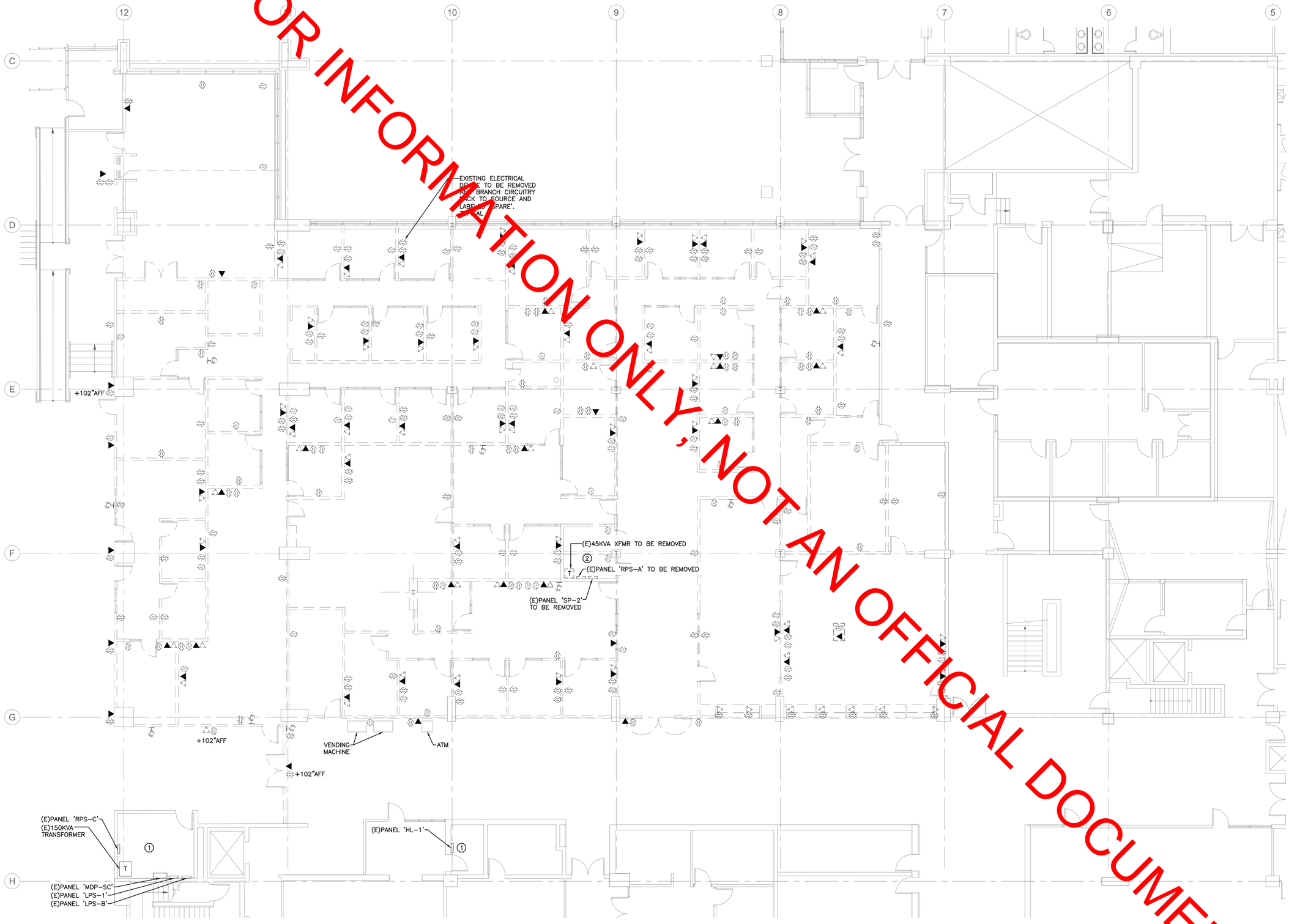
NOTES, SYMBOLS & ABBREVIATIONS ELECTRICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 ELECTRICAL.DWG

E-101



DEMOLITION PLAN – POWER
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

POWER DEMOLITION PLAN GENERAL NOTES:

1. ALL EXISTING RECEPTACLES AND DATA PORTS SHOWN ON PLANS AND ASSOCIATED BRANCH WIRING TO BE DISCONNECTED AND REMOVED BACK TO SOURCE.

POWER DEMOLITION PLAN KEY NOTES:

1. EXISTING PANELS HL-1, RPS-C, MDP-SC, LPS-1, LPS-B AND 150KVA TRANSFORMER ARE TO REMAIN.
2. EXISTING PANELS RPS-A, SP-2, 45KVA TRANSFORMER AND ASSOCIATED FEEDERS TO BE DISCONNECTED AND REMOVED BACK TO SOURCE.

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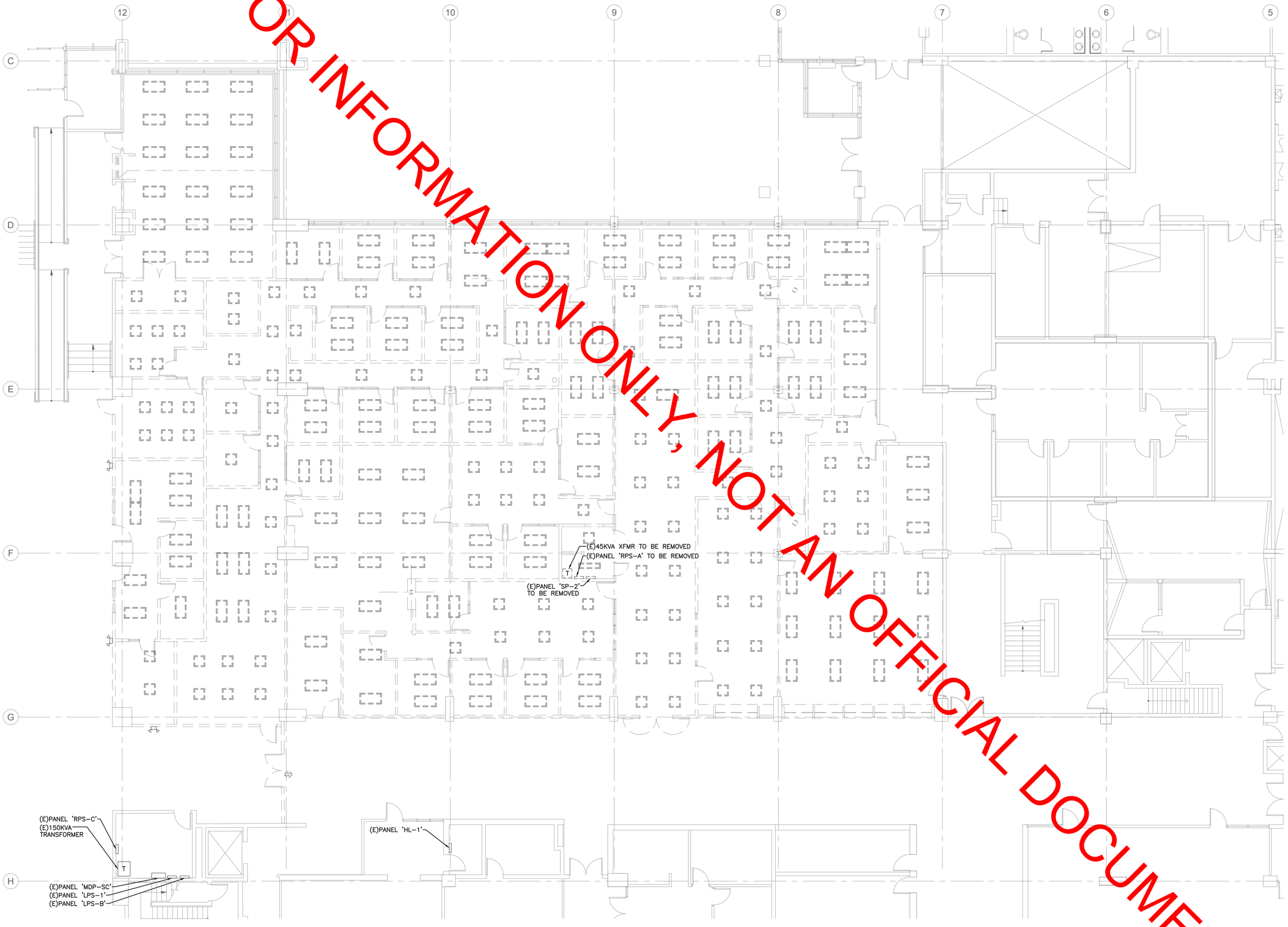

DEMOLITION PLAN – LIGHTING
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

POWER DEMOLITION PLAN GENERAL NOTES:

1. ALL EXISTING LIGHTING FIXTURES AND SWITCHES/CONTROLS TO BE DISCONNECTED AND REMOVED BACK TO SOURCE. ALL LIGHTING AND CONTROLS SHALL BE NEW. EXISTING WIRING/CIRCUITS SHALL BE LEFT IN PLACE FOR NEW LIGHTING.

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DEMOLITION
LIGHTING PLAN
ELECTRICAL

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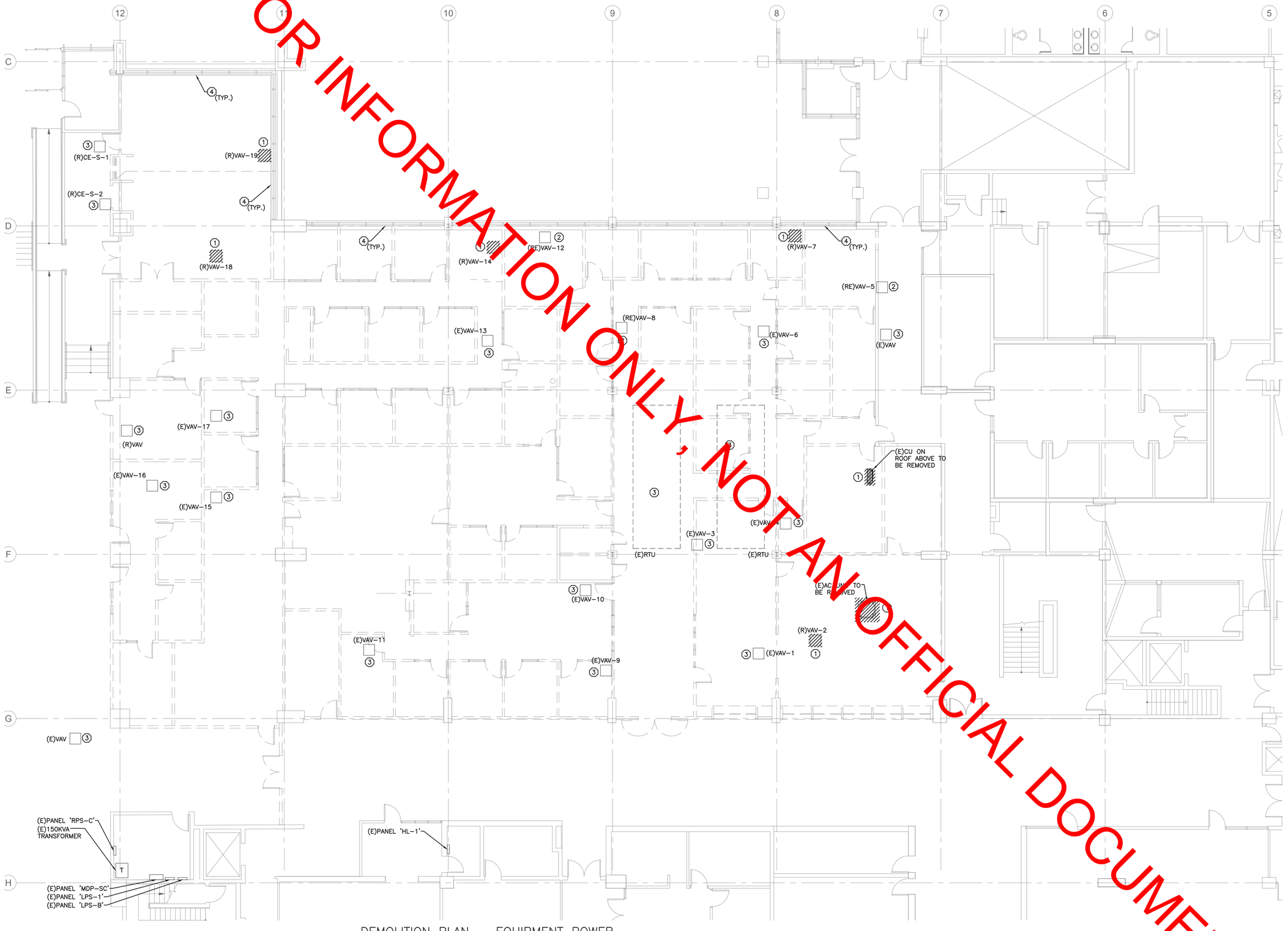

DEMOLITION PLAN – EQUIPMENT POWER
SCALE: 1/8" = 1'-0"

EQUIPMENT POWER DEMOLITION PLAN KEY NOTES:

1. EXISTING UNIT AND ASSOCIATED CIRCUIT/WIRING & DISCONNECT SWITCH TO BE DISCONNECTED AND REMOVED BACK TO SOURCE AS FIELD VERIFIED.
2. EXISTING UNIT AND ASSOCIATED DISCONNECT SWITCH TO BE RELOCATED. EXTEND EXISTING WIRING TO NEW LOCATION AS FIELD VERIFIED.
3. EXISTING UNIT AND ASSOCIATED CIRCUIT/WIRING & DISCONNECT SWITCH TO REMAIN.
4. EXISTING ELECTRIC BASEBOARD & DISCONNECT SWITCH TO BE DISCONNECT AND REMOVED BACK TO SOURCE AS FIELD VERIFIED.

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DEMOLITION
EQUIPMENT POWER PLAN
ELECTRICAL

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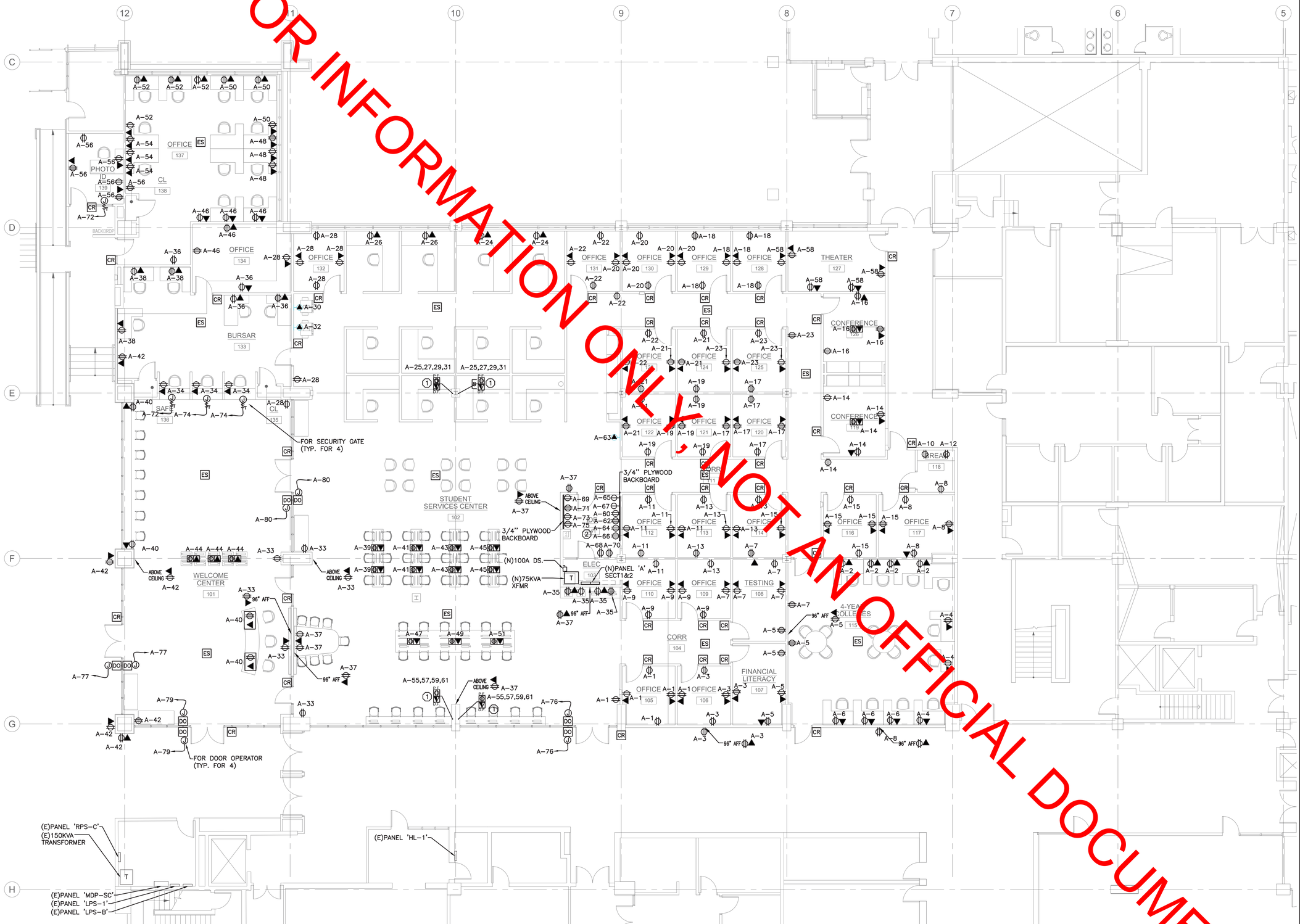

NEW WORK PLAN – POWER
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

POWER PLAN KEY NOTES:

1. FURNITURE SYSTEM IS ASSUMED TO BE 4–CIRCUIT 2+2 SYSTEM. ELECTRICAL CONTRACTOR TO CONFIRM POWER/WIRING REQUIREMENTS WITH FURNITURE VENDOR PRIOR TO INSTALLATION. SEE WIRING DETAILS ON SHEET E–501.
2. IDF ROOM SHALL BE PROVIDED WITH GROUNDING BUSBAR. SEE ARCHITECTURAL DRAWINGS & E–502 FOR ADDITIONAL DETAILS. PROVIDE OVERHEAD LADDER TRAY, LADDER TRAY SHALL BE AT LEAST 2' WIDE AND BE MECHANICALLY AND ELECTRICALLY BONDED TO THE RACKS AND ALSO BONDED TO THE GROUND BUS BAR THAT WILL BE ON THE WALL BEHIND THE RACKS. THIS BAR MUST BE CONNECTED TO AN INDEPENDENT GROUND SOURCE. THIS TRAY SHOULD HAVE SOME SORT OF AN EXTENSION SPILLWAY THAT TRAVELS FROM THE STRAIGHT SECTION ABOVE THE RACKS AND SPILLS UP OR OVER TO WHEREVER THE CABLES ENTER THE IDF ROOM. ALL CABLING SHOULD BE APPROPRIATELY CABLE TIED TO THE OVERHEAD LADDER SYSTEM. ALL REQUIREMENTS SHALL BE COORDINATED WITH ARCHITECT, COLLEGE IT MANAGER AND IT CONTRACTOR

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NEW WORK
POWER PLAN
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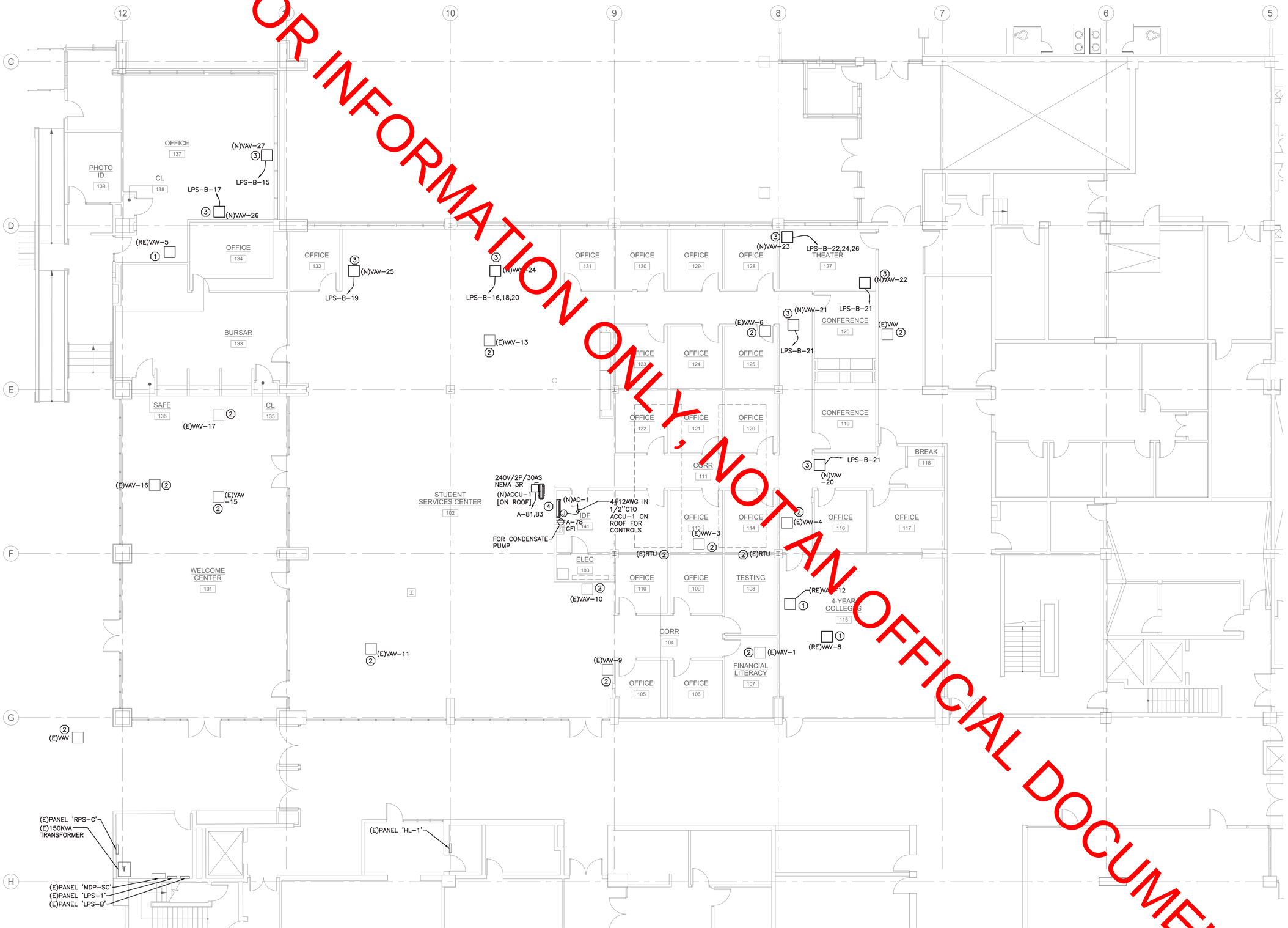

NEW WORK PLAN – EQUIPMENT POWER
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

EQUIPMENT POWER PLAN KEY NOTES:

1. EXISTING UNIT AND ASSOCIATED DISCONNECT SWITCH TO BE RELOCATED. EXTEND EXISTING WIRING TO NEW LOCATION AS FIELD VERIFIED.
2. EXISTING UNIT AND ASSOCIATED CIRCUIT/WIRING & DISCONNECT SWITCH TO REMAIN.
3. VAV BOXES ARE EQUIPPED WITH MANUFACTURER SUPPLIED DOOR INTERLOCKING DISCONNECT SWITCH.
4. INDOOR UNITS AC-1 IS POWERED FROM OUTDOOR UNITS ACCU-1, LOCATED ON ROOF.

11.21.19 FOR BIDDING

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NEW WORK
EQUIPMENT POWER PLAN
ELECTRICAL

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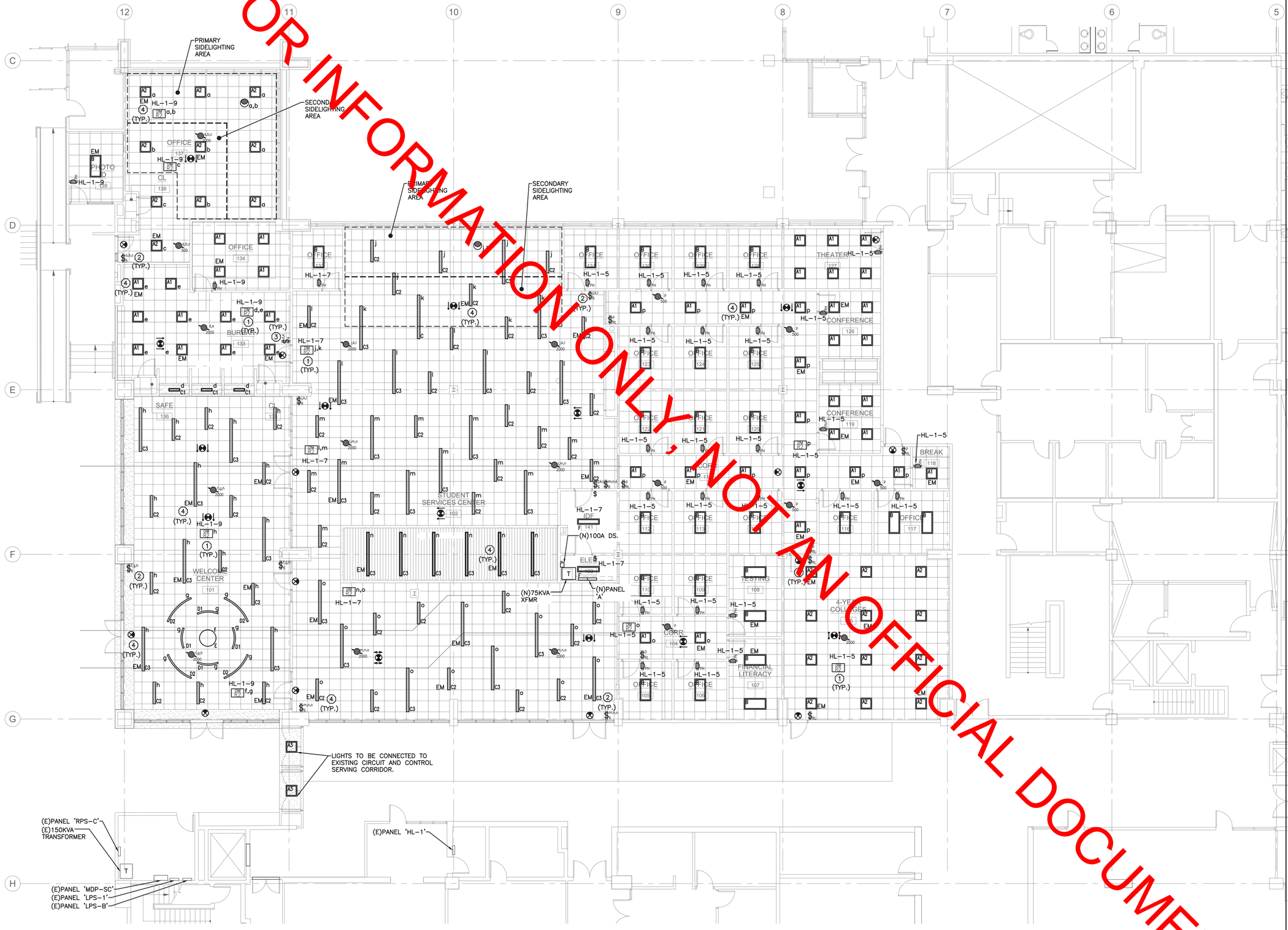

NEW WORK PLAN – LIGHTING
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

LIGHTING KEY NOTES:

1. PROVIDE NEW 1 OR 2 RELAY DIMMING ROOM CONTROLLER, NETWORK BRIDGE, OCCUPANCY SENSOR(S), PHOTOSENSOR AND NETWORK LIGHT SWITCH(ES), AS PER THE PLANS. ROOM CONTROLLER SHALL BE PROGRAMMED WITH THE FOLLOWING:
   NORMAL WORKING HOURS (CONFIRM WORKING HOURS WITH TENANT)
   - OCCUPANCY SENSORS WILL BE SET TO TURN LIGHTS ON TO 50% UPON ENTRY AND THEN RETURNED TO 50% UPON VACANCY.
   - IF LIGHTS IN THE OPEN OFFICE ARE MANUALLY SET TO A HIGHER LEVEL VIA THE LOCAL CONTROL, THEY WILL REMAIN AT THAT SETTING FOR AS LONG AS THE OPEN OFFICE IS OCCUPIED.
   - WHEN THE OPEN OFFICE IS VACATED DURING NORMAL WORKING HOURS THEN THE LIGHTS WILL RETURN TO 50%

   AFTER HOURS (CONFIRM WORKING HOURS WITH TENANT)
   - EVERY 30 MINUTES (OR WHATEVER TIMEOUT IS DESIRED), A SWEEP OFF TIMECLOCK EVENT WILL BE SENT TO THE OPEN OFFICE VIA THE ONBOARD TIMECLOCK LOCATED IN THE ROOM CONTROLLERS.
   - THE AFTER-HOURS TIMECLOCK SWEEP OFF WILL ONLY TURN THE LIGHTS OFF IF THE ROOM IS NOT OCCUPIED.
   - IF THE LIGHTS IN THE OPEN OFFICE ARE MANUALLY SET TO 100% VIA THE LOCAL CONTROL AND THEN THE OCCUPANCY SENSOR TIMES OUT, THE LIGHTS WILL RETURN TO 50%
   - THEN NEXT TIMECLOCK SWEEP WOULD THEN TURN THE LIGHTS OFF PROVIDED THE ROOM REMAINS UNOCCUPIED.
2. THE 6 BUTTON HUBBELL NXSW WALL SWITCH SHALL BE PROGRAMMED AS FOLLOWS:
   - BUTTON 1 – ALL LIGHTING ON/OFF
   - BUTTON 2 – CONTROL SWITCH LEG 'X'
   - BUTTON 3 – CONTROL SWITCH LEG 'Y'
   - BUTTON 4 – CONTROL SWITCH LEG 'Z'
   - BUTTON 5 – DIMMER CONTROL (RAISE)
   - BUTTON 6 – DIMMER CONTROL (LOWER)
3. THE 4 BUTTON HUBBELL NXSW WALL SWITCH SHALL BE PROGRAMMED AS FOLLOWS:
   - BUTTON 1 – CONTROL SWITCH LEG 'X'
   - BUTTON 2 – CONTROL SWITCH LEG 'Y'
   - BUTTON 3 – DIMMER CONTROL (RAISE)
   - BUTTON 4 – DIMMER CONTROL (LOWER)
4. PROVIDE 90-MINUTE EMERGENCY BATTERY PACK/BALLAST FOR EMERGENCY EGRESS LIGHTING.

11.21.19 FOR BIDDING

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ONE STOP CENTER RENOVATION

400 PARAMUS ROAD PARAMUS, NJ

arcari + iovino ARCHITECTS PC

ONE KATHERINE STREET
LITTLE FERRY, NJ 07643
201 641 0600, FAX 201 641 0626
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EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

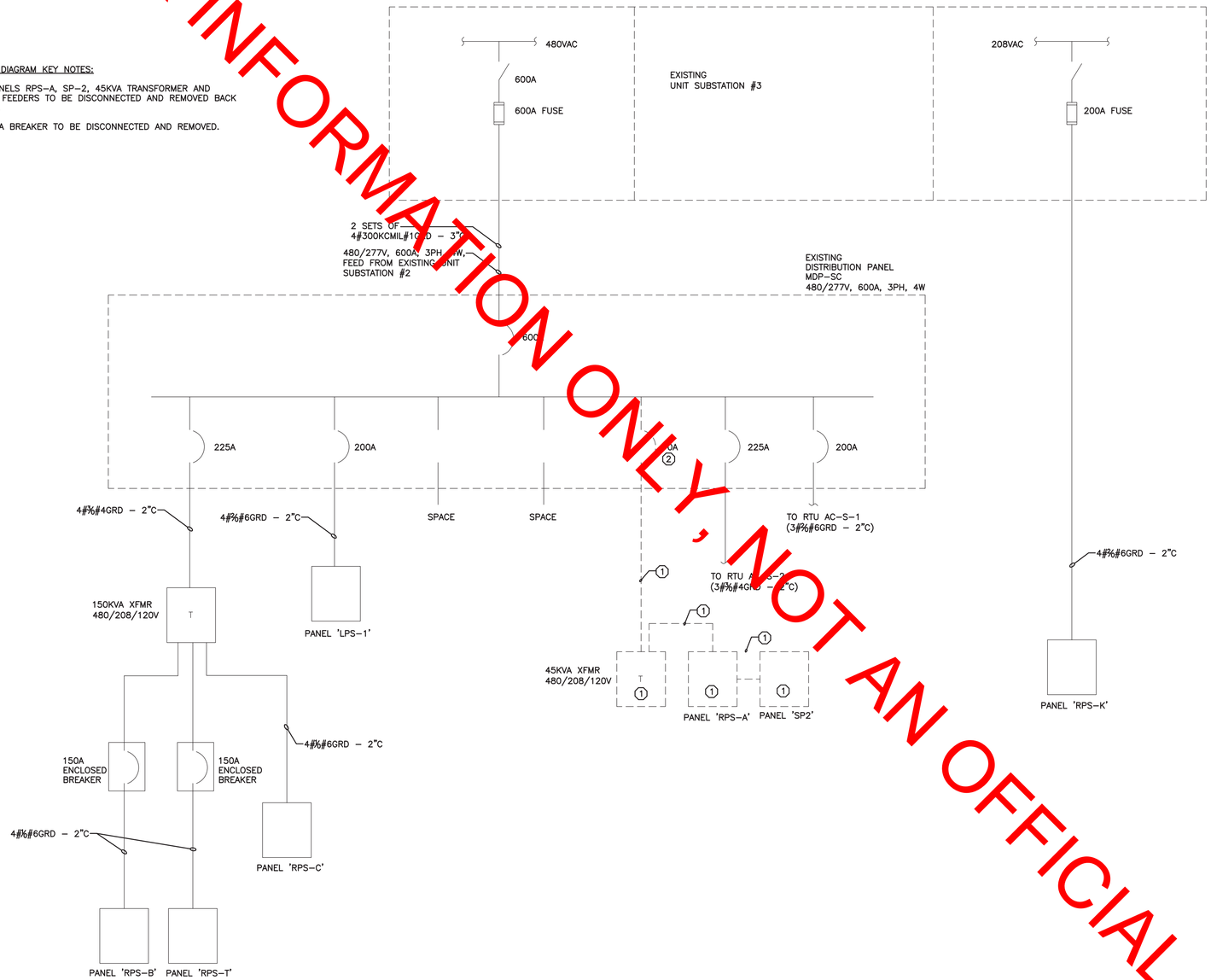
NEW WORK
LIGHTING PLAN
ELECTRICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 ELECTRICAL.DWG

E-301

EXISTING RISER DIAGRAM KEY NOTES:

1. EXISTING PANELS RPS–A, SP–2, 45KVA TRANSFORMER AND ASSOCIATED FEEDERS TO BE DISCONNECTED AND REMOVED BACK TO SOURCE.
2. EXISTING 70A BREAKER TO BE DISCONNECTED AND REMOVED.



EXISTING RISER DIAGRAM– ELECTRICAL

SCALE: NOT TO SCALE

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

SHINE ENGINEERING, P.A.
6 RENSHAW DRIVE, MONTVILLE, NJ 07045
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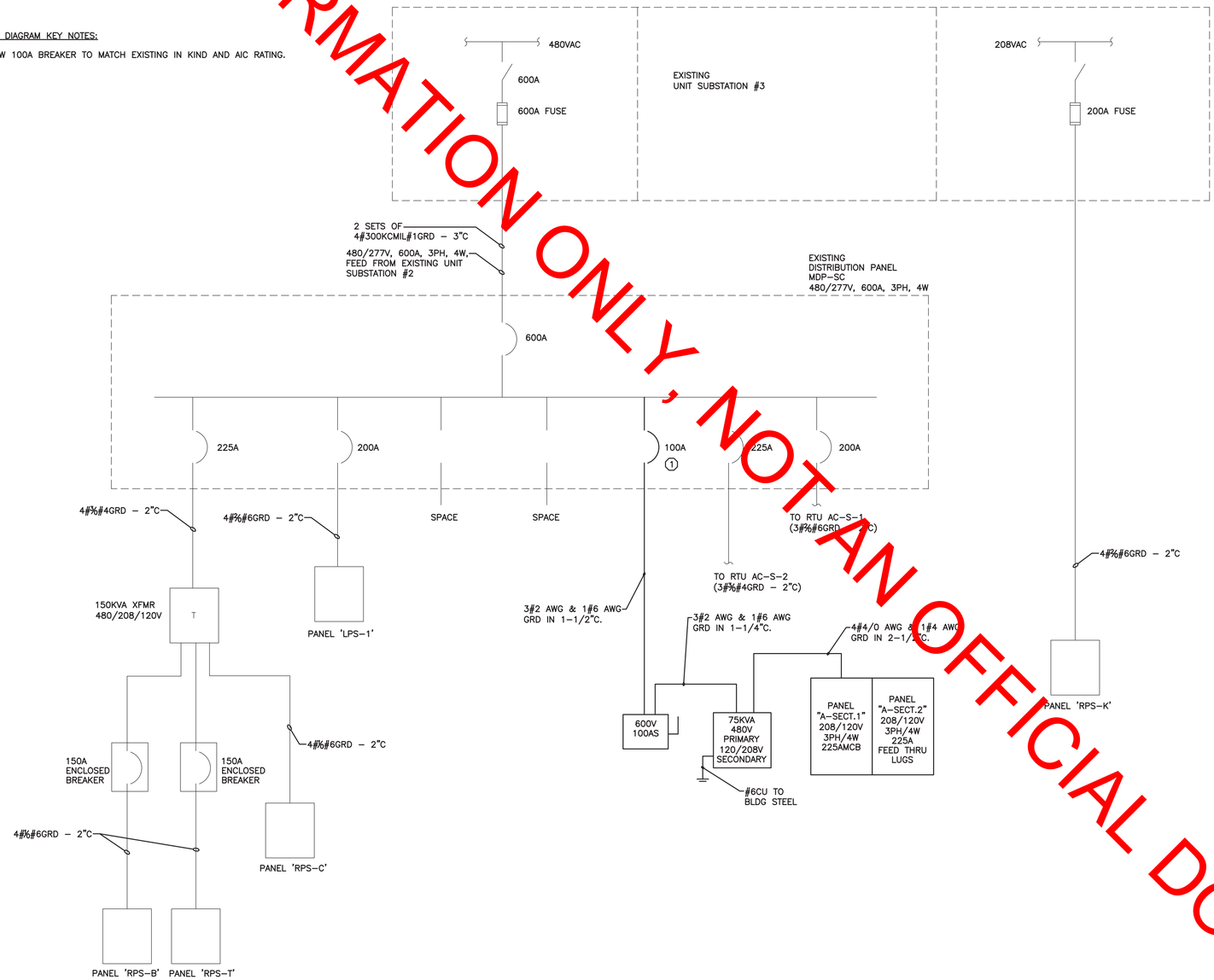
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

RISER DIAGRAM
ELECTRICAL

SCALE: AS NOTED	E-401
DATE: 08.22.2019	
FILE: 19003 ELECTRICAL.DWG	

PROPOSED RISER DIAGRAM KEY NOTES:

1. PROVIDE NEW 100A BREAKER TO MATCH EXISTING IN KIND AND AIC RATING.



PROPOSED ONE–LINE DIAGRAM– ELECTRICAL

SCALE: NOT TO SCALE

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

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RISER DIAGRAM
ELECTRICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 ELECTRICAL.DWG

E-402

Panel "A-SECT 1" (NEW)

JOB NAME:19003 - BCC ONE STOP
RATING: 208/120V, 4W, 3PH, 225A
LOCATION: ELECTRICAL CLOSET

CKT. NO.	CIRCUIT DESCRIPTION	POLE	LOAD KVA	BKR.	BRANCH CIRCUIT	A	B	C	BRANCH CIRCUIT	BKR.	LOAD KVA	POLE	CIRCUIT DESCRIPTION	CKT. NO.
1	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C	2.3			2#12 & 1#12EG IN 3/4"C	20	1.2	1	COMPUTERS	2
3	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C		2.0		2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	4
5	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C			2.0	2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	6
7	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C	2.0			2#12 & 1#12EG IN 3/4"C	20	0.9	1	RECEPTACLES	8
9	RECEPTACLES	1	0.9	20	2#12 & 1#12EG IN 3/4"C		1.2	1.4	2#12 & 1#12EG IN 3/4"C	20	1.5	1	COFFEE MAKER	10
11	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C			1.6	2#12 & 1#12EG IN 3/4"C	20	1.5	1	MICROWAVE	12
13	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C	2.2			2#12 & 1#12EG IN 3/4"C	20	1.1	1	RECEPTACLES	14
15	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C		2.0		2#12 & 1#12EG IN 3/4"C	20	0.9	1	RECEPTACLES	16
17	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C			2.2	2#12 & 1#12EG IN 3/4"C	20	1.1	1	RECEPTACLES	18
19	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C	2.2			2#12 & 1#12EG IN 3/4"C	20	1.1	1	RECEPTACLES	20
21	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C		2.2		2#12 & 1#12EG IN 3/4"C	20	1.1	1	RECEPTACLES	22
23	RECEPTACLES	1	0.9	20	2#12 & 1#12EG IN 3/4"C			1.8	2#12 & 1#12EG IN 3/4"C	20	0.6	1	COMPUTERS	24
25	WORKSTATIONS	1	1.1	20	SEE	1.7			2#12 & 1#12EG IN 3/4"C	20	0.6	1	COMPUTERS	26
27	WORKSTATIONS	1	1.1	20	WIRING		2.2		2#12 & 1#12EG IN 3/4"C	20	1.1	1	RECEPTACLES	28
29	WORKSTATIONS	1	1.1	20	DETAILS			2.6	2#12 & 1#12EG IN 3/4"C	20	1.5	1	COPIER	30
31	WORKSTATIONS	1	1.1	20	ON SHEET E-501	2.6			2#12 & 1#12EG IN 3/4"C	20	1.5	1	COPIER	32
33	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C		2.0		2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	34
35	PRINTERS/SCANNERS	1	1.5	20	2#12 & 1#12EG IN 3/4"C			2.4	2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	36
37	RECEPTACLES	1	1.1	20	2#12 & 1#12EG IN 3/4"C	2.0			2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	38
39	COMPUTERS	1	1.1	20	2#12 & 1#12EG IN 3/4"C		2.3		2#12 & 1#12EG IN 3/4"C	20	1.2	1	COMPUTERS	40
41	COMPUTERS	1	1.1	20	2#12 & 1#12EG IN 3/4"C			2.2	2#12 & 1#12EG IN 3/4"C	20	1.1	1	RECEPTACLES	42
43	COMPUTERS	1	1.1	20	2#12 & 1#12EG IN 3/4"C	2.2			2#12 & 1#12EG IN 3/4"C	20	1.1	1	KIOSK	44
45	COMPUTERS	1	1.1	20	2#12 & 1#12EG IN 3/4"C		2.2		2#12 & 1#12EG IN 3/4"C	20	1.1	1	COMPUTERS	46
47	COMPUTERS	1	1.1	20	2#12 & 1#12EG IN 3/4"C			2.0	2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	48
49	COMPUTERS	1	1.1	20	2#12 & 1#12EG IN 3/4"C	2.0			2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	50
51	COMPUTERS	1	1.1	20	2#12 & 1#12EG IN 3/4"C		2.0		2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	52
53	SPARE	1		20				0.9	2#12 & 1#12EG IN 3/4"C	20	0.9	1	COMPUTERS	54
					TOTAL (PHASE):	19.2	19.3	18.4						

PANEL TYPE: NEMA 1
MOUNTING: SURFACE
MAIN CIRCUIT BREAKER: 225A
INTERRUPTING RATING: 22KA SYM.
FED FROM: 75KVA XFMR

TOTAL CONN.:	56.9	KVA
TOT. CONN. + SPARE:	56.9	KVA
DEMAND:	45.5	KVA
DEMAND:	126.5	AMPS

SPARE CAPACITY 0 %
DEMAND FACTOR 80 %

NOTES
1. ALL BUSING TO BE COPPER
2. BOLT ON BREAKERS ONLY
3. CONTRACTOR IS RESPONSIBLE TO COORDINATE THE SHORT CIRCUIT RATING AT THE UTILITY TRANSFORMER SECONDARY'S PRIOR TO PURCHASING ANY EQUIPMENT.
4. ALL WIRE SIZES ARE BASED ON 75 DEGREE WIRE.

Panel "A-SECT 2" (NEW)

JOB NAME:19003 - BCC ONE STOP
RATING: 208/120V, 4W, 3PH, 225A
LOCATION: ELECTRICAL CLOSET

CKT. NO.	CIRCUIT DESCRIPTION	POLE	LOAD KVA	BKR.	BRANCH CIRCUIT	A	B	C	BRANCH CIRCUIT	BKR.	LOAD KVA	POLE	CIRCUIT DESCRIPTION	CKT. NO.
55	WORKSTATIONS	1	0.6	20	SEE	1.7			2#12 & 1#12EG IN 3/4"C	20	1.1	1	RECEPTACLES	56
57	WORKSTATIONS	1	0.6	20	WIRING		1.5		2#12 & 1#12EG IN 3/4"C	20	0.9	1	RECEPTACLES	58
59	WORKSTATIONS	1	0.6	20	DETAILS			1.1	2#12 & 1#12EG IN 3/4"C	20	0.5	1	IDF RECEPTACLES	60
61	WORKSTATIONS	1	0.6	20	ON SHEET E-501	1.1			2#12 & 1#12EG IN 3/4"C	20	0.5	1	IDF RECEPTACLES	62
63	COPIER	1	1.5	20	2#12 & 1#12EG IN 3/4"C		2.0		2#12 & 1#12EG IN 3/4"C	20	0.5	1	IDF RECEPTACLES	64
65	IDF (L5-30R)	1	2.5	30	2#10 & 1#10EG IN 3/4"C			3.0	2#12 & 1#12EG IN 3/4"C	20	0.5	1	IDF RECEPTACLES	66
67	IDF (L5-30R)	1	2.5	30	2#10 & 1#10EG IN 3/4"C	3.0			2#12 & 1#12EG IN 3/4"C	20	0.5	1	IDF RECEPTACLES	68
69	ACCESS CONTROL	1	0.5	20	2#12 & 1#12EG IN 3/4"C		1.0		2#12 & 1#12EG IN 3/4"C	20	0.5	1	IDF RECEPTACLES	70
71	ACCESS CONTROL	1	0.5	20	2#12 & 1#12EG IN 3/4"C			1.7	2#12 & 1#12EG IN 3/4"C	20	1.2	1	SEC GATES PHOTO ID/BURSAR	72
73	ACCESS CONTROL	1	0.5	20	2#12 & 1#12EG IN 3/4"C	1.7			2#12 & 1#12EG IN 3/4"C	20	1.2	1	SECURITY GATES BURSAR	74
75	ACCESS CONTROL	1	0.5	20	2#12 & 1#12EG IN 3/4"C		1.7		2#12 & 1#12EG IN 3/4"C	20	1.2	1	DOORS STUDENT SERVICES	76
77	DOORS-WELCOME CENTER	1	1.2	20	2#12 & 1#12EG IN 3/4"C			1.4	2#12 & 1#12EG IN 3/4"C	20	0.2	1	CONDENSATE PUMP GFI	78
79	DOORS-WELCOME CENTER	1	1.2	20	2#12 & 1#12EG IN 3/4"C	2.4			2#12 & 1#12EG IN 3/4"C	20	1.2	1	DOORS BURSAR	80
81	SPLIT SYSYTEM	2	0.8	15	3#12 & 1#12EG IN 3/4"C		0.8			20		1	SPARE	82
83	ACCU-1 ROOF		0.8					0.8		20		1	SPARE	84
85	SPARE	1		20		0.0				20		1	SPARE	86
87	SPARE	1		20			0.0						SPACE	88
89	SPARE	1		20				0.0					SPACE	90
91	SPARE	1		20		0.0							SPACE	92
93	SPARE	1		20			0.0						SPACE	94
95	SPACE							0.0					SPACE	96
97	SPACE					0.0							SPACE	98
99	SPACE						0.0						SPACE	100
101	SPACE							0.0					SPACE	102
103	SPACE					0.0							SPACE	104
105	SPACE						0.0						SPACE	106
107	SPACE							0.0					SPACE	108
					TOTAL (PHASE):	9.9	7.0	8.0						

PANEL TYPE: NEMA 1
MOUNTING: SURFACE
MAIN LUGS ONLY
INTERRUPTING RATING: 22KA SYM.
FED FROM: FEED THRU LUGS

TOTAL CONN.:	24.9	KVA
TOT. CONN. + SPARE:	29.9	KVA
DEMAND:	23.9	KVA
DEMAND:	66.4	AMPS

SPARE CAPACITY 20 %
DEMAND FACTOR 80 %

NOTES
1. ALL BUSING TO BE COPPER
2. BOLT ON BREAKERS ONLY
3. CONTRACTOR IS RESPONSIBLE TO COORDINATE THE SHORT CIRCUIT RATING AT THE UTILITY TRANSFORMER SECONDARY'S PRIOR TO PURCHASING ANY EQUIPMENT.
4. ALL WIRE SIZES ARE BASED ON 75 DEGREE WIRE.

Panel "MDP-SC" (EXISTING)

JOB NAME:19003 - BCC ONE STOP
RATING: 480/277V, 4W, 3PH, 600A
LOCATION: ELECTRICAL ROOM

CKT. NO.	CIRCUIT DESCRIPTION	POLE	LOAD KVA	BKR.	BRANCH CIRCUIT	A	B	C	BRANCH CIRCUIT	BKR.	LOAD KVA	POLE	CIRCUIT DESCRIPTION	CKT. NO.
1						0.0								2
3	EXISTING	3		60	EXISTING		0.0		4#6 & 1#10EG IN 1-1/4"C	60		3	EXISTING	4
5								0.0						6
7			**25.0**			25.0								8
9	**NEW 75KVA TRANSFORMER**	**3**	**25.0**	**100**	**SEE RISER DIAGRAM**		25.0		4#3 & 1#8EG IN 1-1/2"C	100		3	EXISTING	10
11	**NOTE 5**		**25.0**					25.0						12
13						0.0								14
15	EXISTING	3		200	EXISTING		0.0		4#3/0 & 1#6EG IN 2"C	200		3	EXISTING	16
17								0.0						18
19						0.0								20
21	EXISTING	3		225	EXISTING		0.0		4#4/0 & 1#4EG IN 2-1/2"C	225		3	EXISTING	22
23								0.0						24
25						0.0								26
27							0.0							28
29	MAIN	3		600	EXISTING			0.0						30
31						0.0								32
33							0.0							34
35								0.0						36
					TOTAL (PHASE):	25.0	25.0	25.0						

PANEL TYPE: NEMA 1
MOUNTING: SURFACE
MAIN LUGS ONLY
INTERRUPTING RATING: 0KA SYM.
FED FROM:

TOTAL CONN.:	75.0	KVA
TOT. CONN. + SPARE:	90.0	KVA
DEMAND:	72.0	KVA
DEMAND:	86.7	AMPS

SPARE CAPACITY 20 %
DEMAND FACTOR 80 %

NOTES
1. ALL BUSING TO BE COPPER
2. BOLT ON BREAKERS ONLY
3. CONTRACTOR IS RESPONSIBLE TO COORDINATE THE SHORT CIRCUIT RATING AT THE UTILITY TRANSFORMER SECONDARY'S PRIOR TO PURCHASING ANY EQUIPMENT.
4. ALL WIRE SIZES ARE BASED ON 75 DEGREE WIRE.
5. PROVIDE NEW BREAKER TO MATCH EXISTING IN KIND AND AIC RATING.

Panel "HL-1" (EXISTING)

JOB NAME:19003 - BCC ONE STOP
RATING: 480/277V, 4W, 3PH, 100A
LOCATION: ELECTRICAL CLOSET

CKT. NO.	CIRCUIT DESCRIPTION	POLE	LOAD KVA	BKR.	BRANCH CIRCUIT	A	B	C	BRANCH CIRCUIT	BKR.	LOAD KVA	POLE	CIRCUIT DESCRIPTION	CKT. NO.
1	EXISTING	1		20	EXISTING	0.0			EXISTING	20		1	EXISTING	2
3	EXISTING	1		20	EXISTING		0.0		EXISTING	20		1	EXISTING	4
5	**LIGHTING**	**1**	**3.0**	**20**	**2#12 & 1#12EG IN 3/4"C**			3.0	EXISTING	20		1	EXISTING	6
7	**LIGHTING**	**1**	**3.0**	**20**	**2#12 & 1#12EG IN 3/4"C**	3.0			EXISTING	20		1	EXISTING	8
9	**LIGHTING**	**1**	**3.0**	**20**	**2#12 & 1#12EG IN 3/4"C**		3.0		EXISTING	20		1	EXISTING	10
11	EXISTING	1		20	EXISTING			0.0	EXISTING	20		1	EXISTING	12
13	EXISTING	1		20	EXISTING	0.0			EXISTING	20		1	EXISTING	14
15	EXISTING	1		20	EXISTING		0.0		EXISTING	20		1	EXISTING	16
17	EXISTING	1		20	EXISTING			0.0	EXISTING	20		1	EXISTING	18
					TOTAL (PHASE):	3.0	3.0	3.0						

TOTAL CONN.:	9.0	KVA
TOT. CONN. + SPARE:	10.8	KVA
DEMAND:	8.6	KVA
DEMAND:	10.4	AMPS

SPARE CAPACITY 20 %
DEMAND FACTOR 80 %

NOTES
1. ALL BUSING TO BE COPPER
2. BOLT ON BREAKERS ONLY
3. CONTRACTOR IS RESPONSIBLE TO COORDINATE THE SHORT CIRCUIT RATING AT THE UTILITY TRANSFORMER SECONDARY'S PRIOR TO PURCHASING ANY EQUIPMENT.
4. ALL WIRE SIZES ARE BASED ON 75 DEGREE WIRE.

Panel "LPS-B" (EXISTING)

JOB NAME:19003 - BCC ONE STOP
RATING: 480/277V, 4W, 3PH, 100A
LOCATION: ELECTRIC ROOM

CKT. NO.	CIRCUIT DESCRIPTION	POLE	LOAD KVA	BKR.	BRANCH CIRCUIT	A	B	C	BRANCH CIRCUIT	BKR.	LOAD KVA	POLE	CIRCUIT DESCRIPTION	CKT. NO.
1	EXISTING	1	3.0	20	EXISTING	6.0			EXISTING	20	3.0	1	EXISTING	2
3	EXISTING	1	3.0	20	EXISTING		6.0		EXISTING	20	3.0	1	EXISTING	4
5	EXISTING	1	3.0	20	EXISTING			6.0	EXISTING	20	3.0	1	EXISTING	6
7	EXISTING	1	3.0	20	EXISTING	6.0			EXISTING	20	3.0	1	EXISTING	8
9	EXISTING	1	3.0	20	EXISTING		6.0		EXISTING	20	3.0	1	EXISTING	10
11	EXISTING	1	3.0	20	EXISTING			6.0	EXISTING	20	3.0	1	EXISTING	12
13	EXISTING	1	3.0	20	EXISTING	6.0			EXISTING	20	3.0	1	EXISTING	14
15	**VAV-27 NOTE 5**	**1**	**5.0**	**25**	**2#10& 1#10EG IN 3/4"C**		7.3				**2.3**			16
17	**VAV-26 NOTE 5**	**1**	**5.0**	**25**	**2#10& 1#10EG IN 3/4"C**			7.3	**3#12 & 1#12EG IN 3/4"C**	**15**	**2.3**	**3**	**VAV-24**	18
19	**VAV-25 NOTE 5**	**1**	**1.5**	**15**	**2#12 & 1#12EG IN 3/4"C**	3.8					**2.3**		**NOTE 5**	20
21	**VAV-22/21/20 NOTE 5**	**1**	**2.0**	**20**	**2#12 & 1#12EG IN 3/4"C**		4.3				**2.3**			22
23	SPACE							2.3	**3#12 & 1#12EG IN 3/4"C**	**15**	**2.3**	**3**	**VAV-23**	24
25	SPACE					2.3					**2.3**		**NOTE 5**	26
27	SPACE						0.0						SPACE	28
29	SPACE							0.0					SPACE	30
31	SPACE					0.0							SPACE	32
33	SPACE						0.0						SPACE	34
35	SPACE							0.0					SPACE	36
37	SPACE					0.0							SPACE	38
39	SPACE						0.0						SPACE	40
41	SPACE							0.0					SPACE	42
					TOTAL (PHASE):	24.1	23.6	21.6						

PANEL TYPE: NEMA 1
MOUNTING: SURFACE
MAIN LUGS ONLY
INTERRUPTING RATING: 14KA SYM.
FED FROM: LPS-1

TOTAL CONN.:	69.3	KVA
TOT. CONN. + SPARE:	83.2	KVA
DEMAND:	66.5	KVA
DEMAND:	80.1	AMPS

SPARE CAPACITY 20 %
DEMAND FACTOR 80 %

NOTES
1. ALL BUSING TO BE COPPER
2. BOLT ON BREAKERS ONLY
3. CONTRACTOR IS RESPONSIBLE TO COORDINATE THE SHORT CIRCUIT RATING AT THE UTILITY TRANSFORMER SECONDARY'S PRIOR TO PURCHASING ANY EQUIPMENT.
4. ALL WIRE SIZES ARE BASED ON 75 DEGREE WIRE.
5. PROVIDE NEW BREAKER TO MATCH EXISTING IN KIND AND AIC RATING.

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

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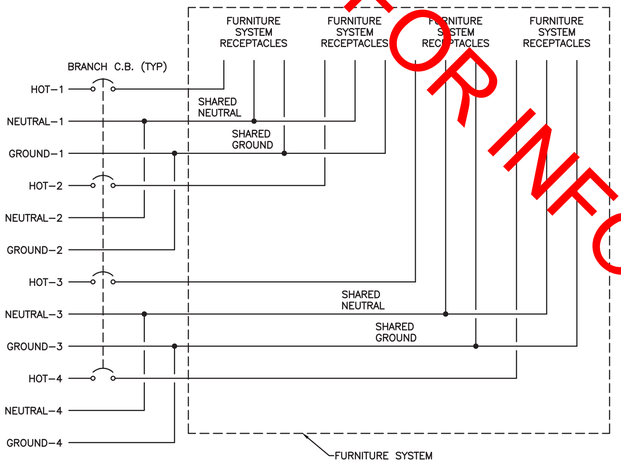
PANEL SCHEDULES
ELECTRICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 ELECTRICAL.DWG

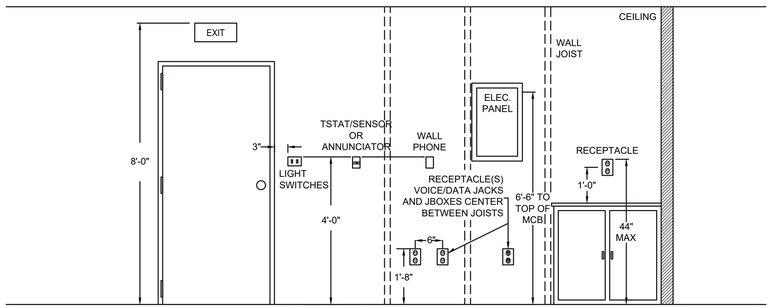
E-403



DETAIL NOTES:

1. FURNITURE SYSTEM INCLUDES (4) 12AWG HOT CONDUCTORS, (2) 10AWG SHARED NEUTRAL, & (2) 12AWG SHARED GROUND. COORDINATE EXACT REQUIREMENTS WITH FURNITURE SYSTEM VENDOR.
2. CONDUCTORS SHALL BE IDENTIFIED PER NEC ARTICLE 200 AND NEC 250.119
3. FURNITURE SYSTEM SHALL BE WIRED IN ACCORDANCE WITH NEC 605.9

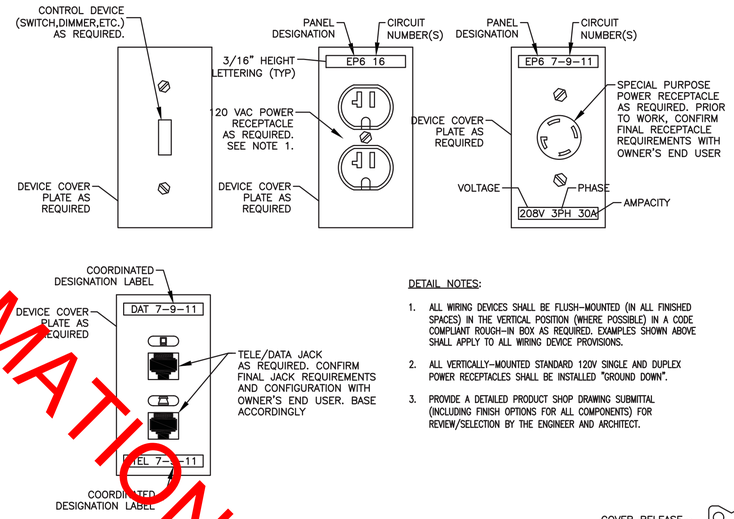
TYPICAL FURNITURE WIRING DIAGRAM – 4 CIRCUIT (2+2)
NOT TO SCALE



DETAIL NOTES:

1. COORDINATE ALL LOCATIONS OF ELECTRICAL EQUIPMENT WITH ARCHITECTURAL DRAWINGS.
2. USE THESE DEVICE MOUNTING HEIGHTS UNLESS OTHERWISE INDICATED ON ARCHITECTURAL DRAWINGS.
3. DEVICE HEIGHTS SHOWN FOR INFORMATIONAL PURPOSES ONLY. HEIGHTS APPLY FOR INSTALLED DEVICES AND EQUIPMENT.

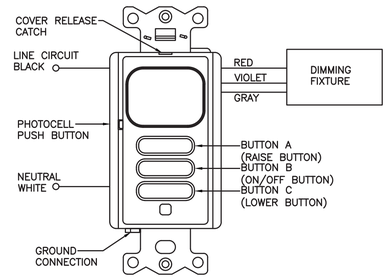
STANDARD MOUNTING HEIGHTS
NOT TO SCALE



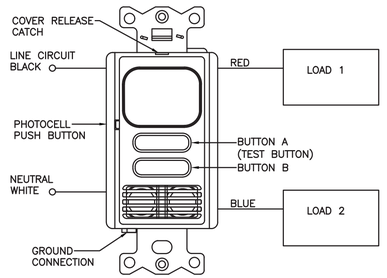
DETAIL NOTES:

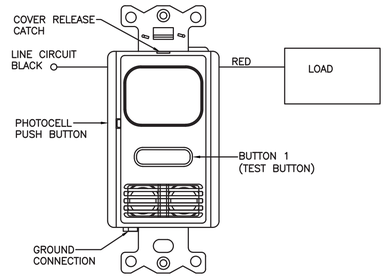
1. ALL WIRING DEVICES SHALL BE FLUSH–MOUNTED (IN ALL FINISHED SPACES) IN THE VERTICAL POSITION (WHERE POSSIBLE) IN A CODE COMPLIANT ROUGH–IN BOX AS REQUIRED. EXAMPLES SHOWN ABOVE SHALL APPLY TO ALL WIRING DEVICE PROVISIONS.
2. ALL VERTICALLY–MOUNTED STANDARD 120V SINGLE AND DUPLEX POWER RECEPTACLES SHALL BE INSTALLED "GROUND DOWN".
3. PROVIDE A DETAILED PRODUCT SHOP DRAWING SUBMITTAL (INCLUDING FINISH OPTIONS FOR ALL COMPONENTS) FOR REVIEW/SELECTION BY THE ENGINEER AND ARCHITECT.

TYPICAL FLUSH–MOUNTED WIRING DEVICES
NOT TO SCALE

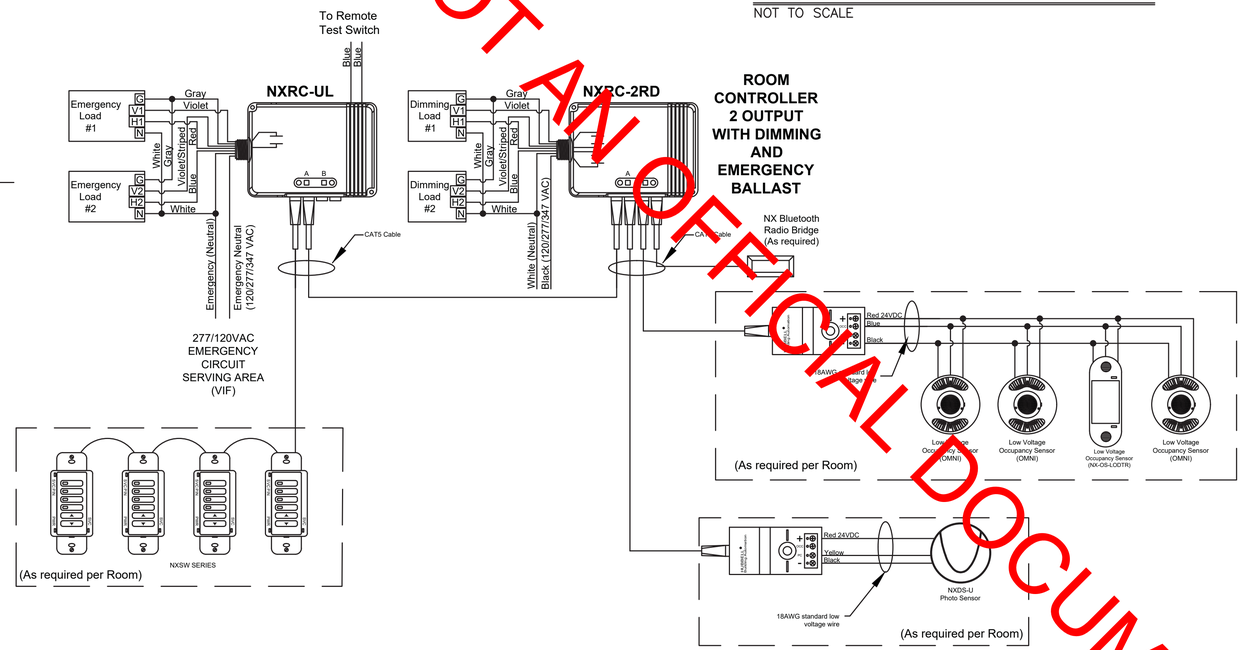


TYPICAL WALL DIMMING VACANCY SWITCH DETAIL
NOT TO SCALE





TYPICAL WALL VACANCY SWITCH DETAIL
NOT TO SCALE



TYPICAL DUAL OUTPUT DIMMING ROOM CONTROLLER WITH EMERGENCY RELAY DETAIL
NOT TO SCALE

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

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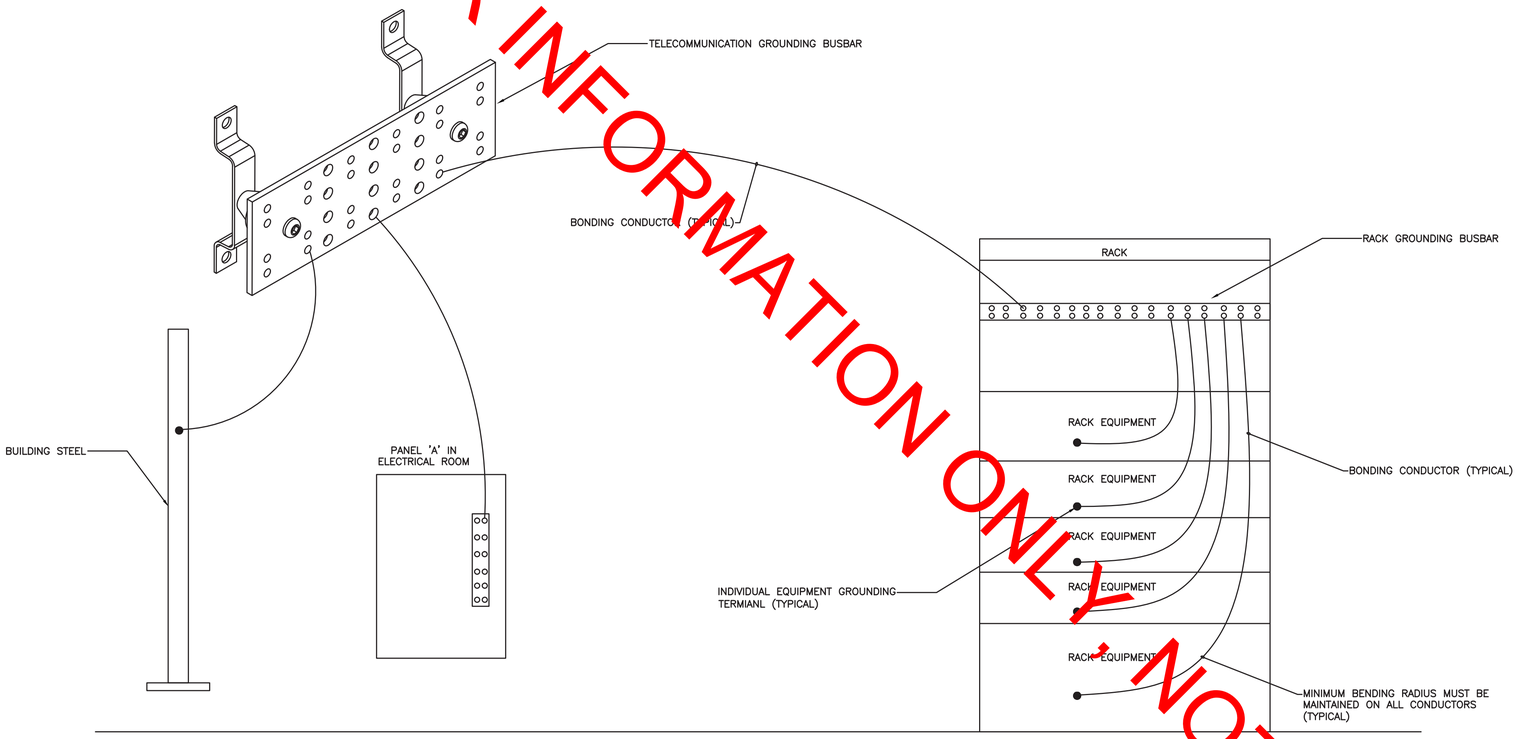
EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

DETAILS
ELECTRICAL

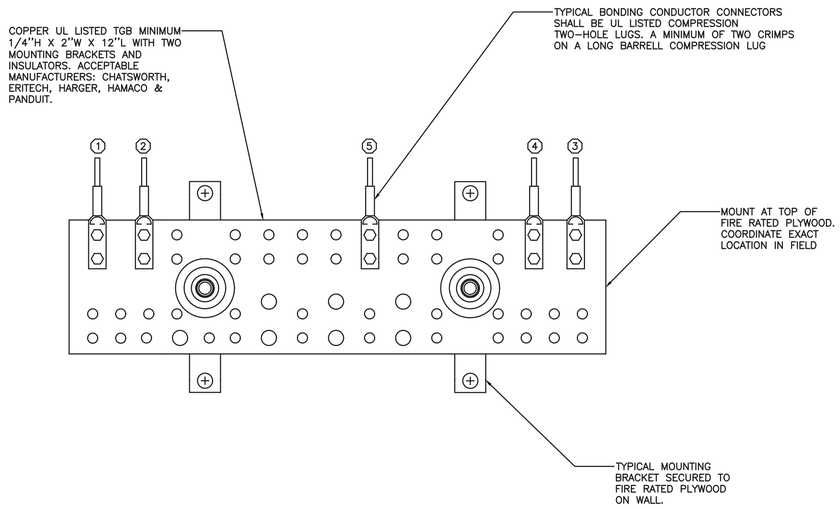
SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 ELECTRICAL.DWG

E-501



RACK GROUNDING DETAILS (TYPICAL)

SCALE: NOT TO SCALE



TELECOMMUNICATION GROUNDING BUSBAR (TGB)

SCALE: NOT TO SCALE

GROUNDING & BONDING GENERAL NOTES:

1. BONDING CONDUCTOR SHALL BE GREEN COLOR INSULATED COPPER CONDUCTOR SIZED PER "BONDING CONDUCTOR SIZING CHART" (ANSI J-STD-607-A).

BONDING CONDUCTOR SIZING CHART	
LENGTH (FEET)	SIZE (AWG)
LESS THAN 13'	#6
14'-20'	#4
21'-26'	#3
27'-33'	#2
34'-41'	#1
42'-52'	#1/0
53'-66'	#2/0
GREATER THAN 66'	#3/0

GROUNDING & BONDING GENERAL NOTES:

1. BONDING CONDUCTOR TO NEAREST BUILDING STEEL STRUCTURE. UTILIZE EXORTHERMIC WELDING BUILDING STEEL.
2. BONDING CONDUCTOR TO NEAREST BUILDING ELECTRICAL PANELBOARD GROUND BAR. UTILIZE LISTED CONNECTOR TO PANELBOARD GROUND BUS.
3. TELECOMMUNICATION BONDING BACKBONE FOR GROUNDING EQUALIZER IF APPLICABLE.
4. TYPICAL TELECOMMUNICATION BONDING BACKBONE (TBB) THAT INTERCONNECTS ALL TELECOMMUNICATION GROUNDING BUSBARS (TGB) WITH THE TELECOMMUNICATION MAIN GROUNDING BUSBAR (TMGB).
5. BONDING CONDUCTOR TO TELECOMMUNICATION CABLE RUNWAY(S), RACK(S), CABINET(S) AND APPLICABLE EQUIPMENT. DAISY CHAINING OF BONDING CONDUCTOR IS NOT ACCEPTABLE. EACH RACK IS TO HAVE A DEDICATED HOMERUN BONDING CONDUCTOR BACK TO THE TGB.

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

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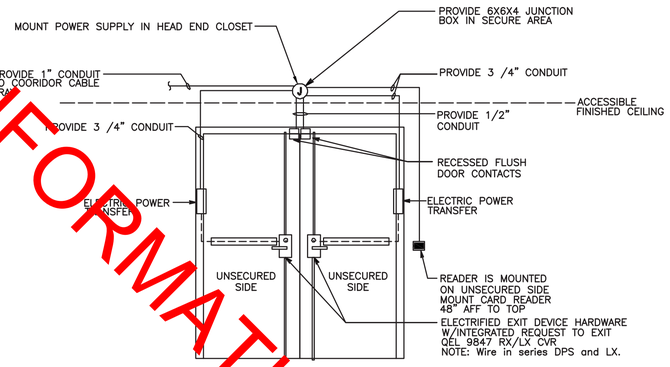
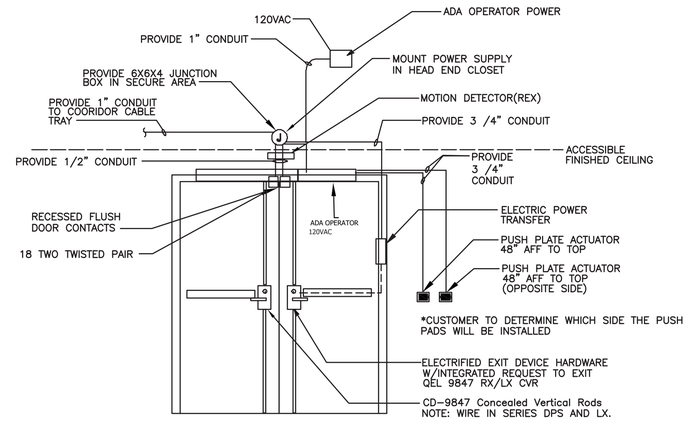
IDF ROOM
GROUNDING DETAILS
ELECTRICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 ELECTRICAL.DWG

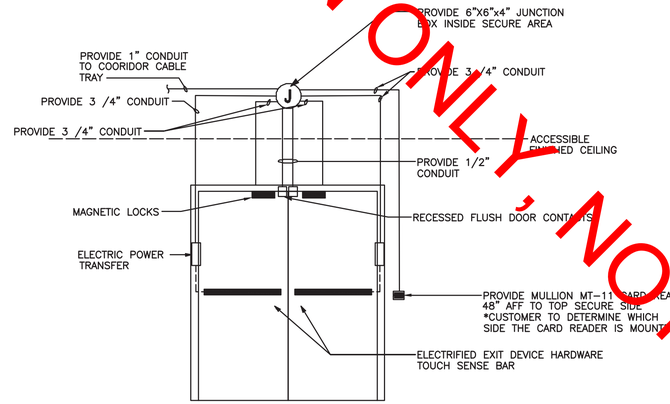
E-502



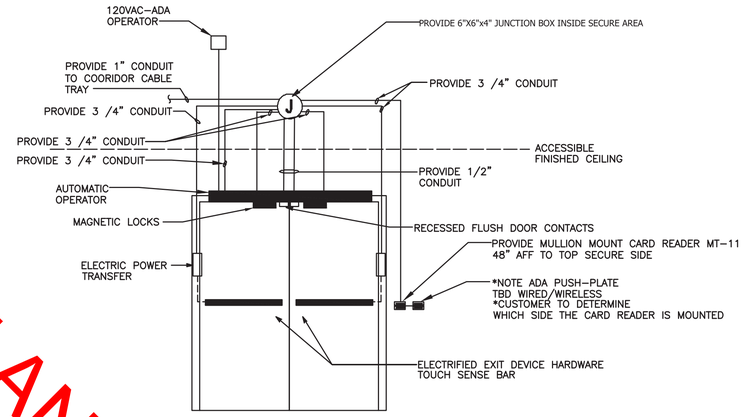
ACCESS CONTROL DOOR ELEVATION DETAIL 1
NOT TO SCALE



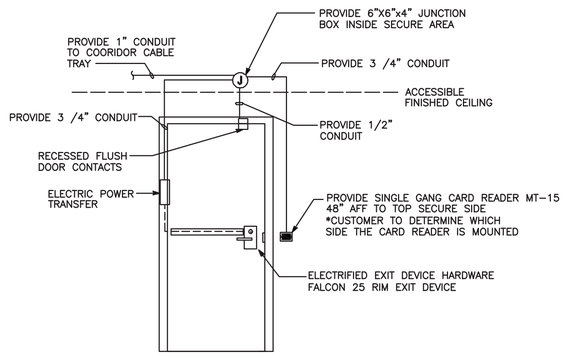
ACCESS CONTROL DOOR ELEVATION DETAIL 2
NOT TO SCALE



ACCESS CONTROL DOOR ELEVATION DETAIL 3
NOT TO SCALE



ACCESS CONTROL DOOR ELEVATION DETAIL 4
NOT TO SCALE



ACCESS CONTROL DOOR ELEVATION DETAIL 5
NOT TO SCALE

REFER TO ARCHITECTURAL DRAWINGS FOR DOOR HARDWARE REQUIREMENTS AND PROVIDE THE REQUIRED COMPONENTS.

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

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ACCESS CONTROL
DOOR DETAILS
ELECTRICAL

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 ELECTRICAL.DWG

E-503

FIRE ALARM NOTES

A. FIRE ALARM SPECIFICATION

1. THE FOLLOWING ARE MINIMUM REQUIREMENTS. THE SYSTEM PROVIDED SHALL BE IN COMPLIANCE WITH THE LATEST EDITION OF THE N.E.C., IBC2015–NEW JERSEY EDITION AND LOCAL JURISDICTIONS. THE RISER AND THE PLANS ARE OF THE SIMPLIFIED FORMAT. PRECISE INSTALLATION DETAILS AND WIRING REQUIREMENTS SHALL BE PER THE MANUFACTURER'S SHOP DRAWINGS. THE SYSTEM PROVIDED SHALL BE COMPLETE IN ALL DETAILS.

B. GENERAL

1. EQUIPMENT SHALL MATCH WITH EXISTING. EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
2. EQUIPMENT SHALL BE PRESENTED AS A 'SINGLE SOURCE' ITEM FOR WHICH RESPONSIBLE 'ONE PARTY' MAINTENANCE AND SERVICE IS AVAILABLE.
3. ALL ACCESS DOORS REQUIRED IN GENERAL CONSTRUCTION ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY SIZE, TYPE AND LOCATION OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED EQUIPMENT, JUNCTION BOXES AND OTHER RELATED EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL IDENTIFY THESE REQUIREMENTS ON A COORDINATED SHOP DRAWING.

C. DEVICES

1. PROVIDE ADDRESSABLE SPACE AND DUCT MOUNT SMOKE DETECTORS, ADDRESSABLE THERMAL DETECTORS, ADDRESSABLE MANUAL STATIONS, CONTROL MODULES, 'ADA' STROBES AND COMBINATION VISUAL/AUDIBLE DEVICES AND OTHER DEVICES AS REQUIRED TO PROVIDE A FULLY OPERATIONAL AND CODE COMPLIANT SYSTEM.
2. INTERFACING CONTROL RELAYS SHALL BE PROVIDED AS REQUIRED FOR THE POWER CONTROL FUNCTIONS.
3. DEVICES SHALL BE INSTALLED 'FLUSH' IN FINISHED AREAS. PROVIDE SURFACE MOUNTED DEVICE BACKBOXES WHERE IT IS IMPOSSIBLE TO INSTALL FLUSH MOUNTED EQUIPMENT.

D. FIELD WIRING

1. ALL WIRING SHALL BE INSTALLED IN METAL RACEWAYS (EMT) ½" TRADE SIZE MINIMUM OR UL LISTED FIRE ALARM METAL CLAD CABLE. UL LISTED FIRE ALARM RATED PLENUM CABLE MAY BE USED ONLY ABOVE HUNG CEILINGS WHERE APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

E. TESTING AND START UP

1. THE ELECTRICAL CONTRACTOR SHALL FULLY TEST HIS WIRING FOR SHORTS, GROUNDS AND OPENS BEFORE CALL IN THE MANUFACTURER'S REPRESENTATIVE AND PRIOR TO ENERGIZING THE SYSTEM. THE MANUFACTURER'S REPRESENTATIVE SHALL CHECK AND START THE SYSTEM. THE MANUFACTURER SHALL DEMONSTRATE THE SYSTEM TO THE OWNERS REPRESENTATIVE AND A FULL PERFORMANCE TEST SHALL BE PERFORMED IN HIS PRESENCE. A TEST REPORT INDICATING THE FUNCTIONALITY OF ALL THE COMPONENTS SHALL BE FILLED OUT IN TRIPLICATE AND SIGNED BY ALL PARTICIPANTS. THEREAFTER, THE TESTS SHALL BE PERFORMED TO THE SATISFACTION OF THE SUB–CODE OFFICIAL AS APPLICABLE.
2. ALL FIRE ALARM TESTING MUST BE DONE OUTSIDE OF NORMAL BUSINESS HOURS.

F. SHOP DRAWING SUBMISSION

1. SHOP DRAWINGS SHALL INDICATE THE FULL INFORMATION OF INDIVIDUAL DEVICES, THE CONTROL AND A COMPLETE SYSTEM POINT TO POINT WIRING DIAGRAM. A LISTING OF ALL THE ADDRESSES SHALL BE INCLUDED. TEN (10) COPIES SHALL BE SUBMITTED PLUS ONE ADDITIONAL SUBMISSION SHALL BE MADE TO THE LOCAL FIRE CODE OFFICIALS FOR THEIR COMMENTS AND APPROVAL.

G. SEQUENCE OF OPERATION

1. ALL ALARMS SHALL BE ANNUNCIATED IN THE ENGLISH LANGUAGE ON THE FIRE ALARM PANEL WINDOW AND REMOTE ANNUNCIATOR.
2. ACTIVATION OF ANY ALARM SENSING DEVICE SHALL CONTINUOUSLY EFFECT THE ALARM THROUGHOUT THE BUILDING UNTIL MANUALLY RESET AT THE CONTROL PANEL.
3. ALARMS SHALL BE RECORDED AT THE CONTROL PANEL PER THE BUILT–IN FEATURES OF THE SPECIFIED SYSTEM. EVENT HISTORY SHALL BE PRINTED OUT.
4. ACTIVATION OF AN ALARM SHALL SHUT DOWN ALL THE ROOF FANS AND MUA'S.
5. THE FIRE ALARM PANEL SHALL BE ACTIVATED TO THE MUNICIPAL AND CENTRAL STATION CONNECTIONS. PROVIDE ALL EQUIPMENT REQUIRED FOR THIS PURPOSE INCLUDING AUTO–DIALERS. PROVIDE PHONE LINES TO THE TELEPHONE TERMINAL SERVICE BOARD.
6. ALL WORK SHALL BE SUPERVISED BY THE OWNER'S EXISTING FIRE ALARM MAINTENANCE CONTRACTOR

EXISTING SERVICE CONTRACTOR

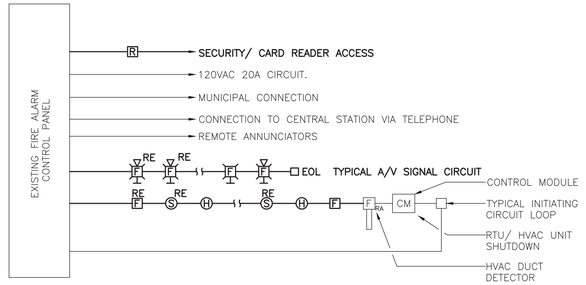
1. ALL WORK SHALL BE SUPERVISED BY THE OWNER'S EXISTING FIRE ALARM MAINTENANCE CONTRACTOR. CONTACT BOB FARM @ 'UNITED FIRE PROTECTION' @ 908–688–0300.

GENERAL ABBREVIATIONS

IDENTIFIER	DESCRIPTION	IDENTIFIER	DESCRIPTION
AFF	ABOVE FINISHED FLOOR	MH	MOUNTING HEIGHT
AFG	ABOVE FINISHED GRADE	MIN	MINIMUM
BFG	BELOW FINISHED GRADE	MOD	MOTOR OPERATED DAMPER
BLDG	BUILDING	MTD	MOUNTED
cd	CANDELA	NIC	NOT IN CONTRACT
CO	COMPANY	NTS	NOT TO SCALE
DN	DOWN	OC	ON CENTER
DWG(S)	DRAWING(S)	PC	PLUMBING CONTRACTOR
EC	ELECTRICAL CONTRACTOR	PSI	POUNDS PER SQUARE INCH
EM	EMERGENCY	R	EXISTING EQUIPMENT TO BE REMOVED
EQUIP	EQUIPMENT	RC	REFRIGERATION CONTRACTOR
E	EXISTING	RE	EXISTING EQUIPMENT TO BE RELOCATED
FLA	FULL LOAD AMPS	RLA	RUNNING LOAD AMPS
FS	FLOW SWITCH	RPM	REVOLUTIONS PER MINUTE
GC	GENERAL CONTRACTOR	SQ. FT.	SQUARE FEET
HP	HORSEPOWER	TYP	TYPICAL
MAX	MAXIMUM	UC	UNDERCUT DOOR
MC	MECHANICAL CONTRACTOR	UON	UNLESS OTHERWISE NOTED
MCA	MINIMUM CIRCUIT AMPS	V.I.F.	VERIFY IN FIELD
MFR	MANUFACTURER	WP	WEATHERPROOF

FIRE ALARM SYMBOLS

F 75cd	COMBINATION FIRE ALARM INDICATING A.D.A. VISUAL/AUDIBLE DEVICE – SEMI–FLUSH MTD 80" AFF TO BOTTOM OF DEVICE. NUMBER INDICATES CANDELA
F 110cd	FIRE ALARM INDICATING A.D.A. VISUAL DEVICE – SEMI–FLUSH MTD 80" AFF TO BOTTOM OF DEVICE. NUMBER INDICATES CANDELA
F	FIRE ALARM MANUAL PULL STATION – MOUNT 48" AFF TO TOP OF DEVICE
R	FIRE ALARM RELAY
S	SMOKE DETECTOR – CEILING MOUNTED
C	CARBON MONOXIDE SENSOR POWER FROM FIRE ALARM SYSTEM
H	HEAT DETECTOR (ROR – INDICATES RATE OF RISE, OTHERWISE)
RTS	REMOTE TEST STATION
F RA	AIR DUCT SMOKE DETECTOR – RA = RETURN AIR
	MAGNETIC DOOR HOLDER
F RE	DEVICE WITH AN "RE" IS AN EXISTING DEVICE TO BE RELOCATED
F E	DEVICE WITH AN "E" IS AN EXISTING DEVICE TO REMAIN
	SYMBOL HATCHED IS A DEVICE TO BE REMOVED. REMOVE BRANCH CIRCUITRY/SYSTEM WIRING BACK TO SOURCE

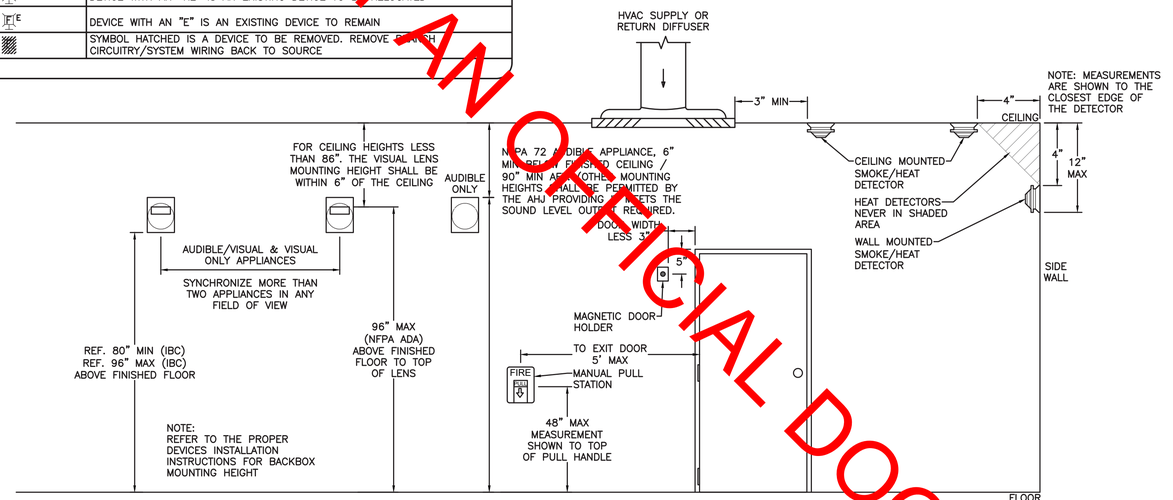


FIRE ALARM SYSTEM CONCEPTUAL WIRING

NOT TO SCALE

NOTES:

1. CONTRACTOR SHALL PROVIDE FIRE ALARM SHOP DRAWINGS IN ACCORDANCE WITH THE 2015 IBC SECTION 907.1.2. THE SHOP DRAWINGS SHALL BE SIGNED & SEALED BY A NJ LICENSED PROFESSIONAL ENGINEER WHICH SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING:
   a. FIRE ALARM PLAN
   b. POINT TO POINT RISER DIAGRAM
   c. BATTERY CALCULATIONS
   d. VOLT DROP CALCULATIONS
   e. FIRE ALARM WIRE TYPES
   f. CUT SHEETS OF PANEL & ALL DEVICES
2. THIS DIAGRAM IS FOR BASIC CONCEPT ONLY. SYSTEM SHALL BE WIRED IN ACCORDANCE W/AN APPROVED SET OF WIRING DIAGRAMS INCLUDED IN THE FIRE ALARM SHOP DRAWINGS.
3. INTERLOCK HEAT DETECTORS IN ELEVATOR SHAFT AND MACHINE ROOM WITH ELEVATOR CONTACTOR FOR SHUTDOWN.
4. PROVIDE LINE ISOLATION MONITOR MODULES.



STANDARD MOUNTING DETAILS

NOT TO SCALE

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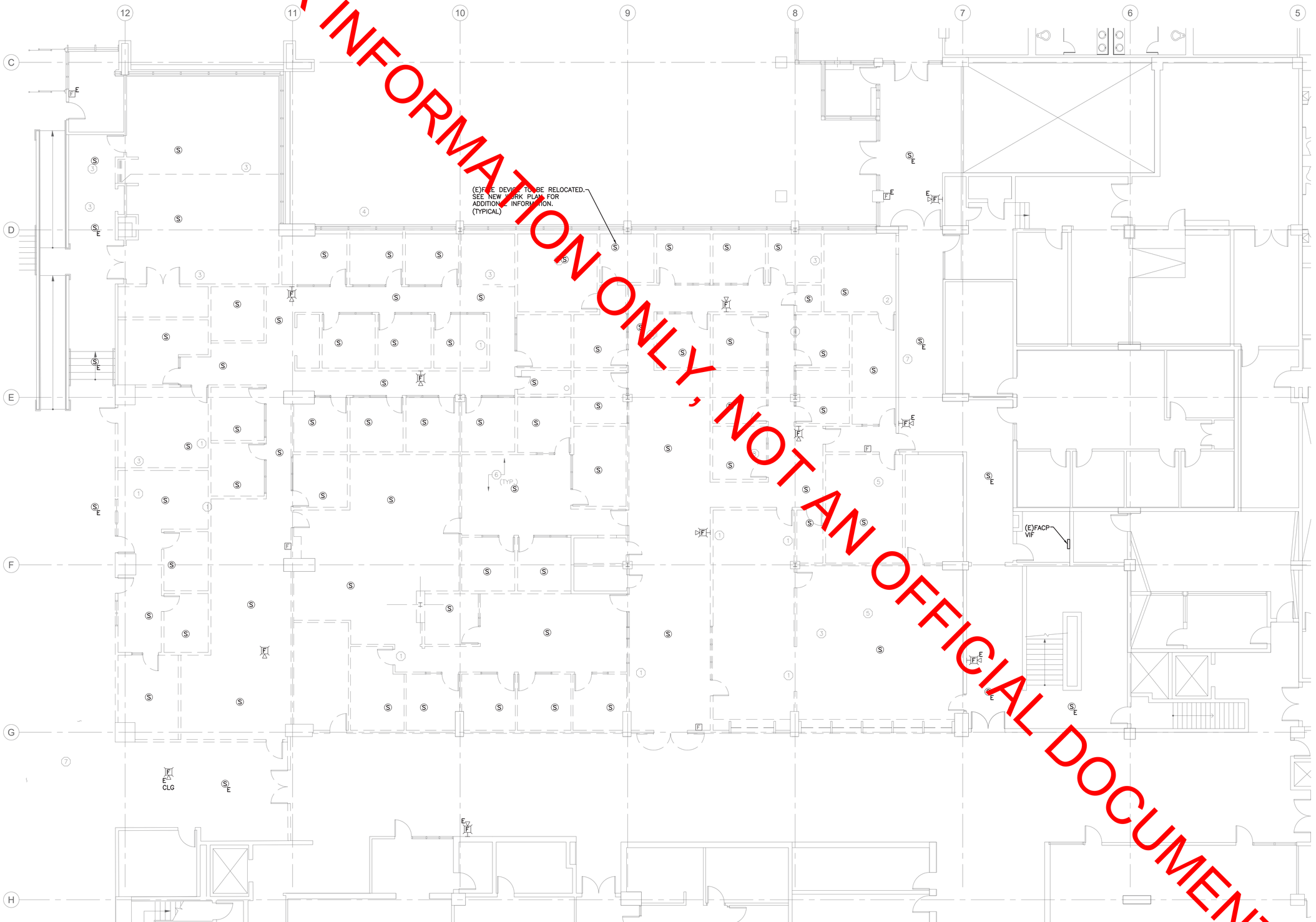
NOTES, SYMBOLS & ABBREVIATIONS FIRE ALARM

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 FIRE ALARM.DWG

FA-101



DEMOLITION PLAN – FIRE ALARM
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

FIRE ALARM DEMOLITION PLAN GENERAL NOTES:

1. EXISTING DEVICES TO BE RELOCATED AS SHOWN ON PLANS. CONTRACTOR TO FIELD VERIFY ALL DEVICE LOCATIONS.

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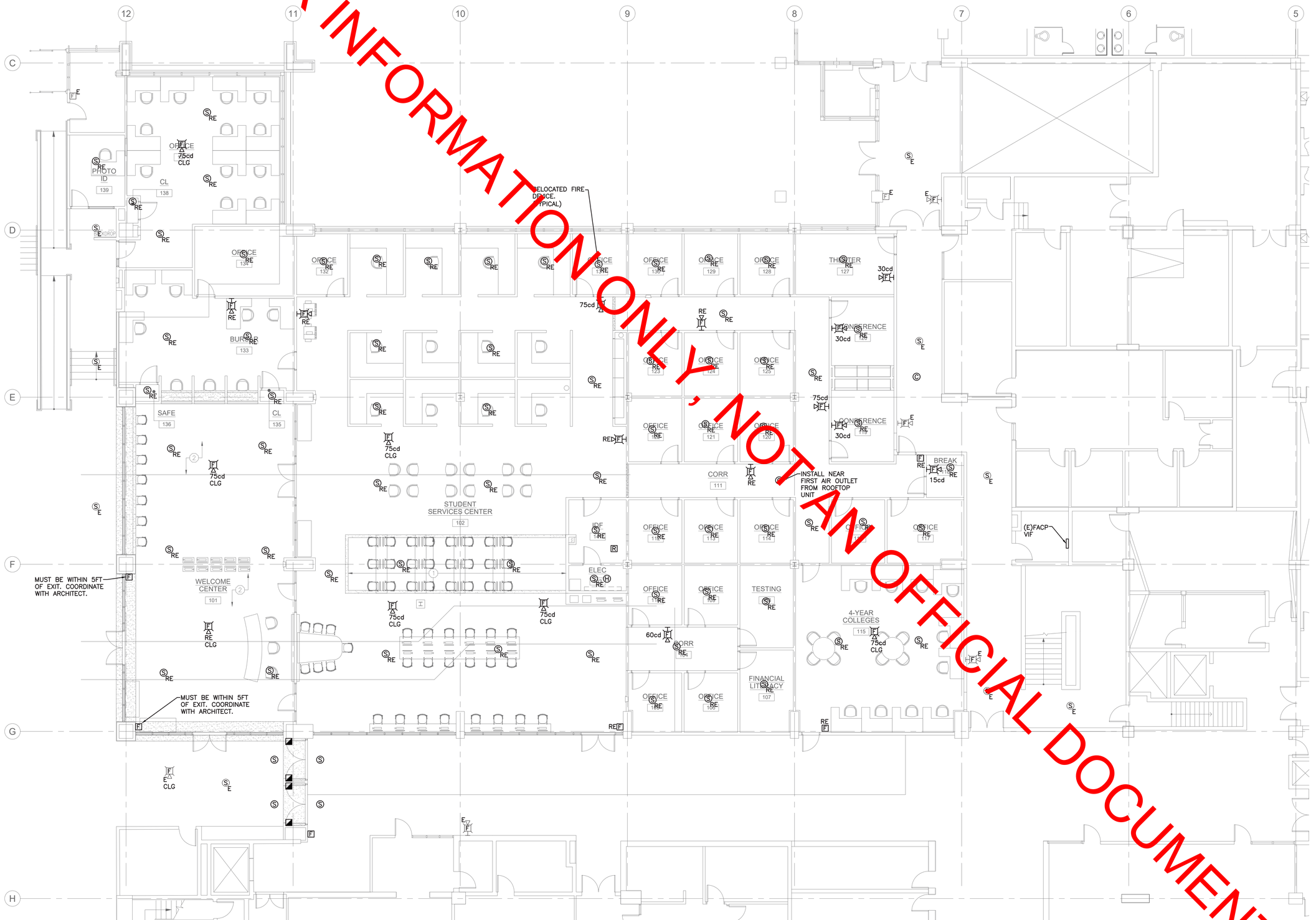
DEMOLITION PLAN
FIRE ALARM

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 FIRE ALARM.DWG

DFA-201



NEW WORK PLAN – FIRE ALARM
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

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NEW WORK PLAN
FIRE ALARM

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 FIRE ALARM.DWG

FA-201

PLUMBING NOTES

1. ALL PLUMBING WORK UNDER THIS CONTRACT SHALL CONFORM TO THE UNIFORM CONSTRUCTION CODE, THE 2015 NATIONAL STANDARD PLUMBING CODE, THE NEW JERSEY STATE ENERGY CODE, THE LOCAL BUILDING DEPARTMENT, THE REQUIREMENTS OF THE UTILITY AND THE LOCAL WATER COMPANY.
2. ALL MATERIALS SHALL BE NEW UNLESS NOTED OTHERWISE.
3. THE PLUMBING CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ALL LABOR AND MATERIALS SUPPLIED AND INSTALLED UNDER THIS CONTRACT AND SHALL GUARANTEE THE WORK PERFORMED UNDER THIS CONTRACT FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE OF THIS WORK.
4. PLUMBING CONTRACTOR SHALL CONSULT WITH, COOPERATE AND COORDINATE WITH THE GENERAL CONTRACTOR, HEATING CONTRACTOR, SPRINKLER CONTRACTOR, ELECTRICAL CONTRACTOR, ETC. IN ORDER TO MINIMIZE INTERFERENCES BETWEEN TRADES DURING PERFORMANCE OF THIS WORK.
5. CONTRACTOR SHALL VERIFY LOCATION, INVERT, DIRECTION OF FLOW, AND CONDITION OF EXISTING SANITARY AND OR STORM PIPING PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL SUBMIT EXISTING UNDERGROUND DRAWINGS PRIOR TO SAW CUTTING. CONTRACTOR SHALL NOTE ANY DEFECTS AND CONDITIONS FOUND FROM SCOPING THE PIPING ON THE DRAWINGS.
6. THE PLUMBING CONTRACTOR SHALL PREPARE AND FILE ALL REQUIRED PLANS AND PERMITS WITH THE LOCAL BUILDING DEPARTMENT AND SHALL PAY ALL FILING FEES AS REQUIRED. HE SHALL OBTAIN ALL AUTHORITIES AND SHALL PAY ALL WORK PERMITS, INSPECTIONS AND WRITE-OFFS AS REQUIRED TO EXECUTE THIS WORK IN A MANNER IN CONFORMANCE WITH THE CODES AND AUTHORITIES HAVING JURISDICTION.
7. THE PLUMBING CONTRACTOR SHALL PERFORM ALL TESTS AND ARRANGE FOR ALL INSPECTIONS FOR WORK UNDER HIS CONTRACT AS REQUIRED BY LAW AND SHALL SUPPLY ALL CERTIFICATES OF INSURANCE AS REQUIRED BY THE LAW AND THE OWNER.
8. PLUMBING CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS, INCLUDING THE SIZE OF CONNECTIONS, ROUGHING DIMENSIONS, ETC. BEFORE SUBMITTING A QUOTATION FOR THE WORK.
9. PLUMBING CONTRACTOR SHALL PERFORM ALL CUTTING, EXCAVATION, BACKFILLING, ROUGH AND FINISH PATCHING AS PER THE SPECIFICATIONS AS REQUIRED FOR THE INSTALLATION OF THE WORK, UNLESS NOTED OTHERWISE.
10. ALL ACCESS DOORS REQUIRED IN GENERAL CONSTRUCTION ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO IDENTIFY SIZE, TYPE AND LOCATION OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED PLUMBING EQUIPMENT, VALVES AND OTHER RELATED EQUIPMENT. THE PLUMBING CONTRACTOR SHALL IDENTIFY THESE REQUIREMENTS ON A COORDINATED SHOP DRAWING.
11. ALL CONNECTIONS TO NEW AND/OR EXISTING EQUIPMENT SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
12. IT IS THE INTENT OF THIS CONTRACT THAT THE COMPLETED WORK BE FULLY OPERATIONAL.
13. ALL PIPE HANGERS AND SUPPORTS SHALL BE INSTALLED AT INTERVALS AND BE FABRICATED OF MATERIALS AS REQUIRED BY THE CODE.
14. WATERPROOF PIPE SLEEVES SHALL BE INSTALLED AT ALL PENETRATIONS THROUGH EXTERIOR WALLS. PIPE SLEEVES SHALL BE INSTALLED AT ALL WALL PENETRATIONS THROUGH INTERIOR WALLS AND FLOORS. ALL PIPING PENETRATIONS TO BE SEALED AROUND WITH "NELSON" FIRE SEAL.
15. ALL PIPING SHALL BE TESTED AT A MINIMUM PRESSURE OF 1-1/2 TIMES THE MAXIMUM OPERATING PRESSURE UNLESS OTHERWISE NOTED ON THE DOCUMENTS OR THE PLUMBING CODE AND IN ACCORDANCE WITH THE UTILITY REQUIREMENTS FOR GAS PIPING SYSTEMS.
16. ALL REMOVALS PERFORMED UNDER THIS CONTRACT SHALL INCLUDE REMOVAL OF ALL DEBRIS AND DISPOSAL AT AN APPROPRIATE SITE.
17. REFER TO THE ARCHITECTURAL PLANS FOR ALL STRUCTURAL DIMENSIONS.
18. ALL WATER AND HORIZONTAL STORM DRAIN PIPING INCLUDING ROOF DRAIN BODY SHALL BE INSULATED.
19. ALL PIPE DIMENSIONS ARE INSIDE CLEAR.
20. ALL PIPING SHALL BE CLEARLY AND DISTINCTLY IDENTIFIED WITH STENCIL MARKERS, SIMILAR TO SETON NAMEPLATE CO.
21. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND LABOR FOR ONE YEAR FROM THE FINAL ACCEPTANCE DATE OF THE OWNER. THE CONTRACTOR SHALL INCLUDE ALL MAINTENANCE AND ADJUSTMENTS FOR THE FIRST YEAR.
22. CONTRACTOR TO PROVIDE COORDINATION DRAWINGS FOR ALL TRADES.

PLUMBING ABBREVIATIONS

IDENTIFIER	DESCRIPTION
AD	ACCESS DOOR
C.O.	CLEAN OUT
CW	COLD WATER
DPCO	DECK PLATE CLEAN OUT
FD	FLOOR DRAIN
HW	HOT WATER
LAV	LAVATORY
JS	JANITOR SINK
RD	ROOF DRAIN
SAN.	SANITARY
ST	STORM DRAIN
U.O.N.	UNLESS OTHERWISE NOTED
UR	URINAL
V	VENT
VIF	VERIFY IN FIELD
WC	WATER CLOSET
PC	PLUMBING CONTRACTOR
MC	MECHANICAL CONTRACTOR

SCHEDULE OF PIPING MATERIAL

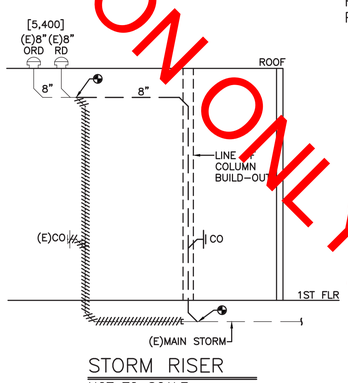
SYSTEM OR EQUIPMENT	MATERIALS
UNDERGROUND STORM DRAIN PIPING	SERVICE WEIGHT CAST IRON PIPE WITH NEOPRENE COMPRESSION GASKETS (ASTMA A74),
STORM DRAIN PIPING IN BUILDING	SERVICE WEIGHT CAST IRON PIPE WITH NO-HUB TYPE WITH STAINLESS STEEL COUPLINGS, (CISPI 301, ASTM A888).
JOINTS: a) CAST IRON PIPE AND FITTINGS	MECHANICAL JOINTS FOR BELL AND SPIGOT. NO WICKING IS ALLOWED.

PLUMBING SYMBOL LIST

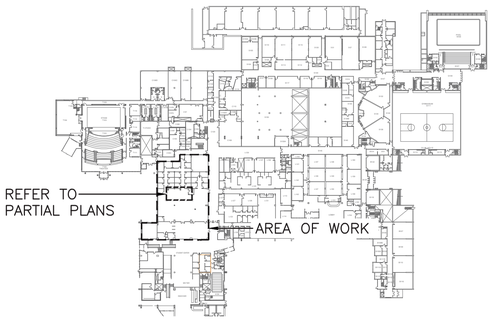
IDENTIFIER	DESCRIPTION
	PRESSURE REDUCING VALVE
	MOTORIZED VALVE
	DIRECTION OF FLOW
	AIR VENT
	BALL VALVE
	GLOBE VALVE
	BALANCING VALVE
	CHECK VALVE
	UNION
	CAPPED PIPE
	EXISTING PIPING TO REMAIN
	CW DOMESTIC SUPPLY PIPING
	HW DOMESTIC SUPPLY PIPING
	HW RETURN PIPING
	VENT PIPING
	SANITARY PIPING
G	GAS PIPING
	CONNECT NEW TO EXISTING
T	TEMPERATURE GAUGE – SEE SPECIFICATIONS
P	PRESSURE GAUGE – SEE SPECIFICATIONS
CS	CIRCUIT SETTER

SYMBOL LIST NOTES:

1. SYMBOL LIST SHOWN IS FOR GENERAL REFERENCE ONLY. THE PRESENCE OF A SYMBOL DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR SPECIFIC SYMBOLS USED.



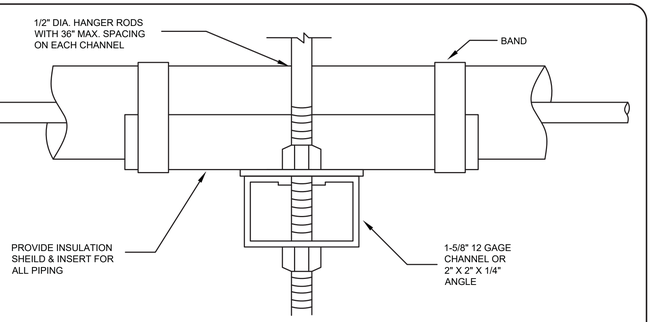
STORM RISER
NOT TO SCALE



KEY PLAN
SCALE: NOT TO SCALE

PLUMBING FIXTURE SCHEDULE

MARK	RD	ORD	CO
FIXTURE	ROOF DRAINS	OVER FLOW ROOF DRAIN	CLEANOUT
MANUFACTURER	EXISTING	EXISTING	J.R SMITH
CATALOG NUMBER	EXISTING	EXISTING	9775
MOUNTING	ROOF DECK	ROOF DECK	WALL
WASTE SIZE	-	-	-
VENT SIZE	-	-	-
COLD WATER SIZE	-	-	-
HOT WATER SIZE	-	-	-
DRAINAGE FIXTURE UNITS (DFU)	-	-	-
SUPPLY FIXTURE UNITS (SFU)	-	-	-
ACCESSORIES AND REMARKS	EXISTING.	EXISTING	ROUGH FINISH STAINLESS STEEL PLUG, POLISHED STAINLESS STEEL COVER PLATE



MAXIMUM HORIZONTAL PIPE/TUBING SUPPORT SPACING, FEET

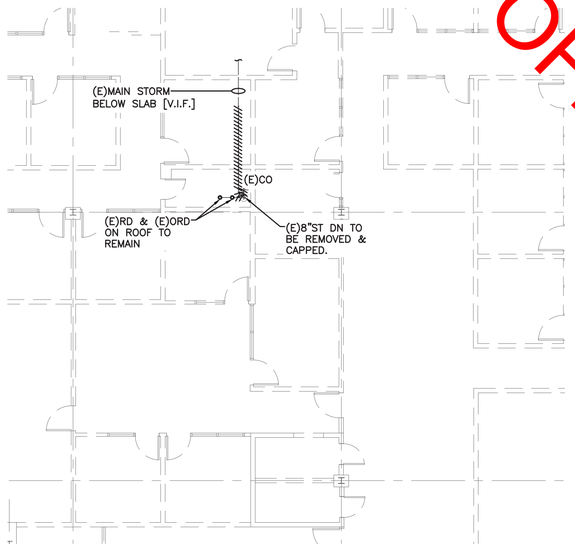
NOM. SIZE	THRU 3/4"	1	1-1/4"	1-1/2"	2	2-1/2"	3	4	5	6	8
STEEL PIPE	10 FEET	12	12	12	12	12	12	12	12	12	12
COPPER TUBING	6 FEET	6	6	10	10	10	10	10	10	10	10

NOTE: FOR TRAPEZE HANGER TAKE SMALLEST SIZE ON TRAPEZE

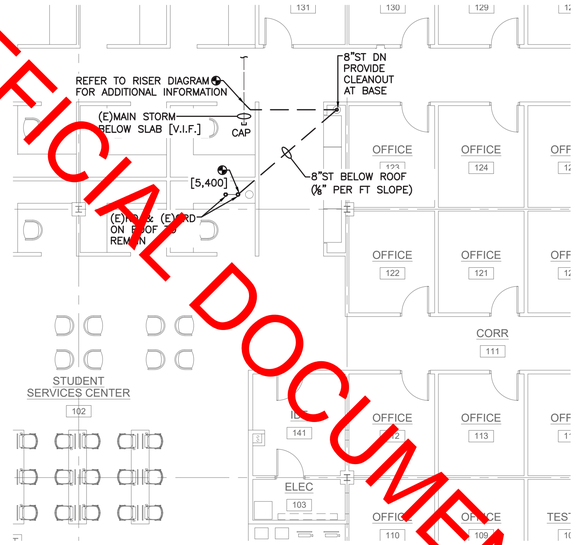
MAXIMUM VERTICAL PIPE/TUBING SUPPORT SPACING, FEET

NOM. SIZE	THRU 3/4"	1	1-1/4"	1-1/2"	2	2-1/2"	3	4	5	6	8
STEEL PIPE	15 FEET	15	15	15	15	15	15	15	15	15	15
COPPER TUBING	10 FEET	10	10	10	10	10	10	10	10	10	10

PIPE HANGER DETAIL — SCALE: N.T.S.



DEMOLITION PLAN – PLUMBING
SCALE: 1/8" = 1'-0"



NEW WORK PLAN – PLUMBING
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

SHINE ENGINEERING, P.A.
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EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

NOTES, SYMBOLS, ABBREVIATIONS & PART PLANS PLUMBING

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 PLUMBING.DWG

P-101

SPRINKLER NOTES

1. THIS CONTRACTOR SHALL DESIGN THE SPRINKLER SYSTEM IN ACCORDANCE WITH CURRENT NFPA AND IBC CODES FOR THE PROPOSED USE AND OCCUPANCY. ALL DEVICES SHALL BE APPROVED BY FACTORY MUTUAL AND/OR LISTED BY UNDERWRITERS LABORATORIES. ALL ELECTRICAL DEVICES SHALL BE LISTED BY THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRIC CODE. THIS CONTRACTOR SHALL SUBMIT HYDRAULIC CALCULATIONS AND DESIGN DRAWINGS SIGNED AND SEALED BY A NJ STATE PROFESSIONAL ENGINEER. CONTRACTOR SHALL PERFORM OR OBTAIN A CURRENT WATER SUPPLY. THE ADDITION OF ANY REQUIRED FIRE PUMPS AFTER THE AWARD OF THE CONTRACT WILL BE THE SPRINKLER CONTRACTOR'S RESPONSIBILITY.
2. THE SYSTEM SHALL BE DESIGNED PER NFPA 13 2013 EDITION, LIGHT HAZARD OCCUPANCY (4000 SQ. FT. OVER THE MOST REMOTE 1500 SQ. FT.) THIS CONTRACTOR SHALL BE RESPONSIBLE FOR HYDRAULIC CALCULATIONS, PIPING, FITTINGS AND SPRINKLER HEADS FOR A COMPLETE INSTALLATION.
3. LOCAL AUTHORITIES HAVING JURISDICTION AND THE INSURANCE CARRIER, IF APPLICABLE, WILL HAVE FINAL APPROVAL OF THE INSTALLATION AND DESIGN.
4. THE SPRINKLER SYSTEM SHALL BE FURNISHED AND INSTALLED COMPLETE WITH ALL ITEMS, AS INCLUDED IN THE SCOPE OF WORK, SPECIFIED IN THE CONTRACT AND IN ACCORDANCE WITH ALL CURRENTLY ACCEPTED IBC AND NFPA CODES.
5. ALL SPRINKLER PIPING TO BE CONCEALED IN ALL OCCUPIED SPACES.
6. SPRINKLER MATERIALS:

6.1. PIPING: ALL PIPING AND FITTINGS SHALL BE LISTED FOR USE IN SPRINKLER SYSTEMS AND SHALL BE IN ACCORDANCE TO THE LATEST NFPA STANDARDS.

7. DESIGN NOTES:
   - ALL MATERIAL SHALL BE LISTED BY UNDERWRITERS LABORATORIES.
   - ALL EQUIPMENT SHALL BE APPROVED BY FACTORY MUTUAL.
   - ALL HANGERS SHALL BE INSTALLED IN ACCORDANCE TO NFPA #13 SECT. 3-15.
   - CONTRACTOR SHALL PROVIDE HIGH TEMPERATURE SPRINKLER HEADS WHERE REQUIRED.
8. ALL SPRINKLERS WITHIN THE SAME COMPARTMENT ARE TO BE OF THE SAME RESPONSE TYPE. CONTRACTOR SHALL FIELD VERIFY EXISTING SPRINKLERS AND AND PROVIDE NEW HEADS TO MATCH.

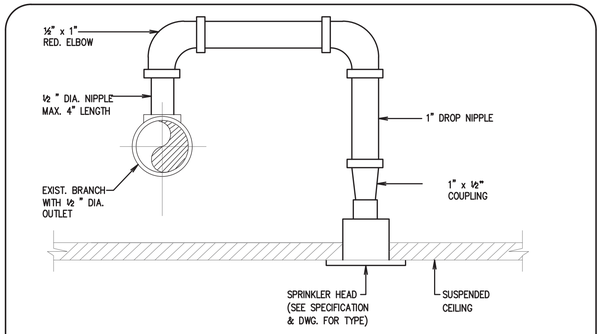
GENERAL NOTES

1. THE INSTALLATION COMPONENTS, SIZING, SPACING, MATERIALS LOCATION CLEARANCES, POSITION AND TYPE OF SYSTEM SHALL CONFORM TO NFPA 13 AND LATEST BUILDING CODE.
2. ALL ACCESS DOORS REQUIRED IN GENERAL CONSTRUCTION ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE SPRINKLER CONTRACTOR TO IDENTIFY SIZE, TYPE AND LOCATION OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED EQUIPMENT, VALVES AND OTHER RELATED EQUIPMENT. THE SPRINKLER CONTRACTOR SHALL IDENTIFY THESE REQUIREMENTS ON A COORDINATED SHOP DRAWING PRIOR TO SYSTEM FABRICATION AND INSTALLATION.
3. SPRINKLERS SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER NFPA CODE.
4. INSPECTION AND TESTS OF SPRINKLER SYSTEM SHALL BE CONDUCTED AS SPECIFIED IN NFPA CODE.
5. WATER SUPPLY TEST PIPES AND GAUGES SHALL BE PROVIDED AS SPECIFIED IN CHAPTER 4 OF NFPA 13.
6. PIPING SPECIFICATIONS, PIPE SCHEDULES, SYSTEM TEST PIPES, PROTECTION AGAINST CORROSION, DAMAGED FITTINGS, VALVES, HANGERS, SPRINKLERS, GUARDS AND SHIELDS SHALL BE IN ACCORDANCE WITH NFPA 13, LATEST ADOPTED EDITION.
7. STOCK OF EXTRA SPRINKLERS WILL BE FURNISHED AS PER CHAPTER 3 OF NFPA 13 (REQUIRED FOR EACH TEMPERATURE RATING).
8. SPRINKLER ALARMS WILL BE IN ACCORDANCE WITH NFPA 13.
9. SPACING, LOCATION AND POSITION OF SPRINKLERS SHALL BE IN ACCORDANCE WITH CHAPTER 5 OF NFPA 13.
10. ALL BLIND SPACES EXCEEDING 6 INCHES IN WIDTH OR DEPTH WHICH CONTAIN COMBUSTIBLE MATERIAL SHALL BE SPRINKLERED.
11. ALL PIPING PASSING THROUGH WALLS SHALL COMPLY WITH NFPA FOR FIRE PROOFING.
12. DISTANCE OF SPRINKLERS FROM HEAT SOURCES SHALL BE IN ACCORDANCE WITH TABLE 5-3.1.4.2 OF NFPA 13.
13. AUTOMATIC INTERLOCK CUTOFF SWITCH FOR VENTILATION SHALL BE BY HVAC FAN SHUTDOWN.
14. PROVIDE LOCAL WATER DISTRICT WATER SUPPLY LETTER WITH FLOW TEST DATA.
15. ALL PIPES PASSING THROUGH FOUNDATION WALLS TO BE PROTECTED.
16. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY NFPA 13.
17. DRAINAGE TO CONFORM TO CHAPTER 5-14.2 OF NFPA 13.
18. A ONE PIECE REDUCING FITTING OF GOOD DESIGN SHOULD BE USED WHEREVER A CHANGE IS MADE IN THE SIZE OF PIPE AS PER SECTION 3-5.5 OF NFPA 13.
19. ALL VALVES ON CONNECTIONS TO WATER SUPPLIES AND IN SUPPLY TO SPRINKLERS SHALL BE APPROVED O.S.&Y. OR APPROVED INDICATOR TYPE WITH TAMPER SWITCHES.
20. DRAIN VALVES AND TEST VALVES SHALL BE APPROVED TYPE AS PER SECTION 3-8 OF NFPA 13.
21. HANGERS SHALL BE OF A TYPE APPROVED FOR USE WITH THE PIPE OR TUBE INVOLVED, SPRINKLER PIPING SHOULD BE SUPPORTED BY ADJUSTABLE HANGERS PER NFPA 13, CHAPTER 6.
22. PROVISIONS SHOULD BE MADE TO FACILITATE FLUSHING SYSTEM PIPING BY PROVIDING FLUSHING CONNECTIONS CONSISTING OF A CAPPED NIPPLE 4" LONG ON THE END OF THE CROSS MAIN, AS PER SECTION 5-13.17 OF NFPA 13.
23. SPRINKLER SHALL BE AN APPROVED TYPE AS PER SECTION 3-2 OF NFPA 13.
24. TEMPERATURE RATING SHALL COMPLY WITH SEC. 3-2.5.1 OF NFPA 13.
25. CLEARANCES BETWEEN SPRINKLERS AND STORAGE OR PARTITIONS AS PER NFPA 13, SECTION 5-8.5.2.3.
26. SPACING AND LOCATION OF SPRINKLER SHALL COMPLY WITH CHAPTER 5 OF NFPA 13.
27. CONTRACTOR TO COORDINATE HIS WORK WITH OTHER TRADES.
28. HEAT IS TO BE PROVIDED THROUGHOUT THE ENTIRE AREA THAT PIPING, EQUIPMENT AND HEADS ARE INSTALLED.
29. ONLY EXPERIENCED SPRINKLER MECHANICS TO WORK ON THE SYSTEM.
30. ALL PIPING TO BE A MINIMUM OF 1" UNLESS OTHERWISE NOTED.
31. PROVIDE WATER SHIELDS OVER ALL / SURFACE MOUNTED ELECTRIC PANELS AND EQUIPMENT IN ELECTRICAL ROOMS PER NFPA & LOCAL FIRE MARSHALL REQUIREMENTS.
32. THE FLOW TEST STATIC AND RESIDUAL PRESSURES TO BE OBTAINED BY THE SPRINKLER CONTRACTOR.
33. THE FIRE SPRINKLER CONTRACTOR IS TO SCHEDULE AND COMPLETE A NEW FLOW TEST ON SITE FOR USE IN THE PREPARATION OF THEIR SHOP DRAWINGS.
34. ALL PIPING TO BE SCHEDULE 40.
35. FINAL SPRINKLER DESIGN TO BE COMPLETED BY SPRINKLER CONTRACTOR.
36. ALL UPRIGHT SPRINKLERS TO BE INSTALLED ON 1" SPRIGS TO BRING SPRINKLER TO WITHIN 12" OF DECK.
37. THE USE OF FLEX HEADS IS PERMITTED ON THIS JOB BUT MUST BE TAKEN INTO CONSIDERATION HYDRAULICALLY.
38. GUARANTEE ALL MATERIALS AND LABOR FOR ONE YEAR FROM THE FINAL ACCEPTANCE DATE OF THE OWNER
39. CONTRACTOR TO PROVIDE COORDINATION DRAWINGS FOR ALL TRADES,

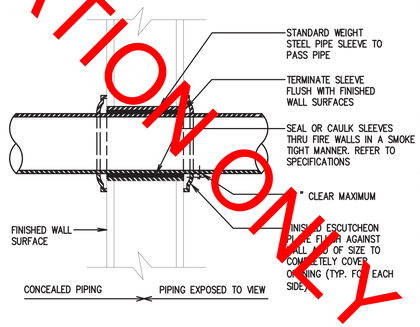
LEGEND

E	EXISTING PENDANT SPRINKLER HEAD
E	EXISTING CONCEALED SPRINKLER HEAD
E	RELOCATED SPRINKLER HEAD
N	NEW PENDANT SPRINKLER HEAD
N	NEW CONCEALED SPRINKLER HEAD
N	NEW UPRIGHT SPRINKLER HEAD
N	NEW SIDEWALL SPRINKLER HEAD
R	RELOCATED PENDANT SPRINKLER HEAD
R	RELOCATED CONCEALED SPRINKLER HEAD
R	RELOCATED UPRIGHT SPRINKLER HEAD
D	REMOVE EXISTING SPRINKLER HEAD AND CAP PIPE

NOTE: SYMBOL LIST SHOWN IS FOR GENERAL REFERENCE ONLY. THE PRESENCE OF A SYMBOL DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR SPECIFIC SYMBOLS USED.



SPRINKLER HEAD CONNECTION FOR SUSPENDED CEILING — SCALE: N.T.S.



SLEEVES AND ESCUTCHEONS

A. SLEEVES FOR PIPING THROUGH MASONRY WALLS SHALL BE SCHEDULE 40, STANDARD GALVANIZED STEEL PIPE; IN FRAMED PARTITIONS SHALL BE 20 GAUGE SHEET METAL. THE SPACE BETWEEN THE PIPE AND ITS SLEEVE SHALL NOT EXCEED ONE-HALF INCH. THE SLEEVE SHALL HAVE A SUFFICIENT LENGTH TO BE FLUSH WITH THE FINISHED WALL SURFACE.

B. EXPOSED PIPING PASSING THROUGH WALLS, FLOORS OR CEILING SHALL BE FITTED WITH CHROMIUM-PLATED CAST BRASS ESCUTCHEONS WITH FASTENING SET SCREWS.

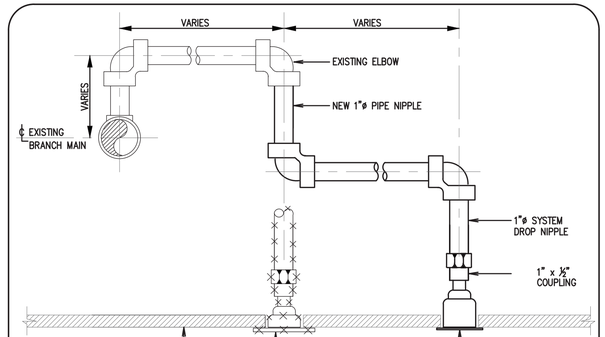
CUTTING AND PATCHING

A. PIPING PASSING THROUGH WALLS SHALL HAVE A TRIM OPENING CUT NO GREATER THAN NECESSARY FOR THE INSTALLATION OF A SLEEVE SECURED THEREIN.

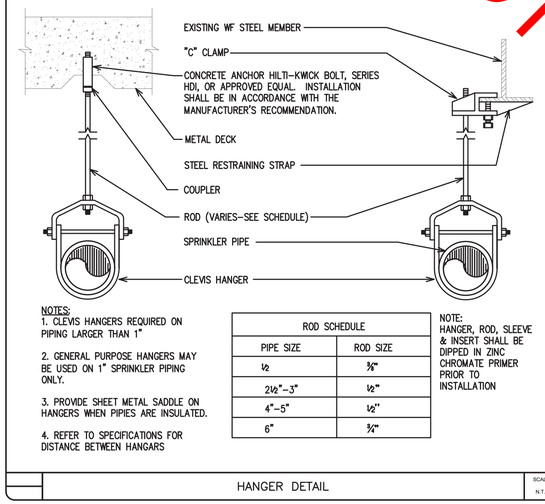
B. PIPING PASSING THROUGH CONCRETE FLOORS SHALL HAVE AN OPENING CORE DRILLED SO THAT THE SPACE BETWEEN THE OPENING AND THE PIPE SHALL NOT EXCEED ONE-HALF INCH.

C. ANNULAR SPACES BETWEEN PIPING AND SLEEVES OR CORE DRILLED FLOOR OPENINGS SHALL BE PACKED WITH MINERAL WOOL AND SEALED, TO RETAIN THE FIRE INTEGRITY OF THE WALLS AND FLOORS, WITH A NON-HARDENING COMPOUND SIMILAR OR EQUAL TO CASEAL AS MANUFACTURED BY THE J.M. CLIPPER CORP.

TYPICAL DETAIL OF PIPE INSTALLATION THRU RATED WALL — SCALE: N.T.S.



SPRINKLER ARM OVER DETAIL — SCALE: N.T.S.

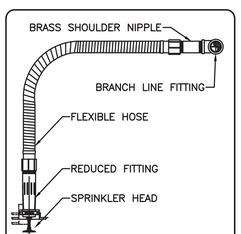


NOTES:
1. CLEVIS HANGERS REQUIRED ON PIPING LARGER THAN 1"
2. GENERAL PURPOSE HANGERS MAY BE USED ON 1" SPRINKLER PIPING ONLY.
3. PROVIDE SHEET METAL SADDLE ON HANGERS WHEN PIPIES ARE INSULATED.
4. REFER TO SPECIFICATIONS FOR DISTANCE BETWEEN HANGARS

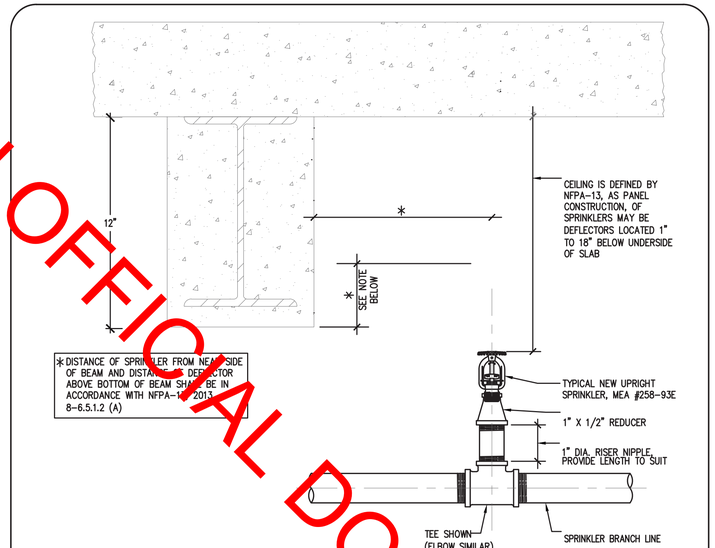
ROD SCHEDULE	
PIPE SIZE	ROD SIZE
1"	⅜"
2½"-3"	½"
4"-5"	½"
6"	¾"

NOTE: HANGER, ROD, SLEEVE & INSERT SHALL BE DIPPED IN ZINC CHROMATE PRIMER PRIOR TO INSTALLATION

HANGER DETAIL — SCALE: N.T.S.



FLEXIBLE DROP DETAIL — SCALE: N.T.S.



TYPICAL UPRIGHT SPRINKLER - NO SUSPENDED CEILING — SCALE: N.T.S.

EXISTING SERVICE CONTRACTOR

1. ALL WORK SHALL BE SUPERVISED BY THE OWNER'S EXISTING SPRINKLER CONTRACTOR. CONTACT 'UNITED FIRE PROTECTION' @ 908-688-0300.

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

11.21.19 FOR BIDDING

SHINE ENGINEERING, P.A.
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EDWARD ARCARI NJ#12306 ANTHONY IOVINO NJ#11720

NOTES, SYMBOLS & ABBREVIATIONS SPRINKLER

SCALE: AS NOTED
DATE: 08.22.2019
FILE: 19003 SPRINKLER.DWG

SPR-101

NEW WORK PLAN - SPRINKLER
SCALE: 1/8" = 1'-0"

DRAWINGS BASED ON ARCHITECTURAL BACKGROUNDS RECEIVED ON: 10-23-2019

SPRINKLER KEY NOTES:

1. CONTRACTOR SHALL RELOCATE ANY SPRINKLER PIPING ABOVE THIS NEW CEILING AT 11'-0". FIELD VERIFY EXISTING PIPING CONDITIONS.
2. CONTRACTOR SHALL RELOCATE ANY SPRINKLER PIPING, DRAINS, ETC. ABOVE THIS NEW CEILING AT 10'-0". FIELD VERIFY EXISTING PIPING CONDITIONS.

11.21.19 FOR BIDDING

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EDWARD ARCARI NJ#12306 *ANTHONY IOVINO NJ#11720*

NEW WORK PLAN
SPRINKLER

SCALE: AS NOTED	SPR-201
DATE: 08.22.2019	
FILE: 19003 SPRINKLER.DWG	