

FASHION INSTITUTE TECHNOLOGY

FRED D. POMETRANTZ BUILDING

**D442 FOURTH FLOOR CLASSROOM RENOVATION
INVITATION FOR BID NUMBER C1576**

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SECTION I:
NOTICE TO BIDDERS

SECTION I: NOTICE TO BIDDERS

FASHION INSTITUTE OF TECHNOLOGY FRED P. POMERANTZ BUILDING D442 FOURTH FLOOR CLASSROOM RENOVATION INVITATION FOR BID NUMBER C1576

For the purposes of this project (the “Project”) the Fashion Institute of Technology and its auxiliary dormitory organization, the F.I.T. Student Housing Corporation, shall hereinafter be collectively referred to as “FIT” unless otherwise distinguished herein. Neither the Fashion Institute of Technology nor F.I.T. Student Housing Corporation will be responsible for receipt of any Bid which does not comply with the instructions as set forth further in this document.

FIT is **ONLY** accepting electronic scanned bids for the subject project. You must email your bid to purchasingbids@fitnyc.edu in PDF format and it should include all the requested documents (See Attachment A – Bid Checklist) including a scanned image of your bid security (Certified Check of 2 percent or Bid Bond of 10 percent of your total bid price), we’ll also need you to mail us the original copy of the bid security to have on file. The bid security must either be mailed to 227 W 27th Street, New York, NY 10001 or dropped off at 333 7th Avenue (16th Floor), New York, NY 10001. Bids must be received by **July 7, 2023, on or before 12:00 P.M.** All bidders will be notified of the bid results within the hour. Bid results are not official until each package has been fully reviewed.

ATTACHMENT A - BID CHECKLIST

FASHION INSTITUTE OF TECHNOLOGY FRED P. POMERANTZ BUILDING D442 FOURTH FLOOR CLASSROOM RENOVATION INVITATION FOR BID NUMBER C1576

Bidder shall meet the following requirements and submit necessary information with the Bid. Failure to comply with these requirements shall be grounds for rejection of your Bid.

- Did you attend the **mandatory** site inspection?
- Did you include all required documentation? (As per Bidder Requirements – i.e. proof of being in business, permits, licenses, certifications, etc.)
- Did you include the Form of Bid? (See Section VIII.)
- Did you include the Non-Collusive Bidding Certification? (See Section IX.)
- Did you complete in full the Bid Analysis Form, (See Attachment C)
- Did you sign for each Addendum to this project, if any were published? (It is the contractor's responsibility to check FIT's "Current Bid Opportunities" webpage for addendums prior to submitting their bid.)
<http://www.fitnyc.edu/about/administration/finance/purchasing/current-bids.php>
- Did you complete the Contractor Reference Sheet? **Do not list FIT as your projects of similar size and scope.** (See Attachment B)
- Can you provide the required levels of insurance coverage? See: General Conditions – Article 15
- Did you include the Bid Security?
- Can the bidder provide references to at least three (3) different prior contracts that have been completed within the past five (5) years that are similar in size and scope to the project indicated for this Contract?
- Did you provide proof of years in business/date of incorporation?
- Sub-contracting percentage shall **not exceed 60%** of the project cost.
- Did you include an audited or reviewed financial report for the last two (2) years with your bid?

ATTACHMENT B - CONTRACTOR REFERENCE SHEET

**FASHION INSTITUTE OF TECHNOLOGY
FRED P. POMERANTZ BUILDING
D442 FOURTH FLOOR CLASSROOM RENOVATION
INVITATION FOR BID NUMBER C1576**

FIT requests a minimum of three references for **completed** projects of similar size and scope. Please complete the following information for each reference: **(Do not list FIT as your projects of similar size and scope.)**

Contact Name/Title: _____
Company Name/Address: _____
Phone Number: _____
Project Name: _____
Project Cost: _____
Project Start/End Date: _____
For FIT Use Only – Reference Responses
Quality of Work: _____ Site Maintenance: _____
Scheduling: _____ Cooperation: _____ Safety Standards: _____
Permits: _____ Report Submittals: _____ Payments: _____
Other Relevant Factors: _____
Overall Performance Rating: Excellent ___ Satisfactory ___ Marginal ___ Unsatisfactory ___

Contact Name/Title: _____
Company Name/Address: _____
Phone Number: _____
Project Name: _____
Project Cost: _____
Project Start/End Date: _____
For FIT Use Only – Reference Responses
Quality of Work: _____ Site Maintenance: _____
Scheduling: _____ Cooperation: _____ Safety Standards: _____
Permits: _____ Report Submittals: _____ Payments: _____
Other Relevant Factors: _____
Overall Performance Rating: Excellent ___ Satisfactory ___ Marginal ___ Unsatisfactory ___

Contact Name/Title: _____
Company Name/Address: _____
Phone Number: _____
Project Name: _____
Project Cost: _____
Project Start/End Date: _____
For FIT Use Only – Reference Responses
Quality of Work: _____ Site Maintenance: _____
Scheduling: _____ Cooperation: _____ Safety Standards: _____
Permits: _____ Report Submittals: _____ Payments: _____
Other Relevant Factors: _____
Overall Performance Rating: Excellent ___ Satisfactory ___ Marginal ___ Unsatisfactory ___

FIT

Interviewer: _____ Signature: _____ Date: _____

SECTION II:
BID TERMS AND CONDITIONS

SECTION II. BID TERMS AND CONDITIONS

SPECIFICATIONS FOR FASHION INSTITUTE OF TECHNOLOGY FRED P. POMERANTZ BUILDING D442 FOURTH FLOOR CLASSROOM RENOVATION INVITATION FOR BID NUMBER C1576

I. INTRODUCTION

The Fashion Institute of Technology, a community college of art and design, business and technology of the State University of New York, currently has an enrollment of approximately 10,000 full and part-time students. Located in the Chelsea area of Manhattan, FIT's facilities are composed of a twelve building complex containing administrative/academic offices, classrooms, computer labs, and studios. There are three (3) residence halls located on West 27th Street that currently house approximately 1,250 students and one (1) residence hall located at 406 West 31st Street that houses approximately 1,100 students. F.I.T. Student Housing Corporation is a separate, not-for-profit corporation that was established pursuant to the laws of the State of New York to own and operate these residence halls for the benefit of the College and its students. For purposes of this project all references to FIT shall be recognized to refer to the Fashion Institute of Technology (hereafter, "FIT" or the "College") and the F.I.T. Student Housing Corporation together, unless specifically designated otherwise. The successful responsive and responsible bidder (hereinafter "Contractor") shall be required to enter into a contract with FIT based on the Contract Documents, (including Notice to Bidders, Bid Terms and Conditions, Contract Terms and Conditions, General Requirements, General Conditions, Labor & Material Payment Bond, Performance Bond, Form of Bid, Non-Collusive Bidding Certification, Substitution Form Request, Contract, Affirmative Action Form, Change Order, Form, Contractor's Trade Payment Breakdown, Safety EHS Plan, Prevailing Wage Schedule, Specifications, and Drawings), attached hereto and incorporated herein.

II. SUMMARY OF SCOPE OF WORK

The Work of the Project is defined by the immediately following Project Description herein below and by the Contract Documents.

Project Description: Provide labor, materials, tests, tools, and equipment to complete the renovation of an existing vacant office space and active mechanical room into a modernized mechanical room and new classroom D442. Contractor may begin survey and procurement of materials immediately following award.

The work includes demolition of an existing demising wall as well as its relocation. Existing lockers will be relocated in the corridor. A new fire-rated door with fire-rated glass to be installed. Duct work, diffuser, lighting and electrical will be new. New finishes include, window treatments, LVT, base, acoustical cotton ceiling, and paint. Furniture will be purchased by FIT, and installed by FIT's vendor. AV/IT wiring and equipment to be installed by FIT's AV and Data Contractors. Coordination with all of FIT's vendors and contractors

is required.

The installation of all finishes and equipment in accordance with industry standards and professionalism and the Manufacturer's Installation/Operation & Maintenance Manuals & Instructions shall be followed.

III. BIDDER REQUIREMENTS

Bidder shall meet the following requirements and submit necessary information with the Bid. Failure to comply with these requirements shall be grounds for rejection of your Bid. FIT reserves the right to reject bids with incomplete information or bid security, or which contain conditions not specified in the Bid Terms and Condition herein, or which are presented on a different form other than that provided to bidders. FIT reserves the right to determine whether a Bidder has substantially met all the Bid requirements and to ask for additional information prior to making such a determination.

- A. **Bidder shall have been primarily a General Contractor in the construction renovation business for a minimum of five (5) years as of the Bid Opening Date. Proof shall be submitted with the Bid.**
- B. Bidder shall have satisfactorily performed work of the size, scope and nature to be performed under this Contract, as evidenced by **references from at least three (3) different successfully completed contracts in an installation similar to those indicated for this Contract in the past five (5) years.** Bidder shall include for each reference: project location, dollar value of contract; initiation and completion date, name, title, address and telephone number of contact person. References cannot be members of FIT staff or FIT consultants.
- C. **Bidder shall attend the mandatory pre-bid meeting and site inspection. Failure to comply with this requirement shall be grounds for rejection of the Bid.**
- D. Bidder is responsible for all necessary field measurements, all necessary data on the existing conditions and verification of all quantities and dimensions listed in the Project Specifications and Drawings, if applicable.
- E. By submitting a Bid, Bidder agrees that s/he has examined the Contract Documents, visited the site, noted all conditions and limitations affecting the Work, and fully understands the nature of the Work. Bidder is required to inform FIT in writing immediately of any instance where changed conditions are encountered.
- F. Bidder shall submit documentation of financial viability, including balance sheets and profit and loss statement for the prior two (2) years, with the Bid.
- G. Bidder, upon request, shall submit copies of current licenses and certifications applicable to the work, including, but not limited to, licenses issued by the

Commissioner of Buildings of the City of New York. Proof of the following certificates will also be required: 10 Hour OSHA Outreach Training Program; Asbestos Awareness Training, FDNY Certificate of Fitness, with the Bid.

IV. APPROVAL OF SUBCONTRACTORS

Subcontracting shall be permitted **not to exceed 60%** of the work of the Project as determined by FIT. The ratio of the contractors and subcontractors work must be included with your bid submission. All subcontractors are required to gain prior written approval by FIT's Facilities Director. The General Contractor will be the Prime Contractor (hereinafter "Contractor") and shall be permitted to Subcontract the following types of Services:

- Services to develop, amend and/or upgrade EHS Plan
- Demolition
- Painting
- HVAC
- Electrical

The Contractor will require that the terms of this Contract apply to the sub-contractors and shall cause all sub-contractors to comply with the terms of this contract.

V. BID SECURITY

Failure to provide Bid Security in the prescribed manner shall result in the rejection of the Bid.

Bidder shall provide Bid Security in the form of either a bid deposit or a bid bond, at Bidders option. The bid deposit shall be in the form of a certified check made payable to "Fashion Institute of Technology" in an amount no less than two percent (2%) of the total bid price. The bid bond shall be in an amount no less than ten percent (10%) of the total bid price.

VI. PRE-BID SITE INSPECTION AND QUESTIONS

A **mandatory** Pre-Bid Site Inspection for prospective Bidders will be held on **June 21st, 2023 at 10:00 A.M.** at the Fashion Institute of Technology, Feldman Building "C Building" Lobby, located at 27th Street (between 7th and 8th Avenues). We highly encourage the Bidder to invite their sub-contractors as this will be the one and only site visit prior to awarding the project. **Failure of the Bidder to attend the mandatory pre-bid site inspection shall be grounds for rejection of your Bid. Please also bring a business card.**

Bidder shall examine the Bid documents carefully. Before bidding, Bidder shall make any requests for interpretation of Bid documents or clarification of any ambiguity therein that should have been detected by a reasonably prudent Bidder. Questions shall be submitted in writing to the attention of Purchasing Department via email: purchasingbids@fitnyc.edu, no later than **June 28, 2023 on or before 3:00 P.M.** Answers shall be provided in the form of Addendum and be posted on the FIT purchasing department website. Reference Bid number **C1576**.

VII. **BID DESIGNATION**

- A. FIT is **ONLY** accepting electronic scanned bids for the subject project. You must email your bid to purchasingbids@fitnyc.edu in PDF format and it should include all the requested documents (See Attachment A – Bid Checklist) including a scanned image of your bid security (Certified Check of 2 percent or Bid Bond of 10 percent of your total bid price), we'll also need you to mail us the original copy of the bid security to have on file. The bid security must either be mailed to 227 W 27th Street, New York, NY 10001 or dropped off at 333 7th Avenue (16th Floor), New York, NY 10001. Bids must be received by **July 7th, 2022, on or before 12:00 P.M.** All bidders will be notified of the bid results within the hour. Bid results are not official until each package has been fully reviewed.
- B. Bids received late will not be considered.

VIII. **PREPARATION OF THE BIDS**

- A. Bids must be submitted on the forms supplied by FIT in the Bidder's full legal name or the Bidder's full legal name plus a registered assumed name. All blank spaces for bid prices must be filled in, using both words and figures, words to take precedence over figures. **Conditional bids shall not be accepted.** Bids shall not contain any recapitulation of the Work to be done. Bidder exclusions shall be grounds for bid rejection. Do not modify the bid forms supplied by FIT
- B. Bids that are illegible or that contain omission, alterations, additions or items not called for in the bidding documents may be rejected as not responsive. Any bid which modifies, limits, or restricts all or any part of such bid, other than as expressly provided for in the Notice to Bidders, Bid Terms and Conditions, and Contract Terms and Conditions, may be rejected as not responsive.
- C. FIT may reject any bid not prepared and submitted in accordance with the provisions of the Notice to Bidders, Bid Terms and Conditions, and Contract Terms and Conditions. Neither FIT nor the FIT Student Housing Corporation will be responsible for receipt of any Bid which does not comply with these instructions. Only those Bids emailed to the FIT Purchasing Dept. inbox (purchasingbids@fitnyc.edu) on or before **July 7, 2023, on or before 12:00 PM** will be considered.
- D. Any bid may be withdrawn prior to the scheduled time for the opening of bids or authorized postponement thereof and any bid received after such time and date shall not be considered.
- E. No Bidder may withdraw a bid within ninety (90) days after the actual date of the opening thereof.

IX. **AWARD OF CONTRACT**

- A. The award of the Contract shall be made to the Bidder submitting the lowest responsible bid if, in the opinion of FIT, the bid is responsive to the bid solicitation, and such Bidder is responsible and qualified to perform the work involved in the sole discretion of FIT. The lowest bidder will be considered the contractor with the lowest bid for the base bid. In case FIT will decide to include the 'alternate' in the scope of work, the lowest bidder will be considered the contractor with the lowest total of the base bid plus the alternate bid.
- B. FIT reserves the right to reject any bid or all bids, to waive any informalities or irregularities or omissions in any bid received.
- C. During the term of the Contract, the Contractor shall promptly notify FIT of any change in the ownership of the Contractor. Failure to notify FIT may result in termination of the Contract.
- D. FIT reserves the right, exercisable in its sole discretion, to cancel and withdraw from the Project at any time in advance of the award.
- E. Prior to the opening of the bids, Bidder shall promptly notify FIT of Change in ownership of the Bidder. Failure to notify with this bid shall be grounds for rejection of the Bid.

X. DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful Bidder, upon failure or refusal to execute and deliver the Contract and bond required within ten (10) days after such Bidder has received notice of the acceptance of such bid, shall forfeit to FIT as damages for such failure or refusal, the security deposited with the Bid or the sum of the difference between the total bid of the successful Bidder and the total bid of the Bidder submitting the next lowest bid, whichever sum shall be higher.

XI. PREVAILING WAGE

This contract is subject to New York State Labor Law 220, Article 8 Prevailing Wage Schedules. The Contractor shall submit with, each invoice, certified payrolls for all labor. Submission of a Certified Payroll with invoice in full compliance with labor laws is a condition of payment.

Contractor and its subcontractors shall pay at least the prevailing wage rate and pay or provided the prevailing supplements in accordance with the Labor Law.

A copy of the prevailing wage schedule, for New York County, can be found at the New York State Department of Labor website. (PRC# 2023006714).

www.labor.ny.gov

Bidder must also comply with all applicable federal, state, and local laws rules, regulations, requirements, and codes, including but not limited to, the statues regulations, laws, rules and requirements specifically referenced in the documents annexed hereto.

XII. M/WBE AND SDVOB

FIT encourages minority and women business enterprise participation in this project by contractors, subcontractors and suppliers, and all bidders are expected to cooperate with that commitment. Also, bidders are encouraged to use Service-Disabled Veteran-Owned Businesses (SDVOB). A directory of New York State Certified Minority and Women's Business Enterprises is available from: Empire State Development Corporation, Minority and Women's Business Development Division at: <http://www.esd.ny.gov/mwbe.html> to assist potential bidders in locating sources of M/WBE subcontractors and reaching these goals. SDVOBs can be readily identified on the directory of certified businesses at: <https://online.ogs.ny.gov/SDVOB/search>."

XIII. MISCELLANEOUS

- A. FIT reserves the right to request clarifications from bidders for purposes of assuring a full understanding of responsiveness and further reserves the right to permit revisions from all bidders who might be, in FIT's sole discretion determined to be viable bidders for contract award, prior to the award.
- B. FIT reserves the right to reject separable portions of any offer, to negotiate terms and conditions consistent with the bid, and to make an award for any or all remaining portions.
- C. FIT reserves the right to eliminate mandatory requirements unmet by all bidders.
- D. Any additional vendor terms which are attached or referenced with a submission shall not be considered part of the bid or proposal, but shall be deemed included for informational purposes only.
- E. Unless otherwise specifically stated in the Bid Terms and Conditions, all specifications and requirements constitute minimum requirements. All bids must meet or exceed stated specifications and requirements.
- F. FIT reserves the right to make an award to the responsive and responsible bidder whose product or service meets the terms, conditions, and specifications of the Bid and whose bid is considered to best serve FIT's interest. In determining the responsiveness and responsibility of the bidder, FIT may consider the following factors, including but not limited to: the ability, capacity, and skill of the bidder to perform as required; whether the bidder can perform promptly, or within the time specified without delay or interference; the character, integrity, reputation, judgment, experience and efficiency of the bidder; the quality of past performance by the bidder; the previous and existing compliance by the bidder with relevant laws and regulations; the sufficiency of the bidder's financial resources; the availability, quality, and adaptability of the bidder's equipment, supplies and/or services to the required use; and the ability of the bidder to provide future maintenance, service, and parts.

XIV. EXECUTIVE ORDERS/COVID-19

Contractors and Subcontractor shall comply with Governor Cuomo's Executive Order 202 & 202.16 (Exhibit E) and the COVID-19 Contractor Guidance for Construction Jobsites (Exhibit F). In addition to the foregoing requirements you are responsible for compliance with any additional safety directives that may be forthcoming by Executive Order between the date of issuance of this addendum and the date of award.

In the event the Contractor's performance under this agreement is delayed or interfered with arising out of or connected to the COVID19 pandemic, including but not limited to worker availability, government-mandated suspension of work or any other emergency action associated with protecting the health and safety of the workforce, which leads to a site closure, delay or suspension of the work, Contractor or any subcontractors hereby acknowledge their only remedy under this agreement is to request an extension of time for the performance of the unfinished work as herein provided; under no circumstances will Contractor or any subcontractors or vendors be entitled to any increase in the subcontract price or additional compensation for any alleged costs, expenses or damages as a consequence of such delays or interference, including but not limited to: i) General Condition Costs (e.g.: site clean-up, home and field office expenses, telecommunications equipment or use, and/or supervisory costs including but not limited to Project Manager, Project Engineer, Superintendent and Foremen, etc.), ii) escalation (increases in material costs, transportation charges or any alleged wage or salary increases) or iii) any alleged inefficiencies or loss of productivity. NOTE: The above examples are not intended to be an exhaustive list of all the alleged costs, expenses or damages excluded by this clause. It is offered only as an example of some costs within each category.

Owner shall review the Contractors request for delay and, if acceptable, shall extend the time of performance by Change Order for such reasonable time as the Owner, in its sole discretion, may determine.

SECTION III:
CONTRACT TERMS AND CONDITIONS

SECTION III. CONTRACT TERMS AND CONDITIONS

I. COMPLIANCE REQUIREMENTS

All work hereunder, including but not limited to material and installations, shall be in compliance with the Contract Documents including both specifications and drawings, as well as all applicable state and local building codes (such as the New York City Building Code) and the rules, regulations of governmental agencies and utility companies having jurisdiction over the work.

The following additional notes shall be considered as part of the officially filed drawings:

NONE

THE WORK:

Unless modified by the Contract Documents, the work of each section of the specifications shall include all labor, materials, testing, tools and equipment necessary and reasonably incidental to work on the D442 Classroom Renovation project.

WORKMANSHIP:

All work shall be performed by persons skilled in the work. Work shall be installed true to dimension, plumb and level with neat, accurate cutting and fitting of all materials in accordance with recognized standards of workmanship.

ON-SITE VERIFICATION:

The Contractor shall verify all dimensions and site conditions prior to commencing the work. Dimensions may not be scaled from drawings. Should there be a discrepancy, Contractor is to notify FIT Facilities Director and Architect immediately for clarification.

COORDINATION OF THE WORK:

The Contractor shall be responsible for the coordination of the work and the means and methods of construction and provide FIT with the resume of Contractor's project manager ("Project Manager"). FIT's Facilities Director shall approve the Project Manager and reserves the right to request a replacement Project Manager upon reasonable notice.

WORK HOURS:

Regular work hours are from **7:00 am to 9:00 pm** unless otherwise specified in the Contract Documents. Contractor will have reasonable access to the site in order to complete the work in the given time frame. Contractor shall comply with FIT's additional work rules related to such extended access. All labor costs required to meet this deadline are the sole responsibility of the Contractor and shall be included in the contract price. FIT reserves the right to put the work on hold on three (3) occasions during the course of construction for any length of time and for any reason.

PERFORMANCE AND PAYMENT BONDS

In addition to the insurance and bond requirements specified in the General Conditions, Performance and Payment Bonds shall be required for the Work of this Contract.

- A. Simultaneously with the delivery of the executed Contract, Contractor shall furnish to FIT and maintain, at its own cost and expense a Performance Bond in an amount at least equal to one hundred percent (100%) of the contract price as security for faithful performance of the Contract and also a Labor and Material Payment Bond in an amount at least equal to one hundred percent (100%) of the Contract price for the payment of all persons performing labor on the project under the contract or furnishing materials in connection with the Contract. The surety on such bonds shall be a surety company rated B+ or better by A.M. Best Company, shall be licensed to do business in the State of New York, and shall hold a certificate of authority as an acceptable surety on federal bonds or otherwise satisfactory to FIT.
- B. Attorneys-in-fact who sign said bonds on behalf of a surety must affix to each bond a certified and effectively dated copy of their power of appointment.

CONFLICTS, ERRORS AND OMISSIONS:

1. The Contract Documents and typical details apply throughout the work unless noted otherwise.
2. In the event that certain features of the work are not fully shown on the drawings, Contractor must obtain clarification from the FIT Facilities Director and Architect through the use of an AIA Standard RFI form (copies can be obtained from the Architect) before proceeding with the work.
3. In the event of conflicts with the drawings and/or specifications, the Contractor must promptly notify the FIT Facilities Director and Architect. The Architect will determine which shall govern.

MANUFACTURER'S PRODUCTS AND FABRICATIONS:

1. All manufacturers and fabricators printed warnings for handling of their products must be strictly observed.
2. All products and materials must be provided and installed in strict accordance with the recommendations of the manufacturer. In the event of conflict between the drawings or the specifications and the manufacturer's recommendations, Contractor must notify FIT Facilities Director and Architect to obtain clarification before proceeding with the work.
3. Contractor must verify all materials and manufactured items to be in conformance with applicable codes and regulations.

DELIVERY AND STORAGE OF MATERIALS:

1. All materials shall be new and delivered to the site in original, unbroken containers.
2. All materials shall be inspected by the Contractor at time of delivery and Contractor shall reject material evidencing damage or other defects.
3. Contractor shall provide secure and environmentally compatible storage facilities for all materials in accordance with the recommendations of the manufacturer.

PROJECT SCHEDULE:

1. Contractor shall attend a Project Initiation Conference, prior to the commencement of work at the site. Attending this Conference on behalf of the Contractor shall be a representative of FIT and the Project Manager assigned to the project. Contractor shall submit at this Conference a detailed timeline indicating the important milestones of the project and establishing an estimated date of substantial completion in accordance with Contract Documents. He/she shall also present all submittals required by the Contract Documents, such as Insurance Certificates, product tear sheets (not at the initial conference), copy of the General Liability insurance policy (amended to reflect required additional insureds), etc. Project access, storage locations, required crew size and other relevant issues shall also be addressed at this Conference.
2. Time is of the essence. Contractor shall be required to commence work of the Fashion Institute of Technology D442 Classroom Renovation, within five (5) working days of receipt of a Notice to Proceed from FIT. The shop drawings process and ordering need to proceed first. Work shall commence on or about **July 13, 2023**. **The project shall be Substantially Completed no later than October 12, 2023**. Contractor must be demobilized and leave the job site on the ending date of work period. Only close-out, administrative tasks may continue beyond the closing date. Unless otherwise specified, the work is to be performed solely between the hours of **7:00 A.M. to 9:00 P.M.**, Monday through Friday, legal and union holidays excluded. All labor costs encountered to meet this deadline are the sole responsibility of the Contractor and shall be included in the Bid Price. FIT reserves the right, at no financial liability associated with the same, to put the Project work on hold on as many as three (3) separate occasions during the course of the Project for any length of time and for any reason.
3. On Monday of each week during the construction period, the Contractor shall email to FIT's Facility Director (or such other individual as FIT may designate at its sole discretion) a written report outlining the work completed during the preceding week and the work planned for the upcoming week. Included will be any unforeseen or anticipated problems regarding implementation of the work, in addition to Change Order requests, submission data, etc. Daily reports **MUST** be submitted to the CM and or the Facilities Department Designee.
4. Job meetings will be held at the site on dates to be determined by Architect and FIT. These meetings shall be attended by an officer of the Contractor, the Project Manager, FIT's representative, and the Architect. The purpose of these meetings will be to review

the status of the project, discuss any potential changes to the project scope, and resolve any problems relating to successful completion of the work.

5. Owner's meetings will be held weekly via zoom when needed. The dates to be determined by the Architect and FIT. These meetings shall be attended by the Contractors Project Manager, FIT, and the Architect. The purpose of these meetings is to keep the Owners informed of the process and to discuss any issues relating to the successful completion of the work.

PAYMENT:

In accordance with, and in addition to, the payment requirements of the Contract Documents, the Contractor shall provide sufficient and appropriate documentation for all invoices to FIT including submittal of invoices for actual cost of materials, labor rates, and certified payrolls. Filing of such payrolls shall comply with the New York State Labor Law and is a condition precedent to payment. FIT reserves the right to request additional information and/or documentation at any time.

Contractor is required to submit Monthly Contractor's Compliance Form (as attached in Section XII. Affirmative Action Form) with each Payment Requisition.

Contractor is required to submit a Certificate of Monthly Payment/Lien Waiver signed by each Sub-contractor with each Payment Requisition.

Contractor is required to submit Waste Management Form with each Payment Requisition.

LABOR HARMONY:

- A. Contractor is advised that he/she must maintain labor harmony throughout the duration of the Contract. All labor disputes, slowdowns, strikes and/or sympathy actions will be the sole responsibility of the Contractor to resolve in order to maintain harmony.
- B. All costs, delays and scheduling impacts associated with any labor dispute that arises from such action or inaction will be borne by the Contractor.
- C. Contractor will also be responsible for all costs, damages and scheduling impacts which affect and disrupt any other workers on site as well as FIT employees.
- D. It will be the Contractor's responsibility to resolve all labor disputes immediately.

Contractor is further advised that FIT has a large union presence on the campus. All work performed by the Contractor must provide the required labor harmony to perform work without labor incident or dispute which can delay, obstruct or effect the work and project schedule, or interfere with FIT's ability to operate.

II. GENERAL NOTES

In accordance with, and in addition to, the requirements of the Contract Documents:

1. All work listed on the construction notes and shown or implied on all drawings shall be supplied and installed by the Contractor unless otherwise noted on drawings and/or in specifications.
2. Contractor to determine coordination of trades.
3. Contractor shall verify all dimensions and conditions shown on drawings and shall notify FIT Facilities Director and Architect of any discrepancies, omissions, and/or conflicts before proceeding with the work.
4. Contractor must comply with the rules and regulations of agencies having jurisdiction and shall conform to all construction and safety codes, statutes and ordinances. All fees, taxes, permits and applications to be obtained through governmental agencies shall be the responsibility of the Contractor.
5. Contractor shall comply with the rules and regulations of the building as to hours of availability of loading docks and elevators for the purposes of delivery, waste removal and other needs related to the work. Coordination with FIT Facilities Department is required for the handling materials, movement in and out of building, equipment and debris to avoid conflict and interference with normal building operations.
6. All drawings and construction notes are complementary and what is called for by any will be binding as if called for by all.
7. Contractor shall maintain a current and complete set of construction documents on the construction site during all phases of construction.
8. Do not scale drawings; dimensions shown govern. Larger scale drawings shall govern over smaller scale.
9. Contractor shall maintain a current and complete set of shop drawings on the construction site
10. Contractor shall maintain a current and complete RFI (Request for Information) log on the construction site.
11. Contractor shall submit for approval, prior to commencing work, a list of all sub-contractors to FIT's Facilities Director, with the name, address and phone number of the principal contact of each sub-contractor. In addition, he will file with the owner the emergency numbers available for 24-hour contact.
12. All work shall be performed by skilled and qualified workmen in accordance with the best practices of the trades involved and in compliance with building regulations and/or governmental laws, statutes or ordinances.

13. All materials shall be new, unused and of professional quality, unless otherwise noted, installed as per manufacturer's recommendations and instructions.
14. For purposes of the Specifications and Drawings sections in the Contract, the use of the words "Supplied By" or "Provided" in connection with any item specified is intended to mean that such item shall be furnished, installed and connected where so required.
15. All approvals of submittals shall be for design intent only. Contractor shall be responsible for quantities, dimensions and compliance with Contract Documents and for information pertaining to fabrication processes or techniques of first class construction and for coordination with other trades.
16. All work shall be erected and installed plumb, level, square, true and in proper alignment.
17. Contractor shall be responsible for cutting, patching and restoration required for this work.
18. If, during the course of construction, Contractor believes materials that might contain asbestos may be disturbed during performance of the work, Contractor shall immediately notify FIT of the area(s) of concern, and stop work if that area would be disturbed by the continuing work.
19. All correspondence to FIT shall be directed to the attention of the FIT Facilities Director with a copy of the same forwarded to the Architect.
20. Contractor shall at all times keep the premises free of accumulation of waste materials and rubbish; premises to be broom swept clean daily. At the completion of the work, Contractor shall leave the job site free of construction debris and materials, and "broom clean" including thorough cleaning of toilets, bathrooms, electrical closets, stairwells, and all areas of work or staging, etc.
21. Contractor shall provide all necessary protection against dirt and damage within the premises, as well as public areas, and shall be responsible for keeping these areas clean and free of materials at all times.
22. Contractor shall verify location of existing utilities and coordinate with location shown on drawings.
23. During construction, security and fire exit doors must remain unobstructed at all times.
24. Contractor shall take every precaution to properly protect all existing construction to remain. Contractor shall be responsible for all damaged areas to be returned to original condition.
25. Contractor shall schedule construction, in such a manner so as not to disturb areas outside of the area under construction during normal operating hours. The Contractor shall coordinate with FIT Facilities Director minimum of 24 hours prior to any disruption of services to those areas not under construction even if such a disruption occurs during or after normal operating hours.

26. Contractor shall staff the project with a Project Manager with at least 5 years' experience in this type of project scope, with similar complexity and schedule requirements.
27. The acceptance of shop drawings containing deviations not specifically brought to the attention of FIT, or containing errors or omissions of any sort, shall not relieve Contractor of the responsibility for executing the Work in accordance with the Contract Documents and Contract Terms and Condition.

III. DEMOLITION NOTES

In accordance with, and in addition to, the requirements of the Contract Documents. It shall be Contractor's responsibility to perform the following:

1. Prior to commencement of selective removals and demolition work, inspect the areas in which the work will be performed.
2. Any asbestos contaminated material will be removed by FIT's certified asbestos abatement contractor prior to the work of this contract.
3. Provide temporary barricades and other forms of protection required to protect all FIT personnel, inclusive of its faculty, staff and students as well as the general public from injury due to selective removals and demolition work.
4. Remove and dispose of exposed bolts, supports, brackets, cleats, grounds, and other items, that are no longer required for the purpose for which they were originally installed.
5. Where existing work is required to be removed and replaced but found to be defective in any way, it shall be reported to the FIT Facilities Director and Architect before it is disturbed.
6. All existing work damaged or lost as a result of performing the required new work, shall be patched, repaired or replaced with new, and finished to match the existing work, or as the individual case requires at the Contractor's expense.
7. Perform cutting, drilling and removals in a manner which will prevent damage to construction which is to remain.
8. Promptly repair any and all damages to all property and finishes caused by the removals and demolition work; to FIT's satisfaction and at no extra cost to FIT.
9. Cut, patch, paint and finish existing walls, ceiling and/or floor disturbed to match existing.
10. Perform patching around items penetrating existing construction in a manner that will maintain the water and fire resistive capability of existing construction. Should either of these be compromised, it is the responsibility of the Contractor to repair prior to completion.

11. Remove debris, rubbish and other materials resulting from the removals and demolitions from the building immediately; transport and legally dispose of materials off-site. Disposal method shall be in accordance with city, state and federal statues regulations, and ordinances.
12. Work of this section shall conform to all requirements of the New York City Building Code and all applicable regulations and guidelines of all governmental authorities having jurisdiction, including, but not limited to, Safety, Health and Anti-Pollution regulations.
13. Work is to conform to OSHA requirements.

IV. ADDITIONAL CONTRACTOR'S RESPONSIBILITIES

In accordance with, and in addition to, the requirements of the Contract Documents:

1. Contractor shall coordinate all work with FIT Facilities Department and Director.
2. Contractor to provide daily crew manpower log/count to FIT.
3. Contractor shall perform work in a neat workmanlike manner in accordance with accepted industry standards.
4. FIT Facilities Department shall notify Contractor before commencing work which floors are accessible by Contractor.
5. Contractor shall mask all signs, window frames, door frames, etc. when painting around them.
6. Contractor shall use Benjamin Moore, Regal Paint, or approved equal.
7. Employee Identification and Building Access: All Managers and their crew must wear at all times company identification. All Managers and their crew must sign in and out, upon entering and leaving the facility, at the FIT front security desk.
8. After Bid opening, FIT will evaluate and review submissions and notify the lowest Bidder, who is deemed most responsive and responsible. Within five (5) business days of such written notification, such Bidder shall submit the following information. Failure to comply with these requirements in whole or part shall constitute grounds for rejection of the Bid. FIT reserves the right to determine whether a Bidder has substantially met these requirements and to ask for additional information. Documentation of the following:
 - a. Health and safety training program and procedures for employees and on-site EHS Coordinator.
 - b. Copies of current licenses and certifications applicable to the Work, including but not limited to licenses issued by the Fire Department of New

York, Department of Buildings of the City of New York, must be provided to FIT Facilities.

9. Contractor shall complete the attached Outline for Preparing Work-Specific Environment, Health and Safety Plan (“EHS Plan”) which will be reviewed and approved by FIT’s EHS Compliance Director prior to commencement of work. Contractor shall include the costs of completing the EHS Plan in the Bid price. Proof of the 10 Hour OSHA Outreach Training Program for Construction certificate will be required.
10. Contractor shall provide as described in the FIT Safety EHS Plan, legible copies of SDS sheets and estimates of anticipated amounts of chemicals Contractor intends to store on site to the FIT’s Director of EHS Compliance for review and approval at least ten (10) days before Contractor allows on-site storage.
11. Contractor shall ensure that legible copies of all SDS are available at the location of chemical storage and available for review at all times. Contractor shall take all necessary precautions necessary to prevent vapors, fumes, or dust from leaving the work area. This includes but is not limited to the construction of negatively ventilated containments as controls.
12. Contractor shall provide as described in the FIT Safety EHS Plan a written statement of the types of project waste disposed, including the amounts and the name of the waste disposal facility for each type of waste disposed. Contractor shall provide the statement with each Payment Application. Contractor shall provide a separate copy of the statement to FIT’s Director of EHS Compliance.
13. Contractor may not store Hazardous Waste on site at any time. Contractor may not generate or accumulate Hazardous Waste on site without the written approval of FIT’s Director of EHS Compliance. Contractor shall obtain FIT’s Director of EHS Compliance approval at least ten (10) days before the Contractor generates or accumulates Hazardous Waste on site beginning with demolition work.
14. Off-site shipments of Universal or Hazardous Waste. The Contractor may not allow the off-site removal of Universal or Hazardous Waste without the written approval of the FIT Director of EHS Compliance. Contractor will ensure that the FIT Director of EHS Compliance alone signs any shipping papers for the off-site removal of Universal or Hazardous Waste.
15. Contractor’s personnel must report daily to the FIT Security area in the Feldman Lobby of Building “C” before entering FIT’s site. All Contractor’s personnel must obtain temporary FIT identification that shall be displayed at all times while on the FIT site. While on FIT property, all Contractor’s personnel shall be subject to all FIT campus policies and procedures,

including, but not limited to, prohibitions related to tobacco, drug, and alcohol use, and policies and procedures regarding appropriate and civil conduct. Contractor's personnel shall not fraternize with FIT students and employees beyond what is necessary to complete their work or any assigned Projects. FIT policies may be found at <https://www.fitnyc.edu/policies/>. FIT reserves the right, in its sole determination, to eject from the campus, any Contractor personnel violating such policies, in addition to any other rights and remedies.

V. **PERMITS**

Contractor shall be responsible for obtaining all required Permits and paying all costs and fees associated therewith. New York City Department of Buildings (DOB) Work Permit will be required for this project. Contractor will also be required to perform the following functions as it relates to this project:

- A. Contractor shall submit to FIT and Engineer appropriate Workman's Compensation and New York State Disability insurance certificates for use in securing the required Work Permits to be posted at the site. The Contractor shall provide FIT's Facility Director with the appropriate insurance tracking numbers assigned to their firm by the NYC Department of Buildings.
- B. The Contractor shall submit to FIT and Engineer a copy of all Licenses as issued by the NYC Department of Buildings.
- C. Permits for the work shall be posted by the Contractor in a conspicuous location at the site at all times. No work shall begin until the necessary DOB work permits have been obtained by the Contractor.
- D. The Contractor shall be responsible for obtaining any other governmental permits and approvals required to undertake the work, and shall pay any and all fees associated therewith.

VI. **PROJECT MANAGER**

1. The Contractor shall provide the services of an experienced Project Manager, who shall be in continual responsible charge of the work and shall have a valid Certificate of Fitness by the New York City Department of Buildings.
2. The Project Manager shall be on site at all times, shall speak fluent English, shall maintain on the site a complete set of these specifications (including any addenda and/or change orders, as well as all project drawings and all applicable manufacturers' instruction sheets), and shall have full authorization to make all field changes as directed by FIT's Facility Director and Architect.
3. The Project Manager shall be required to maintain a daily log at the site indicating the following:

-the date

-the number of workers at the site on said date

-the specific work and locations of the Work completed on said date

4. The Project Manager (or another authorized representative of the Contractor) shall telephone FIT's Facility Director at least once daily throughout the construction period, to report on the day's activities and the work planned for the following day.
5. The name of the Project Manager shall be submitted to FIT's Facility Director prior to initiation of the project. This Manager shall remain in charge of the project for its entire length, at FIT's discretion, unless said Manager no longer remains in the employ of the Contractor. In such case, a capable and experienced replacement shall be immediately assigned subject to approval by FIT's Facilities Director.
6. No telephone service is available at the site for use by the Contractor; therefore, the Contractor shall equip the Project Manager with a cellular telephone at the site for the duration of the Project. The Contractor shall provide FIT and Architect with the appropriate contact numbers at the initiation of the Project.

VII. SUBMISSIONS AND SUBSTITUTIONS

1. All submissions called for in the Contract Documents shall be submitted at least twenty (20) working days prior to proposed initiation of any related work.
2. FIT and FIT's Architect and Engineer will review and accept or take other appropriate action regarding Contractor submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. FIT's review of all shop drawings submitted by the Contractor shall be for concept only and does not remove the Contractor's responsibility for insuring that all specific details of the installation shall be performed in such a way so as to achieve satisfactory results. Acceptance by FIT, the Architect & Engineer of Contractor submittals does not relieve the Contractor from responsibility for errors which may exist in the submitted data.
3. Where the phrase "or approved equal" or "equal as approved by FIT" occurs in the Contract Documents, the Contractor may not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically approved by FIT and the Architect.
4. Any proposed substitute products or procedures are to be submitted to FIT's

assigned Architect/Engineer for prior approval with any proposed price adjustments to the contract within 14 days of the signing of the agreement between FIT and the Contractor, so that FIT, the Architect and Engineer are permitted adequate time for review.

VIII. PROGRESS PAYMENTS

1. All submissions called for in the Contract Documents shall be submitted at least twenty (20) working days prior to proposed initiation of any related work.
2. Progress payments will be made to the Contractor based solely on actual work completed. Furthermore, payment will not be made for the purchase of materials, nor for their transfer onto the site, nor for any costs associated with mobilization.
3. Payment requests shall be submitted to FIT's Facilities Director on AIA Documents G702 and G703.
4. Payments will be authorized based upon FIT's field visits and review of work. All FIT's decisions regarding progress payments shall be final.
5. The values quoted on the bid form shall constitute the Schedule of Values for AIA Document G703. Additional breakdown of the bid form shall be provided on the Schedule of Values and will be used for progress payments.
6. No progress payments will be processed without submission by the Contractor of properly executed Affidavit of Payment and Release of Liens (AIA Documents G706 and G706A or equivalent forms as may be requested by FIT), up-to-date weekly written reports and timeline in bar chart form, and all submittals, certificates, permits, etc. required pursuant to the terms of the contract.
7. A 10% retainage shall be deducted from all progress payments made by FIT.
8. Payment requests shall be submitted to FIT not more than once per month.
9. Contractor shall provide sufficient and appropriate documentation for all invoices to FIT including submittal of invoices for actual cost of materials, labor rates and certified payrolls. Filing of such payrolls shall comply with the Labor Law and is a condition precedent to payment. FIT reserves the right to request additional information at any time. Contractor required to submit Monthly Contractor's Compliance Form with each Payment Requisition.
10. Contractor required to submit a Certificate of Monthly Payment signed by each Sub- contractor with each Payment Requisition.
11. Contractor shall be required to submit a detailed Trade Payment Breakdown.

IX. SITE VISITS BY ARCHITECT/ENGINEER

1. Failure by Architect/Engineer to detect and/or notify the Contractor of any aspect of the Contractor's actions or materials that are not in conformance with the Contract Documents shall not remove the Contractor's responsibility to adhere to the Contract Documents in all instances, including but not limited to the Contractor's responsibility to expeditiously correct and/or replace all defective work.
2. Architect/Engineer will be the final judge as to whether the work is satisfactorily performed, and shall have the authority to order that any work deemed unacceptable or not in conformance with the Contract Documents be redone by the Contractor at no cost to FIT.
3. Architect/Engineer shall have no responsibility for the presence, discovery, identification, handling, removal or disposal of, or exposure of persons to hazardous materials in any form at the Project site.

X. CHANGE ORDERS

1. FIT may order changes in the work of any quantity and without invalidating the Agreement so long as the Contract Sum and/or Contract Time of Completion are adjusted accordingly. All such changes in the work shall be authorized by written Change Order. All Change Orders shall be reviewed by Architect and Engineer and authorized by a representative of FIT.
2. No work shall be performed by the Contractor unless it is specifically included in the Contract Scope of Work or authorized in advance by a bulletin issued by the Architect which will serve as the backup paperwork for a change order. The contractor needs to submit a Change Order. All work to proceed prior to approval of change orders. Change Orders will be negotiated fairly in separate meetings. All written Change Orders are to be signed by all parties.
3. Any sums to be paid to Contractor as a result of any Change Order or any sums to be credited to FIT as a result of any Change Order shall be computed by one of the following methods:
 - (1) As agreed upon between the parties to the contract in writing prior to commencement of the work required by the Change Order, or;
 - (2) By Unit Prices detailed in the Contract Documents or subsequently agreed upon.

XI. GUARANTEES

1. All work on this project shall be guaranteed by the Contractor for a period of not less than five (5) years, or longer where covered by manufacturer warranty. Warranty to start on the day of the final signoff by FIT.
2. If within the guarantee period any of the work is found to be defective or not in conformance with the Contract Documents, the Contractor shall correct it promptly at his own expense after receipt of written notice from FIT.

XII. FINAL PAYMENT

1. Final payment (retainage) shall be released to the Contractor thirty (30) days after the project has been signed off by FIT and Architect/Engineer and the Contractor has satisfied all requirements of the Contract Documents.
2. In addition to any other requirements of the Contract Documents final payment shall not become due until the Contractor has delivered to FIT and Architect a fully executed 1-year guarantee for all work performed under this project, as well as a complete release of all liens arising out of this Contract, or receipts in full covering all labor, materials, equipment, applicable finance charges, and fines for which a lien could be filed. If such lien remains unsatisfied after payments are made, the Contractor shall refund to FIT all money that FIT may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.
3. A Performance Bond and a Labor & Material Payment Bond, a copy of the "Contractor's Affidavit of Payment of Debts and Claims (AIA Document G706)" and "Consent of Surety to Final Payment (AIA Document G707)" shall be submitted by the Contractor prior to the release of final payment.
4. One (1) set each of record drawings (measuring 24 inches by 36 inches) indicating the "As- Built" manner of installation of all work, shall be submitted to FIT and Engineer prior to the release of final payment.
5. Once the project has reached substantial completion, FIT and Architect will prepare a "Certificate of Substantial Completion". This certificate must be signed by all parties (Engineer, FIT and Contractor), to acknowledge the date the project has reached substantial completion, and confirm agreement on a final punch-list of work to be performed. The Contractor shall be responsible for completing all punch-list items prior to release of final payment.

XIII. SUPPLEMENTAL CONDITIONS

Project Schedule. Contractor shall complete all work as specified within the time period specified in the Contract Documents, inclusive of rain days, but excluding any shutdowns

authorized by FIT.

XIV. PREVENTIVE MAINTENANCE SCHEDULE

Prior to final payment, the contractor shall provide a recommended maintenance schedule from the manufacturer for quarterly, semi-annual and yearly requirements, including part numbers where applicable, upon completion of the job.

BID ANALYSIS FORM FOLLOWS

ATTACHMENT C – BID ANALYSIS FORM

**FASHION INSTITUTE OF TECHNOLOGY
 FRED P. POMERANTZ BUILDING
 D442 FOURTH FLOOR CLASSROOM RENOVATION
 INVITATION FOR BID NUMBER C1576
 NYS PREVAILING WAGE SCHEDULE PRC# 2023006714**

BID BREAKDOWN

Line	Description	Total Labor Cost	Total Materials, Tools & Equipment	Line Total
1	SELECTIVE DEMOLITION	\$	\$	\$
2	CONCRETE	\$	\$	\$
3	METALS	\$	\$	\$
4	WOOD, PLASTIC AND COMPOSITES	\$	\$	\$
5	THERMAL AND MOISTURE PROTECTION	\$	\$	\$
6	OPENINGS	\$	\$	\$
7	FINISHES	\$	\$	\$
8	FURNISHINGS	\$	\$	\$
9	HVAC	\$	\$	\$
10	ELECTRICAL	\$	\$	\$
11	SPECIAL REQUIREMENTS HVAC/ELECTRICAL	\$	\$	\$
12	GENERAL REQUIREMENTS	\$	\$	\$
13	GENERAL CONDITIONS	\$	\$	\$
14	NONE	\$	\$	\$
15	NONE	\$	\$	\$
16	NONE	\$	\$	\$

TOTAL BID PRICE (1-16) \$ _____

As stated in Section IV of the front-end documents: Subcontracting shall be permitted **not to exceed 60%** of the work of the project. Please provide the ratio of the contractors and subcontractors work that will be used on this project.

Contractor _____ **%**, **Subcontractor(s)** _____ **%**

For Bidding Purposes: the following sections pricing should cover the following items:

General Requirements: permits & licenses; project meetings; administrative overhead for submissions and shop drawings; progress photos; temporary facilities & controls; storage & protection of materials; project closeout; and project record documents.

General Conditions: supervision of work; all testing; coordination drawings; safety programs; insurance and performance & payment bonds.

The undersigned, having carefully examined all Contract Documents, including Notice to Bidders, Bid Terms and Conditions, Contract Terms and Conditions, General Requirements, General Conditions, Labor & Material Payment Bond, Performance Bond, Form of Bid, Non-Collusive Bidding Certification, Substitution Form Request, Contract, Affirmative Action Form, Change Order, Form, Contractor’s Trade Payment Breakdown, Safety EHS Plan, Prevailing Wage Schedule, Specifications, and Drawings and having examined the existing conditions by on-site visit(s), hereby submits this Bid Analysis, covering all labor, materials, equipment, tools, machinery, licensing, insurance, taxes, and fees required to perform the specified work at the above-referenced site, in accordance with the Contract Documents. **No exclusions & no exceptions.**

Company Name and Address of Bidder:

Signature of Bidder _____ Date _____

Printed Name and Title of Representative: _____

Email Address: _____

Telephone: _____

EIN#: _____

IMPORTANT:

This bid analysis form is the **only** pricing format acceptable. Bidders **must** submit pricing using this form. **FIT will not accept bid responses on any other form.**

NOTE:

FIT will not sign any bidder generated contract, agreement or scope of work. FIT Bid and Terms and Conditions apply. Bidder requirement for FIT to sign any document will be grounds for rejection. Bidder inclusion of any conditions, clarifications, exceptions or changes which are not in compliance with FIT Bid and Terms and Conditions will be grounds for rejection.

SECTION IV.
GENERAL REQUIREMENTS

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01010 -- SUMMARY OF THE WORK

.01 - Work Under The Contract

The Work shall be as described in the Contract Documents.

.02 - Work by Others

Should any other contractor be engaged by the Owner to perform work on the Site or in areas adjoining or adjacent to the Site, the Contractor and such other contractor shall coordinate the work of the Contractor and such other contractor.

.03 - Items Not Included

The following items shown on the drawings are not included in the Work:

- A. Items indicated "By Others".
- B. Items indicated "N.I.C." (Not in Contract)
- C. Existing construction not indicated or specified to be removed, replaced or altered.

.04 - Openings and Chases

- A. The Contractor shall build openings, including but not limited to channels, chases and flues as required to complete the Work as set forth in the Contract and as directed by the Owner before any work is installed.
- B. After the installation and completion of any work for which openings, including but not limited to, channels, chases and flues, have been provided for the Contractor, the Contractor shall build in, over, around and finish all such openings as required to complete the Work.
- C. If a contractor fails to furnish drawings and information required in connection with such openings before the General Construction Contractor performs any Work affected thereby, said contractor who so fails to furnish such drawings and information shall bear the cost of all cutting and refinishing including that part of the General Construction Contractor's Work affected.
- D. The Contractor shall Furnish and Install all sleeves, inserts, hangers and supports required for the execution of the Work.
- E. Specific instructions shall be obtained from the Owner or the Owner's Representative before cutting beams or other structural members, arches or lintels.
- F. The Contractor shall not endanger the Work and shall not cut or alter the Work unless prior approval and instructions are received from the Owner or the Owner's Representative.

.05 - Surveys and Layout

- A. If, for any reason, stakes, batter boards or monuments are disturbed, it shall be the responsibility of the Contractor to reestablish them.
- B. The Owner or the Owner's Representative may order construction work suspended at any time when location of monuments, stakes, bench marks and other layout markings established by the Contractor are not adequate to permit checking the Work.
- C. The Contractor shall Provide and shall maintain axis lines on each floor and shall establish and shall maintain grade marks 4' 0" above the finished floor on each floor level.
- D. The Contractor shall Furnish such stakes and other required equipment, tools and materials, and all labor as may be required in laying out any part of the Work.

.06 - Scheduling

- A. The Contractor shall deliver to the Owner schedules and forms in accordance with the Contract.
- B. The Owner or the Owner's Representative may require the Contractor to modify schedules which the Contractor has submitted either before or after such schedules are approved so that:
 - 1. The Work shall not be delayed.
 - 2. Changes in the Work are reflected in the schedules of the Contractor.

.07 - Contractor Use of Premises

While performing the Work, the Contractor shall take every precaution against injuries to persons and damage to property.

01080 -- PERMITS AND COMPLIANCE

.01 - Permits and Licenses

The Contractor shall obtain, maintain and pay for all permits and licenses necessary for the execution of the Work and for the use of such Work when completed.

Prior to final payment the Contractor shall deliver to the Owner's Representative all permits and certificates of approval issued by any agency having jurisdiction.

.02 - Compliance

The Contractor shall give all notices, pay all fees and comply with all laws, rules and regulations applicable to the Work.

.03 - Additional Compliance

The Contractor, Subcontractors, and the employees of the Contractor and Subcontractors, shall comply with all regulations governing conduct, access to the premises, operation of equipment and systems and conduct while in or near the premises and shall perform the Work in such a manner as not to unreasonably interrupt or interfere with the conduct of business of the Institution.

.04 - Royalties and Patents

It is the sole responsibility of the Contractor to determine what, if any, patents are applicable to the Project. The Contractor shall pay all royalties and/or license fees. The Contractor shall defend all suits or claims for infringement of any patent rights and save the Owner, Architect, Engineer, Environmental Consultant and Construction Manager harmless from loss, including attorney's fees, on account thereof.

01200 -- PROJECT MEETINGS

.01 - Project meetings shall be held to accomplish the following:

- A. Coordinate the Work.
- B. Establish a sound working procedure and relationship between all contractors, the Owner and the Owner's Representative.
- C. Review requisitions, proposals and change orders.
- D. Review the progress of the Work, review quality of work in place and review approval required by the Work and review delivery of materials.
- E. Expedite the Work to completion within the scheduled time limit.
- F. Review progress payments.

.02 - Initial Job Meeting (Orientation Meeting)

The Owner or the Owner's Representative shall call an initial job meeting which the Contractor shall attend. This meeting shall be called prior to the start of construction.

.03 - Job Progress Meetings

- A. Job progress meetings shall be scheduled by the Owner or the Owner's Representative during the course of construction. The Contractor or the Contractor's duly authorized representative and such Subcontractors as required by the Contractor or the Owner or the Owner's Representative shall be present at all job progress meetings. The Contractors and Subcontractors shall answer questions on progress, workmanship, approvals required, delivery of material and other subjects concerning the Work. The purpose of such meetings is to coordinate the efforts of all

concerned so that the Work proceeds without delay to completion as required by the Contract.

- B. The Owner or the Owner's Representative may require any schedule to be modified so that changes in the Work, delays or acceleration of any segment of the Work shall be reflected in such schedule. The Contractor shall cooperate with the Owner or the Owner's Representative in providing data for such changes in or modifications of schedules.

01300 -- SUBMITTALS

.01 - Schedules & Records

- A. Within the time set forth in the Contract, the Contractor is required to complete and submit to the Owner or the Owner's Representative the following forms:
 - 1. Submit construction progress schedule to the Owner or the Owner's Representative no later than thirty (30) calendar days after receipt by the Contractor of notice to proceed.
 - 2. Submit names and addresses of all Subcontractors to the Owner or the Owner's Representative within thirty (30) calendar days of approval of the construction progress schedule.
 - 3. Submit to the Owner or the Owner's Representative the date on which the Contractor proposes to award each subcontract a minimum of ten (10) days prior to such proposed award.
 - 4. Submit Shop Drawings and material sample schedule to the Owner or the Owner's Representative no later than thirty (30) days after approval of the construction progress schedule. Such schedule shall include the date of all Shop Drawings, samples and materials shall be submitted and the date approval is required.
 - 5. Submit to the Owner or the Owner's Representative on a form approved by the Owner, a schedule of anticipated monthly requisition amounts. Such schedule shall be submitted from time to time as directed by the Owner, the first such submission being required to be made by the Contractor within ten (10) days of receipt by the Contractor of a written order to proceed issued by the Owner. The amounts employed in preparing such schedules in no way shall be binding upon the Owner.
- B. Sample forms shall be provided by the Owner or the Owner's Representative for the above mentioned schedules and records.

01311 – PROJECT ANALYSIS

.01 - Project Control and Progress Meetings

- A. The Contractor shall attend all scheduling meetings as directed by the Owner or the Owner's Representative.
- B. In addition to the Owner or the Owner's Representative and the Contractor's Superintendent and Scheduling Coordinator, such meetings shall also be attended by representatives of such subcontractors as the Contractor, the Owner or the Owner's Representative may deem advisable. The agenda for such meetings shall include the progress and current status of the Work, proposed solutions for problem areas and a review of schedules for future Work in order to meet the Contractor's objectives and his obligations under the Contract. Consideration shall be given to establishing actual start dates, actual completion dates, planned starts and finishes, quantities installed, man hours worked, as well as other data relevant to the performance of the Contract.
- C. At least one week before each meeting described in subsection .01A of this Division 01311, the Contractor shall furnish progress data in the form required by the Owner or the Owner's Representative as follows:
 - 1. The status of all activities as of date determined by the Owner or the Owner's Representative.
 - 2. A list of actual start and completion dates for all activities.
 - 3. Projected durations of completion of those activities in progress.
 - 4. Relevant data of submittals in progress including equipment releases and equipment in fabrication.
 - 5. All other information which in the discretion of the Owner or its Representative, may be required to complete the Project Schedule Update.

.02 – Payment

The Contractor's Payment Breakdown and Monthly Requisition as called for by Section 17.01 of the General Conditions of the Contract shall be the basis by which the Contractor is to be paid.

.03 - Time of Completion

It is the sole responsibility of the Contractor to complete the Work within the time of completion required by the Contract.

01340 -- SHOP DRAWINGS AND SAMPLES

.01 - Contractor Submittal

- A. The Contractor shall submit the Shop Drawings and samples required by the Architect and the Contractor shall adhere to all submittal and scheduling requirements for Shop Drawings and samples. After examination of such Shop Drawings and samples by the Architect and the return of such items by the Architect to the Contractor, the Contractor shall make corrections indicated and shall furnish to the Architect the required number of corrected copies of Shop Drawings or samples.
- B. Shop Drawings shall be accompanied by a letter of transmittal to the Owner or the Owner's Representative requesting approval and date approval is desired.
- C. Each Shop Drawings and letter of transmittal shall be identified with the following information:
 - 1. Project title
 - 2. Contract name
 - 3. Date of the drawing, including dates of any revisions
 - 4. Name of Contractor, name of Subcontractor, material supplier and manufacturer, as applicable
 - 5. Name of person or firm preparing Shop Drawings
 - 6. Contract drawing numbers and specifications, section division and paragraph numbers used as references in preparing Shop Drawings, and titles of items to which the Shop Drawing refers.
- D. Shop Drawings shall show the design, dimensions, connections and other details necessary to insure that the Shop Drawings accurately interpret the Contract Documents and shall also show adjoining Work in such Detail as required to provide proper connections with said adjoining Work. Where adjoining connected Work requires Shop Drawings, such Shop Drawings shall be submitted to the Owner or the Owner's Representative for approval at the same time so that connections can be checked.
- E. The Contractor shall verify all field measurements. Measurements available prior to submittal of Shop Drawings shall be shown and so noted on the Shop Drawings. Measurements not available prior to submission of Shop Drawings shall be noted on the Shop Drawings as not available and such measurements shall be obtained prior to fabrication.

- F. The Contractor shall submit manufacturer's drawings and specifications when necessary to fully explain apparatus or equipment required by the Work. These manufacturer's drawings and specifications shall be treated as Shop Drawings. Manufacturer's catalog numbers alone are not acceptable as sufficient information for compliance with this requirement.
- G. Samples shall be accompanied by a letter of transmittal to the Owner or the Owner's Representative requesting approval, and date approval is desired.
- H. Each sample shall be labeled with the following information:
 - 1. Project title
 - 2. Contract name
 - 3. Date of submission
 - 4. Name and quality of the material
 - 5. Name of Contractor, name of Subcontractor, material supplier and manufacturer, as applicable
 - 6. Contract drawing numbers and specification section, division and paragraph numbers used as reference in preparing samples.
- I. Samples shall be of sufficient size and number to show the quality, type, color, finish and texture of the material required to be furnished by the Contractor pursuant to the Contract.

.02 - Contractor Review

The Contractor shall review, verify and determine all field measurements, field construction criteria, materials, catalog numbers and similar data, shall coordinate each Shop Drawing and sample with the requirements of the Contract and shall determine whether or not such Shop Drawings are in conformity with the provisions of the Contract before submitting the Shop Drawings to the Architect for approval.

.03 - Contractor Responsibility

The Architect's approval of Shop Drawings and samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract. The Contractor shall be responsible for the accuracy of the Shop Drawings and samples and for the conformity of Shop Drawings and samples with the Contract unless the Contractor has notified the Architect of the deviation in writing at the time of submission and has received from the Architect written approval of the specified deviations. The Architect's approval shall not relieve the Contractor of responsibility for errors or omissions in the Shop Drawings or samples.

.04 - Commencement of Work

No portion of the Work shall be commenced until required Shop Drawings or samples are approved by the Architect.

01380 -- PROGRESS PHOTOGRAPHS

.01 - Contractor Submission

- A. The Contractor shall furnish to the Owner, progress photographs of the Work as follows: three (3) 8" x 10" glossy prints of each of the following views:
1. Two (2) different views of the area in which the building or buildings are to be located, taken before excavation starts.
 2. Two (2) different views for each building when footings are in place and forms completed.
 3. Four (4) different views for each building when foundations are completed.
 4. Four (4) different views for each building when exterior wall is fifty per cent (50%) completed.
 5. Four (4) different views for each building when the structure is ready for roofing.
 6. Four (4) different exterior views in color for each building at completion.
 7. Six (6) interior views in color for each building as directed upon completion.
- B. A title identifying the view shown by each photograph and date taken shall appear on the back of each print.

01500 -- TEMPORARY FACILITIES AND CONTROLS

.01 - Requirements

The Contractor shall Provide the temporary facilities and controls as hereinafter specified and as required by law.

.02 - Temporary Lighting and Electric Service

The Contractor shall Provide and maintain all temporary lighting and power required in connection with the Contractor's operations from the commencement of the Work until the completion of each structure or for such other time as

directed by the Owner or the Owner's Representative. When the use of such temporary lighting and power is no longer required, all temporary wiring and equipment shall be completely removed by the Contractor. The Contractor shall make the necessary application to the lighting company and pay for all charges, costs and expenses incidental to the installation and maintenance of temporary lighting and power as required in connection with the Contractor's operations, and the Contractor shall pay for all power used. The minimum temporary lighting to be provided is at the rate of one-quarter watt per square foot and is to be maintained in each room and changed as required when interior walls are being erected. The required temporary lighting must be maintained for twenty-four (24) hours a day and seven (7) days a week at all stair levels and in all corridors below ground; in all other spaces temporary lighting is to be maintained only during working hours. All temporary wiring and equipment shall be in conformity with the National Electric Code. Three-phase temporary power circuits shall be installed as required to operate construction equipment of the various trades and to install and test equipment such as pumps and elevators. The Contractor shall install and maintain temporary or permanent service for the permanently installed building equipment such as sump pumps, boilers, boiler controls, fans, pumps, so that such equipment may be operated when required and so ordered by the Owner or the Owner's Representative for drainage or for temporary heat.

.03 - Material Hoists

A. General

1. Material hoists shall be operated by diesel, gasoline or steam engines and shall be complete with all equipment necessary for operation. Such hoists shall run from grade to roof, shall be installed immediately following the structural framing, centering or form work, and centering or form work unless otherwise approved by the Owner or the Owner's Representative. Electrically operated hoists shall not be used except as otherwise allowed by the Contract.
2. Material hoists shall meet any and all requirements of law, rule or regulation.
3. Hoist cars shall be of required size and design for the hoisting of all normal size building materials.

B. The Contractor shall:

1. Furnish, install, maintain and operate at the Contractor's expense, all hoisting equipment required for the Work.
2. Furnish all labor required for the Work.

.04 - Temporary Use of Permanent Elevator as Equipment Material Hoist

- A. The Contractor shall:
 - 1. Use the temporary hoists until a building is completed, or until the Contractor may, with the Owner's permission, use the equipment of one (1) elevator in a building for temporary service after the permanent elevator equipment and the permanent electric service have been installed.
 - 2. If the Contractor elects to use such permanent elevator equipment, the Contractor shall:
 - a. Provide adequate protection for such equipment and shall operate such equipment within a capacity not to exceed that allowed by law, rule or regulation.
 - b. Provide for the maintenance of the elevator equipment as approved by the Owner or the Owner's Representative.
 - c. Leave such equipment in perfect condition.
- B. The permanent elevator equipment shall be ready for use when required by the Work and shall permit any use approved by the Owner or the Owner's Representative.

.05- Temporary Enclosures

The Contractor shall:

- A. Provide, install and maintain any temporary weather resistant enclosures for all openings in exterior walls and roof that are not enclosed.
- B. After building is enclosed, maintain proper temperatures required by the Contract.

.06 - Temporary Fence Enclosures

The Contractor shall Provide, Install and maintain any temporary fence enclosures required by the Contract.

.07 - Maintenance of Permanent Roadways

The Contractor shall immediately remove dirt and debris which may collect on permanent roadways due to the Work.

.08 – Traffic Control

- A. Routes to and from the location of the Work shall be as indicated in the Contract or as directed by the Owner or the Owner's Representative.
- B. Parking areas for the use of those engaged in the Work shall be as indicated in the Contract or as directed by the Owner or the Owner's Representative.

.09 - Fire Prevention Control

The Contractor Shall:

- A. Provide private unlisted telephone service reserved for fire calls at a location or locations approved by the Owner or the Owner's Representative. Such service shall be in addition to any other telephone service. The Contractor shall pay all costs thereof until completion and acceptance of the Work or as otherwise directed by the Owner or the Owner's Representative.
- B. Comply with the safety provisions of the National Fire Protection Association's "National Fire Codes" pertaining to the Work and, particularly, in connection with any cutting or welding performed as part of the Work.

.10 - Pollution Control

The Contractor shall:

- A. Comply with all laws, rules and regulations governing pollution control, including but not limited to those of the Department of Environmental Conservation of the State of New York.
- B. Take all necessary precautions including, but not limited to digging and maintaining settling basins and dams; diverting streams, and taking all other actions that may be necessary to prevent silt, and waste of any kind from being deposited, silting and reduction of quality of streams below the construction area and downstream properties as a result of the Work.
- C. Refrain from the disposal of volatile fluid wastes into storm or sanitary sewer systems, approved sewage disposal systems or any waterway.
- D. Refrain from burning trash or waste materials.

.11 - Temporary Field Office

- A. The Contractor may Provide a temporary office structure, for the Contractor's use during the course of the Work.
 - 1. The Contractor must receive prior written approval from the Owner or the Owner's Representative for such temporary office structure in relation to location, type of structure, and included facilities.
 - 2. All toilet and sink facilities in any such office structure shall be connected to an approved sewage disposal system.
 - 3. The Contractor shall remove the temporary office structure from the Site and shall repair the Site and finish the area as directed by the Owner or the Owner's Representative.

- B. The Contractor shall:
 - 1. Provide a temporary office structure completely separate from any other office structures at a location approved by the Owner or the Owner's Representative until the Work is completed and is accepted.
 - 2. Provide such office structure for the exclusive use of the Owner.
 - 3. Bear all costs in relation to the furnishing, construction and removal of such office structure.
 - 4. Repair and refinish the area as directed by the Owner or the Owner's Representative.
 - 5. Construct such office structure and furnish such office structure as required by the Contract.
 - 6. Maintain such office structure in a sanitary condition and in proper repair, properly heat the structure, furnish the fuel and furnish all utilities and pay all utility charges.
 - 7. Install a telephone for the sole use of the Owner or the Owner's Representative and pay all service and local toll charges incurred as a result of the use of such telephone service.

- C. **With** the prior written approval of the Owner or the Owner's Representative any other Contractor may erect a substantial office structure at the Site for the use of such Contractor in relation to the Work.
 - 1. All toilet and sink facilities in any such office structure shall be connected to an approved sewage disposal system.

2. Such Contractor shall remove the temporary office structure from the Site and shall repair the Site and finish the area as directed by the Owner or the Owner's Representative.
- D. When adequate space is available in a building, the Contractor may transfer such office to available space with the prior written permission of the Owner or the Owner's Representative.
- E. Trailers providing comparable facilities may be accepted at the discretion of the Owner or the Owner's Representative.

.12 - Rubbish Removal

- A. The Contractor shall:
 1. Keep the Work free from rubbish at all times.
 2. Clean all enclosed structures daily.
 3. Remove rubbish from the Site at least once a week.
- B. The Contractor shall conform with the following:
 1. Burning of rubbish shall not be permitted.
 2. All rubbish shall be lowered by way of chutes, taken down by hoists, or lowered in receptacles. Under no circumstances shall any rubbish be dropped or thrown from one (1) level to another inside or outside any building.

.13 - Discontinuance, Changes and Removal

The Contractor shall:

- A. Discontinue all temporary services required by the Contract when so directed by the Owner or the Owner's Representative. The discontinuance of any such temporary service prior to the completion of the Work shall not render the Owner liable for any additional cost entailed thereby.
- B. Remove and relocate such temporary facilities as directed by the Owner or the Owner's Representative without additional cost to the Owner, and shall restore the Site and the work to a condition satisfactory to the Owner.

.14 - Project Identification

- A. No signs or advertisements shall be displayed on the site except as required by the Contract.

- B. The Contractor shall Furnish, erect and maintain the Site, the exact location thereof to be designated by the Owner or the Owner's Representative, a construction sign, in the form provided by the Contract.

.15 - Moisture and Condensation Control

The Contractor shall provide for ventilation of all structures until Physical Completion and acceptance of the Work and shall control such ventilation to avoid excessive rates of drying of construction materials, including but not limited to concrete and to plaster, and to prevent condensation on sensitive surfaces.

.16 - Protective Services

The Contractor shall provide security services required by the Contract.

01600 -- MATERIAL AND EQUIPMENT

.01 - Storage and Protection

- A. Materials stored on the Site shall be neatly piled and protected, and shall be stored in an orderly fashion in locations that shall not interfere with the progress of the Work or with the daily functioning of the Institution.
- B. Should it become necessary during the course of the Work to move materials or equipment stored on the Site, the Contractor, at the direction of the Owner or the Owner's Representative, shall move such material or equipment.

01700 -- PROJECT CLOSE OUT

.01 - Final Cleanup

- A. The Contractor shall leave the Work ready for use and occupancy without the need of further cleaning of any kind.
- B. The Contractor shall remove all tools, appliances, projects signs, material and equipment from the premises as soon as possible upon completion of the Work.
- C. The Work is to be turned over to the Owner in new condition, in proper repair and in perfect adjustment.

.02 - Required Close Out Documentation

- A. Prior to final payment the Owner shall receive the following documents as required by the Contract:

1. The Contractor's general guarantee.
 2. Specific guarantees, material, equipment and other items of work.
 3. All certificates obtained in connection with the Work.
 4. All final photographs of the Work.
- B. The Owner shall also receive from the Contractor prior to final payment:
1. A complete listing of all Subcontractors, business addresses and items supplied by each such Subcontractor.
 2. A listing of manufacturer's of major materials, equipment and systems installed in the Work.
 3. A copy of all test data taken in connection with the Work.
 4. Three (3) copies of all operation and maintenance manuals.
 5. All keys, tools, screens, spare construction material, finishing material and equipment required to be furnish to the Owner as part of the Work.

.03 - Orientation Instruction

Prior to final payment appropriate maintenance personnel of the Owner shall be oriented and instructed by the Contractor in the operation of all systems and equipment as required by the Contract.

.04 - Project Close Out Inspections

- A. When the Work has reached such a point of completion that the building or buildings, equipment or apparatus or any part thereof required by the Owner for occupancy or use can be so occupied and used for the purpose intended, the Owner or the Owner's Representative shall make a detailed inspection of the Work to insure that all requirements of the Contract have been met and that the Work is complete and is acceptable.
- B. A copy of the report of the inspection shall be furnished to the Contractor as the inspection progresses so that the Contractor may proceed without delay with any part of the Work found to be incomplete or defective.
- C. When the items appearing on the report of inspection have been completed or corrected, the Contractor shall so advise the Owner and the Owner's Representative. After receipt of the notification, the Owner or the Owner's Representative shall inform the Contractor of the date and time of final inspection. A copy of the report of the final inspection containing all

remaining contract exceptions, omissions and incompletions shall be furnished to the Contractor.

- D. After receipt of notification of completion and all remaining contract exceptions, omissions and incompletions from the Contractor, the Owner and the Owner's Representative shall make an inspection to verify completion of the exception items appearing on the report of final inspection.

01720 -- PROJECT RECORD DOCUMENTS

.01 - Project Record Drawings

- A. The purpose of the project drawings is to record the actual location of the Work in place including but not limited to underground lines, concealed piping within buildings, concealed valves and control equipment, and to record changes in the Work.
- B. In addition to the sets of contract drawings that are required by the Contractor on the Site to perform the Work, the Contractor shall maintain, at the Site, one (1) copy of all drawings, specifications and addenda that are part of the Contract as awarded. Each of these documents should be clearly marked "Project Record Copy", maintained in a clean and neat condition available at all times for inspection by the Owner or the Owner's Representative, and shall not be used for any other purpose during the progress of the Work.
- C. Project Record Requirements
 - 1. The Contractor shall mark-up the "Project Record Copy" to show:
 - (a) Approved changes in the Work.
 - (b) Location of underground Work and concealed Work.
 - (c) Details not shown in the original Contract Documents.
 - (d) Any relocation of Work.
 - (e) All changed in dimensions.
 - (f) All access doors.
 - (g) Location of all plumbing, heating, ventilating, air conditioning or electrical assemblies.
 - 2. Such information shall include, but shall not be limited to:

- (a) Footing depth in relation to finished grade elevations.
 - (b) Any change in floor elevations.
 - (c) Any structural changes.
 - (d) Any substitutions.
 - (e) Elevations and locations of all underground utilities, services, or structures referenced to permanent above-ground structures or monuments.
 - (f) Designation of all utilities as to the size and use of such utilities.
 - (g) All invert elevations of manholes.
 - (h) The location of all utilities, services and appurtenances concealed in building structures that have been installed different from that required by the Contract.
 - (i) Any approved change order.
- D. The Contractor shall keep the Project Record Documents up-to-date from day to day as the Work progresses. Appropriate documents are to be updated promptly and accurately; no Work is to be permanently concealed until all required information has been recorded.
- E. The project record drawings are to be submitted by the Contractor to the Owner or the Owner's Representative when all the Work is completed and is approved by the Owner and the Owner's Representative before the Contractor may request final payment.

01740 -- WARRANTIES, GUARANTEES, AND BONDS

See the Contract Documents for details.

SECTION V.
GENERAL CONDITIONS

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ARTICLE 1 -- DEFINITIONS

Section 1.01 - The following terms as used in the Contract Documents shall be defined as follows:

Beneficial Occupancy - The use, occupancy or operation by the Owner of the Work, or any part thereof, as evidenced by a notification of Beneficial Occupancy executed by the Owner.

Construction Completion - Acceptance by the Owner of the Work as evidenced by a Notification of Construction Completion executed by the Architect.

Construction Manager - A person, persons, firm, partnership or corporation, regularly engaged in the management of construction projects, and so designated by the Owner.

Consultant - A person, persons, firm, partnership or corporation providing Architectural, Engineering or other professional services, and so designated by the Owner.

Contract - The agreement between the Owner and the Contractor consisting of the Contract Documents including all amendments and supplements thereto.

Contract Documents - The Contract, Notice to Bidders, Bid Checklist, Bid Terms and Conditions, Contractor Reference Sheet, Contract Terms and Conditions, Bid Analysis Form, Affirmative Action Form, Change Order Form, Contractors Trade Payment Breakdown, Safety EHS Plan, Prevailing Wage Schedule, Information for Bidders, Form of Bid, General Conditions, General Requirements, Bonds, Drawings, Specifications, Addenda, Change Orders and any supplementary data together with all provisions of law deemed to be inserted in the Contract or incorporated by reference.

Contractor - A person, persons, firm, partnership or corporation with whom the Contract is entered into by the Owner to perform the Work.

Extra Work - Any work in addition to the Work initially required to be performed by the Contractor pursuant to the Contract.

Furnish - To deliver to the site ready for installation.

Install - To unload at the delivery point at the Site and perform every operation necessary to establish secure mounting and correct operation at the proper location.

Owner – The Fashion Institute of Technology and/or its auxiliary corporations, as applicable.

Owner's Representative - A person, persons, firm, partnership or corporation so designated by the Owner.

Project - Work at the Site(s) carried out pursuant to one or more sets of Contract Documents.

Provide - To Furnish and Install complete in place and ready for operation and use.

Shop Drawings - Diagrams, fabrication drawings, illustration, schedules, test data, performance charts, cuts brochures and other data which are submitted by the Contractor to the Architect and illustrate any portion of the Work. These drawings and data are reviewed and acted upon by the architect.

Site - The area within the Contract limit, as indicated by the Contract.

Subcontract - An agreement between the Contractor and Subcontractor for work on the Site.

Subcontractor - A person, persons, firm, partnership or corporation under contract with the Contractor, or under contract with any subcontractor, to provide labor and material at the Site.

Substantial Completion - Stage of construction at which the Architect determines there is a minimal amount of the Work to be completed, or Work to be corrected.

Work - The performance of all obligations imposed upon the Contractor by the Contract.

ARTICLE 2 -- CONTRACT DOCUMENTS

Section 2.01 - Captions

The table of contents, titles, captions, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect the interpretation of the provisions to which they refer.

Section 2.02 - Conflicting Conditions

Should any provision in any of the Contract Documents be in conflict or inconsistent with any of the General Conditions or Supplements thereto, the General Conditions or Supplements thereto shall govern.

Section 2.03 - Notice and Service Thereof

Any notice to the Contractor from the Owner relative to any part of the Contract shall be in writing and service considered complete when said notice is mailed to the Contractor at the last address given by the Contractor, or when delivered in person to said Contractor or the Contractor's authorized representative.

Section 2.04 - Nomenclature

Materials, equipment or other Work described in words which have a generally accepted technical or trade meaning shall be interpreted as having said meaning in connection with the Contract.

Section 2.05 - Invalid Provisions

If any term or provision of the Contract Documents or the application thereof to any person, firm or corporation or circumstance shall, to any extent, be determined to be invalid or unenforceable, the remainder of the Contract Documents, or the application of such terms or provisions to persons, firms or corporations or circumstances other than those to which it is held invalid or unenforceable, shall not be affected thereby and each term or provision of the Contract Documents shall be valid and be enforced to the fullest extent permitted by law.

ARTICLE 3 -- INTERPRETATION OF CONTRACT DOCUMENTS

Section 3.01 – Owner/Architect

- A. The Owner's representative/Architect shall give all orders and directions contemplated under the Contract relative to the execution of the Work. The Architect shall determine the amount, quality, acceptability of the Work and shall decide all questions which may arise in relation to said Work. The Owner's estimates and decisions shall be final except as otherwise expressly provided. In the event that any question arises between the Owner and Contractor concerning the Contract, the decision of the Owner shall be a condition precedent to the right of the Contractor to receive any money or payment under the Contract.
- B. Any differences or conflicts concerning performance which may arise between the Contractor and other contractors performing Work for the Owner shall be adjusted and determined by the Owner's representative.
- C. The Owner may act through a representative designated by the Owner.

Section 3.02 - Meaning and Intent of Contract Documents

The meaning and intent of all Contract Documents shall be as interpreted by the Architect.

Section 3.03 - Order of Preference

- A. Figured dimensions shall take precedence over scaled dimensions. Larger scale drawings shall take precedence over smaller scale drawings. Latest addenda shall take precedence over previous addenda and earlier dated drawings and specifications.
- B. Should a conflict occur in or between or among any parts of the Contract Documents that are entitled to equal preference, the better quality or greater quantity of material, of the more specific compared to the general, shall govern, unless the Architect/Owner's representative directs otherwise.
- C. Drawings and specifications are complementary. Anything shown on the drawings and not mentioned in the specifications, or mentioned in the specifications and not shown on the drawings, shall have the same effect as if shown or mentioned in both.

ARTICLE 4 -- MATERIALS AND LABOR

Section 4.01 - Contractor's Obligations

- A. The Contractor shall, in a good workmanlike manner, perform all the Work required by the Contract Documents within the time specified in the Contract.
- B. The Contractor shall Furnish, erect, maintain, and remove such construction plant and such temporary Work as may be required for the performance of its work. The Contractor shall be responsible for the safety, efficiency and adequacy of the Contractor's plant, appliances and methods, and for damage which may result from failure or improper construction, maintenance or operation of said plant, appliances and methods. The Contractor shall comply with all terms of the Contract, and shall, carry on and complete the entire Work to the satisfaction of the Owner.
- C. Any labor, materials or means whose employment or utilization during the course of this Contract may tend to or in any way cause or result in strike, work stoppages, delays, suspension of Work or similar troubles by workmen employed by the Contractor, its subcontractors or material suppliers, or by any of the trades working in or about the buildings and premises where Work is being performed under this Contract, or by other contractors, their subcontractors or material suppliers pursuant to other contracts shall not be allowed. Any violation by the Contractor of this requirement may in the sole judgment of the Owner be considered as proper and sufficient cause for declaring the Contractor to be in default, and for the Owner to take action against the Contractor as set forth in the General Conditions Article entitled "Termination" or such other action as the Owner may deem proper.

Section 4.02 - Contractor's Title to Materials

- A. No materials or supplies for the Work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by any other party. The Contractor warrants that the Contractor has full, good and clear title to all materials and supplies used by the Contractor in the Work, or resold to the Owner pursuant to the Contract free from all liens, claims or encumbrances.
- B. All materials, equipment and articles which become the property of the Owner shall be new unless specifically stated otherwise.

Section 4.03 - "Or Equal" Clause

- A. Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue number or make, said identification is intended to establish a standard. Any material, article or equipment of other manufacturers and vendors which performs satisfactorily the duties imposed by the general design may be considered equally acceptable provided that, in the opinion of the Architect/Engineer, the material, article or equipment so proposed is of equal quality, substance and function and the Contractor shall not Provide, Furnish or Install any said proposed material, article or equipment without the prior written approval of the Architect/Engineer. The burden of proof and all costs related thereto concerning the "or equal" nature of the substitute item, whether approved or disapproved, shall be borne by the Contractor.
- B. Where the Architect/Engineer, pursuant to the provisions of this Section, approves a product proposed by the Contractor and said proposed product requires a revision of the Work covered by this Contract, or the Work covered by other contracts, all changes to the Work of all contracts, revision or redesign, and all new drawings and details required therefore shall be provided by the Contractor at the cost of the Contractor and shall be subject to the approval of the Consultant.
- C. No substitution will be permitted which may result in a delay to the Project.

Section 4.04 - Quality, Quantity and Labeling

- A. The Contractor shall Furnish materials and equipment of the quality and quantity specified in the Contract.
- B. When materials are specified to conform to any standard, the materials delivered to the Site shall bear manufacturer's labels stating that the materials meet said standards.

- C. The above requirements shall not restrict or affect the Owner's right to test materials as provided in the Contract.
- D. The Contractor shall develop and implement quality control plans to assure itself and the Owner that all Work performed by the Contractor and its Subcontractors complies fully with all Contract requirements, and shall submit the plans to the Owner as required by the Contract. See Submittals Section of the General Requirements. The Contractor's quality control plans shall be independent of any testing or inspection performed by or on behalf of the Owner.

ARTICLE 5 -- CONTRACTOR

Section 5.01 - Supervision by Contractor

- A. The Contractor shall provide full-time competent supervision for the duration of the Contract; during the course of on-site work the Contractor shall provide a full-time on-site superintendent who shall have full authority to act for the Contractor at all times. The Superintendent shall be able to read, write and speak English fluently, as well as communicate with the workers.
- B. If at any time the supervisory staff is not satisfactory to the Owner, the Contractor shall, if directed by the Owner, immediately replace such supervisory staff with other staff satisfactory to the Owner.
- C. The Contractor shall remove from the Work any employee of the Contractor or of any Subcontractor when so directed by the Owner.

Section 5.02 - Representations of Contractor

The Contractor represents and warrants:

- A. That it is financially solvent and is experienced in and competent to perform the Work, and has the staff, equipment, subcontractors and suppliers available to complete the Work within the time specified for the Contract price.
- B. That it is familiar with all Federal, State or other laws, ordinances, orders, rules and regulations that may in any way affect the Work.
- C. That any temporary and permanent Work required by the Contract can be satisfactorily constructed, and that said construction will not injure any person or damage any property.
- D. That it has carefully examined the Contract and the Site of the Work and that, from the Contractor's own investigations and through the bid process and requirements is satisfied as to the nature and materials likely to be encountered, the character of equipment and other facilities needed

for the performance of the Work, the general and local conditions and all other materials or items which may affect the Work.

- E. That it is satisfied that the Work can be performed and completed as required in the Contract, and warrants that it has not been influenced by any oral statement or promise of the Owner or the Consultant.

SECTION 5.03 – COPIES OF CONTRACT DOCUMENTS FOR CONTRACTORS

- A. The Owner shall furnish to the Contractor, without charge, up to five (5) copies of Contract Documents.
- B. Any sets in excess of the number mentioned above may be furnished to the Contractor at the cost of reproduction and mailing or delivery.

SECTION 5.04 - MEETINGS

The Contractor shall attend all meetings as directed by the Owner or the Owner's Representative.

SECTION 5.05 – RELATED WORK

To ascertain the relationship of its work to all Work required by the Contract Documents, the Contractor shall examine the Contract Documents for Work of its Contract and any related work of other contracts.

SECTION 5.06 – ERRORS OR DISCREPANCIES

The Contractor shall examine the Contract thoroughly before commencing the Work and report in writing any errors or discrepancies to the Owner or the Owner's Representative within five (5) days of discovery.

ARTICLE 6 -- SITE CONDITIONS

SECTION 6.01 – SUBSURFACE OR SITE CONDITIONS FOUND DIFFERENT

- A. The Contractor acknowledges that the Contract amount set forth in its bid includes such provisions which the Contractor deems proper for all Site

conditions the Contractor could reasonably anticipate encountering as indicated in the Contract or from the Contractor's inspection and examination of the Site prior to submission of bids.

SECTION 6.02 – VERIFYING DIMENSIONS AND CONDITIONS

- A. The Contractor shall take all measurements and verify all dimensions and conditions at the Site before proceeding with the Work. If said dimensions or conditions are found to be in conflict with the Contract, the Contractor immediately shall refer said conflict to the Architect in writing. The Contractor shall comply with any revised Contract Documents.
- B. During the progress of Work, the Contractor shall verify all field measurements prior to fabrication of building components or equipment and proceed with the fabrication to meet field conditions.
- C. The Contractor shall consult all Contract Documents to determine exact location of all Work and verify spatial relationships of all Work. Any question concerning said location or spatial relationships may be submitted in a manner approved by the Architect.
- D. Special locations for equipment, pipelines, ductwork and other such items of Work, where not dimensioned on plans, shall be determined in consultation with other affected contractors.
- E. The Contractor shall be responsible for the proper fitting of the Work in place.

SECTION 6.03 - SURVEYS

Unless otherwise expressly provided in the Contract, the Owner shall furnish the Contractor all surveys of the property necessary for the Work, but the Contractor shall lay out the Work.

ARTICLE 7 -- INSPECTION AND ACCEPTANCE

SECTION 7.01 – ACCESS TO THE WORK

The Owner, the Owner's Representative, and the architect shall at all times have access to the Work and the Contractor shall provide proper facilities for said access.

SECTION 7.02 – NOTICE FOR TESTING

If the Contract Documents, the Owner's instructions, laws, rules, ordinances or regulations require that any Work be inspected or tested, the Contractor shall give the Architect and/or Owner's representative a minimum of three (3) work days written notice of readiness of the Work for inspection or testing and the date fixed for said inspections or testing.

SECTION 7.03 – REEXAMINATION OF WORK

Reexamination of any part of the Work may be ordered by the Owner, and if so ordered, the Work must be uncovered by the Contractor. If said Work is found to be in accordance with the Contract, the Owner shall pay the cost of reexamination. If said Work is not found to be in accordance with the Contract, the Contractor shall pay the cost of reexamination and replacement.

SECTION 7.04 – INSPECTION OF WORK

All Work, all materials whether or not incorporated in the Work, all processes of manufacture and all methods of construction shall be, at all times and places, subject to the inspection of the Owner or the Owner's Representative or the architect, and the Architect shall be the final judge of the quality and suitability of the Work, materials, processes of manufacture and methods of construction for the purposes for which said Work, materials, processes of manufacture and methods of construction are used. Any Work not approved by the Architect shall be reconstructed, made good, replaced or corrected immediately by the Contractor including all Work of other contractors destroyed or damaged by said removal or replacement. Rejected material shall be removed immediately from the Site. Acceptance of material and workmanship by the Owner shall not relieve the Contractor from the Contractor's obligation to replace all Work which is not in compliance with the Contract.

SECTION 7.05 – DEFECTIVE OR DAMAGED WORK

If, in the opinion of the Owner, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the Work damaged or not performed in accordance with the Contract, the compensation to be paid to the Contractor shall be reduced by an amount which, in the judgment of the Owner, shall be deemed to be equitable.

SECTION 7.06 - TESTING

All materials and equipment used in the Work shall be subject to inspection and testing in accordance with accepted standards to establish conformance with specifications and suitability for uses intended, unless otherwise specified in the Contract. If any Work shall be covered or concealed without the approval or consent of the Architect, said Work shall, if required by the Architect, be uncovered for examination. Any inspection by the Architect or by a testing laboratory on behalf of the Owner does not relieve the Contractor of the responsibility to maintain quality control of materials, equipment and installation to conform to the requirements of the Contract. If any test results are below specified minimums, the Architect may order additional testing. The cost of said additional testing, any additional professional services required, and any other expenses incurred by the Owner as a result of said additional testing shall be at the Contractor's expense. The Owner may deduct such costs from moneys due the Contractor.

SECTION 7.07 - ACCEPTANCE

No previous inspection shall relieve the Contractor of the obligation to perform the Work in accordance with the Contract. No payment, either partial or full, by the Owner to the Contractor shall excuse any failure by the Contractor to comply fully with the Contract Documents. The Contractor shall remedy all defects and deficiencies, paying the cost of any damage to other Work resulting therefrom.

ARTICLE 8 -- CHANGES IN THE WORK

SECTION 8.01 - CHANGES

- A. Without invalidating the Contract, the Owner/Architect may order Extra Work or make changes by altering, adding to, or deducting from the Work, the Contract consideration being adjusted accordingly. No claims for Extra Work shall be allowed unless such Extra Work is ordered in writing by the Owner/Architect. No changes in the Work shall be made unless such Work is ordered in writing by the Owner/Architect or Owner's Representative. If the time for completion is affected by this change, the revised time for completion shall be included in the change order. The Owner may order the Contractor to perform the Extra Work and proceed under the Dispute Article.

- B. The amount by which the Contract consideration is to be increased or decreased by any change order may be determined by the Owner by one or more of the following methods:
1. By applying the applicable unit price or prices contained in the Contract.
 2. By estimating the fair and reasonable cost of the Extra Work:
 - a. Labor, including all wages, required wage supplements and insurance required by law, paid to employees below the rank of superintendent directly employed at the Site. Wages are the prevailing rate of wages defined in the Contract Documents and supplemental updates.
 - b. Premiums or taxes paid by the Contractor for worker's compensation insurance, unemployment insurance, FICA tax and other payroll taxes as required by law, net of actual and anticipated refunds and rebates.
 - c. Materials
 - d. Equipment, excluding hand tools, which in the judgment of the Owner, would have been or will be employed in the Work. It is the duty of the Contractor to utilize either rented or self-owned equipment that is of a nature and size appropriate for the Work to be performed. The Owner reserves the right to determine reasonable and appropriate equipment sizing, and at the Owner's discretion, to adjust the costs allowed to reflect a smaller or less elaborate piece of equipment more suitable for performance of the Extra Work.
 3. By determining the actual cost of the Extra Work in the same manner as in Article 8, Section 8.01, Subsection B. 2. except that the actual costs of the Contractor shall be used in lieu of estimated costs.
- C. The Owner shall have the option of determining by which method the Contractor shall proceed with said Extra Work. Wages are the prevailing rate of wages defined in the Contract Documents and supplemental updates. The Contractor shall submit a signed and notarized Labor Rate Worksheet(s) to the Owner to be used to determine hourly rates for various classifications of workers. The Contractor agrees to provide documentation verifying costs and calculations at the Owner's request.

- D. Regardless of the method used by the Owner in determining the value of a change order, the Contractor shall, within the time-frame given by the Owner, submit to the Owner or Owner's Representative a detailed breakdown of the Contractor's estimate of the value of the omitted or Extra Work.
- E. Unless otherwise specifically provided for in a change order, the compensation specified therein for Extra Work includes full payment for the Extra Work covered thereby, and the Contractor waives all rights to any other compensation for said Extra Work, damage or expense.
- F. The Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and when requested by the Owner shall give the Owner access to all accounts and records relating thereto, including records of subcontractors and material suppliers.
- G. Increased bonding costs for the Work which may result from Owner issued Changes in the Work will be addressed by the Owner at the completion of the Project Work upon submission of satisfactory proof of Contractor's increased cost.
- H. Increased contractual liability insurance premium costs which may result from changes in the Work will be addressed by the Owner at the completion of the Work upon submission of satisfactory proof of Contractor's increased cost.

SECTION 8.02 – OVERHEAD AND PROFIT ALLOWANCE

A. See Example A for changes in the Work performed directly by the Contractor, whether a base cost is arrived at by estimated cost or actual cost method; add to base cost a sum equal to twenty percent. See Exceptions - Paragraphs “D” and “E”.

Example A:

Contractor base cost	\$1,000
20% overhead and profit	<u>200</u>
Total	\$1,200

B. See Example B for changes in the Work performed by a Subcontractor under contract with the Contractor, where estimated or actual cost is Ten Thousand Dollars (\$10,000.00) or less; add to the base cost a sum equal to twenty percent of cost, for the benefit of the Subcontractor. For the benefit of the Contractor; add an additional sum equal to ten percent of the Subcontractor's base cost.

Example B:

Subcontractor base cost	\$1,000
20% Subcontractor overhead and profit	<u>200</u>
Subcontractor Total	\$1,200
10% Contractor overhead and profit on base cost	<u>100</u>
Total	\$1,300

C. See Example C for changes in the Work performed by a Subcontractor, under contract with the Contractor, which exceeds a base cost of Ten Thousand Dollars (\$10,000) in estimated or actual cost; add to the base cost a sum equal to twenty percent of cost for the benefit of the Subcontractor. For the benefit of the Contractor; add an additional sum equal to ten percent of the first Ten Thousand Dollars (\$10,000) of the Subcontractor's base cost, plus five percent of the next Ninety Thousand Dollars (\$90,000) of the Subcontractor's base cost, plus three percent of any sum in excess of One Hundred Thousand Dollars (\$100,000) of the Subcontractor's base cost.

Example C:

Subcontractor base cost	\$200,000
20% Subcontractor overhead and profit	<u>40,000</u>
Subcontractor Total	\$240,000
10% Contractor overhead and profit on first \$10,000 base cost	1,000
5% on next \$90,000 base cost	4,500
3% on base cost over \$100,000	<u>3,000</u>
Total	\$248,500

D. See Example D for overhead and profit on major equipment such as: switchgear, transformers, air handling units, boilers, etc. For extra equipment purchases by the Contractor or Subcontractors which exceeds a base cost of Ten Thousand dollars (\$10,000) in estimated or actual cost; add to the base cost for the benefit of the Contractor a sum equal to ten percent of the first Ten Thousand dollars (\$10,000) of the vendor's base cost plus five percent of the next Ninety Thousand dollars (\$90,000) of the vendor's base cost, plus three percent of any sum in excess of One Hundred Thousand dollars (\$100,000) of the vendor's base cost. If the equipment is supplied by the Subcontractor, the Contractor is entitled to a maximum of ten (10) percent of the first Ten Thousand dollars (\$10,000) of the base cost.

Example D:

Vendor base cost	\$200,000
10% Contractor or Subcontractor overhead and profit on first \$10,000 base cost	1,000
5% on next \$90,000 base cost	4,500
3% on base cost over \$100,000	<u>3,000</u>
Contractor or Subcontractor Total	\$208,500
10% Contractor overhead and profit on first \$10,000 base cost when equipment is supplied by the Subcontractor, no other mark-up allowed	<u>1,000</u>
Total	\$209,500

E. See Example E for overhead and profit on a material only Change Order. For increased material purchases by the Contractor or Subcontractors which exceed a base cost of Ten Thousand dollars (\$10,000) in estimated or actual costs; add to the base cost for the benefit of the Contractor a sum equal to ten percent of the first Ten Thousand dollars (\$10,000) of the supplier's cost plus five percent of the next Ninety Thousand dollars (\$90,000) of the supplier's cost, plus three percent of any sum in excess of One Hundred Thousand dollars (\$100,000) of the supplier's cost. If the material is supplied by the Subcontractor, the Contractor is entitled to a maximum of ten (10) percent of the first Ten Thousand dollars (\$10,000) of the base cost.

Example E:

Material cost (net difference between original contract and revised)	\$200,000
10% Contractor or Subcontractor overhead and profit on first \$10,000 base cost	1,000
5% on next \$90,000 base cost	4,500
3% on base cost over \$100,000	<u>3,000</u>
Contractor or Subcontractor Total	\$208,500
10% Contractor overhead and profit on first \$10,000 base cost when material is supplied by the Subcontractor, no other mark-up allowed	1,000
Total	\$209,500

F. Other than the overhead and profit described in General Conditions Section 7.02A, no further overhead and profit will be allowed for changes to the Work performed by a Subcontractor under Subcontract with the Contractor or for major equipment or material supplier determined to be an affiliate of or controlled by the Contractor. An affiliate is considered any firm or entity in which the Contractor or any individual listed on the Contractor's NYS Vendor Responsibility Questionnaire either owns 5% or more of the shares of, or is one of the five largest shareholders, a director, officer, member, partner or proprietor of said Subcontractor, major equipment or material supplier; a controlled firm is any firm or entity which, in the opinion of the Owner, is controlled by the Contractor or any individual listed on the Contractor's NYS Vendor Responsibility Questionnaire.

1. The Owner, in its sole and exclusive discretion, will determine if a firm or entity is an affiliate of or controlled by the Contractor.

G. No overhead and profit shall be paid for changes in the Work performed by a Subcontractor not under Subcontract with the Contractor. No overhead and profit shall be paid on the premium portion of overtime pay. Where the changes in the Work involve both an increase and a reduction in similar or related Work, the overhead and profit allowance shall be applied only to the cost of the increase that exceeds the cost of the reduction.

SECTION 8.02A – DEDUCT CHANGE ORDER

The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a decrease in the Contract amount shall be as determined by the Owner. The credit shall include the overhead and profit allocable to the deleted or changed Work unless the Owner, in its sole and exclusive discretion, determines otherwise.

SECTION 8.03 – FORM OF CHANGE ORDERS

All Change Orders shall be processed, executed and approved on AIA document G701, which is included herein and made part of the Contract Documents. No alteration to this form shall be acceptable to the Owner and no payment for Extra Work shall be due the Contractor unless it executes a Change Order on said form.

ARTICLE 9 -- TIME OF COMPLETION

SECTION 9.01 – TIME OF COMPLETION

- A. The Work shall be commenced at the time stated in the Owner's written notice to proceed, and shall be completed no later than the time of completion specified in the Contract Documents. Notwithstanding anything to the contrary, a schedule submitted by the Contractor showing a time of completion earlier than that specified in the Contract shall not entitle the Contractor to any additional compensation in the event the earlier time of completion is not realized.
- B. It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the time for completion of the Work, as specified in the Contract Documents, is an essential and material condition of the Contract.
- C. The Contractor agrees that the Work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as shall insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for completion of the Work described herein is a reasonable time for completion of the same.
- D. If the Contractor shall neglect, fail or refuse to complete the Work within the time specified, or any proper extension thereof granted by the Owner, the Contractor agrees to pay to the Owner for loss of beneficial use of the structure an amount specified in the Contract, not as a penalty, but as liquidated damages, for each and every calendar day that the Contractor is in default. Default shall include abandonment of the Work by the Contractor.
- E. Said amount of liquidated damages is agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages which the Owner would sustain for loss of beneficial use of the structure in the event of delay in completion, and said amount is agreed to be the amount of damages sustained by the Owner and said amount may be retained from time to time by the Owner.

- F. It is further agreed that time is of the essence for each and every portion of the Work. In any instance in which additional time is allowed for the completion of any Work, the new time of completion established by said extension shall be of the essence. The Contractor shall not be charged with liquidated damages or any excess cost if the Owner determines that the Contractor is without fault and that the delay in completion of the Work is due:
1. to an unforeseeable cause beyond the control and without the fault of, or negligence of the Contractor, and approved by the Owner, including, but not limited to, acts of God or of public enemy, acts of the Owner, fires, epidemics, quarantine, restrictions, strikes, freight embargoes and unusually severe weather; and
 2. to any delays of Subcontractors or suppliers occasioned by any of the causes specified in Subsections 1. of this paragraph.

The Contractor shall, within ten (10) days from the beginning of any such delay, notify the Owner, in writing, of the causes of the delay.

- G. The time for completion can be extended only by Change Order approved by the Owner and may be extended for:
1. all of the Work, or
 2. only that portion of the Work altered by the Change Order.

- H. The foregoing liquidated damages are intended to compensate the Owner only for the loss of beneficial use of the structure. In addition, the Contractor shall be liable to the Owner for whatever actual damages (other than actual loss of beneficial use) the Owner may incur as a result of any actions or inactions of the Contractor or its Subcontractors including, without limitation, interest expense and carrying costs, liabilities to other Contractors working on the project or other third parties, job extension costs and other losses incurred by the Owner. The provisions of this paragraph are for the exclusive use of the Owner, and shall not accrue to other contractors or third parties.

ARTICLE 10 -- TERMINATION OR SUSPENSION

SECTION 10.01 – TERMINATION FOR CAUSE

In the event that any provision of the Contract is violated by the Contractor or by any Subcontractor, the Owner may serve written notice upon the Contractor and upon the Contractor's surety, if any, of the Owner's intention to terminate the Contract; such notice shall contain the reasons for the intention to terminate the Contract upon a date specified by the Owner. If the violation or delay shall not cease or arrangements satisfactory to the Owner shall not be made, the Contract shall terminate upon the date so specified by the Owner. In the event of any such termination, the Owner may take over the Work and prosecute same to completion by Contract or otherwise for the account and at the expense of the Contractor, and the Contractor and Contractor's surety shall be liable to the Owner for all costs occasioned the Owner thereby. In the event of such termination the Owner may take possession of and may utilize such materials, appliances and plant as may be on the Site and necessary or useful in completing the Work.

SECTION 10.02 – TERMINATION FOR CONVENIENCE OF OWNER

The Owner, at any time, may terminate the Contract in whole or in part. Any such termination shall be effected by delivering to the Contractor a notice of termination specifying the extent to which performance of Work under the Contract is terminated and the date upon which the termination becomes effective. Upon receipt of the notice of termination, the Contractor shall act promptly to minimize the expenses resulting from the termination. The Owner shall pay the Contractor for Work of the Contract performed by the Contractor and accepted by the Owner for the period extending from the date of the last approved Application for Payment up to the effective date of the termination, including retainage. In no event shall the Contractor be entitled to compensation in excess of the total consideration of the Contract. . In the event of such termination the Owner may take over the Work and prosecute the Contract to completion and may take possession of and may utilize such materials, appliances, and equipment as may be on the Site and necessary or useful in completing the Work.

SECTION 10.03 – OWNER'S RIGHT TO DO WORK

The Owner may, after notice to the Contractor, without terminating the Contract and without prejudice to any other right or remedy the Owner may have, perform or have performed by others all of the Work or any part thereof and may deduct the cost thereof from any moneys due or to become due the Contractor.

SECTION 10.04 – SUSPENSION OF WORK

- A. The Owner may order the Contractor in writing to suspend, delay or interrupt performance of all or any part of the Work for a reasonable period of time as the Owner may determine. The order shall contain the reason or reasons for issuance which may include but shall not be limited to the following: latent field conditions, substantial program revisions, acquisition of rights of way or real property, financial crisis, labor disputes, civil unrest or acts of God.
- B. Upon receipt of a suspension order, the Contractor shall, as soon as practicable, cease performance of the Work as ordered and take immediate affirmative measures to protect such Work from loss or damage.
- C. The Contractor specifically agrees that such suspension, interruption or delay of the performance of the Work pursuant to this Article shall not increase the cost of performance of the Work of this Contract.
- D. Time for completion of the Work may be extended to such time as the Owner determines shall compensate for the time lost by the suspension, interruption or delay, such determination to be set forth in writing.

ARTICLE 11 -- DISPUTES

SECTION 11.01 – CLAIMS FOR EXTRA WORK

- A. If the Contractor claims that any Work which the Contractor has been ordered to perform will be Extra Work, or that any action or omission of the Owner is contrary to the terms and provisions of the Contract and will require the Contractor to perform Extra Work the Contractor shall:
 - 1. Promptly comply with said order.
 - 2. File with the Owner and the architect within fifteen (15) working days after being ordered to perform the Work claimed by the Contractor to be Extra Work or within fifteen (15) working days after commencing performance of the Work, whichever date shall be earlier, or within fifteen (15) working days after the said action or omission on the part of the Owner occurred, a written notice of the basis of the Contractor's claim, including estimated cost, and request for a determination thereof.

3. Proceed diligently, pending and subsequent to the determination of the Owner with respect to any said disputed matter, with the performance of the Work in accordance with all instructions of the Owner.
- B. No claim for Extra Work shall be allowed unless the same was done pursuant to a written order of the Owner. The Contractor's failure to comply with any or all parts of this Article shall be deemed to be:
1. a conclusive and binding determination on the part of the Contractor that said order, Work, action or omission does not involve Extra Work and is not contrary to the terms and provisions of the Contract,
 2. a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, Work, action or omission.
- C. The value of claims for Extra Work, if allowed, shall be determined by the methods described in the Contract.

SECTION 11.02 – CLAIMS FOR DELAY

No claims for increased costs, charges, expenses or damages of any kind shall be made by the Contractor against the Owner for any delays or hindrances from any cause whatsoever; provided that the Owner, in the Owner's discretion, may compensate the Contractor for any said delays by extending the time for completion of the Work as specified in the Contract.

SECTION 11.03 – FINALITY OF DECISIONS

- A. Any decision or determination of the Architect, Owner or the Owner's Representative shall be final, binding and conclusive on the Contractor unless the Contractor shall, within ten (10) working days after said decision, make and deliver to the Owner a verified written statement of the Contractor's contention that said decision is contrary to a provision of the Contract. The Owner shall determine the validity of the Contractor's contention. Pending the decision of the Owner, the Contractor shall proceed in accordance with the original decision.
- B. Wherever it is required in the Contract that an application must be made to the Owner or a determination made by the Owner, the decision of the Owner on said application or the determination of the Owner under the Contract shall be final, conclusive and binding upon the Contractor unless the Contractor, within ten (10) working days after receiving notice of the Owner's decision or determination, files a written statement with the Owner that the Contractor reserves the Contractor's rights in connection with the matters covered by said decision or determination.

ARTICLE 12 -- SUBCONTRACTS

SECTION 12.01 – SUBCONTRACTING

- A. The Contractor may utilize the services of Subcontractors subject to the bid terms and conditions.
- B. The Contractor shall submit to the Owner, in writing, the name of each proposed Subcontractor as required by the Contract or earlier when requested. The Owner reserves the right to disapprove any proposed Subcontractor. Such disapproval shall not result in additional cost to the Owner.
- C. The Contractor shall be fully responsible for the Work, acts and omissions of Subcontractors, and of persons either directly or indirectly employed by Subcontractors.
- D. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind Subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the work of Subcontractors.
- E. The Contractor's use of Subcontractors shall not diminish the Contractor's obligation to complete the Work in accordance with the Contract Documents. The Contractor shall control and coordinate the work of Subcontractors.
- F. Nothing contained in the Contract or any subcontract shall create any contractual relationship between Subcontractors and the Owner.

ARTICLE 13 -- CONTRACT COORDINATION AND COOPERATION

SECTION 13.01 – COOPERATION WITH OTHER CONTRACTORS

- A. During the progress of the Work, other contractors may be engaged in performing work. The Contractor shall coordinate the Contractor's Work with the work of said other contractors in such a manner as the Owner may direct.
- B. If the Owner shall determine that the Contractor is failing to coordinate the Work with the work of other contractors as the Owner has directed:
 - 1. the Owner shall have the right to withhold any payments due under the Contract until the Owner's directions are complied with by the Contractor; and
 - 2. the Contractor shall assume the defense and pay on behalf of the Owner any and all claims or judgments or damages and from any costs or damages to which the Owner may be subjected or which the Owner may suffer or incur by reason of the Contractor's failure to promptly comply with the Owner's directions.
- C. If the Contractor notifies the Owner, in writing, that another contractor on the Site is failing to coordinate the work of said contractor with the Work, the Owner shall investigate the charge. If the Owner finds it to be true, the Owner shall promptly issue such directions to the other contractor with respect thereto as the situation may require. The Owner shall not be liable for any damages suffered by the Contractor by reason of the other contractor's failure to promptly comply with the directions so issued by the Owner, or by reason of another contractor's default in performance.
- D. Should the Contractor sustain any damage through any act or omission of any other contractor having a contract with the Owner or through any act or omission of any Subcontractor of said other contractor, the Contractor shall have no claim against the Owner for said damage.
- E. Should any other contractor having or which shall have a contract with the Owner sustain damage through any act or omission of the Contractor or through any act or omission of a Subcontractor, the Contractor shall reimburse said other contractor for all said damages and shall indemnify and hold the Owner harmless from all said claims.

- F. The Owner cannot guarantee the responsibility, efficiency, unimpeded operations or performance of any Contractor. The Contractor acknowledges these conditions and shall bear the risk of all delays including, but not limited to, delays caused by the presence or operations of other contractors and delays attendant upon any construction schedule approved by the Owner and the Owner shall not incur any liability by reason of any delay.

SECTION 13.02 – SEPARATE CONTRACTS

- A. The Owner may award other contracts, work under which may proceed simultaneously with the execution of the Work. The Contractor shall coordinate the Contractor's operations with those of other contractors as directed by the Owner. Cooperation shall be required in the arrangements for access, the storage of material and in the detailed execution of the Work.
- B. The Contractor shall keep informed of the progress and workmanship of other contractors and any Subcontractors and shall notify the Owner in writing immediately of lack of progress or defective workmanship on the part of other contractors or subcontractors, where said delay or defective workmanship may interfere with the Contractor's operations.
- C. Failure of a Contractor to keep so informed and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by the Contractor of said progress and workmanship as being satisfactory for proper coordination with the Work.
- D. Where the Contractor shall perform Work in close proximity to work of other contractors or subcontractors, or where there is evidence that Work of the Contractor may interfere with work of other contractors or subcontractors, the Contractor shall assist in arranging space conditions to make satisfactory adjustment for the performance of said work and the Work. If the Contractor performs work in a manner which causes interference with the work of other contractors or subcontractors, the Contractor shall make changes necessary to correct the condition.

SECTION 13.03 – COORDINATED COMPOSITE DRAWINGS

The Contractor shall prepare coordinated composite scale reproducible drawings and sections, on reproducible paper, clearly showing how the Work of the Contractor is to be performed in relation to work of other contractors or subcontractors.

ARTICLE 14 -- PROTECTION OF RIGHTS, PERSONS AND PROPERTY

SECTION 14.01 – ACCIDENT PREVENTION

The Contractor shall, at all times, take every precaution against injuries to persons or damage to property and for the safety of persons on or about the Site or engaged in the performance of the Work.

SECTION 14.02 – SAFETY PROGRAMS

The Contractor shall be responsible for the initiation, maintenance and supervision of safety precautions and programs in connection with the Work.

SECTION 14.03 – PROTECTION OF WORK AND PROPERTY

- A. The Contractor shall, at all times, guard the Owner's property from injury or loss in connection with the Work. The Contractor shall, at all times, guard and protect the Contractor's Work, and adjacent property. The Contractor shall replace or make good any said loss or injury unless said loss or injury is caused directly by the Owner.
- B. The Contractor shall have full responsibility to protect and maintain all materials and supplies on and off site in proper condition and forthwith repair, replace and make good any damage thereto until construction completion. The Contractor shall maintain an inventory of all materials and supplies for the Project that are delivered to the Site or approved for off-site storage facilities.
- C. The Contractor shall report any loss, theft, burglary, vandalism or damage of materials or installed work to the Owner by phone and fax as soon as it is discovered. If vandalism, theft, or burglary are suspected as the cause of the loss, the Contractor shall notify site security personnel and the municipal police. The Contractor shall also protect the place of the loss until released from protection by the Owner or the Owner's Representative. The Contractor shall insure that no potential evidence relating to the loss is removed from the place of the loss.

SECTION 14.04 – ADJOINING PROPERTY

The Contractor shall protect all adjoining property and shall repair or replace any said property damaged or destroyed during the progress of the Work.

SECTION 14.05 – RISKS ASSUMED BY THE CONTRACTOR

- A. The Contractor solely assumes the following distinct and several risks whether said risks arise from acts or omissions, whether supervisory or otherwise, of the Owner, of any Subcontractor, of third persons or from any other cause, including unforeseen obstacles and difficulties which may be encountered in the execution of the Work, whether said risks are within or beyond the control of the Contractor and whether said risks involve any legal duty, primary or otherwise, imposed upon the Owner, excepting only risks which arise from faulty designs as shown by the plans and specifications or from the negligence of the Owner or the Owner's members, officers, representatives or employees that caused the loss, damage or injuries hereinafter set forth:
1. The risk of loss or damage, includes direct or indirect damage or loss, of whatever nature to the Work or to any plant, equipment, tools, materials or property furnished, used, installed or received by the Owner, the Construction Manager, the Contractor or any Subcontractor, material or workmen performing services or furnishing materials for the Work. The Contractor shall bear said risk of loss or damage until construction completion or until completion or removal of said plant, equipment, tools, materials or property from the Site and the vicinity thereof, whichever event occurs last. In the event of said loss or damage, the Contractor immediately shall repair, replace or make good any said loss or damage.
 2. The risk of claims, just or unjust, by third persons against the Contractor or the Owner and the Construction Manager on account of wrongful death, bodily injuries and property damage, direct or consequential, loss or damage of any kind whatsoever arising or alleged to arise out of or as a result of or in connection with the performance by the Contractor of the Work, whether actually caused by or resulting from the performance of the Work, or out of or in connection with the Contractor's operations or presence at or in the vicinity of the Site. The Contractor shall bear the risk for all deaths, injuries, damages or losses sustained or alleged to have been sustained prior to the construction completion of the Work. The Contractor shall bear the risk for all deaths, injuries, damages or losses sustained or alleged to have been sustained resulting from the Contractor's negligence or alleged negligence which is discovered, appears or is manifested after acceptance by the Owner.

3. The Contractor assumes entire responsibility and liability for any and all damage or injury of any kind or nature whatsoever, including death resulting therefrom, to all persons, whether employees of the Contractor or otherwise, and to all property, caused by, resulting from, arising out of or occurring in connection with the execution of the Work. If any person shall make said claim for any damage or injury, including death resulting therefrom, or any alleged breach of any statutory duty or obligation on the part of the Owner, the Owner's Representative, Construction Manager, servants and employees, the Contractor shall assume the defense and pay on behalf of the Owner, the Owner's Representative, the Construction Manager, servants and employees, any and all loss, expense, damage or injury that the Owner, the Owner's Representative, Construction Manager, servants and employees, may sustain as the result of any claim, provided however, the Contractor shall not be obligated to indemnify the Owner, the Owner's Representative, Construction Manager, servants and employees for their own negligence, if any. The Contractor agrees to assume, and pay on behalf of the Owner and the Owner's Representative, Construction Manager, servants and employees, the defense of any action at law or equity which may be brought against the Owner and the Owner's Representative, Construction Manager, servants and employees. The assumption of defense and liability by the Contractor includes, but is not limited to the amount of any legal fees associated with defending, all costs of investigation, expert evaluation and any other costs including any judgment or interest or penalty that may be entered against the Owner and the Owner's Representative, Construction Manager, servants and employees, in any said action.
 4. The Contractor is advised that the Work required under this Contract may impose certain obligations and requirements mandated by the U.S. Department of Labor Occupational Safety and Health Administration regulations, Title 29 CFR Part 1926.62 Lead Exposure in Construction, relative to the potential exposure to lead by its employees. The Contractor assumes entire responsibility and liability for complying fully in all respects with these regulations.
- B. The Contractor's obligations under this Article shall not be deemed waived, limited or discharged by the enumeration or procurement of any insurance for liability for damages. The Contractor shall notify its insurance carrier within twenty four (24) hours after receiving a notice of loss or damage or claim from the Owner.

The Contractor shall make a claim on its insurer specifically under the provisions of the contractual liability coverages and any other coverages afforded the Owner including those of being an additional insured where applicable.

- C. Neither Final Acceptance of the Work nor making any payment shall release the Contractor from the Contractor's obligations under this Article. The enumeration elsewhere in the Contract of particular risks assumed by the Contractor or of particular claims for which the Contractor is responsible shall not be deemed to limit the effect of the provisions of this Article or to imply that the Contractor assumes or is responsible for only risks or claims of the type enumerated; and neither the enumeration in this Article nor the enumeration elsewhere in the Contract of particular risks assumed by the Contractor or of particular claims for which the Contractor is responsible shall be deemed to limit the risks which the Contractor would assume or the claims for which the Contractor would be responsible in the absence of said enumerations.

Upon the conclusion of any action, proceeding or lawsuit, should a final binding determination of responsibility be made which allocates responsibility to the Owner, or the Owner's members, officers, employees or representatives, the Owner agrees that the obligation to indemnify and hold harmless shall not be applicable to the portion of any uninsured money judgment for which the Owner is responsible, and the Owner agrees to pay the Contractor the percentage of uninsured defense costs which the Contractor incurred based upon an apportionment of the Owner's allocated responsibility.

The Contractor agrees that any claim or costs of the Owner and/or Construction Manager arising from obligations in this Article and/or Article 15 shall be set off or deducted from payments due the Contractor.

ARTICLE 15--INSURANCE AND CONTRACT SECURITY

SECTION 15.01 – INSURANCE PROVIDED BY CONTRACTOR

- A. The Contractor shall procure and maintain all of the insurance required under this Article until all Work, including punch list items, is complete.

The Contractor shall provide insurance as follows:

1. Workers' Compensation and Employers Liability Insurance
 - a. Statutory Workers' Compensation (including occupational disease)

- b. Employers Liability (with a minimum limit of \$1,000,000) New York Statutory Endorsement
2. Commercial General Liability (CGL) with a combined single limit for Bodily Injury, Personal Injury and Property Damage of at least \$2,000,000 per occurrence & aggregate. The limit may be provided through a combination of primary and umbrella/excess liability policies.

Coverage shall provide and encompass the following:

- a. Written on an occurrence form;
 - b. Endorsement naming the following as additional insureds: The Fashion Institute of Technology, its auxiliary corporations, the State University of New York, the New York City Department of Education and the City and State of New York, the Construction Manager (if applicable) and other entities specified.
 - c. Policy or policies must be endorsed to be primary as respects the coverage afforded the Additional Insureds and such policy shall be primary to any other insurance maintained by the Owner. Any other insurance maintained by the Owner shall be excess of and shall not contribute with the Contractor's or Subcontractor's insurance, regardless of the "other insurance" clause contained in the Owner's own policy of insurance.
3. Commercial Automobile Liability and Property Damage Insurance covering all owned, leased, hired and non-owned vehicles used in connection with the Work with a combined single limit for Bodily Injury and Property Damage of at least \$1,000,000 per occurrence. The limit may be provided through a combination of primary and umbrella/excess liability policies.
4. Umbrella/excess liability insurance with limits of:
- \$5,000,000 per occurrence
 - \$5,000,000 general aggregate

- B. Before commencement of Work, the Contractor shall submit to the Owner for approval two (2) Certificates of Insurance, indicating the Project. Certificates shall provide thirty (30) days' written notice prior to the cancellation, non-renewal, or material modification of any policy. Upon request, the Contractor shall furnish the Owner and the Construction Manager with certified copies of each policy. In addition, where applicable, the Contractor shall provide copies of Certificates of Insurance to the Construction Manager.

Certificates shall be forwarded to Owner in care of: Purchasing

Sammy Li
Purchasing Deputy Director
FIT Purchasing
333 Seventh Avenue, 15th Floor
New York, NY 10001

Certificate(s) of Insurance, when submitted to the Owner, constitutes a warranty by the Contractor that the insurance coverage described is in effect for the policy term shown.

Should the Contractor engage a Subcontractor, the same conditions as are applicable to the Contractor under these insurance requirements shall apply to each Subcontractor of every tier. Proof thereof shall be supplied to the Owner at the address listed above.

- C. All insurance required to be procured and maintained must be procured from insurance companies licensed to do business in the State of New York and rated at least B+ by A.M. Best and Company, or meet such other requirements as are acceptable to the Owner.
- D. Should the Contractor fail to provide or maintain any insurance required by this Contract, the Owner may, after providing written notice to the Contractor, purchase insurance complying with the requirements of this Article and charge back such purchase to the Contractor.
- E. At any time that the coverage provisions and limits on the policies required herein do not meet the provisions and limits set forth above, the Contractor shall immediately cease Work on the Project. The Contractor shall not resume Work on the Project until authorized to do so by the Owner. Any delay or time lost as a result of the Contractor not having insurance required by this Article shall not give rise to a delay claim or any other claim against the Owner or the Client.
- F. Notwithstanding any other provision in this Article, the Owner may require the Contractor to provide, at the expense of the Owner, any other form or limit of insurance necessary to secure the interests of the Owner.
- G. The Contractor shall secure, pay for, and maintain Property Insurance necessary for protection against the loss of owned, borrowed or rented capital equipment and tools, including any tools owned by employees, and any tools or equipment, staging towers, and forms owned, borrowed or rented by the Contractor. The requirement to secure and maintain such insurance is solely for the benefit of the Contractor. Failure of the Contractor to secure such insurance or to maintain adequate levels of coverage shall not render the Additional Insureds or their

agents and employees responsible for any losses; and the Additional Insureds, their agents and employees shall have no such liability.

- H. Neither the procurement nor the maintenance of any type of insurance by the Owner, the Contractor or the Construction Manager shall in any way be construed or deemed to limit, discharge, waive or release the Contractor from any of the obligations or risks accepted by the Contractor or to be a limitation on the nature or extent of said obligations and risks.

SECTION 15.01A – OTHER INSURANCE PROVIDED BY CONTRACTOR

Railroad Protective Liability insurance: If any Work of the Contract is to be performed on or within fifty (50) feet of a railroad property or railroad right of way or will require entrance upon railroad property or right of way or will require assignment of a railroad employee, the Contractor shall provide and maintain a Railroad Protective Liability policy with the policy limits required by the owner(s) of the railroad, including the MTA. For purposes of this paragraph, a subway is a railroad. The policy form shall be ISO-RIMA or an equivalent form approved by the owner(s) of the railroad. The railroad owner(s) shall be the named insured on the policy and the definition of “physical damage to property” shall mean direct and accidental loss of or damage to all property of any named insured and all property in any named insured’s care, custody, or control. If the Contractor shall provide a Railroad Protective Liability insurance policy, the Contractor and any Subcontractor performing on or within fifty (50) feet of railroad property or railroad right of way or entering railroad property or right of way or requiring assignment of a railroad employee shall have their CGL insurance policy endorsed to delete the exclusion of coverage for Work within fifty (50) feet of railroad property.

SECTION 15.02 – GENERAL CONFORMANCE

The Contractor and Subcontractors shall not violate, or be permitted to violate, any term or condition of their insurance policies, and shall at all times satisfy the safety requirements of the Owner and of the insurance companies issuing such policies.

SECTION 15.03 – CONTRACT SECURITY

The Contractor shall furnish a surety bond in an amount at least equal to one hundred (100%) of the Contract price as security for the faithful performance of the Contract and also labor and material bond in the form set forth in the Contract in an amount at least equal to one hundred (100%) of the Contract price for the payment of all persons performing labor or providing materials in connection with the Work. The surety on said bond shall be a surety company authorized to do business in the State of New York and shall be rated at least B+ by A.M. Best and Company, or meet such other requirements as are acceptable to the Owner.

SECTION 15.04 – ADDITIONAL OR SUBSTITUTE BOND

If at any time the Owner shall become dissatisfied with any surety or sureties upon the performance bond, or the labor and material payment bond, or if for any other reason said bonds shall cease to be adequate security to the Owner, the Contractor shall, within five (5) days after notice from the Owner to do so, substitute an acceptable bond or bonds in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on said bond or bonds shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond or bonds to the Owner.

SECTION 15.05 – FAILURE TO COMPLY WITH PROVISIONS OF ARTICLE 15

The Contract may, at the sole option of the Owner, be declared void and of no effect if the Contractor fails to comply with the provisions of Article 15.

ARTICLE 16 -- USE OR OCCUPANCY PRIOR TO ACCEPTANCE BY OWNER

SECTION 16.01 – OCCUPANCY PRIOR TO ACCEPTANCE

NOT APPLICABLE

ARTICLE 17 -- PAYMENT

SECTION 17.01 – PROVISION FOR PAYMENT

- A. The Owner may make a partial payment to the Contractor on the basis of an approved estimate of the Work performed during each preceding business month. The Owner shall retain ten percent (10%) of the amount of each said estimate.

The Contractor shall submit a detailed Contract Payment Breakdown prior to the Contractor's first application for payment. The model contract payment breakdown included in the Contract Documents shall establish the minimum level of detail required for the Contractor's payment breakdown. It is understood and the Contractor acknowledges that this model is included as an administrative tool for

the purpose of illustrating a format and minimum level of detail required for the Contract Payment Breakdown and shall not be considered as delineating the Contractor's Scope of Work. The Owner may request further and more detailed Contract Payment Breakdown. Further, the Owner reserves the right to accept only those cost distributions which, in the Owner's opinion, are reasonable, equitably balanced and correspond to the estimated quantities in the Contract Documents.

No payment shall be made by the Owner until the Contract Payment Breakdown is approved by the Owner.

Each monthly partial payment requisition must include Affirmative Action Form AAP 7.0, Contractor's Compliance Report, properly executed, as a condition precedent to requisition payment by the Owner.

- B. In preparing estimates for partial payment, material delivered to the Site and properly stored and secured at the Site, and Material approved to be stored off-site under such conditions as the Owner shall prescribe may be taken into consideration. All costs related to the storage of materials are the sole responsibility of the Contractor.

The Owner will provide an Agreement for Materials Stored Off-Site and specific forms which the Contractor must complete and submit with any request for approval of partial payment for such material. Required information includes but is not limited to: a general description of the material; a detailed list of the materials; a pre-approved storage area; segregation and identification of the material; insurance covering full value against all risks of loss or damage, with non-cancellation provision; immediate replacement agreement in event of loss or damage; agreement to pay the expense of all inspections of the material; ownership provisions; delivery guarantee; project completion statement; bill of sale, releases, and inventory.

- C. Any partial payment made shall not be construed as a waiver of the right of the Owner to require the fulfillment of all the terms of the Contract.
- D. After the Owner has determined Substantial Completion of the Work, the Contractor shall submit to the Owner, for the Owner's approval, a detailed estimate of the value of the known remaining items of Work as set forth by the Owner and a schedule of completion for said items of Work. The Owner shall review that estimate and make the final determination.

The Owner, when all the Work is substantially complete, shall pay to the Contractor the balance due the Contractor pursuant to the Contract, less:

1. two (2) times the value of any remaining items of Work to be completed or corrected; and
2. an amount necessary to satisfy any and all claims, liens or judgments against the Contractor.

As the remaining items of Work are completed and accepted by the Owner, the

Owner shall pay the appropriate amount pursuant to the duly completed and submitted monthly requisitions.

The list of remaining Work items may be expanded to include additional items of corrective or completion Work until final acceptance as certified by the Owner's execution of "Notification of Construction Completion". Appropriate payments may be withheld to cover the value of these items pursuant to this Section.

- E. All Monthly Requisitions submitted by the Contractor shall be on AIA documents G702 and G703. The Contractor shall furnish such affidavits, vouchers and receipts as to delivery and payment for materials as required by the Owner to substantiate each and every payment requested. The Contractor and its Subcontractors will submit with all applications for payment copies of the certified payrolls and certification of payment of wage supplements in a form satisfactory to the Owner. The submission of Contractor and Subcontractor certified payrolls is required at least monthly. No progress payments will be processed without submission by the Contractor of properly executed Affidavit of Payment and Release of Liens (AIA Documents G706 and G706A).”

Section 17.02 - Acceptance of the First Payment Pursuant to Section 17.01 D. of the Contract Constitutes Release

The acceptance by the Contractor of the first payment pursuant to Section 17.01 D. shall be and shall operate as a release to the Owner of all claims by and all liability to the Contractor for all things in connection with the Work and for every act and neglect of the Owner and others relating to or arising out of the Work. No payment, final or otherwise, shall operate to release the Contractor or the Contractor's sureties from any obligations under this Contract or the performance or labor and material payment bonds.

SECTION 17.03 – RELEASE AND CONSENT OF SURETY

Notwithstanding any other provision of the Contract Documents to the contrary, the first payment pursuant to Section 17.01 D. shall not become due until the Contractor submits to the Owner a General Release and a Consent of Surety to said payment pursuant to Section 17.01 D., both in form and content acceptable to the Owner.

SECTION 17.04 - LIENS

Upon the Owner's receipt of a lien, a sum which shall be one and one-half (1 1/2) times the amount stated to be due in the notice of lien shall be deducted from the current payment due the Contractor. This sum shall be withheld until the lien is discharged.

SECTION 17.05 – WITHHOLDING OF PAYMENTS

- A. The Owner may withhold from the Contractor any part of any payment as may, in the judgment of the Owner, be necessary:
 - 1. to assure payment of just claims of any persons supplying labor or materials for the Work;
 - 2. to protect the Owner from loss due to defective Work not remedied; or
 - 3. to protect the Owner, Construction Manager or Consultant from loss due to failure to defend, loss due to injury to persons or damage to the Work or property of other contractors, Subcontractors or others caused by the act or neglect of the Contractor or Subcontractors.
 - 4. to assure payment of fines and penalties which may be imposed on the Contractor pursuant to the provisions of this Contract.
- B. The Owner shall have the right to apply any such amounts so withheld, in such manner as the Owner may deem proper to satisfy said claims, fines and penalties or to secure said protection. Said application of the money shall be deemed payments for the account of the Contractor.
- C. The provisions of this Article 17 are solely for the benefit of the Owner, and any action or non-action hereunder by the Owner shall not give rise to any liability on the part of the Owner.

SECTION 17.06 – OWNER’S RIGHT TO AUDIT AND INSPECTION OF RECORDS

The Contractor shall maintain and keep, for a period of at least six (6) years after the date of final payment, all records and other data relating to the Work, including records of Subcontractors and material suppliers. The Owner or the Owner's Representative shall have the right to inspect and audit all records and other data of the Contractor, Subcontractors and material suppliers relating to the Work.

SECTION 17.07 – FALSE STATEMENTS/INFORMATION

- A. False statements, information or data submitted on or with applications for payment may result in one or more of the following actions:
 - 1. Termination of the Contract for cause;
 - 2. Disapproval of future bids or contracts and sub-contracts;
 - 3. Withholding of final payment on the Contract; and
 - 4. Civil and/or criminal prosecution.

- B. These provisions are solely for the benefit of the Owner, and any action or non-action hereunder by the Owner shall not give rise to any liability on the part of the Owner.

ARTICLE 18 -- TAX EXEMPTION

SECTION 18.01 – TAX EXEMPTION

- A. The Owner is exempt from payment of Federal, State, local taxes and sales and compensating use taxes of the State of New York and of cities and counties on all materials and supplies incorporated into the completed Work. These taxes are not to be included in bids. This exception does not apply to tools, machinery, equipment or other property leased by or to the Contractor or a Subcontractor, or to supplies and materials which, even though they are consumed, are not incorporated into the completed Work, and the Contractor and Subcontractors shall be responsible for and pay any and all applicable taxes, including sales and compensating use taxes, on said leased tools, machinery, equipment or other property and upon all said unincorporated supplies and materials.
- B. The Contractor and Subcontractors shall obtain any and all necessary certificates or other documentation from the appropriate governmental agency or agencies, and use said certificates or other documentation as required by law, rule or regulation.

ARTICLE 19 -- GUARANTEE

SECTION 19.01 - GUARANTEE

The Contractor shall in all respects guarantee the Work to the Owner and be responsible for all material, equipment and workmanship of the Work. The Contractor shall forthwith repair, replace or remedy in a manner approved by the Owner, any said material, equipment, workmanship, or other part of the Work found by the Owner to be defective or otherwise faulty and not acceptable to the Owner, which defect or fault appears during the minimum period of one (1) year, or such longer period as may be prescribed by the Contract, from the date of Construction Completion or any part thereof, by the Owner. The Contractor shall also pay for any damage to the Work resulting from said defect or fault.

ARTICLE 20 -- STANDARD PROVISIONS

SECTION 20.01 – PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted therein and the Contract shall read and shall be enforced as though so included therein.

SECTION 20.02 – COMPLIANCE WITH LAWS, RULES AND REGULATIONS

The Contractor shall comply fully with all applicable laws, rules and regulations.

SECTION 20.03 – LAW GOVERNING THE CONTRACT

The Contract shall be governed by the laws of the state of New York.

SECTION 20.04 - ASSIGNMENT

The Contractor shall not assign the Contract in whole or in part without prior written consent of the Owner. If the Contractor assigns all or part of any moneys due or to become due under the Contract, the instrument of assignment shall contain a clause substantially to the effect that the Contractor and assignee agree that the assignee's right in and to any moneys due or to become due to the Contractor shall be subject to all prior claims for services rendered or materials supplied in connection with the performance of the Work.

SECTION 20.05 – NO THIRD PARTY RIGHTS

Nothing in the Contract shall create or shall give to third parties any claim or right of action against the Owner, the Fashion Institute of Technology, the State University of New York, Board of Education of the City of New York, the City or State of New York and the Construction Manager beyond such as may legally exist irrespective of the Contract.

SECTION 20.06 – CONTRACT DEEMED EXECUTORY

The Contractor agrees that the Contract shall be deemed executory to the extent of moneys available and that no liability shall be incurred by the Owner beyond the moneys available therefore.

SECTION 20.07 – ANTI-RIOT PROVISIONS

- A. The Contractor agrees that no part of the Contract funds shall be used to make payments, give assistance, or supply services, in any form, to any individual convicted in any Federal, State or local court of competent jurisdiction for inciting, promoting, or carrying on a riot or engaging in any group activity resulting in material damage to property or injury to persons found to be in violation of Federal, State or local laws designed to protect persons or property.
- B. The Contractor and each Subcontractor shall notify their employees of all rules and

regulations adopted pursuant to Article 129-A of the Education Law of the State of New York. Notices containing the text of the aforementioned rules and regulations shall be posted by the Contractor at the Site.

SECTION 20.08 – DOMESTIC STEEL

The Contractor agrees, that if the value of this contract exceeds \$100,000 all structural steel, reinforcing steel and other major steel items to be incorporated in the Work of this Contract shall be produced and made in whole or substantial part in the United States, its territories or possessions.

SECTION 20.09 – PROTECTION OF LIVES AND HEALTH

- A. Each Contractor and Subcontractor shall comply with all applicable provisions of the laws of the State of New York, the United States of America and with all applicable rules and regulations adopted or promulgated by agencies or municipalities of the State of New York or the United States of America. The Contractor's and Subcontractor's attention is specifically called to the applicable rules and regulations, codes and bulletins of the New York State Department of Labor and to the standards imposed under the Federal Occupational Safety and Health Act of 1970, as amended.
- B. The Contractor shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment of Work under the Contract, and shall immediately notify the Owner in writing of any injury which results in hospitalization or death. The Contractor shall provide to the Owner a copy of Form C-2, Employers Report of Injury/Illness within twenty- four (24) hours of any job related injury on the Owner's job site. Further, a copy of the OSHA Log of Injury and Illness shall also be provided to the Owner for any reporting period in which a job related injury or illness is recorded. The Contractor shall also provide a list of witnesses to the Owner. The list shall include at least the full name, home address, occupation and telephone number of each person who saw or has knowledge of the incident which caused the injury or illness.
- C. The Contractor alone shall be responsible for the safety, efficiency and adequacy of the Contractor's Work, plant, appliances and methods, and for any damage which may result from the failure or the improper construction, maintenance or operation of such Work, plant, appliances and methods.
- D. If, in the performance of the Work, a harmful hazard is created for which appliances or methods of elimination have been approved by regulatory authorities, the Contractor shall install, maintain and operate said appliances or methods.
- E. The Owner may impose a payment penalty on the Contractor for any act of non-compliance with this section. The payment penalty shall not exceed one twentieth

(1/20) of the Contract price or a maximum of One Thousand Dollars (\$1,000.00) for each time the Contractor fails to perform or to provide the information, reports or forms required in this section. This payment penalty is not exclusive, the Owner may avail itself of any other contractual remedy available.

- F. The Owner, Owner's Representative, or Architect may inspect the Site at any time without notice to the Contractor. If the Owner or its representatives find that the Contractor is not complying with Section 20.10 A or any other provision of Section 20.10, the Owner may send written notice to the Contractor to correct any deficiency. Upon re-inspection, if the Owner finds the deficiencies have not been corrected, or in instances where a safety violation (s) must be corrected before Work continues and the Contractor is given three (3) hours to make correction (s) and they are not made, the Owner may let a separate contract to correct any deficiencies and back charge the cost of the separate contract to the Contractor at a premium rate. The Contractor cannot pass these additional charges on to the Owner. No action taken under this section shall be deemed as a basis for any delay claim or any other claim against the Owner by the Contractor.

- G. The Contractor shall preserve and safeguard the scene of an accident involving a ladder, scaffold, mobile machinery, equipment, safety railing or uncovered floor opening or any other incident where the injured person required emergency medical treatment. The Contractor shall "tape off" the area, and not allow any material object or property to be altered, changed, moved or removed from the accident site. In addition to "taping off" the accident site, the Contractor shall telephone and send a facsimile or email to Owner immediately, and post a person at the accident site to protect it. Safeguarding and protecting the accident site shall only be abandoned by the Contractor upon release by the Owner or the Owner's Representative. Failure of the Contractor to comply with the provisions of this paragraph shall be deemed a breach of this Contract. In addition to any other contractual remedies available, the Owner may satisfy the breach by imposing the penalties set out in paragraph 20.10 E or void the entire Contract and retain any or all amounts due the Contractor under this Contract.

SECTION 20.10 – PROHIBITED INTERESTS / ETHICAL CONDUCT

- A. No officer, employee, architect, attorney, engineer, inspector or consultant of or for the Owner authorized on behalf of the Owner to exercise any legislative, executive, administrative, supervisory or other similar functions in connection with the Contract or the Work, shall become personally interested, directly or indirectly, in the Contract, material supply contract, subcontract, insurance contract, or any other contract pertaining to the Work.
- B. The Owner strongly discourages the Contractor from offering or giving anything of value to employees of the Owner under circumstances which may constitute, or even suggest, impropriety. Contractor, or its agents, shall not directly or indirectly offer or give any gift whether in the form of money, service, loan, travel, lodging, meals, refreshments, entertainment, discount, forbearance or promise, or in any other form, to an employee or any representatives of the Owner.
- C. To promote a working relationship with the Owner based on ethical business practices, the Contractor shall:
- furnish all goods, materials and services to the Owner as contractually required and specified,
 - submit complete and accurate reports to the Owner and its representatives as required,
 - not seek, solicit, demand or accept any information, verbal or written, from the Owner or its representatives that provides an unfair advantage over a competitor,
 - not engage in any activity or course of conduct that restricts open and fair competition on Owner-related projects and transactions,
 - not engage in any course of conduct with Owner employees or its representatives that constitutes a conflict of interest, in fact or in appearance, and
 - not offer or give any unlawful gifts or gratuities, or engage in bribery or other criminal activity.
- D. The Owner encourages the Contractor to advance and support ethical business conduct and practices among its directors, officers and employees, through the adoption of corporate ethics awareness training programs and written codes of conduct.
- E. Although the Contractor may employ relatives of Owner's employees, the Owner must be made aware of such circumstances as soon as possible, in writing, to ensure a conflict of interest situation does not arise. The Owner reserves the right to request that the Contractor modify the work assignment of a relative of an Owner's

employee or representative where a conflict of interest, or the appearance thereof, is deemed to exist.

- F. The Contractor may hire former employees of the Owner. However, as a general rule, former employees of the Owner may neither appear nor practice before the Owner, nor receive compensation for services rendered on a matter before the Owner, for a period of *two (2) years* following their separation from service with the Owner. In addition, former employees of the Owner are subject to a "*lifetime bar*" from appearing before the Owner or receiving compensation for services regarding any transaction in which they personally participated or which was under their active consideration during their tenure with the Owner.
- G. The Contractor agrees to notify Stephen Tuttle, Esq., the Owner's attorney, at (212) 217-4030 of any activity by an employee of the Owner that is inconsistent with the contents of this Section.
- H. Any violation of these provisions shall justify termination of this Contract and may result in Owner's rejection of the Contractor's bids or proposals for future contracts.

SECTION 20.11 – STATE AND FEDERAL LABOR LAW PROVISIONS

- A. Although the Work of this Contract is not public work, the Owner intends that all applicable provisions of the Labor Law of the State of New York shall be carried out in the performance of the Work.
- B. The Contractor specifically agrees to comply with Labor Law, Sections 220 and 220-d as amended, that:
 - 1. no laborer, workman or mechanic, in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or any part of the Work contemplated by the Contract shall be permitted or required to work more than eight (8) hours in any one (1) calendar day and more than five (5) days in any one week, except in the extraordinary emergencies set forth in the Labor Law;
 - 2. the wages paid for a legal day's work shall be not less than the prevailing rate of wages as defined by law;
 - 3. the minimum hourly rate of wage to be paid and supplement provided shall be not less than that stated in the Contract and as shall be designated by the Industrial Commissioner of the State of New York; and
 - 4. the Contractor and every Subcontractor shall post in a prominent and accessible place on the Site, a legible statement of all minimum wage rates and supplements to be paid or provided for the various classes of laborers and mechanics to be engaged in the Work and all deductions, if any,

required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged.

- C. The minimum wage rates, if any, herein specified for apprentices shall apply only to persons working with the tools of the trade which such persons are learning under the direct supervision of journeyman mechanics. Except as otherwise required by law, the number of apprentices in each trade or occupation employed by the Contractor or any Subcontractor shall not exceed the number permitted by the applicable standards of the New York State Department of Labor, or, in the absence of such standards, the number permitted under the usual practice prevailing between the unions and the employers' association of the respective trades or occupations.
- D. All employees of the Contractor and each Subcontractor shall be paid in accordance with the provisions of the Labor Law. Certified payroll copies shall be provided to the Owner as specified in these General Conditions and otherwise upon request.
- E. The Contractor agrees that, in case of underpayment of wages to any worker engaged in the Work by the Contractor or any Subcontractor, the Owner shall withhold from the Contractor out of payments due an amount sufficient to pay such worker the difference between the wages required to be paid under the Contract and the wages actually paid such worker for the total number of hours worked, and that the Owner may disburse such amount so withheld by the Owner for and on account of the Contractor to the employee to whom such amount is due. The Contractor further agrees that the amount to be withheld pursuant to this paragraph may be in addition to the percentages to be retained by the Owner pursuant to other provisions of the Contract.
- F. Pursuant to subdivision 3 of section 220 and section 220-d of the Labor Law the Contract shall be forfeited and no sum paid for any Work done thereunder upon a Contractor's or Subcontractor's second conviction for willfully paying or providing less than:
 - 1. the stipulated wage scale or supplement as established by the fiscal officer, or
 - 2. less than the stipulated minimum hourly wage scale as designated by the Industrial Commissioner.
- G. Pursuant Labor Law, Section 220-e, the Contractor specifically agrees:
 - 1. That in the hiring of employees for the performance of Work under the Contract or any subcontract hereunder, or for the manufacture, sale or distribution of materials, equipment or supplies hereunder, but limited to operation performed within the territorial limits of the State of New York, no Contractor, Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the Work to which the employment relates;

2. That no Contractor, Subcontractor, nor any person on behalf of such Contractor or Subcontractor shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under the Contract on account of race, creed, color, disability, sex or national origin;
3. That there may be deducted from the amount payable to the Contractor, by the Owner under the Contract, a penalty of fifty dollars (\$50.00) for each person for each calendar day during which such person was discriminated against or intimidated in violation of the terms of the Contract; and
4. That the Contract may be canceled or terminated by the Owner and all moneys due or to become due hereunder may be forfeited for a second or any subsequent violation of the terms or conditions of this section of the Contract, or when one final determination involves the falsification of payroll records or the kickback of wages and/or supplements.

H. The Contractor specifically agrees:

1. That the Contractor shall certify its payrolls and keep these certified records on site and available, and provide copies to the Owner upon request.
2. That the Contractor shall provide each worker with a written notice informing the worker of the prevailing wage requirements for the job. The notice shall contain a simple statement or declaration for the worker's

SECTION 20.12 - NONDISCRIMINATION

During the performance of the Work, the Contractor agrees as follows:

- A. The Contractor will not discriminate against any employee or applicant for employment because of race, religion/creed, color, sex, sexual orientation, gender, gender identity/expression, national origin, age, disability, marital status, or any other protected category.
- B. If directed to do so by the Commissioner of Human Rights, the Contractor will send to each labor union or representative of workers with which the Contractor has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the State Commissioner of Human Rights, advising such labor union or representative of the Contractor's agreement under clauses A through G (hereinafter called "non-discrimination clauses"). If the Contractor was directed to do so by the Owner as part of the bid or negotiation of this Contract, the Contractor shall request such labor union or representative to furnish a written statement that such labor union or representative will not discriminate because of race, creed, color, sex, national origin, age, disability or marital status, and that such labor union or representative will cooperate, within the limits of its legal and contractual authority, in the implementation of the policy and provisions of these nondiscrimination clauses and that it consents and agrees that recruitment, employment and the terms and conditions of employment under this Contract shall be in accordance with the purposes and provisions of these nondiscrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the Contractor shall promptly notify the State Commissioner of Human Rights of such failure or refusal.
- C. If directed to do so by the Commissioner of Human Rights, the Contractor shall post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Commissioner of Human Rights setting forth the substance of the provisions of clauses A and B and such provisions of the State's laws against discrimination as the State Commissioner of Human Rights shall determine.
- D. The Contractor shall state, in all solicitations or advertisement for employees placed by or on behalf of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, sex, national origin, age, disability or marital status.
- E. The Contractor shall comply with the provisions of Section 290-299 of the Executive Law and with the Civil Rights Law, will furnish all information and reports deemed necessary by the State Commissioner of Human Rights under these nondiscriminatory clauses and such sections of the Executive Law, and will permit access to the Contractor's books, records and accounts by the State Commissioner for the purposes of investigation to ascertain compliance with these nondiscrimination clauses and such sections of the Executive Law and Civil Rights Law.

- F. This Contract may be forthwith canceled, terminated or suspended, in whole or in part, by the Owner upon the basis of a finding made by the State Commissioner of Human Rights that the Contractor has not complied with these nondiscrimination clauses, and the Contractor may be declared ineligible for future contracts made by or on behalf of the State or a public authority or agency of the State, until the Contractor satisfies the State Commissioner of Human Rights that the Contractor has established and is carrying out a program in conformity with the provisions of these nondiscrimination clauses. Such finding shall be made by the State Commissioner of Human Rights after conciliation efforts by the Commissioner have failed to achieve compliance with these nondiscrimination clauses and after a verified complaint has been filed with the Commissioner, notice thereof has been given to the Contractor and an opportunity has been afforded the Contractor to be heard publicly in accordance with the Executive Law. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided by law.
- G. The Contractor shall include the provisions of clauses A through F above in every subcontractor purchase order in such a manner that such provisions will be binding upon each Subcontractor or vendor as to operation to be performed within the State of New York. The Contractor shall take such action in enforcing such provisions of such Subcontract or purchase order as the State Commissioner of Human Rights or the Owner may direct, including sanctions or remedies for noncompliance. If the Contractor becomes involved in or is threatened with litigation with a Subcontractor or vendor as a result of such direction by the State Commissioner of Human Rights or the Owner, the Contractor shall promptly so notify the Attorney General, requesting the Attorney General to intervene and to protect the interests of the State of New York.

SECTION 20.13 – LIMITATION ON ACTIONS

No action or proceeding shall lie in favor of or shall be maintained by the Contractor against the Owner unless such action shall be commenced within six (6) months after receipt by the Owner of the Contractor's final requisition or, if the Contract is terminated by the Owner, unless such action is commenced within six (6) months after the date of such termination.

SECTION 20.14 – WAIVER OF REMEDIES

Inasmuch as the Contractor can be compensated adequately by money damages for any breach of the Contract which may be committed by the Owner, the Contractor agrees that no default, act or omission of the Owner shall constitute a material breach of Contract entitling the Contractor to cancel or rescind the same or to suspend or abandon performance thereof; and the Contractor hereby waives any and all rights and remedies to which the Contractor might otherwise be or become entitled to because of any wrongful act or omission of the Owner saving only the Contractor's right to money damages.

SECTION 20.15 – WAIVER OF CERTAIN CAUSES OF ACTION

No action or proceeding shall lie or shall be maintained by the Contractor, nor anyone claiming under or through the Contractor, against the Owner upon any claim arising out of or based upon the Contract, relating to the giving of notices or information.

SECTION 20.16 – CONTRACTOR RELATIONSHIP

The relationship created by the Contract between the Owner and the Contractor is one of an independent contractor and it is no way to be construed as creating an agency relationship between the Owner and the Contractor nor is it to be construed as, in any way or under any circumstances, creating or appointing the Contractor as an agent of the Owner for any purpose whatsoever.

SECTION 20.17 – FAILURE TO COMPLY WITH THIS ARTICLE

The Contract shall be void and of no effect unless the Contractor complies with the provisions of this Article 20.

SECTION 20.18 – YEAR 2000 WARRANTY

SECTION DELETED

SECTION 20.19 – FALSE RECORDS/KICKBACKS

The Contractor agrees that this Contract may be canceled or terminated for cause by the Owner and all moneys due or to become due hereunder may be forfeited upon the Owner's determination that the Contractor has submitted false records to the Owner and/or that the Contractor has participated in the kickback of wages. Said determination by the Owner must first allow the Contractor an opportunity to show why its Contract should not be canceled or terminated for cause for said actions.

ARTICLE 21- COOPERATION WITH INVESTIGATIONS

The Contractor agrees to cooperate fully and faithfully with any investigation, audit or inquiry conducted by the Owner or any other duly authorized representative of the Owner ("Representative").

The Contractor shall grant the Owner or the Representative the right to examine all books, records, files, accounts, computer records, documents and correspondence, including electronically-stored information, in the possession or control of the Contractor, its subsidiaries and affiliated companies and any other company directly or indirectly controlled by the Contractor, relating to the Contract. These shall include, but not be limited to: Subcontracts; bid files; payroll and personnel records; cancelled checks; correspondence; memoranda; reports; audits; vendor qualification records; original estimate files; change order/amendment estimate files; detailed worksheets; Subcontractor, consultant and supplier proposals for both successful and unsuccessful bids; back-charge logs; any records detailing cash, trade, or volume discounts earned; insurance proceeds, rebates or dividends received; payroll and personnel records; tax returns, and the supporting documentation for the aforesaid books and records.

At the Owner's or the Representative's request, said materials shall be provided in a computer readable format, where available. At the request of the Owner or the Representative, the Contractor shall execute such documents, if any, as are necessary to give the Owner or the Representative access to Contract-related books, documents or records which are, in whole or part, under control of the Contractor but not currently in the Contractor's physical possession. The Contractor shall not enter into any agreement with a Subcontractor, consultant or supplier, in connection with the Contract, that does not contain a right to audit clause in favor of the Owner. The Contractor shall assist the Owner or the Representative in obtaining access to past and present Subcontractor, consultant and supplier amendment/change order files (including detailed documentation covering negotiated settlements), accounts, computer records, documents, correspondence, and any other books and records in the possession of Subcontractors, consultants and suppliers pertaining to the Contract, and, if appropriate, enforce the right-to-audit provisions of such agreements.

The Contractor shall assist the Owner or the Representative in obtaining access to, interviews with, and information from all former and current persons employed and/or retained by the Contractor, for purposes of the Contract.

The Contractor shall require each Subcontractor to include in all agreements that the

Subcontractor may hereinafter enter into with any and all Subcontractors, consultants and suppliers, in connection with the Contract, a right-to-audit clause in favor of the Owner conferring rights and powers of the type outlined in this section. The Contractor shall not enter into any Subcontract with a Subcontractor in connection with the Contract that does not contain such a provision.

The Contractor shall not make any payments to a Subcontractor, consultant or supplier from whom the Contractor has failed to obtain and supply to the Owner or the Representative complete, accurate and truthful information in compliance with a request from the Owner or the Representative to the Contractor.

Any violation of the provisions of this Article shall justify termination of this Contract and may result in the Owner's rejection of the Contractor's bids or proposals for future contracts.

SECTION VI.

LABOR & MATERIAL PAYMENT BOND

LABOR & MATERIAL PAYMENT BOND

KNOW ALL BY THESE PRESENTS:

That _____
(Here insert the name and address or legal title of the Contractor)

as Principal, hereinafter called Principal, and _____

(Here insert the legal title of Surety)

(Address)

as Surety, hereinafter called Surety, are held and firmly bound unto The Fashion Institute of Technology, as applicable, as Obligee, hereinafter called Owner, for the use and benefit of the claimants as hereinbelow defined, in the amount of _____

_____ and /100 Dollars (\$_____)

WHEREAS, Principal has by written agreement dated _____

entered into a Contract with Owner for _____

in accordance with the Contract Documents and any changes thereto, which are made a part hereof, and are hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise such obligation shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct Contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.
2. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full

before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:
 - a. Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two (2) of the following: 1) the Principal, 2) the Owner, or 3) the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner, or Surety, at any place where an office is regularly maintained by said Principal, Owner, or Surety for the transaction of business, or served in any manner in which legal process may be served in the State in which the aforesaid project is located, save that such service need not be made by a public officer.
 - b. After the expiration of one (1) year following the date on which Principal ceased work of said Contract, however, if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
 - c. Other than in a State court of competent jurisdiction in and for the county or other political subdivision of the State in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.
4. The penal sum of this Bond is in addition to any other Bond furnished by the Contractor and in no way shall be impaired or affected by any other Bond.
5. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of Mechanics' Liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this Bond.

Signed this _____ day of _____ 20__.

IN THE PRESENCE OF:

(Principal)

(Surety)

(Signature)

(Signature)

(Print Name and Title)

(Print Name and Title)

(Address)

(Address)

(City, State, Zip)

(City, State, Zip)

Telephone (____) _____

Fax No. _____

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

STATE OF _____) ss:

COUNTY OF _____)

On the _____ day of _____ in the year 20__, before me personally came _____ to me known, who, being by me duly sworn, did depose and say that (s)he resides at _____, that (s)he is the _____ of _____, the corporation described in and which executed the above instrument; and that (s)he signed her/his name thereto by order of the Board of Directors of said corporation.

Notary Public

ACKNOWLEDGEMENT OF PRINCIPAL, IF A PARTNERSHIP

STATE OF _____)ss:

COUNTY OF _____)

On the _____ day of _____ in the year 20__ , before me personally came

_____, to me known and known to me to be a member of the firm _____, described in and who executed the foregoing instrument, and (s)he duly acknowledged to me that (s)he executed the same for and in behalf of said firm for the uses and purpose mentioned therein.

Notary Public

ACKNOWLEDGEMENT OF PRINCIPAL, IF AN INDIVIDUAL

STATE OF _____) ss:

COUNTY OF _____)

On the _____ day of _____ in the year 20__ , before me personally came _____, to me known and known to me to be the person described in and who executed the foregoing instrument and (s)he duly acknowledged that (s)he executed the same.

Notary Public

ACKNOWLEDGEMENT OF SURETY

STATE OF NEW YORK)

COUNTY OF _____) ss:

On the _____ day of _____ in the year 20__ , before me personally came _____ to me known, who, being by me duly sworn, did depose and say that (s)he resides at _____, that (s)he is the _____ of _____, the corporation described in and which executed the above instrument; and that (s)he signed her/his name thereto by order of the Board of Directors of said corporation.

Notary Public

SECTION VII.
PERFORMANCE BOND

PERFORMANCE BOND

KNOW ALL BY THESE PRESENTS:

That _____
(Here insert the name and address or legal title of the Contractor)

as Principal, hereinafter called Principal, and _____

(Here insert the legal title of Surety)

(Address)

as Surety, hereinafter called Surety, are held and firmly bound unto The Fashion Institute of Technology, as applicable, as Obligee, hereinafter called Owner, in the amount of _____ and ____ /100 Dollars (\$ _____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, CONTRACTOR has by written agreement dated _____ entered into a Contract with Owner for _____

in accordance with the Contract Documents and any changes thereto, which are made a part hereof, and are hereinafter referred to as the Contract.

1. If the Contractor performs the Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 2.1.
2. If there is no Owner default, the Surety's obligation under this Bond shall arise after:
 - 2.1 The Owner has notified the Contractor, the Surety at its address described in Paragraph 8. below that the Owner is considering declaring a Contractor in default.
 - 2.2 The Owner has declared a Contractor in default and formally terminated the Contractor's right to complete the Contract.

- 2.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Contract or to a Contractor selected to perform the Contract in accordance with the terms of the Contract with the Owner.
3. When the Owner has satisfied the conditions of Paragraph 2 herein., the Surety shall, at the Owner's option, promptly and at the Surety's expense take on the following actions:
 - 3.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Contract; or
 - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the Owner and the Contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified Surety equivalent to the bonds issued on the Contract, and pay to the Owner the amount of damages as described in Paragraph 5. in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor default.
4. If the Surety does not proceed with reasonable promptness, the Surety shall be deemed to be in default on this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner.
5. After the Owner has terminated the Contractor's right to complete the Contract, and if the Surety elects to act under Subparagraph 3.1, 3.2, or 3.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:
 - 5.1 The responsibilities of the Contractor for correction of defective work and completion of the Contract;
 - 5.2 Additional legal, design, professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 3.; and
 - 5.3 Liquidated Damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor. 3
6. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators or successors.
7. The Surety hereby waives notice of any change, including changes of time, to the Contract

or to related subcontracts, purchase orders, and other obligations.

8. Notice of the Surety and the Contractor shall be mailed or delivered to the address shown on the signature page. Notice to the Owner shall be mailed or delivered to the address shown in the preamble.
9. Definitions:
 - 9.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.
 - 9.2 Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
 - 9.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
 - 9.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

The penal sum of this Bond is in addition to any other Bond furnished by the Contractor and in no way shall be impaired or affected by any other Bond.

Any suit under this Bond must be instituted before the expiration of two (2) years from the date on which Final Payment is made under this Contract.

Signed this _____ day of _____ 20__.

IN THE PRESENCE OF:

(Principal)

(Surety)

(Signature)

(Signature)

(Print Name and Title)

(Print Name and Title)

(Address)

(Address)

(City, State, Zip)

(City, State, Zip)

Telephone (____) _____

Fax No. _____

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

STATE OF _____) ss:

COUNTY OF _____)

On the _____ day of _____ in the year 20__, before me personally came

_____ to me known, who, being by me duly sworn, did depose and say that (s)he resides at _____, that (s)he is the _____ of _____, the corporation described in and which executed the above instrument; and that (s)he signed her/his name thereto by order of the Board of Directors of said corporation.

Notary Public

ACKNOWLEDGEMENT OF PRINCIPAL, IF A PARTNERSHIP

STATE OF _____)ss:

COUNTY OF _____)

On the _____ day of _____ in the year 20__, before me personally came

_____, to me known and known to me to be a member of the firm _____, described in and who executed the foregoing instrument, and (s)he duly acknowledged to me that (s)he executed the same for and in behalf of said firm for the uses and purpose mentioned therein.

Notary Public

ACKNOWLEDGEMENT OF PRINCIPAL, IF AN INDIVIDUAL

STATE OF _____) ss:

COUNTY OF _____)

On the _____ day of _____ in the year 20__, before me personally

came _____, to me known and known to me to be the person described in and who executed the foregoing instrument and (s)he duly acknowledged that (s)he executed the same.

Notary Public

ACKNOWLEDGEMENT OF SURETY

STATE OF NEW YORK)

COUNTY OF _____) ss:

On the _____ day of _____ in the year 20__, before me personally came

_____ to me known, who, being by me duly sworn, did depose and say that (s)he resides at _____, that (s)he is the _____ of _____, the corporation described in and which executed the above instrument; and that (s)he signed her/his name thereto by order of the Board of Directors of said corporation.

Notary Public

SECTION VIII.
FORM OF BID

SECTION IX.
NON-COLLUSIVE
BIDDING
CERTIFICATION

Non-collusive Bidding Certification

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and, in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief:

1. The prices in the bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
2. Unless otherwise required by law, the prices which have been quoted in the bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a bid for the purpose of restricting competition.

Firm Name _____

Address _____

By _____
(Signature and Title)

Dated: _____

Telephone (____) _____ Fax No. (____) _____

(Taxpayer ID or Social Security Number)

ACKNOWLEDGEMENT OF BIDDER, IF A CORPORATION

STATE OF NEW YORK)
COUNTY OF _____) ss:

On the ____ day of _____, 20__ , before me personally came _____
to me known, who, being by me duly sworn, did depose and say that (s)he resides at _____
_____, that (s)he is the _____ of _____
_____, the corporation described in and which executed the above instrument;
and that (s)he signed her/his name thereto by order of the Board of Directors of said corporation.

Notary Public

ACKNOWLEDGEMENT OF BIDDER, IF A PARTNERSHIP

STATE OF NEW YORK)
COUNTY OF _____) ss:

On the ____ day of _____, 20__, before me personally came _____
to me known and known to me to be a member of the firm _____
_____, described in and who executed the foregoing instrument, and (s)he duly
acknowledged to me that (s)he executed the same for and in behalf of said firm for the uses and
purposes mentioned therein.

Notary Public

ACKNOWLEDGEMENT OF BIDDER, IF AN INDIVIDUAL

STATE OF NEW YORK)
COUNTY OF _____) ss:

On the ____ day of _____, 20__, before me personally came _____
to me known and known to me to be the person described in and who executed the foregoing
instrument, and (s)he duly acknowledged that (s)he executed the same.

Notary Public

SECTION X:

SUBSTITUTION FORM REQUEST

FASHION INSTITUTE OF TECHNOLOGY

SUBSTITUTION REQUEST FORM

1.1 CONDITIONS OF SUBSTITUTIONS

- A. Substitution indicated on this Form is a proposed substitute to requirements indicated in the Contract Documents. Substitution listed has not been included in an Addendum. Submit one Form for each proposed substitution.
- B. For each proposed Substitution, state difference in price or "No Change" where Substitution is offered.
- C. Attach complete technical data, specifications, and description of substitutions.
- D. Architect reserves the right to accept or reject any or all proposed substitutions.

1.2 SUBSTITUTION REQUEST

The following information is hereby submitted for a substitution to the specified item.

Specification Section and Title: _____

Paragraph _____ Page _____ Specified Item _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No: _____

Price Difference: _____ or No Change _____

The Undersigned certifies:

- A. Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- B. Same warranty will be furnished for proposed substitution as for specified product.
- C. Same maintenance service and source of replacement parts, as applicable is available.
- D. Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- E. Proposed substitution does not affect dimensions and functional clearances.
- F. Payment will be made for changes to the building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____ FAX: _____

ARCHITECT'S REVIEW AND ACTION

- Substitution Approved – Make submittals in accordance with General Requirements
- Substitution Approved As Noted – Make submittals in accordance with General Requirements.
- Substitution Rejected – Use specified materials.
- Substitution Request Received Too Late. Use specified materials.

Signed by: _____

Supporting Data Attached: Drawings Product Data Samples Tests
 Reports Other _____

SECTION XI.
CONTRACT

TO BE SIGNED ONLY UPON AWARD

CONTRACT

This Agreement made as of the _____ day of _____ 20____, by and between the _____, hereinafter referred to as the "OWNER" and _____ hereinafter referred to as the "Contractor", for Work at _____

WITNESSETH: That the **OWNER** and the Contractor for the consideration named agree as follows:

1. The Contractor shall Provide and shall perform all Work of every kind or nature whatsoever required and all other things necessary to complete in a proper and workmanlike manner the _____
_____ in strict accordance with the Contract Documents as defined in the General Conditions (and of which a listing of specifications and drawings are attached hereto) and in strict accordance with such changes as are ordered and approved pursuant to the Contract, and shall perform all other obligations imposed on such Contractor by the Contract.

2. The Contractor agrees to perform all Work and labor required, necessary, proper for, or incidental to the Work, and to Furnish all supplies and materials required, necessary, proper for, or incidental to the Work for the total sum of _____ and 00/100 Dollars (\$ _____ .00), which sum shall be deemed to be in full consideration for the performance by the Contractor of all the duties and obligations of such Contractor under the Contract.

3. The Contractor shall commence Work on the Contract at a time to be specified in a written notice to proceed issued by the OWNER and complete the project no later than _____.

IN WITNESS WHEREOF, the parties hereto have executed this Contract the day and year first above written.

Fashion Institute of Technology

Sherry Brabham, VP of Finance

(Name of Contractor)

By _____
(Signature)

(Print Name and Title)

ACKNOWLEDGEMENT OF CONTRACTOR, IF A CORPORATION

STATE OF _____)
COUNTY OF _____) ss:

On the _____ day of _____ in the year 20 ____, before me personally came _____ to me known, who, being by me duly sworn, did depose and say that (s)he resides at _____, that (s)he is the _____ of _____, the corporation described in and which executed the above instrument; and that (s)he signed her/his name thereto by order of the Board of Directors of said corporation.

Notary Public

ACKNOWLEDGEMENT OF CONTRACTOR, IF A PARTNERSHIP

STATE OF _____)
COUNTY OF _____) ss:

On the _____ day of _____ in the year 20 ____, before me personally came _____ to me known and known to me to be a member of the firm _____, described in and who executed the foregoing instrument, and (s)he duly acknowledged to me that (s)he executed the same for and in behalf of said firm for the uses and purpose mentioned therein.

Notary Public

ACKNOWLEDGEMENT OF CONTRACTOR, IF AN INDIVIDUAL

STATE OF _____)
COUNTY OF _____) ss:

On the _____ day of _____ in the year 20 ____, before me personally came _____, to me known and known to me to be the person described in and who executed the foregoing instrument and (s)he duly acknowledged that (s)he executed the same.

Notary Public

SECTION XII.
AFFIRMATIVE ACTION FORM

MONTHLY CONTRACTOR'S COMPLIANCE REPORT FORM AAP 7.0

INSTRUCTION SHEET

ALL PAYMENT REQUISITION, CONTRACTOR AND PROJECT INFORMATION ON THE TOP PORTION OF THE FORM MUST BE COMOPLETELY FILLED OUT. PLEASE NOTE:

False statements, information or data submitted on or with application for payment may result in one or more of the following actions: Termination of Contract for cause; Disapproval of future bids, or contracts or subcontracts; Withholding of final payments on the contract; and Civil and/or criminal prosecution.

PART B- PAYMENTS TO SUBCONTRACTORS AND SUPPLIERS

- 1) ALL FIRMS THAT YOU ARE UTILIZING ON THE JOB MUST BE LISTED EACH TIME **REGARDLESS** IF THEY ARE SCHEDULED TO RECEIVE PAYMENTS OUT OF THE PROCEEDS OF THE REQUISITION FOR PAYMENT.
- 2) All relevant information for each subcontractor and/or supplier must be filled in. This includes firm's complete name, address, phone number and Federal ID #. In addition, if the firm is a **NYS CERTIFIED MBEIWBE**, please indicate as such in the appropriate box.

AS A REMINDER, ONLY THOSE FIRMS THAT HAVE NYS CERTIFICATION BY THE EMPIRE STATE DEVELOPMENT CORPORATION CAN BE COUNTED TOWARDS THE MBE/WBE GOAL ACHIEVEMENT FOR THE PROJECT.
- 3) The percentage of the job or purchases completed must be filled in and in addition, please indicate the number of change orders issued on any subcontract agreement or the number of purchase orders issued to date if purchasing supplies.
- 4) A description of the work being performed by a subcontractor or the type of supplies being purchased must be filled in.

DEFINITIONS

INTENDED PAYMENT: This is the amount of money that you intend to pay to each firm with the money that you will receive from the accompanying requisition. **This is not** the amount that you intend to pay over the life of the contract.

AMOUNT PAID TO DATE: This is the amount of money that has **ACTUALLY** been paid to date from previous requisitions submitted. It does not include the amount that you intend to pay from this requisition. THIS AMOUNT WILL BE VERIFIED BY OUR OFFICE PRIOR TO CLOSE OUT OF THE JOB BY THE RECEIPT OF COPIES OF CANCELED CHECKS OR PAID INVOICES.

CURRENT VALUE OF SUBCONTRACT: This is the total value to date of any subcontract agreement that has been issued to the firm by your company. It should be inclusive of any change orders issued to the original contract. **NOTE:** THIS LINE IS FOR SUBCONTRACTOR INFORMATION ONLY. IF THE FIRM LISTED IS A SUPPLIER THAT YOU ARE PURCHASING SUPPLIES OR MATERIAL FROM, LEAVE BLANK AND GO TO THE NEXT LINE.

TOTAL VALUE OF ALL PURCHASE ORDERS: This is the total amount of **all** purchase orders that will be issued to the firm for the entire job. The number of purchase orders issued to date should be reflected in the area indicated to the left. **NOTE:** THIS LINE IS FOR SUPPLIER INFORMATION ONLY. IF THE FIRM IS A SUBCONTRACTOR, LEAVE THIS AREA BLANK. A SUBCONTRACTOR AGREEMENT SHOULD BE ISSUED WHICH WOIULD BE REFLECTED ON THE PREVIOUS LINE.

The current form that you should be utilizing is form: AAP 7.0 Revised 1/9/08. This form must be included with each payment requisition submitted or the payment will not be processed.

If the form is not filled out according to the above instructions, your next payment requisition may be held until corrections are made. In addition, each report submitted must have an original signature and date.

MONTHLY CONTRACTOR'S COMPLIANCE REPORT

Payment Requisition Date _____
Payment Requisition Amount \$. _____
FIT Contract Number _____

CONTRACTOR INFORMATION

Name _____ Federal ID No. _____

Address _____

Contact Person _____ Telephone Number _____

PROJECT INFORMATION

Institution _____ City and Zip Code _____

Work Description _____

Part B - Payments to Subcontractors and Suppliers: Provide name, address and telephone number of ALL subcontractors to which you have awarded a subcontract or suppliers to which you have issued a purchase order. Place X in check box to indicate whether they are a New York State certified MBE or WBE or Other. In addition, for each firm listed below you must also include: the firms federal identification number; amount of intended payment to be made from proceeds of the accompanying requisition; percent complete, amount paid to date; the number of change orders or purchase orders; current value of subcontract (including change orders) or cumulative value of purchase orders; and a brief description of the work or service. All subcontractors or suppliers with whom you have an agreement should be listed below, even if they are not scheduled to receive a payment out of the proceeds of the attached requisition for payment. For further details, see Instruction Sheet

Firm _____ [] MBE [] WBE [] Other Fed. ID# _____

Address _____ Phone# _____ Intended Payment\$. _____

Address _____ Percent Complete _____ Amount Paid to Date\$ _____

No. of Change Orders. _____ Current Value of Subcontract \$ _____

No. of Purchase Orders Issued _____ Total Value of Purchase Orders \$ _____

Work Description _____

Firm _____ [] MBE [] WBE [] Other Fed. ID# _____

Address _____ Phone # _____ Intended Payment\$. _____

Address _____ Percent Complete _____ Amount Paid to Date\$ _____

No. of Change Orders. _____ Current Value of Subcontract \$ _____

No. of Purchase Orders Issued _____ Total Value of Purchase Orders \$ _____

Work Description _____

False statements, information or data submitted on or with application for payment may result in one or more of the following actions: Termination of Contract for cause; Disapproval of future bids, or contracts or subcontracts; Withholding of final payments on the contract; and Civil and/or criminal prosecution.

Name of Principal or Officer (Type or Print)

Title of Principal or Officer (Type or Print)

Signature of Principal or Officer

Date

SECTION XIII.
CHANGE ORDER FORM

CHANGE ORDER

TO:

Contractor: _____ Contract No. _____

Street: _____ Contract Date: _____

City, State, Zip: _____ Original Contract Amount: \$ _____

Phone No. _____ Total Approved Change Orders: _____

Current Contract Amount: \$ _____

You are hereby directed to perform all labor and to provide all materials necessary to carry out the Work described below:

Full consideration for this change order shall be on **INCREASE/DECREASE** of the original contract amount by:
_____ Dollars.

Labor = _____

Materials = _____

INCREASE/DECREASE of the original schedule by days. In accepting and executing this change order, the Contractor, its heirs, executors, administrators, successors, and assigns hereby release and forever discharge the Owner, its successors, and assigns from any and all actions, causes of action, claims and demands whatsoever in law or in equity which the Contractor ever had, now has, or may have against the Owner in any way arising out of this change.

Recommended by:
CONSTRUCTION MANAGER OR ARCHITECT

Name: _____

By: _____ Date: _____

Approved by:

Name: _____

By: _____ Date: _____

Accepted by:
CONTRACTOR

Name: _____

By: _____ Date: _____

OWNER

Name: _____

By: _____ Date: _____

SECTION XIV.
CONTRACTOR'S
TRADE PAYMENT BREAKDOWN

EXHIBIT A: SAFETY EHS PLAN

EXHIBIT A. SAFETY EHS PLAN

FASHION INSTITUTE OF TECHNOLOGY

**OUTLINE FOR PREPARING WORK-SPECIFIC
ENVIRONMENT, HEALTH AND SAFETY (EHS) PLAN**

Before commencing work on site at FIT, Contractor shall prepare a work-specific EHS Plan and submit the EHS Plan to both the Facilities Management and EHS Departments for review and approval. Such approval shall be given in a timely manner.

I) A work-specific EHS Plan is required in the following instances:

- A) When proposed work will:
 - 1) use regulated hazardous chemicals;
 - 2) have the potential to generate fumes, vapors or dusts;
 - 3) involve cutting torches or other spark-generating equipment (“hot” work);
 - 4) generate any waste;
 - 5) involve high-energy systems or
 - 6) require any type of air monitoring.
 - B) When work involves the removal of less than 25 linear feet, or 10 square feet, of asbestos-containing material (that is greater than 1% asbestos). For work involving more than these amounts of asbestos, Contractor must consult with the EHS Department for additional guidelines.
 - C) When work involves the use of tools and equipment in areas where FIT employees or students are present.
 - D) When work involves construction, other than minor repairs or alterations to on-campus facilities.
 - E) When work involves dangerous environments, such as confined spaces, hazardous energy, use scaffolds greater than 10 feet high, or vehicle-mounted articulated booms.
- II) Use the outline below to develop the work-specific EHS Plan. Contractor shall amend the work-specific EHS Plan as needed to accommodate work on-campus as it proceeds.**

DESCRIPTION OF CONTENTS OF WORK-SPECIFIC EHS PLAN

III) GENERAL INFORMATION – PROJECT PLANNING

- A) List primary information about Contractor’s firm and that of sub-

contractors, if any, Project Name, FIT Bid Number and Contractor's safety-related performance measurements on Table 1.

- B) Describe the scope of work and list a breakdown of its specific tasks.
- C) Provide a project schedule that, at a minimum, shows the anticipated start date of the work, the duration of each phase of the work, the anticipated date of completion of each phase, and the project completion date.
- D) List name of Contractor's on-site EHS Coordinator and the names of all OSHA-competent persons needed to carry out the scope of work on Table 2. The EHS Coordinator shall serve as the primary contact with FIT's Director of EHS Compliance during all work.

IV) WORK-SPECIFIC HAZARD ANALYSIS/RISK ASSESSMENT

- A) Describe each task associated with the work of the project.
- B) List the potential hazards, if any, associated with each task.
- C) Provide copies of Contractor's EH&S program applicable to scope of work.
- D) List the types of protective work practices or personal protective equipment (PPE) Contractor will employ to carry-out each task.
- E) Describe the types of exposure assessments that are needed to address potential hazardous exposures related to the work of the project. These include:
 - 1) Work practices and engineering controls Contractor will use to prevent exposure of Contractor's employees to hazardous chemicals or hazardous energy;
 - 2) Work practices and engineering controls Contractor will use to prevent exposure of FIT students and staff to any detectable chemical exposure;
 - 3) Contractor's use of respiratory protection and other protective equipment (PPE) and
 - 4) Qualitative or quantitative monitoring protocols, personal and area monitoring equipment, and contaminant action levels.
- F) Attach copies of certified documentation of "Hazard Assessment and Equipment Selection" required by 29 CFR 1910.132 (d)(2) that complies with 1910 Subpart I Appendix B for all tasks in the work-specific EHS Plan.
- G) Attach a copy of Contractor's written Hazard Communication Program that OSHA requires for the work-specific EHS Plan.

V) WORK-SPECIFIC ENVIRONMENTAL, HEALTH AND SAFETY ELEMENTS

- A) To address health and safety issues, the work-specific EHS Plan shall:
- 1) Describe criteria for upgrading or downgrading personal protective equipment (PPE) or modifying work practices to control hazardous exposures during the work;
 - 2) Describe criteria Contractor will use to set up exclusion zones, including physical barriers and decontamination zones, as needed to prevent spread of debris and restrict access of unauthorized persons to work areas;
 - 3) List equipment Contractor will use for routine and emergency on-site communication;
 - 4) Describe utility clearance and marking procedures to prevent damage to buried utilities, or to lines, piping, or cables located inside of walls and ceilings, if applicable;
 - 5) Describe decontamination and cleaning procedures for Contractor's employees and equipment to prevent the spread of debris. This includes procedures during work, at the end of each work day, and at the completion of the project before FIT's final inspection of the work area;
 - 6) Identify measures to manage dangerous environments, such as confined spaces, scaffold work greater than 10 feet, or articulated booms;
 - 7) List "Hot Work" procedures involved in the work of the project. This may include, but not be limited to, work such as welding, burning, open flames, tar melting or other type of melting pots, grinding that throws sparks. (See Appendix 1 - "Daily Safety Management Work Permit");
 - 8) Identify the need for air monitoring or special testing to carry out the work. Include a listing of monitoring equipment or special tests and the Action Levels that Contractor will apply to project work;
 - 9) Describe safety procedures for excavations more than four 4 feet deep and sloping or shoring procedures where excavations will exceed 5 feet deep;
 - 10) Describe fire protection and explosive hazard review;
 - 11) List the name and address of Contractor's on-contract Confined Space rescue team;
 - 12) Describe spill control procedures for chemical products Contractor will have on-campus during work. Include a listing of spill control or containment supplies that Contractor will have on-hand in case of a spill;
 - 13) Describe the need for site coordination with FIT employees, other contractors on-site and other adjacent work groups. This includes identification of hazardous energy Lock Out and Tag Out

requirements to make to work area safe and

- 14) Provide a listing of other safety equipment that Contractor will have on site during the work of the project.
- B) To address oil, chemical and waste management issues, the work-specific EHS Plan shall:
- 1) Provide estimates of the types and amounts of waste (both hazardous and non-hazardous) that Contractor anticipates the work will generate. As applicable, provide a copy of a waste analysis plan that lists the types of analysis required, the USEPA SW-846 method number and the method detection limits;
 - 2) Provide facility name, USEPA ID number, and a contact name for each facility that will transport and dispose of each of the waste streams identified above. Provide this information for any facility that will dispose of residuals from the treatment of project waste, as applicable;
 - 3) On a copy of a drawing that will be provided by FIT, identify location where Contractor proposes to accumulate waste during work, to set-up exclusion zones and to provide employee decontamination areas;
 - 4) Provide a statement that describes the methods that Contractor will use to minimize the amount of waste generated from the work of the project;
 - 5) Provide a tabular listing, along with copies of Safety Data Sheets (SDS), for any chemical products that Contractor intends to store or use on-site during the work. The listing shall include the product name, manufacturer's name, type, amounts, intended storage location on FIT site, the specific use of the chemical and identification of any NYCDEP/USEPA regulated hazardous substances that Contractor intends to store or use on-site during the work. In all cases, Contractor must submit the listing before chemical products are delivered to the FIT campus;
 - 6) On a copy of a drawing that will be provided by FIT, identify location where Contractor proposes to store chemical products on-site during work;
 - 7) Identify the need, if any, to amend existing FIT emergency contingency planning documents. Such documents include, but are not limited to: Spill Prevention Control and Countermeasure Plan, Spill Prevention Report, Right-to-Know Survey and
 - 8) List permits and Certificates of Fitness (NYCDEP, NYSDEC, USEPA, FDNY) needed to carry-out the scope of work and have copies on-site of permits and Certificates to carry-out project work.

VI) ON-SITE DOCUMENTATION

- A) Contractor shall record initial and daily safety-related procedures on Table 3. These shall include:

- 1) Before start of the work, FIT's Project Manager will conduct a FIT Hazard Communication briefing for Contractor's employees;
 - 2) Before start of the work, FIT's Project Manager and Contractor's on-site EHS Coordinator shall conduct a briefing for FIT employees in areas adjacent to work areas about proposed work;
 - 3) Review of FIT Emergency Evacuation Procedures;
 - 4) Listing of initial and ongoing project status meetings on-site with FIT Project Manager to address EHS concerns safety and health and
 - 5) Scheduled and unscheduled employee safety briefings, toolbox talks.
- B) Contractor shall provide a summary of the on-site EHS Coordinator's EHS-related training and experience relevant to the work of the project.
- C) Contractor's employees shall sign-in daily with FIT Security in the A-Building Lobby.
- D) For each work shift necessary to complete the project, Contractor's on-site EHS Coordinator shall open and fill out the "Daily Safety Management Work Permit" (See Appendix 1) at the start of each work shift and close the Permit at the end of each work shift.

VII) EMERGENCY RESPONSE PLANNING

Contractor shall review the summary of the Emergency Response Contact Names listed on Table 4 and provide the information as follows:

- A) On a site map that will be provided by FIT, identify the primary and secondary routes for the evacuation of Contractor's employees, including the "rally point" where Contractor's employees will assemble and carry-out an accountability check in case of an evacuation;
- B) List emergency response contacts with titles and telephone numbers. Contractor shall immediately call FIT Security and the FIT Project Manager in the event of a spill of oil, chemicals, waste water, or hazardous materials;
- C) Identify the name, address and route to nearest hospital or Contractor's wellness center and
- D) Provide a listing of emergency equipment for first aid, personal protection, spill response, fire protection and rescue.

TABLE 2

ON-SITE SUPERVISORY PERSONNEL of 2

Page 1

TITLE	: NAME(S) AND ON-SITE PHONE NUMBER
On-site EHS Coordinator	:
Contractor Project Managers	:
FIT's Project Manager(s)	:
<p><u>Contractor's Competent Persons</u></p>	<p>List all that Apply – Indicate not applicable areas for department /project work as “NA” For subcontractor employees, place subcontractor firm name in parenthesis after the employee's name</p>
<ul style="list-style-type: none"> • Confined Spaces 	:
<ul style="list-style-type: none"> • Excavations 	:
<ul style="list-style-type: none"> • Industrial Hygiene 	:
<ul style="list-style-type: none"> • Electrical--Lock Out/Tag Out 	:
<ul style="list-style-type: none"> • PPE, Respiratory Protection 	:
<ul style="list-style-type: none"> • Hazard Communication (Required for each department and project. Identify responsible employee for each subcontractor) 	:
<ul style="list-style-type: none"> • Fall Protection 	:
<ul style="list-style-type: none"> • Scaffolds 	:
<ul style="list-style-type: none"> • Cranes & Derricks 	:
<ul style="list-style-type: none"> • Blasting & Use of Explosives 	:

TABLE 2 (Cont'd)

ON-SITE SUPERVISORY PERSONNEL

Page 2 of 2

- Asbestos (Attach copies of Company license, supervisor and handler certificates for all employee that will perform work) :

- Lead

- Silica

- Hot Work (Complete and submit permits daily - see Appendix 1)

- FDNY Certificate of Fitness-Torch Operations

- FDNY Certificate of Fitness-Fire Guard

- FDNY Certificate of Fitness-Fire proofing

- FDNY Certificate of Fitness-Powder Activated Tools

- FDNY Certificate of Fitness-Air Compressors_____

- FDNY Certificate of Fitness-Use of LPG and Use in Tar Kettles

- FDNY REFRIGERATING SYSTEM OPERATING ENGINEER

- FDNY Certificate of Fitness-Other_____

- FDNY Certificate of Fitness-Other_____

-

-

TABLE 4

EMERGENCY CONTACT NAMES & TELEPHONE NUMBERS

1

TITLE	CONTACT NAME	EMERGENCY PHONE NUMBERS
Contractor: MAIN OFFICE		
Contractor President:		
On-site EHS Coordinator		
FIT Facilities Management	Executive Director: George Jefremow Assoc. Executive Director: Allen King	Phone: 212-217-4423 Phone: 212-217-4424
FIT Environmental, Health and Safety Department	Director: Paul DeBiase paul_debiase@fitnyc.edu Acting Coordinator: Kathy Espinoza-Caraba kathy_espinozacaraba@fitnyc.edu	Phone: 212-217-3752 Phone: 212-217-3754
Contractor Project Manager(s)		
FIT Public Safety	Central Control	212-217-7777, or Use Red Phone
Occupational Safety And Health Administration, – Area Director	Provide Zip Code for the location of Accident	800-321-6742
Location of nearest hospital and/or contractor’s wellness center		
Rally Point and Accountability Check Location	In case of Building Evacuation Alarm	

Note: Call FIT Central Control at 212-217-7777 in case or any emergency such as fire, chemical spills, injury requiring medical treatment, or exposure of contractor or FIT personnel to fumes, vapors, or dusts.

EXHIBIT B: PREVAILING WAGE SCHEDULE



Kathy Hochul, Governor

Roberta Reardon, Commissioner

Fashion Institute of Technolog
Sam Li, Deputy Director of Purchasing
227 W 27th St
New York NY 10001

Schedule Year 2022 through 2023
Date Requested 06/12/2023
PRC# 2023006714

Location Fashion Institute of Technolog
Project ID# C1576
Project Type Provide labor, materials, tests, tools, and equipment to complete the renovation of an existing vacant office space and active mechanical room into a modernized mechanical room and new classroom D442.

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Wage Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2022 through June 2023. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission; a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion [online](#).

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

There are very few exceptions to this rule. Complete information regarding these exceptions is available on the ["Request for a dispensation to work overtime" form \(PW30\)](#) and ["4 Day / 10 Hour Work Schedule" form \(PW 30.1\)](#).

Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12240; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.ny.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid

or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment. Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, but are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed \$100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds \$25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8 . Section 220-a).

Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYSDOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "Public Work Project" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers' compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeyworkers in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above or is performing work outside the classification of work for which the apprentice is indentured, must be paid the prevailing journeyworker's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12240 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b)).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of \$50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c)).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d)).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.



Kathy Hochul, Governor

Roberta Reardon, Commissioner

Fashion Institute of Technolog
Sam Li, Deputy Director of Purchasing
227 W 27th St
New York NY 10001

Schedule Year 2022 through 2023
Date Requested 06/12/2023
PRC# 2023006714

Location Fashion Institute of Technolog
Project ID# C1576
Project Type Provide labor, materials, tests, tools, and equipment to complete the renovation of an existing vacant office space and active mechanical room into a modernized mechanical room and new classroom D442.

Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), **MUST** be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

Contractor Information

All information must be supplied

Federal Employer Identification Number: _____		
Name: _____		
Address: _____ _____		
City: _____	State: _____	Zip: _____
Amount of Contract: \$ _____	Contract Type:	
Approximate Starting Date: ____/____/____	<input type="checkbox"/> (01) General Construction	
Approximate Completion Date: ____/____/____	<input type="checkbox"/> (02) Heating/Ventilation	
	<input type="checkbox"/> (03) Electrical	
	<input type="checkbox"/> (04) Plumbing	
	<input type="checkbox"/> (05) Other : _____	

Phone: (518) 457-5589 Fax: (518) 485-1870
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Social Security Numbers on Certified Payrolls:

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concern regarding inclusion of this information on payrolls if another identifier will suffice.

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to \$1,500 for a first offense and up to \$5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, <https://dol.ny.gov/public-work-and-prevailing-wage>

If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov .

Worker Notification: (Labor Law §220, paragraph a of subdivision 3-a)

Effective June 23, 2020

This provision is an addition to the existing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage and supplement rate* for their particular job classification *on each pay stub**. It also requires contractors and subcontractors to *post a notice* at the beginning of the performance of every public work contract *on each job site* that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her job classification. The required notification will be provided with each wage schedule, may be downloaded from our website www.labor.ny.gov or be made available upon request by contacting the Bureau of Public Work at 518-457-5589. *In the event the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

(12.20)

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12240

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.

Required Notice under Article 25-B of the Labor Law

**Attention All Employees, Contractors and Subcontractors:
You are Covered by the Construction Industry Fair Play Act**

The law says that you are an employee unless:

- You are free from direction and control in performing your job, **and**
- You perform work that is not part of the usual work done by the business that hired you, **and**
- You have an independently established business.

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.

Employee Rights: If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor, **you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

Penalties for paying workers off the books or improperly treating employees as independent contractors:

- **Civil Penalty** First offense: Up to \$2,500 per employee
 Subsequent offense(s): Up to \$5,000 per employee
- **Criminal Penalty** First offense: Misdemeanor - up to 30 days in jail, up to a \$25,000 fine and debarment from performing public work for up to one year.
 Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a \$50,000 fine and debarment from performing public work for up to 5 years.

If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.

Employer Name:

IA 999 (09/16)

Attention Employees

THIS IS A: **PUBLIC WORK PROJECT**

If you are employed on this project as a **worker, laborer, or mechanic** you are entitled to receive the **prevailing wage and supplements rate** for the classification at which you are working.

Chapter 629 of
the Labor Laws
of 2007:

These wages are set by law and must be posted at the work site. They can also be found at:

<https://dol.ny.gov/public-work-and-prevailing-wage>

If you feel that you have not received proper wages or benefits, please call our nearest office.*

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 932-2419	White Plains	(914) 997-9507
Newburgh	(845) 568-5156		

* For New York City government agency construction projects, please contact the Office of the NYC Comptroller at (212) 669-4443, or www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is \$250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date.*)
- Training roster, attendance record or other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is \$3 million in Bronx, Kings, New York, Queens and, Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3
Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
 Bureau of Public Work
 State Office Campus, Bldg. 12
 Albany, NY 12240

District Office Locations:	Telephone #	FAX #
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Garden City	516-228-3915	516-794-3518
Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

New York County General Construction

Asbestos Worker

06/01/2023

JOB DESCRIPTION Asbestos Worker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour: 07/01/2022

Asbestos Worker \$ 44.00
Removal & Abatement Only*

NOTE: *On Mechanical Systems that are NOT to be SCRAPPED.

SUPPLEMENTAL BENEFITS

Per Hour:

Asbestos Worker \$ 8.70
Removal & Abatement Only

OVERTIME PAY

See (B, B2, *E, J) on OVERTIME PAGE

*Hours worked on Saturdays are paid at time and one half only if forty hours have been worked during the week.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8) on HOLIDAY PAGE

REGISTERED APPRENTICES

Apprentice Removal & Abatement Only:

1000 hour terms at the following percentage of Journeyman's rates.

1st	2nd	3rd	4th
78%	80%	83%	89%

SUPPLEMENTAL BENEFIT

Per Hour:

Apprentice
Removal & Abatement \$ 8.70

4-12a - Removal Only

Boilermaker

06/01/2023

JOB DESCRIPTION Boilermaker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per Hour: 07/01/2022

Boilermaker \$ 63.38
Repairs & Renovations 63.38

SUPPLEMENTAL BENEFITS

Per Hour:

Boilermaker 32% of hourly
Repair \$ Renovations Wage Paid
+ \$ 25.38

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay.

Repairs & Renovation Includes replacement of parts and repairs & renovation of existing unit.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

Repairs & Renovation see (B,E,Q)

HOLIDAY

Paid: See (8, 16, 23, 24) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 11, 12, 15, 16, 22, 23, 24, 25) on HOLIDAY PAGE

NOTE: *Employee must work in pay week to receive Holiday Pay.

**Employee gets 4 times the hourly wage rate for working Labor Day.

REGISTERED APPRENTICES

Wage per hour:

(1/2) Year Terms at the following percentage of Boilermaker's Wage

1st	2nd	3rd	4th	5th	6th	7th
65%	70%	75%	80%	85%	90%	95%

Supplemental Benefits Per Hour:

Apprentice(s) 32% of Hourly Wage Paid Plus Amount Below

1st Term	\$ 19.41
2nd Term	20.26
3rd Term	21.11
4th Term	21.96
5th Term	22.82
6th Term	23.68
7th Term	24.52

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

Broadband **06/01/2023**

JOB DESCRIPTION Broadband

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour:	10/01/2022	06/15/2023
Field Tech Install/Repair	\$ 48.91	\$ 50.87

For outside work (excluding installation on building construction/alteration/renovation projects), stopping at first point of attachment (demarcation), installing/maintaining/repairing broadband internet service.

SUPPLEMENTAL BENEFITS

Per Hour:	\$ 23.17	\$ 23.24
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OVERTIME PAY

See (B, K, *R) on OVERTIME PAGE

Note: *Two and one half times the hourly rate after the 8th hour

HOLIDAY

Paid: See (5, 6, 7, 11, 12) on HOLIDAY PAGE

4-CWA-Dist1

Carpenter **06/01/2023**

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour:	07/01/2022
Piledriver	\$ 58.16 + 9.54*
Dockbuilder	\$ 58.16 + 9.54*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 44.54

OVERTIME PAY

See (B, E2, O) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour

(1)year terms:

1st	2nd	3rd	4th
\$24.60	\$30.20	\$38.58	\$46.97
+ 5.05*	+ 5.05*	+ 5.05*	+ 5.05*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All Terms: \$ 31.03

8-1556 Db

Carpenter

06/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Carpet/Resilient

Floor Coverer \$ 55.05
 + 8.25*

*This portion is not subject to overtime premiums

INCLUDES HANDLING & INSTALLATION OF ARTIFICIAL TURF AND SIMILAR TURF INDOORS/OUTDOORS.

SUPPLEMENTAL BENEFITS

Per hour: \$ 39.40

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE.

Paid for 1st & 2nd yr.

Apprentices See (5,6,11,13,16,18,19,25)

Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wage per hour - (1) year terms:

1st	2nd	3rd	4th
\$ 24.80	\$ 27.80	\$ 32.05	\$ 39.93
+ 1.85*	+ 2.35*	+ 2.85*	+ 3.85*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$ 14.80	\$ 15.80	\$ 18.90	\$ 19.90

8-2287

Carpenter

06/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per Hour: 07/01/2022

Marine Construction:

Marine Diver \$ 73.03
+ 9.54*

Marine Tender \$ 62.11
+ 9.54*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 44.54

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 11, 13, 16, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms.

1st year \$ 24.60
+ 5.05*
2nd year 30.20
+ 5.05*
3rd year 38.58
+ 5.05*
4th year 56.97
+ 5.05*

*This portion is not subject to overtime premiums

Supplemental Benefits

Per Hour:

All terms \$ 31.03

8-1456MC

Carpenter

06/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Building
Millwright \$ 57.80
+ 12.62*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Millwright \$ 43.16

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18,19) on HOLIDAY PAGE.

Overtime See (5,6,8,11,13,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
\$31.24	\$36.69	\$42.14	\$53.04
+ 6.75*	+ 7.92*	+ 9.09*	+ 11.43*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
\$29.01	\$31.54	\$34.72	\$39.14

8-740.1

Carpenter

06/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:

07/01/2022

Timberman

\$ 53.05
+ 10.01*

*This portion not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per Hour:

07/01/2022

\$ 43.75

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms:

1st	2nd	3rd	4th
\$22.42	\$27.53	\$35.18	\$42.84
+ 5.30*	+ 5.30*	+ 5.30*	+5.30*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All terms \$ 30.74

8-1556 Tm

Carpenter

06/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Westchester

PARTIAL COUNTIES

Orange: South of but including the following, Waterloo Mills, Slate Hill, New Hampton, Goshen, Blooming Grove, Mountainville, east to the Hudson River.

Putnam: South of but including the following, Cold Spring, TompkinsCorner, Mahopac, Croton Falls, east to Connecticut border.

Suffolk: West of Port Jefferson and Patchogue Road to Route 112 to the Atlantic Ocean.

WAGES

Per hour:	07/01/2022	10/18/2022
Core Drilling: Driller	\$ 42.27 + 2.30*	\$ 43.38 + 2.50*
Driller Helper	33.47 + 2.30*	34.47 + 2.50*

Note: Hazardous Waste Pay Differential:

For Level C, an additional 15% above wage rate per hour

For Level B, an additional 15% above wage rate per hour

For Level A, an additional 15% above wage rate per hour

Note: When required to work on water: an additional \$ 3.00 per hour.

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Driller and Helper	\$ 28.30	\$ 28.85
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OVERTIME PAY

See (B, G, P) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

8-1536-CoreDriller

Carpenter

06/01/2023

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, New York, Putnam, Queens, Richmond

PARTIAL COUNTIES

Nassau: That portion of the county that lies west of Seaford Creek and south of the Southern State Parkway.

WAGES

Per hour:	07/01/2022
Show Exhibit	\$ 55.00 + 9.50**
Bldg. Carpenter*	\$55.05 + 8.25**

* Not applicable in Putnam County

**This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour worked:

Show Exhibit	\$ 44.20
Bldg. Carpenter	39.40

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18,19) on HOLIDAY PAGE.

Paid:for 1st & 2nd yr.

Apprentices See (5,6,11,13,16,18,19,25)

Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour: Show Exhibit

(1) year terms:

1st.	2nd.	3rd.	4th.
\$22.00	\$27.50	\$35.75	\$44.00
+ 4.75*	+ 4.75*	+ 4.75*	+ 4.75*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All terms \$ 30.25

Wages per hour: Bldg. Carpenter

(1) year terms:

1st	2nd	3rd	4th
\$19.80	\$22.80	\$27.05	\$34.93
+ 1.85*	+ 2.30*	+ 2.80*	+ 3.80*

*This portion is not subject to overtime premiums.

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$14.82	\$15.87	\$18.97	\$19.97

8-EXHIB

Carpenter - Building High Rise Concrete Form Work

06/01/2023

JOB DESCRIPTION Carpenter - Building High Rise Concrete Form Work

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

PARTIAL COUNTIES

Nassau: Work performed beginning at the Intersection of the City Line & North Shore of Long Island, then running Southerly to the Southern State Pkwy, then East to Seaford Creek in Nassau County, then South to Atlantic Ocean, then West to Southern tip of Richmond County

WAGES

Per hour: 07/01/2022

Building High Rise:

Concrete Carpenter A \$ 51.48
 + 8.43**

Concrete Carpenter B* \$ 40.89
 + 1.85**

*NOTE: Tier B work excludes erection of decking, perimeter debris netting, leading edge work, self & climbing form systems and the installation of cocoon systems.

**This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Concrete Carpenter A \$ 36.16

Concrete Carpenter B \$ 16.05

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 13, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:

One (1) year terms:

Concrete Carpenter	1st	2nd	3rd	4th
Apprentices	\$ 18.27	\$ 24.70	\$ 31.28	\$ 38.90
	+ .65*	+ 1.78*	+ 1.91*	+ 2.06*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

Concrete Carpenter:	
Apprentices	All Terms \$ 15.75

8-NYC Bldg/212

Carpenter - Heavy&Highway **06/01/2023**

JOB DESCRIPTION Carpenter - Heavy&Highway **DISTRICT 8**

ENTIRE COUNTIES
 Bronx, Kings, New York, Queens, Richmond

PARTIAL COUNTIES
 Nassau: That portion of the county that lies West of Seaford Creek and South of the Southern State Parkway.

WAGES

Per hour: 07/01/2022

Heavy & Highway	
Carpenter	\$ 58.16 + 9.54*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour worked:

Heavy & Highway	
Carpenter	\$ 44.54

OVERTIME PAY
 See (B, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 13, 25) on HOLIDAY PAGE
 Paid : for 1st & 2nd yr
 Apprentices See (5, 6, 11, 13, 25)

REGISTERED APPRENTICES

Wage per hour:

One (1) year terms:				
Heavy & Highway	1st	2nd	3rd	4th
	\$ 24.60	\$ 30.20	\$ 38.58	\$ 46.97
	+ 5.05*	+ 5.05*	+ 5.05*	+ 5.05*

*This portion is not subject to overtime premiums

Supplemental Benefits:

Per Hour:	
	All terms \$ 31.03

8-NYC H/H

Electrician **06/01/2023**

JOB DESCRIPTION Electrician **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour: 07/01/2022 01/01/2023

Tree Trimmer	\$ 33.22	\$ 34.21
Ground Person	20.69	20.69

Applies to line clearance, tree work, and right-of-way preparation on all new or existing overhead, electrical, telephone, and CATV lines.

SUPPLEMENTAL BENEFITS

Per hour:

Tree Trimmer	\$ 12.44	\$ 12.81
Ground Person	7.75	7.75

OVERTIME PAY

See (B, *H, Q) on OVERTIME PAGE

*Worked performed on Sundays & Holidays outside of 7.00am - 4.00pm shall be paid at double time, in addition to the holiday pay if applicable.

HOLIDAY

HOLIDAY:

Paid: See (5,6,10,11,15,16,26) on HOLIDAY PAGE.

(An additional floating holiday after four years service)

Overtime: See (5,6,10,11,15,16,26) on HOLIDAY PAGE.

9-3T

Electrician **06/01/2023**

JOB DESCRIPTION Electrician

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:	07/01/2022	04/12/2023
Electrician	\$ 31.25	\$ 31.25
Telephone	31.25	31.25

Maintenance and Jobbing-Electrical and teledata work of limited duration and scope, consisting of repairs and/or replacement of electrical and teledata equipment.

- Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

SUPPLEMENTAL BENEFITS

Journeyworker:

	07/01/2022	04/12/2023
	\$ 25.30	\$ 26.55
	27.28*	28.52*

* Applies to overtime hours

OVERTIME PAY

See (B, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

9-3m

Electrician **06/01/2023**

JOB DESCRIPTION Electrician

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond, Westchester

WAGES

Per hour:	07/01/2022	03/09/2023
Service Technician	\$ 35.40	\$ 36.40

Service and Maintenance on Alarm and Security Systems.

Maintenance, repair and /or replacement of defective (or damaged) equipment on, but not limited to, Burglar - Fire - Security - CCTV - Card Access - Life Safety Systems and associated devices. (Whether by service contract of T&M by customer request.)

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker: \$ 20.18 \$ 21.07

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

9-3H

Electrician 06/01/2023

JOB DESCRIPTION Electrician

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per Hour: 07/01/2022 04/13/2023

Electrician
 Audio/Sound and
 Temporary Light/
 Power \$ 59.00 \$ 61.00

Evening(Swing Shift):

Electrician
 Audio/Sound and
 Temporary Light/
 Power 69.23 71.57

Night (Graveyard Shift):
 Electrician
 Audio/Sound and
 Temporary Light 77.54 80.17

Solar-Photovoltaic Systems

Group 1 59.00 61.00
 All tasks not listed in Group 2

Group 2 31.25 31.25

D.C portion and associated mechanical equipment related to solar systems
 (excluding battery storage and its associated equipment) including work related to
 Weather Stations and Data Acquisitions/Monitoring Systems on solar photovoltaic systems.

Mounting of PV modules.

Mounting of DC optimizers to back of modules if the installation calls for this equipment.

Mounting of microinverters to back of modules and install trunk cabling on racking if called for.

Module to module connection of PV modules to adjacent modules. If racking manufacturer provides integrated inter-row cable management, install string jumper to complete the string in full in same sub-array.

If racking manufacturer does not provide integrated inter-row cable management, run conduit between rows, bond it and run string jumper to complete string in full in same sub-array.

Installation of weather stations and other weather station relevant sensors as specified.

Installation of data acquisition system (DAS) for PV system monitoring.

SUPPLEMENTAL BENEFITS

Per Hour:

Electrician \$ 61.50 \$ 63.84
 65.22* 67.69*

Swing Shift:	69.97 74.34*	72.58 77.10*
Graveyard Shift:	77.12 82.01*	79.96 85.02*
Temporary Light/Power:	28.10 31.16*	28.56 31.81*
Group 1:	61.50 65.22*	63.84 67.69*
Group 2:	25.30 27.28*	26.55 28.52*

* Applies when premium wages are paid.

Temporary Light and Power benefit rate applies for three or less workers.

Reduce benefit rate by 6.2% for any employee who has accumulated wages of \$137,700 for the same employer.

OVERTIME PAY

See (A, H) on OVERTIME PAGE

See (B) for Temporary Light and Power

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages Per Hour:

One (1) year terms		
First term:	07/01/2022	04/13/2023
0-6 mos.	\$ 18.00	\$ 18.00
7-12 mos.	18.50	18.50
Second term:		
0-6 mos.	19.50	19.50
7-12 mos.	20.50	20.50
Third term:		
0-6 mos.	21.50	21.50
7-12 mos.	22.50	22.50
Fourth term:		
0-6 mos.	23.50	23.50
7-12 mos.	25.50	25.50
Fifth term/MIJ:		
0-12 mos.	26.75	26.75
13-18 mos.	31.25	31.25

Supplemental Benefits per hour:

One (1) year terms:

First Term:	Regular	Overtime	Regular	Overtime
0-6 mos.	\$ 15.68	\$ 16.88	\$ 16.68	\$ 17.87
7-12 mos.	15.94	17.17	16.69	17.92
Second Term:				
0-6 mos.	16.47	17.76	17.48	18.78
7-12 mos.	16.99	18.35	17.74	19.10
Third Term:				
0-6 mos.	17.52	18.94	18.56	19.98
7-12 mos.	18.04	19.53	18.79	20.28
Fourth Term:				
0-6 mos.	18.56	20.12	19.63	21.19
7-12 mos.	19.61	21.30	20.36	22.05
Fifth Term/MIJ:				
1-12 mos.	22.88	24.57	24.13	25.82

13-18 mos. 25.30 27.28 26.55 28.52

9-3

Electrician - Highway and Street Lighting, Traffic Signals and Controls

06/01/2023

JOB DESCRIPTION Electrician - Highway and Street Lighting, Traffic Signals and Controls **DISTRICT 9**

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:

	07/01/2022	04/19/2023
Electro Pole Electrician	\$ 59.00	\$ 61.00
Electro Pole Foundation Installer	44.66	46.66
Electro Pole Maintainer	38.61	40.61

SUPPLEMENTAL BENEFITS

Per Hour:

	07/01/2022	04/19/2023
Electro Pole Electrician	\$ 63.50	\$ 65.91
	67.23*	69.77*
Electro Pole Foundation Installer	48.04	50.05
	50.86*	53.00*
Electro Pole Maintainer	43.40	45.40
	45.83*	47.97*

* Applies when premium wages are paid

Note: Reduce benefit rate by 6.2% for any employee who has accumulated wages in \$137,700 for the same employer.

OVERTIME PAY

See (A, B, E4, F, K) on OVERTIME PAGE

B - Applies to Electro Pole Foundation Installer

E4 - Applies to Electro Pole Maintainer

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

9-3J

Elevator Constructor

06/01/2023

JOB DESCRIPTION Elevator Constructor **DISTRICT 4**

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

PARTIAL COUNTIES

Rockland: Entire County except for the Township of Stony Point

Westchester: Entire County except for the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per hour:

	07/01/2022	03/17/2023
Elevator Constructor	\$ 75.14	\$ 77.49
Modernization & Service/Repair	59.09	60.89

Four(4), ten(10) hour days may be worked at straight time during a week, Monday thru Friday.

NOTE- In order to use the '4 Day/10 Hour Work Schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 IS NOT SUBMITTED you will be liable for overtime payments for work over the allotted hours per day listed.

SUPPLEMENTAL BENEFITS

Per Hour:

Elevator Constructor	\$ 43.914	\$ 45.574
Modernization & Service/Repairs	42.787	44.412

OVERTIME PAY

Constructor See (D, M, T) on OVERTIME PAGE.

Modern/Service See (B, F, S) on OVERTIME PAGE.

HOLIDAY

Paid: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

*Note:1st, 2nd, 3rd Terms are based on Average wage of Constructor & Modernization.
 Terms 4 thru 9 Based on Journeyman's wage of classification Working in.

6 MONTH TERMS:

1st Term* 50%	2nd & 3rd Term* 50%	4th & 5th Term 55%	6th & 7th Term 65%	8th & 9th Term 75%
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SUPPLEMENTAL BENEFITS

Elevator Constructor		
1st Term	\$ 0.00	\$ 0.00
2nd & 3rd Term	34.772	36.024
4th & 5th Term	35.606	36.943
6th & 7th Term	37.052	38.448
8th & 9th Term	38.497	39.953
Modernization & Service/Repair		
1st Term	\$ 0.00	\$ 0.00
2nd & 3rd Term	34.672	35.694
4th & 5th Term	35.195	36.525
6th & 7th Term	36.571	37.948
8th & 9th Term	37.938	39.38

4-1

Glazier **06/01/2023**

JOB DESCRIPTION Glazier

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per hour:	7/01/2022	11/01/2022
Glazier & Glass Tinting	\$ 59.59	\$ 60.34
*Scaffolding	61.55	62.55
Window Film		
**Repair & Maintenance	30.11	30.11

*Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 24' or more, but not pipe scaffolding.

**Repair & Maintenance- All repair & maintenance work on a particular building whenever performed, where the total cumulative contract value is under \$148,837.

SUPPLEMENTAL BENEFITS

Per hour:	7/01/2022	11/01/2022
Glazier & Glass Tinting	\$ 37.55	\$ 38.05
Window Film Repair & Maintenance	22.01	22.01

OVERTIME PAY

See (B,H,V) on OVERTIME PAGE.
 For 'Repair & Maintenance' see (B, B2, I, S) on overtime page.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (4, 6, 16, 25) on HOLIDAY PAGE

For 'Repair & Maintenance'

Paid: See(5, 6, 16, 25)

Overtime: See(5, 6, 16, 25)

REGISTERED APPRENTICES

Wage per hour:

(1) year terms at the following wage rates:

	7/01/2022	11/01/2022
1st term	\$ 21.15	\$ 21.45
2nd term	29.07	29.45
3rd term	35.20	35.65
4th term	47.38	47.98

Supplemental Benefits:

(Per hour)

1st term	\$ 17.15	\$ 17.35
2nd term	24.42	24.67
3rd term	27.06	27.36
4th term	32.15	32.55

8-1087 (DC9 NYC)

Insulator - Heat & Frost

06/01/2023

JOB DESCRIPTION Insulator - Heat & Frost

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour: 07/01/2022 06/01/2023

Insulators Additional
 Heat & Frost \$ 70.01 \$ 1.10/Hr.

SUPPLEMENTAL BENEFITS

Per Hour:

Insulators \$ 35.16
 Heat & Frost

OVERTIME PAY

See (B, E, *Q, V) on OVERTIME PAGE

* Triple time for Labor Day (If worked)

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages:

1 year terms.

Wages Per Hour:

1st	2nd	3rd	4th
\$ 28.00	\$ 35.02	\$ 42.01	\$ 49.02

Supplemental Benefits:

\$ 14.06 \$ 17.59 \$ 21.10 \$ 24.62

4-12

Ironworker **06/01/2023**

JOB DESCRIPTION Ironworker

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:	07/01/2022	01/01/2023
		Additional
Stone Derrickmen Rigger	\$ 72.26	+ \$ 1.64
Stone Handset Derrickman	70.11	+ \$ 1.11

SUPPLEMENTAL BENEFITS

Per hour:

Stone Derrickmen Rigger	\$ 42.10
Stone Handset Derrickman	42.09

OVERTIME PAY

See (B, D1, *E, Q, **V) on OVERTIME PAGE

*Time and one-half shall be paid for all work on Saturday up to eight (8) hours and double time shall be paid for all work thereafter.

** Benefits same premium as wages on Holidays only

HOLIDAY

Paid: See (18) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 25) on HOLIDAY PAGE
 Work stops at schedule lunch break with full day's pay.

REGISTERED APPRENTICES

Wage per hour:

Stone Derrickmen Rigger:				
	1st	2nd	3rd	4th
07/01/2022	\$ 35.58	\$ 50.89	\$ 56.71	\$ 62.48

Supplemental benefits:

Per hour:				
07/01/2022	21.61	31.97	31.97	31.97

Stone Handset:

1/2 year terms at the following hourly wage rate:

	1st	2nd	3rd	4th
07/01/2022	34.50	49.43	54.99	61.00

Supplemental benefits:

Per hour:				
07/01/2022	21.60	31.96	31.96	31.96

9-197D/R

Ironworker **06/01/2023**

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:	07/01/2022	01/01/2023
Ornamental	\$ 46.65	\$ 46.90
Chain Link Fence	46.65	46.90
Guide Rail	46.65	46.90

SUPPLEMENTAL BENEFITS

Per hour:
 Journeyworker: \$ 62.04 \$ 63.04

OVERTIME PAY

See (B, B1, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Apprentices Hired after 9/1/18:

1 year terms		
	07/01/2022	01/01/2023
1st Term	\$ 20.63	\$ 21.13
2nd Term	24.22	24.77
3rd Term	27.80	28.40
4th Term	31.38	32.06

Supplemental Benefits per hour:

1st Term	\$ 17.90	\$ 17.90
2nd Term	19.15	19.15
3rd Term	20.41	20.41
4th Term	21.67	21.67

4-580-Or

Ironworker

06/01/2023

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

PER HOUR:

	07/01/2022	01/01/2023
Ironworker:		
Structural	\$ 55.70	\$ 56.45
Bridges		
Machinery		

SUPPLEMENTAL BENEFITS

PER HOUR PAID:

Journeyman	\$ 85.35	\$ 86.35
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OVERTIME PAY

See (B, B1, Q, *V) on OVERTIME PAGE

*NOTE: Benefits are calculated for every hour paid

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

6 month terms at the following rate:

1st	\$ 28.97	\$ 29.35
2nd	29.57	29.95
3rd - 6th	30.18	30.56

Supplemental Benefits

PER HOUR PAID:

All Terms	\$ 59.18	\$ 59.94
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4-40/361-Str

Ironworker

06/01/2023

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES

Rockland: Southern section - south of Convent Road and east of Blue Hills Road.

WAGES

Per hour:	07/01/2022	07/01/2023
Reinforcing & Metal Lathing	\$ 56.90	Additional \$ 1.50
"Base" Wage	\$ 55.20 plus \$ 1.70	

"Base" Wage is used to calculate overtime hours only.

SUPPLEMENTAL BENEFITS

Per hour:	
Reinforcing & Metal Lathing	\$ 41.18

OVERTIME PAY

See (B, E, Q, *X) on OVERTIME PAGE
 *Only \$23.50 per Hour for non worked hours

Supplemental Benefit Premiums for Overtime Hours worked:

Time & One Half	\$ 47.68
Double Time	\$ 54.18

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 13, *18, **19, 25) on HOLIDAY PAGE
 *Note: Work performed after first 4 Hours.

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

1st term	2nd term	3rd term	4th Term
Wage Per Hour: \$ 22.55	\$ 23.60	\$ 24.60	\$ 37.18
"Base" Wage \$ 21.00 plus \$1.55	\$ 22.00 plus \$1.60	\$ 23.00 plus \$1.60	\$ 35.60 plus \$1.58

"Base" Wage is used to calculate overtime hours ONLY.

SUPPLEMENTAL BENIFITS

Per Hour:			
1st term \$ 18.17	2nd term \$ 17.17	3rd term \$ 16.22	4th Term \$ 22.50

4-46Reinf

Laborer **06/01/2023**

JOB DESCRIPTION Laborer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:		
Striper (Highway/streets):	07/01/2022	07/01/2023
Striping-Machine Operator	\$ 39.00	Additional \$ 3.00
Striping Thermoplastic	43.00	
Flagger - Traffic Safety*	37.00	

Note: * Includes but is not limited to: Positioning of cones and directing of traffic using hand held devices. Excludes the Driver/Operator of equipment used in protection of traffic safety.

SUPPLEMENTAL BENEFITS

Per hour paid:

Journeyworker \$ 15.27

OVERTIME PAY

See (B, H) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 13) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 13) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

1st Term (1-2000 hours) \$ 30.36

2nd Term (2001-4000 hours) 32.00

Supplemental Benefits per hour:

All Terms 15.27

9-1010-LS

Laborer

06/01/2023

JOB DESCRIPTION Laborer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:	07/01/2022	07/01/2023
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Laborer/Excavation		Additional
**Asbestos and Lead Abatement & Removal, Hazardous Waste Removal (including soil)	\$ 44.00	\$ 2.30
Basic	44.00	
Flagman	44.00	
Pipelayer	44.00	
*Tree Work, *Landscape	44.00	

*Includes trimming, cutting, planting and/or removal of trees.

** Applies to Heavy & Highway projects

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 50.43

Note: No payment of Supplemental Benefits is required on paid holidays, when employees do not work.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

When an observed holiday falls on a Saturday, work done shall be paid at double time.

HOLIDAY

Paid: See (2, 20) on HOLIDAY PAGE

Overtime: See (2, 5, 6, 11, 20) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:

1000 hour terms at the following hourly wage rate.

		07/01/2022
1st	0 - 1000	\$ 22.00
2nd	1001-2000	26.40
3rd	2001-3000	33.00
4th	3001-4000	39.60

Supplemental Benefits per hour:

All Apprentices 50.43

9-731Ex

Laborer **06/01/2023**

JOB DESCRIPTION Laborer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:

GROUP 14: Blasters.

GROUP 16: Tunnel workers - including Miners, Drill Runners, Iron Men, Maintenance Men, Conveyor Men, Safety Miners, Riggers, Block Layers, Cement Finishers, Rod Men, Caulkers, Powder Carriers, Miners' Helpers, Chuck Tenders, Track Men, Nippers, Brake Men, Derail Men, Form Men, Bottom Bell, Top Bell or Signal men, Form Workers, Movers, Concrete Workers, Shaft Men, Tunnel Laborers and Caulkers' Helpers.

GROUP 17: All others including: Powder Watchmen, Top Laborers and Changehouse Attendants.

Wages: (per hour)	07/01/2022
Laborer (Tunnel)-FREE AIR:	
Group 14	\$ 71.94
Group 16	68.80
Group 17*	63.59
Small Bore Micro Tunnel Machines	80% of rates above
For Repairs on Existing Water Tunnels	90% of rates above
For Repairs of Sewer & Drainage Tunnels	85% of rates above
For Repair & Maintenance of all Subway & Vehicular Tunnels	80% of rates above

*An additional \$3.00 per day when using an air spade, jack hammer or pavement breaker.

Note: For jobs bid before July 1, 2010 employer shall pay \$6.00 per day for each one half (1/2) mile or fraction starting from a point 500 feet from the shaft. For all jobs bid after July 1, 2010, said premium shall be \$10.00 per day.

SUPPLEMENTAL BENEFITS

Per hour:

GROUP 14	\$ 51.27
GROUP 16	49.16
GROUP 17	45.51
Small Bore Micro Tunnel Machines	80% of rates above
For Repairs on Existing Water Tunnels	90% of rates above
For Repairs of Sewer & Drainage Tunnels	85% of rates above
For Repair & Maintenance of all Subway & Vehicular Tunnels	80% of rates above

OVERTIME PAY

OVERTIME: For Laborer (Free Air) See (D, M, R*) on OVERTIME PAGE.
 For Repair Categories See (B, F, R*) on OVERTIME PAGE.
 & Micro Tunneling
 * Straight time first 8 hours, double time after 8 hours.

HOLIDAY

Paid: See (5, 6, 9, 11, 12, 15, 16, 25) on HOLIDAY PAGE
 Overtime: See (5, 6, 9, 11, 12, 15, 16, 25) on HOLIDAY PAGE
 Good Friday may be exchanged for one of the holidays listed.

9-147Tnl/Free

Laborer

06/01/2023

JOB DESCRIPTION Laborer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour: 07/01/2022

Laborer:

Laborer-Concrete
 (including flag person) \$ 42.53
 + \$6.75*

* This portion is not subjected to overtime premiums.

SUPPLEMENTAL BENEFITS

Per Hour \$ 19.70
 + \$8.00**

** This portion subjected to overtime premiums only on codes (E,Q)

OVERTIME PAY

OVERTIME: See (A,E,Q) on OVERTIME PAGE attached.
 See (B,E,Q,) for work below street level to top of foundation.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 13, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Terms based on hours listed:

1st	2nd	3rd
0-1334	1334-2668	2669-4000
\$ 19.04	\$ 21.26	\$ 26.83
+\$1.99*	+\$5.82*	+\$6.30*

* This portion is not subjected to overtime premiums.

Supplemental Benefits:

Per hour:			
	\$ 12.20	\$ 16.20	\$ 16.20
	+\$2.00*	+\$2.45*	+\$3.55*

Journeyworker rate applies after 4000 hours

*This portion subjected to same premium as wages.

9-6A/18A/20-C

Laborer - Building

06/01/2023

JOB DESCRIPTION Laborer - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour: 07/01/2022 01/01/2023

Basic Laborer and
 Mason Tender \$ 42.70* \$ 43.80**

*Before calculating premium wage deduct \$2.75

**Before calculating premium wage deduct \$3.00

SUPPLEMENTAL BENEFITS

Per hour:

Basic Laborer and
 Mason Tender \$ 29.24 \$29.39

OVERTIME PAY

See (B, B2, E, E2, Q, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 25) on HOLIDAY PAGE

(Easter is paid at Time and One-half if worked)

REGISTERED APPRENTICES

Wage per hour:

1000 hour terms at the following wage rate:

Term:	1st	2nd	3rd	4th
Basic Laborer and Mason Tender				
07/01/2022	\$ 21.45*	\$ 23.40*	\$ 24.90*	\$ 27.40*
01/01/2023	\$ 21.80*	\$ 23.55*	\$ 25.05*	\$ 27.55*

*Before calculating premium wage deduct \$0.50

Supplemental Benefits per hour:

All Terms	
07/01/2022	\$ 10.32
01/01/2023	\$ 10.47

9-MTDC(79)

Laborer - Building

06/01/2023

JOB DESCRIPTION Laborer - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:

07/01/2022

Skilled Interior Demolition Laborer: \$ 39.19*
 General Interior Demolition Laborer: 28.38**

* Before calculating overtime wages deduct \$1.50

**General Demolition Laborer performs manual work and work incidental to demolition, such as loading and carting of debris from work site to an area where it can be loaded into trucks for removal. Also performs clean-up of the site when demolition is complete.

SUPPLEMENTAL BENEFITS

Per Hour:

Skilled Interior Demolition Laborer: 24.60
 General Interior Demolition Laborer: 18.92

OVERTIME PAY

See (B, B2, I, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage Per Hour:

1000 hour terms at the following wage rate:

1st	2nd	3rd	4th
\$ 21.20*	\$ 23.15*	\$ 24.65*	\$ 27.15*

* Before calculating overtime wages deduct \$0.50

Supplemental Benefits per hour:

All Terms: 10.32

9-MTDC (79-ID)

Laborer - Building **06/01/2023**

JOB DESCRIPTION Laborer - Building **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:	07/01/2022	01/01/2023
Building:		Additional
Plasterer Tender and Spray Fireproofing Tender	\$ 42.70*	\$ 1.25

* Before calculating overtime wages deduct \$2.75.

SUPPLEMENTAL BENEFITS

Per hour:	
Journeyworker	\$ 29.24

OVERTIME PAY
 See (B, B2, E, E2, Q, R) on OVERTIME PAGE

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES
 Wage per hour:

1000 hours terms at the following wage.

	1st	2nd	3rd	4th
	\$21.45*	\$23.40*	\$24.90*	\$27.40*

* Before calculating overtime wages deduct \$ 0.50

Supplemental Benefits per hour:

07/01/2022
 All Terms: \$ 10.32

9-30 (79)

Laborer - Building **06/01/2023**

JOB DESCRIPTION Laborer - Building **DISTRICT 4**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour:	07/01/2022	01/02/2023
Asbestos, Lead and Hazardous Material Abatement Laborer	\$ 38.05	\$ 39.50*

(Re-Roofing Removal See Roofer)
 NOTE: Asbestos removed from Mechanical Systems not to be scrapped
 See Asbestos Worker

SUPPLEMENTAL BENEFITS

Per Hour:	
Laborer	\$ 19.10 \$ 19.65

OVERTIME PAY
 See (B, B2, I) on OVERTIME PAGE
 *Calculate at \$38.55 per hour then add \$0.95

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 28) on HOLIDAY PAGE

REGISTERED APPRENTICES

1000 hour terms at the following;
 Per Hour:

1st term	\$ 20.00	\$ 20.50*
2nd Term	21.00	21.50**
3rd Term	24.00	24.50***
4th Term	26.00	26.50****

SUPPLEMENTAL BENEFIT

Per Hour:

All Terms	\$ 14.25	\$ 14.25
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OVERTIME PAY:

- *Calculate at \$20.00 per hour then add \$0.50
- **Calculate at \$21.00 per hour then add \$0.50
- ***Calculate at \$24.00 per hour then add \$0.50
- ****Calculate at \$26.00 per hour then add \$0.50

4-NYDC(78)

Laborer - Building

06/01/2023

JOB DESCRIPTION Laborer - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:	07/01/2022	01/01/2023
Skilled Demolition Laborer:	\$ 41.08*	\$ 41.93***
General Demolition Laborer:	29.66**	30.51****

- *Before calculating overtime wages deduct \$2.85
- **Before calculating overtime wages deduct \$2.20
- ***Before calculating overtime wages deduct \$3.00
- ****Before calculating overtime wages deduct \$2.35

**General Demolition Laborer performs manual work and work incidental to demolition, such as loading and carting of debris from work site to an area where it can be loaded into trucks for removal. Also performs clean-up of the site when demolition is complete.

NOTE: Total Demolition Only: Demolition shall be the complete demolition (wrecking) or dismantling of entire buildings or structures. Also may include the removal of all or any portion of a roof in which structural change is to occur. Structural change is defined as the removal of structural slabs, steel members, concrete members and penetration through the structural slab.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:

Skilled Demolition Laborer:	\$ 28.12	\$ 28.27
General Demolition Laborer:	21.18	21.33

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:
 (1) year terms at the following wage.

1st	2nd	3rd	4th
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07/01/2022

1st term	2nd term
1-1999	2000-4000
\$ 17.15	\$ 17.15

9-1010H/H

Laborer - Trac Drill

06/01/2023

JOB DESCRIPTION Laborer - Trac Drill

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Group 1: Chipper/Jackhammer, Powder Carrier, Hydraulic Chuck tender, Chuck Tender and Nipper, Magazine Keeper

Group 2: Hydraulic Trac Drill

Group 3: Air Trac, Wagon and Quarry bar

Group 4: Blaster

Per Hour: 07/01/2022

Group 1	\$ 44.00
Group 2	51.35
Group 3	50.52
Group 4	57.21

SUPPLEMENTAL BENEFITS

Per Hour:

All Classifications 50.43

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

When an observed holiday falls on a Saturday, work done shall be paid at double time.

HOLIDAY

Paid: See (2, 20) on HOLIDAY PAGE

Overtime: See (2, 5, 6, 11, 20) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:

1000 hour terms at the following hourly wage rate.

07/01/2022

1st	0 - 1000	\$ 22.00
2nd	1001-2000	26.40
3rd	2001-3000	33.00
4th	3001-4000	39.60

Supplemental Benefits per hour:

All Apprentices 50.43

9-731/29

Laborer - Tunnel

06/01/2023

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

GROUP 5: Blasters and Mucking Machine Operators

GROUP 6: Tunnel Workers* * (including Miners, Drill Runners, Iron Men, Maintenance Men, Inside Muck Lock Tender, Pumpmen, Electricians, Cement Finishers, Rod Men, Caulkers, Carpenters, Hydraulic Men, Shield Drivers, Monorail Operators, Motor Men, Conveyor Men, Safety Miners, Powder Carriers, Pan Men, Riggers, Miner's Helpers, Chuck Tenders, Track Men, Nippers, Brake Men, Form Workers, Concrete Workers, Tunnel Laborers, Caulker's Helpers), Hose Men, Grout Men, Gravel Men, Derail Men and Cable Men.

GROUP 7: Top Nipper

GROUP 8,9: Outside Man Lock Tender, Outside Muck Lock Tender, Shaft Men, Gauge Tender and Signal Men.

GROUP 10: Powder Watchmen, Top Laborers and Changehouse Attendants.

WAGES: (per hour)

07/01/2022

Laborer(Compressed Air):

GROUP 5	\$ 75.42
GROUP 6	72.73
GROUP 7	71.52
GROUP 8,9	70.09
GROUP 10	61.62

Note: For jobs bid before July 1, 2010 employer shall pay \$6.00 per day for each one half (1/2) mile or fraction starting from a point 500 feet from the shaft. For all jobs bid after July 1, 2010, said premium shall be \$10.00 per day.

SUPPLEMENTAL BENEFITS

SUPPLEMENTAL BENEFITS:

per hour:

GROUP 5	\$ 53.35
GROUP 6	51.70
GROUP 7	50.66
GROUP 8,9	49.85
GROUP 10	47.25

OVERTIME PAY

See (D, M, *R) on OVERTIME PAGE

NOTE: Time and one-half to be paid for all overtime repair-maintenance work on existing equipment and facilities.

* Straight time first 8 hours, double time after 8 hours.

HOLIDAY

Paid: See (5, 6, 9, 11, 12, 15, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 9, 11, 12, 15, 16, 25) on HOLIDAY PAGE

Good Friday may be exchanged for one of the holidays listed.

9-147Tnl/Comp Air

Mason

06/01/2023

JOB DESCRIPTION Mason

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour:	07/01/2022	07/01/2023
Brick/Block Layer	\$ 65.23	Additional \$ 2.41
Base Wage for OT Calculation	54.18	

SUPPLEMENTAL BENEFITS

Per Hour:

Brick/Block Layer	\$ 30.60
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OVERTIME PAY

See (A, E, E2, Q) on OVERTIME PAGE
 Note: OT Calculated on Base Wage plus \$ 11.10/hr.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(800 hour) Terms at the following Percentage of Journey workers "Base Wage" plus \$ 6.35/hr.:

1st	2nd	3rd	4th	5th
50%	60%	70%	80%	90%

Supplemental Benefits per hour:

All Apprentices \$ 21.45

4-1Brk

Mason - Building

06/01/2023

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Building 07/01/2022

Wages per hour:

Mosaic & Terrazzo Mechanic \$ 59.21

Mosaic & Terrazzo Finisher 57.60

SUPPLEMENTAL BENEFITS

Per hour:

Mosaic & Terrazzo Mechanic \$ 26.21*
 + \$11.73

Mosaic & Terrazzo Finisher \$ 26.21*
 + \$11.72

*This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (A, E, Q) on OVERTIME PAGE
 07/01/2022- Deduct \$7.00 from hourly wages before calculating overtime.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

Easter Sunday is an observed holiday. Holidays falling on a Saturday will be observed on that Saturday. Holidays falling on a Sunday will be celebrated on the Monday.

REGISTERED APPRENTICES

Wages Per hour:

1st	2nd	3rd	4th	5th	6th
0-1500	1501-3000	3001-3750	3751-4500	4501-5250	5251-6000
\$ 22.82	\$ 29.34	\$ 31.32	\$ 36.55	\$ 41.77	\$ 46.99

Supplemental Benefits per hour:

\$4.62*	\$5.94*	\$15.73*	\$18.35*	\$20.97*	\$23.59*
+\$6.56	+\$8.43	+\$11.24	+\$13.11	+\$14.99	+\$16.85

*This portion of benefits subject to same premium rate as shown for overtime wages.

Mason - Building **06/01/2023**

JOB DESCRIPTION Mason - Building **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:	07/01/2022	12/05/2022	06/05/2023 Additional \$ 0.73
Tile Setters	\$ 62.41	\$ 63.03	

SUPPLEMENTAL BENEFITS

Per Hour:	\$ 26.06* + 10.04	\$ 26.16* + \$10.04
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*This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY
 See (B, *E, Q, V) on OVERTIME PAGE
 Work beyond 10 hours on Saturday shall be paid at double the hourly wage rate.

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES
 Wage per hour:
 750 hour terms at the following wage rate:

	1st 1- 750	2nd 751- 1500	3rd 1501- 2250	4th 2251- 3000	5th 3001- 3750	6th 3751- 4500	7th 4501- 5250	8th 5251- 6000	9th 6001- 6750	10th 6501- 7000
07/01/2022	\$21.23	\$26.11	\$33.26	\$38.14	\$41.67	\$45.04	\$48.60	\$53.47	\$56.25	\$60.33
12/05/2022	\$21.47	\$26.39	\$33.60	\$38.52	\$42.06	\$45.47	\$49.05	\$53.96	\$56.77	\$60.90

Supplemental Benefits per hour:

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
07/01/2022	\$12.55* + \$.69	\$12.55* + \$.74	\$15.16* + \$.84	\$15.16* + \$.88	\$16.75* + \$1.28	\$18.30* + \$1.33	\$19.35* + \$1.70	\$19.40* + \$1.75	\$17.45* + \$5.90	\$22.80* + \$6.42
12/05/2022	\$12.55* + \$.71	\$12.55* + \$.76	\$15.16* + \$.86	\$15.16* + \$.90	\$16.16* + \$1.32	\$17.66* + \$1.37	\$18.66* + \$1.76	\$18.66* + \$1.81	\$16.66* + \$5.96	\$21.91* + \$6.51

*This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/52

Mason - Building **06/01/2023**

JOB DESCRIPTION Mason - Building **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour:	07/01/2022
Building-Marble Restoration: Marble, Stone &	\$ 46.60

Terrazzo Polisher, etc

SUPPLEMENTAL BENEFITS
 Per Hour:

Journeyworker:

Building-Marble Restoration:

Marble, Stone &

Polisher \$ 29.77

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*ON SATURDAYS, 8TH HOUR AND SUCCESSIVE HOURS PAID AT DOUBLE HOURLY RATE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE

1ST TERM APPRENTICE GETS PAID FOR ALL OBSERVED HOLIDAYS.

REGISTERED APPRENTICES

WAGES per hour:

900 hour term at the following wage:

1st 1- 900	2nd 901- 1800	3rd 1801- 2700	4th 2701
\$ 32.61	\$ 37.28	\$ 41.94	\$ 46.60

Supplemental Benefits Per Hour:

27.07	27.97	28.87	29.77
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9-7/24-MP

Mason - Building

06/01/2023

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Wages: 07/01/2022

Marble Cutters & Setters \$ 62.17

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 38.27

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage Per Hour:

750 hour terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1- 750	751- 1500	1501- 2250	2251- 3000	3001- 3750	3751- 4500	4501- 5250	5251- 6000	6001- 6751	6751- 7500
\$ 24.88	\$ 27.97	\$ 31.08	\$ 34.17	\$ 37.29	\$ 40.39	\$ 43.51	\$ 46.61	\$ 52.82	\$ 59.05

Supplemental Benefits per hour:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 20.55	\$ 22.04	\$ 23.52	\$ 25.01	\$ 26.47	\$ 27.96	\$ 29.42	\$ 30.91	\$ 33.86	\$ 36.81

9-7/4

Mason - Building **06/01/2023**

JOB DESCRIPTION Mason - Building **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:	07/01/2022	12/05/2022	06/05/2023
			Additional
Tile Finisher	\$ 48.00	\$ 48.44	\$ 0.60

SUPPLEMENTAL BENEFITS

Per Hour:	\$ 22.91*	\$ 23.06*
	+ \$9.86	+ \$9.86

* This portion of benefits is subject to same premium rate as shown for overtime wages.

OVERTIME PAY
 See (A, *E, Q) on OVERTIME PAGE
 Double time rate after 10 hours on Saturdays

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88-tf

Mason - Building **06/01/2023**

JOB DESCRIPTION Mason - Building **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour:	07/01/2022
Marble, Stone, etc. Maintenance Finishers:	\$ 27.01

Note 1: An additional \$2.00 per hour for time spent grinding floor using "60 grit" and below.
 Note 2: Flaming equipment operator shall be paid an additional \$25.00 per day.

SUPPLEMENTAL BENEFITS

Per Hour:	
Marble, Stone, etc Maintenance Finishers:	\$ 14.40

OVERTIME PAY
 See (B, *E, Q, V) on OVERTIME PAGE
 *Double hourly rate after 8 hours on Saturday

HOLIDAY
 Paid: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
 1st term apprentice gets paid for all observed holidays.

REGISTERED APPRENTICES

WAGES per hour:	07/01/2022
0-750	\$ 21.67
751-1500	22.38
1501-2250	23.10
2251-3000	23.80
3001-3750	24.87
3751-4500	26.29
4501+	27.01

Supplemental Benefits:

Per hour:

0-750	11.52
751-1500	11.90
1501-2250	12.29
2251-3000	12.67
3001-3750	13.25
3751-4500	14.01
4501+	14.40

9-7/24M-MF

Mason - Building / Heavy&Highway

06/01/2023

JOB DESCRIPTION Mason - Building / Heavy&Highway

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Marble-Finisher \$ 48.97

SUPPLEMENTAL BENEFITS

Journeyworker:
per hour

Marble- Finisher \$ 35.76

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

Work beyond 8 hours on a Saturday shall be paid at double the rate.

HOLIDAY

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

When an observed holiday falls on a Sunday, it will be observed the next day.

9-7/20-MF

Mason - Building / Heavy&Highway

06/01/2023

JOB DESCRIPTION Mason - Building / Heavy&Highway

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour: 07/01/2022

Cement Mason \$ 53.77

SUPPLEMENTAL BENEFITS

Per Hour:

Cement Mason \$ 34.16

1.5 X overtime rate \$ 61.70

2 X overtime rate \$ 68.32

OVERTIME PAY

See (B1, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 13, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following Percentage of Journeyworkers Wage.

1st Term \$ 19.92

2nd Term \$ 24.82

3rd Term \$ 30.22

Supplement Benefits per hour paid:

		1.5X OT	2X OT
1st Term	\$ 14.36	\$ 21.55	\$ 28.72
2nd Term	\$ 14.66	\$ 22.00	\$ 29.32

3rd Term \$ 14.77 \$ 22.16 \$ 29.54

4-780

Mason - Building / Heavy&Highway

06/01/2023

JOB DESCRIPTION Mason - Building / Heavy&Highway

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

NOTE: Shall include but not limited to Precast concrete slabs (London Walks)Marble and Granite pavers 2'x 2' or larger.

Per Hour:

	07/01/2022	05/01/2023
		Additional
Stone Setter	\$ 69.72	\$ 2.17
Base Rate	52.06	

Stone Tender	52.12
Base Rate	44.54

SUPPLEMENTAL BENEFITS

Per Hour:

Stone Setter \$ 37.07

Stone Tender 21.35

OVERTIME PAY

See (*C, **E, Q) on OVERTIME PAGE

Base Rates are use to Calculate Overtime Premiums then adding in:

\$16.70/Hr. for Stone Setter and \$7.58/Hr. for Stone Tender

* On weekdays the eighth (8th) and ninth (9th) hours are time and one-half all work thereafter is paid at double the hourly rate.

** The first nine (9) hours on Saturday is paid at time and one-half all work thereafter is paid at double the hourly rate.

HOLIDAY

Paid: See (*18) on HOLIDAY PAGE

Overtime: See (5, 6, 10) on HOLIDAY PAGE

Paid: *Must work first 1/2 of day

REGISTERED APPRENTICES

Per Hour:

Stone Setter(800 hour) terms at the following Percentage of Stone Setters Base wage rate per hour plus \$8.16:

1st	2nd	3rd	4th	5th	6th
50%	60%	70%	80%	90%	100%

Supplemental Benefits:

All Apprentices \$ 23.95

4-1Stn

Mason - Heavy&Highway

06/01/2023

JOB DESCRIPTION Mason - Heavy&Highway

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour: 07/01/2022

Pointer, Caulkers & Cleaners \$ 59.09

SUPPLEMENTAL BENEFITS

Per Hour:

Pointer, Cleaners & Caulkers \$ 31.22

OVERTIME PAY

See (B, E2, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms at the following wage rates.

	1st	2nd	3rd	4th
	\$ 29.86	\$ 33.74	\$ 39.02	\$ 47.05

Apprentices Supplemental Benefits:
 (per hour paid)

	\$ 15.30	\$ 19.85	\$ 23.60	\$ 24.60
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4-1PCC

Operating Engineer - Building

06/01/2023

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Putnam, Queens, Richmond, Westchester

PARTIAL COUNTIES

Dutchess: that part of Dutchess County lying south of the North City Line of the City of Poughkeepsie.

WAGES

NOTE: Construction surveying

Party Chief--One who directs a survey party

Instrument Man--One who runs the instrument and assists Party Chief.

Rodman--One who holds the rod and assists the Survey Crew

Wages:(Per Hour) 07/01/2022

Building Construction:

Party Chief	\$ 76.64
Instrument Man	60.50
Rodman	40.64

Steel Erection:

Party Chief	79.41
Instrument Man	62.85
Rodman	43.48

Heavy Construction-NYC counties only:
 (Foundation, Excavation.)

Party Chief	84.60
Instrument man	63.79
Rodman	54.52

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

Building Construction	\$ 26.69* +\$ 7.40
Steel Erection	27.29* +\$ 7.40
Heavy Construction	25.25* +\$ 7.15

* This portion subject to same premium as wages

Non-Worked Holiday Supplemental Benefit:

16.45

OVERTIME PAY

See (A, B, E, Q) on OVERTIME PAGE

Code "A" applies to Building Construction and has double the rate after 7 hours on Saturdays.
Code "B" applies to Heavy Construction and Steel Erection and had double the rate after 8 hours on Saturdays.

HOLIDAY

Paid: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

9-15Db

Operating Engineer - Building, Maintenance, Steel Erection & Heavy Construction **06/01/2023**

JOB DESCRIPTION Operating Engineer - Building, Maintenance, Steel Erection & Heavy Construction **DISTRICT 9**

ENTIRE COUNTIES
Bronx, Kings, New York, Queens, Richmond

WAGES

STEEL ERECTION:

Group 1: Derrick, travelers, tower, crawler tower & climbing cranes

Group 2: Oiler (Truck Crane)

Group 3: Oiler (Crawler Crane)

BUILDING CONSTRUCTION:

Group 1: Installing, repairing, maintaining, dismantling of all equipment including Steel cutting& bending machines, mechanical heaters, mine hoists, climbing cranes, tower cranes, Linden Peine, Lorain, Liebherr, Mannes and machines of a similar nature; Well Point system, Deep Well pumps, Concrete mixers with loading devices, Concrete plants, motor generators (When used for temporary power and lights)(Driving maintenance trucks and mounted-welded machines)-All Pumps(excluding River Cofferdam Pumps and Well Point Pumps), Motorized Concrete Buggies(When three or more are on job site), Skid-Steer and similar machines

Group 2:Maintenance of: Pumps, Generators, Mixers, Heaters

Group 3: Oilers of all gasoline, electric, diesel or air operated Gradalls; Concrete Pumps, Overhead Cranes in Power Houses, Assist in oiling, greasing and repairing of all machines, including: Driving Truck Cranes, Driving and operating Fuel and Grease Trucks, Cherry Pickers(Hydraulic Cranes) over 70,000 GVW and machines of a similar nature

Group 4: Oiler on Crawler Cranes, Backhoes, Trenching Machines, Gunite Machines, Compressors(3 or more in battery)

Group 5: Maintenance on Radiant Mechanical Heaters

HEAVY CONSTRUCTION (Excavation, Foundations, etc)

Group 1:Maintenance of: Generators, Light Towers

Group 2:Maintenance of: Pumps, Mixers including mudsucking

Group 3: Base Mounted Tower Cranes

Group 4: Installing, repairing, maintaining, dismantling(of all equipment including Steel cutting & Bending machines, Fusion Coupling Machines, Vermeer Trenching machines, on-site crushing plant, mechanical heaters(1 through 7),Mine hoists, Tower Cranes, Linden Peine, Lorrain, Lebherr, Mannes or machines of a similar nature, Wellpoints)-Driving maintenance trucks and truck mounted welding machines, burning, welding-operating of accumulator for shield-driven tunnels, in addition to the performance of other duties: Handling, installation, jointing, coupling of all permanent steel and plastic pipe. RIDE UPON MOLES-tunnel boring machines-MICRO TUNNELING SYSTEMS, All temporary pipefitting;When three or more motorized concrete buggies(Ride type)are utilized on the jobsite they shall be serviced, maintained and repaired by the maintenance engineer. The Operating Engineer on autogrades(C.M.I.)is to be assisted by the maintenance engineer who shall in addition perform other duties.

WAGES:

Per hour: 07/01/2022

Steel Erection:

Group 1 \$ 78.26

Group 2 73.64

Group 3 57.51

Building Construction:

Group 1 \$ 73.13

Group 2 58.08

Group 3	69.81
Group 4	53.34
Group 5	46.79

Heavy Construction:

Group 1	\$ 55.76
Group 2	57.01
Group 3	103.68
Group 4	80.71

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

Building Construction	\$ 27.80* plus \$7.40
Steel Erection & Heavy	28.30* plus \$7.40

* This portion of benefits subject to same premium as wages.

Non-Worked Holiday Supplemental Benefits:

23.47

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages Per Hour:

(1) year terms at the following wage rates:

1st	2nd	3rd	4th.
\$ 36.11	\$ 42.97	\$ 46.40	\$ 49.83

Supplemental Benefits:

Per Hour:

All Terms \$ 12.55* Plus 7.40

* This portion of benefits subject to same premium as wages.

9-15Ab

Operating Engineer - Building / Heavy&Highway

06/01/2023

JOB DESCRIPTION Operating Engineer - Building / Heavy&Highway

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

EQUIPMENT COVERED: Jet-Rodder/Vacuum Truck, Flusher, Sewer Rodder, Stetco Hoist and similar, Sewer Winch/Tugger Hoist and similar, Vacall/Vactor, Closed Circuit Television Inspection Equipment, Chemical Grouting Equipment and similar, John Beame, Meyers and similar.

Per Hour: 07/01/2022

Maintenance Engineer \$ 80.71
(Sewer Systems)

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

Journeyman 26.05*
plus \$ 7.40

*This portion of benefits subject to same premium as wages.

Non-Worked Holiday Supplemental Benefits:

16.95

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

Overtime: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

REGISTERED APPRENTICES

Per Hour:

(1) year terms at the following wage rates.

1st	2nd	3rd	4th
\$36.11	\$42.97	\$46.40	\$49.83

Supplemental Benefits:

Per Hour:

All Apprentices: \$ 12.55* plus \$ 7.40

* This portion of benefits subject to the same premium as overtime wages

9-15Sewer

Operating Engineer - Building / Heavy&Highway

06/01/2023

JOB DESCRIPTION Operating Engineer - Building / Heavy&Highway

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour: 07/01/2022 08/01/2022

Well Driller \$ 39.45 \$ 40.63

Well Driller Helper 34.17 34.17

Hazardous Waste Differential
 Added to Hourly Wage:

Level A	\$ 3.00	\$ 3.00
Level B	2.00	2.00
Level C	1.00	1.00

Monitoring Well Work
 Add to Hourly Wage:

Level A	\$ 3.00	\$ 3.00
Level B	2.00	2.00

SUPPLEMENTAL BENEFITS

Per Hour:

Well Driller & Helper	10% of straight time rate plus \$ 13.50	10% of straight time rate plus \$ 13.50
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Additional \$ 4.25/Hr. for Premium Time Hours Worked

OVERTIME PAY

See (B2, P, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 16, 23) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 23) on HOLIDAY PAGE

REGISTERED APPRENTICES

Apprentices at 12 Month Terms

Wages Per Hour:

1st Term	\$ 28.00	\$ 28.00
2nd Term	29.00	29.00
3rd Term	30.00	30.00

SUPPLEMENTAL BENEFITS

Per Hour:

All Terms 10% of Wage + \$ 13.50

Additional \$4.25/Hr. for premium time hours worked.

4-138well

Operating Engineer - Building & Steel Erection

06/01/2023

JOB DESCRIPTION Operating Engineer - Building & Steel Erection

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per Hour: 07/01/2022

STEEL ERECTION:

Three Drum Derricks \$ 101.88

Cranes, Two Drum Derricks, Hydraulic Cranes & Fork Lifts,
Boom Trucks 98.19

Compressors, Welding Machines 61.54

Compressors 58.96
(not combined with welding machines)

BUILDING CONSTRUCTION:

Cranes, Stone Derrick, Boom Trucks, Hydraulic Cranes,
98.72

Double Drum 93.64

4 Pole Hoists and Single
Drum Hoists 87.38

Fork Lifts, Plaster(Platform Machine)Plaster Bucket, Concrete
Pumps and all other equipment used for hoisting
80.14

*House Cars and Rack & Pinion 70.75

*House Cars (New Projects) 58.07

Erecting and dismantling Cranes 88.24

Compressors, Welding Machines(Cutting Concrete-Tank Work),
Paint Spraying, Sand Blasting, Pumps(With the exclusion of
concrete pumps), House Car (Settlement basis only), All
Engines irrespective of power(Power-Vac)used to drive
auxiliary equipment Air, Hydraulic, etc., Boilers, Jacking System
61.80

APPLICABLE TO ALL CATEGORIES:

CRANES: Crawler Or Truck

In Addition To Above Crane Rates

100' to 149' Boom \$ 1.75/hr

150' to 249' " \$ 2.00/hr

250' to 349' " \$ 2.25/hr

350' to 450' " \$ 2.75/hr

Tower Crane \$ 2.00/hr

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

All Operator Classes \$ 24.65*
plus \$ 6.20

* This portion of the benefits is subject to the same premium as shown for overtime wages.

OVERTIME PAY

See (*B, **C, ***D, O) on OVERTIME PAGE

*Applies to House Cars and Rack & Pinion after 8 hours worked in a day, Saturday, Sunday and Holidays

**Applies to Building Construction category

***Applies to Steel Erection

HOLIDAY

Paid: See (5, 6, 7, 8, 11, 12, 16, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 7, 8, 11, 12, 16, 26) on HOLIDAY PAGE

Codes 8 and 12 apply ONLY to Steel Erection

Code 16 applies ONLY to Building Construction

REGISTERED APPRENTICES

Wage Per Hour:

Apprentices (1) year terms at the following rates:

	1st	2nd	3rd
07/01/2022	\$ 41.98	\$ 50.77	\$ 59.56

Supplemental Benefits Per Hour:

Straight Time	07/01/2022 \$ 13.65* plus \$ 5.95
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* This portion of benefits subject to the same premium as shown for overtime wages.

9-14 B&S

Operating Engineer - Heavy Construction 1

06/01/2023

JOB DESCRIPTION Operating Engineer - Heavy Construction 1

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

(For Groups 23 - 28, see Operating Engineer - Heavy Construction 2)

- Group 1: Tower Crane/Climbing Crane
- Group 2: Backhoes (Including all track and rubber tire backhoes over 37,000 lbs), Power Shovels, Steel Erection: Hydraulic Clam Shells, Moles and machines of a similar nature
- Group 3: Mine Hoists, Cranes, etc, used as Mine Hoists
- Group 4: Gradalls, Keystones, Cranes (With digging buckets), Bridge Cranes, Trenching Machines, Vermeer Cutter and machines of a similar nature
- Group 5: Pile Drivers and Rigs (Employing Dock-Builders Foreman), Derrick Boats, Tunnel Shovels,
- Group 6: All Drills and machines of a similar nature
- Group 7: Back-Filling Machines and Cranes, Mucking Machines, Dual Drum Pavers
- Group 8: Mixers (Concrete with loading attachment), Concrete Pavers, Cableways, Land Derricks, Power House (Low pressure units)
- Group 9: Concrete Pumps, Concrete Plant, Stone Crushers, Double Drum Hoists, Power Houses (Other than above)
- Group 10: Concrete Mixer
- Group 11: Elevators
- Group 12: Concrete Breaking Machines, Single Drum Hoists, Load Masters, Locomotives and Dinkies (Over 10 tons), Hydraulic Crane-Second Engineer
- Group 13: On-Site Concrete Plant Engineers, On-Site Asphalt Plant Engineer and Vibratory Console
- Group 14: Barrier Mover, Barrier Transport and machines of a similar nature
- Group 15: Compressors (Portable, 3 or more), Truck Compressor (Engineer Driver), Tugger Machines, Well Point Pumps, Chum Drill
- Group 16: Boilers(High pressure),Compressors, Pumps(River Cofferdam) and Welding Machines(except where arc is operated by another Operating Engineer) Push Button Machines, All Engines, irrespective of power(Power Pac) used to drive auxiliary equipment, Air, Hydraulic, etc.
- Group 17: Utility-Horizontal Boring Rig
- Group 18: Utility Compressors
- Group 19: Paving-Asphalt Spreader, Autogrades (C.M.I.), Roto-Mill
- Group 20: Paving-Asphalt Roller
- Group 21 Paving-Asphalt Plant
- Group 22: Roller (non paving, all sizes)

WAGES:(per hour) 07/01/2022

Group 1	\$ 114.55
Group 2	95.85
Group 3	98.69
Group 4	96.50
Group 5	94.74
Group 6	91.28
Group 7	92.85
Group 8	90.39
Group 9	88.65
Group 10	85.08
Group 11	80.01
Group 12	81.61
Group 13	82.16
Group 14	74.51

Group 15	63.86
Group 16	59.91
Group 17	86.36
Group 18	59.57
Group 19	90.39
Group 20	88.27
Group 21	75.84
Group 22	88.27

Cranes: Crawler or Truck
 100' to 149' \$0.50 per hour additional to above Crane Rates
 150' to 249' \$0.75 per hour additional to above Crane Rates
 250' to 349' \$1.00 per hour additional to above crane Rates
 350' to 450' \$1.50 per hour additional to above crane Rates

SUPPLEMENTAL BENEFITS

Per Hour:
 Groups 1-22
 Regular Time \$ 24.65* plus \$ 6.20

* This portion of benefits subject to the same premium as shown for wages.

Non-Worked Holiday Supplemental Benefits:
 \$ 18.50

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 7, 11, 16) on HOLIDAY PAGE
 Overtime: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

REGISTERED APPRENTICES

Per Hour:
 (1) year terms at the following wage rates:

Groups 1-22	1st	2nd	3rd
	41.98	50.77	59.56

Supplemental Benefits:
 Per Hour:
 Groups 1-22
 Regular Time \$ 13.65*
 plus \$ 5.95

* This portion of benefits is subject to the SAME PREMIUM as shown for overtime wages

9-14 HC

Operating Engineer - Heavy Construction 2

06/01/2023

JOB DESCRIPTION Operating Engineer - Heavy Construction 2

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

(For Groups 1 - 22, see Operating Engineer - Heavy Construction 1)

Group 23: Cherry Picker (Over 20 tons), Loader (Over 6 yards)

Group 24: Backhoes and Loaders (Up to 37,000lbs), Bulldozers, Scrapers, Turn-A-Pulls, Tugger Hoists, Tractors, Hysters, Roustabout Cranes, Conveyors, Ballast Regulators (Ride On), Track Removal Machine or similar, Motor Graders, Locomotives (10 tons and under), Curb & Gutter Pavers and machines of a similar nature

Group 25: Post Hole Digger, Ditch Winch, Road Finishing Machines, Rollers (5 tons and under, Dual Purpose Trucks, Forklifts, Dempsey Dumpsters, Fireman

Group 26: Service Engineer (Gradalls, Concrete Pumps, Cold Planers Grader)

Group 27: Service Mechanic (Shovels, Draglines, Crawler Cranes, Backhoes, Trenching Machines, Compressors (3 or more in battery)

Group 28: Steam Equipment Operator (Water rigs, steam shovels, power boilers, derrick boats)

WAGES:(per hour)	07/01/2022
Group 23	\$ 83.31
Group 24	81.06
Group 25	77.28
Group 26	73.48
Group 27	53.11
Group 28	77.28

Cranes: Crawler or Truck

100' to 149'	\$0.50 per hour additional to above Crane Rates
150' to 249'	\$0.75 per hour additional to above Crane Rates
250' to 349'	\$1.00 per hour additional to above crane Rates
350' to 450'	\$1.50 per hour additional to above crane Rates

SUPPLEMENTAL BENEFITS

Per Hour:

Groups 23-28	26.05* plus \$7.40
Regular Time	

* This portion of benefits subject to the same premium as shown for wages.

Non-Worked Holiday Supplemental Benefits:

	16.95
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OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid:	See (5, 6, 7, 11, 16) on HOLIDAY PAGE
Overtime:	See (5, 6, 7, 11, 16) on HOLIDAY PAGE

REGISTERED APPRENTICES

Per Hour:

(1) year terms at the following wage rates:

	1st	2nd	3rd	4th
Groups 23-28	\$36.11	\$42.97	\$46.40	\$49.83

Supplemental Benefits:

Per Hour:

Groups 23-28	
Regular Time	\$ 12.55* plus \$ 7.40

* This portion of benefits is subject to the SAME PREMIUM as shown for overtime wages

9-15 HC

Operating Engineer - Marine Dredging

06/01/2023

JOB DESCRIPTION Operating Engineer - Marine Dredging

DISTRICT 4

ENTIRE COUNTIES

Albany, Bronx, Cayuga, Clinton, Columbia, Dutchess, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Orange, Oswego, Putnam, Queens, Rensselaer, Richmond, Rockland, St. Lawrence, Suffolk, Ulster, Washington, Wayne, Westchester

WAGES

These wages do not apply to Operating Engineers on land based construction projects. For those projects, please see the Operating Engineer Heavy/Highway Rates. The wage rates below for all equipment and operators are only for marine dredging work in navigable waters found in the counties listed above.

Per Hour:	07/01/2022	10/01/2022
CLASS A1 Deck Captain, Leverman Mechanical Dredge Operator Licensed Tug Operator 1000HP or more.	\$ 42.66	\$ 43.94
CLASS A2 Crane Operator (360 swing)	38.02	39.16
CLASS B	To conform to Operating Engineer	

Dozer, Front Loader Operator on Land	Prevailing Wage in locality where work is being performed including benefits.	
CLASS B1 Derrick Operator (180 swing) Spider/Spill Barge Operator Operator II, Fill Placer, Engineer, Chief Mate, Electrician, Chief Welder, Maintenance Engineer Licensed Boat, Crew Boat Operator	36.89	38.00
CLASS B2 Certified Welder	34.73	35.77
CLASS C1 Drag Barge Operator, Steward, Mate, Assistant Fill Placer	33.78	34.79
CLASS C2 Boat Operator	32.69	33.67
CLASS D Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor	27.16	27.97

SUPPLEMENTAL BENEFITS

Per Hour:
 THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

All Classes A & B	\$ 11.40 plus 6% of straight time wage, Overtime hours add \$ 0.63	\$ 11.85 plus 6% of straight time wage, Overtime hours add \$ 0.63
All Class C	\$ 11.10 plus 6% of straight time wage, Overtime hours add \$ 0.48	\$ 11.60 plus 6% of straight time wage, Overtime hours add \$ 0.50
All Class D	\$ 10.80 plus 6% of straight time wage, Overtime hours add \$ 0.33	\$ 11.35 plus 6% of straight time wage, Overtime hours add \$ 0.38

OVERTIME PAY
 See (B2, F, R) on OVERTIME PAGE

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 15, 26) on HOLIDAY PAGE

4-25a-MarDredge

Operating Engineer - Survey Crew - Consulting Engineer **06/01/2023**

JOB DESCRIPTION Operating Engineer - Survey Crew - Consulting Engineer **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES
 Dutchess: That part in Dutchess County lying South of the North City line of Poughkeepsie.

WAGES
 Feasibility and preliminary design surveying, any line and grade surveying for inspection or supervision of construction.

Per hour: 07/01/2022
 Survey Classifications

Party Chief	\$ 46.44
Instrument Man	38.60
Rodman	33.64

SUPPLEMENTAL BENEFITS

Per Hour:

All Crew Members: \$ 21.60

OVERTIME PAY

OVERTIME:.... See (B, E*, Q, V) ON OVERTIME PAGE.

*Doubletime paid on the 9th hour on Saturday.

HOLIDAY

Paid: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

Overtime: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

9-15dconsult

Painter

06/01/2023

JOB DESCRIPTION Painter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Brush \$ 51.45*

Abatement/Removal of lead based or lead containing paint on materials to be repainted. 51.45*

Spray & Scaffold \$ 54.45*

Fire Escape 54.45*

Decorator 54.45*

Paperhanger/Wall Coverer 53.83*

*Subtract \$ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS

Per hour:

Paperhanger \$ 33.15

All others 30.88

Premium 37.72**

**Applies only to "All others" category, not paperhanger journeyworker.

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rate.

Per hour: 07/01/2022

Appr 1st term... \$ 19.95*

Appr 2nd term... 25.56*

Appr 3rd term... 31.00*

Appr 4th term... 41.52*

*Subtract \$ 0.10 to calculate premium rate.

Supplemental benefits:

Per Hour:

Appr 1st term... \$ 15.22

Appr 2nd term... 18.90

Appr 3rd term... 21.81

Apr 4th term... 27.58

8-NYDC9-B/S

Painter 06/01/2023

JOB DESCRIPTION Painter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

PARTIAL COUNTIES

Nassau: Atlantic Beach, Ceaderhurst, East Rockaway, Hewlett, Hewlett Bay, Hewlett Neck, Hewlett Park, Inwood, Lawrence, Lido Beach, Long Beach, parts of Lynbrook, parts of Oceanside, parts of Valley Stream, and Woodmere. Starting on South side of Sunrise Hwy in Valley Stream running east to Windsor and Rockaway Ave, Rockville is the boundary line up to Lawson Blvd, turning right going west all the above territory. Starting at Union Turnpike & Lakeville Rd going north to northern Blvd. the west side of Lakeville Rd to Northern Blvd. At Northern Blvd going east the district north of Northern Blvd to Port Washington Blvd. West of Port Washington Blvd to St. Francis Hospital then north of first traffic light to Port Washington & Sands Point, Manor Haven, & Harbour Acres.

WAGES

Per hour: 07/01/2022

Drywall Taper \$ 55.10

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker: \$ 23.88

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (4, 6, 8, 11, 18, 19, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:

1st term \$ 21.29

2nd term 27.84

3rd term 33.29

4th term 44.20

Supplemental Benefits per hour:

1st term \$ 14.43

2nd term 18.16

3rd term 19.30

4th term 21.59

8-NYC9-1974-DWT

Painter - Bridge & Structural Steel 06/01/2023

JOB DESCRIPTION Painter - Bridge & Structural Steel

DISTRICT 8

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per Hour:

STEEL:

Bridge Painting: 07/01/2022 10/01/2022

\$ 53.00 \$ 54.50

+ 9.63* + 10.10*

ADDITIONAL \$6.00 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

NOTE: All premium wages are to be calculated on base rate per hour only.

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

NOTE: Generally, for Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter's Rate; the contract must be ONLY for Bridge Painting.

SHIFT WORK:

When directly specified in public agency or authority contract documents for an employer to work a second shift and works the second shift with employees other than from the first shift, all employees who work the second shift will be paid 10% of the base wage shift differential in lieu of overtime for the first eight (8) hours worked after which the employees shall be paid at time and one half of the regular wage rate. When a single irregular work shift is mandated in the job specifications or by the contracting agency, wages shall be paid at time and one half for single shifts between the hours of 3pm-11pm or 11pm-7am.

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker:	\$ 10.90	\$ 11.78
	+ 30.60*	+ 30.75*

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (4, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage - Per hour:

Apprentices: (1) year terms

1st year	\$ 21.20	\$ 21.80
	+ 3.86	+ 4.04
2nd year	\$ 31.80	\$ 32.70
	+ 5.78	+ 6.06
3rd year	\$ 42.40	\$ 43.60
	+ 7.70	+ 8.08
Supplemental Benefits - Per hour:		
1st year	\$.25	\$.25
	+ 12.24	+ 12.34
2nd year	\$ 10.90	\$ 10.90
	+ 18.36	+ 18.51
3rd year	\$ 10.90	\$ 10.90
	+ 24.48	+ 24.68

NOTE: All premium wages are to be calculated on base rate per hour only.

8-DC-9/806/155-BrSS

Painter - Metal Polisher

06/01/2023

JOB DESCRIPTION Painter - Metal Polisher

DISTRICT 8

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

07/01/2022

Metal Polisher	\$ 37.78
Metal Polisher*	38.80
Metal Polisher**	41.78

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

Journeyworker:

All classification \$ 11.24

OVERTIME PAY

See (B, E, P, T) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 9, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year term at the following wage rates:

07/01/2022

1st year \$ 16.00

2nd year 17.00

3rd year 18.00

1st year* \$ 16.39

2nd year* 17.44

3rd year* 18.54

1st year** \$ 18.50

2nd year** 19.50

3rd year** 20.50

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

Supplemental benefits:

Per hour:

1st year \$ 7.99

2nd year 7.99

3rd year 7.99

8-8A/28A-MP

Plasterer

06/01/2023

JOB DESCRIPTION Plasterer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per hour:

07/01/2022

Building:

Plasterer/Traditional & \$ 51.00*

Spraying Fireproofing

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 23.15

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

*When calculating overtime pay, subtract \$5.00 from wages.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages:

(per hour)

800 hours term:

1st term	\$ 28.19
2nd term	30.59
3rd term	35.88
4th term	38.43

Supplemental Benefits:
 (per hour):
 (800) hours term:

1st term	\$ 14.70
2nd term	15.60
3rd term	17.43
4th term	18.35

9-262

Plumber

06/01/2023

JOB DESCRIPTION Plumber

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:

07/01/2022

Plumber \$ 72.50

Temporary Service** \$ 58.08

** Temporary Service- Includes Maintenance of cooling & heating apparatus, maintenance work on pneumatic systems during the construction period, and work on temporary heat. All hours paid at straight time, including holidays.

**THERE ARE NO HELPERS UNDER THIS CLASSIFICATION.

On tower work, bridges, elevated highway, or buildings, where pipe is being installed, fifty (50) or more feet vertically in a free drop from its base, an additional \$1.00 per hour.

SHIFT WORK:

Shift work, when directly specified in public agency or authority contract documents, and continues for a period of not less than ten (10) consecutive work days. A shift shall consist of seven(7) hours with one-half (1/2) hour for lunch after the first four (4) hours of each shift. A premium of thirty percent (30%) for wages and supplemental benefits on shift work performed Monday through Friday on the 4 P.M. and midnight shifts.

For shift work performed on weekends the shift premium shall be fifty percent (50%) of wages and supplemental benefits.

For shift work performed on holidays designated below, double time wages and supplemental benefits shall be paid. Also noted that the normal workday Monday through Friday 8:00 A.M. to 3:00 P.M. is not considered shift work, and therefore not subject to shift premium.

SUPPLEMENTAL BENEFITS

Per hour:

Plumber \$ 41.45

Temporary Service \$ 33.08

OVERTIME PAY

Plumber See (C, O, V) on OVERTIME PAGE.

HOLIDAY

Plumber

Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE.

Repairs & Maintenance

Paid: See (1) on HOLIDAY PAGE.

Overtime: See (5, 6, 25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

(1/2) year terms at the following wage:

1st	2nd	3rd&4th	5th&6th	7th&8th	9th	10th
\$16.78	\$19.78	\$28.99	\$31.09	\$33.94	\$35.34	\$47.41

Supplemental Benefits:

(1/2) year term at the following dollar amount:

1st	2nd	3rd-10th
\$5.43	\$6.43	\$21.95

9-1 Const

Plumber - Pump & Tank: Oil Trades Installation & Maintenance	06/01/2023
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JOB DESCRIPTION Plumber - Pump & Tank: Oil Trades Installation & Maintenance **DISTRICT 9**

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:

07/01/2022

Pump & Tank \$ 69.31

SUPPLEMENTAL BENEFITS

Per hour:

Plumber \$ 26.33

OVERTIME PAY

Pump & Tank See (B, F, H) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Overtime: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE.

9-1-P&T

Plumber - Repairs & Maintenance	06/01/2023
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JOB DESCRIPTION Plumber - Repairs & Maintenance **DISTRICT 9**

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond

WAGES

Per hour:

07/01/2022

Repairs & Maintenance \$ 47.50

*Repair & Maintenance work is any repair and/or replacement of present plumbing system that does not change existing roughing or water supply lines. Projects regardless of work type which have approved plans and specifications wherein the plumbing exceeds \$725,000 are excluded.

SUPPLEMENTAL BENEFITS

Per hour:

Repair \$ 19.06

Maintenance

OVERTIME PAY

Repairs & Maintenance See (B, H) on OVERTIME PAGE.

HOLIDAY

Repairs & Maintenance

Paid: See (1) on HOLIDAY PAGE.

Overtime: See (5, 6, 25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Note: The Repairs & Maintenance Category has NO Apprentices.

9-1 R&M

Roofer **06/01/2023**

JOB DESCRIPTION Roofer **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Dutchess, Kings, New York, Orange, Putnam, Queens, Richmond, Rockland, Sullivan, Ulster, Westchester

WAGES
 Per Hour: 07/01/2022 05/01/2023
\$ 45.25 Additional
+ \$7.00* \$ 2.00

* This portion is not subjected to overtime premiums.

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

SUPPLEMENTAL BENEFITS
 Per Hour: \$ 30.62

OVERTIME PAY
 See (B, H) on OVERTIME PAGE
 Note: An observed holiday that falls on a Sunday will be observed the following Monday.

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES
 (1) year term

	1st	2nd	3rd	4th
	\$ 15.84	\$ 22.63	\$ 27.15	\$ 33.94
		+ 3.50*	+ 4.20*	+ 5.26*
Supplements:	1st	2nd	3rd	4th
	\$ 3.88	\$ 15.48	\$ 18.50	\$ 23.04

* This portion is not subjected to overtime premiums.

9-8R

Sheetmetal Worker **06/01/2023**

JOB DESCRIPTION Sheetmetal Worker **DISTRICT 4**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES
 Per Hour: 07/01/2022
 Sign Erector \$ 53.79

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

SUPPLEMENTAL BENEFITS
 Per Hour: 07/01/2022
 Sign Erector \$ 53.33

OVERTIME PAY
 See (A, F, S) on OVERTIME PAGE

HOLIDAY
 Paid: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE
 Overtime: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES
 Per Hour:
 6 month Terms at the following percentage of Sign Erectors wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
35%	40%	45%	50%	55%	60%	65%	70%	75%	80%

SUPPLEMENTAL BENEFITS
 Per Hour:

07/01/2022									
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 14.34	\$ 16.26	\$ 18.17	\$ 20.10	\$ 28.02	\$ 30.47	\$ 33.72	\$ 36.27	\$ 38.77	\$ 41.29

4-137-SE

Sheetmetal Worker **06/01/2023**

JOB DESCRIPTION Sheetmetal Worker **DISTRICT 4**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES
 Per Hour: 07/01/2022
 Sheetmetal Worker \$ 57.60

Temporary Operation or
 Maintenance of Fans 47.33

SUPPLEMENTAL BENEFITS
 Per Hour:
 Sheetmetal Worker \$ 49.24
 Maintenance Worker 49.24

OVERTIME PAY
 See (B, E, E2, Q, V) on OVERTIME PAGE
 For Maintenance See Codes B,E, Q & V

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES
 Per Hour:Wages

Six(6) Month Terms As Follows:

1st & 2nd Term	\$ 20.19
3rd & 4th Term	25.96
5th & 6th Term	31.71
7th & 8th Term	40.37
9th Term	46.10

Per Hour: Supplemental Benefits

1st & 2nd Term	\$ 18.10
3rd & 4th Term	24.79
5th & 6th Term	29.25
7th & 8th Term	35.90
9th Term	40.37

4-28

Steamfitter **06/01/2023**

JOB DESCRIPTION Steamfitter **DISTRICT 4**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES
 Per Hour: 07/01/2022
 AC Service/Heat Service & Refrigeration \$ 43.85

Refrigeration, A/C, Oil Burner and Stoker Service and Repair.
 NOTE: Refrigeration Compressor installation. (Not to exceed 5 Hp combined on any one project).
 NOTE: Air Condition / Heating Compressor installation.(Not to exceed 15 tons combined on any one project).

SUPPLEMENTAL BENEFITS

Per Hour Worked:

AC Service/Heat Service \$ 19.96
 Per Hour Paid: 16.45

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

1 year terms

Wages per hour:

1st Term \$ 21.23
 2nd Term 25.63
 3rd Term 29.85
 4th Term 36.05

Benefits per hour Worked:		Per Hour Paid:
1st Term	\$ 13.29	\$ 9.78
2nd Term	14.57	11.06
3rd Term	15.91	12.40
4th Term	17.72	14.21

4-638B-StmFtrRef

Steamfitter

06/01/2023

JOB DESCRIPTION Steamfitter

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

WAGES

Per Hour: 07/01/2022

Sprinkler/Steam \$ 68.61
 AC/Heat Fitter

Temporary 52.16
 Heat & AC
 Fitter

Note: Add 15% to Hourly Wage for "Contracting Agency" Mandated Off Shift Work.

SUPPLEMENTAL BENEFITS

Per Hour:

Sprinkler/Steam \$ 52.74
 Fitter

Temporary 43.29
 Heat & AC
 Fitter

Note: Add 15% to Hourly Benefit for "Contracting Agency" Mandated Off Shift Work.

OVERTIME PAY

Note: The posted overtime rates are applicable after 8 hours plus Saturday, Sunday and Holidays on Fire Protection/Sprinkler contracts under \$3,000,000.00 and HVAC/Mechanical contracts under \$30,000,000.00:

Sprinkler/Steam	Wages \$ 137.22	Benefit \$ 103.50
Temp Heat/AC	Wages \$ 104.32	Benefit \$ 84.60

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

1 year Terms at the Following:

WAGES per hour:				
1st Term	2nd Term	3rd Term	4th Term	5th Term
\$ 27.48	\$ 34.34	\$ 41.19	\$ 48.05	\$ 54.90
SUPPLEMENTAL BENEFIT per hour:				
1st Term	2nd Term	3rd Term	4th Term	5th Term
\$ 21.60	\$ 26.80	\$ 31.98	\$ 37.18	\$ 42.36
Premium Time Amounts:				
41.52	51.86	62.18	75.52	82.84

4-638A-StmSpFtr

Teamster - Heavy Construction **06/01/2023**

JOB DESCRIPTION Teamster - Heavy Construction **DISTRICT 4**

ENTIRE COUNTIES
 Bronx, Kings, New York, Queens, Richmond

WAGES

Per Hour:

Dump Trucks/Drivers (Debris Removal, Street Level and below)

07/01/2022

Dump Trucks	\$ 43.835
Tractor Trailers	46.115
Euclid/Turnapull	46.68

Effective 7/1/2020 an Additional \$2.75/Hr. to be allocated.

SUPPLEMENTAL BENEFITS

Per Hour:

Dump Trucks	
Up to 40 Hours Worked	\$ 51.5525

ALL OTHERS	
Up to 40 Hours Worked	51.5025

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

Note: Employees receive 2 hours of Holiday Pay for each day worked in holiday week (not to exceed 8 hours)

Note: Employees receive 5 1/3 hours of Holiday Pay for each day worked in Thanksgiving Holiday Week.

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Welder **06/01/2023**

JOB DESCRIPTION Welder **DISTRICT 1**

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour 07/01/2022

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY

HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

- (AA) Time and one half of the hourly rate after 7 and one half hours per day
- (A) Time and one half of the hourly rate after 7 hours per day
- (B) Time and one half of the hourly rate after 8 hours per day
- (B1) Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday.
Double the hourly rate for all additional hours
- (B2) Time and one half of the hourly rate after 40 hours per week
- (C) Double the hourly rate after 7 hours per day
- (C1) Double the hourly rate after 7 and one half hours per day
- (D) Double the hourly rate after 8 hours per day
- (D1) Double the hourly rate after 9 hours per day
- (E) Time and one half of the hourly rate on Saturday
- (E1) Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
- (E2) Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E3) Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
- (E4) Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E5) Double time after 8 hours on Saturdays
- (F) Time and one half of the hourly rate on Saturday and Sunday
- (G) Time and one half of the hourly rate on Saturday and Holidays
- (H) Time and one half of the hourly rate on Saturday, Sunday, and Holidays
- (I) Time and one half of the hourly rate on Sunday
- (J) Time and one half of the hourly rate on Sunday and Holidays
- (K) Time and one half of the hourly rate on Holidays
- (L) Double the hourly rate on Saturday
- (M) Double the hourly rate on Saturday and Sunday
- (N) Double the hourly rate on Saturday and Holidays
- (O) Double the hourly rate on Saturday, Sunday, and Holidays
- (P) Double the hourly rate on Sunday
- (Q) Double the hourly rate on Sunday and Holidays
- (R) Double the hourly rate on Holidays
- (S) Two and one half times the hourly rate for Holidays

- (S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.
- (T) Triple the hourly rate for Holidays
- (U) Four times the hourly rate for Holidays
- (V) Including benefits at SAME PREMIUM as shown for overtime
- (W) Time and one half for benefits on all overtime hours.
- (X) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

- (1) None
- (2) Labor Day
- (3) Memorial Day and Labor Day
- (4) Memorial Day and July 4th
- (5) Memorial Day, July 4th, and Labor Day
- (6) New Year's, Thanksgiving, and Christmas
- (7) Lincoln's Birthday, Washington's Birthday, and Veterans Day
- (8) Good Friday
- (9) Lincoln's Birthday
- (10) Washington's Birthday
- (11) Columbus Day
- (12) Election Day
- (13) Presidential Election Day
- (14) 1/2 Day on Presidential Election Day
- (15) Veterans Day
- (16) Day after Thanksgiving
- (17) July 4th
- (18) 1/2 Day before Christmas
- (19) 1/2 Day before New Years
- (20) Thanksgiving
- (21) New Year's Day
- (22) Christmas
- (23) Day before Christmas
- (24) Day before New Year's
- (25) Presidents' Day
- (26) Martin Luther King, Jr. Day
- (27) Memorial Day
- (28) Easter Sunday

(29) Juneteenth



**New York State Department of Labor - Bureau of Public Work
State Office Building Campus
Building 12 - Room 130
Albany, New York 12240**

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

This Form Must Be Typed

Submitted By:

(Check Only One)

Contracting Agency Architect or Engineering Firm Public Work District Office Date:

A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address (Check if new or change)

Telephone: ()

Fax: ()

E-Mail:

2. NY State Units (see Item 5)

- | | |
|---|--|
| <input type="checkbox"/> 01 DOT | <input type="checkbox"/> 07 City |
| <input type="checkbox"/> 02 OGS | <input type="checkbox"/> 08 Local School District |
| <input type="checkbox"/> 03 Dormitory Authority | <input type="checkbox"/> 09 Special Local District, i.e.,
Fire, Sewer, Water District |
| <input type="checkbox"/> 04 State University
Construction Fund | <input type="checkbox"/> 10 Village |
| <input type="checkbox"/> 05 Mental Hygiene
Facilities Corp. | <input type="checkbox"/> 11 Town |
| <input type="checkbox"/> 06 OTHER N.Y. STATE UNIT | <input type="checkbox"/> 12 County |
| | <input type="checkbox"/> 13 Other Non-N.Y. State
(Describe) |

3. SEND REPLY TO check if new or change)
Name and complete address:

Telephone:()

Fax: ()

E-Mail:

4. SERVICE REQUIRED. Check appropriate box and provide project information.

New Schedule of Wages and Supplements.

APPROXIMATE BID DATE :

Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR THIS PROJECT :

OFFICE USE ONLY

B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:
Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

- 1. New Building
- 2. Addition to Existing Structure
- 3. Heavy and Highway Construction (New and Repair)
- 4. New Sewer or Waterline
- 5. Other New Construction (Explain)
- 6. Other Reconstruction, Maintenance, Repair or Alteration
- 7. Demolition
- 8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- | | |
|---|--|
| <input type="checkbox"/> Construction (Building, Heavy Highway/Sewer/Water) | <input type="checkbox"/> Guards, Watchmen |
| <input type="checkbox"/> Tunnel | <input type="checkbox"/> Janitors, Porters, Cleaners, Elevator Operators |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Moving furniture and equipment |
| <input type="checkbox"/> Landscape Maintenance | <input type="checkbox"/> Trash and refuse removal |
| <input type="checkbox"/> Elevator maintenance | <input type="checkbox"/> Window cleaners |
| <input type="checkbox"/> Exterminators, Fumigators | <input type="checkbox"/> Other (Describe) |
| <input type="checkbox"/> Fire Safety Director, NYC Only | |

9. Has this project been reviewed for compliance with the Wicks Law involving separate bidding? YES NO

10. Name and Title of Requester

Signature



NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

**LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE
AWARDED ANY PUBLIC WORK CONTRACT**

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

Debarment Database: To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: <https://applications.labor.ny.gov/EDList/searchPage.do>

For inquiries where WCB is listed as the "Agency", please call 1-866-546-9322

NYSDOL Bureau of Public Work Debarment List 06/07/2023

Article 8

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	DOL	****5754	0369 CONTRACTORS, LLC		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL	****4018	ADIRONDACK BUILDING RESTORATION INC.		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	AG	****1812	ADVANCED BUILDERS & LAND DEVELOPMENT, INC.		400 OSER AVE #2300HAUPPAUGE NY 11788	09/11/2019	09/11/2024
DOL	DOL	****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	NYC		ALL COUNTY SEWER & DRAIN, INC.		7 GREENFIELD DR WARWICK NY 10990	03/25/2022	03/25/2027
DOL	NYC		AMJED PARVEZ		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL		ANGELO GARCIA		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL		ANGELO TONDO		449 WEST MOMBASHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL		ANITA SALERNO		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL	****4231	ANKER'S ELECTRIC SERVICE, INC.		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	DOL		ANTONIO ESTIVEZ		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	NYC		ARADCO CONSTRUCTION CORP		115-46 132RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL		ARNOLD A. PAOLINI		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC		ARSHAD MEHMOOD		168-42 88TH AVENUE JAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC	****2591	AVI 212 INC.		260 CROPSY AVENUE APT 11BROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	NYC		AVM CONSTRUCTION CORP		117-72 123RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	NYC		AZIDABEGUM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	****8421	B & B DRYWALL, INC		206 WARREN AVE APT 1WHITE PLAINS NY 10603	12/14/2021	12/14/2026
DOL	NYC		BALWINDER SINGH		421 HUDSON ST SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	NYC	****8416	BEAM CONSTRUCTION, INC.		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	DOL		BERNARD BEGLEY		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	NYC	****2113	BHW CONTRACTING, INC.		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		BIAGIO CANTISANI			06/12/2018	06/12/2023
DOL	DOL	****3627	BJB CONSTRUCTION CORP.		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	DOL	****4512	BOB BRUNO EXCAVATING, INC		5 MORNINGSIDE DR AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		BOGDAN MARKOVSKI		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL		BRADLEY J SCHUKA		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	DOL		BRUCE P. NASH JR.		5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL	****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL	****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	****4083	C.P.D. ENTERPRISES, INC		P.O BOX 281 WALDEN NY 12586	03/03/2020	03/03/2025
DOL	DOL	****5161	CALADRI DEVELOPMENT CORP.		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026

NYSDOL Bureau of Public Work Debarment List 06/07/2023

Article 8

DOL	DOL	****3391	CALI ENTERPRISES, INC.		1223 PARK STREET PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		CANTISANI & ASSOCIATES LTD		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CANTISANI HOLDING LLC			06/12/2018	06/12/2023
DOL	DOL	****3812	CARMODY "2" INC			06/12/2018	06/12/2023
DOL	DOL	****1143	CARMODY BUILDING CORP	CARMODY CONTRACTING AND CARMODY CONTRACTING CORP.	442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY CONCRETE CORPORATION			06/12/2018	06/12/2023
DOL	DOL		CARMODY ENTERPRISES, LTD.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY INC		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	****3812	CARMODY INDUSTRIES INC			06/12/2018	06/12/2023
DOL	DOL		CARMODY MAINTENANCE CORPORATION		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY MASONRY CORP		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	AG	****7247	CENTURY CONCRETE CORP		2375 RAYNOR ST RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	****0026	CHANTICLEER CONSTRUCTION LLC		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	NYC		CHARLES ZAHRADKA		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL		CHRISTOPHER GRECO		26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL		CHRISTOPHER J MAINI		19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL		CHRISTOPHER PAPASTEFANO A/K/A CHRIS PAPASTEFANO		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	****1927	CONSTRUCTION PARTS WAREHOUSE, INC.	CPW	5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL		CRAIG JOHANSEN		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	DOL	****3228	CROSS-COUNTY LANDSCAPING AND TREE SERVICE, INC.	ROCKLAND TREE SERVICE	26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL	****2524	CSI ELECTRICAL & MECHANICAL INC		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	DOL	****7619	DANCO CONSTRUCTION UNLIMITED INC.		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL		DANIEL ROBERT MCNALLY		7 GREENFIELD DRIVE WARWICK NY 10990	03/25/2022	03/25/2027
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL		DELPHI PAINTING & DECORATING CO INC		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	AG		EDWIN HUTZLER		23 NORTH HOWELLS RD BELLPORT NY 11713	08/04/2021	08/04/2026
DOL	DA		EDWIN HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	NYC	****5917	EPOCH ELECTRICAL, INC		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2024

NYS DOL Bureau of Public Work Debarment List 06/07/2023

Article 8

DOL	DOL		FAIGY LOWINGER		11 MOUNTAIN RD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL		FRANK BENEDETTO		19 CATLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL	****4722	FRANK BENEDETTO AND CHRISTOPHER J MAINI	B & M CONCRETE	19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DA		FREDERICK HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	NYC	****6616	G & G MECHANICAL ENTERPRISES, LLC.		1936 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		GABRIEL FRASSETTI			04/10/2019	04/10/2024
DOL	NYC		GAYATRI MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DOL		GEOFF CORLETT		415 FLAGGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DA		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DOL		GIGI SCHNECKENBURGER		261 MILL RD EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DA		GIOVANNA TRAVALJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL		IRENE KASELIS		32 PENNINGTON AVE WALDWICK NJ 07463	05/30/2019	05/30/2024
DOL	DOL	****9211	J. WASE CONSTRUCTION CORP.		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		J.M.J CONSTRUCTION		151 OSTRANDER AVENUE SYRACUSE NY 13205	11/21/2022	11/21/2027
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	12/12/2022	12/12/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL	****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL	****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JAMES J. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL		JAMES LIACONE		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JAMES RACHEL		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	****7993	JBS DIRT, INC.		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL	****5368	JCH MASONRY & LANDSCAPING INC.		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	DOL	****2435	JEFFEL D. JOHNSON	JMJ7 AND SON	5553 CAIRNSTRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JEFFEL JOHNSON ELITE CARPENTER REMODEL AND CONSTRUCTION		C2 EVERGREEN CIRCLE LIVERPOOL NY 13090	11/21/2022	11/21/2027

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DOL	DOL	****2435	JEFFREY M. JOHNSON	JMJ7 AND SON	5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	NYC		JENNIFER GUERRERO		1936 HEMPSTEAD TURNPIKE EAST MEADOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		JIM PLAUGHER		17613 SANTE FE LINE ROAD WAYNEFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		JMJ7 & SON CONSTRUCTION, LLC		5553 CAIRNS TRAIL LIVERPOOL NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 AND SONS CONTRACTORS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS		7014 13TH AVENUE BROOKLYN NY 11228	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS AND SONS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS, LLC		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		JOHN MARKOVIC		47 MANDON TERRACE HAWTHORN NJ 07506	03/29/2021	03/29/2026
DOL	DOL		JOHN WASE		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		JORGE RAMOS		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	DOL		JORI PEDERSEN		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		JOSE CHUCHUCA		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	DOL		JOY MARTIN		2404 DELAWARE AVE NIGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL	****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		JULIUS AND GITA BEHREND		5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002
DOL	DOL		KARIN MANGIN		796 PHELPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	DOL		KATE E. CONNOR		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL	****2959	KELC DEVELOPMENT, INC		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KIMBERLY F. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL	****3490	L & M CONSTRUCTION/DRYWALL INC.		1079 YONKERS AVE YONKERS NY 10704	08/07/2018	08/07/2023
DOL	DA	****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL		LEROY E. NELSON JR		531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		LEROY E. NELSON JR		531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	AG	****3291	LINTECH ELECTRIC, INC.		3006 TILDEN AVE BROOKLYN NY 11226	02/16/2022	02/16/2027
DOL	DA	****4460	LONG ISLAND GLASS & STOREFRONTS, LLC		4 MANHASSET TRL RIDGE NY 11961	09/06/2018	09/06/2023

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DOL	DOL		LOUIS A. CALICCHIA		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		LUBOMIR PETER SVOBODA		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL	****2196	MAINSTREAM SPECIALTIES, INC.		11 OLD TOWN RD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DA		MANUEL P TOBIO		150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	DA		MANUEL TOBIO		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	NYC		MAREK FABIJANOWSKI		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	NYC		MARIA NUBILE		84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DOL		MASONRY CONSTRUCTION, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	****3333	MASONRY INDUSTRIES, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		MATTHEW P. KILGORE		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	DOL		MAURICE GAWENO		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		MICHAEL LENIHAN		1079 YONKERS AVE UNIT 4 YONKERS NY 10704	08/07/2018	08/07/2023
DOL	DOL	****4829	MILESTONE ENVIRONMENTAL CORPORATION		704 GINESI DRIVE SUITE 29MORGANVILLE NJ 07751	04/10/2019	04/10/2024
DOL	NYC	****9926	MILLENNIUM FIRE PROTECTION, LLC		325 W. 38TH STREET SUITE 204NEW YORK NY 10018	11/14/2019	11/14/2024
DOL	NYC	****0627	MILLENNIUM FIRE SERVICES, LLC		14 NEW DROP LNE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL	****1320	MJC MASON CONTRACTING, INC.		42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL	****1320	MJC MASON CONTRACTING, INC.		42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	NYC		MUHAMMED A. HASHEM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	NYC		NAMOW, INC.		84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DA	****9786	NATIONAL INSULATION & GC CORP		180 MILLER PLACE HICKSVILLE NY 11801	12/12/2018	12/12/2023
DOL	NYC		NAVIT SINGH		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	****7429	NICOLAE I. BARBIR	BESTUCCO CONSTRUCTI ON, INC.	444 SCHANTZ ROAD ALLEN TOWN PA 18104	09/17/2020	09/17/2025
DOL	NYC	****5643	NYC LINE CONTRACTORS, INC.		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		PAULINE CHAHALES		935 S LAKE BLVD MAHOPAC NY 10541	03/02/2021	03/02/2026
DOL	DOL		PETER STEVENS		11 OLD TOWN ROAD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DOL		PETER STEVENS		8269 21ST ST BELLEROSE NY 11426	12/22/2022	12/22/2027
DOL	DOL	****0466	PRECISION BUILT FENCES, INC.		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC		RASHEL CONSTRUCTION CORP		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	****1068	RATH MECHANICAL CONTRACTORS, INC.		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL	****2633	RAW POWER ELECTRIC CORP.		3 PARK CIRCLE MIDDLETOWN NY 10940	07/11/2022	07/11/2027

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DOL	DA	****7559	REGAL CONTRACTING INC.		24 WOODBINE AVE NORTHPORT NY 11768	10/01/2020	10/01/2025
DOL	DOL	****9148	RICH T CONSTRUCTION		107 WILLOW WOOD LANE CAMILLUS NY 13031	11/13/2018	11/13/2023
DOL	DOL		RICHARD MACONE		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	DOL		RICHARD REGGIO		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	DOL	****9148	RICHARD TIMIAN	RICH T CONSTRUCTI ON	108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	11/13/2018	11/13/2023
DOL	DOL		ROBBYE BISSEAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003
DOL	DOL		ROBERT A. VALERINO		3841 LANYARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		ROBERT BRUNO		5 MORNINGSIDE DRIVE AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		RODERICK PUGH		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL	****4880	RODERICK PUGH CONSTRUCTION INC.		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	07/11/2022	07/11/2027
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		ROSEANNE CANTISANI			06/12/2018	06/12/2023
DOL	DOL	****7172	RZ & AL INC.		198 RIDGE AVENUE VALLEY STREAM NY 11581	06/06/2022	06/06/2027
DOL	DOL	****1365	S & L PAINTING, INC.		11 MOUNTAIN ROAD P.O BOX 408MONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	****7730	S C MARTIN GROUP INC.		2404 DELAWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		SAL FRESINA MASONRY CONTRACTORS, INC.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL		SAL MASONRY CONTRACTORS, INC.		(SEE COMMENTS) SYRACUSE NY 13202	07/16/2021	07/16/2026
DOL	DOL	****9874	SALFREE ENTERPRISES INC		P.O BOX 14 2821 GARDNER RDPOMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		SALVATORE A FRESINA A/K/A SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	DOL		SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	NYC	****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	DA	****0476	SAMCO ELECTRIC CORP.		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	NYC	****1130	SCANA CONSTRUCTION CORP.		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL	****2045	SCOTT DUFFIE	DUFFIE'S ELECTRIC, INC.	P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	DOL		SCOTT DUFFIE		P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	NYC	****6597	SHAIRA CONSTRUCTION CORP.		421 HUDSON STREET SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	DOL		SHANE NOLAN		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		SHULEM LOWINGER		11 MOUNTAIN ROAD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DA		SILVANO TRAVALJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	DOL	****0816	SOLAR ARRAY SOLUTIONS, LLC		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023

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DOL	DOL	****0440	SOLAR GUYS INC.		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	NYC		SOMATIE RAMSUNAHAI		115-46 132ND ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL	****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC	****3661	SPANIER BUILDING MAINTENANCE CORP		200 OAK DRIVE SYOSSET NY 11791	03/14/2022	03/14/2027
DOL	DOL		STANADOS KALOGELAS		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL	****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL	****6844	STEAM PLANT AND CHX SYSTEMS INC.		14B COMMERCIAL AVENUE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	****9933	STEED GENERAL CONTRACTORS, INC.		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	****9528	STEEL-IT, LLC.		17613 SANTE FE LINE ROAD WAYNESFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		STEFANOS PAPASTEFANO, JR. A/K/A STEVE PAPASTEFANO, JR.		256 WEST SADDLE RIVER RD UPPER SADDLE RIVER NJ 07458	05/30/2019	05/30/2024
DOL	DOL		STEVE TATE		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		STEVEN MARTIN		2404 DELWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL	****3800	SUBURBAN RESTORATION CO. INC.		5-10 BANTA PLACE FAIR LAWN PLACE NJ 07410	03/29/2021	03/29/2026
DOL	DOL	****1060	SUNN ENTERPRISES GROUP, LLC		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL	****9150	SURGE INC.		8269 21ST STREET BELLEROSE NY 11426	12/22/2022	12/22/2027
DOL	DOL		SYED RAZA		198 RIDGE AVENUE NY 11581	06/06/2022	06/06/2027
DOL	DOL	****8209	SYRACUSE SCALES, INC.		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL	****9733	TERSAL CONSTRUCTION SERVICES INC		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13208	07/16/2021	07/16/2026
DOL	DOL		TERSAL CONTRACTORS, INC.		221 GARDNER RD P.O BOX 14POMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		TERSAL DEVELOPMENT CORP.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL		TEST		P O BOX 123 ALBANY NY 12204	05/20/2020	05/20/2025
DOL	DOL	****6789	TEST1000		P O BOX 123 ALBANY NY 12044	03/01/2021	03/01/2026
DOL	DOL	****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DA	****4106	TRIPLE H CONCRETE CORP		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	****8210	UPSTATE CONCRETE & MASONRY CONTRACTING CO INC		449 WEST MOMBASHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL	****6392	V.M.K CORP.		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	DOL	****6418	VALHALLA CONSTRUCTION, LLC.		796 PHELEPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	NYC	****2426	VICKRAM MANGRU	VICK CONSTRUCTI ON	21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	NYC		VICKRAM MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DOL		VICTOR ALICANTI		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	NYC		VIKTAR PATONICH		2630 CROSEY AVE BROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025

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DOL	NYC	****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL	****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		WHITE PLAINS CARPENTRY CORP		442 ARMONK RD	06/12/2018	06/12/2023
DOL	DOL	****8266	WILLIAM CHRIS MCCLENDON	MCCLENDON ASPHALT PAVING	1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM CHRIS MCCLENDON		1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM G. PROERFRIEDT		85 SPRUCEWOOD ROAD WEST BABYLON NY 11704	01/19/2021	01/19/2026
DOL	DOL	****5924	WILLIAM G. PROPHY, LLC	WGP CONTRACTIN G, INC.	54 PENTAQUIT AVE BAYSHORE NY 11706	01/19/2021	01/19/2026
DOL	DOL	****4730	XGD SYSTEMS, LLC	TDI GOLF	415 GLAGE AVE #302STUART FL 34994	10/31/2018	10/31/2023

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- | | |
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- | | |
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- | | |
|-------------|--|
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SECTION 01 10 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. The work to be done under the Contract, in accordance with the Contract Documents, consists of performing, installing, furnishing and supplying all materials, equipment, labor and incidentals necessary or convenient for the construction of the referenced renovation project at the Fashion Institute of Technology and carrying out all of the duties and obligations imposed upon the Contractor by the Contract Documents.
- B. Contractor shall provide temporary lighting for the duration of the Project, as required.
- C. The main features of the work as indicated in plans shall include, but not be limited to the following:

Project Scope:

- 1. Asbestos contaminated material will be removed by a certified asbestos remover prior to the work of this contract.
- 2. See drawings for complete scope of work.

Demolition

- 1. Demolition of the previous security offices.
- 2. Demolition of existing wall and wall base.
- 3. Selective demolition of existing walls as required.
- 4. Demolition of existing acoustical drop ceiling.
- 5. Demolition of existing homasote wall panels.
- 6. Demolition of existing entry door.
- 7. Selective removal of existing ceiling tiles in corridor as required for new electrical runs.

Demolition HVAC

- 1. Demolition of existing supply and return ductwork.
- 2. Demolition of existing 2,300 cfm constant vav with reheat coil; cap existing hot water pipes. This work is inside of mechanical shaft behind the elevator.
- 3. Demolition of existing fin tube enclosures.
- 4. Demolition of the existing diffusers in D405, and existing thermostat located in D403.

Demolition Electrical

- 1. Disconnect and remove all lighting fixtures, wiring and electrical devices located on ceilings and partitions as indicated.
- 2. Prior to removal contractor shall trace and identify active branch circuit wiring. Existing conduit and wiring maybe reused where permissible. Associated conduit

and wiring that is not reused shall be removed back to the point of source. The load directory for energized equipment shall be updated to reflect the removed work.

New General Construction

1. Construction of new demising walls.
2. Install new VCT flooring and wall base throughout.
3. Install new paint finish for all walls.
4. Install small soffits as implicated.
5. Provide and install new fin tube cabinets.
6. Install new Hollow Metal/Glass entry door & HM door at mechanical room.
7. Installation of firestopping as required at all fire rated conduit penetrations.
8. Installation of new ceiling to match in corridor as required for new electrical runs.
9. Installation of conduit runs and back boxes at all new data locations.
10. Install cotton acoustical ceiling material.
11. Install new access panels in soffits portions to be cut and capped.

New Work HVAC

1. Install new ductwork as indicated.
2. Install diffusers and connect to the new ductwork, vav boxes and reheat coils.
3. Install new room temperature sensors.
4. Install new fin tube radiator covers.
5. Connect all the new diffusers and fin tube radiators to the existing BMS.

New Electrical Work

1. Contractor shall provide new branch circuit wiring for new wiring devices, lighting, and other equipment as indicated on plans.
2. Installation of outlets as indicated on plans.
3. Installation of new light fixtures as indicated on plans.
4. Provide new occupancy sensors for ambient lighting control.
5. Provide controls for lighting fixtures.
6. Provide power wiring for all new energized mechanical equipment.
Coordination with the mechanical contractor is required.
7. Installation of empty conduits and backboxes for data wiring.

Fire Alarm

1. Installation of new fire alarm strobe as indicated on plans. Take back to exit FACP.

1.2 RELATED SECTIONS

- A. All specification sections.

1.3 PHYSICAL COMPLETION DATE

- A. Physically complete the Work within FIT's established calendar after the Agreement is approved by the College.

1.4 ITEMS NOT INCLUDED

- A. Any items shown on the drawings not included in this Contract are indicated as "NIC" (Not in Contract).
 - 1. Existing construction, except where such construction is to be removed, replaced, or altered.

1.5 EXAMINATION OF PREMISES

- A. Verification of Existing Conditions after Award
 - 1. Various existing conditions at locations of the Work which cannot be determined until removals are under way cannot be indicated on the Drawings or described in the Specifications.
 - 2. Perform all such removals as required to verify all existing conditions before fabricating the work.
 - 3. Where applicable, before disturbing any structural work, make all possible preliminary investigations to verify the existing conditions threat. Notify Architect of any existing conditions not previously documented prior to proceeding with work.
 - 4. Where removals or preliminary investigations reveal existing conditions that differ materially from what is indicated or specified, or that may require changes, immediately notify the Architect in writing and await instructions before proceeding further with that part of the work.
- B. Discrepancies in Existing Conditions:
 - 1. During the process of the Work, should conditions be encountered that materially differ from those shown on the Drawings or indicated in the Specifications, or conditions which could not reasonably have been anticipated, which conditions will materially affect the cost of the Work, such conditions shall immediately be called to the attention of the Architect, before they are further disturbed. The Architect will promptly investigate the conditions and if it is found that they do so materially differ, shall issue a clarification.

1.6 CONNECTION TO ELECTRICAL EQUIPMENT OR SYSTEMS

- A. Contractor will not be allowed to tie into electrical equipment or systems until the F.I.T. Facilities Management Department has reviewed and approved the connection.

1. Submit written procedures to the F.I.T. Facilities Management Department, detailing how the connection Work is proposed to be performed.
2. After procedures have been approved, notify the F.I.T. Representative at least 3 working days prior to the connection Work so that arrangements can be made to have a F.I.T. Facilities Management Department Representative witness the Work.

1.7 CONTRACTOR USE OF PREMISES

- A. Comply with the Facility's Visitor Identification Policy. A copy of the current policy will be distributed at the initial job meeting.
- B. Work hours shall be as established by the Facilities Authorities.
- C. Check in with the Facility Representative, as directed, at the beginning of each work day. Furnish information regarding where employees will be working during the day.
- D. Comply with applicable Federal and State of New York Right-to-Know Law provisions and supply copies of the appropriate Material Safety Data Sheets (MSDS) to the F.I.T. Facility's Right-to-Know Information Officer.
- E. Do not diminish the level of life safety during performance of the Work.
- F. Contractor responsible to coordinate with Owner and make all necessary provisions to receive materials and remove debris.

1.8 REFERENCE SPECIFICATIONS AND STANDARDS

- A. Comply with the requirements of the various specifications and standards referred to in these specifications, except where they conflict with the requirements of these specifications. Such reference specifications and standards shall be the date of latest revision in effect at the time of receiving bids, unless otherwise stated.

1.9 LAYING OUT

- A. Examine the Contract Documents thoroughly and promptly report any errors or discrepancies to the Architect before commencing the Work.
- B. Lay out the Work in accordance with the Contract Documents.

1.10 CLEANING UP

- A. Clean up and containerize the rubbish (refuse, debris, waste materials, and removed materials and equipment) resulting from the Work at the end of each work day and leave work areas broom clean. Locate containerized rubbish where directed.
- B. Remove piled rubbish from property at least once a week or more often if the rubbish presents a hazard. Properly dispose of rubbish. Burning of rubbish will not be permitted.

1.11 SUSTAINABILITY REQUIREMENTS

- A. The Contractor shall meet sustainability performance and documentation requirements to comply with New York City Local Law 86 of 2005, and to achieve the following objectives: sustainable site use, water use reduction, conservation of energy and resources, and improvement of indoor environmental quality.
- B. Sustainability performance requirements include, but are not limited to: water use reduction, energy conservation, construction waste management, and indoor air quality controls during construction and prior to occupancy.
- C. Sustainability documentation requirements include, but are not limited to, Contractor's Certification Form, cost information, documentation on VOC content, urea-formaldehyde content and recycled and regional content.

1.12 NEW YORK CITY CODE OF 2008 IMPLEMENTATION

- A. Beginning July 1, 2008, Chapters 17 and 33 of the New York City Construction Code go into affect. These two chapters supersede the Controlled Inspections requirements contained in the 1968 Building Code, and Chapter 19 of the 1968 Building Code that deals with protection of the public.
 - 1. References to "Controlled Inspections" and applicable code sections and "Controlled Inspector" referenced in the Contract Documents shall mean the equivalent "Special Inspection" and "Special Inspector" in accordance with the 2008 NYC Construction Code. It shall be noted that some individual "Controlled Inspection" items have been combined into one "Special Inspection" category.
 - 2. References to public protective's and code sections included in Chapter 19 of the 1968 code referenced in the Contract Documents shall mean those equivalent Sections contained in Chapter 33 of the NYC Construction Code. The Contractor shall be responsible for complying with all provisions of Chapter 33 of the NYC Construction Code.

END OF SECTION 01 10 00

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. This Section is to be coordinated with and complementary to the General Conditions, and all other sections of the specification, wherever applicable to Mechanical and Electrical Work.
- B. Where items of the General Conditions are repeated in this Section of the Specifications, it is intended to qualify or to call particular attention to them; it is not intended that any other parts of the General Conditions shall be assumed to be omitted if not repeated herein.
- C. This Section applies equally and specifically to all Contractors and Subcontractors supplying labor and/or equipment and/or materials as required under the Heating, Ventilating and Air Conditioning, Plumbing, Sprinkler and Electrical Sections of the Specifications.

1.02 DEFINITIONS

- A. "The Contractor" or "Each Contractor" means specifically, the Contractor or Subcontractor working under his respective Section (Heating, Ventilating and Air Conditioning, Plumbing, Sprinkler or Electrical) of this Specification.
- B. "Provide" means to supply, erect, install, and connect up in complete readiness for regular operation, the particular work referred to.
- C. "Furnish" means to supply and deliver to the job.
- D. "Piping" includes, in addition to pipe, all fittings, valves, hangers, and other accessories related to such piping.
- E. "Concealed" means hidden from sight as in chases, furred spaces, shafts, hung ceilings, or embedded in construction.
- F. "Exposed" means "not concealed" as defined above. Work in trenches, crawl spaces, and tunnels shall be considered "exposed" unless otherwise specifically noted. Work located in mechanical rooms, accessible attics, open storage rooms, janitor's closets, on the roof or anywhere outdoors shall be considered "exposed".
- G. "Approved equal" means any equipment or material which, in the opinion of the Architect, is equal in quality, durability, appearance, strength, design, performance, physical dimensions, and arrangement to the equipment or material specified, and will function adequately in accordance with the general design.
- H. "Governmental" means all municipal, state and federal governmental agencies.
- I. Where any device or part of equipment is herein referred to in the singular number (such as "the pump"), such reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the Drawings.
- J. "HVAC" means Heating, Ventilating and Air Conditioning.
- K. "Plumbing Contractor" means the Contractor doing Plumbing and Fire Protection Work including Sprinkler Work.

1.03 CODES AND STANDARDS

- A. NY State Building Code, Fire Code, Mechanical Code, Plumbing Code, Fuel Gas Code, Energy Conservation Construction Code
- B. NFPA National Fire Protection Association
- C. ASME American Society of Mechanical Engineers
- D. ANSI American National Standards Institute
- E. ASTM American Society for Testing Materials
- F. AWWA American Water Works Association
- G. IBR Institute of Boiler and Radiator Manufacturers
- H. NEMA National Electrical Manufacturers Association
- I. ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
- J. SMACNA Sheet Metal and Air Conditioning Contractors National Association, Inc.
- K. ARI Air Conditioning and Refrigeration Institute
- L. UL Underwriters' Laboratories
- M. AMCA Air Movement Control Association
- N. AABC Associated Air Balance Council
- O. Local Water Company Rules and Regulations
- P. National Electric Code

1.04 INTENT

- A. It is the intention of the Specifications and Drawings to call for finished work, tested, and ready for operation. All materials, equipment, and apparatus shall be new and of first-class quality.
- B. Any apparatus, appliance, material, or work not shown on Drawings, but mentioned in the Specifications, or vice versa, or any incidental accessories, or minor details not shown but necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be provided without additional expense to the Owner.

1.05 DRAWINGS

- A. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement of equipment, ducts, conduits, piping, and fixtures.
- B. The locations of all items shown on the Drawings or called for in the Specifications that are not definitely fixed by dimensions are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project and shall have the approval of the Architect before being installed. Do not scale Drawings.

- C. Follow Drawings in laying out work and check Drawings of other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points. Where headroom and space conditions appear inadequate, Architect shall be notified before proceeding with installation.
- D. If directed by the Architect, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.
- E. Piping or ductwork connected to equipment may require different size connection than indicated on the Drawings. The Contractor shall provide transition pieces as required at the equipment.

1.06 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

- A. Any questions or disagreements arising as to the true intent of this Specification or the Drawings or the kind and quality of work required thereby shall be decided by the Architect, whose interpretations thereof shall be final, conclusive, and binding on all parties.
- B. In case of disagreement between Drawings and Specifications, or within either document itself, the better quality, greater quantity or more costly work shall be included in the Bid Price and the matter referred to the Architect's attention for decision and/or adjustment prior to the Contractor's submission of their Bid. If such ambiguity is identified by the Contractor during construction (after bid period), then the Architect shall be consulted merely to decide on the proper technical approach; the more costly work's value shall be included.
- C. Maintain an awareness to avoid space conflict with other trades.
- D. Purchase the equipment and material required in accordance with field measurements taken at the proper time during the construction progress.

1.07 VISITING THE SITE

- A. Before submitting the final proposal, examine the site of the proposed work to determine the existing conditions that may affect the work, as this Section will be held responsible for any assumptions in regard.

1.08 EQUIPMENT AND MATERIALS

- A. The proposal and bid must cover all items on the Drawings and in the Specifications exactly as drawn and specified.
- B. All pipe, fittings and valves shall be manufactured in the United States of America.
- C. All proposed substitutions of equipment of other manufacturers than those specified shall be attached to the base bid in an itemized list. Directly opposite each item indicate the amount to be added to or deducted from the base bid if the proposal is accepted. Failure to furnish such an itemized list will be interpreted to mean that it is agreed to provide all items exactly as drawn and specified. The information given in the above itemized list will in no way affect the determination of low bidder.
- D. Within twenty (10) working days after the acceptance of the proposal, and prior to the submission of any shop drawings for review, a complete list of manufacturers shall be submitted to the Architect of all equipment and materials proposed for the work. No reviews will be rendered on shop drawings submitted before the complete list of manufacturers is reviewed.

- E. If material or equipment is installed before the Contractor obtained "No Objections" comment from Architect, and/or in the opinion of the Architect the material or equipment does not meet the intent of the Drawings and Specifications, the removal and replacement shall be made at no extra cost to the Owner.
- F. The materials, workmanship, design, and arrangement of all work installed under the Contract shall be subject to the approval of the Architect.
- G. If material or equipment is installed before the Contractor obtained "No Objections" comment from the Architect, trade installing same shall be liable for the removal and replacement at no extra charge to the Owner if, in the opinion of the Architect, the material or equipment does not meet the intent of the Drawings and Specifications.
- H. The words "or approved equal" are understood to follow:
 - 1. The name of any manufacturer, vendor, equipment or materials.
 - 2. Any trade name, plate number, or catalog number.
 - 3. Any detailed description used to define equipment or material; except where otherwise indicated on the Drawings or in the Specifications.
 - 4. It is the intent of these Specifications that wherever a manufacturer of a product is specified, and the terms "other approved" or "or approved equal" are used, the substituted item must conform in all respects to the specified item. Consideration will not be given to claim that the substituted item meets the performance requirements with lesser construction (such as lesser heat exchange surface, etc.) Performance as delineated in schedules and in the Specifications shall be interpreted as minimum performance.
- I. All equipment and materials required for installation under these Specifications shall be new and without blemish or defect. All electrical equipment shall bear labels attesting to Underwriters' Laboratories approval. Where no specific indication as to the type or quality of the material or equipment is indicated, a first class standard article shall be furnished.
- J. Where it is proposed to use an item of equipment other than that specified or detailed on the Drawings which requires any redesign of the structure, partitions, foundations, piping, wiring, or of any other part of the mechanical, electrical, or architectural layout, all such redesign, and all new drawings and detailing required therefore shall, with the review of the Architect and subsequent comments by the Architect "No Exception" or "Exception as Noted" on the shop drawings, be prepared at no additional cost to the Owner.
- K. Where such deviation from contract documents requires a different quantity and arrangement of ductwork, piping, wiring, conduit, and equipment from that specified or indicated on the Drawings, furnish and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring, and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.
- L. All equipment of one type (such as fan, coils, etc.) shall be the product of the same manufacturer.
- M. Note that the comments "No Exception" or "Exception as Noted" marked on the shop drawings or other information submitted in accordance with the requirements herein before specified does not assure that the Engineer, Architect, or any other Owner's representative attests to the dimensional accuracy or dimensional suitability of the material or equipment involved or the mechanical performance of equipment. Comments on the shop drawings does not invalidate the Plans and Specifications if the shop drawings are in conflict with the Plans and Specifications.

1.09 SHOP DRAWINGS AND SUBMITTALS

- A. Prior to delivery to job site, but sufficiently in advance of requirements necessary to allow Architect ample time for review, submit copies (as stated in "General Conditions") of shop drawings of all equipment, materials, piping, sleeves, conduit, ductwork, and wiring diagrams, and further obtain written comments "No Exception" or "Exception as Noted" for same from the Architect, before installing any of these items.
- B. All shop drawings shall be prepared using AutoCAD. Manually drafted shop drawings are prohibited. If a Contractor is incapable of developing CAD drawings in-house, then they shall engage the services of an external drafting service in order to do so. The cost for such service shall be borne by the Contractor and included as part of their bid. Shop drawing submittals shall be on paper as described herein. While shop drawings are being developed and revised throughout the construction process, the Contractor shall continually update the CAD files. As construction approaches completion, these shop drawing CAD files shall be developed by the Contractor(s) into "As-Built" drawings. As part of standard project close-out documents, in addition to providing conventional paper copies of As-Built Shop Drawings, the Contractor must also provide CD's containing electronic AutoCAD versions of same.
- C. Shop drawings shall consist of manufacturer's certified scale drawings, cuts, or catalogs, including descriptive literature and complete certified characteristics of equipment, showing dimensions, capacity, code requirements, motor and drive testing, as indicated on the Drawings or Specifications.
- D. Certified performance curves for all pumping and fan equipment shall be submitted for review.
- E. Shop drawings submitted with insufficient information shall be rejected without review.
- F. All shop drawings and submittals shall be sent electronically in PDF format. Other electronic file formats will be rejected without review.
- G. Samples of materials or equipment, when requested by the Architect, shall be submitted for review.
- H. Provide a detailed Transmittal with all shop drawings, via email. Any Transmittal, Shop drawing, sample, specification, etc. which is not labeled with all of the following information shall be rejected without review:
 - 1. Project name
 - 2. Project location
 - 3. Contractor's name and address, Subcontractor's name and address
 - 4. Applicable section and article number of specifications
 - 5. Contractor's approval stamp and signature
 - 6. Submission number
 - 7. Specific service for which material is to be used.
- I. Catalogs, pamphlets, or other documents submitted to describe items on which review is being requested, shall be specific and shall include clear identification in such catalog, pamphlet, etc., of item submitted, with identification clearly made in ink and highlighted. Data of a general nature such as tabulated charts will not be accepted and will be rejected without review.
- J. Shop drawings indicating an unsuitable manufacturer shall be rejected without review.

- K. The HVAC Subcontractor shall prepare ductwork shop drawings at $\frac{3}{8}$ "=1'-0" scale and submit to the Architect for their approval to prepare the coordination drawings as called for in paragraph 1.14. Ductwork shop drawings shall be drawn with double line ductwork and shall indicate the elevation above finished floor of all ducts, location, and height of building structure (beams, etc.), lengths of fabrication pieces and fittings. Show new and existing work. Shop drawings submitted shall be ready for sheet metal fabrication.
- L. The comments "No Exception" or "Exceptions as Noted" rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are reviewed, said review does not in any way relieve responsibility, or necessity, of furnishing material or performing work as required by the Contract Drawings and Specifications.
- M. "EXCEPTIONS, AS NOTED" means, unless otherwise noted on the drawings to approved for construction, fabrication and/or manufacture subject the provision that the work shall be carried out in compliance with all annotations and/or corrections indicated on the shop drawings and in accordance with the requirements of the Contract Documents. If also marked "RESUBMIT", "EXCEPTIONS AS NOTED" is invalid and a corrected submittal of the drawing is required.
- N. If a shop drawing is resubmitted and does not comply with all of the comments indicated on the previous submission(s), and does not reflect specific reasons for such non-compliance, it shall be rejected without review.
- O. Label resubmitted shop drawings with a stamp indicating the submittal number, for example: SECOND SUBMISSION; THIRD SUBMISSION, etc. and send separate transmittals for each item being submitted so that one transmittal does not cover more than one specific item or group of items from one manufacturer.
- P. Failure to submit shop drawings in ample time for checking shall not entitle an extension of Contract time, and no claim for extension by reason of such default will be allowed.
- Q. Prior to submission of shop drawings, thoroughly check each shop drawing, reject those not conforming to the Specifications, and indicate (by signature) that the shop drawings submitted meet Contract requirements. Deviations and/or exceptions to the contract documents should be clearly noted as being deviations and/or exceptions. The Contractor will later be required to correct such deviation and/or exceptions at his own expense, if they have not been noted and approved on the shop drawing.
- R. All shop drawings showing routing of ductwork, piping and conduit, shall be not less than $\frac{3}{8}$ " = 1'-0" scale.
- S. Incorporate a numbering system to help keep track of shop drawing submittals as follows:
 - 1. H or M..... HVAC shop drawings
 - 2. P Plumbing shop drawings
 - 3. FP..... Sprinkler / Standpipe shop drawings
 - 4. E..... Electrical and Fire Alarm shop drawings
- T. Concurrent numbers shall follow the prefix letter. Example: H-1, H-2, etc. In addition, shop drawings requiring resubmission should bear the number of the original submission and bear a suffix as follows: H-1A (second submission), H-1B (third submission), etc.
- U. Before request for acceptance and final payment for the work, write a letter to the Architect stating that all shop drawings are brought to a condition "No Exception" or "Exception as Noted". Any outstanding shop drawings must be cleared with the Engineer.

1.10 RECORD DRAWINGS

- A. The Contractor shall furnish, coordinate, produce and distribute record drawings as stated within the General Conditions of the Contract.
- B. During construction keep an accurate record of all deviations between the work as shown on the Drawings and that which is actually installed.
- C. On certain projects where Record Drawings must be on Mylar, secure from the Architect, a complete set of Drawings and note thereon all changes. Make a complete record of all changes and revisions in the original design which exist in the complete work. Furnishing of these transparencies and preparing these Record Drawings shall be at no additional cost to the Owner. When all revisions showing the work as finally installed are made, the corrected Mylar transparencies shall be submitted for review by the Architect. After review of the Record Drawings by the Architect, provide the Owner with one set of black-line prints and Mylar transparencies, at no additional cost to the Owner.
- D. Where record drawings are CAD type, provide CD's containing AutoCAD files of these drawings to the Architect, the Engineer and the Owner.

1.11 LAWS, ORDINANCES, PERMITS AND FEES

- A. Give all necessary notices, obtain all permits and pay all governmental taxes, fees, and other costs in connection with the work; file all necessary plans, prepare all documents, and obtain all necessary approvals of all governmental departments having jurisdiction; obtain all required Certificates of Inspection for the work and deliver to the Architect before request for acceptance and final payment for the work. File for and obtain all required equipment use permits, Special Inspections, submission of fire alarm as-built drawings, backflow prevention device (BFP) sign-offs, boiler and domestic hot water heater filings with DEP and all other required filings.
- B. Include in the work, without extra cost to the Owner, any labor, materials, services, apparatus, drawings, (in addition to Contract Drawings and Documents) in order to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on Drawings and/or specified.
- C. All materials furnished and all work installed shall comply with the rules and recommendations of the National Fire Protection Association, with all requirements of local utility companies, with the recommendations of the fire insurance rating organization having jurisdiction, and with the requirements of all governmental departments having jurisdiction.
- D. Include in the bid, without extra cost to the Owner, retaining the service of a licensed professional engineer to obtain equipment use permits, filing of sprinkler drawings with hydraulic calculations, DEP BFP sign-off, all DEP chimney and boiler submissions, preparation of fire alarm as-built drawings, testing of all fire and fire smoke dampers, and approvals and all other required filings.

1.12 INDEMNIFICATION

- A. Pay all royalties and defend all suits or claims for infringement of any patent rights and save the Owner harmless from loss on account thereof.
- B. If process or article specified is an infringement of a patent, promptly notify the Architect in writing, and any necessary changes shall be as provided in the Contract for changes in the work.

If the Contractor performs any work specified knowing it to be an infringement of patent, he shall bear all costs arising therefrom.

- C. Take out all necessary insurance, free of extra charge, and agree to indemnify and save harmless the party contracting for services against loss or expense, by reason of the liability imposed by law upon such party for damages because of bodily injuries, including death at any time resulting therefrom, accidentally sustained by any person or persons or on account of damage to property arising out of or in consequence of the performance of this Contract, whether such injuries to persons or damage to property are due or claimed to be due to any negligence in the performance of the Contract, the party contracting for services, employees or agents, or any other person.

1.13 ORGANIZATION OF WORK

- A. The work throughout shall be executed in the best and most thorough manner under the direction of and to the satisfaction of the Engineers, Owners and Architects, who will jointly interpret the meaning of the Drawings and Specifications and shall have the power to reject any work and materials which, in their judgment, are not in full accordance therewith.
- B. The work called for under this Contract shall be carried on simultaneously with the work of other trades in a manner such as not to delay the overall progress of the work. Furnish promptly to other trades involved at the project, all information and measurements relating to the work which they may require. Cooperate with them in order to secure the harmony necessary in the interest of the project as a whole.
- C. Furnish and install all work as expeditiously as possible in order to meet all construction schedules.
- D. Keep a competent superintendent in charge of the work at all times. Such superintendent shall be replaced if deemed unsatisfactory to the Owner.
- E. Upon award of contract, consult with the Architect and negotiate with subcontractors and manufacturers, and within thirty (30) days submit a preliminary list of major equipment for approval, complete with name of manufacturer, dates of purchase orders, and delivery dates to the site. Also submit within thirty (30) days, a preliminary schedule of installation of the various systems. This list shall be revised monthly and resubmitted. The second submittal shall contain the names of manufacturers of scheduled equipment (with names, addresses, and telephone numbers of local representatives).
- F. Maintain a complete file of shop drawings at all times available to the Owner's representative.
- G. Every facility shall be provided to permit inspection of the work by the Owner's representative during the course of construction.
- H. Where items of equipment and/or materials are indicated in the Specifications as being furnished by other trades for installation, assume responsibility for the unloading of such equipment and/or materials from the delivery trucks, and for providing safe storage for same as required pending installation.
- I. Where the work is to be installed in close proximity to work of other trades, or where there is evidence that the work is to interfere with work of other trades, assist in working out space conditions to make a satisfactory adjustment.

- J. If so directed by the Architect, prepare composite working drawings and sections at a suitable scale not less than $\frac{3}{8}" = 1'-0"$ clearly showing how the work is to be installed in relation to the work of other trades. If the installation is made before coordinating with other trades, make all necessary changes in the work without extra charge to the Owner.
- K. Before submitting shop drawings for sleeves, piping and ductwork, the Heating, Ventilating and Air Conditioning Subcontractor shall prepare a combined $\frac{3}{8}" = 1'-0"$ scale shop drawing for piping and ductwork indicating location of piping and ductwork with dimensions for each floor and Mechanical Rooms. A digital version of these shop drawings shall be given to the Electrical Contractor. The Electrical Contractor shall indicate the location of all lighting fixtures and conduit runs on these shop drawings. The Electrical Contractor shall provide a digital version of the updated shop drawings, with lighting fixtures and conduit runs indicated to the Plumbing Contractor. The Plumbing and Sprinkler Contractor shall indicate his piping on these digital shop drawings.
- L. The Heating, Ventilating and Air Conditioning Contractor shall arrange a Coordination Meeting for each floor and Mechanical Equipment Room with Plumbing and Electrical Contractors under the supervision of the General Contractor. After coordination, each Contractor shall digitally sign the copy. The Heating, Ventilating and Air Conditioning Contractor shall submit these drawings to the Architect for review and he shall call any conflicts that could not be resolved in the coordination meetings, and/or deviation from original design, to the Architect's attention. After receiving written review from the Architect, each Contractor shall prepare the shop drawings as required under the paragraph "Shop Drawings" in the Specifications.

1.14 PROTECTION OF WORK AND PROPERTY

- A. Maintain and protect all equipment, materials and tools from loss or damage from all causes until final acceptance by the Owner.
- B. Assume responsibility for the protection of any finished work or other trades from damage or defacement by the operations and remedy any such injury or damages.

1.15 ACCESS DOORS IN FINISHED CONSTRUCTION

- A. Install all work so that all parts required are readily accessible for inspection, operation, maintenance and repair. Minor deviations from the Drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written review from the Architect.
- B. Wherever mechanisms requiring access for maintenance, reading of instruments, or for operation are concealed in the structure and wherever else indicated on the Drawings, supply access doors of sizes necessary to provide ready access to the concealed items. Group together valves, controls, dampers, traps, expansion joints, cleanouts, gauges, switches, and other equipment requiring access in walls and furred spaces to reduce the number of access doors.
- C. Access doors shall be Milcor Style A, B or K, L or M, as manufactured by Inland Steel Products Co. or approved equal. Minimum access door shall be 12" x 12". For installation in plastered wall or ceiling, provide Style "K" or "L" as required. For installation in masonry walls, provide Style "M". For installation in acoustical tile surfaces, provide Style "AT". For installation in acoustical plaster surfaces provide Style "AP". Fire resistive access doors for suspended dry wall ceiling shall be Style ATC's. Provide fire rated access doors at fire rated shafts, stairwells, corridors and at all other walls with Fire Rating.

- D. Provide 24" x 24" access door for each duct or pipe shaft. Provide at least one (1) per floor, or as indicated on the drawings. Provide 18" x 24" access door in each outside air and exhaust air plenum.
 - E. Access doors shall be installed in building structure under a separate Section.
 - F. All plumbing, electric and heating and ventilating access doors etc., shall be provided with Corbin #2722-1/2 master keyed cylinder locks. These locks shall be supplied and installed by the respective Contractor. These cylinder locks shall be purchased through the General Contractor's subcontractor for hardware after submission and review of the panel schedule as hereinafter specified.
 - G. Prepare a schedule showing location of all panels, cabinets, etc. to receive the Corbin lock. This schedule shall designate, by building and room number, the panel or cabinet location and shall be submitted to the Architect. This schedule is required for use in preparation of keying information. Locks shall not be purchased prior to review of this schedule.
 - H. Access doors for fire and smoke dampers shall be permanently identified on the exterior by a label having letters not less than 0.5 inch in height and reading: **SMOKE DAMPER or FIRE DAMPER or FIRE/SMOKE DAMPER**. This shall include ceiling tiles which provide access to these dampers.
- 1.16 SCAFFOLDING, RIGGING, HOISTING
- A. Provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises of all equipment and materials furnished under this Section of the Specifications, and remove same from premises when no longer required.
 - B. In the event that supplementary bracing of the basic building structure is required to assure a secure rigging procedure and a secure route for the equipment being handled, assume full responsibility for such supplementary bracing.
- 1.17 SLEEVES, PIPE AND CONDUIT INSERTS AND ANCHOR BOLTS
- A. Provide and assume responsibility for the location and maintenance in proper position of all sleeves, inserts, and anchor bolts required for the work. In the event that failure to do so requires cutting and patching of finished work, it shall be done without additional cost to the Owner.
 - B. All pipes and conduits passing through all walls or partitions shall be provided with sleeves having an internal diameter larger than the outside diameter of the pipe or insulation enclosing the pipe or conduit. Sleeves through masonry walls and partitions shall be Schedule 40 black steel pipe. Sleeves through non-masonry partitions may be 22 gauge galvanized steel sheet metal, set flush with finished surfaces of partitions.
 - C. Sleeves through foundation walls shall be James B. Clow & Sons № F-1430 or F-1435 cast iron wall sleeve with intermediate integral flange. Sleeves shall be set with ends flush with each face of wall. The space between sleeve and pipe shall be packed with a mechanical rubber seal, such as "Link Seal" manufactured by Thunderline Corp., (VICO) and then with oakum to within 2" of each face of the wall. The remaining space shall be packed and made watertight with a waterproof compound.

- D. Sleeves through concrete floors shall be Schedule 40 black steel pipe and extending 1" above finished floors. The open sleeve space shall be packed with non-combustible materials.
- E. Inserts shall be preset concrete inserts with steel reinforced rods through the insert and both ends hooked over the reinforced mesh. Inserts shall be of individual type of malleable iron construction with accommodation for removable nuts and threaded rods up to ¾" diameter, permitting lateral adjustment, except as otherwise noted. Individual inserts shall be Grinnell Fig. 279 up to 5" pipe and conduit, Fig. 282, 6" and up to 8" pipe and conduit, Fig. 152 above 8" and up to 12" pipe and conduit. For figures 282 and 152, they shall come with an opening at the tip to allow reinforcing rods up to ½" diameter to be passed through the insert body. Rods shall extend a minimum of 4" on either side of the insert. Pipes larger than 12" shall be suspended from steel members only.
- F. In general, all piping and conduit shall be supported from structural steel building members only or approved malleable steel inserts imbedded in concrete pours. Concentrated loads up to 200 lbs. may use inserts in concrete in buildings having poured concrete floors whose thickness is 6" or more. All other loads shall be supported from steel building members. Inserts shall not be located in any corrugated deck flute as ceiling tabs nor within 2 feet in any direction from ceiling tabs. Inserts shall not be spaced closer than 4 feet on center in all directions.
- G. Where layout revisions are required, and are approved after concrete deck is poured, piping conduit 3" and smaller may be supported at Intermediate Points by Phillips' ¾" expansion bolts with lead shields, provided main supports are welded to structural steel and are not more than twenty feet on centers.
- H. Piping and conduit 3" and smaller shall be supported from existing slab by "Phillips" ¾ expansion bolts with lead shields. Piping 4" and larger shall be supported by means of 4" x 4" x ⅜" clip knee angle with ¾" expansion bolt in shear and supporting rod at 90° from another bolt or using two expansion bolts per hanging post - pipes 8" and larger shall be supported from steel building members. In concrete buildings, add supplementary steel tied into the concrete structural members. Support such piping, conduits and ductwork from the supplementary steel.
- I. Provide sleeves for pipes passing through roofs. Sleeves passing through roofs shall be as detailed on drawings extending min. 12" above finished roof. All pipes passing through roof shall be minimum of 10" from walls or other construction to permit proper flashing. Provide counter flashing.
- J. Where sleeves pass through waterproofed floors, they shall be IPS brass pipe sleeves of the required diameter, brazed at the bottom to 18" x 18", 16-ounce copper flashing for bond with waterproofing. The tops of the sleeves shall extend 1" above finished floor.
- K. No ductwork, piping, conduit or equipment shall be supported from corrugated decking construction. For this area provide supplementary steel to support ductwork, piping, conduit or equipment. Supplemental steel members shall be welded to building structural steel.
- L. All hangers, rods and supports shall be installed prior to construction fireproofing.
- M. The required fire resistance rating of floor or floor/ceiling assemblies and walls shall be maintained where a penetration is made for electrical, mechanical, plumbing pipes, conduits, ducts and systems. Fire stopping shall be provided at openings around vents, pipes, ducts, conduits at floor levels and walls with non-combustible materials. For openings around pipes and conduits and/or sleeves, 3M product Caulk CP 25 and Putty 303 or approved equal shall be provided.

- N. Owner shall retain the services of a NYS Licensed Professional Engineer and under his direction shall inspect the existing spray or fire proofing of existing structural members exposed during the renovation. Provide a report of deficiencies.

1.18 ESCUTCHEONS

- A. Provide escutcheons on pipes wherever they pass through ceilings, walls, or partitions.
- B. Escutcheons on pipes passing through outside walls shall be Ritter Pattern and Casting Co., № 1, solid, cast brass, flat type secured to pipe with set screw.
- C. Escutcheons for pipes passing through floors shall be Ritter Pattern and Casting Co., № 36A, split-hinged, cast brass type, designed to fit pipe on one end and cover sleeve projecting through floor on the other end.
- D. Escutcheons for pipes passing through interior walls, partitions, and ceilings shall be Ritter Pattern and Casting Co., № 3A, split-hinged, cast brass chromium plated type.

1.19 MANUFACTURERS' IDENTIFICATION

- A. Manufacturer's nameplate, name or trademark, shall be permanently affixed to all equipment and material furnished under this Specification. Where such equipment is in a finished occupied space, the nameplate shall be in a concealed but accessible location. The nameplate of a Subcontractor or Distributor will not be acceptable.

1.20 EQUIPMENT NAMEPLATES

- A. Provide for each item of equipment, including panelboards, disconnects, breakers, starters, switches, and all control devices, pumps, fans, compressors, boilers, etc., a permanently attached nameplate made of black surface, white core laminated plastic with incised letters. Subcontractor furnishing equipment shall provide nameplate. Pneumatic, electric and mechanically actuated gauges shall have a brief, but complete description of their function. Stating the air pressure or voltage range alone is not acceptable. Nameplates shall be a minimum of 3" long by 1½" wide and shall bear the equipment name and item number (tag number) in ½" high white letters as designated in the equipment schedule. Nameplates shall be attached to their respective equipment by screws or rivets.

1.21 TAGS AND CHARTS

- A. Furnish and attach to each valve as hereinafter specified, a 1½" diameter brass tag with ½" indented numerals filled with durable black compound. Tags shall be securely attached to stems of valves with chain and "S" hooks.
- B. Valve charts shall consist of schematic drawings of piping layouts, showing and identifying each valve and describing the function. Upon completion of the work, one (1) copy of each chart, sealed to rigid backboard with clear lacquer placed under glass and framed, shall be hung in a conspicuous location in the main equipment room, unless otherwise directed by the Architect. Two (2) additional unmounted copies in 8½" x 11" leather ring binders shall be delivered to the Architect. Also furnish three (3) copies of schematic flow chart with corresponding valve numbers noted on chart.
- C. Provide tags for the following valves:

1. Zone control, bypass, shut-off, check and balancing valves.
 2. Building and area shut-off and balancing valves.
 3. Control, by-pass, shut-off, balancing and drain valves for major pieces of equipment such as boilers, domestic hot water heaters, heat exchangers, refrigeration machines, pumps, heating, ventilating and air conditioning units, cooling towers, etc.
 4. System drain valves, safety and relief valves. Vacuum breakers.
- D. Tags on control valves shall bear the valve tag numbers shown on the ATC shop drawings. These shall be brass 1¼” diameter tags, with ½” indented numerals filled with durable black compound. Tags shall be securely attached to stems of valves with chain and “S” hooks.

1.22 IDENTIFICATION

- A. Identification shall be in accordance with "Scheme for Identification of Piping System ANSI A13.1" and OSHA safety color regulation.
- B. Markers shall be snap-on type as manufactured by Craftmark, Fort Worth, TX or Seton Nameplate Corp., New Haven, CT (Setmark System), or Bunting Stamp Co. Inc., Pittsburgh, PA or approved equal. Markers shall completely encircle the pipe with a substantial overlap. No adhesive shall be used. They shall be manufactured of U.L. approved, self-extinguishing plastic. When the pipe, including insulation (if any), is 4 inches diameter and larger, markers shall be strap-on type. For piping located outdoors, all markers shall be strap-on type for all pipe diameters, and straps shall be of stainless steel. Markers for medical gas piping shall be by means of metal tags, stenciling, stamping or with adhesive markers, in a manner which is not readily removable. *
- C. Provide identification for piping, ductwork and electrical conduits.
- D. All piping and ductwork shall be labeled, whether concealed above ceilings or exposed. Labels shall be installed at intervals no greater than 15 feet (unless noted otherwise) and shall be installed after every turn or elbow, and in every room. Where concealed above ceilings, a minimum of one (1) label shall occur above each room. Due to various above ceiling visual obstructions, the Engineer reserves the right to request additional labels in order to ensure visibility, at no additional cost to the Owner.
- E. Pipe shall be lettered and valves tagged in accordance with the schedule below. Lettering shall be located near each valve and branch connection and at intervals of not over 20 feet (10 feet on fire lines, and at least once in each room and in each story traversed for medical gas piping*) on straight runs of pipe. Provide flow arrows on all piping and ductwork labels. Adjacent to the legend, stencil the size of the pipe, conduit or ductwork. Letter Colors are as follows: Yellow with black letters, green with white letters, blue with white letters and red with white letters.

LABEL AND VALVE TAG SCHEDULE			
Service	Label Designation	Color	Tag Designation
Chilled Water Supply	Chilled Water	Green	CHWS
Chilled Water Ret.	Chilled Water Return	Green	CHWR
Sanitary Sewer	San. Sewer	Green	----
Storm Sewer	Storm Sewer	Green	----

LABEL AND VALVE TAG SCHEDULE			
Service	Label Designation	Color	Tag Designation
Combined Sewer	Comb. Sewer	Green	----
Storm Water Piping	St. W.	Green	----
Return Air	R.A.	Green	----

- F. Tanks, pumps, fans and other equipment shall be labeled to show the number, if any, and service.
 - G. Exposed conduits for alarm and communication systems shall be banded at intervals of not over 10 feet. Bands shall be of the following colors:
 - 1. Fire Alarm System..... Red
 - 2. Mechanical & Electrical Supervisory System Green & Blue
 - H. HIGH VOLTAGE" in black letters two inches high, stenciled at 10-foot intervals over a continuous painted orange background.
 - I. Except where other means of identification are specified, electric cabinets, switchboards, motor control centers, transformers, system control boards, disconnecting switches, remote control switches, individual motor starters and motor control pushbutton stations shall be stenciled to show the service and number, if any, of the equipment controlled, as appropriate. Panelboards and other electrical equipment located in finished areas, such as offices, shall have the identification placed on the inside of the cabinet doors.
 - J. Cabinets housing 460Y/265 Volt panelboards shall have "460/265 volt" stenciled in 2-inch high yellow letters on the inside of the cabinet doors.
 - K. Cabinet housing emergency lighting panelboards shall have the word "EMERGENCY" stenciled in 2-inch high red letters on the outside of the cabinet, in addition to other lettering required above.
 - L. The bolted covers of housings for disconnecting switches or links in bus ducts between network transformers and switchboards shall be lettered to identify the equipment within.
 - M. Serial numbers shall be stenciled on the tanks and covers of transformers having their nameplates attached to the high voltage switch chamber covers.
 - N. Signs for Equipment Controlled through the BAS: For all fans, pumps and other motor driven equipment with start/stop control through the BAS provide a red surface, white core laminated plastic sign with incised letters, permanently mounted on the equipment indicating, **“Warning. This Equipment Is Started and Stopped Automatically from the Building Automation System.”**
- 1.23 COORDINATION OF MECHANICAL AND ELECTRICAL EQUIPMENT LOCATIONS
- A. The space equal to the width and depth plus 6” on either side of the electrical equipment and extending to a height of 6 feet above the equipment or the structural ceiling, whichever is lower, shall be dedicated to the electrical installation and shall not contain piping ducts or other equipment foreign to the electrical installation. Electrical equipment shall include switchboards, panelboards and motor control centers.

- B. Examine the drawings, and in cooperation with the Electrical Work confirm the final location of all electrical equipment to be installed in the vicinity of piping and ductwork. Plan and arrange all overhead piping no closer than three feet, and ductwork no closer than one foot from a vertical line to electric switchboards, panelboards, motor control centers or similar equipment.
- C. Where the installation of piping or ductwork does not comply with the requirements of foregoing paragraphs, where feasible, the piping and ductwork shall be relocated. Installation of a barrier between piping and ductwork and electrical equipment below will be considered if located more than six feet above the electrical equipment. Refer to NEC Article 110. If piping ductwork and foreign equipment cannot be located outside of the space dedicated to electrical installation, a drip pan as described below can be considered to protect the electrical equipment from condensation, leaks or breaks, but shall be approved by the Engineer after the Contractor has demonstrated that piping, ductwork and/or equipment cannot be installed to avoid this space.
- D. Provide galvanized steel gutters as follows:
 - 1. Provide a gutter of 18 gauge galvanized steel under every pipe and roof drain which is within 2'-0" (two feet) of being vertically over any motor, transformer, electrical controllers, switchboards, panelboards, generator or the like.
 - 2. Also provide drip pans below any drain piping located above the ceiling in food preparation or storage areas. In such areas, if piping also runs vertical through the floor slab above, then fully enclose the vertical portion with an extension of said drip pan and fully seal this enclosure to the underside of the floor slab above.
 - 3. Each gutter shall be made watertight, properly suspended; and carefully pitched to a convenient point for draining. Provide a $\frac{3}{4}$ inch drain, to nearest floor drain or slopsink.
 - 4. In lieu of such separate gutters, a continuous protecting sheet of similar construction, adequately supported and braced, properly rimmed, pitched and drained, may be provided over any such motor, and extending 3'-0" in all directions beyond the motor, over which such piping has to run.

1.24 QUIET OPERATION

- A. All equipment and material shall operate under all conditions of load without any sound or vibration which in the opinion of the Architect is objectionable. Where sound or vibration conditions arise which are considered objectionable by the Architect, eliminate same in a manner reviewed by the Architect.

1.25 CLEANING, PIPING, DUCTS AND EQUIPMENT

- A. Clean all piping, ducts, and equipment of all foreign substances inside and out before being placed in operation.
- B. If any part of a system should be stopped by foreign matter after being placed in operation, the system shall be disconnected, cleaned, and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of removing obstructions shall be repaired when the system is reconnected at no additional cost to the Owner.
- C. During construction, properly cap all pipes and equipment nozzles so as to prevent the entrance of sand, dirt, etc.

1.26 DELIVERY OF MATERIAL

- A. Deliver the material and store same in spaces indicated by the Architect and assume full responsibility for damage to structure caused by any overloading of the material.

1.27 CUTTING AND PATCHING (IN EXISTING CONSTRUCTION)

- A. All cutting and patching shall be done under another Section. Furnish the sizes and locations of all chases and openings required for the installation for his work before the walls, floors and partitions are built.
- B. As a general rule, chases, shafts and wall openings as shown on the Drawings will be provided for most of the ducts and piping, but promptly arrange with the Construction Supervisor for additional openings should any be required for the work.
- C. Provide the labor and materials for all work included under the Contract or Subcontract in ample time and sufficient quantities so that all of the work of the Contract or Subcontract may be installed in proper sequence to avoid unnecessary cutting of the floors and walls.
- D. Any cutting and patching required due to the failure to comply with the above provisions, shall be done at no extra cost to Owner. Such cutting and patching shall be done under Division One, as approved by the Architect.
- E. Where existing piping or ductwork insulation are damaged by the requirements of the work, replace all damaged insulation to match existing.
- F. Refer to Paragraph: "Sleeves, Inserts and Anchor Bolts" for additional requirements.
- G. Prior to performing any core drilling or cutting of existing floor or roof slabs, Contractor shall perform a scan of the slab using ground penetrating radar (GPR) to confirm that there are no existing conduits or pipes in area of core drill or cutting of slab.

1.28 ALTERATIONS

- A. When new work and alterations render equipment, piping and ductwork useless, such equipment, piping and ductwork when exposed to view, shall be removed and connections thereof to lines or ducts remaining shall be properly capped or plugged and left in construction. If construction, such as hung ceiling, furred beam, chase, etc., is opened up and removed during the course of the construction, the useless pipe and ducts therein shall be treated as though exposed to view. When required to accommodate new work, useless piping and ductwork concealed in construction shall be treated as though exposed to view.
- B. When existing piping and duct systems, at points of connection to new work or in rerouting are found defective, such defective portions shall be removed and replaced with new materials without cost to the Owner.
- C. Provide temporary supports where required.
- D. Where alterations reveal piping, ductwork, conduit circuits, wiring, and accessories that must necessarily remain in service, same shall be rerouted, replaced or altered as required to make same completely concealed in the new work at no additional cost to the Owner.

- E. Where existing piping or ductwork insulation is damaged by the requirements of the work, replace all damaged insulation to match existing.
- F. Cutting in existing building shall be done by each Contractor as reviewed by the Architect. Rough patching shall be done by each Contractor. Finish patching, ceiling construction removal, new ceiling in existing building will be done under another Section.

1.29 PAINTING

- A. All finished painting of MEP/FP work shall be provided as specified below.
- B. Painting Schedule
 - 1. No on-site painting is required on the following items unless specifically indicated otherwise:
 - a. Stainless steel or aluminum sheet metal.
 - b. Stainless steel piping.
 - c. Piping or ductwork to be insulated.
 - d. Insulation on piping or ductwork in unfinished spaces or concealed.
 - e. Insulated piping covered with stainless steel, aluminum or all service jacketing, unless otherwise specified.
 - f. Insulated piping in walk-in and non-walk-in tunnels.
 - g. Mechanical equipment with a factory applied baked-on enamel finish, not specified to be insulated or provided with an enameled steel insulated jacket.
 - h. Insulated equipment or smokestacks specified or noted on the Drawings to be covered with stainless steel or aluminum sheet metal jacketing.
 - i. Factory fabricated multi-wall metal smoke flue piping.
 - j. Concealed piping.
 - 2. Paint the following:
 - a. Uninsulated Black Steel Piping:
 - 1) Exposed in Finished Rooms or Finished Spaces: 1 coat of primer and 2 coats of latex semi-gloss enamel.
 - 2) Exposed in Unfinished Rooms, or Unfinished Spaces, or in Pipe Shafts: 1 coat of primer and 2 coats of finish.
 - 3) Exposed Exterior to a Building: 1 coat of primer and 2 coats of exterior acrylic latex gloss enamel.
 - b. Uninsulated Galvanized, Cast Iron, Brass or Copper Piping:
 - 1) Exposed in Finished Rooms or Finished Spaces: 1 coat of primer and 2 coats of latex semi-gloss enamel.
 - 2) Exposed Exterior to a Building: 1 coat of primer and 2 coats of exterior acrylic latex gloss enamel.
 - 3) Exposed in Unfinished Rooms or Unfinished Spaces: 1 coat of primer and 2 coats of finish.
 - c. Piping in floor trenches after fabrication: primer and finish.
 - d. Uninsulated Mechanical Equipment:
 - 1) Furnished with a Factory Applied Prime Coat Finish: 2 coats of acrylic latex semi-gloss enamel. No primer required.
 - e. Vessels, Tanks, and Like Equipment Specified to be Insulated: 1 coat of corrosion resistant paint, prior to the application of insulation.
 - f. Uninsulated Exposed Iron and Steel Surfaces of Boilers, Including the Steel Casing, Buck Stays, Boiler Fronts, Castings, Smoke Pipes, Breeching and the Exposed Surfaces of all Other Iron or Steel Installed in Conjunction with Boiler Work: 1 coat of primer and 2 coats of heat resistant enamel.

- g. Insulated exposed piping in Mechanical Rooms, Boiler Plants, Chiller Plants and Generator Rooms (except on segments of pipe which are clad in aluminum).
 - h. Hangers, Supports and Accessories:
 - 1) Exposed: Paint to match adjacent piping, pipe insulation or ductwork insulation.
 - 2) All black steel or iron pipe hangers, rods, inserts, brackets and accessories for supporting piping systems and duct systems: 1 coat of primer and 2 coats of latex semi-gloss enamel. Paint black steel hanger rods, threaded on the job site, with a primer immediately after installation.
 - 3) Metal Fabrications in Finished Spaces: Paint over shop coat with 2 coats of alkyd gloss enamel.
 - i. Sheet Metal Work:
 - 1) Exposed Black Iron, Galvanized Iron, and Aluminum, including Hangers for Insulated and Uninsulated Ductwork, in Finished Rooms, Finished Spaces or Exterior to a Building: 1 coat of primer and 2 coats of latex semi-gloss enamel.
 - 2) Jacketing on Exposed Insulated Ductwork in Finished Rooms and Finished Spaces: 2 coats of latex semi-gloss enamel. No primer required.
 - j. Uninsulated Exposed Valves, Flanges, Unions and Irregular Surfaces in Piping Systems Installed in Finished Rooms or Finished Spaces: 1 coat of primer and 1 coat of black heat resistant enamel.
 - k. Convector enclosures shall be painted at the factory as specified in Section 15835: Convectors.
- C. Color Coding:
- 1. Apply finish paints of colors indicated opposite the various items listed below where such items are installed in Mechanical Equipment Rooms, Machine Rooms, Boiler Rooms, Penthouse Mechanical Equipment Rooms.
 - 2. Ductwork: Grey.
 - 3. Equipment - Bare and Insulated (Except Factory Painted): Grey.
- D. The inside of all ductwork where visible through openings shall be painted with two prime coats of flat black paint.
- E. Nameplates on all equipment shall be cleaned and left free of paint. Where equipment is to be painted, the Contractor shall carefully mask off all equipment nameplates and data tags prior to application of paint. Such masking shall be removed after paint has dried.
- F. All flashing shall be painted with two coats of waterproof black asphaltum varnish.
- 1.30 TESTS
- A. All piping, wiring, and equipment shall be tested as specified under the various sections of the work. Labor, materials, instruments and power required for testing shall be furnished under the particular Section of the Specifications.
 - B. Tests shall be performed satisfaction of the Architect. The Architect will be present at such test, when he deems necessary and such other parties as may have legal jurisdiction.
 - C. Pressure tests shall be applied to piping only before connection of equipment and installation of insulation. In no case shall piping, equipment, or accessories be subjected to pressure exceeding their rating.

- D. All defective work shall be promptly repaired or replaced, and the tests shall be repeated until the particular system and component parts thereof receive the review of the Architect.
- E. Any damages resulting from tests shall be repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architect.
- F. The duration of tests shall be as determined by all authorities having jurisdiction, but in no case less than the time prescribed in each Section of the Specifications.
- G. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems, and their controls. Whenever the equipment or system under test is interrelated with and depends upon the operation of other equipment, systems and controls for proper operation, functioning, and performance, the latter shall be operated simultaneously with the equipment or system being tested.
- H. The electrical work shall include providing any assistance (such as removal of switchboard and panelboard trims and covers, pull and junction box covers, etc.) deemed necessary by the Architect to check compliance with the Drawings and Specifications.

1.31 OPERATING INSTRUCTIONS

- A. Two months prior to the completion of all work and the final inspection of the installation by the Owner, five (5) copies of a complete Instruction Manual, bound in booklet form and suitably indexed, shall be submitted to the Architect for review. All written material contained in the manual shall be typewritten or printed.
- B. The Manual shall contain the following items:

Table of Contents (Plumbing, HVAC and Electrical)

- I. Introduction - Explanation of Manual and its use.
- II. Description of Systems
 - 1. Complete schematic drawings of all systems.
 - 2. Functional and sequential description of all systems.
 - 3. Relationship of system where applicable to the supervisory data system.
- III. Systems Operation
 - 1. Start-up procedures.
 - 2. Shut-down procedures.
 - 3. Reset and adjustment and balancing procedures.
 - 4. Seasonal operation.
 - 5. All posted instruction charts.
- IV. Maintenance
 - 1. Cleaning and replacement - lines, components, filters, strainers, ducts, fans, etc.
 - 2. Lubrication.
 - 3. Charging and filling.
 - 4. Purging and draining.

5. Systems trouble shooting charts.
6. Instruments checking and calibration.
7. Procedures for checking out functions with remote (Supervisory Data Console) indication and control.
8. Recommended list of spare parts.

V. Listing of Manufacturers

VI. Manufacturer's Data (Where multiple model, type and size listings are included, clearly and conspicuously indicate those that are pertinent to this installation).

1. Description - Literature, drawings, illustrations, certified performance charts, technical data, etc.
2. Operation.
3. Maintenance - including complete trouble-shooting charts.
4. Parts List.
5. Names, addresses and telephone numbers of local recommended repair and service companies.
6. Guarantee data.
7. Model No. and Serial No. of all equipment.

1.32 INSTRUCTION OF OWNER'S PERSONNEL

- A. Provide training on the operation and maintenance for equipment, as indicated within the equipment specification. If not indicated within the equipment specification section, provide the following training:
1. Automatic Temperature Controls: Four (4) hours.

1.33 GUARANTEE

- A. The Contractor guarantees by his acceptance of the Contract that all work installed will be free from any and all defects and that all apparatus will develop capacities and characteristics specified, and that if during a period of one year from date of completion and acceptance of work, one (1) entire heating and cooling season or eighteen (18) months from date of shipment, whichever is **later**, any such defects in workmanship, material or performance. He shall immediately replace, repair, or otherwise correct the defect or deficiency, including parts, labor and travel time, without cost to the Owner within a reasonable time. Notify the Architect in writing of the time required to do work. For heating systems, the guarantee period must include one continuous heating season from November 1st to April 1st. For cooling systems, the guarantee period must include one continuous cooling season from May 1st to October 1st.
- B. Replace or repair to the satisfaction of the Owner any and all damage done to the building or its contents or to the work of other trades in consequence of work performed in fulfilling guarantee.
- C. This Article is general in nature and will not waive stipulations of other claims which specify guarantee periods in excess of one (1) year.
- D. In the event default on this Guarantee, the Owner may have such work done as required and charge the cost to the Contractor.
- E. The date of acceptance shall be the date of final payment by the Owner or notice of acceptance by the Owner, whichever is later.

1.34 OPERATION PRIOR TO COMPLETION

- A. The Owner may require operation of parts or all of the installation for the beneficial occupancy prior to final completion and acceptance of the building.
- B. The operation shall not be construed to mean acceptance of the work by the Engineer for the Owner. The Owner will furnish supervisory personnel to direct operation of the entire system and the Contractor shall continue to assume this responsibility until final acceptance.

1.35 SEMI-FINAL AND FINAL SITE VISITS FOR OBSERVATION

- A. As the project approaches completion, the Engineer and Architect, at their discretion shall determine a period of time in which they shall perform a Semi-Final Site Visit to observe the Mechanical and Electrical installation. At the conclusion of this Semi-Final Site Visit, a Semi-Final Punchlist shall be issued to the appropriate Contractor for the deficiencies in the work of his trade. Complete all work and perform all corrective measures as required by the Semi-Final Punchlist. After this corrective and completion work has been accomplished, in writing, advise the Architect and the Engineer that every item on the Semi-Final Punchlist has been completed. After the Architect and Engineer make a Final Site Visit to observe the Mechanical and Electrical installation and make a Punchlist, a similar letter of Compliance shall be forwarded through the appropriate channels.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.01 INSTALLATION OF EQUIPMENT

- A. The Contractor shall be responsible for the installation of all equipment in accordance with the Manufacturer's Installation/Operation & Maintenance Manuals and instructions. If other requirements of this Specification contradict what is stated in the Manufacturer's instructions, the matter shall be brought to the attention of the Architect and Engineer for clarification. Any and all of the Manufacturer's requirements for utilities (electrical power and control wiring, piped water, drain, gas, fuel oil, steam, condensate, etc.), ducted supply or exhaust air, mounting and support shall be provided by the Contractor, regardless of how, or whether or not stated elsewhere in the Contract/Bid Documents.

END OF SECTION 01 31 46

SECTION 01 33 00 - SUBMITTALS

PART 1 - GENERAL

1.1 DEFINITIONS

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

1.2 DEVIATIONS FROM REQUIREMENTS OF THE CONTRACT DOCUMENTS

- A. Deviations from the requirements of the Contract Documents will not be allowed unless a request for deviation is made in writing prior to or at the time of submission and the specific deviation is approved by the Owner or Architect. The submission of a deviation shall be done in a timely manner according to the schedule of submittals to allow the Architect sufficient time for review.

1.3 “OR EQUAL” TO BRAND NAME PRODUCTS

- A. Whenever a product is specified by brand name, a comparable brand, equal to that named, may be submitted for approval subject to:
 - 1. The contractor shall bear the burden of proving that the proposed product is equal to the specified product. The submission of an “or equal” shall be done in a timely manner to allow sufficient time to review the proposed product by the Architect.
 - 2. Whenever a color or pattern is indicated by a specific manufacturer’s name or number, the intent is to communicate the required color or pattern of the material. Other manufacturers’ comparable colors or patterns may be submitted for approval as equal.

1.4 WAIVER OF CERTAIN SUBMITTAL REQUIREMENTS

- A. Unless otherwise specified, the requirement to submit product data and samples for approval will be waived for products specified by brand name if the specifically named products are furnished for the Work. In such cases, furnish two copies of required Product Data and/or Samples to the Architect for information only.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Identify all submittals by project title and number. Include Contractor's name, date, and revision date. On shop drawings, product data and samples, also include the name of the supplier and subcontractor (if any), and applicable specification section number. Stamp each submittal and initial or sign the stamp to certify review and approval of submittal.
- B. Assemble submittals in accordance with the requirements in the individual sections of the Specifications and as required by this section. It is the Contractor's responsibility to review and verify that all information required for each submittal is included in the submittal package. Errors or omissions found by the Contractor are to be corrected prior to the submission of the submittal package for approval. Incomplete submittal packages that have been submitted for review and approval will be returned.
 - 1. It is the Contractor's responsibility to verify that portions of the submittal package to be provided by a subcontractor (or supplier) are complete, as well as portions of the submittal package being provided directly by the Contractor.
 - 2. Do not combine the submittals of more than one specification section with submittals required by other specification sections unless specifically stated in the contract specifications.
- C. If a submittal is based on, or the result of, a change order or field order to the Contract documents, include copies of the applicable change order or field order with the submittal.

1.6 COORDINATION DRAWINGS

- A. Provide coordination drawings showing scope of all work. Coordination drawings to indicate any conflicts between services or ceiling heights as indicated on Architectural Drawings or otherwise specified.

1.7 SHOP DRAWINGS

- A. Provide shop drawings in the format required by the specifications. Show the information, dimensions, connections and other details necessary to ensure that the shop drawings accurately interpret the Contract Documents. Show adjoining construction in such detail as required indicating proper connections. Where adjoining connected construction requires shop drawings or product data, submit such information for approval at the same time so that connections can be accurately checked.
 - 1. Submit 1 electronic copy (e-copy) of each shop drawing required by the Specifications.

- B. Have shop drawings prepared by a qualified detailer. Shop drawings shall be neatly drawn and clearly legible. Machine duplicated copies of Contract Drawings will not be accepted as shop drawings.
 - 1. Where shop drawings are indicated to be drawn to scale:
 - a. Use scale normally found on an “Architect” scale.
 - b. Written Scale: Clearly label scales being used on each drawing and/or on each detail on the drawing.
 - 1) Examples: 1/8” = 1’-0”
 - c. Graphic Scale: Adjacent to each Written Scale, provide a graphic scale delineating the scale being used. Graphic scale shall be divided into measuring units relating to the accuracy required for the drawing or details.
 - d. Clearly dimension key elements of the drawing or detail.
 - 2. When the drawing sheet is printed full size, the minimum text size shall be 1/8" (3.2 mm) for CAD drawings.
- C. The shop drawings will be reviewed and 1 stamped copy returned. If returned copies are stamped “DISAPPROVED” or “REVISE AND RESUBMIT”, promptly resubmit 1 e-copy of shop drawings meeting Contract requirements.

1.8 PRODUCT DATA

- A. Provide product data in the format required by the specifications. Modify product data by deleting information that is not applicable to the project or by marking the product data to identify pertinent products. Supplement standard information, if necessary, to provide additional information applicable to project.
 - 1. Submit 1 e-copy of product data as required by the Specifications.
- B. The product data will be reviewed and 1 stamped copies returned. If returned copies are stamped “DISAPPROVED” or “REVISE AND RESUBMIT”, promptly resubmit 1 copy of product data meeting Contract requirements.

1.9 QUALITY ASSURANCE

- A. Provide quality assurance information in the format required by the specifications, including supporting documentation as required.
 - 1. Submit 1 copy of quality assurance information as required by the Specifications.
- B. The quality assurance information will be reviewed, and 1 stamped copy returned. If returned copies are stamped “DISAPPROVED” or “REVISE AND RESUBMIT”, promptly resubmit 1 copy of quality assurance information meeting Contract requirements.

1.10 SAMPLES

- A. Submit 2 (unless a different number is specified) of each sample required by the Specifications.
- B. 1 sample will become the property of the Owner when submitted and will not be incorporated in the Work unless specifically stated otherwise. 1 sample will become the property of the Architect for comparative reasons in the field.

1.11 REVIEW OF SUBMITTALS

- A. Items submitted for review will be reviewed for compliance with the contract documents, based upon the information submitted. The items will be acted upon with the following dispositions:
 - 1. Approved (or No Exception Taken): Where the submittal is marked “Approved”, the work covered by the submittal may proceed provided it complies with the contract documents. Final acceptance will depend on that compliance.
 - 2. Furnish as Noted: Where the submittal is marked “Approved as Noted”, the work covered by the submittal may proceed provided it complies with the review comments noted on the submittal and the contract documents. Final acceptance will depend on that compliance.
 - 3. Revise and Resubmit: Where the submittal is marked “Revise and Resubmit”, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or other activity for the item submitted. Revise or prepare a new submittal according to the review comments noted on the submittal and meeting the contract documents.
 - 4. Rejected: Where the submittal is marked “Rejected”, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or other activity for the item submitted. Prepare a new submittal according to the review comments noted on the submittal and meeting the contract documents.
 - 5. Acknowledged: Where the submittal is marked “Acknowledged”, receipt of the submittal is acknowledged and has been recorded.
 - 6. No Action: Where the submittal is marked “No Action” or “No Action Taken”, no review was made of this item, see comments noted on submittal and take appropriate action.

1.12 SCHEDULES AND RECORDS

- A. Submit the following Schedules and Records information not later than 7 days after approval of the Contract unless an earlier submission is required to properly schedule or progress the Work.
 - 1. **SCHEDULE OF SUBMITTALS:** On the Schedule of Submittals forms, indicate in the spaces following each item, the date the item will be submitted, the date approval is required, and the date delivery of the material or equipment is necessary for timely completion of the Work in accordance with the Project Schedule. The date entered for submittal of each item is the last day a deviation will be considered. Deliver the **SCHEDULE OF SUBMITTALS** to the Architect and Owner.
- B. **Warrantees:** Unless specified elsewhere contractor shall warrantee all work for (1) one year.

END OF SECTION 01 33 00

SECTION 01 73 29 - REMOVALS, CUTTING AND PATCHING

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work under this section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this section as shown on the drawings, as specified herein, and/or as specified by job conditions.

1.2 DESCRIPTION OF WORK

- A. Provide materials, labor, equipment and services to complete cutting and patching as specified herein and as indicated on the Drawings.

1.3 RELATED WORK SHOWN ELSEWHERE

- A. Selective Removals and Demolition - Section 02 41 13

1.4 QUALITY ASSURANCES

- A. Codes and Regulations
 - 1. Work specified herein shall conform to all applicable State and Local codes and regulations having jurisdiction.

1.5 SUBMITTALS

- A. Product Literature
 - 1. Submit manufacturers' products literature, catalog cuts and data sheets for all products used in patching.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site, ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to approved samples.
- B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain a uniform temperature between 55 and 70 degrees F within the work area.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Match the appearance and performance of existing corresponding materials as closely as practicable, unless otherwise indicated.

PART 3 – EXECUTION

3.1 MANUFACTURERS

- A. Do not disturb any existing structure, piping, apparatus, or other construction unless required by the Contract.
- B. Cut and alter existing materials as required to perform the Work. Limit cutting to the smallest amount necessary. Core drill round holes and saw-cut other openings where possible.
- C. Remove existing construction as required to install and connect the Work to adjacent construction in an approved manner. Remove materials and equipment superseded by the Work unless specifically indicated otherwise.
- D. Provide temporary supports necessary to prevent settlement or other damage to existing construction which is to remain.
- E. Perform the cutting, drilling, and removals in a manner which will prevent damage to adjoining construction which is to remain.
- F. Prior to any cutting, drilling, or removal, investigate both sides of the surface involved.
- G. Determine the exact location of all structural members. Do not cut, drill, or remove structural members such as joists, beams, or columns supporting construction that is to remain unless expressly required by the Work. If unforeseen obstructions are encountered, take all precautions necessary to prevent damage and obtain instructions from the FIT Representative before proceeding with the Work.
- H. If existing remaining items are within the damaged area, these items shall be removed and carefully stored until they can be reinstalled.

3.2 PATCHING

- A. Patch existing construction and finishes defaced, damaged, or left incomplete due to alterations and removals. Patching, except as otherwise indicated, shall be limited to the areas which have been cut or altered.
- B. Prepare existing surfaces properly to receive and, where required, bond with the Work.
- C. Unless otherwise indicated, provide new materials to match the appearance and performance of existing corresponding materials as closely as practicable.

- D. Paint patched areas and surfaces which will remain exposed by removals to match existing adjacent surfaces as closely as practicable using same type of paint. Painting, except as otherwise indicated, shall be limited to the areas which have been patched.

3.3 REINSTALLATION

- A. Where reinstallation of existing, remaining items removed during cutting is required, reinstall them to a condition equal to or better than their condition before removal.

END OF SECTION 01 73 29

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes requirements for Construction Waste Management (CWM), with criteria for recycling and/or salvaging demolition and construction waste generated during the project. A Construction Waste Management Plan shall be developed for approval by the Facilities Representative. The Plan shall be implemented throughout the duration of the project, and shall be documented in accordance with the SUBMITTALS Article below.
- B. Each contract shall supply the means for recycling job site waste. Locations for removal bins or dumpsters shall be coordinated with Facilities Representative. Following contract award, the Contractors may elect a single entity to act as the construction waste manager.

1.2 PERFORMANCE REQUIREMENTS

- A. The General Contractor shall prepare and submit a Construction Waste Management Plan (CWM) to the Facilities Representative for approval. The CWM Plan shall outline the provisions to be implemented to recycle and salvage demolition and construction waste generated during the project.
- B. Upon approval of the CWM Plan by the Facilities Representative, it shall be implemented throughout the duration of the project, and documented in accordance with the SUBMITTALS Article below.
- C. The Construction Waste Management Plan shall include, but not be limited to, the following components:
 - 1. Listing of Targeted Materials: Develop a list of the waste materials from the Project that will be targeted for reuse, salvage, or recycling. The following materials shall be accounted for (materials that will not be recycled shall be indicated as such):
 - a. Cardboard, paper, packaging
 - b. Clean dimensional wood, palette wood
 - c. Beverage containers
 - d. Metals from banding, stud trim, ductwork, piping, rebar, windows, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze
 - e. Gypsum board
 - f. Paint
 - g. Glass/Mirrors
 - h. Plastics
 - i. Woods

- j. Tile
- 2. Information: Provide the name of the landfill(s) where trash will be disposed of and the applicable landfill tipping fee(s).
- 3. Sorting Method: Provide a description of the proposed means of sorting and transporting the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site for off-site sorting).
- 4. Packaging Waste: Provide an estimate of packaging materials generated, and note whether suppliers will eliminate or take back packaging.
- 5. Field Conditions: Include provisions in the Construction Waste Management Plan for addressing conditions in the field that do not adhere to the CWM Plan, including provisions to implement a stop work order, or to rectify non-compliant conditions.
- 6. Recycling facilities: Provide the name of the recycling facilities(s) where materials will be sent for recycling, how it will be recycled, and the applicable fee(s).
- 7. Additional Information: Include any additional information deemed relevant to describe the scope and intent of the CWM Plan to the Facilities Representative.
- 8. Re-Used materials/Equipment: Materials or equipment to be removed from the site or turned over to the College which are classified as recycled materials shall be documented. Documentation shall include the materials turned over, weight or quantity of materials/equipment and a letter on company letterhead indicating the intended use of items.
- 9. Subcontractor Requirements: Construction Waste Management and recycling requirements shall be incorporated into all Subcontractor's contracts.

1.3 SUBMITTALS

- A. Submittal Requirements:
 - 1. A copy of the Construction Waste Management Plan, as defined in the PERFORMANCE REQUIREMENTS Article above.
 - 2. In conjunction with payment applications, contractors shall submit a monthly Waste Management submission. This submission shall include waste receipts for the payment period and a completed Waste Management Form for the same payment period.
 - 3. Calculations and supporting documentation to demonstrate end-of-project recycling rates meeting the requirements of the Construction Waste Management Plan. The process for recording and assembling documentation shall be as follows:
 - a. Record and document the total weight (in tons) of all demolition and construction waste materials sent to the landfill. Monthly Waste Management Reporting Forms

(sample included at the end of this Section identified as Exhibit “A”) shall be used as the basis for determining the total amount of waste landfilled for the project. The monthly reporting forms shall specify:

- 1) The number of dumpsters or other containers sent to the landfill for that month.
- 2) The volume (in cubic yards) of each dumpster or container sent to the landfill for that month.
- 3) The type of waste contained in each dumpster or container.
- 4) The weight of the waste in each dumpster or container. If the weight of the waste is not directly measured for each dumpster or container, the following Solid Waste Conversion Factors shall be used to convert the volume of waste to weight:

Solid Weight Conversion Factors	
Mixed Waste	350 lbs/cubic yard
Wood	300 lbs/cubic yard
Cardboard	100 lbs/cubic yard
Gypsum Board	500 lbs/cubic yard
Rubble	1,400 lbs/cubic yard
Steel	1,000 lbs/cubic yard

- 5) Identification of the landfill. In addition, provide the name of the landfill that will be accepting the materials. Receipts or other proof of facility reception of materials is required.
- b. Record and document the total weight (in tons) of all demolition and construction waste materials recycled or salvaged. Monthly Waste Management Reporting Forms shall be used as the basis for determining the total amount of waste recycled or salvaged for the project. The monthly reporting forms shall specify:
- 1) The number of dumpsters or other containers of recycled or salvaged materials for that month.
 - 2) The volume (in cubic yards) of each dumpster or container of recycled or salvaged materials for that month.
 - 3) The type of recycled or salvaged material contained in each dumpster or container.
 - 4) The weight of the recycled or salvaged material in each dumpster or container. If the weight of the material is not directly measured for each dumpster or container, the Solid Waste Conversion Factors listed for landfill waste above shall be used, where applicable, to convert the volume of material to weight. For materials not contained in the Solid

- Waste Conversion Factors above propose a conversion factor for review by the Director's Representative.
- 5) In addition, provide the name of the receiving facilities/companies that will be purchasing or accepting the recycled or salvaged materials. Receipts or other proof of facility reception of materials is required.
 - 6) For materials separated for recycling off-site, establish a method for tracking the weight of the recycled material. The method shall be included in the CWM Plan for the Director's Representative review and approval.
- c. Calculate the end-of-project recycling rate percentage by dividing the recycled and salvaged waste (in tons) by the total waste generated (recycled, salvaged, and landfilled waste – also in tons), and multiplying by 100.
 - d. For materials turned over to others for reuse, provide documentation on company letterhead indicating the material(s), the quantity (either by weight or units), the date and the intended reuse of the product.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 IMPLEMENTATION

- A. The General Contractor shall be responsible for the provision of containers and the removal of all waste, non-returned surplus materials, and rubbish from the site in accordance with the Waste Management Plan. The General Contractor shall oversee and document the results of the Plan. The Sub-Contractors shall be responsible for collecting, sorting, and depositing in designated areas, their waste, non-returned surplus materials, and rubbish, as per the Waste Management Plan.
- B. Instruction. The General Contractor shall provide on-site instruction of appropriate separation, handling and recycling, salvage, reuse and return methods to be used by all parties in appropriate stages of the Project.
- C. Separation Facilities: The General Contractor shall lay out a specific area(s) to facilitate separation of materials for potential recycling, salvage, reuse and return. Each potential material shall be collected and stored to avoid being mixed with other materials. Recycling and waste bin areas are to be kept neat and clean, and clearly marked.

3.2 MEETINGS

- A. Conduct Construction Waste Management meetings. Meetings shall include Subcontractors affected by the CWM Plan. At a minimum, waste management goals and issues shall be discussed at the following meetings:
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.

3.3 MONTHLY WASTE MANAGEMENT REPORTING FORMS

- A. Monthly Waste Management Reporting Forms, as required in the SUBMITTALS Article above, shall be submitted to the Facilities Representative and Architect for review throughout the duration of the project.

END OF SECTION 01 74 19

Total Universal Waste Quantities			

B. Submittals

1. Before Start of Work: Submit the following to the Owner's Representative for review. Do not start the work until these submittals are returned with Owner's Representative's approval.
 - a. Copy of State or local license for hazardous waste hauler;
 - b. Certification of at least one on-site supervisor which has satisfactorily completed the OSHA 40 Hour Health and Safety Course for Handling Hazardous Materials;
 - c. Certificates of workers which have successfully completed at least the OSHA 40-Hour Health and Safety Course for Hazardous Materials;
 - d. Certificates of workers which have successfully completed the required employee training for universal waste or appropriate type of training to the type of wastes being managed;
 - e. Schedule of start and finish times and dates for this work;
 - f. Name and address of the universal waste handler or a destination facility where the waste materials is to be treated, deposited or recycled in accordance with all regulatory requirements (include contact person and telephone numbers), if the universal waste meets the definition of hazardous waste, the name and address of the hazardous waste treatment, storage and disposal (TSD) facility;
 - g. Material Safety Data Sheets for all materials requiring removal;
 - h. If Contractor introduces any chemical into the work environmental, a MSDS for that chemical is required before use;
 - i. Contingency Plan for handling emergency spills or leaks;
 - j. Provide a copy of the NYS DEC Part 364 Waste Transporter permit for Universal Waste Transporters that transport more than 500 pounds of

universal waste in a single shipment since they must be a permitted hazardous waste transporter.

- k. Large Quantity Handlers of universal waste must provide documentation of notification to the EPA and/or the appropriate local government agency in advance of its intentions to transport the waste and receive from the facility or provide an EPA identification number prior to exceeding 5,000 kilograms of waste on-site, and
- l. Provide a record of all universal waste shipments received and sent offsite from the project.

C. Definitions

1. Large Quantity Handler (LQH) of Universal Waste shall be a waste handler who accumulates 5,000 kilograms or more of universal waste (batteries, pesticides, thermostats, or lamps, calculated collectively) at any time. This designation as a large quantity handler of universal waste is retained through the end of the calendar year in which 5,000 kilograms (11,000 pounds) or more total of universal waste is accumulated. The LQH shall notify the EPA, acquire or co-ordinate with a facility regarding an EPA identification number, and provide records for each shipment. The LQH shall ensure all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal facility operations and emergencies.
2. Small Quantity Handler of Universal Waste (SQH) shall be a waste handler who does not accumulate 5,000 kilograms (11,000 pounds) or more of total universal waste (batteries, pesticides, thermostats, or lamps, calculated collectively) at any time.
3. Destination Facility shall be a facility that legitimately and can legally accept universal waste from offsite so that the universal waste can be treated, disposed, or recycled in accordance with the regulatory requirements.
4. Universal Waste Transporter shall be anyone who transports universal waste. In New York, universal waste transporters that transport greater than 500 pounds of universal waste in a single shipment must be a permitted hazardous waste transporter pursuant to Federal and State regulations. Proper notification with the receiving handler agreeing to receive the shipment is required by the Universal Waste Transporter.
5. Employee training shall ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal operations and emergencies and to the type of waste they are handling.
6. Universal Waste Regulations – Universal Waste Rule - 40 CFR Part 273, New York State – Standards for Universal Wastes 6 NYCRR Subpart 374-3.

1.2 PRODUCTS

A. Materials

1. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil thick, clear, frosted, or black.
2. Duct Tape: Provide duct tape in 3" widths, with an adhesive which is formulated to stick aggressively to sheet polyethylene.
3. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
4. Disposal Bags: Provide 6 mil thick leak-tight polyethylene bags.
5. Labels: As required by the EPA and OSHA for handling, transportation, and disposal of hazardous waste.
6. Drums: Recovery or salvage drums acceptable for disposal of hazardous waste. Prior approval of drums is required. Drums or containers must meet the required OSHA EPA (40 CFR Parts 264265 and 300), and DOT regulations (49 CFR Parts 171-178). Use of damaged drums will not be allowed.

1.3 EXECUTION

A. Universal Waste

1. Once the properly labeled containers holding the universal waste have been filled and sealed, they shall be stored in designated accumulation areas as agreed upon by the Owners Representative and Contractor. They shall not be allowed to store in transportation vehicles, or onsite for more than one year from when the waste has been generated.
2. Documentation when a universal waste in storage was first accumulated shall be provided. This is to be done by dating and labeling the waste with the date of the earliest accumulation that can document the length of time the universal waste has been accumulated.
3. Maintenance of an inventory system on-site that identifies the earliest date that any universal waste in a group of universal waste items or a group of containers of universal waste became a waste was received.
4. Any waste developed from the work that exhibits one or more characteristics of hazardous waste must be handled accordingly and not as a universal waste.

B. Off-Site Shipment of Universal Waste

1. Off-Site shipments shall meet the requirements for offsite shipments and is prohibited from sending or taking universal waste to a place other than a designated universal waste handler or a universal waste destination facility.
2. LQH's of universal waste must notify EPA in writing and develop an EPA identification number or co-ordinate with the facility regarding use of their EPA identification number, prior to exceeding 5,000 kilograms of universal waste onsite.

3. SQH's do not need to notify EPA, receive and EPA identification number or deep records of shipments of universal waste.
 4. LQH's must keep a record of all universal waste shipments received or sent offsite, and must retain those records for at least three years from the date of receipt or shipment. Records may include invoices, manifests, logs, bills or lading, or other shipping documents.
- C. Storage Of Hazardous Waste (if required)
1. Once the properly labeled containers holding the hazardous waste have been filled and sealed, they shall be stored in designated areas as agreed upon by the Owners Representative and Contractor. They shall not be allowed to store the hazardous waste for more than the storage limitations relating to quantities stored and the length of time the material may be stored.
 2. Documentation when a hazardous waste in storage was first stored shall be provided. This is to be done by dating and labeling the waste with the date of the earliest accumulation that can document the length of time the hazardous waste has been accumulated.
 3. Maintenance of an inventory system on-site that identifies the earliest date that any hazardous waste was placed into proper storage.
- D. Off-Site Shipment of Hazardous Waste
1. Off site shipments shall meet the requirements for offsite shipments and is prohibited from sending or taking hazardous waste to a place other than an authorized treatment, storage and disposal (TSD) facility.
 2. An EPA identification shall be developed or provided by the facility.
 3. A copy of the transporter's Part 364 Permit shall be provided to the Owner's Representative and the facility representative.
 4. A copy of all waste manifests and any test results or waste analysis utilized for the off-site transportation and disposal shall be submitted to FIT.

END OF SECTION 02 08 30

SECTION 02 41 13 - SELECTIVE REMOVALS AND DEMOLITION

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Construction Waste Management - Section 01 74 19
- B. Cutting and Patching - Section 01 73 29
- C. Removal of Universal Waste and Miscellaneous Hazardous Materials – Section 02 08 30

1.2 SUMMARY

- A. There is no major demolition under this contract. Perform selective demolition in accordance with the Contract Documents. The Work of this Section shall include but not be limited to the following:
 - 1. Removal of selected items to accommodate new construction.
 - 2. Removal of interior finishes and other items, to accommodate new construction.
 - 3. Protect existing items to remain.
 - 4. The maintenance of the College's operations during selective demolition operations.
 - 5. Protection of the cables and utilities serving other buildings and other areas at the College Campus during the demolition and construction activities. The above services shall be maintained in operation without any interruption at all times unless otherwise scheduled and authorized by the Campus.

1.3 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the College's property.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the College's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to the College's designated storage area.
- C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.4 SUBMITTALS

- A. Proposed schedule of operations including coordination for shutoff, capping, and continuation of utility services as required.
 - 1. Provide a detailed sequence of selective demolition and removal work to ensure uninterrupted progress of the College's on-site operations.
 - 2. Coordinate with the College's continuing occupation of portions of existing building.
 - 3. Include proposed methods for dust and noise control measures.
 - 4. Contractor to submit intermediate life safety plan demonstrating how required government regulations will be maintained for occupied portions of the building.

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition Work similar to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Fluorescent tubes shall be considered hazardous waste and shall be disposed of according to the regulations of the New York State EPA.
 - 1. All demolition work shall comply with requirements of the College's operational requirements and authorities having jurisdiction.
 - a. Coordinate with the College's engineering department.
- C. Contractor shall verify all conditions at site prior to the start of Work.
- D. Notify appropriate agencies of any hazardous materials unearthed at the site. Do not proceed with removal of said substances until so instructed.

1.6 JOB CONDITIONS

- A. Condition of Structures: The College assumes no responsibility for actual condition of structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by the College insofar as practicable.
- B. Explosives: Use of explosives will not be permitted. Explosives will not be permitted for any Work of the project.
- C. Traffic: Conduct selective demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from the College and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing authorities or regulations.

- D. Protections: Ensure safe passage of persons around area of demolition. Conduct operations to prevent damage to adjacent buildings, structures, and other facilities and injury to persons.
 - 1. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structures to be demolished and adjacent facilities to remain.
- E. Damages: Promptly repair damages caused to adjacent areas and facilities by demolition operations.
- F. Flame Cutting: Do not use cutting torches for removal of material to be salvaged. Do not use cutting torches for demolition or removal until work area is cleared of flammable materials. Maintain portable fire suppression devices during flame-cutting operations.
- G. Utility Services: Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities and/or the College.
- H. Utility Services: Do not start demolition work until utility disconnections have been completed and verified in writing.
- I. Environmental Controls: Use temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as damage to finishes, flooding, and pollution.

1.7 SCHEDULING

- A. Arrange selective demolition schedule so as not to interfere with the College's on-site operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
 - 1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. Use materials whose installed performance equals or surpasses that of existing materials

PART 3 – EXECUTION

3.1 EXAMINATION

- A. General: Prior to commencement of selective demolition operations, verify that existing utilities have been located, identified, disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.
- E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition. Design for shoring and bracing shall be prepared by an engineer licensed in the State of New York.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

- A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Architect and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the Architect and to governing authorities.
 - a. Provide not less than 72 hours notice to the College if shutdown of service is required during changeover.
- B. Utility Requirements: Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

- A. General: Provide shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.
 - 1. Cease operations and notify College Safety Officer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations. Maintain interior and exterior shoring and bracing throughout the term of this Contract.

2. Cover and protect equipment and fixtures from soilage or damage when selective demolition work is performed in areas where such items have not been removed.
3. Erect and maintain dust-proof partitions and closures as required, to prevent spread of dust or fumes, to occupied portions of the building.
 - a. Where selective demolition occurs immediately adjacent to designated portions of the building, construct dust-proof partitions of minimum 3 5/8-inch studs at 16 inches on center, 5/8-inch drywall (joints taped) on occupied side, 1/2-inch fire-retardant plywood on demolition side. Fill partition cavity with sound-deadening insulation. Create dust-tight joints at edges and penetrations of dust-proof partitions.
 - b. Provide weatherproof closures for exterior openings resulting from demolition work.
4. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.
 - a. Provide bypass connections as necessary to maintain continuity of service to designated areas of building. Provide minimum of 72 hours advance notice to the College if shutdown of service is necessary during changeover.
- B. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air. Comply with governing regulations pertaining to environmental protection.
 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.
- D. Demolition, General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition work above each floor or tier before disturbing supporting members on lower levels.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 8. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
 9. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
- E. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the Architect in written, accurate detail. Pending receipt of directive from the Architect, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: As a minimum, remove weekly from site accumulated debris, rubbish, and other materials resulting from demolition operations. However, more frequent off site removal of accumulated debris is required as soon as the dumpster is full.
1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
 2. Burning of demolished materials will not be permitted on site.
- B. Removal: Transport materials removed from demolished structures and legally dispose off site.

3.5 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site.
1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by demolition work.
 2. Clean adjacent areas, of all dust, dirt, and debris caused by selective demolition, cutting, and patching operations. Daily and final clean up shall be satisfactory to the Architect.
 3. Clean existing heating and cooling devices to remain.

END OF SECTION 02 41 13

SECTION 03 54 00 – SELF-LEVELING UNDERLAYMENT CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Work of this section includes leveling over existing floors to receive new floor covering materials.

1.2 SECTION INCLUDES PRODUCTS BY ARDEX

- A. ARDEX K 15™ Self-Leveling Underlayment Concrete
- B. ARDEX P 51™ Primer
- C. ARDEX P 82™ Ultra Prime
- D. ARDEX E 25™ Resilient Emulsion
- E. ARDEX MC™ Moisture Control Systems
- F. Approved Equal

1.3 QUALITY ASSURANCE

- A. Installation of self leveling material must be by a factory-trained applicator, such as an ARDEX levelMaster Elite Installer, using mixing equipment and tools approved by the manufacturer.
- B. Manufacturers Representative shall review existing conditions prior to the Work. Contractor shall provide written approval from the Manufacturer that the substrate is acceptable to be installed with the Self Leveling Underlayment Concrete.
- C. Underlayment shall be able to be installed at 1/8” typical for 85% of the area to be covered and 1” plus or minus for the remaining 15%.
- D. Underlayment compressive strength shall be 4100 psi after 28 days per ASTM C109/mod (air cure only).
- E. Underlayment shall be walkable after 2 hours and allow floor covering to be installed after 16 hours at 70 degrees Fahrenheit.
- F. Manufacturer’s certification that the product is cement-based having an inorganic binder content which is 100% cement, to include Portland cement per ASTM C150: Standard specification for Portland Cement and other specialty hydraulic cements.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in their unopened packages and protect from extreme temperatures and moisture. Protect liquids from freezing.

1.5 SITE CONDITIONS

- A. ARDEX K 15 is a cementitious material. Observe the basic rules of concrete work. Do not install below 50°F surface temperature. Install quickly if floor is warm and follow hot weather precautions available from the ARDEX Technical Service Department. Never mix with cement or additives other than ARDEX-approved products.

1.6 SUBMITTALS

- A. Manufacturer's technical information for all material and installation.
- B. MSDS Sheets

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The cement-based self-leveling underlayment shall be ARDEX K 15 Self-Leveling Underlayment Concrete.
- B. Primer for non-porous subfloors such as burnished concrete, terrazzo, quarry and ceramic tile shall be ARDEX P 82 ULTRA PRIME.
- C. Aggregate shall be well graded, washed gravel (1/8" to 1/4" or larger) for use when underlayment is installed over 1 1/2" thick.(if required)
- D. Water shall be clean, potable, and sufficiently cool (not warmer than 70 degrees Fahrenheit).

2.2 MIX DESIGNS

- A. Standard mixing ratio: ARDEX K 15 is mixed in 2-bag batches at one time. Mix each bag of ARDEX K 15 (55 lb.) with 7 quarts of water. Product shall be mixed in an ARDEX T-10 Mixing Drum using an ARDEX T-1 Mixing Paddle and a 1/2" heavy-duty drill (min. 650 rpm). Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Follow written instructions per the ARDEX K 15 bag label.
- B. Resilient mix for applications over cutback and non-water soluble adhesive residues, wood and metal: Use 6 qt. of water and 2 qt. of ARDEX E 25 Resilient Emulsion for each bag of ARDEX K 15.
- C. For pump installations, ARDEX K 15 shall be mixed using the ARDEX Levelcraft Automatic Mixing Pump. Start the pump at 210 gallons of water per hour, and then adjust to the minimum water reading that still allows self-leveling properties. DO NOT OVERWATER! Check the consistency of the product on the floor to ensure a uniform distribution of the sand aggregate at both the top surface and bottom of the pour. If settling is occurring, reduce the water amount and recheck. Conditions during the installation, such as variations in water, powder, substrate, and ambient temperature, require that the water setting be monitored and adjusted carefully to avoid overwatering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. All subfloors must be sound, solid, cleaned, and primed:
 - 1. All concrete subfloors must be of adequate strength, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bondbreaker before priming. Mechanically clean if necessary using shot blasting or other. Acid etching and the use of sweeping compounds and solvents are not acceptable.
 - 2. Non-porous subfloors such as ceramic and quarry tile as well as terrazzo should be clean and free of all waxes and sealers. If necessary, have the surface professionally cleaned.
 - 3. All cracks in the subfloor shall be repaired to minimize telegraphing through the underlayment.
 - 4. Substrates shall be inspected and corrected for moisture or any other conditions that could affect the performance of the underlayment or the finished floor covering.
- B. Joint Preparation
 - 1. Moving Joints – honor all expansion and isolation joints up through the underlayment.
 - 2. Saw Cuts and Control Joints – fill all non-moving joints with ARDEX FEATHER FINISH or ARDEX SD-P if required.
- C. Priming
 - 1. Primer for standard absorbent concrete subfloors: Mix ARDEX P 51, 1:1 with water and apply evenly with a soft push broom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, thin film (min. 3 hours, max. 24 hours). Underlayment shall not be applied until the primer is dry. Primer coverage is approximately 400 to 600 sq. ft. per gallon.
 - 2. Primer for non-porous subfloors, or cutback and other nonwater soluble adhesive residues over concrete: Prime with ARDEX P 82. Mix Part A (red) with Part B (white) and apply with a short-nap or sponge paint roller, leaving a thin coat of primer no heavier than a thin coat of paint. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, slightly tack film (minimum 3 hours, maximum 24 hours). Underlayment shall not be installed until primer is dry. Primer coverage is approximately 200 to 400 square feet per gallon.
 - 3. Minimum drying time for ARDEX P 82 over cutback adhesive is 18 hours.

3.2 APPLICATION OF UNDERLAYMENT

- A. Installation
 - 1. Pour or pump the liquid ARDEX K 15 and spread in place with the ARDEX t-4 Spreader. Use the ARDEX t-5 Smoother for featheredge and touch-up. Wear baseball shoes with non metallic cleats to avoid leaving marks in the liquid ARDEX K 15. Underlayment can be walked on in 2-3 hours at 70 degrees Fahrenheit.

3.3 PREPERATION FOR FLOORING INSTALLATION

- A. Underlayment can accept finish floor covering materials after 16 hours at 70 degrees Fahrenheit and 50% relative humidity.
- B. Due to the wide range of adhesives that are used to install floor coverings, some adhesives may dry more quickly over ADREX underlayments then over other substrates. If this condition occurs, priming the surface of the underlayment with ARDEX P 51 Primer diluted 1:3 with water will ever out the drying of the adhesive. Allow the primer to dry 1-3 hours before proceeding with the adhesive installation.

3.4 FIELD QUALITY CONTROL

- A. Where specified, field sampling of the ARDEX underlayment is to be done by taking an entire unopened bag of the product being installed to an independent testing facility to perform compressive strength testing in accordance with ASTM C 109/modified: air-cure only. There are no in situ test procedures for the evaluation of compressive strength.

3.5 PROTECTION

- A. Prior to installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

END OF SECTION 03 54 00

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 GENERAL

1.01 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Lag Bolts

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. WOOD NAILERS AND BLOCKING: Section 06 10 53.

1.03 REFERENCES

- A. Except as shown or specified otherwise, the Work of this Section shall meet the requirements of the following:
 - 1. Design and Fabrication of Cold-Formed Shapes: "Specification for the Design of Cold-Formed Steel Structural Members", by the American Iron and Steel Institute (AISI Specification).
 - 2. Welding: "Structural Welding Code - Steel, AWS D1.1", or "Structural Welding Code - Sheet Steel, AWS D1.3", by the American Welding Society (AWS Codes).
- B. Organizations:
 - 1. AISI: American Iron and Steel Institute, 1140 Connecticut Ave., NW, Suite 705, Washington, D.C. 20036, (202) 452-7100, www.steel.org.
 - 2. AWS: American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126, (800) 443-9353, www.aws.org.
 - 3. ANSI: American National Standards Institute, 1819 L Street, NW, 6th Floor, Washington, DC 20036, (202) 293-8020, www.ansi.org.
 - 4. ASME: ASME International, 3 Park Ave., New York, NY 10016-5990, (800) 843-2763, www.asme.org.
 - 5. ASTM: ASTM International, 100 Barr Harbor Dr., PO Box C700, West Conshohocken, PA, 19428-2959, (610) 832-9500, www.astm.org.
 - 6. MPI: The Master Painters Institute Inc., 2808 Ingleton Ave., Burnaby, BC, V5C 6G7, (888) 674-8937, www.specifypaint.com.
 - 7. SSPC: The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh PA 15222-4656, (877) 281-7772, www.sspc.org.

1.04 SUBMITTALS

- A. Shop Drawings: Show application to project. Furnish setting drawings and templates for installation of bolts and anchors in other Work. Indicate shop and field welds by standard AWS welding symbols in accordance with AWS A2.4.
- B. Product Data: Catalog sheets, specifications, and installation instructions for each fabricated item specified, except submit data for fasteners only when directed.
- C. Shop Drawings

1. Submit Shop Drawings for all Grilles, schluter strips, and adjustable shelving metal brackets. Installation to be coordinated with field conditions, adjacent materials installation. Sizes will vary.
- D. Manufacturer's Data
- Submit manufacturers catalog data:
1. Schluter Strips

1.05 DELIVERY AND STORAGE

- A. Coordinate delivery of items to be built into other construction to avoid delay.
- B. Promptly cover and protect steel items delivered to the Site.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Shapes, Plates, and Bars: ASTM A 36.
- B. Steel Plates to be Cold-Formed: ASTM A 283, Grade C.
- C. Steel Bars and Bar-Size Shapes: ASTM A 675, Grade 70; or ASTM A 36.
- D. Cold-Finished Steel Bars: ASTM A 108, grade as selected by fabricator.
- E. Steel Tubing: Hot-formed, welded or seamless, structural tubing; ASTM A 501.
- F. Cold-Drawn Steel Tubing: ASTM A 512, buttwelded, cold-finished carbon steel tubing, sink drawn and stress relieved.
- G. Cast Iron Castings: ASTM A 48, gray iron castings, Class 30.
- H. Steel Pipe: ASTM A 53, type as selected, Grade A; black finish unless galvanizing is required; standard weight (Schedule 40), unless otherwise shown or specified.
- I. Anchors: Except where shown or specified, select anchors of type, size, style, grade, and class required for secure installation of metal fabrications. For exterior use and where built into exterior walls, anchors shall be galvanized or of corrosive-resistant materials.
 1. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent test agency.
 - a. Carbon Steel: Zinc-Plated; ASTM B 633, Class Fe/Zn 5.
 - b. Stainless Steel: Bolts, Alloy Group 1 or 2; ASTM F593, Nuts; ASTM F 594.

- J. Fasteners: Except where shown or specified, select fasteners of type, size, style, grade, and class required for secure installation of metal fabrications. For exterior use and where built into exterior walls, fasteners shall be galvanized.
 - 1. Standard Bolts and Nuts: ASTM A 307, Grade A, regular hexagon head.
 - 2. Stainless Steel Fasteners: ASTM A 666; Type 302/304 for interior Work; Type 316 for exterior Work; Phillips flathead (countersunk) screws and bolts for exposed Work unless otherwise specified.
 - 3. Eyebolts: ASTM A 489.
 - 4. Machine Bolts: ASME B18.5 or ASME B18.9, Type, Class, and Form as required.
 - 5. Machine Screws: ASME B18.6.3.
 - 6. Lag Screws: ASME B18.2.1.
 - 7. Wood Screws: Flat head, ASME B18.6.1.
 - 8. Plain Washers: Round, ASME B18.22.1.
 - 9. Lock Washers: Helical, spring type, ASME B18.21.1.
 - 10. Toggle Bolts: Spring Wing Type; Wing AISI 1010, Trunion Nut AISI1010 or Zamac Alloy, Bolt Carbon Steel ANSI B18.6.3.

- K. Shop Paint (General): Universal shop primer; fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

- L. Shop Paint for Galvanized Steel: Epoxy zinc-rich primer; complying with MPI#20 and compatible with topcoat.

- M. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

- N. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

- O. Schluter Strips: Schluter-Quadec profile, with stainless steel finish

2.02 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Fabricate metal framing and supports to support related items required by the Work. Fabricate of welded construction unless otherwise indicated. Preassemble to largest extent possible, off site.

- B. When required to be built into other Work, equip units with integral anchors spaced not more than 24 inches on center.

2.03 MISCELLANEOUS STEEL TRIM

- A. Fabricate trim of shapes, sizes, and profiles shown, with continuously welded joints and ground smooth exposed edges, unless otherwise indicated or approved. Use concealed field splices wherever possible. Furnish necessary cutouts, fittings, and anchorages.

2.04 LOOSE BEARING PLATES

- A. Steel plates fabricated flat, free from warp or twist, and of required thickness and bearing area. Drill plates as required for anchor bolts and for grouting access. Furnish bearing plates where shown and where required for steel items bearing on masonry or concrete construction.

2.05 FABRICATION

- A. Use materials of size and thickness indicated. If not indicated, use material of required size and thickness to produce adequate strength and durability for the intended use of the finished product. Furnish suitable, compatible anchors and fasteners to support assembly.
- B. Fabricate items to be exposed to view of material entirely free of surface blemish, including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove surface blemishes by grinding or by welding and grinding prior to cleaning, treating, and finishing. Ease exposed edges to a radius of approximately 1/32 inch unless otherwise shown.
- C. Joints: Fabricate accurately for close fit. Weld exposed joints continuously unless otherwise indicated or approved. Dress exposed welds flush and smooth.
- D. Connections: Form exposed connections with flush, smooth, hairline joints. Use concealed fasteners wherever possible. Use Phillips flathead (countersunk) bolts or screws for exposed fasteners, unless otherwise shown or specified.
 - 1. Furnish flat washer under connections requiring raised bolt heads.
 - 2. Furnish lock washer under nuts when through-bolting occurs.
- E. Punch, reinforce, drill, and tap metal Work as required to receive hardware and other appurtenant items.
- F. Galvanizing:
 - 1. Unless otherwise specified or noted, items indicated to be galvanized shall receive a zinc coating by the hot-dip process, after fabrication, complying with the following:
 - a. ASTM A 153 for iron and steel hardware.
- G. Shop Painting:
 - 1. Cleaning Steel: Thoroughly clean all steel surfaces. Remove oil, grease, and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning". Remove loose mill scale, loose rust, weld slag and spatter, and other detrimental material in accordance with SSPC SP-2 "Hand Tool Cleaning", SSPC SP-3 "Power Tool Cleaning", or SSPC SP-7 "Brush-Off Blast Cleaning".
 - 2. Apply one coat of shop paint to all steel surfaces except as follows:
 - a. Do not shop paint steel surfaces to be field welded.
 - b. Apply 2 coats of shop paint, before assembly, to steel surfaces inaccessible after assembly or erection. Paint color to be determined by Architects.

3. Apply paint and compound on dry surfaces in accordance with the manufacturer's printed instructions, and to the following minimum thickness per coat:
 - a. Shop Paint (General): 4.0 mils wet film.
 - b. Cold Galvanizing Compound: 2.0 mils dry film.

2.06 MANUFACTURERS

- A. Schluter Strips:
 1. Schluter Systems LP
194 Pleasant Ridge Road
Plattsburgh, NY 12901-5841
1-800-472-4588
www.schluter.com
- B. Or Approved equal

PART 3 EXECUTION

3.01 PREPARATION

- A. Temporarily brace and secure items which are to be built into concrete, masonry, or similar construction.
- B. Isolate non-ferrous metal surfaces to be permanently fastened in contact with ferrous metal surfaces, concrete, or masonry by coating non-ferrous metal surface with bituminous mastic, prior to installation.

3.02 INSTALLATION

- A. Fit and set fabricated metal Work accurately in location, alignment, and elevation. Securely fasten in place. Cut off exposed threaded portion of bolts flush with nut.
- B. Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar or grout.
- C. Attached Work: Fasten to concrete and solid masonry with expansion anchors and to hollow masonry with toggle bolts in cells, unless otherwise indicated. Drill holes for fasteners to exact required size using power tools.

END OF SECTION

SECTION 05 71 00 – MISCELLANEOUS METALS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

1. Installation accessories.
2. Channels, metal pans and plates.
3. Fry Reglet Reveals and Moldings.
4. Metal blocking

1.2 REFERENCE STANDARDS

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. American Society for Testing and Materials (ASTM).
 - A501 Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
 - A568 Standard Specification for Steel, Sheet, Carbon, and High Strength Low Alloy, Hot Rolled and Cold Rolled
 - A325 Standard Specification for Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength Structural Bolts
 - A563 Standard Specification for Carbon and Alloy Steel Nuts
 - E70 Standard Test Method for PH of Aqueous Solutions with the Glass Electrode
 - E985 Standard Specification for Permanent Metal
2. ANSI/BHMA (A156.9-2003) American National Standard for Cabinet Hardware
3. American Welding Society (AWS).
 - D1.1 “Structural Welding Code – Steel”
 - D1.2 “Structural Welding Code – Sheet Steel”

1.3 SUBMITTALS

- A. Shop Drawings
1. Submit Shop Drawings for all grilles, control joints and trims. Installation to be coordinated with field conditions, adjacent materials installation. Sizes will vary.

B. Manufacturer's Data

Submit manufacturers catalog data for:

1. Fry Reglet Reveals and Moldings
2. Paint Grade Products
3. Adjustable Shelving Metal Brackets

1.4 PERFORMANCE CRITERIA

- A. Assume all responsibility for the correctness and accuracy of installation, and take and verify all measurements at the Building. The Contractor shall assume full responsibility for the correctness of dimensions and fit.

1.5 QUALITY ASSURANCE

- A. Fabricators: Five (5) years minimum experience in steel fabrications of similar Work.
- B. Welding – Shop & Field: Certify that each welder has satisfactorily passed qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- C. Comply with requirements specified herein of the New York City Building Code.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Fry Reglet Reveals and Moldings:
- | | |
|--|---|
| <ol style="list-style-type: none">1. Fry Reglet Corporation
1377 Stonefield Court
Alpharetta, GA 30004
Phone: 800-237-9773
Fax: 800-200-43972. Or approved equal. | <p>Fry Reglet Corporation
12342 Hawkins Street
Santa Fe Springs, CA 90670
Phone: 800-237-9773
Fax: 800-200-4397</p> |
|--|---|

2.2 MATERIALS

- A. Steel plate, angles, channels, beams, bars and other hot-rolled Sections: ASTM A36.
- B. Bolts: ASTM A325: a563 nuts.
- C. Fry Reglet Reveals and Moldings:

1. Reveal: Reveal Channel Screed DCS-625-50
 - a. Reveal Finish: Anodized Aluminum
2. Molding: L Trim Molding DRML-625
 - a. Molding Finish: Paint to match adjacent wall, as per the Design Documents.

2.3 PAINTING

- A. Remove oil, grease and similar contaminants in accordance with SSPC SP-1 “Solvent Cleaning”, prior to any additional surface preparation specified.
- B. Immediately after surface preparation, paint as per Painting Section.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, shop drawings, diagrams, instructions, and directions for installation of anchorages, such as inserts, sleeves, anchor bolts and miscellaneous items having integral anchors.

3.2 INSTALLATION

- A. Fastening to Construction: See details on drawings.

3.3 CONNECTIONS

- A. Other connections: Fillet welds; grind smooth, where exposed.
- B. Field Welding: Comply with AWS for procedures of welding, appearance and quality of welds made, and methods used in correcting welding work.
- C. Coordination: Coordinate and schedule this work with the work of other trades. Provide soffit clips on stringers required for securing other work, so as to achieve the proper fire rating.

END OF SECTION 05 71 00

06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions shall apply to the Work of this section.

1.2 DESCRIPTION OF WORK

- A. Provide rough carpentry Work as indicated on the Drawings, as required for the completed Work of this Contract, and as specified herein, including, but not limited to, the following:
 - 1. Wood Grounds, nailing strips, blocking, furring, nailers, and framing.
 - 2. Rough hardware, including nails, screws, anchors, brackets, braces, bolts, nuts, fittings, and other devices required for the proper fitting, connecting, and erecting of the Work.
 - 3. Fire-retardant treatment for wood.
 - 4. Miscellaneous Lumber and plywood.

1.3 REFERENCES

- A. U.S. Department of Commerce.
- B. American Plywood Association (APA).
- C. Western Wood Product Association (WWPA).
- D. Southern Pine Inspection Bureau (SPIB).
- E. Redwood Inspection Service (RIS).
- F. American Wood Preservers' Association (AWPA).
- G. American Society for Testing and Materials (ASTM).
- H. Underwriters Laboratories, Inc. (UL).
- I. Federal Specifications (FS).
- J. American Lumber Standards Committee (ALSC).
- K. West Coast Lumber Inspection Bureau (WCLIB).
- L. American Wood Preservers Bureau (AWPB).
- M. National Fire Protection Association (NFPA).

1.4 SUBMITTALS

- A. Quality Control Submittals
 - 1. Certificates: Certification for the following wood treatments:
 - a. Dip Treatment: Certification by treating plant stating chemical solutions used, submersion period, and conformance with applicable standards.
 - b. Pressure Treatment: Certification by treating plant stating chemicals and process used, net amount of chemical preservative retained, and conformance with specified standards.
 - c. Waterborne Preservatives: Certified written statement that moisture content of treated materials was reduced to a maximum of 19 percent prior to shipment to Project site.
 - d. Fire-Retardant Treatment: Certification by treating plant stating treated material complies with specified standards and treatment will not bleed through specified finishes.

1.5 QUALITY ASSURANCE

- A. Mill and Producers Mark

Each piece of lumber and plywood shall be gradestamped indicating type, grade, mill, and grading agency certified by the Board of Review of the American Lumber Standards Committee. Mark shall appear on unfinished surface, or ends of pieces with finished surfaces.

 - 1. Fire-Retardant Treated Material: Accredited testing agency mark on each piece of wood indicating compliance with the fire hazard classification.
- B. Standards

Comply with the following unless otherwise specified or indicated on the Drawings:

 - 1. Lumber: American Softwood Lumber Standard PS 20 by the U.S. Department of Commerce. Comply with applicable provisions by each indicated use.
 - 2. Plywood: Product Standard PS 1 for Softwood Plywood, Construction and Industrial by the U.S. Department of Commerce.
 - 3. Plywood Installation: APA Design/Construction Guide, by the American Plywood Association (APA), except as indicated otherwise.
 - 4. Grading Rules:
 - a. Douglas Fir, Hem-Fir, Idaho White Pine, and other Western Woods: Western Wood Products Association (WWPA) or West Coast Lumber Inspection Bureau (WCLIB).
 - b. Southern Pine: Southern Pine Inspection Bureau (SPIB).
 - c. Redwood: Redwood Inspection Service (RIS).
 - 5. Fire-Retardant Treatment: American Wood Preservers' Association (AWPA) Standards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials dry during delivery. Store materials 6" minimum above ground surface. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation between stacks.
- B. Cover stored materials until ready for use for protection from moisture. Place and anchor covering in a manner which will assure good ventilation under the covering.

1.7 PROJECT CONDITIONS

- A. Correlate location of supporting members to allow proper attachment of other Work.

PART 2 - PRODUCT

2.1 LUMBER

- A. General:
Furnish seasoned dimensional lumber dressed to nominal sizes indicated with 19 percent maximum moisture content at time of dressing, marked "S-DRY". Comply with dry size requirements of PS 20.
 - 1. Dress: Surfaced 4 sides (S4S) unless otherwise indicated.
- B. Miscellaneous Lumber:
Standard grade, No. 3 grade, or better grade of the following species unless otherwise indicated:
 - 1. Nailers and Blocking: Douglas Fir, Hem-Fir, Idaho White Pine or Southern Pine.
 - 2. Furring: Douglas Fir or Southern Pine.

2.2 MISCELLANEOUS MATERIALS

- A. Adhesive:
APA Specification AFG-01.

2.3 FIRE-RETARDANT TREATMENT

- A. All lumber is to be fire-retardant treated, provide "FR-S" lumber, complying with AWWA Standards for pressure impregnation with fire-retardant chemicals to achieve a flamespread rating of 25 or less, when tested in accordance with UL Test 723, ASTM E84 or NFPA Test 255.
 - 1. Provide UL label or identifying mark on each piece of fire-retardant lumber.
 - 2. Redry treated items to a maximum moisture content of 19 percent after treatment.
- B. Fire-retardant Treated Plywood:
Comply with APA requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
Examine substrate and supporting structure on which rough carpentry is to be installed for defects that will adversely affect the execution and quality of the Work. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION - GENERAL

- A. Do not use units of material with defects which impair the quality of the Work and units which are too small to fabricate the Work with minimum joints or with optimum joint arrangement.
- B. Install Work accurately to required lines and levels with members plumb and true, accurately cut and fitted and securely fastened. Closely fit rough carpentry to other associated construction.
- C. Securely attach carpentry Work to substrates by anchoring and fastening as indicated, or, if not indicated, as required by the referenced standards. Select fasteners of size that will not penetrate through members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required. Set nail heads in exposed Work which is to be painted or stained and fill resulting holes.
- D. Fire-retardant Wood
Do not rip or mill; only end cuts, drilling holes and joining cuts shall be permitted.

3.3 WOOD NAILERS, BLOCKING, AND GROUNDS

- A. Install required items where indicated and where required for support, attachment or screeding of other Work. Form to shapes indicated or required. Coordinate locations and cut and shim as required to provide items at true and level planes to receive Work to be attached. Install closure strips to nailers at all edges.
 - 1. Attach to substrates as indicated; if not indicated, size and space fasteners as required to support applied loading. Maximum spacing of fasteners shall not exceed 16".

3.4 PLYWOOD APPLICATIONS

- A. Comply with printed installation requirements of the APA Design Construction Guide for plywood application unless otherwise noted.

3.5 ROUGH HARDWARE

- A. Furnish all rough hardware, such as nails, bolts, clips, and all other rough hardware required to secure the carpentry work in place, unless otherwise specified.

END OF SECTION 06 10 00

SECTION 06 10 53 - WOOD NAILERS AND BLOCKING

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Non-Loading Bearing Framing and Furring: Section 09 22 13

1.02 QUALITY ASSURANCE

- A. Mill and Producer's Stamp: Each piece of lumber shall bear a stamp indicating type, grade, mill, and grading agency.
 - 1. Pressure treated wood shall bear a stamp or tag indicating the name of the treating company, year treated, preservative used, the level of treatment, intended use (appropriate AWPAs Standard), and logo of inspecting company.

1.03 STORAGE

- A. Store lumber a minimum of 6 inches off the ground, in a dry, well-ventilated place, protected from the weather.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Lumber: "Standard" Grade Douglas Fir, Hem-Fir, White Pine, Southern Pine, or Spruce-Pine-Fir pressure preservative treated in accordance with the American Wood Preservers Association (AWPA) Standard U1, Commodity Specification A for the requirements listed under Use Category UC2 and kiln dried to 19 percent moisture content after treatment.
 - 1. Use Category UCFA and UCFB: Wood nailers and blocking intended for fire protection and is used in either interior weather protected (UCFA) or exterior construction, exposed to weather (UCFB).
- B. Nails, Screws, and Bolts: ASTM A653 Class G185 hot dipped galvanized, zinc or cadmium plated, or silicon bronze.
 - 1. Screws and Bolts for fastening to Aluminum: Stainless steel, Type 304 or 316.
- C. Expansion Anchors: G185 Hot dipped galvanized steel wedge anchors, FS FF-S-325, Group II, Type 4, Class 1.
- D. Toggle Bolts: Cadmium or zinc plated tumble - wing type; FS FF-B-588.
- E. Self Threading Masonry Screws: Zinc Plated; "Tapcon" by Elco Industries, Inc., 1111 Samuelson Rd., PO Box 7009, Rockford, IL 61125-7009, (815) 397-5151.

- F. Separation Membrane For Aluminum Metals: Self adhering, self sealing, rubberized asphalt sheet membrane.
1. Physical Properties:
 - a. Thickness: 40 mils minimum ASTM D 3767 Method A.
 - b. Tensile strength: 250 psi ASTM D 412.
 - c. Elongation (ultimate failure of the rubberized asphalt) 250% ASTM D 412 Die C Modified).
 - d. Permeance: 0.05 Perms max.) ASTM E 96.
 2. "Ice And Water Shield" by W.R. Grace Co., 62 Whittemore Ave., Cambridge, MA 02140, (800) 354-5414; "Deck Guard" by Polyguard Products Inc., P.O. Box 755, Ennis, TX 75120, (800) 541-4994; "MetalSeal" by NEI Advanced Composite Technology, 50 Pine Road, Brentwood, NH, (800) 998-4634.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install nailers and blocking true to line and plane within a tolerance of 1/8 inch in 10 feet.
- B. Fit joints neatly with no more than 1/16 inch space between abutting members.
- C. Do not install nailers or blocking across bonding expansion joints.
- D. Attach nailers and blocking securely as required to properly support the items that will be attached to them.
- E. Space fasteners equally at not more than 16 inches on center and 4 inches from each end of each member, unless noted otherwise. Secure the nailers and blocking with the following types of fasteners:
 1. To Cast-In-Place Concrete, Solid Concrete Masonry Units, and Brick: Use expansion anchors or self-threading masonry screws.
 2. To Faces of Hollow Concrete Masonry Units: Use toggle bolts.
 3. To Tops of Hollow Concrete Masonry Units: Use anchor bolts extending to course below, embedded in 3000 psi concrete filled cores.
 4. To Wood: Use nails or screws.
 5. To Metal: Use bolts or self-tapping screws.
- F. Countersink fasteners if they interfere with the proper installation of items to be attached to the nailers and blocking.

END OF SECTION

SECTION 07 20 12 – MISCELLANEOUS BUILDING INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide all insulation not explicitly specified in other Sections and drawings.

1.2 SUSTAINABILITY REQUIREMENTS

- A. The Contractor shall implement practices and procedures to meet the Project's sustainable requirements. The Contractor shall ensure that the requirements related to these goals, as defined in Specification Section 01 74 19 Construction Waste Management, and in this Section, are implemented to the fullest extent. Substitutions or other changes to the work shall not be proposed by the Contractor or their sub-contractors if such changes compromise the stated Sustainable Design Performance Criteria.
- B. Sustainability requirements included in the Section are as follows:
 - 1. Meet established minimum post and pre-consumer % recycled content for specified insulation.
 - 2. Documentation of Recycled materials.

1.3 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. American Society for Testing and Materials (ASTM)
- C. New York City Board of Standards and Appeals (BSA) approvals, or New York City Materials Equipment Acceptance (MEA) approvals.

1.4 SUBMITTALS

- A. Samples
 - 1. Submit 12" x 12" sample of each type of insulation.
 - 2. Sample shall clearly indicate manufacturer's label and material designation.

- B. Manufacturer's Catalog Information
Provide current manufacturers' catalog information and data sheets on each type of insulation furnished.
- C. Sustainable Submittals:
 - 1. Submit Contractor's Sustainable Materials Form with complete information on recycled content for materials provided under the work of this section in accordance with Section S01352, Sustainability Requirements. Include cost of materials and percentage, by weight, of materials that have post-consumer or pre-consumer recycled content for the following:
 - a. Mineral fiber blanket and batt.
 - 2. Submit documentation of recycled content in extruded foam and fiber insulation materials – product data, mix design information, or manufacturer's statement.
 - 3. Submit Contractor's Sustainable Materials Form with complete information on regional content for each mineral fiber insulation provided under the work of this section in accordance with Section S01352, Sustainability Requirements. Include cost of all insulation materials and distance in miles to point of materials extraction and manufacture.
 - 4. Submit documentation of regional materials – product data, mix design information, or manufacturer's statement.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be properly identified with manufacturer's name.
- B. Store materials on the site in a dry area protected from the weather.
- C. Do not leave exposed in areas where traffic might cause mechanical damage to product.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Dow Chemical U.S.A
- B. UC Industries, Inc.
- C. Thermafiber Corporation
- D. Owens – Corning
- E. CertainTeed
- F. Roxul, Inc.

2.2 MATERIALS

- A. Mineral Fiber Blanket or Batt (ASTM C665)
 - 1. Foil-backed insulation: Type III, Class A. Density: 3 lbs./cubic foot minimum.
 - 2. Blanket and batt insulation units shall be manufactured with a minimum of 20% of pre-consumer content materials.
 - 3. Fungi Resistance: Insulation and facing shall be fungi resistant when tested in accordance with ASTM C1338-00

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are free of defects or protrusions and ready to receive insulation. Do not begin installation until defects are remedied.

3.2 INSTALLATION

- A. Install insulation as shown on Drawings and in accordance with manufacturer's instructions.
- B. Butt units tightly.
- C. Shape insulation around obstructions by means of saw, knife, or other sharp tool.

END OF SECTION 07 20 12

SECTION 07 81 00 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Statement of Special Inspections: BDC 406.

1.02 DEFINITIONS

- A. Fireproofing Manufacturer: Manufacturer of primary fire resistive materials.
- B. Fire Resistance Rating: Time rating (in hours) in accordance with Underwriters Laboratories Fire Resistance Directory listings.

1.03 PERFORMANCE REQUIREMENTS

- A. Fire Resistance Rating: Fireproofing shall meet the existing indicated hourly rating.
- B. Fire Hazard Classification: Fireproofing shall be listed in the Underwriters Laboratories Building Materials Directory with the following performance properties:
 - 1. Flame Spread: 10 or less.
 - 2. Smoke Developed: 5 or less.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's product descriptions for each required material.
 - 1. Fireproofing: Include fireproofing manufacturer's application instructions, including primer/adhesive requirements and recommended minimum thickness and density for each required hourly rating.
- B. Quality Control Submittals:
 - 1. Certificates:
 - a. UL fire resistance rating certificate.
 - b. UL fire hazard classification certificate.
 - c. Fireproofing manufacturer's certification (or confirming independent test reports) that fireproofing meets the performance requirements and physical properties.
 - 2. Applicators Qualifications Data: Information confirming that the firm, supervisor, and workers have the specified qualifications.

1.05 QUALITY ASSURANCE

- A. Applicators Qualifications:
 - 1. Firm: Approved by fireproofing manufacturer.
 - 2. Supervisor: Not less than 5 years of experience in the application of sprayed fire resistive material.

3. Workers: Not less than one year of experience in the application of sprayed fire resistive material.
- B. Fireproofing: Fire resistive materials free of all forms of asbestos, formulated for sprayed-on application, factory packaged, and complying with specified performance requirements and physical properties.
 1. Source Limitations: Obtain fireproofing materials through one source from a single manufacturer.
 - C. Equipment: Use mixing and application equipment recommended by the fireproofing manufacturer.
 - D. Fireproofing Certifications:
 1. UL fire resistance rating certificate.
 2. UL fire hazard classification certificate.
 3. Affidavit by fireproofing manufacturer (or confirming independent test reports) certifying that fireproofing meets the performance requirements and physical properties.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fireproofing materials in factory packaged and sealed containers, clearly labeled, bearing manufacturer's name, product name, product type, batch number, date, and UL labels for classifications.
- B. Store materials in an enclosed area protected from the elements, and maintain within the manufacturer's recommended temperature limits.
- C. Handle materials in accordance with manufacturer's printed instructions.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements: Continuously heat spaces to receive flooring to a temperature of 68 degrees F for at least 48 hours prior to flooring installation, during the installation, and for 48 hours after installation. Make provision for and maintain adequate ventilation for proper curing of fireproofing as required by conditions.
- B. Make provision for and maintain adequate ventilation for proper curing of fireproofing as required by conditions.
- C. Compatibility Coordination: Where fireproofing is missing coordinate shop paint for structural steel, steel joists, and steel decks with the fireproofing system to ensure that they are compatible.
- D. Apply fireproofing prior to installation of ductwork, piping, conduits, and other suspended items. However, hangers, clips and other supports for these items shall be installed before application of fireproofing.

PART 2 - PRODUCTS

2.01 TYPE 1 FIREPROOFING

- A. Use: Interior.
- B. Physical Properties:
 - 1. Dry Field Density (ASTM E 605): 15 lb/cu ft minimum average.
 - 2. Cohesion/Adhesion (Bond Strength) (ASTM E 736): Minimum average 200 lb/sq ft.
 - 3. Compressive Strength (ASTM E 761): Minimum 1000 lb/sq ft.
 - 4. Impact (Bond Impact) Resistance (ASTM E 760): Shall not crack or delaminate.
 - 5. Effect of Deflection (ASTM E 759): Shall not crack or delaminate.
 - 6. Corrosion Resistance (ASTM E 937): No evidence of corrosion.
 - 7. Air Erosion (ASTM E 859): Maximum 0.025 g/sq ft weight loss.

2.04 ACCESSORIES

- A. Primer/Adhesive: Primer or adhesive recommended by the fireproofing manufacturer to obtain required bond strength for the specific fireproofing and substrate.
- B. Sealer/Topcoat: Surface sealer and/or protective topcoat, as specified; materials as recommended by the fireproofing manufacturer for the intended use and conditions unless otherwise indicated.
 - 1. Color of Exposed Material: Manufacturer's standard.
- C. Water: Potable, cool, fresh, and free from such amounts of organic and mineral substances which would be harmful to the fireproofing.
- D. Furring and Corner Beads: Accessories recommended by the fireproofing manufacturer for the specific fireproofing use/application and substrate.
- E. Sealant: Sealant recommended by the fireproofing manufacturer for the specific fireproofing use/application and substrate.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Examine the substrate and conditions under which fireproofing is to be applied. Do not proceed with the fireproofing Work until unsatisfactory conditions have been corrected.
 - 1. Verify that hangers, clips, sleeves, and other items that will penetrate the fireproofing are in place.
 - 2. Check paint on substrate for compatibility with primer/fireproofing and adequacy of bond strength in accordance with fireproofing manufacturer's instructions.

3.02 PREPARATION

- A. Protection:
 - 1. Protect surfaces that are not to receive fireproofing with suitable covers.
 - 2. Cover openings in the work areas with suitable temporary closures.

- B. Surface Preparation:
 - 1. Remove dirt, dust, oil, grease, loose paint and rust, mill scale, and other foreign matter that may impair the bonding of the fireproofing to the substrate. Clean substrate free of contamination from chemicals and solvents.
 - 2. Apply primer/adhesive where necessary to obtain bond strength of fireproofing to steel shop paint and where recommended by the fireproofing manufacturer. Follow manufacturer's instructions.
 - 3. Install reinforcement and other metal items where shown on the Drawings, where recommended by the fireproofing manufacturer, and when required by the fire rated design. Install reinforcement and accessories in accordance with fireproofing manufacturer's instructions, unless otherwise indicated.

3.03 APPLICATION

- A. Apply the fireproofing in accordance with UL fire test report and the manufacturer's application instructions.
 - 1. Application Method: Apply the fireproofing material by spraying, except use trowel application where spraying is impractical.

- B. Thickness and density of fireproofing shall be in accordance with the approved product data and as required to produce the hourly fire resistance rating shown on the Drawings.

- C. Apply the fireproofing in a monolithic covering of uniform density and texture, free of seams, staging breaks, holes, voids, and other defects that might impair the fire resistance. Install the fireproofing to the full required thickness over entire area of each surface to be covered.
 - 1. Stop-off application operation at natural stopping points, such as inside corners, wherever possible.
 - 2. Edge of fireproofing adjoining other materials shall be sharp and clean, without overlapping.

- D. Finish of Fireproofing: Unless otherwise indicated, finish shall be a uniform surface texture as applied, without noticeable icicles or sagging.

- E. Sealer or Topcoat: Apply sealer or topcoat on surfaces of fireproofing in accordance with the fireproofing manufacturer's application instructions.

3.04 FIELD QUALITY CONTROL

- A. Testing Agency: The College will engage a qualified testing agency to perform special inspections, tests, and prepare reports. The testing agency will interpret the tests and indicate in each report whether the tested work complies with or deviates from project requirements. The testing agency will perform tests in accordance with the New York State Uniform Fire Prevention and Building Code (BCNYS).

3.05 ADJUSTING

- A. Correct fireproofing in damaged areas, and areas with less than the required thickness or standard of quality.

3.06 CLEANING

- A. After completion of the fireproofing in each containable area of the project, remove protective covers and temporary closures, and clean surfaces that have been soiled performing the Work.

END OF SECTION

SECTION 07 84 00 - FIRESTOPPING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide firestopping at all penetrations and juncture joints of fire-rated walls, floors and ceilings in accordance with the requirements of the NYC Building Code.
- B. Firestopping shall be provided:
 - 1. At all penetrations through fire rated partitions and assemblies.
- C. If exposed to view fire stopping shall be painted to match adjacent surface.

1.2 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
 - 1. American Society for Testing and Materials (ASTM)
 - 2. Underwriters Laboratories, Inc. (UL)
 - 3. National Fire Protection Association (NFPA)
 - 4. Warnock Hersey

1.3 DESIGN REQUIREMENTS

- A. Technical Requirements
 - 1. Firestopping materials shall be UL Classified as "Fill, Void or Cavity Material" for use in Through-Penetration Firestop Systems.
 - 2. Firestop Systems shall provide a fire resistance rating at least equal to the hourly resistance rating of the fire-rated barrier and resist passage of smoke and other gases.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product information for each type of firestopping/smoke seal and assembly installed, including application instructions and specifications.
- B. Quality Control Submittals
 - 1. Certificates
 - a. Furnish manufacturer's certification that materials meet or exceed specification requirements for each of the performance tests specified in Part 2. Provide testing certification.

- b. Furnish applicator's certification that material has been completed as specified to meet fire resistance ratings, thickness requirements, and application requirements of the applicable assembly.
- c. Furnish UL, BSA, MEA, or OTCR approval of material.
- d. Furnish certificate stating each material is 100% asbestos free.
- 2. Contractor Qualifications
 - a. Provide proof of Manufacturer and Applicator qualifications specified under "Quality Assurance".
- C. Guarantee
 - 1. Contractor and installer's installation guarantee.

1.5 QUALITY ASSURANCE

- A. Qualifications
 - 1. Manufacturer
Company specializing in the manufacture of firestopping/smoke seal materials to be used in this Contract shall have a minimum of five years experience.
 - 2. Installer: All firestopping Work shall be performed by a Subcontractor who will be acceptable to the firestopping manufacturer in the application of its products and systems and have a minimum of three years experience and shall have worked on at least two projects with similar quantities of materials used.
- B. Regulatory Requirements
 - 1. Building Code: Material and application shall meet the requirements for firestopping materials in accordance with the NYC Building Code.
 - 2. Material must have UL or NYC BSA, MEA or OTCR approval for each assembly utilized. Comply with the following for firestopping that is required to be in compliance with BC 712 of the 2008 NYC Building Code:
 - a. ASTM E84 - Surface Burning Characteristics of Building Materials.
 - b. ASTM E814 - Fire Tests of Through Penetration Firestops.
 - c. U.L. 1479 - Fire Tests of Through-penetration `Firestops.
 - d. U.L. - Fire Resistance Directory; Through-Penetration Firestop Systems (XHEZ), and Fill, Void or Cavity Materials (XHHW).
 - e. U.L. 723 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. Manufacturer's Certification
 - 1. Manufacturer shall provide written certification stipulating that its products and systems used in this Project, if installed in accordance with the manufacturer's recommendations, shall provide the firestopping specified in this Section, as indicated by its UL rating for that specific installation.

2. The certification shall not include either or both of the following statements, or variations thereof:
"Owner or User shall determine suitability of the product or system for its intended use and assume all risks and liabilities connected therewith" and,
"Owner or User shall test application of product or system for its specific use".

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, unopened packages bearing name of manufacturer, product identification, and the proper UL labels for fire hazard and fire-resistance classification.
- B. Store materials off ground, under cover, and away from damp surfaces, keep dry.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain air and substrate temperature at a minimum temperature of 50°F for 24 hours before, during, and for 24 hours after application of the material or as required by the product literature, which ever is more stringent. Contractor shall provide enclosures with heat to maintain temperatures.

1.8 GUARANTEE

- A. Submit a guarantee, executed by the Contractor and co-signed by the installer, agreeing to repair/replace firestopping work performed under this Contract which has cracked, flaked, dusted excessively, peeled, or has separated or fallen from the substrate due to defective workmanship for a period of two (2) years from the date of substantial.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Hilti Construction Chemicals, Inc., Tulsa, OK.
- B. The Carborundum Company, Niagara Falls, NY.
- C. 3M Fire Protection Products, St. Paul, MN.
- D. Bio Fireshield, Inc., Concord, MA
- E. Tremco Sealant Division, Tremco LTD, Toronto, Ontario, Canada.
- F. Specified Technologies, Inc., Somerville, NJ
- G. W. R. Grace & Co., Macungie, PA
- H. RectorSeal Corp., Houston, TX

2.2 MATERIALS

- A. Grout and sealant systems, as well as integral firestopping sleeves and membranes, shall meet or exceed requirements as specified in Part 1 of this Section and shall be acceptable to the Architect.
- B. Firestopping systems shall meet the requirements of ASTM E814, which include, but are not limited to, the following:
 - 1. Prevent flame pass-through.
 - 2. Restrict temperature to not exceed 325°F over ambient on side of assembly opposite flames.
 - 3. Provide a positive smoke seal.
 - 4. Withstand hose stream test with a minimum positive pressure differential of 0.01 inch (2.49 pa.)
 - 5. Provide an F rating of not less than the required fire rating of the wall penetrated.
- C. Firestopping materials shall be asbestos-free, emit no toxic or combustible fumes and be capable of maintaining an effective barrier against flame, smoke, gas, and water in compliance with requirements of this Section.
- D. Firestopping materials/systems shall be flexible to allow for normal movement of building structure and penetrating items(s) without affecting the adhesion or integrity of the system.
- E. Firestopping materials shall not require hazardous waste disposal of used containers/packages.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine and confirm the compatibility of surfaces to receive firestopping materials. Verify that surfaces are sound, clean and dry and are ready to receive the firestopping.
- B. Verify that penetration elements are properly located and securely fixed, with the proper space between the penetration element and surfaces of the opening.

3.2 PREPERATION

- A. Protect adjacent surfaces and equipment from damage.
- B. Clean surfaces of opening.

3.3 INSTALLATION

- A. Install firestopping system in strict accordance with the manufacturer's instructions to obtain the fire-rating required at the specific location
- B. Provide escutcheons for piping at each side of penetration.
- C. Paint firestopping to match walls and ceiling where exposed.

3.4 FIELD QUALITY CONTROL

- A. Contractors Responsibility for Quality Control
 - 1. Inspect all installations to ensure that all work meets the requirements specified as the Work progresses.
 - 2. Do not cover firestopping work until it is accepted and approved.

3.5 CLEANING

- A. Remove excess materials, droppings, and debris; remove excess materials from adjacent surfaces.

3.6 PROTECTION

- A. Protect firestopping installations from damage until completion of all Project Work.

END OF SECTION 07 84 00

SECTION 07 92 00 – JOINT SEALANTS

PART 1 – GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- | | | |
|----|-------------------------------|------------------|
| A. | Hollow Metal Doors and Frames | Section 08 11 13 |
| B. | Fire Rated Glass and Framing | Section 08 88 13 |
| C. | Gypsum Board Assemblies | Section 09 29 00 |

1.2 SUBMITTALS

- A. Product Data: Catalog sheets, specifications, and installation instructions for each product specified except miscellaneous materials.
- B. Samples:
 - 1. Sealants: One pint or standard tube.
 - 2. Joint Fillers: 12 inch long section
 - 3. Joint Primer/Sealer/Conditioners: One pint.
 - 4. Backer Rods: 12 inch long section.
 - 5. Bond Breaker Tape: 12 inch long section.

1.3 QUALITY ASSURANCE

- A. Container Labels: Include manufacturer's name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable), and packaging date or batch number.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Temperature: Follow manufacturer's directions.
 - 2. Ventilation: Provide sufficient ventilation wherever sealants, primers, and other similar materials are installed in enclosed spaces. Follow manufacturer's recommendations.
- B. Protection:
 - 1. Protect all surfaces adjacent to sealants with non-staining removable tape or other approved covering to prevent soiling or staining.
 - 2. Protect all other surfaces in the Work area with tarps, plastic sheets, or other approved coverings to prevent defacement from droppings.

PART 2 – PRODUCTS

2.1 SEALANTS

- A. GE Silicone II paintable sealant for sound penetrations or approved equal.
- B. USG Acoustical sealant or approved equal
- C. Sealant for exterior glazing, GE Silicone based.

- D. Sealant Colors: For exposed materials provide color as indicated or, if not indicated, as selected by the Architect from manufacturer's standard colors. For concealed materials, provide the natural color which has the best overall performance characteristics.

2.2 JOINT FILLERS

- A. Expanded Polyethylene Joint Filler: Flexible, compressible, closed-cell polyethylene of not less than 10 psi compression deflection (25 percent).

2.4 MISCELLANEOUS MATERIALS

- A. Joint Primer/Sealer/Conditioner: As recommended by the sealant manufacturer for the particular joint surface materials and conditions.
- B. Backer Rod: Compressible rod stock of expanded, extruded polyethylene.
- C. Bond Breaker Tape: Polyethylene or other plastic tape as recommended by the sealant manufacturer; non-bonding to sealant; self adhesive where applicable.
- D. Cleaning Solvents: Oil free solvents as recommended by the sealant manufacturer. Do not use re-claimed solvents.
- E. Masking Tape: Removable paper or fiber tape, self-adhesive, non-staining.
- F. Provide setting blocks and spacing material at exteriors windows.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine all joint surfaces for conditions that may be detrimental to the performance of the completed Work. Do not proceed until satisfactory corrections have been made.

3.2 PREPARATION

- A. Clean joint surfaces immediately before installation of sealant and other materials specified in this Section.
 - 1. Remove all loose materials, dirt, dust, rust, oils and other foreign matter that will impair the performance of materials installed under this Section.
 - 2. Remove protective coatings and similar materials from joint faces with manufacturer's recommended solvents.
 - 3. Do not limit cleaning of joint surfaces to solvent wiping. Use methods such as grinding, acid etching or other approved and manufacturer's recommended means, if required, to clean the joint surfaces, assuring that the sealant materials will obtain positive and permanent adhesion.
- B. Set joint fillers at proper depth and position as required for installation of bond breakers, backer rods, and sealants. Do not leave voids or gaps between the ends of joint filler units.

- C. Priming Joint Surfaces:
 - 1. Prime joints if recommended by the manufacturer's printed instructions.
 - 2. Do not allow the primer/sealer to spill or migrate onto adjoining surfaces.

3.3 JOINT BACKING INSTALLATION

- A. Install bond breaker tape in relaxed condition as it comes off the roll. Do not stretch the tape. Lap individual lengths.
- B. Install backer rod of sufficient size to fill the joint width at all points in a compressed state. Compress backer rod at the widest part of the joint by a minimum of 25 percent. Do not cut or puncture the surface skin of the rod.

3.4 SEALANT INSTALLATION

- A. Except as shown or specified otherwise, install sealants in accordance with the manufacturer's printed instructions.
- B. Install sealants with ratchet hand gun or other approved mechanical gun. Where gun application is impractical, install sealant by knife.
- C. If low temperature makes application difficult, preheat sealants using manufacturer's recommended heating equipment.
- D. Finishing: Tool all vertical, non-sag sealants so as to compress the sealant, eliminating all air voids and providing a neat smoothly finished joint. Provide slightly concave joint surface, unless otherwise indicated or recommended by the manufacturer.
 - 1. Use tool wetting agents as recommended by the sealant manufacturer.

3.5 CLEANING

- A. Immediately remove misapplied sealant and droppings from metal surfaces with solvents and wiping cloths. On other materials, remove misapplied sealant and droppings by methods and materials recommended in writing by the manufacturer of the sealant material.
- B. After sealants are applied and before skin begins to form on sealant, remove all masking and other protection and clean up remaining defacement caused by the Work.

END OF SECTION 07 92 00

SECTION 08 06 71 – DOOR HARDWARE SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section references specification sections relating to commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding Doors.
 - 3. Other doors to the extent indicated.
- B. Commercial door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical and access control door hardware.
 - 3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
 - 4. Automatic operators.
 - 5. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section “Door Hardware.”
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

- D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1.6 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. Refer to “PART 3 – EXECUTION” for required specification sections.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

- A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
1. Quantities listed are for each pair of doors, or for each single door.
 2. The supplier is responsible for handing and sizing all products.
 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.
1. Section 08 06 71 – Door Hardware.
- C. Manufacturer’s Abbreviations:
1. MK - McKinney
 2. RU - Corbin Russwin
 3. RF - Rixson
 4. RO - Rockwood
 5. PE - Pemko

Hardware Sets

Set: 1.0

Doors: 1

3 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D MK 080671
1 Entrance Lock	CL3161 NZD D214 CT6R	626 RU 080671
1 Electric Strick	6223	630 VON
1 Permanent Core	To Match Existing	626 RU 080671
1 Surface Closer	DC6200 A10	689 RU 080671
1 Wall Stop	409	US26D RO 080671
1 Gasketing	S88BL	PE 080671

Notes

1. Door and frame to be prepped to accept owner supplied Sentrol 1076C-N Recess Contact by others.
2. Electrified strike to be connected to owner supplied HID MultiClass/Mag Stripe Reader.
3. Cylinder to be 6-pin interchangeable core.

Set: 2.0

Doors: 2

3 Hinge, Full Mortise	TA2714 [NRP]	US26D MK 080671
1 Entrance Lock	CL3161 NZD CT6R	626 RU 080671
1 Permanent Core	To Match Existing	626 RU 080671
1 Conc Overhead Stop	1-_36	689 RF 080671
1 Surface Closer	DC6200 A10	689 RU 080671
1 Wall Stop	409	US26D RO 080671
1 Gasketing	S88BL	PE 080671

1. Cylinder to be 6-pin interchangeable core.

END OF SECTION 08 06 71

08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Standard and custom hollow metal doors and frames.
- 2. Louvers installed in hollow metal doors.
- 3. Light frames and glazing installed in hollow metal doors.

- B. Related Sections:

- 1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
- 2. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
- 3. Division 08 Section "Door Hardware".
- 4. Division 09 Section "Interior Painting" for field painting hollow metal doors and frames.
- 5. Division 09 Section "Gypsum Board Assemblies".

- C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
- 2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
- 3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- 4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- 5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
- 6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- 7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- 9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
- 10. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

11. ASTM E 413 - Classification for Rating Sound Insulation.
12. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
13. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
14. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
15. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
16. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
17. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
18. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
- D. Samples for Verification:
 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are 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. Provide labeled glazing material.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages 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.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CECO Door Products.
 - 2. Curries Company.
 - 3. Steelcraft.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide 2 1/4" doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
- B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Design: Flush panel.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
 - 3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
 - 4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
 - 5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
 - 6. Manufacturers Basis of Design:
 - 1. CECO Door Products Legion Series.
 - 2. Curries Company 707 Series.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners.
 2. Fabricate frames, with the exception of slip-on drywall types, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.
 3. Frames for Steel Doors: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 4. Frames for Borrowed Lights: Minimum 16 gauge (0.053-inch-1.3-mm-) thick steel sheet.
 5. Manufacturers Basis of Design:
 - a. CECO Door Products BQ/BU/DQ/DU/BR/DR Series (Drywall Profile).
 - b. CECO Door Products SQ/SU/SR Series (Masonry Profile).
 - c. Curries Company C/CM/CG Series (Drywall Profile).
 - d. Curries Company M/G Series (Masonry Profile).
- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, 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.
 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames

- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.
- F. Glazing: Comply with requirements of the hollow metal door manufacturer's written instructions.
 - 1. Factory Glazing: Factory install glazing in doors as indicated. Doors with factory installed glass to include all of the required glazing material.

2.8 ACCESSORIES

- A. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.9 FABRICATION

- A. 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 thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Glazed Lites: Factory install glazing.
- D. Hollow Metal Frames:
 - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
 - 3. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
 - 4. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

5. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry 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) 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.
 - b. 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) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
6. Door Silencers: Except on gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

2.10 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
 1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in-shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3.4 ADJUSTING AND CLEANING

- A. 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.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08 11 13

SECTION 08 31 13 - ACCESS DOORS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Provide glass reinforced gypsum (GRG) access door in gypsum drywall ceiling soffits complete with accessories, as specified herein.
- B. Install access panels or doors as required for operation, maintenance and/or inspection of dampers, smoke/heat detectors, equipment, valves, controls, or other devices concealed behind finished surfaces, non-removable ceiling construction, and in pipe shafts.”

1.03 RELATED SECTIONS

- A. Gypsum Board AssembliesSection 09 29 00

1.04 REFERENCES

- A. Underwriters Laboratories, Inc. (UL)
- B. National Fire Protection Association (NFPA)
- C. Warnock Hersey (WHI)

1.05 SUBMITTALS

- A. Product Data: Submit manufacturer’s technical data and installation instruction for GRG access door assembly, including setting drawings, templates, instructions and direction for installation of anchorage devices.
- B. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment, and indicate on submittal schedule.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle access doors and frames as recommended by the Manufacturer, to protect the units from damage.

1.07 QUALILTY ASSURANCE

- A. Coordination: Furnish inserts and anchoring devices which must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Glass Reinforced Gypsum (GRG) Access Doors, For GWB Ceiling
 - 1. Chicago Metallic Company
 - 2. Or Equal

2.02 ACCESS DOOR: DRYWALL CEILING

- A. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
- B. The access door panel is made from glass reinforced gypsum and installs and finishes in the same manner as drywall. The Access Door comes in 2 pieces – the frame is attached with drywall screws, then taped and finished using conventional drywall finishing techniques.

2.03 FABRICATION AND MANUFACTURE

- A. Manufacture access door assemblies as integral units complete with all parts and ready for installation. Attachment devices shall be of size and type suitable to secure access doors to type of ceiling being installed into.
 - 1. Access doors or panels shall be as required for the device being serviced by the access door/panel.”

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install the access doors in accordance with the manufacturer’s printed installation instructions, except as shown or specified otherwise.
- B. Coordinate access door installation with installation of supporting construction.
- C. Set units accurately in position and securely attach to support with face panel plumb or level in relation to adjoining finish surface.

3.02 ADJUSTMENT

- A. Remove and replace panels and/or frames which are warped, bowed or otherwise damaged.

END OF SECTION 08 31 13

SECTION 08 80 20 – GLASSBOARDS

PART 1 - GENERAL

1.1 DESCRIPTION/SUMMARY

- A. General Information
 - 1. Specification is based on Clarus Glassboard SLLC. 8715 Harman Road, Fortworth, TX 76177
T: 888-813-1414
- B. Related Sections
 - 1. Section 06 10 00- Rough Carpentry
 - 2. Section 09 29 00- Gypsum Wall Board
 - 3. Section 09 91 00- Painting

1.2 SUBMITTALS

- A. Submit shop drawing showing jointing and attachments to wall.
- B. Submit manufacturer's Product Data Sheet instructions.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's instruction for receiving, handling, storing and protection.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperatures and humidity conditions recommended by the manufacturer.
- D. Exercise exceptional care to prevent edge damage.

1.4 WARRANTY

- A. Five years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufactured by Clarus Glassboards LLC (basis of design).
- B. Or Approved Equal.

2.2 MATERIALS

- A. 1/4" tempered safety glass, color as approved by Architect.
- B. CRL Aluminum 1/4" L-Bar top and bottom.
- C. 3M VHB Structural Glazing Tape.
- D. M65 Permawhite Polythane Construction Glue.
- E. Magnetic

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification and Conditions
 - 1. Verify that site conditions are acceptable for installation of the board and attachments.
 - 2. Use blocking if required.

3.2 INSTALLATION

- A. Walls must be clean of all dust particles.
- B. Fasten L channel to studs and metal backing on bottom and top of application.
- C. Apply Structural Glazing Tape on the edges and select locations behind glass.
- D. Use glue applied to back of glass thoroughly. Glue must not be applied too close to the edge as to not come out from behind the glass as it cures.
- E. Glue takes approximately 24hrs. to cure. Braces are recommended to stabilize product during curing process.

3.4 CLEANING

- A. Clean surface as recommended by manufacturer.

END OF SECTION 08 80 20

SECTION 08 80 30 – MAGNETIC PEGBOARD

PART 1 - GENERAL

1.1 DESCRIPTION/SUMMARY

- A. General Information
 - 1. Specification is based on Diamond Life Brand.
- B. Related Sections
 - 1. Section 06 10 00- Rough Carpentry
 - 2. Section 09 29 00- Gypsum Wall Board
 - 3. Section 09 91 00- Painting

1.2 SUBMITTALS

- A. Submit shop drawing showing jointing and attachments to wall.
- B. Submit manufacturer's Product Data Sheet instructions.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's instruction for receiving, handling, storing and protecting of material.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperatures and humidity conditions recommended by the manufacturer.
- D. Exercise exceptional care to prevent any damage to panels.

1.4 WARRANTY

- A. Five years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufactured by Gupta Pernold Corporation, 234 Lott Road, Pittsburg PA
T: 888-983-4377 (Bases of Design)
- B. Or Approved Equal

2.2 MATERIALS

- A. Custom sized steel pegboard panels as detailed in drawings. All panels to have returns on all sides, as per manufacturer design.
- B. Color: Bone White

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification and Conditions
 - 1. Verify that site conditions are acceptable for installation of the pegboard and attachments.
 - 2. Verify dimensions are correctly sized and within tolerances.

3.2 INSTALLATION

- A. Install wood blocking at corners of panels fully secured to wall.
- B. Paint wood blocking to match wall as required.
- C. Follow all manufacturer's recommendation for hanging.

3.4 CLEANING

- A. Clean surface as recommended by manufacturer.

END OF SECTION 08 80 30

SECTION 08 88 13 – FIRE RESISTANT GLAZING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fire-rated glazing materials installed at borrowed lights and within rated hollow metal doors.

1.2 RELATED REQUIREMENTS

- A. Section 08 11 13 – Hollow Metal Doors and Frames, Borrowed Lights.
- B. Section 09 29 00 - Gypsum Board Assemblies.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2011
 - 2. ASTM E2074 - Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side Hinged and Pivoted Swinging Door Assemblies; 2000
- B. American National Standards Institute (ANSI):
 - 1. ANSI Z97.1 - For Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2009
- C. Consumer Product Safety Commission (CPSC):
 - 1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; 2009
- D. Glass Association of North America (GANA):
 - 1. GANA - Glazing Manual; 2008
 - 2. GANA - Sealant Manual; 2008
- E. National Fire Protection Association (NFPA):
 - 1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2010
 - 2. NFPA 251 - Standard Methods of Tests of Fire Endurance of Building Construction and Materials; 2006
 - 3. NFPA 252 – Standard Methods of Fire Tests of Door Assemblies; 2012
 - 4. NFPA 257 – Standard on Fire Tests for Window and Glass Block Assemblies; 2012
- F. Underwriters Laboratories, Inc. (UL):
 - 1. UL 9 – Standard for Fire Tests of Window Assemblies; 2009
 - 2. UL 10B – Standard for Fire Tests of Door Assemblies; 2008
 - 3. UL10C – Standard for Positive Pressure Fire Tests of Door Assemblies; 2009
 - 4. UL 263 – Standard for Fire tests of Building Construction and Materials; 2003

1.4 DEFINITIONS

- A. Fire Protection: As defined by the International Building Code (IBC), fire protection glass has fire rating of 45 or 90 minutes and is in compliance with NFPA 252, NFPA 257, UL 9, UL 10B, and UL 10C testing standards.
- B. Fire Resistance: As defined by the International Building Code (IBC), fire resistant glass has fire rating of 60 or 120 minutes and is in compliance with ASTM E119, NFPA 251, NFPA 252, NFPA 257, UL 9, UL 10B, UL 263, and CAN/ULC-S101 testing standards.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each glazing material indicated, including installation and maintenance instructions.
- B. Certificates: Submit from glass and glazing materials manufacturer verifying that glass and glazing materials furnished for project comply with requirements.
 - 1. Certification submittals are not required for glazing materials bearing manufacturer's permanent label that designate type and thickness of glass, and labels represent a quality control program from recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.
- C. Product Test Listings: Submit UL listing, indicating that fire-resistant glass complies with requirements based on comprehensive testing of products indicated.
- D. Samples: Submit, for verification purposes, 8 inch by 8 inch size samples for each type of glass indicated.
- E. Warranty: Submit sample of manufacturer's warranty.

1.6 QUALITY ASSURANCE

- A. Glazing Standards: GANA Glazing and Sealant Manuals
- B. Fire Resistance Rated Glass: Each lite shall bear permanent, non-removable UL label certifying it for use in tested and rated fire resistive assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate with hollow metal door.
- B. Deliver material to designated location on project site in manufacturer's original packaging, undamaged, and complete with installation instructions.
- C. Do not expose fire-resistant glazing to temperatures greater than 120 degrees F or less than minus 40 degrees F during storage and transportation, as well as installation.
- D. Store in dry conditions, evenly supported along full length of edge, off ground, under cover, and protected from weather and construction activities.
- E. Do not expose non-polyvinyl butyral (PVB) side of glass to ultra violet light.
- F. Do not leave glass temporarily held in frames without fixing of glazing beads and completion of capping silicone sealant.
- G. Store sheets of glass vertically, do not lean glass against surfaces for support, ensure maximum of 6 degree incline from vertical.

1.8 WARRANTY

- A. Provide manufacturer's limited warranty subject to requirements of proper handling and installation requirements, and if properly installed in fire rated support system, approved by independent testing laboratory as follows:
 - 1. Manufacturer will meet published fire-resistant glass requirements.
 - 2. Manufacturer's insulating glass units will not develop material obstruction of vision between interior glass surfaces due to manufacturing defects.
 - 3. Fire ratings indicated will not be degraded due to manufacturing defects.
- B. Warranty Period: For period of five years commencing the date of original factory shipment of glazing materials to project site by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Pilkington Fire Protection Glass North America; Product Pyrostop:
www.pilkington.com/fire
 - 1. Pilkington North America, Inc.
 - 2. Location: Toledo, Ohio.
 - 3. Phone: (419) 478-0165.
 - 4. Fax: (419) 478-0165.
- B. Distributed by Technical Glass Products, Snoqualmie, Washington:
www.fireglass.com
 - 1. Phone: (800) 426-0279.
 - 2. Fax: (800) 451-9857.
 - 3. Email: sales@fireglass.com.
- C. Or Approved qual.

2.2 PERFORMANCE REQUIREMENTS

- A. Clear, laminated, fully insulating fire-resistant safety glass for use in impact safety-rated locations such as doors, sidelites, and wall applications with fire rating requirements ranging from 45 to 120 minutes and passing hose stream test; for use in interior applications.
- B. Fire-resistant glazing provides protection by effectively blocking radiant and conductive heat, and maximizing natural light and visibility.
- C. Passes positive pressure test standard; UL 10C.

2.3 GLAZING MATERIALS

- A. Composition: For fire ratings equal to or greater than 45 minutes, glazing is composed of multiple sheets of high visibility light transmitting glass laminated together using intumescent type interlayers.

- B. Permanently label each piece of fire-resistant glazing with UL control number, product and manufacturer's name, hourly fire rating, and human impact safety rating.
- C. Impact Safety Resistance: ANSI Z97.1 and CPSC 16 CFR 1201 (Categories I and II).
- D. Glazing assemblies for 45 minute and above fire rated assemblies are composed of the following glass:
 - 1. Product; Optiwhite™ low iron glass as manufactured by Pilkington or approved equal.
- E. Interior Use Fire Resistant Glazing Properties
 - 1. Glazing Type: 45-200 (Door Glazing)
 - a. Fire Rating: 45 minutes
 - b. Glass Thickness: 3/4 inch (19 mm)
 - c. Daylight Transmission: 86 percent
 - d. Weight: 9.2 lbs per sq ft
 - e. STC: 40 dB
 - f. Assembly: Doors
 - 1) Maximum Exposed Area: 3,724 sq in
 - 2) Maximum Exposed Width: 41 5/8 inch
 - 3) Maximum Exposed Height: 89 3/4 inch
 - g. Building Code Marking: DOH-N-45

2.4 GLAZING COMPOUNDS

- A. Glazing Tape: Provide closed cell polyvinyl chloride foam that is coiled on release paper over adhesive on two sides with maximum water absorption of 2 percent by volume and compression of 25 percent to ensure air and vapor seal, and also non-combustible and flexible.
- B. Silicone Sealant: Non-combustible, one-part neutral curing silicone, medium modulus sealant, in accordance with ASTM C920; Type S, Grade NS, Class 25 with additional movement capability of 50 percent in both extension and compression for total of 100 percent, Exposure NT, Substrates G, A, and O as applicable.
 - 1. Acceptable Manufacturers:
 - a. Product; Dow Corning 795 Silicone Building Sealant manufactured by Dow Corning Corp.: www.dowcorning.com
 - b. Product; SilGlaze II SCS2800 manufactured by Momentive Performance Materials: www.momentive.com
 - c. Product; Spectrem 2 manufactured by Tremco Inc.: www.tremcosealants.com
 - d. Substitutions: Not permitted.
- C. Setting Blocks: Hardwood that is suitably treated against humidity or calcium silicate; sized to width of glass by 4 inches by 3/16 to 1/4 inches thick
- D. Spacers: Neoprene or other resilient blocks of 40 to 50 Shore A durometer hardness, adhesive-backed on one face only, tested for compatibility with specified glazing compound.

- E. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.5 FABRICATION

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with manufacturer recommendations and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine glass framing, with glazier present, for compliance with the following:
 - 1. Verify manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Verify for minimum required face or edge clearances.
 - 3. Examine for edge damage or face imperfections.
- B. Clean glazing channels and other framing members receiving glass immediately before glazing, and remove coatings that are not firmly bonded to substrates.
- C. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with referenced GANA standards and manufacturer's handling and installation instructions for glass, glazing sealants, and glazing compounds.
- B. Protect glass edges and glazing tapes from damage during handling and installation.
- C. Inspect glass during installation and report damaged glazing tape that could be detrimental to performance to manufacturer's product representative.
- D. Cut glazing tape to length and set against permanent stops, flush with sight lines and fitting openings exactly, and with allowance for stretch during installation.
- E. Install setting blocks with edge block, located at quarter points of glass, no more than 6 inches from corners.
- F. Install glazing vertically into fire-rated metal frames or partition walls with same fire rating as glass, and push against tape for full contact at perimeter of pane or unit.
- G. Install glazing tape on free perimeter of glazing as indicated above.
- H. Do not remove or tamper with special edge protection tape.
- I. Do not allow direct contact between glass and framing material.
- J. Install removable stop and secure without displacement of tape.
- K. Do not put heavy pressure on glass through glazing beads, sealing profiles or glazing tapes.
- L. Carefully trim protruding tape with sharp knife.

- M. Apply cap bead of silicone sealant along void between the stop and the glazing, to uniform line, with bevel to form watershed away from glass, tool or wipe sealant surface smooth.
- N. Provide at least 3/16 inch of edge clearance.
- O. Install glazing so that UL and manufacturer's labels remain visible and oriented properly per instructions after installation.

3.3 TOLERANCES

- A. Deflection: Designed deflection of insulating glass units in their frame under the maximum potential design load should be less than the span of glass unit in millimeters divided by 300, or 8 mm, whichever of these two numbers is the least.
- B. Glazing pressure on glass edges shall be low and uniform, less than 20 N per cm edge length at border of pane.
 - 1. Point loading of glass edges is not permitted.

3.4 PROTECTION AND CLEANING

- A. Protect glass from contact with contaminating substances resulting from construction operations.
 - 1. Remove any such substances by method approved by glass manufacturer.
- B. Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of Substantial Completion.
 - 1. Wash glass by method recommended by glass manufacturer.

END OF SECTION 08 88 13

**SECTION 09 00 01
LIMESTONE COATING**

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide cleaning, preparation and application of approved coating on limestone walls indicated on the Drawings and as specified herein.

1.02 SPECIAL CONDITIONS

- A. Prior to the work Contractor shall meet with Architect, Owner and Manufacturer's Representative to review the sequence and scope of work and existing conditions.

1.03 SUBMITTALS

- A. Product Data:
 - 1. Manufacturers' catalog sheets, specifications, and application instructions.
- B. Quality Control Submittals:
 - 1. Subcontractor's Qualifications Data:
 - a. Firm name, address, and telephone number.
 - b. Period of time firm has performed masonry finish work, and names and addresses of (2) similar projects completed by the firm.
- C. Submit a schedule of activities for each type of procedure.

1.04 QUALITY ASSURANCE

- A. Contractors Qualification:
 - 1. The firm performing the work shall have been regularly engaged in similar work for a minimum of (3) years and completed (2) projects using specified methods.

B. Field Examples:

1. Before the finishing materials are applied, clean and prepare a sample panel of the wall approximately 4'-0" wide x 4'- 0" tall at a location on the building wall directed by the Architect. If the first sample panel is not satisfactory, as determined by the Architect, modify the cleaning and preparation procedure, and prepare another 4'-0" wide x 4'- 0" tall sample panel. Continue cleaning and preparing panels until satisfactory results are obtained and approved by the Architect. When a final approval is obtained, go back, and refinish all previously rejected panels.

- C. Remove adhesives from previously installed material affixed to wall prior to finishing.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's packaging, with instructions for use.
- B. Store, protect, and handle cleaning materials in accordance with the architect and manufacturer's instructions.

1.06 PROJECT CONDITIONS

- A. Prior to the work, contractor shall meet with Manufacturer's Representative to review all existing conditions.
- B. Existing Conditions:
 1. Take necessary precautions and protective measures to prevent injury to people and damage to property in areas adjacent to the work area.
 2. All procedures and materials to be approved for interior application.

PART 2 - PRODUCTS

2.01 MAERIALS

- A. Cleaning Materials: Provide liquid detergents and clean water that will remove the dirt, grime, carbon, surface residues, stains, and other foreign material from the masonry surfaces, but will not damage the masonry. Obtain the approval of the coating manufacturer.
- B. Do not use low pressure micro-abrasive power process or any other cleaning method until written permissions is given by the Owner or Architect.

- C. Approved Product: Limestone Coating, manufactured by Conproco Corporation 17 Production Drive Dover New Hampshire
 - a. Primex.
 - b. MP3.

PART 3 - EXECUTION

3.01 PREPARATION

A. Preparation

1. Remove loose and deteriorated material, laitance, dirt, dust, oil and any surface contaminants that will inhibit proper penetration.
2. Prepare surface as recommended by Manufacturer and approved by Architect. Refer to Surface Preparation Guide 03732 for information about Concrete Surface Profile (CSP).
3. Surface must be dry and frost free.

B. Priming

1. Apply a uniform application of *Primex*.
2. For best results spray apply, beginning at the bottom of the structure and working upwards to the top.
3. Allow primer to react for 12 hours before applying *M3P*.

C. Mixing

1. Stir or mechanically mix using a low speed drill (400 - 600) until homogenous.
2. Mix pails from different batches when an entire surface is visible.

3.02 APPLICATION

1. Apply a test sample to determine suitability. Ensure by visual inspection that *Primex* and *M3P* have penetrated the substrate. A white film on the surface after either material reacts – 12 hours indicates substrate is either too dense for proper penetration or a previous treatment, such as a water repellent, has been applied.
2. Substrate temperature must be above 45°F.
3. Ambient temperature must be above 45°F for the entire curing period.
4. For roller applications use a 3/8 - 1/2 inch synthetic nap roller depending on texture of substrate.
5. Work to pre-determined break points in the structure.
6. Maintain a wet edge.
7. Allow *Primex* to react for 12 hours before applying *M3P*.
8. If *Primex* has been applied, a second application of *M3P* can be applied after the first is dry-to-touch.

3.03 CURING

1. Protect from moisture for 24 hours.

3.04 CLEAN UP

1. Clean tools and equipment with water. Clean adjacent areas with water before material dries.

END OF SECTION 09 00 01

SECTION 09 22 13 - NON-LOAD BEARING FRAMING AND FURRING

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data: Catalog sheets, specifications, and installation instructions for the following:
 - 1. Studs, Tracks, and Furring.
 - 2. Fasteners.

- B. Samples:
 - 1. Steel Framing and Furring: 12 inches long, each component.
 - 2. Fasteners: 10 each type.

1.02 QUALITY ASSURANCE

- A. Fire Resistance Rated Applications: Provide UL listed or ASTM E 119 tested materials, accessories, and application procedures to comply with the rating indicated.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Studs, Tracks, and Furring: ASTM C 645; 20 gage galvanized steel, with additional framing members, reinforcing, accessories, and anchors necessary for the complete framing system.

- B. Fasteners: Except where shown or specified, select fasteners of type, size, style, grade, and class required for secure installation of framing and furring. Galvanize all fasteners and accessories.
 - 1. Standard Bolts and Nuts: ASTM A 307, Grade A, regular hexagon head.
 - 2. Lag Bolts: FS FF-B-561, square head.
 - 3. Machine Bolts: FS FF-B-584 head; FS FF-N-836 nuts.
 - 4. Machine Screws: FS FF-S-92, cadmium plated steel.
 - 5. Plain Washers: FS FF-W-92, round, general assembly grade, carbon steel.
 - 6. Lock Washers: FS FF-W-84, helical spring type, carbon steel.
 - 7. Toggle Bolts: Tumble-wing type; FSS FF-B-588, type, class and style as required to sustain load.
 - 8. Self-Drilling Fasteners: No. 12-14 x 3/4 inch, hex washer head, self-drilling fastener with pilot point.

- C. Anchors: Steel framing manufacturer's recommended types and sizes for substrates involved.

PART 3 EXECUTION

3.01 STEEL FRAMING AND FURRING INSTALLATION

- A. Install steel framing, furring and accessories in accordance with manufacturer's printed instructions, unless otherwise shown or specified.

- B. Framing Installation:
 - 1. Align tracks accurately at floor and ceiling. Secure tracks as recommended by the framing manufacturer for the upper and lower construction involved, except do not exceed 24 inches oc spacing for nail or powder-driven fasteners, or 16 inches oc for other types of attachment. Provide fasteners approximately 2 inches from corners and ends of tracks.
 - 2. Position studs vertically and engage both upper and lower tracks. Space studs 16 inches on center, unless otherwise indicated on the Drawings. Fasten studs to track flanges with screws or by crimping.
 - a. Use full length studs between tracks wherever possible. If necessary, splice studs with a minimum 8 inch nested lap and fasten with two screws per stud flange.
 - 3. Install additional studs to support inside corners at intersections and corners, and to support outside corners, terminations of partitions, and both sides of control joints (if any).
 - 4. Terminate partitions at finish ceiling line unless otherwise indicated on the Drawings.
 - 5. Brace chase wall framing horizontally to opposite studs with 12 inch wide gypsum board gussets or metal framing braces, spaced vertically not more than 4 feet on center.
 - a. Attach gypsum board gussets with a minimum 3 screws per stud flange.
 - b. Attach metal framing braces with a minimum 2 screws per stud flange.

- C. Steel Furring Installation: Install steel furring at 16 inches oc maximum spacing and provide additional furring at openings, cutouts, and corners. Securely anchor with fasteners spaced 24 inches oc maximum and stagger on opposite flanges of hat-shaped channels.

- D. Tolerances: Do not exceed 1/8 inch in 8 feet variation from plumb or level in any exposed line or surface, except at joints between boards do not exceed 1/16 inch variation between planes or abutting edges or ends. Shim as required to comply with specified tolerances.

END OF SECTION 09 22 13

SECTION 09 29 00- GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work under this section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this section as shown on the drawings, as specified herein, and/or as specified by job conditions.

1.2 DESCRIPTION OF WORK

- A. Provide materials, labor, equipment and services to complete all gypsum board installation including metal studs, regular, fire resistant, moisture resistant gypsum board, and all accessories as specified herein and as indicated on the Drawings.
- B. This section includes gypsum wallboard assemblies which meet specified criteria for:
1. Post-consumer recycled paper content in the gypsum wallboard paper facing; and
 2. Post-industrial recycled content (synthetic gypsum) in the gypsum wallboard cores (optional).

1.3 RELATED SECTIONS

- A. Section 06 10 00 – Rough Carpentry
- B. Section 08 11 13 - Hollow Metal Doors & Frames
- C. Section 09 91 00 – Painting

1.4 QUALITY ASSURANCES

- A. Codes and Regulations
1. Work specified herein shall conform to all applicable State and Local codes and regulations having jurisdiction.
 2. Where fire resistant ratings are required for work of this section, the gypsum drywall assemblies shall be installed in strict accordance with the Underwriters Laboratory requirements.
- B. Environmental Criteria for gypsum wallboard:
1. Recycled Content:
Gypsum wallboard shall contain recycled content material as follows:
 - a. Paper facings: a minimum of 100% post-consumer recycled paper content.
 - b. Gypsum cores: Where feasible, a minimum of 75% post-industrial recycled gypsum content (also called “synthetic” gypsum – from coal-fired power plants).The percentage of recycled content is based on the weight of the component materials.

- C. Environmental Criteria for Glass Fiber:
(for recycled content and other High Performance building criteria)
 - 1. Recycled content:
 - a. EPA Comprehensive Procurement Guidelines, www.epa.gov/cpg
 - b. ASTM D5359, “Glass Cullet Recovered from Waste for Use in Manufacture of Glass Fiber”
 - c. Fiberglass insulation shall contain a minimum of 20% (combined) post-industrial/post-consumer recycled content. The percentage of recycled content is based on the weight of the component materials.
 - 2. Emissions:
 - a. Where feasible, provide fiberglass insulation that does not contain formaldehyde binders.
 - b. Fiberglass insulation in exposed locations and in ceiling plenums (used for HVAC return) shall be encapsulated with a continuous wrap of polyethylene or similar material.

1.5 SUBMITTALS

- A. Product Literature
 - 1. Submit manufacturers' products literature, catalog cuts and data sheets for all products.
- B. Gypsum wallboard:
 - 1. Manufacturer’s certification of recycled content per paragraph 1.04.
 - 2. Material Safety Data Sheets.
 - 3. Manufacturer’s maintenance instructions.
 - 4. Manufacturer’s policy statement on gypsum wallboard recycling programs.
 - 5. Samples of accessories, studs, attachments

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site, ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to approved samples.
- B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
- C. Gypsum wallboard to be stored per manufacturer’s recommendations for allowable temperature and humidity range. Panels shall not be allowed to become damp.
- D. Where feasible, gypsum wallboard shall not be stored with materials which have high emissions of VOCs or other contaminants (see paragraph 3.03 below).

1.7 ENVIRONMENTAL REQUIREMENTS

- A. During joint finishing, maintain within the work area a uniform ambient temperature between 55 and 70 degrees F.

1.8 REGULATORY REQUIREMENTS.

- A. New York City Building Code

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering gypsum board systems which may be incorporated in the Work include but are not limited to the following:
 - 1. Steel Framing and Furring:
 - a. Bostwick Steel Framing Co.
 - b. Gold Bond Building Products Division
 - c. Marino Industries Corp.
 - d. United States Gypsum Co.
 - 2. Grid Suspension Systems:
 - a. Chicago Metallic Corp.
 - b. National Rolling Mills Co.
 - c. United States Gypsum Co.
 - 3. Gypsum Boards and Related Products:
 - a. Georgia-Pacific Corp.
 - b. National Gypsum Company
 - c. United States Gypsum Co.

2.2 GYPSUM BOARD

- A. See drawings
- B. Provide 5/8" fire rated gypsum board at all rated walls.
- C. Shaft wall where shown on drawings (as required).

2.3 FURRED AND STUD WALL FRAMING MEMBERS

- A. General: Select size and gage of framing members and establish spacing to comply with requirements of ASTM C 754 unless otherwise specifically indicated.
 - 1. Maximum deflection: L/240 at 5 lbf per square foot, except limit deflection to L/360 where gypsum board partitions are substrates for ceramic tile.

- B. Metal studs: as indicated on the drawings, non-load bearing channel or C-H type, formed from 20 gauge electro-galvanized steel, as per ASTM C-645 designed for screw attachment and provided with knockouts to accommodate pipe and/or conduit installations. Width and height of studs shall conform to partition types noted on the drawings. See drawing for additional gauges of studs.
- C. Ceiling and floor runners: channel type formed of 20 gauge electro-galvanized steel, designed to receive partition types and studs as required. Stud, runners and furring shall conform to ASTM C-645.

2.4 CEILING SUPPORTS

- A. Ceiling suspension system shall be in accordance with the latest NYC Building Code.
- B. General: Size ceiling support components to comply with State of New York Building Code and with ASTM C 754.
- C. Steel Angle and Plate
ASTM A-36. Provide angle 3"x3"x3"/16"x1" wide, clip angles with slot for 3/8" bolts. Provide 1" x3/16" steel plate hangers with 3/8" bolt holes or 1/4" diameter rods, or approved equal. Test for pull out into concrete.
- D. Bolts
ASTM A307, 3/8" diameter, with lock washers and nuts. Provide shop coat of asphaltum paint.
- E. Running Channels
1 1/2" deep x 7/16" wide flanges, 475 lbs. per 1000' painted, 508 lbs. per 1000', galvanized. S (in.3) = .0538, I(in.4) = .0404. Provide shop coat of asphaltum paint for paint channels. Use painted channels unless indicated otherwise.
- F. Sleeve Anchors (Angle to Deck)- Installed after Deck in Place:
 - 1. Manufacturers
 - a. Hilti Fastening Systems.
 - b. Illinois Tool Works, Inc.
 - 2. Stainless Steel
 - 3. Bolts: Minimum diameter of 3/8", with hex head.
 - 4. Safe working loads: for pullout: 400 lbs. (min.); for shear: 400 lbs. (min.) in 3,000 p.s.i lightweight concrete.
- G. Hanger Anchorage Devices: Devices whose suitability for use has been proven by standard construction practices or by certified test data. Size devices for 3x load, as determined by ASTM E 488.
- H. Furring Members: ASTM C 645; 0.0179 inch minimum thickness (25 gage), hat-shaped; "C"-shaped studs for spans of more than 4 feet.
- I. Painting: all steel members and accessories of the support system unless galvanized or of stainless steel, shall be dipped or painted with one coat approved asphaltum paint.
- J. Hanging System shall meet requirements of the latest New York City Building Code.

2.5 INSULATION

- A. See drawings for wall assembly insulation.
- B. Insulation within partitions: sound attenuation blankets consisting of a paperless, semi-rigid mineral fiber mat, or glass fiber having a density of not less than 3 pounds per cu. ft., except where indicated otherwise.
- C. Insulation shall conform to ASTM C665, Type 1, Class A and have a fire hazard classification in accordance with ASTM E-84 as follows: flame spread-25; fuel contributed-20; smoke developed-0.
- D. See details for insulation in corridor and classroom wall. To be thermafiber SAFB or approved equal.

2.6 RESILIENT CLIPS

- A. Genie clip type RST by PLITEQ INC.
- B. Or Approved Equal

2.7 FURRING CHANNELS

- A. Min. gauge 25 with hemmed edges

2.8 JOINT TREATMENT

- A. General: Provide products by manufacturer of gypsum boards. Comply with ASTM C 475 and with manufacturer's recommendations for specific project conditions.
- B. Joint Tape: Manufacturer's standard paper reinforcing tape.
- C. Drying Type Joint Compound: Vinyl-based ready-mixed type for interior use, and as follows:
 - 1. All-purpose type, for both embedding tape and as topping.
- D. Joint Compound: At joints and fasteners in water-resistant gypsum backing board intended for tile surfacing, provide compound specifically recommended or permitted by manufacturer of gypsum board.
- E. Provide adhesive to laminate GWB in new restroom or install furring strips if wall is not plumb.

2.9 MISCELLANEOUS ACCESSORIES

- A. Metal accessories shall consist of corner beads, stops, edge trim, casing beads and control joints and other accessories as required, conforming to proper profiles and sizes to accommodate drywall partition components encountered. Accessories: formed of 26 galvanized or cadmium plated steel after manufacture. Hot dip galvanized as per ASTM A-525.
 - 1. For terminations as indicated, provide USG Series 200 casing beads (J-molding not acceptable).

- B. Screws for securing drywall and accessories in place: self-drilling, self-tapping, Phillips head steel screws as recommended by the manufacturer of the partition system and by conditions encountered in the field. The use of nails for application will not be permitted. Screws shall conform to ASTM C-646.
- C. Joint and recess fastener treatment: a three (3) coat application as recommended by the approved gypsum drywall manufacturer. Materials shall conform to ASTM C-475.
- D. For supports to hang equipment on wall: provide metal strip secured to vertical studs.
- E. Reglets and Reveals: see drawings for types.

2.10 ACOUSTICAL SEALANT

- A. Acoustical sealant: ASTM C 919; a highly elastic, non-bleeding and non-staining, pumpable type sealant which shall remain permanently flexible, formulated especially for this type of application and manufactured by one of the following:
 - 1. U.S. Gypsum
 - 2. Tremco, Inc.
 - 3. Miracle Adhesives

2.11 ISOLATION CLIPS

- A. Genie Clip
- B. Furring Channels
 - 1. Minimum gauge 25ga with hemmed edges
 - 2. Width at base 2.5"
 - 3. Max at base 2.75"
 - 4. Width at top 1.25"
 - 5. Height 7/8"
- C. Fasteners
 - 1. 3/16 or 1/4" x 2 1/4" long anchor screws.
 - 2. Fasteners shall have a maximum pull out of 120 lb., pull out to shear.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Study the contract drawings and specifications with regard to the work as shown and required under this section so as to insure its completeness.
- B. Examine the surfaces and conditions to which this work is to be attached or applied and notify the Architect if conditions or surfaces exist which are detrimental to the proper and expeditious installation of the work. Starting on the work shall imply acceptance of the surfaces and conditions to perform corrective measures before the start of installation.

- C. Verify dimension taken at the job site, affecting the work. Bring field dimensions which are at variance to the attention of the Architect. Obtain decision regarding corrective measures before the start of installation.
- D. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.

3.2 WORKMANSHIP

- A. Install materials and partition systems specified herein and as indicated on the drawings in strict accordance with the printed directions and/or specifications of the approved manufacturer to attain fire ratings noted on the drawings.
- B. Apply drywall with the reverse side against the framing members, and with the separate panels in moderate contact. In no case shall the panels be forced into place. At interior and exterior corners, conceal the cut edges of the panels so that the corners of any four panels will not meet at the same point. Vertical joints shall not occur on the same stud on both sides of a partition. Apply panels in such lengths as will result in a minimum of joints.
- C. Build into drywall partitions reinforcing plates on not less than 3/16" thick to accommodate items which will be secured on and/or hung from the drywall partitions such as: wall mounted equipment. (see drawings for location of accessories). Coordinate with other trade contractors as required.
- D. Unless otherwise indicated, provide continuous faces of gypsum drywall partitions, with control joints, spaced not over 30 feet o.c. Verify control joint locations with the Architect prior to installation.

3.3 ENVIRONMENTAL CONSIDERATIONS

- A. Where feasible, one or both of the following procedures shall be used to minimize the exposure of gypsum wallboard to materials or finishes which have high short-term emissions of VOC's, formaldehyde, particulates, or other air-borne compounds:
 - 1. The gypsum wall board shall be taped, spackled and primed *before* the installation of the highly-emitting materials.
 - 2. Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paint, wood preservatives, and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders.

3.4 FRAMING FOR PARTITIONS AND FURRING

- A. Floor and ceiling runners: accurately locate and align and install continuously at locations noted, and securely attached to adjacent construction using power driven anchors spaced 16" o.c. Anchor floor runners not over one (1) inch from runner ends.
- B. Two continuous beads of sealant, one along either edge shall be placed at the bottom of floor runner channels prior to anchoring to floor.
- C. Position and anchor all studs vertically in the runners, spaced as recommended by the manufacturer but not more than 16" on center. Anchor studs which are located adjacent to door frames, partition intersections, furred wall, and at corners to floor and ceiling runner flanges with required screws.
- D. Install studs in all cases in one piece from noted floor location to underside of the encountered structure or to horizontal termination runner.
- E. When drywall panels are not scheduled to go on the underside of the structure, provide an additional horizontal stud member at the point above the ceiling line where the drywall panels are terminated. Brace to underside of slab above with every other stud - plus diagonal bracing at same spacing (if required).
- F. Locate double studs not more than 2" from all door frame jambs, abutting partitions, partition corners and other construction, and as indicated on the drawings.
- G. Provide double studs at jambs of door and window frames and head and sill runners as required to completely frame out these openings. Screw to runners at top and bottom and both sides. In addition, provide two (2) braces to slab above head runners.
- H. Over metal doors and borrowed lights, place a section of runner track horizontally with a web-flange bent at each end. Fasten with one positive attachment per flange.
- I. Provide additional studs and runners to conform to details noted and/or required by conditions encountered in the field.

3.5 HUNG CEILING FRAMING (See Section 05 17 00 for additional information)

- A. Coordinate this Work with the various trades who may have ducts, pipes, conduits, or other Work in the spaces above the suspended ceilings, in order that anchors, hangers and running channels may be properly placed to avoid such ducts, pipes, conduits, and other obstructions. Any changes required to be made in the locations of anchors, hangers, and running channels by reason of the Contractor's failure to observe this requirement shall be made by the Contractor without additional cost to the Owner.
- B. Coordinate Work with Gypsum Board.
- C. Secure 3"x3" steel angle to structural deck with inserts; install anchors as recommended by the manufacturer. Space at 48" o.c. maximum in each direction to accommodate the running channel layout.
- D. Attach steel plate hangers to angle with 3/8" diameter bolt, lock washer, and nut.
- E. Attach running channels to plate hangers with 3/8" diameter bolt, lock washer and

- nut.
- F. Install channels level, true to grid layout, at proper height, ready to receive the ceiling system: furring channels for gypsum board; or for drop clips for acoustical ceiling tees.
 - G. Ceiling Openings
 - 1. Provision shall be made for the installation of lighting fixtures, ventilating or air conditioning equipment, access openings, and other ceiling openings.
 - 2. Rigid frames of furring channels or angles shall be provided around openings, Adequately braces and reinforced.
 - H. Grillage for hung ceilings: composed of hangers placed not over 4'-0" o.c. along the main runner direction and not over 4'-0" o.c. in the opposite direction and 6" from boundary walls.
 - I. Hangers: of sufficient length to provide proper anchorage to the main runners and shall be hang plumb. Install main runners level with a tolerance of 1/8" in 12'-0" at designated heights with hangers secured to runners not over 4'-0". Splice channel ends not less than 12" with double strand of the wire near end of each splice.
 - J. In addition, below metal deck slabs, use hook and bridge components as required and adjust and modify the existing hook and bridge framing components as required.
 - K. Furring Channels (if required): Saddle tie furring channels at right angles to main runners 24" o.c. and 1" from parallel walls with double strand of 16 gauge tie wire. Lap furring channel ends 8" by nesting one channel into the other and wire tie at center of splice.
 - L. Screw attach drywall panels to the furring channels as specified herein. At the Contractor's option, furring channels may be secured to carrying channels using furring channel clips as recommended by the approved manufacturer.
 - M. Provide additional framing members as required to accommodate conditions encountered in the field at no additional cost to the Owner.
 - N. Access doors: Receive, store, and install access doors and frames furnished by other trade contractors in a secure, plumb and rigid manner.
 - O. Light fixtures: Coordinate location and frame (if required).

3.6 GYPSUM DRYWALL

- A. Apply drywall with long dimension (parallel) to framing members, with abutting ends and edges occurring over stud flanges. Use panels of the maximum practical length to minimize joints. Arrange joints on opposite sides of the partition to occur on different studs. Cut panels to fit outlets, switch boxes and all other items encountered which penetrate the drywall surfaces.
- B. For vertical single-layer drywall application, space 1" screws a maximum of 12" o.c. in the field of the panel and 8" o.c. staggered along the vertical abutting edges.
- C. For horizontal single-layer drywall application, space 1" screws a minimum of 12" o.c. in the field of the panel and 12" o.c. along the abutting edges.
- D. Stagger drywall joints above door openings and not opposite each other on the same stud at door heads. At door jambs, secure drywall panels to each stud of the double stud arrangement with screws spaced 8" on center into each stud.

- E. Horizontal drywall joints not permitted.
- F. If drywall panels are not scheduled to extend to underside of structure, then extend panels a minimum of 6 inches above the finished suspended ceilings as shown.

3.7 ACCESSORIES

- A. Install corner beads on all exterior corners in one length without joints and secure with fasteners spaced 9" on center on both sides. Corner beads: formed to an angle of 90 degrees with 1-1/4" fine mesh flanges.
- B. Wherever an end of drywall will remain exposed or cannot be taped, provide continuous casing beads over face layer and secure in place with fasteners spaced 9" on center. "J" molding not acceptable.
- C. Provide control joints in the face layer at continuous walls exceeding 30'-0" and where indicated on the drawings and staple in place in a secure and rigid manner. (See plans for location of control joints in ceiling).
- D. Drywall abutting dissimilar materials shall terminate in casing beads fastened to terminal stud only. "J" molding is not acceptable.
- E. See details for additional reveals and trim.

3.8 INSULATION

- A. Install continuous, full height insulation blankets between channel studs. Secure insulation to the back to the drywall on one side leaving no voids.

3.9 ACOUSTICAL SEALANT

- A. Apply caulking in continuous beads of 1/4" diameter. Each partition shall receive not less than four (4) beads at the bottom. Apply two (2) continuous beads between the floor runner channel and the floor slab, and two (2) continuous beads between the ceiling channel runner and abutting construction.
- B. Apply two (2) continuous beads between base layer of gypsum drywall, or single layer of gypsum drywall and the abutting ceiling and floor construction, on each side of every partition.
- C. Caulk around entire perimeters of outlet boxes, switch plate boxes and all other items which penetrate the gypsum drywall partitions to maintain the STC of the partition.

3.10 SOUND ISOLATION CLIPS (GENIE CLIP TYPE RST)

- A. Do not exceed 48" O.C.
- B. Furring strips shall not exceed 24".
- C. Fasten clips to substrate (concrete) for a minimum pull out and shear of 120 lbs.
- D. Tighten fasteners to come in solid contact with the top washer in the clip. Do not over tighten.
- E. Locate first row of channels to be within 3" to 6" of the wall edge. Last furring channel within 6" from edge of wall or beam.

- F. All other rows should have maximum spacing not to exceed 24”.
- G. Furring channels (24ga) shall not be more than 6” beyond last sound clip.
- H. Snap furring channel into clip and make joints between clips with a 6” overlap. Secure with (2), 7/16” framing screws.
- I. Stagger layers of gypsum board.
- J. Caulk around perimeter of GWB.
- K. Tape and finish GWB.
- L. Seal any penetrations, or air leaks with non hardening acoustic caulking.
- M. Any penetration, (hanger) shall have a rubber gasket.

3.11 TREATMENT FOR JOINTS AND FASTENERS

- A. Completely fill all joints formed by the drywall panels and/or adjoining materials with a three (3) coat application of joint cement and tape. Joint treatment compound shall be mixed according to the approved manufacturer's directions.
- B. Drive fasteners in slightly below the surface of the board, with heads forming a slight depression below the surface of the drywall. Fasteners shall not be driven closer than 3/8" from edges and ends of boards. Drywall adjacent to the joint of fastening shall be held tightly against the framing members while driving fasteners. Dependence on fasteners to draw drywall against the framing will not be acceptable.
- C. All boards shall fit tightly against the supporting frame work before applying joint treatment and concealing screw depressions.
- D. Joint Compound and Taping:
 - 1. Mix joint compound in strict accordance with manufacturer's recommendations.
 - 2. Apply taping or embedding compound in a thin uniform layer of all joints and angles to be reinforced. Immediately apply reinforcing tape centered over joint and seated into compound. Sufficient compound - approximately 1/64" to 1/32" - must remain under the tape to provide proper bond. Follow immediately with a thin skim coat to embed tape, but not to function as a second coat. Fold and embed tape properly in all interior angles to provide a true angle. The tape or embedding coat must be thoroughly dry prior to application of second coat.
 - 3. Apply second coat of joint compound over embedding coat, filling panel taper flush with surface; cover tape and feather out slightly beyond first coat. On joints with no taper, cover the tape and feather out at least 4" on either side of tape. Allow second coat to dry thoroughly prior to application of finish coat.
 - 4. Spread finish coat evenly over and extend slightly beyond second coat on all joints and feather to a smooth, uniform finish. Over tapered edges, do not allow finished joint to protrude beyond plane of the surface. Apply a finish coat to cover tape and taping compound at all tapered angles and provide a true angle. Where necessary, sand between coats and following the final application of compound to provide a smooth surface ready for decoration.

- E. Finishing Fasteners
 - 1. Apply a taping or all-purpose type compound to fasten depressions as the first coat. Follow with a minimum of two additional coats of topping or all-purpose compound, leaving all depressions level with the plane of the surface.
- F. Finishing Beads and Trims
 - 1. Apply first coat to all bead and trim and properly feather out from ground to plane of surface. Compound must thoroughly dry prior to application of second coat.
 - 2. Apply second coat in same manner as first coat, extending compound slightly beyond onto face of panel. Compound must be thoroughly dry prior to application of finish.
 - 3. Apply finish coat to all bead and trim, extending compound slightly beyond the second coat and properly feathering from ground to plane or surface. Sand finish as necessary to provide a flat, smooth surface ready for decoration.

3.11 PREPARATION FOR FINISHES

- A. All exposed surfaces of gypsum drywall which have depressions, gouges, cuts and dimples shall be spackled and sanded to present a smooth level surface acceptable for painting and wall covering by other trades.
- B. Spackle openings around pipes, switches and all other framed openings.

3.12 CLEANING

- A. Promptly remove joint compound from doors, door frames, windows, floors and all other surfaces which are not scheduled to receive the joint compound.
- B. At the completion of installation, remove all rubbish, excess material, scaffolding, tools, and other equipment from the building and job site and leave surfaces clean and whole.

END OF SECTION 09 29 00

SECTION 09 65 19 - RESILIENT FLOORING AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, tools and equipment required to install vinyl tile, vinyl base, reducer strips at doorways.
- B. Contractor shall coordinate with the underlayment concrete installer and review the installation prior to installing the new floor tile. Contractor shall provide written acceptance for the underlayment prior to installing the floor tile.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Self Leveling Underlayment Concrete – Section 03 54 00

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM), latest editions.
 - 1. E 84 Test Method for Surface Burning Characteristics of Building Materials.
 - 2. E 648 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
 - 3. E 662 Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- B. Federal Specifications (FS)
 - 1. SS-W040 Wall Base: Vinyl Plastic.
- C. National Fire Protection Association (NFPA)
 - 1. Standard 253 Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.5 SUBMITTALS

- A. Product data for all material including MSDS sheets
- B. Floor Plan showing layout of each type of floor tile.
- C. Samples
 - 1. For Verification, prior to installation, submit 2 samples of each of the specified materials including floor tile, reduce strips base.

1.6 QUALITY ASSURANCE

- A. Qualifications
Manufacturer: Provide each type of resilient flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.
Installer: A firm with not less than 5 years of successful experience in the installation of specified materials.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Storage
Store materials (flooring, base and adhesives) in location having a minimum temperature of 68 degrees F. for at least 24 hours prior to start of laying of flooring.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements
Continuously heat spaces to receive base to a temperature of 68 degrees F. for at least 48 hours prior to flooring installation, and for 48 hours after installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Vinyl Wall Base:
Johnsonite
AllState
Armstrong World Industries, Inc.
- B. LVT tile
MFG. Arm Strong

2.2 MATERIALS

- A. Floor tile
1. Armstrong World Industries, Inc.
Style: Static
Color: Cathode
Number: ST910
Size: 6" x 36"

- B. Adhesives: Type recommended by manufacturer of resilient products for specific substrate conditions.
- C. Vinyl Base
 - 1. AllState
Style: Cove
Color: A47
 - 2. AllState
Style: Cove
Color: To match existing

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect subfloor surfaces to determine that they are smooth and free from cracks, holes, ridges, coatings preventing adhesive bond, and other defects impairing performance or appearance.

3.2 PREPARATION

- A. Apply primer, if recommended by flooring manufacturer, in compliance with manufacturer's directions.

3.3 INSTALLATION OF FLOOR TILE

- A. Armstrong Exchange
 - 1. Install floor tile with manufacturers approved adhesive over all areas to be covered.
 - 2. Lay out tile so that the tile is centered in each room.

3.4 INSTALLATION OF RESILIENT BASE

- A. Apply base securely in locations indicated, using maximum lengths available to minimize joints. Adhere to substrate with full spread of adhesive, assuring continuous contact with vertical and horizontal surfaces. Site-fabricate corners, coping or mitering inside corners and heat-forming outside corners using manufacturer-approved device.
 - 1. At irregular vertical surfaces where top edge of resilient base does not make continuous contact, fill voids with manufacturer's recommended adhesive compound.

3.5 CLEANING

- A. Initial Cleaning: Remove excess and waste materials promptly.
- B. Final Cleaning: Remove scuff marks, excess adhesive, and other foreign substances, using only cleaning products and techniques recommended by manufacturer of resilient products.

3.6 PROTECTION

- A. Construction Period: Cover traffic routes across completed resilient flooring with plywood, hardboard, or other durable material to protect against damage from loaded dollies and other construction traffic.
- B. Final Protection: Cover resilient floor surface with nonstaining building paper until substantial completion in each area.

3.7 ATTIC STOCK

- A. Each type of flooring and base.
 - 1. Armstrong 1 tiles
 - 2. Base 10' vinyl

END OF SECTION 09 65 19

SECTION 09 84 11 – ACOUSTICAL CEILING MATERIAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. This Section includes bonded acoustical cotton used as ceiling panels with adhesive.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions.
- B. Samples: Submit 2 samples of 6" x 6", showing full range of exposed texture to be executed in adhesive work.
- C. Adhesive.
- D. Test Reports: Submit certified test reports from recognized test laboratories.
- E. Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Installer shall review existing ceiling conditions prior to installation and accept the ceiling conditions in writing prior to installation.
- B. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

1.5 DELIVERY, STORAGE & HANDLING

- A. Delivery: Deliver material in the manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Provide labels indicating brand name, source of procurement, style, size and thickness.
- C. Storage and protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1.6 MAINTENANCE

- A. Extra Materials: Provide an additional 5% for use by owner in building maintenance and repair.
- B. Provide new unopened cartons of extra materials, packaged with protective covering for storage and identified with appropriate labels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Bonded Acoustical Cotton:
 - 1. Echo Eliminator by Acoustical Surfaces Inc. (Basis of Design)
123 Columbia Court North, Suite 210
Chaska, MN 55318
Tel.: (800) 448-0121
Website: www.AcousticalSurfaces.com
 - 2. Or approved equal.

2.2 BONDED ACOUSTICAL COTTON

- A. Material: Manufactured from recycled cotton fiber, which shall be capable of being recycled upon completion of its useful life.
- B. Acoustical panels shall be impact resistant.
- C. Thickness: 2" Thick panels, 3lb density.
- D. Color: White
- E. Edge, Square.
- F. Sizes: Nominal (As indicated on Drawings)
- G. Density: 3 pounds/cubic foot.
- H. Provide manufacturer recommended adhesives for complete single source installation.
- I. Accessories: Adhesives as recommended by manufacturer, AGS 12 – Spray applied, PSA29 - Brush applied.
- J. Flammability:
 - 1. ASTM E84, Class A. Flame Spread 5.
 - 2. Smoke Developed: 35.
- K. Noise Reduction Coefficient (NRC) Rating:
 - 1. For Direct adhesive NCR 1.05

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Examine surfaces scheduled to receive directly attached acoustical units for unevenness, irregularities and dampness that would affect quality and execution of work.
 - 2. Do not proceed with installation of acoustical panels until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. General: Do not begin installation until materials sufficient to complete an entire room are received and are ready for installation.
 - 1. Field cut acoustical panels as required, in accordance with manufacturers recommended procedure and equipment.
 - 2. Acoustical wall panels shall be adhesively mounted in accordance with manufacturer's recommendations and/or as detailed on the drawings.
 - 3. Review spacing to match spacing as shown on drawings. Evenly space panels.
- B. Manufacturer's Instructions:
 - 1. Comply with the instructions and recommendations of the acoustical panel manufacturer.
 - 2. Install materials in accordance with governing regulations, fire resistance rating requirements and industry standards applicable to work.

3.3 CLEANING

- A. Clean exposed surfaces of acoustical panel to comply with manufacturer's instructions for cleaning.
- B. Remove and replace tiles, which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.4 PROTECTION

- A. Protect installed work from damage due to subsequent construction activity. Including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the owner.

END OF SECTION

SECTION 09 91 00 – PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section includes requirements for reduced emission, reduced toxicity interior paints (primers & top coats) and anti-corrosive paints for metal in interior applications.
- B. Work Included: Provide painting in accordance with the Contract Documents. The Work of this Section shall include but not be limited to the following:
 - 1. Gypsum board walls and ceilings, concrete ceilings, hollow metal doors and frames, wood trim / blocking for screens and beams.
 - 2. Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color is not designated, the Architect will select these from standard colors.
- C. Work Not Included:
 - 1. Concealed Surfaces: Painting is not required on surfaces in concealed and generally inaccessible areas.
 - 2. Finished Metal Surfaces: Anodized aluminum factory-finished aluminum, bronze, stainless steel, and similar finished metals will not require painting. Exposed no-hub piping will not require painting.
 - 3. Do not paint hinges, access panels, plates and doors or URL.
 - 4. Do not paint glass, concrete.
 - 5. Do not paint joint of wall surfaces and any applied plates such as light switches, receptacles and escutcheons. Allow paint to completely dry prior to reattachment of such devices to prevent binding.
 - 6. Do not paint any artwork, signs, room numbers
- D. Labels: Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 REFERENCES

- A. Federal Specifications TT
 - 1. Primers, Sealers, Undercoats
 - a. Metal Primer (Zinc Dust, Zinc Oxide) for Galvanized surfaces: FS TT-P-641
 - b. Metal Primer (Zinc Chromate) Aluminum or Steel surfaces: FS TT-P-645
 - c. Primer Sealer (Latex Emulsion): FS TT-P-650
 - d. Enamel Undercoat (Alkyd Resin): FS TT-E-545
 - e. Alkyd Primer (Corrosion Inhibiting): FS TT-P-664
 - Lead and Chromate Free, VOC Complying
 - f. Wood Primer: FS TT-P-25

2. Finish Paints
 - a. Alkyd Enamel, Gloss: FS TT-E-489
 - b. Interior Latex, Flat: FS TT-P-29
 - c. Interior Alkyd, Gloss: FS TT-E-506
 - d. Latex Semi-Gloss Enamel: FS TT-P-1511
 - e. Alkyd Semi-Gloss Enamel: FS TT-E-509
for white tints; FS TT-E-529
Class A for deep colors.
3. Miscellaneous Materials:
 - a. Turpentine: ASTM D 13.
 - b. Mineral Spirits (Petroleum Paint Thinner): FS TT-T-291
 - c. Color Pigments: Pure, non-fading, finely ground pigments, at least 99 percent passing a 325 mesh sieve. Color pigments that are to be used on masonry, concrete and plaster shall be lime proof - FS-TT-P-381.
 - d. Spackling: FS SS-P-00450.
 - e. Putty: Linseed-Oil type for Wood Sash Glazing -FS-TT-P-791B.
 - g. Paste Wood Filler: FS TT-F-336
 - h. Plastic Wood Filler: FS TT-F-340C.
 - i. Surface Sealer: Pigmented Oil for Plaster & Wallboard - FS-TT-S-179.
 - j. Linseed Oil: Boiled CID-A-A-371
 - k. Linseed Oil: Raw CID-A-A-379A

1.4 SUBMITTALS

- A. Product Data
Provide manufacturers' product literature for all materials specified. In addition to actual material data, submit material manufacturer's printed directions and recommendations for environmental conditions, surface preparation, priming, mixing, reduction, spreading rate, application, and storage, as applicable for each of the materials specified that will be used.
- B. Manufacturer's certification of product compliance with paint standards (VOC content and prohibited compounds) per paragraph 1.05.
- C. Material Safety Data Sheets.
- D. Manufacturer's maintenance and cleaning instructions.
- E. Samples
 1. Initial Selection
See plans for colors approved for the project. Verify colors specified with manufacturers' color charts for availability and notify the Architect if any discrepancies should occur.
 2. Verification prior to installation
 - a. Submit two samples of each color and material on 12" x 12" hard-board.
 - b. Submit two samples of finish metal surfaces as required until acceptable color, sheen and texture are achieved.

1.5 QUALITY ASSURANCE

- A. General
1. All painting materials shall arrive at the job ready-mixed.
 2. Remove all rejected materials from the premises immediately.
 3. All thinning and tinting materials shall be as recommended by the manufacturer. Generally, all paints shall not require additional thinning and/or tinting
 4. Check other Sections of this Specification that the specified shop prime paint is compatible with the total coating system. Report discrepancies to the Architect before commencing painting Work.
 5. Materials selected for each system type shall be products of a single manufacturer.
- B. Qualifications
Work of this Section shall be performed by personnel with a minimum of three years experience in performing this type of Work.
- C. Regulatory Requirements
1. New York State Building Code, latest edition.
 2. U.S. Department of Labor, Occupational Safety and Health Administration, latest regulations.
- D. Certifications
Federal Specifications: When materials are specified to comply with Federal Specifications, products will be accepted which meet or exceed the performance requirements of such Federal Specifications and comply with all regulations currently in effect.
1. Indicate that material complies with Federal Specifications by including the Federal Specification number on the container label or on the product literature, or submit a statement with the Product Data stating that material meets or exceeds the performance requirements of the Federal Specification.
- E. References/Quality Assurance (*for indoor air quality and toxicity criteria*)
1. “Green Seal Environmental Standard for Paints” (GS-11), Green Seal, Washington, DC, www.greenseal.org.
 2. “Green Seal Environmental Standard for Anti-Corrosive Paints (GC-03), Green Seal, Washington, DC, www.greenseal.org.
- F. Environmentally-Preferable Product Criteria:
1. VOC Content of Paints:
The volatile organic compound (VOC) content of interior paints, interior primers, and anti-corrosive paints used in interior applications shall not exceed the limits defined in the Green Seal Environmental Standards for Paints (GS-11, dated 5/20/93) and Anti-Corrosive Paints (GC-03, dated 1/7/97), of Green Seal, Washington, DC. The VOC limits defined in the referenced Green Seal standards are as follows. All VOC limits are defined in grams per liter, and exclude water and tinting color added at the point of sale (as determined by U.S. EPA Reference Test Method 24).

<u>Interior Paints & Primers</u>		<u>Anti-Corrosive Paints</u>	
Non-flat:	150	Gloss:	250
Flat:	50	Semi-gloss:	250
		Flat:	250

2. Additional Chemical Component Restrictions in Paints:

To the extent feasible, interior paints, interior primers, and anti-corrosive paints used in interior applications shall comply with the following chemical component restrictions of the Green Seal Environmental Standards for Paints (GS-11, dated 5/20/93) and Anti-Corrosive Paints (GC-03, dated 1/7/97), of Green Seal, Washington, DC.

- a) Aromatic Compounds: the product must contain no more than 1.0% by weight of the sum total of aromatic compounds. Testing for the concentration of these compounds will be performed if they are determined to be present in the product during a materials audit.
- b) Other Chemicals: the manufacturer shall demonstrate that the following chemical compounds are not used as ingredients in the manufacture of the product.
 - Halomethanes: methylene chloride
 - Chlorinated ethanes: 1,1,1-trichloroethane
 - Aromatic solvents: benzene, toluene (methylbenzene), ethylbenzene
 - Chlorinated ethylenes: vinyl chloride
 - Polynuclear aromatics: naphthalene
 - Chlorobenzenes: 1,2-dichlorobenzene
 - Phthalate esters: di (2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, diethyl phthalate, dimethyl phthalate
 - Miscellaneous semi-volatile organics: isophorone
 - Metals and their compounds: antimony, cadmium, hexavalent chromium, lead, mercury
 - Preservatives (antifouling agents): formaldehyde
 - Ketones: methyl ethyl ketone, methyl isobutyl ketone
 - Miscellaneous volatile organics: acrolein, acrylonitrile

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery

Deliver materials to the site in original, unopened containers bearing manufacturers name and label containing the following information:

1. Product name or title of material
2. Manufacturer's stock number and date of manufacture
3. Manufacturer's name
4. Federal Specification number, if applicable.
5. Federal regulations for amount of lead in paint (less the 0.06% lead in non-

- volatile ingredients)
 - 6. Contents by volume for major pigment and vehicle constitutions
 - 7. Thinning instructions
 - 8. Application instructions
 - 9. Color name and number
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
- 1. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from use of paints.
- C. To the extent feasible, do not store paint products with materials that have a high capacity to adsorb VOC emissions (i.e., materials which are woven, fibrous or porous in nature, such as acoustical ceilings, carpet, textiles, etc.). Do not store paint products in occupied spaces.

1.7 PROJECT CONDITIONS

- A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 deg. F and 90 deg. F, unless otherwise permitted by paint manufacturer's instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 deg. F and 95 deg. F, unless otherwise permitted by paint manufacturer's instructions.
- C. Do not apply paint when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer.

1.8 GUARANTEES

- A. Adherence of workmanship and materials to Specification requirements shall be maintained for the one year contract guarantee period. These requirements shall include the following:
 - 1. There shall be no evidence of blistering, peeling, crazing, alligating, streaking, staining, or chalking.
 - 2. Dirt shall be removed without blemishing the finish by washing with mild soap and water.
 - 3. Colors of surfaces shall remain free from serious fading; the variation, if any, shall be uniform.
- B. Correct all defects, appearing within the guarantee period, by removal of the defective work and replacement as directed.
- C. All corrective measures shall be the Contractor's responsibility, and will be made at no extra cost to the owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following manufacturers: Colors selected are Benjamin Moore and Co. If an other manufacturer is used, colors must match Benjamin Moore.
1. Benjamin Moore and Co.
 2. PPG Industries, Pittsburgh Paints.
 3. The Sherwin-Williams Company.

2.2 MATERIALS

- A. Provide products which meet all New York State VOC requirements for applications outlined herein.
- B. Provide products which meet all Federal regulations for amount of lead in paint (less than 0.06% lead in non-volatile ingredients).
- C. Provide best quality grade of various types of coatings as regularly manufactured by the paint materials manufacturers. Materials not displaying manufacturers' identification as a standard, best-grade product will not be acceptable.
- D. Use only thinners approved by paint manufacturers for applications intended and use only within recommended limits.
- E. **PRIMER**
Primer coat product shall meet or exceed the following:
1. Volume Solids: 40% ± 2%
 2. Weight Solids: 51% ± 2%
 3. VOC (EPA Method 24): 90 g/L; 0.75 lb/gal
 4. Provides performance which is comparable to the products that are formulated in accordance with federal specification:
 - a. A-A-2340
 - b. A-A-2994, Type II
 - c. TT-P-650D, Type I
 5. Spreading Rate per coat: @ 4 mils wet; 1.6 mils dry
- F. **INTERMEDIATE AND FINISH COATS**
Intermediate and finish coat products shall meet or exceed the following:
1. Volume Solids: 39% ± 2%
 2. Weight Solids: 53% ± 2%
 3. VOC (EPA Method 24): 0 g/L; 0.0 lb/gal
 4. Spreading Rate per coat: @ 4 mils wet; 1.6 mils dry

2.3 COLORS

- A. Selection
 - 1. Paint colors are as indicated on Paint Schedule.
- B. Colors:
 - 1. For multicoat systems, apply each coat using a successively darker tint or shade, unless approved otherwise.
 - 2. Top coat colors: As indicated in finish schedule, by reference to nomenclature of manufacturer listed on schedule. This reference is for color matching only.

2.4 PAINTING SCHEDULE

- A. Interior
 - 1. Gypsum wall board surface in all area spaces: Eggshell Enamel
 - 2. Hollow metal and miscellaneous metal trim: Semi-Gloss
 - 3. Wood: Semi-Gloss

2.5 INTERIOR PAINT SYSTEMS

- A. Gypsum Drywall, Concrete and Plaster
 - 1. Semi-gloss Finish
 - 1st Coat - Latex primer sealer -- 1.0 Mils DFT
 - 2nd Coat - Semi-gloss enamel -- 1.3 Mils DFT
 - 3rd Coat - Semi-gloss enamel -- 1.3 Mils DFT
- B. Ferrous Metal
 - * 1st Coat (New) - Alkyd Modified Latex Primer -- 1.2 Mils DFT
 - ** 1st Coat (Repaint) - Alkyd Modified Rust Preventive Latex Primer -- 1.6 Mils DFT
 - 2nd & 3rd Coats Semi-Gloss Latex Enamel -- 1.3 Mils DFT
 - * Touch-up required on shop primed items.
 - ** Spot prime as needed.
- C. Wood
 - 1 coat Vinyl Acrylic Latex Enamel Underbody
 - 2 coats Semi-gloss Latex Enamel

PART 3 - EXECUTION

3.1 ENVIRONMENTAL CONSIDERATIONS

- A. Comply, at minimum, with paint manufacturer recommendations for space ventilation during and after installation. Where feasible, the following ventilation conditions shall be maintained during the paint curing period, or for 72 hours after application: 1) supply 100% outside air 24 hours a day; 2) supply airflow at a rate

of 6 air changes per hour, when outside temperatures are between 55 degrees F and 85 degrees F and humidity is between 30% and 60%; and 3) supply airflow at a rate of 1.5 air changes per hour, when outside air conditions are not within the range stipulated in item 2 above.

- B. To the extent practical, allow paint installations to cure *prior to* the reinstallation of materials that adsorb VOCs. Materials that adsorb VOCs include carpets, textiles, and acoustical ceiling panels.

3.2 PREPARATION

A. Protection

1. Cover or otherwise protect all finished surfaces on the wall. Protection includes taping, masking, and draping all items on or near the areas to be painted.
2. Floors to be protected from paint

B. Surface Preparation

1. Perform preparation and cleaning procedures in accordance with the paint manufacturer's instructions and as specified.
 - a. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to other cleaning procedures. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
2. Ferrous Metals
 - a. Remove dirt and grease with cleaning solvents which will not affect shop prime coat. Wipe off with clean cloths.
 - b. Remove rust, mill scale and defective paint down to bare metal, using scraper, sandpaper, or wire brush. Grind if necessary to remove shoulders at edge of sound paint to prevent flaws from photographing finish coats.
3. Steel Doors, Frames/or Wall Access Panels
 - a. Fill small dents, pits, and other minor imperfections flush and smooth with polyester filler.
 - b. Apply and finish filler in accordance with manufacturer's instructions.
4. Gypsum Board: Fill cracks and other blemishes with spackling or patching compound and sand smooth.
 - a. Latex-fill minor defects.
 - b. Spot-prime defects after repair.
6. Mildew:
 - a. Remove mildew by scrubbing with solution of trisodium phosphate and bleach.
 - b. Rinse with clean water and allow surface to dry.

3.3 APPLICATION

A. General

1. No Work shall be performed in spaces which are not broom clean and free of dust and waste.
2. Apply paint materials to produce smooth finished surfaces, free of brush or roller marks, drops, runs, or sags.
3. Paint materials shall be kept at a proper and uniform consistency.
4. Thin only when necessary to achieve best results.

5. Thinners shall be turpentine, mineral spirits or material recommended by manufacturer of paint, and in quantity as recommended.
6. Excessive use of thinner as indicated by variation in absorption, lack of "hide", thickness of dry film, mottled or streaky coat, shall be cause for rejection. Correct as directed.
7. Apply all coats with brush, roller or spray, varying slightly the color of succeeding coats to achieve approved color
8. Brush out or roll on first or prime coat; work well into surface.
9. Allow at least 48 hrs. for enamels to dry.
10. The surfaces of interior woods and metals shall be sanded or rubbed between coats to assure smooth finish and proper adhesion of subsequent coats.
11. Finish doors on tops, bottoms and side edges same as exterior faces.

3.4 CLEANING

A. General

Contractor is required to clean-up behind each paint crew such that painting and clean-up will be a continuous uninterrupted operation. The practice of one general clean-up after completion of all painting will be strictly prohibited. This clean-up will include, but not be limited to the following:

1. Remove spots or defacement resulting from Work of this Section.
2. Retouch all damaged surfaces to leave Work in perfect finished condition.
3. If spots or defacement cannot be satisfactorily removed and retouched, re-finish the surfaces as directed.
4. Free all operating units of painted materials and leave them clean and in proper working order.
5. Remove from premises all surplus paint materials, debris and any other rubbish resulting from the Work.
6. Leave storage space clean and in condition required for equivalent spaces in project.

3.5 PROTECTION

- A. Provide "Wet Paint" signs to protect newly-painted finishes. Remove temporary protective after completion of painting operations.
- B. At the completion of Work touch-up and restore all damaged or defaced painted surfaces as directed by the FIT Project Manager and the Architect.

3.6 ATTIC STOCK

- A. Additional 2 gallons of each color.

END OF SECTION 09 91 00

SECTION 12 24 13 – MANUAL ROLLER SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Black out manual roller shades.

1.2 REFERENCES

- A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
 - 3. Storage and handling requirements and recommendations.
 - 4. Mounting details and installation methods.
 - 5. Typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable.
- C. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.
 - 1. Prepare shop drawings on Autocad or Microstation format using base sheets provided electronically by the Architect.
- D. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.
- E. Selection Samples: For finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.
- G. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

- B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.
- C. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- D. Electrical Components: NFPA Article 100 listed and labeled by either UL or ETL or other testing agency acceptable to authorities having jurisdiction, marked for intended use, and tested as a system. Individual testing of components will not be acceptable in lieu of system testing.
- E. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.
- F. Mock-Up: Provide a mock-up (manual shades only) of one roller shade assembly for evaluation of mounting, appearance and accessories.
 - 1. Locate mock-up in window designated by Architect.
 - 2. Do not proceed with remaining work until, mock-up is accepted by Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 WARRANTY

- A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating twenty-five year limited warranty.
- B. Standard Shadecloth: Manufacturer's standard twenty-five year warranty.
- C. Ecoveil Shadecloth: Manufacturer's standard ten year warranty.
- D. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: MechoShade Systems, Inc.: 42-03 35th St.; Long Island City, NY 11101; Tel: 718-729-2020; Fax: 718-729-2941; Email: info@mechoshade.com (john.goldberg@mechosystems.com); Website: www.mechoshade.com
- B. Sol-R-Shade: DFB Sales, Inc., 21-07 Borden Avenue, Long Island City, NY 11101; Tel: 718-729-8310; Email: sales@dfbsales.com; Website: www.dfbsales.com
- C. Or approved equal.

2.2 SHADE BAND

- A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
 - 1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
 - 2. Shade Band and Shade Roller Attachment:
 - a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades, and less than 2.55 inches (64.77 mm) for motorize shades are not acceptable.
 - b. Provide for positive mechanical engagement with drive / brake mechanism.
 - c. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" "snap-off" spline mounting, without having to remove shade roller from shade brackets.
 - d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
 - e. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.3 SHADE FABRICATION

- A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.
- B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design. Fabricate hem as follows:
 - 1. Hembar: Concealed hembar.

- C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.
- D. Blackout shadebands, when used in side channels, shall have horizontally mounted, roll-formed stainless steel or tempered-steel battens not more than 3 feet (115 mm) on center extending fully into the side channels. Battens shall be concealed in a integrally-colored fabric to match the inside and outside colors of the shadeband, in accordance with manufacturer's published standards for spacing and requirements.
 - 1. Battens shall be roll formed of stainless steel or tempered steel and concave to match the contour of the roller tube.
 - 2. Batten pockets shall be self-colored fabric front and back RF welded into the shadecloth. A self-color opaque liner shall be provided front and back to eliminate any see through of the batten pocket that shall not exceed 1-1/2 inches (38.1 mm) high and be totally opaque. A see-through moire effect, which occurs with multiple layers of transparent fabrics, shall not be acceptable.

2.4 COMPONENTS

- A. Access and Material Requirements:
 - 1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
 - 2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
 - 3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.
- B. Manual Operated Chain Drive Hardware and Brackets:
 - 1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
 - 2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
 - 3. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
 - 4. Drive Bracket / Brake Assembly:
 - a. MechoShade Drive Bracket model M5 shall be fully integrated with all MechoShade accessories, including, but not limited to: SnapLoc fascia, room darkening side / sill channels, center supports and connectors for multi-banded shades.
 - b. M5 drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.525 mm) steel pin.

- c. The brake shall be an over-running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.
- d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
- e. The entire M5 assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
- f. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

2.5 ACCESSORIES

- A. Fascia:
 - 1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
 - 2. Fascia shall be able to be installed across two or more shade bands in one piece.
 - 3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
 - 4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
 - 5. Notching of fascia for manual chain shall not be acceptable.
- B. Room Darkening Channels:
 - 1. Side Channels, MechoShade: Extruded aluminum with polybond edge seals and SnapLoc-mounting brackets and with concealed fastening. Exposed fastening is not acceptable. Units 1-15/16 inches (49.2 mm) wide by 1-3/16 inches (30.1 mm) deep, two-band center channels, 2-5/8 inches (66.6 mm) wide by 1-3/16 inches (30.1 mm) deep. The 2-5/8-inch (66.6 mm) double-center channels may be installed at center-support positions of multi-band-shade ElectroShades. MechoShade side channels 2-5/8 inch (66.6 mm) may be used as center supports for ElectroShades; shadebands up to 8 high. For shadebands over 8 feet (2438 mm), provide ElectroShade side channels.
 - a. Blackout Lightseal Hembar: Channels shall accept one-piece exposed blackout hembar with vinyl seal to assure light control.
 - 2. Sill Channels: Extruded aluminum with polybond edge seals and SnapLoc-mounting brackets and with concealed fastening. Exposed fastening is not acceptable.
 - 3. Channel Color: Selected from manufacturer's standard colors.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow proper clearances for window operation hardware.
- B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
- C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- D. Engage Installer to train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 12 24 13

SECTION 22 10 00 – PXC JACKETING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. PVC Jacketing and Fittings
- B. PVC Adhesives
- C. Industrial Grade Silicone Sealant

1.2 REFERENCES

ASTM E84	Surface burning characteristics
ASTM E136	Non-combustibility (insert only)
ASTM C585	Standard dimensions for pipe
ASTM D1784	Specification for rigid PVC
ASTM C1338	Fungi test
ASTM G21 & G22	Fungi and bacteria test
Federal Specification	
LP-1035A	Federal standard PVC – Type II Grade GU
LP-535E	US Army standard PVC – Type II Grade GU
USDA	United States Department of Agriculture
New York City MEA	Toxicity

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Jacketing, fittings, sealants and adhesives.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, and relationship to adjacent work.
 - 1. Prepare shop drawings on AutoCAD using base sheets provided electronically by the Architect.
- D. For all PVC jacketing, use existing RCP. Include opening sizes and key.

- E. Maintenance Data: Methods for maintaining roller PVC, precautions regarding cleaning materials and methods.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain materials through one source from a single manufacturer with a minimum of fifteen experience in manufacturing products comparable to those specified in this section.
- B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of five years' experience in installing products comparable to those specified in this section.
- C. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- D. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Install after ceiling painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 WARRANTY

- A. Standard: Manufacturer's warranty.

PART 2 PRODUCTS

2.1 ACCESSORIES

- A. A300 Series PVC Adhesives
Colorado Paint Company
- B. S.L-Plex RTV-7500 Multi Surface Silicone Sealant

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install PVC level, plumb, square, and true according to manufacturer's written instructions. Allow proper clearances for window operation.
- B. Clean surfaces after installation, according to manufacturer's written instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 12 24 13

SECTION 23 05 12
GENERAL PROVISIONS FOR HVAC WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinated with and complementary to the General Conditions and Supplementary General Conditions of the Work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical Work shall apply.

1.02 DESCRIPTION OF WORK INCLUDED

- A. Work Included:
 - 1. The work includes providing all labor, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner, all Heating, Ventilating and Air Conditioning Work as shown on the Drawings and hereinafter specified, including, but not limited to the following:
 - a. Sheet metal ductwork and accessories such as dampers, access doors, etc.
 - b. Registers, grilles and diffusers.
 - c. Fire dampers and smoke dampers.
 - d. Installation of smoke detectors in ductwork.
 - e. Acoustical duct lining.
 - f. Pipe, duct and equipment insulation.
 - g. Constant and variable volume air terminals with electric reheat.
 - h. Temperature Control: A complete system of temperature control shall be installed in connection with the HVAC systems, including all thermostats, control valves, damper motors and dampers for the outdoor air intakes and fan discharges. All control wiring for automatic temperature controls, including interlocking wiring for fans, chillers, pumps, etc. by this Contractor.
 - i. Painting and pipe, duct and equipment identification for all work by this Contractor is previously specified under "Special Requirements for Mechanical and Electrical Work".
 - j. Test and balancing.
 - k. Sleeves, pipe inserts and anchor bolts, escutcheons, prefabricated roof curbs, etc., as hereinafter specified.
 - l. Identification, name plates, tags and charts.
 - m. Cutting and rough patching.
 - n. All demolition work associated with HVAC systems.
 - o. Installation of fire and smoke dampers in the existing ductwork and fan systems.

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with quality established in Section 01 31 46 "Special Requirements for Mechanical and Electrical Work", and hereinafter specified. All work performed shall comply with local codes.

1.04 SUBMITTALS

- A. Submit shop drawings covering the following items:
 - 1. Coordination drawings.
 - 2. Sleeve and ductwork penetration drawings.
 - 3. Identification schedule and samples.
 - 4. Air diffusers, registers and grilles.
 - 5. Schedule of ductwork, joints, gauges, supports, flexible connections, fire dampers, access doors, etc.
 - 6. Sheet metal fabrication drawings.
 - 7. Thermometers and pressure gauges.
 - 8. Ductwork supports, including inserts, escutcheons, etc.
 - 9. Schedule of insulation types and samples of each type.
 - 10. Vibration isolation schedule.
 - 11. Acoustic material.
 - 12. VAV and constant air valve boxes.
 - 13. Automatic Temperature Control System.

- B. All shop drawings being submitted that include electrical work shall be submitted with all internal and external wiring diagrams.

- C. The previously listed items are major equipment and do not limit this Division's responsibility to submit shop drawings for all equipment and accessories which are to be provided under this Division of Specifications.

PART 2 - PRODUCTS

2.01 LIST OF MANUFACTURERS

- A. The manufacturer's name appearing first on this list is the manufacturer the project design was based upon. However, the additional manufacturers listed herein are also acceptable with the provision that they meet the requirements of these Specifications, ratings, and/or space allocations listed in the Specifications or shown on the Drawings.
 - 1. Duct Terminal Units
 - a. Titus
 - b. Price
 - c. Envirotech
 - d. Anemostat
 - e. Or approved equal
 - 2. Draft Gauges
 - a. Dwyer
 - b. or approved equal
 - 3. Louvers & Dampers
 - a. Arlan Damper Corp. (631-589-7431)
 - b. Ruskin
 - c. Titus
 - d. or approved equal
 - 4. Thermometers & Pressure Gauges
 - a. Ashcroft
 - b. Weiss Instruments

5. Diffusers, Registers & Grilles
 - a. Titus
 - b. Price
 - c. Anemostat
 - d. Acutherm
 - e. Nailor
6. Valves
 - a. Milwaukee Valve
 - b. Crane
 - c. Hammond Valve
 - d. or as specified under paragraph on "Valves".
7. Insulation and Acoustic Lining
 - a. Owens-Corning Fiberglass Corp.
 - b. CSG Snap-on
 - c. Johns Manville
 - d. or approved equal
8. Vibration Isolation
 - a. VMC East
 - b. Mason Industries
 - c. Korfund Corp
 - d. or approved equal
9. Automatic Temperature Controls
 - a. Distech
 - b. or approved equal

PART 3 - EXECUTION

END OF SECTION 23 05 12

23 05 93 - TESTING AND BALANCING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinate with and complementary to the General Conditions and Supplementary General Conditions of the Work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical Work shall apply.

1.02 DESCRIPTION OF WORK

- A. All piping and equipment shall be tested. Labor including standby electrician, materials, instruments and power required for testing shall be furnished unless otherwise indicated under the particular Section of the Specification.
- B. Tests shall be performed in the presence of and to the satisfaction of the Architect and such other parties as may have legal jurisdiction.
- C. In no case shall piping, equipment, or accessories be subjected to pressure exceeding their ratings.
- D. All defective work shall be promptly repaired or replaced, and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architects.
- E. Any damage resulting from tests to any and all trades shall be repaired and damaged materials replaced, all to the satisfaction of the Architect.
- F. The duration of tests shall be as determined by all authorities having jurisdiction, but in no case less than the time prescribed below.
- G. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems, and their controls. Whenever the equipment or system under test is interrelated and depends upon the operation of other equipment, systems and controls for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment or system being tested.
- H. All fans and duct systems shall be completely balanced by the adjustment of sheaves, dampers, registers and other volume and diverting control devices, to obtain the air quantities indicated on the design drawings. Replace sheaves if required to meet design conditions.
- I. All pumps and piping systems shall be completely balanced by the adjustment of plug cocks, globe valves or other control devices, to obtain flow quantities indicated on the design drawings.
- J. Tests shall be performed in presence and to satisfaction of Architect, and such other parties as may have legal jurisdiction. Submit completed reports for approval. If air and water balancing cannot be verified in two, four hour tests (total of eight hours) the Contractor shall pay the Architect or his representative for any additional time spent to balance the system.

- K. Upon completion of the work, a test shall be conducted in the presence and under the direction of a NYS Licensed Professional Engineer, retained by the Contractor, and qualified to conduct such tests. The tests shall show compliance with the code requirements for ventilation and the proper functioning of operating devices, before the system is approved. Tests shall also be conducted under the direction of the same Licensed Professional Engineer to demonstrate that all installed fire and fire smoke dampers operate properly. The Contractor shall submit a letter signed and sealed by the Licensed Professional Engineer indicating that such testing has been successfully conducted and shall make all associated controlled Special Inspections and other submissions to the Authority Having Jurisdiction (AHJ).

1.03 QUALITY ASSURANCE

- A. Prior to installation of the mechanical systems, engage the services of an independent air and water balancing firm that shall be subject to the approval of the Architect. The firm shall have no affiliation with a mechanical contracting or sheetmetal company. Balancing and testing company shall be a member of the Associated Air Balance Council (AABC), National Environmental Balance Bureau (NEBB) or Testing, Adjusting and Balancing Bureau (TABB). The balancing firm shall have at least one member of its full time staff who is a licensed professional engineer who shall supervise the balancing work. Prior to balancing, a list of instruments to be used shall be submitted to the Architect. All instruments shall be calibrated within six months before tests.

- B. Prior to installation of the mechanical systems, the licensed Professional Engineer for the Balancing and Testing Company shall review the contract documents to confirm that all balancing devices are provided to allow for complete balancing of the air and water systems for the project. The Balancing and Testing Company shall submit a letter confirming that they have performed this review and identifying any issues.

After the mechanical systems are installed and before the systems are enclosed behind walls and ceilings, the PE for the Balancing and Testing Company shall perform a review of the installation to verify that the required balancing devices have been installed and that the systems are ready for balancing. The Balancing and Testing Company shall submit a letter confirming that the inspection has been performed and that the system is ready for balancing.

Both letters shall be signed and sealed by the Balancing and Testing Company's Professional Engineer.

- C. When all specified testing and balancing procedures have been completed, a written report shall be submitted to the Architect for review. The report shall be tabulated in standard AABC/TABB format. As part of the Architect's review process, the accuracy of the balancing report shall be field spot checked on a random basis, with the assistance of the balancing firm's project supervisor. The HVAC Contractor shall reimburse the Architect for all time spent in excess of eight working hours, to demonstrate the accuracy of the balancing report.

1.04 SUBMITTALS

- A. Refer to Section 01 31 46 "Special Requirements for Mechanical and Electrical Work". Submit all test and balancing reports as described hereinafter.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 FIRE DAMPER AND FIRE SMOKE DAMPER TEST

- A. Under this section test each and every fire damper by removing the fusible link to demonstrate that the damper properly closed.
- B. Under this section test each and every fire smoke damper by removing the fusible link or alternately applying heat to the heat detector for dampers utilizing heat detectors) to demonstrate full closure. Also demonstrate that the damper opens and closes properly under automatic control through the operator.
- C. After the successful completion of such tests reinstall fusible links and reset heat detectors.
- D. All such tests shall be conducted under direction of a NYS Professional Engineer retained by the Contractor.

3.02 TEST PREPARATION AND PROCEDURE

- A. On initial startup, prior to any tests, check the rotation and running amperage of all fan and pump motors to prevent damage to equipment by overload.
- B. Final balancing must be done with all systems completely installed and operating, and after the automatic temperature controls have had their final adjustment.
- C. New, clean filters must be installed in all supply systems prior to balancing.
- D. All main supply air ducts shall be traversed, using a pitot tube and manometer. The manometer shall be calibrated to read two significant figures in all velocity pressure ranges. Duct traverses shall be conducted using the log-Tchebycheff method. The equal area method is not acceptable.
- E. A main duct is defined as either of the following:
 - 1. A duct serving five or more outlets.
 - 2. A duct serving two or more branch ducts.
 - 3. A duct serving a reheat coil.
 - 4. A zone duct from a multi-zone unit.
 - 5. A duct emanating from a fan discharge or plenum and terminating at one or more outlets.
- F. The intent of this operation is to measure by traverse the total air quantity supplied by the fan and to verify the distribution of air to zones.
- G. Submit data in support of all supply fan deliveries by the following four methods:
 - 1. By summation of the air quantity readings at all outlets.
 - 2. By duct traverse of main supply ducts and directly at the air handler or fan discharge.
 - 3. By a rotating vane traverse across a filter or coil bank.
 - 4. By plotting RPM and static pressure readings on the fan curve. Air density corrections must be indicated.
- H. For return air and exhaust fans, the rotating vane traverse is not required.

- I. Inspect all fan scrolls and remove objects or debris. Inspect all coils and remove debris or obstructions. Verify that all fire dampers are open.
- J. The supply air systems shall be completely balanced prior to the final balancing of the water systems.
- K. Upon completion of all air and water balancing, all duct dampers, plug valves and other throttling devices shall be permanently marked in the final adjusted position.

3.03 AIR BALANCE

- A. Record the following design requirements for all fans and fan motors from the approved shop drawings.
 - 1. Air quantities - CFM
 - 2. Approximate fan speed - RPM
 - 3. Fan static pressure (total or external) - inches of water.
 - 4. Maximum tip speed - FPM
 - 5. Outlet velocity - FPM
 - 6. Fan brake horsepower
 - 7. Motor horsepower
 - 8. Volts, phases, cycles and amps at design conditions.
- B. Record the following data from all fans and fan motors installed at the project:
 - 1. Manufacturer, model and size
 - 2. Motor horsepower, service factor and RPM
 - 3. Volts, phases, cycles and full load amps
 - 4. Motor starter and heaters size
 - 5. Equipment location
- C. All fans and duct systems shall be completely balanced by the adjustment of sheaves, dampers, registers and other volume and diverting control devices, to obtain the air quantities indicated on the Drawings. Outside air and return air modulating dampers shall be adjusted to admit the specified quantities of air under all cycles of operation. All final adjusted air quantities shall be within 10% of the design requirements while adhering to positive or negative pressure roof design conditions. Replace sheaves if required to meet design conditions.
- D. Record the following test data for all fans and motors installed at the Project at final balanced conditions:
 - 1. Fan speed RPM.
 - 2. Fan static pressure (external and total) inches of water.
 - 3. Static pressure drop across all filters, dampers, coils and other items in the supply fan casings.
 - 4. Motor operating amps. (Measure, record and report all motor amps at minimum outside air volume and at maximum outside air volume.) This requirement applies to both constant volume and variable air volume systems where economizers are present.
 - 5. Actual voltage
 - 6. Fan CFM
 - 7. Calculated brake horsepower.

- E. Submit single line diagrams of all duct systems indicating all terminal outlets identified by number. Data sheets shall list all such outlets denoted by the same numbers, including the outlet's size, "K" factor, location, CFM and jet velocity.
- F. Submit this data for all supply, return and exhaust air systems.
- G. Adjust the outside air, relief air and return air dampers to admit the required amounts of outside air. Record and submit outside air flow measurement and the outside, return and mixed air temperatures for both cycles after final adjustments.
- H. Air balancing shall be performed with filters partially blocked to simulate a pressure drop across the filters equal to that midway between the clean and the dirty condition.

3.04 VARIABLE AIR VOLUME SYSTEM

- A. Check and record the following items on the supply and return fans:
 - 1. Correct fan rotation.
 - 2. Filter condition (clean or dirty).
 - 3. Cooling coil condition (dry or wet).
- B. Set the controls for the supply and return fans to operate at maximum capacity and for all variable volume dampers to be at the full open position.
- C. Set the system up to operate with maximum return air and minimum outside air.
- D. The following preliminary data should be obtained and recorded at the supply and return fans:
 - 1. Fan and motor RPM.
 - 2. Motor and current voltage.
 - 3. Fan, coils and filter statics.
 - 4. Nameplate data on the fans and motors.
 - 5. Motor sheave, fan pulley and belt sizes.
- E. Traverse the main supply ducts and return ducts to determine CFM deliveries of the fans.
- F. Set the system to operate at 100% outside air and check the motor amperage. The motor amperage should remain relatively constant indicating no change in total air flow. If a change in flow does occur, adjust outside air, return air, and relief air dampers accordingly. Set enough variable volume controllers throughout the building to maximum in order to simulate a maximum load on the fan.
- G. Measure the system duct static pressure at selected points throughout the system. Monitoring points shall be in those duct runs which are of the longest equivalent length (greatest friction loss). Monitor these points during the adjusting and balancing procedures to assure proper inlet static pressure is being maintained to the variable volume units.
- H. Adjust the return fan to approximately 5% above design CFM and the supply fan to either 5% above design or to the point where the static pressure at the end of each branch is at required static pressure, whichever condition is reached first.
 - 1. If the fan is adjusted to obtain the minimum static pressure, then it may be necessary to readjust the fan during the balancing as the static pressure will decrease as the constant volume controller deliveries are increased.

- I. Make preliminary outlet readings and balance the outlets to design CFM and record all readings.
- J. Individually set the controls for each variable volume damper to comply with correct sequence of operation.
- K. Check the variable volume controller for design delivery.
 - 1. Check all the units, but make no adjustments. Report the results.
 - 2. If check passes, then proceed with balancing.
 - 3. Do all setting and adjusting required.
 - 4. When necessary corrections have been made, a verification test will be required.
- L. Adjust the outlets for design delivery.
- M. The following final data should be obtained and recorded at the supply and return fans:
 - 1. Fan and motor RPM.
 - 2. Motor current and voltage.
 - 3. Fans, coils and filter statics
 - 4. Approximate motor sheave setting
- N. Check the following controls:
 - 1. Economizer system function, calibration and damper synchronization.
 - 2. Face and bypass dampers function and calibration, if any.
 - 3. High temperature limit shutoff function and calibration, if any.
 - 4. Low temperature limit shutoff function and calibration, if any.
- O. Set all controls to their normal set points and allow all controllers to reach a satisfied state.
- P. Measure the mixed air plenum static pressure to verify that the return fan capacity controller is functioning properly. The static pressure in the plenum should be within .05" W.C. of the final balance condition.
- Q. Walk through the building and listen for noise generated by the air distribution system. Excessive noise should be reported.
- R. All above recorded items and readings shall be submitted to the Architect.
- S. Balance all induction units by primary air nozzle pressure. Record the following data in addition to the design requirements for each unit.
 - 1. Unit size and location.
 - 2. Final nozzle pressure - inches of water.
 - 3. Water entering and leaving temperature and pressure drop through coil at full flow.
 - 4. Primary air temperature, room temperature and supply air temperature.
- T. Adjust and test all terminal boxes, mixing boxes and their controls to deliver the required air quantities. Record the following data in addition to the design requirements for each unit:
 - 1. Box size and location.
 - 2. Air temperatures in the hot duct and cold duct inlets for cooling and full heating.
 - 3. Static, velocity and total pressures in hot duct and cold duct inlets for full cooling and full heating.

3.14 ADDITIONAL PROCEDURES FOR VARIABLE AIR VOLUME SYSTEM

- A. Set the controls for the supply and return fans to operate at maximum capacity and for all variable volume dampers to be at the full open position. Open VAV diffuser dampers by heating up the building so that diffusers call for full cooling.

- B. For VAV boxes check the variable volume controller for design delivery.
 - 1. Check all the units, but make no adjustments. Report the results.
 - 2. If check passes, then proceed with balancing.
 - 3. When necessary corrections have been made, a verification test will be required.
 - 4. For VAV boxes with an upstream volume damper check that box damper is more than 50% open at design delivery and that no objectionable noise exists in the rooms served. If necessary, adjust upstream volume damper to achieve these conditions.
 - 5. Measure and record CFM and inlet static pressure for each VAV box.

- C. Adjust the outlets for design delivery. For VAV diffusers comply with manufacturer's balancing procedures. The VAV diffuser manufacturer's representative shall provide training in the balancing process.

END OF SECTION 23 05 93

23 07 00 - INSULATION FOR HVAC WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinated with and complementary to the General Conditions and Supplementary General Conditions of the Work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical Work shall apply.

1.02 DESCRIPTION OF WORK

- A. The work includes furnishing and installing all labor, materials, equipment, accessories and services necessary to provide Piping, Ductwork and Equipment Insulation installation, which is complete in every respect and of the composition and quality as shown on the Drawings and hereinafter specified.

1.03 DUCTWORK INSULATION

- A. Insulate all ductwork except the following portions of ductwork:
 - 1. Ducts provided with sound absorptive lining (except where humidifier is installed and except where located outdoors) may have external insulation thickness decreased provided overall insulation R-value internal plus external complies with R-value specified herein.
 - 2. All exhaust ductwork, except where otherwise noted.
 - 3. Return air ductwork passing through air conditioned space and/or hung ceiling of air conditioned space, except in single story buildings and ducts in ceiling of uppermost floor or in attic space, where all return air ducts must be insulated.
 - 4. Return air ductwork for heating and ventilating systems, where return air ducts pass through heated areas.
 - 5. Exposed supply and return air ducts in air conditioned spaces if same supply air duct serves that area only.
 - 6. Exposed supply air duct in ventilated spaces, if same duct serves that area only.

1.04 QUALITY ASSURANCE

- A. "Installer": A firm with at least ten 10 years successful installation experience on projects with piping and ductwork insulation similar to that required for this project.
- B. All insulation shall have composite (including insulation jacket or facing and adhesive) fire and smoke hazard ratings as tested by procedure ASTM E-84, NFPA 255 and UL 723 not exceeding:
 - 1. Flame Spread 25
 - 2. Smoke Developed 50
 - 3. Fuel Contributed 50
- C. Accessories such as adhesives, mastics, cements, tapes and cloths for fittings shall have component ratings as listed above. All products shall bear UL labels indicating the above are not exceeded.

- D. Provide certifications or other data as necessary to show compliance with these Specifications and governing regulations. Include proof of compliance for test of products for fire rating, corrosiveness, and compressive strength.
- E. Provide products produced by the manufacturers which are listed in Section 23 05 12, "Approved Manufacturers List"
- F. Insulation Materials: Insulating materials manufacturing facilities must be certified and registered with an approved registrar for conformance with ISO9000 quality standard.

1.05 SUBMITTALS

- A. Refer to Section 01 31 46 - "Special Requirements for Mechanical and Electrical Work", and submit shop drawings and samples.

1.06 GUARANTEE

- A. Refer to Section 01 31 46 - "Special Requirements for Mechanical and Electrical Work".

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect insulation against dirt, water, chemical and mechanical damage. Do not install damaged insulation; remove from project site.
- B. Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated containers with the manufacturer's stamp, or label, affixed showing fire hazard ratings of the products.
- C. Store insulation in original wrappings and protect from weather and construction traffic.

PART 2 - PRODUCTS

- A. Insulation on any piping, fitting, flange and valve located in areas exposed to freezing (in unheated areas, at cooling towers and where noted on the Drawings as to provide "Frost Insulation") shall be increased by one inch with the same finish as specified for the particular service when not subject to freezing. Insulation shall always be a minimum of 2½" inches in thickness.
- B. Insulation shall be glass fiber complying with ASTM C547, Type I with a maximum K factor of 0.23 BTU in/hr ft² F at 75 degrees F. mean temperature with factory-applied all service vapor barrier jacket with self-seal lap meeting the requirement of ASTM C-1136 Type I.
- C. Insulation shall be heavy density fiberglass sectional pipe insulation as made by Owens-Corning Fiberglass Corp. or Johns-Manville Micro-Lok fiberglass insulation.
- D. Ends of pipe insulation shall be sealed off at all flanges, fittings, valves and at intervals of 21 feet on continuous runs of pipe, with Foster fire-resistant vapor barrier coating Foster 30-65 or Childers CP-34 or equal.
- E. All fittings, valves and flanges for pipe sizes smaller than 4" shall be insulated with molded fiberglass fittings of same thickness as the adjoining pipe insulation, secured with No. 20 gauge

galvanized annealed steel wire and covered with Zeston 2000 25/50 PVC as made by Johns Manville, applied per manufacturer's recommendation, except as specified in 2.01 H.

- F. All fittings, valves and flanges for pipe sizes 4" and larger shall be insulated with fabricated mitered segments of pipe insulation of same thickness as the adjoining pipe insulation, secured with No. 20 gauge galvanized annealed steel wire and covered with Zeston 2000 25/50 PVC fitting covers as made by Johns Manville installed per manufacturer's recommendation, except as specified in 2.01 H.
- G. Finish for Exposed Pipe Insulation:
 - 1. The term "exposed" is hereby defined as any place outdoors, as well as any place indoors in Mechanical Rooms, Storage Rooms, Janitor's Closets, etc., within 7 feet of floor or access platforms or where indicated on the drawings.
 - 2. All exposed pipe, valve and fittings insulation shall have 0.016 inch thick corrugated aluminum jacket banded with ½" s.s. bands spaced 12" o.c. Piping, fittings and valves exposed in building, within seven feet of the floor or access platform, shall have 0.016" thick aluminum jacket banded with ½" aluminum bands spaced 12" o.c. or two bands per section. Joints and jacket shall provide complete weatherproof protection either by mechanical contact or by use of Foster 95-44 or Childers CP-76 metal jacketing sealant (gallon cans only; no tubes).
 - 3. All calcium silicate pipe insulation, all insulated condenser water piping exposed to weather and all other insulated pipe exposed to weather shall have 0.016 inch thick aluminum jacket banded with ½" s.s. bands spaced 12" o.c. This shall include pipe, fittings and valves.
- H. All below ambient, coated molded fittings and mitered segments shall be vapor sealed with a layer of open weave glass fabric embedded between two 1/16" thick coats of Foster 30-65 or Childers CP-34 vapor barrier coating and lap seal at least 1" for molded type and 2" for mitered type on itself and adjoining insulation.
- I. Direct contact between pipe and hanger shall be avoided. Hanger shall pass outside of a metal saddle which shall support a section of high density insulation equal thickness to adjacent insulation (such as calcium silicate) and of sufficient length to support pipe without crushing insulation. (See table below.) Hangers shall not pierce insulation and all vapor barriers shall be unbroken and continuous.

Pipe Size	Saddle & Insert Length
1½"- 2"	10" Long
3"-6"	12" Long
8"-10"	16" Long
12" & Over	22" Long

- J. At pipe supports, insulation shield protection saddles and matching hanger shall be used.

2.02 HOT PIPE INSULATION

- A. The following piping shall be covered with fiberglass insulation:

<u>Service</u>	<u>Thickness</u>
Steam and Condensate Pressure above 120 psig	

Up to ¾"	4½"
1" and above	5"
Steam and Condensate Pressure between 15 and 120 psig	
Up to ¾"	3"
1 to 1¼"	4"
1½" and above	4½"
Steam Pressure below 15 psig Blowdown Vents, Sample Cooler Inlet, Steam Safety and Relief, Soot Blower Blow Off:	
Up to 1¼"	2½"
1½" and above	3"
Condensate Pump Discharge	
Up to 3½"	2½"
4" and above	3"
Hot Water Supply and Return (351 Degrees F and above)	
Up to ¾"	4½"
1" and above	5"
Hot Water Supply and Return (between 251-350 Degrees F)	
Up to ¾"	3"
1 to 1¼"	4"
1½" and above	4½"
Hot Water Supply and Return (between 201-250 Degrees F)	
Up to 3"	2½"
4" and above	3"
Hot Water Supply and Return (200 Degrees F and below)	
Up to 1¼"	1½"
1½" and above	2"
Snow Melting Supply and Return Above Ground and Hot Fuel Oil Supply and Return	
	1½"
Exposed L.P. Steam Safety and Relief Vent	
	2½"

Boiler Feed Water Suction and Discharge	2½"
Hot Gas Refrigeration Piping Exposed in Occupied Areas	1½"

- B. Insulation on any piping, fitting, flange and valve located in areas exposed to freezing (in unheated areas, at cooling towers and where noted on the Drawings as to provide "Frost Insulation") shall, in addition to above covering, be increased by one inch with the same finish as specified for the particular service when not subject to freezing. Insulation shall always be a minimum of 2½" inches in thickness.
- C. Insulation shall be glass fiber complying with ASTM C547, Type I with a maximum K factor of 0.23 at 75 degrees F. mean temperature. Insulation shall be suitable for 650 degree F. (2" minimum thickness above 450 degrees F.).
- D. Insulation shall be sectional pipe insulation as made by Owens- Corning Fiberglass Corp., or Johns Manville Micro-Lok fiberglass pipe insulation, with all purpose white kraft reinforced jacket with self-seal lap to comply with ASTM C1136 Type I.
- E. Longitudinal jacket laps and butt strips shall be smoothly secured per manufacturers recommendations.
- F. All fittings, valves and flanges for pipe sizes smaller than 4" shall be insulated with molded fiberglass fittings of same thickness as the adjoining pipe insulation, secured with No. 20 gauge galvanized annealed steel wire and covered with Zeston 2000 25/50 PVC fittings as made by Johns Manville, except as specified in 2.02 H.
- G. All fittings, valves and flanges for pipe sizes 4" and larger shall be insulated with fabricated mitered segments of pipe insulation of same thickness as the adjoining pipe insulation, secured with No. 20 gauge galvanized annealed steel wire and covered with Zeston 2000 25/50 PVC fittings by Johns Manville, except as specified in 2.02 H.
- H. Finish for Exposed Pipe Insulation:
 - 1. All exposed pipe, valve and fittings insulation shall have 0.016 inch thick corrugated aluminum jacket banded with ½" s.s. bands spaced 12 inches o.c. Piping, fittings and valves exposed in building, within seven feet of the floor or access platform, shall have 0.016" thick aluminum jacket banded with ½" aluminum bands spaced 12" o.c. or two bands per section. Joints and jacket shall provide complete weatherproof protection either by mechanical contact or by use of Foster 95-44 or Childers CP-76 metal jacketing sealant (gallon cans only; no tubes).
 - 2. All calcium silicate pipe insulation, all insulated condenser water piping exposed to weather and all other insulated pipe exposed to weather shall have 0.016 inch thick aluminum jacket banded with ½" s.s. bands spaced 12" o.c. This shall include pipe, fittings and valves.
 - 3. The term "exposed" is hereby defined as any place outdoors, as well as any place indoors in Mechanical Rooms, Storage Rooms, Janitor's Closets, etc., where located within 7 feet of floor or access platforms.
- I. Insulation shall be protected by saddles from hangers, guides and rollers.
- J. Strainers on hot pipes shall not be insulated.

- K. Direct contact between pipe and hanger shall be avoided. Hanger shall pass outside of a metal saddle which shall cover a section of high density insulation (such as calcium silicate) of sufficient length to support pipe without crushing insulation. (See table below.) Hangers shall not pierce insulation and all vapor barriers shall be unbroken and continuous.

Pipe Size	Saddle & Insert Length
1½"- 2"	10" Long
3"-6"	12" Long
8"-10"	16" Long
12" & Over	22" Long

- L. At pipe supports, insulation shield protection saddles and matching hanger shall be used.

2.03 PVC INSULATED FITTING COVERS

- A. The Contractor shall use Zeston 2000 25/50 rated PVC covers as made by Johns Manville or approved equal, for concealed piping.
- B. Hot Systems: Fittings shall be insulated by applying the proper factory precut Hi-Lo Temp insulation insert to the pipe fitting. The ends of the Ho-Lo Temp insulation insert shall be tucked snugly into the throat of the fitting and the edges adjacent to the pipe covering tufted and tucked in, fully insulating the pipe fitting. PVC fitting cover is then applied and shall be secured by tack fastening, banding or taping the ends to the adjacent pipe covering.
- C. On fittings where the operating temperature exceeds 250 deg. F, 2 or more layers of the Hi-Lo Temp insulation inserts shall be applied prior to the installation of the PVC fitting cover. The first layer shall be applied with a few wrappings of fiber glass yarn to eliminate voids or hot spots.
- D. Cold Systems: Fittings shall be insulated by applying the proper factory precut Hi-Lo Temp insulation insert to the pipe fitting. The ends of the Hi-Lo Temp insulation insert shall be tucked snugly into the throat of the fitting and the edges adjacent to the pipe covering tufted and tucked in, fully insulating the pipe fitting. All fittings and elbows shall be coated with vapor barrier coating and reinforcing mesh before PVC covers are applied.
- E. A vapor barrier mastic compatible with the PVC shall be applied around the edges of the adjoining pipe insulation and on the fitting cover throat overlap seam. The PVC fitting cover is then applied and shall be secured with pressure sensitive pearl gray Z-Tape along the circumferential edges. The tape shall extend over the adjacent pipe insulation and have an overlap on itself at least 2" on the downward side.
- F. 2 or more layers of the Hi-Lo Temp insulation inserts shall be applied with the first layer being secured with a few wrappings of fiberglass yarn.
- G. Refrigerant systems and cold systems located outdoors: Fittings shall be insulated to a full thickness the same as the adjacent pipe insulation, with insulation which has been mitered. An intermediate vapor barrier shall be applied, completely sealing the insulation and on the fitting cover overlap seam. 0.016" aluminum cladding shall be applied and shall be secured with pressure sensitive pearl gray Z-Tape along the throat seam and the circumferential edges overlapping itself 2" on the downward side with aluminum bands on 12" intervals.

- H. Qualifications for Using Insulation: When the pipe insulation thickness is greater than 1½” or the pipe temperature is greater than 250°F or less than 45°F, additional insulation inserts should be used. Use one Hi-Lo Temp insert for each additional 1" of pipe insulation.
- I. Fitting cover: The temperature of the PVC fitting cover must be kept below 150°F by the use of proper thickness of insulation and by keeping the PVC cover away from contact with, or exposure to, sources of direct or radiant heat.
- J. Where insulated piping is exposed (indoors up to 7 feet above the floor or platform) or any place outdoors, the PVC covers shall be omitted since the use of 0.016” thick aluminum cladding is required on all piping, fittings and valves.

2.04 FIRE STOPPING

- A. Packing of openings, where ducts and pipes penetrate fire barriers, shall be done with Rockwool insulation as made by United States Gypsum, Co.
- B. Insulation shall comply with Fed. Spec. HH-1-558, Form A, Class 4, K=0.24, melting point 2000 degrees F.
- C. An acceptable alternative to rockwool insulation shall be 3M Product Caulk CP25 or approved equal.

2.05 DUCTWORK INSULATION

- A. Insulation for Concealed Duct
 - 1. Except where otherwise noted, all concealed rectangular and round ductwork shall be covered with flexible duct insulation with or without vapor barrier complying with ASTM C553, Types I and II and of the thickness and densities indicated below.

<u>Service</u>	<u>R Value</u>	<u>With</u>
Cold and Hot Air Supply Ducts	6	Vapor Barrier
Return Air Ducts (only where required)	6	Vapor Barrier
Hot Supply Ducts	6	---
Flexible connections to Mixing Boxes, Induction Units, Lighting Troffers	6	Vapor Barrier
Outside Air Duct	6	Vapor Barrier
Sound traps	6	Vapor Barrier
Within 5'-0" downstream and upstream of Humidifier in ducts	6	Vapor Barrier

- B. Flexible duct insulation with vapor barrier shall be 1 lb. per cu. ft. density glass fiber with a maximum K factor of 0.29 at 75 deg. F. mean temperature, with reinforced foil-faced, flame resistant kraft vapor barrier (facing to comply with ASTM C1136, Type II).
- C. Insulation with vapor barrier shall be duct wrap insulation FRK-25, type 100 as made by Owens-Corning or Johns Manville Microlite Type 100 with FSK vapor barrier facing or standard 1 lb./cf duct insulation as made by CGG with FSK facing.

- D. Flexible duct insulation without vapor barrier shall be 1 lb. per cu. ft. density glass fiber with a maximum K factor of 0.29 at 75 deg. F. mean temperature and shall be Owens Corning Fiberglass Type 75P, Johns Manville Microlite Type 100 or approved equal.
- E. Adhere insulation to duct with Foster fire resistant adhesive 85-60 or Childers CP-127 or approved equal, applied in 4 inch wide transverse strips at 8 inch intervals. Insulation shall be butted with facing overlapping all joints at least 2 inches and sealed with Foster fire resistant adhesive 85-60 or Childers CP-127 or equal. For insulation with vapor barrier use Foster fire resistant vapor barrier adhesive or approved equal and joints without tabs shall be firmly sealed with aluminum foil tape adhered with same adhesive. Secure insulation with 18 gauge corrosion resistant wire spaced not more than 18 inches on center. Coat all duct taped seams, punctures and breaks with Foster 30-65 or Childers CP-34 vapor barrier coating.
- F. Additionally, secure insulation to bottom of rectangular ducts over 24" wide with welded pins or stick clips on 18" centers. Cut off excess pins and seal as above.
- G. Insulation for Exposed Rectangular Duct
 - 1. Except where otherwise noted, all exposed rectangular ductwork and plenums shall be covered with rigid duct insulation complying with ASTM C612 Types IA and IB and of the thickness and densities indicated below.

<u>Service</u>	<u>R Value</u>	<u>With</u>
Cold and Hot Air Supply Ducts in Mechanical Equipment Rooms	6	Vapor Barrier
Return Air Ducts in Mechanical Equipment Room	6	Vapor Barrier
Cold and Hot Air Supply Ducts Except where otherwise noted	6	Vapor Barrier
Cold and Hot Air Return Air Ducts Except where otherwise noted	6	_____
Outside Air Intake Ducts & plenums	6	Vapor Barrier
Sound Traps	6	Vapor Barrier
Combustion Air Ducts & plenums	6	Vapor Barrier
Within 5'-0" downstream and upstream of Humidifier in Ducts	6	Vapor Barrier
Outside and Return Mixed Air Duct	6	Vapor Barrier
Hot Supply Duct	6	
Exhaust Air Plenum or Duct		

Behind Louver up to Automatic damper	6	Vapor Barrier
Exhaust Ducts connected to penthouse louvers or goosenecks up to damper	6	Vapor Barrier
Unused portion of Louvers	6	in 20 gauge sheetmetal sandwich.
Supply and Return ducts located outdoors	8	

2. Rigid duct insulation with vapor barrier shall be 6 lbs. per cu. ft. density glass fiber with maximum K factor of 0.22 at 75 deg. F mean temperature with fire retardant vapor barrier facing all service jacket complying with ASTM C1136 Type I (white finish).
3. Rigid duct insulation with vapor barrier shall be Fiberglass Type 705 by Owens-Corning or Johns Manville, No. 817 spin-glass w/ASJ or approved equal.
4. Rigid duct insulation without vapor barrier shall be 6 lbs. per. cu. ft. density glass fiber with maximum K factor of 0.22 at 75 deg. F mean temperature with fire retardant facing foil reinforced draft. (all service jacket).
5. Rigid duct insulation without vapor barrier shall be Fiberglass type 705 by Owens-Corning, Johns Manville, No. 817 spin glass w/ASJ or approved equal.
6. Insulation shall be fastened to duct with 12 gauge welded pins and washers, or equivalent as approved. Fasteners shall be spaced 12 to 18 inches on center, a minimum of two rows per side of duct. Secure insulation in place with washers firmly embedded in insulation, or push a self-locking cap over pin after coating with fitting mastic type C by Owens-Corning or approved equal.
7. Seal all joints, breaks and impressions with Foster fire resistant vapor barrier coating Foster 30-65 or Childers CP-34, or equal, and apply 5" wide joint sealing tape to all joints. All surface must be clean and dry before applying tape.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Contractor shall examine location where this insulation is to be installed and determine space conditions and notify Architect in writing of conditions detrimental to proper and timely completion of the work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install insulation in accordance with manufacturer's written instructions, and with recognized industry practices, to ensure that insulation complies with requirements and serves intended purposes.
- B. Coordinate with other work as necessary to interface installation of insulation with other components of systems.

- C. All insulating materials shall be applied only by experienced workmen, in accordance with the best covering practice. All piping, duct or equipment shall be blown out, cleaned, tested and painted prior to the application of any covering. Adhesives, sealers and mastics shall not be applied, when the ambient temperature is below 40°F, or surfaces that are wet.
- D. Insulation for factory-fabricated air handling units, furnished as part of units.
- E. At all openings in insulation and acoustical duct lining, insulate edges neatly and protect with sheet metal nosing. Use sealant as well.
- F. All items described in general indicate the type of covering required, however, all piping, ductwork or equipment that transmits heat or will form condensation shall be insulated.
- G. Finish for Concealed Pipe Insulation:
 - 1. Factory ASJ (All service jacket) secured in place with Bostich staples 4" o.c. or ASJ with self-sealing lap as made by Johns Manville, Owens-Corning or approved equal. All fittings shall be covered with Zeston PVC covers.
- H. All piping and ductwork insulation shall be continuous through non-fire rated ceiling openings and sleeves passing through non-fire rated walls or floors. Sleeves shall be packed with mineral wool or thermofiber. Discontinue insulation as it passes through fire-rated wall or floor and use mineral wool or thermofiber packing instead. Specific mastics, adhesives and coating shall be applied in strict accordance with Manufacturer's instruction, including recommended coverages.
- I. Where packaged type units are called for in the Specifications, or as scheduled on the Drawings, the insulation shall be as herein specified for the specific system.
- J. All valved and capped outlets left for future work shall be insulated as herein specified for the specific systems with a removable section of insulation over caps.
- K. Where insulation on existing piping, equipment, etc., has been cut, removed or damaged, this Contractor shall reinsulate as herein specified.
- L. All insulation of access doors shall be set in sheet metal double-pan construction.
- M. All ductwork shall be insulated in the field, following complete installation of the ductwork. Installation of insulation on the ductwork in the shop (prior to delivery and installation of the ductwork) is prohibited.
- N. For installation of elastomeric closed-cell insulation:
 - 1. Piping:
 - a. Install pipe insulation by slitting tubular sections and applying onto piping or tubing. Alternately, whenever possible, slide unslit sections over the open ends of piping or tubing. All seams and butt joints shall be adhered and sealed using Armaflex 520, 520 BLV or 520 Black Adhesive. When using AP Armaflex SS, only the butt joints shall be adhered using Armaflex 520, 520 BLV or 520 Black Adhesive. Armaflex HT 625 Adhesive shall be used with UT Solaflex.
 - b. Insulation shall be pushed onto the pipe, never pulled. Stretching of insulation may result in open seams and joints.
 - c. Tape the ends of the copper tubing before slipping the Armaflex insulation over the new pipes to prevent dust from entering the pipe.

- d. All edges shall be clean cut. Rough or jagged edges of the insulation shall not be permitted. Proper tools such as sharp non-serrated knives must be used.
 - e. On cold piping, insulation shall be adhered directly to the piping at the high end of the run and every 18 feet, using a two-inch strip of Armaflex 520, 520 BLV or 520 Black Adhesive on the ID of the insulation and on the pipe. All exposed end cuts of the insulation shall be coated with Armaflex 520, 520 BLV, or 520 Black Adhesive. All penetrations through the insulation and termination points must be adhered to the substrate to prevent condensation migration.
 - f. Sheet insulation shall be used on all pipes larger than 8" IPS. Insulation shall not be stretched around the pipe. On pipes larger than 12" IPS, adhere insulation directly to the pipe on the lower 1/3 of the pipe. On pipes greater than 24" IPS, complete adhesion is recommended.
 - g. Seams shall be staggered when applying multiple layers of insulation.
2. Hangers:
- a. Support piping system using high density inserts with sufficient compressive strength. The pipe support insulation shall be elastomeric foam with the same or greater thickness than the pipe insulation. All joints shall be sealed with Armaflex 520, 520 BLV or 520 Black adhesive.
 - b. Standard and split hangers -- Piping supported by ring hangers shall have hangers insulated with the same insulation thickness as the adjacent pipe. All seams and butt joints shall be sealed with Armaflex 520, 520 BLV or 520 Black Adhesive. Armaflex HT 625 Adhesive shall be used with UT Solaflex. Ring hangers may be sleeved using oversized tubular insulation. On cold piping, insulation shall extend up the hanger rod a distance equal to four times the insulation thickness. Insulation tape may be used to a thickness equal to the adjacent insulation thickness.
 - c. Clevis hangers or other pipe support systems -- Saddles shall be installed under all insulated lines at unistrut clamps, clevis hangers, or locations where the insulation may be compressed due to the weight of the pipe. All piping shall have wooden dowels or blocks of a thickness equal to the insulation inserted and adhered to the insulation between the pipe and the saddle.
It is highly recommended for continuous insulation protection to use hanger sizes equal to the outer diameter of the pipe plus insulation thickness.
 - d. Armafix IPH or Armafix NPH can be used to prevent compression of insulation at standard split, clevis hangers or other pipe support systems. To minimize the movement of Armafix, it is recommended that a pair of non-skid pads be adhered to the clamps. In addition, to prevent loosening of the clamps, use of an anti-vibratory fastener, such as a nylon-locking nut, is also recommended.
3. Square and Rectangular Ductwork:
- a. The top of the ductwork must be sloped to prevent "ponding" of water. The recommendation is at least a 2° angle to the outer side.
 - b. Armaflex Sheet Insulation shall be adhered directly to clean, oil-free surfaces with a full coverage of Armaflex 520, 520 Black or Low VOC Spray Adhesive. Armaflex HT 625 Adhesive shall be used with UT Solaflex. AP Armaflex SA shall be adhered directly to clean, oil-free surfaces.
 - c. The duct insulation shall be constructed from the bottom up, with the top insulation sized to extend over the side insulation. This will form a watershed.
 - d. Butt-edge seams shall be adhered using Armaflex 520, 520 Black, or HT 625 Adhesive by the compression fit method to allow for expansion/contraction. Leave a 1/2"-wide uncoated border at the butt-edge seams on the duct surface and the insulation surface. Overlap the insulation 1/4" at the butt-edges and compress the

- edges into place. Apply Armaflex 520, 520 Black or HT 625 Adhesive to the butt-edges of the insulation.
- e. Standing metal duct seams shall be insulated with the same insulation thickness as installed on the duct surface. Seams may be covered using strips of Armaflex Sheet Insulation or half sections of tubular pipe insulation with miter-cut ends. Standing seams shall be adhered using Armaflex 520, 520 Black or HT 625 Adhesive.
 - f. Insulation seams shall be staggered when applying multiple layers of insulation.
4. Round Ductwork:
- a. AP Armaflex Sheet and Roll Insulation, UT Solaflex Roll Insulation, or NH Armaflex Sheet and Roll Insulation shall be used on all round ductwork. Insulation shall be wrapped not stretched around the duct. On ductwork larger than 12" in diameter, the insulation shall be adhered to the duct surface on the lower one third. On ductwork greater than 24" in diameter, the insulation shall be completely adhered to the duct surface. Longitudinal seams shall be located on the lower half of any round ductwork.
 - b. Butt-edge seams shall be adhered using Armaflex 520, 520 Black or HT 625 Adhesive by the compression fit method to allow for expansion/contraction. Leave a 1/2" wide uncoated border at the butt-edge seams on the duct surface and the insulation surface. Overlap the insulation 1/4" at the butt-edges and compress the edges into place. Apply Armaflex 520, 520 Black, or HT 625 Adhesive to the butt-edges of the insulation.
 - c. Insulation seams shall be staggered when applying multiple layers of insulation.
5. Exposed Outdoor Duct:
- a. All outdoor exposed ductwork shall be finished using one of the following applications: For all the application methods described below it is very important that the exterior horizontal surfaces shall be sloped to prevent ponding on the top surface of the coated insulation. If the substrate is not sloped make the necessary adjustments to provide for a slope. DO NOT compromise the Armaflex insulation thickness to achieve the necessary slope.
6. Armaflex WB Finish
- a. All outdoor ductwork shall be finished with a minimum requirement of two coats of Armaflex WB Finish.
 - 1) Rectangular ductwork
 - a) The surface of the insulation must be clean and dry.
 - b) Apply first coat of Armaflex WB Finish at a rate of 400 square feet per gallon.
 - c) Allow to dry at least four hours.
 - d) Apply second coat at a rate of 400 square feet per gallon.
- O. Finish for Exposed Insulation:
1. The term "exposed" is hereby defined as any place outdoors, as well as any place indoors in Mechanical Rooms, Storage Rooms, Janitor's Closets, etc., where located within 7 feet of floor or access platforms.
 2. All exposed pipe, valve and fittings insulation shall have 0.016 inch thick corrugated aluminum jacket banded with 1/2" s.s. bands spaced 12" o.c. Piping, fittings and valves exposed in building, within seven feet of the floor or access platform, shall have 0.016" thick aluminum jacket banded with 1/2" aluminum bands spaced 12" o.c. or two bands per section. Joints and jacket shall provide complete weatherproof protection either by mechanical contact or by use of Foster 95-44 or Childers CP-76 metal jacketing sealant (gallon cans only; no tubes).

3.03 PROTECTION

- A. The installer of the insulation shall advise the Contractor of required protection for the insulation work during the remainder of the construction period, to avoid damage and deterioration.

END OF SECTION 23 07 00

23 09 00 - AUTOMATIC TEMPERATURE CONTROLS - ELECTRIC

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinated with and complementary to the General Conditions and Supplementary General Conditions of the Work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical work shall apply.
- C. The work of this section shall be integrated with the existing BMS provided by Advantex Solutions. Please contact Giovanni Natale from Advantex Solutions Inc. Contact Information: P-718-278-2290; C-917-682-2521; Email GNatale@Advantexsolutions.com).

1.02 DESCRIPTION OF WORK

- A. The work includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and place into satisfactory operation a complete system of automatic temperature controls as shown on the drawings and hereinafter specified.
- B. The control system shall be of the electric unless otherwise indicated, all as hereinafter specified. Control equipment shall be as manufactured by Distech Controls. All controls and the Building Management System (BMS) shall be the product of one manufacturer. The temperature control manufacturer shall be responsible for the quality and satisfactory operation of material provided but not actually manufactured by him. The system shall be a BACNET MSTP system.
- C. The system shall have a graphic system which is compatible with the system currently installed in accordance with the specification, which is a Distech Controls system, installed and maintained by Advantex Solutions Inc. Please contact **Giovanni Natale** from Advantex (P-718-278-2290; C-917-682-2521; Email - GNatale@Advantexsolutions.com).
- D. The control system shall include all necessary thermostats, damper motors, relays, etc., and all necessary equipment for a complete control system, regardless of whether or not specifically mentioned, including electric relays and contactors required for control interlocking.
- E. The control system shall include all control and interlock wiring from freezestats, firestats and relays, to motor controllers, contactors, etc. All control circuits shall be 120 volts.
- F. Provide nameplates on all devices, whether or not mounted on the face of local control panels. In occupied areas, nameplates shall be concealed beneath covers of room type instruments, to describe functions.

1.03 QUALITY ASSURANCE

- A. Only firms regularly engaged in manufacture and installation of this equipment with characteristics and capacities required and whose products have been installed by them and are in satisfactory use in similar service for not less than 10 years will be acceptable.
- B. All control equipment used in this project shall have been successfully proven in actual field installations for a period of two (2) years prior to the date of submittal of said equipment to the Architect for approval.
- C. The control system shall be installed complete in all respects by competent mechanics, regularly employed by the manufacturer of the control system.

1.04 SUBMITTALS

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work and submit shop drawings.
- B. Complete shop drawings shall be submitted to the Architect for approval before any field installation is started. Such drawings shall give a complete description of all control elements and shall show completed schematic piping and wiring diagrams, including functional description. Valve and damper schedules shall be included.
- C. Floor plans indicating all room thermostat locations not shown on the Drawings, and samples of each type, shall be prepared and submitted to the Architect for approval before installation. Samples of unitary controls shall also be submitted for approval, and a typical assembly shall be field erected, before installation. All room controls shall be mounted five feet above finished floor.

1.05 RELATED WORK UNDER ELECTRICAL WORK

- A. All power wiring for pumps, fans, unit heaters, clocks, etc. See Special Requirements for Mechanical and Electrical Work.

1.06 COORDINATION

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.

1.07 GUARANTEE

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.
- B. The control system herein specified shall be free from defects in workmanship and material under normal use and service. If, within one year from date of acceptance by the Architect, any equipment herein described is proved to be defective in workmanship or material, it shall be adjusted, repaired or replaced, free of charge, during the guarantee period.

PART 2 - PRODUCTS

2.01 VALVE AND DAMPER OPERATORS

- A. All operators shall be of totally enclosed type in dustproof housings of pressed steel or approved cast metal. All motors shall be of a permanently lubricated type with oil immersed gear train or internal servo relief valve. An open type gear train will not be acceptable. All operators shall be of the spring return type, to provide failsafe operation and overtravel protection. Each automatic damper shall be provided with a separate damper operator. Operators to be located outdoors shall be NEMA 3R rated.

2.02 INSERTION AND IMMERSION THERMOSTATS

- A. All thermostats shall have adjustable throttling ranges and shall be capable of positioning valve or damper operators in intermediate positions. The control elements of the thermostats shall be centrally mounted inside the supply duct or casing to measure the air temperature. The sensing shall be transmitted to the central mechanism located on the local control panel by means of capillary tubing or electronic transmission. Thermostats shall be capable of controlling without hunting and shall be respond to a change of plus or minus 3EF. Control point shall be adjustable 15E above and below intended setting, with a minimum scale of at least 50EF. Sensing elements shall be of proper design and material for its specific application and shall have sufficient length to cover a minimum of two-thirds of the coil or duct.

2.03 AUTOMATIC CONTROL VALVES AND DAMPERS

- A. All automatic control valves shall be furnished by the temperature control manufacturer and shall be installed by the HVAC Contractor under the control manufacturer's supervision.
- B. Automatic dampers shall be furnished by the control manufacturer and shall be set in place by the HVAC Contractor under the supervision of the control manufacturer, unless otherwise indicated.

2.04 DAMPERS

- A. Control dampers shall have galvanized frames of not less than 2" in width and blades of #16 galvanized steel and shall be adequately braced to form a rigid assembly, where required in galvanized ductwork. In aluminum ductwork, damper material shall be 16-gauge aluminum. No dampers shall have blades more than 10" wide. Dampers shall be painted with two coats of black enamel.
- B. All dampers shall be of the proportioning or opposed blade type. Dampers shall have continuous stops to avoid leakage. Bearings shall be of oilite nonferrous sleeve type. Outside air and exhaust air dampers shall be provided with continuous neoprene gasketing around perimeter of frame and at interlocking blade edges, to form airtight seal.

2.05 THERMOMETERS

- A. Furnish and install dial thermometers with 1% of range accuracy, on each local panel with appropriate temperature ranges, adjacent to each air insertion and water immersion controller. Thermometers shall have a 32" dial, remote bulb, of liquid filled or electronic transmission type, uniform scale and same type sensing bulbs as thermostats. In addition, provide thermometers on local panels for the following:

1. O.A. temperature.
2. Return air temperature
3. H.W. supply and return temperature
4. Ch. W. supply and return temperature
5. Air handling unit discharge
6. Each zone discharge air temperature

2.06 VALVES

- A. All valves shall be equipped with throttling plugs and removable composition discs. All valves shall be sized by the control manufacturer and guaranteed to be of sufficient size to meet the heating and cooling requirements. All water valves shall be sized for pressure drop and flow rates indicated on the drawings. All valves shall be single seated.

2.07 ROOM THERMOSTATS

- A. All proportioning thermostats shall have adjustable throttling range. All thermostats shall be provided with an adjustable range of 55°F - 85°F., key operated, non-indicating, locked cover type. Finish and final locations shall be approved by the Architect.

2.08 FREEZE PROTECTION DUCTSTATS

- A. An electric freeze protection ductstat with 20 feet low temperature sensing capillary, and with manual reset, shall be located across the discharge of each heating coil bank in each AC or HV unit, which shall, on a fall in temperature below 35°F., shut down its respective supply fan and close the outdoor air damper. Case of instrument shall be located outside of supply unit, within 10 feet of supply fan motor.
- B. For systems with return air fans, on fan shut down, the return fan shall continue running or shall start, if not running.

2.09 FIRE PROTECTION DUCTSTATS

- A. A manual reset fire protection ductstat shall be provided in the air inlet to each return air fan, and exhaust fan within 10 feet of fan motor, to stop the return fan, exhaust fan, and its respective supply fan, whenever the temperature exceeds 125°F.

2.10 LOCAL PANELS

- A. Furnish and install adjacent to each water system and each H & V unit and AC unit as herein specified, locked enclosed local control panel of 14 gauge steel or a face of plywood board with bonded aluminum sheets on each side set in an extruded aluminum enclosure and with welded angle iron brackets, wall or floor type, in which shall be mounted the associated temperature controls, relays, thermostats, etc., and on which shall be flush mounted the associated switches, gauges, thermometers, etc., as previously and hereinafter described. The basic background color of the panel shall be as approved by the Architect. Provide canopy light on top of local control panel with light switch.
- B. Panels shall be prewired to terminal strips.

- C. Details of panel shall be submitted for approval prior to fabrication. Locations of local panel are to be convenient for adjustment and service and all such locations are to be approved prior to installation. Provide engraved nameplates beneath panel mounted control device and gauge, clearly describing the function of said device and the range of operation. Provide a laminated color coded schematic control diagram on panel face. Provide a key for local panel.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine location where controls and equipment are to be installed and determine space conditions and notify architect in writing of conditions detrimental to proper and timely completion of the work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's written instructions, and with recognized industry practices, to ensure that equipment comply with requirements and serve intended purposes.
- B. Coordinate with other work as necessary to interface installation of equipment with other components of systems.

3.03 FIELD QUALITY CONTROL

- A. Upon completion of installation of the automatic temperature control system and after motors have been energized with normal power source, test system to demonstrate compliance with requirement. When possible, field correct malfunctioning controls then retest to demonstrate compliance. Replace controls which cannot be satisfactorily corrected. Refer to Section - Test and Balancing

3.04 SERVICE

- A. After completion of the control system installation, the control manufacturer shall regulate and adjust all thermostats, control valves, damper motors, etc., and place in complete operating condition, subject to the approval of the Architect. Complete instructions shall be given to the operating personnel.

END OF SECTION 23 09 00

23 09 01 - BUILDING AUTOMATION SYSTEM

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinate with and complementary to the General Conditions and Supplementary General Conditions of the Work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical Work shall apply.
- C. The work of this section shall be integrated with the existing BMS provided by Advantex Solutions. Please contact Giovanni Natale from Advantex Solutions Inc. Contact Information: P-718-278-2290; C-917-682-2521; Email - GNatale@Advantexsolutions.com).

1.02 DESCRIPTION OF WORK

- A. The work includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner, a building automatic system as shown on the drawings and hereinafter specified.
- B. The Building Automatic System shall be provided by the Distech Controls as the automatic temperature controls. The graphics for the new AC units installed under this project shall be completed by the ADVANTEX Solutions under this contract and integrated into the existing BMS system.
- C. The Automatic System Subcontractor shall furnish and install all equipment, accessories, wiring and instrument piping required for a complete and functioning system.
- D. All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed especially for this project. All systems and components shall have been thoroughly tested and proven in actual use.
- E. The automation system shall be of a fully modular architecture permitting expansion by adding computer memory, application software, operator peripherals and field hardware.
- F. If expansion of the automation system necessitates greater computer processing power, it shall be possible to transfer all existing software and data base, both vendor supplied and user-defined, to a new more powerful computer. This shall be accomplished by using removable, compatible disk cartridges.
- G. Systems which require the existing user-defined data base to be re-entered through the operator's terminal shall not be acceptable.
- H. Although fire alarm and security points will not be installed or monitored, initially the system shall be installed completely ready to receive or accept these points at a later date without additional central hardware or software.

- I. The system as specified shall monitor, control, and calculate all of the points and functions as listed in the Building Automation Schedule.
- J. The system as installed shall have sufficient computer memory and application software for 100% point expansion above those points as listed in the Building Automation Schedule.
- K. The entire system of Automatic Temperature Controls and the Building Automation System shall be powered from the building's emergency power system. Components and devices to be powered include, but are not limited to, all ATC panels, BAS computers and remote stations, valve actuators, damper actuators, central and unitary equipment controls and terminal unit controls including VAV boxes. The source of emergency power for all such devices shall be derived from either junction boxes left by the Electrical Contractor as indicated on the electrical drawings, or, if not indicated on the electrical drawings, the HVAC Contractor under his contract shall provide power wiring taken directly from the building's Emergency Power Distribution Panel(s).

1.03 QUALITY ASSURANCE

- A. Only firms regularly engaged in manufacture and installation of this equipment with characteristics and capacities required, whose products have been in satisfactory use in similar service for not less than 10 years shall be acceptable.
- B. The entire building automation system shall be installed by skilled electricians and mechanics, all of whom are properly trained and qualified for this work. All wiring shall be installed in accordance with the Project Electrical Specifications.
- C. Supervision and checkout of the system shall be by factory-trained engineers and technicians directly employed by the automation Contractor.
- D. Provide system produced and installed by the manufacturers, which are listed in Section "Approved Manufacturer's List".
- E. Provide equipment which performance, under specified conditions, is certified by the manufacturer.

1.04 SUBMITTALS

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical work and submit shop drawings.

1.05 COORDINATE

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.

1.06 GUARANTEE

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.
- B. The system including all hardware and software components shall be guaranteed for a period of one year following the date of final acceptance. Any manufacturing defects arising during this warranty period shall be corrected without cost to the Owner.

- C. All applicable software as detailed in this Specification shall be updated by the Automation Subcontractor free of charge during the warranty period. This will ensure that all system software will be the most up-to-date software available from the Automation Subcontractor.

PART 2 - PRODUCTS

2.01 TRANSMISSION NETWORK

- A. Distributed Communication Processor
 - 1. The system shall use an intelligent Distributed Communication Processor (DCP). This processor shall be microprocessor based and shall interface with Central Processing Unit and Remote Processing Units.
- B. Multi-Drop Trunk(s)
 - 1. The automation system shall include a multi-drop digital transmission network that provides the communication link between the Distributed Communication Processor and all Remote Processing Units.
 - 2. The transmission shall be asynchronous and utilize a polled-response method. The system shall utilize a cyclic redundancy check or dual transmission with parity check to ensure signal reliability.
 - 3. The transmission network shall utilize a twisted shielded pair. The transmission speed shall be a minimum of 1200 baud and operate in a half-duplex mode.
 - 4. The system shall support multiple multidrop trunks. Each multi-drop trunk shall support a minimum of 20 Remote Processing Units.
 - 5. Each multi-drop trunk shall have an allowable line length of at least 20,000 feet without signal degradation. All multidrop trunks shall be interfaced to the system via standard EIA interfaces. With the addition of modems, the multidrop trunk shall interface to unconditioned voiceband 3002 telephone lines for remote building tie-in to the automation system.
 - 6. Transmission technique shall allow trunk cable to be installed in conduit with other system signals as well as switched 120 VAC or 240 VAC.

2.02 FIELD HARDWARE

- A. Remote Processing Units
 - 1. The system shall utilize intelligent distributed Remote Processing Units (RPU's to interface sensors being monitored and equipment being controlled by the automation system. Each RPU shall be microprocessor based and perform the following functions:
 - a. Acquire, process and transfer information to the CPU.
 - b. Accept, process and execute commands from the CPU or other input devices.
 - c. Record evaluate and report changes of state and/or value that occur among points associated with the RPU.
 - 2. Each RPU shall use multi-point function cards to carry out the control and monitoring functions as specified in the point list. For each RPU location, electronics shall be provided for at least 12 spare points.
 - 3. Each RPU shall perform continuous diagnostics, and any malfunction shall be annunciated at the operator's console as well as visually indicated at the RPU.
 - 4. Failure of any RPU on the system shall not affect the proper operation of the CPU and other RPU's.

5. The system shall be capable of phased startup. That is any RPU shall be capable of properly communicating with the CPU while remaining RPU's are being installed.
6. Surge transient protection shall be provided in each RPU for the purpose of suppressing induced voltage transients.
7. Each RPU shall contain a function card cage and backplane which can accommodate up to 128 points. Each RPU shall contain a power supply sized to drive the function cards, interface relays and sensors for the maximum allowable points.
8. Any RPU which used volatile memory shall have a minimum of four hour uninterruptible battery backup unless the automation system has an automatic down loading capability.
9. If the CPU or transmission network fails but power to the RPU does not, the RPU shall continue to monitor all changes of state and/or value and shall retain the most recent values. The RPU shall also maintain all analog set points and command positions.
10. RPU's shall have all metal cabinets. Each RPU including cabinet, power supply, function cards and termination modules shall be approved by U.L. Each RPU shall have a pin-hinged door and master keyed lock. RPU's shall be capable of proper operation in an ambient environment of 32E to 120EF and 10% to 90% RH.

B. Function Cards/Termination Modules

1. Each RPU shall be capable of accepting at least 8 multi-point function cards. It shall be possible to insert any function card into any of the available card slots. There shall be four types of function cards corresponding to industry nomenclature. They are:
 - a. Digital In for monitoring status, alarms and accumulating pulses.
 - b. Digital Out for commanding two and three state devices.
 - c. Analog Out for positioning set points.
2. Each function card shall be microprocessor based with sufficient memory to retain characterization data for its associated points.
3. Characterization of point data shall be accomplished on-line at the operators console. The operator shall be able to individually characterize points on each function card through a procedure whereby the operator down-line loads the specific point parameters from the CPU through the operator's keypad to the RPU. This downline loading shall also occur automatically after a power outage to a RPU.
4. Function cards that require foil path cuts, jumpers, or similar physical modifications to customize them for particular applications will not be acceptable.
5. To reduce downtime, each function card shall have a built-in self-test diagnostic and be able to visually indicate its operational status at the RPU as well as failure annunciation at the operator's console.
6. The failure of any one function card shall not deter the reporting or command capability of other function cards in the same of other RPU's.
7. Each function card shall have an associated termination module where the field wiring or tubing shall be connected. All termination modules shall have plug connectors interfacing them to their respective function cards through the card cage backplane.
8. Any termination modules requiring on-site hardwire interconnection to their function cards shall not be acceptable.
9. Digital input signals shall be terminated through plug-in isolation relays. These shall be form "C" type relays, located in the RPU.
10. Analog input signals shall be terminated on screw type terminals. Each analog input shall have the capability to accept 2 or 4 wire inputs.
11. Digital output signals shall be accomplished through plug-in form "C" relays, located in the RPU.
12. Analog output signals shall be accomplished through 3" pneumatic tubing fittings.

C. Sensors

1. All analog sensors shall utilize industry standard 4-20 milliamp signals to facilitate owner expansion. Sensors based on proprietary equipment shall not be acceptable.
2. All analog signals shall be converted for digital transmission to the CPU at the function card.
3. All sensing wiring whether it be analog or digital, input or output, shall be capable of sharing single conduit runs without affecting signal performance. All signal wiring shall also be capable of sharing single conduit runs with switched AC of 120 VAC or 240 VAC.

2.03 SOFTWARE

- A. The Automation System Subcontractor shall provide all software required for efficient operation of all the automation system functions required by this Specification. Software shall be modular in design for flexibility in expansion or revision of the system.
- B. The software shall include a computer-vendor supplied and supported, unmodified real-time disk operating system. Systems which use an operating system which has been modified or is proprietary to the Automation System Subcontractor shall not be acceptable. The Automation System Subcontractor shall supply all the building automation system software. The building automation system software shall be written in high level language such as FORTRAN IV or Pascal.

2.04 REAL-TIME OPERATING SYSTEM

- A. The operating system shall be a general purpose real-time operating system and shall provide the following features of their equivalent:
 1. Program Control: The real-time operating system executive shall control the timing and sequencing of all programs.
 2. Multiple Tasking Capability: Multiple Tasking Capability shall be provided to allow the operating system and real-time control programs to run concurrently with the programs assembling or compiling, debugging, loading or executing.
 3. Memory Protection: The operating systems shall manage a scheme of storage protection which shall enable assembling, compiling, debugging and execution of programs without direct effect on the real-time programs.
 4. Real-Time Clock Routine: The real-time clock routine shall maintain the current date and 24 hour clock time resolved to the nearest second. The real-time clock shall control or be used as reference for time-initiated command signals and printouts and shall be easily resettable by the operator from the operator's console.
 5. Input/Output Control: The operating system shall include routines to coordinate all input/output functions of the computer system.
 6. Disk File Input/Output: The operating system shall provide routines for disk file input/output including routines to perform the following:
 - a. Open file for input and/or output of data.
 - b. Input from or output to a disk file sequentially.
 - c. Input from or output to a disk file a; record at a time in random order.
 7. Powerfail and Automatic Restart: A powerfail routine shall provide an orderly shutdown of the automation system when the power failure to the computer is detected, and which shall automatically restart the automation system when power is restored.
 8. Programming Support Capabilities: The operating system shall be capable of supporting the following programs for user program development, compiling, loading and executing.

- a. Fortran Compiler: Compile the source language into machine language object code that can be loaded and executed directly into the instruction set of the CPU. This compiler shall be directly compatible with FORTRAN IV.
- b. Assembler Program: This program accepts and translates symbolic instructions into machine instructions. The assembler also generates object code.
- c. Source Editor: This program allows an operator to edit source programs in assembler and Fortran languages as well as other ASCII text data.
- d. Loader Program: This program combines relocatable object modules produced by the assembler and the Fortran compiler into an executable program.
- e. Disk Utility Program: Routines for manipulating program and data files stored on the disk including the following shall be available:
 - 1) Creating new files.
 - 2) Deleting old files.
 - 3) Copying files.
 - 4) Creating file directories.
- f. Memory Dump and Modify Program: Provides the capability to modify or dump the contents of selected locations in main memory.
- g. Debug Program: This program aids in the debugging of assembler and FORTRAN programs.
- h. System Generation Provides the capability for reconfiguring the software system to accommodate new software or hardware functions.
- i. System Save and Restore: Provides the capability to save and restore a copy of the software programs and the system data base to facilitate reloading.
- j. Diagnostic Software: Diagnostic software provides the capability to test the computer memory and peripherals.

2.05 BUILDING AUTOMATION SYSTEM SOFTWARE

- A. The building automation system software shall be provided in four categories which are defined as:
 1. Operator access to system data base.
 2. User control over system configuration.
 3. Facility monitoring functions.
 4. Energy management control functions.
- B. Each category of software shall consist of interactive software modules written in FORTRAN IV. Each module shall have an associated priority level and shall execute as determined by the program controller as defined in the real-time operating system.
- C. Systems with software written in other than Fortran IV shall be provided with a cross-compiler to FORTRAN IV.
- D. Operator Access to System Data Base:
 1. Operator/System Communication: The building automation system shall use English language for each point identification. This shall be full English words with the option to abbreviate at the users discretion. To facilitate different building operators, the system shall accept multiple English language identifiers as well as foreign language identifiers for each point on the system. These shall be known as "User Names". For example:
 - ADMINISTRATION BUILDING AHU 1
 - SUPPLY FAN 1
 - AIR HANDLING UNIT 1

shall all identify the same desired point. In addition system formatting shall be provided which shall allow for software grouping of related points.

2. Input Format:
 - a. Allowable operators as defined under operator access shall be able to control system functions by their inputs at appropriate operator terminals.
 - b. The system shall recognize all inputs as functions or commands to be performed. The system's handling of operator inputs such as requests to start a motor, output a log, change a time program, acknowledge an alarm, or do any of the other commands described in this specification, shall be in a similar format.
 - c. All operator interaction with the automation system shall be performed as follows: The operator entry shall begin with the commands he desires the system to perform, followed by the user name and any data, such as limit values, program times, etc. Manual commands such as start, stop, log, etc. have no data values associated. Example: COMMAND ON AHU 1.
 - d. Upon entry of a command to the point or points desired as described above, the system shall, before performing any command, respond with an echo of the request on the device (Cathode Ray Tube or keyboard printer) being used. This echo feedback shall include the command requested, the user name and any entered data.
 - e. Should an operator make an error in entry, the system shall output an advisory message detailing the nature of the error. Advisory messages shall be in full English with a unique advisory for each type of operator input error. Typical operator error advisories might be:
 - 1) System input format is incorrect.
 - 2) Invalid command entered.
 - 3) Analog limit is outside specified range.
 - 4) Point does not respond to the command entered, such as a "start" command to a temperature sensor.
 - 5) Operator's entry did not contain sufficient information.
 - 6) Invalid operator password.
3. Output Format:
 - a. The system shall operate on a System Format basis, regardless of the manner of hardware configuration in which data is required. A system of points shall consist of a logical grouping of data points related to a piece of mechanical equipment, an energy distribution system, or an architectural area. For example, in some cases it may be desired to display a space temperature with its associated air handling unit, and in other cases to display all space temperatures on a floor or in a building as a single system. The Automation System shall allow such determinations to be made without regard to a point or group of points physical hardware locations(s). Likewise, the system shall accommodate future changes of system groupings and operations without field hardware changes whatsoever.
 - b. All output displays and logs shall contain a header line indicating the following information:
 - 1) time
 - 2) console identifier
 - 3) date
 - 4) initials of on-duty operator
 - 5) day
 - 6) owner definable information

Example:

12:45 06/23/83 FRI MASTER CONSOLE SMD 76EF 42% RH

- c. All output displays or logs of a system point or group of points shall contain as a minimum the following information:
 - 1) user name of point
 - 2) associated engineering units
 - 3) point descriptor
 - 4) alarm descriptor
 - 5) current value/status

Example:

EAST MECHANICAL ROOM AHU SUPPLY TEMP 85EF

- d. User names, point descriptors, and engineering units shall be operator definable on a per point basis. Systems which use fixed vendor-supplied look up tables shall not be acceptable.
4. Split Screen Formatting:
- a. To further simplify operator interpretation of displayed data, the display software shall divide the operator's video display into at least 5 areas. The 5 areas shall be defined as:
 - 1) Time Line - continuous display of time, date, day, console identifier, operator's initials and other owner-defined data.
 - 2) Operator Command Line - accept operator English work commands.
 - 3) System Response Line - acknowledgement of commands carried out or operator error advisories.
 - 4) Data Display Area - display the current value of a point or group of points.
 - 5) Alarm Area - Reserved for the display of critical alarm reporting.
 - b. It shall be possible for the above defined areas to display independently of and concurrently with each other.
5. Operator Access Restriction:
- a. Operator access to the automation system shall be via user-defined passwords providing at least five access levels.
 - b. Each operator shall gain access to the system by entering a unique name and password combination.
 - c. Properly signing-on by an operator shall produce a hard copy report indicating the name of the operator, time, and date that operator has signed on.
 - d. Invalid operator attempts to enter the system shall also produce a hard copy report as defined above and additionally indicate the nature of the unsuccessful sign-on.
 - e. To return the system to a secured mode, the operator shall sign off the system.
 - f. Signing off the system shall also produce a hard copy report of the operator's name, time and date.
 - g. The automation system shall automatically sign off an operator should that operator not sign off after a specified period of time.
 - h. In addition to producing hard copy reports of valid or invalid sign-on and sign-off attempts, the automation system shall store in nonvolatile memory a historical record for a minimum of 30 system entries, valid and invalid. This information shall only be available to the operator with the highest access level.
 - i. All information pertaining to operator access shall be user-defined while the system is on-line and fully operational.
 - j. Typical operator access levels are:
 - 1) LEVEL 0 - Normal operator functions such as log and display request, alarm acknowledgement.
 - 2) LEVEL 1 - All Level 0 functions plus analog limit changes, point lockouts and comment functions.

- 3) LEVEL 2 - All lower level functions plus modification to calculations and system messages.
- 4) LEVEL 3 - All lower level functions plus changes to point descriptors, user names.
- 5) LEVEL 4 - All lower level functions plus access to add, modify or delete any and all user-defined parameters and access levels.
- k. It shall be possible for the user to define the distinctions between various access levels.
- l. Systems that utilize fixed vendor defined operator access levels shall not be acceptable.
6. Dynamic Color Graphics: The automation system shall include a software program allowing an operator to create, modify or delete dynamic color graphics on-line.
 - a. Generation of Graphics:
 - 1) Through the use of a high level English language, an operator shall be able to create, modify or delete dynamic color graphics while the automation system is on-line and fully operational.
 - 2) A complete set of standard symbols and building systems shall be stored in the computer system memory to aid in creating graphic displays.
 - 3) Each system, symbol or graphic character shall be able to display in any one of the eight colors.
 - 4) Each system, symbol or graphic character shall be able to display in variable size.
 - 5) A mechanism shall be provided for copying graphics of similar requirements. Example: Dual-duct air handling system (2-thus). After the first graphic is created, a one-line input shall make an identical copy.
 - b. Dynamic Data Display:
 - 1) Dynamic data shall be located for display at any location on the CRT screen. Each graphic shall be able to accommodate any combination of dynamic (analog or binary) information, graphic symbols and text displayed on the entire screen. The number of dynamic points being displayed and updated shall be limited only by the area of the CRT screen. A graphic shall be constructed to include any dynamic points regardless of the physical location of these points.
 - 2) Dynamic data shall update automatically without manual initiation at user-defined intervals. Update intervals shall have resolution down to one second.
 - c. Manual or Automatic Operation:
 - 1) Each graphic shall be manually or automatically displayed.
 - 2) In the manual mode an operator shall display a graphic by inputting the appropriate graphic name.
 - 3) In the automatic code, a graphic shall display as a result of:
 - a) An alarm occurrence
 - b) A change of state
 - c) Specific time, day, or date
 - d. Dynamic Graphics Capacity: The automation system shall have the capacity to store a minimum of 170 unique dynamic color graphics. Graphics shall be stored on hard disk.
- E. User Control Over System Configuration:
 1. Data Base Creation and Modification:

- a. The intent of this specification is to allow the owner to independently do his own modifications to the system.
 - b. All changes shall be done utilizing standard procedures and must be capable of being done while the system is on-line and operational.
 - c. To aid an operator, instructive prompting software shall be provided. An operator shall be required to simply answer to "yes" and "no" type questions as well as provide information such as English user names, desired engineering units, point descriptors, etc.
 - d. The owner must have the minimum capability to:
 - 1) Add and delete points.
 - 2) Modify any point parameter.
 - 3) Change, add or delete English language descriptors.
 - 4) Change add or delete engineering units.
 - 5) Change add or delete points in start/stop programs, trend logs, etc.
 - 6) Select analog alarm limits.
 - 7) Characterize each function card to accept different analog inputs, pulsed or steady state digital signals.
 - 8) Adjust analog differentials.
 - 9) Create custom relationships between points. A general purpose user language shall be provided, such that the user can implement software interlocks, master/slave relationships, and calculations.
 - e. The operator shall be able to modify all points within the data base. This modification shall include adding, deleting and modifying required additional or ranges, engineering units, mode of operation, etc. The addition of a new field point may be totally accomplished from the keyboard once the proper field hardware devices are installed, or the change function may modify existing field hardware to serve a new purpose.
 - f. As points are added to the field, they may be grouped into new system and building displays or they may be substituted for existing points within existing systems or added to existing systems.
2. Multiple Console Support:
- a. The automation system software shall support a minimum of six operator consoles. A console shall be defined as at least one input/output device.
 - b. Once the hardware terminal devices are installed, the operator shall be able to modify the system software to accommodate the new or reconfigured devices. This modification shall take place while the system is on-line.
 - c. It shall be possible to limit the capabilities of any console on the system.
 - d. It shall be possible to further assign on a per point basis the ability to command, display or alarm a point at a specific console.
3. Custom Equations and Point Relationships: The system shall provide a comprehensive processor which allows a user (chief engineer, supervisor, etc.) to develop custom operational sequences, unique control algorithms, interactive point relationships, custom calculations, etc. This capability shall use on-line dynamic system data.
- a. Mathematical and Logical Functions:
 - 1) The processor shall provide as a minimum the following mathematical operators:
 - a) addition, subtraction
 - b) multiplication, division
 - c) square root, exponentials
 - d) linear equations, quadratic equations
 - 2) The processor shall provide as a minimum the following logical operators:

- a) and, or
- b) equal to, not equal to
- c) less than, greater than
- b. System Inputs: Any of the system connected points such as temperature, pressure, humidity, flow rate, start/stop, status and alarm points shall be valid real time inputs. Also, inputs shall include real time, day of week, date, constants and results of other calculations.
- c. Result Performance:
 - 1) As a result of evaluating any combination of mathematical or logical functions and dynamic system data, the automation system shall perform as a minimum system changes such as:
 - a) Issuing and off commands
 - b) Increasing/decreasing system set points
 - c) Initiating logs and displays
 - d) Activating/inactivating application programs
 - e) Enabling/disabling alarm functions.
 - d. Processor Implementation:
 - 1) Operator entries to this comprehensive processor shall be through the operator's terminal in an English language format. A step by step interactive prompting routine shall be provided to guide operator entries.
 - 2) Systems requiring binary, hexadecimal, machine language, or coded numeric input shall not be acceptable.
 - e. Applications:
 - 1) The following is a brief list of the types of operational sequences, control algorithms, point relationships and custom calculations required by this comprehensive processor:
 - a) If outside air is above 70EF, close OSA dampers.
 - b) If freeze stat is in alarm, start circulating pump.
 - c) Start pump one, wait two minutes, start pump two.
 - d) Display operator instructions on alarm.
 - e) Calculate energy input to monitored equipment.
 - f) Calculate BTU output of boiler.
 - g) Calculate differential temperature.
 - h) Calculate degree days.
 - i) Calculate department energy allocation costs.
- F. Facility Monitoring Functions:
 - 1. Report and Logs:
 - a. An operator shall be able to manually request reports and logs from the console keyboard. The operator shall have the capability to direct any log or report to either a report printer or CRT display.
 - b. It shall be possible for the automation system to automatically initiate logs and reports. These logs and reports shall be initiated on time, date, or day basis, or any combination of time, date or day.
 - c. Each report shall be in English language with information logically grouped in a format that facilitates easy interpretation. Reports and logs shall be attainable on a per point basis or user-defined group of points. Groups of points shall be logically combined without regard to the hardware physical locations. Example:
 - 1) Current value of a discharge temperature in a particular air handler.
 - 2) Current value of all discharge temperatures in a specific building.
 - 3) Current value of all discharge temperatures in a multi-building complex.

- d. As a minimum, the following report categories shall be provided:
 - 1) Summaries
 - 2) Access Reports
 - 3) Historical Trends
 - 4) Data Base Management Reports
 - 5) Profile Reports
 - 6) System Diagnostic Report
 - 7) Totalization Logs
 - 8) Energy Management
2. Summaries:
 - a. All Point
 - 1) A summary shall be provided detailing the current values of any and all points associated with the automation system.
 - b. Building or System or Custom Group
 - 1) A summary shall be provided detailing the current values of any and all points within a building or system as detailed by the Owner.
 - c. Motor Status
 - 1) A summary shall be provided detailing the current status of any and all motors connected to the system. This summary shall also have the capability of detailing the current values of points associated with any of the system motors.
 - d. Alarm
 - 1) A summary shall be provided to detail the status of any and all the points currently in alarm.
 - e. Alarm Limit
 - 1) A summary shall be provided to detail the operator assigned high and/or low alarm limit for any and all alarmable points on the system.
 - f. CPA Set Point
 - 1) A summary shall be provided detailing the set point for any and all CPA points supported by the system.
 - g. Point Lockout
 - 1) A summary shall be provided of the most recent status of any and all locked out (disabled for alarm reporting) points by the system or operator.
 - h. Message
 - 1) A summary shall be provided detailing the contents of any and all messages within the system.
 - i. Graphics
 - 1) A summary shall be provided detailing the instruction listings for any and all dynamic color graphics.
3. Historical Trend Log: A log shall be provided for each defined trend group which shall include as a minimum; user name(s) assigned to that group, time increment in real-time, and associated values per time increment.
 - a. Profile Report
 - 1) Boiler Profile Report
 - b. The automation systems shall include a software program that will provide a boiler profile report (BPR).
 - c. The BPR program shall automatically print a boiler summary report over a day, week or month's time. The boiler profile report shall be capable of reporting the following:
 - 1) Boiler output in BTU's
 - 2) Boiler output in tons of steam

- 3) Energy input in proper units of fuel
 - 4) Boiler efficiency
 - 5) Hours of operation
 - 6) Heating degree days
 - 7) Energy Cost
 - d. The boiler profile report shall be automatically printed at an operator defined time.
 - 1) Chiller Profile Report
 - e. The automation system shall include a software program that will provide a chiller profile report (CPR).
 - f. The chiller profile report shall be automatically printed at an operator defined time.
4. Totalization Logs
 - a. A log shall be provided including any and all points as defined in the point list. Log shall include user name(s) and associated totalized values.
5. Access Reports
 - a. Access Level Assignments
 - 1) A report shall be provided detailing operator access level assignments. This report shall include as a minimum operator's name, password, access level assignment and on-duty initials.
 - b. System Entry
 - 1) A report shall be provided detailing which operator signed on or off the building automation system. The report shall include; operator's name, password, time and date, console number and elapsed time of operator access.
6. Data Base Management Report
 - a. A report shall be provided including a report of the current system data base.
7. System Diagnostic Report
 - a. A report shall be provided detailing any system hardware software errors. This report shall include as a minimum those errors occurring within the central processing unit including disk subsystem.
8. Energy Management Reports
 - a. A report shall be provided for each application program as detailed in the appropriate section of this specification.
9. Alarm Processing
 - a. The automation system shall have the following alarm processing features, all of which shall be owner defined through the input keyboard.
 - 1) Alarm Reporting
 - b. Each alarm as determined by the system shall cause the following information to be logged:
 - 1) Current time, date and initials of on-duty operator.
 - 2) User name assigned to point.
 - 3) Point descriptor.
 - 4) Current value or status.
 - 5) Appropriate engineering units.
 - 6) Alarm designator -nature of alarm - high or low.
 - 7) Operator instructive message.
 - c. The operator message shall be an owner-defined message with a text capability of at least 256 characters per message. These messages shall be generated by the operator while the system is online and fully operational.
 - d. The operator shall have the ability to direct the alarm report and message to any output device on the system.
 - e. Any point which goes into alarm and has a graphic display associated with that point shall automatically display that graphic for operator review.

- f. An operator shall be able to define any alarm as being critical or non-critical.
 - g. All critical alarms shall be displayed in a separate area of the operator's terminal.
 - h. In the event of multiple alarms, all alarms shall be buffered according to priority until displayed or printed.
 - i. All operator acknowledgement of critical alarms shall be logged including time, date, operator's initials and user name of point being acknowledged. Alarms shall be acknowledged on a per point basis in the order they reported on the operator's terminal.
10. Analog Limits
- a. Each analog point shall have associated high and low limits. If the measured or calculated value drops below the low limit or exceeds the high limit that point shall be considered in alarm and report as previously defined in alarm reporting.
 - b. Each high and low limit shall have an associated user defined limit differential to prevent nuisance alarms caused from floating about the alarm limit.
 - c. Any analog point shall be disable from alarm reporting if it is associated with a previously defined master point which is turned off.
11. Binary Alarms
- a. Each binary point detected as being in alarm shall report as previously defined in alarm reporting.
 - b. Any binary point shall be disabled from alarm reporting if it is associated with a previously defined master point which is turned off. The operator shall be able to define an adjustable time delay which disables alarm checking during starting and stopping of equipment.
12. Analog/Binary Totalization
- a. The automation system software shall support both analog and binary totalization.
 - b. The operator shall be able to:
 - 1) enable to disable individual points from totalizing.
 - 2) assign upper limits for each point enabled for totalization.
 - 3) reset a totalized value.
13. Display the current value of an individual point, group of points of all system points.
14. Reporting: Any point's current value exceeding its assigned upper limit shall report as a totalized alarm point.
15. Analog Points: It shall be possible to totalize analog values with appropriate engineering units such as kilowatt hours, gallons, pounds, liters, etc.
16. Binary Points: It shall be possible to totalize the accumulated:
- a. Run time in hours or minutes
 - b. Contact status in hours or minutes
(Example: magnetic contact switch indicates a door open for 45 minutes).
- G. History Trending:
- 1. The system software shall provide the ability to historically trend operator selectable points.
 - 2. The operator shall be able to assign any system point, analog or binary, real or calculated to a trend group. Trend groups shall consist of a single point or multiple point groups with a capacity of at least 50 points.
 - 3. Operator assignments shall be through the operator's terminal in simple English language. Points assigned to a trend group shall be the point's English user name.
 - 4. Trended values shall be historically retained on the system disk for future inquiry.
 - 5. Operator shall be able to request trended values to be retrieved from disk and printed out at operator defined time intervals.
 - 6. Operator shall be able to define time intervals to one minute resolution.

- H. Preventive Maintenance Work Orders:
1. The system shall provide preventive maintenance instructive work orders which can be displayed manually or automatically.
 2. The operator shall have the capability to create, modify and delete work orders while the system is on-line and fully operational.
 3. Operator entries shall be through the operator's keyboard and all entries shall be in English language.
 4. A report shall be provided to display or log the contents of any and all work orders in the system.
 - a. Capacity:
 - 1) The system shall have the capacity to store on-line a minimum of 750 operator defined work orders.
 - 2) Each work order shall have a capacity of not less than 256 characters.
 - 3) A mechanism shall be provided which allows for lengthy work orders by linking more than one together.
 - b. Display:
 - 1) Work orders shall manually or automatically be displayed on a specified CRT or printed on a specified printer.
 - 2) Manual - The operator shall be able to display or print any and all maintenance work orders by requesting the same.
 - 3) Automatically - The system shall have the capability of displaying or printing maintenance work orders on the following occurrences:
 - a) A designated point exceeding a specified run time limit.
 - b) A specific time, day or date.
 - c) Any combination of time, day and date.
 - d) A designated point having gone into "ALARM".
- I. Powerfail/Automatic System Restart:
1. Power failures affecting the Central Processing Unit (CPU) shall cause the CPU to go into an orderly shut down with no less of memory under any circumstances.
 2. Upon resumption of power to the CPU, the system shall automatically restart the print-out the time and date of the power failure.
 3. The restart program shall automatically restart affected field equipment. Restart shall be of a static nature (restart of operator pre-assigned equipment) or an appropriate state restart (places the building equipment in the proper operational state as of the time of return to commercial power.) The nature of the restart program shall be user-definable.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine location where this equipment is to be installed and determine space conditions and notify Architect in writing of conditions detrimental to proper and timely completion of the work.
- B. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install equipment where shown, in accordance with manufacturer's written instructions and with recognized industry practices, to ensure that equipment comply with requirements and serve intended purposes.
- B. Coordinate with other work as necessary to interface installation of equipment with other components.

3.03 SYSTEM TURN-OVER AND SERVICE

- A. System Start-up and Acceptance
 - 1. Upon completion of the installation, the Automation System Sub-Contractor shall startup the system and perform all necessary testing and debugging operations. An acceptance test in the presence of the Owner's representative, the Architect, and the Engineer shall be performed. When the system performance is deemed satisfactory in whole or in part by these observers, the system parts will be accepted for beneficial use and placed under warranty.
- B. Owner's Instruction
 - 1. The Automatic System Subcontractor shall provide two copies of an operator's manual describing all operating and routine maintenance service procedures to be used with the system. The Automatic Subcontractor shall instruct the Owner's designated representatives in these procedures during the start-up and test period. The duration of the instruction period shall be no less than four hours. These instructions are to be conducted during normal working hours. The instructions shall consist of both hands-on and classroom training at the job site.

END OF SECTION 23 09 01

SECTION 23 09 93 - CONTROLS AND INSTRUMENTATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The Control Contractor shall furnish and install a complete Building Automation System including all equipment, accessories, wiring and instrument piping, air compressors, control devices and components required for a complete and functioning system.
- B. All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and shall not be custom designed especially for this project. All components shall have been thoroughly tested and proven in actual use.
- C. The building control system shall possess a fully modular architecture, permitting expansion through the addition of more stand-alone control units, sensors, actuators, and/or operator terminals.
- D. The equipment, components, and accessories used should be suitable for environment as well as operating condition.
- E. The manufacturer's wiring diagram shall identify and color code all internal and external wires.
- F. Control equipment, valves, panels, and dampers shall bear the manufacturer's name plate.

1.02 RELATED WORK

- A. Work of this section shall comply with the requirements of the Contract Conditions (General and Supplementary), with sections of Division 1 - General Requirements, with the drawings, and all other Contract Documents.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.

1.03 REFERENCES

- A. NFPA 70, NFPA 90A - National Fire Protection Association
- B. SMACNA - Low Pressure Duct Work
- C. ASHRAE 15
- D. ANSI B31.1; ANSI B31.5; ANSI B31.9; ANSI C12

1.04 SUBMITTALS

The Contractor shall submit the following to the Architect/Engineers for approval:

- A. Submittals/Drawings
 - 1. The Control Contractor shall submit prior to installation a set of installation drawings and control strategies for review by the consultant and/or owner's representative. These drawings shall include the physical location of building control system equipment and

- system architecture. The complete sequence of operation of the control system shall be provided.
2. Upon completion of the installation and final system adjustment, the Control Contractor shall provide a full set of as-built drawings of the installation and the control strategies.
- B. Manufacturer's Data
1. Dampers, valves, and operators
 2. Controllers, including complete wiring and connection diagrams
 3. Temperature sensors, including complete wiring and connection diagrams
 4. Temperature and pressure indicators
 5. Switches, relays, transducers, including complete wiring and connection diagrams
 6. Control Panels

1.05 QUALITY ASSURANCE

- A. The Control System Contractor shall provide a list of no less than ten similar projects which have building control systems as specified. These projects must be on-line and functional such that the Owner's representative would observe a direct digital control system in full operation.
- B. The control system shall be installed complete in all respects by competent mechanics, regularly employed by the manufacturer of the control system.
- C. Bids by Wholesalers, Contractors, Franchised Dealers or any firm whose principal business is not that of manufacturing and installing automatic temperature control systems shall not be acceptable.
- D. Single source responsibility of supplier shall be the complete installation and proper operation of the BAS and control system and shall include debugging and calibration of each component in the entire system.
- E. All electronic equipment shall conform to the requirements of FCC regulation Part 15, Section 15, governing radio frequency electromagnetic interference and be so labeled.
- F. All system components are to be designed, built, and installed to be fault tolerant as follows:
 1. Satisfactory operation without damage at 110% above and 85% below rated voltage and at ± 3 hertz variation in line frequency.
 2. Static, transient, and short circuit protection on all inputs and outputs.
 3. Communications lines protected against incorrect wiring, static transients, and induced magnetic interference.
 4. All real time clocks and data file RAM shall be battery backed for a minimum of 72 hours in the host, and 8 hours in the SAC panels.
 5. Bus connected devices to be AC coupled or equivalent so that any single device failure will not disrupt or halt bus communication.
- G. All pressure piping, valves, and accessories should be hydraulically/pneumatically tested to 1.5 times the operating pressure.
- H. Performance test should be carried out for all instruments, control equipment, and accessories as required.
- I. Factory performance test results should be submitted with the equipment drawings.

1.06 SYSTEM TURN-OVER AND SERVICE

- A. Upon completion of the installation, the Control System Contractor shall start up the system and perform all necessary testing and run diagnostics to ensure proper operation. An acceptance test in the presence of the Owner's representative, the Architect, and the Engineer shall be performed. When the system performance is deemed satisfactory in whole or in part by these observers, the system parts will be accepted for beneficial use and placed under warranty.
- B. The acceptance test shall consist of verifying the ability of the SAC panels to communicate with each other, communicate with the central system (located in the power plant), verifying calibration of each sensor and/or transmitter, verifying the operation of each control point and verifying the operation of the control algorithms. The contractor shall provide all equipment and support to demonstrate these items.

1.07 TRAINING/OWNER'S INSTRUCTION

- A. The Control System Contractor shall provide two copies of an operator's manual describing all operating and routine maintenance service procedures to be used with the system. The Control Contractor shall instruct the Owner's designated representatives in these procedures during the start-up and test period. The duration of the instruction period shall be no less than 40 hours. These instructions are to be conducted during normal working hours. The instructions shall consist of both hands-on and classroom training at the job site.

1.08 WARRANTY

- A. The building control system, including all hardware, software components and end devices shall be warranted for a period of one (1) year following the date of beneficial use. Any manufacturing defects arising during this period shall be corrected without cost to the owner.

PART 2 - PRODUCTS

2.01 BUILDING CONTROL SYSTEM

- A. The building control system specified herein shall be a direct digital distributed control system which can, without additional equipment, perform all of the automatic temperature control and energy management functions as required in this Specification. Direct Digital Control shall be defined as a control technique through which the process variable is continuously monitored by a digital computer which accomplishes loop control by calculating a control solution for output to a control device.
- B. The system, as specified, shall independently control the building's HVAC equipment to maintain a comfortable environment in an energy efficient manner. The building operator shall communicate with the system and control the sequence of operation within the building.
- C. System Architecture
 - 1. The building control system shall consist of a network of independent, stand-alone control (SAC) units. Each stand-alone control unit shall be capable of performing all specified control functions in a completely independent manner. Host based systems shall not be acceptable. Control units shall be capable of being networked for single point programming and for the sharing of point information and control instructions between panels. All operator communication with the system shall be via operator terminal provided as

specified hereafter. It shall be possible for each control unit to have a dedicated local display or for a collection of control units to share a single operator terminal.

D. Stand-Alone Control (SAC) Unit:

1. Each control unit shall be capable of full operation either as a completely independent unit or as a part of the building-wide control system. All units shall contain the necessary equipment for direct interface to the sensors and actuators connected to it. Provide phone line modem in SAC panel located in main communications closet of each building.
2. Control strategies shall be owner-definable at each control unit, and for all control units in the system from any one operator terminal. Each control unit shall provide the ability to support its own operator terminal if so desired.
3. Each stand-alone control unit shall include its own microcomputer controller, power supply, input-output modules, modem (as needed) termination modules, and battery. The battery shall be self-charging and be capable of supporting all memory within the control unit if the commercial power to the unit is interrupted or lost for a minimum of eight (8) hours.
4. The stand-alone control unit shall be listed by Underwriters Laboratories (UL) against fire and shock hazard as a signal system appliance unit.

E. Sensors/Input Signals

1. Each stand-alone control unit shall be capable of direct interface to sensors and input devices.
2. It shall be possible for each stand-alone control unit to monitor the following types of inputs:
 - a. analog inputs
 - 4-20 mA
 - 0-10 vDC
 - thermistors
 - RTD's
 - b. digital inputs
 - dry contact closure
 - pulse accumulator

F. Actuators/Output Signals

1. The stand-alone control unit shall directly control pneumatic and electronic actuators and control devices. Each control unit shall be capable of providing the following control outputs:
 - a. digital outputs (contact closure)
 - motor starters, sizes 1 to 4
 - shunt trip panels
 - b. analog outputs
 - 3-15 PSI
 - 4-20 mA
 - 0-16 vDC

G. Building Control Functions

1. Each Stand-Alone Control Unit within the Building Control System shall perform both temperature control functions, smoke control functions, and energy management routines as defined by these Specifications.
2. All temperature control functions shall be executed within the stand-alone control unit. Loop control shall be executed via direct digital control algorithms. The user shall be able

- to customize control strategies and sequences of control and shall be able to define appropriate control loop algorithms and choose the optimum loop parameters for loop control. Control loops shall support any of the following control modes:
- a. Two-position (on-off, slow-fast, etc.)
 - b. Proportional (P)
 - c. Proportional, plus integral (PI)
 - d. Proportional, integral, plus derivative (PID)
3. It shall be possible to fully create, modify or remove control algorithms within a specific stand-alone control unit while it is operating and performing other control functions. Input for these changes may be made directly into the stand-alone control unit or via the network from any other control unit. Each control loop shall be fully user definable in terms of:
 - a. sensors/actuators that are part of the control strategy.
 - b. control mode
 - c. gain
 - d. control action
 - e. sampling time
 4. In order to minimize wiring and sensor costs, provide stand-alone control units that are able to share point information such that control sequences or control loops executed at one control unit may receive input signals from sensors connected to other stand-alone control units within the network. If the network communication link fails or the other stand-alone control unit malfunctions, the control loop shall continue to function using the last value received from the stand-alone control units. Provide protocol necessary to allow the panel needing the point information to have a local buffer updated periodically. The need to wait on the network shall be avoided. The buffer to be updated by change of value and on time interval, as required.
 5. Each stand-alone control unit shall be capable of performing the following energy management routines as a minimum:
 - a. time of day scheduling
 - b. start/stop time optimization
 - c. peak demand limiting
 - d. supply air reset
 - e. event initiated programs
 6. In addition, the owner shall be able to create customized control strategies based upon arithmetic, Boolean or time delay logic. The arithmetic functions shall permit simple relationships between variables (i.e. +, -, x) as well as more complex relationships (i.e. square root, exponential).
 7. Each stand-alone control unit shall be capable of performing the following control functions as a minimum:
 - a. discharge air control
 - b. heating and chilled water coil control
 - c. humidity control
 - d. equipment start/stop
 - e. mechanical equipment control
 - f. smoke control functions (as defined in these specifications)
 - g. hot water systems control
 - h. chilled water systems control
 8. The system shall permit the generation of job-specific control strategies that can be activated in any of the following ways:
 - a. continuously
 - b. at a particular time-of-day
 - c. on a predefined date

- d. when a specific measured or controlled variable reads a selected value or state
 - e. when a piece of equipment has run for a certain period of time
 - 9. Upon a loss of commercial power to any stand-alone control unit, the other units within the network shall not be affected, and the loss of operation of that unit shall be reported at the designated operator's terminal. All control strategies and energy management routines defined for the stand-alone control unit shall be retained during a power failure via the battery with the unit for a minimum of eight (8) hours. Upon resumption of commercial power, the control unit shall resume full operation without operator intervention. The unit shall also automatically reset its clock such that proper operation of timed sequences is possible without the need for manual reset of the clock.
 - 10. Should a loss of power exceed memory back-up, the building operator shall be able to manually restore all system programs off of memory storage in the Building Engineers Operators Console.
- H. Operator Interface
- 1. The building control system shall permit full operator communication including: obtaining information about the performance of his system; allowing the operator to change the system operation; diagnosing the system malfunctions and programming of the system. Operator communication shall be through the black and white CRT, hand-held terminal or printer. Any one of these devices shall allow operator communications.
 - 2. The building control system shall permit complete operation of any stand-alone control unit within the network, from any operator terminal within the system.
 - 3. The network shall be addressable as a whole and shall not require referencing a particular control unit for the commanding or monitoring of points on the network.
- I. User Programmability
- 1. All temperature control strategies and energy management routines shall be definable by the operator through the operator's terminal. It shall be possible for the operator to program and modify system functions independently after receiving the training from the control contractor as previously specified. The system shall be provided complete with all equipment and documentation necessary to allow a trained operator to independently perform the functions listed below:
 - a. read the value of a measured variable (i.e. temperature)
 - b. start or stop equipment
 - c. monitor the status of equipment being controlled
 - d. read the set point of a control loop
 - e. determine the control strategies that have been defined for a specific piece of equipment
 - f. generate displays of control strategies
 - g. add/delete control loops to the system
 - h. add/delete points to the system
 - i. create, modify or delete control strategies
 - j. assign sensors and/or actuators to a control strategy
 - k. tune control loops through the adjustment of control loop parameters
 - l. enable or disable control strategies
 - m. generate hard copy records of control strategies on a printer
 - n. select points to be alarmable and define the alarm state(s)
- J. Self-Diagnostic and Alarm Reporting
- 1. Each stand-alone control unit shall contain self-diagnostics that continuously monitor the proper operations of the unit. A malfunction of the unit will be reported, and will inform

the operator of the nature of the malfunction, and the control unit affected. It shall be possible to annunciate malfunctions as well as other control unit alarms at a selected central operator's terminal.

2. The system shall also allow on-line diagnosis via telephone modem from a remote location.

K. Transmission Network

1. The control system shall include a multi-drop digital transmission network that provides the communication link between all the stand-alone control units, and main campus operators console via modem.
2. The transmission shall be asynchronous and utilize a polled-response method. The system shall utilize a cyclic redundancy check or dual transmission with parity check to ensure signal reliability.
3. The transmission network shall utilize a twisted shielded pair. The transmission speed shall be minimum of 4800 baud and operate in a half-duplex mode.
4. The system shall support multi-drop trunks. Each multi-drop trunk shall support a minimum of 32 Remote Units.
5. Each multi-drop trunk shall have an allowable line length of at least 20,000 feet without signal degradation. All multi-drop trunks shall be interfaced to the system via standard EIA interfaces.
6. Transmission techniques shall allow trunk cable to be installed in conduit with other system signals as well as switched to 120 VAC or 240 VAC.
7. Surge protection shall be provided where the transmission cable enters or leaves a building. Electrical noise suppression shall be provided on all control devices (i.e. relays, transducers, etc.)

L. Sensors

1. All analog sensors shall utilize industry standard 4-20 milli-amp signals to facilitate Owner expansion. Sensors based on proprietary equipment shall not be acceptable.
2. All analog signals shall be converted for digital transmission to the CPU at the function card.
3. All sensing wiring, whether it be analog or digital, input or output, shall be capable of sharing single conduit runs without affecting signal performance. All signal wiring shall also be capable of sharing single conduit runs with switched AC or 120 VAC or 240 VAC.
4. Sensors shall meet the following minimum specifications:
 - a. Room Temperature (RTD Type):
Temperature Monitoring Range..... +20°/+120°F
Accuracy:
RTD Element ∇0.5°F
Sensor ∇0.7°F
 - b. RTD Duct Sensor (Fan Discharge, and Return Air):
Temperature Monitor Range..... +20°/120°F
Accuracy:
RTD Element ∇0.5°F
Sensor ∇0.7°F
 - c. RTD Averaging Type Duct Sensor (Mixed Air, Heating, and Cooling Coil):
Temperature Monitoring Range..... +20°/+120°F
Sensor ∇1.1°F
 - d. RTD Immersion Sensor (hot water, chilled water and glycol heating):
Temperature Monitoring Range
(LTHW) +20°/+220°F
(MTHW) +100°/+400°F

- Accuracy:
 - RTD Element ∇0.5°F
 - Sensor ∇0.9°F
- e. Outside Air Temperature (RTD):
 - Temperature Monitor Range -30°/+120°F
 - Accuracy:
 - RTD Element ∇0.5°F
 - Sensor ∇1°F
- f. Room/Duct/Outside Air Dew Point sensor (High Accuracy) (For Enthalpy Control):
 - Dew Point Monitoring Range -40°/+115°FDP
 - Accuracy:
 - Dew Point Element ∇1.1°FDP
 - Sensor ∇1.5°FDP
 - RH% Range 12%-99%
- g. Room Relative Humidity Sensor (High Accuracy):
- h. Humidity Range 0-100%
- i. Accuracy:
 - (Over Full Range of Instrument) ∇2%
- j. Sensing Element Crystallite Fibre Strain Gage Beam
- k. Companion Transmitter:
 - RFI Susceptibility ∇3% of Scale

2.02 SOFTWARE

- A. The Control System Subcontractor shall provide all software required for efficient operation of all the control system functions required for this Specification. Software shall be modular in design for flexibility in expansion or revision of the system. Software shall be loaded into the system via a compact "floppy" disk from the operator's terminal. The operator's terminal shall also be capable of copying the system software on a "floppy" disk for archival purposes.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine location where controls and equipment are to be installed and determine space conditions and notify Architect in writing of conditions detrimental to proper and timely completion of the work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's written instructions and with recognized practices, to ensure that equipment complies with requirements and serves intended purposes.
- B. Coordinate with other work as necessary to interface installation of equipment with other components of systems.

A. VAV CONTROL

1. VAV setpoints:
 - a. Heating 70 deg F (adjustable)
 - b. Cooling 75 deg F (adjustable)
2. Wall mounted temperature sensors located on each space shall modulate the VAV damper from maximum to minimum on a drop in temperature below its Setpoint.
3. Should the room continue to drop below the Space Setpoint the VAV controller shall modulate the reheat coil valve or signal to maintain the Setpoint. When the reheat coil valve is at 100% and the space temperature continue to drop, the damper should open from MIN to MAX.
4. The opposite shall occur on a rise in space temperature above the setpoint.
5. Alarm: Provide alarm at BMS if the valve command varies by more than 15%. Provide alarm is space temperature is more than 3 deg F (adjustable) higher or lower than the setpoint.
6. Display: Display system graphic, MODE, valve position, flow, temperatures, alarms.

3.03 FIELD QUALITY CONTROL

- A. Upon completion of installation of the automatic temperature control system and after motors have been energized with normal power source, test system to demonstrate compliance with requirements.
- B. When possible, field correct malfunctioning controls, then retest to demonstrate compliance. Replace controls which cannot be satisfactorily corrected. Refer to Section "Testing and Balancing".
- C. Checkout of the installation shall be conducted by the Contractor with a representative of the Owner and Architect. The checkout shall consist of verifying the ability of the S.A.C. panels to communicate with the operator's console, verifying calibration of each sensor and/or transmitter, and verifying the operation of each control point.
- D. All software processes shall be thoroughly demonstrated to the Owner's representative and Architect. Alarm conditions shall be simulated for conformance. Analog control points shall be exercised through their entire range. All control interlocks and sequences shall be completely verified. The checkout shall be a thorough and exhaustive review of the installation to assure proper operation of the total system.

3.04 SERVICE

- A. After completion of the control system installation, the control manufacturer shall regulate and adjust all thermostats, control valves, damper motors, etc., and place in complete operating condition, subject to the approval of the Architect.
- B. The Control System contractor shall provide two copies of an operator's manual describing all operating and routine maintenance service procedures to be used with the system. The Control System contractor shall instruct the Owner's designated representatives in these procedures during the start-up and test period. The duration of the instruction period shall be no less than eighty hours. These instructions are to be conducted during normal working hours. The instructions shall consist of both hands-on and classroom training at the job site.

END OF SECTION 23 09 93

23 31 13 - SHEET METAL DUCTWORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinate with and complementary to the General Conditions and Supplementary General Conditions of the work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical work shall apply.

1.02 DESCRIPTION OF WORK

- A. The work includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner, all Sheet Metal Ductwork as shown on the drawings and hereinafter specified.

1.03 QUALITY ASSURANCE

- A. Fabrication and installation shall be by a single firm specializing and experience in metal ductwork for not less than 10 years.
- B. Comply with SMACNA's (Sheet Metal and Air Conditioning Contractors National Association) 2005 HVAC Duct Construction Standards, Metal and Flexible, Third Edition recommendations for fabrication, construction and details and installation procedures, except as otherwise indicated.
- C. Comply with ASHRAE (American Society of Heating Refrigeration and Air Conditioning Engineers) recommendations, except as otherwise indicated.
- D. Compliance to SMACNA and ASHRAE is a minimum requirement. In case of disagreement between sheet metal work described in this Section and SMACNA or ASHRAE, the specification shall govern.

1.04 SUBMITTALS

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical work and submit shop drawings and coordinate drawings.
- B. Before submitting any sheet metal drawings, submit a complete set of shop standards for review and approval. Sheet metal shop drawings may be submitted only after approval of the shop standards.

1.05 COORDINATION

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical work.

1.06 GUARANTEE

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical work.

- B. Contractor will guarantee all work for one year from the date of acceptance against all defect in material, equipment and workmanship. This guarantee shall include repair of damage to any part of the premises resulting from leaks or other defects in material, equipment or workmanship.

1.07 PRODUCT HANDLING

- A. Protect shop fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Protect ends of ductwork and prevent dirt and moisture from entering ducts and fittings.
- B. Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclosed with waterproof wrapping.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR DUCTWORK

- A. Furnish and install the size, connections and run of ducts as indicated on the drawings.
- B. While the Drawings shall be adhered to as closely as possible, the Architect's right is reserved to vary the run and size of ducts during the progress of the work if required to meet structural conditions.
- C. Install all ductwork in strict adherence to the ceiling height schedule indicated on the Architect's Drawings. Consult with the Plumbing, Fire Protection and Electrical Contractors and, in conjunction with the above Contractors, establish the necessary space requirements for each trade.
- D. The sheet metal ductwork shall, whether indicated or not, rise and/or drop and/or change in shape to clear any and all conduits, lighting fixtures, piping and equipment to maintain the desired ceiling heights and to provide adequate maintenance room and headroom in mechanical equipment rooms.
- E. The ductwork shall be continuous, with airtight joints and seams presenting a smooth surface on the inside and neatly finished on the outside. Ducts shall be constructed with curves and bends so as to affect an easy flow of air. Unless otherwise shown on the Drawings, the inside radius of all curves and bends shall be not less than width of ducts in plane of bend.
- F. All rectangular ductwork, unless otherwise noted, shall be built from galvanized sheet steel and thoroughly braced and stiffened.
- G. Provide 18" x 18" access doors for every 30'-0" run of supply and return air duct for cleaning purposes. For ducts whose height or width is less than 20", provide access doors which are 18" wide by a height calculated as 2" less than the height of the duct (thereby providing 1" of clearance between the bottom of the access door and the bottom of the duct, and similar for the top).

2.02 DUCT PENETRATION THRU FLOOR

- A. Provide 4" high and 4" wide concrete curb all around opening at duct penetration thru floors. Fill in space between duct and floor construction with mineral wool.

2.03 INSTALLATION OF HVAC DEVICES

- A. Installation of Duct Smoke Detectors: Duct smoke detectors shall be furnished by the Electrical Contractor and shall be installed in the ductwork under this Section. Provide an access door to each smoke detector.
- B. Installation of Dampers: Refer to Drawings and temperature control specification for smoke dampers and other automatic dampers and install them in ductwork.
- C. Installation of variable air volume system control devices: Install in sheet metal ductwork all control devices furnished by the manufacturer of the variable air volume system controls. Provide an access door at each location.

2.04 DUCT FABRICATION

- A. Ducts shall be neatly finished on the outside with all sharp edges removed.
- B. Inside surfaces shall be smooth with no projections into the air stream except where otherwise indicated.
- C. Longitudinal joints shall be Pittsburgh lock at corners or Acme lock on flat surfaces double seams hammered tight and shall be located above the horizontal axis of the duct. A snap lock seam shall not be permitted as a substitute for the Pittsburgh lock at corners of ducts.
- D. Transverse joints shall be made airtight with all laps in the directions of air flow.
- E. All fasteners and attachments shall be made of the same material as the ducts.
- F. Furnish test wells 12" on the center horizontally and vertically in the suction and discharge duct of each fan. Test wells shall consist of a 1" x $\frac{3}{4}$ ", 125 lb., bronze, screwed hex bushing, secured to the duct with a bronze hex locknut on the inside of the duct. A $\frac{3}{4}$ " x 2" long standard weight bronze, screwed nipple and cap shall be fitted to the housing on the outside of the duct. Test wells shall be No. 699 as made by Ventlok or approved equal.
- G. All turns in ductwork shall be accomplished using radius elbows rather than square elbows. Square elbows will only be permitted in instances where the Contractor, through depiction on their sheet metal shop drawings, proves that only a square elbow may be installed due to such limited space availability. All radius elbows shall have a minimum centerline radius of 12 times the width of the duct.
- H. All square elbows shall have factory-designed and built single thick turning vanes. Shop fabricated vanes will not be approved. Where turning vanes are in conflict with the access doors to fire dampers, they shall be made movable so that fire dampers shall be accessible.
- I. Dissimilar metals shall be connected with flanged joints made up with fiber or neoprene gaskets to prevent contact between dissimilar metals. Flanges shall be fastened with bolts protected by ferrules and washers made of the same materials as the gaskets. Where an aluminum duct is to be connected to a galvanized steel duct, the end of the galvanized steel duct shall be coated with heavy black asphaltum paint before connecting it to the aluminum duct.
- J. Changes in shape and dimension shall conform to the following: Except where otherwise noted, for increases in cross-sectional area, the shape of the transformation shall not exceed 1" in 7".

Except where otherwise noted, for reductions in area, the slope shall not be less than 1" in 4" but 1" in 7" preferred.

- K. Wherever it may be necessary to make provisions for vertical hangers of the ceiling construction passing through ducts, provide streamlined shaped sleeves around such ceiling construction hangers as to fully protect the duct from being penetrated with holes for the passage of such hangers. Any such streamlined sleeves shall be made air tight at top and bottom of ducts. In no case shall there be more than two rods in any 9 sq. ft. area. No rods shall pierce ducts smaller than 12" in horizontal area.
- L. Ductwork shall be constructed in accordance with the latest version of the SMACNA Duct Construction Standards for both rectangular and round duct. The duct Pressure Class for each duct system shall be determined from the maximum possible (shut-off) static pressure achievable by the supply, return or exhaust fans, and in no instance shall the minimum pressure class be lower than 1" WC. The Sheet Metal Subcontractor shall obtain the associated fan curves from the Mechanical Contractor in order to confirm the maximum static (shutoff) pressure of the fan(s). This pressure class shall extend from the air handlers to the first automatic damper (including fire dampers, smoke dampers and combination fire/smoke dampers). For VAV systems, the pressure class of the ductwork between the first automatic damper and the VAV or CV boxes shall be equal to the external static pressure (ESP) rating of the fan.
- M. Seal Class: All ductwork shall be sealed to SMACNA Seal Class A, with no exceptions.
- N. Ductwork Testing:
 - 1. The intent is to test all ductwork and all ducted systems. All ductwork shall be tested in accordance with SMACNA Procedures, including SMACNA Duct Performance Test Standard m DPTS-1995 and the latest editions of the SMACNA HVAC Duct Construction Standards and the SMACNA HVAC Air Duct Leakage Test Manual.
 - 2. Additional requirements for all ductwork:
 - a. The testing of all joints for air leakage after erection and the repair of any leaks are positive requirements. Leakage must be kept to a specified minimum. The test for air leakage is divided into two phases; namely, testing of individual vertical risers and testing of all branches. Provide all required instruments.
 - b. All risers, branches and runouts shall be tested after installation before insulation is applied and before the air mixing units are installed. The total allowable leakage for the entire system shall be tested, measured and proven to be in accordance with Table 4-1, Applicable Leakage Classes, of the SMACNA HVAC Air Duct Leakage Test Manual; joints, seams and all wall penetrations shall meet Leakage Class 6 for rectangular ducts and Leakage Class 3 for round ducts.
 - c. Equipment necessary for performing this test shall include a rotary hand blower calibrated orifice section and a "U" tube gauge board complete with cocks and rubber tubing. The test hookup, as well as details for the fabrication of the orifice section shall be in accordance with the recommendation of the "High Velocity Duct Manual" of Sheetmetal and Air Conditioning Contractors National Association, Inc.
- O. The construction for low pressure rectangular sheet metal ducts shall be made in accordance with recommendations of ASHRAE Guide, Latest Edition, or as per SMACNA Manual but not less than the following weights and construction:

LOW PRESSURE - RECTANGULAR DUCTWORK				
Dimension Longest Side Inches	Sheet Metal Gauge All Four Sides			Transverse Reinforcing at Joints and Between Joints
	Steel Gauge	Aluminum Thickness In.	Copper Oz. Per Sq. Ft.	
Up thru 12	26	0.020	16	1" pocket lock 24 gauge, standing seam joint 24 gauge, 1" standing S slip 24 gauge. Joint max. on 8 ft. centers.
13 thru 18	24	0.025	24	Same as for up thru 12.
19 thru 30	24	0.025	24	1" pocket lock 22 gauge. Joints max, on 8 ft. centers with 1 x 1 x c in. angles 4 feet from joint.
31 thru 42	22	0.032	32	Same as for 19 thru 30.
43 thru 54	22	0.032	32	1" standing S slip 22 gauge with 1½" x 1½" x ⅛ in. angles, 1½" standing seam joint, 1½" pocket lock 22 gauge. Joints on 8 ft. centers with 1½" x 1½" x ⅛ in. angles max. 4 feet from joint.
55 thru 60	20	0.040	36	Same as for 43 thru 54.
61 thru 84	20	0.040	36	1" standing S slip gauge with 1½" x 1½" x ⅛ in. angles, 1½" standing seam joint, with 1½" x 1½" x ⅛ in. angles, 1½" in. pocket lock 22 gauge with 1½" x 1½" x ⅛ in. angles. Joints max. on 8 ft. centers with 1½" x 1½" x ⅛ in. angles max on 2 ft. centers.
85 thru 96	18	0.050	48	Same as for 61 thru 84 except all angles shall be 1½" x 1½" x 3/16 in.
over 96	18	0.050	48	Same as for 61 thru 84 except all angles shall be 2 x 2 x ¼ in.

1. Flat areas of duct over 18 in. wide shall be stiffened by cross breaking of beading.
2. All joints to have corner closures.
3. All joints (longitudinal and transverse) shall be sealed with Foster 32-19, Childers CP-146 or 3M EC-800 mastic or equal UL181A approved mastic, to provide sealing equivalent to SMACNA Seal Class A.

P. The construction for low pressure round sheet metal ducts and fittings shall be as follows:

Girth Reinforcing			
Duct Diameter Inches	Steel-Galv Sheet Gage	Minimum Reinforcing Angle Size & Maximum Longitudinal Spacing	Girth Joints (Continuously Welded or as Below)
Up thru 8	26	None required	Crimped and beaded joint
9 thru 13	26	None required	Crimped and beaded joint
14 thru 22	24	None required	Crimped and beaded joint
23 thru 36	22	None required	--
37 thru 50	20	1¼ x 1¼ x ⅛ @ 72 in.	--

Girth Reinforcing			
Duct Diameter Inches	Steel-Galv Sheet Gage	Minimum Reinforcing Angle Size & Maximum Longitudinal Spacing	Girth Joints (Continuously Welded or as Below)
51 thru 60	18	1¼ x 1¼ x ⅛ @ 72 in.	--
61 thru 84	16	1½x 1½ x ⅛ @ 72 in.	--

NOTE: Flanged joints may be considered as girth reinforcing.

1. Ductwork up to 36 in. diameter shall be spiral lockseam construction and it shall be assembled with prefabricated fittings made up of 20 gauge galvanized iron.
2. All joints (longitudinal and transverse) shall be sealed tight with EC-800 to provide sealing equivalent to SMACNA Seal Class A. Joints shall, in addition, be fastened with self-tapping screws.

2.05 FLEXIBLE RUN-OUTS

- A. The run-outs from the (medium) (high) pressure duct to (terminal units such as Variable air Volume or constant air volume boxes) (induction units) (air mixing boxes) shall be flexible duct.
 1. Flexible metal duct shall be all-metal, bendable, self-supporting and mechanically interlocked to be totally leak proof under operating conditions without manufacturing use of adhesives.
 2. Flexible ducts shall be type AL006 uninsulated or Type AL006-150 insulated as made by United Sheet Metal or approved equal. The flexible run-outs shall take all bends without kinking. The run-outs shall be flame resistant, shall have a low friction loss, and shall have working pressure minimum of 10 inch W.G. Flexible run-outs shall be no longer than 3'-0" and shall comply with Local Union Requirements. Any additional lengths necessary to connect the flexible duct to the high or medium pressure ductwork shall be made with spiral lockseam sheet metal duct of the same size as the flexible ductwork.
 3. Clevaform type S and Type SFV as made by Clevaflex is approved equal.
- B. The flexible run-out duct shall meet all requirements of the National Fire Protection Association 90A - Latest Edition.
 1. Flame spread not over 25, smoke developed not over 50.
- C. Each flexible run-out shall be sealed to its male outlets on both ends with Foster 32-19, Childers CP-146 or 3M EC-800 sealer, or sealing compound as recommended by the flexible air duct manufacturer. The flexible air duct shall be sealed and covered to a minimum depth of 2 inches of its mating metal coupling, branch take-off lap or duct at each of its ends.
- D. Flexible ducts shall be terminated with stainless steel band clamps at duct takeoff, terminal box or diffuser. Plastic strap locks and Nylon "ZIP-TIES" are not acceptable.
- E. Complete installation shall be airtight.
- F. Flexible ducts shall be rated and labeled to the requirements of UL 181 for Class 0 or Class 1 flexible air ducts and shall be so identified.

2.06 SMOKE DAMPERS

- A. Smoke dampers shall be classified and labeled in accordance with UL 555S, "Standard for Leakage Rated Dampers for Use in Smoke Control System." Smoke dampers shall be of UL 555 S leakage class I, 4 CFM/Ft² at 1" w.g.; 8 CFM/Ft² at 4" w.g.
- B. Smoke dampers installed at smoke barriers shall be installed no more than 2 ft. from the barrier and between any branch takeoff or duct inlet and outlets and the smoke barrier.
- C. Smoke dampers shall be automatically return to closed position in the event of loss of electricity. All wiring required to interconnect the dampers with fire detection, fire alarm and fire alarm supervisory control systems shall be provided under the Division 26 of the Specification. Pneumatic control system for damper actuators shall be provided under Section 23 09 00, as specified hereinafter. All combination fire/smoke dampers and smoke dampers shall be provided with 120 VAC actuators. Power wiring for all combination fire/smoke dampers and all smoke dampers shall be through the fire alarm system control relay and through a BAS relay and control module. The Electrical Contractor shall provide all such wiring; the ATC Sub-Contractor shall provide a BAS relay which must be installed for each combination fire/smoke damper and each smoke damper. If the air handling system is shut down, all associated combination fire/smoke dampers and all smoke dampers shall close. The fire alarm relay shall, if necessary, override the BAS relay. Each damper shall be individually powered and controlled.
- D. Smoke dampers shall be constructed as described above for dampers.
- E. Damper actuators shall be as specified in Section 23 09 00.
- F. For fire/smoke dampers, provide two (2) damper end switches that are blade actuated to signal the fire alarm system when dampers are in the open and closed position. For smoke and fire/smoke dampers which can isolate a fan from its distribution ductwork or as otherwise required by the Sequence of Operation, provide an additional end switch which shall be wired to the fan starter (VFD) control wiring to prevent the fan from operating unless the damper is open.
- G. Apply a bead of sealant between damper and sleeve and between dampers for multiple damper assemblies, as defined below for combination smoke and fire dampers.

2.07 FIRE DAMPERS

- A. Fire dampers and sleeve installation shall be in accordance with NFPA-90A recommendations and shall bear U.L. Label in compliance with U.L. 555.
- B. Clearly indicate fire damper location on shop drawings. Provide access doors in the ducts and supply access doors or panels at building construction at each damper of sufficient size and type to permit inspection and replacement of linkage. Assume responsibility to coordinate all locations of duct access doors with the other Contractors to conform with whatever architectural access openings may be necessary and supply access doors or panels in building construction. Provide shop drawings indicating location of access panels or doors for Architect's approval.
- C. It is the intention of these plans and specifications to be complete. However, it is the responsibility of the Contractor, as being completely cognizant of local regulations, to determine where fire dampers are required and to advise the Architect prior to construction as to any discrepancies or questions in the plans or specifications.

- D. Fire dampers shall be enclosed in sleeve of fourteen gage metal. Sleeve shall be secured at both sides of fire partitions with $1\frac{1}{2} \times 1\frac{1}{2} \times 14$ ga. mounting angles secured to sleeves only; retaining angles must lap structural opening 1" minimum and cover corners of opening. Provide duct breakaway connections, see detail on drawings. Breakaway connections shall be located within 6 inches of the fire wall on both sides of the fire wall.
- E. Dampers shall be steel plate, mounted to turn freely, in steel plate frame inserted in duct. Dampers shall be proportioned and weighted to close at once, if released from link with spring catches to hold closed, until manually reset. Dampers and frames to have suitable standard fusible-links, normally holding them open, but releasing upon contact with fire. Damper blades shall be mounted on corrosion resisting bearings. Damper shall close by gravity, moving with the air stream to full closed position against one-eighth ($\frac{1}{8}$) inch angle stop. Steel spring catch shall hold damper closed. Radius arm on shaft shall show position of damper. Submit details for approval.
- F. Fire dampers shall be as made by Ruskin, Lau, Arlan Damper Corp. (631-589-7431) or approved equal, U.L. labeled.
- G. Damper shall be fully out of the air stream (type B) U.O.I.
- H. In stainless steel and aluminum ductwork provide stainless steel construction fire dampers.

2.08 COMBINATION SMOKE AND FIRE DAMPERS

- A. In lieu installing separate fire and smoke dampers in fire walls with a rating of two hours or less, a combination fire/smoke damper can be installed. Fire walls with a rating exceeding two hours must use separate fire and smoke dampers.
- B. Combination fire/smoke dampers shall be model FSD36 as manufactured by Ruskin, Lau, Arlan Damper Corp. (631-589-7431) or approved equal.
- C. Combination fire/smoke dampers shall be installed in sleeves in accordance with NFPA-90A, UL555 and manufacturer's installation instructions. Dampers shall be UL rated, UL555S, leakage class II, 4 CFM/Ft² at 1-inch w.g.; 8 CFM/Ft² at 4" w.g., and UL555 1½ hour fire rated. Each damper shall bear a UL label attesting to these qualifications, in accordance with established UL labeling procedure.
- D. Damper manufacturer shall have tested and qualified with UL, a complete range of damper sizes covering all combination smoke and fire dampers required for this project.
- E. Damper actuators shall be pneumatic or electric as specified in Section 23 09 00. Damper actuators shall be installed by the damper manufacturer at the time of damper fabrication; damper and actuator shall be supplied as a single entity which meets all applicable UL555S qualifications for both dampers and operators. Damper and actuator shall be qualified under UL555S and UL555 to an elevated temperature of 250 deg. F.
- F. Each combination fire/smoke damper shall be equipped with a fusible link which shall melt at 165° F causing the damper to close and lock in the closed position.
- G. Dampers shall automatically return to closed position in the event of loss of control air or electric power.

- H. Each combination fire/smoke damper shall have a factory installed sleeve of length and gauge required for satisfactory installation and with the damper actuator factory installed on the exterior of the sleeve and properly linked to the damper operating shaft. Contractor shall coordinate space requirements where dampers are located, providing required service clearance for actuators.
- I. All wiring required to interconnect the dampers with fire detection, fire alarm and fire alarm supervisory control systems shall be provided under the Division 26 of the Specification. Pneumatic control system for damper actuators shall be provided under Section 23 09 00, as specified hereinafter. All combination fire/smoke dampers and all smoke dampers shall be provided with 120 VAC actuators. Power wiring for all combination fire/smoke dampers and all smoke dampers shall be through the fire alarm system control relay and through a BAS relay and control module. The Electrical Contractor shall provide all such wiring; the ATC Sub-Contractor shall provide a BAS relay which must be installed for each combination fire/smoke damper and each smoke damper. If the air handling system is shut down, all associated combination fire/smoke dampers and all smoke dampers shall close. The fire alarm relay shall, if necessary, override the BAS relay. Each damper shall be individually powered and controlled.
- J. For fire/smoke dampers, provide two (2) damper end switches that are blade actuated to signal the fire alarm system when dampers are in the open and closed position. For smoke and fire/smoke dampers which can isolate a fan from its distribution ductwork or as otherwise required by the Sequence of Operation, provide an additional end switch which shall be wired to the fan starter (VFD) control wiring to prevent the fan from operating unless the damper is open.
- K. Clearly indicate fire damper location on shop drawings. Provide access doors in the duct and supply access doors for installation at building construction, at each damper, of sufficient type to permit inspection and replacement of damper actuators and linkage. Assume responsibility to coordinate all locations of access doors with other contractors. Provide shop drawings indicating locations of access doors, both duct and building construction, for Architect's approval.
- L. It is the intention of these plans and specifications to be complete. However, it is the responsibility of the Contractor, as being completely cognizant of local regulations, to determine where combination fire/smoke dampers are required and to advise the Architect prior to construction as to any discrepancies or questions in the plans or specifications.
- M. Combination fire/smoke dampers shall be enclosed in a sleeve of fourteen gauge metal set and grouted into the fire partition. The sleeve shall be secured on both sides of the fire partition with 1½ x 1½ x 14 gauge mounting angles secured to the sleeves only. Retaining angles must lap structural opening 1 inch minimum and cover corners of the opening.
- N. Multiple damper assemblies shall be installed and fastened together per manufacturers instructions. Unless the manufacturer's instructions indicate otherwise multiple damper assemblies shall be fastened together with ¼"-20 bolts, No. 10 screws or ½" long welds staggered intermittently on both sides. Fasteners shall be spaced 6" on center and a maximum of 2" from the ends of the joining sections or from the corner. A continuous ⅛" bead of Dow-Corning 100% silicon rubber, Dow-Corning Selastic 732 or GE RTV 108 sealant shall be applied on the mullion joint. Press the surface of the sealant in place to dispel any air.
- O. A bead of sealant, as described above, shall be applied between the damper and the sleeve.
- P. Fire/smoke dampers shall be provided with end switches (Ruskin SP100 or equal) for status indication.

- Q. In stainless steel and aluminum ductwork provide stainless steel construction combination fire/smoke dampers.

2.09 ACCESS DOORS IN SHEET METAL WORK

- A. Wherever necessary in ductwork, casings or sheet metal partitions, provide suitable access doors and frames to permit inspections, operation and maintenance of all valves, coils, humidifiers, controls, smoke dampers, smoke detectors, fire dampers, filters, bearings, traps, or other apparatus concealed behind the sheet metal work. All such doors shall be of double construction of not less than No. 20 gauge sheet metal and shall have sponge rubber gaskets around their entire perimeter. Doors in insulated ducts of insulated casings shall have rigid insulation between the metal panels.
- B. All access doors in sheet metal ducts shall be hung on heavy flat hinges and shall be secured in the closed position by means of cast zinc clinching type latches. Where space conditions preclude hinges, use four heavy window type latches. Doors into ducts shall in general not be smaller than 24" x 24" except for access door to fire dampers which will depend on size of fire damper.
- C. In no case shall access to any items of equipment requiring inspection, adjustment, or servicing require the removal of nuts, bolts, screws, wing nuts, wedges, or any other screwed or loose device.
- D. Each sheet metal chamber or plenum shall have access doors for access to all parts of the system (outside air intake, exhaust and return air). Doors shall be fitted with cast zinc door latches, two per door. Latches shall be operable from both sides of casing. Hinges shall be extra heavy, zinc plated hinges, minimum of two per door. The doors shall be felted or provided with rubber gaskets so as to make them airtight. The doors shall be made with inner and outer shells 2 inches apart so that they may be properly insulated and properly operated. Doors shall be a minimum size of 20" x 48".
- E. Hinges shall be Ventlok No. 150 or 260 with or without screw holes or approved equal. Latch for walk-in access doors shall be No. 260 as made by Ventlok Co. or approved equal. Latch for access door in ductwork shall be Ventlok No. 100 or approved equal.
- F. Where reheat coils are installed in ductwork, provide two (2) access doors; one on the upstream side of the coil and one on the downstream side of the coil, both within 2'-0" of the coil.
- G. Access doors at humidifier locations shall be provided on both sides of duct.
- H. Provide access doors of adequate size to allow easy access to the equipment that will require maintenance. Provide insulated or acoustically lined doors to prevent condensation where applicable.
- I. Manufacturer to provide an installed neoprene gasket around perimeter of access door for airtight seal.
- J. Systems 3" w.g. or less shall utilize a hinged, cam, or hinged & cam square-framed access door.
- K. Systems 4" w.g. and above shall utilize a sandwich-type access door. Construct doors in accordance with Figure 7-3 of the 2005 SMACNA Manual, HVAC Duct Construction Standards, Metal & Flexible Third Edition.
1. Approved Manufacturer: Ductmate Industries Sandwich style door or approved equal.

2.10 GRILLES, REGISTERS AND DIFFUSERS

- A. Furnish and install where shown on the drawings all metal diffusers, grilles and registers of the sizes and capacities indicated.
- B. Ceiling diffusers shall be selected to diffuse the air uniformly throughout the occupied space. The air shall be introduced at a temperature differential of 20 deg. F and shall be diffused at the five (5) foot level to a velocity of not greater than 50 FPM and a temperature differential of not greater than 2 deg. F when compared with mean room temperature. The sound power level of air distribution equipment devices shall not exceed ratings as shown by Titus Corp. data.
- C. Equipment manufacturer shall submit engineering data in a manner to facilitate convenient review of the following factors:
 - 1. Aspiration ability, including temperature and velocity traverses, throw and drop of each unit, noise criteria ratings for each unit, sizes, free area and quality of construction.
- D. All air distribution equipment shall be manufactured by Titus Corp., or approved, as scheduled on plans.
- E. All ceiling diffusers shall be furnished with an equalizing grid.
- F. Location of ceiling diffusers and registers shown on the drawings are approximate. Coordinate with the acoustic tile ceiling Sub-Contractor for exact locations of ceiling diffusers and registers. They shall be in accordance with approved ceiling layout shop drawings.
- G. Return grilles shall match return registers Titus Corp or approved equal.
- H. All registers, grilles and diffusers shall be coated with baked aluminum enamel, baked flat white (W-1), or baked gloss white (W-4) as supplied by Titus Corp. unless otherwise indicated. All supply registers and grilles shall have a ¼" sponge rubber gasket around the grille frame.
- I. All grilles, registers and diffusers shall be provided without an integral shut-off damper.
- J. Exceptions to foregoing types of grilles, registers and diffusers shall be as indicated on the plans.
- K. Each air supply outlet shall have the required capacity and shall be guaranteed to give the required draft with draftless diffusion. Where manufacturer's recommendations require duct sizes differing from those on the drawings, the same shall be provided at no additional cost to the Owner.
- L. All registers and grilles located at face of partitions or plaster line of ceilings or soffits, etc. shall have plaster frames, Titus or approved equal.
- M. Relocations of ceiling diffusers or registers in order to match the ceiling tile layout shall be made at no additional cost to Owner.

2.11 SOUND REDUCTION

- A. Furnish and install all soundproofing material specified, indicated or necessary to that all systems will comply with requirement of quiet operation. In general, noise level in any part of building (except in machinery rooms), due to air conditioning or ventilating equipment, ducts, and outlets, shall not exceed 40 decibels at 1200-2400 cycles per second, except as otherwise hereinafter specified.

- B. Furnish and install sound-absorptive lining in ductwork for locations and lengths as indicated and/or hereinafter specified. All soundproofing material, installation and arrangement, shall be as approved. Where ducts are acoustically lined and insulation is required per 15850 (23 07 00), external insulation may be omitted provided a minimum R value 6 is maintained for indoor ducts. Dimensions noted for lined ducts are inside clear dimensions. Duct sizes shall be increased for liner.
- C. *Sound Absorbent Duct Lining for Low Pressure Ductwork - Furnish and install as herein specified and/or shown on the drawings (except where otherwise noted) 2" thick, meeting ASTM C1071 Type I flexible with a NRC of .70 tested per ASTM C423 using a type "A" mounting, fibrous glass duct lining meeting the requirements of NFPA 90A with a FHC of 25/50, limited combustible and ASTM C411 at 250 deg. F.
- D. *Liner shall be adhered to all interior sides of duct with minimum 90% coverage of fire-retardant adhesive similar to Foster 85-60 or Childers CP-127 and with weld pins and washers or equivalent mechanical fastening starting 3" from edges and sides, 12" on center all sides. Minimum one row per side for duct size of 12" or less. Mechanical fasteners shall cause quilting of surface. Acrylic coated surface shall be toward air stream. Before installing liner, seal all butting edges and final edges with heavy coat of adhesive to seal off air between lining and duct unless the material has factory applied edge coating. All exposed edges of lining shall be installed with sheet metal nosing 12" wide, two gauges heavier than duct at fan discharge and at any section preceded by an unlined section. Installation shall be suitable for duct velocities up to 3,000 fpm. Low pressure duct lining shall be provided where specified and/or where shown and noted on the drawings.
- E. Duct sizes indicated on drawings are clear inside dimensions. Increase sheet metal sizes as required to install acoustic lining.
- F. Do not install lining within 5'-0" (downstream and upstream) of humidifier in ductwork. This portion of ductwork shall be externally insulated.
- G. The following ductwork shall be acoustically lined whether or not shown on Drawings.
1. Ductwork downstream of (mixing box) (terminal) units a minimum distance of 10 feet.
 2. All ductwork downstream of (mixing box) (terminal) units.
 3. Single wall built-up casing walls and ceiling except that lining shall be 2" thick 4 lb. density, and inner liner of perforated galvanized sheet metal (7/64" dia. holes on 3/16" staggered centers) shall be used for all systems.
 4. All conditioned air rectangular supply/return ductwork within mechanical equipment rooms, and not less than 20 ft. from fan towards occupied space for supply, exhaust and return fans.
 5. Return air fan and toilet exhaust plenum walls and ceiling, except that the lining shall be 2 inch thick 4 lb. density, and inner liner of perforated galvanized sheet metal (7/64" dia. holes on 3/16" staggered centers) shall be used.
- H. Sound Absorbent Duct Lining for Medium and High Pressure Ductwork.
1. Furnish and install 1" thick meeting ASTM C1071 Type II (board) with a NRC of .80 tested according to ASTM 423 using a Type "A" mounting, acoustical lining and meeting requirements of NFPA 90A with a FHC of 25/50, limited combustible and ASTM C411 at 250 deg. F, as herein specified and/or as shown on the drawings.
 2. Liner shall be adhered to all interior sides of duct and plenums with minimum 90% coverage of fire-retardant adhesive similar to Foster 85-60 or Childers CP-127 and with weld pins and washers or equivalent mechanical fastening on not more than 16" centers on

all sides, top and bottom of duct. Acrylic coating surface shall be toward air stream. Before installing liner, caulk all butting edges and final edges with heavy coat of adhesive to seal off air between lining and duct unless material has factory applied edge coating. Coat cap of fasteners with brush coat of fire retardant Foster Eclipse 40-11 insulation coating. Use metal corners and nosing to protect leading edges of liner insulation at fan discharge or after and any section preceded by an unlined section and at any section with an air velocity in excess of 4000 fpm. Apply light brush coat (150 sq. ft. per gallon) of fire retardant Foster Eclipse 40-11 insulation coating over all interior insulation surfaces. Installation shall be suitable for duct velocities up to 5,000 fpm.

3. When indicated in the drawings, the sound absorption material in mechanical and high pressure ducts shall be faced with a galvanized perforated metal facing having the same dimensions as the unlined ductwork connecting to the lined section of the ductwork. The perforated metal shall be 26 gauge and have one of the following perforation patterns or approved equal.

Open Area

7/64" round holes on 3/16" staggered centers	29%
1/8" round holes on 7/32" staggered centers	29%
1/8" round holes on 1/4" staggered centers	23%
.085" round holes on 5/32" staggered centers	29%
1/16" round holes on 1/8" staggered centers	22.5%

4. Duct sizes indicated on drawings are clear inside dimensions. Increase sheet metal sizes as required to install acoustic lining.

2.12 ACOUSTICAL PERFORMANCE SPECIFICATIONS - GENERAL

- A. It is the intent of this Specification that noise levels due to air conditioning and/or ventilating equipment, ducts, grilles and registers, diffusers and air light fixtures, will permit attaining sound pressure levels in occupied spaces conforming to the following NC curves as explained in the ASHRAE Guide and Data Book.

Room Type	NC Level
Offices and Conference Rooms	NC 25-35
Corridors and Public Spaces	NC 35-45

- B. Grilles, Registers, Diffusers
 1. The maximum permissible sound power levels of air terminal devices when installed and operating per plans and specifications shall be as follows:

Maximum PWL re 10-12 Watts			
<u>Octave Band</u>	<u>NC-30</u>	<u>NC-35</u>	<u>NC-40</u>
1	62	64	66
2	52	56	60
3	44	49	54
4	41	46	51
5	38	43	48

Maximum PWL re 10-12 Watts			
<u>Octave Band</u>	<u>NC-30</u>	<u>NC-35</u>	<u>NC-40</u>
6	37	42	47
7	36	41	46
8	37	42	47

- C. Sound Power Levels for air outlets and inlets shall be tested in accordance with ASHRAE Standard 70.

2.13 ACOUSTICAL PERFORMANCE WITHIN EQUIPMENT SPACES

- A. Equipment room noise levels and noise transmission to adjacent buildings shall comply with all Federal, State, and City Noise Ordinances.
- B. Motor Acoustical Performance:
 - 1. Motor drives for pumps and refrigeration machine when installed per plans and specifications shall operate with noise levels not to exceed 80 dbA.
 - 2. Noise levels shall be determined in accordance with IEEE Standard #85 test "procedure for Air-Borne Noise Measurements on Rotating Electric Equipment".

PART 3 - EXECUTION

3.01 INSPECTION

- A. Contractor shall examine location where ductwork is to be installed and determine space conditions and notify Architect in writing of conditions detrimental to proper and timely completion of the work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF DUCTWORK

- A. Install ductwork in accordance with recognized industry practices, to ensure that ductwork complies with requirements and serve intended purposes.
- B. Coordinate with other work as necessary to interface installation or ductwork with other components of systems.
- C. Duct sizes shown on the drawings at connection to fans or other equipment may vary in actual installation. Contractor shall provide transition pieces as required.
- D. Ducts, casings and hangers shall be installed straight and level and shall be free of vibration and noise when fans are operating.
- E. Ducts at ceilings shall be suspended from inserts in concrete slabs except where otherwise indicated. Inserts shall be Grinnell Fig. 279, 282, or 152 as required. Ducts at floor shall be supported by steel angles suitably anchored to floor construction. Each duct shall be independently supported and shall not be hung from or supported by another duct, pipe, conduit or equipment of any trade.

- F. Supports shall be placed at each joint and change in direction up to a maximum spacing of 8 feet on centers. Prevent buckling of ductwork.
- G. All fastenings to building structure shall be adequate to insure permanent stability of sheet metal work and shall be capable of resisting all applied forces.
- H. Vertical ducts in shafts or passing through floors shall be supported by steel angles or channels, welded, riveted, screwed or bolted to ducts and fastened to building structural members at each floor level. Provide safing to close all floor openings around ductwork - pack annular space with rockwool and 18 gauge sheet metal safing. Floor openings in plenums shall have ½ inch diameter steel bars.
- I. Rigid connections between ductwork and non-rotating equipment shall be made with flanged joints, sealed with fireproof material (Fiber or Neoprene gaskets).
- J. It is the intent to obtain low pressure ductwork construction with minimum leakage. The construction noted in Specifications can produce low or high leakage rates, depending upon the workmanship, particularly with regard to the connection at the top of the ducts. Guarantee that total diffuser volume, measured by means of velometer, shall be at least 95% of actual fan supply (measured by means of a duct traverse taken with a Pitot tube and water manometer). Seal the ductwork at all joints (longitudinal & transverse and duct wall penetrations) with suitable sealers Foster 32-19, Childers CP-146 or 3M EC-800 and tape equivalent to SMACNA Seal Class A. Use of "HARDCAST" or any other material is subject to Architect's approval.
- K. For leakage test for medium ductwork refer to Section "Testing and Balancing".

3.03 DUCT HANGERS

- A. Low pressure ducts up to 24" on a side or up to 20" diameter shall be suspended with 16 gauge, galvanized strap hangers, 1" wide.
- B. Low pressure ducts 25" to 40" on a side or 21" to 42" diameter shall be suspended with galvanized strap hangers 1" wide by ⅛" thick.
- C. Strap hangers shall be bent 90°, extended down sides of ducts and turned under bottom of ducts a minimum of 2". Strap hangers shall be fastened at ceiling with nuts, bolts and lock washers and to sides and bottom of ducts with sheet metal screws.
- D. All ductwork 43" and larger on a side or diameter and all roof-mounted ducts (regardless of size) shall be suspended with steel angle type hangers with rod and angle steel trapeze. The use of strut for support of any HVAC work (ducts, piping or equipment) is prohibited.
- E. No screws shall penetrate medium and high pressure ductwork.
- F. For any ducts which require seismic bracing, provide trapeze and rod type hangers regardless of duct size.
- G. Trapeze type hangers shall have steel rods threaded at both ends and bottom bracing angles on ducts, with nuts and lock washers. Threaded rod diameter shall be as scheduled on the drawings based on the size of the duct supported.
- H. Angle type hangers shall be extensions of side bracing angles on ducts, bent 90 at ceiling and fastened with nuts, bolts and lock washers.

- I. The minimum spacing intervals for all duct supports shall be as scheduled on the drawings based on the size of the duct supported.
- J. Hangers for vertical ducts shall be as per SMACNA Duct Manual.
- K. Stainless steel ductwork shall be supported with rod or angle type hangers, so that there will be no penetration of the stainless steel ducts.
- L. Any steel and hardware used for support of aluminum ductwork or any supports for ductwork located outdoors shall be constructed of hot-dipped galvanized or stainless steel. Carbon steel, painted steel or zinc-coated steel is unacceptable.

3.04 CLEANING AND PROTECTION

- A. Clean ductwork internally, unit by unit as it is installed of dust and debris. Clean external surfaces of foreign substances, which might cause corrosion, deterioration of metal or interfere with painting.
- B. At end of ducts which are not connected to equipment or air distribution devices at the time of ductwork installation, provide temporary closure of polyethylene film or other covering.
- C. Cleaning of new and existing supply ductwork: After completion of ductwork installation clean ductwork as follows.
 - 1. Use supply fan or install temporary fan to provide air to the system for four (4) hours.
 - 2. Remove temporary filter mesh.

END OF SECTION 23 31 13

23 36 00 - DUCT TERMINAL UNITS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinated with and complementary to the General Conditions and Supplementary General Conditions of the Work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical Work shall apply.

1.02 DESCRIPTION OF WORK

- A. The work includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and made ready for operation by the Owner, all Duct Terminal Units as shown on the drawings and hereinafter specified.

1.03 QUALITY ASSURANCE

- A. Firms regularly engaged in manufacture of this material with characteristics and capacities required, whose products have been in satisfactory use in similar service for not less than 10 years.
- B. Provide product produced by the manufacturers, which are listed in Section 23 05 12 "Approved Manufacturer's List".
- C. Provide equipment whose performance, under specified conditions, is certified by the manufacturer.

1.04 SUBMITTALS

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work and submit shop drawings.

1.05 COORDINATION

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.

1.06 GUARANTEE

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.

PART 2 - PRODUCTS

2.01 CONSTANT (C.A.V.) AND VARIABLE (V.A.V.) VOLUME AIR TERMINAL UNITS

- A. Furnish and install pressure independent constant and variable air volume terminal units of size and capacities as shown on Drawings. Units shall be DESV as manufactured by Titus or approved equal.

- B. Unit casings shall be 22 gauge galvanized steel and be fully lined with 1 inch, 1½ lb. density, fiber-free closed-cell polymeric foam insulation. The insulation shall comply with U.L.-181 for erosion, ASTM C-534 and NFPA-90A, NFPA-90B, ASTM-84 and UL-723 for fire resistivity. There shall be no cut edges of the lining exposed to the moving air stream.
- C. Unit inlets shall be round or rectangular. Rectangular inlets shall have S and Drive connections. Attenuation section where called for in the Schedule shall be integral to the basic unit casing to minimize casing leakage and eliminate all field assembly.
- D. Damper to be heavy gauge metal with Delrin self-lubricating bearings. Tight close-off. Damper leakage is less than 2% of nominal cfm at 3 inches sp. Terminals shall be certified under the ARI Standard 880 Certification Program and must carry the ARI Seal.

For optimum control, the inlet duct must be of the same size as the assembly inlet.
- E. If flexible duct is used, a section of straight duct 1½ diameters long shall be installed between the flexible duct and the assembly inlet.
- F. Units shall be tested in accordance with ARI Standard 880. Unit sound power levels (second thru seventh octave band) and minimize pressure drop ratings shall not exceed those in the schedules.
- G. Pressure independent air terminal units shall operate over an inlet velocity range of 0 to 3000 fpm. Terminals shall incorporate a multipoint center averaging sensor. Measuring ports in series are not acceptable. Sensors must provide control signal accuracy within ± 5%. CFM delivery shall be in accordance with (maximum-minimum) settings and/or as required by thermostat to satisfy space-served conditions. Adjustable minimum and maximum cfm limits gauge tee for flow measurement and balancing.
- H. All actuators, controls, and circuitry shall be factory furnished and installed. Control and CFM settings must be easily accessible. Access shall also be provided to inspect, clean, and remove the velocity sensing device.
- I. Provide integral electric coils. Coils shall be specified under "COILS" section of this Specification.
- J. The integral hot water heating coils shall be of size rows and capacities as indicated in schedules.
- K. Where integral electric coils are provided, provide an access door upstream of the coil. Access door shall be factory installed. An access door shall also be provided immediately downstream of the reheat coil and may be installed in the supply air ductwork.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Contractor shall examine location where this equipment is to be installed and determine space conditions and notify architect in writing of conditions detrimental to proper and timely completion of the work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install equipment where shown, in accordance with manufacturer's written instructions, and with recognized industry practices, to ensure that equipment comply with requirements and serve intended purposes.
- B. Coordinate with other work as necessary to interface installation of equipment with other components of systems.
- C. Check alignment and, where necessary (and possible), realign shafts or motors and equipment within tolerances recommended by manufacturer.

3.03 FIELD QUALITY CONTROL

- A. Upon completion of installation of equipment, test equipment to demonstrate compliance with requirement. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected. Refer to Section 23 05 93 - Testing and Balancing.

END OF SECTION 23 36 00

23 82 18 - ELECTRIC HEATING COILS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. This Section is coordinate with and complementary to the General Conditions and Supplementary General Conditions of the Work, wherever applicable to Mechanical Work.
- B. Section 01 31 46 - Special Requirements for Mechanical and Electrical Work shall apply.

1.02 DESCRIPTION OF WORK

- A. The work includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and made ready for operation by the Owner, all electric heating coils as shown on the drawings and hereinafter specified.

1.03 QUALITY ASSURANCE

- A. Firms regularly engaged in manufacture of this material with characteristics and capacities required, whose products have been in satisfactory use in similar service for not less than 10 years.
- B. Provide product produced by the manufacturers, which are listed in Section "Approved Manufacturer's List".
- C. Provide equipment whose performance, under specified conditions, is certified by the manufacturer.

1.04 SUBMITTALS

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work and submit shop drawings.

1.05 COORDINATION

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.

1.06 GUARANTEE

- A. Refer to Section 01 31 46 - Special Requirements for Mechanical and Electrical Work.

PART 2 - PRODUCTS

2.01 ELECTRIC DUCT HEATING COILS

- A. Furnish and install as indicated heaters as manufactured by Titus and should be integral to the VAV unit, or approved equal. Voltage, size, wattage, number of steps and accessories shall be as scheduled.

- B. Heaters shall be U.L. listed for zero clearance and meet all the applicable requirements of the Latest Edition of National Electrical Code or other local codes.
- C. Heaters shall be made with galvanized or aluminum steel frame.
- D. The terminal box shall be provided with solid hinged cover in order to minimize dust infiltration.
- E. All resistance coil terminals and nuts shall be made of stainless steel, and terminal insulators and bracket bushings shall be made of high grade ceramic and securely positioned. Resistance wire shall be iron free, 80% nickel and 20% chromium. Bracket supports for the resistance wire shall be reinforced with stiffening ribs and gussets, and spaced no more than four inches apart. Heaters shall be tested dielectrically for 1000V plus twice and rated voltage or 2000V, whichever is higher.
- F. Heaters shall be suitable for mounting in a horizontal or vertical duct, as shown on the Drawings, and air flow may be through the heater in either direction.
- G. Electric heaters shall be integral part of the VAV unit, unless otherwise noted. Flanged heaters shall be constructed by having a slip-in heater inserted into a flanged frame and flanges shall be independent of the terminal box.
- H. Heaters shall be furnished for single or three phase power as scheduled. Three phase heaters shall be furnished with balanced three phase steps. The control voltage shall be 120 volts, internally wired through control transformer fused on the secondary.
- I. Overcurrent protection shall consist of built-in and pre-wired dual element fuses with clip reinforcing springs.
 - 1. With one overcurrent device for each 40 ampere circuit.
 - 2. And with one overcurrent device for entire heater for those heaters rated 40 amperes or less only.
- J. A disc type automatic reset thermal cutout in control lines, shall be furnished for primary protection. Heat limiters in all power lines shall be provided for secondary protection. In addition a disc type manual reset thermal cutout with bulb extending the length of the heater shall be furnished. Manual reset thermal cutout to be in series with automatic reset thermal cutout. All three devices shall be serviceable through the terminal box, without having to remove heater from duct. In lieu of heat limiters, disc type manual reset thermal cut-outs will be acceptable.
- K. The following accessories shall be furnished and built in for each heater, except as otherwise noted:
 - 1. Insulated terminal box
 - 2. Magnetic contractors (when load exceeds control device ratings)
 - 3. Transformer with primary fuse protection to supply control voltage, when power supply exceeds 120 volts.
 - 4. Air flow switch - pressure type.
 - 5. P.E. switch per step, normally open, or field installed (by Electrical Contractor) electric room thermostat, as scheduled on the Drawings.
 - 6. Non-fused disconnect with interlocking door handle.
- L. Electric heaters shall be provided with SCR controllers.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 23 82 16

26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Electrical equipment coordination and installation.
 - 2. Sleeves for raceways and cables.
 - 3. Sleeve seals.
 - 4. Grout.
 - 5. Common electrical installation requirements.

1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

- A. Product Data: For sleeve seals.

1.5 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
 - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - 3. To allow right of way for piping and conduit installed at required slope.
 - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

- C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."
- D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- C. Sleeves for Rectangular Openings: Galvanized sheet steel.
 - 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Sealing Elements: EPDM, NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
 - 3. Pressure Plates: Carbon steel. Include two for each sealing element.
 - 4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestopping system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
- K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

END OF SECTION 26 05 00

26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

- A. VFC: Variable frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following or approved equal:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide products by the following or comparable product approved equal:
 - 1. Alcan Products Corporation; Alcan Cable Division.
 - 2. Alpha Wire.
 - 3. Belden Inc.

4. Encore Wire Corporation.
 5. General Cable Technologies Corporation.
 6. Southwire Incorporated.
- C. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- D. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THW-2, Type THHN-2-THWN-2 and Type XHHW-2.
- E. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC with ground wire.
- F. VFC Cable:
1. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable.
 2. Type TC-ER with oversized crosslinked polyethylene insulation, dual spirally wrapped copper tape shields and three bare symmetrically applied ground wires, and sunlight- and oil-resistant outer PVC jacket.

2.2 CONNECTORS AND SPLICES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products by the following or comparable product approved equal:
1. AFC Cable Systems, Inc.
 2. Hubbell Power Systems, Inc.
 3. Ideal Industries, Inc.
 4. NSi Industries LLC.
 5. O-Z/Gedney; a brand of the EGS Electrical Group.
 6. Tyco Electronics.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Comply with New York City Electrical Code.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-2-THWN-2, single conductors in raceway, Metal-clad cable, Type MC.
- B. Exposed Branch Circuits: Type THHN-2-THWN-2, single conductors in raceway.
- C. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Metal-clad cable, Type MC.
- D. VFC Output Circuits: Type XHHW-2 in metal conduit.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."
- G. Complete cable tray systems installation prior to installing conductors and cables.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and 486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078400 "Firestopping."

3.8 FIELD QUALITY CONTROL

- A. Contractor shall field test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform the following tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test all service entrance and all feeder conductors and conductors feeding the following critical equipment and services for compliance with requirements:
 - a. All conductors serving emergency and standby power system fuel-oil pumps and gas-booster pumps.
 - b. All conductors serving motors 3 hp and larger.
 - c. All conductors serving data center and computer room HVAC system equipment.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 3. Perform insulation resistance (megger) testing on all feeder and service conductors. Provide testing as per ANSI/NETA ATS-2013 (InterNational Electrical Testing Association Standard for Acceptance Testing Specifications) part 7.3.2. Test results shall be validated as per ANSI/NETA ATS-2013 Table 100.1. Applied potential shall be 1000VDC for a duration of one minute. Record on NETA standard forms or other forms approved by engineer. Identify specific feeder tested on each form including equipment name/reference at each end of feeder. Test equipment must measure values accurately up to a minimum of 100 meg-ohms (not a 'pass-fail' tester). Record actual meg-ohm readings below 100 meg-ohms. Submit completed test forms to engineer for review & approval.
 - 4. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice and all terminations in conductors

No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.

- a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
- b. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

C. Test and Inspection Reports: Prepare a written report to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 05 19

26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, and New York City Electrical Code by a qualified testing agency and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 and New York City Electrical Code and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 4. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches (6.3 by 100 mm) in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.3 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Compression fittings that are installed with hydraulically operated tools, approved for the class type.
- D. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions. Only welded connectors for connections and splices concealed in concrete structure or buried in earth.
- E. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.4 ELECTRODES

- A. Ground Rods:
 - 1. Material: Copper-clad steel.
 - 2. Diameter: 3/4 inch (19 mm).
 - 3. Rods shall be not less than 120 inches (3050 mm) long.
- B. Ground Plates:
 - 1. Material: Copper.
 - 2. Thickness: 1/4 inch (min).
 - 3. Plates shall be not less than 24 inches by 24 inches.

2.5 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- C. Grounding Bus: Install in electrical and telecommunication equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.
5. Connections within Concrete Structure: Welded connectors.
6. Lightning Protection System Connections: Welded connectors.

2.6 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.
- B. Provide copper grounding bar in all electric service rooms and at all telecom points-of-entry (PoE). Provide copper bar for intersystem bonding bus (if required). Provide copper grounding bar as otherwise indicated on plans.

2.7 GROUNDING SEPARATELY DERIVED SYSTEMS

- A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the frame of the generator; and, only where generator is identified as a separately derived system, to the equipment grounding conductor.

2.8 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70 and New York City Electrical Code:
 1. Feeders and branch circuits.
 2. Lighting circuits.
 3. Receptacle circuits.
 4. Single-phase motor and appliance branch circuits.
 5. Three-phase motor and appliance branch circuits.
 6. Flexible raceway runs.
 7. Armored and metal-clad cable runs.
 8. Computer and rack-mounted electronic equipment circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.

- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

2.9 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, unless otherwise noted, and install in conduit.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Exothermic welding: Exothermically weld all grounding and bonding connections and splices that will be installed to be inaccessible, including underground and within concrete slabs, columns, walls, floor slabs, etc.
- E. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to **all** metal water service entrances to building. Connect grounding conductors to all metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve and utility meter(s).
- F. Grounding for concrete reinforcing bars in new buildings: Connect grounding electrode system to reinforcing bars via exothermic weld.
- G. CORROSION PROTECTION
1. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
 2. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

2.10 FIELD QUALITY CONTROL

- A. Tests and Inspections:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81. Submit test report to Engineer for approval prior to closing up any related underground work.
 4. Prepare dimensioned Drawings locating each ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- B. Grounding system will be considered defective if it does not pass tests and inspections.

- C. Prepare test and inspection reports.
- D. Report measured ground resistances that exceed the following values:
 - 1. Power and lighting equipment or system with capacity of 500 kVA and less: 10 ohms.
 - 2. Power and lighting equipment or system with capacity of 500 to 1000 kVA: 5 ohms.
 - 3. Power and lighting equipment or system with capacity more than 1000 kVA: 3 ohms.
 - 4. Power distribution units (PDUs) or panelboards serving electronic equipment: 1 ohm(s).
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.
- B. Related Sections include the following:
 - 1. Section 260548 "Vibration and Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor as recommended by structural engineer.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:

1. Steel slotted support systems.
 2. Nonmetallic slotted support systems.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
1. Trapeze hangers. Include Product Data for components.
 2. Steel slotted channel systems. Include Product Data for components.
 3. Equipment supports.

1.6 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.
- C. Comply with New York City Electrical Code.

1.7 COORDINATION

- A. Coordinate all metal supports with HVAC ductwork and electrical work

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or comparable product approved equal:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. Thomas & Betts Corporation.
 - d. Unistrut; Tyco International, Ltd.
 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following or comparable product approved equal:
 - 1) Hilti Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
 - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following or comparable product approved equal:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Hilti Inc.
 - 3) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 4) MKT Fastening, LLC.
 - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
 - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 - 6. Toggle Bolts: All-steel springhead type.
 - 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted [or other]support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 - 6. To Light Steel: Sheet metal screws.
 - 7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Touchup: Comply with requirements as described in architectural sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29

26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Surface raceways.
 - 5. Boxes, enclosures, and cabinets.

1.3 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel, threaded conduit.
- C. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. Structural members in paths of conduit groups with common supports.
 - 2. HVAC, fire protection and plumbing items and architectural features in paths of conduit groups with common supports.

- B. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
 - 4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.
- C. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or comparable products approved equal:
 - 1. Allied Tube & Conduit.
 - 2. O-Z/Gedney.
 - 3. Thomas & Betts Corporation.
 - 4. Western Tube and Conduit Corporation.
 - 5. Wheatland Tube Company.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. IMC: Comply with ANSI C80.6 and UL 1242.
- E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit and IMC.
 - 1. Comply with NEMA RN 1.
 - 2. Coating Thickness: 0.040 inch (1 mm), minimum.
- F. EMT: Comply with ANSI C80.3 and UL 797.
- G. FMC: Comply with UL 1; zinc-coated steel.
- H. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- I. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Fittings for EMT:

- a. Material: Steel.
 - b. Type: Setscrew.
2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.
- J. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70 and New York City Electrical Code, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or comparable products approved equal:
1. AFC Cable Systems, Inc.
 2. Anamet Electrical, Inc.
 3. Condux International, Inc.
 4. Lamson & Sessions; Carlon Electrical Products.
 5. RACO; Hubbell.
 6. Thomas & Betts Corporation.
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.
- C. ENT: Comply with NEMA TC 13 and UL 1653.
- D. LFNC: Comply with UL 1660.
- E. RTRC: Comply with UL 1684A and NEMA TC 14.
- F. Fittings for ENT: Comply with NEMA TC 3; match to conduit or tubing type and material.
- G. Fittings for LFNC: Comply with UL 514B.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or comparable products approved equal:
1. Cooper B-Line, Inc.
 2. Hoffman.
 3. Mono-Systems, Inc.
 4. Square D.

- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 and Type 3R, unless otherwise indicated, and sized according to NFPA 70 and New York City Electrical Code.
 - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Flanged-and-gasketed type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or comparable products approved equal:
 - 1. Cooper Technologies Company; Cooper Crouse-Hinds.
 - 2. Hoffman.
 - 3. Milbank Manufacturing Co.
 - 4. O-Z/Gedney.
 - 5. Thomas & Betts Corporation.
 - 6. Wiremold / Legrand.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Metal Floor Boxes:
 - 1. Material: Cast metal.
 - 2. Type: Fully adjustable.
 - 3. Shape: Rectangular or as required by field conditions, subject to engineer's approval.
 - 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.
- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.
- G. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb (32 kg).

1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.
- H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- I. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- J. Device Box Dimensions: As required by field conditions, subject to engineer's approval.
- K. Gangable boxes are allowed.
- L. Cabinets:
 1. NEMA 250, Type 1 and Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 2. Hinged door in front cover with flush latch and concealed hinge.
 3. Key latch to match panelboards.
 4. Metal barriers to separate wiring of different systems and voltage.
 5. Accessory feet where required for freestanding equipment.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 1. Exposed Conduit: GRC; except where IMC or GRC, PVC coated is specified in the Contract Drawings.
 2. Concealed Conduit, Aboveground: IMC.
 3. Underground Conduit: Refer to Section 260543 – Underground Ducts and Raceways for Electrical Systems. Refer to utility specifications for all raceways under utility jurisdiction.
 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R].
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading dock.
 - b. Mechanical rooms.
 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.

5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 6. Damp or Wet Locations: GRC.
- C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 3. EMT: Use setscrew cast-metal fittings except below design flood elevation (DFE). Comply with NEMA FB 2.10.
 4. EMT below design flood elevation (DFE): Rainproof compression connectors. Comply with NEMA FB 2.10.
 5. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 and New York City Electrical Code limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Comply with New York City Code.
- C. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- D. Complete raceway installation before starting conductor installation.
- E. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- F. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- G. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.
- H. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

- I. Support conduit within 12 inches (300 mm) of enclosures to which attached.
- J. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot (3-m) intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 2 inches (50 mm) of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 5. Change from ENT to GRC or IMC before rising above floor.
- K. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT, IMC, or flexr raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- P. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- R. Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch (50-mm) radius control at bend points.
 - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

- S. Install raceway sealing fittings at accessible locations according to NFPA 70 and New York City Electrical Code and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70 and New York City Electrical Code.
- T. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70 and New York City Electrical Code.
- U. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- V. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Y. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- Z. Locate boxes so that cover or plate will not span different building finishes.
- AA. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- BB. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- CC. Set metal floor boxes level and flush with finished floor surface.
- DD. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.4 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078400 "Firestopping."

3.5 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

26 05 44 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeve-seal systems.
 - 2. Sleeve-seal fittings.
 - 3. Grout.
 - 4. Silicone sealants.
- B. Related Requirements:
 - 1. Section 078400 "Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
- B. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- C. Sleeves for Rectangular Openings:
 - 1. Material: Galvanized sheet steel.
 - 2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 3. Pressure Plates: Carbon steel.
 - 4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.3 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.4 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.

- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 26 05 44

SECTION 26 05 48 - VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Isolation pads.
 - 2. Spring isolators.
 - 3. Restrained spring isolators.
 - 4. Channel support systems.
 - 5. Restraint cables.
 - 6. Hanger rod stiffeners.
 - 7. Anchorage bushings and washers.
- B. Related Sections include the following:
 - 1. Section 260529 "Hangers and Supports for Electrical Systems" for commonly used electrical supports and installation requirements.

1.3 DEFINITIONS

- A. The IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.
- C. OSHPD: Office of Statewide Health Planning and Development for the State of California.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic-Restraint Loading:
 - 1. Site Class as Defined in the New York City Building Code: 'C'.
 - 1. Assigned Seismic Use Group and Building Category as Defined in the New York City Building Code:
 - Seismic Use Group: 'I'.
 - Seismic Design Category: 'B'.
 - a. Occupancy Importance Factor: 1.0.

- b. Component Importance Factor (I_p): 1.0.
 - c. Life-Safety System Component Importance Factor (I_p): 1.5
 - d. Component Response Modification and amplifier Factors: Shall be in accordance with ASCE 7-10, Section 13.6, for seismic coefficients for “Mechanical and Electrical Components”.
3. Design Spectral Response Acceleration at Short Period (0.2 Second): ‘0.365 g’.
 4. Design Spectral Response Acceleration at 1.0-Second Period: ‘0.071 g’.

1.5 ACTION SUBMITTALS

- A. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators and seismic restraints.
 - a. Coordinate design calculations with wind-load calculations required for equipment mounted outdoors. Comply with requirements in other electrical Sections for equipment mounted outdoors.
 2. Indicate materials and dimensions and identify hardware, including attachment and anchorage devices.
 3. Field-fabricated supports.
 4. Seismic-Restraint Details:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
 - c. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints.
- B. Qualification Data: For testing agency.
- C. Welding certificates.
- D. Field quality-control test reports.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
- B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- E. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following or comparable products approved equal:
 - 1. Ace Mountings Co., Inc.
 - 2. Amber/Booth Company, Inc.
 - 3. Isolation Technology, Inc.
 - 4. Kinetics Noise Control.
 - 5. Vibration Eliminator Co., Inc.
 - 6. Vibration Isolation.
 - 7. Vibration Mountings & Controls, Inc.
- B. Pads: Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
 - 1. Resilient Material: Oil- and water-resistant neoprene.
- C. Spring Isolators: Freestanding, laterally stable, open-spring isolators.
 - 1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 - 2. Minimum Additional Travel: 50 percent of the required deflection at rated load.

3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4-inch- (6-mm-) thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig (3447 kPa).
 6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.
- D. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.
1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
 2. Restraint: Seismic or limit-stop as required for equipment and authorities having jurisdiction.
 3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.2 SEISMIC-RESTRAINT DEVICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following or comparable products approved equal:
1. Cooper B-Line, Inc.; a division of Cooper Industries.
 2. Hilti Inc.
 3. Loos & Co.; Seismic Earthquake Division.
 4. Mason Industries.
 5. TOLCO Incorporated; a brand of NIBCO INC.
 6. Unistrut; Tyco International, Ltd.
- B. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.

- D. Restraint Cables: ASTM A 603 galvanized-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.
- E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod. Do not weld stiffeners to rods.
- F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchors and studs.
- G. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices.
- H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- I. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- J. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.3 FACTORY FINISHES

- A. Finish: Manufacturer's standard prime-coat finish ready for field painting.
- B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
 - 1. Powder coating on springs and housings.
 - 2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
 - 3. Baked enamel or powder coat for metal components on isolators for interior use.
 - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.

- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Equipment and Hanger Restraints:
 - 1. Install restrained isolators on electrical equipment.
 - 2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
 - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.
- B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- D. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.

5. Set anchors to manufacturer's recommended torque, using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Perform tests and inspections.
- C. Tests and Inspections:
 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post-connection testing has been approved), and with at least seven days' advance notice.
 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
 5. Test to 90 percent of rated proof load of device.
 6. Measure isolator restraint clearance.
 7. Measure isolator deflection.
 8. Verify snubber minimum clearances.
 9. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Adjust isolators after isolated equipment is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

- C. Adjust active height of spring isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 26 05 48

26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels. Refer to the drawings for equipment identifications for electrical equipment.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with New York City Electrical Code.
- D. Comply with New York City Building Code.
- E. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- F. Comply with ANSI Z535.4 for safety signs and labels.

- G. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

- A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
- B. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

- A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
- B. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mil- (0.08-mm-) thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the cable diameter such that the clear shield overlaps the entire printed legend.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
- C. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
- B. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mil- (0.08-mm-) thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the conductor diameter such that the clear shield overlaps the entire printed legend.
- C. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve with diameter sized to suit diameter of conductor it identifies and to stay in place by gripping action.
- D. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.5 FLOOR MARKING TAPE

- A. 2-inch- (50-mm-) wide, 5-mil (0.125-mm) pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

2.6 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Metal-Backed, Butyrate Warning Signs:
 1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for application.
 2. 1/4-inch (6.4-mm) grommets in corners for mounting.
 3. Nominal size, 10 by 14 inches (250 by 360 mm).
- C. Warning label and sign shall include, but are not limited to, the following legends:
 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."
3. Electrical room: "WARNING, ELECTRICAL EQUIPEMNT, NO STORGAE PERMITTED".

2.7 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
 1. Engraved legend with white letters on black face.
 2. Punched or drilled for mechanical fasteners.
 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
- B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm).
- C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm). Overlay shall provide a weatherproof and UV-resistant seal for label.

2.8 EQUIPMENT IDENTIFICATION LABELS

- A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm).
- B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm). Overlay shall provide a weatherproof and UV-resistant seal for label.
- C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).
- D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).
- E. Stenciled Legend: In nonfading, waterproof, paint. Minimum letter height shall be 1 inch (25 mm).

2.9 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 1. Minimum Width: 3/16 inch (5 mm).
 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).

3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 4. Color: Black except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
1. Minimum Width: 3/16 inch (5 mm).
 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
1. Minimum Width: 3/16 inch (5 mm).
 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 7000 psi (48.2 MPa).
 3. UL 94 Flame Rating: 94V-0.
 4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
 5. Color: Black.

2.10 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- E. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- F. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:

1. Outdoors: UV-stabilized nylon.
 2. In Spaces Handling Environmental Air: Plenum rated.
- G. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl tape applied in bands. Install labels at 30-foot (10-m) maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
1. Emergency Power.
 2. Power.
- C. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- D. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- E. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
1. Limit use of underground-line warning tape to direct-buried cables.
 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- F. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- G. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Metal-backed, butyrate warning signs.
1. Comply with 29 CFR 1910.145.
 2. Identify system voltage with black letters on an orange background.
 3. Apply to exterior of door, cover, or other access.

4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.

- H. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

- I. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer.

- J. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
 1. Labeling Instructions:
 - a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

 2. Equipment to Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be engraved, laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Switchgear.
 - d. Switchboards.
 - e. Emergency system boxes and enclosures.
 - f. Enclosed switches.
 - g. Enclosed circuit breakers.
 - h. Enclosed controllers.
 - i. Variable-speed controllers.
 - j. Power transfer equipment.
 - k. Contactors.
 - l. Remote-controlled switches, dimmer modules, and control devices.
 - m. Power-generating units.

- n. Monitoring and control equipment.

END OF SECTION 26 05 53

26 09 23 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Time switches.
 - 2. Photoelectric switches.
 - 3. Indoor occupancy sensors.
 - 4. Lighting contactors.
- B. Related Requirements:
 - 1. Section 262726 "Wiring Devices" for wall-box dimmers, wall-switch occupancy sensors, and manual light switches.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show project specific installation details for occupancy and light-level sensors.
 - 1. Interconnection diagrams showing field-installed wiring.
 - 2. Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each type of lighting control device to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following, or comparable products approved equal:

1. Cooper Industries, Inc.
 2. Leviton Mfg. Company Inc.
 3. NSi Industries LLC; TORK Products.
 4. Tyco Electronics; ALR Brand.
- B. Electronic Time Switches: Solid state, programmable, with alphanumeric display; complying with UL 917.
1. Listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.
 2. Contact Configuration: SPST.
 3. Contact Rating: 30-A inductive or resistive, 240-V ac.
 4. Astronomic Time: All channels.
 5. Automatic daylight savings time changeover.
 6. Battery Backup: Not less than seven days reserve, to maintain schedules and time clock.

2.2 INDOOR OCCUPANCY SENSORS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following or comparable products approved equal:
1. Bryant Electric; a Hubbell company.
 2. Leviton Mfg. Company Inc.
 3. Lightolier Controls.
 4. Lutron Electronics Co., Inc.
 5. Osram Licht AG, Encelium Brand
 6. Sensor Switch, Inc.
 7. Watt Stopper.
- B. General Requirements for Sensors: Wall- or ceiling-mounted, solid-state indoor occupancy sensors with a separate power pack.
1. Listed and labeled as defined in NFPA 70 and New York City Electrical Code, by a qualified testing agency, and marked for intended location and application.
 2. Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
 3. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack.
 4. Power Pack: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70 and New York City Electrical Code.
 5. Mounting:
 - a. Sensor: Suitable for mounting in any position on a standard outlet box.
 - b. Relay: Externally mounted through a 1/2-inch (13-mm) knockout in a standard electrical enclosure.
 - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.

6. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
 7. Bypass Switch: Override the "on" function in case of sensor failure.
 8. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc (21.5 to 2152 lux); turn lights off when selected lighting level is present.
- C. PIR Type: Ceiling mounted; detect occupants in coverage area by their heat and movement.
1. Detector Sensitivity: Detect occurrences of 6-inch- (150-mm-) minimum movement of any portion of a human body that presents a target of not less than 36 sq. in. (232 sq. cm).
 2. Detection Coverage (Room): Detect occupancy anywhere in a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 3. Detection Coverage (Corridor): Detect occupancy within 90 feet (27.4 m) when mounted on a 10-foot- (3-m-) high ceiling.
- D. Ultrasonic Type: Ceiling mounted; detect occupants in coverage area through pattern changes of reflected ultrasonic energy.
1. Detector Sensitivity: Detect a person of average size and weight moving not less than 12 inches (305 mm) in either a horizontal or a vertical manner at an approximate speed of 12 inches/s (305 mm/s).
 2. Detection Coverage (Small Room): Detect occupancy anywhere within a circular area of 600 sq. ft. (56 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 4. Detection Coverage (Large Room): Detect occupancy anywhere within a circular area of 2000 sq. ft. (186 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 5. Detection Coverage (Corridor): Detect occupancy anywhere within 90 feet (27.4 m) when mounted on a 10-foot- (3-m-) high ceiling in a corridor not wider than 14 feet (4.3 m).
- E. Dual-Technology Type: Ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.
1. Sensitivity Adjustment: Separate for each sensing technology and adjustable from 100% to 0% sensitivity.
 2. Detector Sensitivity: Detect occurrences of 6-inch- (150-mm-) minimum movement of any portion of a human body that presents a target of not less than 36 sq. in. (232 sq. cm), and detect a person of average size and weight moving not less than 12 inches (305 mm) in either a horizontal or a vertical manner at an approximate speed of 12 inches/s (305 mm/s).
 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.

2.3 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 SENSOR INSTALLATION

- A. Sensor layout shown on plans is diagrammatic. Contractor shall provide complete sensor coverage of spaces as required to provide a 100% fully-functional system at no added costs for additional sensors. Contractor shall adjust quantity of all sensors, including occupancy sensor, vacancy sensor, daylight sensor, photo-cell and any additional sensors as required and submit sensor layout shop drawings to engineer for review and approval.
- B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- C. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.2 WIRING INSTALLATION

- A. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch (13 mm).
- B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."
 - 1. Identify controlled circuits in lighting contactors.
 - 2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

- B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

- A. Contractor shall test and inspect components, assemblies prior to installation, and after equipment installations, including connections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative, if required:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Lighting control devices will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
 - 1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
 - 2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
 - 3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

3.6 DEMONSTRATION

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

END OF SECTION 26 09 23

26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.
 - 3. Load centers.

1.3 DEFINITIONS

- A. SVR: Suppressed voltage rating.
- B. TVSS: Transient voltage surge suppressor.
- C. SPD: Surge protection device.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
 - 1. The term "withstand" means" the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.

3. Detail bus configuration, current, and voltage ratings.
4. Short-circuit current rating of panelboards and overcurrent protective devices.
5. Include evidence of NRTL listing for series rating of installed devices.
6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
7. Include wiring diagrams for power, signal, and control wiring.
8. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device.

1.6 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems." Include the following:
 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- B. Field Quality-Control Reports:
 1. Test procedures used.
 2. Test results that comply with requirements.
 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- C. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals include the following:
 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Keys: Two spares for each type of panelboard cabinet lock.
 2. Circuit Breakers Including GFCI and Ground Fault Equipment Protection (GFEP) Types: Two spares of each size for each panelboard.

3. Fuses for Fused Switches: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.9 QUALITY ASSURANCE

- A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NEMA PB 1.
- E. Comply with NFPA 70.
- F. Comply with New York City Electrical Code.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.
- B. Handle and prepare panelboards for installation according to NECA 407 and NEMA PB 1.

1.11 PROJECT CONDITIONS

- A. Environmental Limitations:
 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding minus 22 deg F (minus 30 deg C) to plus 104 deg F (plus 40 deg C).
 - b. Altitude: Not exceeding 6600 feet (2000 m).
- B. Service Conditions: NEMA PB 1, usual service conditions, as follows:
 1. Ambient temperatures within limits specified.
 2. Altitude not exceeding 6600 feet (2000 m).

- C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Construction Manager and Owner no fewer than 7 business days in advance of proposed interruption of electric service.
 - 2. Do not proceed with interruption of electric service without Construction Manager's and Owner's written permission.
 - 3. Comply with NFPA 70E.

1.12 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.13 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

- A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- B. Enclosures: Flush- and surface-mounted cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 3R, unless otherwise indicated.
 - c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
 3. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
 4. Finishes:
 - a. Panels and Trim: Galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
 5. Directory Card: Inside panelboard door, mounted in metal holder frame with transparent card protector.
- C. Incoming Mains Location: Top and bottom, coordinate with field conditions.
- D. Phase, Neutral, and Ground Buses:
1. Material: Hard-drawn copper, 98 percent conductivity.
 2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 3. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box, where specifically indicated.
 4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads, where specifically indicated.
- E. Conductor Connectors: Suitable for use with conductor material and sizes.
1. Material: Hard-drawn copper, 98 percent conductivity.
 2. Main and Neutral Lugs: Mechanical or compression type.
 3. Ground Lugs and Bus-Configured Terminators: Mechanical or compression type.
 4. Feed-Through Lugs: Mechanical or compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
 5. Subfeed (Double) Lugs: Mechanical or compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
 6. Gutter-Tap Lugs: Mechanical or compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
 7. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus. Provide where extra-capacity neutral bus is required.
- F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- G. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION PANELBOARDS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible products approved equal:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Schneider Electric.
- B. Panelboards: NEMA PB 1, power and feeder distribution type.
- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
 - 1. For doors more than 36 inches (914 mm) high, provide two latches, keyed alike.
- D. Mains: As specified on drawings.
- E. Branch Overcurrent Protective Devices: Fused switches, unless otherwise noted.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible products approved equal:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: As indicated on the drawings.
- D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
- F. Column-Type Panelboards: Narrow gutter extension, with cover, to overhead junction box equipped with ground and neutral terminal buses.

2.4 LOAD CENTERS

Load centers with plug-in circuit breakers are acceptable only for residential dwelling units and where specifically described within contract drawings.

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible products approved equal:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. Siemens Energy & Automation, Inc.
 3. Square D; a brand of Schneider Electric.
- B. Load Centers: Comply with UL 67.
- C. Mains: As indicated on the drawings.
- D. Branch Overcurrent Protective Devices: Plug-in circuit breakers, replaceable without disturbing adjacent units.
- E. Conductor Connectors: Mechanical type for main, neutral, and ground lugs and buses.

2.5 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible products approved equal:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 3. Siemens Energy & Automation, Inc.
 4. Square D; a brand of Schneider Electric.
- B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replaceable electronic trip; and the following field-adjustable settings:
 - a. Instantaneous trip.
 - b. Long- and short-time time adjustments.
 - c. Ground-fault pickup level, time delay, and I^2t response.
 4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
 5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
 6. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
 7. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.

- c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
- d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
- e. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
- f. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
- g. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.
- h. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Receive, inspect, handle, and store panelboards according to NECA 407 and NEMA PB 1.1, whichever is more stringent.
- B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install panelboards and accessories according to NECA 407 and NEMA PB 1.1, whichever is more stringent.
- B. Retain first paragraph below for floor-mounted distribution panelboards. Even if floor mounted, all panelboard cabinets must still be securely attached to a vertical wall or surface.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.
- D. Comply with mounting and anchoring requirements specified in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- E. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- F. Install overcurrent protective devices and controllers not already factory installed.

- G. Install filler plates in unused spaces.
- H. Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.
- I. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.
- J. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 260553 "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer to create directory; handwritten directories are not acceptable.
- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Contractor shall inspect components, assemblies, and equipment installations, including connections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Perform the following infrared scan tests and inspections and prepare reports:

- a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
- b. Instruments and Equipment:
 - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
- D. Panelboards will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.
- B. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.
 - 1. Measure as directed during period of normal system loading.
 - 2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
 - 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
 - 4. Tolerance: Difference exceeding 10 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

END OF SECTION 26 24 16

26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Tamper-resistant receptacles.
 - 3. Weather-resistant receptacles.
 - 4. Snap switches and wall-box dimmers.
 - 5. Solid-state fan speed controls.
 - 6. Wall-switch and exterior occupancy sensors.
 - 7. Communications outlets.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

- C. Approvals: All submittals shall be approved by the Engineer and Architect. Architect shall approve wiring devices and wall plates for style and finish.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles, subject to approval by architect:
 - 1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand (Pass & Seymour).
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.
- C. Provide wiring devices as specified in this section unless otherwise noted by the Architect and /or Interior designer. Listed manufacturers are subject to approval by the Architect and /or Interior designer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Comply with the current New York City Electrical Code.
- D. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 - 2. Devices shall comply with the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 5351 (single), CR5362 (duplex).
 - b. Hubbell; HBL5351 (single), HBL5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5361 (single), 5362 (duplex).
- B. Tamper-Resistant Convenience Receptacles, 125 V, 15 A and 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement sd, and FS W-C-596.
 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; TR8300.
 - b. Hubbell; HBL8300SGA.
 - c. Leviton; 8300-SGG.
 - d. Pass & Seymour; TR63H; 885TR.

2.4 GFCI RECEPTACLES

- A. General Description:
 1. Straight blade, feed-through type.
 2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; VGF20.
 - b. Hubbell; GFR5352L.
 - c. Pass & Seymour; 2095.
 - d. Leviton; 7590.
- C. Tamper-Resistant GFCI Convenience Receptacles, 125 V, 15 A and 20 A:
 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Hubbell; GFTR20.
 - b. Pass & Seymour; 2095TR.

2.5 TOGGLE SWITCHES

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.
- B. Switches, 120/277 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:

- 1) Single Pole:
 - 2) Cooper; AH1221.
 - 3) Hubbell; HBL1221.
 - 4) Leviton; 1221-2.
 - 5) Pass & Seymour; CSB20AC1.
- 6) Two Pole:
 - 7) Cooper; AH1222.
 - 8) Hubbell; HBL1222.
 - 9) Leviton; 1222-2.
 - 10) Pass & Seymour; CSB20AC2.
- 11) Three Way:
 - 12) Cooper; AH1223.
 - 13) Hubbell; HBL1223.
 - 14) Leviton; 1223-2.
 - 15) Pass & Seymour; CSB20AC3.
- 16) Four Way:
 - 17) Cooper; AH1224.
 - 18) Hubbell; HBL1224.
 - 19) Leviton; 1224-2.
 - 20) Pass & Seymour; CSB20AC4.

C. Pilot-Light Switches, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; AH1221PL for 120 and 277 V.
 - b. Hubbell; HBL1201PL for 120 and 277 V.
 - c. Leviton; 1221-LH1.
 - d. Pass & Seymour; PS20AC1RPL for 120 V, PS20AC1RPL7 for 277 V.
2. Description: Single pole, with neon-lighted handle, illuminated when switch is "off."

D. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors.

1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; 1995.
 - b. Hubbell; HBL1557.

- c. Leviton; 1257.
- d. Pass & Seymour; 1251.

2.6 DECORATOR-STYLE DEVICES

- A. Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
 - 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; 6252.
 - b. Hubbell; DR15.
 - c. Leviton; 16252.
 - d. Pass & Seymour; 26252.
- B. Tamper-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
 - 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; TR6252.
 - b. Hubbell; DR15TR.
 - c. Pass & Seymour; TR26252.
 - 2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.
- C. Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
 - 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; TWRBR15.
 - b. Hubbell; DR15TR.
 - c. LevitonTRW15.
 - d. Pass & Seymour; TRW26252.
 - 2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section, when installed in wet and damp locations.
- D. GFCI, Feed-Through Type, Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.
 - 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:

- a. Cooper; VGF15.
 - b. Hubbell; GF15LA.
 - c. Leviton; 8599.
 - d. Pass & Seymour; 1594.
- E. GFCI, Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.
- 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; TWRVGF15.
 - b. Hubbell; GFTR15.
 - c. Pass & Seymour; 1594TRWR.
 - 2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.
- F. Toggle Switches, Square Face, 120/277 V, 15 A: Comply with NEMA WD 1, UL 20, and FS W-S-896.
- 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; 7621 (single pole), 7623 (three way).
 - b. Hubbell; DS115 (single pole), DS315 (three way).
 - c. Leviton; 5621-2 (single pole), 5623-2 (three way).
 - d. Pass & Seymour; 2621 (single pole), 2623 (three way).
- G. Lighted Toggle Switches, Square Face, 120 V, 15 A: Comply with NEMA WD 1 and UL 20.
- 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; 7631 (single pole), 7633 (three way).
 - b. Hubbell; DS120IL (single pole), DS320 (three way).
 - c. Leviton; 5631-2 (single pole), 5633-2 (three way).
 - d. Pass & Seymour; 2625 (single pole), 2626 (three way).
 - 2. Description: With neon-lighted handle, illuminated when switch is "off."

2.7 RESIDENTIAL DEVICES

- A. Residential-Grade, Tamper-Resistant Convenience Receptacles, 125 V, 15 A and 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, and UL 498.
- 1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:

- a. Cooper; TR270.
 - b. Hubbell; RR155TR.
 - c. Leviton; T5320.
 - d. Pass & Seymour; TR62.
2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.
- B. Weather-Resistant and Tamper-Resistant Convenience Receptacles, 125 V, 15 A and 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, and UL 498.
1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; TWR270.
 - b. Hubbell; RR155WRTR.
 - c. Leviton; TWR15.
 - d. Pass & Seymour; 3232TRWR.
 2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section, when installed in wet and damp locations.
- C. Telephone Outlet:
1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; 3560-6.
 - b. Leviton; 40649.
 2. Description: Single RJ-45 jack for terminating 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1; complying with Category 5e. Comply with UL 1863.
- D. Combination TV and Telephone Outlet:
1. Products: Subject to compliance with requirements, provide one of the following or comparable product approved equal:
 - a. Cooper; 3562.
 - b. Leviton; 40159.
 2. Description: Single RJ-45 jack for 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1; complying with Category 5e. Comply with UL 1863.

2.8 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
1. Plate-Securing Screws: Metal with head color to match plate finish.

2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
 3. Material for Unfinished Spaces: Galvanized steel.
 4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.9 MULTIOUTLET ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following or comparable product approved equal:
1. Hubbell Incorporated; Wiring Device-Kellems.
 2. Wiremold/Legrand.
- C. Description:
1. Two-piece surface metal raceway, with factory-wired multioutlet harness.
 2. Components shall be products from single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
- D. Raceway Material: Metal, with manufacturer's standard finish.

2.10 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
 2. Wiring Devices Connected to Emergency Power System: Red.
- B. Wall Plate Color: For plastic covers, match device color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:

1. Take steps to ensure that devices and their boxes are protected... Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
 - a. Cut back and pigtail or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections. No. 10 AWG may be directly wired to devices listed for 10 AWG using side-wire clamping terminals.
8. Tighten all unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down and on horizontally mounted receptacles to the right, unless otherwise indicated.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Dimmers:
 - 1. Install dimmers within terms of their listing.
 - 2. Verify that dimmers used for fan speed control are listed for that application.
 - 3. Install unshared neutral conductors online and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on bottom. Group adjacent switches under single, multigang wall plates.
- I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test Instruments: Use instruments that comply with UL 1436.
 - 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. Tests for Convenience Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports, upon request.

END OF SECTION 26 27 26

SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Shunt trip switches.
 - 4. Molded-case circuit breakers (MCCBs).
 - 5. Enclosures.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to SEI/ASCE 7 or as specified by the structural engineer.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Enclosure types and details for types other than NEMA 250, Type 1.
 - 2. Current and voltage ratings.

3. Short-circuit current ratings (interrupting and withstand, as appropriate).
4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
5. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NFPA 70.
- E. Comply with New York City Electrical Code.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
 2. Altitude: Not exceeding 6600 feet (2010 m).
- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 1. Notify Construction Manager and Owner no fewer than 7 business days in advance of proposed interruption of electric service.
 2. Indicate method of providing temporary electric service.
 3. Do not proceed with interruption of electric service without Construction Manager's and Owner's written permission.
 4. Comply with NFPA 70E.

1.8 COORDINATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible product approved equal:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Type GD, General Duty, Single Throw, 240-V ac, 800 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with cartridge fuse interiors to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- C. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- D. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 - 3. Isolated Ground Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 - 4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 - 5. Lugs: Mechanical type, suitable for number, size, and conductor material.
 - 6. Service-Rated Switches: Labeled for use as service equipment.
 - 7. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac/208-V ac.

2.2 NONFUSIBLE SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 3. Siemens Energy & Automation, Inc.
 4. Square D; a brand of Schneider Electric.
- B. Type GD, General Duty, Single Throw, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 3. Lugs: Mechanical type, suitable for number, size, and conductor material.
 4. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac/208-V ac.

2.3 SHUNT TRIP SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible product approved equal:
1. Cooper Bussmann, Inc.
 2. Ferraz Shawmut, Inc.
 3. Littelfuse, Inc.
- B. General Requirements: Comply with ASME A17.1, UL 50, and UL 98, with 200-kA interrupting and short-circuit current rating when fitted with Class J fuses.
- C. Switches: Three-pole, horsepower rated, with integral shunt trip mechanism and Class J fuse block; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- D. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power source of enough capacity to operate shunt trip, connected pilot, and indicating and control devices.
- E. Accessories:
1. Oiltight key switch for key-to-test function.
 2. Oiltight green ON pilot light.
 3. Isolated neutral lug; 200 percent rating.
 4. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
 5. Form C alarm contacts that change state when switch is tripped.

2.4 MOLDED-CASE CIRCUIT BREAKERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible product approved equal:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- D. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
- E. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:
 - 1. Instantaneous trip.
 - 2. Long- and short-time time adjustments.
 - 3. Ground-fault pickup level, time delay, and I^2t response.
- F. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.
- G. Ground-Fault, Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
- H. Features and Accessories:
 - 1. Standard frame sizes, trip ratings, and number of poles.
 - 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
 - 3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads.
 - 4. Ground-Fault Protection: Comply with UL 1053; integrally mounted type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
 - 5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
 - 6. Zone-Selective Interlocking: Integral with ground-fault trip unit; for interlocking ground-fault protection function.
 - 7. Electrical Operator: Provide remote control for on, off, and reset operations.

2.5 MOLDED-CASE SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following or compatible product approved equal:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. General Requirements: MCCB with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.
- C. Features and Accessories:
 - 1. Standard frame sizes and number of poles.
 - 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
 - 3. Ground-Fault Protection: Comply with UL 1053; remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
 - 4. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.

2.6 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 3R, unless otherwise indicated.
 - 3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

- B. Comply with mounting and anchoring requirements specified in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- D. Install fuses in fusible devices.
- E. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

- A. Contractor shall field inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - 4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges as specified in Section 260573 "Overcurrent Protective Device Coordination Study."

END OF SECTION 26 28 16

SECTION 26 51 00 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Interior lighting fixtures, lamps, and ballasts.
- 2. Emergency lighting units.
- 3. Exit signs.
- 4. Lighting fixture supports.

B. Related Sections:

- 1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
- 2. Section 262726 "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

1.3 DEFINITIONS

- A. BF: Ballast factor.
- B. CCT: Correlated color temperature.
- C. CRI: Color-rendering index.
- D. HID: High-intensity discharge.
- E. LER: Luminaire efficacy rating.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
 2. Emergency lighting units including battery and charger, where specified. **Submittal must indicate the initial emergency power lumen output rating of all fixtures with local emergency power battery packs.**
 3. Ballast, including BF.
 4. Energy-efficiency data.
 5. Life, output (lumens, CCT, and CRI), and energy-efficiency data for lamps.
 6. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.
 - a. **Manufacturer Certified Data:** Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. **Shop Drawings:** For nonstandard or custom lighting fixtures. Include plans, elevations, sections, details, and attachments to other work.
1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 2. **Wiring Diagrams:** For power, signal, and control wiring.
- C. **Samples:** For each lighting fixture indicated in the Interior Lighting Fixture Schedule. Each Sample shall include the following:
1. Lamps and ballasts, installed.
 2. Cords and plugs.
 3. Pendant support system.
- D. **Installation instructions.**

1.5 INFORMATIONAL SUBMITTALS

- A. **Coordination Drawings:** Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Lighting fixtures.
 2. Suspended ceiling components.
 3. Partitions and millwork that penetrate the ceiling or extends to within 12 inches (305 mm) of the plane of the luminaires.
 4. Structural members to which suspension systems for lighting fixtures will be attached.
 5. Other items in finished ceiling including the following:
 - a. Air outlets and inlets.
 - b. Speakers.
 - c. Sprinklers.

- d. Smoke and fire detectors.
 - e. Occupancy sensors.
 - f. Access panels.
- B. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, from manufacturer.
- C. Warranty: Sample of special warranty.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- 1. Lamps: 10 for every 100 of each type and rating installed. Furnish at least one of each type.
 - 2. Plastic Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.
 - 3. Ballasts: [One for every 100 of each type and rating installed. Furnish at least one of each type.
 - 4. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

1.7 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Comply with New York City Electrical Code.

1.8 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.
- C. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
- D. HID Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5B.
- E. Metal Parts: Free of burrs and sharp corners and edges.
- F. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.
- G. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp and ballast characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter code (T-4, T-5, T-8, T-12, etc.), tube configuration (twin, quad, triple, etc.), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
 - c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
 - d. Start type (preheat, rapid start, instant start, etc.) for fluorescent and compact fluorescent luminaires.
 - e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
 - f. CCT and CRI for all luminaires.

2.3 BALLASTS FOR LINEAR FLUORESCENT LAMPS

- A. General Requirements for Electronic Ballasts:
 - 1. Comply with UL 935 and with ANSI C82.11.
 - 2. Designed for type and quantity of lamps served.
 - 3. Ballasts shall be designed for full light output unless another BF, dimmer, or bi-level control is indicated.
 - 4. Total Harmonic Distortion Rating: Less than 10 percent.
 - 5. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
 - 6. Operating Frequency: 42 kHz or higher.
 - 7. Lamp Current Crest Factor: 1.7 or less.
 - 8. BF: 0.88 or higher.
 - 9. Power Factor: 0.95 or higher.

10. Parallel Lamp Circuits: Multiple lamp ballasts shall comply with ANSI C82.11 and shall be connected to maintain full light output on surviving lamps if one or more lamps fail.
- B. Electronic Programmed-Start Ballasts for T8 Lamps: Comply with ANSI C82.11 and the following:
 1. Lamp end-of-life detection and shutdown circuit for T5 diameter lamps.
 2. Automatic lamp starting after lamp replacement.
- C. Electromagnetic Ballasts: Comply with ANSI C82.1; energy saving, high-power factor, Class P, and having automatic-reset thermal protection.
 1. Ballast Manufacturer Certification: Indicated by label.
- D. Ballasts for Low-Temperature Environments:
 1. Temperatures 0 Deg F (Minus 17 Deg C) and Higher: Electronic type rated for 0 deg F (minus 17 deg C) starting and operating temperature with indicated lamp types.
- E. Ballasts for Residential Applications: Fixtures designated as "Residential" may use low-power-factor electronic ballasts having a Class B sound rating and total harmonic distortion of approximately 30 percent.
- F. Ballasts for Dimmer-Controlled Lighting Fixtures: Electronic type.
 1. Dimming Range: 100 to 5 percent of rated lamp lumens.
 2. Ballast Input Watts: Can be reduced to 20 percent of normal.
 3. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.
 4. Control: Coordinate wiring from ballast to control device to ensure that the ballast, controller, and connecting wiring are compatible.
- G. Ballasts for Bi-Level Controlled Lighting Fixtures: Electronic type.
 1. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off.
 - a. High-Level Operation: 100 percent of rated lamp lumens.
 - b. Low-Level Operation: 30 percent of rated lamp lumens.
 2. Ballast shall provide equal current to each lamp in each operating mode.
 3. Compatibility: Certified by manufacturer for use with specific bi-level control system and lamp type indicated.
- H. Ballasts for Tri-Level Controlled Lighting Fixtures: Electronic type.
 1. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off.
 - a. High-Level Operation: 100 percent of rated lamp lumens.
 - b. Low-Level Operation: 30 and 50 percent of rated lamp lumens.

2. Ballast shall provide equal current to each lamp in each operating mode.
3. Compatibility: Certified by manufacturer for use with specific tri-level control system and lamp type indicated.

2.4 BALLASTS FOR COMPACT FLUORESCENT LAMPS

- A. Description: Electronic-programmed rapid-start type, complying with UL 935 and with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:
1. Lamp end-of-life detection and shutdown circuit.
 2. Automatic lamp starting after lamp replacement.
 3. Sound Rating: Class A.
 4. Total Harmonic Distortion Rating: Less than 20 percent.
 5. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
 6. Operating Frequency: 20 kHz or higher.
 7. Lamp Current Crest Factor: 1.7 or less.
 8. BF: 0.95 or higher unless otherwise indicated.
 9. Power Factor: 0.95 or higher.
 10. Interference: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.

2.5 BALLASTS FOR HID LAMPS

- A. Electronic Ballast for Metal-Halide Lamps: Include the following features unless otherwise indicated:
1. Minimum Starting Temperature: Minus 20 deg F (Minus 29 deg C) for single-lamp ballasts.
 2. Rated Ambient Operating Temperature: 130 deg F (54 deg C).
 3. Lamp end-of-life detection and shutdown circuit.
 4. Sound Rating: Class A.
 5. Total Harmonic Distortion Rating: Less than 20 percent.
 6. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
 7. Lamp Current Crest Factor: 1.5 or less.
 8. Power Factor: 0.90 or higher.
 9. Interference: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.
 10. Protection: Class P thermal cutout.
 11. Bi-Level Dimming Ballast: Ballast circuit and leads provide for remote control of the light output of the associated fixture between high- and low-level and off.
 - a. High-Level Operation: 100 percent of rated lamp lumens.
 - b. Low-Level Operation: 35 percent of rated lamp lumens.
 - c. Compatibility: Certified by ballast manufacturer for use with specific bi-level control system and lamp type indicated. Certified by lamp manufacturer that ballast operating modes are free from negative effect on lamp life and color-rendering capability.

- B. High-Pressure Sodium Ballasts: Electromagnetic type, with solid-state igniter/starter. Igniter/starter shall have an average life in pulsing mode of 10,000 hours at an igniter/starter-case temperature of 90 deg C.
 - 1. Instant-Restrike Device: Integral with ballast, or solid-state potted module, factory installed within fixture and compatible with lamps, ballasts, and mogul sockets up to 150 W.
 - 2. Minimum Starting Temperature: Minus 40 deg F (Minus 40 deg C).

2.6 BATTERY-BACKED LIGHTING FIXTURES (EMEGENCY EGRESS LIGHTING)

- A. **Unit-mounted Emergency Lighting Equipment: Provide self-contained, modular, battery-inverter unit, factory mounted within luminaire body and compatible with ballast. Comply with UL 924. Emergency Connection: Operate (min) one fluorescent lamp(s) continuously at a minimum initial output of 1100 lumens each. Connect un-switched circuit to battery-inverter unit and switched circuit to luminaire ballast. Where fixtures do not put out 1100 lumens under normal power conditions, the battery shall be sized so that the initial output of the fixture is its full normal lumen rating. Submittals shall indicate the emergency power lumen output rating of all fixtures.**

2.7 EXIT SIGNS

- A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
- B. Internally Lighted Signs:
 - 1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.

2.8 FLUORESCENT LAMPS

- A. T8 rapid-start lamps, rated 32 W maximum, nominal length of 48 inches (1220 mm), 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life 20,000 hours unless otherwise indicated.
- B. T5 rapid-start lamps, rated 28 W maximum, nominal length of 45.2 inches, 2900 initial lumens (minimum), CRI 85 (minimum), color temperature 3500 K, and average rated life of 20,000 hours unless otherwise indicated.
- C. Compact Fluorescent Lamps: 4-Pin, CRI 80 (minimum), color temperature 3500 K, average rated life of 10,000 hours at three hours operation per start, unless otherwise indicated.
 - 1. 13 W: T4, double or triple tube, rated 900 initial lumens (minimum).
 - 2. 18 W: T4, double or triple tube, rated 1200 initial lumens (minimum).
 - 3. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
 - 4. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).

2.9 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Section 260529 "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, 1/2-inch (13-mm) steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).
- E. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.
- F. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures:
 - 1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
 - 2. Install lamps in each luminaire.
- B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.
- C. Lay-in Ceiling Lighting Fixtures Supports: Use grid as a support element.
 - 1. Install ceiling support system rods or wires, independent of the ceiling suspension devices, for each fixture. Locate not more than 6 inches (150 mm) from lighting fixture corners.
 - 2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
 - 3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
 - 4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.
- D. Suspended Lighting Fixture Support:
 - 1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.

2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
 4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.
- E. Air-Handling Lighting Fixtures: Install with dampers closed and ready for adjustment.
- F. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.2 IDENTIFICATION

- A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
- B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.4 STARTUP SERVICE

- A. Burn-in all lamps that require specific aging period to operate properly, prior to occupancy by Owner. Burn-in fluorescent and compact fluorescent lamps intended to be dimmed, for at least 100 hours at full voltage.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Some of this work may be required after dark.
1. Adjust aimable luminaires in the presence of Architect.

END OF SECTION 26 51 00

EXHIBIT D: DRAWINGS

General Notes

THE FOLLOWING NOTES SHALL APPLY THROUGHOUT. EXCEPTIONS ARE SPECIFICALLY NOTED ON EACH DRAWING.

- ALL WORK OF THIS CONTRACT SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NEW YORK CITY BUILDING CODE AND REGULATIONS OF OTHER AGENCIES HAVING JURISDICTION ON THE WORK OF THIS CONTRACT.
- DO NOT SCALE DRAWINGS; DIMENSIONS SHOWN GOVERN. LARGER SCALE DRAWINGS SHALL GOVERN OVER SMALLER SCALE. USE DIMENSIONS ONLY. ALL DIMENSIONS AND CONDITIONS SHOWN AND ASSUMED ON THE DRAWINGS MUST BE VERIFIED AT THE SITE BY THE CONTRACTOR BEFORE ORDERING ANY MATERIAL OR DOING ANY WORK. ANY DISCREPANCIES IN THE DRAWINGS AND SPECIFICATIONS SHALL BE REPORTED TO THE ARCHITECT. NO CHANGE IN DRAWINGS OR SPECIFICATIONS IS PERMISSIBLE WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT/ENGINEER. NO WORK SHALL PROCEED UNTIL SUCH DISCREPANCY HAS BEEN RECTIFIED.
- ALL WORK ON THESE DRAWINGS SHALL BE CONSIDERED NEW WORK WHETHER STATED OR NOT EXCEPT WHERE SPECIFICALLY NOTED AS 'EXISTING TO REMAIN'.
- COORDINATION OF ALL WORK UNDER THIS CONTRACT SHALL BE MAINTAINED TO ENSURE THE QUALITY AND TIMELY COMPLETION OF THE WORK/PROJECT.
- THE CONTRACTOR SHALL DISCONNECT AND/OR REMOVE ANY EXISTING PLUMBING, ELECTRICAL FIXTURES, WIRE CONDUITS, HVAC OR OTHER WORK WHICH MIGHT INTERFERE WITH THE WORK OF THIS CONTRACT. AFTER NEW WORK IS COMPLETED, THE DISCONNECTED OR REMOVED ITEMS SHALL BE REINSTALLED BY THE CONTRACTOR AT THE SAME LOCATION OR AT NEW LOCATION IF INDICATED ON DRAWINGS. CONTRACTOR TO FURNISH ALL NECESSARY NEW MATERIALS/HARDWARE FOR COMPLETION OF WORK.
- THE CONTRACTOR SHALL PATCH, REPAIR OR REPLACE ALL DAMAGED OR EXPOSED SURFACES DUE TO CONTRACT WORK. ALL NEWLY INSTALLED, PATCHED WORK AND ALL AFFECTED AREAS SHALL BE PAINTED OR FINISHED AS INDICATED OR TO MATCH EXISTING. ALL WORK SHALL BE PERFORMED TO COVER THE ENTIRE HORIZONTAL OR VERTICAL SURFACE TO THE CLOSEST CORNER IN ALL FOUR DIRECTIONS TO MATCH EXISTING CONDITIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING AND PROTECTING ALL WORK DURING CONSTRUCTION AGAINST DAMAGE, BREAKAGE, COLLAPSE, DISTORTIONS AND INCORRECT ALIGNMENTS ACCORDING TO ALL APPLICABLE CODES AND STANDARDS OF GOOD PRACTICE.
- THE CONTRACTOR SHALL INCLUDE ALL PREPARATORY AND ASSOCIATED SUPPLEMENTAL WORK TO PROVIDE A COMPLETE AND FINISHED INSTALLATION.
- WHERE MANUFACTURER'S NAMES AND PRODUCT NUMBERS ARE INDICATED ON DRAWINGS, IT SHALL BE CONSIDERED TO MEAN THE ESTABLISHMENT OF QUALITY AND PERFORMANCE STANDARDS OF SUCH ITEMS. ALL OTHER PRODUCTS MUST BE SUBMITTED TO THE ARCHITECT FOR APPROVAL BEFORE THEY SHALL BE DEEMED EQUAL.
- FIRESTOPPINGS SHALL BE INSTALLED AT ALL NEW & EXISTING PENETRATIONS OF FIRE RATED CONSTRUCTION AS PER SPECIFICATIONS.
- SIZE OF MASONRY UNITS AND WOOD MEMBERS ON PLANS, BUILDING ELEVATIONS AND SECTIONS ARE SHOWN AS NOMINAL SIZE, UNLESS OTHERWISE NOTED.
- DIMENSIONS ON PLANS ARE INDICATED FROM SURFACE TO SURFACE BETWEEN WALLS, PARTITIONS AND OTHER ITEMS EXCLUSIVE OF FINISHES.
- PROVIDE GUARDS, RAILS, BARRICADES, FENCES, NIGHT LIGHTING, ETC. AS REQUIRED BY THE NEW YORK CITY BUILDING CODE, SECTION 104.5 AND AS REQUIRED TO PROVIDE ADEQUATE PROTECTION.
- THERE WILL BE NO CHANGE IN USE, EGRESS OR OCCUPANCY BECAUSE OF THE WORK OF THIS CONTRACT.
- ADDITIONAL NOTES WHICH ARE APPLICABLE TO THIS PROJECT MAY BE FOUND THROUGHOUT THE CONTRACT DOCUMENTS.
- ALL WORK LISTED ON THE CONSTRUCTION NOTES AND SHOWN OR IMPLIED ON ALL DRAWINGS SHALL BE SUPPLIED AND INSTALLED BY THE TRADE CONTRACTOR UNLESS OTHERWISE NOTED ON DRAWINGS AND/OR IN SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON DRAWINGS AND SHALL NOTIFY DAVID SMOTRICH & PARTNERS LLP (DSP) OF ANY DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS BEFORE PROCEEDING WITH THE WORK.
- CONTRACTOR MUST COMPLY WITH THE RULES AND REGULATIONS OF ALL AGENCIES HAVING JURISDICTION AND SHALL CONFORM TO ALL CONSTRUCTION AND SAFETY CODES, STATUTES AND ORDINANCES. ALL FEES, TAXES, PERMITS AND APPLICATIONS OF ALL WORK WITH GOVERNMENTAL AGENCIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE BUILDING AS TO HOURS OF AVAILABILITY FOR LOADING DOCKS AND ELEVATORS FOR THE PURPOSES OF DELIVERY AND ALSO AS TO THE MANNER OF HANDLING AND STORAGE & STAGING OF MATERIALS, EQUIPMENT AND DEBRIS TO AVOID CONFLICT AND INTERFERENCE WITH NORMAL BUILDING OPERATIONS.
- ALL DRAWINGS AND CONSTRUCTION NOTES ARE COMPLEMENTARY AND WHAT IS CALLED FOR BY ANY WILL BE BINDING AS IF CALLED FOR BY ALL.
- THE CONTRACTOR SHALL MAINTAIN A CURRENT AND COMPLETE SET OF CONSTRUCTION DOCUMENTS AND APPROVED SUBMITTALS ON THE CONSTRUCTION SITE DURING ALL PHASES OF CONSTRUCTION.
- THE CONTRACTOR SHALL SUPPLY, PRIOR TO COMMENCING WORK, A LIST OF ALL SUBCONTRACTORS TO DSP AND THE OWNER, WITH THE NAME, ADDRESS AND PHONE NUMBER OF THE PRINCIPAL CONTACT OF EACH SUB-CONTRACTOR. IN ADDITION, HE WILL FILE WITH THE OWNER THE EMERGENCY NUMBERS AVAILABLE FOR 24-HR. CONTACT. THE OWNER & ARCHITECT TO BE NOTIFIED IF THERE IS A CHANGE IN SUBCONTRACTOR DURING THE COURSE OF THE PROJECT.
- ALL WORK SHALL BE PERFORMED BY SKILLED AND QUALIFIED WORKMEN IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADES INVOLVED AND IN COMPLIANCE WITH BUILDING REGULATIONS AND/OR GOVERNMENTAL LAWS, STATUTES OR ORDINANCES.
- ALL MATERIALS SHALL BE NEW UNLESS AND OF THE HIGHEST QUALITY, UNLESS OTHERWISE NOTED. MANUFACTURED MATERIALS AND EQUIPMENT SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

- ALL APPROVALS OF SUBMITTALS SHALL BE FOR DESIGN INTENT ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR QUANTITIES, DIMENSIONS AND COMPLIANCE WITH CONTRACT DOCUMENTS AND FOR INFORMATION PERTAINING TO FABRICATION PROCESSES OR TECHNIQUES OF FIRST CLASS CONSTRUCTION AND FOR COORDINATION WITH OTHER TRADES.
- ALL WORK SHALL BE ERECTED AND INSTALLED PLUMB, LEVEL, SQUARE, TRUE AND IN PROPER ALIGNMENT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING, PATCHING AND RESTORATION REQUIRED FOR THIS WORK.
- ALL CORRESPONDENCE TO ARCHITECT OR TO OWNER SHALL BE FORWARDED IN COPY TO THE OTHER PARTY.
- THE CONTRACTOR SHALL AT ALL TIMES KEEP THE PREMISES FREE OF ACCUMULATION OF WASTE MATERIALS AND RUBBISH; PREMISES TO BE SHEET CLEAN DAILY. AT THE COMPLETION OF THE WORK, EACH CONTRACTOR SHALL LEAVE THE JOB SITE FREE OF CONSTRUCTION DEBRIS AND MATERIALS, AND "BROOM CLEAN" INCLUDING THOROUGH CLEANING OF TOILETS, BATHROOMS, ELECTRICAL CLOSETS, STAIRWELLS, AND ALL AREAS OF WORK OR STAGING, ETC.
- PROVIDE ALL NECESSARY PROTECTION AGAINST DIRT AND DAMAGE WITHIN THE PREMISES AS WELL AS PUBLIC AREAS, AND SHALL BE RESPONSIBLE FOR KEEPING THESE AREAS CLEAN AND FREE OF MATERIALS AT ALL TIMES.
- THE CONTRACTOR SHALL VERIFY LOCATION OF EXISTING UTILITIES AND COORDINATE WITH LOCATION SHOWN ON DRAWINGS.
- THE CONTRACTOR SHALL CHECK FOR ALL BROKEN OR CRACKED WINDOW GLAZING PRIOR TO START OF CONSTRUCTION AND SHALL REPORT SUCH CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WINDOW GLAZING LATER FOUND TO BE DAMAGED OR MISSING.
- DURING CONSTRUCTION, SECURITY AND FIRE EXIT DOORS & EXIT PASSAGEWAYS MUST REMAIN UNOBSTRUCTED AT ALL TIMES.
- THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROPERLY PROTECT ALL EXISTING WORK TO REMAIN. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGED AREAS TO BE RETURNED TO ORIGINAL CONDITION, AT NO EXTRA COST TO THE OWNER.
- THE CONTRACTOR SHALL SCHEDULE CONSTRUCTION IN SUCH A MANNER SO AS NOT TO DISTURB AREAS OUTSIDE OF THE AREA UNDER CONSTRUCTION DURING NORMAL OPERATING HRS. THE CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND COLLEGE FACILITIES DEPT. PRIOR TO ANY DISRUPTION OF SERVICES TO THOSE AREAS NOT UNDER CONSTRUCTION EVEN IF SUCH A DISRUPTION OCCURS AFTER NORMAL OPERATING HRS.
- THE PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZRD AREA (SFHA).

Building Dept. Notes

- WORK SHALL BE EXECUTED IN FULL COMPLIANCE WITH THE APPLICABLE PROVISIONS OF ALL LAWS, BY-LAWS, STATUTES, ORDINANCES, CODES, RULES, REGULATIONS AND LAWFUL ORDERS OF PUBLIC AUTHORITIES BEARING ON THE PERFORMANCE AND EXECUTION OF THE WORK.
THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT OF ANY PORTIONS OF THE WORK, IN THE CONTRACT DOCUMENTS THAT ARE AT VARIANCE WITH THE ABOVE.
- ALL MATERIALS, ASSEMBLIES, FORMS, METHODS OF CONSTRUCTION AND SERVICE EQUIPMENT SHALL MEET THE FOLLOWING REQUIREMENTS:
 - THEY SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE BY THE BOARD OF STANDARDS AND APPEALS.
 - THEY SHALL HAVE BEEN ACCEPTED FOR THE USE UNDER THE PRESCRIBED TEST METHODS BY THE COMMISSIONER (OR)
 - APPROVED BY THE OFFICE OF TECHNICAL CERTIFICATION AND RESEARCH (OTCR)
- MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH ONE OF THE FOLLOWING:
 - THEY SHALL CONFORM WITH A.I.S.I. "FIRE RESISTANCE RATINGS", DATED 1985 (OR)
 - THEY SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ASTM E119, STANDARD METHODS OF FIRE TESTS OF BUILDING CONSTRUCTION AND MATERIALS AND ACCEPTED BY THE COMMISSIONER (OR)
 - THEY SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE BUILDING CODE (OR)
 - APPROVED BY THE OFFICE OF TECHNICAL CERTIFICATION AND RESEARCH (OTCR)
- THESE DRAWINGS HAVE BEEN PREPARED BY OR AT THE DIRECTION OF THE UNDERSIGNED AND TO THE BEST OF THE UNDERSIGNED'S KNOWLEDGE, INFORMATION AND BELIEF MEET THE REQUIREMENTS OF THE BUILDING CODE.
- ALL WORK SHALL COMPLY WITH ANSI I17.1 AND LOCAL LAW 58.
- ALL NEW WORK SHALL COMPLY WITH NEW YORK CITY ENERGY CONSERVATION CODE.
- ALL NEW INTERIOR FINISHES SHALL BE CONSTRUCTED OF MATERIALS MEETING SECTION 21-524 FOR FLAME SPREAD RATINGS.
- THE CONTRACTOR IS RESPONSIBLE FOR FILING APPLICATION AND OBTAINING PERMITS FOR ANY CONSTRUCTION EQUIPMENT OR PUBLIC PROTECTIVES REQUIRED TO ENSURE SAFETY OF OPERATION AND THE PUBLIC AS PER NYC CONSTRUCTION CODE, CHAPTER 33, SECTION E03801. THE CONTRACTOR IS ALSO RESPONSIBLE FOR OBTAINING CONSTRUCTION PERMITS.
- THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE INSURANCE REQUIRED BY THE NYC DOB IN ORDER TO OBTAIN CONSTRUCTION PERMITS.
- EMERGENCY POWER, IF REQUIRED, UNDER THIS CONTRACT SHALL BE INSTALLED AS PER SECTION 21-346.04
- FOLLOW CHAPTER 33 OF THE 2014 NYC CONSTRUCTION CODE(NYCC) PROTECTION OF THE PUBLIC AND ADJACENT PROPERTIES.

Special Inspections

SPECIAL INSPECTIONS REQUIRED IN ACCORDANCE WITH CHAPTER 17 AND THE APPLICABLE SECTIONS OF THE NYC CONSTRUCTION CODE ARE LISTED IN THE FOLLOWING TABLES.

THE CONTRACTOR MUST NOTIFY THE ARCHITECT OR ENGINEER FOR SPECIAL INSPECTIONS AT LEAST 72 HOURS BEFORE THE SPECIFIC WORK COMMENCES.

THE OWNER SHALL BE RESPONSIBLE FOR THE FOLLOWING SPECIAL INSPECTIONS:

SPRAY RESISTANT MATERIALS	BC 1704.11
FIRE-RESISTANT PENETRATIONS & JOINTS	BC 1704.21
MECHANICAL SYSTEMS	BC1705.21
MECHANICAL & ELECTRICAL COMPONENTS	BC1705.12.3

THE CONTRACTOR MUST NOTIFY THE ARCHITECT OR ENGINEER FOR PROGRESS INSPECTIONS AT LEAST 72 HOURS BEFORE THE SPECIFIC WORK COMMENCES.

THE OWNER SHALL BE RESPONSIBLE FOR THE FOLLOWING PROGRESS INSPECTIONS:

ENERGY CORE COMPLIANCE	BC1103.5
FINAL INSPECTION	28-116.2.4.2 AND BC 1103, DIRECTIVE 14 OF 1975 AND 1 RCNY 101-10

Material Designations

	CONCRETE MASONRY UNITS
	GLASS
	GYPSUM DRYWALL/ CEMENT FILL
	INSULATION (LOOSE OR BATT)
	INSULATION (RIGID)
	METAL (SMALL SCALE)
	PLYWOOD
	STEEL (LARGE SCALE)
	TILE - CERAMIC, ACOUSTIC, VCT
	WOOD, FINISHED
	WOOD, ROUGH

Abbreviations

ACCES	ACCESSORY	INFO	INFORMATION
ACOUS	ACOUSTIC(AL)	MFD	MANUFACTURED
AFF	ABOVE FINISHED FLOOR	MFR	MANUFACTURER
AL	ALUMINUM	MECH	MECHANICAL
ALT	ALTERNATE	MTL	METAL
ANOD	ANODIZED	MIN	MINIMUM
APFL	APPLIANCE	MISC	MISCELLANEOUS
ARCH	ARCHITECT(URAL)	MLWK	MILLWORK
BLDG	BUILDING	MTD	MOUNTED
BD	BOARD	NIC	NOT IN CONTRACT
BLKG	BLOCKING	NTS	NOT TO SCALE
CAB	CABINET	OS	OWNER SUPPLIED
CPT	CARPET	PLYWD	PLYWOOD
CLS	CEILING	RCP	REFLECTED CEILING PLAN
COATG	COATING	CONSTR	CONSTRUCTION
CONC	CONCRETE	COV	COVER
CONSTR	CONSTRUCTION	CMU	CONCRETE MASONRY UNIT
DBL	DOUBLE	DEPT	DEPARTMENT
DEPT	DEPARTMENT	DET	DETAIL
DIA	DIAMETER	DIFF	DIFFUSER
DIM	DIMENSION	DN	DOWN
DR	DOOR	DR	DOOR
DRWG	DRAWINGS	ELEC	ELECTRICAL
ENG	ENGINEER	EQ	EQUAL
EQUIP	EQUIPMENT	ETC	ETCETERA
EXIST	EXISTING	EXT	EXTERIOR
FAB	FABRICATION	FV	WITH WOOD
FE	FIRE EXTINGUISHER	W/O	WITHOUT WEIGHT
FEG	FIRE EXTINGUISHER	FIN	FINISH
FR	FIRE RAT(ING)/ED	GA	GAUGE
GC	GENERAL CONTRACTOR	GL	GLASS
GL	GLASS	GYP	GYPSUM
HD	HEAD	HDWD	HARDWOOD
HDWD	HARDWOOD	HM	HOLLOW METAL
HM	HOLLOW METAL	HVAC	HEATING, VENTILATION, AND AIR CONDITIONING

Graphic Symbols

	SECTION LETTER
	BUILDING SECTION REFERENCE
	DETAIL NO.
	WALL SECTION OR DETAIL REFERENCE
	DETAIL NUMBER
	DETAIL REFERENCE
	ELEVATION NUMBER
	WALL ELEVATION REFERENCE
	NORTH INDICATOR
	REVISION NO.
	DOOR TYPE NO.
	WINDOW NO.
	ROOM/SPACE NO.
	CENTERLINE
	PARTITION TYPE INDICATOR
	LEVEL LINE
	ALIGN
	APPLIANCE AND PLUMBING FIXTURE DESIGNATION
	FLOORING DESIGNATION BASE DESIGNATION
	WALL MATERIAL DESIGNATION
	HIDDEN LINES OR REMOVALS
	EXISTING WORK TO REMAIN
	EXISTING WORK TO BE REMOVED
	NEW INFILL
	NEW PARTITIONS
	EXISTING DOOR & FRAME TO REMAIN
	NEW DOOR & FRAME W/ DOOR NUMBER
	EXISTING DOOR & FRAME TO BE REMOVED
	EXIT SIGN
	EXIT SIGN W/ DIRECTIONAL ARROWS
	ELECTRICAL OUTLET DUPLEX
	ELECTRICAL OUTLET QUADRUPLEX
	DATA OUTLET
	JUNCTION BOX
	SWITCH
	SWITCH WITH DIMMER
	THERMOSTAT
	OCCUPANT SENSOR
	CLOCK
	EMERGENCY TELEPHONE
	DRINKING FOUNTAIN
	FLOOR OUTLET
	A/V SPEAKER, CEILING MOUNTED

Site Safety and Protection Notes

- SUBMIT TO THE CAMPUS FACILITIES DEPT. FOR REVIEW A ENVIRONMENTAL HEALTH & SAFETY PLAN PREPARED AND SIGNED BY A NEW YORK CITY LICENSED SITE SAFETY MANAGER. THE PLAN(S) SHALL BE COMPLETE, REFLECTING THE ENTIRE SITE AND SHALL SHOW ANY PHASED PROTECTION.
- THE ENVIRONMENTAL HEALTH & SAFETY PLAN TO INCLUDE, BUT NOT BE LIMITED TO, NOTES, EGRESS, SCAFFOLDING, FIRE PROTECTION ETC. THEY SHOULD ADDRESS ANY POTENTIAL INTERACTION BETWEEN THE BUILDING OCCUPANTS AND GENERAL PUBLIC AND EXPOSURE TO THE CONSTRUCTION PROCESS. SEE SPECIFICATIONS.
- NO WORK IS TO PROCEED UNTIL ENVIRONMENTAL HEALTH & SAFETY PLAN ARE APPROVED BY THE EHS DIRECTOR OF FIT.

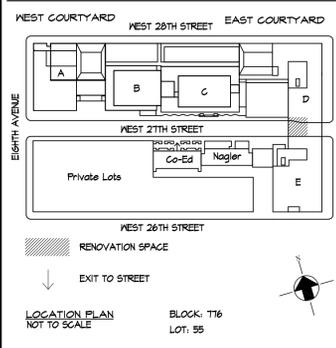
Drawing List

ARCHITECTURAL	
T-000.00	COVER SHEET
G-001.00	GENERAL NOTES
DM-100.00	4TH FLOOR DEMOLITION PLAN
DM-400.00	4TH FLOOR DEMOLITION REFLECTED CEILING PLAN
A-100.00	4TH FLOOR FLOOR PLAN
A-300.00	INTERIOR ELEVATIONS
A-400.00	4TH FLOOR RCP & LIGHTING SCHEDULE
A-700.00	PARTITION & DOOR SCHEDULE & DETAILS
A-701.00	DETAILS
A-702.00	FIRESTOPPING DETAILS
A-800.00	4TH FLOOR FURNITURE POWER & DATA PLAN
A-801.00	4TH FLOOR FINISH PLAN & SCHEDULES
MECHANICAL	
M-001.00	MECHANICAL SYMBOL LIST, ABBREVIATIONS, NOTES AND DRAWING LIST
M-104.00	FOURTH FLOOR MECHANICAL PLAN
M-501.00	MECHANICAL DETAILS
M-701.00	MECHANICAL SCHEDULES
M-801.00	MECHANICAL CONTROL DIAGRAMS
M-904.00	FOURTH FLOOR MECHANICAL DEMOLITION PLAN
ELECTRICAL	
E-001.00	ELECTRICAL SYMBOL LIST, ABBREVIATIONS, NOTES AND DRAWING LIST
E-100.00	ELECTRICAL 4TH FLOOR PART LIGHTING PLAN
E-200.00	ELECTRICAL 4TH FLOOR PART POWER PLAN
E-600.00	ELECTRICAL PARTIAL POWER RISER DIAGRAM AND DETAILS
E-900.00	ELECTRICAL 4TH FLOOR REMOVAL PART POWER PLAN

Scope of Work

- DEMOLITION AS INDICATED ON DEMOLITION DRAWINGS
- RELOCATION OF EXISTING LOCKERS.
- CONSTRUCTION OF NEW DEMISING WALLS.
- INSTALL NEW VCT FLOORING AND WALL BASE THROUGHOUT.
- INSTALL NEW PAINT FINISH FOR ALL WALLS.
- INSTALL SMALL SOFFITS AS SHOWN.
- PROVIDE AND INSTALL NEW FIN TUBE COVERS.
- INSTALL NEW HOLLOW METAL/GLASS ENTRY DOOR & HM DOOR AT MECHANICAL ROOM.
- INSTALLATION OF FIRESTOPPING AS REQUIRED AT ALL FIRE RATED CONDUIT PENETRATIONS.
- INSTALLATION OF NEW CEILING TO MATCH IN CORRIDOR AS REQUIRED FOR NEW ELECTRICAL RUNS.
- INSTALLATION OF CONDUIT RUNS AND BACK BOXES AT ALL NEW DATA LOCATIONS.
- INSTALL COTTON ACOUSTICAL CEILING MATERIAL.
- INSTALL NEW ACCESS PANELS IN SOFFITS PORTIONS TO BE CUT AND CAPPED.
- INSTALL NEW ELECTRICAL, DUCTWORK IT AND HVAC INDICATED ON DRAWINGS.

REV. NO. DATE REVISIONS



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MGENGINEERING
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Fashion Institute of Technology
 340 8TH AVENUE
 NEW YORK, NY 10001

David Smotrich & Partners LLP
 Architects/Planners

443 Park Avenue South New York, NY 10016
 212 889 4045 Fax 212 889 3672

PROJECT:
D-442 CLASSROOM RENOVATION
 POMERANTZ 300 7TH AVE
 NEW YORK NY 10001

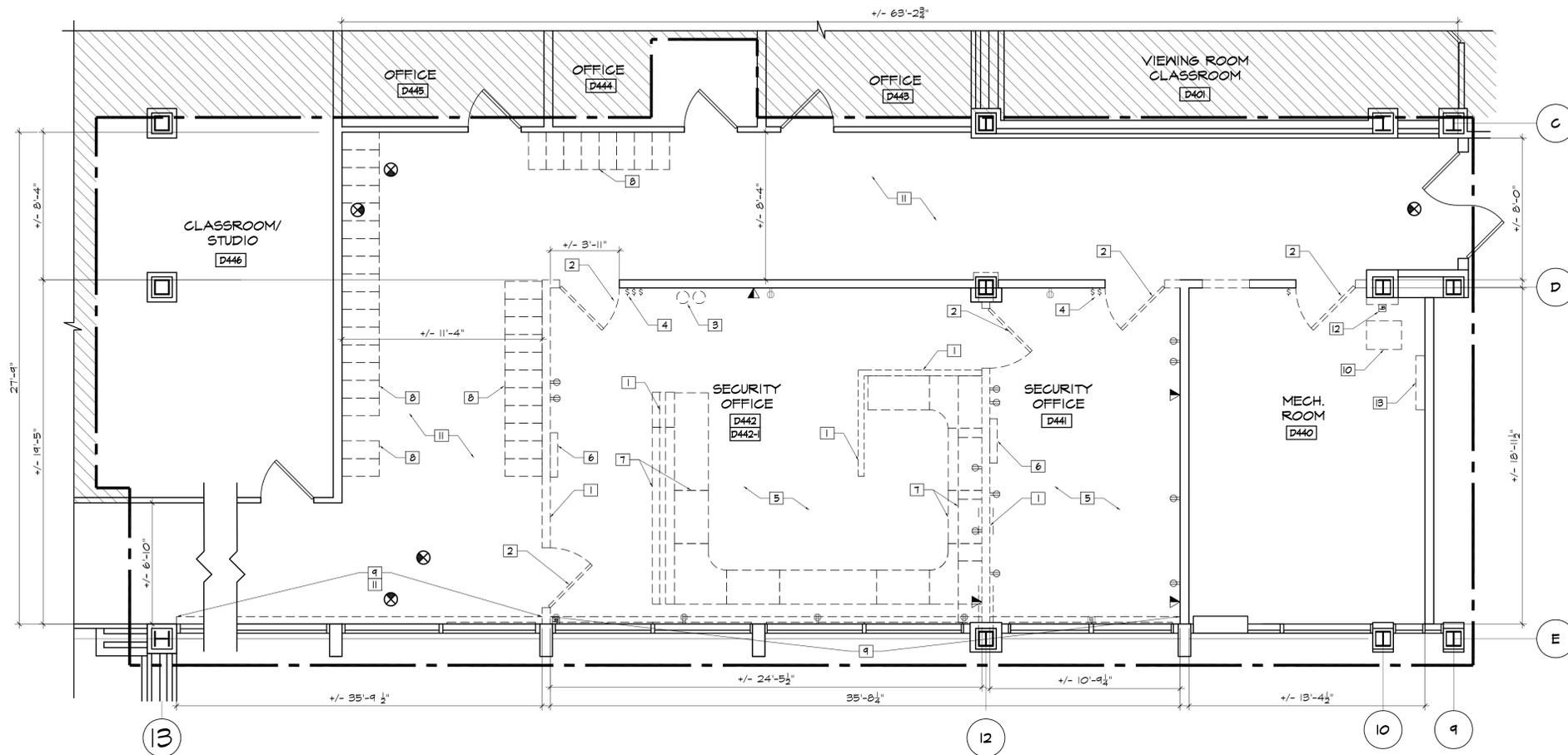
DRAWING TITLE:
GENERAL NOTES

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE: DATE: 6.7.2023
 PROJECT No: 222203
 DRAWING BY: MS/MM
 CHK BY: DH & CK
 DWG No:

G-001.00

SCALE: N.T.S. 2 of 12



1 4TH FLOOR DEMO PLAN
 DM-100 SCALE: 1/4" = 1'-0"

DEMOLITION NOTES

- 1 REMOVE EXISTING GMB WALLS AND ALL ASSOCIATED OUTLETS & EQUIPMENT AS INDICATED.
- 2 REMOVE EXISTING DOOR AND FRAME.
- 3 REMOVE WALL MOUNTED FIRE EXTINGUISHER & TURN OVER TO FIT.
- 4 REMOVE LIGHT SWITCH
- 5 REMOVE EXISTING CARPETING & VCT BELOW DOWN TO QUARRY TILE, SCRAPE & PREP AS REQ.
- 6 REMOVE WALL MOUNTED SCREEN & TURN OVER TO FIT.
- 7 REMOVE EXIST. FURNITURE AND CABINETS
- 8 EXIST. LOCKERS TO BE RELOCATED.
- 9 REMOVE EXIST. FTR COVER, FIN TUBE COVERS ONLY.
- 10 TEMPORALLY REMOVE WALL- MOUNTED HEATER AS REQUIRED TO INSTALL NEW FIRE RATED FURRED-OUT WALL BEHIND.
- 11 REMOVE EXIST VINYL BASE
- 12 EXIST. J-BOX TO BE RELOCATED AND POWER PROVIDED. (SEE A-100).
- 13 EXIST. TELEPHONE WIRING TO BE RELOCATED BY FIT

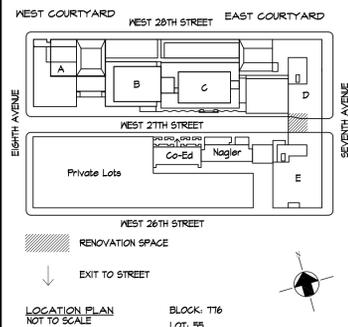
GENERAL NOTES:

- 1. ALL EXISTING EQUIPMENT TO REMAIN TO BE PROTECTED AS REQUIRED.
- 2. CONTRACTOR TO PROVIDE PROTECTION TO ALL EXISTING WALLS AND CEILING THAT ARE TO REMAIN (TYP).

LEGEND

- DOOR & DOOR FRAME TO BE REMOVED
- ==== WALL TO BE REMOVED
- ===== WALL TO REMAIN
- - - - - CONSTRUCTION LIMIT LINE

REV. NO. DATE REVISIONS



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PROJECT:
 D442 CLASSROOM RENOVATION
 POMERANTZ 300 7TH AVE
 NEW YORK NY 10001

DRAWING TITLE:
 4TH FLOOR
 DEMOLITION PLAN

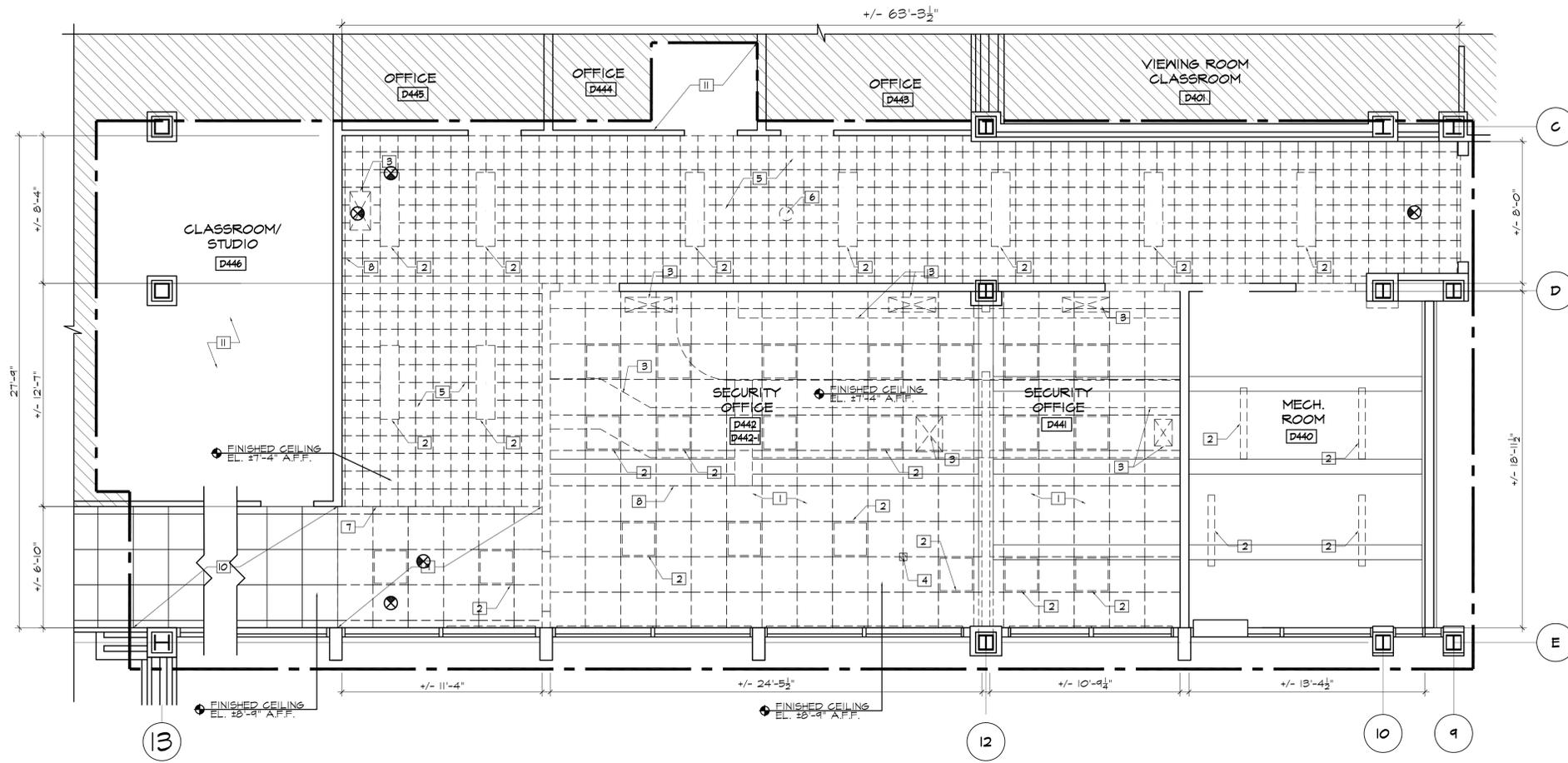
DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE:

DATE: 6.7.2023
 PROJECT No: 222203
 DRAWING BY: MS/MM
 CHK BY: DH & CK
 DWG No:

DM-100.00

SCALE: 1/4" = 1'-0" 3 of 12



1 4TH FLOOR DEMO RCP
 DM-400
 SCALE: 1/4" = 1'-0"

DEMOLITION NOTES

- 1 REMOVE ALL EXISTING 2X2 CEILING TILES, HANGERS AND SUPPORTING FRAME.
- 2 REMOVE ALL CEILING LIGHTS.
- 3 REMOVE EXIST. CEILING VENTS AND DUCTWORK, SEE MECH. DWGS FOR DETAILS
- 4 REMOVE EXIST. LIGHT SENSOR.
- 5 REMOVE EXIST. SPLINE CEILING AND ALL SUPPORTS.
- 6 FIT TO REMOVE EXIST. WIRE ACCESS POINT (WAP)
- 7 REMOVE EXIST. SOFFIT.
- 8 REMOVE EXIST. SPEAKER
- 9 EXIST. 2X2 ACT & LIGHTING TO BE REMOVED AND STORED FOR REINSTALLATION
- 10 EXIST. 2X2 ACT & LIGHTING TO REMAIN & PROTECT AS REQ.
- 11 EXIST. CEILING & LIGHTING TO BE REMOVED AND STORED FOR REINSTALLATION. COORDINATE THE EXACT DEMO. SCOPE WITH MECH. DWGS.

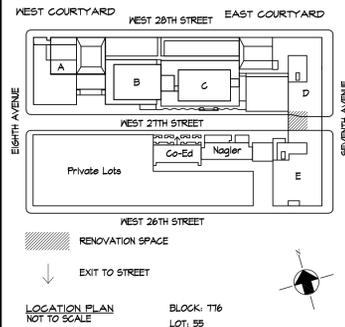
GENERAL NOTES:

- 1. ALL EXISTING EQUIPMENT TO REMAIN TO BE PROTECTED AS REQUIRED.
- 2. CONTRACTOR TO PROVIDE PROTECTION TO ALL EXISTING WALLS AND CEILINGS THAT ARE TO REMAIN (TYP.).
- 3. PROTECT ALL ADJACENT AREAS AND PATHWAYS OF TRAVEL TO AND FROM AREAS OF WORK.

LEGEND

- DOOR & DOOR FRAME TO BE REMOVED
- WALL TO BE REMOVED
- WALL TO REMAIN
- CONSTRUCTION LIMIT LINE

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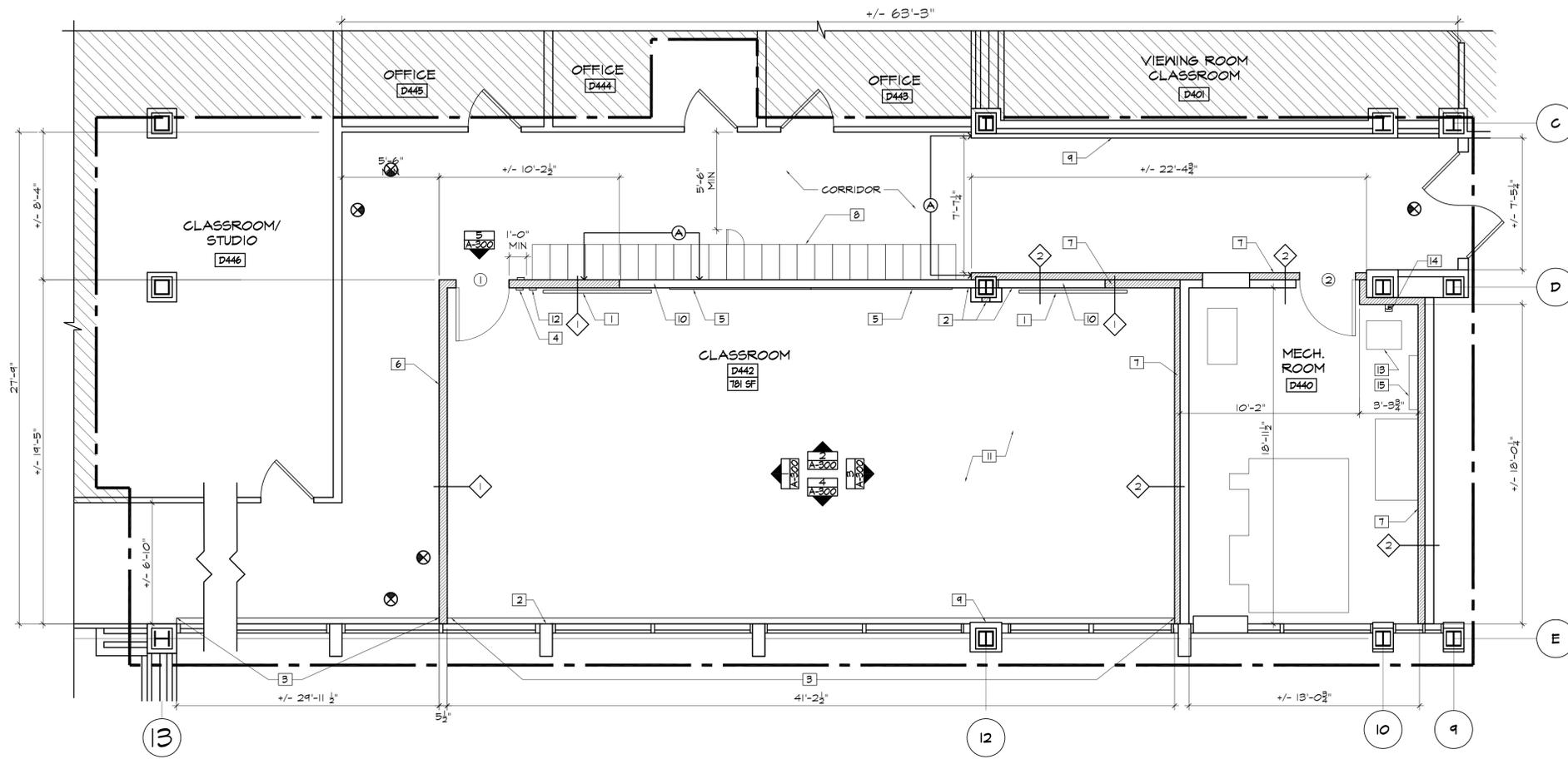
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PROJECT:
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DRAWING TITLE:
 4TH FL DEMOLITION PLAN
 REFLECTED CEILING PLAN

DEPARTMENT OF BUILDING JOB #

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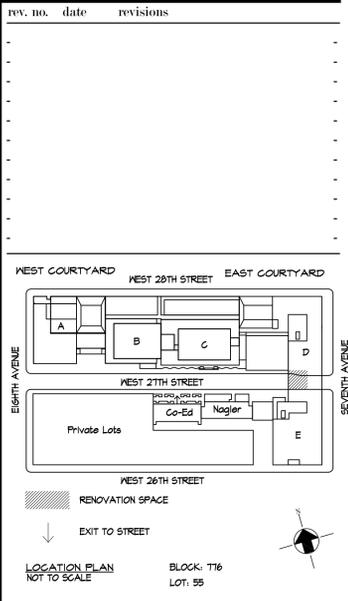


1 4TH FLOOR PLAN
A-100
SCALE: 1/4" = 1'-0"

CONSTRUCTION PLAN NOTES	
1	INSTALL TV MONITOR & PROVIDE BLOCKING AS REQ'D
2	PATCH EXISTING FIRE-PROOFING AS REQUIRED
3	NEW PTR COVER POWDER COATED COLOR WHITE. SEE MECHANICAL DRAWINGS (TYP).
4	LIGHTING CONTROL
5	NEW CLARUS FLOAT MAGNETIC GLASS MARKER BOARD W/BOX TRAY & PROVIDE BLOCKING AS REQ'D
6	NEW GNB WALL. SEE DRAWING A-100 FOR PARTITION TYPES.
7	NEW 2-HR RATED SHAFT PARTITION FURRED-OUT, PROVIDE FIRE STOPPING AT ALL RATED WALL PENETRATIONS (TYP)
8	RELOCATED 36 EXIST. LOCKERS
9	EXIST. LIMESTONE PANEL TO BE PATCHED, PREP TO RECEIVE PAINT. SEE A-201 FOR FINISHES.
10	PATCH EXIST. FIRE RATED WALL WHERE MECH. DUCTWORK HAS BEEN REMOVED USING WALL TYPE-I TO MATCH EXIST. WALL
11	PATCH EXIST. QUARRY TILE FLOOR & INSTALL SELF LEVELING
12	NEW COURTESY TELEPHONE
13	REINSTALL EXIST. HEATER
14	EXIST. J-BOX TO BE RELOCATED POWERED ONTO NEW FURRED OUT WALL.
15	EXIST. TELEPHONE WIRING TO BE RELOCATED BY FIT

CONSTRUCTION NOTES:
1. MAINTAIN MIN 5'-6" WIDTH FOR CORRIDOR

CONSTRUCTION LEGEND	
	EXISTING WALL TO REMAIN
	NEW WALL
	NEW DOOR & FRAME W/ DOOR NUMBER



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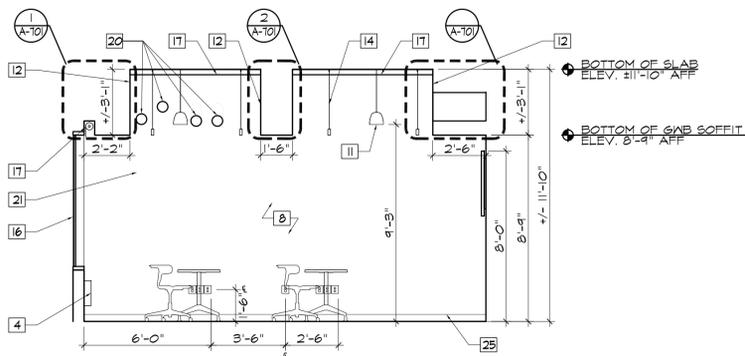
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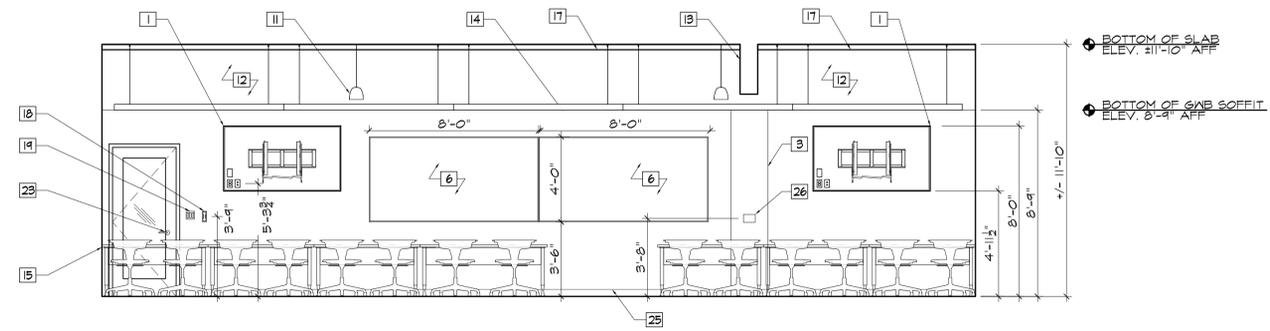
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4H FLOOR PLAN

DEPARTMENT OF BUILDING JOB #

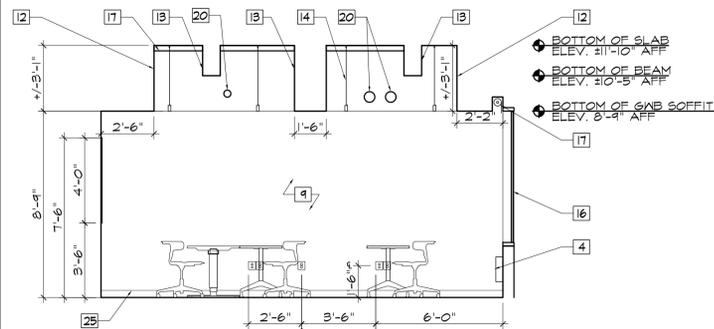
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	CHK BY: DH & CK
	DWG No:
	A-100.00
SCALE: AS NOTED	5 of 12



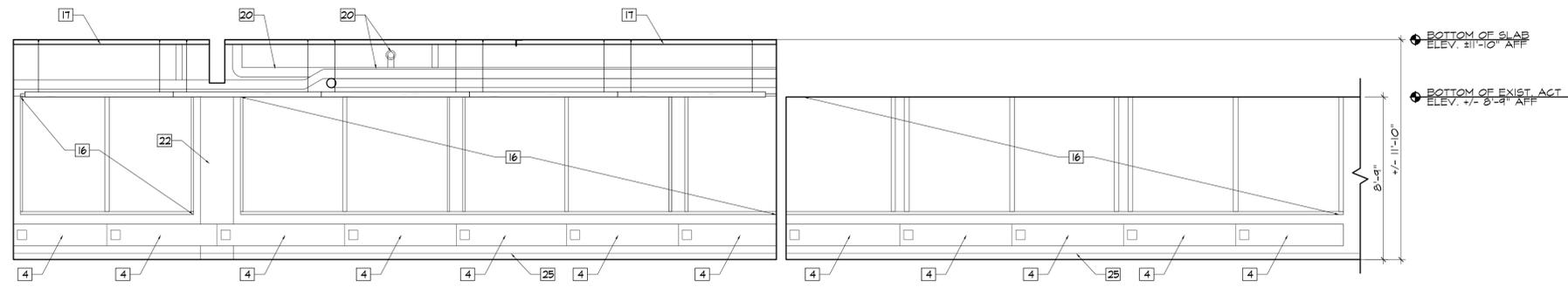
1 NORTH INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



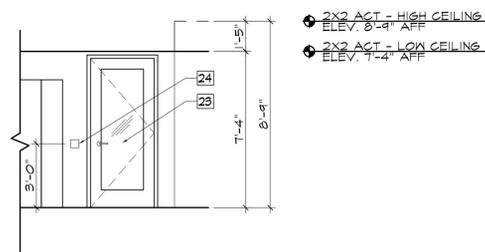
2 EAST INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



3 SOUTH INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

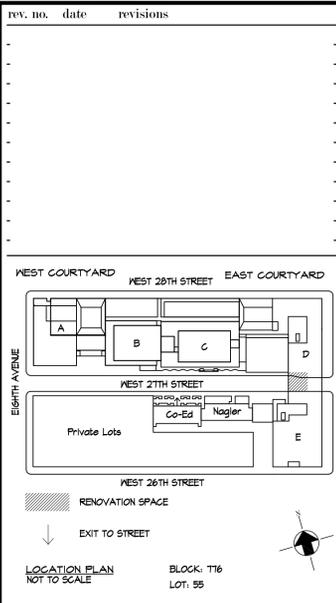


4 WEST INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



5 WEST INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

PLAN NOTES	
1 PROVIDE CONTINUOUS 126A METAL PLATE BLOCKING AS REQ'D FOR OWNER SUPPLIED TV & MOUNT.	14 NEW PENDANT LIGHT. SEE LIGHTING SCHEDULE ON DWG. A-400
2 NEW BLACK-OUT SHADES & POCKET COVER. PROVIDE BLOCKING AS REQ'D	15 PROVIDE DATA & POWER FROM THE WALL (TYP)
3 PATCH, REPAIR & PAINT EXIST. GAB & OPENINGS WHERE PARTITION AND DUCTWORK HAVE BEEN REMOVED THROUGHOUT (TYP.)	16 NEW GASKETS @ EXIST. WINDOW GLASS & FRAME TO BE CLEANED (TYP)
4 NEW FTR COVER POWDER COATED COLOR WHITE. SEE MECHANICAL DRAWINGS (TYP).	17 ACOUSTICAL COTTON PANEL - ECHO ELIMINATOR
5 NOT USED.	18 COURTESY TELEPHONE
6 NEW CLARUS FLOAT MAGNETIC GLASS MARKER BOARD W/BOX TRAY. PROVIDE BLOCKING AS REQ'D	19 LIGHTING CONTROLS
7 NOT USED.	20 ALL EXIST. PLUMBING PIPING IN CEILING TO BE INSULATED & FINISHED W/ PVC JACKETING (TYP)
8 NEW GAB WALL. SEE DRAWING A-700 FOR PARTITION TYPE.	21 NOT USED.
9 NEW 2-HR RATED SHAFT PARTITION FURRED-OUT, PROVIDE FIRE STOPPING AT ALL RATED WALL PENETRATIONS (TYP)	22 EXIST. LIMESTONE PANEL TO BE PATCHED, PREP TO RECEIVE PAINT. SEE A-800 FOR FINISHES.
10 NOT USED.	23 FIRE RATED H.M. & GLASS DOOR, SEE A-700 FOR DETAILS
11 INSTALL NEW PENDANT SPEAKERS (TYP), SEE EQUIPMENT SCHEDULE DWG. A-800	24 PROVIDE BACK BOX FOR OWNER SUPPLIED CARD READER
12 NEW GAB SOFFIT	25 NEW VINYL BASE - REF. A-800
13 PATCH, REPAIR & PAINT EXIST. CONCRETE BEAM (TYP)	26 NEW OWNER SUPPLIED BUTTON PANEL CONTROLLER. SEE EQUIPMENT SCHEDULE ON DWG. A-800



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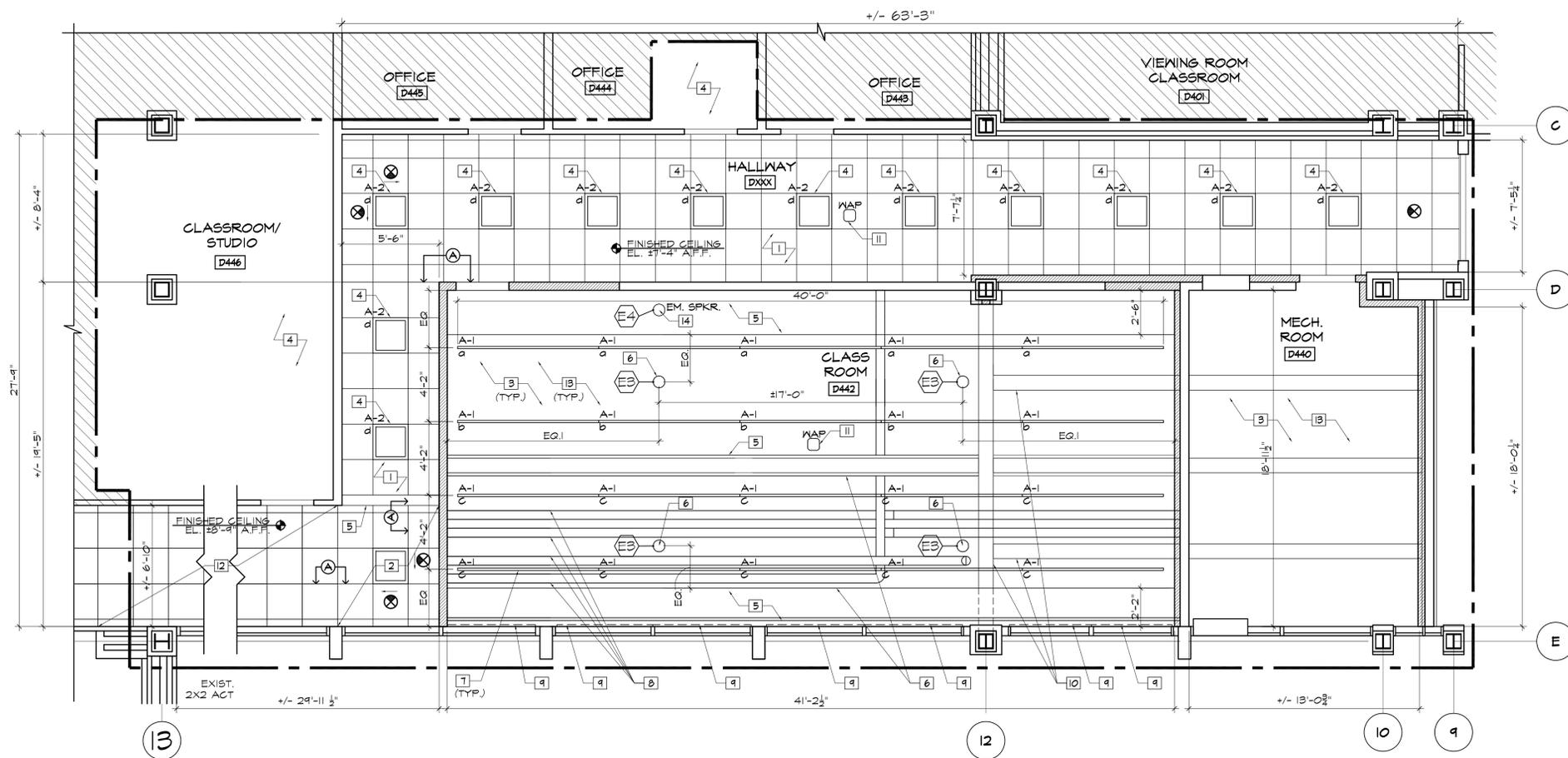
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PROJECT:
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DRAWING TITLE:
INTERIOR ELEVATIONS

DEPARTMENT OF BUILDING JOB #

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DWG No: _____
A-300.00
SCALE: AS NOTED 6 of 12



1 4TH FLOOR RCP
A-400
SCALE: 1/4" = 1'-0"

- REFLECTED CEILING PLAN NOTES**
- NEW 2'X2' ACT CEILING WITH SUSPENSION SYSTEM, MATCH EXIST.
 - REINSTALL EXIST. 2'X2' ACT & LIGHTING
 - PATCH & PAINT UNDERSIDE OF THE EXIST. STRUCTURAL SLAB
 - REMOVE & REPLACE EXIST. CEILING TILES AS REQUIRED TO COMPLETE MECHANICAL WORK
 - NEW GAB SOFFIT
 - NEW PENDANT SPEAKER (TYP) SEE EQUIPMENT SCHEDULE ON DWG. A-800
 - NEW PENDANT LIGHT (TYP)
 - ALL EXIST. PLUMBING PIPING IN CEILINGS TO BE INSULATED & FINISHED W/ PVC JACKETING (TYP)
 - NEW BLACK-OUT SHADES & POCKET COVER. PROVIDE BLOCKING AS REQ'D
 - PATCH, REPAIR & PAINT EXIST. CONCRETE BEAM (TYP)
 - WIRE ACCESS POINT (WAP)
 - EXIST. 2'X2' ACT TO REMAIN
 - ACOUSTIC COTTON PANEL - ECHO ELIMINATOR - TO BE APPLIED TO UNDERSIDE OF SLAB
 - NEW EMERGENCY SPEAKER. SEE EQUIPMENT SCHEDULE ON DWG. A-800

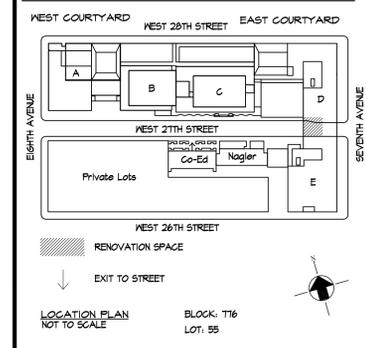
- LEGEND:**
- LINEAR LIGHTING
 - 2'X2' FIXTURE
 - ⊗ CLG MOUNTED EXIT SIGN
 - ⊙ WALL MOUNTED EXIT SIGN
 - WAP CEILING MOUNTED WIRELESS ACCESS POINT
 - EM SPK CEILING RECESSED EMERGENCY SPEAKER
 - RETURN AIR REGISTER
 - SUPPLY AIR REGISTER
 - ACCESS PANEL

- RCP NOTES:**
- REFER TO MECHANICAL DRAWINGS FOR HVAC EQUIPMENT INFORMATION, INCLUDING FIN TUBE COVERS
 - ALL WAP UNITS ARE TO BE COORDINATED WITH FIT IT.
 - REFER TO ELECTRICAL DRAWINGS FOR LIGHTING CONTROL INFORMATION.
 - CONTRACTOR TO SUPPLY & INSTALL (8) 18"X18" GRFC ACCESS PANELS TAPED & SPACKLED INTO GAB SOFFIT. LOCATIONS TO BE COORDINATED IN THE FIELD.

LIGHTING FIXTURE SCHEDULE

TYPE	FIXTURE DESCRIPTION	MANUFACTURER	LAMP QUANT.	LAMP TYPE	TOTAL WATTS	VOLTAGE	CONTROL	MTG HEIGHT	COMMENTS
A1	QUICKLINE LINEA 1.5' PENDANT DIRECT/INDIRECT	QUICKLINE QLPI-032	20	LED 3500K	108	UNV	0-10V DIM	8'-0" AFF	DIMMABLE, UP/DOWN LIGHT FEATURE INDIVIDUALLY CONTROLLED, 4 PRE-SET SETTINGS, SUSPENDED, WHITE FINISH, 8'-0" LENGTH
A2	EZPAN LOW-PROFILE LED PANEL 2'X2' EDGE-LIT PANELS.	RAB	12	LED 4000K	360	120V 50/60Hz	0-10V DIM	+/- 7'-4" AFF	DIMMABLE, RECESSED DRYWALL MOUNTED, MATCH EXIST.
⊗	UNO EDGE LIT EXIT SIGN	ENCORE LIGHTING		LED				±8'-2" AFF	CLG MOUNTED SINGLE FACE CLEAR

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DRAWING TITLE:
**4TH FLOOR RCP
& LIGHTING SCHEDULE**

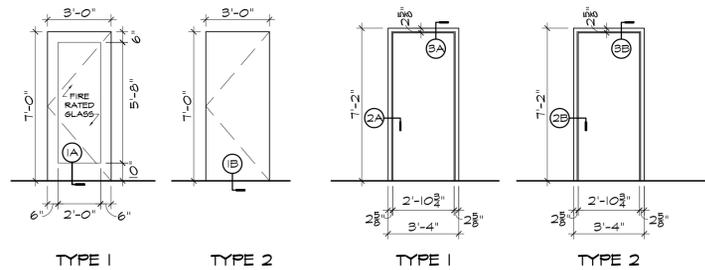
DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE: _____ DATE: 6.7.2023
PROJECT No: 22B203
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A-400.00
SCALE: AS NOTED 7 of 12

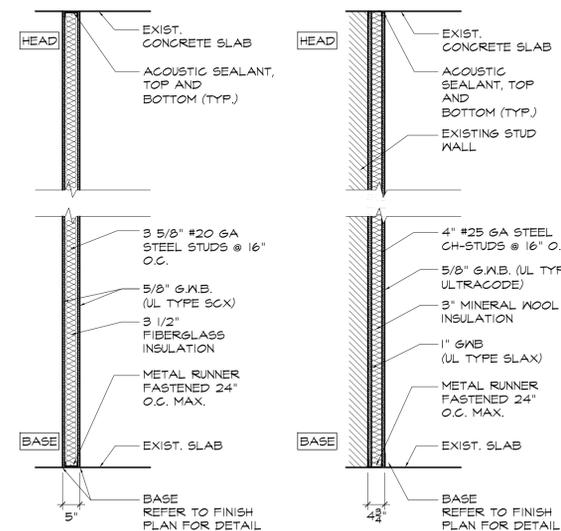
Door Schedule

#	DOOR		DOORS				FRAMES			LABEL	HARDWARE SET	REMARKS	
	FROM	TO	SIZE	THICK	MAT.	TYPE	MAT.	TYPE	JAMB				HEAD
1	CORRIDOR	D442	3'-0"x7'-0"	2 1/4"	H.M./GLASS	I	H.M.	1	2A	3A	UL 45 MIN	1	FIRE RATED GLASS
2	CORRIDOR	D440	3'-0"x7'-0"	1 3/4"	H.M.	II	H.M.	2	2B	3B	15 HR	2	

NOTES:
1. ALL DIMENSIONS ARE TO MATCH EXISTING DOORS TO BE REMOVED.
VERIFY ALL DIMENSIONS IN FIELD PRIOR TO FABRICATION.



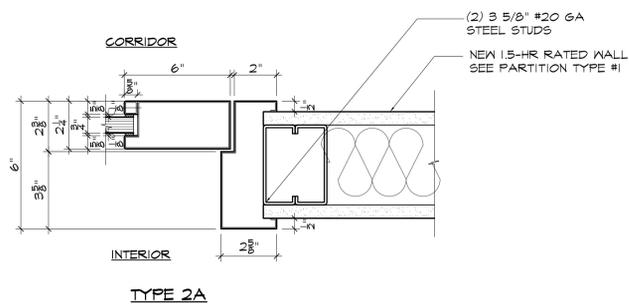
1 DOOR TYPE SCALE: 1/4" = 1'-0"
2 FRAME TYPE SCALE: 1/4" = 1'-0"



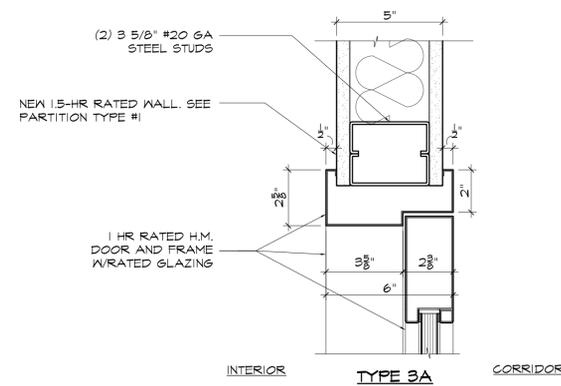
SOUND-INSULATED STC 49
1-HR RATED PARTITION
UL DESIGN F4119

SOUND-INSULATED STC 51
2-HR RATED PARTITION
UL DESIGN F4115

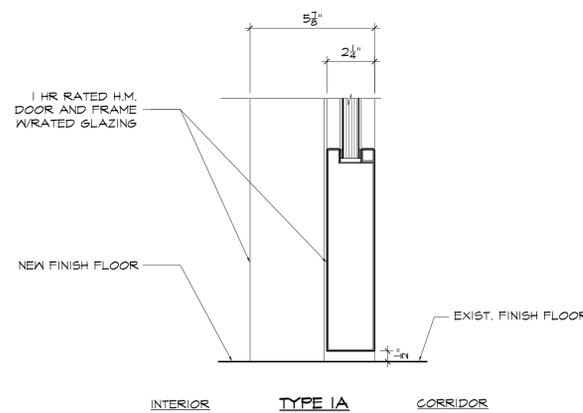
3 PARTITION SCHEDULE SCALE: 1/2" = 1'-0"



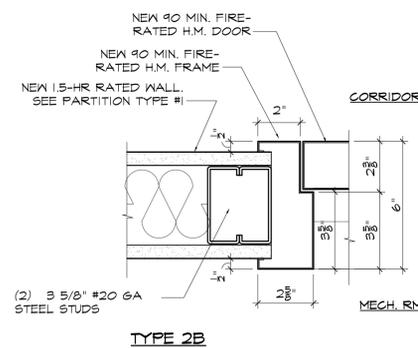
4 DOOR JAMB DETAIL SCALE: 3" = 1'-0"



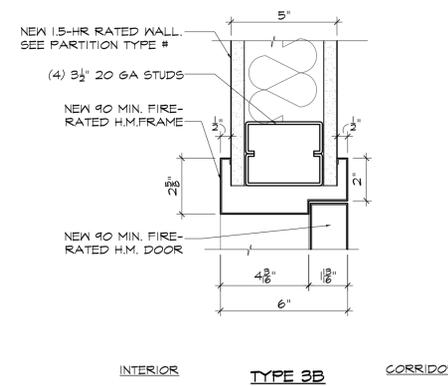
5 DOOR HEAD DETAILS SCALE: 3" = 1'-0"



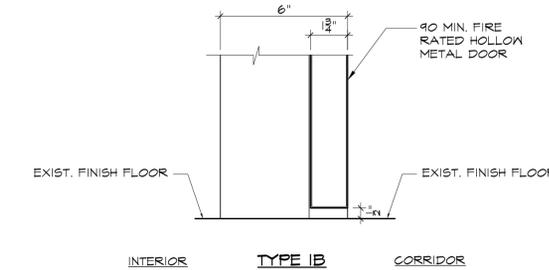
6 DOOR TYPES DETAILS SCALE: 3" = 1'-0"



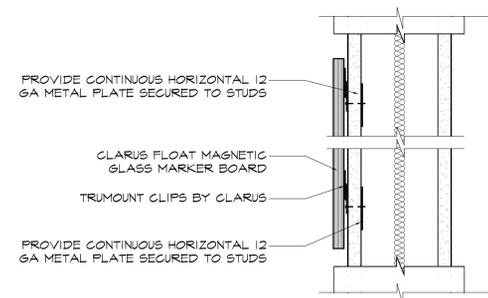
7 DOOR JAMB DETAIL SCALE: 3" = 1'-0"



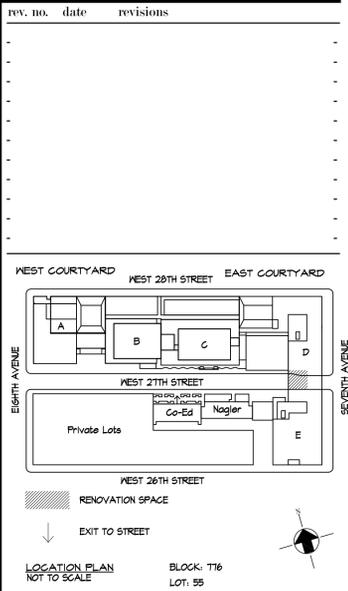
8 DOOR TYPES DETAILS SCALE: 3" = 1'-0"



9 DOOR TYPES DETAILS SCALE: 3" = 1'-0"



10 GLASS MARKER BOARD MOUNTING DETAIL SCALE: 3" = 1'-0"



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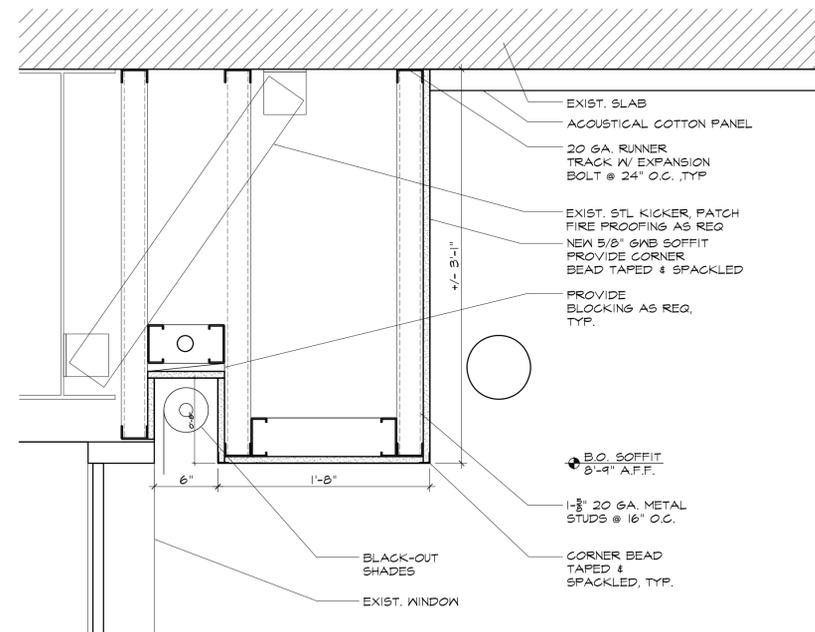
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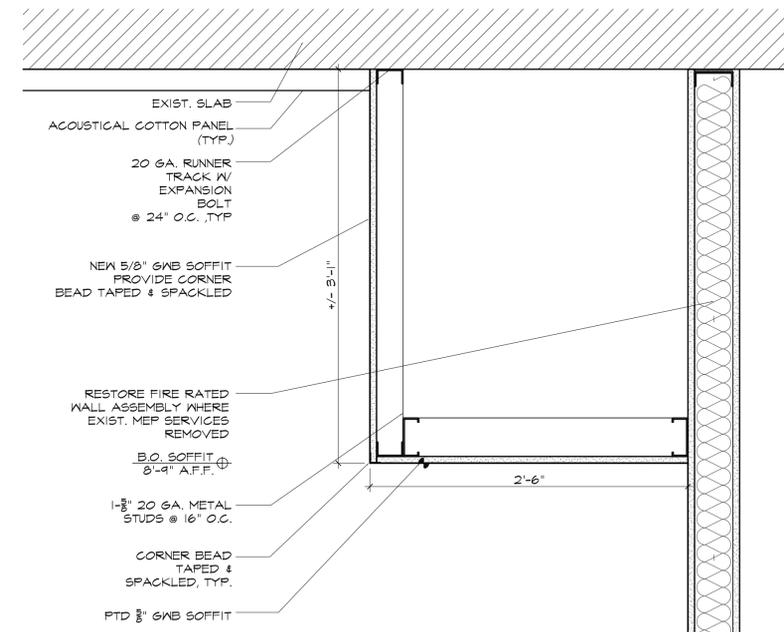
DRAWING TITLE:
**PARTITION &
DOOR SCHEDULE & DETAILS**

DEPARTMENT OF BUILDING JOB #

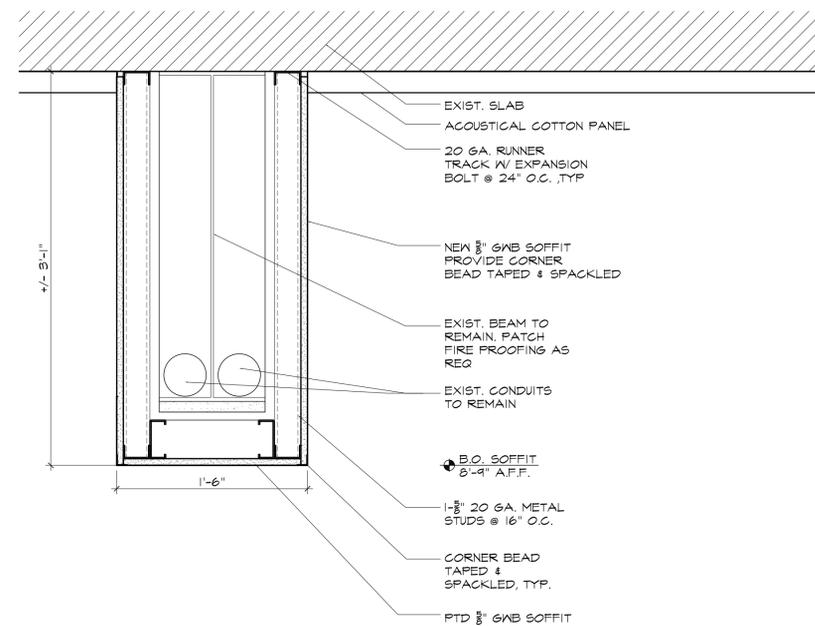
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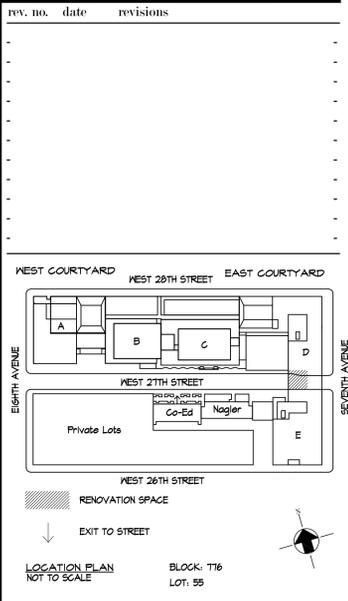
1 SOFFIT DETAIL
A-10 SCALE : 1/2" = 1'-0"



3 SOFFIT DETAIL
A-10 SCALE : 1/2" = 1'-0"



2 SOFFIT DETAIL
A-10 SCALE : 1/2" = 1'-0"



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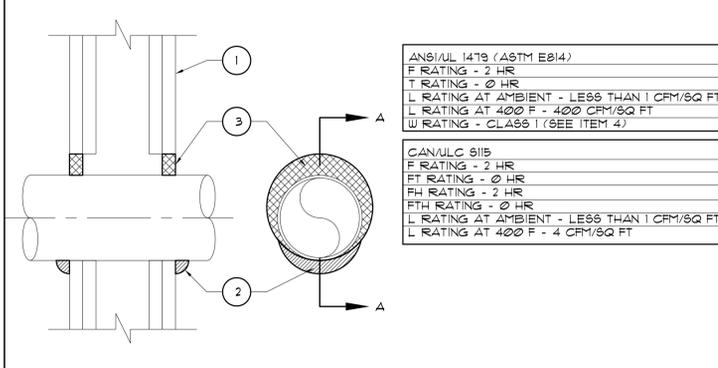
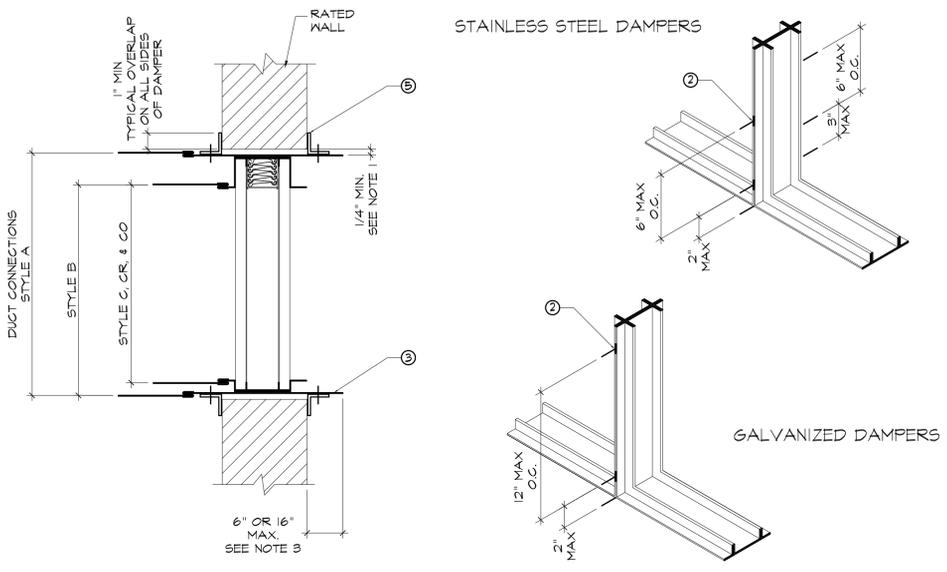
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DRAWING TITLE:

DETAILS

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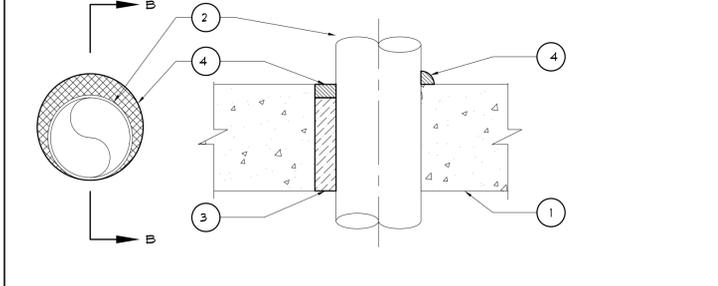
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DWG No:
A-701.00
SCALE: AS NOTED 9 of 12



- WALL ASSEMBLY - THE 1 OR 2 HR FIRE RATED WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES.
 - STUDS - WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
 - GYPSON BOARD - NOM 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSON WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 9-1/2 IN. THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
- THROUGH PENETRANT - ONE METALLIC TUBING OR CONDUIT INSTALLED CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. TUBE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDERS OF WALL ASSEMBLY. THE ANNULAR SPACE BETWEEN THE TUBE OR CONDUIT AND PERIPHERY OF THE STEEL SLEEVE SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1 IN. THE FOLLOWING TYPES AND SIZES OF METALLIC TUBE OR CONDUIT MAY BE USED:
 - CONDUIT - NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.
- FILL VOID OR CAVITY MATERIAL - PUTTY, MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT POINT CONTACT LOCATION BETWEEN PENETRANT AND WALL, A 1/4 IN. GROOVE OF FILL MATERIAL SHALL BE APPLIED AT THE CONDUIT/WALL INTERFACE ON BOTH SIDERS OF THE ASSEMBLY, LAPPING 1/4 IN. ON THE CONDUIT AND 1/4 IN. BEYOND THE PERIPHERY OF THE OPENING. HILTI INC - CP618 PUTTY STICK

2 FIRESTOPPING DETAIL - RATED WALLS HILTI FIRE RATED SYSTEM NO. W-L-1175 SCALE: 3" = 1'-0"

ANSI/UL 1479 (ASTM E814)	CAN/ULC 919
F RATING - 2 HR	FT RATING - 2 HR
T RATING - 0 HR	FT RATING - 0 HR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT	FT RATING - 0 HR
W RATING - CLASS 1 (SEE ITEM 4)	L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
	L RATING AT 400 F - 4 CFM/SQ FT

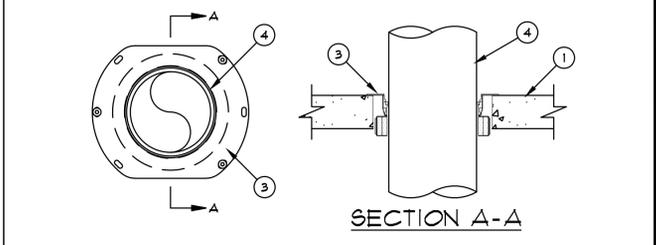


4 FIRESTOPPING DETAIL - SLAB HILTI FIRE RATED SYSTEM NO. F-A-1128 SCALE: 3" = 1'-0"

- FLOOR OR WALL ASSEMBLY - MIN 4-1/2 IN. (114 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M³) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS, MAX DIAM OF OPENINGS IS 12 IN. (305MM) SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
 - THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDERS OF FLOOR OR WALL ASSEMBLY. THE ANNULAR SPACE SHALL BE 0 IN. (POINT CONTACT) TO MAX 1-1/4 IN. (32 MM). THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
 - STEEL PIPE - NOM 10 IN. (254 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE
 - IRON PIPE - NOM 10 IN. (254 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
 - CONDUIT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.
 - COPPER TUBING - NOM 4 IN. (102 MM) (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
 - COPPER PIPE - NOM 4 IN. (102 IN.) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
 - PACKING MATERIAL - MIN 3 IN. (76 MM) THICKNESS OF MIN 4 PCF (64 KG/M³) MINERAL WOOL BATT INSULATION FOR NOM 4 IN. DIAM (AND SMALLER) PIPES, CONDUITS OR TUBINGS AND A MIN 4 IN. (102 MM) THICKNESS OF MIN 4 PCF (64 KG/M³) MINERAL WOOL BATT INSULATION FOR PIPE GREATER THAN NOM 4 IN. DIAM. FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
 - FILL, VOID OR CAVITY MATERIAL - SEALANT - MIN 1/4 IN. (13 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH THE TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL. AT POINT CONTACT LOCATION BETWEEN PIPE AND CONCRETE, A MIN 1/4 IN. (13 MM) DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/PIPE INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL. UL RATINGS APPLIES ONLY WHEN CP9-9 SIL G, CP9-9 SIL SL (FLOORS ONLY), CP6015, CP604 SEALANT OR FS-ONE MAX INTUMESCENT SEALANT IS USED. FOR W RATING WHEN FS-ONE MAX IS USED, PACKING MATERIAL TO BE A MIN 4 IN. (102 MM) THICKNESS OF MIN 4 PCF (64KG/M³) MINERAL WOOL BATT INSULATION. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - CP6015, CP604, CP6-5 SIL SL (FLOORS ONLY), CP600 OR FS-ONE SEALANT OR FS-ONE MAX INTUMESCENT SEALANT.
- *INDICATES SUCH PRODUCTS SHALL BEAR THE UL OR CUL CERTIFICATION MARK FOR JURISDICTIONS EMPLOYING THE UL OR SUL CERTIFICATION (SUCH AS CANADA), RESPECTIVELY.

3 FIRESTOPPING DETAIL - CONCRETE SLAB OR WALL HILTI FIRE RATED SYSTEM NO. C-JA-1149 SCALE: 3" = 1'-0"

ANSI/UL 1479 (ASTM E814)	CAN/ULC 919
F RATING - 2 4 3 HR (SEE ITEMS 1 & 1A)	F RATING - 2 4 3 HR (SEE ITEM 1 & 1A)
T RATING - 0 1/4 HR (SEE ITEM 2)	FT RATING - 0 1/4 HR (SEE ITEM 2)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT	FT RATING - 2 4 3 HR (SEE ITEMS 1 & 1A)
L RATING AT 400 F - LESS THAN 1 CFM/SQ FT	FT RATING - 0 1/4 HR (SEE ITEM 2)
W RATING - CLASS 1 (SEE ITEM 3A)	L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
	L RATING AT 400 F - LESS THAN 1 CFM/SQ FT



- FLOOR ASSEMBLY - MIN 2-1/2 IN. (64 MM) TO MAX 8 IN. (203 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M³) CONCRETE. WHEN CONCRETE THICKNESS IS MIN 4-1/2 IN. (114 MM), THE F AND FT RATINGS ARE 3 HR.
 - CONCRETE - MIN 2-1/2 IN. (64 MM) TO MAX 8 IN. (203 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M³) CONCRETE AS MEASURED OVER CREST OF FLUTED STEEL DECK. WHEN CONCRETE TOPPING THICKNESS IS MIN 4-1/2 IN. (114 MM), F AND FT RATINGS ARE 3 HR.
 - STEEL FLOOR AND FORM UNITS - COMPOSITE OR NON-COMPOSITE MAX 3 IN. (76 MM) DEEP GALV STEEL FLUTED UNITS AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILING DESIGN.
- METALLIC SLEEVE (OPTIONAL, NOT SHOWN) - NOM 4, 5 OR 6 IN. (102, 127 OR 152 MM) DIAM SCHEDULE 10 (OR HEAVIER) STEEL SLEEVE CAST OR GROUDED INTO FLOOR ASSEMBLY. FLUSH WITH FLOOR SURFACES. WHEN METALLIC SLEEVE IS USED, THE T, FT AND FT RATINGS ARE 0 HR.
 - SHEET METAL SLEEVE (OPTIONAL, NOT SHOWN) - NOM 4, 5, 6 OR 9 IN. (102, 127, 152 OR 229 MM) DIAM, MIN 26 GA GALV STEEL PROVIDED WITH A 26 GA GALV STEEL SQUARE FLANGE SPOT WELDED TO THE SLEEVE AT APPROX MID-HEIGHT, OR FLUSH WITH BOTTOM OF SLEEVE IN FLOORS, AND SIZED TO BE 4 MIN OF 2 IN. (51 MM) LARGER THAN THE SLEEVE DIAM. THE SLEEVE IS TO BE CAST IN PLACE AND MAY EXTEND A MAX OF 4 IN. (102 MM) BELOW THE BOTTOM OF THE DECK AND FLUSH WITH THE TOP SURFACE OF THE CONCRETE FLOOR. WHEN SHEET METAL SLEEVE IS USED, THE T, FT AND FT RATINGS ARE 0 HR.
- FIRESTOP DEVICE - DROP-IN FIRESTOP DEVICE INSTALLED IN CORE-DRILLED OR SLEEVED OPENING IN CONCRETE FLOOR ASSEMBLY. IN ACCORDANCE WITH ACCOMPANYING INSTALLATION INSTRUCTIONS, THE FIRESTOP DEVICE FLANGE SHOULD BE SECURED TO THE TOP SURFACE OF THE FLOOR WITH THREE 1/4 IN. (6 MM) DIAM BY MIN 1-1/4 IN. (32 MM) LONG STEEL EXPANSION BOLTS OR SCREW ANCHORS (INSTALLED IN A TRIANGULAR FASHION THROUGH HOLES PROVIDED), AS ALTERNATES TO THE ANCHORS SPECIFIED ABOVE, HILTI 1/4 IN. (6 MM) DIAM BY 1-1/4 IN. (32 MM) LONG KWIK-CON II+ CONCRETE SCREW ANCHOR, HILTI 1/4 IN. (6 MM) DIAM BY 1-3/4 IN. (45 MM) LONG KWIK-BOLT 3 STEEL EXPANSION ANCHOR OR HILTI 1/4 IN. (6 MM) BY 3/4 IN. (19 MM) LONG METAL HIT ANCHOR MAY BE USED. IN ADDITION, FOR NOM 2 IN. (51 MM), 3 IN. (76 MM) AND 4 IN. (102 MM) FIRESTOP DEVICES, FOUR 1/16 IN. (16 MM) LONG HILTI X-GH F18 MX STEEL FASTENERS MAY BE INSTALLED THROUGH THE STEEL FLANGE. TWO ON EACH SIDE. THE FIRESTOP DEVICES SHALL BE INSTALLED AS DETAILED IN THE FOLLOWING TABLE:

CORE HOLE OR SLEEVE DIAM.	FIRESTOP DEVICE	NOM. DIAM. OF THROUGH PENETRANT
4" (102 MM)	CF8-DID 2" MD	2" (51 MM) OR SMALLER
5" (127 MM)	CF8-DID 3" MD	3" (76 MM)
6" (152 MM)	CF8-DID 4" MD	4" (102 MM)
8" (203 MM)	CF8-DID 6" MD	5" (127 MM)

- FOR PIPE SMALLER THAN NOM 2 IN. (51 MM) DIAM, ADAPTER AND TOP SEAL PLUG IS REQUIRED TO BE USED. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - CF8-DID 2" MD, CF8-DID 3" MD, CF8-DID 4" MD, CF8-DID 6" MD
 - FIRESTOP DEVICE - WATER BARRIER MODULE (OPTIONAL, NOT SHOWN) - USED IN COMBINATION WITH THE CF8-DID DEVICE AND SUPPLIED BY DEVICE MANUFACTURER MODULE IS THREADED ONTO TOP OF DEVICE. W RATING AND L RATING APPLY ONLY WHEN WATER BARRIER MODULE IS USED. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - WATER BARRIER MODULE
 - THROUGH PENETRANT - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED WITHIN THE FIRESTOP DEVICE. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDERS OF FLOOR ASSEMBLY. THE FOLLOWING TYPES OF PIPE, CONDUIT OR TUBING MAY BE USED:
 - STEEL PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
 - IRON PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
 - CONDUIT - NOM 6 IN. (152 MM) DIAM (OR SMALLER) RIGID STEEL CONDUIT.
 - CONDUIT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.
 - COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
 - COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
- *BEARING THE UL CLASSIFICATION MARK

4 FIRESTOPPING DETAIL - SLAB HILTI FIRE RATED SYSTEM NO. F-A-1128 SCALE: 3" = 1'-0"

- OPENING CLEARANCE - THE OPENING IN THE WALL OR FLOOR SHALL BE LARGER THAN THE DAMPER/SLEEVE ASSEMBLY TO PERMIT INSTALLATION OR EXPANSION. FOR TWO ANGLE INSTALLATIONS THE OPENING SHALL BE A MINIMUM OF 1/8" PER FOOT LARGER THAN THE OVERALL SIZE OF THE DAMPER/SLEEVE ASSEMBLY. THE MAXIMUM OPENING SIZE SHALL NOT EXCEED 1/8" PER FOOT PLUS 2", NOR SHALL THE OPENING BE LESS THAN 1/4" LARGER THAN THE DAMPER/SLEEVE ASSEMBLY. FOR ONE ANGLE INSTALLATIONS, THE OPENING SHALL BE A MINIMUM OF 1/4" TO A MAXIMUM OF 1" LARGER THAN THE OVERALL SIZE OF THE DAMPER/SLEEVE ASSEMBLY. THE OPENING MAY BE AS MUCH AS 2" LARGER THAN THE DAMPER/SLEEVE ASSEMBLY IF 16 GA MOUNTING ANGLES ARE UTILIZED.
- FASTENERS AND MULTIPLE SECTION DAMPER ASSEMBLY - USE NO. 10 BOLTS OR SCREWS, 3/8" RIVETS, TACK WELDS OR SPOT WELDS AS DEPICTED IN FIGURES 3 AND 4 AND SPACED AS FOLLOWS WHEN JOINING INDIVIDUAL DAMPERS TO MAKE MULTIPLE SECTION DAMPER ASSEMBLIES OR WHEN FASTENING DAMPER TO THE SLEEVE:

VERTICAL MOUNT (IN WALL)	
GALVANIZED STEEL DAMPERS	12" SPACING
STAINLESS STEEL DAMPERS	6" SPACING
HORIZONTAL MOUNT (IN FLOOR)	
ALL DAMPERS	6" SPACING

 MULTIPLE SECTION HORIZONTAL MOUNT DAMPERS REQUIRE A 14 GAGE THICK X 4 1/2" WIDE STEEL REINFORCING PLATE SANDWICHED BETWEEN THE DAMPER FRAMES WITH 1/2" LONG WELDS STAGGERED INTERMITTENTLY AND SPACED ON MAXIMUM 6" CENTERS. THE REINFORCING PLATE MUST BE THE SAME MATERIAL AS THE DAMPERS. THE LENGTH MUST BE EQUAL TO THE DAMPER WIDTH OF TWO OR MORE ADJOINING DAMPER SECTIONS. REINFORCING PLATES ARE NOT REQUIRED FOR ASSEMBLIES CONSISTING OF TWO DAMPERS ATTACHED END-TO-END OR THREE DAMPERS ATTACHED SIDE-TO-SIDE AS DEPICTED IN FIGURE 5.
- DAMPER SLEEVE - SLEEVE THICKNESS MUST BE EQUAL TO OR THICKER THAN THE DUCT CONNECTED TO IT. SLEEVE GAGE REQUIREMENTS ARE LISTED IN THE SMACNA FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE FOR HVAC SYSTEMS AND IN NFPA 90A. IF A BREAKAWAY STYLE DUCT/SLEEVE CONNECTION IS NOT USED, THE SLEEVE SHALL BE A MINIMUM OF 16 GAGE FOR DAMPERS UP TO 36" WIDE BY 24" HIGH AND 14 GAGE FOR DAMPERS EXCEEDING 36" WIDE BY 24" HIGH. DAMPER SLEEVE SHALL NOT EXTEND MORE THAN 6" BEYOND THE FIRE WALL OR PARTITION UNLESS DAMPER IS EQUIPPED WITH A FACTORY INSTALLED ACCESS DOOR. SLEEVE MAY EXTEND UP TO 16" BEYOND THE FIRE WALL OR PARTITION ON SIDERS EQUIPPED WITH A FACTORY INSTALLED ACCESS DOOR. SLEEVE SHALL TERMINATE AT BOTH SIDE OF WALL WITHIN DIMENSIONS SHOWN.
- DAMPER ORIENTATION - USE "AIR FLOW" AND "MOUNT WITH ARROW UP" LABELS ON DYNAMIC D1BD AND D1BDX MODELS FOR PROPER DAMPER ORIENTATION. FOR STATIC IBD MODELS USE ONLY "MOUNT WITH ARROW UP" LABEL ON DAMPER FOR PROPER DAMPER ORIENTATION. STATIC AND DYNAMIC DAMPERS MUST BE INSTALLED WITH LEADING EDGE OF THE CLOSED BLADES WITHIN THE WALL OR FLOOR.
 - MOUNTING ANGLES - MOUNTING ANGLES SHALL BE A MINIMUM OF 1 1/4" X 1 1/4" X 20 GAGE STEEL. FOR OPENINGS IN METAL STUD, WOOD STUD WALLS OR CONCRETE/MASONRY WALLS AND FLOORS OF SIZES 30"X49" OR 49"X90" AND LESS MOUNTING ANGLES ARE ONLY REQUIRED ON ONE SIDE OF THE WALL OR TOP SIDE OF THE FLOOR AND MUST BE ATTACHED TO BOTH THE SLEEVE AND THE WALL OR FLOOR. MOUNTING ANGLES MAY BE INSTALLED DIRECTLY TO THE METAL STUD UNDER THE WALL BOARD ON METAL STUD WALL INSTALLATIONS ONLY. LARGER OPENINGS REQUIRE MOUNTING ANGLES ON BOTH SIDERS OF THE PARTITION AND MUST BE ATTACHED ONLY TO THE SLEEVE. MOUNTING ANGLES MUST OVERLAP THE PARTITION A MINIMUM OF 1". DO NOT WELD OR FASTEN ANGLES TOGETHER AT CORNERS OF DAMPERS. RUSKIN FIRE DAMPERS MAY BE INSTALLED USING RUSKIN FAST ANGLE FOR ONE ANGLE INSTALLATION OR RUSKIN FFMA FOR TWO ANGLE INSTALLATIONS.
 - MOUNTING ANGLE FASTENERS

SLEEVE: #10 BOLTS OR SCREWS, 3/8" STEEL RIVETS OR 1/2" LONG WELDS.
MASONRY/WALL OR FLOOR: #10 SELF-TAPPING CONCRETE SCREWS
WOOD/STEEL STUD WALL: #10 SCREWS
 - MOUNTING ANGLE FASTENER SPACING

FOR ONE ANGLE INSTALLATIONS THE SLEEVE FASTENERS SHALL BE SPACED AT 6" O.C. AND THE WALL OR FLOOR FASTENERS SHALL BE SPACED AT 12" O.C. WITH A MINIMUM OF 2 FASTENERS ON EACH SIDE, TOP AND BOTTOM. SCREW FASTENERS USED IN METAL STUD MUST ENGAGE THE METAL STUD A MINIMUM OF 1/2". SCREW FASTENERS USED IN WOOD STUD MUST ENGAGE THE WOOD STUD A MINIMUM OF 3/4". SCREW FASTENERS USED IN MASONRY WALLS OR FLOORS MUST ENGAGE THE WALL A MINIMUM OF 1 1/2". FOR TWO ANGLE INSTALLATIONS THE FASTENERS SHALL BE SPACED AT 8" O.C.
--
- DUCT/SLEEVE CONNECTIONS
 - BREAK-AWAY DUCT/SLEEVE CONNECTIONS - RECTANGULAR DUCTS MUST USE ONE OR MORE OF THE CONNECTIONS DEPICTED:

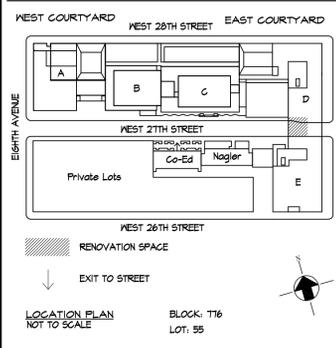
PLAIN "S" CLIP	HEMMED "S" CLIP	DOUBLE "S" CLIP	INSIDE SLIP JOINT	STANDING S
STANDING S (ANGLE REINFORCED)	STANDING S (ALT.)	STANDING S (BAR REINFORCED)	STANDING S (ANGLE REINFORCED)	DRIVE SLIP JOINT

 A MAXIMUM OF TWO #10 SHEET METAL SCREWS ON EACH SIDE AND THE BOTTOM, LOCATED IN THE CENTER OF THE SLIP POCKET AND PENETRATING BOTH SIDERS OF THE SLIP POCKET MAY BE USED. CONNECTIONS USING THESE SLIP JOINTS ON THE TOP AND BOTTOM WITH FLAT DRIVE SLIPS UP TO 20" LONG ON THE SIDERS MAY ALSO BE USED.
 - ROUND AND OVAL BREAK-AWAY CONNECTIONS - ROUND AND FLAT OVAL BREAK-AWAY CONNECTIONS MUST USE EITHER A 4" WIDE DRAWBAND OR #10 SHEET METAL SCREWS SPACED EQUALLY AROUND THE CIRCUMFERENCE OF THE DUCT AS FOLLOWS:

DUCT DIAMETERS 22" AND SMALLER - MAXIMUM 3 SCREWS
DUCT DIAMETERS OVER 22" AND INCLUDING 36" - MAXIMUM 5 SCREWS
DUCT DIAMETERS OVER 36" AND UP TO AND INCLUDING 181" TOTAL PERIMETER - MAXIMUM 8 SCREWS. FOR FLAT OVAL DUCTS, THE DIAMETER IS CONSIDERED THE LARGEST (MAJOR) DIMENSION OF THE DUCT.

 NOTE: WHEN OPTIONAL SEALING OF THESE JOINTS IS DESIRED, THE FOLLOWING SEALANTS MAY BE APPLIED IN ACCORDANCE WITH THE SEALANT MANUFACTURER'S INSTRUCTIONS: DESIGN POLYMERICS - DP1010 PRECISION - PA2084T HARDCAST, INC. - IRON GRIP 601 ECO DUCT SEAL 44-92
 - FLANGED BREAK-AWAY STYLE DUCT SLEEVE CONNECTIONS - FLANGED CONNECTION SYSTEMS MANUFACTURED BY DUCTMATE, NEXUS, OR WARD ARE APPROVED BREAK-AWAY CONNECTIONS WHEN INSTALLED AS SHOWN ON THE FLANGED SYSTEM BREAKAWAY CONNECTIONS SUPPLEMENT, TDC AND TDF ROLL-FORMED FLANGED CONNECTIONS USING 3/8" STEEL BOLTS AND NUTS, AND METAL CLEATS, AS TESTED BY SMACNA, AS APPROVED BREAK-AWAY CONNECTIONS WHEN INSTALLED AS SHOWN ON THE FLANGED SYSTEM BREAKAWAY CONNECTIONS SUPPLEMENT.
 - NON-BREAK-AWAY DUCT/SLEEVE CONNECTIONS - IF OTHER DUCT SLEEVE CONNECTIONS ARE USED, THE SLEEVE SHALL BE A MINIMUM OF 16 GAGE FOR DAMPERS UP TO 36" WIDE X 24" HIGH AND 14 GAGE FOR DAMPERS EXCEEDING 36" WIDE X 24" HIGH.
- INSTALLATION AND MAINTENANCE - TO ENSURE OPTIMUM OPERATION AND PERFORMANCE, THE DAMPER MUST BE INSTALLED SO IT IS SQUARE AND FREE FROM RACKING. EACH FIRE DAMPER SHOULD BE MAINTAINED AND TESTED ON A REGULAR BASIS AND IN ACCORDANCE WITH THE LATEST EDITIONS OF NFPA 90A AND LOCAL CODES. CARE SHOULD BE EXERCISED TO ENSURE THAT SUCH TESTS ARE PERFORMED SAFELY AND DO NOT CAUSE SYSTEM DAMAGE.

1 FIRESTOPPING DETAIL - DAMPER RUSKIN FIRE RATED SYSTEM NO. UL-R5531 SCALE: 1 1/2" = 1'-0"



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 POMERANTZ 300 7TH AVE
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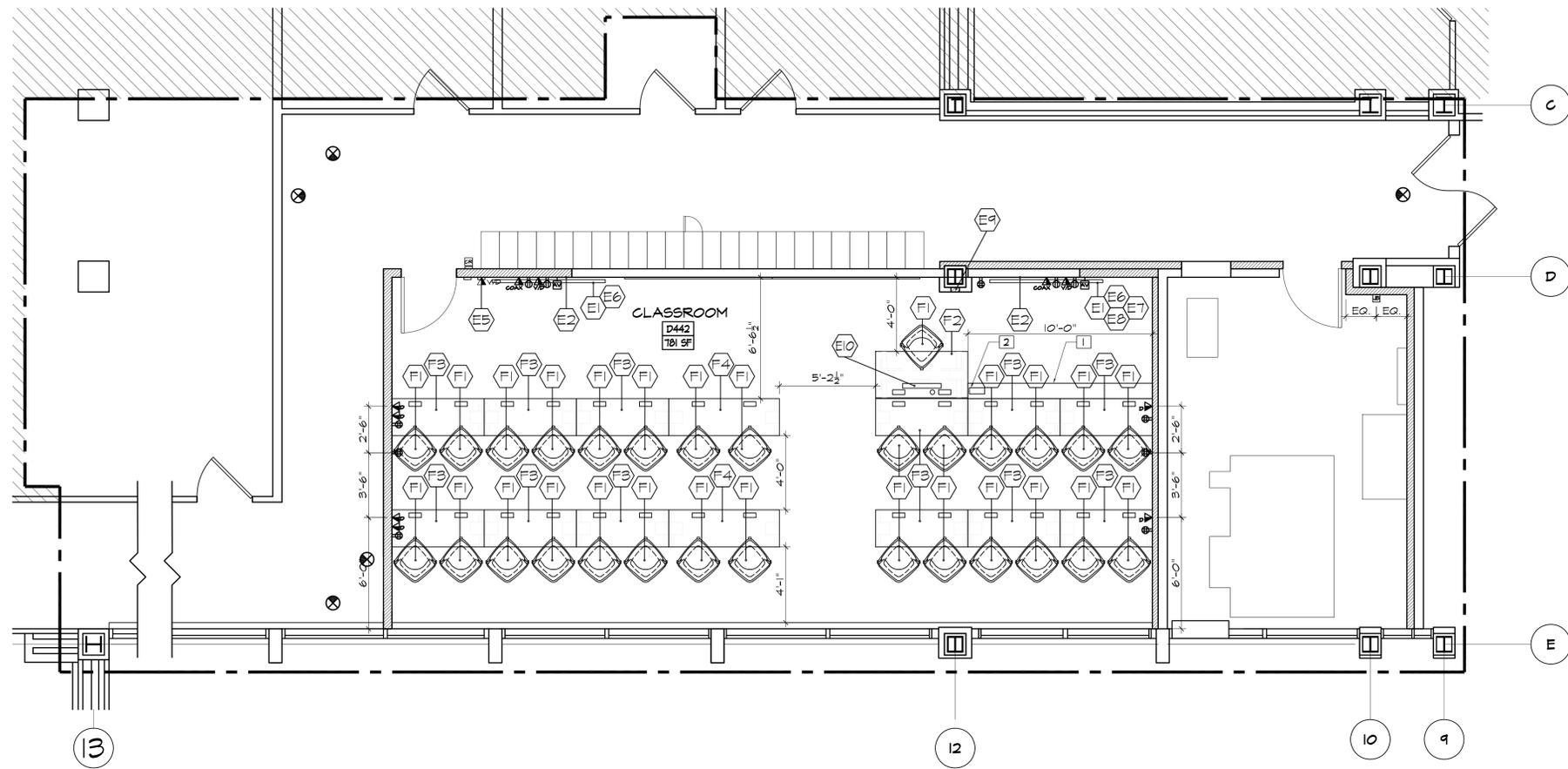
DRAWING TITLE:
FIRESTOPPING DETAILS

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE: DATE: 6.7.2023
 PROJECT No: 223203
 DRAWING BY: MS/MH
 CHK BY: DH & CK
 DWG No:

A-702.00

SCALE: AS NOTED 1 of 12



1 FURNITURE & POWER PLAN
A-300
SCALE: 1/4" = 1'-0"

- LEGEND
- ⊕ OUTLET
 - ⊕ QUAD
 - ⊕ DATA
 - ▽ VOICE/DATA
 - ▽ COAX JACK
 - ⊕ GANG BACK BOX
 - ⊕ CARD READER BACK BOX

Furniture Schedule - By Others

ITEM NO.	QTY.	MANUFACTURER	ITEM	DESCRIPTION	REMARKS
F1	24	KI	RUCKUS CHAIR	Polymer: Sky Blue Storage: Zesty Lime Legs: Chrome	SUPPLIED & INSTALLED BY OWNER
F2	1	KI	TOGGLE HEIGHT-ADJUSTABLE MOTORIZED RECTANGULAR TOP, FIXED T-LEG BASE TABLE 30X60 WITH MODESTY PANEL W/ (1) NACRE POP UP UNIT & GROMMET	Legs: Cotton Wood Top Laminate: Cotton Wood Edge: Sky Blue Modesty Panel: Felt Heather	SUPPLIED & INSTALLED BY OWNER
F3	12	KI	PIROUETTE FIXED RECTANGULAR TABLE 24X60 (2) NACRE POP UP UNITS W/ LEVITON QUICK PORT SERIES CAT 6 JACK	Legs: Cotton Wood Top Laminate: Cotton Wood Edge: Sky Blue	SUPPLIED & INSTALLED BY OWNER
F4	2	KI	PIROUETTE FIXED RECTANGULAR TABLE 24X12 (2) NACRE POP UP UNITS W/ LEVITON QUICK PORT SERIES CAT 6 JACK	Legs: Cotton Wood Top Laminate: Cotton Wood Edge: Sky Blue	SUPPLIED & INSTALLED BY OWNER

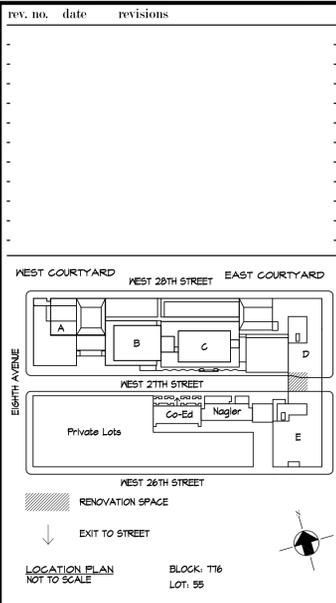
NOTE: FURNITURE TO BE PURCHASED BY, FIT & INSTALLED BY OTHERS UNLESS OTHERWISE NOTED

- NOTES:
- COORDINATE WITH ELEVATIONS FOR ALL POWER AND DATA LOCATIONS (TYP).
 - COORDINATE ALL ELECTRICAL WORK WITH ELECTRICAL DRAWINGS.
 - ALL NEW POWER TO BE COORDINATED WITH CPU POWER REQUIREMENTS
 - ALL NEW DATA TO BE COORDINATED WITH CPU REQUIREMENTS.
 - ALL FURNITURE AND EQUIPMENT, WHICH IS TO BE SUPPLIED BY OWNER, G.C. TO COORDINATE INSTALLATION.
 - G.C. TO COORDINATE FINAL LOCATIONS OF ELECTRICAL OUTLETS WITH OWNER AND ARCHITECT.
 - ALL OUTLETS TO BE INSTALLED NO LOWER THAN 15" ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED. SEE ELEVATIONS FOR MORE DETAILS.
 - OWNER TO PULL AV/IT WIRING AND MAKE FINAL CONNECTION
 - G.C. TO INSTALL CONDUIT TO RUN AND BACK BOX AT ALL NEW DATA LOCATIONS.
 - REFER TO MEP DRAWINGS FOR FURTHER INFORMATION

Equipment Schedule - By Others

ITEM NO.	ITEM	QTY.	MANUFACTURER	MODEL NO.	NOTES
E1	LED MONITOR	2	PANASONIC	TH-75CQE1W 75" 4K LED	FIT IT TO SUPPLY & INSTALL
E2	WALL MOUNT	2	CHIEF	LARGE UNIVERSAL FIXED MOUNT	FIT IT TO SUPPLY & INSTALL
E3	SPEAKER	4	CRESTRON	SAROS PD6T-W-T	FIT IT TO SUPPLY & INSTALL
E4	EMERGENCY SPEAKER	1	BOSEN	S86TT25P68U	FIT IT TO SUPPLY & INSTALL
E5	CONVENIENCE PHONE	1	CORTELCO	2554-15	FIT IT TO SUPPLY & INSTALL
E6	ENCODER/DECODER	1	CHIEF	DM-NVX-351 NETWORK AV ENCODER/DECODER	FIT IT TO SUPPLY & INSTALL
E7	LOCKING PLATE	1	CHIEF	C88LP15X10	FIT IT TO SUPPLY & INSTALL
E8	AMPLIFIER	1	CRESTRON	AMP-X300	FIT IT TO SUPPLY & INSTALL
E9	BUTTON PANEL CONTROLLER	1	CRESTRON	MPC3-302-B	FIT IT TO SUPPLY & INSTALL
E10	COMPUTER MONITOR	1	DELL	OPTIFLEX-T450 ALL-IN-ONE	FIT IT TO SUPPLY & INSTALL

- PLAN NOTES
- INSTALL CONNECTRAC FLEX SYSTEM RACEWAY FOR POWER & DATA
 - CONNECTRAC POWER & DATA OUTLET SNAP INTO THE RACEWAY



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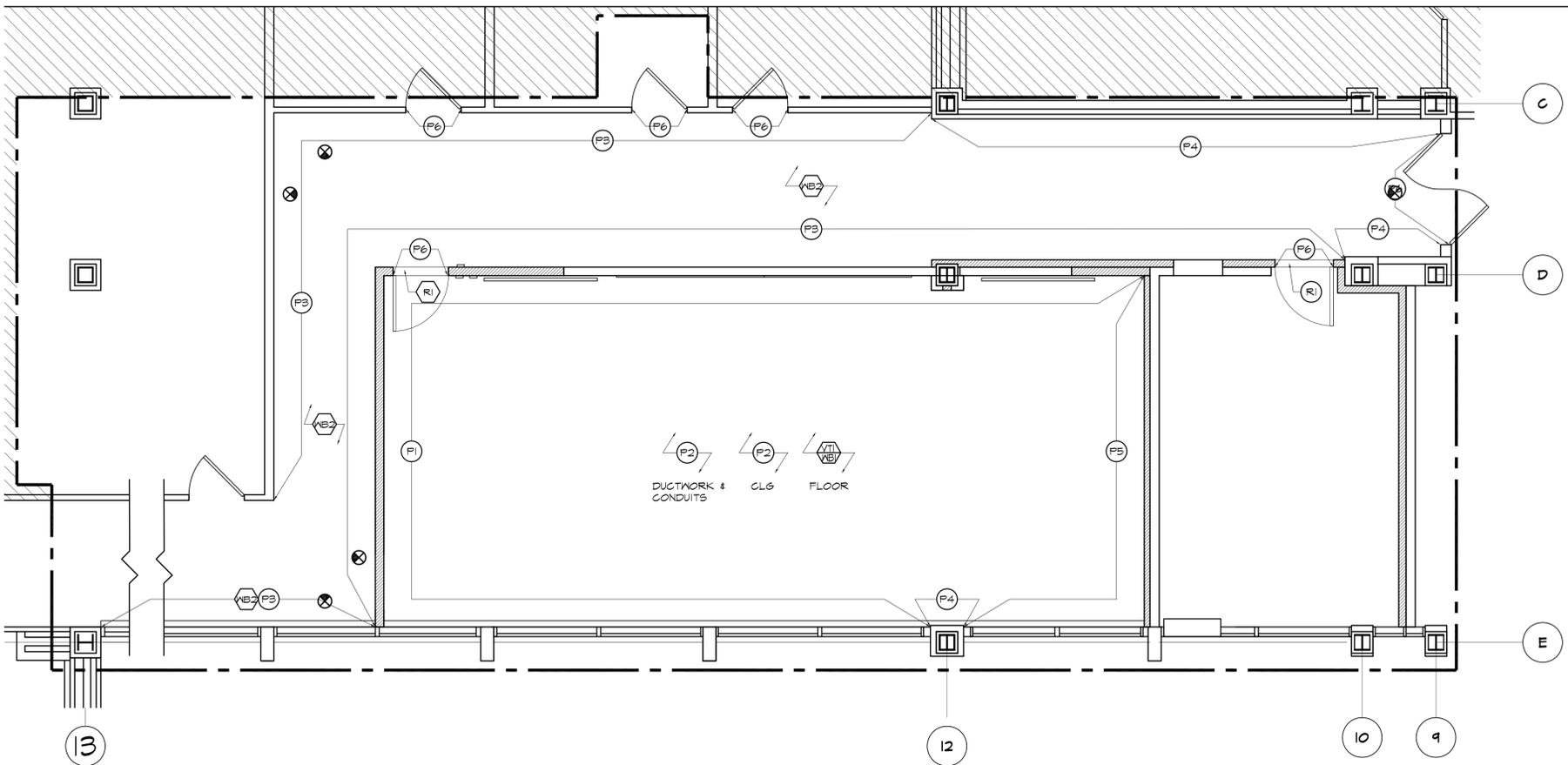
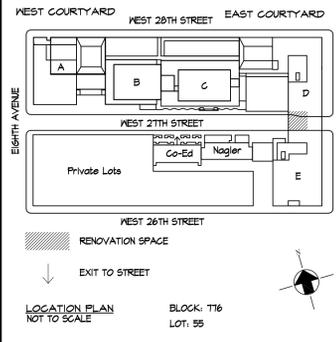
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DRAWING TITLE:
4TH FLOOR FURNITURE
POWER & DATA PLAN

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE: _____ DATE: 6.7.2023
PROJECT No: 223203
DRAWING BY: MS/MM
CHK BY: DH & CK
DWG No: _____
A-300.00
SCALE: AS NOTED 11 of 12



Finish Legend

PAINT	
P1	MFR: BENJAMIN MOORE NO: OC-121 COLOR: MOUNTAIN PEAK WHITE
P2	MFR: BENJAMIN MOORE NO: OC-121 COLOR: MOUNTAIN PEAK WHITE
P3	MFR: BENJAMIN MOORE NO: OC-121 COLOR: MOUNTAIN PEAK WHITE
P4	MFR: CONPROCO NO: 2008 COLOR: PUREST WHITE FINISH:
P5	MFR: BEN. MOORE NO: 2123-40 COLOR: SHADOW GRAY FINISH:
P6	MFR: BEN. MOORE NO: 2134-30 COLOR: IRON MOUNTAIN FINISH:
VINYL COMPOSITION TILE	
VTI	MFR: ARMSTRONG EXCHANGE STYLE: STATIC COLOR: CATHONE NUMBER: ST910
WALL BASE	
WBI	MFR: ALL STATE COVE NO: A4T
WBE	MFR: ALL STATE NO: MATCH EXISTING
REDUCING STRIP	
RI	

FINISH NOTES:
1. PAINT TYPE P-1 TO BE USED ON ALL WALLS, CEILING UNLESS OTHERWISE NOTED

1 FLOOR FINISH PLAN
A-801 SCALE: 1/4" = 1'-0"

Finish Schedule

RM. NO.	SPACE DESCRIPTION	FLOOR MATERIAL	REDUCING STRIP	BASE MATERIAL	WALLS MATERIAL	FIN	CEILING MATERIAL	FIN	HEIGHT
D442	CLASSROOM	VCT		WBI	WBE	P1	EXPOSED	P-1	+/-11'-10"

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PROJECT:
D442 CLASSROOM RENOVATION
POMERANTZ 300 7TH AVE
NEW YORK NY 10001

DRAWING TITLE:
4TH FLOOR FINISH PLAN & SCHEDULES

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE: _____ DATE: 6.7.2023
PROJECT No: 22B203
DRAWING BY: MS/MM
CHK BY: DH & CK
DWG No:
A-801.00
SCALE: AS NOTED 12 of 12

SYMBOL LIST AND ABBREVIATIONS		
ABBREV.	SYMBOL	DESCRIPTION
(E)		EXISTING WORK TO REMAIN
		NEW WORK
		EXISTING WORK TO BE REMOVED
		DIRECTION OF FLOW
		RETURN OR EXHAUST DUCT DOWN
		RETURN OR EXHAUST DUCT UP
		SUPPLY DUCT DOWN
		SUPPLY DUCT UP
MD		MOTORIZED DAMPER
FSD/AD, FD/AD, SD/AD		FIRE & SMOKE DAMPERS WACCESS DOOR IN DUCT AT WALL
		ACOUSTICALLY LINED DUCT
		DUCT MOUNTED SMOKE DETECTOR W/AD
		CARBON DIOXIDE SENSOR
		THERMOSTAT WITH DISPLAY
		HUMIDISTAT WITH DISPLAY
		CONNECT NEW TO EXISTING WORK
		POINT OF DISCONNECTION, CAP IF NOT TO BE RECONNECTED
TS		TEMPERATURE SENSOR
		THERMOMETER
		WATER PRESSURE GAUGE
		STEAM PRESSURE GAUGE WITH SYPHON
AAV		AUTOMATIC AIR VENT
CV		TWO WAY CONTROL VALVE
		THREE WAY CONTROL VALVE
		BUTTERFLY VALVE
		BUTTERFLY CONTROL VALVE
PSV		SAFETY RELIEF VALVE
		GATE VALVE / SHUT-OFF VALVE
		GLOBE VALVE
		BALL VALVE
		CHECK VALVE
		PLUG VALVE
		COMBINATION FLOW MEASURING AND BALANCING VALVE
		NEEDLE VALVE
		NEEDLE VALVE WITH BLOCK AND BLEED
		STRAINER WITH CAPPED BLOW-DOWN VALVE
TDV		TRIPLE DUTY VALVE
		ECCENTRIC REDUCER
		UNION
		CHILLED WATER RETURN
		CHILLED WATER SUPPLY
		LOW PRESSURE CONDENSATE RETURN
		LOW PRESSURE STEAM
		COLD (CITY) WATER
		PIPE DOWN
		PIPE UP
		END CAP
		PUMP

ABBREVIATIONS	
ABV	ABOVE
AC	AIR CONDITIONING
ACC	AIR COOLED CONDENSER
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFM	AIR FLOW MEASURING STATION
AHU	AIR HANDLING UNIT
AL	ACOUSTIC LINING
APD	AIR PRESSURE DROP
ATC	AUTOMATIC TEMPERATURE CONTROL
BHP	BRAKE HORSEPOWER
BG	BOTTOM GRILLE
BMS	BUILDING MANAGEMENT SYSTEM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BR	BOTTOM REGISTER
BTU	BRITISH THERMAL UNITS
CAR	CONSTANT AIRFLOW REGULATOR
CD	CONDENSATE DRAIN
CFM	CUBIC FEET OF AIR PER MINUTE
CHWS/R	CHILLED WATER SUPPLY AND RETURN
CO	CLEANOUT
COP	COEFFICIENT OF PERFORMANCE
CR	CEILING REGISTER
CT	COOLING TOWER
CTE	CONNECT TO EXISTING
CW	DOMESTIC COLD WATER MAKE-UP
CWS/R	CONDENSER WATER SUPPLY AND RETURN
CO	CLEANOUT
DDC	DIRECT DIGITAL CONTROL
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DR	DRAIN
DWG	DRAWING
E	EXISTING
EAT	ENTERING AIR TEMPERATURE
EBH	ELECTRIC BASEBOARD HEATER
ELEV	ELEVATION
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EW	ENTERING WATER TEMPERATURE
FC	FLEXIBLE CONNECTION
FD	FIRE DAMPER
FSD	COMBINATION FIRE/SMOKE DAMPER
FLA	FULL LOAD AMPERES
FLR	FLOOR
FOR	FUEL OIL FILL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
FPM	FEET PER MINUTE
FT	FEET
FTR	HOT WATER FINNED TUBE RADIATION
GA	GAUGE
GAL	GALLONS
GPM	GALLONS PER MINUTE
GS/R	GLYCOL SUPPLY AND RETURN
HP	HORSEPOWER
HP/WL/S/R	HEAT PUMP LOOP SUPPLY AND RETURN
HWS/R	HOT WATER SUPPLY AND RETURN
HZ	HERTZ
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LD	LINEAR DIFFUSER
LRA	LOCKED ROTOR AMPS
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MD	MOTORIZED DAMPER
MER	MECHANICAL EQUIPMENT ROOM
MFS	MAXIMUM FUSE SIZE
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
NC	NORMALLY CLOSED
NIC	NOT IN CONTACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OED	OPEN ENDED DUCT
PD	PRESSURE DROP
PH	PHASE
PRV	PRESSURE REDUCING VALVE
RG	RETURN GRILLE
RL	REFRIGERANT LIQUID PIPING
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RS	REFRIGERANT SUCTION PIPING
SD	SMOKE DAMPER
SEN	SENSIBLE
SG	SUPPLY GRILLE
SR	SUPPLY REGISTER
SPXF	SMOKE PURGE EXHAUST FAN
TG	TOP GRILLE
TO	TRANSFER OPENING
TR	TOP REGISTER
TRXF	TRASH ROOM EXHAUST FAN
TSP	TOTAL STATIC PRESSURE
TX	TOILET EXHAUST
TYP	TYPICAL
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
V	VENT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
VRV	VARIABLE REFRIGERANT VOLUME
WB	WET BULB (TEMPERATURE)
WC	WATER COLUMN
WCC	WATER COOLED CONDENSER
WMS	WIRE MESH SCREEN
WPU	WATER PRESSURE DROP
WT	WEIGHT

N.Y.C. BUILDING DEPARTMENT NOTES

- ALL WORK SHALL COMPLY WITH THE APPLICABLE SECTIONS OF THE BUILDING CODE, NEW YORK CITY, EFFECTIVE NOVEMBER 7, 2022 AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE, AND MATERIALS AND EQUIPMENT SUBJECT TO SPECIAL INSPECTION.
- THE FOLLOWING SPECIAL INSPECTIONS ARE REQUIRED BY THE NYC BUILDING CODE FOR HVAC SYSTEMS:
 - MECHANICAL SYSTEMS - BC 1705.21
 - MECHANICAL AND ELECTRICAL COMPONENTS - 1705.12.3
 - ENERGY CODE COMPLIANCE INSPECTIONS - BC 110.3.5
 - FINAL INSPECTIONS - UNDER DIRECTIVE 14
- THE FOLLOWING ENERGY CODE INSPECTIONS ARE REQUIRED BY THE NYC ENERGY CONSERVATION CODE FOR HVAC SYSTEMS:
 - VENTILATION AND AIR DISTRIBUTION SYSTEM (IB2)
 - HVAC-R AND SERVICE WATER HEATING EQUIPMENT - (IB3), (IB3)
 - HVAC-R AND SERVICE WATER HEATING SYSTEM CONTROLS - (IB4), (IB4)
 - HVAC-R AND SERVICE WATER PIPING DESIGN AND INSULATION - (IB5), (IB5)
 - MAINTENANCE INFORMATION - (ID1), (ID1)
 - DUCT LEAKAGE TESTING, INSULATION AND DESIGN - (IB6), (IB6)
- TEST OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION-MC 108 AND THE FOLLOWING SECTIONS OF THE NEW YORK CITY MECHANICAL CODE:
 - VENTILATION SYSTEM BALANCING - MC 403.3.1.6
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC., SHALL COMPLY WITH THE FOLLOWING CODE REFERENCE.
 - TEMPERATURE CONTROL - MC 309
 - NOISE CONTROL AND VIBRATION ISOLATION REQUIREMENTS - MC 313
 - DUCT CONSTRUCTION, SUPPORT - MC 603
 - FIRE DAMPERS AND SMOKE DAMPERS AND SMOKE DETECTORS - MC 607
- 68 DEGREES F IS THE MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON
- VENTILATION FOR ALL AREAS SHALL COMPLY WITH MC 401
- UPON COMPLETION OF THIS VENTILATION SYSTEM, A TEST SHALL BE CONDUCTED IN THE PRESENCE OF AND DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR HAVING NOT LESS THAN FIVE (5) YEARS OF EXPERIENCE SUPERVISING INSTALLATION OF VENTILATING SYSTEMS. THE TEST SHALL SHOW COMPLIANCE WITH THE CODE REQUIREMENTS FOR VENTILATION AND THE PROPER FUNCTIONING OF ALL OPERATING DEVICES BEFORE THE SYSTEM IS APPROVED. THE LICENSED PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT WHO CONDUCTS THE TESTS SHALL FILE A CERTIFICATE AS TO WHETHER THE SYSTEM COMPLIES WITH THE APPLICABLE LAWS. HE SHALL ALSO FILE WITH THE CERTIFICATION, A REPORT OF THE TEST, THE TEST AND REPORT SHALL BE MADE IN A MANNER SATISFACTORY TO THE SUPERINTENDENT. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING NORMAL OCCUPANCY OF THE STRUCTURE AS PROVIDED IN THE APPLICABLE SECTIONS OF THE CODE. BASE BUILDING PLANS ARE FILED FOR SINGLE TENANT OCCUPANCY. ALL TENANT PLANS WILL BE FILED UNDER SEPARATE APPLICATIONS.
- ALL FIRE DAMPERS SHALL BE APPROVED BY THE NEW YORK CITY DEPARTMENT OF BUILDINGS AND SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555, STANDARD FOR FIRE DAMPERS AND CEILING DAMPERS.
- REFER TO ARCHITECTURAL DRAWING FOR FIRE RATED WALL LOCATIONS AND RATED CONSTRUCTION.

NOTE

SYMBOLS AND ABBREVIATIONS LISTED IN THE TABLES ABOVE ARE TYPICAL FOR HVAC AIR AND WATER DISTRIBUTION SYSTEMS. NOT ALL OF LISTED SYMBOLS OR ABBREVIATIONS WERE USED IN THIS PROJECT.

GENERAL NOTES

- ANY EXISTING LEAD-BASED PAINT AREAS OF THE BUILDING WHERE THE CONTRACTOR AND ITS SUBCONTRACTORS ARE REQUIRED TO WORK SHALL BE MITIGATED PRIOR TO BEGINNING WORK. SUCH MITIGATION MAY INCLUDE FIT DIRECTING THE CONTRACTOR TO TAKE NECESSARY PRECAUTIONS AND WEAR PROTECTIVE GEAR TO WORK IN THE VICINITY OF THE LEAD PAINT. CONTRACTOR WILL NOT BE RESPONSIBLE FOR DELAYS CAUSED BY THE MITIGATION ACTIVITIES OR ANY ASSOCIATED COSTS.
- ALL PIPING AND DUCTWORK SHALL BE SUSPENDED FROM BUILDING STRUCTURE ONLY, EXCEPT AS SPECIFICALLY ALLOWED IN THE SPECIFICATIONS. HVAC CONTRACTOR SHALL PROVIDE SUPPLEMENTARY STEEL AS NECESSARY TO SUPPORT PIPES AND DUCTS FROM BUILDING STRUCTURE. THE ARCHITECT AND STRUCTURAL ENGINEER SHALL BE THE SOLE DETERMINANT AS TO PERMISSIBILITY OF HANGING NEW WORK FROM BUILDING STRUCTURE AND SLABS.
- PIPING AND DUCTWORK PROVIDED UNDER THIS CONTRACT SHALL BE COORDINATED UNDER THIS CONTRACT WITH WORK BEING PROVIDED BY OTHER TRADES.
- WHILE THE DRAWINGS SHALL BE ADHERED TO AS CLOSELY AS POSSIBLE, THE ARCHITECT'S RIGHT IS RESERVED TO VARY THE RUN AND SIZE OF DUCTS DURING THE PROGRESS OF THE WORK IF REQUIRED TO MEET CEILING HEIGHTS, TO MEET STRUCTURAL AND FIELD CONDITIONS. CONTRACTOR SHALL PROVIDE REDRAWING OF SHOP DRAWINGS AS NECESSARY TO ACCOMMODATE THE ARCHITECT'S REQUIREMENTS, AT NO ADDITIONAL COST TO THE OWNER. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR REQUIRED CEILING HEIGHTS.
- INSTALL ALL DUCTWORK IN STRICT ADHERENCE TO THE CEILING HEIGHTS INDICATED ON THE ARCHITECT'S DRAWINGS. CONSULT WITH OTHER CONTRACTORS AND IN CONJUNCTION WITH THE OTHER CONTRACTORS, ESTABLISH THE NECESSARY SPACE REQUIREMENTS FOR EACH TRADE.
- THE SHEET METAL DUCTWORK SHALL, WHETHER INDICATED OR NOT, RISE AND/OR DROP AND/OR CHANGE IN SHAPE TO CLEAR ANY AND ALL OTHER DUCTWORK, CONDUITS, LIGHTING FIXTURES, PLUMBING AND HEATING/COOLING MAINS TO MAINTAIN THE DESIRED CEILING HEIGHTS AND TO PROVIDE ADEQUATE MAINTENANCE ROOM AND HEADROOM IN MECHANICAL EQUIPMENT ROOMS. THE DRAWINGS, IN GENERAL, DO NOT SHOW ALL RISES, DROPS AND DUCT TRANSITIONS REQUIRED. THE DRAWINGS SHOW GENERAL ROUTING REQUIREMENTS ONLY.
- ALL RECTANGULAR DUCTWORK, UNLESS OTHERWISE NOTED, SHALL BE BUILT FROM GALVANIZED SHEET STEEL AND THOROUGHLY BRACED AND STIFFENED.
- PROVIDE 12" x 12" ACCESS DOORS EVERY 50'-0" RUN OF SUPPLY AND RETURN AIR DUCT FOR CLEANING PURPOSES. EXCEPT IN DUCT ABOVE SOUND CONTROL CEILING. PROVIDE 18" x 18" ACCESS DOORS UPSTREAM AND DOWNSTREAM OF EACH REHEAT COIL, AT EACH FIRE AND FIRE/SMOKE DAMPER, AT EACH MOTORIZED DAMPER, AT EACH CV AND VAV TERMINAL BOX AND WHEREVER ELSE INDICATED IN THE SPECIFICATION. IF THE DUCT IS TOO SMALL TO PROVIDE AN 18" x 18" ACCESS DOOR, A 12" x 12" ACCESS DOOR SHALL BE PROVIDED. SEE SPECIFICATIONS FOR ADDITIONAL ACCESS DOOR REQUIREMENTS.
- SEE SPECIFICATION FOR DUCTS REQUIRED TO BE ACOUSTICALLY LINED. DIMENSIONS GIVEN ON PLANS ARE INSIDE CLEAR DIMENSIONS. INCREASE SIZE OF SHEET METAL DUCT TO PROVIDE THE SPECIFIED INSIDE CLEAR DIMENSION WITH ACOUSTICAL LINING ADDED.
- PROVIDE ISOLATION VALVES WHERE TYING NEW PIPING INTO THE EXISTING SYSTEM. REFER TO THE VALVES SPECIFICATIONS FOR THE PROPER VALVE TYPE FOR THE SERVICE. REFER TO THE DRAWINGS FOR THE PIPE/VALVE SIZE. IN ADDITION TO THE ISOLATION VALVES AT THE TIE-IN POINTS, ALSO PROVIDE A BALANCING VALVE ON THE SUPPLY SIDE FOR CHILLED WATER, CHILLED GLYCOL/BRINE, CONDENSER WATER AND HEATING/REHEAT HOT WATER SYSTEM TIE-INS.
- SYMBOLS AND ABBREVIATIONS SHOWN ON THE DRAWINGS ARE FOR MECHANICAL DRAWINGS ONLY. SEE OTHER TRADES DRAWINGS FOR THEIR RESPECTIVE SYMBOLS AND ABBREVIATIONS.
- PRIOR TO PERFORMING ANY CORE DRILLING OR CUTTING OF EXISTING FLOOR OR ROOF SLAB, CONTRACTOR SHALL PERFORM A SCAN OF THE SLAB USING GROUND PENETRATING RADAR (GPR) TO CONFIRM THAT THERE ARE NO EXISTING CONDUITS OR PIPES IN THE AREA OF CORE DRILL OR CUTTING OF THE SLAB.

PROJECT DATA LOCATION:
300 7TH AVENUE
NEW YORK, NY 10001

PROPERTY IS NOT LOCATED IN SPECIAL FLOOD HAZARD AREA.

DEMOLITION NOTES

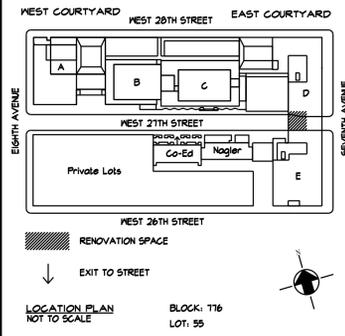
- DEMOLITION OF HVAC ITEMS SHALL BE PERFORMED UNDER THE HVAC CONTRACT.
- LOCATION OF THE EXISTING DUCTWORK & PIPING AS SHOWN ON DRAWINGS IS APPROXIMATE.
- PROVIDE TEMPORARY SUPPORTS WHERE REQUIRED.
- DURING DEMOLITION, PROPERLY CAP AND PROTECT ALL DUCTWORK, EQUIPMENT, AND PIPING THAT WILL REMAIN IN OPERATION.
- WHERE EXISTING INSULATION TO REMAIN IS DAMAGED BY THE REQUIREMENTS OF THE WORK, REPLACE ANY DAMAGED INSULATION TO MATCH EXISTING.
- DEMOLISH ALL EQUIPMENT AS INDICATED, FIXTURES AND/OR MISCELLANEOUS ARTICLES IN THEIR ENTIRETY INCLUDING AUXILIARY EQUIPMENT, PIPING, WIRING, CONDUIT AND DUCTWORK. DEMOLITION WORK SHALL BE PERFORMED BY WORKMEN EXPERIENCED IN THIS TYPE OF WORK AND SHALL BE CARRIED THROUGH TO COMPLETION WITH DUE REGARDS TO THE SAFETY OF ALL BUILDING OCCUPANTS AND THE EMPLOYEES OF THE CONTRACTOR WITH AS LITTLE DISTURBANCE AS POSSIBLE.
- MATERIALS RESULTING FROM THE DEMOLITION OPERATIONS SHALL NOT BE ALLOWED TO ACCUMULATE ON THE FLOORS AND ROOF SURFACES. EXTERIOR GRADE SURFACES OR OTHER PARTS OF THE PREMISES, AND SHALL BE PROMPTLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES.
- INCLUDE ALL DEMOLITION OF SYSTEMS AND COMPONENTS WHERE SYSTEMS SHALL BE REPLACED BY NEW WORK. REFER TO THE DRAWINGS AND SPECIFICATIONS FOR THE SCOPE OF NEW AND RECONNECTED WORK. THE INTENT OF THIS REQUIREMENT IS TO HAVE THE CONTRACTOR DISCONNECT, DEMOLISH AND REMOVE ALL EXPOSED AND CONCEALED WORK WHERE BEING REPLACED OR CONNECTED TO THE NEW LAYOUTS.
- COORDINATE ELECTRICAL POWER DISCONNECTION PRIOR TO DEMOLITION WITH ELECTRICAL CONTRACTOR.
- PROTECT ALL HVAC WORK AND WORK OF OTHER TRADES WHICH IS TO REMAIN, FROM DAMAGE DURING DEMOLITION.
- ALL PIPING AND DUCTWORK TO REMAIN SHALL HAVE ENDS TERMINATED IN A NEAT MANNER READY FOR CONNECTION OF NEW WORK. ALL EXPOSED ENDS OF PIPING AND DUCTWORK SHALL BE CAPPED. SCREWED PIPING SHALL END ON A SCREWED JOINT. FLANGED PIPE SHALL END WITH A FLANGED JOINT. WELDED PIPING SHALL BE MECHANICALLY CUT, CLEANED OF BURRS AND A CAP WELDED TO THE PIPE. DUCTWORK SHALL BE CAPPED WITH SHEET METAL CONNECTED TO THE DUCT TO REMAIN.
- REMOVAL OF EQUIPMENT, PIPING AND DUCTWORK SHALL INCLUDE ALL HANGERS & SUPPORT ASSOCIATED WITH THE EQUIPMENT, PIPING AND DUCTWORK TO BE REMOVED.

SCOPE OF WORK

- RENOVATION OF CLASSROOM D442 INCLUDES INSTALLATION OF NEW VAV TERMINAL UNIT, DUCTWORK AND AIR OUTLETS.
- DEMOLITION OF EXISTING SECURITY OFFICES D441 & D442 INCLUDES DEMOLITION OF EXISTING RETURN AND SUPPLY DUCTWORK.

DRAWING LIST

M-001.00	MECHANICAL SYMBOLS, ABBREVIATIONS, NOTES AND DRAWING LIST
M-104.00	FOURTH FLOOR MECHANICAL PLAN
M-501.00	MECHANICAL DETAILS
M-701.00	MECHANICAL SCHEDULES
M-801.00	MECHANICAL CONTROL DIAGRAMS
M-904.00	FOURTH FLOOR MECHANICAL DEMOLITION PLAN



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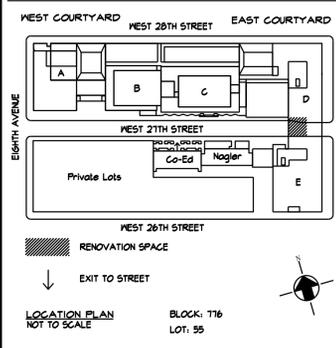
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PROJECT:
D442 CLASSROOM RENOVATION
POMERANTZ 300 7TH AVE
NEW YORK NY 10001

DRAWING TITLE:
MECHANICAL SYMBOL LIST, ABBREVIATIONS, NOTES AND DRAWING LIST

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE: _____ DATE: 06.07.2023
PROJECT No: 223203
DRAWING BY: AB
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SCALE: NTS 1 OF 6



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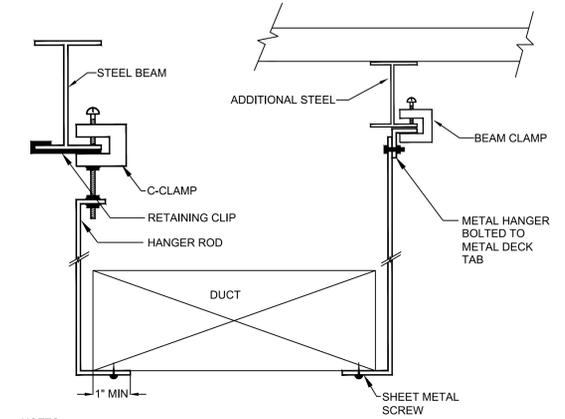
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DRAWING TITLE:
MECHANICAL DETAILS

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE:	DATE: 06.01.2023
	PROJECT No: 223203
	DRAWING BY: AB
	CHK BY: DN
	DWG No:
	M-501.00
	SCALE: NTS
	3 OF 6



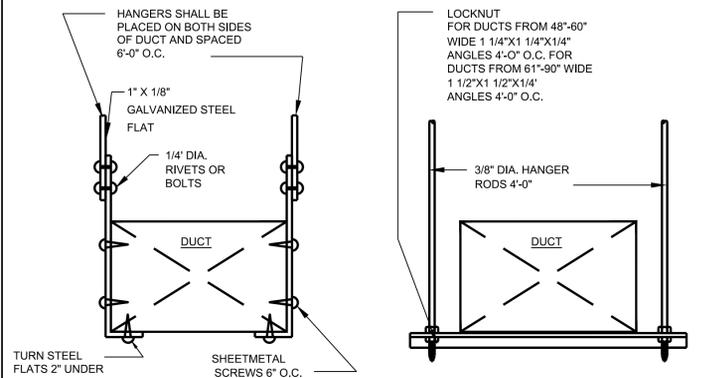
NOTES:
 1. HANGERS SHALL BE OF METAL NOT LESS THAN 1/16" FOR DUCTS 2 SQ.FT. & LESS, AND NOT LESS THAN 1/8" FOR DUCTS LARGER THAN 2 SQ.FT.
 2. WHERE CROSS-SECTIONAL AREA OF DUCT EXCEEDS 8 SQ.FT., HANGERS SHALL BE SPACED NOT MORE THAN 4 FT. ON CENTERS.
 3. C-CLAMP FOR DUCTS UP TO 36" MAXIMUM DIMENSION.

1 DUCT SUPPORT ATTACHMENT TO STRUCTURE

DUCT SUPPORT SCHEDULE

HALF OF DUCT PERIMETER	PAIR AT 10 FT. SRACING		PAIR AT 8 FT. SRACING		PAIR AT 5 FT. SRACING		PAIR AT 4 FT. SRACING	
	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD
30"	1" x 22 GA	10 GA (.135")	1" x 22 GA	10 GA (.135")	1" x 22 GA	12 GA (.135")	1" x 22 GA	12 GA (.135")
72"	1" x 18 GA	3/8"	1" x 20 GA	1/4"	1" x 22 GA	1/4"	1" x 22 GA	1/4"
96"	1" x 16 GA	3/8"	1" x 18 GA	3/8"	1" x 20 GA	3/8"	1" x 22 GA	1/4"
120"	10" x 16 GA	1/2"	1" x 16 GA	3/8"	1" x 18 GA	3/8"	1" x 20 GA	1/4"
168"	10" x 16 GA	1/2"	10" x 16 GA	1/2"	1" x 16 GA	3/8"	1" x 18 GA	3/8"
192"	-	1/2"	10" x 16 GA	1/2"	1" x 16 GA	3/8"	1" x 16 GA	3/8"

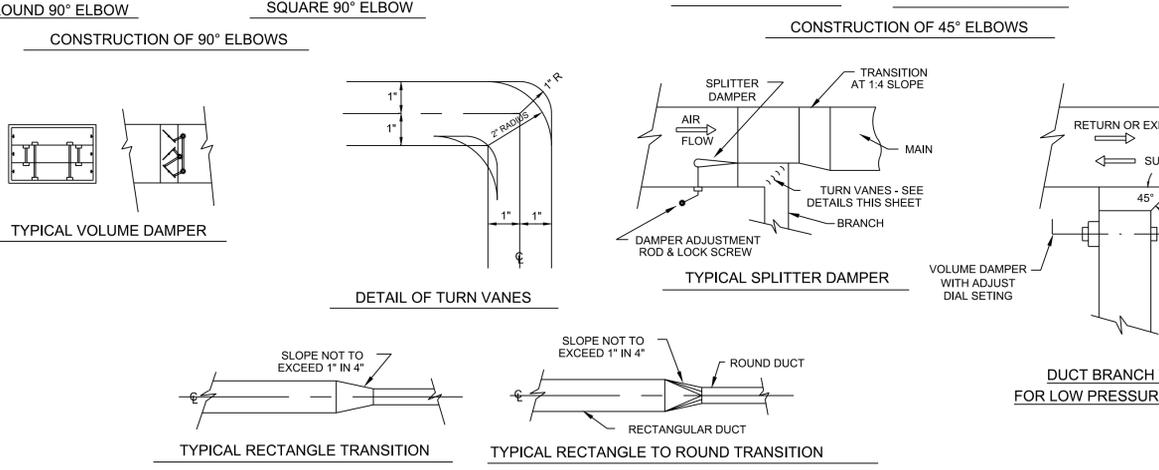
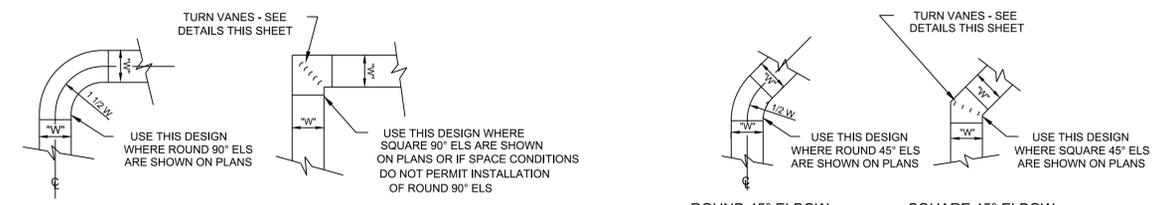
2 DUCT SUPPORT SCHEDULE



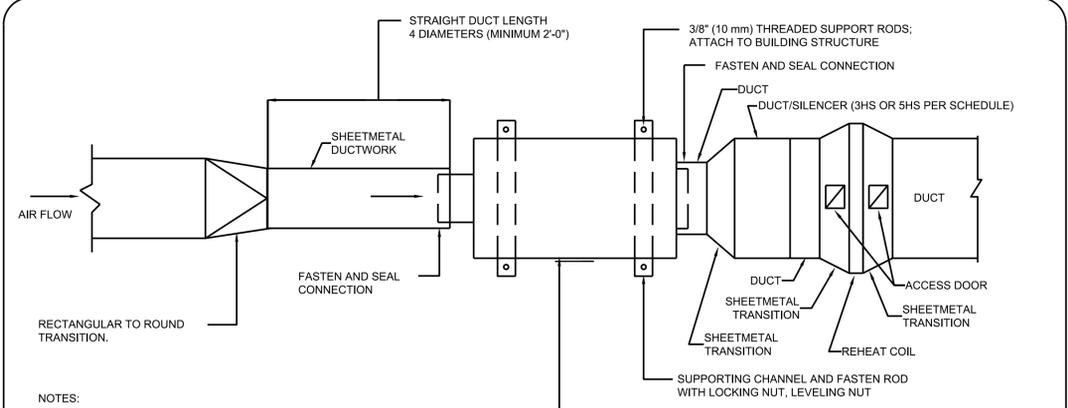
3 METHOD OF SUPPORTING DUCTS
 NTS

UP TO 8SQ. FT. IN AREA AND 47" WIDTH MAX.

OVER 8SQ. FT. IN AREA AND OVER 47" WIDE

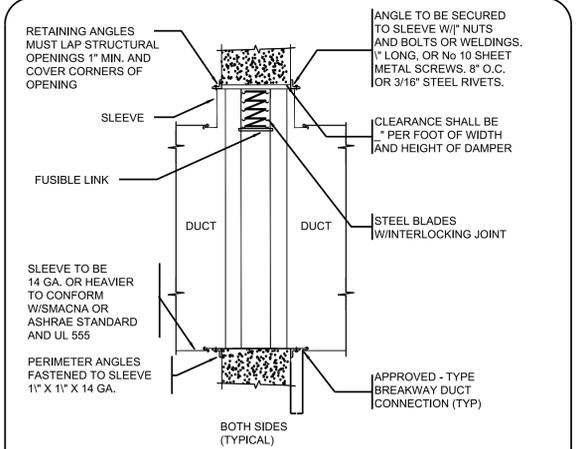


4 DUCTWORK DETAILS
 NTS



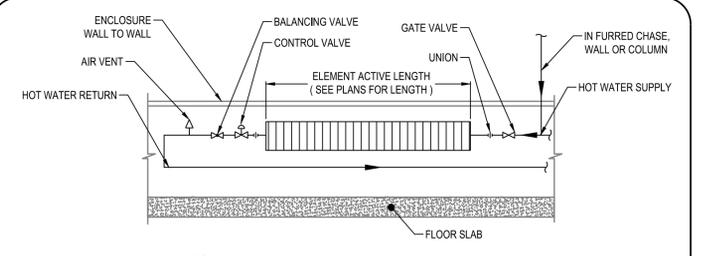
NOTES:
 1. MANUFACTURER OF TERMINAL UNIT SHALL INSTALL THE CONTROLS (RECEIVED FROM BAS CONTROL CONTRACTOR) ON LEFT OR RIGHT SIDE AS REQUIRED BY FIELD CONDITIONS.
 2. ARRANGE ACCESS TO PERMIT EASY FIELD BALANCE AND MAINTENANCE OF TERMINAL UNIT.
 3. PROVIDE REHEAT COILS ONLY WITH CV UNITS AS SHOWN ON DWGS.

6 TYPICAL CV & VAV TERMINAL UNIT INSTALLATION DETAIL
 NTS



NOTES:
 A. SECURE DAMPER TO SLEEVE USING 1" NUTS & BOLTS OR WELDING, 1" LONG, OR No 10 SHEET METAL SCREWS, 8" O.C. OR 3/16" STEEL RIVETS.
 B. PROVIDE ACCESS DOOR IN DUCT UPSTREAM OR DOWNSTREAM OF THE FIRE DAMPER.
 C. INSTALLATION AS INDICATES SHALL BE COORDINATED WITH DAMPER MANUFACTURER INSTALLATION INSTRUCTIONS.

8 FIRE DAMPER DETAIL
 NTS



7 FINNED TUBE RADIATION DETAIL
 NTS

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AIR OUTLET SCHEDULE					"TITUS" AS STANDARD					
MARK	SERVICE	CFM	SIZE (IN.)	TOTAL PRESSURE DROP (PI) AT MAX FLOW (IN WC)	SOUND LEVEL (NC)	DAMPER STYLE	BORDER TYPE	MANUFACTURER	MODEL	NOTES
SG-1	SUPPLY	500	18X12	0.016	12	NONE	DUCT MOUNTED	TITUS	112RL 18X12	SEE NOTES
RG-1	RETURN	2700	42X20	0.067	39	NONE	DUCT MOUNTED	TITUS	23RL 42X20	SEE NOTES

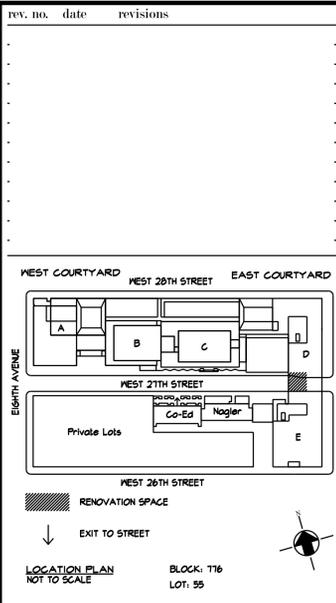
- NOTE:
1. ALL DIFFUSERS & DAMPERS TO BE PER SCHEDULE. PROVIDE WHITE COLOR AND COORDINATE WITH ARCHITECTURAL DRAWINGS FOR COLOR FINISHING.
 2. ALL DIFFUSERS TO BE STANDARD FACTORY POWDER COATED. PROVIDE CONCEALED FASTENERS FOR ALL AIR OUTLETS.
 3. COORDINATE WITH THE ARCHITECTURAL DRAWINGS.

FIN TUBE RADIATION ENCLOSURE SCHEDULE												
GENERAL DATA		ELEMENT								ENCLOSURE		REMARKS
UNIT NO	LENGTH (FT)	FIN SIZE	FIN MATERIAL	PIPE MATERIAL	NO OF FINS PER FT.	NO OF ROWS	AVG WATER TEMP (F)	EAT (F)	BTUH PER LINEAR FT.	HEIGHT		
F-1	AS NOTED IN DRAWING	EXISTING	ALUMINUM	COPPER	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	SEE NOTE 5	SEE NOTES

- NOTES:
1. 18 GAUGE ENCLOSURE. COORDINATE WITH ARCHITECT FOR THE COLOR FINISHING.
 2. THE ENCLOSURE SHALL BE FACTORY POWDER COATED.
 3. 20 GAUGE FULL BACK PANEL. PRIME COATED FOR MOUNTING.
 4. 16 GAUGE GALVANIZED FOR HANGERS WITH FIN CLIP SLIDER AND LINEAR EXPANSION FOR QUIET OPERATION.
 5. EXISTING HEIGHT TO BE VERIFIED IN FIELD BY CONTRACTOR.

TERMINAL AIR UNIT SCHEDULE					TITUS AS STANDARD											
GENERAL DATA			PERFORMANCE DATA												REMARKS	
UNIT NO	AREA SERVED (ROOM)	SYSTEM	VAV MIN BOX SETTING	AIR FLOW CFM	SIZE UNIT	ELECTRIC REHEAT COIL					MODEL	OVERALL SIZE LxWxH (IN)	WEIGHT (LBS)	SUPPORT (LOCATION /TYPE)		
						INLET MIN (IN-WC)	EAT (F)	LAT (F)	MIN CAP (BTUH)	ELECTRIC [KW]						VOLTS/PHASE/HZ
VAV-4-3	CLASSROOM D442	AC-SD	20%	2800	16	0.05	55	65.00	30,240	9.00	208/3/60	DESV	15.5x24x18	60	CLNGHNGR	SEE NOTES

- NOTES:
1. SELECTIONS ARE BASED ON TITUS AS MANUFACTURER.
 2. ALL PERFORMANCE BASED ON TESTS CONDUCTED IN ACCORDANCE WITH ASHRAE 130-2008.
 3. ALL NC LEVELS DETERMINED USING AHR985-2008 APPENDIX E.
 4. ALL AIR FLOW, PRESSURE LOSSES AND HEATING PERFORMANCE VALUES HAVE BEEN CORRECTED FOR ALTITUDE.
 5. PROVIDE TWO DUCT DIAMETER OF STRAIGHT DUCT RUN UPSTREAM OF THE INLET OF TERMINAL UNIT.
 6. PROVIDE HARDDUCT CONNECTION. FLEXIBLE CONNECTION IS NOT ACCEPTABLE.
 7. PROVIDE 20 GAUGE GALVANIZED STEEL UNIT.
 8. PROVIDE 115V/24V TRANSFORMER, DISCONNECT SWITCH.
 9. PROVIDE REMOVABLE AIR FLOW SENSOR.
 10. PROVIDE DUCT ATENUATOR.
 11. NC IS NOISE CRITERIA.



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 212 889 4045 Fax 212 889 3672

PROJECT:
D442 CLASSROOM RENOVATION
POMERANTZ 300 11TH AVE
NEW YORK NY 10001

DRAWING TITLE:
MECHANICAL SCHEDULES

DEPARTMENT OF BUILDING JOB #

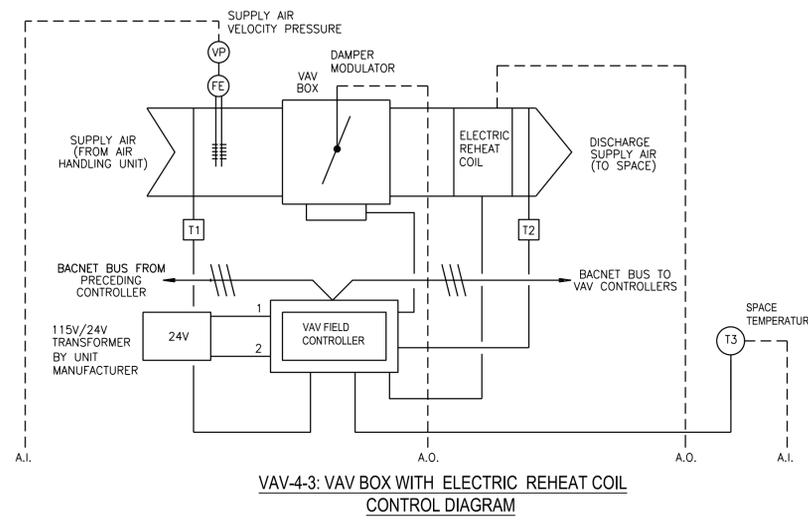
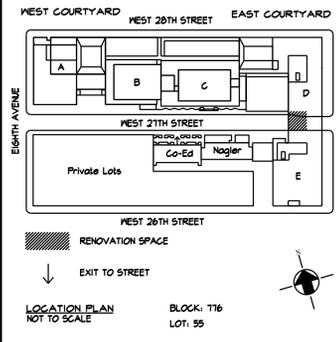
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 PROJECT No: **223203**
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 CHK BY: **DN**
 DWG No: _____
M-701.00
 SCALE: NTS 4 OF 6

ISSUED FOR BID 06.07.2023

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PROJECT:
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DRAWING TITLE:
MECHANICAL CONTROL
DIAGRAMS

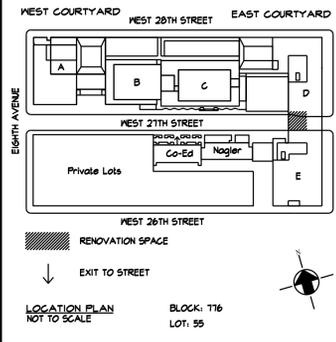
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	M-801.00
	SCALE: NTS
	5 OF 6

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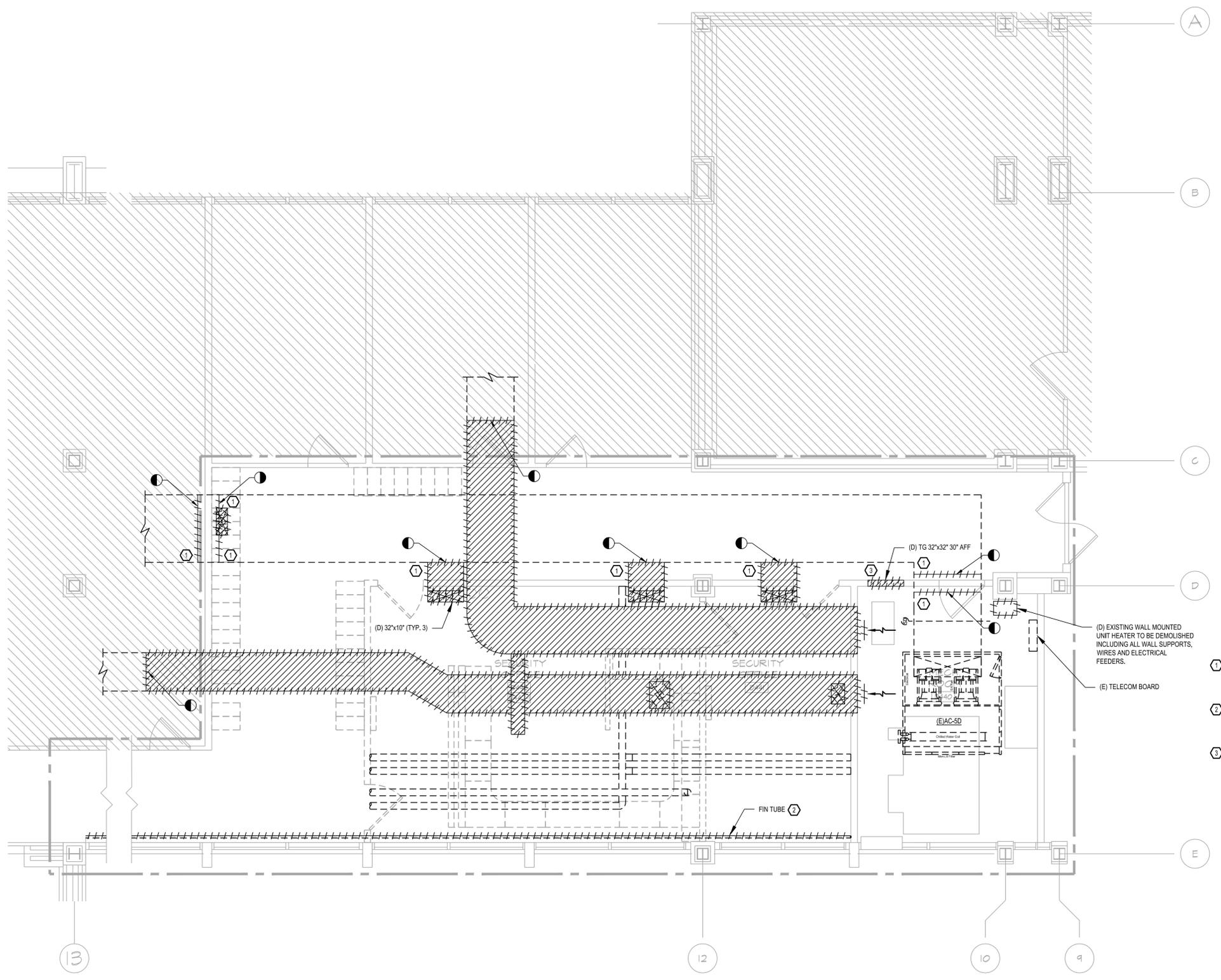
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PROJECT:
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DRAWING TITLE:
FOURTH FLOOR
MECHANICAL
DEMOLITION PLAN

DEPARTMENT OF BUILDING JOB #

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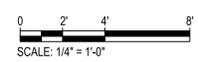


WORK NOTES:

- 1 DUCTWORK SHALL BE CUT AND CAPPED. PROTECT THE REMAINING DUCT WITH PLASTIC FILM TO AVOID CONTAMINATION.
- 2 REMOVE EXISTING FIN TUBE RADIATION ENCLOSURE AND VACUUM CLEAN THE EXISTING FIN TUBE RADIATION ELEMENTS ALONG THE WINDOWS UP TO COLUMN #13.
- 3 FILL TRANSFER GRILLE OPENING WITH FIRE RATED PARTITION. COORDINATE WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

FOURTH FLOOR MECHANICAL DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



ISSUED FOR BID 06.07.2023

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ELECTRICAL - SYMBOLS

	WALL MOUNTED EXIT LIGHT.
	CEILING MOUNTED EXIT LIGHT WITH SELF CONTAINED BATTERY PACK, SHADED AREA INDICATES ILLUMINATED FACE(S). DIRECTIONAL ARROWS ARE INDICATED.
	PANELBOARD
	DISTRIBUTION OR POWER PANELBOARD.
	GROUND BAR
	CT CABINET
	METER (DIRECT / UTILITY)
	SUB-METER
	HOMERUN TO DESIGNATED PANELBOARD - NUMERALS INDICATE CIRCUIT NUMBER.
	GROUND CONNECTION
	DUPLICATE RECEPTACLE. SUBSCRIPT INDICATES: WP - WEATHERPROOF ENCLOSURE GFI - GROUND-FAULT CIRCUIT-INTERRUPTER RECEPTACLE IS - ISOLATED GROUNDING RECEPTACLE 20A - 20 AMP RECEPTACLE HG - HOSPITAL GRADE RECEPTACLE C - AUTOMATICALLY CONTROLLED RECEPTACLE F - FUTURE SWITCHED RECEPTABLES FOR MOTORIZED SHADES # - IDENTIFIES PANELBOARD CIRCUIT NUMBER (TYPICAL FOR ALL RECEPTABLES) USB - USB RECEPTACLE - NEMA 5-20R USB, PASS & SEYMOUR CAT# TMB-USB-C6 OR EQUIVALENT
	DOUBLE DUPLEX CONVENIENCE RECEPTACLE WALL MOUNTED IN GANG BOX
	HALF-SWITCHED DUPLEX RECEPTACLE.
	NEMA 5-20R, 20A RECEPTACLE (GFCI)
	RECEPTACLE, NEMA 6-50R 208V, 50A COORDINATE WITH MANUFACTURER
	DOUBLE DUPLEX RECEPTACLE
	STUB UP FACE PLATE TO BE MTD. ON MILLWORK FOR RECEPTACLE
	DUPLEX RECEPTACLE GFI
	FLOOR MOUNTED DUPLEX / DOUBLE DUPLEX / SIMPLEX RECEPTACLE, 20A, 3 WIRE, 125 VOLT, POKE-THRU SERVICE FITTING, UON.
	SPECIAL PURPOSE OUTLET. (COORDINATE REQUIREMENTS WITH VENDOR FOR EACH EQUIPMENT)
	SIMPLEX RECEPTACLE
	NEMA 5-20R RECESSED SIMPLEX CLOCK-HANGAR RECEPTACLE
	SINGLE CEILING MOUNTED CONVENIENCE RECEPTACLE
	SPECIAL PURPOSE CEILING MOUNTED RECEPTACLE
	SINGLE POLE SWITCH, LOWER CASE LETTER IDENTIFIES OUTLET(S) CONTROLLED, UPPER CASE LETTER AND OR NUMERAL INDICATES: 2 - DOUBLE POLE 3 - THREE WAY 4 - FOUR WAY P - WITH PILOT LIGHT H - HORSEPOWER RATED WITH HASP FOR LOCK K - KEY OPERATED D - DIMMER SWITCH T - TIMER SWITCH J - DOOR JAM SWITCH L - LOCKING - WITH HASP FOR LOCK LV - LOW VOLTAGE TS - THERMAL SWITCH OS - OCCUPANCY SENSOR SWITCH VS - VACANCY SENSOR SWITCH SS - SCENE SELECTOR OV - OVER-RIDE SWITCH
	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR
	CEILING MOUNTED DUAL TECHNOLOGY VACANCY SENSOR
	PHOTO-CELL
	DAYLIGHT SENSOR
	3-POLE UNFUSED DISCONNECT (SAFETY) SWITCH. NUMERAL INDICATES AMPACITY, 'WP' DENOTES WEATHERPROOF ENCLOSURE. NO NUMBER INDICATES 30A OR LESS.
	3-POLE FUSED DISCONNECT (SAFETY) SWITCH. NUMERAL INDICATES SWITCH AMPACITY/FUSE SIZE. 'WP' DENOTES WEATHERPROOF ENCLOSURE. NO NUMBER INDICATES 30A OR LESS.
	3-POLE COMBINATION DISCONNECT & MOTOR STARTER. NUMERAL INDICATES FUSE SIZE. 'WP' DENOTES WEATHERPROOF ENCLOSURE.
	3-POLE MOTOR STARTER. NUMERAL INDICATES FUSE SIZE, 'WP' DENOTES WEATHERPROOF ENCLOSURE.
	VARIABLE FREQUENCY DRIVE
	MOTOR, # INDICATES HORSEPOWER
	FUSIBLE SWITCH
	BOLTED PRESSURE SWITCH
	CIRCUIT BREAKER

ELECTRICAL - SYMBOLS

	KIRK KEY INTERLOCK, NUMBERS INDICATE MATCHING KEYS.
	DIESEL GENERATOR
	NATURAL GAS GENERATOR
	TRANSFORMER
	ATS, OPEN TRANSITION
	ATS, CLOSED TRANSITION
	ATS, MAINTENANCE BYPASS
	POWER & ENERGY METER (PEM), SATEC CAT# PM135EH OR EQUIVALENT, CONTRACTOR TO FURNISH AND INSTALL ELECTRICAL POWER & ENERGY METER AND ASSOCIATED CURRENT TRANSFORMERS & WIRING. PEM SHALL BE ABLE TO INTERFACE VIA RS-485 AND MODBUS OVER ETHERNET CABLING WITH BLDG CENTRAL POWER & ENERGY MANAGEMENT SYSTEM, TO BE PROVIDED BY OTHERS.
	EMERGENCY LIGHTING RELAY (ELR), CONTRACTOR TO FURNISH, INSTALL AND WIRE EMERGENCY LIGHTING RELAY, WATTSTOPPER (LEGRAND) CAT# ELCU-200 OR EQUAL APPROVED IN WRITING BY ENGINEER. CONTRACTOR TO PROVIDE TEST BUTTON AND BACK-BOX FLUSH-MOUNTED PREFERABLY 8" AFF. COORDINATE EXACT LOCATION AND HEIGHT OF TEST BUTTON WITH ARCHITECT. RELAY SHALL BE CONFIGURED SO THAT UNDER NORMAL CONDITIONS, LIGHT FIXTURES ARE CONTROLLED BY DIMMER (OR SWITCH) AND SUPPLIED BY NORMAL POWER FROM LOCAL LIGHTING PANEL. UNDER POWER FAILURE OF CIRCUIT, RELAY SHALL PROVIDE UN-DIMMED (OR UN-SWITCHED) EMERGENCY POWER FROM EMERGENCY LIGHTING PANEL.
	GENERATOR REMOTE ANNUNCIATOR AND ATS REMOTE CONTROL PANEL
	REMOTE LIGHTING TRANSFORMER
	FUSE CUT OUT
	FIRE ALARM FUSED DISCONNECT SWITCH
	FIRE ALARM DATA GATHERING PANEL
	FIRE ALARM CONTROL PANEL
	FIRE ALARM REMOTE ANNUNCIATOR
	SMOKE ALARM. 'C/S' DENOTES SELF-CONTAINED COMBINATION CARBON MONOXIDE / SMOKE ALARM DETECTOR D - DENOTES DUCT DETECTOR
	120V CARBON MONOXIDE DETECTOR, CONNECT TO CIRCUIT NOT PROTECTED BY A GFCI CIRCUIT BREAKER
	FIRE SMOKE DAMPER
	HEAT TRACE
	MOTORIZED SHADE
	MOTORIZED DAMPER
	BREAK GLASS SWITCH
	EMERGENCY POWER OFF
	EMERGENCY STOP
	THERMOSTAT
	CEILING/WALL/FLOOR MOUNTED JUNCTION BOX
	SPLICE BOX
	PULLBOX
	TIME CLOCK
	CONTACTOR / RELAY
	LEAK DETECTOR
	CONNECTOR - LETTER DESIGNATES UNIQUE CONNECTION POINT
	PUSHBUTTON
	DOOR CONTACT. SEE LIGHTING PLANS FOR LOCATIONS.

GENERAL NOTES

- ELECTRICAL CONTRACTOR IS RESPONSIBLE TO VISIT AND INSPECT SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS ASSOCIATED WITH, BUT NOT LIMITED TO THE FOLLOWING - CONTRACTOR'S INSPECTION SHALL BE CONDUCTED PRIOR TO FINAL BID, AND ANY ADDITIONAL WORK REQUIRED DUE TO FAILURE TO VISIT SITE OR INADEQUATE INSPECTION SHALL NOT BE CONSIDERED FOR COMPENSATION.
- ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL AND GROUNDING REQUIREMENTS OF ALL NEW AND EXISTING EQUIPMENT TO BE USED. ALL SPECIAL PURPOSE RECEPTABLES INDICATED ON PLAN SHALL BE VERIFIED WITH EQUIPMENT MANUFACTURER TO INSURE PROPER WIRING.
- CIRCUIT NUMBERS ARE FOR GUIDANCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO BALANCE PHASES, REFER TO PANEL SCHEDULES FOR BRANCH CIRCUIT REQUIREMENTS.
- CIRCUIT WIRE SIZES OTHER THAN 2 #12-3/4" ARE INDICATED ON PLAN, REFER TO PANEL SCHEDULES FOR BRANCH CIRCUIT BREAKERS OTHER THAN 1 POLE, 20 AMP. ALL CIRCUITS AND FEEDERS SHALL HAVE A FULL SIZE INSULATED GREEN GROUND CONDUCTOR AND BE CONNECTED TO GROUND BUS IN RESPECTIVE PANEL. MINIMUM SIZE CONDUCTOR AND CONDUIT IS #12 THHN CU, 34°C (EMT).
- THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND PROVIDING THE ACTUAL NUMBER OF CONDUCTORS REQUIRED FOR ALL BRANCH CIRCUIT WIRING TO SERVE THE INTENDED FUNCTION.
- ALL DEVICE PLATE FINISHES/COLORS SHALL BE AS INDICATED BY ARCHITECT. REFER TO ARCHITECT'S TELECOM AND ELECTRIC PLANS FOR ADDITIONAL ELECTRICAL INFORMATION.
- FOR EXACT LOCATION AND QUANTITY OF RECEPTABLES, TELEPHONE AND OTHER OUTLETS, REFER TO THE ARCHITECT'S DRAWINGS.
- MOUNT ALL WALL SWITCHES, DIMMERS, ETC., AT 40" A.F.F. TO CENTER LINE OF DEVICES, UON. RECEPTABLES SHALL BE MOUNTED AT 15" A.F.F., UON, REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHT.
- THIS CONTRACTOR IS TO NOTIFY ENGINEER/ARCHITECT OF ANY CONTRADICTIONS FOUND ON THE DESIGN DOCUMENTS AND BASE THE BID ON THE MORE "STRINGENT & EXPENSIVE" CONDITIONS.
- ELECTRONIC AS-BUILT DRAWINGS, SHOWING CONDUIT RUNS AND CIRCUITING MUST BE GIVEN TO ARCHITECT, ENGINEER AND OWNER AT THE COMPLETION OF THE JOB.
- THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL WORK WHICH INTERFERES WITH THE NEW ARCHITECTURAL AND ELECTRICAL LAYOUTS. ALL WORK WHICH IS NO LONGER REQUIRED TO FUNCTION SHALL BE DE-ENERGIZED AND DISCONNECTED AT THE SOURCE OF POWER SUPPLY.
- PANEL DIRECTORIES SHALL BE MODIFIED AND COMPLETELY FILLED IN AT COMPLETION OF JOB.
- ANY EXISTING WORK NOT STATED FOR REMOVAL AND DAMAGED AS A RESULT OF PERFORMING THE WORK OF THIS CONTRACT SHALL BE REPAIRED OR REPLACED AS REQUIRED. MATERIAL AND FINISH TO MATCH EXISTING TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
- CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND ACCEPTABLE MANNER.
- DISPOSE OF REMOVED RACEWAYS, WIRE, PANELS, ETC., AS DIRECTED BY CM & OWNER.
- ALL ELECTRICAL WORK IN ADJOINING AREAS WHICH IS REQUIRED TO FUNCTION BUT IS AFFECTED BY THIS WORK SHALL BE RECONNECTED AND RESTORED TO ITS PRESENT FUNCTION AS PART OF THE ELECTRICAL SYSTEM OF THE BUILDING(S).
- ALL RACEWAYS WHICH BECOME EXPOSED BEYOND FINISHED SURFACES BECAUSE OF THE ALTERATION WORK SHALL BE REMOVED AND RE-ROUTED BEHIND THE FINISHED SURFACES.
- ANY FIRE SAFETY EQUIPMENT AND THIS ASSOCIATED CONDUIT AND WIRING SYSTEM SHALL NOT BE HARMED DURING DEMOLITION AND/OR CONSTRUCTION AND SHALL BE PROTECTED FROM ANY PHYSICAL DAMAGE.
- ALL NEW VOICE AND DATA WIRING IN CEILING PLENUM SHALL BE TEFLON-COATED OR RUN IN EMT CONDUIT. NEW WALL OUTLETS SHALL RECEIVE 3/4" EMPTY CONDUIT STUB-UP WITH DRAG WIRE AND JUNCTION BOX.
- EACH COMBINATION DATA/TELEPHONE AND DATA OUTLET SHALL UTILIZE 1" E.M.T. STUBBED UP TO HUNG CEILING FROM JUNCTION BOX.
- ALL NEW TELEPHONE, ELECTRIC AND DATA OUTLETS TO BE INSTALLED ON AN EXISTING WALL SHOULD BE FLUSH MOUNTED WITH THE FINISHED WALL SURFACE.
- CONTRACTOR SHALL COORDINATE ALL NEW TELEPHONE CONDUIT RUNS WITH TELECOM COMPANY REPRESENTATIVE BEFORE STARTING WORK.
- CONTRACTOR TO PROVIDE AN EMPTY CONDUIT SYSTEM AND OUTLET BOXES FOR INSTALLATION OF NEW SECURITY SYSTEM. VERIFY EXACT REQUIREMENTS WITH SECURITY VENDOR.
- ALL OPEN FLOOR OUTLETS, NOT USED, SHALL BE CAPPED.
- ALL HOLES IN SLABS OR WALLS SHALL BE FIRE STOPPED VIA LISTED FIRE-STOPPING ASSEMBLIES. SUBMIT TO ENGINEER FOR APPROVAL.
- PROVIDE A GROUND BUS IN NEW PANELS.
- CONTRACTOR TO DE-RATE CONDUCTORS IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES WHEN INSTALLING MORE THAN THREE (3) CIRCUITS IN A 3/4" HOMERUN AND OTHERWISE REQUIRED.
- REFER TO PROJECT 'BOOK' SPECIFICATIONS FOR ADDITIONAL, IMPORTANT REQUIREMENTS.

GENERAL DEMOLITION NOTES

- THE CONTRACTOR SHALL INCLUDE ALL COSTS FOR REMOVALS AND RELOCATIONS IN THE CONTRACT. THESE COSTS SHALL INCLUDE WORK DESCRIBED IN THE SPECIFICATIONS AND SHOWN ON THE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS WITH ALLOWANCES FOR NORMAL UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN SPECIFIC CASES CONSIDERED JUSTIFIABLE BY THE ARCHITECT.
- THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL WORK WHICH INTERFERES WITH THE NEW ELECTRICAL LAYOUTS. ALL WORK WHICH IS NO LONGER REQUIRED TO FUNCTION SHALL BE DE-ENERGIZED AND DISCONNECTED AT THE SOURCE OF POWER SUPPLY.
- ALL PRESENT ELECTRICAL MATERIAL AND EQUIPMENT WHICH ARE TO BE REMOVED UNDER THIS CONTRACT SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR AND SHALL BECOME THE PROPERTY OF BUILDING MANAGEMENT, U.O.N.
- ALL RACEWAYS WHICH BECOME EXPOSED BEYOND FINISHED SURFACES BECAUSE OF THE ALTERATION WORK SHALL BE REMOVED AND REROUTED BEHIND THE FINISHED SURFACES.
- PORTIONS OF FEEDER LINES THAT HAVE TO BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK BUT ARE REQUIRED TO CONTINUE TO FUNCTION SHALL BE CUT AT CONVENIENT LOCATIONS; REROUTED AND RECONNECTED FOR CONTINUATION OF THEIR PRESENT FUNCTION. NEW FEEDER EXTENSIONS SHALL MATCH EXISTING ONES IN ALL RESPECTS, CONDUCTOR CAPACITY, CONDUITS SIZE, ETC.
- EXISTING ELECTRICAL ITEMS AND/OR CONDUIT AND WIRE IN WALLS, HUNG CEILING, ETC., OR AREAS NOT BEING UTILIZED, SHALL BE DISCONNECTED AND REMOVED.
- ANY FIRE SAFETY EQUIPMENT AND THIS ASSOCIATED CONDUIT AND WIRING SYSTEM SHALL NOT BE HARMED DURING DEMOLITION AND/OR CONSTRUCTION AND SHALL BE PROTECTED FROM ANY PHYSICAL DAMAGE.
- THIS DEMOLITION NOTES ARE DIAGRAMMATIC DESCRIPTION OF THE REMOVAL SCOPE OF WORK. THE CONTRACTOR, BY SITE INVESTIGATION, SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT SCOPE OF THE WORK INVOLVED PRIOR TO SUBMITTING HIS BID. COORDINATE WITH ARCHITECT, BUILDING MANAGEMENT AND MECHANICAL CONTRACTORS BEFORE ANY WORK.

EXISTING CONDITION & RELOCATION NOTES

- GENERALLY, IN AREAS SCHEDULED FOR DEMOLITION AND REMODELING, REMOVE ALL ELECTRICAL DEVICES SUCH AS LIGHTING FIXTURES, WIRING DEVICES, TELEPHONE BOXES, SPEAKERS, FIRE ALARM DEVICES, TELEVISION OUTLETS, DISCONNECT, MOTORS, ETC., THAT ARE LOCATED ON EXISTING WALLS OR PARTITIONS WHICH ARE TO BE DEMOLISHED. REMOVE EXPOSED PORTIONS OF THE BRANCH AND SIGNAL CIRCUIT WIRING AND CONDUITS AND BE RESPONSIBLE FOR MAINTAINING THE CONTINUITY OF EXISTING CIRCUITS FEEDING DEVICES THAT ARE TO REMAIN. MAINTAIN THE CONTINUITY OF EXISTING CIRCUITS SERVING OTHER SPACES BUT PASSING THROUGH THE AREA OF REMOVAL.
- ALL RACEWAYS AND FEEDERS SERVING PANEL BOARDS SCHEDULED FOR DEMOLITION SHALL BE REMOVED IN THEIR ENTIRETY BACK TO THEIR SOURCE. UPDATE PANEL SCHEDULES AND LABELS OF UPSTREAM PANEL BOARDS TO REFLECT DEMOLITION.
- CIRCUITS STILL IN USE WHICH ARE DERIVED FROM PANELS SCHEDULED TO BE DEMOLISHED SHALL BE REROUTED TO ALTERNATE PANELS. NOTIFY OWNER'S REPRESENTATION AND ARCHITECT FOR RECOMMENDATIONS.
- IN SUCH CASES WHERE EXISTING WALLS ARE TO REMAIN, EXPOSED RACEWAYS, SURFACE AND RECESSED OUTLET BOXES, ETC., WHICH ARE NOT TO BE REUSED SHALL BE COMPLETELY REMOVED. IN SUCH CASES, WHERE NEW CONDUITS AND OUTLETS ARE TO BE INSTALLED IN EXISTING WALLS IN FINISHED ROOMS, THEY SHALL BE CONCEALED BY CUTTING AND PATCHING THE WALLS FOR THE CONDUITS AND OUTLET BOXES UNLESS OTHERWISE NOTED.
- CONDUITS OR SLEEVES, THAT ARE NO LONGER REQUIRED, WHICH ARE PROTRUDING THROUGH THE FLOOR SLAB, SHALL BE CUT BACK AND CAPPED. ALL FEEDERS TO BE REMOVED BACK TO PANEL BOARD.
- ELECTRICAL EQUIPMENT REMOVED SHALL BE RETURNED TO OWNER OR DISCARDED PER OWNER DIRECTIVE.
- REMOVE TELEPHONE AND DATA CABLES BACK TO CLOSET OF ORIGINATION. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER'S TELECOMMUNICATION DEPARTMENTS FOR THE DISCONNECTION AND REMOVAL LOW TENSION DEVICES.
- ELECTRICAL CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF EXISTING SYSTEM CIRCUITS FOR FIRE ALARM, POWER AND TELE COMMUNICATIONS, ETC., DURING DEMOLITION.
- THE ELECTRICAL CONTRACTOR SHALL REMOVE ALL ABANDONED WIRING/CABLING NO LONGER IN USE FROM RACEWAYS.
- UTILIZE, WHENEVER POSSIBLE, PRACTICAL AND APPROVED BY ARCHITECT, EXISTING OUTLET BOXES, ETC., COMPATIBLE WITH THE MATERIAL SPECIFIED FOR INSTALLATION IN THE NEW CONSTRUCTION AREAS. WHENEVER EXISTING RACEWAY SYSTEMS ARE UTILIZED, REMOVE ALL EXISTING WIRING. IN SUCH CASES, ALL ASSOCIATED CONDUITS AND WIRING SHALL BE ARRANGED TO ACCOMMODATE THE NEW CIRCUITING AS SHOWN ON THE DRAWING.
- THE ELECTRICAL DEMOLITION PLANS INDICATE GENERAL INTENT AND ARE NOT INTENDED TO SHOW ALL COMPONENTS AND ITEMS TO BE REMOVED OR RETAINED. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMISSION OF THEIR BID TO BECOME FAMILIAR WITH THE ACTUAL WORKING CONDITIONS AND EXTENT OF WORK. DEVICES AND EQUIPMENT LOCATED ON THE WALLS AND OR CEILINGS DESIGNATED TO BE REMOVED SHALL BE DISCONNECTED AND MADE SAFE. THE ELECTRICAL CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATION AND ARCHITECT OF ANY UNANTICIPATED OR HIDDEN CONDITIONS ENCOUNTERED DURING DEMOLITION.
- THE ELECTRICAL CONTRACTOR SHALL CIRCUIT TRACE AND LABEL ALL EXISTING BRANCH AND FEEDERS WITHIN OR ASSOCIATED WITH DEMOLITION SCOPE PRIOR TO DEENERGIZING AND DISCONNECTION. ALL CIRCUITS WITHIN PANELBOARDS, LOAD CENTERS, MOTOR CONTROL CENTERS AND SWITCHBOARDS, IDENTIFIED FOR REMOVAL SHALL BE TRACED AND FIELD LABELED TO ENSURE THAT NO AREA OUTSIDE THE SCOPE LIMIT IS AFFECTED.
- COORDINATE ALL TEL/DATA WIRING DEMOLITION WITH FIT INFORMATION SYSTEMS STAFF PRIOR TO THE START OF ANY DEMOLITION AFTER PROPERLY IDENTIFYING TEL/DATA WIRING. CABLES ARE TO BE COMPLETELY REMOVED FROM ALL TERMINATION INCLUDING JACKS, WALL PLATES AND PATCH PANELS.
- CONTRACTOR TO OPEN EXISTING CEILING AS REQUIRED FOR INSTALLATION OF NEW WORK OR REMOVAL/MODIFICATION OF EXISTING SYSTEMS AND EQUIPMENT. CEILINGS TO BE CLOSED UPON COMPLETION OF WORK.

ELECTRICAL DRAWING LIST

DWG No.	DRAWING TITLE
E-001.00	ELECTRICAL SYMBOL LIST, ABBREVIATIONS, AND DRAWING LIST
E-100.00	4TH FLOOR PART LIGHTING PLAN
E-200.00	4TH FLOOR PART POWER PLAN
E-600.00	PARTIAL POWER RISER DIAGRAM AND DETAILS
E-900.00	4TH FLOOR REMOVAL PART PLAN

LEGEND

SYMBOL	DESCRIPTION
	NEW WORK
	EXISTING
	DEMO
	UIG / CONCRETE ENCASED
	MULTI-OUTLET RACEWAY ASSEMBLY (PLUGMOLD-WIREMOLD)
	BUSWAY
	CONDUIT BANK
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	FLEX TYPE FMC / LFMC CONDUIT AS REQUIRED
	CAPPED CONDUIT

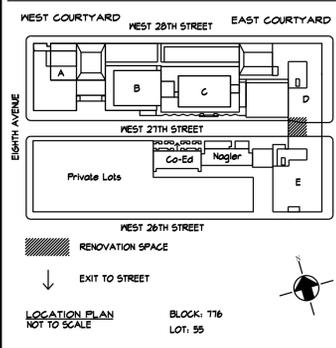
MISCELLANEOUS SYMBOLS

SYMBOLS	DESCRIPTION
	RISER DESIGNATION
	RISER SERVICE
	RISER NUMBER
	SECTION
	DETAIL
	REVISION NUMBER

ABBREVIATIONS

DESCRIPTION	DESCRIPTION
A AMPERE	LTC LIGHTING
AC ABOVE COUNTER TOP	MCM/KCML THOUSAND CIRCULAR MILS
AFF ABOVE FINISHED FLOOR	MECH MECHANICAL
AWG AMERICAN WIRE GAUGE	MISC MISCELLANEOUS
BLDG BUILDING	MTD MOUNTED
C CONDUIT	NC NOT-IN-CONTRACT
CB CIRCUIT BREAKER	NL NIGHT LIGHT
CCTV CLOSED CIRCUIT TELEVISION	NTS NOT TO SCALE
CKT CIRCUIT	PB PULL BOX
CLG CEILING	PNL PANEL
CU COPPER	R REMOVE
DISC DISCONNECT	RE RELOCATED EXISTING DEVICE
DWG DRAWING	RM ROOM
E EXISTING	SPECS SPECIFICATIONS
EC EMPTY CONDUIT	SW SWITCH
ELEC ELECTRICAL	TV TELEVISION
EM EMERGENCY	TYP TYPICAL
ER EXISTING TO BE RELOCATED	UC UNDER COUNTER
FA FIRE ALARM	UF UNFUSED
FT FEET	UON UNLESS OTHERWISE NOTED
GD GROUND	V VOLT OR VOLTAGE
GFI GROUND FAULT INTERRUPTER	W WAIT
HP HORSEPOWER	WP WEATHER-PROOF
KAIC INTERRUPTING CAPACITY	
JB JUNCTION BOX	
KVA KILOVOLT AMPERE	
KW KILOWATT	

REV. NO. DATE REVISIONS



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PROJECT:
D442 CLASSROOM RENOVATION
POMERANTZ 300 7TH AVE
NEW YORK NY 10001

DRAWING TITLE:
ELECTRICAL SYMBOL LIST, ABBREVIATIONS, NOTES AND DRAWING LIST

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE: DATE: 06.01.2023
 PROJECT No: 223203
 DRAWING BY: KB
 CHK BY: WM
 DWG No:

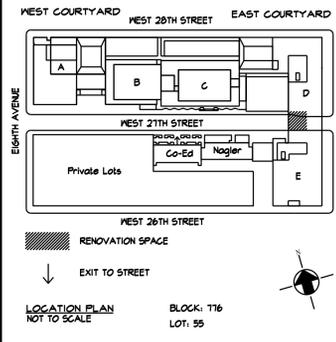
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 SCALE: NTS 1 OF 5

ISSUED FOR BID 06.07.2023

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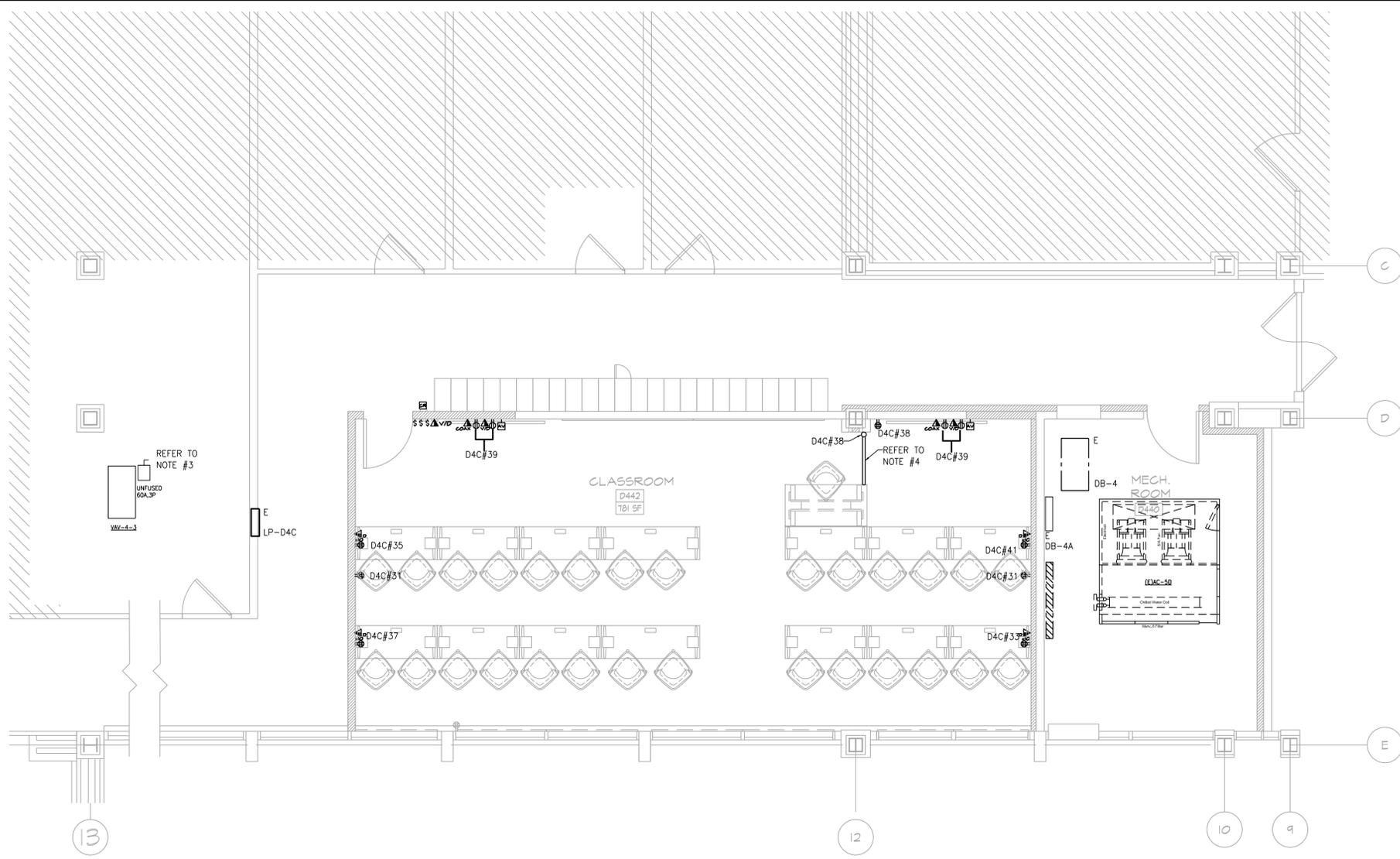
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PROJECT:
**D442 CLASSROOM RENOVATION
POMERANTZ 300 7TH AVE
NEW YORK NY 10001**

DRAWING TITLE:
**ELECTRICAL
4TH FLOOR PART
POWER PLAN**

DEPARTMENT OF BUILDING JOB #

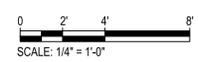
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	DRAWING BY: DG
	CHK BY: KB
	DWG No:
	E-200.00
SCALE: NTS	3 OF 5



FOURTH FLOOR PART POWER PLAN
SCALE: 1/4"=1'-0"

POWER NOTES:

- REFER TO ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATION AND MOUNTING HEIGHTS OF ALL WIRING DEVICES.
- CIRCUIT NUMBERS ARE INDICATED FOR GROUPING INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL REUSE EXISTING CIRCUIT BRANCH WIRING PREVIOUSLY FEEDING LIGHTING FIXTURES IN THE AREA. ALL BRANCH CIRCUIT WIRING ORIGINATES IN A NEW 20A/1P CIRCUIT BREAKER IN PANEL INDICATED U.O.N. PROVIDE 2# 12 & 1# 12G-3/4" C. UON FOR BRANCH WIRING FEEDERS U.O.N. SPARE BRANCH CIRCUITS WILL BE PRODUCED FROM THE SCOPE OF THIS PROJECT. CONTRACTOR MAY UTILIZE EXISTING BRANCH CIRCUIT WIRING FOR INDICATED WORK WHERE FEASIBLE.
- REFER TO PANEL SCHEDULE FOR ADDITIONAL INFORMATION.
- CONTRACTOR SHALL PROVIDE SURFACE MOUNTED CONDUIT SYSTEM WITH 2 DUPLEX OUTLETS, AND THE ABILITY TO HOUSE 8 OR MORE DATA CABLES. PROVIDE A CONNECTRAC FLEX SYSTEM OR APPROVED EQUAL.

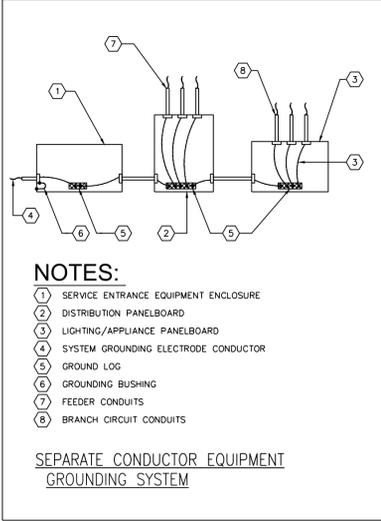
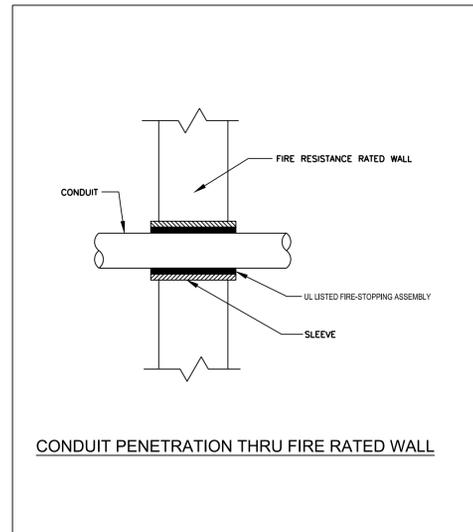


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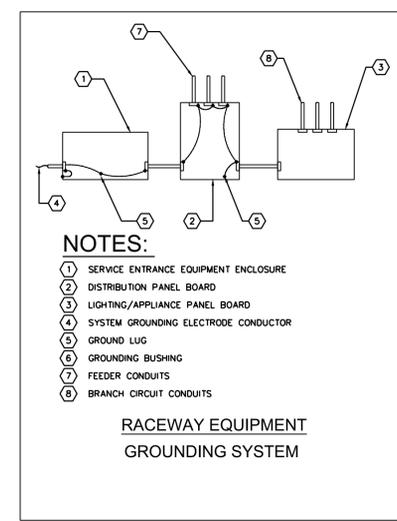
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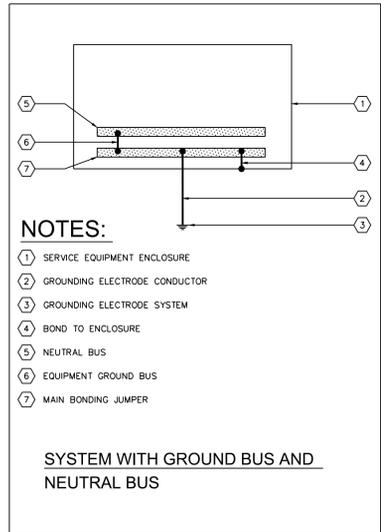




- NOTES:**
- 1 SERVICE ENTRANCE EQUIPMENT ENCLOSURE
 - 2 DISTRIBUTION PANELBOARD
 - 3 LIGHTING/APPLIANCE PANELBOARD
 - 4 SYSTEM GROUNDING ELECTRODE CONDUCTOR
 - 5 GROUND LUG
 - 6 GROUNDING BUSHING
 - 7 FEEDER CONDUITS
 - 8 BRANCH CIRCUIT CONDUITS



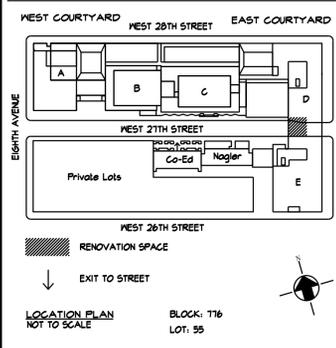
- NOTES:**
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 - 5 GROUND LUG
 - 6 GROUNDING BUSHING
 - 7 FEEDER CONDUITS
 - 8 BRANCH CIRCUIT CONDUITS



- NOTES:**
- 1 SERVICE EQUIPMENT ENCLOSURE
 - 2 GROUNDING ELECTRODE CONDUCTOR
 - 3 GROUNDING ELECTRODE SYSTEM
 - 4 BOND TO ENCLOSURE
 - 5 NEUTRAL BUS
 - 6 EQUIPMENT GROUND BUS
 - 7 MAIN BONDING JUMPER

SERVICE TO:	TRIP	NO. SURFACE MOUNTED			TRIP	SERVICE TO:
		A	B	C		
EDH-4-1	20000	1	2		EDH-4-2	
3/2 & 1/80 - 1 1/2" C	20000	3	4		3/2 & 1/80 - 1 1/2" C	
VAV-4-3	5600	7	8		F250	
3/4 & 1/80 - 1" C	5600	9	10		3/4 & 1/80 - 3/4" C	
VAV-4-6	840	13	14		F240	
VAV-4-7	1120	15	16		3/4 & 1/80 - 3/4" C	
VAV-4-8	1120	17	18			
SPARE	4000	19	20			
VAV-4-4	6000	21	22		VAV-4-5	
3/8 & 1/100 - 1" C	6000	23	24		3/8 & 1/100 - 3/4" C	
SPARE	3300	25	26			
SPARE	3300	27	28		EXIST VAV (D442)	
SPARE	0	29	30		3/8 & 1/100 - 1" C	
SPACE	0	31	32		SPACE	
SPACE	0	33	34		SPACE	
SPACE	0	35	36		SPACE	
SPACE	0	37	38		SPACE	
SPACE	0	39	40		SPACE	
SPACE	0	41	42		SPACE	
TOTAL CONNECTED LOAD PER PHASE (KVA)		26.96	26.42	26.42		
TOTAL CONNECTED LOAD		108.80 KVA		304.8 A		
MINIMUM FEEDER SIZE PER ARTICLE 220		50.00 KVA		200.4 A		

SERVICE TO:	TRIP	NO. SURFACE MOUNTED			TRIP	SERVICE TO:
		A	B	C		
EXISTING	0	1	2		EXISTING	
EXISTING	0	3	4		EXISTING	
EXISTING	0	5	6		EXISTING	
EXISTING	0	7	8		EXISTING	
EXISTING	0	9	10		EXISTING	
EXISTING	0	11	12		EXISTING	
EXISTING	0	13	14		EXISTING	
EXISTING	0	15	16		EXISTING	
EXISTING	0	17	18		EXISTING	
EXISTING	0	19	20		EXISTING	
EXISTING	0	21	22		EXISTING	
EXISTING	0	23	24		EXISTING	
EXISTING	0	25	26		EXISTING	
EXISTING	0	27	28		EXISTING	
EXISTING	0	29	30		EXISTING	
DUPLEX	400	31	32		EXISTING	
DUPLEX FOR FURNITURE SYSTEM	1400	33	34		EXISTING	
DUPLEX FOR FURNITURE SYSTEM	1400	35	36		EXISTING	
DUPLEX FOR FURNITURE SYSTEM	1800	37	38	20A	DUPLEX	
DUPLEX FOR FURNITURE SYSTEM	1400	39	40		EXISTING	
DUPLEX FOR FURNITURE SYSTEM	1400	41	42		EXISTING	
TOTAL CONNECTED LOAD PER PHASE (KVA)		2.30	2.80	2.80		
TOTAL CONNECTED LOAD		7.80 KVA		21.7 A		
MINIMUM FEEDER SIZE PER ARTICLE 220		0.90 KVA		16.7 A		



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PROJECT:
D442 CLASSROOM RENOVATION
POMERANTZ 300 1TH AVE
NEW YORK NY 10001

DRAWING TITLE:
ELECTRICAL
PARTIAL POWER
RISER DIAGRAM AND DETAILS

DEPARTMENT OF BUILDING JOB #

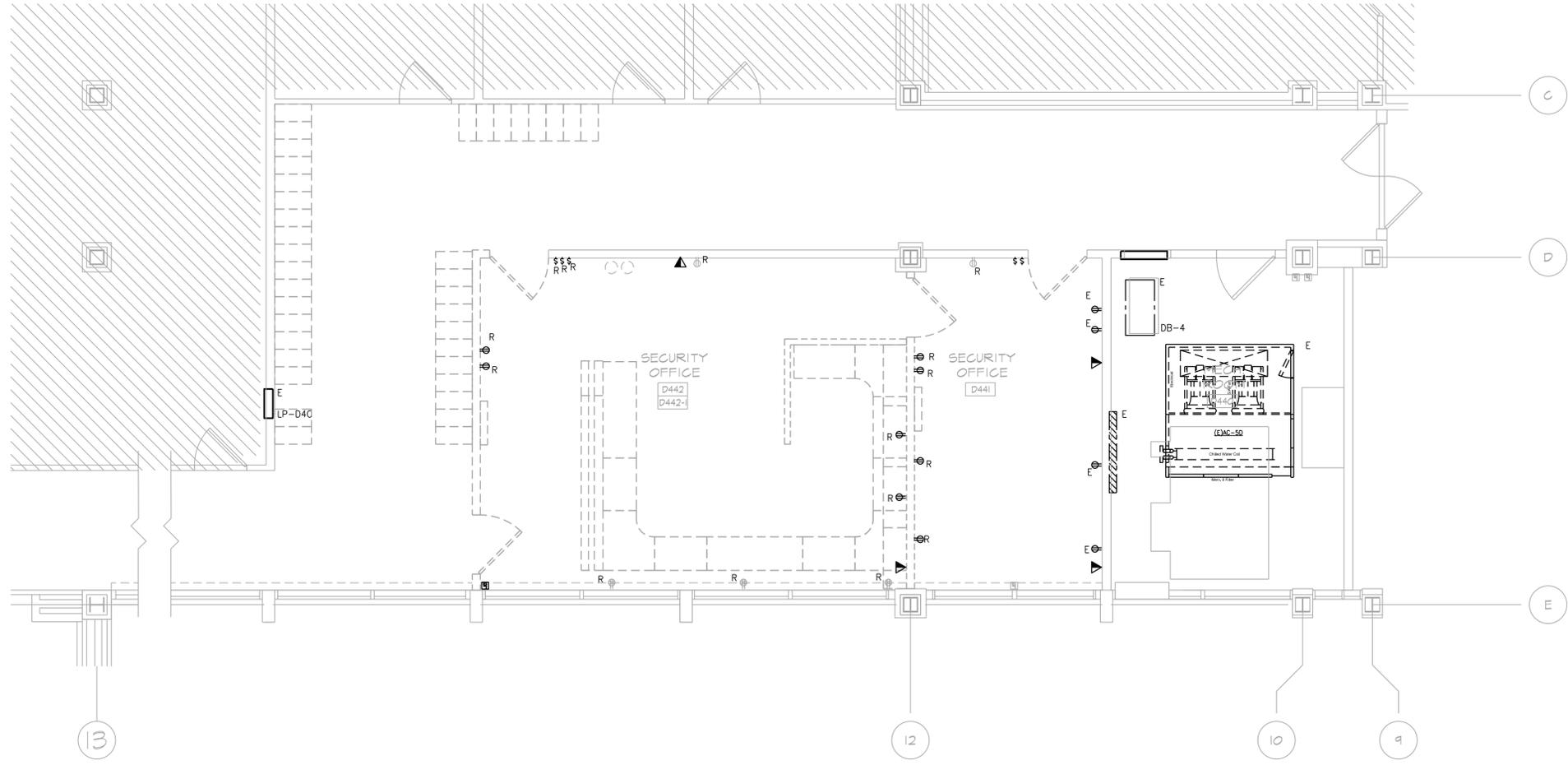
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 CHK BY: WM
 DWG No: _____
E-600.00
 SCALE: NTS 4 OF 5

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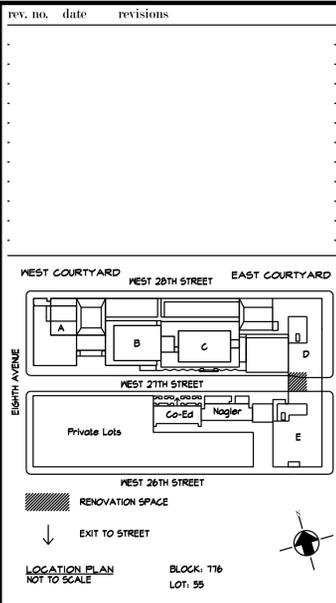
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DEMOLITION KEY NOTES	
REFER TO THIS DWG, E-900 FOR GENERAL DEMOLITION NOTES. FOR ADDITIONAL DEMO NOTES SEE ARCHITECTURAL DRAWING.	
AREAS THAT ARE HATCHED ARE CONSIDERED NOT IN CONTRACT. SCOPE OF WORK IS AREA THAT IS NOT HATCHED.	
1	UNLESS OTHERWISE NOTED, ALL EXISTING DEVICES AND RECEPTACLES SHALL BE DISCONNECTED AND REMOVED IN THEIR ENTIRETY INCLUDING ALL BRANCH WIRING AND CONDUIT. EXISTING FLOOR BOXES TO BE DISCONNECTED AND REMOVED IN THEIR ENTIRETY. FLOOR SHALL BE FILLED AND PATCHED AS REQUIRED.
2	UNLESS OTHERWISE NOTED, ALL EXISTING LIGHT FIXTURES AND ASSOCIATED LIGHTING CONTROLS TO BE DISCONNECTED AND REMOVED IN THEIR ENTIRETY INCLUDING ALL BRANCH WIRING AND CONDUIT.
3	ALL BRANCH CIRCUITS TO BE TRACED OUT TO VERIFY CIRCUITS ARE NOT SERVING EQUIPMENT TO REMAIN. IDENTIFY ALL PANEL FEEDERS AND ASSOCIATED BRANCH CIRCUITS WHICH WILL NEED TO REMAIN. THE EXISTING BRANCH CIRCUITS IDENTIFIED SHALL BE TERMINATED IN A JUNCTION BOX AND LABELED WITH PANEL NAME AND CXT NUMBER FOR RE-USE/EXTENSION DURING CONSTRUCTION PHASE.



FOURTH FLOOR PART REMOVAL PLAN
SCALE: 1/4" = 1'-0"



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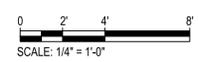
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PROJECT:
D442 CLASSROOM RENOVATION
POMERANTZ 300 7TH AVE
NEW YORK NY 10001

DRAWING TITLE:
ELECTRICAL
4TH FLOOR REMOVAL
PART POWER PLAN

DEPARTMENT OF BUILDING JOB #

SEAL & SIGNATURE:	DATE: 06.01.2023
	PROJECT No: 223203
	DRAWING BY: KB
	CHK BY: WM
	DWG No:
	E-900.00
	SCALE: NTS
	5 OF 5



ISSUED FOR BID 06.07.2023

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