INVITATION TO BID – RE-BID

#21366

For

INTERIOR RENOVATIONS TO H. B. BOOKER SCHOOL

FOR THE CLEVELAND MUNICIPAL SCHOOL DISTRICT
DBA: CLEVELAND METROPOLITAN SCHOOL DISTRICT
BOARD OF EDUCATION, 1111 SUPERIOR AVENUE E, SUITE 1800
CLEVELAND, OHIO 44114

UNDER THE DIRECTION OF OPERATIONS DEPARTMENT OF THE BOARD OF EDUCATION OF THE CLEVELAND METROPOLITAN SCHOOL DISTRICT - CUYAHOGA COUNTY, OHIO

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Part I: ITB Submission & Process Requirements

Part I of the ITB provides a detailed set of directions which the service provider will use to prepare their bid.

Schedule for posting and contractor selection for the Interior Renovations to H.B. Booker School ITB 21360

Step	Date*
ITB Posted	September 22, 2022
Pre-Bid Meeting	September 29, 2022
All final questions from service providers to the District	October 4, 2022
Answers to service providers from the District and all addenda issued (if necessary)	October 6, 2022
ITB Responses Due	October 10, 2022
Bid Opening	October 10, 2022
Contract Negotiation	October 24 -October 28, 2022
Contract Start	November 7, 2022

*Dates listed are subject to change at discretion of the District. Service Providers will be notified of changes to the schedule, as appropriate.

Section A: Bid Submission & Format Requirements

Bid Submission Requirements

a. In order for the District to evaluate bids fairly and completely, service providers should follow the format set forth herein and provide all of the information requested. The District discourages costly bids.
b. All bids shall include all bid format requirements found below. All information requested in the district related forms must be filled in legibly and completely with blue ink signatures, or the bid may be considered non-responsive. **Interior Renovation for H.B. Booker School and #21366 must be on the outside of the envelope of submittals including shipping labels.**
c. Sealed Responses are due at the Cashier's Office of the Cleveland Metropolitan School District, 1111 Superior Ave E. Cleveland, Ohio 44114 on or before 1:00 PM current local time on October 10, 2022. Mailing of Bids are encouraged. However, hand deliveries will be accepted from 12:00 PM to 1:00 PM on October 10, 2022. The bids will be opened following the bid cut off time at 1111 Superior Ave. E. Cleveland, Ohio 44114
d. There will be a Pre-Bid Meeting at **11:00 AM on September 29, 2022.** The meeting will be held at **H.B. Booker School, 2121 W. 67th Street, Cleveland, OH 44102.** Attendance at the pre-bid is encouraged but not mandatory. Suppliers are encouraged to submit questions prior to the Pre-Bid Meeting so they may be addressed.
e. All submissions must include one(1) original with blue signatures, one(1) copy, and one(1) electronic bid on a USB B Flash Drive. Original Copy should be easily identifiable. Electronic bid should include all documents. Service Providers not complying with this requirement shall be notified that they have twenty-four(24) hours in which to comply with this requirement or their bid may be disqualified. This applies to copies only. All materials are submitted as is.
f. All written questions shall be directed to the Purchasing Division via email to: **dion.turner@clevelandmetroschools.org**. Written questions will be accepted via email until 12:00 pm on September 6, 2022. Under no circumstances should any firm interested in providing the services identified in the ITB, their designees, or anyone affiliated with their firm, contact any other District employee or official during the ITB process, in an attempt to lobby or

influence the selection of a service provider pursuant to this ITB

g. The District reserves the right to reject any and all proposals, to waive any and all informalities or irregularities, and to disregard all non-conforming responsive conditional proposals. Each Proposer is liable for all proposal errors or omissions. A proposer shall not be permitted to alter or amend any proposal documents after the Proposal deadline time and date detailed in the RFP unless such is formally requested, in writing, by the District.

Bid Format Requirements

a. The Interior Renovations to H.B. Booker School specifications for ITB #21366 is described in Part III. Contractors are required to provide the information below as well as complete the District Related Forms in Appendix A.

b. Bid Responses are to include the documents as follows:

   i. **Transmittal Cover Letter**: Prepare a letter transmitting the bid on business letterhead. The letter should identify the business name, phone number, and business web address along with the name, phone number, and email address of the key contact person. The letter must have the signature of a person with authority to obligate the business. The transmittal cover letter shall also contain a statement that the bid is a firm offer for a ninety (90) day period.

   ii. Bid Cost Form, including evidence of State certification to perform the work required.

   iii. Completed District Related Forms set forth in Appendix A of this ITB.

   iv. **Bid Guaranty:** A Certified Check for 10% of the total amount of the bid payable to the Treasurer of the Cleveland Metropolitan School District, or satisfactory bid bond executed by the bidder or a Surety company on a form supplied by the bondsman.

Section B: Bid Constraints

i. The service provider must comply with all laws, rules and regulations dictated by the Board of Education of the Cleveland Metropolitan School District, City of Cleveland, the State of Ohio and the United States Federal Government.

ii. Purchases funded by federal grant funds must adhere to regulations found in Uniform Guidance "Super Circular", 2 CFR 200 (UGG), as a condition of receiving funds and to meet annual audit compliance. In an effort to keep policy for all grants consistent, the District implemented the new federal guidelines regarding procurement utilized with federal grants immediately.

iii. The District will only accept proposals that cover all of the major components requested in the RFP.

iv. Service provider shall not include Ohio Sales Tax in the price quoted. The District will provide tax exempt certificate to the successful Proposer.

v. Service provider's personnel and subcontractors on the District site will be required to meet security requirements. Service provider agrees to successfully complete background checks on all of its employees, agents and subcontracts, if necessary, who provide services on site under this scope of work. Each person on site must wear an identification badge that clearly identifies and makes visible the person's name and company.

vi. No response may be withdrawn for at least ninety(90) days after receipt of bids.

vii. Bidder understands and agrees that subsequent to submission of the bid, any District resolution authorizing the award of a contract or agreement does not vest any contractual rights to the bidder.

viii. Bidder understands and agrees that such District resolution operates only to encumber funds necessary for the project and does not create a binding contract.

ix. Bidder further acknowledges and agrees that any such District resolution may be revoked, at any time prior to execution of a formal, written contract.

x. Bidder acknowledges and agrees that it has no vested contractual right until such time as a purchase

order or contract have been issued.

xi. Bidder further acknowledges and agrees that execution of a contract and issuance of a purchase order is not a ministerial function but is a formal requirement for acceptance of a bid.

xii. Bidder must present evidence to the District, upon request, that they are fully competent and have the necessary facilities, equipment and financial resources to perform the work required in the specifications within the time frame required.

xiii. The District reserves the right to award the bid in whole or in parts, by item, by group of items, to a single service provider or to multiple service providers, where such action serves the best interests of the District.

xiv. The successful Service provider and their subcontractor(s), including organizations having personnel, equipment and vehicles on District property, shall provide evidence of insurance as follows:

a.	Commercial General Liability	Including limited contractual liability $2,000,000.00 Limit of Liability (Per occurrence)
b.	Automobile Liability	Including non-owned and hired $2,000,000.00 Limit of Liability (Per occurrence)
c.	Worker's Compensation	Worker's compensation and employer's insurance to full extent required by applicable law

xv. This requirement must be fulfilled by the successful service provider providing the District with a current Certificate of Insurance (standard ACORD form), showing the Board of Education of the Cleveland Municipal School District as an additional insured (Certificate Holder does not constitute being an additional insured), within five(5) days of Notice of Intent to Award Agreement. The certificates of insurance shall contain a provision that the policy or policies shall not be cancelled without thirty (30) days' prior written notice to the District.

xvi. The required insurance must be provided by a company licensed by the State of Ohio, which company must be financially acceptable to the Administration of the Cleveland Municipal School District

xvii. The District is not liable for vandalism which results in damage(s) to the property or vehicles of the Vendor. The school District will not reimburse for private insurance deductibles for such vandalism.

a. Vandalism damage is defined as damage resulting from criminal conduct for which an individual may (but not necessarily be processed under the Ohio Revised Code

xviii. In submitting a bid, service providers agree, unless specifically authorized in writing by an authorized representative of the District on a case by case basis, that it shall have no right to use, and shall not use, the name of Cleveland Metropolitan School District, its officials or employees, in any advertising, publicity, promotion, nor to express or imply any endorsement of service provider's services.

xix. The Diversity Business and Service Provider Contract Compliance Programs shall make every good faith effort to ensure that certified diversity business enterprises in the District's relevant geographic market area shall be afforded the maximum opportunity to compete for contracts, services, and purchases. The general goals for diversity business participation are: 15% for services, 20% for goods and supplies, and 30% for maintenance, construction, and repair. Non-diversity vendors will have their diversity business participation counted toward their goal attainment only with minority vendors who are certified and demonstrate previous experience in the respective business classification of the prime contractor. Only direct participation in the subcontract will be counted toward diversity business enterprise goal attainment. Service Providers shall refer to https://bit.ly/3wvVApK for further information and requirements on the District's diversity goals.

Section C: Evaluation Process

i. **Responsiveness:** Bids will be evaluated, first, as responsive or non-responsive to the Bid specifications. A preliminary review will be conducted of all bids submitted on time to ensure the bid adheres to the material submission requirements specified in the Bid. Bids that do not meet the material submission requirements may be deemed non-responsive and rejected. In the event that all bidders do not meet one or more of the material submission requirements, the District reserves the right to continue the qualitative evaluation of the bids and select the bid(s) which most closely meets the specifications in the ITB. Bids must include, or meet, the following submission requirements:
   - **a.** Timely Submission
   - **b.** Transmittal Cover Letter
   - **c.** Bid Cost Form
   - **d.** District Related Forms
   - **e.** Bid Guaranty

ii. **Qualitative Evaluation** – The Bids will be evaluated to determine the lowest responsive and responsible bidder.

Section D: All District Related Forms

There are a number of REQUIRED forms in Appendix A of the ITB that must be completed and submitted with the bid response. These forms include

- **a.** Addendum Acknowledgement
- **b.** Certificate of Debarment
- **c.** Conflict of Interest
- **d.** Proposer Qualification Form
- **e.** Non-Collusion Affidavit
- **f.** DBE Forms – A, B, C, D, E, F, G, & H
- **g.** EOA Contractual Declaration Forms
- **h.** References

Section E: Award of Contract

i. The terms of this agreement will begin immediately upon selection, approval, and contract execution through completion of the lowest responsive and responsible service provider.

ii. The contract documents consist of the following:
   a. District Contract
   b. Certified Purchase Order or Supplier Contract
   c. ITB Submission Requirements
   d. Bid Cost Form
   e. Bid Guaranty
   f. All Required District Related Forms
   g. All applicable addenda

iii. The awarded bidder shall perform all work described in the contract documents, including without limitation, all terms and conditions of the specifications contained herein or otherwise stated in the bid documents and reasonably inferable therefrom by the bidder as necessary to produce the results intended thereby for specifications requested herein by the District.

iv. CMSD reserves the right to reject all bids and deviate from this purchasing process to utilize other purchasing mechanisms available to the district under Ohio Law. Scope review and follow-up discussions with the apparent low bidder may be requested. CMSD reserves the right to interview or to seek additional information related to criteria already specified in the Invitation to Bid after opening the bids prior to issuance a certified Purchase Order or Supplier Contract

Part II: Overview, Background, and Specifications

Section A: Overview

The Cleveland Metropolitan School District (hereafter the "District) under ITB #21366 is seeking contractors to complete the Interior Renovations to H.B. Booker School.

The District is seeking a qualified contractor to furnish all labor, materials, and equipment necessary to renovate the interior for H.B. Booker School.

To facilitate submission and evaluation of bids, the following provides relevant background information and specifications. Instructions on how to submit a bid can be found in Part I. Contractors may submit a bid in response to the specifications below.

Section B: Background

The District is a large urban school system with over 100 instructional non-instructional sites, approximately 6,000 teachers and administrative staff, 36,000 District students, and 3,500 classrooms.

Section C: Specifications

Project Timeline: **Substantial Completion of the Project is March 31, 2023.**
Alternate for Substantial Completion by December 30, 2022.

PHOTOGRAPHIC DOCUMENTATION

a) PART 1 – GENERAL
   i) RELATED DOCUMENTS
      (1) Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
   ii) SUMMARY
      (1) Section includes administrative and procedural requirements for the following:
         (a) Preconstruction photographs.
      (2) Related Requirements:
         (a) Section 01732 "Selective Demolition" for photographic documentation before selective demolition operations commence.
   iii) INFORMATIONAL SUBMITTALS
      (1) Digital Photographs: Submit image files within **three** days of taking photographs.
         (a) Digital Camera: Minimum sensor resolution of **8** megapixels.
         (b) Format: Minimum **3200 by 2400** pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
         (c) Identification: Provide the following information with each image description in file metadata tag:
            (i) Name of Project.
            (ii) Name of Contractor.

(iii) Date photograph was taken.

iv) USAGE RIGHTS

(1) Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

b) PART 2 – PRODUCTS

i) PHOTOGRAPHIC MEDIA

(1) Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of **8** megapixels, and at an image resolution of not less than **3200 by 2400** pixels.

c) PART 3 – EXECUTION

i) CONSTRUCTION PHOTOGRAPHS

(1) General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

(2) Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

(a) Date and Time: Include date and time in file name for each image.

(b) Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.

(3) Preconstruction Photographs: Before **commencement of demolition**, take photographs of Project site, including existing items to remain during construction, from different vantage points, as directed by **Architect.**

SUBMITTAL PROCEDURES

a) PART 1 – GENERAL

i) SUMMARY

(1) Section Includes:

(a) Submittal schedule requirements.

(b) Administrative and procedural requirements for submittals.

ii) DEFINITIONS

(1) Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

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

iii) SUBMITTAL SCHEDULE

(1) Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

iv) SUBMITTAL FORMATS

(1) Submittal Information: Include the following information in each submittal:

(a) Project name.

(b) Date.

(c) Name of Architect.

(d) Name of Contractor.

(e) Name of firm or entity that prepared submittal.

(f) Names of subcontractor, manufacturer, and supplier.

(g) Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.

(h) Category and type of submittal.

(i) Submittal purpose and description.

(j) Number and title of Specification Section, with paragraph number and generic name for each of multiple items.

(k) Drawing number and detail references, as appropriate.

(l) Indication of full or partial submittal.

(m) Location(s) where product is to be installed, as appropriate.

(n) Other necessary identification.

(o) Remarks.

(p) Signature of transmitter.

(2) Options: Identify options requiring selection by Architect.

(3) Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

(4) Paper Submittals:

(a) All submittals to be electronic except for material samples, initial color selection brochures, and similar.

(b) Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.

(c) Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.

(d) Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies to the Contractor for distribution.

(e) Informational Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies to the Contractor for distribution.

(f) Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using facsimile of sample form included in Project Manual transmittal form.

(5) PDF Submittals: Prepare submittals as PDF package, incorporating complete information into

each PDF file. Name PDF file with submittal number.

v) SUBMITTAL PROCEDURES

(1) Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

(a) Email: Prepare submittals as PDF package, and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.

(b) Paper: Prepare submittals in paper form, and deliver to Architect.

(2) Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

(a) Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

(b) Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

(c) Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

(3) Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

(a) Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

(b) Resubmittal Review: Allow 15 days for review of each resubmittal.

(4) Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

(5) 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.

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

vi) SUBMITTAL REQUIREMENTS

(1) Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

(a) If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.

(b) Mark each copy of each submittal to show which products and options are applicable. Submittals with multiple products without job specific products marked as being provided for the project will be rejected. Products proposed for the project MUST be specifically marked in the submittals.

(c) Include the following information, as applicable:

(i) Manufacturer's catalog cuts.

(ii) Manufacturer's product specifications.

(iii) Standard color charts.

(iv) Statement of compliance with specified referenced standards.

(v) Testing by recognized testing agency.

(vi) Application of testing agency labels and seals.

(vii) Notation of coordination requirements.

(viii) Availability and delivery time information.

(d) For equipment, include the following in addition to the above, as applicable:

(i) Wiring diagrams that show factory-installed wiring.

(ii) Printed performance curves.

(iii) Operational range diagrams.

(iv) Clearances required to other construction, if not indicated on accompanying Shop Drawings.

(e) Submit Product Data before Shop Drawings, and before or concurrent with Samples.

(2) 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 unless submittal based on Architect's digital data drawing files is otherwise permitted.

(a) Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

(i) Identification of products.

(ii) Schedules.

(iii) Compliance with specified standards.

(iv) Notation of coordination requirements.

(v) Notation of dimensions established by field measurement.

(vi) Relationship and attachment to adjoining construction clearly indicated.

(vii) Seal and signature of professional engineer if specified.

(3) Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

(a) Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

(b) Identification: Permanently attach label on unexposed side of Samples that includes the following:

(i) Project name and submittal number.

(ii) Generic description of Sample.

(iii) Product name and name of manufacturer.

(iv) Sample source.

(v) Number and title of applicable Specification Section.

(vi) Specification paragraph number and generic name of each item.

(c) Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.

(d) Paper Transmittal: Include paper transmittal including complete submittal information indicated.

(e) Disposition: Maintain sets of approved Samples at Project site, available for quality-

control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

(i) Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

(ii) Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

(f) Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

(i) Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

(g) Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

(i) Number of Samples: Submit three sets of Samples. Architect will return two copies to the Contractor for distribution. Contractor to mark up and retain one returned Sample set as a project record Sample.

1. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

2. If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least two sets of paired units (of the five sets required) that show approximate limits of variations.

(4) Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

(5) Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

(6) Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

(7) Certificates:

(a) Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

(b) Installer Certificates: Submit written statements on manufacturer's letterhead certifying

that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

(c) Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

(d) Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

(e) Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

(f) Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

(8) Test and Research Reports:

(a) Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

(b) Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

(c) Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

(d) Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

(e) Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

(f) Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

(i) Name of evaluation organization.

(ii) Date of evaluation.

(iii) Time period when report is in effect.

(iv) Product and manufacturers' names.

(v) Description of product.

(vi) Test procedures and results.

(vii) Limitations of use.

vii) DELEGATED-DESIGN SERVICES

(1) Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

(a) If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

(2) Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and five paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

(a) Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

viii) CONTRACTOR'S REVIEW

(1) Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

(2) Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include 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.

(a) Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

ix) ARCHITECT'S 'S REVIEW

(1) Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return it.

(a) PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.

(b) Paper Submittals: Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

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

(3) Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

(4) Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

(5) Architect will return without review submittals received from sources other than Contractor.

(6) Submittals not required by the Contract Documents will be returned by Architect without action.

PRODUCT REQUIREMENTS

a) PART 1 - GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) 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; and comparable products.

iii) DEFINITIONS

(1) Products: Items obtained 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.

(i) 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.

(ii) New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

(iii) Comparable Product: Product that is demonstrated and approved by Architect through submittal process 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.

(2) Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

(3) Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

iv) PRODUCT WARRANTIES

(1) 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.

(a) Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

(b) Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

(2) Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

(a) Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.

(b) Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.

(c) See other Sections for specific content requirements and particular requirements for submitting special warranties.

(3) Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

b) PART 2 – PRODUCTS

i) PRODUCT SELECTION PROCEDURES

(1) General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

(a) Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

(b) 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.

(c) Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.

(d) Where products are accompanied by the term "as selected," Architect will make selection.

(e) Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

(f) Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

(i) Submit additional documentation required by Architect in order to establish equivalency of proposed products. Evaluation of "or equal" product status is by the Architect, whose determination is final.

SELECTIVE DEMOLITION

a) PART 1 – GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) Section Includes:

(a) Demolition and removal of selected portions of building or structure.

(b) Salvage of existing items to be reused or recycled.

(2) Related Requirements:

(a) Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.

(b) Section 017300 "Execution" for cutting and patching procedures.

iii) DEFINITIONS

(1) Remove: Detach items from existing construction and dispose of them off-site unless indicated

to be salvaged or reinstalled.

(2) Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

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

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

(5) 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.

iv) MATERIALS OWNERSHIP

(1) Unless otherwise indicated, demolition waste becomes property of Contractor.

v) INFORMATIONAL SUBMITTALS

(1) Qualification Data: For refrigerant recovery technician.

(2) Schedule of Selective Demolition Activities: Indicate the following:

(a) Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's and other tenants' on-site operations are uninterrupted.

(b) Interruption of utility services. Indicate how long utility services will be interrupted.

(c) Coordination for shutoff, capping, and continuation of utility services.

(d) Use of elevator and stairs.

(e) Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

(3) Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.

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

vi) CLOSEOUT SUBMITTALS

(1) Inventory: Submit a list of items that have been removed and salvaged.

vii) FIELD CONDITIONS

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

(2) Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

(3) Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

(4) Hazardous Materials: If present in building and structure are not in Contract.

(a) Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

(b) Owner will provide material safety data sheets as needed for suspected hazardous

materials that are known to be present in buildings and structures if demolition is required because of building operations or processes performed there.

(5) Storage or sale of removed items or materials on-site is not permitted.

(6) Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

(a) Maintain fire-protection facilities in service during selective demolition operations.

viii) WARRANTY

(1) Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

(2) Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

ix) COORDINATION

(1) Arrange selective demolition schedule so as not to interfere with Owner's operations.

b) PART 2 – PRODUCTS

i) PERFORMANCE REQUIREMENTS

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

(2) Standards: Comply with ASSE A10.6 and NFPA 241.

c) PART 3 – EXECUTION

i) EXAMINATION

(1) Verify that utilities have been disconnected and capped before starting selective demolition operations.

(2) 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.

(3) 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.

(a) Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

(4) Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

(5) Verify that hazardous materials have been remediated before proceeding with building demolition operations.

(6) Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.

(a) Comply with requirements specified in Section 013233 "Photographic Documentation."

(b) 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.

(c) Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

ii) UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

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

(2) 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.

(a) Owner will arrange to shut off indicated services/systems when requested by Contractor.

(b) Arrange to shut off utilities with utility companies.

(c) 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.

(d) Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.

(i) Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

(ii) Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.

(iii) Equipment to Be Removed: Disconnect and cap services and remove equipment.

(iv) Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

(v) Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

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

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

iii) PROTECTION

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

(a) Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

(b) Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.

(c) Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

(d) Cover and protect furniture, furnishings, and equipment that have not been removed.

(e) Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

(2) 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.

(a) Strengthen or add new supports when required during progress of selective demolition.

(3) Remove temporary barricades and protections where hazards no longer exist.

iv) SELECTIVE DEMOLITION, GENERAL

(1) 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:

(a) 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.

(b) 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.

(c) Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

(d) 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.

(e) Maintain fire watch during and for at least 2 hours after flame-cutting operations.

(f) Maintain adequate ventilation when using cutting torches.

(g) Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

(h) Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

(i) Dispose of demolished items and materials promptly.

(2) 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.

(3) Removed and Salvaged Items:

(a) Clean salvaged items.

(b) Pack or crate items after cleaning. Identify contents of containers.

(c) Store items in a secure area until delivery to Owner.

(d) Transport items to Owner's storage area designated by Owner.

(e) Protect items from damage during transport and storage.

(4) Removed and Reinstalled Items:

(a) Clean and repair items to functional condition adequate for intended reuse.

(b) Pack or crate items after cleaning and repairing. Identify contents of containers.

(c) Protect items from damage during transport and storage.

(d) Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

(5) 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.

v) SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

(1) Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

(2) Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

(3) Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

(4) Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

(5) 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.

vi) DISPOSAL OF DEMOLISHED MATERIALS

(1) 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.

(a) Do not allow demolished materials to accumulate on-site.

(b) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

(c) Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

(d) Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

(2) Burning: Do not burn demolished materials.

vii) CLEANING

(1) 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.

THERMAL INSULATION

a) PART 1 – GENERAL

i) RELATED DOCUMENTS

(1) Drawings and general provisions of the Contract, including General and Supplementary

Conditions and Division 01 Specification Sections, apply to this Section.

ii) SUMMARY

(1) Section Includes:

(a) Glass-fiber blanket.

(2) Related Requirements:

(a) Section 092900 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

iii) ACTION SUBMITTALS

(1) Product Data: For each type of product.

iv) INFORMATIONAL SUBMITTALS

(1) Product Test Reports: For each product, for tests performed by a qualified testing agency.

(2) Evaluation Reports: For foam-plastic insulation, from ICC-ES.

v) DELIVERY, STORAGE, AND HANDLING

(1) Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

(2) Protect foam-plastic board insulation as follows:

(a) Do not expose to sunlight except to necessary extent for period of installation and concealment.

(b) Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.

(c) Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

b) PART 2 – PRODUCTS

i) MINERAL-WOOL BLANKETS

(1) Recycled Content of Insulation: Postconsumer recycled content plus one-half of preconsumer recycled content not less than t percent.

(2) Mineral-Wool Blanket, Unfaced : ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

(a) Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

(i) Roxul Inc.

(ii) Thermafiber Inc.; an Owens Corning company.

(iii) Johns Manville

ii) INSULATION FASTENERS

(1) Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.

(a) Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.

(b) Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.

(2) Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.

(a) Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:

(i) Ceiling plenums.

(ii) Attic spaces.

(iii) Where indicated.

(3) Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.

iii) ACCESSORIES

(1) Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

c) PART 3 – EXECUTION

i) PREPARATION

(1) Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

ii) INSTALLATION, GENERAL

(1) Comply with insulation manufacturer's written instructions applicable to products and applications.

(2) Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

(3) Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

(4) Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

iii) INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

(1) Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

(a) Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.

(b) Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

(c) Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

(d) For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

(i) Exterior Walls: Set units with facing placed toward interior of construction.

(ii) Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

iv) PROTECTION

(1) Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

JOINT SEALANTS

a) PART 1 – GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) Section Includes:

(a) Latex joint sealants.

iii) ACTION SUBMITTALS

(1) Product Data: For each joint-sealant product.

iv) QUALITY ASSURANCE

(1) Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

(2) Product Testing: Test joint sealants using a qualified testing agency.

v) FIELD CONDITIONS

(1) Do not proceed with installation of joint sealants under the following conditions:

(a) When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.

(b) When joint substrates are wet.

(c) Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

(d) Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

vi) WARRANTY

(1) 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.

(a) Warranty Period: Two years from date of Substantial Completion.

b) PART 2 – PRODUCTS

i) LATEX JOINT SEALANTS

(1) **AJS-1**: Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

(a) Products: Subject to compliance with requirements, provide one of the following:

(i) Pecora Corporation; AC-20.

(ii) Tremco Incorporated; Tremflex 834.

(iii) Bostik, Inc.

ii) MISCELLANEOUS MATERIALS

(1) 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.

(2) 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.

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

c) PART 3 – EXECUTION

i) EXAMINATION

(1) 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.

(2) Proceed with installation only after unsatisfactory conditions have been corrected.

ii) PREPARATION

(1) 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:

(a) 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.

(b) 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:

(i) Concrete.

(ii) Masonry.

(iii) Unglazed surfaces of ceramic tile.

(iv) Exterior insulation and finish systems.

(v) Insert other porous joint substrate.

(c) Remove laitance and form-release agents from concrete.

(d) 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:

(i) Metal.

(ii) Glass.

(iii) Porcelain enamel.

(iv) Glazed surfaces of ceramic tile.

(2) 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.

(3) 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.

iii) INSTALLATION OF JOINT SEALANTS

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

(2) Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

(3) 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.

(a) Do not leave gaps between ends of sealant backings.

(b) Do not stretch, twist, puncture, or tear sealant backings.

(c) Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

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

(5) Install sealants using proven techniques that comply with the following and at the same time backings are installed:

(a) Place sealants so they directly contact and fully wet joint substrates.

(b) Completely fill recesses in each joint configuration.

(c) Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

(6) 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.

(a) Remove excess sealant from surfaces adjacent to joints.

(b) Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

(c) Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

(d) Provide flush joint profile locations indicated on Drawings according to Figure 8B in ASTM C 1193.

(e) Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.

(i) Use masking tape to protect surfaces adjacent to recessed tooled joints.

(7) 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.

iv) CLEANING

(1) 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.

v) PROTECTION

(1) 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.

HOLLOW METAL DOORS AND FRAMES

a) PART 1 – GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) Section includes hollow-metal work.

(2) Related Requirements:

(a) Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

iii) DEFINITIONS

(1) Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

iv) COORDINATION

(1) 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.

v) ACTION SUBMITTALS

(1) Product Data: For each type of product.

(a) Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.

(2) Shop Drawings: Include the following:

(a) Elevations of each door type.

(b) Details of doors, including vertical- and horizontal-edge details and metal thicknesses.

(c) Frame details for each frame type, including dimensioned profiles and metal thicknesses.

(d) Locations of reinforcement and preparations for hardware.

(e) Details of each different wall opening condition.

(f) Details of anchorages, joints, field splices, and connections.

(g) Details of accessories.

(h) Details of moldings, removable stops, and glazing.

(i) Details of conduit and preparations for power, signal, and control systems.

(3) Samples for Initial Selection: For units with factory-applied color finishes.

(4) Samples for Verification:

(a) For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches.

(b) For "Doors" and "Frames" subparagraphs below, prepare Samples approximately 12 by 12 inches to demonstrate compliance with requirements for quality of materials and construction:

(i) Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.

(ii) Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

(5) Schedule: Provide a schedule of hollow-metal work 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.

vi) INFORMATIONAL SUBMITTALS

(1) Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

(2) Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

vii) DELIVERY, STORAGE, AND HANDLING

(1) Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

(a) Provide additional protection to prevent damage to factory-finished units.

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

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

b) PART 2 – PRODUCTS

i) MANUFACTURERS

(1) Manufacturers: Subject to compliance with requirements, provide products by one of the following:

(a) Amweld International, LLC.

(b) Ceco Door; ASSA ABLOY.

(c) Curries Company; ASSA ABLOY.

(d) Steelcraft; an Ingersoll-Rand company.

(2) Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

ii) REGULATORY REQUIREMENTS

(1) Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings[and temperature-rise limits] indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

(a) Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets 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) Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

iii) INTERIOR DOORS AND FRAMES

(1) Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

(2) Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3. At locations indicated in the Door and Frame Schedule.

(a) Frames:

(i) Construction: Full profile welded.

(3) Construction: Full profile welded.

iv) FRAME ANCHORS

(1) Jamb Anchors:

(a) Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.

(b) Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

(c) Post installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

(2) Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:

(a) Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

v) MATERIALS

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

(2) Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

(3) Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

(a) For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

(4) Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

(5) 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.

(6) Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

(7) Glazing: Comply with requirements in Section 088000 "Glazing."

(8) Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

vi) FABRICATION

(1) Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

(2) Hollow-Metal Doors:

(a) Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.

(b) Fire Door Cores: As required to provide fire-protection[and temperature-rise] ratings indicated.

(c) Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.

(d) Top Edge Closures: Close top edges of doors with inverted closures of same material as face sheets.

(e) Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.

(f) Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

(3) Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

(a) Sidelite Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

(b) Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

(c) Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

(d) Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.

(e) Jamb Anchors: Provide number and spacing of anchors as follows:

(i) Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:

1. Two anchors per jamb up to 60 inches high.
2. Three anchors per jamb from 60 to 90 inches high.
3. Four anchors per jamb from 90 to 120 inches high.
4. Four anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

(ii) Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1. Three anchors per jamb up to 60 inches high.
2. Four anchors per jamb from 60 to 90 inches high.
3. Five anchors per jamb from 90 to 96 inches high.
4. Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

(iii) Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

(f) Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

(i) Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

(ii) Double-Door Frames: Drill stop in head jamb to receive two door silencers.

(g) Terminated Stops: Terminate stops 6 inches above finish floor with a 45 -degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.

(4) Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

(5) Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

(a) Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

(b) Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

(6) Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.

(a) Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.

(b) Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.

(c) Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

(d) Provide loose stops and moldings on inside of hollow-metal work.

(e) Coordinate rabbet width between fixed and removable stops with glazing and installation

types indicated.

vii) STEEL FINISHES

(1) Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

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

(2) ACCESSORIES

(a) Louvers: Provide louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch- thick, cold-rolled steel sheet set into 0.032-inch- thick steel frame.

(i) Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.

(ii) Lightproof Louver: Stationary louvers constructed with baffles to prevent light from passing from one side to the other.

(iii) Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same qualified testing and inspecting agency that established fire-resistance rating of door assembly.

(b) Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

(c) Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

c) PART 3 – EXECUTION

i) EXAMINATION

(1) Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

(2) Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

(3) Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

(4) Proceed with installation only after unsatisfactory conditions have been corrected.

ii) PREPARATION

(1) 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.

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

iii) INSTALLATION

(1) General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

(2) Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

(a) Set frames accurately in position; plumbed, aligned, and braced securely until permanent

anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

(i) At fire-rated openings, install frames according to NFPA 80.

(ii) Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

(iii) Install frames with removable stops located on secure side of opening.

(iv) Install door silencers in frames before grouting.

(v) Remove temporary braces necessary for installation only after frames have been properly set and secured.

(vi) Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

(vii) Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

(b) Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

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

(c) Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.

(d) Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.

(e) Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.

(f) 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.

(g) In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.

(h) Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

(i) Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

(ii) Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

(iii) Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

(iv) Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

(3) Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

(a) Non-Fire-Rated Steel Doors:

(i) Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.

(ii) Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.

(iii) At Bottom of Door: 3/4 inch plus or minus 1/32 inch.

(iv) Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

(b) Fire-Rated Doors: Install doors with clearances according to NFPA 80

(c) Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

(4) Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

(a) Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

iv) ADJUSTING AND CLEANING

(1) Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

(2) Remove grout and other bonding material from hollow-metal work immediately after installation.

(3) 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.

(4) Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

(5) Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

FLUSH WOOD DOORS

a) PART 1 - GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) Section Includes:

(a) Solid-core doors with wood-veneer faces.

(b) Factory finishing flush wood doors.

(c) Factory fitting flush wood doors to frames and factory machining for hardware.

(2) Related Requirements:

(a) Section 088000 "Glazing" for glass view panels in flush wood doors.

(b) Section 081113 "Hollow Metal Doors and Frames" for hollow metal frames.

iii) ACTION SUBMITTALS

(1) Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

(2) Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

(a) Dimensions and locations of blocking.

(b) Dimensions and locations of mortises and holes for hardware.

(c) Dimensions and locations of cutouts.

(d) Undercuts.

(e) Requirements for veneer matching.

(f) Doors to be factory finished and finish requirements.

(g) Fire-protection ratings for fire-rated doors.

(3) Samples for Initial Selection: For factory-finished doors.

(4) Samples for Verification:

(a) Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

(b) Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edges representing actual materials to be used.

(i) Provide Samples for each species of veneer and solid lumber required.

(ii) Provide Samples for each color, texture, and pattern of plastic laminate required.

(iii) Finish veneer-faced door Samples with same materials proposed for factory-finished doors.

iv) QUALITY ASSURANCE

(1) Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

(2) Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

v) DELIVERY, STORAGE, AND HANDLING

(1) Comply with requirements of referenced standard and manufacturer's written instructions.

(2) Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.

(3) Mark each door on bottom rail with opening number used on Shop Drawings.

vi) FIELD CONDITIONS

(1) 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 ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

b) PART 2 – PRODUCTS

i) MANUFACTURERS

(1) Manufacturers: Subject to compliance with requirements, provide products by one of the following:

(a) Algoma Hardwoods, Inc.

(b) Eggers Industries.

(c) Graham Wood Doors; an Assa Abloy Group company.

(d) Mohawk Doors; a Masonite company.

(e) VT Industries, Inc

ii) FLUSH WOOD DOORS, GENERAL

(1) Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

(a) Contract Documents contain selections chosen from options in quality standard and

additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.

(2) Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.

(3) WDMA I.S.1-A Performance Grade: Extra Heavy Duty.

(4) WDMA I.S.1-A Performance Grade:

iii) VENEER-FACED DOORS FOR TRANSPARENT FINISH

(1) Interior Solid-Core Doors SCW:

(a) Grade: Custom (Grade A faces).

(b) Species: Match existing.

(c) Cut: Plain sliced (flat sliced).

(d) Match between Veneer Leaves: Book match.

(e) Assembly of Veneer Leaves on Door Faces: Running match.

(f) Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.

(g) Room Match: Provide door faces of compatible color and grain within each separate room or area of building.

(h) Core: Particleboard or Either glued wood stave or structural composite lumber.

(i) Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.

(j) Construction: Seven plies, either bonded or nonbonded construction.

(k) WDMA I.S.1-A Performance Grade: Extra Heavy Duty .

iv) FABRICATION

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

(a) Comply with NFPA 80 requirements for fire-rated doors.

(2) Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

(a) Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

(3) Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.

(a) Fabricate door and transom panels with full-width, solid-lumber, rabbeted, meeting rails. Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.

(4) Openings: Factory cut and trim openings through doors.

(a) Light Openings: Trim openings with moldings of material and profile indicated.

(b) Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

(c) Louvers: Factory install louvers in prepared openings.

v) FACTORY FINISHING

(1) General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

(a) Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

(2) Factory finish doors.

(3) Transparent Finish:
(a) Grade: Premium.
(b) Finish: WDMA TR-6 catalyzed polyurethane.
(c) Staining: Match existing doors.
(d) Effect: Semi-filled finish, produced by applying an additional finish coat to partially fill the wood pores.
(e) Sheen: Satin.

c) PART 3 – EXECUTION
i) EXAMINATION
(1) Examine doors and installed door frames, with Installer present, before hanging doors.
(a) 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.
(b) Reject doors with defects.
(c) Proceed with installation only after unsatisfactory conditions have been corrected.
ii) INSTALLATION
(1) Hardware: For installation, see Section 087100 “Door Hardware”
(2) Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as
(a) Install fire-rated doors according to NFPA 80.
(3) Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
(4) Factory-Finished Doors: Restore finish before installation if fitting or machining is required at project site.
iii) ADJUSTING
(1) Operation: Rehang or replace doors that do not swing or operate freely.
(2) 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.

DOOR HARDWARE

a) PART 1 – GENERAL
i) RELATED DOCUMENTS
(1) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
ii) SUMMARY
(1) Section includes:
(a) Mechanical door hardware for:
(i) Swinging doors.
(b) Field verification, preparation and modification of existing doors and frames to receive new door hardware.
(2) Related Sections:
(a) Division 08 Section “Hollow Metal Doors and Frames”
(b) Division 08 Section “Flush Wood Doors”
iii) REFERENCES

(1) Fire/Life Safety
    (a) NFPA - National Fire Protection Association
        (i) NFPA 70 – National Electric Code
        (ii) NFPA 80 - Standard for Fire Doors and Fire Windows
        (iii) NFPA 101 - Life Safety Code
        (iv) NFPA 105 - Smoke and Draft Control Door Assemblies
    (b) Ohio Building Code (OBC)
    (c) All applicable State and Local Building Codes.
(2) UL - Underwriters Laboratories
    (a) UL 10B - Fire Test of Door Assemblies
    (b) UL 10C - Positive Pressure Test of Fire Door Assemblies
    (c) UL 1784 - Air Leakage Tests of Door Assemblies
    (d) UL 305 - Panic Hardware
(3) Accessibility
    (a) ADA - Americans with Disabilities Act.
    (b) ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities.
(4) DHI - Door and Hardware Institute
    (a) Sequence and Format for the Hardware Schedule
    (b) Recommended Locations for Builders Hardware
    (c) Key Systems and Nomenclature
(5) ANSI - American National Standards Institute
    (a) ANSI/BHMA A156.1 - A156.29, and ANSI A156.31 - Standards for Hardware and Specialties

iv) SUBMITTALS
(1) General:
    (a) Submit in accordance with Conditions of Contract and Division 01 requirements.
    (b) Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
    (c) Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.
(2) Action Submittals:
    (a) Product Data: Product data including manufacturers’ technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
    (b) Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
        (i) Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

(c) Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

(i) Door Index; include door number, heading number, and Architects hardware set number.

(ii) Opening Lock Function Spreadsheet: List locking device and function for each opening.

(iii) Type, style, function, size, and finish of each hardware item.

(iv) Name and manufacturer of each item.

(v) Fastenings and other pertinent information.

(vi) Location of each hardware set cross-referenced to indications on Drawings.

(vii) Explanation of all abbreviations, symbols, and codes contained in schedule.

(viii) Mounting locations for hardware.

(ix) Door and frame sizes and materials.

(x) Name and phone number for local manufacturer's representative for each product.

(xi) Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.

1. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

(d) Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

(3) Informational Submittals:

(a) Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.

(b) Product Certificates for electrified door hardware, signed by manufacturer:

(i) Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

(4) Closeout Submittals:

(a) Operations and Maintenance Data : Provide in accordance with Division 01 and include:

(i) Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.

(ii) Catalog pages for each product.

(iii) Name, address, and phone number of local representative for each manufacturer.

(iv) Parts list for each product.

(v) Final approved hardware schedule, edited to reflect conditions as-installed.

(vi) Final keying schedule

(vii) Copies of floor plans with keying nomenclature

(viii) As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

(ix) Copy of warranties including appropriate reference numbers for manufacturers to identify project.

v) QUALITY ASSURANCE

(1) Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.

(a) Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)

(i) Where no additional products or manufacturers are listed in product category, requirements for "No Substitute" govern product selection.

(b) Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.

(2) Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

(a) Warehousing Facilities: In Project's vicinity.

(b) Scheduling Responsibility: Preparation of door hardware and keying schedules.

(c) 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.

(d) Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.

(i) Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

(3) Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.

(4) Architectural Hardware Consultant Qualifications: 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 meets these requirements:

(a) For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).

(b) Can provide installation and technical data to Architect and other related subcontractors.

(c) Can inspect and verify components are in working order upon completion of installation.

(d) Capable of producing wiring diagrams.

(e) Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

(5) Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.

(6) Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.

(a) Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf (22.2 N).

(b) Maximum opening-force requirements:

(i) Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.

(ii) Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.

(iii) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

(c) Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.

(d) Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.

vi) DELIVERY, STORAGE, AND HANDLING

(1) Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

(2) Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

(a) Deliver each article of hardware in manufacturer's original packaging.

(3) Project Conditions:

(a) Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

(b) Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

(4) Protection and Damage:

(a) Promptly replace products damaged during shipping.

(b) Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.

(c) Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

vii) COORDINATION

(1) Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.

(2) 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.

(3) Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

(4) Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware

with connections to power supplies and building safety and security systems.

(5) Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

(6) Direct shipments not permitted, unless approved by Contractor.

b) PART 2 – PRODUCTS

i) MANUFACTURERS

(1) The Owner requires use of certain products for their unique characteristics and particular project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."

(a) Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

(2) Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer " or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

(3) Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

Item	Scheduled Manufacturer	Acceptable Manufacturer
Hinges	Ives (IVE)	Hager, McKinney
Continuous Hinges	Ives (IVE)	Hager, McKinney
Electric Power Transfers	Von Duprin (VON)	Owners Standard - No Substitutions
Flush Bolts & Coordinators	Ives (IVE)	Hager, Rockwood
Locksets	Schlage (SCH)	Best, Sargent
Cylinders/Cores/Keying	Schlage (SCH) - Everest D	Owners Standard - No Substitutions
Exit Devices	Von Duprin	Precision, Sargent
Electric Strikes	Von Duprin	Folger Adams, HES
Power Supplies	Von Duprin	Precision, Sargent
Door Closers	LCN	Sargent, Stanley
Auto Operators	LCN	Owners Standard - No Substitutions
Door Trim	Ives (IVE)	Hager, Rockwood
Protection Plates	Ives (IVE)	Hager, Rockwood
Overhead Stops	Glynn-Johnson (GLY)	Rixson, ABH
Stops & Holders	Ives (IVE)	Hager, Rockwood
Magnetic Wall Holders	LCN	Rixson, ABH
Silencers	Ives (IVE)	Hager, Rockwood
Weatherstrip/Gasketing	Zero (ZER)	Hager, NGP, Pemko
Key Cabinets	Lund (LUN)	HPC, Telkee

(4) Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

(5) Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

ii) MATERIALS

(1) Fasteners

(a) Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.

(b) Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.

(c) Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.

(d) Install hardware with fasteners provided by hardware manufacturer.

(2) Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.

(a) Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.

(b) Use materials which match materials of adjacent modified areas.

(c) When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

(3) Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

(a) Where fasteners are exposed to view: Finish to match adjacent door hardware material.

iii) HINGES

(1) Provide three-knuckle, ball bearing hinges.

(a) Manufacturers and Products:

(i) Scheduled Manufacturer and Product: Ives 5BB1 series

(ii) Acceptable Manufacturers and Products: Hager BB series, McKinney TB/T4B series,

(2) Requirements:

(a) 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

(i) Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high

(ii) Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

(b) Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.

(c) Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.

(d) Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

(i) Steel Hinges: Steel pins

(ii) Non-Ferrous Hinges: Stainless steel pins

(iii) Out-Swinging Exterior Doors: Non-removable pins

(iv) Out-Swinging Interior Lockable Doors: Non-removable pins

(v) Interior Non-lockable Doors: Non-rising pins

(e) Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

(f) Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.

(g) Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.

(h) Provide mortar guard for each electrified hinge specified, unless specified in hollow metal frame specification.

(i) Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

(j) mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

iv) MORTISE LOCKS

(1) Manufacturers and Products:

(a) Scheduled Manufacturer and Product: Schlage L9000 series

(b) Acceptable Manufacturers and Products: Best 45H series, Sargent 8200 series

(2) Requirements:

(a) Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1 Operational, Grade 1 Security, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to “KEYING” article, herein.

(b) Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.

(c) Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.

(d) Provide electrified options as scheduled in the hardware sets. Where scheduled, provide a request to exit (RX) switch that is actuated with rotation of inside lever.

(e) Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

(i) Lever Design: Schlage 06A.

(ii) Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

v) CYLINDERS

(1) Manufacturer:

(a) Scheduled Manufacturer: Schlage “Everest D”, Owner’s District Wide Standard, NO SUBSTITUTIONS.

(2) Requirements: Provide cylinders/cores complying with the following requirements.

(a) Cylinders/cores compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer’s series as indicated.

(3) Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Blind code marks shall not include actual key cuts.

(4) Replaceable Construction Cores.

(a) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.

(b) Owner or Owner’s Representative will replace temporary construction cores with permanent cores.

vi) KEYING

(1) Requirements:

(a) Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.

(i) Keying system as directed by the Owner.

vii) SILENCERS

(1) Manufacturers:

(a) Scheduled Manufacturer: Ives

(b) Acceptable Manufacturers: Hager, Rockwood

(2) Requirements:

(a) Provide "push-in" type silencers for hollow metal or wood frames.

(b) Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.

(c) Omit where gasketing is specified.

c) PART 3 – EXECUTION

i) EXAMINATION

(1) Prior to installation of hardware, 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.

(2) Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.

(3) Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

(4) Proceed with installation only after unsatisfactory conditions have been corrected.

ii) PREPARATION
(1) Where on-site modification of doors and frames is required:
(a) Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
(b) Field modify and prepare existing door and frame for new hardware being installed.
(c) When modifications are exposed to view, use concealed fasteners, when possible.
(d) Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
(i) Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
(ii) Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
(iii) Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

iii) INSTALLATION
(1) All hardware will be installed by qualified tradesmen, skilled in application of commercial grade hardware. A pre-installation meeting shall be conducted by the manufacturer's representative. The manufacturer's representative shall also conduct a post construction review of all doors as part of the punch list process.
(2) Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
(a) Standard Steel Doors and Frames: ANSI/SDI A250.8.
(b) Custom Steel Doors and Frames: HMMA 831.
(c) Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
(3) Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
(4) Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
(5) Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
(6) Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
(7) Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
(8) Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity 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.
(9) Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches (750 mm) of door height greater than 90 inches (2286 mm).
(10) Lock Cylinders: Install construction cores to secure building and areas during construction period.
(a) Replace construction cores with permanent cores as indicated in keying section.
(b) Permanent cores will be supplied to owner and installed by the owners' representative.
(11) Wiring: Coordinate with Division 26 and Division 28 sections for:

(a) Conduit, junction boxes and wire pulls.
(b) Connections to and from power supplies to electrified hardware.
(c) Connections to fire/smoke alarm system and smoke evacuation system.
(d) Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
(e) Testing and labeling wires with Architect's opening number.

iv) ADJUSTING
(1) 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.
(a) Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees
(b) Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
(c) Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

v) CLEANING AND PROTECTION
(1) Clean adjacent surfaces soiled by door hardware installation.
(2) Clean operating items as necessary to restore proper function and finish.
(3) Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

vi) DOOR HARDWARE SCHEDULE
(1) Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements. Contractor is to provide hardware sets, per the project notes and requirements for each door, then submit these sets in the shop drawing phase for review and approval.

NON-STRUCTURAL METAL FRAMING

a) PART 1 – GENERAL
i) RELATED DOCUMENTS
(1) Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

ii) SUMMARY
(1) Section Includes:
(a) Non-load-bearing steel framing systems for interior partitions.
(b) Suspension systems for interior ceilings and soffits.
(c) Grid suspension systems for gypsum board ceilings.

iii) ACTION SUBMITTALS
(1) Product Data: For each type of product.
(a) Studs and Runners: Provide documentation that framing members' certification is according to SIFA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members."

iv) INFORMATIONAL SUBMITTALS
(1) Evaluation Reports: For embossed steel studs and runners firestop tracks, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

b) PART 2 – PRODUCTS

i) PERFORMANCE REQUIREMENTS
   (1) Horizontal Deflection: For wall assemblies, limited to 1/240 at gypsum board assemblies and 1/360 at cementitious backer units of the wall height based on horizontal loading of 5 lbf/sq. ft. .
ii) FRAMING SYSTEMS
   (1) Framing Members, General: Comply with ASTM C 754 for conditions indicated.
      (a) Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
      (b) Protective Coating: ASTM A 653/A 653M, G40 , hot-dip galvanized coating unless otherwise indicated.
   (2) Studs and Runners: ASTM C 645. Use either steel studs and runners or embossed steel studs and runners.
      (a) Steel Studs and Runners:
         (i) Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection.
         (ii) Depth: As indicated on Drawings .
      (b) Embossed Steel Studs and Runners:
         (i) Minimum Base-Metal Thickness: As required by horizontal deflection performance requirements.
         (ii) Depth: As indicated on Drawings .
   (3) Slip-Type Head Joints: Where indicated, provide one of the following:
      (a) Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
      (b) Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
      (c) Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
   (4) Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
      (a) Minimum Base-Metal Thickness: 0.0329 inch .
   (5) Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-metal thickness, with minimum 1/2-inch- wide flanges.
      (a) Depth: 1-1/2 inches .
      (b) Clip Angle: Not less than 1-1/2 by 1-1/2 inches , 0.068-inch- thick, galvanized steel.
   (6) Hat-Shaped, Rigid Furring Channels: ASTM C 645.
      (a) Minimum Base-Metal Thickness: 0.0329 inch .
      (b) Depth: 7/8 inch .
   (7) Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
      (a) Configuration: Asymmetrical or hat shaped.
   (8) Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.
      (a) Depth: 3/4 inch .
   (9) Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches , wall

attachment flange of 7/8 inch , minimum uncoated-metal thickness of 0.0179 inch , and depth required to fit insulation thickness indicated.

iii) SUSPENSION SYSTEMS

(1) Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.

(2) Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

(3) Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

(4) Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch- wide flanges.

(a) Depth: As indicated on Drawings.

(5) Furring Channels (Furring Members):

(a) Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.

(b) Steel Studs and Runners: ASTM C 645.

(i) Minimum Base-Metal Thickness: As indicated on Drawings.

(ii) Depth: As indicated on Drawings.

(c) Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.

(i) Minimum Base-Metal Thickness: 0.0329 inch .

(d) Resilient Furring Channels: 1/2-inch- deep members designed to reduce sound transmission.

(i) Configuration: Asymmetrical or hat shaped.

(6) Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

iv) AUXILIARY MATERIALS

(1) General: Provide auxiliary materials that comply with referenced installation standards.

(a) Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

(2) Isolation Strip at Exterior Walls: Provide the following:

(a) Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

c) PART 3 – EXECUTION

i) EXAMINATION

(1) 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.

(2) Proceed with installation only after unsatisfactory conditions have been corrected.

ii) PREPARATION

(1) Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

(a) Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

iii) INSTALLATION, GENERAL

(1) Installation Standard: ASTM C 754.

(a) Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to

framing installation.

(2) Install framing and accessories plumb, square, and true to line, with connections securely fastened.

(3) Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

(4) Install bracing at terminations in assemblies.

(5) Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

iv) INSTALLING FRAMED ASSEMBLIES

(1) Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

(a) Single-Layer Application: 16 inches o.c. unless otherwise indicated.

(2) Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

(3) Install studs so flanges within framing system point in same direction.

(4) Install tracks (runners) 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.

(a) 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.

(b) Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

(i) Install two studs at each jamb unless otherwise indicated.

(ii) 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.

(iii) Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

(c) 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.

(5) Direct Furring:

(a) Screw to wood framing.

(b) Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

(6) Z-Shaped Furring Members:

(a) Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.

(b) Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

(c) At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

(7) 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.

v) INSTALLING SUSPENSION SYSTEMS

(1) Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

(2) Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

(3) Suspend hangers from building structure as follows:

(a) Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

(i) Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

(b) Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

(i) Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

(c) Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

(d) Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

(e) Do not attach hangers to steel roof deck.

(f) Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

(g) Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

(h) Do not connect or suspend steel framing from ducts, pipes, or conduit.

(4) Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

(5) Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

GYPSUM BOARD

a) PART 1 – GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) Section Includes:

(a) Interior gypsum board.

(2) Related Requirements:

(a) Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

iii) ACTION SUBMITTALS
(1) Product Data: For each type of product.
iv) DELIVERY, STORAGE AND HANDLING
(1) 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.
v) FIELD CONDITIONS
(1) Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
(2) Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
(3) Do not install panels that are wet, moisture damaged, and mold damaged.
(a) Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
(b) Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

b) PART 2 – PRODUCTS
i) GYPSUM BOARD, GENERAL
(1) Materials: Products shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
ii) INTERIOR GYPSUM BOARD
(1) Gypsum Wallboard: ASTM C 1396/C 1396M.
(a) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
(i) Georgia-Pacific Building Products.
(ii) National Gypsum Company.
(iii) USG Corporation.
(2) Gypsum Ceiling Board: ASTM C 1396/C 1396M.
(a) Manufacturers: Subject to compliance with requirements, provide products by one of the following:
(i) Georgia-Pacific Building Products; Toughrock CD Ceiling Board.
(ii) National Gypsum Company; High Strength Ceiling Board.
(iii) USG Corporation; Sheetrock Brand Sag-Resistant Gypsum Board.
(b) Thickness: 1/2 inch.
(c) Long Edges: Tapered.
iii) TRIM ACCESSORIES
(1) Interior Trim: ASTM C 1047.
(a) Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
(b) Shapes:
(i) Cornerbead.
(ii) LC-Bead: J-shaped; exposed long flange receives joint compound.
(iii) L-Bead: L-shaped; exposed long flange receives joint compound.
(iv) Expansion (control) joint.
(v) Curved-Edge Cornerbead: With notched or flexible flanges
iv) JOINT TREATMENT MATERIALS

(1) General: Comply with ASTM C 475/C 475M.
(2) Joint Tape:
(a) Interior Gypsum Board: Paper.
(b) Exterior Gypsum Soffit Board: Fiber Glass.
(c) Tile Backing Panels: As recommended by panel manufacturer.
(3) Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
(a) Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
(b) Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
(i) Use setting-type compound for installing paper-faced metal trim accessories.
(c) Fill Coat: For second coat, use compound per gypsum board manufacturer's written recommendations.
(d) Finish Coat: For third coat, use compound per gypsum board manufacturer's written recommendations.
(e) Skim Coat: For final coat of Level 5 finish, use compound or coating per gypsum board manufacturer's written recommendations.
(4) Joint Compound for Exterior Applications:
(a) Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
(5) Joint Compound for Tile Backing Panels:
(a) Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

v) AUXILIARY MATERIALS
(1) General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
(2) Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
(a) Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
(b) For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
(3) Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
(4) Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
(a) Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

c) PART 3 – EXECUTION
i) EXAMINATION
(1) 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.
(2) Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

(3) Proceed with installation only after unsatisfactory conditions have been corrected.

ii) APPLYING AND FINISHING PANELS, GENERAL

(1) Comply with ASTM C 840.

(2) Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

(3) 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.

(4) Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

(5) Form control and expansion joints with space between edges of adjoining gypsum panels

(6) Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

(a) 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.

(b) Fit gypsum panels around ducts, pipes, and conduits.

(c) 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.

(7) 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.

(8) Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

(9) Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side

iii) APPLYING INTERIOR GYPSUM BOARD

(1) Single-Layer Application:

(a) On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.

(b) On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

(i) Stagger abutting end joints not less than one framing member in alternate courses of panels.

(ii) At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

(c) On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

(d) Fastening Methods: Apply gypsum panels to supports with steel drill screws.

iv) INSTALLING TRIM ACCESSORIES

(1) 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.

(2) Control Joints: Install control joints according to ASTM C 840 and in specific locations

approved by Architect for visual effect.

(3) Interior Trim: Install in the following locations:
   (a) Cornerbead: Use at outside corners unless otherwise indicated.
   (b) LC-Bead: Use at exposed panel edges.
   (c) L-Bead: Use where indicated.
   (d) Curved-Edge Cornerbead: Use at curved openings.

v) FINISHING GYPSUM BOARD

(1) 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.

(2) Prefill open joints and damaged surface areas.

(3) Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

(4) Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
   (a) Level 1: Ceiling plenum areas, concealed areas, and where indicated.
   (b) Level 2: Panels that are substrate for tile.
   (c) Level 3: Where indicated on Drawings.
   (d) Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
      (i) Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

vi) PROTECTION

(1) 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.

(2) Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

(3) Remove and replace panels that are wet, moisture damaged, and mold damaged.
   (a) Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   (b) Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration

ACOUSTICAL PANEL CEILINGS

a) PART 1 – GENERAL

i) SUMMARY

(1) Section includes acoustical panels and exposed suspension systems for interior ceilings.

(2) Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

ii) PREINSTALLATION MEETINGS

(1) Preinstallation Conference: Conduct conference at Project site to be attended by the installer, the architect, and the construction manager to review the specifications, and detail the materials, the installation, the initial maintenance, and protection of the installed ceiling.

iii) ACTION SUBMITTALS

(1) Product Data: For each type of product.

(2) Samples: For each exposed product and for each color and texture specified, 6 inches in size.

iv) INFORMATIONAL SUBMITTALS

(1) Qualification Data: For testing agency.

(2) Product Test Reports: For each acoustical panel ceiling, for tests performed by a qualified testing agency.

(3) Evaluation Reports: For each acoustical panel ceiling suspension system, from ICC-ES.

v) CLOSEOUT SUBMITTALS

(1) Maintenance Data: For finishes to include in maintenance manuals.

vi) MAINTENANCE MATERIAL SUBMITTALS

(1) 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.

(a) Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed for each panel type specified.

(b) Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed for each type specified

(c) Hold-Down Clips: Equal to 2 percent of quantity installed.

(d) Impact Clips: Equal to 2 percent of quantity installed.

vii) DELIVERY, STORAGE, AND HANDLING

(1) Deliver acoustical panels, 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.

(2) Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

(3) Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

viii) FIELD CONDITIONS

(1) Environmental Limitations: Do not install acoustical panel 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.

(a) Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

b) PART 2 – PRODUCTS

i) SOURCE LIMITATIONS

(1) Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

ii) PERFORMANCE REQUIREMENTS

(1) Ceiling products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 16.5 mcg/cu. m or 13.5 ppb, whichever is less.

(2) Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

(a) Flame-Spread Index: Class A according to ASTM E1264.

(b) Smoke-Developed Index: 450 or less.

(3) Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

(a) Indicate design designations from UL or from the listings of another qualified testing agency.

iii) ACOUSTICAL PANELS

(1) Suspended Acoustical Ceiling Tiles

(a) Manufacturers: Subject to compliance with requirements, provide products by one of the following:

(i) Armstrong World Industries, Inc.; Cirrus #574 (24 by 24 inch) and #533 (24 by 48 inch) Square Lay-in Item #1714.

(ii) CertainTeed Corp.; Celotex Brand Fine Fissured High NRC #HHF-497 DP.

(iii) USG Interiors, Inc.; Subsidiary of USG Corporation; Eclipse ClimaPlus, Square Lay-in Item #76575.

(b) Classification: Provide fire-resistance rated panels complying with ASTM E 1264 for type, form, and pattern as follows:

(i) Type and Form: Type III, mineral base with painted finish; Form 2, water felted.

(ii) Pattern: CE (perforated, small holes and lightly textured).

(c) Color: White.

(d) LR: Not less than 0.85.

(e) NRC: Not less than 0.70.

(f) CAC: Not less than 35.

(g) Edge/Joint Detail: Square.

(h) Thickness: 3/4 inch.

(i) Modular Size:24 by 48 inches and 24 by 24 inches, as indicated in Drawings.

(j) Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard 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 D 3273 and evaluated according to ASTM D 3274 or ASTM G 21 (basis of design: Armstrong, Humiguard Plus).

(2) Surface Mounted Ceiling Tiles

(a) Armstrong Ceilings “Impression” or equivalent

(i) White

(ii) 12” x 12”

(iii) Textured Surface

iv) METAL SUSPENSION SYSTEMS

(1) Suspension system for ACT-1.

(a) Products: Subject to compliance with requirements, provide one of the following:

(i) Armstrong World Industries, Inc.; Prelude XL 15/16” Exposed Tee System.

(ii) CertainTeed Corporation.; 15/16” Classic System.

(iii) USG Interiors, Inc.; Donn DX Exposed 15/16” Face Suspension System

(b) Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 (Z90) coating designation, with prefinished, 15/16-inch- (24-mm-) wide, aluminum caps on flanges.

(i) Structural Classification: Intermediate-duty system.

(ii) End Condition of Cross Runners: Override stepped or butt-edge type.

(iii) Face Design: Flat, flush.

(iv) Face Finish: Painted white.

v) ACCESSORIES

(1) 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.

(a) 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 10 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.

(i) Type: Postinstalled expansion anchors.

(ii) Corrosion Protection, Carbon Steel: Components zinc plated according to ASTM B633, Class SC 1 (mild) service condition.

(iii) Corrosion Protection, Stainless Steel: Components complying with ASTM F593 and ASTM F594, Group 1 Alloy 304 or 316.

(iv) Corrosion Protection, Nickel-Copper Alloy: Components fabricated from nickel-copper- alloy rods complying with ASTM B164 for UNS No. N04400 alloy.

(b) 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.

(2) Wire Hangers, Braces, and Ties: Provide wires as follows:

(a) Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.

(b) Stainless-Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.

(c) Nickel-Copper-Alloy Wire: ASTM B164, nickel-copper-alloy UNS No. N04400.

(d) 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.

(3) Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

(4) Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

(5) 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.

(6) Hold-Down Clips: Manufacturer's standard hold-down.

(7) Impact Clips: Manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

(8) Clean-Room Gasket System: Where indicated, provide manufacturer's standard system, including manufacturer's standard gasket and related adhesives, tapes, seals, and retention clips, designed to seal out foreign material from and maintain positive pressure in clean room.

c) PART 3 – EXECUTION

i) EXAMINATION

(1) Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

(2) Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

(3) Proceed with installation only after unsatisfactory conditions have been corrected.

ii) PREPARATION

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

(2) Layout openings for penetrations centered on the penetrating items.

iii) INSTALLATION

(1) Install acoustical panel ceilings according to ASTM C636/C636M and manufacturer's written instructions.

(a) Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

(2) Suspend ceiling hangers from building's structural members and as follows:

(a) 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.

(b) Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

(c) 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.

(d) 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.

(e) 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.

(f) 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.

(g) 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.

(h) Do not attach hangers to steel deck tabs.

(i) Do not attach hangers to steel roof deck. Attach hangers to structural members.

(j) 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.

(k) Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

(3) 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.

(4) Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

(a) Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

(b) 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.

(c) Do not use exposed fasteners, including pop rivets, on moldings and trim.

(5) Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

(6) Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.

(a) Arrange directionally patterned acoustical panels as follows:

(i) Install panels with pattern running in one direction parallel to long axis of space or as indicated in drawings.

(b) For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.

(c) For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

(d) For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.

(e) Paint cut edges of panel remaining exposed after installation; match color of exposed

panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

(f) Install impact clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.

(i) Hold-Down Clips: Space 24 inches o.c. on all cross runners.

(g) Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

(7) Install surface-mounted ceiling tiles to the substrate with adhesives recommended by the manufacturer.

iv) ERECTION TOLERANCES

(1) Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non- cumulative.

(2) 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.

v) CLEANING

(1) Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

(2) Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

RESILIENT BASE AND ACCESSORIES

a) PART 1 – GENERAL

i) SUMMARY

(1) Section Includes:

(a) Thermoset-rubber base.

ii) ACTION SUBMITTALS

(1) Product Data: For each type of product.

(2) 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 2 inches long.

iii) MAINTENANCE MATERIAL SUBMITTALS

(1) 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.

(a) Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

iv) QUALITY ASSURANCE

(1) Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

(a) Coordinate mockups in this Section with mockups specified in other Sections.

(b) Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

(c) Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

(2) Installation Qualification: Contractors for floor covering installation should be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified. An installer is "qualified" if trained by a certified International Standards and Training Alliance resilient floor covering installer.

v) DELIVERY, STORAGE, AND HANDLING

(1) 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 55 deg F or more than 85 deg F.

vi) FIELD CONDITIONS

(1) Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 degrees F or more than 85 degrees F, in spaces to receive resilient products during the following periods:

(a) 48 hours before installation.

(b) During installation.

(c) 48 hours after installation.

(2) 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.

(3) Install resilient products after other finishing operations, including painting, have been completed.

b) PART 2 – PRODUCTS

i) PERFORMANCE REQUIREMENTS

(1) Fire-Test-Response Characteristics: For resilient base and accessories, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

(a) Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

(b) ASTM E (Smoke Generation) Maximum Specific Optical Density of 450 or less.

ii) THERMOSET-RUBBER BASE (RB)

(1) Manufacturers: Subject to compliance with requirements, provide products by one of the following:

(a) Flexco; Wallflowers Wall Base.

(b) Johnsonite; A Tarkett Company; Baseworks Rubber Wall Base.

(c) Mannington Commercial: BurkeBase Type TS Wall Base.

(d) Mondo Contract Flooring; Wall Base.

(e) Nora Systems, Inc.; Nora Wall Base

(f) Roppe Corporation, U.S.A.; Pinnacle Wall Base.

(2) Product Standard: ASTM F 1861, Type TS (rubber, thermoset).

(a) Group: I (solid, homogeneous).

(b) Style: B, Cove.

(c) Thickness: 0.125 inch.

(d) Height: 4 inches and 6 inches were indicated in drawings.

(e) Lengths: Coils in manufacturer's standard length, minimum 100 feet.

(f) Outside Corners: Job formed.

(g) Inside Corners: Job formed.

(h) Colors: As selected by Architect from full range of industry colors.

iii) VINYL MOLDING ACCESSORIES

(1) Manufacturers: Subject to compliance with requirements, provide products by one of the following:

(a) Flexco, Corporation; Flooring Accessories.

(b) Johnsonite; A Tarkett Company; Specialty Flooring Finishing Accessories.

(c) Mannington Commercial; Vinyl Accessories.

(d) Roppe Corporation, U.S.A.; Vinyl Accessories.

(2) Description: Vinyl cap for cover resilient flooring, carpet edge for glue-down applications, nosing for carpet, nosing for resilient flooring, reducer strip for resilient flooring, joiner for tile and carpet, and transition strips.

(3) Profile and Dimensions: As indicated.

(4) Locations: Provide vinyl molding accessories in areas indicated.

(5) Colors: As selected by Architect from full range of industry colors.

iv) INSTALLATION MATERIALS

(1) 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.

(2) Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

(a) Adhesives shall have a VOC content of 50 g/L or less.

(3) Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

(4) Metal Edge Strips: of width shown, nominal 2 inches wide, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.

c) PART 3 – EXECUTION

i) EXAMINATION

(1) Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

(a) 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.

(2) Proceed with installation only after unsatisfactory conditions have been corrected.

(a) Installation of resilient products indicates acceptance of surfaces and conditions.

ii) PREPARATION

(1) Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

(2) Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F710.

(a) Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

(b) Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

(c) Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

(d) Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

(i) Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

(ii) Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

(3) Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

(4) Do not install resilient products until materials are the same temperature as space where they are to be installed.

(a) At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

(5) Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

iii) RESILIENT BASE INSTALLATION

(1) Comply with manufacturer's written instructions for installing resilient base.

(2) Use only manufacturer's recommended adhesive for installation.

(3) 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.

(4) Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

(5) Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

(6) Do not stretch resilient base during installation.

(7) On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

(8) Preformed Corners: Install preformed corners before installing straight pieces.

(9) Job-Formed Corners:

(a) Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches in length.

(i) Form without producing discoloration (whitening) at bends.

(b) Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches in length.

(c) Mitered corners are not acceptable.

iv) RESILIENT ACCESSORY INSTALLATION

(1) Comply with manufacturer's written instructions for installing resilient accessories.

(2) Resilient Stair Accessories:

(a) Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.

(b) Use only manufacturer's recommended adhesive for installation.

(c) Tightly adhere to substrates throughout length of each piece.

(d) For treads installed as separate, equal-length units, install to produce a flush joint between units.

(3) 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.

v) CLEANING AND PROTECTION

(1) Comply with manufacturer's written instructions for cleaning and protecting resilient products.

(2) Perform the following operations immediately after completing resilient-product installation:

(a) Remove adhesive and other blemishes from surfaces. Follow manufacturer's instructions to avoid damage to flooring finish and accessory materials' finish

(b) Sweep and vacuum horizontal surfaces thoroughly.

(c) Damp-mop horizontal surfaces to remove marks and soil.

(3) Initial Maintenance for Rubber Tread and Riser Units: Remove soil, visible adhesive and surface blemishes from floor tile surfaces before performing manufacturer's recommended maintenance.

(a) Use commercially available product recommended by flooring manufacturer.

(b) Remove silicone finish with a diluted pH neutral cleaner/degreaser using flooring and solution manufacturers' accepted method.

(4) Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

(5) Cover resilient products subject to wear and foot traffic until Substantial Completion.

RESILIENT TILE FLOORING

a) PART 1 – GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) Section Includes:

(a) Vinyl enhanced tile.

(2) Related Sections:

(a) Division 09 Section "Resilient Base and Accessories" for resilient base, reducer strips,

and other accessories installed with resilient floor coverings.

iii) ACTION SUBMITTALS
   (1) Product Data: For each type of product.

iv) INFORMATIONAL SUBMITTALS
   (1) Qualification Data: For Installer.

v) CLOSEOUT SUBMITTALS
   (1) Maintenance Data: For each type of floor tile to include in maintenance manuals.
   (2) Maintenance Tutorial: For each type of floor tile, provide a maintenance tutorial for the owners by the manufacturer including the recommended products, procedures, equipment required to retain the flooring at its optimum condition.

vi) MAINTENANCE MATERIAL SUBMITTALS
   (1) Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      (a) Floor Tile: Furnish (2) full cartons (90 sq. ft) of each field color and 1 full carton (45 sq. ft), of each accent color in the dye lots installed.

vii) QUALITY ASSURANCE
   (1) Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
      (a) Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
   (2) Source Limitations: Obtain each floor tile type through one source from a single manufacturer.

viii) DELIVERY, STORAGE, AND HANDLING
   (1) 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.

ix) FIELD CONDITIONS
   (1) 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 time periods:
      (a) 48 hours before installation.
      (b) During installation.
      (c) 48 hours after installation.
   (2) 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.
   (3) Close spaces to traffic during floor tile installation.
   (4) Close spaces to traffic for 48 hours after floor tile installation.
   (5) Install floor tile after other finishing operations, including painting, have been completed.

b) PART 2 – PRODUCTS

i) PERFORMANCE REQUIREMENTS
   (1) Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
      (a) Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
      (b) ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.

ii) VINYL ENHANCED FLOOR TILE (VET)

(1) Products: Subject to compliance with requirements, provide one of the following:
(a) Altro; Dolce, Dolce Essentials, and Quartz Tile.
(b) Armstrong Flooring, Commercial; Eco Flooring
(c) Johnsonite, A Tarkett Company; Azterra and Azrock Color Essence Vinyl Enhanced Tile.
(d) Flexco, Corporation; Delane Solid Vinyl Tile.
(2) Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
(3) Wearing Surface: Smooth.
(4) Thickness: 0.125 inch.
(5) Size: 12 by 12 inches and/or 12 by 24 inches.
(6) Colors and Patterns: As selected by Architect from full range of industry colors, minimum (65).
(7) Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
(8) Wearing Surface: Smooth.
(9) Thickness: 0.125 inch.
(10) Size: 12 by 12 inches and/or 12 by 24 inches.
(11) Colors and Patterns: As selected by Architect from full range of industry colors, minimum (65).

iii) INSTALLATION MATERIALS
(1) 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.
(2) Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
(a) Adhesives shall comply with the following limits for VOC content:
(i) Vinyl Composition Tile Adhesives: 50 g/L or less.
(ii) Rubber Floor Adhesives: 60 g/L or less.
(b) Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
(3) Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

c) PART 3 – EXECUTION
i) EXAMINATION
(1) Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
(a) 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.
(2) Proceed with installation only after unsatisfactory conditions have been corrected.

ii) PREPARATION
(1) Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
(2) Concrete Substrates: Prepare according to ASTM F 710.
(a) Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
(b) 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) Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrates pass testing.

(d) Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations:

(i) Perform anhydrous calcium chloride test according to ASTM F 1869.

1. Rubber Floor Tile: Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
2. Vinyl Composition Floor Tile: Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. (2.27 kg of water/92.9 sq. m) in 24 hours.

(ii) Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum **75** percent relative humidity level.

(3) Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.

(4) Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

(5) Do not install floor tiles until they are the same temperature as the space where they are to be installed.

(a) At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

(6) Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

iii) FLOOR TILE INSTALLATION

(1) Comply with manufacturer's written instructions for installing floor tile.

(2) 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.

(a) Lay tiles **in pattern indicated**.

(3) 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.

(a) Lay tiles **with grain running in one direction** and **in pattern of colors and sizes indicated**.

(4) 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.

(5) Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

(6) 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.

(7) Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

(8) Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at

joints, telegraphing of adhesive spreader marks, and other surface imperfections.

iv) CLEANING AND PROTECTION

(1) Comply with manufacturer's written instructions for cleaning and protecting floor tile.

(2) Perform the following operations immediately after completing floor tile installation:

(a) Remove adhesive and other blemishes from exposed surfaces.

(b) Sweep and vacuum surfaces thoroughly.

(c) Damp-mop surfaces to remove marks and soil.

(3) Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

(4) Floor Polish for Vinyl Enhanced Tile: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.

(a) Use commercially available product acceptable to manufacturer and owner

(b) Coordinate selection of floor polish with Owner's maintenance service.

(c) Apply number of coat(s) as recommended in writing by flooring manufacturer for given area.

(5) Cover floor tile until Substantial Completion.

INTERIOR PAINTING

a) PART 1 – GENERAL

i) RELATED DOCUMENTS

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

ii) SUMMARY

(1) Section includes surface preparation and the application of paint systems on the following interior substrates:

(a) Concrete.

(b) Concrete masonry units (CMU).

(c) Steel.

(d) Galvanized metal.

(e) Gypsum board.

(2) Related Requirements:

(a) Section 051200 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this Section.

(b) Section 099600 "High-Performance Coatings" for high-performance and special-use coatings.

(c) Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.

(d) Section 099300 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.

iii) ACTION SUBMITTALS

(1) Product Data: For each type of product. Include preparation requirements and application instructions.

(2) Product List: For each product indicated, include the following:

(a) Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

(b) VOC content.

iv) MAINTENANCE MATERIAL SUBMITTALS

(1) 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.

(a) Paint: 5 percent, but not less than 5 gal. (18.9 L) for field colors and 1 gal. (3.8 L) of each accent color applied.

v) QUALITY ASSURANCE

(1) Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

(2) Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

(3) Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

(4) Paint mockups as required per owners and architect.

vi) DELIVERY, STORAGE, AND HANDLING

(1) Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

(a) Product name or title of material.

(b) Product description (generic classification or binder type).

(c) Manufacturer's stock number and date of manufacture.

(d) Contents by volume, for pigment and vehicle constituents.

(e) Thinning instructions.

(f) Application instructions.

(g) Color name and number.

(h) VOC content.

(2) 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 .

(a) Maintain containers in clean condition, free of foreign materials and residue.

(b) Remove rags and waste from storage areas daily.

vii) FIELD CONDITIONS

(1) Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F .

(2) Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

b) PART 2 – PRODUCTS

i) MANUFACTURERS

(1) Manufacturers: Subject to compliance with requirements, [provide products by one of the following]:

(a) Benjamin Moore & Co.

(b) PPG Architectural Finishes, Inc.

(c) Sherwin-Williams Company (The).

ii) PAINT, GENERAL

(1) Material Compatibility:

(a) Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

(b) For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

(2) Colors: Match Architect's samples.

iii) WATER-BASED PAINTS

(1) Latex, Interior, Institutional Low Odor/VOC, Flat (Gloss Level 1):MPI#143

(a) Benjamin Moore: Spec 500 Interior Latex Flat N536 (0 g/L), MPI # 53, X-Green 53, 143, X- Green 143, LEED 2009, LEED V4, CHPS Certified.

(b) PPG Architectural Finishes, Inc.: 6-4110 Speedhide zero VOC Interior Flat.

(c) Sherwin-Williams Company (The):.ProMar 200 Zero VOC Interior Latex Flat B30W12651

(2) Latex, Interior, Institutional Low Odor/VOC, (Gloss Level 3):MPI#145

(a) Benjamin Moore: Ultra Spec 500 Latex Eggshell N538 (0 g/L), MPI # 52, X-Green 52, 145, X- Green 145, 139, X-Green 139, LEED 2009, LEED V4, CHPS Certified.

(b) PPG Architectural Finishes, Inc.: 6-4310 Speedhide zero VOC Interior Eggshell.

(c) Sherwin-Williams Company (The): ProMar 200 Zero VOC Eg-Shel in Lieu of MPI#145.

(3) Latex, Interior, Institutional Low Odor/VOC, Semi-Gloss (Gloss Level 5):MPI#141

(a) Benjamin Moore: Benjamin Moore Ultra Spec 500 Interior Latex Gloss N540 (0 g/L), MPI # 54, X-Green 54, 147, X-Green 147, 141, X-Green 141, LEED 2009, LEED V4.

(b) PPG Architectural Finishes, Inc.: 6-4510 Speedhide zero VOC Interior Semi-Gloss.

(c) Sherwin-Williams Company (The): ProMar 200 Zero VOC Interior Latex Semi-Gloss in Lieu of MPI #141

iv) DRY FOG/FALL COATINGS

(1) Dry Fall, Water Based, Flat (Gloss Level 1): MPI#118

(a) Benjamin Moore: Coronado Super Kote 5000 Dry Fall Latex Flat N110 (46 g/L), MPI # 118

(b) PPG Architectural Finishes, Inc.: 6-715xi Speedhide Flat Dry Fall.

(c) Sherwin-Williams Company (The): B42W000181 Pro Industrial Low VOC Waterborne Acrylic Dryfall Flat.

v) SOURCE QUALITY CONTROL

(1) Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

(a) 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.

(b) Testing agency will perform tests for compliance with product requirements.

(c) Owner may direct Contractor to stop applying coatings 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.

c) PART 3 – EXECUTION

i) EXAMINATION

(1) Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

(2) Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

(a) Concrete: 12 percent.

(b) Masonry (Clay and CMU): 12 percent.

(c) Gypsum Board: 12 percent.

(3) Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

(4) Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

(5) Proceed with coating application only after unsatisfactory conditions have been corrected.

(a) Application of coating indicates acceptance of surfaces and conditions.

ii) PREPARATION

(1) Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

(2) 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.

(a) After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

(3) Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

(a) Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

(4) Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

(5) Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

(6) Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

(7) Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

(8) Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

(9) Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

iii) APPLICATION

(1) Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

(a) Use applicators and techniques suited for paint and substrate indicated.

(b) 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.

(c) Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

(d) Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

(e) Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

(2) 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.

(3) If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

(4) 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.

(5) Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

(a) Paint the following work where exposed in equipment rooms:

(i) Equipment, including panelboards.

(ii) Uninsulated metal piping.

(iii) Uninsulated plastic piping.

(iv) Pipe hangers and supports.

(v) Metal conduit.

(vi) Plastic conduit.

(vii) Tanks that do not have factory-applied final finishes.

(viii) Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

(b) Paint the following work where exposed in occupied spaces:

(i) Equipment, including panelboards.

(ii) Uninsulated metal piping.

(iii) Uninsulated plastic piping.

(iv) Pipe hangers and supports.

(v) Metal conduit.

(vi) Plastic conduit.

(vii) Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

(viii) Other items as directed by Architect.

(c) Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

iv) FIELD QUALITY CONTROL

(1) 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.

(a) Contractor shall touch up and restore painted surfaces damaged by testing

(b) 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.

v) CLEANING AND PROTECTION

(1) At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

(2) After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

(3) 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.

(4) At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

vi) INTERIOR PAINTING SCHEDULE

(1) CMU Substrates:

(a) Institutional Low-Odor/VOC Latex System:

(i) Block Filler: Block filler, latex, interior/exterior.

(ii) Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

(iii) Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5).

(iv) Surfaces: New masonry walls, graphics (do not use in high humidity areas).

(2) Steel Substrates:

(a) Water-Based Dry-Fall System:

(i) Prime Coat: Primer, acrylic, anti-corrosive, for metal or primer, acrylic, quick dry, for metal.

(ii) Topcoat: Dry fall, water based, flat (Gloss Level 1).

(iii) Surfaces: Exposed metal decking, trusses, structural steel, metal joists.

(3) Gypsum Board Substrates:

(a) Institutional Low-Odor/VOC Latex System:

(i) Prime Coat: Primer sealer, interior, institutional low odor/VOC.

(ii) Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

(iii) Topcoat: Latex, interior, institutional low odor/VOC, flat (Gloss Level 1).

(iv) Surfaces: Drywall ceilings and soffits subject to no abuse.

Part III: Bid Cost Form
ITB #21360 Interior Renovations to H.B. Booker School

The Bidder proposes to furnish all labor, materials, and equipment necessary to complete Interior Renovations to H.B. Booker School. The undersigned proposes to renovate the interior of H.B. Booker School for the District in accordance with the Specifications and to the entire satisfaction of, and acceptance by, the District and for the following prices. The Agreement will begin **October 15, 2022** pending authorization of funds at the discretion of the District.

The Architect's opinion of probable cost of construction, for base bid is $800,000.

Base Bid: Unless otherwise noted, all work indicated on the drawings and/or described in this project manual for Base Bid. The work includes, but is not limited to selective demolition, general trades, electrical, mechanical, plumbing, fire protection, and technology. Base Bid shall also include, removal and disposal of all temporary plywood covering of exterior windows and doors, and temporary security chain link fencing and posts around the building/site.

Base bid shall include a 5% contingency allowance to address concealed conditions.

Materials: $_____

Labor: $_____

5% Contingency Allowance $_____

_____

Total Sum: $_____

Alternate Base Bid – Accelerated Completion Date: Bidder shall include a detail estimate of premium charges necessary to complete this work by December 30, 2022.

Materials: $_____

Labor: $_____

_____

Total Sum: $_____

Schedule:
Date to Begin Construction:

Event:	Date:

Substitutions: Bidder is to list here any "Substitutions" for which consideration is desired, showing the addition or reduction in price to be made, for each, if the substitution is accepted, or stated "No Change in Price", if none is provided. Submission of proposed substitution for approval, whether for savings in cost or improvement in construction is encouraged.

Substitutions are for consideration of inclusion only. The District has the right to require all work to conform to the Specifications issued.

Branded or Make Specified	Proposed Substitutions	Add	Deduct

Unit Prices:

The Base Bid is a lump sum for furnishing the necessary labor, materials, equipment and performing all work required by the drawings and specifications. The Owner reserves the right to increase or diminish the work or to omit any one or more items as it may deem desirable. Unit prices indicated below will be utilized as a basis for progress payments and as a basis of adjusted remuneration for any authorized increase or decrease in the scope of work. These unit prices must be filled in and accompany the proposal and the total sum of all the amounts resulting from the quantities multiplied by their unit prices. The Contractor shall be responsible for all quantities and should make his own calculation.

ITEM DESCRIPTION	QUANTITIES	UNIT	UNIT COST	TOTAL
		.		
		.		

Vendors are required to complete the signatory section below.

Company Name:_____

Address:_____

City, State, Zip Code:_____

Telephone Number:_____ Fax Number:_____

Email Address:_____

Signature:_____

Printed Name:_____

Date:_____

Appendix A: District Related Forms
Addendum Acknowledgement Form for ITB #21366

Having read and examined the Request for Proposal Documents, including the specifications, prepared by the Cleveland Metropolitan School District for the above-referenced Project, and the following Addenda:

Addendum Number	Date of Receipt
_____	_____
_____	_____
_____	_____
_____	_____

Bidder:_____.

The undersigned Vendor proposes to perform all work for the applicable contract, in accordance with the contract document for the proposed sums.

Failing to acknowledge a published Addendum may cause your bid to be rejected.

Signature:_____ Date:_____

Certificate of Debarment

Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 13 CFR Part 145. The regulations were published as Part VII of the May 26, 1988 *Federal Register* (pages 19160-19211). Copies of the regulations are available from local offices of the U.S. Small Business Administration.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective primary participant certifies to the best of its knowledge and belief that it and its principals:

(a) Are not presently debarred, suspended, proposed for disbarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective primary participant shall attach an explanation to this proposal.

Business Name _____

Date _____ By _____
Name and Title of Authorized Representative

_____
Signature of Authorized Representative

SBA Form 1623 (10-88) Federal Recycling Program Printed on Recycled Paper

This form was electronically produced by Elite Federal Forms, Inc.

Certificate of Debarment Pg. 2

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.

3. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

4. The prospective primary participant shall provide immediate written notice to the department or agency to which this proposal is submitted if at any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations (13 CFR Part 145).

6. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

7. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

8. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the ineligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

10. Except for transactions authorized under paragraph 6 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Conflict of Interest Form

Statement of Potential Conflicts of Interest

Vendor Name:	Primary Contact:
Address 1:	Telephone #:
Address 2:	Fax #:
City:	Email:
State, Zip:	Website:

Cleveland Metropolitan School District (CMSD) adheres to Ohio Ethics Law and strictly follows the opinion of the Ohio Ethics Commission. As such, each vendor is requested to submit this statement declaring any potential conflicts of interest in doing business with the District. Please answer the following two questions providing all requested information.

1. Are any current Cleveland Metropolitan School District (CMSD) employees, Cleveland Board of Education members, or any of their immediate family members, also members of the vendor's board of directors, hold any officer position with the vendor, or own any shares of any stock issued by the vendor?

   Yes_____ No_____

If **Yes**, and if the CMSD employee, CMSD board member, or immediately family member is a member of the vendor's board of directors or holds an office with the vendor, please state the person's name and position with the vendor.

Name: _____

Position: _____

If **Yes**, and if the CMSD employee, CMSD board member, or immediate family member owns share of any stock in the vendor organization or company, state the percentage of all outstanding company shares owned by the CMSD employee or board member.

_____%

2. Are any current CMSD employees, CMSD board members, or any immediate family members also employees of the vendor?

   Yes_____ No_____

If **Yes**, please state the person's name and provide a description of their job duties for the provider:

Name: _____

Job Duties:_____

If **Yes**, please describe the contact that the vendor will have with the CMSD employee or CMSD board member in the course of providing services to the District:

_____

_____

CERTIFICATION

I do hereby certify that the foregoing statements are true and accurate, and that my signature below attests to the authenticity of my identity as the person actually signing this form. This document is not a contract. In order for a binding Agreement to exist, a signed Agreement will be required prior to any legally binding commitment by the District.

NOTARIZED STATEMENT

_____being duly sworn and deposes says

That he/she is the _____of
(title)

_____, and answers to all the
(organization)
foregoing questions and all statements therein contained are true and correct.

_____
(signature)

Subscribed and sworn before me this ____day of _____, 20____

Notary Public: _____

My commission expires: _____

Bidder Qualifications Form

Bidder must answer all questions or attach a written explanation for each question.

PROPOSER NAME:_____

ADDRESS:_____

CITY; STATE:_____ ZIP:_____

CONTACT PERSON:_____

TITLE:_____

TELEPHONE: ( )_____ __ TOLL FREE: ( )_____

TAXPAYER IDENTIFICATION NUMBER:_____

1. What type of organization? (i.e. corporation, partnership, etc.)

2. How many years has your organization been in business?

3. How many years has your organization been in business under its current name?

4. List any other aliases your organization has utilized in the last two years and the form of Business

5. If you are currently a corporation, list the following:
    a. State of incorporation
    b. Date of incorporation
    c. President's name
    d. Secretary's name
    e. Treasurer's name
    f. Statutory agent's name
    g. Name of shareholders, if less than 10

h. Principal place of doing business

6. If you are currently in a partnership, list the following:
    a. Name and address of all general and limited partners.

    b. Original name and date of organization's inception

7. If you are neither a corporation nor a partnership, please describe your organization and list principals.

8. Are you legally qualified to do business in the State of Ohio?

9. Are you legally qualified to do business in Cuyahoga County and licensed by the City of Cleveland?

10. Has your organization ever been (i) declared by a customer to be in default under a contractor and/or (ii) sued by a customer for failure to completely a contract or properly perform services in a timely manner? If yes, please state where, when, and why.

11. Has your organization ever been cited by a local, county, state, or federal authority for violation of a regulation or statute or failing to timely complete a contract in accordance with specifications? I yes, please state date, agency, and final disposition.

12. Has your organization ever filed for bankruptcy? If yes, please state where, when and why?

13. On a separate sheet, list the major customers for whom your organization has provided this type of equipment or service in the past five years. Include owner's name and type of work performed.

14. Has your organization ever been sued by a supplier for failure to timely pay for materials or equipment provided? If yes, please provide details.

15. What is the dollar limit of your firm's General (CLS) Liability Insurance?

    Name of insuring company: _____

    Policy number: _____

16. What is the dollar limit of your firm's Automotive Liability Insurance?

Owned vehicles_____

Non-Owned vehicles_____

Name of insuring company_____

Policy number_____

17. List the name and address of every person having an interest in this ITB.

18. Has any federal, state or local government entity ever cited or taken any action against your organization or any of its principals for failure to pay or remit any taxes including but not limited to income, withholding, sales, franchise, or personal property taxes? If yes, please give name of agency, date and amount of taxes overdue and resolution of the issue.

19. Is your organization and its' principals current in payment of personal property taxes?

20. The prospective lower tier participant certifies, by submission of this ITB, that neither it nor its principals is presently debarred, suspended, proposed, for debarment or suspension, declared ineligible, or voluntarily excluded from participation in this transaction by any State and/or Federal Department or Agency.

21. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participants shall attach an explanation to this ITB.

Notarized Statement

_____being duly sworn and deposes says

that he/she is the _____of
(title)

_____, and answers to all the
(organization)

foregoing questions and all statements therein contained are true and correct.

_____
(signature)

Subscribed and sworn before me this _____day of _____, 20____

Notary Public:_____

My commission expires: _____

Non-Collusion Affidavit

This Affidavit must be executed and shall accompany the proposal in order for the proposal to be considered.

NON-COLLUSION AFFIDAVIT
State of Ohio, Cuyahoga County

_____, being first duly sworn, deposes and says that

he/she is _____of _____

of the party making the foregoing proposal; that such proposal is genuine and not collusive or sham; that said proposer has not colluded, conspired, connived, or agreed, directly or indirectly, with any proposer or person, to put in a sham proposal, or that such other person shall refrain from proposing, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the proposal price of affiant or any other proposer, to fix any overhead, profit or cost element of said proposal price, or of that of any proposer, or to secure any advantage against the Board of Education of the Cleveland Metropolitan School District, or any person or persons interested in the proposal; and that all statements contained in said proposal are true; and further that such proposer has not, directly or indirectly, submitted this proposal, or the contents thereof, or divulged information or data relative thereto to any Association or to any member or agent thereof.

_____
Affiant

Sworn to and subscribed before me this _____ day of _____, 20___.

_____
Notary Public in and for Cuyahoga County, Ohio

My commission expires: _____

Diversity Business Enterprise Forms

Information about the District's Diversity Business Enterprise Program can be found at https://bit.ly/3wvVApK.

DBE Form A

Name of Firm:_____

Address:_____

City, State, Zip Code:_____

Telephone Number: _____

Type of Business (Product or Service): _____

_____

Date of Proposed Contract Award: _____

Amount of Proposed Contract Award: _____

Diversity Business Enterprise Subcontractor(s):

_____

Dollar Amount Subcontract Award: _____

Percent of Subcontract Award: _____

D.B.E. Participation: _____ $_____

F.B.E. Participation: _____ $_____

Name of EEO Officer:_____

_____
(Signature of owner, partner, or authorized officer)

Name:_____ Dated:_____
(printed)

Title:_____

DO NOT COMPLETE BELOW THIS LINE

___Compliant ___Compliance Pending___Non-Compliant

Compliance Date: _____

_____ _____
(signature, DBE Department) (date)

DBE Form B

NOTICE OF REQUIREMENT TO ENSURE
DIVERSITY BUSINESS ENTERPRISE (DBE) OPPORTUNITY

Note: All eligible proposers for award of the contract should comply with the Requirements, Terms, and Conditions of this Notice.

The undersigned proposer hereby agrees that the goal it has established for DBE participation in this project through either subcontracting or entering into a joint Venture with DBEs in conformity with the Requirements. Terms and Conditions of this Notice is a goal of thirty (30%) percent for a construction/repair/ maintenance contract, twenty (20%) percent for a supply contract, and fifteen (15%) for a service contract of the total contract amount of this project. In no event will the absence of goals as stated above be deemed as compliance with the requirements, terms and conditions of this notice.

In addition, the undersigned will complete and attach hereto the DBE (Form C) Schedule for DBE participation, showing all DBE/FBE that will participate as subcontractors or joint ventures in this contract and a DBE (Form D), DBE Letter of Intent form for each DBE/FBE listed on the Schedule.

Proposer: _____

Date: _____

By: _____

Title: _____

Definition of DBE: A Diversity Business Enterprise (DBE)

"Small Diversity business concern" means a small business concern that is a least (51) percent unconditionally owned by one or more individuals who are both socially and economically diverse, or a publicly owned business that has at least (51) percent of its stock unconditionally owned by one or more socially and economically diverse individuals and that has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least (51) percent unconditionally owned by an economically diverse Indian tribe or Native Hawaiian Organization, or a publicly owned business that has least (51) percent of its stock unconditionally owned by one of these entities, that has its management and daily business controlled by members of an economically diverse Indian tribe or Native Hawaiian Organization.

DBE Form C

SCHEDULE MBE/FBE PARTICIPATION

Project Name:_____

Name of Non-DBE Contractor: _____

Identification Number:_____

Location:_____

Name of Minority Contractor: _____

Address:_____

City, State, Zip:_____

Type of work to be performed and work hours involved:

_____

Projected commencement and completion dates for work:

_____

Agreed price in dollars or percentage:

_____

The undersigned will enter into a formal agreement with DBE for work listed in this schedule conditioned upon execution for a contract with the Cleveland Municipal School District

TO BE RETURNED WITH THE PROPOSAL

_____
Signature of Non-DBE Prime Contractor

Date: _____

DBE Form D

DBE LETTER OF INTENT

To: _____
Non-DBE Prime or General Proposer

Project:_____

NON-DBE PRIME OR GENERAL PROPOSER
The Undersigned intends to perform work in connection with the above-referenced project as (check one):

☐ an individual ☐ a corporation ☐ a partnership ☐ a joint venture

DBE status of the undersigned is confirmed in the Cleveland Municipal School District's DBE file of bona fide enterprises with a certification date of: _____

The Undersigned is prepared to perform the following described work in connection with the above referenced project. Specify in detail particular work items or parts thereof to be performed:

_____

_____

_____

at the following price or percent of contract: $_____
You have projected the following commencement date of such work, and the undersigned is projecting completion of such work as follows:
Items _____
Projected Commencement Date _____
Projected Completion Date _____

_____% (percent) of the dollar value of the subcontract will be sublet and/or awarded to NON-DBE contractor (s) and/or NON-FBE SUPPLIERS. The undersigned will enter into a formal agreement for the above work with you conditioned upon your execution of a contract with the Cleveland Municipal School District.

_____ _____
Date **Name of DBE Firm (where applicable)**

_____ _____
Signature of DBE (where applicable) Signature of MBE Firm

(TO BE RETURNEDWITH ITB)

_____ _____
Name of FBE Firm **Signature of FBE Firm**

DBE Form E

DBE Unavailability Certification

I, _____,_____
Name *Title*

Of _____, certify that on_____
Date

I contacted the following DBE to obtain a Proposal for work items to be performed on:

Board Project: _____

Minority Contractor: _____

Work Items Sought: _____

Form of Proposal Sought:_____

Female Contractor: _____

Work Items Sought: _____

Form of Proposal Sought: _____

To the best of my knowledge and belief said minority business enterprise was unavailable (exclusive of the unavailability due to lack of agreement on price) for work on this project or unable to prepare a proposal for the following reason (s):
_____
_____
_____

_____ _____
Signature, Non-DBE prime Proposer *Date*

_____was offered an opportunity to proposal on the above-referenced work on
_____ by _____
Date *Non-DBE Prime Proposer*

_____
Signature, Non-DBE Prime Proposer

The above statement is a true and accurate account of why I did not submit a Proposal on this project.

_____
Signature, Non-DBE prime Proposer

DBE Form F

Non-Minority Prime Affidavit For DBE

STATE OF }
COUNTY OF } SS. AFFIDAVIT

The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the items and operation of our subcontract and the intended participation by each party in the undertaking. Further, the undersigned covenant and agree to provide to the Cleveland Municipal School District current, complete, and accurate information regarding actual subcontract work and the payments thereof, and any proposed changes in any of the subcontract arrangements and to permit the audit and examination of the books, records and files of the subcontract or those of each party relevant to the subcontract, by authorized representatives of the Cleveland Municipal School District. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under federal and state laws concerning false statements.

Name of Firm:_____

Signature:_____

Name and Title:_____

Date: _____

STATE OF }
COUNTY OF } SS.

On this _____day of _____ 20_____, before me appeared _____

_____, to me personally known, who being duly sworn,

did execute the foregoing affidavit, and did state that they were properly authorized by _____

_____to execute the affidavit and did so as their free act and deed.

(Seal)

Notary Public_____

Commission expires_____

DBE Form G

This form need not be completed if all join venture firms are diversity business enterprises

1. Name of Joint Venture: _____

2. Address of Joint Venture: _____

3. Phone Number of Joint Venture: _____

4. Identify the firms which comprise this joint venture. (The DBE partner must complete DBE Form A or have current DBE Certification)

_____

_____

   a. Describe the roll of the DBE firm in the joint venture: _____

   _____

   b. Describe briefly the experience and business qualifications of each non-DBE Joint Venture:_____

   _____

5. Nature of Joint Venture's Business: _____

_____

6. Provide a copy of the Joint Venture Agreement.

7. What is the percentage of DBE Ownership? DBE_____% FBE_____%

8. Ownership of Joint Venture: (This need not be completed if described in the Joint Venture agreement provided in response to question 6).

   a. Profit and loss sharing: _____

   _____

   b. Capital contributions, including equipment: _____

   _____

   c. Other applicable ownership interest: _____

   _____

9. Control of and participation in this contract. Identify by name, race, and "firm" those individuals and their titles who are responsible for day-to-day management and policy decision making, including, but not limited to, those prime responsibility form:

a. Financial decisions: _____

_____

b. Management decisions, such as:

   i. Estimating: _____

   ii. Marketing and Sales: _____

   iii. Hiring and firing of management personnel: _____

   _____

   iv. Purchasing of major items or supplies: _____

   _____

c. Supervision of field operations: _____

_____

Note: If after complete the DBE Form B and before the completion of the joint venture's work on any contract awarded, there is any significant change in the information submitted, the joint venture must inform the Cleveland Municipal School District, either directly or through the non-DBE prime subcontractor if the joint vendor is a subcontractor.

DBE Form H

Non-Minority Prime Affidavit (Joint Venture)

STATE OF OHIO CUYAHOGA COUNTY AFFIDAVIT

The undersigned swear that the forgoing statements are correct and include all material information necessary to identify and explain the items and operation of our subcontract and the intended participation by each joint venture in the undertaking. Further, the undersigned covenant and agree to provide to the Cleveland Municipal School District current, complete, and accurate information regarding actual joint venture work and the payments thereof and any proposed changes in any of the subcontract arrangements and to permit the audit and examination of the books, records and files of the joint venture or those of each party relevant to the joint venture, by authorized representatives of the Cleveland Municipal School District. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under federal and state laws concerning false statements.

_____	_____
Name of Firm (Prime)	***Name of Firm (DBE)***
_____	_____
Signature	***Signature***
_____	_____
Name and Title	***Name and Title***
_____	_____
Date	***Date***

STATE OF] COUNTY OF]SS.

On this _____ day of _____ 20 ___ , before me appeared _____, to me personally known, who being duly sworn, did execute the foregoing affidavit, and did state that they were properly authorized by _____ to execute the affidavit and did so as their free act and deed.

(Seal)

_____
Notary Public

_____
Commission expires

EOA Contractual Declaration Forms

Information about the District's Affirmative Action Program can be found at https://bit.ly/3wvVApK.

Service Provider Contract Compliance Form

Name of Firm:_____

Address:_____

City, State, Zip Code:_____

Telephone Number:_____

Standard Metropolitan Statistical Area: _____

Recruitment Area:_____

Type of Business (product or service): _____

Name of EEO Officer:_____

Signature of Owner, Partner, or Authorized Officer: _____

Name (type or print):_____

Date:_____ Title:_____

Do not complete below this line

Status of Vendor:

___ Compliance ___ Conditional Compliance

___ Non-Compliance ___Compliance Pending

Comments:_____

_____

Date:_____ Signature:_____

Compliance Declaration

The following must be filled out completely:

It is the policy of _____that equal employment opportunity be afforded to all qualified persons without regard to race, religion, color, sex, national origin, age, or handicap.

In support of this policy, _____will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, or handicap.

_____will take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to race, color, sex, national origin, age, or handicap. Such action will include, but not be limited to:

Recruitment, advertising, or solicitation for employment, hiring, placement, upgrading, transfer or demotion, selection for training including apprenticeship rates of pay or other forms of compensation, layoffs or termination.

The undersigned company states that they are of current applicable requirement pertaining to Fair Labor Standards and Non-Discriminatory Practices of Federal, State, and Local Governments.

The undersigned further acknowledges that if the contract is awarded to the undersigned, that the undersigned will comply with all Fair Labor Standard Practice.

_____
(Name of Company)

_____ Date: _____

(Signature of Company Official)

STATE OF ( )
COUNTY OF ( ) SS.

BEFORE ME, a Notary Public in and for said County and State personally appeared the above-named Company _____by _____

It's_____, who acknowledged that they knowingly signed the aforesaid instrument, and that the same is their free act and deed duly authorized and the free act and deed of said company.

IN TESTIMONY WHEREOF, I have hereto set my hand and affixed seal at

_____, _____, this

day of _____, 20___.

Employment Data Form

Please note this data may be obtained by visual survey or post-employment record. Neither visual surveys nor post-employment records are prohibited by any federal, state or local law. All specified data is required to be filled in by District policy.

	All EMPLPOYEES			MALES					FEMALES				
Job Categories	TOALS MALES & FEMALES	MALES	FEMALES	WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	ASIAN AMERICAN OR PACIFIC ISLANDER	AMERICAN INDIAN OR ALSKAN NATIVE	HISPANIC	WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	ASIAN AMERICAN OR PACIFIC ISLANDE	AMERICAN INDIAN OR ALSKAN NATIVE	HISPANIC
OFFICIALS, MGRS & SUPERVISORS													
PROFESSIONALS													
TECHNICIANS													
SALES WORKERS													
OFFICE/CLERICAL													
CRAFTWORKERS (SKILLED)													
OPERATIONS (SEMI-SKILLED)													
LABORERS (UNSKILLED)													
SERVICE WORKERS													
APPRENTICES													
TOTAL													

Additional information (optional):
Describe any other actions taken which show that all employees are recruited, hired, or trained or promoted without regard to their race, religion, color, sex, handicap, age or national origin. Use second sheet if additional space is needed:

The undersigned certifies that they are legally authorized by the proposer to make the statements and representations contained in this report, and that they have red all of the foregoing statements and representations which are true and correct to the best of their knowledge and belief.

FIRM OR CORPORATE NAME: _____ DATE: _____

SIGNATURE: _____ TITLE: _____

References

Include below three references of equal or larger size to this current ITB project. Public sector experience is preferred, but not required. Please attach relevant supporting documentation, such as project plans, scope of work.

Reference #1:

Company/School Name: _____

Address: _____

Type of Business: _____

Contact Person: _____

Telephone and Fax#: _____

Dates of Service: _____

Description of Services Provided: _____

_____

_____

_____

Reference #2:

Company/School Name: _____

Address: _____

Type of Business: _____

Contact Person: _____

Telephone and Fax #: _____

Dates of Service: _____

Description of Services Provided: _____

_____

_____

_____

Reference #3:

Company/School Name: _____

Address: _____

Type of Business: _____

Contact Person: _____

Telephone and Fax#: _____

Dates of Service: _____

Description of Services Provided: _____

_____

_____

Appendix B: Service Provider Checklist

To assist service providers in the preparation of their proposals to ensure compliance with all document requirements

- ☐ Cover Page
- ☐ Transmittal Cover Letter, signed
- ☐ Table of Contents
- ☐ Bid Cost Form
  - ☐ Signatory
- ☐ District Related Forms
  - ☐ Addendum Acknowledgement, checked: https://www.clevelandmetroschools.org/purchasing for any addendums
  - ☐ Certificate of Debarment
  - ☐ Conflict of Interest
  - ☐ Bidder Qualification Form
  - ☐ Non-Collusion Affidavit
  - ☐ DBE Forms- A, B, C, D, E, F, G, & H, for more information: https://bit.ly/3wvVApK
  - ☐ EOA Contractual Declaration Forms 1 &2, for more information: https://bit.ly/3wvVApK
  - ☐ Employment Data Form
  - ☐ References
- ☐ Bid Guaranty

Copies

- ☐ Original, marked
- ☐ Copies (1), marked
- ☐ USB B/Flashdrive

RENOVATIONS TO

H BARBARA BOOKER SCHOOL

2121 W 67th Street
Cleveland, Ohio 44102

FUNDED THROUGH A PARTNERSHIP WITH:

CLEVELAND METROPOLITAN SCHOOL DISTRICT

ARCHITECT:

tda
thendesign architecture
4135 ERIE ST.
WILLOUGHBY, OH 44094
440.269.2266

CLEVELAND METROPOLITAN SCHOOL DISTRICT

ERIC GORDON	CHEIF EXECUTIVE OFFICER
JUSTIN BIBB	MAYOR OF CLEVELAND
ANNE E BINGHAM	BOARD OF EDUCATION CHAIR

CODE:

USE GROUP: E EDUCATION

CONSTRUCTION TYPE: 1-B

FLOOR AREA:

FIRST: 28,390 SF
SECOND: 22,753 SF

GENERAL NOTES

DIVISION 1
GENERAL INFORMATION

A. GENERAL
1.Conform to all general and special conditions of contract as specified by Architect and Owner
2.Specifications are applicable to all Contractors and/or Subcontractors.
3.Check other plans and specifications and fully coordinate with other systems and grades.
4.The drawings and project manual, where applicable, are intended to supplement each other and any material or labor called for in one shall be furnished even though not specifically mentioned in both.
5.Drawings are diagrammatic and are intended to show approximate locations. Dimensions given on the plans in figures shall take precedence over scaled dimensions; and all dimensions, whether figured or scaled, shall be verified in the field.
6.The architect reserves the right to make minor changes in location up to the time of installing without additional cost.
7.Visit site, check facilities and conditions, and take all items into consideration in bid. Contractor to review and become familiar with all existing conditions prior to commencing work. Any conditions not documented on these drawings or observed to be different than those shown on these drawings are to be reported to the architect, prior to beginning work.
8.Systems are to be complete and workable in all respects, placed in operation and properly adjusted.
9.Each Contractor shall provide for his own clean up, removal and legal disposal of all rubbish on a daily basis or as directed by Owner's representative.
10. Fully coordinate all work with other Contractors, Subcontractors, and the Owner and cooperate completely.
11. The Contractor shall take all precautions necessary to secure the area of work.
12. Arrange for and obtain Owner's permission for any service shutdowns required under this contract.
13. Parking at the site by all construction staff shall be limited to only the areas designated by the Owner.
14. Contractor to contact local utilities, if necessary, submit all applicable permit documents, qualifications, etc., and be responsible for all fees associated with permits, utility extensions, tap-ins, etc. Architect to submit documents for permit plan review and owner review; however, the contractor will be responsible for obtaining the permits and all permit and inspection costs.
15. The Contractor shall protect existing facilities, equipment, fixtures, etc. from damage during the course of construction.
16. All damaged surfaces and/or finishes as a result of and adjacent to the work shall be repaired and finished to their original condition.
17. The Contractor shall be soley responsible for contruction means, methods, sequences of construction and the safety of workmen.
18. Demolition and/or removal of existing pavement, equipment, etc. may necessitate the removal or relocation of existing piping, conduit, services, etc. Such removal and relocation shall be considered part of the demolition work without additional cost, whether or not specifically shown on the drawings or listed in the specifications.
19. The contractor shall schedule his work and material and equipment deliveries so as not to interfere with the daily operations of the facility.
20. Prior to completion, clean premises for occupancy by owner. cleaning shall include, but not be limited to the following:
- removal of grease, mastic, adhesive, dust, dirt, stains, labels and other foreign materials from exposed surfaces.
- the external surface of all equipment shall be cleaned at the completion of the work to remove all concrete, dust and dirt, welding and cutting splatter, etc.
- prior to final completion, or owner occupancy, contractor shall conduct an inspection of sight-exposed surfaces, and all work areas, to verify that the entire work is clean.

B. CODES, STANDARDS AND REGULATIONS
1. Conform to all applicable codes and government regulations.
2.Obtain permits and pay all fees. Arrange for all required inspections and approvals.

C. BASE EQUIPMENT AND MATERIALS AND SUBSTITUTIONS
1.All equipment and materials shall be new and free of defects.
2.Base equipment, manufacturer, model, and capacity of equipment are listed on the drawings or in this specification. Any other manufacturer is considered a substitution.
3.Substitutions are subject to the approval of the Owner. If a substition is submitted, include complete performance data for evaluation.
4.If substitutions are approved, notify all other Contractors and Subcontractors of trades affected by the substitutions and fully coordinate. Any costs resulting from substitution, whether by Contractor or others, shall be the responsibility of and paid for by the substituting Contractor.
5.All equipment shall be installed in full accordance with the manufacturer's data and installation instructions. It is the Contractor's responsibility to check and conform to these requirements prior to starting work.

D. WARRANTY
1.Fully warrant all materials, equipment, and workmanship for one (1) year from date of acceptance, unless noted otherwise.
2.Repair or replace without charge to the Owner all items found defective during the warranty period.

SYMBOL LEGEND

ROOM INDICATION
ROOM NAME
ROOM NUMBER
SQUARE FOOTAGE
USE GROUP
OCCUPANCY LOAD

NORTH ARROW

DOOR SYMBOL

WINDOW SYMBOL
WINDOW TYPE OR METAL FRAME
ON ELEVATION
IN PLAN

BUILDING WALL SECTION INDICATION
SECTION NUMBER
SHEET WHERE SHOWN

ELEVATION INDICATION
EXTERIOR
MULTIPLE INTERIOR

FIRE EXTINGUISHER CABINET
F.E.C

DETAIL INDICATION
AREA DETAILED
DETAIL NUMBER
SHEET WHERE SHOWN

REVISION INDICATION
REVISION NUMBER

ALIGN WITH EXISTING CONSTRUCTION

PARTITION TYPE SYMBOL

EQUIPMENT DESIGNATION
(SEE EQUIPMENT MANUAL)
EQUIPMENT TYPE

CEILING HEIGHT

FINISH SYMBOLS
DENOTES CORNER GUARD LOCATION

MATCHLINE
INDICATOR OF AREA SHOWN ON DRAWING
SHEET NUMBER OF ADJACENT DRAWING

LINETYPE SYMBOLS
EXISTING COLUMN GRID DENOTED WITH AN E/ PREFIX
COLUMN GRID
LIMIT OF WORK
PROPERTY LINE
CENTER LINE / ELEVATION LINE
WORK ABOVE, BEYOND OR TO BE REMOVED
BREAK LINE

KEYNOTE SYMBOL
KEYNOTE INDICATOR

EXISTING DOOR DESIGNATION
EXISTING DOOR

NEW DOOR DESIGNATION
NEW DOOR

EMERGENCY DOOR DESIGNATION
NEW DOOR
EMERGENCY SWING

DOUBLE EGRESS DOOR DESIGNATION
NEW DOOR

GENERAL DIMENSIONING
COLUMN GRID CENTERLINE INDICATOR
FACE OF SURFACE INDICATOR

NOTE: DIMENSIONS ARE TAKEN FROM/TO FINISH SURFACE, UNLESS OTHERWISE NOTED.

NOTE: THE ± INDICATES A DIMENSION THAT CAN VARY. (NOTIFY THE ARCHITECT OF ANY CHANGE IN THAT DIMENSION IF IT IS GREATER THAN 1")

NOTE: EXISTING DIMENSIONS INDICATED AS [0'-0"] OR WITH (VIF) ARE SUPPLIED TO THE ARCHITECT BY OTHERS AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR. (SEE "GENERAL CONTRACTOR RESPONSIBILITIES WITH RESPECT TO EXISTING CONDITION NOTES")

NOTE: CLEAR = THE ACTIVE DIMENSION MAY NEVER BE LESS THEN THE CLEAR DIMENSION, BUT MAY BE GREATER BY 1" MAX.

NOTE: HOLD = THE ACTUAL DIMENSION IS THAT DIMENSION AND MUST BE MAINTAINED

DRAWING LIST

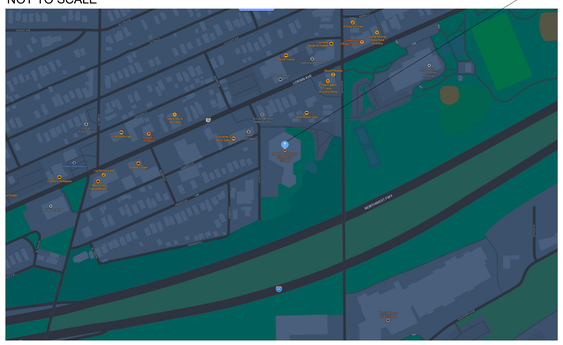
SITE MAP

NOT TO SCALE

PROJECT

VICINITY MAP

NOT TO SCALE



MATERIAL LEGEND

SECTIONS

- ACOUSTICAL TILE
- ALUMINUM (3/4 SCALE OR LARGER)
- BATT OR BLANKET INSULATION
- BRASS OR BRONZE (3/4 SCALE OR LARGER)
- CERAMIC OR QUARRY TILE
- CONCRETE
- CONCRETE MASONRY UNIT
- CRUSHED STONE OR GRAVEL
- EARTH
- E.I.F.S. (EXTERIOR INSULATION AND FINISH SYSTEM)
- FACE BRICK
- FINISHED WOOD (FOR LARGE SCALE DETAILS)
- FIRE SAFING
- MEDIUM DENSITY FIBERBOARD
- PLASTER, CEMENT, MORTAR OR G.W.B.
- PLYWOOD VENEER
- PRE-CAST CONCRETE
- RIGID INSULATION
- ROUGH WOOD (ALL BLOCKING AND FRAMING LUMBER)
- SHIM
- SPRAY-ON FIREPROOFING
- SPRAY-APPLIED INSULATION
- STEEL (3/4 SCALE OR LARGER)
- STONE: GRANITE OR MARBLE

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RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date

Sheet Revisions

no.	description	date
02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22

Project Issues

sheet name: COVER SHEET

drawn by: Author
checked by: Checker
sheet number: CS1
job number: 22021

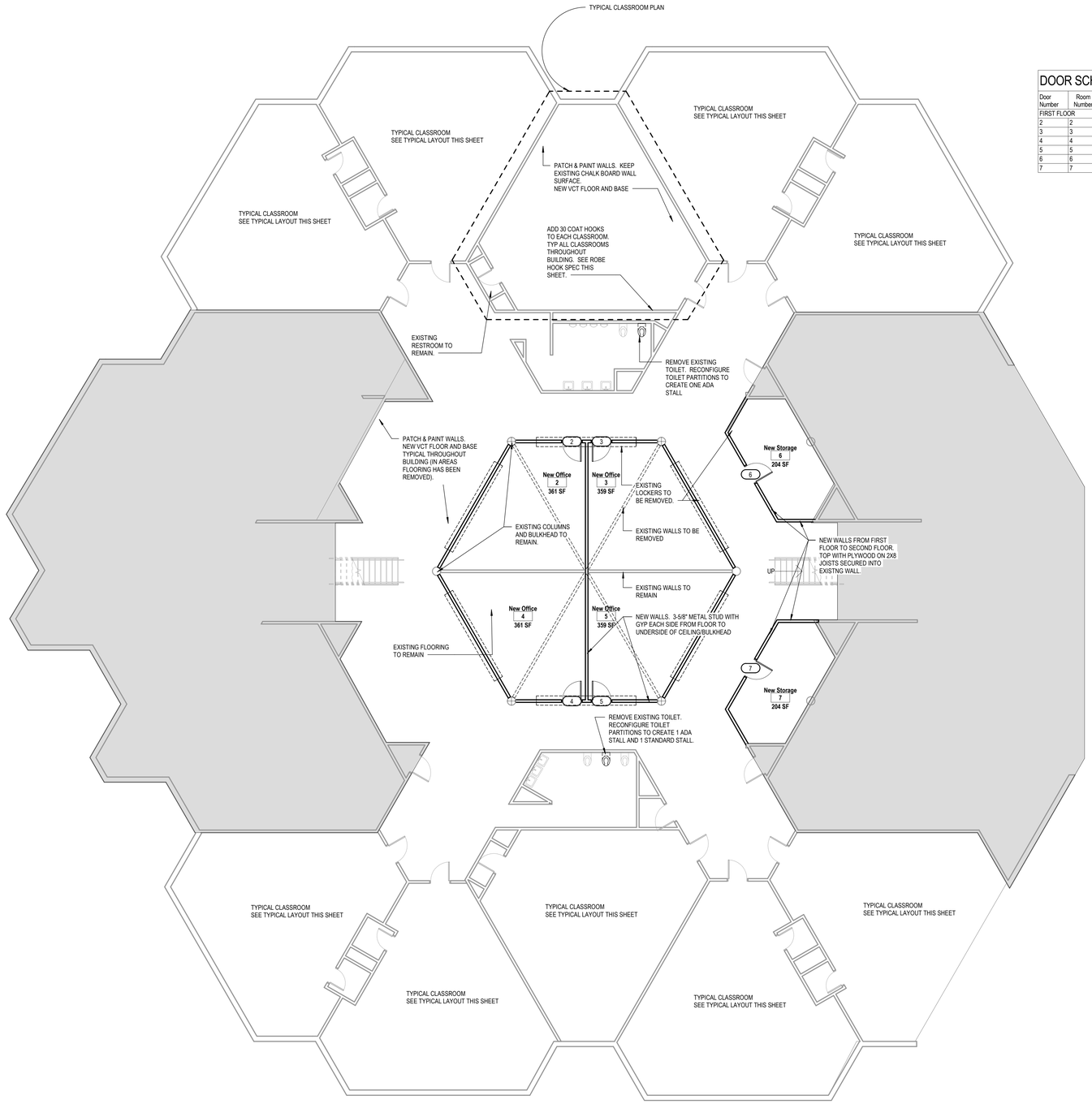
GENERAL NOTES - ARCHITECTURAL

1. ALL DIMENSIONS ARE DRAWN TO FINISH FACE OF WALL.
2. DO NOT SCALE DRAWINGS. DIMENSIONS LOCATED ON PLANS, ELEVATIONS, AND DETAILS SHALL GOVERN OVER SMALL SCALE DETAILS. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE CONTINUING WITH CONSTRUCTION.
3. DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION AND INSTALLATION OF CASEWORK. REFER TO CASEWORK NOTES FOR ADDITIONAL INFORMATION.
4. PROVIDE METAL STUD FRAMING AROUND ALL PENETRATIONS THRU METAL STUD PARTITIONS.

SPEC
ROBE HOOK (RHADA):
1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENT, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   A. AMERICAN SPECIALITIES, INC.
   B. BOBRICK WASHROOM EQUIPMENT, INC.
   C. BRADLEY CORPORATION
   D. GAMCO SPECIALTY ACCESSORIES; A DIVISION OF BOBRICK
2. DESCRIPTION" SINGLE PRONG UNIT
3. MATERIAL AND FINISH: STAINLESS STEEL, ASTM A480/A480M NO 4 FINISH (SATIN).

DOOR SCHEDULE

Door Number	Room Number	Room Name	Panel Type	Doors Mat.	Doors Width	Doors Height	Frame Mat.	Head Detail	Jamb Detail	Hardware Set No.	Fire Rating	Remarks
FIRST FLOOR												
2	2	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
3	3	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
4	4	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
5	5	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
6	6	New Storage	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
7	7	New Storage	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING.		



1 A101 FIRST FLOOR EXISTING/DEMO/NEW
SCALE: 1/8" = 1'-0"

STATE OF OHIO
CHRISTOPHER D SMITH 9912446
REGISTERED ARCHITECT
CHRISTOPHER D SMITH
LICENSE #9912446
EXPIRATION DATE 12/31/2023
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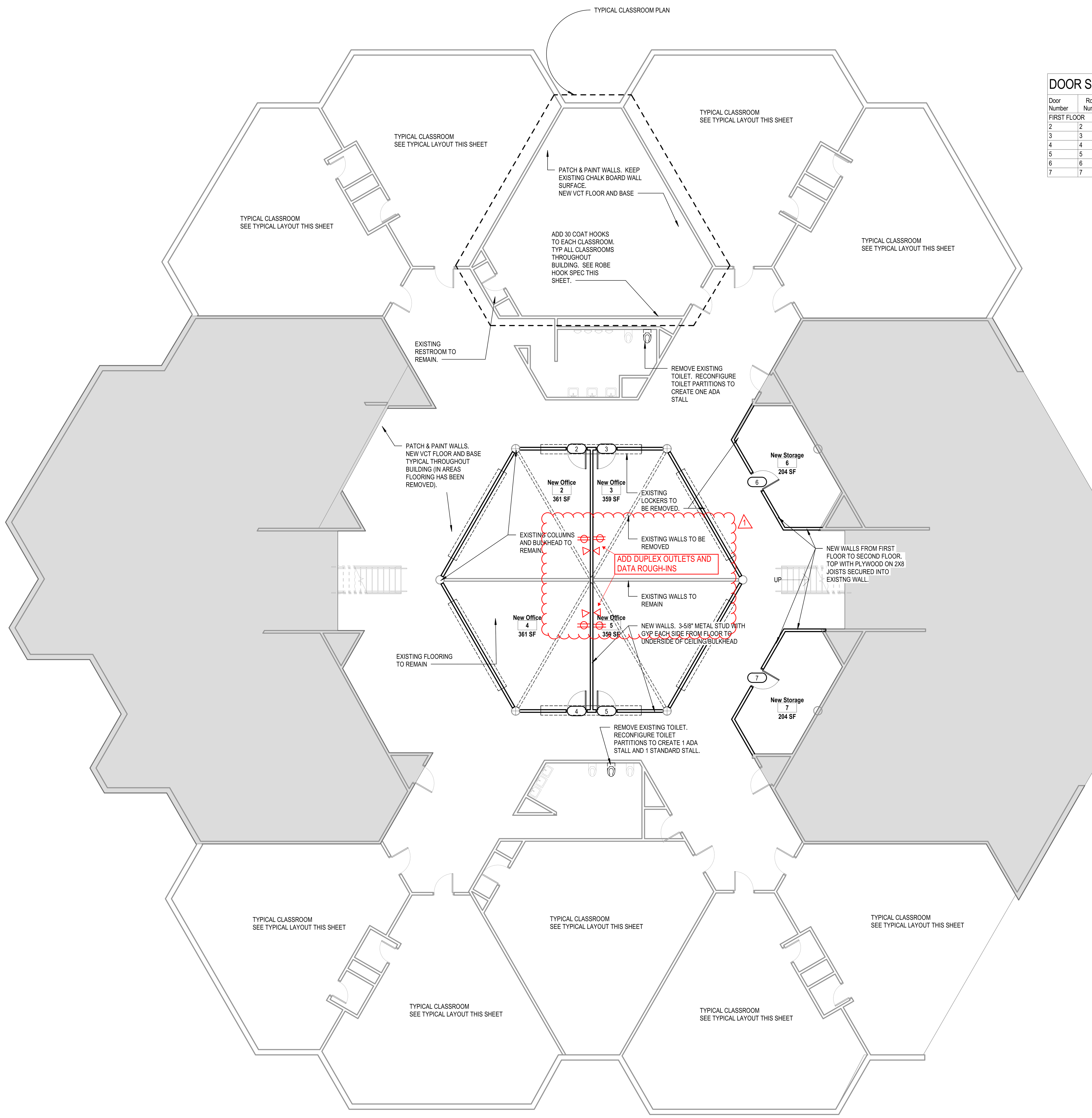
RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date
	Sheet Revisions	

no.	description	date
02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22
	Project Issues	

sheet name:
FIRST FLOOR PLAN

drawn by: Author
checked by: Checker
sheet number: A101
job number: 22021



1 A101 FIRST FLOOR EXISTING/DEMO/NEW

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

GENERAL NOTES - ARCHITECTURAL

1. ALL DIMENSIONS ARE DRAWN TO FINISH FACE OF WALL.
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4. PROVIDE METAL STUD FRAMING AROUND ALL PENETRATIONS THRU METAL STUD PARTITIONS.

SPEC

ROBE HOOK (RHADA):

1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENT, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   A. AMERICAN SPECIALITIES, INC.
   B. BOBRICK WASHROOM EQUIPMENT, INC.
   C. BRADLEY CORPORATION
   D. GAMCO SPECIALTY ACCESSORIES; A DIVISION OF BOBRICK
2. DESCRIPTION" SINGLE PRONG UNIT
3. MATERIAL AND FINISH: STAINLESS STEEL, ASTM A480/A480M NO 4 FINISH (SATIN).

DOOR SCHEDULE

Door Number	Room Number	Room Name	Panel Type	Doors Mat.	Doors Width	Doors Height	Frame Mat.	Head Detail	Jamb Detail	Hardware Set No.	Fire Rating	Remarks
FIRST FLOOR												
2	2	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
3	3	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
4	4	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
5	5	New Office	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
6	6	New Storage	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING		
7	7	New Storage	F	SCW	3' - 0"	7' - 0"	HM			MATCH EXISTING.		

ELECTRICAL ITEM 1

STATE OF OHIO
CHRISTOPHER D SMITH 9912446
REGISTERED ARCHITECT

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RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date

Sheet Revisions

no.	description	date
03	Addendum #1	
02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22

Project Issues

sheet name: FIRST FLOOR PLAN

drawn by: Author

checked by: Checker

sheet number: A101E

job number: 22021

GENERAL NOTES - ARCHITECTURAL

1. ALL DIMENSIONS ARE DRAWN TO FINISH FACE OF WALL.
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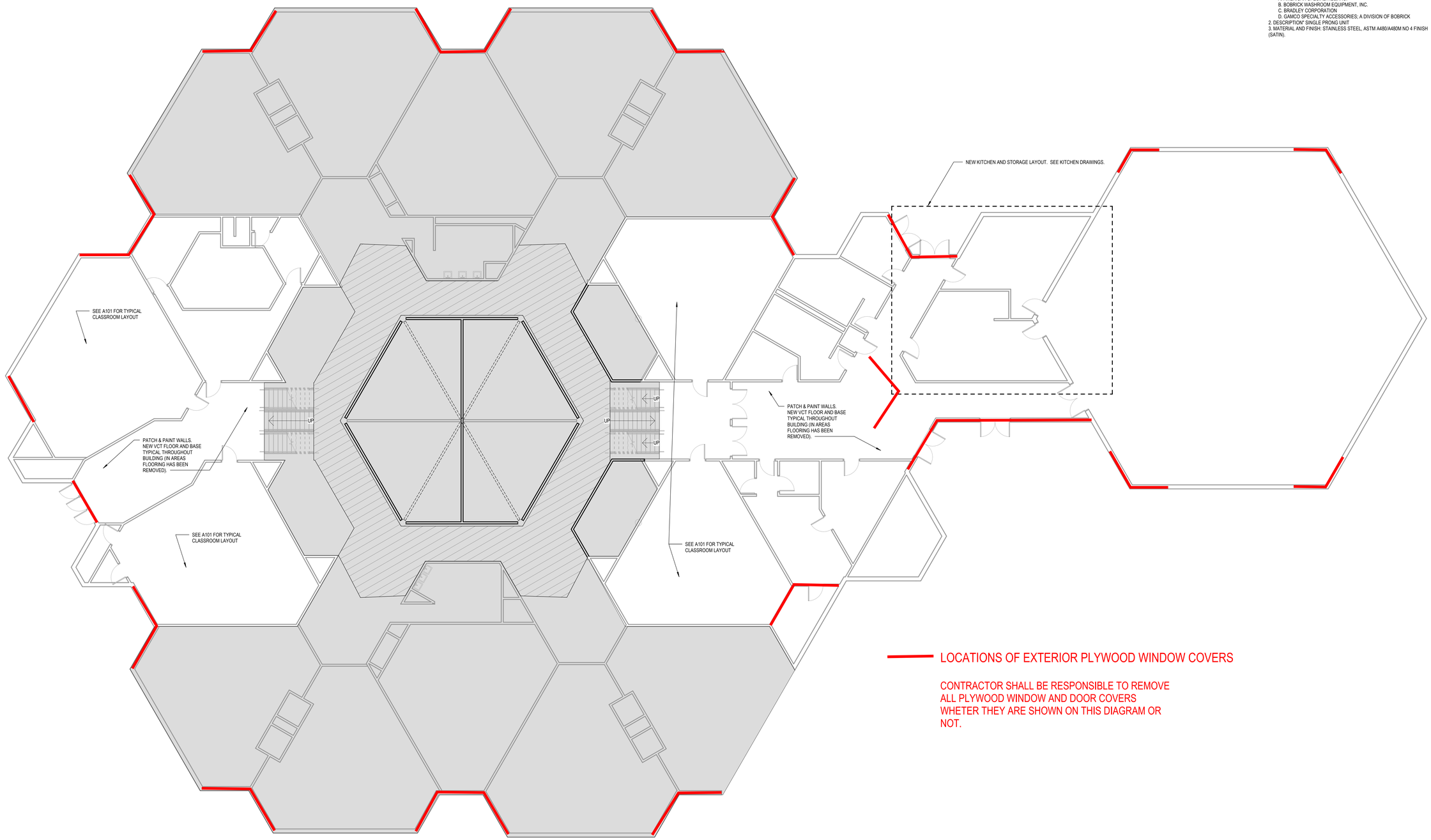

LOCATIONS OF EXTERIOR PLYWOOD WINDOW COVERS

CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE ALL PLYWOOD WINDOW AND DOOR COVERS WHETER THEY ARE SHOWN ON THIS DIAGRAM OR NOT.

1 / A102 FIRST FLOOR MEZZANINE EXISTING/DEMO/NEW
SCALE: 1/8" = 1'-0"

STATE OF OHIO
CHRISTOPHER D SMITH
9912446
REGISTERED ARCHITECT
CHRISTOPHER D SMITH
LICENSE #9912446
EXPIRATION DATE 12/31/2023

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RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date
	Sheet Revisions	

02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22
no.	description	date
	Project Issues	

sheet name:
FIRST FLOOR MEZZANINE PLAN

drawn by: Author
checked by: Checker
sheet number: A102P
job number: 22021

GENERAL NOTES - ARCHITECTURAL

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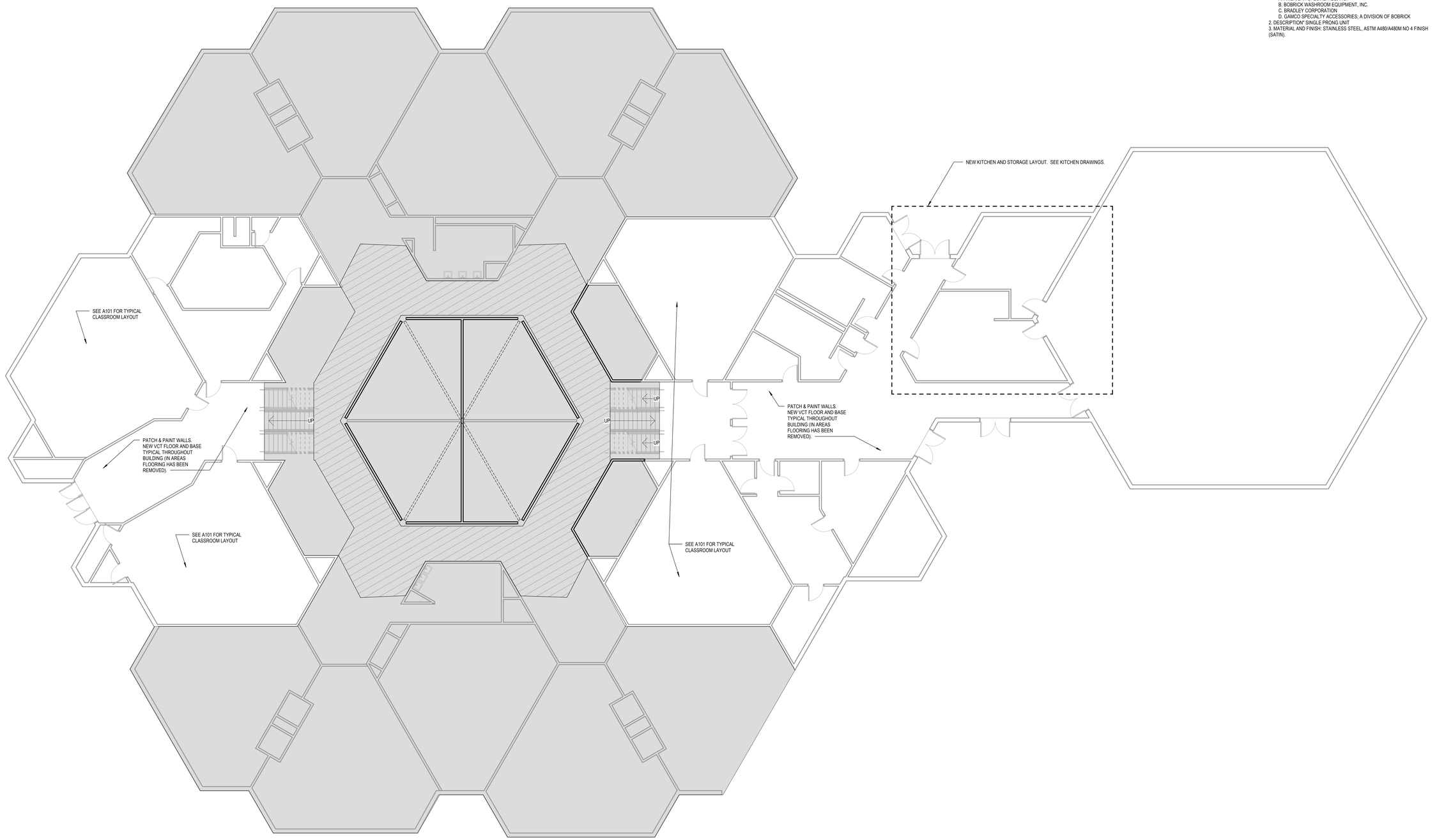


1 / A102 FIRST FLOOR MEZZANINE EXISTING/DEMO/NEW
SCALE: 1/8" = 1'-0"

CHRISTOPHER D SMITH
LICENSE #9912446
EXPIRATION DATE 12/31/2023

tda thendesign architecture

RENOVATIONS TO H BARBARA BOOKER SCHOOL

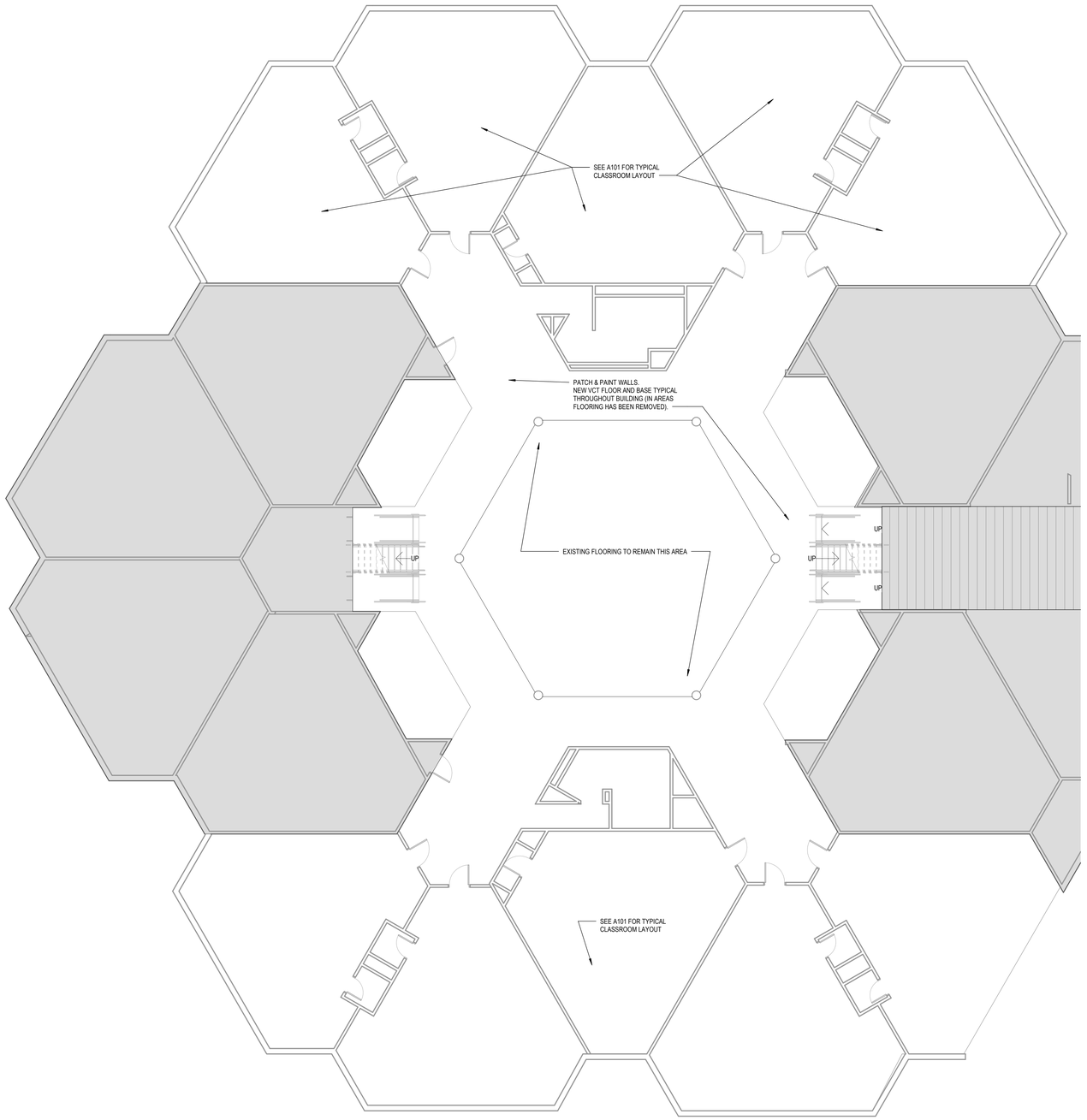
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date
	Sheet Revisions	

no.	description	date
02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22
	Project Issues	

sheet name:
FIRST FLOOR MEZZANINE PLAN

drawn by: Author
checked by: Checker
sheet number: A102
job number: 22021



1 A103 SECOND FLOOR EXISTING/DEMO/NEW
SCALE: 1/8" = 1'-0"

GENERAL NOTES - ARCHITECTURAL

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   B. BOBRICK WASHROOM EQUIPMENT, INC.
   C. BRADLEY CORPORATION
   D. GAMCO SPECIALTY ACCESSORIES; A DIVISION OF BOBRICK
2. DESCRIPTION" SINGLE PRONG UNIT
3. MATERIAL AND FINISH: STAINLESS STEEL, ASTM A480/A480M NO 4 FINISH (SATIN).

STATE OF OHIO
CHRISTOPHER D SMITH
9912446
REGISTERED ARCHITECT
CHRISTOPHER D SMITH
LICENSE #9912446
EXPIRATION DATE 12/31/2023

tda thendesign architecture

RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date
	Sheet Revisions	

02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22

no.	description	date
	Project Issues	

sheet name:
SECOND FLOOR PLAN

drawn by:
Author
checked by:
Checker
sheet number:
A103
job number:
22021

GENERAL NOTES - ARCHITECTURAL

1. ALL DIMENSIONS ARE DRAWN TO FINISH FACE OF WALL.
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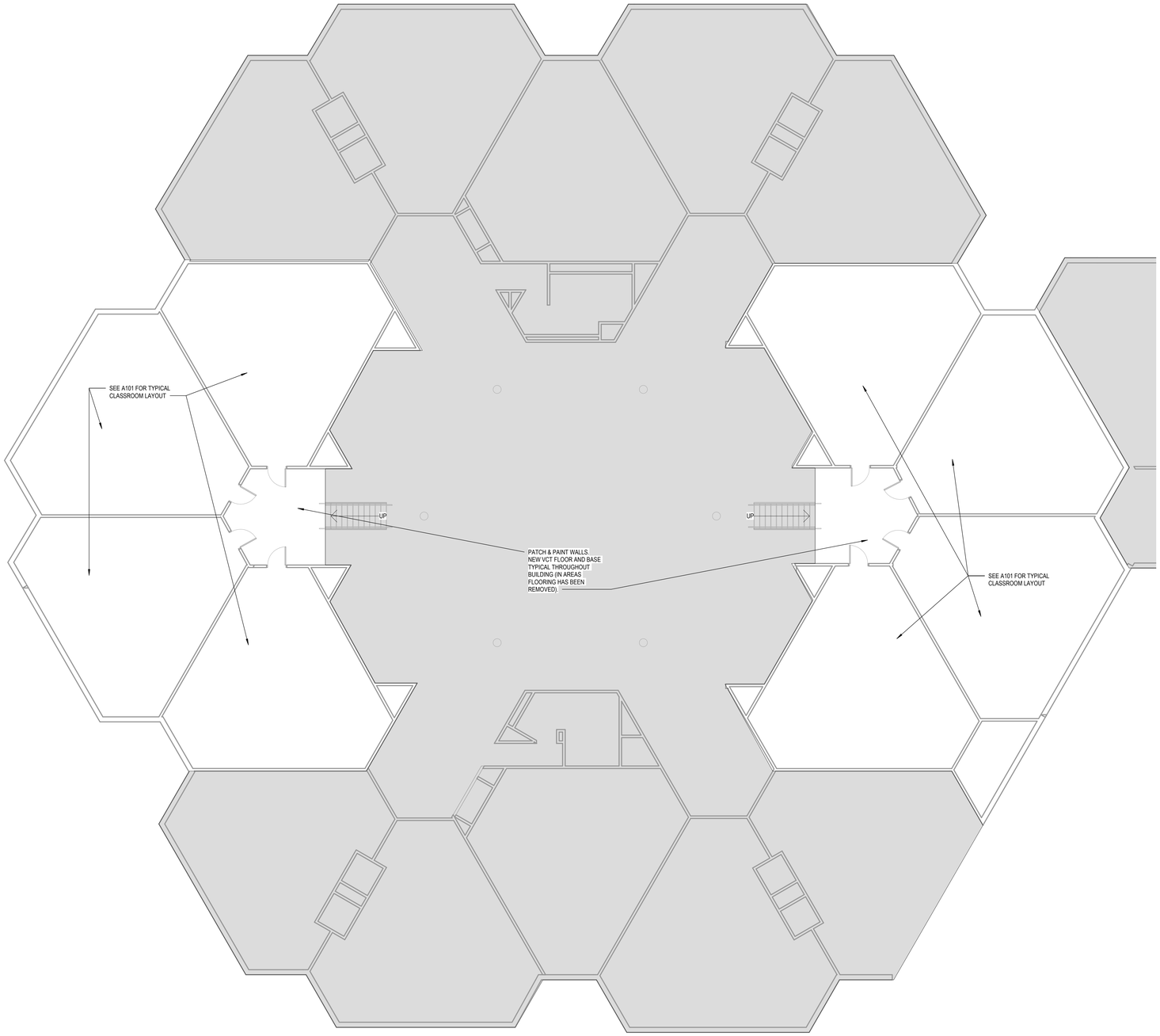

1 / A104 SECOND FLOOR MEZZANINE EXISTING/DEMO/NEW
SCALE: 1/8" = 1'-0"

STATE OF OHIO
CHRISTOPHER D SMITH 9912446
REGISTERED ARCHITECT
CHRISTOPHER D SMITH
LICENSE #9912446
EXPIRATION DATE 12/31/2023

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RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date
	Sheet Revisions	

02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22
no.	description	date
	Project Issues	

sheet name:
SECOND FLOOR MEZZANINE PLAN

drawn by:
Author

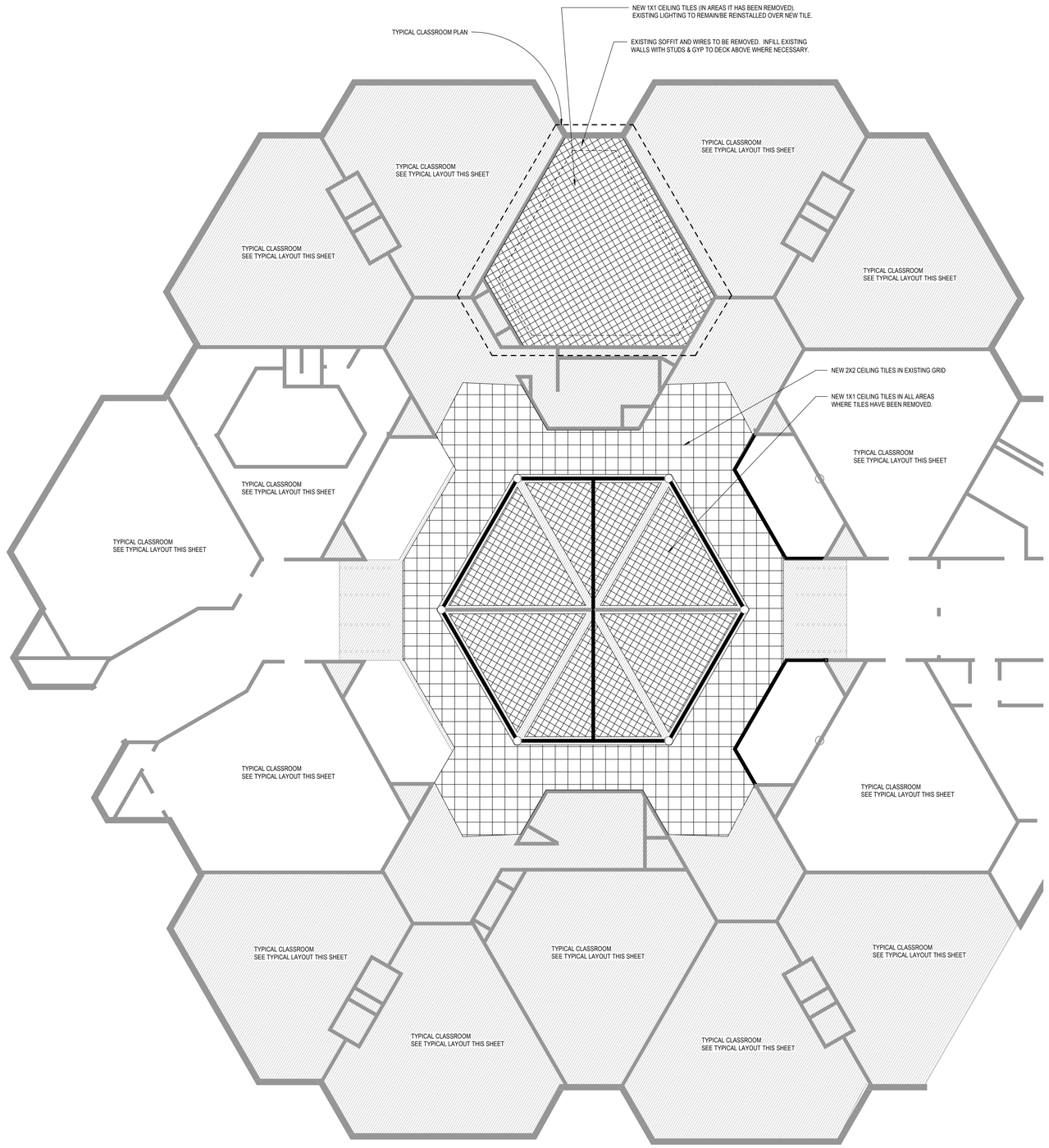
checked by:
Checker

sheet number:
A104

job number:
22021

GENERAL NOTES - CEILING PLAN

1. CEILING PLANS MAY NOT INDICATE ALL MECHANICAL, ELECTRICAL, PLUMBING, AND TECHNOLOGY ITEMS, SEE MECHANICAL/ELECTRICAL DRAWINGS FOR FURTHER REQUIREMENTS.
2. NEW SUSPENDED GRID CEILINGS SHALL BE ARRANGED SO THAT GRID IS SPACED EQUALLY FROM MOST REMOTE WALL IN EACH DIRECTION, WITH NO TILE LESS THAN 6" UNLESS OTHERWISE INDICATED.
3. PROVIDE CONTROL JOINTS AS NOTED OR REQUIRED TO PREVENT CRACKING.
4. WHERE SUPPORT WIRES FOR ACOUSTICAL CEILING GRID CANNOT BE INSTALLED VERTICALLY, THE CONTRACTOR SHALL PROVIDE A UNISTRUT BENEATH THE OBSTRUCTION AS TO PERMIT WIRES TO BE VERTICALLY ATTACHED TO THE UNISTRUT.
5. PAINT ALL EXPOSED STRUCTURAL STEEL.
6. CONTRACTOR SHALL PROVIDE HOLD-DOWN CLIPS AT VESTIBULE.



1 A201 TYPICAL RCP 1ST & 2ND FLOORS
SCALE: 1/8" = 1'-0"

STATE OF OHIO
CHRISTOPHER D SMITH 9912446
REGISTERED ARCHITECT
CHRISTOPHER D SMITH
LICENSE #9912446
EXPIRATION DATE 12/31/2023
tda thendesign architecture

RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date

Sheet Revisions

no.	description	date
02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22

Project Issues

sheet name:
TYPICAL RCP 1

drawn by: Author
checked by: Checker
sheet number: A201
job number: 22021

GENERAL NOTES - CEILING PLAN

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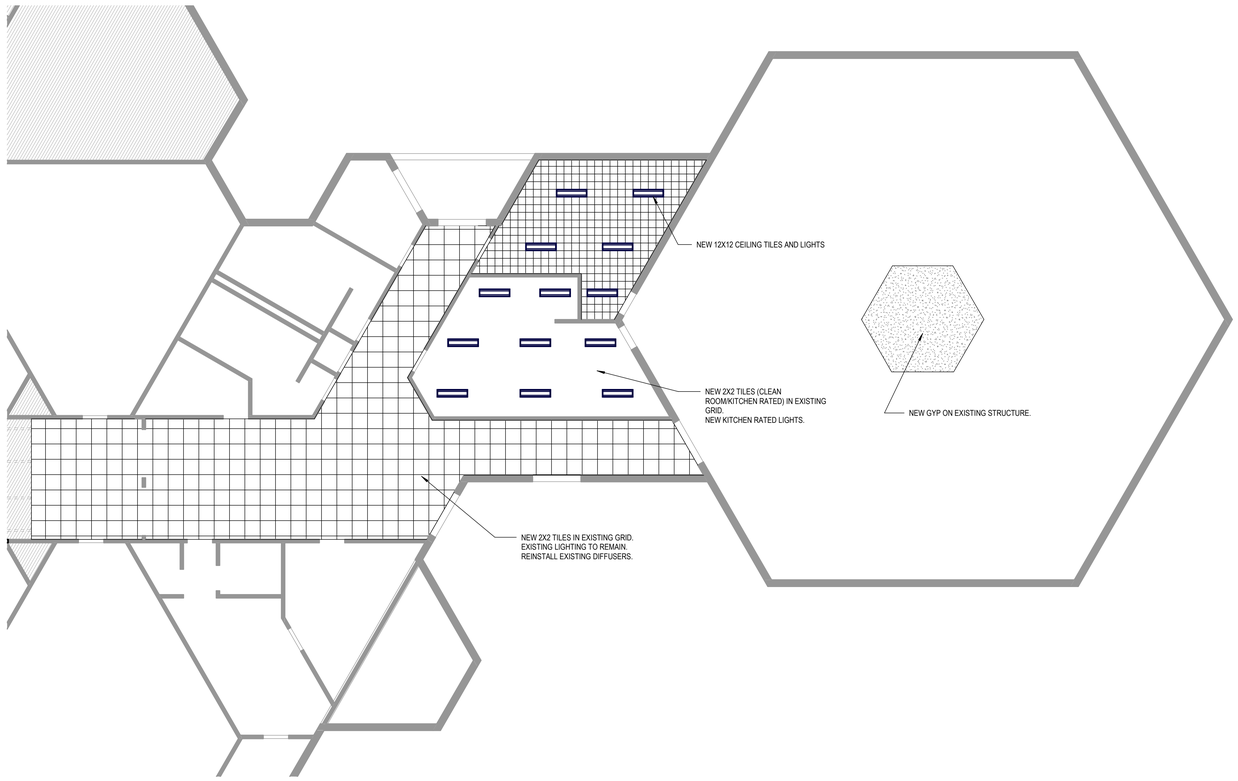
6. CONTRACTOR SHALL PROVIDE HOLD-DOWN CLIPS AT VESTIBULE.

CEILING SYMBOLS

- DIFFUSER (SUPPLY)
- DUCT OR REGISTER (RETURN OR EXHAUST)
- 2'X4' SUSPENDED LAY-IN ACOUSTICAL CEILING
- 2'X2' SUSPENDED LAY-IN ACOUSTICAL CEILING
- SUSPENDED GYPSUM BOARD FASCIA, SOFFIT OR CEILING
- EXTERIOR GYPSUM BOARD SOFFIT (MOISTURE RESISTANT IF INTERIOR)
- EXP - EXPOSED STRUCTURE AND MTL. DECK
- 2' X 4' LAY-IN FIXTURE
- 2' X 2' LAY-IN FIXTURE
- 1' X 4' LAY-IN FIXTURE
- DOWN LIGHT FIXTURE
- ACT-1 10' - 0" — CEILING HEIGHT & TYPE
- CLP — CMU LINTEL, PAINTED
- EXP — EXPOSED STRUCTURE
- CEILING ACCESS PANEL - COORDINATE LOCATION WITH ABOVE CEILING EQUIPMENT ACCESS.
- EXTERIOR LIGHT
- PENDANT LIGHT FIXTURE
- 2' X 4' LAY-IN FIXTURE
- 2' X 2' LAY-IN FIXTURE
- CURTAIN TRACK
- 2' x 4' RADIAL GEOMETRIC DIFFUSER
- RS — ROLLER SHADE
- MRS — MOTORIZED ROLLER SHADE

SEE ELECTRICAL DWG'S FOR FURTHER INFO ON LIGHT FIXTURES AND TYPES



1 / A202 FIRST FLOOR MEZZANINE PARTIAL RCP
SCALE: 1/8" = 1'-0"

STATE OF OHIO
CHRISTOPHER D SMITH 9912446
REGISTERED ARCHITECT
CHRISTOPHER D SMITH
LICENSE #9912446
EXPIRATION DATE 12/31/2023

tda thendesign architecture

RENOVATIONS TO
H BARBARA BOOKER SCHOOL
2121 W 67th Street
Cleveland, Ohio 44102

no.	description	date
	Sheet Revisions	

no.	description	date
02	BIDDING	8.29.22
01	PLAN REVIEW	8.29.22
	Project Issues	

sheet name:
FIRST MEZZANINE PARTIAL RCP

drawn by: Author
checked by: Checker
sheet number: A202
job number: 22021

GENERAL NOTES

DESIGN CRITERIA

1. Applicable Building Codes
   - A. Building: IBC 2015 | OBC 2017
     - 1) Construction classification type: TYPE II | B
     - 2) Primary use and occupancy classification:
       - a) Educational: Group E
   - B. Mechanical: IMC 2015 | OMC 2017
   - C. Plumbing: IPC 2015 | OPC 2017
   - D. Electrical: NEC 2017
   - E. Gas: IFGC 2017
   - F. Local Building Code and Revisions.

GENERAL

1. The term General Contractor (G.C.) as used in these documents refers to the Contractor / Construction Manager in responsible charge of the project in terms of coordination, scheduling, subcontractor coordination, etc. this term refers to, but is not limited to, General Contractor, Construction Manager, Design Build Contractor, Prime Contractor, etc. The term is referencing the entity that coordinates the work of other trades.
2. These drawings are diagrammatic and indicate the general extent of the work. The contractor shall be responsible for the coordination and proper installation of all mechanical systems. The contractor shall provide all necessary offsets and fitting which may be required due to space constraints or other conditions.
3. Existing building HVAC and Plumbing systems shown on these drawings which are to be removed or modified where taken from the original drawings dated April 1, 1939 and may not show current installations or conditions. Each contractor shall field verify all existing systems.
4. It is the contractor's responsibility to enforce all applicable safety codes and regulations during all phases of construction.
5. Construction loads shall not exceed structural design live loads. The contractor shall be responsible for all design required to support construction equipment used in constructing this project. Verify and coordinate with structural drawings.
6. The contractor shall perform all construction for the project in a manner and sequence that are based on accepted industry standards that recognize the interaction of the components that comprise the systems, without causing distress, unanticipated movements or irregular load paths as a result of the construction means and methods employed.
7. The contractor shall provide all miscellaneous supporting steel, etc. for the proper installation of all mechanical systems.
8. Before fabrication and/or installing any work, contractor shall see that it does not interfere with clearance required for finish on beams, columns, pilasters, walls, or other structural or architectural members, as shown on architectural drawings. If any work is so installed and it later develops that architectural design cannot be followed, contractor shall, at his own expense, make such changes in his work as architect may direct to permit completion of architectural work in accordance with plans and specifications.
9. All piping shall be protected as required by the applicable Mechanical, Plumbing, and Building Codes: " General Regulations" and other Code Chapters.
10. Pipes passing through or under walls shall be protected from breakage. Pipes passing through studs, joist, rafters or similar members less than 1 1/2" from the nearest edge of the members shall be protected by steel shield plates.
11. Piping shall be installed to prevent strains and stresses that exceed the structural strength of the pipe. Where necessary, provisions shall be made to protect piping from the damage resulting from pipe expansion and contraction and structural/soil settlement. Expansion joint fittings shall be used where necessary to provide for expansion and contraction of the pipes. Sleeved openings shall be sized appropriately to accommodate pipe movement and structural/soil settlement. Expansion joint fittings shall be of the typical material suitable for use with the type of piping in which fittings are installed. At a minimum install rubber mechanical joint couplings or CSA-certified expansion joints on all vertical piping at every other floor of the building and rigidly support the stack pipe on alternating floors to direct any movement into the appropriate expansion compensator. Design of these expansion fittings shall be provided by the contractor. Any analysis which requires additional support or expansion detailing shall be shared with the mechanical design professional and any stresses or point loads created by the engineered system shall be shared with the structural designer for review.
12. Install additional offsets on piping or ductwork where required to obtain maximum headroom or to avoid conflict with other work without additional cost to owner.
13. Report any interferences between work under this division and that of any other contractors to architect as soon as they are discovered. Architect will determine which equipment shall be relocated, regardless of which was first installed, and his decision shall be final.
14. The contractor shall coordinate floor, wall, and roof penetrations, louver sizes, etc. with general trades.
15. All mechanical and electrical work: Ductwork, plumbing, piping, wiring, lighting, etc. and all architectural items that need to be removed during the modification of or reinforcing of, existing structure shall be replaced in kind by the respective contractor. The contractors shall keep all existing systems in operation during the construction phase of the project.
16. All contractors are required to examine the drawings and specifications carefully, visit the site and fully inform themselves as to all existing conditions and limitations, prior to agreeing to perform the work. Failure to visit the site and familiarize themselves with the existing conditions and limitations will in no way relieve the contractor from furnishing any materials or performing any work in accordance with drawings and specification without additional cost to the owner to have a complete and working system.
17. Details labeled "Typical Details" or "Typical" on drawings apply to situations occurring on the whole project that are the same or similar to those specifically detailed. Such details apply whether or not details are referenced at each location on drawings. Notify engineer for clarifications regarding applicability of "Typical Details".
18. Work and coordinate these drawings with architectural, food service, mechanical, plumbing, and electrical drawings.
19. Do not scale drawings.
20. Any discrepancies between mechanical and architectural drawings shall be brought to the attention of the architect and mechanical engineer.
21. Should any of the general notes conflict with any details or instructions on plans, or in the specifications, the strictest provision shall govern.
22. Cutting, Patching and Drilling
    - A. All cutting and patching of the building construction required for this work shall be by this contractor unless shown on architectural drawings and confirmed as to size and location prior to new construction. Cutting shall be in a neat and workmanlike manner.
    - B. Neatly saw cut all rectangular openings, set sleeve through opening, and finish patch or provide trim flange around opening.
    - C. Neatly saw cut floors and patch floor to match existing, including floor covering.
    - D. Contractor shall field verify slab-on-grade or supported floor construction type prior to cutting. Under no circumstances shall this contractor cut a floor thicker than 4 inches, a structural floor slab, whether on grade or supported, without prior written approval from the architect. If floor slab indicated to be cut on mechanical plans is found to be structural in nature, do not cut. Contact architect immediately for further directions.
    - E. Core drill and sleeve all round openings.
    - F. Do not cut any structural components without architect's written approval, including, but not limited to roof joists, columns, floor joists, beams, girders, structural floor slabs, rebar, etc.
    - G. Patch, and finish to match adjacent areas that have been cut, damaged or modified as a result of the installation of the mechanical systems. Fire-stop all penetrations of fire rated construction in a code approved manner.
    - H. All contractors shall confirm with owner, prior to bid, times available for noise producing work such as cutting and core drilling of floors, walls, etc. as well as times for work which requires access into adjoining tenant spaces. Include any premium time in bid.
    - I. All openings required for this branch of work shall be accomplished in time to be incorporated in, and be compatible with the construction program; otherwise this contractor shall be responsible and pay for all changes made necessary for his failure to do so. Pipe holes in floors and walls shall be core drilled if not sleeved during construction.
    - J. Existing slabs shall be core drilled at reentrant corners of new floor openings to prevent overcutting.
23. Refer to mechanical, plumbing, and electrical plans for location of mechanical, plumbing, and electrical equipment. Coordinate location of disconnect switch associated with each piece of mechanical and plumbing equipment with electrical contractor.
24. Installation requirements for plumbing systems shall be reviewed and coordinated with all other trades involved prior to rough-in. Give equipment shop drawings from installer/supplier/contractor equipment, as required, for review and coordination to all other trades involved. Contact architect/engineer with any discrepancies found between construction drawings and equipment being furnished prior to rough-in.
25. Firestopping
    - A. The contractor shall review all architectural drawings for type of walls, fire rating, & firestopping details and shall provide all fire dampers and firestopping required for these walls whether shown or not on the mechanical plans.
    - B. All penetrations through fire rated walls associated with the installation shall be sleeved and fire-stopped using a UL approved method. UL approved method shall meet or exceed fire rating of structure being penetrated. Reference architectural plans for fire rated structures. If shown, reference architectural, mechanical and electrical drawings for penetration details.
    - C. All openings through fire rated walls, floors, and/or roofs for ductwork, piping, conduit, etc., shall be fire sealed with a calcium salicate, silicone "RTV" foam, "3M" fire rated sealants, Hilti Firestop Systems, or approved equal to maintain the intended fire rating and associated UL ratings as recommended by the architect and/or sealant manufacturer.
    - D. All fire stopping sealants shall be thixotropic so as not so slump or sag and shall be trowelable. Fire stopping sealants shall be intumescent and shall be free of asbestos, halogens, and volatile solvents.
    - E. Fire stopping materials shall be classified in the Underwriters Laboratories (UL) fire resistance directory or listed in the Warnock Hersey International Directory.
26. All equipment and devices for this project must be UL listed. Devices, equipment, systems shall be installed per National Electrical Code requirements and manufacturer's instructions.
27. All conduit and cabling shall be properly supported as required by the National Electrical Code. For existing installations, the contractor shall be responsible to replace and/or rework existing conduit and/or cabling that is not in compliance with this requirement.
28. Shop Areas and Material Storage
    - A. The contractor shall make provisions for the delivery and safe storage of his materials and equipment in coordination with the work of others. Materials and equipment shall be delivered at such stages of the work as will expedite the work as a whole and shall be marked and stored in such a way as to be easily checked and inspected. The arrival and placing of large equipment items shall be scheduled early enough to permit entry and setting when there is no restriction or problem due to size and weight.

Demolition

1. The architectural drawings are to be used only as a guideline for demolition. The contractor must visit the site prior to bidding to verify all work required for a complete job and include the cost of such work in his bid.
2. The mechanical drawings are intended to show only the general existing building construction within the area of demolition. The drawings do not show all systems, quantities, sizes, obstructions, etc., and are not intended to be used by the contractor to define the complete scope of demolition. The contractor must field verify the actual building and systems conditions to define all elements within the scope of demolition.
3. Examine areas and conditions under which demolition work must be performed. This contractor shall coordinate his work with other trades performing demolition work and/or demolition work performed by the owner. In every instance of demolition and/or remodeling, the contractor shall figure a complete job as none other shall be accepted.
4. The extent of work shown or not shown shall include removal and legally dispose off site, all the items and systems being removed.
5. This contractor shall retain on the premises in neatly stacked piles where instructed for selection by the owner, all material, wire, fixtures and/or equipment which are specified to be removed or replaced. All such items, not selected for salvage by the owner, shall become the property of this contractor and shall be removed from the premises and legally disposed.
6. Conform to all applicable codes for demolition of items and systems, safety of adjacent systems, dust control, legal run-off control, disposal and all items necessary to complete the work completely.
7. Demolition shall be done in a manner so as not to damage adjacent work and not affect the operation of systems to remain in use. Any item to remain that is damaged by the contractor shall be replaced and/or repaired at the contractor's expense.
8. Demolition and cutting shall be done in a manner which does not deform or apply loads to the existing framing and equipment of the building to remain.
9. All walls, ceilings, floors, etc., being disturbed by the work shall be returned to finished conditions to match existing by the contractor and contractor shall do his own cutting and patching as necessary under his contract.
10. The contractor shall maintain existing services to and in the existing area as required.
11. The existing systems to remain are to be supported as required until the modified elements are installed and supported.
12. If necessary, the contractor shall provide temporary services in the existing areas.
13. Existing slabs shall be saw-cut in a manner that does not cause the steel framing or the rebar supporting the slab to be cut. Contractor shall field verify slab thickness and rebar spacing.
14. Existing slabs shall be core drilled at reentrant corners of new floor openings to prevent over cutting.
15. The demolished systems shall be reduced to pieces of a weight, and transported across the remaining structure in a manner, such that the remaining structure is not overstressed.
16. Equipment and devices shall be removed complete including hangers, supports, conduit, wire, pipes, etc. Wiring shall be disconnected at circuit breakers, removed and breakers marked "spare."
17. All open ended piping that is to remain shall be capped and property secured.
18. Any existing pipes, conduit, low voltage control, wiring and/or electrical and mechanical devices being disturbed by the work shall be reworked by this contractor as required to return to its former existing operating condition.
19. Any pipes or tubing feeding through devices or equipment being relocated, reworked, or abandoned and serving other devices, and/or equipment shall be maintained in working condition.
20. All asbestos removal will be handled by the owner and is not a part of this work.
21. Use of explosives shall not be permitted.
22. Existing architectural, mechanical and electrical equipment and systems shall be protected from damage resulting from demolition.
23. Contractor shall submit a proposed deconstruction sequence to the owner and architect for review prior to commencement of work.

MECHANICAL LEGEND

Symbol	Description
A	COMPRESSED AIR PIPING
CD	CONDENSATE DRAIN PIPING
CPD	CONDENSATE PUMP DISCHARGE
CW	DOMESTIC COLD WATER PIPING
HW	DOMESTIC HOT WATER PIPING
RHW	DOMESTIC RECIRCULATING HOT WATER PIPING
CW (E)	DOMESTIC COLD WATER PIPING (EXIST.)
HW (E)	DOMESTIC HOT WATER PIPING (EXIST.)
RHW (140°)	DOMESTIC RECIRCULATING HOT WATER PIPING (EXIST.)
D	DRAIN LINE
G	GAS PIPING
G-#	GAS PIPING # PSIG
GW	GREASE WASTE
GV	GREASE WASTE VENT
LPR	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
LPR(E)	LOW PRESSURE CONDENSATE RETURN (EXIST.)
LPR(E)	LOW PRESSURE STEAM (EXIST.)
PD	PUMP DISCHARGE PIPING
RC	RAIN CONDUCTOR
HG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RV	REFRIGERANT VENT
SAN	SANITARY SEWER PIPING
SCW	SOFT COLD WATER PIPING

Symbol	Description
SHW	SOFT HOT WATER PIPING
SV	STEAM VENT
ST	STORM PIPING
TW	TEMPERED WATER PIPING
V	VENT PIPING
	PIPING ABOVE GRADE/FLOOR
	PIPING BELOW GRADE/FLOOR
	EXISTING PIPING TO BE REMOVED
	EXISTING PIPING TO REMAIN
	2-WAY MODULATING VALVE
	3-WAY MODULATING VALVE
	AUTOMATIC CONTROL VALVE
	BALANCE VALVE
	CHECK VALVE
	MODULATING VALVE
	PRESSURE REGULATING / REDUCING VALVE
	RELIEF VALVE
	SHUTOFF VALVE
	PRESSURE GAUGE W/COCK
	STEAM TRAP
	STRAINER
	THERMOMETER
	PIPE UNION
M	UTILITY METER
	DIRECTION OF DOWNWARD PITCH
	DIRECTION OF FLOW

Symbol	Description
DTS	DUCT TEMPERATURE SENSOR
	EXISTING DUCTWORK
	EXISTING DUCTWORK TO BE REMOVED
SD	SMOKE DAMPER
MOD	MOTOR OPERATED DAMPER
BDD	BACKDRAFT DAMPER
T AC-1	THERMOSTAT, MOUNT 48" AFF, UNLESS OTHERWISE NOTED
	POINT OF CONNECTION
XX / XX	EQUIPMENT TAG
UH-1	UNIT HEATER DESIGNATION UH-1 = SEE SCHEDULE
	SUPPLY OR OUTDOOR AIR DUCT
	RETURN OR RELIEF DUCT
	EXHAUST DUCT
	DUCT UP
	DUCT DOWN
	AIRFLOW DIRECTION
UC	3/4" DOOR UNDERCUT
R	DUCT RISE
T	TRANSFER AIR
	DIFFUSER WITH BLANK -OFF SECTION
CL	CENTERLINE

ABBREVIATIONS

A	AMPS
ADD'L	ADDITIONAL
AFC	ABOVE FINISH COUNTER
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AP	ACCESS PANEL
ARCH	ARCHITECTURAL
BLDG	BUILDING
BOT	BOTTOM
C	CONDENSER
CB	CATCH BASIN
CC	COOLING COIL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CJ	CONTROL JOINT
CL (C)	CENTERLINE
CLG	CEILING
CO	CLEANOUT
COL	COLUMN
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CTX	CONNECT TO EXISTING
CU L	CONDENSING UNIT
CUH	CABINET UNIT HEATER
D	DAMPER
DCBP	DOUBLE CHECK BACKFLOW PREVENTER
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA (Ø)	DIAMETER
DN	DOWN
DS	DOWN SPOUT
DSW	DISCONNECT SWITCH
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
EA	EXHAUST AIR
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EQ	EQUIPMENT
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EXIST (E)	EXISTING
EXP	EXPANSION
FA	FIRE ALARM
FCO	FLOOR CLEAN-OUT
FD	FLOOR DRAIN / FIRE DAMPER
FFE	FINISH FLOOR ELEVATION
FPC	FIRE PROTECTION CONTRACTOR
FS	FLOW SWITCH
G	GRILLE (EXHAUST, RETURN, OR TRANSFER)
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GCO	GRADE CLEANOUT
GE	GENERAL EXHAUST
GND	GROUND
GRE	GRAVITY ROOF EXHAUSTER
GWH	GAS WATER HEATER
HB	HOSE BIBB
HE	HOOD EXHAUST
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HX	HEAT EXCHANGER
JB	JUNCTION BOX
KEC	KITCHEN EQUIPMENT CONTRACTOR
KHE	KITCHEN HOOD EXHAUST
KVA	KILOVOLT AMPERE
KW	KILOWATT
L	LOUVER
LTG	LIGHTING
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MB	MOP BASIN
MBH	1,000 BTUH
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MTD	MOUNTED
N	NEW
NEC	NATIONAL ELECTRIC CODE
NF	NON FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OC	ON CENTER
OD	OVERFLOW DRAIN
P	PUMP
PC	PLUMBING CONTRACTOR
PH (ϕ)1	PHASE
PNL	PANEL
PRE	POWER ROOF EXHAUSTER
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS/SQUARE FOOT
PSI	POUNDS/SQUARE INCH
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RAD	RADIUS
RD	ROOF DRAIN
REQ'D	REQUIRED
RG	RETURN GRILLE
RHC	REHEAT COIL
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPZ	REDUCED PRESSURE ZONE ASSEMBLY
SA	SUPPLY AIR
SECT	SECTION
SG	SUPPLY GRILLE
SF	SUPPLY FAN
SK	SINK
SQ	SQUARE
SS	SERVICE SINK
STL	STEEL
STRUCT	STRUCTURAL
SW	SAFE WASTE
SYM	SYMMETRICAL
TA	TRANSFER AIR
TC	TEMPERATURE CONTROL
TCC	TEMPERATURE CONTROL CONTRACTOR
TD	TRENCH DRAIN
TG	TRANSFER GRILLE
TPV	TRAP PRIMER VALVE
TS	TAMPER SWITCH
TYP OR T/	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UNO	UNLESS NOTED OTHERWISE
UV	UNIT VENTILATOR
V	VOLTS
VD	VOLUME DAMPER
VERT	VERTICAL
VTR	VENT THRU ROOF
W	WATTS
W/	WITH
WP	WEATHERPROOF
X'FMR	TRANSFORMER

STATE OF OHIO
NATHANIEL KOBB
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BARBARA BOOKER ELEMENTARY SCHOOL
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no.	description	date

Sheet Revisions

no.	description	date
10		
09		
08		
07		
06		
05		
04		
03		
02		
01	Issue for Bidding	08.05.2022

Project Issues

sheet name: PLUMBING GENERAL NOTES

drawn by: TBA
checked by: TBA
sheet number: P-1
job number: 2022-0221

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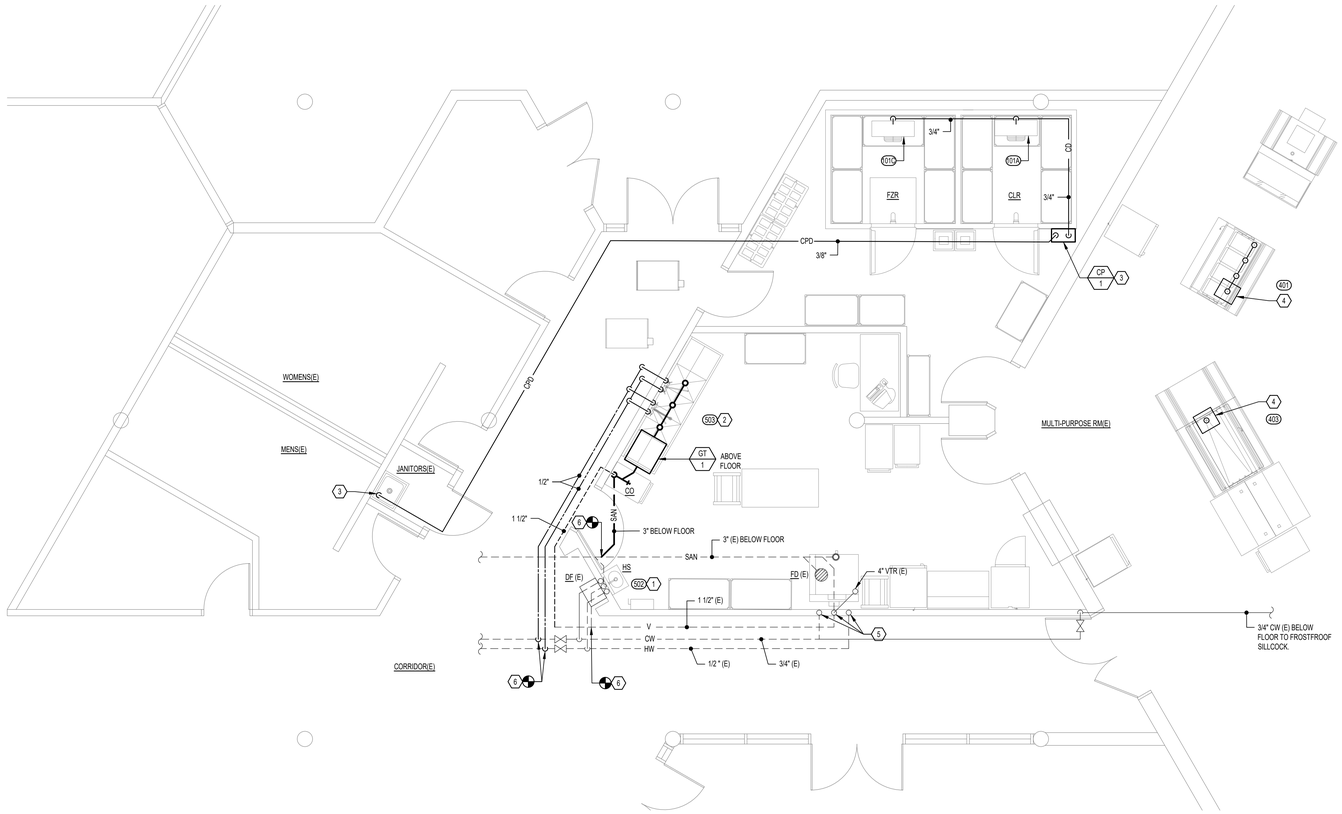


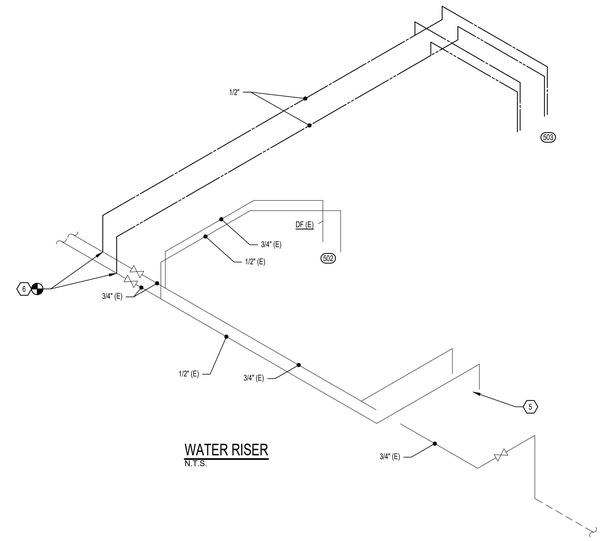
FIRST FLOOR PLUMBING PLAN
1/4" = 1' - 0"

GENERAL NOTES:

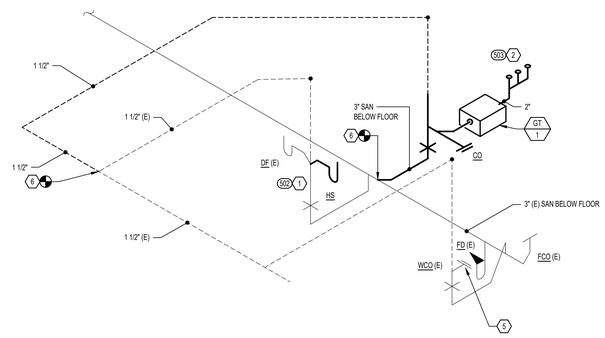
1. EXISTING BUILDING PLUMBING SYSTEMS SHOWN ON THESE DRAWINGS WHICH ARE TO BE REMOVED. MODIFIED OR TO REMAIN IN PLACE WERE TAKEN FROM INFO GATHERED ON A FIELD VISIT ON 6/28/22 AND ORIGINAL DRAWINGS DATED 5/5/1971 MAY NOT SHOW CURRENT INSTALLATIONS OR CONDITIONS AS THEY ARE. EACH CONTRACTOR SHALL VERIFY ALL EXISTING SYSTEMS AND THEIR CURRENT CAPACITY.
2. THE COLD AND HOT WATER SYSTEMS IN THE KITCHEN ARE ASSUMED TO BE ABLE TO PROVIDE THE NECESSARY FLOW, TEMPERATURE AND PRESSURE FOR THE NEW KITCHEN EQUIPMENT. THE EXISTING KITCHEN WAS OPERATIONAL A FEW YEARS AGO AND THERE WERE NOT ANY DEFICIENCIES IN THE COLD AND HOT WATER SYSTEMS THEN.
3. THE SANITARY DRAIN AND VENT SYSTEM SERVING THE KITCHEN IS ASSUMED TO BE WORKING AND ABLE TO PROVIDE THE NECESSARY DRAINAGE FOR THE NEW KITCHEN EQUIPMENT. THE NEW KITCHEN WAS OPERATIONAL A FEW YEARS AGO AND THERE WERE NOT ANY DEFICIENCIES IN THE SANITARY DRAINAGE THEN.

CODED NOTES: (#)

1. REMOVE EXISTING HAND SINK TO MAKE ROOM FOR KEC ITEM 502. CONNECT EXISTING SAN, CW AND HW PIPING TO NEW HAND SINK.
2. PROVIDE NEW SAN, CW, HW AND VENT PIPING FOR KEC ITEM 503. PROVIDE LOCAL GREASE TRAP GT-1 FOR 3-COMP SINK.
3. PROVIDE CONDENSATE PUMP CP-1 FOR FREEZER FAN COIL UNIT ITEM 101C AND COOLER ITEM 101A CONDENSATE. CONDENSATE PUMP DISCHARGE PIPING TO DRAIN INTO EXISTING JANITOR'S MOP SINK WITH REQUIRED AIR GAP.
4. HOT FOOD TABLE ITEM 401 AND COLD FOOD TABLE ITEM 403 TO DRAIN INTO A SCHOOL PROVIDED WASTE CONTAINER.
5. EXISTING SAN, CW AND HW PIPING TO BE CAPPED AND ABANDONED IN PLACE.
6. CONNECT NEW PIPING TO EXISTING PIPING ABOVE THE CEILING OR BELOW THE FLOOR. VERIFY IN FIELD EXACT LOCATION AND SIZE OF PIPING TO BE EQUAL TO OR LARGER THAN THE NEW PIPING.



WATER RISER
N.T.S.



SANITARY ISOMETRIC
N.T.S.

EQUIPMENT SCHEDULE

Item	EQUIPMENT DESCRIPTION	CW (in)	HW (in)	AFF (in)	DIRECT DRAIN (in)	AFF (in)	INDIRECT AIR GAP	GAS (in)	AFF (in)	MBTUH	REMARKS
101A	COOLER COIL						CP				FSEC PIPE COIL TO CONDENSATE PUMP
101C	FREEZER COIL						CP				FSEC PIPE COIL TO CONDENSATE PUMP
502	HAND SINK W/ FOOT PEDALS	0.5	0.5	18	1.5	16					SOAP & TOWEL DISPENSER - BY OWNER
503	POT SINK	0.5	0.5	16	2						TO GREASE TRAP

PLUMBING FIXTURE CONNECTION SCHEDULE

MARK	FIXTURE	MANUFACTURER	MODEL	C.W.	H.W.	SAN	VENT	DESCRIPTION
GT-1	GREASE TRAP	SCHIER	GB-2	-	-	3"	1 - 1/2"	INDOOR, ABOVE FLOOR, GREASE TRAP FOR 50 GPM FLOW / 127 LBS. GREASE CAPACITY, 35" x 23" x 13.75" WITH 3" PIPE CONNECTIONS, BOLTED GAS / WATER TIGHT PE COVER, BUILT - IN FLOW CONTROL AND INTEGRAL AIR RELIEF / ANTI - SIPHON CONSTRUCTION.

REMARKS:
1. REFER TO SPECIFICATIONS FOR APPROVED EQUAL MANUFACTURERS.

CONDENSATE PUMP SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	SERVICE	GPH	TOTAL HEAD (FT)	IMPELLER DIAMETER (")	HP	RPM	ELECTRICAL			OPERATING WEIGHT (LBS)	REMARKS
										VOLT.	PH.	FLA		
CP-1	LITTLE GIANT	VCL-4SULS	SUB.	COND.	380	15	-	1/6	1550	1 / 5	1	3.5	13	1,2

REMARKS:
1. ACCEPTABLE MANUFACTURERS: ARMSTRONG, AURORA, BELL AND GOSSETT, PACO, PATTERSON, PEERLESS, TACO, THRUSH, OR WEINMAN.
2. PROVIDED WITH ONE GALLON COLLECTION TANK, AUTOMATIC START AND STOP OPERATION, OVERFLOW DETECTION SWITCH, CHECK VALVE AND 6 FOOT, 3 CONDUCTOR CABLE WITH GROUNDED PLUG.

GREASE TRAP CALCULATION

3-COMPARTMENT SCULLERY SINK KEC #503
21 x 26 x 13.5 BOWL x 3 = 22,932 CU IN.
22,932 CU IN. / 231 CU IN. PER GALLON = 99 GALLONS.
99 GALLONS x 75% FULL = 74 GALLONS.
74 GAL / 2 MINUTES = 37 GPM FLOW.
PROVIDED 50 GPM CAPACITY GREASE TRAP.

Thorson •Baker +Associates
CONSULTING ENGINEERS
3030 West Streetsboro Road (330) 659-6688 Ph.
Richfield, Ohio 44286 (330) 659-6675 Fax

STATE OF OHIO
NATHAN E. KOBB
E-71263
REGISTERED
PROFESSIONAL ENGINEER

tda thendesign architecture

BARBARA BOOKER ELEMENTARY SCHOOL
CLEVELAND MUNICIPAL SCHOOL DISTRICT
2121 W. 67TH ST.

no.	description	date
	Sheet Revisions	
10		
09		
08		
07		
06		
05		
04		
03		
02		
01	Issue for Bidding	08.05.2022
no.	description	date
	Project Issues	

sheet name: FOOD SERVICE PLUMBING PLAN
drawn by: TBA
checked by: TBA
sheet number: P-2
job number: 2022-0221

MECHANICAL SPECIFICATIONS

Section 200500 - General Requirements

A. General

1. Specifications are applicable to all contractors and/or subcontractors for all mechanical systems in Divisions 01, 20.
2. This contractor is also referred to the architectural, food service and electrical and all other drawings and specifications pertinent to this project and fully coordinate with all other trades, owner and architect requirements. All of the above mentioned drawings and specifications are considered a part of the contract documents.
3. Conform to all Instructions to Bidders, general and special conditions of contract as specified by architect and/or owner.
4. Refer to "Alternate Proposals" for possible changes affecting the extent of this section of work.
5. Before submitting a bid, each contractor is requested to visit the job site to familiarize themselves with construction condition, check facilities and conditions and make all necessary observations and measurements. Note conditions under which work is to be performed and take all items into consideration in bid. No consideration will be given for his failure to do so.
6. Systems are to be complete and workable in all respects, placed in operation and properly adjusted.
7. Each contractor shall provide for his own clean-up, removal and legal disposal of all rubbish daily.
8. Each contractor shall protect his work, his existing and adjacent property against weather.
9. Each contractor shall protect his work, materials, apparatus and fixtures from damage. Any work damaged by failure to provide protection required, shall be removed and replaced with new material at the contractor's expense.
10. Each contractor must confirm size, location and materials at point of tie in connections in the field prior to rough-in of new work.
11. Arrange for and obtain owner's and insurance representative's permission for any service shutdowns.
12. Each contractor shall be solely responsible for construction means, methods, and sequences of construction and the safety of workmen.
13. No piping, ductwork, wiring, etc., shall be installed or routed above or below electrical panels and equipment, through elevator equipment rooms or elevator shafts or stairways unless these items serve these areas only.
14. All contractors shall coordinate with the electrical contractor and obtain a written approval identifying the electrical characteristics of all mechanical equipment prior to ordering of equipment. No additional payment will be made for lack of contractor coordination of electrical characteristics.
15. Each contractor shall include modifying existing conditions to complete the project. During construction the contractors may uncover an existing condition that will have to be modified. Any such work which comes under the jurisdiction of this contractor shall be done by this contractor without extra cost to the owner and project.
16. Work related to the existing building shall be coordinated to minimize interference or interruption of normal building use by the owner. Refer to architectural plans for phasing requirements.
17. Ceiling grid systems shall not be supported from ductwork, heating or plumbing lines or any other utility lines, and vice versa. Each utility and the ceiling grid system shall be a separate installation and each shall be independently supported from the building structure - concrete, steel or masonry. Where interferences occur, in order to support ductwork, piping, ceiling grid systems, etc., trapeze type hangers or supports shall be employed which shall be located so as not to interfere with access to such mechanical equipment as valves, regulators, mixing boxes, fire dampers, etc.

B. Work Coordination and Scope

1. Each contractor under this division shall familiarize himself with the work to be done under other divisions of this specification and their related drawings and shall so coordinate and schedule his work as not to cause delays or interference with the work of others. Such coordination and scheduling shall accomplish the installation of mechanical and plumbing equipment and piping with a minimum of cutting through masonry and other adjustments.
2. Work included under this division shall consist of furnishing all materials, supplies, equipment, tools, transportation and facilities and performing all labor and services necessary for the complete installation of the plumbing systems.
3. The contractor under this division shall report discrepancies in the work of others which affect his work. Any changes made necessary by failure or neglect to report such discrepancies shall be made by and at the expense of the contractor of this division. Obtain written instructions for changes necessary to accommodate work of others.
4. The contractor under this division shall be responsible for proper size and location of anchors, chases, recesses, opening, etc., required for the proper installation of his work.
5. The division of responsibility under separate plumbing contract for tie-in points shall be as follows:
   a. The plumbing contractor shall provide domestic water to within five feet (5'-0") of equipment connection furnished by the food service contractor, final connection by food service contractor. On the water lines, the plumbing contractor shall provide the shut-off valve, check valve, backflow preventer and pressure regulator.
   b. Plumbing contractor shall provide sleeves to the general contractor for placement in floors, walls, etc. and coordinate such location.
   c. The plumbing contractor shall rough-in and connect all other fixtures and equipment where shown on the drawings but not previously mentioned. Provide with shut-off valves and p-traps with clean-out plug.

C. Codes, Permits, Standards and Regulations

1. Contractors shall install work in full accordance with rules and regulations of all applicable codes (local, city, county, state, national codes, NFPA, OSHA, etc.), government regulations, utility company requirements, and applicable standards having jurisdiction over premises. This shall include safety requirements of the state department. Do not construe this as relieving contractor from compliance with any requirements of specifications which are in excess of code requirements and not in conflict therewith.
2. Contractors shall secure and pay for all fees, permits, and certificates of inspection incidental to this work required by foregoing authorities. Arrange for all required inspections and approvals.
3. Contractor shall be responsible for payments to all public utilities for work performed by them in connection with provision of service connections required under this division of specifications.
4. Deliver all permits and certificates to architect in duplicate.

D. Design Drawings

1. The design drawings, as submitted, are diagrammatic and are not intended to show exact location of equipment, piping unless dimensions are given. Piping is to be installed along the general plans shown on the drawings while conforming to actual building conditions. Each contractor shall confirm all dimensions by field measurement.
2. Before entering into a contract, the successful bidder may be required to submit satisfactory evidence to show that the manufacturer of all parts of the equipment offered have been regularly engaged in the manufacture of such equipment for three (3) years and have not less than three (3) installations of a similar type which have been in successful operation under conditions similar to those specified for not less than two (2) years.
3. All equipment, piping and material specified herein after as shown on the drawings shall be furnished and installed by the contractor, unless specifically indicated to the contrary. Installation shall comply with all required "Building Codes" and "Reference Standards."
4. If this contractor proposes to install equipment requiring space conditions other than those as specified and/or shown on the design drawings, or to rearrange the equipment, he shall assume full responsibility and submit drawings for the rearrangement of the space and shall obtain the full approval of the architect prior to start of any work.
5. The exact locations for fixtures, equipment and piping which is not covered by drawings shall be obtained from the architect or his representative in the field and the work shall be laid out accordingly.
6. Drawings and specifications are intended to supplement one another. Any materials or labor called for in one but not the other shall be furnished as if both were mentioned in the specifications and shown on the drawings.

E. Base Bid Equipment, Materials and Substitutions

1. All equipment and materials shall be new, free of defects and UL labeled.
2. Base bid manufacturers are included in the specification or listed in schedules on the drawings. All other manufacturers are considered substitution.
3. The name or make of any article, device, material, form of construction, fixture, etc., stated in this specification, whether or not the words "or approved equal" are used, shall be known as a "standard".
4. All cost shall be based on "standards" specified.
5. The equipment schedules on the drawings indicate manufacturer and their equipment model numbers that this design has been based on. Each contractor is required to bid upon the basis of design and furnish the makes specified.
6. Where more than one make or name is mentioned as being acceptable, it shall be understood that only the name or make referring to the manufacturers model numbers or sizes shall be considered the "Specified Standards." It shall be further understood that other makes and names, even though mentioned, have not been checked for detail and that their size and arrangement are the contractor's responsibility the same as a proposed substitute item. The use of other manufacturer's equipment that is listed as acceptable alternates that entails general trades, structural, mechanical, electrical, etc., revisions is this contractor's responsibility to provide revisions. Any additional cost of such changes shall be paid by the contractor submitting the acceptable alternates which necessitates changes in installing such submitted alternate equipment, even though such costs may be part of another division of work.
7. Bids concerning the use of substitute products must be accompanied by complete specifications and performance characteristic covering these products. Contractor shall provide all available test data and experience records which may be helpful to the architect in evaluating the quality and/or suitability of alternate products.
8. Contractor is also invited to bid on any other similar products the contractor desires to propose as substitutions, stating any difference in cost (add or deduct from base bid cost) for each proposed substitution on the substitution sheet. If the architect decides to accept any of the proposed substitutions, proper notations thereof shall be made in the written contract. Where several makes are mentioned in the specifications and the contractor fails to state that he prefers a particular make in his bid, the owner shall have the right to choose any of the makes mentioned without change in price. No consideration will be given to proposals for alternative products unless submitted with the original bids.
9. Substitutions are subject to the approval of the owner. If a substitution is submitted, it is the contractor's responsibility to evaluate it and certify that the substitution is equivalent in all respects to the base specifications.
10. If substitutions are approved, notify all other contractors, subcontractors, etc., affected by the substitution and fully coordinate with them. Any costs resulting from substitution, whether by this contractor or others, shall be the responsibility of and paid for by the substituting contractor. Approved shop drawings do not absolve this contractor from this responsibility.
11. All equipment shall be installed in full accordance with the manufacturer's data and installation instructions and service clearances. It is this contractor's responsibility to check and confirm these requirements prior to starting of any work.

F. Warranty

1. Fully warrant all materials, equipment and workmanship and the successful operation of all equipment and apparatus installed by this contractor for one (1) year from date of final acceptance.
2. Extend all manufacturers' warranties to owner; including five (5) year compressor and ten (10) year heat exchanger extended warranty on HVAC equipment to include material and labor.
3. Repair or replace without material and labor charge to the owner all items found defective during the warranty periods. In the case of replacement or repair due to failure within the warranty period, the warranty on that portion of the work shall be extended for a minimum period of one (1) year from the date of such replacement or repair.

G. Shop Drawing Submittals

1. Submittals will be reviewed only for general compliance with the contract documents and not for dimensions or quantities. The architect and engineer will make every effort to detect and correct errors, omissions, and inaccuracies in such drawings, but the failure to detect errors, omissions, and inaccuracies shall not relieve the contractor of responsibility for the proper and complete installation in accordance with the intent of the contract documents. The submittal review shall not relieve the contractor of responsibility for purchase of any item in full compliance with the contract documents or its complete and proper installation.
2. Where submittals vary from the contract requirements, the contractor shall clearly indicate on submittal or accompanying documents the nature and reason for the variations.
3. Each manufacturer or his representative must check the application of his equipment and certify at time of shop drawing submittal that the equipment specified has been properly applied and can be installed, serviced and maintained where indicated on the drawings. Advise engineer in writing with submittal drawings of any potential problems. The manufacturer shall be responsible for any changes that might be necessary because of physical characteristics of equipment that have not been called to the engineer's attention at the time of submittal.
4. Submit a minimum of one (1) print and an electronic "pdf" of shop drawings to the architect. The architect and engineer shall review and return a pdf. The contractor shall distribute copies as required to properly conduct the work, including requirements of the operating manual.

H. Supervision

1. The contractor shall have in charge of work at all times during construction a competent foreman or superintendent whose experience and background shall qualify him for the work to be performed under this division. Once assigned, the foreman or superintendent shall be retained until completion of the project and any consideration as to his removal on grounds of incompetence shall either be initiated by or referred to the architect for decision.

Section 200510 - Basic Material and Methods

A. General

1. Provide all materials, labor, equipment, and accessories required to furnish and install the mechanical items identified in this section.
2. This section includes basic mechanical materials and methods to complement other division sections in this specification and requirements indicated on the mechanical drawings.

B. Interferences

1. Before installing any work, contractor shall see that it does not interfere with clearance required for finish on beams, columns, pilasters, walls, or other structural or architectural members, as shown on architectural drawings. If any work is so installed and it later develops that architectural design cannot be followed, contractor shall, at his own expense, make such changes in his work as architect may direct to permit completion of architectural work in accordance with plans and specifications.
2. Install additional offsets on piping or ductwork where required to obtain maximum headroom or to avoid conflict with other work without additional cost to owner.
3. Report any interferences between work under this division and that of any other contractors to architect as soon as they are discovered. Architect will determine which equipment shall be relocated, regardless of which was first installed, and his decision shall be final.

C. Protection of Work and Property

1. The contractor shall be responsible for safeguarding work, property, and facilities against damage, both his own as well as others with which he may come into contact in the performance of his work.
2. Stored materials shall be protected against damage from weather. Pipe, and duct openings shall be closed with caps or plugs during installation. All fixtures and equipment shall be covered and protected against damage. Any materials or equipment damaged at any stage in the construction shall be replaced or repaired. Final completion, all work shall be in a clean and unblemished condition.
3. During construction, all return air ductwork and transfer air openings serving new and existing air handling equipment and/or adjacent tenant spaces shall be protected. Openings which need to remain active shall be covered and protected with MERV 8 filtration media; openings which can remain inactive during construction shall be covered with plastic sheathing and sealed air tight. Filter media shall be replaced regularly as required during construction in order to ensure adequate airflow through all required active openings. In addition, at the end of each phase of construction, and at the end of the construction project, all filtration media within each piece of equipment serving the space shall be replaced.

D. Supports and Hangers

1. Hangers and supports are to be provided to properly support, secure and align piping and to meet field conditions and as manufactured by Grinnell, Michigan Hanger or Caddy.
2. All hangers, brackets, clamps, etc., shall be of standard weight steel. Perforated strap hangers shall not be used in any work. When two or more pipes are run parallel, they may be supported on unistrut-type trapeze hangers. Other hangers for pipe 3" in size and smaller shall be clevis. For pipe transporting medium above 150 degrees F and 4" in size and above, use pipe roll. Each hanger is to be sized to include pipe insulation saddle for protection.
3. All vertical piping passing through floors shall be supported at the floor by a riser clamp.
4. Isolate all copper lines form ferrous hangers or supports by using foil filler or vinyl tape.
5. Spacing to comply with ASHRAE standards and code requirements.

E. Pipe Sleeves, Floor and Ceiling Plates

1. All pipes passing through floors or masonry walls shall be provided with machine-cut schedule 40 pipe steel sleeves. The sleeves shall be so sized to allow at least 1/4" clearance between the inside sleeve wall and the pipe or insulation surface. Sheet metal sleeves shall not be used in this work. Pipe sleeves are to extend 2" above finished floor and sealed. Pipe sleeves are to be full wall thickness and sealed.
2. Unused sleeves shall be plugged and finished to match adjoining surface.

F. Escutcheons

1. Fit all pipe passing through walls, floors or ceilings in finished rooms with steel or brass escutcheons. Where surface is to receive a paint finish, make escutcheons prime painted; otherwise, make escutcheons nickel or chrome plated. Where piping is insulated, fit escutcheons outside insulation.

G. Pipe Identification and Tags (New Piping Only)

1. Identify each pipe, valve and controls in equipment rooms, above accessible ceilings and in accessible shafts.
2. Color code identification bands or marker backgrounds to identify contents of pipe with initials and direction of flow located near each valve and fitting, on both sides of pipe passing through walls and on long runs at not over 20'-0" intervals.
3. At place where pipe is to have marking, covered pipe shall be properly primed with clear lacquer. After marking is applied, coat with lacquer. Apply marking adjacent to valves and equipment at major changes in directions, where pipes pass through walls or floors.
4. Each piece of equipment shall be identified by a number, together with a brief description of its purpose, e.g. "Air Handling Unit - East Lobby." Identification shall be embossed or engraved plastic or stamped brass strips firmly attached to the equipment or adjacent wall at the obvious location. The lettering for such strips shall be not less than 1/2" high.
5. All valves shall be provided with brass numbered tags attached to handle with a brass chain or ring. Wiring of tags will not be acceptable. At the completion of the work, a reproducible valve schedule shall be provided. Three (3) copies of this shall be mounted in metal, glass covered frames where requested by the architect. The schedule shall give a description of the line or equipment controlled; the normal position, emergency and/or shutdown position and location given either by description or diagram.
6. All controls, starters, switches, etc, shall be identified by embossed stencil or engraved plate as to purpose and/or equipment controlled. Control wiring shall be identified with program number and device it services.

H. Access Panels

1. Each contractor shall be responsible for providing all required access panels necessary for his work. This includes any access panels required for Plumbing. Each contractor shall also provide access panels for any existing conditions as required.
2. Refer to architectural drawings and specifications for type of access panel and coordinate locations prior to any work.
3. Piping and ductwork shall be supported independently of the mechanical equipment and shall be isolated as follows:
   a. All suspended piping in the mechanical equipment and air handling rooms shall be supported from the overhead structure by threaded rods incorporating resilient hangers. The resilient hangers shall contain steel springs and precompressed molded fiberglass inserts, designed for static deflections of between 1" and 1-3/4" under operating conditions.
   b. Suspended piping entering or leaving mechanical or air handling equipment outside the equipment rooms shall be supported for the first three hangers away from the equipment by threaded rods incorporating resilient hangers from the overhead structure. The resilient hangers shall contain steel springs and precompressed molded fiberglass inserts, designed for static deflections between 1" and 1-3/4" under operating conditions.
   c. Flexible connections shall be used between air handling equipment and ductwork.
   d. All ductwork within the mechanical equipment and air handling rooms shall be suspended with rod and rubber-in-shear hangers.

I. Expansion Joints

1. Expansion joints in piping for heating and domestic water system 2-1/2" and below shall be Flexicraft ML loop stainless steel for steel and copper pipe or Flexonics model H, stainless steel bellows, internal guides, anti-torque device for steel pipe and model HB, bronze bellows, internal guides, anti-torque device for copper pipe; end connections to match corresponding pipe construction.
2. Expansion joints in heating and domestic water systems 3" pipe size and above shall be flexonics corrugated bellows type with mated neck rings and control rings; allowable working pressure to be 300 PSIG at 850 degrees F. End connections to be flanged.
3. Pipe alignment guide to be steel spider (copper clad for copper pipe) housed in a steel sleeve with feet for attachment to structure.
4. Expansion loops shall be provided on all pipe runs over 100 ft in length. Size loop per manufacturer's recommendations or as scheduled.

Section 200500 (cont.)

J. Thermometers and Gauges

1. Pressure gauges shall be provided in pipe lines and at inlets and outlets to equipment as called for or specified. These shall be installed to indicate pressure changes across equipment only. This means that they must have connections installed as close as possible to equipment flanges. These shall be bourdon tube type with 3" minimum dial 1/4 male NPT connection, steel cages with pressure ranges suitable for indicating the normal operating pressure at the two-third point of the scale range. Ashcroft, 3M or Taylor. Connections shall be made with shut-off cock and surge snubber.
2. Thermometers shall be a red mercury in glass-type with adjustable angle feature, 7" minimum scale length with range and bulb length suitable for the application and insertion well. These shall be located where they sense a true temperature and where they can be easily read and be installed with heat transfer grease.

K. Miscellaneous Steel

1. Furnish and install all miscellaneous steel required for supports, hangers, anchors, guides, etc., required for installation of equipment and materials furnished and installed under this division.

L. Painting

1. This contractor shall perform all painting incidental to this work.
2. All painting shall be done with a brush or roller. Spray painting will be prohibited.
3. All finishing materials, thinners, etc., shall be the best quality, first line materials as manufactured by:
   a. E.I. Dupont De Nemours and Company
   b. Pratt and Lambert, Inc.
   c. The Glidden Company
   d. The Sherwin-Williams Company
   e. The Pittsburgh Plate Glass Company
4. All paint materials shall be delivered to the job in the manufacturer's original unopened and labeled containers, and they shall be used strictly in accordance with the manufacturer's directions.
5. This contractor shall submit a list of materials to the architect. The list shall state the branch names of the materials that the contractor intends to use. This list shall be secured from the paint manufacturer and shall be on his stationery.
6. The architect's approval must be secured before any painting work is started.

M. Clean-Up

1. Insofar as this contract is concerned, at all times keep premises and building in a neat and orderly condition: Follow explicitly any instructions of architect in regard to storing of materials, protective measures, cleaning-up of debris, etc.
2. Upon completion of work, this contractor shall thoroughly clean all apparatus furnished by him, pack all valves and thoroughly clean piping, fixtures and equipment removing all dirt, grease and oil.

N. Operating and Maintenance

1. This contractor shall furnish competent personal instruction to the owner's operating personnel for a period of two (2) days in the proper operation of the heating and air conditioning equipment. He shall also supply the owner with copies of an operation manual containing the following:
   a. Step-by-step procedures for start-up and shut-down for each system and piece of equipment.
   b. Performance data, curves, ratings.
   c. Wiring diagrams.
   d. Manufacturer's descriptive literature.
   e. Automatic controls with diagrams and written description of operation.
   f. Manufacturer's maintenance and service manuals.
   g. Plumbing fixtures.
   h. Spare parts and replacement parts list for each piece of equipment.
   i. Name of service agency and installer.
   j. Final approved shop drawings.

Section 200523 - Piping and Valves

A. General

1. Furnish all material, labor, equipment, and accessories as required to install complete plumbing piping systems as indicated on drawings and in these specifications.
2. Install in full accordance with local code requirements, see other specification section for additional requirements and install in accordance to manufacturer's recommendations and requirements.

B. Connections to Equipment Furnished by Others

1. Provide valved water connection for equipment furnished by other contractors or owner.
2. Include accessories required by code, drawings and manufacturer's installation instructions.
3. Fully coordinate with kitchen equipment suppliers and confirm all rough-in requirements prior to starting work.

C. Installation

1. All piping shall be installed parallel with or perpendicular to the building walls. All vertical risers shall be installed plumb and straight. All piping above accessible ceilings shall be installed as high as possible and at height to allow sufficient space for ceiling panel removal.
2. All piping shall be installed with pitch in the direction of flow of not less than 1" in forty feet, except as otherwise shown. It must be possible to drain every portion of the piping system.
3. Run lines as direct as possible and avoid unnecessary offsets. However, if offsets are required in order to obtain maximum headroom or to avoid conflict with other work, they shall be made as required or as requested by the architect without addition cost to the owner. The architect reserves the right to make minor changes in the location of piping and equipment during the roughing-in, without additional cost to the owner. All changes proposed by others shall be approved by the architect.
4. Lines shall be cut accurately to measurement at the site and worked into place without springing or forcing. Sufficient offsets, pipe loops or expansion joints between anchor points shall be provided as needed, whether or not shown, to limit stresses and control movement of lines subject to the thermal expansion.
5. Before any piping is installed, it shall be up-ended and pounded to remove any foreign matter present, and shall be swabbed, if necessary, for thorough cleaning. After installation and before final connections made, all piping system shall be flushed with a material that is not injurious to either pipe or equipment. (See also "Tests and Adjustments.")
6. Pipe to be threaded shall be cut square and full threaded with clean-cut tapered threads and shall be reamed after threading. Threaded connections shall be made with pipe thread compound applied to the wall threads only.
7. Unions or companion flanges shall be installed in all connections to equipment, automatic valves, etc., as necessary to permit removal of equipment and specialties for servicing, repairing or cleaning. It shall be possible to remove any piece of equipment by removing only one or two sections of piping.
8. Valves shall be provided in suitable locations at each item of equipment, branch circuit, riser, or section of piping as indicated or required for proper and safe operation of the system and to facilitate maintenance and/or removal of all equipment and apparatus. On horizontal pipe runs, install all valve stems vertically up where possible and in no case shall the stems be turned more than 90 degrees from the vertically up position.
9. Drain valves shall be provided at all low points, trapped section, and on the equipment side of all branch valves to permit draining of all parts of all liquid piping systems. Drain valves shall have threaded hose ends with cap and chain. Drain piping shall be provided from pump glands, relief valves, etc., to spill at the floor over floor drains or other acceptable discharge points. The drain line shall terminate with plain, unthreaded end with a minimum 2" air gap at floor drain.
10. Connections between copper piping and screwed ferrous equipment connections or screwed ferrous piping systems shall be made as follows:
    a. For stationary non-rotating, non-vibrating equipment connections: dielectric unions.
    b. For rotating or vibrating equipment connection: cast brass adapter and bronze flanges with dielectric separation of flanges and bolts.
    c. Connections between copper piping and ferrous equipment flanges or flanged ferrous piping systems shall be made using bronze companion flange with dielectric separation of flanges and bolts.
    d. Brass or bronze valves in ferrous piping will not require dielectric separation.
    e. Nipples between copper piping and equipment or fixture connection fittings shall be brass, not galvanized steel.
11. All pressure piping systems shall be installed to conform to the requirements of the local AHJ or state's pressure piping system code.
12. All excavations for installation of pipe shall be open trench work and shall be kept open until piping has been inspected, tested, and accepted.
13. Any piping resting on or coming in contact with building structure shall be insulated at that point to prevent telegraphing of sound.
14. Threaded joints shall conform to American Taper Pipe Thread ASA-B2.1-1960. All burrs shall be removed, pipe ends shall be reamed or filed to size of bore and all chips removed. Pipe cement shall be used only on male threads.
15. Unions shall have metal seats for drainage systems and metal to metal ground seats on water system.
16. Furnish and install valve in branches to fixture groups. Plumbing fixtures shall have wheel or screwdriver stops as specified.
17. All piping shall be rigidly supported and shall not be loose or shaky.

D. Sanitary, Waste and Vent Sewers

1. Install sewers, stacks, vents, drains, etc., as indicated on the drawings.
2. All drainage and vent piping shall be constructed and run as direct as possible, located so as to be accessible for inspection. The actual runs and locations of drains, soil waste, and leader piping shall be installed as to meet with the various conditions at the building and any work necessary to conceal pipes or clear pipes of other trades shall be done as directed by the architect.
3. Sewers to be pitched a minimum of 1/4" per foot for 3" sizes and under and 1/8" per foot for 4" sizes and larger or to slope as indicated on drawings. Kitchen sanitary waste shall be sloped 1/4" per foot for all pipe sizes.
4. All piping shall be correctly aligned before joints are made. All changes of direction in drainage and vent piping shall be made by means of "Y" branches and 1/6, 1/8 or 1/16 bends. No lines shall be run with unnecessary bends or offsets and where changes in direction are unavoidable; they shall be made by use of proper fittings. Single and double sanitary tees, 1/4 bends and 1/8 bends may be used in vertical sections when direction of flow is from horizontal to vertical. Changes in direction and branch connections shall be made with approved drainage fittings compatible with the piping system material in which it is installed.

Section 200523 (cont.)

5. Install cleanouts at base of each vertical waste stack, each change in a direction of piping greater than 45 degrees as shown on drawings. Provide cleanouts not over 50'- 0" on center along straight runs. Cleanouts shall be size of pipe to which it is installed up to 6" in diameter. Pipe over 6" in diameter shall have a 6" cleanout.
6. All fixtures and sanitary drains shall be vented as indicated on drawings and in accordance with Code. Vent pipes, where not vertical shall have continuous slope up to vent through roof.
7. Openings in pipes shall be properly plugged when work is not in progress.
8. Drain piping exposed to 140 degree temperature water shall be cast iron type piping and fittings for a minimum of 10'-0" from fixture.
9. Pipe Schedule:
   a. Above grade and vent material shall be as follows:
      1) No-hub cast iron pipe and fittings CISPI 1-301-78.
      2) PVC-DWV SCH. 40 solid core pipe, ASTM D-1785 with ASTM D-2665 DWV solvent weld socket fittings.
   b. Expansion Joints
      1) Ductile-Iron, flexible expansion joints; AWWA C110 or AWWA C153 with two gasketed ball-joint sections and one or more gasketed sleeve sections rated for 250 psig minimum.
      2) Ductile-Iron expansion joints; three-piece assembly of telescoping sleeve with gaskets and restrained-type, ball-and-spigot end sections; AWWA C110 or AWWA C153; rated for 250 psig minimum.
10. PVC piping shall not be installed unless permitted by Code and shall not be installed in return air plenums.

E. Domestic Water Piping

1. Install domestic water piping as indicated on drawings. Include all fittings, valves, hangers, and other accessories. Extend domestic water piping to all fixtures and equipment required for complete installation.
2. Include unions, or other disconnect means, stops or valves for isolation of fixtures and equipment. Valves to be fully compatible with piping for service intended as manufactured by Nibco, Crane or Milwaukee. Include hose or drain valves at low points where fixtures cannot be used for drainage.
3. Install shock absorbers at each quick closing fixture and where required to prevent water hammer as manufactured by J.R. Smith, Sioux Chief or Zurn. Absorbers shall be installed in vertical upright position.
4. Hangers on insulated pipe to be outside of insulation, sized accordingly with a sufficient saddle to protect insulation as manufactured by Grinnell or Michigan.
5. Pipe Schedule:
   a. Above grade (2" and less)
      1) Type "L" hard copper ASTM B 88-832 with wrought copper fittings ASTM B 16.22 1980 and non-lead or antimony solder joints, or copper tube, pressure-seal-joint with EPDM o-ring seal in each end.
6. Flush, vent and sanitize all water piping with chlorine as required per AWWA, local building department and health department codes.
7. Allow 1-1/4" per 100 feet of length for expansion in domestic hot water lines.
8. All piping in return air ceiling plenums or walls shall be plenum rated materials.

F. Condensate Drain Piping

1. Trap shall be installed near equipment if not integral with equipment. Install piping at a uniform slope of 1" in forty feet downward indirection to drain.
2. Pipe Schedule:
   a. Piping of all sizes shall be type L hard copper pipe with brass or copper fittings and soldered joint.

J. General Domestic Valves and Strainers

1. Ball valves 2" and smaller shall be 600# WOG, 150# SWP, two-piece, full port cast bronze or forged brass body, chrome plated brass ball, replaceable "Teflon" or "TFE" seats and seals, blowout-proof stem, vinyl-covered steel handle and have threaded ends. Valves shall be Hammond 8901, Milwaukee BA-125, Stockham S-207, Nibco T-585, or Apollo 77-100.
2. Gate valves 2" and smaller shall be 150# W.S.P., bronze, screwed pattern with rising stem, union bonnet, solid wedge disc. Valves shall conform to MSS SP-80. Valves shall be Crane 431-UB, Hammond IB-629, Lunkenheimer 3151, Jenkins 47-U, Stockham B-120, Milwaukee 1151, or Nibco T-135.
3. Globe valves 2" and smaller shall be 150# W.S.P., bronze, screwed pattern with rising stem, and union bonnet, and ANSI 420-S stainless steel tapered plug and seat. Valves shall conform to MSS SP-80. Valves shall be crane 14-1/2P, Hammond B-433, Jenkins 546-P, Stockham B-29, Milwaukee 591 A, or Nibco T-235.
4. Check valves 2" and smaller shall be 150# W.S.P. bronze, swing check, bronze seat, screwed pattern. Valves shall conform to MSS SP 80, type 4. Valves shall be Crane 141, Hammond IB-946, Milwaukee 510, Nibco T-43, Stockham B-331B, Lunkenheimer 230, or Jenkins 352.
5. Balance vales 2" and smaller shall be 125#, bronze body screwed pattern ball type circuit setter valves with memory stop, straight pattern with Schrader valve connection for differential pressure gauge. Valves to be Taco or Bell & Gossett.
6. Strainers 2" and smaller shall be 250#, cast iron body, screwed pattern with 20 mesh stainless steel or Monel screens, strainers to be Muessco No. 11, Armstrong, Crane, Sarco, or Hayward.
7. Air vents and drains for main water lines shall be bronze, screwed pattern, ball valves with a 3/4" male hose thread adaptor.
8. Air vents for main water lines shall be 200#, bronze, screwed pattern, non-rising stem angle valves with union bonnet and 3/4" Chicago standard hose thread valves to be Crane 117, Walworth 24, or Jenkins 112.
9. Air vent PET cocks (located inside unitary equipment) shall be 125# bronze "try-cock" similar to Crane 730.

Section 200593 - Testing, Adjusting, and Balancing

A. General

1. After installation, check all equipment and perform start up in accordance with the manufacturer's instructions.
2. All piping shall be tested and free of leaks as required by the local authority having jurisdiction.
3. Work that is scheduled to be concealed or insulated shall remain uncovered until required tests have been completed. If the construction schedule requires, arrange for tests on sections of the system at a time.
4. Instruct owner in operation of systems and submit operating and maintenance manual for all equipment and systems.
5. Work under this division of the specifications shall not be considered complete until the contractor has obtained required inspection, performance tests, made necessary adjustments and has submitted satisfactory evidence of the architect or his representative will make spot checks to determine the accuracy and completeness of final adjustments. Should spot checks indicate more than a reasonable deviation from design requirements, the contractor shall repeat tests and adjustments to the satisfaction of the engineer.
6. Test results shall be submitted to the architect/engineer.

B. Balancing, Start Up and Instructions

1. Start up and place all systems in operation and tag all switches and controls with permanent labels.
2. Train and instruct owner on proper operation and preventative maintenance of system.

C. Piping: Testing to be done by the contractor.

1. All piping shall be given the following pressure test without appreciable pressure drop: Contractor shall use recording line charts to record all pressure testing outcomes.

SERVICE	TEST MEDIUM	MIN. PRESSURE	TIME (HOURS)
Cold Water	Water	125 psi	24
Hot Water	Water	125 psi	24
Re-circulated Hot Water	Water	125 psi	24
Sanitary Sewer	As per State Plumbing Code or Local Authority		

*A minimum notice of 48 hours shall be given the architect prior to purging of any gas lines. Purging shall be to the outside of building at a safe location.

2. During the testing period, this contractor shall maintain on the job a competent individual thoroughly familiar with all phases of plumbing for as long as may be required to thoroughly adjust all of the systems and to demonstrate to the architect that they are functioning properly.
3. All hydrostatic and/or air tests shall be made before piping is concealed or covered. This contractor shall be responsible for completely draining the systems after hydrostatic tests are performed. Any damage from freezing prior to acceptance of the completed installation shall be repaired at the sole expense of this contractor.
4. All materials and installations under the plumbing system shall be inspected by the inspector to ensure compliance with requirements of the Plumbing Code.
5. This contractor shall notify the plumbing inspector whenever work is ready for test and inspection.
6. When work for the plumbing permit is issued and completed, this contractor shall request final inspection. Such request shall be made before the building is occupied or used but not more than 30 days after completion of the work.
7. Before approving the plumbing system, the plumbing inspector may require that the system in whole or part be tested to prove sufficiency. All equipment, material, power and labor necessary for inspections and test shall be supplied by the plumbing contractor.

Section 200523 (cont.)

8. All piping of plumbing system shall be tested with water or air per testing schedule.
   a. Drainage system water test: provide fitting at property line or termination point for purpose of test plug. Water test shall be applied to entire system or by section. When tested in sections, at least the lower 20 feet of the next section above shall be retested so that every section tested shall have at least a 20-foot head test. Hold without pressure loss for 15 minutes.
   b. Drainage system air test - attach air apparatus to suitable opening, close all other inlets and outlets, and then force air into the system until there is uniform pressure, sufficient to balance a column of mercury 10" in height or 5 pounds gauge pressure on the entire system. Hold without pressure loss for 15 minutes.
   c. No part of system shall be covered before inspection is made and approved. If covered before test, contractor shall pay for cost of uncovering so test can be made and accepted.
   d. Defective work or materials shall be replaced and inspection and tests repeated within three days.
11. Certificates of approval of satisfactory completion and final inspection shall be obtained by the plumbing contractor. One copy of each approval shall be given to the architect.
12. Damages which result from breakage or faulty installation shall be the responsibility of the plumbing contractor.
13. After the system has been in service for a two-week period and again before the system is turned over to the owner, all dirt pockets, traps, and strainers shall be cleaned, removed, and reinstalled.

Section 200700 - Insulation

A. General

1. Furnish all material, labor and equipment as required to install complete plumbing insulation as indicated on plumbing drawings and in these specifications.
2. Install in full accordance with manufacturer's recommendations.

B. Scope: This contractor shall furnish and install all insulation necessary to the project and in accordance with the following requirements. All insulation and accessories used in an air plenum space, regardless of physical location, shall have a composite (insulation, jacket, and adhesive) fire and smoke hazard rating as tested under procedure ASTM E-84, NFPA 255 and UL 723, not exceeding a flame spread 25 and smoke developed 50. All other areas shall have insulating materials and accessories on pipes and vessels rated at a flame spread 25 and smoke developed 150 as tested by the same procedure.

C. Workmanship:

1. All insulation shall be installed over clean, dry surfaces. Insulation must be dry and in good condition. Wet or damaged insulation will not be acceptable. No insulation shall be applied prior to pressure test completion of the respective piping and/or duct system.
2. All pipe insulation shall be installed with joints butted firmly together. All valves and fittings shall be insulated using mitered sections of insulation equal in density and thickness to the adjoining insulation, or with an insulation cement equal in thickness to the adjoining insulation or pre-molded insulated fittings. The insulation applied to the valves and fittings shall be covered with the same type of covering as used on the pipe insulation. No staples.
3. All insulation ends shall be tapered and sealed regardless of services.
4. All insulated, exposed piping 8'-0" and below to the finished floor shall include a 0.020" thick vinyl jacket. This jacket is in addition to the normal finish for the respective service.
5. Repair all damaged sections of the existing piping insulation damaged during this construction period. Use insulation of same thickness as existing insulation. Install new jacket lapping and seal over existing.
6. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

D. Plumbing Insulation (as manufactured by Owens Corning, Knauf or Schuller)

1. Insulate all above-grade hot water, hot water return and cold water piping with 1" thick molded fiberglass having an all service jacket.
2. Insulate all above-grade, horizontal condensate floor drains and waste lines with 1" thick molded fiberglass having an all service jacket.
3. Include insulation of fittings and valves. Keep vapor barriers intact. Apply per manufacturer's recommendations.

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thendesign architecture

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no.	description	date

Sheet Revisions

10		
09		
08		
07		
06		
05		
04		
03		
02		
01	Issue for Bidding	08.05.2022
no.	description	date

Project Issues

sheet name:
MECHANICAL SPECIFICATIONS

drawn by: TBA
checked by: TBA
sheet number: P-3
job number: 2022-0221

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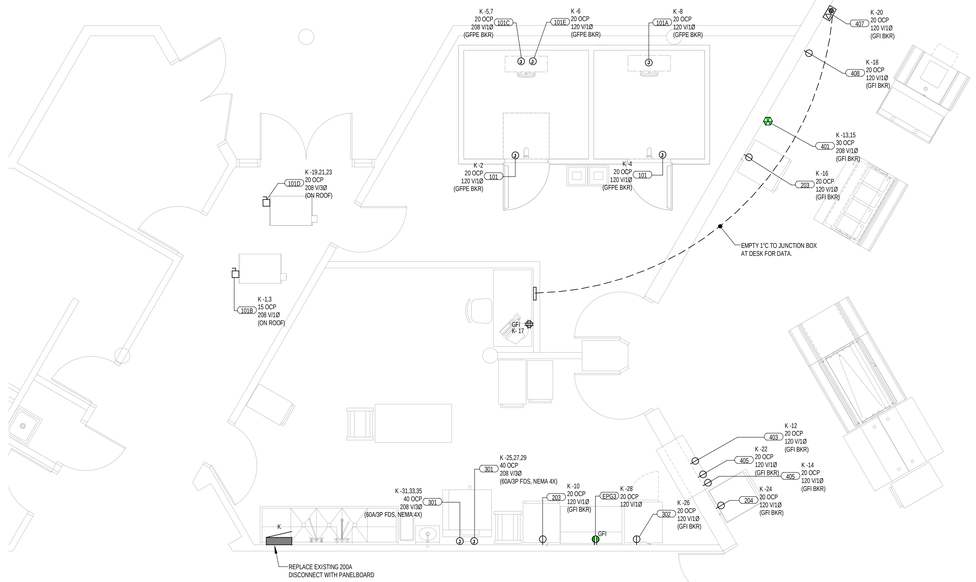

ELECTRICAL PLAN

1/4" = 1'-0"

NOTE:
ALL RECEPTACLES ON THIS DRAWING SHALL BE GFCI PROTECTED PER N.E.C. 210.8(B).

PANELBOARD DESIGNATION: K

LOCATION:
SUPPLY FROM:
MOUNTING:
SPECIAL REQUIREMENTS:

VOLTS: 120/208 Wye
PHASES: 3
WIRES: 4

A.I.C. RATING: 10K
MAINS TYPE: MCB
MAINS RATING: 200
BUS RATING: 200

NOTE	CKT	DESCRIPTION	-A	-P	A		B		C		-P	-A	DESCRIPTION	CKT	NOTE
	1	COOLER COMPRESSOR	20	2	0.6	1.0					1	20	WALK-IN COOLER/FREEZER	2	GFE
--	3	--	--	--			0.6	1.0			1	20	WALK-IN COOLER/FREEZER	4	GFE
	5	WALK-IN FREEZER COIL	20	2					1.0	0.6	1	20	FREEZER COIL HEAT TAPE	6	GFE
--	7	--	--	--	1.0	0.6					1	20	WALK-IN COOLER COIL	8	GFE
	9	SPARE	30	2			0.0	1.4			1	20	HOT FOOD CABINET	10	GFI
--	11	--	--	--					0.0	0.9	1	20	COLD FOOD TABLE	12	GFI
GFI	13	HOT FOOD TABLE	30	2	1.8	0.4					1	20	MILK COOLER	14	GFI
--	15	--	--	--			1.8	1.4			1	20	HOT FOOD CABINET	16	GFI
	17	REC - OFFICE	20	1					0.4	1.2	1	20	LOW PROFILE AIR CURTAIN	18	GFI
	19	FREEZER COMPRESSOR	30	3	1.4	1.2					1	20	CASH REGISTER/POS - BY OWNER	20	GFI
--	21	--	--	--			1.4	0.4			1	20	MILK COOLER	22	GFI
--	23	--	--	--					1.4	1.8	1	20	COLD FOOD CABINET	24	GFI
	25	CONVECTION OVEN	60	3	3.7	0.6					1	20	REFRIGERATOR	26	GFI
--	27	--	--	--			3.7	0.2			1	20	GENERAL PURPOSE DUPLEX	28	
--	29	--	--	--					3.7	0.0	1	20	SPARE	30	
	31	CONVECTION OVEN	60	3	3.7	0.0					1	20	SPARE	32	
--	33	--	--	--			3.7	0.0			1	20	SPARE	34	
--	35	--	--	--					3.7	0.0	1	20	SPARE	36	
	37	SPARE	20	1	0.0	0.0					1	20	SPARE	38	
	39	SPARE	20	1			0.0	0.0			1	20	SPARE	40	
	41	SPARE	20	1					0.0	0.0	1	20	SPARE	42	
	43	SPARE	20	1	0.0	0.0					1	20	SPARE	44	
	45	SPARE	20	1			0.0	0.0			1	20	SPARE	46	
	47	SPARE	20	1					0.0	0.0	1	20	SPARE	48	
	49	SPARE	20	1	0.0	0.0					1	20	SPARE	50	
GFI	51	SPARE	20	1			0.0	0.0			1	20	SPARE	52	GFI
GFI	53	SPARE	20	1					0.0	0.0	1	20	SPARE	54	GFI
GFI	55	SPARE	20	1	0.0	0.0					1	20	SPARE	56	GFI
GFI	57	SPARE	20	1			0.0	0.0			1	20	SPARE	58	GFI
GFI	59	SPARE	20	1					0.0	0.0	1	20	SPARE	60	GFI
		KVA SUB TOTALS			15.9		15.6		14.8				KVA TOTAL	46.3	
		AMPS SUB TOTALS			133.7		130.8		123.3				AMP TOTAL	128.5	

PANELBOARD SCHEDULE CIRCUIT BREAKER NOTES

- ALL BREAKERS SHALL BE "HACR" RATED.
- NOT ALL NOTES MAY APPLY TO THIS PROJECT.

GFI - 5mA "GFI" TYPE FOR PERSONNEL PROTECTION
GFE - 30mA "GFI" TYPE FOR EQUIPMENT PROTECTION
AF - "ARC-FAULT" TYPE
AFG - COMBINATION "ARC-FAULT / 5mA GFI" TYPE
ST - SHUNT-TRIP TYPE
ET - ELECTRONIC TRIP TYPE
L - BREAKER TO HAVE LOCK-ON CLIP
L/R - BREAKER TO HAVE LOCK-ON CLIP AND RED MARKING
HT - FURNISH AND INSTALL HANDLE TIES FOR MULTIPLEX CIRCUITS
EB - EXISTING BREAKER WITH NEW CIRCUIT. EXISTING BREAKER ASSUMED TO BE SPARE OR EXISTING CIRCUIT ASSUMED DEMOLISHED DURING SCOPE OF THIS PROJECT. FIELD VERIFY.
NB - FURNISH AND INSTALL NEW BREAKER. BREAKER SHALL MATCH EXISTING PANELBOARD MANUFACTURER, TYPE AND AIC RATING.
ETR - EXISTING CIRCUIT TO REMAIN. LOAD SHOWN BASED UPON EXISTING DRAWINGS OR 80% OF FULLY LOADED BREAKER AMPACITY.

WHERE ROOM NAME/NUMBER IS INDICATED FOR CIRCUIT DESCRIPTION, CONTRACTOR IS RESPONSIBLE FOR COORDINATING EXACT NAME/NUMBER WITH ARCHITECTURAL PLANS PRIOR TO INSTALLING CIRCUIT DIRECTORY.

KITCHEN EQUIPMENT SCHEDULE - KITCHEN

ITEM #	DESCRIPTION	VOLTAGE	PHASE	LOAD (kW)	HP	AMPS (A)	OCP	CIRCUIT	FEEDER	CONNECTION	ADDITIONAL INFORMATION/ REQUIREMENTS	MOUNTING HEIGHT	REMARKS
101	WALK-IN COOLER/FREEZER	120 V	1	1.0 kW		8.0 A	20 A	K-4	(2) #12 & (1) #12 GND 3/4"C.	DIRECT	GFPE BKR	48"	WIRE TO JB FOR LIGHTS, DOOR HEATER
101	WALK-IN COOLER/FREEZER	120 V	1	1.0 kW		8.0 A	20 A	K-2	(2) #12 & (1) #12 GND 3/4"C.	DIRECT	GFPE BKR	48"	WIRE TO JB FOR LIGHTS, DOOR HEATER
101A	WALK-IN COOLER COIL	120 V	1	0.6 kW		5.0 A	20 A	K-8	(2) #12 & (1) #12 GND 3/4"C.	DIRECT	GFPE BKR	96"	WIRING FROM COIL TO TIME CLOCK
101B	COOLER COMPRESSOR	208 V	1	1.2 kW		5.7 A	15 A	K-1,3	(2) #12 & (1) #12 GND 3/4"C.	30A/3P, WP, FDS	ON ROOF	48"	REMOTE, ROOF MOUNTED COMPRESSOR UNIT FOR WALK-IN COOLER/FREEZER. TRADES TO VERIFY EXACT LOCATION.
101C	WALK-IN FREEZER COIL	208 V	1	2.0 kW		9.8 A	20 A	K-5,7	(2) #12 & (1) #12 GND 3/4"C.	DIRECT	GFPE BKR	96"	WIRING FROM COIL TO TIME CLOCK
101D	FREEZER COMPRESSOR	208 V	3	4.2 kW		11.6 A	20 A	K-19,21,23	(3) #10 & (1) #10 GND 3/4"C.	30A/3P, WP, FDS	ON ROOF	48"	REMOTE, ROOF MOUNTED COMPRESSOR UNIT FOR WALK-IN COOLER/FREEZER. TRADES TO VERIFY EXACT LOCATION.
101E	FREEZER COIL HEAT TAPE	120 V	1	0.6 kW		5.0 A	20 A	K-6	(2) #12 & (1) #12 GND 3/4"C.	DIRECT	GFPE BKR	96"	
203	HOT FOOD CABINET	120 V	1	1.4 kW		12.0 A	20 A	K-10	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	72"	
203	HOT FOOD CABINET	120 V	1	1.4 kW		12.0 A	20 A	K-16	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	72"	
204	COLD FOOD CABINET	120 V	1	1.8 kW		15.0 A	20 A	K-24	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	72"	
301	CONVECTION OVEN - DOUBLE DECK	208 V	3	11.2 kW		31.0 A	40 A	K-25,27,29	(3) #6 & (1) #10 GND 1"C.	DIRECT	60A/3P FDS, NEMA 4X	24"	
301	CONVECTION OVEN - DOUBLE DECK	208 V	3	11.2 kW		31.0 A	40 A	K-31,33,35	(3) #6 & (1) #10 GND 1"C.	DIRECT	60A/3P FDS, NEMA 4X	24"	
302	REFRIGERATOR	120 V	1	0.6 kW		4.9 A	20 A	K-26	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	90"	
401	HOT FOOD TABLE	208 V	1	3.5 kW		17.0 A	30 A	K-13,15	(2) #10 & (1) #10 GND 3/4"C.	6-30P	GFI BKR	16"	
403	COLD FOOD TABLE	120 V	1	0.9 kW		7.8 A	20 A	K-12	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	16"	
405	MILK COOLER	120 V	1	0.4 kW		3.0 A	20 A	K-22	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	16"	
405	MILK COOLER	120 V	1	0.4 kW		3.0 A	20 A	K-14	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	16"	
407	CASH REGISTER/POS - BY OWNER	120 V	1	1.2 kW		10.0 A	20 A	K-20	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR		INTERWIRE TO OFFICE/CPU - VIF
408	LOW PROFILE AIR CURTAIN	120 V	1	1.2 kW		10.4 A	20 A	K-18	(2) #12 & (1) #12 GND 3/4"C.	C&P	GFI BKR	16"	
EPG3	GENERAL PURPOSE DUPLEX	120 V	1	0.2 kW		1.5 A	20 A	K-28	(2) #12 & (1) #12 GND 3/4"C.	C&P		48"	

CONNECTION TYPES:
DIRECT - DIRECT CONNECTION TO UNIT DISCONNECT SWITCH
MS - MOTOR STARTER WITH THERMAL OVERLOAD PROTECTION - TYPE AND RATING PER EQUIPMENT BEING SERVED.
DS - DISCONNECT SWITCH - TYPE AND RATING PER EQUIPMENT BEING SERVED.
FDS - FUSIBLE DISCONNECT SWITCH - TYPE, RATING, AND FUSES PER EQUIPMENT BEING SERVED.
WP - WEATHERPROOF TYPE

NOTE:
FOR ALL DIRECT CONNECTED EQUIPMENT, E.C. TO FURNISH WIRING WHIPS LONG ENOUGH TO PERMIT EQUIPMENT TO BE MOVED OUT FOR SERVICE/CLEANING WITHOUT REQUIRING EQUIPMENT TO BE DISCONNECTED.

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no.	description	date

Sheet Revisions

no.	description	date
01	Issue For Bidding	8-5-22

Project Issues

sheet name:
ELECTRICAL PLAN AND DETAILS

drawn by:
TBA
checked by:
TBA
sheet number:
E-1
job number:
Project Number

TECHNOLOGY ROUGH-IN/ COORDINATION NOTES

1. E.C. TO PROVIDE TECHNOLOGY GROUNDING SYSTEM INCLUDING, BUT NOT LIMITED TO, GROUND CONDUCTORS, COPPER BUS BARS AND ALL ASSOCIATED HARDWARE REQUIRED FOR A COMPLETE GROUNDING SYSTEM.
2. E.C. TO PROVIDE BONDING OF ENTIRE CABLE TRAY & LADDER RACK SYSTEMS TO THE BUILDING ELECTRICAL GROUNDING SYSTEM, INCLUDING BUT NOT LIMITED TO, BONDING JUMPERS BETWEEN CABLE TRAY & LADDER RACKSECTIONS NECESSARY TO PROVIDE ELECTRICAL CONTINUITY.
3. E.C. TO PROVIDE BONDING OF ALL TECHNOLOGY RACKS & EQUIPMENT INCLUDING, BUT NOT LIMITED TO, BONDING JUMPERS AND ASSOCIATED HARDWARE.
4. E.C. TO FURNISH AND INSTALL CABLE TRAY, LADDER RACK AND J-HOOK SYSTEM THROUGH-OUT PROJECT AREA FOR TECHNOLOGY SYSTEMS.
5. E.C. TO PROVIDE SLEEVES AND CONDUIT PATHWAYS. WHETHER OR NOT INDICATED ON THE DOCUMENTS, CONDUIT SLEEVES MUST BE PROVIDED FOR EACH ROOM CONTAINING TECHNOLOGY DEVICES OR OUTLETS. THE SLEEVES SHALL EXTEND FROM THE ROOM SERVED TO THE CABLE TRAY, SLEEVES CROSSING HARD INACCESSIBLE CEILINGS OR ABOVE THE CORRIDOR ACCESSIBLE CEILING SPACE. COORDINATE SLEEVE REQUIREMENT AND LOCATIONS WITH TECHNOLOGY CONTRACTOR(S) PRIOR TO ROUGH-IN.
6. E.C. SHALL PROVIDE COMPLETE CONDUIT PATHWAY SYSTEM FROM BUILDING DMARK TO SERVER ROOM, AND FLOOR TO FLOOR PATHWAYS.
7. PATHWAY SYSTEM SHALL INCLUDE, BUT NOT BE LIMITED TO, CONDUIT, PULL BOXES, J-BOXES, OUTLET BOXES, PLASTER RINGS, BUSHINGS, PULL WIRES, ETC.
8. E.C. SHALL PROVIDE FIRE-RATED PLYWOOD BACKBOARDS FOR TECHNOLOGY USE.
9. E.C. SHALL PROVIDE BLANK FACEPLATES FOR TECHNOLOGY OUTLETS IDENTIFIED AS "FUTURE USE", "ROUGH-IN ONLY", OR SIMILAR NOTATION.
10. E.C. SHALL PROVIDE FLOOR BOXES AND ASSOCIATED FLOOR BOX MOUNTING HARDWARE FOR TECHNOLOGY DEVICES. COORDINATE TECHNOLOGY DEVICE QUANTITIES AND CONFIGURATIONS WITH TECHNOLOGY CONTRACTORS PRIOR TO ORDERING MATERIALS.
11. ALL CORING FOR INSTALLATION OF TECHNOLOGY PATHWAYS AND FLOOR BOXES TO BE COMPLETED BY E.C.
12. ALL POWER DEVICES, AND ASSOCIATED BRANCH CIRCUITS SERVING TECHNOLOGY EQUIPMENT SHALL BE PROVIDED BY E.C.
13. REFERENCE TECHNOLOGY DRAWINGS AND SPECIFICATIONS FOR INSTALLATION AND ROUGH-IN REQUIREMENTS OF SYSTEMS. THE TECHNOLOGY DRAWINGS AND SPECIFICATIONS SHALL BE CONSIDERED PART OF THE ELECTRICAL CONSTRUCTION DOCUMENTS.

KITCHEN ELECTRICAL NOTES

1. ALL COVERPLATES AND DISCONNECT SWITCHES IN KITCHEN AREA SHALL BE STAINLESS STEEL.
2. ALL ELECTRICAL WORK FOR FOOD SERVICE EQUIPMENT SHALL BE COMPLETELY INTERWIRED BY ELECTRICAL CONTRACTOR. FINAL CONNECTIONS TO EQUIPMENT JUNCTION BOX OR PULL BOX, AND ALL ELECTRICAL WORK FROM PANEL BOARDS, TO BE BY THE ELECTRICAL CONTRACTOR.
3. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL ROUGH-IN AND FINAL CONNECTION TO THE FOOD SERVICE EQUIPMENT. ALL WORK TO BE IN COMPLIANCE WITH ALL NATIONAL, STATE AND LOCAL CODES APPLICABLE.
4. VERIFY OUTLET RATING AND CONFIGURATION WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.
5. VERIFY EXACT LOCATION AND MOUNTING HEIGHTS OF ALL OUTLETS WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.
6. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL ALL PLUGS AND CORDS REQUIRED. ALL CORDS SHALL BE NEMA RATED AND UL APPROVED FOR MANUFACTURER AND EQUIPMENT.
7. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL ALL JUNCTION BOXES, PVC OR METAL CONDUIT, CONVENIENCE OUTLETS WITH COVERS, SWITCHES CONNECTORS, CONTROLS, AND OTHER ACCESSORIES THAT ARE NOT AN INTEGRAL PART OF THE FOOD SERVICE EQUIPMENT AS REQUIRED TO MAKE FINAL CONNECTIONS TO THE FOOD SERVICE EQUIPMENT FOR A COMPLETE AND FUNCTIONAL OPERATION MEETING ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AND ORDINANCES.
8. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL ALL DISCONNECTS OR CIRCUIT BREAKERS AS REQUIRED BY CODES FOR EACH CONNECTION. COORDINATE LOCATION WITH THE KITCHEN EQUIPMENT CONTRACTOR.
9. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL WALL SWITCH FOR FACTORY INSTALLED LIGHTING FIXTURES IN EXHAUST VENTILATOR HOODS PER APPLICABLE STATE AND LOCAL CODES APPLICABLE. ELECTRICAL CONTRACTOR SHALL PROVIDE WIRE AND CONNECTION TO EACH LIGHT FIXTURE. THE ELECTRICAL CONTRACTOR SHALL FULLY CONCEAL ALL WIRING BETWEEN POWER SOURCE, WALL SWITCH, AND JUNCTION BOX ON HOOD. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY INNER WIRING OF LIGHT FIXTURES BETWEEN VENTILATOR HOOD SECTIONS AS REQUIRED. ALL WIRING WITHIN HOOD AND POWER SOURCE TO BE IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, NFPA #96 AND ALL OTHER APPLICABLE CODES.
10. IN ACCORDANCE WITH NFPA #96 AND MANUFACTURER'S RECOMMENDATIONS, THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON STATION WITH PILOT LIGHT FOR VENTILATOR FAN MOTOR(S). THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR, AND TO PROVIDE ALL REQUIRED WIRING FROM POWER SUPPLY THROUGH FAN SWITCH TO FAN MOTOR(S) AND PROVIDE MAGNETIC STARTERS AND FULLY INTERWIRE SYSTEM WITH ALL POWER INTERRUPTION DEVICE(S) BUILT INTO HOOD AND FIRE PROTECTION SYSTEM AS REQUIRED BY NFPA #96, NATIONAL, STATE AND/OR LOCAL CODES APPLICABLE. ELECTRICAL CONTRACTOR TO PROVIDE LOCK-OUT DEVICES ON CONTROL BOXES FOR EXHAUST HOOD FANS, SYSTEM AND FIRE PROTECTION SYSTEM.
11. ELECTRICAL CONTRACTOR TO PROVIDE, INSTALL AND FULLY WIRE SHUNT-TRIP BREAKERS FOR SHUT DOWN OF FUEL AND POWER TO COOKING EQUIPMENT AS REQUIRED BY NFPA #96 AND ALL OTHER NATIONAL, STATE, OR LOCAL CODES APPLICABLE. THE HOLDING COILS FOR SHUNT-TRIP BREAKERS SHALL BE WIRED TO A 120 VOLT/SINGLE PHASE CONTROL CIRCUIT BY THE ELECTRICAL CONTRACTOR AND EXTENDED THROUGH A CONTACTOR AND MAINTAINED BY A PRESSURE SWITCH LOCATED AT THE MOUNTING BRACKET OF THE CHEMICAL CYLINDER FOR HOOD PROTECTION. THE ELECTRICAL CONTRACTOR SHALL ALSO PROVIDE, INSTALL, AND FULLY INTERWIRE WITH POWER SHUTDOWN RELAY SWITCH, AND ADDITIONAL RELAY OR SWITCHES REQUIRED TO INTERFACE FIRE PROTECTION SYSTEM WITH FAN VENTILATOR MOTORS AND BUILDING ALARM SYSTEMS AS REQUIRED BY NFPA #96, NATIONAL, STATE, AND LOCAL CODES APPLICABLE. COORDINATE WITH FIRE SUPPRESSION CONTRACTOR FOR LOCATION OF FIRE SUPPRESSION SYSTEM, AND GAS SHUT-OFF VALVE AS PART OF THE COMPLETE SYSTEM AS APPLICABLE.
12. AT THE REMOTE FIRE CABLE PULL. ELECTRICAL TRADES TO PROVIDE EMPTY JUNCTION BOX AT 54" AFF AND CONDUIT CONCEALED IN WALL TO 6" ABOVE FINISHED CEILING. COORDINATE EXACT REQUIREMENTS WITH FOOD SERVICE EQUIPMENT TRADE AND FIRE SUPPRESSION CONTRACTOR.
13. ELECTRICAL CONTRACTOR SHALL INTERWIRE DISPOSER CONTROL SWITCH AND TO TIME DELAY/RELAY, MAGNETIC STARTER, DISPOSER MOTOR, AND SOLENOID VALVE WITH WATER TIGHT CONDUIT AS REQUIRED PER LOCAL CODES.
14. ELECTRICAL CONTRACTOR SHALL INTERWIRE THROUGH TIME CLOCK FOR LOW TEMPERATURE COMPRESSOR AND WALK-IN COMPARTMENT BLOWER COIL FAN MOTORS AND DEFROST ELEMENT POWER SOURCE AS PART OF MAIN POWER SOURCE. PROVIDE ALL WIRING AND CONDUIT WITH DISCONNECT (VERIFY REQUIREMENTS WITH EQUIPMENT SUPPLIER).
15. ELECTRICAL CONTRACTOR SHALL PROVIDE FINAL CONNECTION TO A JUNCTION BOX MOUNTED ON TOP OF A PREFABRICATED REFRIGERATOR AND/OR FREEZER WALL AT APPROXIMATELY 8'-6" AFF. INTERWIRE THE LIGHT ADJACENT TO THE DOOR WITH THE FACTORY MOUNTED LIGHT SWITCH. ALL CONDUIT SHALL BE RUN EXPOSED ON TOP OF WALK-IN, NO EXPOSED CONDUIT WILL BE ALLOWED ON INSIDE OF WALK-IN. ELECTRICAL SERVICE REQUIRED FOR WALK-IN SHALL BE AS SHOWN FOR LIGHTS, DOOR AND DOOR FRAME HEATER, THRESHOLD PLATE HEATERS (WHERE SPECIFIED), HEATED PRESSURE RELIEF PORT (ON FREEZERS) AND ALARM SYSTEMS, WHERE SPECIFIED (VERIFY REQUIREMENTS WITH EQUIPMENT SUPPLIER).
16. ELECTRICAL CONTRACTOR TO PROVIDE THE REQUIRED POWER SUPPLY AND FINAL CONNECTIONS TO THE TERMINAL BLOCK AT THE CONDENSING UNIT AND TO FULLY INTERWIRE TO ANY ADDITIONAL COMPONENTS, INCLUDE THE PROPER SIZE DISCONNECTS OR CIRCUIT BREAKERS. ALL WIRING FOR LOW AND MEDIUM TEMPERATURE CONDENSING UNIT TO BE ROUTED THROUGH DEFROST TIME CLOCK AND THEN WIRED TO EVAPORATOR COIL FOR PROPER POWER SUPPLY WITH THE REQUIRED QUANTITY OF WIRES. THE EVAPORATOR COIL DEFROST HEATER AND FAN MOTOR VOLTAGES AND LOADS ARE AS NOTED ON PLAN. VERIFY LOCATION OF COMPRESSORS AND COORDINATE WITH REFRIGERATION CONTRACTOR FOR FINAL CONNECTIONS (VERIFY REQUIREMENTS WITH EQUIPMENT SUPPLIER).
17. ALL RECEPTACLES IN KITCHEN AREAS SHALL HAVE GROUND FAULT CIRCUIT INTERRUPTER PROTECTION FOR PERSONNEL INSTALLED IN READILY ACCESSIBLE LOCATION PER N.E.C. 210-8.

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION
☐☐☐	SWITCHBOARD FLOOR MOUNTED ON 4" HIGH CONCRETE HOUSING KEEPING PAD. SEE SPECIFICATIONS, PANEL SCHEDULES AND ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
▨	DISTRIBUTION PANEL MOUNTED 6'-6" TO TOP. SEE SPECIFICATIONS, PANEL SCHEDULES AND ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
▬	PANELBOARD RECESSED MOUNTED 6'-6" TO TOP. SEE PANEL SPECIFICATIONS, PANEL SCHEDULES AND ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
▬	PANELBOARD SURFACE MOUNTED 6'-6" TO TOP. SEE SPECIFICATIONS, PANEL SCHEDULES AND ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
⊠	DRY TYPE TRANSFORMER. SEE SPECIFICATIONS AND ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
⌒╫⌒	CONDUIT WITH WIRING RUN CONCEALED IN OR ABOVE CEILING OR WALL, OR RUN EXPOSED IN UNFINISHED AREAS. CROSS HATCHING INDICATES NUMBER OF CONDUCTORS (#12 AWG - MINIMUM). PROVIDE A CODE-SIZED GROUND WIRE IN ALL CONDUITS IN ADDITION TO THE CONDUCTORS SHOWN.
- -╫- -	CONDUIT WITH WIRING RUN CONCEALED BELOW FLOOR. CROSS HATCHING INDICATES NUMBER OF CONDUCTORS (#12 AWG - MINUMUM). PROVIDE A CODE-SIZED GROUND WIRE IN ALL CONDUITS IN ADDITION TO THE CONDUCTORS SHOWN.
Φ	20A - 125V GROUNDING TYPE SIMPLEX RECEPTACLE MOUNTED 18" AFF TO TOP OF BOX, UNLESS NOTED OTHERWISE
⏀	20A - 125V GROUNDING TYPE DUPLEX RECEPTACLE MOUNTED 18" AFF TO TOP OF BOX, UNLESS NOTED OTHERWISE
⊕	20A - 125V GROUNDING TYPE QUADRAPLEX RECEPTACLE MOUNTED 18" AFF TO TOP OF BOX, UNLESS NOTED OTHERWISE
●	20A - 125V GROUNDING TYPE DUPLEX RECEPTACLE MOUNTED 6" ABOVE TOP OF COUNTER/BACKSPLASH TO TOP OF BOX, UNLESS NOTED OTHERWISE. COORDINATE LOCATION WITH INTERIOR ELEVATIONS INDICATED ON ARCHITECTURAL PLANS.
☢	SPECIAL PURPOSE RECEPTACLE - RATING AND NEMA CONFIGURATION AS REQUIRED FOR EQUIPMENT BEING PROVIDED. MOUNT 18" AFF, UNLESS OTHERWISE NOTED.
	RECEPTACLE TYPE DESIGNATIONS: C -RECESSED MOUNTED FLUSH IN FINISHED CEILING, RECEPTACLE AND FACEPLATE FINISH TO MATCH FINISH OF CEILING GFI -GROUND FAULT INTERRUPTING TYPE EM -POWERED FROM EMERGENCY/ STAND-BY DISTRIBUTION SYSTEM. DEVICE FINISH SHALL BE RED, UNLESS NOTED OTHERWISE H -MOUNTED HORIZONTAL T -TAMPER RESISTANT LISTED WP -WEATHER RESISTANT LISTED WITH DIE-CAST ALUMINUM "WHILE IN-USE COVER" WR -WEATHER RESISTANT LISTED USB -WITH (2) USB CHARGING PORTS
Ⓙ	J-BOX - TYPE AND SIZE AS REQUIRED BY NEC
☐	DISCONNECT SWITCH - TYPE AND RATING AS INDICATED ON PLANS
⁚	START/STOP SWITCH ASSEMBLY MOUNTED AT 48" AFF TO TOP OF BOX. TYPE AND RATINGS PER LOAD BEING SERVED. MAKE CONNECTIONS TO EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
⏀	FURNISH AND INSTALL A COMPLETE FLOOR BOX SYSTEM WHICH INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING: SINGLE GANG, CAST IRON, FULLY ADJUSTABLE FLOOR BOX RECESSED IN CONCRETE FLOOR SLAB WITH (1) 20A DUPLEX RECEPTACLE, FLUSH ALUMINUM FINISHED CARPET FLANGE AND COVER. FOR TILE FLOOR INSTALLATION, PROVIDE APPROPRIATE FLANGE SO THAT TOP COVER OF FLOOR BOX IS FLUSH WITH TILE. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION. FLOOR BOX IS CAPABLE OF ACCEPTING (4) 1" CONDUITS. FURNISH AND INSTALL SYSTEM PER MANUFACTURER'S INSTRUCTIONS. WIREMOLD #880CS1-1, #818TCAL, #828R-TCAL
⊕▽	FURNISH AND INSTALL A COMPLETE FLOOR BOX SYSTEM WHICH INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING: 3-GANG, CAST IRON, FULLY ADJUSTABLE MULTI-SERVICE FLOOR BOX RECESSED IN CONCRETE FLOOR SLAB WITH (2) 20A DUPLEX RECEPTACLE, (1) 6-PORT TELE/DATA MOUNTING BEZEL, FLUSH ALUMINUM FINISHED CARPET FLANGE AND COVERS, AND VOLTAGE DIVIDER. THE FURNISHED FLOOR BOX SHALL BE SIZED TO ACCEPT THE QUANTITY AND SIZE OF CONDUITS REQUIRED FOR THE TELE/DATA CABLING. FOR TILE FLOOR INSTALLATION, PROVIDE APPROPRIATE FLANGE SO THAT TOP COVER OF FLOOR BOX IS FLUSH WITH TILE. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION. COORDINATE BRACKET AND TELE/DATA DEVICE REQUIREMENTS WITH TECHNOLOGY INSTALLER PRIOR TO ORDERING MATERIALS. FLOOR BOX IS CAPABLE OF ACCEPTING (6) 1"CONDUITS. FURNISH AND INSTALL SYSTEM PER MANUFACTURER'S INSTRUCTIONS. WIREMOLD #880CS2-1, #828TCAL, #828R-TCAL, #828COMTCAL
⊖	20A - 125V FEDERAL SPECIFICATION GRADE GROUND FAULT INTERRUPTING TYPE DEAD FRONT/BLANK FACE FEED THRU DEVICE WITH LED INDICATOR. DEVICE TO PROVIDE GFCI PROTECTION FOR DOWNSTREAM DEVICES. DEVICE SHALL BE IN READILY ACCESSIBLE LOCATION AND PERMANENTLY LABELED FOR EQUIPMENT SERVED. COORDINATE LOCATION WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
▽	BACKBOX FOR DATA DEVICE(S) MOUNTED 18" AFF TO TOP OF BOX, UNLESS NOTED OTHERWISE, PROVIDE 1"C WITH PULLWIRE FROM J-BOX WITH SINGLE GANG PLASTER RING TO ACCESSIBLE CEILING SPACE. FURNISH AND INSTALL CONDUIT BUSHINGS. IF MOUNTED NEXT TO A RECEPTACLE, SWITCH, ETC MOUNT BOTH DEVICES AT THE SAME HEIGHT.

ELECTRICAL SYMBOL LEGEND NOTES:

1. NOT ALL SYMBOLS SHOWN IN THIS LEGEND MAY APPEAR ON THE DRAWINGS.
2. WHERE CEILINGS DO NOT EXIST TO STUB CONDUITS ABOVE FOR LOW VOLTAGE, CONDUITS SHALL BE STUBBED UP TO BOTTOM OF / ABOVE STRUCTURE ABOVE. IN FINISHED AREAS, PROVIDE COMPLETE CONDUIT PATHWAYS, INCLUDING PULL-BOXES, UNLESS OTHERWISE DIRECTED. CONDUIT, J-BOXES AND THE LIKE SHALL BE PAINTED TO MATCH AREA FINISHES. ALL CONDUIT SHALL BE ROUTED IN STRAIGHT RUNS WITH 90 DEGREE BENDS.
3. WHERE HARD INACCESSIBLE CEILINGS EXIST, PROVIDE COMPLETE CONTINUOUS CONDUIT PATHWAYS, INCLUDING PULL-BOXES, AND ACCESS PANELS, FOR LOW VOLTAGE UNLESS OTHERWISE DIRECTED. PROVIDE CONDUIT SLEEVES TRAVERSING OVER INACCESSIBLE CEILINGS BETWEEN AREAS WITH ACCESSIBLE CEILINGS, AS REQUIRED. VERIFY J-BOXES ABOVE INACCESSIBLE CEILINGS ARE WITHIN REACH OF THE ACCESS PANEL AND CAN BE ACCESSIBLE PER N.E.C. AND LOCAL CODE.

GENERAL NOTES

1. FINAL CONNECTIONS TO LIGHT FIXTURES SHALL BE MADE WITH GREENFIELD FLEXIBLE CONDUIT. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL BE 6'-0".
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF LIGHT FIXTURES. CONTRACTORS TO COORDINATE LOCATIONS OF LIGHTING, SPEAKERS, AIR DIFFUSERS, GRILLES, SPRINKLER HEADS, ETC., WITH REFLECTED CEILING LAY-OUTS AS REQUIRED & DIRECTED BY THE ARCHITECT.
3. ALL DEVICES, EQUIPMENT, FIXTURES, ETC., MUST BE GROUNDED BY USE OF A PROPERLY SIZED GROUNDING CONDUCTOR. MECHANICAL/ELECTRICAL BONDS OF THE METALLIC RACEWAY SYSTEM SHALL ALSO BE MAINTAINED.
4. REFER TO MECHANICAL, PLUMBING, AND FIRE PROTECTION PLANS FOR EXACT LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT. COORDINATE LOCATION OF DISCONNECT SWITCH ASSOCIATED WITH EACH PIECE OF EQUIPMENT WITH RESPECTIVE CONTRACTOR AND INSTALL IN ACCORDANCE WITH THE NEC.
5. REFER TO DIVISION 15 (21, 22 & 23) SPECIFICATIONS, HVAC, PLUMBING & FIRE PROTECTION PLANS FOR ADDITIONAL ELECTRICAL WORK REQUIREMENTS & COORDINATION.
6. ALL RECEPTACLES SHOWN BACK-TO-BACK IN WALLS SHALL BE SEPARATED HORIZONTALLY BY 8" MINIMUM.
7. WHERE OPEN WIRING METHODS FOR LOW VOLTAGE SYSTEMS ARE PERMITTED BY THE CONTRACT DOCUMENTS, OWNER AND LOCAL AUTHORITY, THE CABLE/CONDUCTOR INSULATION SHALL BE RATED PER NEC FOR ENVIRONMENT (I.E. PLENUM RATED, ETC.) BEING INSTALLED.
8. BRANCH CIRCUIT CONDUCTOR SIZES (& CONDUITS) SHALL BE INCREASED FROM THOSE INDICATED ON THE PLANS TO PREVENT EXCESSIVE VOLTAGE DROP. BRANCH CIRCUITS SHALL BE INSTALLED WITH WIRES OF SUFFICIENT SIZE SO THAT VOLTAGE DROP BETWEEN THE PANEL & THE LOADS DO NOT EXCEED A LIMIT OF 3%.
9. REGARDLESS OF THE TEMPERATURE RATING OF THE CONDUCTOR INSULATION, ALL CONDUCTOR AMPACITY RATINGS FOR THIS PROJECT SHALL BE DETERMINED FROM THE 75°C CONDUCTOR TEMPERATURE RATINGS INDICATED IN THE NEC TABLES. WHERE EQUIPMENT OR DEVICES ARE PROVIDED WITH TERMINALS/LUGS RATED FOR 60°C, THE AMPACITY RATING OF THE 75°C CONDUCTOR SHALL BE LIMITED TO ITS ASSOCIATED 60°C RATING AS INDICATED IN THE NEC TABLES. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO INCREASE THE CONDUCTORS AND CONDUIT SIZE AS REQUIRED.
10. ALL 120V AND 277V BRANCH CIRCUITS SHALL BE PROVIDED WITH SEPARATE NEUTRAL CONDUCTORS. SHARED NEUTRALS WILL NOT BE PERMITTED FOR MULTI-CIRCUIT INSTALLATIONS. WHERE MULTIPLE CIRCUITS ARE RUN IN A COMMON RACEWAY, THE AMPACITY OF THE CONDUCTORS SHALL BE PROPERLY DERATED & CONDUIT SHALL BE SIZED PER CODE. UNDER NO CIRCUMSTANCES SHALL MORE THAN SIX (6) CURRENT CARRYING CONDUCTORS BE RUN IN A SINGLE CONDUIT. REFERENCE NEC ARTICLE AND TABLE 310.15(B)(3)(a).
11. ALL CONDUITS SHALL CONTAIN A GROUND CONDUCTOR SIZED PER NEC TABLE #250.122. IN ADDITION, WHERE AN ISOLATED, INSULATED GROUND IS REQUIRED, A SEPARATE GROUND CONDUCTOR WITH GREEN INSULATION SHALL BE RUN FROM THE PANEL GROUND BUS TO THE ISOLATED GROUND CONNECTION OF THE DEVICE. IN NO CASE SHALL THE SYSTEM GROUND (CONDUCTOR & ASSOCIATED OUTLET BOXES, CONDUIT & BUILDING STEEL) BE ALLOWED TO CONTACT THE ISOLATED GROUND (CONDUCTOR & DEVICE). WHERE CIRCUIT CONDUCTORS ARE INCREASED IN SIZE FOR ANY REASON (I.E. VOLTAGE DROP, DERATING, ETC.), THE GROUND CONDUCTOR SIZE SHALL BE INCREASED PROPORTIONATELY (ACCORDING TO CIRCULAR MIL AREA) FROM THE SIZE REQUIRED BY NEC TABLE #250.122.
12. ELECTRICAL INSTALLATION REQUIREMENTS FOR ALL HVAC, PLUMBING, FIRE PROTECTION, SPECIAL SYSTEMS AND OWNER EQUIPMENT BEING FURNISHED BY OTHERS SHALL BE REVIEWED AND COORDINATED WITH OTHER TRADES PRIOR TO ROUGH-IN. OBTAIN EQUIPMENT SHOP DRAWINGS FROM INSTALLER/SUPPLIER/CONTRACTOR/OWNER FURNISHING EQUIPMENT, AS REQUIRED, FOR REVIEW AND COORDINATION. CONTACT ARCHITECT/ENGINEER WITH ANY DISCREPANCIES FOUND BETWEEN CONSTRUCTION DRAWINGS AND EQUIPMENT BEING FURNISHED PRIOR TO ROUGH-IN.
13. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL ACCESS PANELS, AS REQUIRED FOR SERVICING AND TESTING, FOR EQUIPMENT AND/OR DEVICES FURNISHED UNDER HIS CONTRACT. THE GENERAL CONTRACTOR SHALL INSTALL ACCESS PANELS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE SIZE AND LOCATION OF EACH ACCESS PANEL WITH THE ARCHITECT AND GENERAL CONTRACTOR PRIOR TO ROUGH-IN.
14. ELECTRICAL CONTRACTOR SHALL INCLUDE IN HIS BID ALL CUTTING, TRENCHING AND PATCHING ASSOCIATED WITH THE ELECTRICAL INSTALLATION.
15. ALL PENETRATIONS IN OR THROUGH FIRE RATED ASSEMBLIES ASSOCIATED WITH THE ELECTRICAL INSTALLATION SHALL BE FIRE-STOPPED USING A UL APPROVED METHOD. FURNISH AND INSTALL UL LISTED FIRE RATED MATERIALS AND EQUIPMENT SUCH AS BOXES, PUDDY PADS, ENDOTHERMIC MAT, LIGHT FIXTURES WITH RATED ENCLOSURES, ETC... TO COMPLY WITH CODE FOR PROJECT CONDITIONS. FURNISH AND INSTALL SLEEVES, WHERE REQUIRED. UL APPROVED METHOD FOR FIRE STOPPING SHALL MEET OR EXCEED FIRE RATING OF STRUCTURE BEING PENETRATED. REFERENCE ARCHITECTURAL PLANS FOR FIRE RATED STRUCTURES.
16. NO CONDUIT, BOXES, WIRING, OR CABLES SHALL BE INSTALLED WITHIN 1 1/2" OF THE LOWEST POINT OF THE UNDERSIDE OF THE ROOF DECKING, NOR SHALL THEY BE INSTALLED CONCEALED WITHIN METAL-CORRUGATED ROOF DECKING. FOR EXISTING INSTALLATIONS, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE AND/OR REWORK EXISTING CONDUIT, BOXES, WIRING, AND CABLING THAT IS NOT IN COMPLIANCE WITH THIS REQUIREMENT.
17. ALL ELECTRICAL EQUIPMENT AND DEVICES FOR THIS PROJECT MUST BE UL LISTED. DEVICES, EQUIPMENT, SYSTEMS SHALL BE INSTALLED PER N.E.C. REQUIREMENTS AND MANUFACTURER'S INSTRUCTIONS.
18. THE DESIGN INTENT IS ALL DEVICES SHALL BE RECESSED MOUNTED, UNLESS OTHERWISE NOTED. THE DEVICE BACK-BOX AND RACEWAY BEING FURNISHED SHALL BE RATED TO COMPLY WITH NEC PER THE APPLICATION. WHERE MOUNTED WITHIN A FIRE RATED WALL OR STRUCTURE, FURNISH AND INSTALL UL APPROVED FIRE STOPPING ASSEMBLIES AND MATERIALS TO MAINTAIN RATING OF WALL OR STRUCTURE. WHEN THERE IS NO AVAILABLE OPTION BUT TO INSTALL A SURFACE MOUNTED DEVICE, CONSULT ARCHITECT/ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
19. THE DESIGN INTENT IS ALL CONDUIT, CABLES, RACEWAYS AND PATHWAYS SHALL BE CONCEALED FROM SIGHT WITHIN THE BUILDING CONSTRUCTION, UNLESS OTHERWISE NOTED. THE CONDUIT, CABLES, RACEWAYS AND PATHWAYS BEING FURNISHED SHALL BE RATED TO COMPLY WITH NEC PER THE APPLICATION. WHEN THERE IS NO AVAILABLE OPTION BUT TO INSTALL A VISIBLE CONDUIT, CABLE, RACEWAY OR PATHWAY, CONSULT ARCHITECT/ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
20. ALL CONDUIT AND CABLING SHALL BE PROPERLY SUPPORTED AS REQUIRED BY THE NATIONAL ELECTRICAL CODE. FOR EXISTING INSTALLATIONS, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE AND/OR REWORK EXISTING CONDUIT AND/OR CABLING THAT IS NOT IN COMPLIANCE WITH THIS REQUIREMENT.
21. CONTRACTOR SHALL FIELD VERIFY SLAB ON GRADE FLOOR CONSTRUCTION TYPE PRIOR TO CUTTING. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR CUT A STRUCTURAL FLOOR SLAB THICKER THAN FOUR (4") INCHES WITHOUT PRIOR WRITTEN APPROVAL FROM ENGINEER OF RECORD. NOTIFY ENGINEER OF RECORD OF ANY SLAB THICKNESS GREATER THAN FOUR (4") INCHES PRIOR TO PROCEEDING WITH ANY SAW CUTTING.
22. IN OTHER THAN DWELLING UNITS, ALL 125-VOLT THROUGH 250-VOLT RECEPTACLES SUPPLIED BY SINGLE PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND, 50 AMPERES OR LESS, AND ALL RECEPTACLES SUPPLIED BY THREE PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND , 100 AMPERES OR LESS, INSTALLED IN LOCATIONS IDENTIFIED IN 210-8(B) SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL. WHERE DEVICE IS READILY ACCESSIBLE, THE DEVICE SHALL BE PROVIDED WITH INTEGRAL GROUND FAULT PROTECTION. WHERE DEVICE IS NOT READILY ACCESSIBLE AND/OR NOT AVAILABLE WITH INTEGRAL GROUND FAULT PROTECTION, THE BRANCH CIRCUIT BREAKER SERVING THE DEVICE(S) SHALL BE GROUND FAULT TYPE.

DEMOLITION NOTES

1. IN EVERY INSTANCE OF DEMOLITION AND/OR REMODELING, THE ELECTRICAL CONTRACTOR SHALL FIGURE A COMPLETE JOB AS NONE OTHER SHALL BE ACCEPTED.
2. THE DRAWINGS ARE TO BE USED ONLY AS A GUIDELINE FOR DEMOLITION. THE ELECTRICAL CONTRACTOR MUST VISIT THE SITE PRIOR TO BIDDING TO VERIFY ALL WORK REQUIRED FOR A COMPLETE JOB & INCLUDE THE COST OF SUCH WORK IN HIS BID.
3. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN EXISTING SERVICES TO & IN THE EXISTING AREA AS REQUIRED.
4. IF NECESSARY, THE ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY SERVICES IN THE EXISTING AREAS.
5. THE ELECTRICAL CONTRACTOR SHALL DISCONNECT & REMOVE ELECTRIC SERVICE TO ALL MECHANICAL EQUIPMENT BEING REMOVED AS A RESULT OF THE REMODELING.
6. ELECTRICAL EQUIPMENT & DEVICES SHALL BE REMOVED COMPLETE INCLUDING CONDUIT & WIRE.
7. FLUSH MOUNTED OUTLETS SHALL BE BLANKED-OFF WITH A COVERPLATE. COVERPLATE COLOR SHALL BE SELECTED BY ARCHITECT.
8. ANY EXISTING CONDUIT, WIRING AND/OR ELECTRICAL & MECHANICAL DEVICES BEING DISTURBED BY THE WORK SHALL BE REWORKED BY THIS CONTRACTOR AS REQUIRED TO RETURN TO ITS FORMER EXISTING OPERATING CONDITION.
9. ANY CIRCUITS FEEDING THROUGH DEVICES OR EQUIPMENT BEING RELOCATED, REWORKED, OR ABANDONED & SERVING OTHER ELECTRICAL DEVICES, AND/OR EQUIPMENT SHALL BE MAINTAINED BY PROVIDING J-BOXES OR OTHER ACCEPTABLE METHOD AS REQUIRED.
10. ALL WALLS, CEILINGS, FLOORS, ETC., BEING DISTURBED BY THE WORK SHALL BE RETURNED TO FINISHED CONDITIONS TO MATCH EXISTING BY THE ELECTRICAL CONTRACTOR & HE SHALL DO HIS OWN CUTTING & PATCHING AS NECESSARY UNDER HIS CONTRACT.
11. EXISTING MATERIALS SHALL BE TURNED OVER TO THE OWNER. IF NOT REQUIRED BY OWNER, THE ELECTRICAL CONTRACTOR SHALL REMOVE THESE MATERIALS FROM THE PREMISES.
12. CONTRACTOR SHALL FIELD VERIFY SLAB ON GRADE FLOOR CONSTRUCTION TYPE PRIOR TO CUTTING. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR CUT A STRUCTURAL FLOOR SLAB THICKER THAN FOUR (4") INCHES WITHOUT PRIOR WRITTEN APPROVAL FROM ENGINEER OF RECORD. NOTIFY ENGINEER OF RECORD OF ANY SLAB THICKNESS GREATER THAN FOUR (4") INCHES PRIOR TO PROCEEDING WITH ANY SAW CUTTING

ELECTRICAL ABBREVIATIONS

A	AMPS
AC	AIR CONDITIONING UNIT
AFC	ABOVE FINISH COUNTER
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AHU	AIR HANDLING UNIT
AIC	ASYMMETRICAL INTERRUPTING CURRENT
ARCH	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAGE
BKR	BREAKER
BLDG	BUILDING
C.	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CH	CHILLER
CONTR	CONTRACTOR
CT	COOLING TOWER
CU	COPPER
CUH	CABINET UNIT HEATER
DE	DUAL ELEMENT
DN	DOWN
DS	DISCONNECT SWITCH
DWG	DRAWING
(E) or EXIST	EXISTING
EBB	ELECTRIC BASEBOARD
E.C.	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EH	ELECTRIC HEATER
ELEC	ELECTRICAL
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EOR	ENGINEER OF RECORD
EQ.	EQUAL
EQUIP	EQUIPMENT
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
F	FUSE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FC	FAN COIL UNIT
FLUOR	FLUORESCENT
FPB	FAN POWER BOX (VAV)
F.P.C.	FIRE PROTECTION CONTRACTOR
FS	FLOW SWITCH
FT	FOOT/FEET
G.C.	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTING PROTECTION
GND	GROUND
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HVAC	HEATING, VENTILATION, AIR CONDITIONING
IG	ISOLATED GROUND
INCAND	INCANDESCENT
JB or J-BOX	JUNCTION BOX
KCMIL	ONE THOUSAND CIRCULAR MILS
K.E.C.	KITCHEN EQUIPMENT CONTRACTOR
KVA	KILOVOLT AMPERE
KW	KILOWATT
LTG	LIGHTING
MATV	MASTER ANTENNA TV
MAU or MUA	MAKE-UP AIR UNIT
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
M.C.	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	METAL HALIDE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MOD	MOTOR OPERATED DAMPER
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
NEC	NATIONAL ELECTRIC CODE
NF	NON FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
N.I.C.	NOT IN CONTRACT
NL	NIGHTLIGHT
NRTL	NATIONALLY RECOGNIZED TESTING LABORITORY
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
Ø or PH	PHASE
P	POLE
PB	PULL BOX
P.C.	PLUMBING CONTRACTOR
PNL	PANEL
PRE	POWER ROOF EXHAUSTER
PVC	POLYVINYL CHLORIDE
REC or RCPT	RECEPTACLE
RTU	ROOF TOP UNIT
SPKR	SPEAKER
SPST	SINGLE POLE SINGLE THROW
TIE	MULTIPLE OUTLETS WIRED ON SAME BRANCH CIRCUIT
TR	TAMPER RESISTANT
TS	TAMPER SWITCH
TTB	TELEPHONE TERMINAL BOARD
TV	TELEVISION
TYP	TYPICAL
UH	GAS FIRED UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UNO	UNLESS NOTED OTHERWISE
USB	UNIVERSAL SERIAL BUS
UV	UNIT VENTILATOR
V	VOLTS
W	WATTS
WG	WIREGUARD
WP	WEATHERPROOF TYPE DEVICE (NEMA 3R RATED)
X'FMR	TRANSFORMER

JEFFERY D. MITERKO
E-60570
8/5/22

tda
thendesign architecture

CMSD BARBARA BOOKER ELEMENTARY
CLEVELAND METROPOLITAN SCHOOL DISTRICT

2121 W. 67TH ST.
CLEVELAND, OHIO 44102

no.	description	date

Sheet Revisions

no.	description	date
01	Issue For Bidding	8-5-22

Project Issues

sheet name: ELECTRICAL DETAILS

drawn by: TBA
checked by: TBA
sheet number: E-2
job number: Project Number

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Section 16010 - General Provisions

A. General
1. Requirements specified in Division 1, instructions to bidders, supplemental general conditions, special conditions, addenda, alternates, contract and proposal, along with Division 16 and all its sections, comprise the contract documents for the electrical contract, along with these specifications as though they were one, and anything implied by the specifications shall be interpreted as also implied by the drawings and vice versa. Provide necessary items for a complete installation of all electrically operated equipment listed in the specifications or shown on the contract drawings.
2. The bid shall, structural, mechanical, plumbing and equipment drawings and specifications are incorporated into, and become a part of this division. This contractor shall examine all such drawings and specifications and become thoroughly familiar with the provisions contained therein. The submission of his bid shall indicate such knowledge.
3. Electrical drawings are diagrammatic. They are intended to show the approximate locations of equipment and conduit. Dimensions given on the plans, in figures, shall take precedence over scaled dimensions and shall be verified in the field. The electrical contractor shall layout all equipment rooms to make sure the equipment, as purchased, fits in the room or space shown. Exact location of all equipment shall be verified in the field and routing of conduits shall suit field conditions.
4. Until the time of installation, the architect reserves the right to make minor changes in the location of conduit and equipment without additional cost to the contract.
5. The electrical drawings and specifications are intended to supplement each other. Material and labor necessary to the project shall be furnished and installed even though not specifically mentioned in both. Labor and/or materials neither shown nor specified, but obviously necessary for the completion and proper functioning of the system, shall be furnished and installed by the electrical contractor.
6. Arrange all equipment substantially as shown on the drawings. Make deviations only where necessary to avoid interference. Check all equipment sizes against available space prior to shipment to avoid interference.
7. Examine the work of other trades insofar as their work comes in contact with or is covered by this work in no case attach to, or finish against any defective work or install work in a manner which will prevent proper installation of the work of other trades.
8. Electrical contractor shall verify with other trades all electrical characteristics of equipment requiring electrical connections, contractor shall verify voltage, phase and horsepower and shall notify engineer of any discrepancies prior to start of work. Electrical contractor shall provide disconnecting means and overload protection for all equipment, unless furnished integral with equipment package.
9. It is the intent of these drawings that this be a complete electrical job, any errors or omissions shall be brought to the attention of the engineer prior to bidding the job.

B. Visit to the Site
1. This contractor shall visit the site of the work and familiarize himself with all conditions affecting his work. The submission of his proposal shall indicate such knowledge. No additional payment shall be made on claims that arise from a lack of knowledge of the existing conditions.

C. Code and Permits
1. Installation shall be in full accordance with all codes, rules and regulations of municipal, city, county, state and public utilities and all other authorities having jurisdiction over the premises.
2. Comply with any specification requirements that are in excess but not in conflict with code requirements.
3. The contractor shall secure and pay for all permits, plan reviews and certificates of inspection in connection with his work, required by the foregoing authorities. Before final payment of the contract is allowed, all certificates shall be delivered to the architect in duplicate.
4. Electrical material and equipment shall bear the UL label except where UL does not label such types of material and equipment.

D. Shop Drawings Submittals
1. The electrical contractor shall submit five (5) sets of shop drawings, the shop drawings of the following equipment using the indicated numbering system and titles, shall be submitted through the architect to the engineer and then resubmitted for final approval if necessary. Shop drawings shall be submitted for the following items:
    a. Wiring devices
    b. Panelboards, transformers and safety switches including fault current study based on equipment being supplied.

1. All submitted shop drawings (manufacturers' equipment descriptive sheets or vendors' prepared drawings) shall have the general contractor's or subcontractor's "stamp of approval" indicating that the item submitted is as called for on the plans and specifications, is approved by the general contractor or subcontractor, the date of approval and initialed by the person approving the submittal and the name of the company submitting said equipment for approval.
2. Submit bound brochures complete with a table of contents. Loose or stapled together sheets are not acceptable. Any submittals not in brochure form or not as specified shall be returned at the contractor's expense for resubmittal.
3. All descriptive literature shall be submitted in a three (3) hole brochure with a cover identifying the following:
    a. Name of the job
    b. Location of the job, address, city and state.
    c. Name and address of the company submitting the brochures.
    d. Date of the submittal.
4. Every effort shall be made, in checking the shop drawings, to detect and correct all errors, omissions and inaccuracies. Failure to do this will not relieve the electrical contractor of the responsibility for the proper and complete installation in accordance with the contract documents.

A. As-built Drawings
1. Submit to the architect one set of reproducible (mylars) electrical drawings showing the as-built conditions.

B. Standards and Substitutions
1. Wherever the words "approved by", "approved equal", "as directed" or similar phrases are used in the following specifications, they shall be understood to refer to the owner as the approving agency. The name or make of any equipment or materials named in this specifications (whether or not the words "or approved equal" are used) shall be known as the "standard".
2. These specifications establish quality standard of materials and equipment to be provided. Specific items are identified by manufacturer, trade name or catalog designation. This contractor shall submit his base bid price based upon standard specified equipment described herein and as detailed on drawings and associated contract documents. These specifications are not to be considered proprietary. The contractor may submit information on materials and manufacturers (other than those listed) for review by the architect and engineer no later than ten (10) days before bids are submitted. Manufacturers of products accepted by the architect and engineer will be listed in an addendum to the specifications as an acceptable substitution equipment accepted as detailed below and shall be shown as a separate add or deduct price to be factored into the base bid price by the architect and owner if accepted.
3. Should the contractor propose to furnish materials and equipment other than those specified or approved by addendum, submit a written request for substitutions to the architect at the bid opening. The request shall be an alternate to the original bid; be accompanied with complete descriptive (manufacturer, brand name, catalog number, etc.) and technical data for all items. Failure by this contractor to submit the requisite documentation detailed above shall be understood by the architect and engineer to indicate that substitute equipment will not be presented by the contractor for consideration. Such substitutions will not be considered after the bid opening date and delay of project will not be permitted for further inspection and evaluation after this date.
4. Where such substitutions alter the design or space requirements indicated on the drawings, include all items of cost for the revised design and construction including cost of all allied trades involved.
5. Acceptance or rejection of the proposed substitutions shall be subject to approval of the architect and engineer. If requested, the contractor shall submit (at his cost) inspection samples of both the specified and proposed substitute items.
6. In all cases where substitutions are permitted, the contractor shall bear any extra cost of evaluating the quality of the material and equipment to be provided.

C. Testing and Placing in Service
1. Any material or equipment failing a test shall be repaired or replace at the contractor's expense.
2. Tests shall include the following:
    a. Measure the load on each phase of the main service and each phase of every feeder under full load conditions.
    b. Measure the no-load and full-load voltages (phase to phase, phase to neutral and phase to ground for each phase of each service, of each separately derived system, and at each panelboard or transformer).
    c. Measure the ground resistance of the main service grounding electrode and the ground resistance of each separately derived system's grounding electrode.
    d. Make insulation resistance tests on all dry type transformers and motors.

D. Interferences
1. Before the installation of any item begins, the electrical contractor shall carefully ascertain that it does not interfere with clearances for the erection of finish beams, columns, pilasters, walls or other structural or architectural members as shown on the architectural drawings. If any work is installed and the architectural design cannot be followed, this contractor shall, at his own expense, make changes in his work as directed by the architect to permit the completion of the architectural work in accordance with drawings and specifications.
2. It shall be the duty of this contractor to report any interferences between his work and that of any of the other contractors as soon as they are discovered. The architect shall determine which equipment will be relocated, regardless of which was installed first. His decision will be final.

E. Quality Assurance
1. All products shall be new and of the type and quality specified. Where materials, equipment, apparatus or other products are specified by manufacturer, brand name, type of catalog number, such designation shall establish the standards of the desired quality and style. It is the intent of these specifications to establish a standard of quality of materials and equipment installed.

Section 16050 - Basic Electrical Materials and Methods

A. Nameplates
1. General: furnish and mount on each panelboard, switchboard (including branch switches), large junction box, safety switch, starter, remote control, push button station, and all similar controls, a nameplate descriptive of the equipment or equipment controlled
2. Provide black and white nameplates constructed from laminated phenolic with a white center core. Letters shall be engraved in the phenolic to form white letters 3/8" high. Fasten the nameplates with an adhesive type fastener.

B. Mounting Accessories
1. This contractor shall furnish and install all angle iron, channel iron, rods, supports, hangers, concrete or plywood required to install, mount and support any electrical equipment or device called for on the plans.
2. Supporting material shall be complete with hangers, connectors, bolts, clamps and necessary accessories to make a complete installation. Supporting material shall be galvanized, painted or otherwise suitably finished. Products by Binkley, Steel City, or Raco will be acceptable.
3. All surface-mounted equipment on block walls shall be mounted on 3/4" plywood backboard. All floor-mounted equipment shall be installed on a 4" high concrete housekeeping pad.

C. Execution
1. The electrical work for construction proposed shall conform to all federal (OSHA), state, all specific safety requirements and the requirements of the current edition of the NEC.
2. Check the HVAC and plumbing specifications for electrical requirements and include the same in the contract cost.
3. Equipment connections, starters, disconnect switches, control transformers and pushbutton stations for the equipment furnished by the owner or under a separate contract shall be installed and connected under this division, as indicated on the contract drawings.
4. All cutting, patching, excavating, backfilling and concrete work related to this contract will be the responsibility of the electrical contractor. This contractor shall assume the responsibility of providing the sleeves, chases and openings necessary for the electrical installation and for their repair in an acceptable manner, as determined by the architect. All holes shall be core-drilled. Provide fire stop in all openings created through fire-rated walls, floors or ceilings. Contractor shall field verify slab on grade floor construction type prior to cutting. Under no circumstances shall the contractor cut a structural floor slab thicker than four (4") inches without prior written approval from Engineer of Record. Notify Engineer of Record of any slab thickness greater than four (4") inches prior to proceeding with any saw cutting.
5. This contractor shall be responsible for providing all required access panels necessary for his work, coordinate with architect prior to installation.

D. Materials and Workmanship
1. All work shall be installed in a practical and workmanlike manner, by mechanics skilled in the several trades necessary.
2. All materials shall be new and free from defects and shall be the best of their several kinds unless specified or indicated on the drawings to the contrary.
3. During each phase and at the completion of the construction, this contractor shall remove all debris and excess materials caused by his work. He shall leave the area of operation broom clean.
4. All electrical equipment shall bear the underwriters laboratories label or ETL label.
5. This contractor shall guarantee his workmanship and material (lamps excepted) for a period of one year from the date of building opening and leave his work in perfect order at the completion. Should defects develop within the guarantee period, the contractor shall, upon notice of the same, remedy the defects and have all damages to other work or furnishings caused by the repairs corrected at his expense to the condition before such damage.

E. Scope of Work
1. The electrical contractor shall provide all labor, material, storage, unpacking and placement; to include but not be limited to, the following items:
    a. Emergency lighting and power.
    b. Complete power and lighting distribution system including all panels, transformers and feeders.
    c. Complete branch circuit wiring system.
    d. Complete power wiring for all air conditioning equipment, plumbing system, heating equipment, ventilating and exhaust equipment.
    e. Complete lighting fixture installation, including all incandescent, fluorescent and HID lamps.
    f. Complete telephone and communication conduit and wiring system including boxes, plates, jacks, etc., as specified, shown on the drawings and required by the local telephone company and/or owner.
    g. Temporary electrical power and lighting as required for construction.
    h. Testing of all cables and circuit wiring after installation.
    i. Wiring devices and floor boxes.
    j. Grounding of the electrical system.

A. Temporary Service
1. The electrical contractor shall furnish, install and remove as required all temporary power and temporary lighting in all areas and individual rooms when needed by the individual trades in the performance of their work. This contractor shall provide a minimum of twenty (20) footcandles of illumination for temporary lighting. Any additional lighting required by individual trades shall be provided by the individual trades including power for the lighting. The electrical work for construction purposes shall conform to all federal (OSHA), state, specific safety requirements, as well as the requirements of the national electric code and national electrical safety code. The electrical contractor shall obtain and pay for all required applications, permits and inspections pertaining to this work. This cost shall be included in the contractor's price.
2. New light fixtures shall not be used for temporary lighting.

B. Electric Service
1. Provide trenching and backfill to the power company specifications.
2. Provide conduit for primary service where required by the power company.
3. Concrete encase conduits where required by the power company and where indicated on the plans.
4. Provide metering to power company specifications.
5. Make provisions for the pad-mount transformer as required by the power company including the transformer pad and grounding.
6. Pay the cost of all power company charges connected with permanent electric service to the building.
7. Coordinate all work with the power company and perform any work necessary to assure a complete, working installation. The entire service installation shall be in complete conformance with the power company's requirements.
8. Verify the exact routing of the primary and secondary services, and all service requirements, with the power company prior to bidding.

Section 16120 - Wiring and Cable

A. Color code conductors (except control and instrumentation conductors) as follows:

	208/120 System
Phase A	Black
Phase B	Red
Phase C	Blue
Neutral	White
Ground	Green

a. #12 and #10 conductors shall have continuous insulation color, as listed above.
b. Color code conductors larger than above, which do not have continuous insulation color by application of at least two laps of colored tape on each conductor at all points of access including junction boxes. Color tape shall be the equal of 3M products Scotch #35.
c. Conductors shall be soft annealed copper insulated for 600 volts unless specifically indicated otherwise. Aluminum conductors are not allowed on this project.

B. Insulation type shall be type THWN for wire sizes #8 AWG and larger and THHN or THWN for #10 AWG and smaller. THHN shall not be used in wet or damp locations.

C. Flexible cord shall be heavy duty type so with an equipment ground conductor in addition to the current carrying conductors.

D. Provide #12 conductors, unless otherwise indicated.
1. Control conductors shall be #14 minimum for NEC class I and #16 for NEC class II.

E. Conductors #8 AWG and larger shall be stranded.

F. Conductors #10 AWG and smaller shall be solid.

G. Install wiring in conduit.

H. Connect #10 and smaller wires with constant pressure expandable spring type connectors, "Scotchlok" by 3M or B-Cap by Buchanan.

I. Connect #8 and larger wires with compression connectors or splices as manufactured by Burndy or T&B.

J. Insulate splicing connectors to at least 200% of the wire insulation. Use pre-stretched tubing connector insulators, 3M PST for #2 and larger conductors.

K. Pull conductors using recognized methods and equipment leaving at least 6" wire at all junction boxes for connections.
1. Clean out each conduit system before pulling wire.

L. Form and tie all wiring in panelboards.

M. There shall be no wirenut joints or splices made inside switchboards/panelboards.|

N. Branch circuit wire sizes (and conduits) shall be increased from those indicated on the plans to prevent excessive voltage drop. Branch circuits shall be installed with wires of sufficient size so that voltage drop between the panel and the loads does not exceed limit of 3%.

O. Regardless of the temperature rating of the conductor insulation, all conductor ampacity rating for this project shall be determined from the 75°C conductor temperature ratings indicated in the NEC tables. Where equipment or devices are provided with terminals/lugs rated for 60°C, the ampacity rating of the 75°C conductor shall be limited to its associated 60°C rating as indicated in the NEC tables. The electrical contractor shall be responsible to increase the conductors and conduit size as required.

P. Circuits may be multi-plexed in conduit provided wire is properly derated and conduit sized per code. Under no circumstances shall more than six (6) current carrying conductors be run in a single conduit.

Section 16130 - Raceways and Boxes

A. Raceways
1. All wire shall be run in accordance with code in corrosion resistant, rigid, threaded, metal conduit or electrical metallic tubing (E.M.T.) unless otherwise specifically stated herein.
    a. Conduit in exterior walls, below floor slab, or underground shall be rigid, threaded, galvanized, heavy wall type.
    b. Carlon PVC type 40 heavy wall conduit with ground wire may be used below floor slab or underground in lieu of rigid, threaded, galvanized conduit. PVC 40 conduit shall not be run in or above floor slab. PVC conduit shall terminate below floor slab with rigid, threaded metal conduit adapter. Conduit above slab shall be metal.
    c. Conduit run exposed to the weather shall be heavy wall, metal threaded type.
2. Conduit size shall be 3/4" minimum.
3. Conduit shall be securely fastened in place.
4. All conduit shall be concealed in walls, floor and ceilings wherever possible. Exposed conduit in finished areas will not be permitted. Exposed conduit will be permitted in the unfinished areas with the specific approval of the architect.
5. Use flexible conduit for the connection to recessed or semi-recessed lighting fixtures (6' length maximum). Use liquid tight metal conduit for all connections to motors and other equipment subject to vibration and in areas subject to moisture.
6. Use watertight joints with buried and concrete encased conduit. All buried conduits outside of buildings shall have a minimum of 24" of cover. Metal conduits buried in earth shall be painted (two coats) with heavy asphaltum paint.
7. Support runs of conduit as detailed in the appropriate table of the national electrical code (NEC).
8. Installed exposed runs of conduit and conduit above lay-in ceilings parallel or perpendicular to the walls, structural members of intersections of vertical planes and ceilings. Provide right angle turns using fittings or symmetrical bends. Support conduits within 1" of all changes in direction.
9. If a conduit is suspended, it shall be supported on trapeze hangers which use "all-thread" rods from the structural steel. The use of ceiling support wire or similar material will not be accepted.
10. Install empty conduit for future use as indicated on the drawings. Conduit shall be complete with jetline or pull rope, junction/outlet boxes, tile rings and appropriate cover plates.
11. Provide pitchpockets where conduits penetrate the roof.
12. Thread lubrication/sealant is required on outdoor and underground threaded metal joints.
13. Install fire seal fittings where conduits penetrate concrete floor slabs or masonry walls required to be fire rated.
14. Horizontal portion of conduit exposed on the roof and feeding equipment shall not be more than 5'-0" unless the written approval from architect or engineer is obtained.

B. Pull and Junction Boxes
1. Install pull and junction boxes where shown on the drawings, and where required for changes in direction, at junction points, and to facilitate wire pulling. Furnish box sizes in accordance with NEC unless larger boxes are indicated.
2. Provide steel boxes and removable covers of code gauge, hot rolled sheet steel, hot dipped galvanized inside and outside, for above ground work. Furnish weatherproof boxes when installed above ground outside.
3. Provide cast iron boxes, hot dipped galvanized inside and outside where shown on the drawings. Furnish removable covers with gaskets and stainless steel, brass or bronze screws.
4. Provide concrete boxes for underground work unless otherwise indicated on the drawings. Furnish steel frames and covers with the cover attached to the frame with hexagon head, brass or bronze cap screws, 3/8" in diameter. Provide a rubber gasket for sealing between the cover and the frame. Paint the cover with two coats of heavy asphaltum.

C. Outlet Boxes
1. Use sheet steel boxes, zinc coated or cadmium plated, for concealed interior work.
2. Use cast boxes, zinc-cadmium finish malleable iron, for exposed interior work, and for exposed or concealed work in wet, damp or exterior locations. Cast boxes shall be series FD by Crouse Hinds or Appleton.
3. Wall box sizes (minimum) shall be 4" square X 2-1/2" deep where wall construction permits. Where wall construction dictates, the depth may be reduced to 2-1/8" or 1-1/2" under special conditions.
4. Fixture outlets in ceilings (minimum) shall be 4" octagonal X 1-1/2" deep (4-11/16" octagonal X 2-1/2" deep where required to accommodate larger conduit or larger number of wires).
5. Ganged boxes shall be one piece (minimum), 2-1/8" deep.
6. Provide cast iron, concrete-tile floor boxes with adjustable covers set flush and level with the finished floor, with outlets as indicated on the drawings. Provide Hubbell #B-2400, 4200, or 4300 series boxes with leveling screws. Flush type covers and openings to serve outlets used. Furnish flush caps for closing off box when not in use.
7. Flush mount boxes in all finished walls, install the plaster rings in drywalled plastered walls and raised covers as required in walls with other finishes so that the cover plates fit tightly against boxes or rings, 3/16" maximum gaps are allowed for noncombustible walls.
8. Adjust location of outlets in masonry or tile construction to occur in the nearest joint to the height specified. Heights shall meet A.D.A. requirements.
9. Support all boxes to maintain proper alignment and rigidity.
10. Clean boxes of all foreign matter prior to the installation or wiring of devices.
11. Mounting heights on the drawings are to the centerline of the box unless otherwise noted.

Section 16140 - Wiring Devices

A. Wiring device color shall be selected by architect, unless otherwise indicated.

B. Provide totally enclosed, 20 ampere, 120/277 volt, quiet A/C general use snap switches.

C. Switches shall be specification grade as manufactured by Hubbel, P&S, or Leviton.

D. Provide NEMA configuration 5-20R Duplex 125 volt grounding type receptacles rated for 20 amperes unless otherwise indicated on the drawings.

E. Receptacles shall be specification grade as manufactured by Hubbell, P&S or Leviton.

F. Receptacles requiring amperages, voltages or configurations different from the duplex convenience receptacles above shall be as indicated on the drawings.

G. Provide other receptacles of a quality, material and workmanship equal to that specified for duplex convenience receptacles.

H. Provide cover or device plates for outlet boxes as follows unless otherwise noted:
1. Finished areas: Stainless steel.
2. Unfinished areas: zinc coated sheet metal, aluminum, or cast metal as appropriate for the type of box.
3. Exterior areas: copper free aluminum with gray, powder epoxy finish, gasket, weatherproof, Crouse-Hinds "WLRD" for duplex receptacles and WLRS for single receptacles or equal.
4. Telephone, communication, and signal outlet plates, shall match those used for receptacles and switches. All outlet and/or junction boxes shall be complete with a cover plate by this contractor.
5. Where devices are ganged, they shall be installed under a common coverplate.

I. Locate the switches approximately 4'-0" above the finished floor elevation or nearest block course (within A.D.A. requirements), unless otherwise indicated. The long dimension of the switches shall be vertical.

J. Locate receptacles approximately 1'-6" above the finished floor elevation or nearest block course (within A.D.A. requirements), unless noted otherwise. The long dimension of receptacles shall be vertical.

Section 16410 - Safety Switches

A. Safety switches shall be the enclosed heavy-duty type (type HD) with quick-make, quick-break mechanism and external pad lockable operating handle.

B. Safety switches shall be rated for 240 or 600 volts as applicable. They shall be horsepower rated when used in motor circuits.

C. Safety switches shall be fusible or non-fusible 2, 3, or 4 pole as indicated on the drawings.

D. Safety switches shall be single throw unless otherwise indicated on the drawings.

E. Enclosures shall be NEMA 1 indoors and NEMA 3R outdoors unless otherwise indicated on the drawings.

F. Manufacturer shall be Square D, Siemens, G.E., or Cutler-Hammer. All safety switches shall be by one manufacturer.

G. Mount the safety switches securely between 3' X 6' levels above the floor unless otherwise indicated on the drawings.

H. Switches on block walls shall be mounted on a 3/4" plywood backboard, where located indoors.

Section 16420 - Motor Starters

A. Provide motor starters (magnetic or fused combination) and control equipment where shown. Starters shall be provided with 120 volt coils, 3 overloads, control transformer with fused 120 volt secondary control circuit, (2) N.O. and (2) N.C. auxiliary contacts, hand-off-auto selector switch and running pilot light, unless otherwise noted. Wire thru control devices furnished by other trades. Since motor driven equipment is furnished by other trades, the control indicated on the drawings shall be considered as for bidding purposes only. Wire to conform to the actual equipment supplied and installed by the other trades. All fuses shall be dual element type. Provide "blownfuse" indicator lamps in cover.

B. Starters shall be Square D, G.E., Cutler-Hammer, or Siemens.

C. The exact number of normally open and normally close auxiliary contacts in each starter shall be determined by the temperature control contractor.

D. Coordinate all equipment indicated on the electrical drawings with mechanical equipment schedules and specifications and provide motor starters for all equipment indicated as being interlocked or started from a remote location.

E. Starters supplied as an integral part of equipment shall be furnished under the division providing the equipment. Wiring and disconnect shall be by this contractor. All other starters and auxiliary control equipment shall be supplied and wired by this contractor unless otherwise noted.

Section 16442 - Panelboards

A. Panelboards
1. Panelboards shall be enclosed dead front safety type with features and ratings as scheduled on the drawings.
2. Panels known as "load centers" are unacceptable.
3. Molded case circuit breakers shall be as scheduled on the drawings and specified in this division.
4. All bus bar shall be rectangular solid copper.
5. Space, where shown in panel schedules, designates space for future protective devices and shall include bus and support.
6. Install cabinets so that center of the top breaker does not exceed 6'-6" above the finished floor.
7. Entries on directory cards shall be typed, complete and accurate.
8. All bolted connections shall be torqued in accordance with manufacturer's standards.
9. Electrical contractor shall arrange circuits as near as possible to circuit numbers on the drawings. At completion of job, electrical contractor shall take current reading checks of respective phases. A minimum of circuit connections shall be rearranged to balance, as closely as possible, the load in the panel.
10. All breakers shall be bolt-on type.
11. Provide (3) spare 1" conduits into accessible ceiling space where panels are flush-mounted.
12. Manufacturer shall be Square D, Siemens, or Eaton.

Section 16461 - Dry Type Transformers

A. Transformers shall be continuously rated isolating type for 60 hertz service unless otherwise indicated.

B. Insulation systems shall be 220 degrees C (150 degrees C rise).

C. Enclosures for transformers shall be metallic, suitable for indoor and outdoor installation as applicable and rodent proof.

D. Manufacturer shall be Eaton, Square "D", Siemens. Fractional KVA transformers shall be manufactured by Edwards or the special equipment manufacturer in which the transformers are used.

E. Four approved variation dampeners per transformer shall be employed as necessary to avoid transmitting any vibration to the building structure. Sizes of the mountings shall be selected on the basis of the weight of the transformer, using:
1. A minimum 1" thick rubber-cork-rubber sandwich type for floor mounting.
2. A spring type for suspension mounting.
3. Two (2) spring type at the top (with two (2) steel brackets) and two (2) rubber-in compression type at the bottom (instead-of) for wall mounting.

F. No conduits shall be attached directly to the transformer. At each attachment, provide a vibration dampening assembly consisting of:
1. AT&B #5721, 2, 3 etc., or equivalent female hub type liquid-tight connector by Steel City, Efcor or approved equal.
2. T&B #5331, 2, 3 etc., or equivalent male hub type liquid-tight connector with an insulated throat by Steel City, Efcor or approved equal.
3. Shor length (24" plus or minus) of liquid-tight flexible conduit.
4. A bonding jumper of NEC size outside of the assembly.

G. Floor mounting: all floor mounted transformers shall be installed on a 4" high concrete pad. This contractor shall furnish and install concrete pad.

Section 16491 - Fuses

A. The contractor shall furnish a complete set of fuses for all switches, plus fusible equipment furnished by other trades. Unless indicated otherwise on plans, the fuses shall be of the following types:
1. Fuses 601 to 6000 amps shall be UL class. Trade type shall be KRP-C as manufactured by Bussmann Company.
2. Fuses 1/10 to 600 amps shall be UL class RK1. Trade type shall be low peak LPS-RK (600V) and LPN-RK (250V) as manufactured by Bussmann Company.
3. All other fuses shall be dual-element current-limiting type with 200,000 amperes symmetrical interrupting capacity.

B. Fuses shall be manufactured by Bussman, Gould-Shawmutt, or Reliance.

C. Spare fuses amounting to a duplicate set of each size installed shall be turned over to the owner upon completion of the project. Provide and place in a spare fuse cabinet similar to Bussman # SFC.

D. This contractor shall replace all fuses blown during construction.

Section 16060 - Grounding and Bonding

A. Ground all equipment per N.E.C.

B. Ground all dry type transformers as per drawings and NEC #450-10.

C. All conduits shall contain a code-sized ground wire size per N.E.C. in addition to the conductors shown on the plans. Where circuit conductors are increased in size for any reason (i.e. voltage drop, derating, etc.), the ground wire size shall be increased proportionately (according to circular mil area).

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CLEVELAND, OHIO 44102

no.	description	date

Sheet Revisions

no.	description	date
01	Issue For Bidding	8-5-22

Project Issues

sheet name:
ELECTRICAL SPECIFICATIONS

drawn by:
TBA

checked by:
TBA

sheet number:
E-3

job number:
Project Number