Purchase College
STATE UNIVERSITY OF NEW YORK
735 Anderson Hill Road
Purchase, NY 10577-1402
www.purchase.edu

Procurement Department
IFB: Studio A Renovation
Project SU-071321
Addendum #3 * November 23, 2021

To: Prospective Bidders **No. of Pages: 212**

SUNY Purchase hereby issues this Addendum, dated 11/23/2021, for the above referenced IFB, in order to provide the following clarification:

Item 1:
Quote Due Date is hereby moved to Thursday, December 9, 2021 at 2 p.m.

Item 2:
SUNY Purchase has added an allowance of $41,200.00 for Siemens BMS equipment per the proposal dated 11/19/21. The revised Bid Proposal is attached.

Item 3:
Schedule III of the Construction Agreement has also been updated to reflect the addition of the allowance and is attached.

Item 4:
SUNY Purchase wishes to offer additional clarifications in regard to this project's construction documents, which are detailed in the attached Addendum #3.

Please be sure to sign THIS ADDENDUM (as acknowledgment that your firm received it) and submit it with your bid package, which is due **Thursday, December 9th, 2021 at 2 pm**.

Respectfully,

Sheli Taylor, Associate Director
Procurement and Accounts Payable

Acknowledgement of ADDENDUM #3

_____
Signature Date

_____
Typed printed name and title

_____
Company name

_____
NAME OF BIDDER

_____
ADDRESS OF BIDDER

PROPOSAL
FOR

Project Number: **SU-071321** Date: **November 3, 2021**
Project Name: **Studio A Renovation**

TO THE STATE UNIVERSITY OF NEW YORK:

1. **The Work Proposed Herein Will Be Completed Within the timeframe stated on page one of the Agreement.** In the event the bidder fails to complete such work by said date or dates, or within the time to which such completion may have been extended in accordance with the Contract Documents, the bidder agrees to pay the University liquidated damages in an amount equal to the values indicate in the Liquidated Damages Schedule below for each calendar day of delay in completing the work.

LIQUIDATED DAMAGES SCHEDULE

Contract Amount	***Liquidated Damages***
Under $100,000	**$100/day**
$100,000-$499,999	**$200/day**
$500,000-$999,999	**$300/day**
$1MM-$1,999,999	**$400/day**
$2MM-$3,499,999	**$500/day**
$3.5MM-$5MM	**$700/day**
Over $5MM (to be determined by the University in each instance)	**$_____/day**

2. The bidder hereby declares that it has carefully examined all Bidding and Contract Documents and that it has personally inspected the actual location of the work, together with the local sources of supply, has satisfied itself as to all the quantities and conditions, and understands that in signing this Proposal, it waives all right to plead any misunderstanding regarding the same.

3. The bidder further understands and agrees that it is to do, perform and complete all work in accordance with the Contract Documents and to accept in full compensation therefore the amount of the Total Bid, modified by such additive or deductive alternates, if any, as are accepted by the University.

4. The bidder further agrees to accept the unit prices, if any, set forth in paragraph (5) of this proposal, except as the same may be modified pursuant to the provisions of Section (5) of the Information to Bidders, as full payment for the amount of the credit to the University for any deletions, additions, modifications or changes to the portion or portions of work covered by said unit prices.

5. **BID CALCULATION**

a. **BASE BID** *(does not include allowances)*

$_____
(in numbers)

_____
(in words)

b. **ALLOWANCES:** In accordance with the Schedule I and Section 4.05 of Agreement, the bidder further agrees to the following additions to the Base Bid:

Work or Materials Description	Amount in Words	Amount in Figures
Field order allowance	Twenty-five thousand three hundred forty dollars	$ 25,340.00
Allowance for Siemens BMS per proposal dated 11/19/21	Forty-one thousand two hundred dollars	$41,200.00

c. **TOTAL BID** *(base bid + allowances = total bid)*

$_____
(in numbers)

_____
(in words)

d. **ALTERNATES**: In accordance with Section B of the General Requirements the bidder proposes the following additions to or deductions from the Total Bid for the alternates listed below:

Alternate Number	Add/ Deduct	Amount in Words	Amount in Figures

e. **UNIT PRICES**: In accordance with Section (5) paragraph (2) of the Information to Bidders and Section 4.04 of the Agreement the bidder or the University may insert unit prices for the work

or materials listed below for clarification.

Work or Materials Description	Amount in Words	Amount in Figures

6. 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: (a) the prices in this 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; (b) unless otherwise required by law, the prices have been quoted in this 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 (c) no attempt has been made or will be made by the bidder to induce any person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

   A bid shall not be considered for award nor shall any award be made where (a), (b) and (c) above have not been complied with; provided, however, that if in any case the bidder cannot make the foregoing certification the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefor. Where (a), (b), and (c) above shall have not been complied with, the bid shall not be considered for award nor shall any award be made unless the Campus President, or designee, or Vice Chancellor for Capital Facilities, or designee, determines that such disclosure was not made for purposes of restricting competition.

   The fact that a bidder (a) has published price lists, rates, or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being bid, does not constitute, without more, a disclosure within the meaning of this Section.

7. The bidder agrees that if awarded the Contract, it will commence work within (10) calendar days after date of receipt of a fully executed Agreement and that it will fully complete the work by the date stated herein.

8. The bidder acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein.

Addendum Number	Date	Addendum Number	Date
_____	___/___/___	_____	___/___/___
_____	___/___/___	_____	___/___/___
_____	___/___/___	_____	___/___/___

9. The bidder submits herewith bid security in an amount not less than five (5) percent of the Total Bid. In the event that (a) the bidder's Total Bid is the lowest one submitted and the bidder does not timely provide the Post-Bid Information required by the Information for Bidders or (b) this Proposal is accepted by the University and the bidder shall refuse or neglect, within ten (10) calendar days after date of receipt of Agreement, to execute and deliver said Agreement in the form provided herein, or to execute and deliver a Performance Bond and a Labor and Material Bond in the amounts required and in the form prescribed, the bidder shall be liable to the University, as liquidated damages, for the amount of the bid security or the difference between the Total Bid of the bidder and the Total Bid of the bidder submitting the next lowest bid, whichever sum shall be higher, otherwise the total amount of the bid security will be returned to the bidder in accordance with the provisions set forth in the Information for Bidders. The University may apply the bid security in full or partial payments, as the case may be, of said liquidated damages and in the event the bid security is less than the amount of liquidated damages to which the University is entitled, the bidder shall pay the difference, upon demand, to the University.

10. The bidder certifies that all wood products that are to be used in the performance of this Contract shall be in accordance with the Specifications and provisions of Section 167 b. of the State Finance Law which Section prohibits the purchase and use of tropical hardwoods.

11. The bidder affirms that it understands and agrees to comply with the procedures of the Fund relative to permissible contacts as required by Sections 139-j(3) and 139-j-(6)(b) of the State Finance Law.

12. The bidder certifies that all information provided or to be provided to the University in connection with this procurement is, as required by Section 139-k of the State Finance Law, complete, true and accurate.

Dated _____/_____/_____

Firm's Federal ID Number or
Social Security Number as applicable _____

Legal name of person, partnership, joint venture or corporation:

_____

By_____
(signature)

Title_____

ACKNOWLEDGMENT FOR THE PROPOSAL

THE LEGAL ADDRESS OF THE BIDDER

_____

_____

_____

_____

Telephone No._____ Facsimile No._____

If a Corporation

Name Address

_____PRESIDENT _____

_____SECRETARY _____

_____TREASURER _____

If a Partnership

Name of Partners Address

_____ _____

_____ _____

_____ _____

If a Joint Venture

Name of Members Address

_____ _____

_____ _____

_____ _____

If an Individual

Name of Individual Address

_____ _____

Attachment A – List of Completed Similar Construction Projects

Bidder Name: **Project No.:**

Bidders must provide three (3) example projects completed in the past five (5) years in which the Bidder served as the prime contractor. Example projects must be of similar size, scope and complexity to the project currently being bid, as further described in the Description of Work. Each project must include the Owner/Agency, Award Date, Contract Amount, Date Completed, Contact Person, Telephone number of the contact, Architect and/or Engineer's Name, Contract Number, Contact Email, and the Project Title and a brief scope description. Reference contacts may be used to verify project size, scope, dollar value, percentages and quality of performance.

1.	Agency/Owner			Award Date	Contract Amount / Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer	
	Contract No.	Contact Email	Project Title & Scope		
2.	Agency/Owner			Award Date	Contract Amount / Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer	
	Contract No.	Contact Email	Project Title & Scope		
3.	Agency/Owner			Award Date	Contract Amount / Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer	
	Contract No.	Contact Email	Project Title & Scope		
Completed By:				Phone Number: Email: Date:	

PLEASE NOTE: HIGHLIGHTED MUST BE FILLED OUT TO COMPLETE THIS CONTRACT. THIS INCLUDES CONTENT IN PAGE 1, SECTIONS 4.01, 4.20, 5.06, THE SIGNATURE PAGE & SCHEDULE A.

This Agreement (referred to alternately as "Agreement" or "Contract") made as of the _____ day of _____, 20____, for Contract Number D990120 by and between STATE UNIVERSITY OF NEW YORK, a corporation organized and existing under the laws of the State of New York, with its principal office located at State University Plaza, 353 Broadway, Albany, New York 12246, on behalf of State University of New York at Purchase College located at 735 Anderson Hill Road, Purchase, NY 10577, hereinafter referred to as "University" and _____having its principal office located at _____ _____, and a Federal ID or Social Security No. of {insert number}, hereinafter referred to as "the "Contractor."

WITNESSETH:

The parties hereto agree that the Contractor shall:

(a) furnish and perform all work of every kind required and all other things necessary to complete in the most substantial and workmanlike manner the construction of

SU-071321
Studio A Renovation
Purchase College

in strict accordance with the Contract Documents; and

(b) complete all work necessary for substantial completion by **within 180 days after the date of the Notice to Proceed**, or within the time to which such completion may have been extended in accordance with the Contract Documents;

(c) in the event it fails to substantially complete all the work on time, pay to the University liquidated damages in accordance with the liquidated damages schedule listed on page one of the contractors proposal for each calendar day of delay of substantially completing all the work; and

(d) do everything required by the Contract; subject, however, to the terms, provisions and conditions listed hereinafter.

Article I
General Provisions

Section 1.01 Definitions

Where the following words and expressions are used in the Contract Documents it is understood that they have the meaning set forth as follows:

Allowance	Any and all work and materials which may be required of the Contractor in performing work set forth under one or more allowances to this Agreement shall be Work, as defined herein, which shall be performed in accordance with the base schedule for the performance of the Contractor's Work. Contractor shall not be entitled to an extension of time for the performance of an allowance or all allowances.
Consultant	The Architect or Engineer named in the Notice to Bidders or such other person or firm designated by the University to provide general administration of the Contract and inspection of the work.
Bidding Documents	Notice to Bidders, Information for Bidders and Proposals
Bonds	Performance Bond and Labor and Material Bond

Delay	For purposes of this document and as used herein and in any other contract documents between the Contractor and the University the word “delay” shall be interpreted broadly and shall include by way of example only and not by way of limitation: delay, disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the University and/or Consultant, and lack of coordination, cumulative impact of multiple change orders, delay and other impacts.
Contract or Contract Documents	The Agreement, Exhibits A and A-1, Bidding Documents, Bonds, Specifications, Project Manual, Drawings Addenda issued prior to the opening of bids and Change Orders issued after award of the Contract.
University	State University Construction University
Notice to Proceed	Written notice provided by the University to the Contractor stating the date on which the contractor can begin project work.
Project	The facility or facilities to be constructed including all usual, appropriate and necessary attendant work shown on, described in or mentioned in the Contract.
Site	The area within the Contract limit lines, as shown on the Drawings, and all other areas upon which the Contractor is to perform work.
Substantial Completion	Substantial Completion is the completion of Work so that the Project can be fully occupied and used for the purposes for which it is intended. Substantial Completion includes: (1) completion of all work required for the issuance of a code compliance certificate, or a temporary approval for occupancy, completed in a manner that includes no uncorrected deficiency or material violation of the Building Code of New York State within the area or work for which the certificate is to be issued; (2) completion of all building systems and functional testing of said systems (other than tests that cannot be performed due to the seasonal environmental conditions in effect at the time of completion); (3) acceptance and approval of the Operating Instructions and Manuals and Training of Campus Personnel; and (4)the sum of values determined for Punch List work at the time of Substantial Completion shall not exceed one (1) percent of the amount of the Contract consideration unless otherwise agreed to by the University.
Work	The using, performing, installing, furnishing and supplying of all materials, equipment, labor, services and incidentals necessary or proper for or incidental to the successful completion of the Project and the carrying out of all duties and obligations imposed upon the Contractor by the Contract.

Section 1.02 Captions
The titles or captions of Articles and Sections of the Contract are intended for convenience and reference purposes only and in no way define, limit or describe the scope or intent thereof or of the Contract or in any way affect the Contract.

Section 1.03 Nomenclature
Materials, equipment or other work described in words and abbreviations which have a well-known, technical or trade meaning shall be interpreted as having such meaning in connection with the Contract.

Section 1.04 Entire Agreement
The Contract constitutes the entire agreement between the parties hereto and no statement, promise, condition, understanding, inducement or representation, oral or written, expressed or implied, which is not contained herein shall be binding or valid and the Contract shall not be changed, modified, or altered in any manner except by an instrument in writing executed by the parties hereto.

Section 1.05 Successors, Assigns and Agents
To the extent allowed by the terms of "Exhibit A”, the Contract shall bind the successors, assigns and representatives of the parties hereto. The University reserves the right to have the State University Construction University Fund act as its agent at any time or duration of this Agreement. Such designation of the Fund to act on the behalf of the University shall be in writing and addressed to the Contractor.

Section 1.06 Accuracy and Completeness of Contract Documents

(1) The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The intention of the Documents is to include all materials, plant, equipment, tools, skill and labor of every kind necessary for the proper execution of the work and also those things which may be reasonably inferable from the Contract Documents as being necessary to produce the intended results.

(2) The Contract Documents contemplate a finished piece of work of such character and quality as is reasonably inferable from them. The Contractor acknowledges that the Contract consideration includes sufficient money allowance to make its work complete and operational and in compliance with good practice and it agrees that inadvertent minor discrepancies or omissions or the failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another shall not be the cause for additional charges or claims. In case of a conflict between any part or parts of the Contract Documents with any other part or parts thereof, as contrasted to an omission or failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another part thereof, the following shall be given preference, in the order hereinafter set forth, to determine what work the Contractor is required to perform: (a) Exhibit A and A-1, (b) Addenda (later dates to take preference over earlier dates); (c) Amendments to Agreement; (d) Agreement; (e) Bidding Documents; (f) Specifications; (g) Schedules (i.e. finish schedules); (h) Large scale detail Drawings (detail drawings having a scale of 3/4" and over); (i) Large scale plan and section Drawings (plan and section drawings having a scale equal to or larger than that used for the basic floor or site plan, as the case may be); (j) Small scale detail Drawings (detail drawings having a scale of less than 3/4"); and (k) Small scale plan and section Drawings (plan and section drawings having a scale less than that used for the basic floor or site plan, as the case may be). In the event of such a conflict between or among parts of the Contract Documents that are entitled to equal preference, the more expensive way of doing the work, the better quality or greater quantity of material shall govern unless the University otherwise directs.

Section 1.07 Organization of Contract Documents

The Specifications and Drawings are generally divided into trade sections for the purpose of ready references, but such division is arbitrary and such sections shall not be construed as the prescription by the Consultant or the University of the limits of the work of any subcontractor or as a determination of the class of labor or trade necessary for the fabrication, erection, installation or finishing of the work required. The Contractor will be permitted to allot the work of subcontractors at its own discretion regardless of the grouping of the Specifications and Drawings. It shall be the Contractor's responsibility to settle definitively with each subcontractor the portions of the work which the latter will be required to do. The University and the Consultant assume no responsibility whatever for any jurisdiction claimed by any of the trades involved in the work.

Section 1.08 Furnishing of Contract Documents

The University shall establish the format for the Contract Documents (hard copy and/or electronic media) at the start of the Project. The Contractor shall be furnished, free of charge, with two (2) copies of the Specifications and Drawings in the selected format(s). Any other copies of the Specifications and Drawings which the Contractor may desire can be obtained at the Contractors expense.

Section 1.09 Examination of Contract Documents and Site

By executing the Contract, the Contractor agrees that it has carefully examined the Contract Documents together with the site of the proposed work as well as its surrounding territory; that it is fully informed regarding all the conditions affecting the work to be done and the labor and materials to be furnished for the completion of the Contract; and that its information has been acquired by personal investigation and research and not in the estimates and records of the University.

Section 1.10 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 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.

Section 1.11 No Collusion or Fraud
The Contractor hereby agrees that the Contract was secured without collusion or fraud and that neither any officer nor any employee of the University has or shall have a financial interest in the performance of the Contract or in the supplies, work or business to which it relates, or in any portion of the profits thereof.

Section 1.12 Notices
(1) All notices permitted or required hereunder shall be in writing and shall be transmitted either:

a. via certified or registered United States mail, return receipt requested;
b. by personal delivery;
c. by expedited delivery service; or
d. by email if actually received by the University. Contractor bears the burden of proof of service by email and receipt of email by the University.

Such notices shall be addressed as follows or to such different addresses as the parties may from time to time designate:

Purchase College, SUNY
Name: Sheli Taylor
Title: Associate Director, Contracts & Procurement Services
Address: 735 Anderson Hill Road, Purchase, NY 10577
Telephone Number: 914-251-6089
E-mail address: sheli.taylor@purchase.edu

{insert company name}
Name: {insert designated contact's title}
Title: {insert designated contact's title}
Address: {insert company}
Telephone Number: {insert phone}
E-mail Address: {insert email}

(2) Any such notice shall be deemed to have been given either at the time of personal delivery or actual receipt by the University, or in the case of email, upon receipt by the University.

(3) The parties may, from time to time, specify any new or different address in the United States as their address for purpose of receiving notice under this Agreement by giving fifteen (15) days written notice to the other party sent in accordance herewith. The parties agree to mutually designate individuals as their respective representatives for the purposes of receiving notices under this Agreement. Additional individuals may be designated in writing by the parties for purposes of implementation and administration/billing, resolving issues and problems and/or for dispute resolution.

Section 1.13 Singular-Plural; Male-Female
As used in the Contract Documents, the singular of any word or designation, whenever necessary or appropriate, shall include the plural and vice versa, and the masculine gender shall include the female and neutral genders and vice versa.

Article II
Contract Administration and Conduct

Section 2.01 Consultant's Status
(1) The Consultant, as the University's representative, shall provide general administration of the Contract and inspection of the work. The Consultant will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the work, and it will not be responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents. The Consultant's duties, services and work shall in no way supersede or dilute the Contractor's obligation to perform the work in conformance with all Contract requirements, but it is empowered by the University to act on its behalf with respect to the proper execution of the work and to give instructions and/or direction when necessary to

require such corrective measures as may be necessary, in its professional opinion, to insure the proper execution of the Contract or to otherwise protect the University's interest.

(2) The Consultant shall have the authority to stop the work or to require and/or direct the prompt execution thereof whenever such action may be necessary, in its professional opinion, to insure the proper execution of the Contract or to otherwise protect the interests of the University.

(3) Except as otherwise provided in the Contract, the Consultant shall determine the amount, quality, acceptability, fitness and progress of the work covered by the Contract and shall decide all questions of fact which may arise in relation to the interpretation of the plans and Specifications, the performance of the work and the fulfillment by the Contractor of the provisions of the Contract. The Consultant shall in the first instance be the interpreter of the provisions of the Contract and the judge of its performance and it shall use its power under the Contract to enforce its faithful performance.

Section 2.02 Finality of Decisions

(1) Any decision or determination of the Consultant under the provisions of the Contract shall be final, conclusive and binding on the Contractor unless the Contractor shall, within ten (10) working days after such decision, make and deliver to the University a verified written statement of its contention that the decision of the Consultant is contrary to a provision of the Contract. The University shall thereupon determine the validity of the Contractor's contention. Pending decision by the University, the Contractor shall proceed in accordance with the Consultant's decision.

(2) Wherever it is provided in the Contract Documents that an application must be made to the University and/or determination made by the University, the University's decision on such application and/or its determination under the Contract Documents shall be final, conclusive and binding upon the Contractor unless the Contractor, within ten (10) working days after receiving notice of the University's decision or determination, files a written statement with the University and the Consultant that it reserves its rights in connection with the matters covered by said decision or determination and after a court of competent jurisdiction determines the University's said decision or determination to be fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith in an action brought in accordance with Section 4.24.

Section 2.03 Claims and Disputes

(1) If the Contractor claims (i) that any work it has been ordered to do is extra work or (ii) that it has performed or is going to perform extra work or (iii) that any action or omission of the University or the Consultant is contrary to the terms and provisions of the Contract, it shall:

a. Promptly comply with such order;

b. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the University and the Consultant, within five (5) working days after being ordered to perform the work claimed by it to be extra work or within five (5) working days after commencing performance of the extra work, whichever date shall be the earlier, or within fifteen (15) working days after the said action or omission on the part of the University or the Consultant occurred, a written notice of the basis of its claim and request a determination thereof.

c. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the University and the Consultant, within thirty (30) calendar days after said alleged extra work was required to be performed or said alleged extra work was commenced, whichever date shall be the earlier, or said alleged action or omission by the University or the Consultant occurred, a verified detailed statement, with documentary evidence, of the items and basis of its claim, including an initial and updated detailed Time Progress Schedule,

d. Produce for the University's examination, upon notice from the University, such information and documentation as directed by the University, which shall include but not be limited to job cost reports and all estimates and documentation used to develop the Bid Proposal, all its books of account, bills, invoices, payrolls, subcontracts, time books, progress records, daily reports, bank deposit books, bank statements, checkbooks and cancelled checks, showing all of its actions and transactions in connection with or relating to or arising by reason of its

claim, and submit persons in its employment and in its subcontractors' employment for examination under oath by any person designated by the University to investigate any claims made against the University under the Contract, such examination to be made at the offices of the Contractor; and

e. Proceed diligently, pending and subsequent to the determination of the University with respect to any such disputed matter, with the performance of the Contract and in accordance with all instructions of the University and the Consultant.

(2) The Contractor's failure to comply with any or all parts of subdivision b, c and d of paragraph (1) of this Section shall be deemed to be: (i) a conclusive and binding determination on its part that said order, work, action or omission does not involve extra work and is not contrary to the terms and provisions of the Contract; and (ii) a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, work, action or omission. The provisions of subdivision b, c and d of paragraph (1) of this Section are for the purpose of enabling the University to avoid waste of public funds by affording it promptly the opportunity to cancel or revise any order, change its plans, mitigate or remedy the effects or circumstances giving rise to a claim or take such other action as may seem desirable and to verify any claimed expenses or circumstances as they occur. Compliance with such provisions is essential whether or not the University is aware of the circumstances of any order or other circumstances which might constitute a basis for a claim and whether or not the University has indicated it will consider a claim in connection therewith.

(3) The Contractor's failure to submit and maintain a Time Progress Schedule in accordance with Section 3.02 of the Agreement shall be deemed to be a waiver by the Contractor of all claims for additional time, compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work. The Schedule of Record, regularly updated and submitted at required durations in accordance with the provisions of the General Requirements, Section paragraph titled "Project Schedule": (i) informs the University and affords it promptly of regular opportunities to change its plans or mitigate or remedy the effects or circumstances giving rise to a claim of delay in the completion of the work or take such other action as may seem desirable to verify any claimed circumstances as they occur; and (ii) forms a record which becomes the basis of the University's verification of an alleged cause of delay in the completion of the work.

(4) No person has power to waive or modify any of the foregoing provisions and, in any action against the University to recover any sum in excess of the sum certified by the University to be due under or by reason of the Contract, the Contractor must allege in its complaint and prove at the trial compliance with the provisions of this Section.

(5) Nothing in this Section shall in any way affect the University's right to obtain an examination before trial or a discovery and inspection in any action that might be instituted by or against the University or the Contractor.

Section 2.04 Omitted Work

The University reserves the right at any time during the progress of the work to delete, modify or change the work covered by the Contract, by a Change Order or Field Order thereto providing for either a reduction or omission of any portion of the work, without constituting grounds for any claim by the Contractor for allowances for damages or for loss of anticipated profits and in such event a deduction shall be made from the Contract consideration, the amount of which is to be determined in accordance with the provisions of Section 4.02 or 4.05A of the Agreement.

Section 2.05 Extra Work

(1) The University reserves the right at any time during the progress of the work to add, modify or change the work covered by the Contract by Change Order or Field Order or as otherwise required by the University thereto providing for extra work of either a qualitative or quantitative nature and in such event the Contract consideration may be increased by an amount to be determined in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement and the completion date for all or any part of the work may be extended for such period of time as may be determined by the University as necessary, because of the extra work, to complete the work or any part thereof.

(2) Nothing in the Contract Documents shall excuse the Contractor from proceeding with the extra work as directed., The terms and conditions of the Contract Documents shall be fully applicable to all extra work.

(3) The Contractor shall have no claim for extra work or an extension of time if the performance of such work, in the judgment of the Consultant, is made necessary or desirable because of any act or omission of the Contractor which is not in accordance with the Contract.

(4) Notwithstanding the provisions of Section 2.02 of the Agreement and any other provisions of the Contract Documents to the contrary, the University, after conferring with the Consultant, shall have the right to overrule a determination or decision of the Consultant, that relates to whether certain work is included in the Contract Documents or is extra work, which the University believes is incorrect; in the event the University exercises such right, that determination or decision shall be final, conclusive and binding upon the Contractor and the University unless the same shall be determined by a court of competent jurisdiction to have been fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith.

Section 2.06 Contractor to Give Personal Attention

(1) The Contractor shall give its constant personal attention to all the work while it is in progress and shall place the work in charge of a competent and reliable full-time superintendent acceptable to the Consultant and the University who shall have authority to act for the Contractor and who shall be accountable to the Consultant to the extent provided in the Contract. Unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in its employ, such superintendent shall not be changed without the written permission of the Consultant and the University.

(2) When the Contractor and its superintendent are temporarily absent from the site of the work, the Contractor or its superintendent shall designate a responsible supervisory employee, approved by the Consultant and the University, to receive such orders as the Consultant or its representative may give. At no time shall any work be conducted on the site in the absence of an individual present who has been so designated by the Contractor or its superintendent as having authority to receive and execute instructions given by the Consultant or its representative.

(3) If the superintendent, project manager or other supervisory employees are not satisfactory to the University, the Contractor shall, if directed by the University, immediately replace such supervisory employees with other supervisory employees acceptable to the Consultant and the University. Such replacement and all related impacts shall be at no additional cost to the University.

Section 2.07 Employment of Workers

The Contractor shall at all times employ competent and suitable workers and equipment which shall be sufficient to prosecute all the work to full completion in a disciplined orderly manner and in accordance with the Time Progress Schedule and the contractually required time of performance. All workers engaged in special or skilled work shall have had sufficient experience in such work to properly and satisfactorily perform the same. Should the Consultant deem any employee of the Contractor or any subcontractor incompetent, careless, insubordinate or otherwise objectionable or whose continued employment on the work is deemed by the Consultant to be contrary to the public interest, it shall so advise the Contractor and the latter shall dismiss or shall cause the subcontractor, if such employee is employed by the latter, to dismiss such employee and such employee shall not again be employed on the work to be performed under the Contract without obtaining the prior written approval of the Consultant.

Section 2.08 Detailed Drawings and Instructions

Upon timely notice from the Contractor that supplementary information is required, the Consultant shall furnish additional instructions, by means of Drawings or otherwise, necessary for the proper execution of the work. All such Drawings and instructions shall be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. The work shall be executed in conformity therewith and the Contractor shall do no work without proper Drawings and/or instructions.

Section 2.09 Contract Documents to Be Kept at Site

The Contractor shall keep at the site of the work a copy of the Drawings and Specifications and shall at all times give the Consultant and the University access thereto.

Section 2.10 Permits and Building Codes

The Contractor shall obtain from the proper authorities all permits legally required to carry on its work, pay any and all taxes and fees legally required and shall be responsible for conducting its operations in accordance with the provisions

of such permits. Except as otherwise expressly provided in the Contract Documents, all of the work covered by this Agreement which is to be performed on property owned by the State University of New York is not subject to the building code of any city, county or other political subdivision of the State of New York. It is, however, subject to the provisions of the Building Code of New York State and the applicable Federal and State health and labor laws and regulations.

Section 2.11 Surveys

(1) From the data shown on the Drawings and identified at the site by the Consultant, a licensed surveyor, to be designated and paid for by the University, shall establish one (1) fixed benchmark and one (1) fixed base line at the site. The Contractor shall work from the benchmarks and base lines shown on the Drawings, identified at the site by the Consultant and established at the site by the aforesaid surveyor and shall establish such supplementary bench marks and base lines that are required in order for it to lay out the work. The Contractor shall be responsible for all measurements that may be required for execution of the work to the exact position and elevation as prescribed in the Specifications, shown on the Drawings, or as the same may be modified at the direction of the Consultant to meet changed conditions or as a result of modifications to the work covered by the Contract.

(2) The Contractor shall furnish at its own expense such stakes and other required equipment, tools and materials, and all labor as may be required in laying out any part of the work. If, for any reason, monuments are disturbed, it shall be the responsibility of the Contractor to reestablish them, without cost to the University, as directed by the Consultant. The Consultant may require that construction work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking completed work or the work in progress.

(3) In all multiple-story construction, the Contractor shall establish and maintain line marks at each floor level and grade marks four (4) feet above the finished floor at each floor level.

Section 2.12 Site Conditions

(1) The Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such provision as it deems proper for all physical conditions and subsurface conditions as it could reasonably anticipate encountering from the provisions of the Contract Documents, borings, rock cores, topographical maps and such other information as the University or the Consultant made available to it prior to the University's receipt of bids or from its own inspection and examination of the site prior to the University's receipt of bids.

(2) In the event that the Contractor encounters subsurface physical conditions or other latent physical conditions at the site differing substantially from those shown on or described or indicated in the Contract Documents and which could not have been reasonably anticipated from the aforesaid information made available by the University or the Consultant or from the Contractor's aforesaid inspection and examination of the site, it shall give immediate notice to the Consultant of such conditions before they are disturbed. The Consultant will thereupon promptly investigate the conditions and, if it finds that they do substantially differ from that which should have been reasonably anticipated by the Contractor, it shall make such changes in the Drawings and Specifications as may be necessary and a Change Order or Field Order may be issued, the amount of which shall be determined in accordance with the provisions of Sections 4.02 and 4.05A, to reflect any increase or decrease in the cost of, or the time required for, performance of the Contract as a result of any of the aforesaid changes made by the Consultant and/or as a result of such unanticipated subsurface conditions.

Section 2.13 Right to Change Location

When additional information regarding the subsurface conditions becomes available to the University as a result of the excavation work, further testing or otherwise, it may be found desirable to change the location, alignment, dimensions or grades to conform to such conditions. The University reserves the right to make such reasonable changes in the work as, in its opinion, may be considered necessary or desirable; such changes and any adjustments in the Contract consideration as a result thereof are to be made in accordance with the provisions of Sections 2.04, 2.05 4.02 and 4.05A of the Agreement.

Section 2.14 Unforeseen Difficulties

Except as otherwise expressly provided in Section 2.12 of the Agreement and in other Sections of the Contract Documents, the Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such

provisions as it deems proper for any unforeseeable obstacles or difficulties which it may encounter in the performance of the work.

Section 2.15 Moving Materials and Equipment

Should it become necessary, in the judgment of the Consultant, at any time during the course of the work to move materials which are stored on the site and equipment which has been temporarily placed thereon, the Contractor upon request of the Consultant shall move them or cause them to be moved at its sole cost and expense; provided, however, if materials and equipment that have been stored or placed by the Contractor at a location on the site expressly approved, in writing, by the Consultant and the same are moved or caused to be moved by the Contractor at the Consultant's request, such removal shall be deemed extra work and the Contractor shall be compensated therefor in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement.

Section 2.16 Other Contracts

(1) Prior to and during the progress of the work hereunder the University reserves the right to let or permit the letting of other contracts relating to the Project or in connection with work on sites within the Contract limit lines or adjoining or adjacent to that on which the work covered by this Agreement is to be performed. In the event such other contracts are let, or have previously been let, the Contractor and such other contractors shall coordinate their work with each other, arrange the sequence of their work to conform with the progressive operation of all the work covered by such contracts and afford each other reasonable opportunities for the introduction and storage of their materials, supplies and equipment and the execution of their work. If the Contractor or such other contractors contend that their work or the progress thereof is being interfered with by the acts or omissions of the other or others or that there is a failure to coordinate or properly arrange the sequence of the work on the part of the Contractor or such other contractors, they shall, within five (5) working days of the commencement of such interference or failure of coordination or failure to perform work in proper sequence, give written notification to the University and the Consultant of such contention. Upon receipt of such notification or on its own initiative, the Consultant shall investigate the situation and issue such instructions to the Contractor or such other contractors with respect thereto as it may deem proper. The Consultant shall determine the rights of the Contractor and of such other contractors and the sequence of work necessary to expedite the completion of all work covered by this Agreement in relation to the work covered by said other contracts.

(2) The Contractor agrees that it has and will make no claim for damages against the University by reason of any act or omission to act by any other contractor or in connection with the Consultant's or University's acts or omissions to act in connection with such other contractor, but the Contractor shall have a right to recover such damages from the other contractors.

(3) If the proper and accurate performance of the work covered by the Contract depends upon the proper performance and execution of work not included herein or depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Consultant any defects in such work that render it unsuitable for proper execution and results. Its failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the work covered by the Contract, except as to latent defects which may be discovered thereafter.

Section 2.17 Inspection and Testing

(1) All materials and workmanship shall be subject to inspection, examination and testing by the Consultant and the University at all times during the performance of the work and at all places where the work is carried on. Except as otherwise herein specified, the University shall pay for the cost of inspection, examination and testing by the Consultant or the University. If, however, the tests prove that the materials and/or work tested do not meet the requirements of the Contract, then the entire cost of such tests and any additional testing and or inspections required until the work is deemed compliant is to be borne by the Contractor. The Consultant will have the right to reject defective material and workmanship furnished by the Contractor or require its correction. The Contractor, without charge therefor, shall satisfactorily and promptly correct all rejected work and replace all rejected material with proper material.

(2) The Contractor shall promptly segregate and remove from the site of the work all rejected material and work. If the Contractor shall fail to proceed at once with the replacing of rejected material and/or correction of defective workmanship, the University may, by contract or otherwise, replace such material and/or correct such

workmanship, and charge the costs thereof to the Contractor or it may cancel the Contract and terminate the Contractor's employment as provided in the Agreement.

(3) The Contractor, without additional charge, shall promptly furnish all reasonable facilities, labor materials and equipment with associated operators necessary for the safe and convenient access, inspection and testing that may be required by the Consultant or the University.

(4) If the Contract Documents or the Consultant's instructions or the applicable laws, ordinances or regulations of any governmental authority require any part of the work covered by the Contract to be specially tested or inspected, the Contractor shall give the Consultant timely notice of its readiness for such testing or inspection or, if the same is to be performed by a governmental authority, of the date fixed therefor. If any such work, without the written permission of the Consultant, should be covered up prior to such testing or inspection, the Contractor, at its sole cost and expense must, if directed by the Consultant, uncover the same for testing or inspection and reconstruct same after the tests or inspection are conducted. All certificates of inspection or testing, involving the Contractor's work, required to be obtained from governmental authorities are to be secured by the Contractor at its sole cost and expense.

(5) Should it be considered necessary or advisable by the Consultant at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out same, the Contractor, upon request, shall furnish all necessary facilities, labor and material to perform such examination. If the work subject to such examination is found to be defective or nonconforming in any manner due to the fault of the Contractor or any of its subcontractors, such uncovering or destruction and necessary reconstruction, even though such includes work not covered in the Contract, shall be at the expense of the Contractor. If, however, such work after testing and examination is found to be satisfactory, the University will pay the Contractor the cost of such uncovering or destruction and reconstruction, such cost to be determined as in the case of extra work as provided in Sections 4.02 and 4.05A.

(6) Inspection of material and furnished articles to be incorporated in the work may be made at the place of production, manufacture or shipment unless otherwise stated herein. The inspection of material and workmanship for final acceptance as a whole or in part will be made at the site of the work.

Section 2.18 Subcontractors

(1) Except for subcontractors designated by the University, or required to be named at any earlier date, pursuant to the provisions of the Information for Bidders, within thirty (30) calendar days after receipt of the notice to proceed, the Contractor must submit a written statement to the Consultant giving the name and address of all proposed subcontractors. Said statement must contain a description of the portion of the work and materials which the proposed subcontractors are to perform and furnish and any other information tending to prove that the proposed subcontractors have the necessary facilities, skill, integrity, past experience and financial resources to perform the work in accordance with the terms and provisions of the Contract Documents.

(2) If the Consultant finds that the proposed subcontractors are qualified, it will so notify the Contractor within ten (10) working days after receipt of the aforesaid information. If the determination is to the contrary, however, the Consultant within such period will notify the Contractor of such determination and the latter, unless it decides to do such work itself and is qualified, in the Consultant's opinion, to do such work, must, within ten (10) working days thereafter, submit similar information with respect to other proposed subcontractors.

(3) The Consultant's approval of a subcontractor and/or the University's designation of a subcontractor pursuant to the provisions of the Contract Documents shall not relieve the Contractor of any of its responsibilities, duties and liabilities hereunder. The Contractor shall be solely responsible to the University for the acts or defaults of such subcontractors and of such subcontractors' officers, agents and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the Contractor to the extent of its subcontract.

(4) The Contractor shall be fully responsible for the administration, integration, coordination, direction and supervision of all of its subcontractors and of all work and it shall check all space requirements of the work and coordinate and adjust the same so that conflicts in space do not occur in the work being performed by it with its own employees and with the work being performed by its subcontractors and so that all equipment, piping, wiring, etc., can be installed, where possible, in the spaces allowed for same.

(5) No subcontractor shall be permitted to work at the site until: (a) it has furnished satisfactory evidence to the Consultant of the insurance required by law; (b) in the case of a Project involving a federal grant, it has furnished satisfactory evidence to the Consultant of the same type and amount of liability insurance as that required of the Contractor by Section 5.06 of the Agreement; and (c) except for subcontractors designated by the University pursuant to the provisions of the Information for Bidders, it has been approved by the Consultant.

(6) Within ten (10) working days after the Contractor receives payment from the University on account of a progress payment application for the percentage of the work done, it shall pay each of its subcontractors the sum contained in said payment for the percentage of said subcontractor's work, less the same amount retained therefrom by the University under the terms of the Contract Documents or in consequence of any legal proceedings or statutory liens, and less any amounts due the Contractor under the subcontract for work not performed or not properly or timely performed by the subcontractor. In the event any subcontractor is not paid by the Contractor, the former should immediately notify the University of such fact.

(7) The Contractor shall execute with each of its subcontractors and shall require all subcontractors to execute with their sub-subcontractors a written agreement which shall bind the latter to the terms and provisions of this Agreement insofar as such terms and provisions are applicable to the work to be performed by such subcontractors. The Contractor shall require all subcontractors and sub-subcontractors to promptly, upon request, file with the Consultant and the University a conformed copy of such agreements, from which the price and terms of payment may be deleted.

(8) If for sufficient reason, at any time during the progress of the work to be performed hereunder, the Consultant determines that any subcontractor or sub-subcontractor is incompetent, careless, or uncooperative, the Consultant will notify the Contractor accordingly and immediate steps will be taken by the Contractor for cancellation of such subcontract or sub-subcontract. Such termination, however, shall not give rise to any claim by the Contractor or by such subcontractor or sub-subcontractor for loss of prospective profits on work unperformed and/or work unfurnished and a provision to that effect shall be contained in all subcontracts and sub-subcontracts.

(9) No provisions of this Agreement shall create or be construed as creating any contractual relation between the University and any subcontractor or sub-subcontractor or with any person, firm or corporation employed by, contracted with or whose services are utilized by the Contractor.

Section 2.19 Shop Drawings and Samples

(1) The Contractor in accordance with the approved Shop Drawing, Submittal, Mockup, and Sample schedules and with such promptness and in such sequence as to cause no delay in the work, shall submit for the Consultant's approval all Shop Drawings and Samples called for under the Contract or requested by the Consultant.

(2) Shop Drawings and mock-ups shall establish the actual detail of the work, indicate proper relation to adjoining work, amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions. Shop drawings include drawings, diagrams, schedules, product data and other information or materials specially prepared for the work by the Contractor to illustrate some portion of the work. Product data include standard illustrations, schedules, performance charts, instructions, brochures, diagrams and other information identified by the Contractor to illustrate materials or equipment for some portion of the work.

(3) All Shop Drawings, mock-ups and samples shall be thoroughly checked by the Contractor for compliance with the Contract Documents before submitting them to the Consultant for approval and all Shop Drawings shall bear the Contractor's recommendation for approval. Any Shop Drawings submitted without this stamp of approval and certification, and Shop Drawings which, in the Consultant's opinion, are incomplete, contain numerous errors or have not been checked or only checked superficially, will be returned unchecked by the Consultant for resubmission by the Contractor. In checking Shop Drawings, the Contractor shall verify all dimensions and field conditions and shall check and coordinate the Shop Drawings of any section or trade with the requirements of all other sections or trades whose work is related thereto, as required for proper and complete installation and sequence of the work.

(4) Samples must be of sufficient size or number to show the quality, type, range of color, finish and texture of the material. Each Sample shall be properly labeled to show the nature of the material, trade name of manufacturer, name and location of the work where the material represented by the Sample is to be used and the name of the Contractor submitting the Sample. Transportation charges to the Consultant must be prepaid on Samples forwarded to it.

(5) At the start of the Project, the format for submittals shall be established by the University. If an electronic method is selected for the submission and approval of submittals, the Contractor shall provide submittals in a PDF format and the Consultant will return the submittals in electronic format to the Contractor. For both hard-copy and electronic submittal formats, all submittals that require physical samples or mock-ups shall be provided in accordance with the requirements set forth in the Contract Specifications. Shop Drawings and Samples, submitted by the Contractor in accordance with the approved Shop Drawing and Sample schedule that is included in the Time Progress Schedule, will be reviewed by the Consultant within fifteen (15) working days and if satisfactory will be approved. A Shop Drawing, when approved, will be returned to the Contractor. If not satisfactory, the Drawings and Samples will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall resubmit to the Consultant a corrected copy of the Shop Drawing or a new Sample, as the case may be. The Contractor shall make any correction required by the Consultant and shall appropriately note any changes or revisions on the Shop Drawing, dated to correspond with the date of the Consultant's request for the change. Upon approval of the Shop Drawing by the Consultant, the Contractor shall promptly furnish to the Consultant as many copies thereof as the Consultant may reasonably request. Should more than two (2) separate reviews of any required shop drawings or samples submitted be necessary, in the judgement of the Consultant and the University, the Contractor shall be responsible for the reasonable costs incurred by the University for such additional reviews by the Consultant.

(6) At the time of submission of a Shop Drawing or Sample, the Contractor shall inform the Consultant and the University in writing of any deviation in the Shop Drawing or Sample from the requirements of the Contract Documents. Unless such deviation is specifically noted by the Contractor with a notation that such deviation will result in extra work for which the Contractor requests payment, the Contractor shall be deemed to have waived any claim for extra work, additional compensation or payment or an extension of time with respect to all work shown on, described in or related to the Shop Drawing or Sample.

(7) The Consultant's approval of Shop Drawings or Samples is for design only and is not a complete check on the method of assembly, erection or construction. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, except where the Contractor, in accordance with the provisions of paragraph 6 of this Section, has previously notified the University and the Consultant of such departure; (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, omissions or otherwise that may exist; (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or deficiencies in strength; (d) relieving the Contractor of full responsibility for satisfactory performance of all work and coordination with the work of all subcontractors and other contractors; or (e) permitting departure from additional details or instructions previously furnished by the Consultant.

(8) No work requiring a Shop Drawing or Sample shall be commenced until a Shop Drawing or Sample is approved by the Consultant and all such work shall be: (a) in accordance with the approved Shop Drawing, provided the latter conforms in all respects to the Contract Documents or to such deviations therefrom as have been previously noted by the Contractor in accordance with the provisions of paragraph 6 of this Section; and (b) in conformance in all respects to the sample furnished to and approved by the Consultant and, unless otherwise specified, as new and of good quality.

(9) The Contractor may be required to provide professional services that constitute the practice of architecture or engineering when specifically required by the Contract Documents for a portion of the work or the Contractor needs to provide such services in order to carry out its responsibilities for construction means, methods, techniques, sequences and procedures. When professional services are required in the Contract Documents, the Consultant will specify all performance and design criteria that such services must satisfy. The University and Consultant shall be entitled to rely on the adequacy, accuracy and completeness of the professional services, certifications, and approvals performed or provided by design professionals working for the Contractor.

(10) Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% in the review or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.19.

Section 2.20 Equivalents - Approved Equal

(1) Equivalents or Approvals - General

a. The words "similar and equal to", or equal", “equivalent" and such other words of similar content and meaning shall for the purposes of this Agreement be deemed to mean similar and equivalent to one of the named products. For the purposes of subdivisions (1) and (2) of this Section and for the purposes of the Bidding Documents, the word "products" shall be deemed to include the words “articles", "materials", "items", "equipment" and “methods". Whenever in the Contract Documents one or more products are specified, the words "similar and equal to" shall be deemed inserted.

b. Whenever any product is specified in the Contract Documents by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent is not to limit competition, but to establish a standard of quality which the Consultant has determined is necessary for the Project. A Contractor may at its option use any product other than that specified in the Contract Documents provided the same is approved by the Consultant in accordance with the procedures set forth in subdivision (2) of this Section. In all cases the Consultant shall be the sole judge as to whether a proposed product is to be approved and the Contractor shall have the burden of proving, at its own cost and expense, to the satisfaction of the Consultant, that the proposed product is similar and equal to the named product. In making such determination the Consultant may establish such objective and appearance criteria as it may deem proper that the proposed product must meet in order for it to be approved.

c. Nothing in the Contract Documents shall be construed as representing, expressly or implied, that the named product is available or that there is or there is not a product similar and equal to any of the named products and the Contractor shall have and make no claim by reason of the availability or lack of availability of the named product or of a product similar and equal to any named product.

d. The Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Consultant in considering a product proposed by the Contractor or by reason of the failure of the Consultant to approve a product proposed by the Contractor.

e. Requests for approval of proposed equivalents will be received by the Consultant only from the Contractor.

f. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, sequence of work, omissions or otherwise that may exist, (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or deficiencies in strength, (d) relieving the Contractor of full responsibility for satisfactory performance of all work to achieve a functionally complete facility or result and coordination with the work of all subcontractors and other contractors or (e) permitting departure from additional details or instructions previously furnished by the Consultant.

g. Contractor agrees that the Contractor approves and authorizes the deduction from Contractor’s applications for payment any and all costs incurred by the Construction Manager, Consultant, Design Professional or otherwise in evaluating Contractor’s submissions under this Section 2.20, together with a markup upon such hard costs in the amount of 15%.

(2) Equivalents or Approvals After Bidding

a. Any and all submissions for “or equal” products which are submitted by the Contractor after award of the Contract must be made by the Contractor within ninety (90) calendar days after the date of award. Contractor agrees that it waives and relinquishes the right, claim or privilege, if any, to submit “or equal” proposals if such are made ninety (90) calendar days after the date of award of the Contract to the Contractor.

b. Requests for approval of proposed equivalents will be considered by the Consultant after bidding only in the

following cases: (a) the named product cannot be obtained by the Contractor because of strikes, lockouts, bankruptcies or discontinuance of manufacture and the Contractor makes a written request to the Consultant for consideration of the proposed equivalent within ten (10) calendar days of the date it ascertains it cannot obtain the named product; or (b) the proposed equivalent is superior, in the opinion of the Consultant, to the named product; or (c) the proposed equivalent, in the opinion of the Consultant, is equal to the named product and its use is to the advantage of the University, e.g., the University receives an equitable credit, acceptable to it, as a result of the estimated cost savings to the Contractor from the use of the proposed equivalent or the University determines that the Contractor has not failed to act diligently in placing the necessary purchase orders and a savings in the time required for the completion of the construction of the Project should result from the use of the proposed equivalent.

c. Where the Consultant pursuant to the provisions of this subdivision approves a product proposed by a Contractor and such proposed product requires a revision or redesign of any part of the work covered by this Agreement, all such revision and redesign and all new Drawings and details required therefor shall be subject to the approval of the Consultant and shall be provided by the Contractor at its own cost and expense.

Where the Consultant pursuant to the provisions of this Section approves a product proposed by a Contractor and such proposed product requires a different quantity and/or arrangement of duct work, piping, wiring, conduit or any other part of the work from that specified, detailed or indicated in the Contract Documents, the Contractor shall provide the same at its own cost and expense.

(3) Contractor agrees that the University may deduct from any application for payment made by the Contractor any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University, together with a markup upon such hard costs in the amount of 15%, in the consideration or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.20.

Section 2.21 Patents, Trademarks and Copyrights

The Contractor acknowledges that the Contract consideration includes all royalties, license fees and costs arising from patents or trademarks in any way involved in the work; provided, however, that the Contract consideration shall not be deemed to have included therein any royalty, license fee or cost arising from a patent or trademark for a design prepared by the Consultant and neither the Contractor nor the University shall have any liability in connection therewith. Where the Contractor is required or desires to use any product, device, material or process covered by patent or trademark, the Contractor shall indemnify and save harmless the University and the State of New York from any and all claims, actions, causes of action or demands, for infringement by reason of the use of such patented product, device, material or process, and shall indemnify the University and the State of New York from any cost, liability, damage and expense, including reasonable attorneys' fees and court costs, which it may be obligated to incur or pay by reason of any claim or infringement at any time both before or after the University's final acceptance of all the work to be performed under the Contract.

Section 2.22 Possession Prior to Completion

If before the final completion of all the work it shall be deemed advisable or necessary by the University to take over, use, occupy or operate any part of the completed or partly completed work or to place or install therein equipment and furnishings, the University, upon reasonable written notice to the Contractor, shall have the right to do so and the Contractor will not in any way interfere therewith or object to the same. Such action by the University shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract Documents and the Contractor acknowledges that such action by the University does not in any way evidence the completion of the work or any part thereof or in any way signify the University's acceptance of the work or any part thereof. The Contractor agrees to continue the performance of all work covered by the Contract in a manner which will not unreasonably interfere with such takeover, use, occupancy, operation, placement or installation.

Section 2.23 Completion and Acceptance

(1) Partial Completion

If before the final completion of all the work any portion of the permanent construction has been satisfactorily completed and the same will be immediately useful to the University, the latter may, by written notice, advise the Contractor that it accepts such portion of the work. Such action by the University shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any work not so completed and accepted. The partial completion of any portion of the Contractor's work by the University, the

Campus or the Consultant, shall not impact the assessment of liquidated damages or actual costs for delays or disruption to the Project caused by the Contractor, its subcontractors or vendors.

(2) Substantial Completion

When all the Work covered by the Contract is substantially completed, as defined in Section 1.01, the Contractor shall give written notice thereof to the University and the Consultant. The latter will then promptly make an inspection of the work and, if they shall determine that all the work is substantially completed, they shall so advise the Contractor. Such action shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any uncompleted (including untested or deferred work), unaccepted or corrective work or in any way affect, limit or preclude the issuance by the Consultant, from time to time thereafter, of "Punch Lists", i.e., lists of uncompleted or corrective work which the Contractor is to promptly complete and/or correct. In the judgement of the University, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

The Contractor must fully, completely and acceptably perform all Punch List work and any other work subsequently discovered remaining to be completed or corrected, within ninety (90) calendar days of Substantial Completion or within such other timeframe stipulated by the University or Consultant. Failure to complete the Punch List within the time so designated hereunder may be deemed default on the part of the Contractor.

(3) Final Completion and Acceptance

After the completion of all the work the Contractor shall give written notice to the University and the Consultant that all the work is ready for inspection and final acceptance. The University and the Consultant shall promptly make such inspection and, if they shall determine that all the work has been satisfactorily completed, the University shall thereupon by written notice advise the Contractor that it accepts such work. In the judgement of the University, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

Section 2.24 Record Drawings

(1) At the start of the Project, the format for Record Drawings shall be established by the University. Prior to acceptance by the University of all work covered by the Contract, the Contractor shall furnish to the Consultant one (1) set of current Contract Drawings on which the Contractor has recorded, using colored pencil for hard copy format or electronic editing tool in contrasting color for electronic format, in a neat and workmanlike manner, all instances where actual field construction differs from work as indicated on the Contract Drawings. These "Record". Drawings shall show the following information: (a) all significant changes in plans, sections, elevations and details, such as shifts in location of walls, doors, windows, stairs and the like made during construction; (b) all significant changes in foundations, columns, beams, openings, concrete reinforcing, lintels, concealed anchorages and "knock-out" panels made during construction; (c) final location of electric panels, final arrangement of electric circuits and any significant changes made in electrical design as a result of Change Orders, Field Orders or job conditions; (d) final location and arrangement of all mechanical equipment and major concealed plumbing, including, but not limited to, supply and circulating mains, vent stacks, sanitary and storm water drainage; (e) final location and arrangement of all underground utilities, connections to building and/or rerouting of existing utilities, including, but not limited to, sanitary, storm, heating, electric, signal, gas, water and telephone: and (f) final make and model for all significant equipment and devices listed in the specifications. The Contractor shall also provide an electronic version as determined by the Consultant.

(2) Periodically during the work, the Consultant may request submission of a progress set of Record Drawings for review and advise the Contractor of errors or omissions, if any, that must be corrected or completed prior to final submission of the Record Drawings. Shop Drawings shall not be acceptable as Record Drawings.

(3) The Contractor shall submit the Record Drawings to the Consultant at least fifteen (15) days prior to the date of Substantial Completion. The Consultant will then review the Record Drawings and, if they shall determine that the Record Drawings represent the actual field construction being completed, they shall so advise the

Contractor. If not satisfactory, the Record Drawings will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall promptly correct and resubmit to the Consultant a corrected copy of the Record Drawings. Acceptance of the Record Drawings by the University is a condition precedent to the Contractor's entitlement to receive Final Payment.

Section 2.25 Guarantees

(1) The Contractor, at the convenience of the University, shall remove, replace and/or repair at its own cost and expense any defects in workmanship, materials, ratings, capacities or characteristics occurring in or to the work covered by the Contract within one (1) year or within such longer period as may otherwise be provided in the Contract, the period of such guarantee to commence with the University's final acceptance of all work covered under the Contract or at such other date or dates as the University may specify prior to that time, and the Contractor, upon demand, shall pay for all damage to all other work resulting from such defects and all expenses necessary to remove, replace and/or repair such other work which may be damaged in removing, replacing or repairing the said defects. The obligations of the Contractor under the provisions of this paragraph or any other guarantee provisions of the Contract Documents are not limited to the monies retained by the University under the Contract.

(2) Unless such removal, replacement and/or repair shall be performed by the Contractor within ten (10) working days after it receives written notice from the University specifying such defect, or if such defect is of such a nature that it cannot be completely removed, repaired and/or replaced within said ten (10) day period and the Contractor shall not have diligently commenced removing, repairing and/or replacing such defect within said ten (10) day period and shall not thereafter with reasonable diligence and in good faith proceed to do such work, the University may employ such other person, firm or corporation as it may choose to perform such removal, replacement and/or repair and the Contractor agrees, upon demand, to pay to the University all amounts which it expends for such work.

Section 2.26 Default of Contractor

(1) In addition to those instances specifically referred to in other Sections hereof, the University shall have the right to declare the Contractor in default of the whole or any part of the work if:

a. The Contractor becomes insolvent; or if

b. The Contractor makes an assignment for the benefit of creditors pursuant to the statutes of the State of New York; or if

c. A voluntary or involuntary petition in bankruptcy is filed by or against the Contractor; or if

d. A receiver or receivers are appointed to take charge of the Contractor's property or affairs; or if

e. The Contractor fails to commence work when notified to do so by the Consultant; or if

f. The Contractor shall abandon the work; or if

g. The Contractor shall refuse to proceed with the work or extra work when and as directed by the Consultant or the University; or if

h. The Contractor shall without just cause reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the University, to complete the work in accordance with the approved time progress schedule, and shall fail or refuse to sufficiently increase such working force when ordered to do so by the Consultant; or if

i. The Contractor shall sublet, assign, transfer convey, or otherwise dispose of the Contract other than as herein specified; or if

j. The University shall be of the opinion that the Contractor is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the work, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if

k. The University shall be of the opinion that the work cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the University's opinion, attributable to conditions within the Contractor's control; or if

l. The work is not completed within the time herein provided therefor or within the time to which the Contractor may be entitled to have such completion extended; or if

m. The University shall be of the opinion that the Contractor is or has been willfully or in bad faith violating any of the provisions of this Agreement;

n. The University shall be of the opinion that the Contractor is not or has not been executing the Contract in good faith and in accordance with its terms; or if

o. At any time during the period of the Agreement, insurance as required is not in effect or proof thereof is not provided to the University.

(2) Before the University shall exercise its right to declare the Contractor in default by reason of the conditions set forth in the above items *a, b, c, d, e, f, g, h ,i, j, k, l,* m, n and o, it shall give the Contractor three (3) working days' notice of its intention to declare the Contractor in default and unless, within such three (3) day period, the Contractor shall make arrangements, satisfactory to the University, to correct and/or eliminate the conditions set forth in the University's aforesaid notice, the Contractor may be declared in default at the expiration of such three (3) day period or at the expiration of such longer period of time as the University may determine.

(3) The right to declare in default for any of the grounds specified or referred to shall be exercised by the University sending the Contractor a written notice setting forth the ground or grounds upon which such default is declared. Upon receipt of notice that it has been declared in default, the Contractor shall immediately discontinue all further operations under the Contract and shall immediately quit the site, leaving untouched all plant, materials, equipment, tools and supplies then on site.

(4) The University, after declaring the Contractor in default, may then have the work completed by such means and in such manner, by contract, with or without public letting, or otherwise, as it may deem advisable, utilizing for such purpose such of the Contractor's plant, materials, equipment, tools and supplies remaining on the site, and also such subcontractors as it may deem advisable, or it may call upon the Contractor's surety at its own expense to do so.

(5) In the event that the University declared the Contractor in default of the work or any part of the work, the Contractor, in addition to any other liability to the University hereunder or otherwise provided for or allowed by law, shall be liable to the University for any costs it incurs for additional architectural and engineering services necessary, in its opinion, because of the default and the total amount of liquidated damages from the date when the work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the work, both of which items shall be considered as expenses incurred by the University in completing the work and the amount of which may be charged against and deducted out of such monies as would have been payable to the Contractor or its surety if the work had been completed without a default.

(6) If the University completes the work, the Consultant shall issue a certificate stating the expenses incurred in such completion, including the cost of re-letting. Such certificate shall be final, binding and conclusive upon the Contractor, its surety, and any person claiming under or through the Contractor, as to the amount thereof.

(7) The expense of such completion, as so certified by the Consultant, shall be charged against and deducted out of such monies as would have been payable to the Contractor if it had completed the work; the balance of such monies, if any, subject to the other provisions of the Contract, to be paid to the Contractor without interest after such completion. Should the expense of such completion, so certified by the Consultant, exceed the total sum which would have been payable under the Contract if the same had been completed by the Contractor, any such excess shall be paid by the Contractor to the University upon demand.

(8) In the event the University shall determine to complete the work without calling upon the Contractor's surety to do so, the Contractor shall not be entitled, from and after the effective date of the declaration of the default, to receive any further payment under the Contract until the said work shall be wholly completed and accepted by the University.

(9) In case the University shall declare the Contractor in default as to a part of the work only, the Contractor shall discontinue such part, shall continue performing the remainder of the work in strict conformity with the terms of the Contract, and shall in no way hinder or interfere with any other contractors or persons whom the University may engage to complete the work as to which the Contractor was declared in default.

(10) The provisions relating to declaring the Contractor in default as to the entire work shall be equally applicable to a declaration of partial default, except that the University shall be entitled to utilize for completion of the part of the work as to which the Contractor was declared in default only such plant, materials, equipment, tools and supplies as had been previously used by the Contractor on such part.

(11) In completing the whole or any part of the work, the Consultant and the University shall have the power to depart from, change or vary the terms and provisions of the Contract; provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variations, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Consultant's certificate of the cost of completion, nor shall it constitute a defense to any action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for its default.

(12) The provisions of this Section shall be in addition to any and all other legal or equitable remedies provided by this Agreement and otherwise applicable by law.

Section 2.27 Termination for Convenience

(1) The performance of work under this Agreement may be terminated by the University, in whole or in part, whenever the University shall determine that such termination is in the best interest of the University. Any such termination shall be effected by a notice in writing to the Contractor specifying the date upon which such termination shall become effective and the extent to which performance of the Contract shall be terminated. Such termination shall be effective on the date and to the extent specified in said notice.

(2) Upon receipt of a notice of termination, and-except as otherwise directed in writing by the University, the Contractor shall:

a. Discontinue all work and the placing of all orders for materials and facilities otherwise required for the performance thereof,

b. Cancel all existing orders and subcontracts to the extent such orders and subcontracts relate to the performance of work terminated by the notice of termination;

c. Take such action as may be necessary to secure to the University the benefits of any rights of the Contractor under orders or subcontracts which relate to the performance of work terminated by the notice of termination, including, but not limited to, the assignment to the University, in the manner and to the extent directed by the University, all the right, title and interest of the Contractor under the orders or subcontracts so terminated and cancelled. In the event of such assignment, the University shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination and cancellation of such orders and subcontracts;

d. Transfer title and deliver to the University, in accordance with the direction of the University, all materials, supplies, work in process, facilities, equipment, machines or tools produced as a part of or acquired by the Contractor in connection with the work terminated by said notice, and all plans, Drawings, Working Drawings, sketches, Specifications and information for use in connection therewith; provided, however, that the Contractor may retain any of the foregoing if it so elects and foregoes reimbursement therefor;

e. Take such action as may be necessary or as the Consultant or the University may prescribe for the protection and preservation of all property in the possession or control of the Contractor in which the University, under the provisions of the Contract, has or may acquire an interest.

(3) Notwithstanding the foregoing, should the notice of termination relate to only a portion of the work covered by the Contract, the Contractor will proceed with the completion of such portions of the work as are not terminated.

(4) The University will pay and the Contractor shall accept, in full consideration for the performance and completion of the portions of the work as are not terminated, a sum calculated by determining the percentage the portions of the work not terminated bear to the total amount of the work covered by the Contract, and by multiplying the Contract consideration by such percentage - the product thereof being the amount to be paid to the Contractor. The University shall determine the amount of such consideration in accordance with the foregoing.

(5) Upon compliance by the Contractor with the foregoing provisions of this Section and subject to deductions for payments previously made, the University, for the portions of the work terminated, shall compensate the Contractor as follows:

a. By reimbursing the Contractor for actual expenditures made with respect to such work, including expenditures made in connection with any portion thereof which may have been completed prior to termination, as well as expenditures made after termination in completing those portions of the work covered by the Contract which the Contractor may have been required by the notice of termination to complete. The University shall determine the allowability and amount of such expenditures.

b. By reimbursing the Contractor for all actual expenditures made, with the prior written approval of the University or pursuant to a court judgment, in settling or discharging any outstanding contractual obligations or commitments incurred or entered into by the Contractor in good faith with respect to the Contract and resulting from the termination thereof.

c. By reimbursing the Contractor for all actual expenditures made after the effective date of the notice of termination resulting from or caused by the Contractor taking necessary action or action prescribed by the Consultant or the University for the protection and preservation of all property in the possession or control of the Contractor in which the University, under the provisions of the Contract, has or may acquire an interest.

d. By paying the Contractor a markup, which is to be calculated in the same manner as that provided for in subdivision c of paragraph (1) of Sections 4.02 and 4.05A for extra work, on the foregoing expenditures, which markup is to cover the Contractor's overhead and profit; provided, however, that if it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, said markup shall be reduced by one-third.

(6) The sum of all amounts payable under this Section, plus the sum of all amounts previously paid by the University under the provisions of the Contract, shall not exceed the amount of the Contract consideration. In no event shall the Contractor be entitled to any payment for loss of anticipated profits on uncompleted work and the University shall not be liable for same.

(7) Termination by the University under the provisions of this Section shall be without prejudice to any claims or rights which the University may have against the Contractor. The University may retain from the amount due to the Contractor under the provisions of this Section such monies as may be necessary to satisfy any claim which the University may have against the Contractor in connection with the Contract; provided, however, that the University's failure to retain such monies shall not be deemed a waiver of any of its rights or claims against the Contractor.

(8) Notwithstanding the foregoing, where the Contractor and the Consultant can agree upon another method of determining the amount of the consideration to be paid to the Contractor under the provisions of this Section, such method, subject to the approval of the University, may, at the option of the University, be substituted for the method set forth above.

Article III
Time of Performance

Section 3.01 Commencement, Prosecution and Completion of Work

(1) The Contractor agrees that it will begin the work herein embraced upon receipt of notice to proceed, unless the University consents in writing, to begin at a different date, and that it will prosecute the same with such diligence that all work covered by the Contract shall be substantially completed and performed on or before the time specified on page one of the Agreement.

(2) The Contractor further agrees that time is of the essence in this Agreement and that all the work shall be prosecuted in such manner and with sufficient plant and forces to complete all work timely.

Section 3.02 Time Progress Schedule

(1) To show compliance with the requirements of Section 3.01 of the Agreement, provide and maintain a Time Progress Schedule in accordance with the General Requirements, Special Conditions, Section paragraph titled "Project Schedule". Unless otherwise accepted by the University, the Time Progress Schedule shall be strictly adhered to by the Contractor. The time for substantial completion shall be on or before the time specified on page one of the Agreement.

(2) If through the fault of the Contractor or any subcontractor the Contractor shall fail to adhere to the time progress schedule, it must promptly adopt such other and additional means and methods of construction as will make up for the time lost and will assure completion in accordance with such schedule.

(3) The failure of the Contractor to submit a Time Progress Schedule, the University's or the Consultant's acceptance of the Contractor's time progress schedule or lack of such acceptance, the means and/or methods of construction employed by the Contractor, including any revisions thereof, and/or its failure to revise the same shall not relieve the Contractor of its obligation to accomplish the result required by the Contract in the time specified on page one of the Agreement, nor shall the exercise of the Consultant's or the University's right to reject any portion of the work, create or give rise to any claim, action or cause of action, legal, equitable or otherwise, against the Consultant or the University.

4) The failure of the Contractor to submit and maintain a Time Progress Schedule in accordance with the General Requirements shall be deemed to be a waiver by the Contractor of all claims for additional compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work.

Section 3.03 Time Progress Schedule for Shop Drawings and Samples

The Contractor shall include activities for preparation and submission of all Shop Drawings, mock-ups and Samples in the Time Progress Schedule in Section 3.02.

Section 3.04 Notice of Conditions Causing Delay

(1) Within ten (10) working days after the commencement of any condition which is causing or may cause delay in completion or require Contractor to request an extension of time, the Contractor must notify the Consultant and the University in writing of the effect, if any, of such condition upon the Time Progress Schedule, and must state why and in what respects, if any, the condition is causing or may cause such delay.

(2) Contractor agrees that an express condition precedent to Contractor's entitlement to any extension of time on the project shall be full and complete compliance to the satisfaction of the University with the Contractor's obligations in Section 3.06, Contractor's Progress Reports. Failure to submit proper Contractor's progress reports in appropriate and timely fashion shall be deemed a waiver and relinquishment of any right, claim or privilege to obtain an extension of time for the performance of the Contractor's work.

(3) Failure to strictly comply with this requirement may, in the discretion of the University, be deemed sufficient cause to deny any extension of time on account of delay in completion arising out of or resulting from any change, extra work, suspension, or other condition.

(4) Except as otherwise set forth in this Section 3.04 all procedures set forth in Sections 2.02 and 2.03 of this Agreement shall be complied with by the Contractor. Furthermore, full and complete compliance with the requirements of this Article III is a condition precedent to the Contractor's entitlement to receive an extension of time.

Section 3.05 Extension of Time

(1) Within ten (10) working days after the commencement of any condition which is causing or may cause the Contractor to incur, require or otherwise need an extension of time, the Contractor shall notify the Consultant and the University of such condition. Full and complete compliance with this paragraph 3.05(1) is a condition precedent to the Contractor obtaining an extension of time for performance of any portion or all of its work.

(2) An extension or extensions of time for the completion of the work may be granted by the University subject to the provisions of this Section, but only upon written application therefor by the Contractor to the University and the Consultant.

(3) An application for an extension of time must set forth in detail the source and the nature of each alleged cause of delay in the completion of the work, the date upon which each such cause of delay began and ended and the number of days of delay attributable to each of such causes. It must be submitted prior to completion of the work.

(4) If such an application is made, the Contractor may be entitled to an extension of time for delay in completion of the work caused solely: (a) by the acts or omissions of the University, its trustees, officers, agents or employees; or (b) by the acts or omissions of other contractors, not including subcontractors of the Contractor, on this Project; or (c) by unforeseeable supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes).

(5) The Contractor may, however, be entitled to an extension of time for such causes only for the number of calendar days of delay which the University may determine to be due solely to such causes, and then only if the Contractor shall have strictly complied with all of the requirements of this Section and Section 3.04. The University shall make such determination within ninety (90) calendar days after receipt of the Contractor's application for an extension of time; provided, however, said application complies with the requirements of this Section.

(6) The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the work as determined by the University, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of its subcontractors or material-men and would of itself (irrespective of the concurrent causes) have delayed the work, no extension of time will be allowed for the period of delay resulting from such an act, fault or omission.

(7) The granting of an application for an extension of time for causes of delay other than those herein referred to shall be entirely within the discretion of the University.

(8) If the Contractor shall claim to have sustained any damages by reason of delays, extraordinary or otherwise, or hindrances which it claims to be due to any action, omission, direction or order by the University or the Consultant, the Contractor shall be entitled only to an extension of time as hereinabove provided and shall not have or assert any claim or prosecute any suit, action, cause of action or proceeding against the University based upon such delays or hindrances, unless such delays or hindrances were caused by the University's bad faith or its willful, malicious, or grossly negligent conduct, or uncontemplated delays, or delays so unreasonable that they constitute an intentional abandonment of the Contract by the University, or delays resulting from the University's breach of a fundamental obligation of the Contract.

(9) The Contractor shall not be entitled to an extension of time for the performance of any or all of the Work set forth in allowances to the Contract. All allowance work shall be performed in accordance with the Contractor's schedule.

Section 3.06 Contractor's Progress Reports

After commencement of the work the Contractor shall furnish the Consultant with written monthly reports setting forth the condition and progress of the work, the percentage of each part of the work that has been finished, those parts of the work which have been completed within the scheduled time and those parts of the work which have not been finished within the scheduled time, and the general progress of the work that is being performed away from the site and the approximate date when such work will be finished and delivered to the site. Contractor agrees that compliance with this Section 3.06 is an express condition precedent to the Contractor's right, claim or entitlement to obtain an extension of

time for the performance of the Contractor's work. Failure to comply with this Section 3.06 shall be a waiver and relinquishment of all such rights, claims and privileges to request or obtain an extension of time for the performance of Contractor's work.

Article IV
Payment

Section 4.01 Compensation to Be Paid Contractor

The University shall pay to the Contractor and the latter shall accept as full and complete payment for the performance of this Agreement, subject to additions or deductions as provided herein, the sum of **dollars ($«Total_Bid»),** which sum is the amount of the Contract consideration.

Section 4.02 Value of Omitted and Extra Work

(1) The amount by which the Contract consideration is to be increased or decreased by any Change Order or Field Order shall be determined by the University by one or more of the following methods:

a. By applying the applicable price or prices set forth on the attached Schedule "I" of this Agreement or by applying a unit price agreed to by both parties. Subject to the provisions of Section 4.04, this method must be used if the Contract Documents contain applicable unit prices.

b. By estimating the fair and reasonable cost of: (i) labor, including all wages, required wage supplements and insurance required by law (workers' compensation, social security, disability, unemployment, etc.) paid to or on behalf of foremen, workers and other employees below the rank of superintendent directly employed at the site of the Project; (ii) materials; and (iii) equipment, excluding hand tools, which, in the judgment of the University, would have been or will be employed exclusively and directly on the omitted work or extra work, as the case may be; and, in the case of extra work, where the same is performed directly by the Contractor, by adding to the total of such estimated costs a sum equal to 15 percent thereof, but, where the extra work is performed by a subcontractor, by adding a sum equal to 15 percent of said costs for the benefit of such subcontractor, and by adding, for the benefit of the Contractor (no further allowance will be made where extra work is performed by the sub-subcontractor), an additional sum equal to 10 percent of the first $10,000 of the above-estimated costs, including the subcontractor's percentage override, plus 5 percent of the next $90,000 of the total of said items, plus 3 percent of any sum in excess of $100,000 of the total of said items. There is no markup on the premium portion of overtime labor. For the purposes of the aforesaid percentage overrides, the words "extra work" shall be defined as a complete item of added, modified or changed work as described in the Consultant's written instructions to the Contractor. Such "extra work" may include the work of one or more trades and/or subcontractors or sub-subcontractors and shall include all labor, materials, plant, equipment, tools and all incidentals directly and/or indirectly necessary, related, involved in or convenient to the successful completion of the extra work item. Where the Consultant's aforesaid written instructions to the Contractor involve both an increase and a reduction in similar or related work, the above percentage overrides will be applied only on the amount, if any, the cost of the increased work exceeds the cost of the reduced work.

No overhead and profit shall be retained by the Contractor on the cost of work determined by the method provided in Subparagraph (1)a.

All profit, overhead and expense of whatsoever kind and nature, other than those set forth above in items (i) through (iii), of the Contractor, its subcontractors and sub-subcontractors, are covered by the aforesaid percentage overrides and no additional payment therefor will be made by the University.

The University may make such cost estimate either before or after the extra work is completed by the Contractor.

c. By determining the actual cost of the extra work in the same manner as in the above subdivision b except that actual costs of the Contractor shall be utilized in lieu of estimated costs. The University shall have the option to utilize this method provided it notifies the Contractor of its intent to do so prior to the time the Contractor commences performance of such extra work.

(2) Irrespective of the method used or to be used by the University in determining the value of a Change Order or Field Order, the Contractor, within fifteen (15) working days after a request for the same, must submit to the University

and the Consultant a detailed breakdown of the Contractor's estimate of the value of the omitted and/or extra work in a format approved by the University.

(3) Equipment Watch Rental Rate Blue Book (published online by Intertec Penton Media, Inc.) or other published rates as approved by the University in writing, will be utilized for the equipment rental pricing. For the purposes of paragraph (1) hereof, the cost of equipment shall be determined, irrespective of the actual price for any rental or actual cost associated with such equipment as follows: take the monthly rate listed in Equipment Watch and dividing the same by 176 hours to establish an hourly rate and then multiplying such hourly rate by the actual number of hours that the equipment was used. The Contractor will submit an actual rental invoice, or acceptable quotation from a bonafide equipment rental supplier for rented equipment when equipment is not owned by the Contractor. The equipment rental supplier cannot be an “affiliate” of the Contractor, nor in any way be related to the Contractor. If submitted invoices/quotations are acceptable to the University, the Contractor will be reimbursed the actual rental cost including sales tax and appropriate mark-up. If no listing of rates for an item of equipment is contained in Equipment Watch, the University shall determine the reasonable rate of rental of the particular item of equipment by such other means as it finds appropriate. The edition Equipment Watch to be used shall be that in effect on the date of the receipt of bids for this Agreement. None of the provisions of Equipment Watch shall be deemed referred to or included in this Agreement excepting only the aforesaid monthly rates. To the cost of equipment as determined above, there is to be added the actual cost of gasoline, oil, grease and maintenance required for operation of such equipment and, in the case of equipment utilized only for extra work when, in the opinion of the Consultant, suitable equipment therefor was not available on the site, the reasonable cost of transporting said equipment to and from the site. Notwithstanding the foregoing, if the Consultant should determine that the nature or size of the equipment used by the Contractor in connection with the extra work is larger or more elaborate, as the case may be, than the size or nature of the minimum equipment determined by the Consultant to be suitable for the extra work, the cost of equipment will not be based upon the equipment used by the Contractor but instead will be based on the smallest or least elaborate equipment determined by the Consultant to have been suitable for the performance of the extra work.

(4) Unless otherwise specifically provided for in a Change Order or Field Order, the compensation specified therein for extra work includes full payment for both the extra work covered thereby and for any damage or expense caused the Contractor by any delays to other work to be done under the Contract resulting from or on account of said extra work, and the Contractor waives all rights to any other compensation for said extra work, damage or expense.

Section 4.03 Adjustment for Bond and Insurance Premiums

Upon final acceptance of the work to be performed under this Agreement, the University may adjust the Contract consideration to reflect any changes in the cost of all required Bonds and liability and builder's risk insurance premiums which the Contractor had to pay for on all extra work and would have had to furnish and pay for on all omitted work. Unless such cost is agreed upon by the University and the Contractor, the University may calculate and determine the amount of the adjustment in the Contract consideration by estimating such costs. There is no markup on bond or insurance premium adjustment.

Section 4.04 Unit Prices

(1) Except as otherwise provided in the second paragraph of this Section, the unit prices, set forth on the attached Schedule "I" of this Agreement, will be binding upon both the University and the Contractor in determining the value of omitted and/or extra work, and, in the case of extra work, such unit prices shall be deemed to include all profit, overhead and expenses of whatsoever kind and nature of the Contractor, its subcontractors and sub-subcontractors, and the Contractor agrees that it shall make no claim for any profit, overhead, expense or percentage override in connection therewith.

(2) Where said Schedule "I" sets forth a unit price for added and/or deducted work, the University shall have the option, whenever it is found that the quantity of changed work varies by more than 15 percent from the quantity that is stated or that can be determined by the Contract Documents at the time of execution thereof, to accept or reject such unit price for the quantity that the changed work varies by more than 15 percent from the stated or determinable quantity. Where a quantity is not specifically stated in the Contract Documents, the University's determination of the amount of said quantity included in the Contract Documents shall determine the applicability of this paragraph. Where the University, pursuant to the foregoing provisions, exercises its aforesaid option, the amount of the increase or decrease in the Contract consideration for the quantity of work which varies by more

than 15 percent from the stated or determinable quantity shall be determined in accordance with the provisions of Section 4.02 of the Agreement as if there was no unit price therefor set forth in said Schedule "I".

Section 4.05 Allowances

(1) The Contractor acknowledges that the Contract consideration includes the allowances set forth on the attached Schedule "II" and "III" of this Agreement and, except for quantitative and field order allowances, it agrees to cause the work covered thereby to be done by such contractors for such sums as the University may direct. Where cash allowances are provided, the allowances shall be deemed to include the purchase of the materials and/or equipment and the delivery of same to the job site. Unless otherwise specified in the Contract Documents, cash allowances do not include the proper installation of the materials and/or equipment or the connection for final utilities thereto; the cost of said installation and/or connection having been included in the amount of the Contract consideration.

(2) The Contractor acknowledges that the Contract consideration includes such sums for expenses and profit on account of cash allowances as it deems proper and that it shall make no claim for expenses or profit or any percentage override in addition thereto; said items having been included in the amount of the Contract consideration.

(3) In the event any of the cash allowances listed below are either higher or lower than the cost of having the work done in accordance herewith, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be the difference between the amount of the allowance and the actual cost of performing the work covered thereby.

(4) When quantitative allowances are provided, progress payments thereof to the Contractor will be based upon the applicable unit prices set forth on the attached Schedule "I" of the Agreement, subject, however, to the provisions of paragraph (2) of Section 4.04. In the event any of said quantitative allowances are more than or less than the actual quantity of work performed, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be determined in accordance with the provisions of Sections 4.02, 4.04 and 4.05A of the Agreement.

Section 4.05A Field Orders

When the Agreement contains a Field Order Allowance, the bid shall include the amount of such allowance. Said amount shall cover the cost of additional labor, materials and time for contingent activities within the scope of the Agreement as directed and described by the University in writing in a Field Order. The Field Order will include a description of the work and the method for determining the value of such work. The value of the work directed under this allowance will be determined by one or more of the provisions of Section 4.02. If the net cost(s) of all Field Orders issued are more or less than the specified amount of the allowance, the Contract sum will be adjusted by Change Order.

Section 4.06 Deductions for Unperformed and/or Uncorrected Work

(1) Without prejudice to any other rights, remedies or claims of the University, in the event that the Contractor at any time fails or neglects to supply working forces and materials of the proper quantity and quality necessary, in the opinion of the Consultant or the University, to comply with the approved time progress schedule, or fails in any respect to prosecute the work with promptness and diligence or causes by any action or omission the stoppage or delay of or interference with the work of any other contractor having a contract with the University, or fails in the performance of any obligations and responsibilities under this Agreement, then, and in that event, the University, acting itself or through the Consultant, may, upon three (3) working days' notice to the Contractor, either itself provide or have any other contractor, including but limited to the University's Job Order Contracting Program, provide any and all labor or materials or both necessary, in its opinion, to correct any aforesaid deficiency of the Contractor, and the University will thereafter backcharge the Contractor by issuing a Change Order reducing the amount of the Contract consideration for all costs and expenses it incurs in connection with the correction of such deficiency. The Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% for services required in connection with the correction of such deficiency(ies).

(2) Notwithstanding any provisions in the Contract Documents to the contrary, if the University deems it inexpedient to correct work not done in accordance with the Contract or any work damaged as a result thereof, it shall notify

the Contractor of such fact and the latter shall not remedy or correct the same. In such event, however, the amount of the Contract consideration shall be decreased by an amount, determined by the University, which is equal to the difference in value of the work as performed by the Contractor and the value of the work had it been satisfactorily performed in accordance with the Contract or which is equal to the cost of performing the corrective work, whichever shall be the higher amount.

Section 4.07 Liquidated Damages

In the event that the Contractor shall fail to substantially complete all the work within the time fixed for such completion on page one of this agreement, or within the time to which such completion may have been extended or in the event that the Contractor abandons the work and the same is not substantially completed within the aforesaid time for such completion, the Contractor must pay to the University as damages for each calendar day of delay in completing the work the amount set forth on page one of the Contractors proposal, as stated on page one of this agreement. . In view of the difficulty of accurately ascertaining the loss which the University will suffer by reason of delay in completion of the work hereunder, said sum is hereby fixed and agreed as liquidated damages which the University will suffer by reason of such delay and not as a penalty. The University may deduct and retain out of the monies which may become due hereunder to the Contractor the amount of any such liquidated damages and, in case the amount which may become due to the Contractor under the provisions of the Contract may be less than the liquidated damages suffered by the University, the Contractor shall pay the difference, upon demand, to the University.

Section 4.08 Contract Breakdown

Prior to the submission of its first application for a progress payment, the Contractor shall present to the University and the Consultant for their approval a detailed schedule showing the breakdown of the Contract consideration. The Contract Breakdown Summary shall be further broken down as required by the Consultant and the University. Such schedule must contain the amount estimated for each part of the work and quantity survey for each part of the work. It shall also list the estimated value of the Contractor's guarantee obligations under the provisions of the Contract Documents, which is hereby fixed at $5,000 or one-half of one percent (1/2%) of the Contract award amount, whichever is the lesser sum. Such schedule shall be revised by the Contractor until the same shall be satisfactory to the University and the Consultant and shall not be changed after the University and the Consultant have approved the same. The amounts set forth in the schedule will not be considered as fixing the basis for additions to or deductions from the Contract consideration.

Section 4.09 Prompt Payment Requirements

(1) For the purposes of Article XI-A of the State Finance Law, the campus for which the work is being performed is the University's designated payment office. Applications for payment must contain the approval of the Consultant before being submitted to the University.

(2) Whenever the Consultant's approval of an application for payment is required under the Contract, the Consultant shall have fifteen (15) calendar days, after receipt of such application, to inspect the work before acting on the application.

(3) Until such time that the Contract is approved by the University, the thirty (30) day period, referred to in Article XI-A of the State Finance Law for the payment of invoices without interest, shall not begin.

Section 4.10 Progress Payments

(1) Unless otherwise provided in the Contract, progress payments will be made as the work progresses upon applications submitted by the Contractor and approved by the Consultant and the University. Payment of such approved applications shall be made by the University within thirty (30) days after such approval has been given.

(2) The University shall make progress payments to the Contractor on the basis of such approved applications, less a retained amount equal to 5 percent thereof (i.e. retainage) , plus an amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged, , together with any back charges and offsets which are deemed necessary or likely to be incurred by the University as a result of any failure by the Contractor to fully, completely, accurately and timely perform its work, which it shall reserve from each such payment until all of the work covered by the Contract has been completed.

(3) When the University and the Consultant have determined that all the work is substantially completed, or that a substantial portion of the permanent construction has been completed and accepted, the University shall make

a progress payment to the Contractor, on the basis of an application submitted by the Contractor and approved by the Consultant and the University, which shall reduce the unpaid amount due to the Contractor under the terms of the Contract, including all monies retained by the University from previous progress payments to the Contractor, to an amount equal to two (2) times the cost, estimated by the Consultant, of performing, in accordance with the Contract, all uncompleted, unaccepted and corrective work, plus an amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged. As the remaining items of work are satisfactorily completed or corrected, the University shall make progress payments to the Contractor, on the basis of applications submitted by the Contractor and approved by the University and the Consultant, covering said items of work less an amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.

Section 4.11 Applications for Progress Payments

The Contractor shall prepare all applications for progress payments for work performed, together with supporting data and computations as are deemed necessary by the Consultant to determine the accuracy of the application. The application for payment and all required supporting documentation shall be submitted using the University's prescribed forms. The Contractor shall include with such applications reports detailing actual payments to minority and women-owned businesses who participate on University projects. Failure of the Contractor to submit applications for progress payments, or lack of complete and accurate supporting data, shall be sufficient reason for withholding payment until such omissions or errors are rectified. Unless otherwise directed, such applications, signed and certified as correct by the Contractor, shall be delivered by the Contractor to the Consultant once each month showing the total value of work completed and in place on the last day of the payment period covered by the application.

Section 4.12 Progress Payments for Materials Delivered to Site

(1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment to be furnished and installed under the Contract, after such materials and equipment have been delivered and accepted at the site of the work.

(2) Materials and equipment for which such progress payment has been made shall not be removed from the site, shall be stored until incorporated into the work in a location approved by the Consultant and shall be adequately protected from fire, theft and vandalism, the effects of the elements and any other damage whatsoever, and shall at all times be available for inspection by the Consultant and the University.

Section 4.13 Transfer of Title to Materials Delivered to Site

Title to all supplies and materials to be furnished or provided by the Contractor to the University pursuant to the provisions of the Contract Documents shall immediately vest in and become the sole property of the University upon delivery of such supplies and materials to the site. Notwithstanding such transfer of title, the Contractor shall have the full continuing responsibility to install such materials and supplies, protect them, maintain them in proper condition and forthwith repair, replace and make good any damage thereto without cost to the University until such time as the work covered by the Contract is fully accepted by the University. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract. In the event that, after title has passed to the University, any of such supplies and materials are rejected as being defective or otherwise unsatisfactory, title to all such supplies and materials shall be deemed to have been transferred back to the Contractor.

Section 4.14 Progress Payments for Materials Stored Off Site

(1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment which are in short and/or critical supply or have been specially fabricated for the Project. Materials and equipment, for which a progress payment is made pursuant to the preceding sentence, shall be stored by the Contractor, after fabrication, until such time as their delivery to the site is required, at a facility and location approved by the Consultant; shall be adequately protected from fire, theft and vandalism, the effects of the elements and any other damage whatsoever; and shall at all times be available for inspection by the Consultant and the University. No progress payment shall, however, be made for said materials and equipment until:

a. The Contractor furnishes to the University a bill of sale listing quantity and costs of said materials and equipment f.o.b. point of origin;

b. The Consultant shall have inspected said materials and equipment and recommended payment therefor; and

c. The Contractor furnishes to the University a builder's risk insurance policy, with the broad form extended coverage endorsement, for said materials and equipment, in an amount equal to 100 percent of the value thereof, which policy shall be maintained, at the sole cost and expense of the Contractor, until said materials and equipment have been incorporated into the Project. The said insurance policy shall contain a provision that the loss, if any, is to be made adjustable with and payable to the University as trustee for the insured, i.e., the University and the Contractor, and a provision that it shall not be changed or cancelled and that it will be automatically renewed upon expiration and continued in force unless the University is given thirty (30) days written notice to the contrary.

d. The Contractor shall develop and provide a preventive maintenance log for stored equipment when determined appropriate by the Consultant. The Contractor shall provide timely notification and opportunity for the Consultant and the University to view the Contractor's preventative maintenance efforts.

(2) Materials and equipment for which a progress payment has been made by the University pursuant to this Section shall be, become and remain the sole property of the University; provided, however, that the Contractor shall have the full continuing responsibility to install such materials and equipment, to deliver it to the site, to protect it, to maintain it in proper condition and to forthwith repair, replace and make good any damage thereto without cost and/or additional time to the University until such time as the work covered by the Contract is fully accepted by the University. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract.

Section 4.15 Withholding of Progress Payments

Notwithstanding anything contained in the Contract to the contrary, the University may withhold payment of all or any part of a progress, final or guarantee payment, in such an amount as it may deem proper to enforce the provisions of the Contract and to satisfy the claims of third parties, when:

a. The University shall learn of any claim, of whatsoever nature or kind, against the University or the Contractor, which in any way arises or is alleged to arise out of or as a result of or in connection with the performance by the Contractor of the work covered by the Contract or out of or in connection with the Contractor's operations or performance at or in the vicinity of the construction site, that, in the opinion of the University, may not be adequately covered by insurance.

   If an action on such claim is timely commenced and the liability of the University and/or the Contractor shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the Contractor to be valid, the University shall pay such judgment or admitted claim out of the monies retained by it under the provisions of the Contract and return the balance, if any, without interest, to the Contractor.

   The University may withhold from the Contractor any payments retained by it until such time as all such claims are either satisfied or barred by law from being presented. At such time the University, upon written demand by the Contractor, shall return to the Contractor the amount so withheld, without interest.

b. The Contractor has not complied with any lawful or proper direction of the Consultant or the University or their representatives concerning the work covered by the Contract or the performance of the Contract or the production of records as required under the provisions of the Contract.

c. There exists any of the conditions, listed in Section 2.26, which would allow the University to declare the Contractor in default of the whole or any part of the work.

d. The Contractor is a foreign contractor and has not furnished satisfactory proof that all taxes due by such Contractor under the provisions of the Tax Law have been paid. The Certificate of the New York State Tax Commission to the effect that all such taxes have been paid shall be conclusive proof of the payment of such taxes. The term "foreign contractor" as used herein means, in the case of an individual, a person who is not a resident of the State of New York; in the case of a partnership, one having one or more partners not a resident of the State; and in the case of a corporation, one not organized under the laws of the State of New York.

e. The Contractor, upon request of the University at any time after the initial progress payment by the University to the Contractor, fails to furnish the University with such documentary evidence that the University may deem necessary to prove to it that material and labor paid for by the University under previous applications for payment submitted have been paid for by the Contractor and that there are no outstanding claims or liens in connection therewith or fails to satisfy the University that the Contractor, with good cause, has sufficiently provided for the payment and/or satisfaction of claims for said material and labor.

Section 4.16 Lien Law

The attention of the Contractor is specifically called to the provisions of the Lien Law of the State of New York, wherein funds received by a Contractor for a public improvement are declared to constitute trust funds in the hands of such Contractor to be applied first to the payment of certain claims.

Section 4.17 Substitution of Securities for Retainage

Any time after 50 percent of all the work has been completed, the University, if the progress and performance of the work is satisfactory to it, on request of the Contractor, will allow the Contractor to withdraw up to 50 percent of the aforesaid amount retained by the University by depositing with the Comptroller of the State of New York government securities, of the type and kind specified in Section 139 of the State Finance Law, having a market value not exceeding par, at the time of deposit, equal to the amount so withdrawn. The Comptroller of the State of New York shall, from time to time, collect all interest or income on the obligations so deposited, and shall pay the same, when and as collected, to the Contractor. If the deposit be in the form of coupon bonds, the coupons as they respectively become due shall be delivered to the Contractor; provided, however, that the Contractor shall not be entitled to interest or coupons or income on any of the deposited securities, the proceeds of which have or will be used or applied by the University. In the event that the Contractor does not, in accordance with the terms and provisions of the Contract, comply with and fulfill all of its obligations and responsibilities thereunder, the Comptroller of the State of New York shall have the right to sell, assign, transfer or otherwise dispose of the aforesaid securities and the University shall have the right to use and apply all or any part of the monies obtained by the Comptroller of the State of New York from such a sale, assignment, transfer or disposition or from the collection of interest or income from said securities to the performance and fulfillment of said obligations and responsibilities. Notwithstanding the foregoing, when the University makes a payment under Section 4.10 (3) of the Agreement, it will return to the Contractor, as part of such payment, its substituted securities, and thereafter all retention of the University shall be in funds and not in substituted securities.

Section 4.18 Final Payment

Upon acceptance of all the work, except for the Contractor's guarantee obligations under Section 2.25 of the agreement and the Contractor's guarantee obligations under any provision of the Specifications, the Contractor shall prepare and submit to the University and the Consultant, for their approval, a final application for payment, which the University, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to 100 percent of the Contract consideration excluding the Contractor's guarantee obligations, less:

a. All previous payments by the University to the Contractor;

b. All deductions authorized to be made by the University under the Contract; and

c. An amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.

d. The Contractor shall not be entitled to any interest on the monies retained by the University pursuant to Subdivision c of Section 4.18 of the Agreement.

Section 4.19 Acceptance of Final Payment

(1) The acceptance by the Contractor, or by any one claiming by or through it, of the final payment shall, except with respect to the amount retained by the University pursuant to the provisions of subdivisions b and c of Section 4.18 of the Agreement, constitute and operate as a release to the University from any and all claims of any liability for anything theretofore done or furnished for or relating to or arising out of the work covered by the Contract and for any prior act, neglect or default on the part of the University or any of its trustees, officers, agents or employees in connection therewith.

(2) Should the Contractor refuse to accept the final payment as tendered by the University or should the Contractor refuse to execute the final application for payment without protest and without reserving any rights or claims

against the University, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said final application for payment.

Section 4.20 Guarantee Payment

(1) Subject to the provisions of the second paragraph of this Section, at the expiration of one (1) year after the University has accepted all the work covered by the Contract, the Contractor shall prepare and submit to the University and the Consultant, for their approval, a guarantee application for payment, which the University, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to the monies retained by the University for the Contractor's guarantee obligations under the Agreement, less any monies deducted by the University under this Section. The Contractor shall not be entitled to any interest on the monies retained by the University pursuant to subdivision c of Section 4.18 of the Agreement.

(2) In the event the Contractor does not, in accordance with the terms and provisions of the Contract, complete all corrective work or comply with and fulfill its contractual obligations, the University may use and apply all or any part of the monies retained by it to have such work or obligations performed or fulfilled by a person, firm or corporation other than the Contractor. The obligations of the Contractor, under the terms and provisions of the Contract, shall not, however, be limited to the monies retained by the University pursuant to the provisions of the Contract.

(3) No payments may be made under this agreement for work completed more than 365 days after the completion date **{insert completion date}** unless the date/duration listed on page one of this agreement, is extended in writing by the University.

Section 4.21 Acceptance of Guarantee Payment

The acceptance by the Contractor or by anyone claiming by or through it, of the guarantee payment shall constitute and operate as a release to the University from any and all claims in connection with monies retained by the University. Should the Contractor refuse to accept the guarantee payment as tendered by the University or should the Contractor refuse to execute the guarantee application for payment without protest and without reserving any rights or claims against the University, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said guarantee application for payment.

Section 4.22 Contractor Limited to Money Damages

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

Section 4.23 No Estoppel or Waiver

(1) The University shall not be precluded or estopped by any inspection, acceptance, application for payment or payment, final or otherwise, issued or made under the Contract or otherwise issued or made by it, the Consultant, or any trustee, officer, agent or employee of the University, from showing at any time the true amount and character of the work performed, or from showing that any such inspection, acceptance, application for payment or payment is incorrect or was improperly issued or made; and the University shall not be precluded or estopped, notwithstanding any such inspection, acceptance, application for payment or payment, from recovering from the Contractor any damages which it may sustain by reason of any failure on its part to comply strictly with the Contract and any monies which may be paid to it or for its account in excess of those to which it is lawfully entitled.

(2) Neither the acceptance of all or any part of the work covered by the Contract; nor any payment therefor; nor any order or application for payment issued under the Contract or otherwise issued by the University, the Consultant, or any trustee, officer, agent or employee of the University; nor any permission or direction to continue with the performance of the Contract before or after its specified completion date; nor any performance by the University of any of the Contractor's duties or obligations; nor any aid lent to the Contractor by the University in its performance of such duties or obligations; nor any delay or omission by the University to exercise any right or remedy accruing to it under the terms of the Contract or existing at law or in equity or by statute or otherwise;

nor any other thing done or omitted to be done by the University, its trustees, officers, agents or employees; shall be deemed to be a release to the Contractor or its sureties from any obligations, liabilities or undertakings in connection with the Contract or the Performance Bond or a waiver of any provision of the Contract or of any rights or remedies to which the University may be entitled because of any breach thereof, excepting only a written instrument expressly providing for such release or waiver. No cancellation, rescission or annulment hereof, in whole or as to any part of the Contract, because of any breach hereof, shall be deemed a waiver of any money damages to which the University may be entitled because of such breach. No waiver by the University of any breach of the Contract shall be deemed to be a waiver of any other or any subsequent breach.

Section 4.24 Limitation of Actions

(1) No action or proceeding shall be maintained by the Contractor, or anyone claiming under or through the Contractor, against the University, or its trustees, officers, agents or employees, upon any claim arising out of or based upon the Contract or any breach thereof or by reason of any act or omission or requirement of the University, or its trustees, officers, agents or employees, unless:

a. Such action or proceeding is instituted in the Supreme Court of the State of New York in and for the County of Albany;

b. The Contractor or the person claiming under or through it shall have strictly complied with all requirements relating to the giving of notices and information with respect to such claims; and shall have provided the University with an electronic version of any claims, including all required information and copies of all contractually required notices that the Contractor provided to the University and the Consultant throughout the duration of the Contract ;

c. Such action or proceeding by the Contractor shall be commenced within eighteen months after the date of substantial completion set by the University or its Consultant and issued in writing to the Contractor. Any action or proceeding not commenced within this time frame shall be dismissed with prejudice.

d. If the Contract is terminated or the Contractor declared in default by the University, such action is commenced within six (6) months after the date of such termination or declaration of default by the University.

e. All claims and disputes which are subject to or related to this Agreement and the Project shall be subject to non-binding mediation, at the sole option and discretion of the University. Should the University at its sole option and in the exercise of its sole discretion elect to mediate under this clause, then a letter from the University indicating the completion of such mediation shall be a condition precedent to any litigation by Contractor against the University or the State of New York. In the absence of the University exercising its right to proceed to mediation, the condition precedent to any litigation against the University of the State of New York, shall be a letter citing that the University declines its rights under this clause. The costs of any mediation shall be paid equally by the parties to the mediation.

(2) Notwithstanding anything in the laws of the State of New York to the contrary, the Contractor, or anyone claiming under or through the Contractor, shall not be entitled to any additional time to begin anew any other action if an action commenced within the times herein specified is dismissed or discontinued for any reason whatsoever.

Section 4.25 Electronic Payments

The Contractor shall provide complete and accurate payment applications in order to receive payment. Payment applications submitted must contain all information and supporting documentation required by the University. Payment for applications submitted by the Contractor shall only be rendered electronically unless payment by paper check is expressly authorized by the University's sole discretion, due to extenuating circumstances. Such electronic payment shall be made in accordance with ordinary State procedures and practices. The Contractor shall comply with the State Comptroller's procedures to authorize electronic payments. Authorization forms are available at the Office of the State Comptroller's website at www.osc.state.ny.us/epay/index.htm; by email at epunit@osc.state.ny.us; or by telephone at 518-474-4032. The Contractor acknowledges that it will not receive payment on any invoices submitted under this Agreement if it does not comply with the State Comptroller's electronic payment procedures, except where the University has expressly authorized payment by paper check as set forth above.

Article V

Protection of Rights and Property

Section 5.01 Accidents and Accident Prevention

The Contractor shall at all times take reasonable precautions for the safety of persons engaged in the performance of the work. The Contractor shall comply fully with all applicable provisions of the laws of the State of New York and OSHA and with all valid rules and regulations thereunder. The Contractor's attention is specifically called to the applicable rules and regulations, codes and bulletins of the New York State Department of Labor.

Section 5.02 Adjoining Property

The Contractor shall be required to protect all the adjoining property and to repair or replace any such properties damaged or destroyed by it, its employees or subcontractors through, by reason of or as a result of activities under, for or related to the Contract.

Section 5.03 Emergencies

(1) In case of an emergency which threatens loss or injury to persons or property, the Contractor will be allowed to act, without previous instructions from the Consultant or the University, in a diligent manner, to the extent required to avoid or limit such loss or injury, and it shall notify the Consultant and the University immediately thereafter of the action taken by it and of such emergency. Where the Contractor has not taken action but has notified the Consultant or the University of an emergency which threatens loss or injury to persons or property, it shall act in accordance with the instructions and/or authorization by the Consultant or the University.

(2) In the event that the Contractor performs extra work in accordance with the preceding paragraph, it will be compensated therefor in accordance with the provisions of Section 4.02.

Section 5.04 Fire Safety

(1) If the existing building is to be partially occupied during the course of the project, all existing exits except those shown for closure, fire walls, fire barriers and fire protection systems shall be continuously maintained in the occupied phases in compliance with the Fire Code of New York State and as required by NFPA 241 and as recommended in its Annex A, Explanatory Material, or other measures must be taken which in the opinion of the Consultant will provide equal safety. Those portions occupied by the campus must be available for their use 24 hours a day, seven days a week during the contract period unless otherwise scheduled in these documents. Comply with all applicable State and Federal codes and regulations. Prior to removal of existing fire walls, fire barriers and fire protection systems, if such removal is part of the work, install equivalent temporary fire walls, fire barriers and fire protection systems. The cost of all labor, fire watches, variances, materials, installations, maintenance and removal of such temporary fire protection systems or modifications to the existing systems are the responsibility of the Contractor. Install permanent fire walls, fire barriers and fire protection systems, if provided as part of the work, as soon as practical and as required by NFPA 241 and as recommended in its Annex A, Explanatory Material.

(2) Solid fuel salamanders and heaters shall not be used by the Contractor or any of its subcontractors. All other salamanders used by the Contractor or any of its subcontractors shall require constant attendance of competent persons on each floor where in use.

(3) All temporary fabric used by the Contractor or any of its subcontractors for curtains or awnings shall be either non-combustible or flame retarded so that it will not burn or propagate flame.

Section 5.05 Risks Assumed by Contractor

(1) To the fullest extent permitted by law, the Contractor solely assumes the following distinct several risks whether they arise from acts or omissions (whether negligent or not and whether supervisory or otherwise) of the Contractor, of the University, of third persons or from any other cause, including unforeseen obstacles and difficulties which may be encountered in the prosecution of the work covered by the Contract, whether such risks are within or beyond the control of the Contractor and whether such risks involve a legal duty, primary or otherwise, imposed upon the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York or the State University of New York, excepting only risks which arise from defects in maps, plans, designs or Specifications prepared, acquired or used by the Consultant or the University, from the negligence of the University, its agents or employees or from affirmative acts of the, State University Construction Fund, the Dormitory Authority of the State

of New York, the State of New York or the State University of New York or their trustees, officers, agents or employees committed with intent to cause the loss, damage and injuries herein below set forth:

a. The risk of loss or damage, direct or indirect, to the work covered by the Contract or to any plant, equipment, tools, materials or property furnished, used, installed or received by the University or by the Contractor or any subcontractor, material man or worker performing services or furnishing materials for the work covered hereunder. The Contractor shall bear such risk of loss or damage until the work covered by the Contract has been finally accepted by the University or until completion of removal of such plant, equipment, tools, materials or property from the construction site and the vicinity thereof, whichever event occurs last. In the event of such loss or damage, the Contractor shall forthwith repair, replace and/or make good any such loss or damage without cost to the University.

b. The risk of claims, just or unjust, by third persons against the Contractor, the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York, or the State University of New York 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 covered by the Contract (whether actually caused by or resulting from the performance of the Contract) or out of or in connection with the Contractor's operations or presence at or in the vicinity of the construction site.

(2) To the fullest extent permitted by law, the Contractor shall indemnify and save harmless the State University Construction Fund the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees against all claims described above and for all costs and expenses incurred by them in the defense, settlement or satisfaction thereof, including attorneys' fees and court costs. If so directed, the Contractor shall at its own expense defend against such claims, in which event it shall not, without obtaining express advance permission from Counsel of the University, raise any defense involving in any way jurisdiction of the tribunal over the University, governmental nature of the University or the provisions of any statutes respecting suits against the University.

(3) Neither the University's final acceptance of the work to be performed hereunder nor the making of any payment shall release the Contractor from its obligations under this Section. The enumeration elsewhere in the Contract of particular risks assumed by the Contractor or of particular claims for which it is responsible shall not be deemed to limit the effect of the provision of this Section or to imply that it assumes or is responsible for only risks or claims of the type enumerated.

Section 5.06 Compensation and Liability Insurance

(1) General Requirements

a. Prior to the commencement of the work to be performed by the Contractor, the Contractor shall procure at its sole cost and expense, and maintain in force at all times during this Agreement until Final Payment and as further required by the Contract, policies of insurance as herein set forth below. All insurance shall be written by insurance carriers approved by the University, licensed to do business in the State of New York ("admitted" carriers), and rated at least "A-" by A.M. Best Company.

b. Prior to the commencement of the work, the Contractor shall submit to the University, certificates of insurance, in a form acceptable to the University, showing evidence of compliance with all insurance requirements contained in this Agreement. Certificates of Insurance (with the exception of Workers' Compensation and Disability) must be provided on an ACORD 25 Certificate of Insurance, or an equivalent form. Certificates of Insurance shall disclose any deductible, self-insured retention, aggregate limit or any exclusion to the policy that materially changes the coverage required by the Contract; specify the additional insureds and named insureds as required herein; and be signed by an authorized representative of the insurance carrier or producer. Deductibles or self-insured retentions above $25,000 are subject to approval by the University and additional security may be required. Certificates shall reference the Contract number. Only original documents will be accepted.

c. All insurance shall provide that the required coverage apply on a primary and not on an excess or contributing basis as to any other insurance that may be available to the University for any claim arising from the Contractor's

work under this Agreement, or as a result of Contractor's activities. Any other insurance maintained by the University shall be in excess of and shall not contribute with the Contactor's insurance, regardless of the "other insurance" clause contained in the University's own policy of insurance. A copy of the endorsement reflecting this requirement may be requested by the University.

d. Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the University with updated replacement certificates of insurance and endorsements. The Contractor shall advise the University of any letter or notification that cancels, materially changes, or non- renews the policy and Contractor shall require the insurance carrier(s) to copy the University on any letter or notification that cancels, materially changes, or non- renews the policy. If, at any time during the period of the Agreement, insurance as required is not in effect, or proof thereof is not provided to the University, the University shall have the options to (i) direct the Contractor to stop work with no additional cost or extension of time due on account thereof; or (ii) treat such failure as an event of default under Section 2.26 of the Agreement. At any time the coverage provisions and limits of the policies required herein do not meet the provisions and limits set forth in the Agreement 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 University. Any delay or time lost as a result of the Contractor not having insurance required by the Agreement shall not give rise to a delay claim or any other claim against the University. If required by the University, Contractor shall deliver to the University within forty-five (45) days of such request, a copy of any or all policies of insurance not previously provided, certified by the insurance carrier as true and complete.

e. Should the Contractor engage a subcontractor, the Contractor shall impose the insurance requirements of this document on those entities, as applicable. Required insurance limits should be determined commensurate with the work of the subcontractor. Contractor shall keep the subcontractor certificates of insurance on file and produce them upon the demand of the University.

f. The aggregate insurance limits set forth herein shall apply separately to each contract for which a certificate of insurance and/or policy is issued.

g. Unless otherwise agreed to in writing by the University, policies must be endorsed to provide that there shall be no right of subrogation against the University. To the extent that any of the policies of insurance prohibit such a waiver of subrogation, Contractor shall secure the necessary permission to make this waiver.

h. Except as otherwise specifically provided herein or agreed in writing, policies must be written on an occurrence basis. The insurance policy(ies) shall name the State University Construction Fund, State University of New York, State of New York, its officers, agents, and employees as additional insureds thereunder. The additional insured requirement does not apply to Workers' Compensation or Disability coverage. Include ISO Endorsement CG 20 10 11 85 or its equivalent.

(2) Specific Coverage and Limits

The Contractor shall obtain and maintain in full force and effect, the following insurance with limits not less than those described below and as required by the terms of the Contract, or as required by law, whichever is greater:

a. Commercial General Liability Insurance. A Commercial General Liability insurance policy with coverage that shall include, but not be limited to coverage for bodily injury, property damage, personal/advertising injury, premises liability, independent contractors, blanket contractual liability including tort liability of another assumed in Contract, liability arising from all work and operations under this Agreement, defense and indemnification obligations, including those assumed under Contract, cross liability coverage for additional insureds, products/completed operations for a term no less than three years commencing upon acceptance of the work, explosion, collapse, and underground hazards, contractor means and methods, and liability resulting from Section 240 or Section 241 of the NYS Labor Law. The limits under such policy shall not be less than $2,000,000 each occurrence; $2,000,000 general aggregate; and products/completed operations with an aggregate limit of $2,000,000.

b. Workers Compensation and Disability Benefits as required by New York State.

c. Comprehensive Business Automobile Liability Insurance. A policy with a combined single limit for bodily injury and property damage of no less than $1,000,000 covering liability arising out of the use of any motor vehicle in connection with the work, including owned, leased, hired, and non-owned vehicles bearing, or, under the circumstances under which they are being used, required by the Motor Vehicle Laws of the State of New York to bear license plates. If the Contract involves the removal of hazardous waste from the project site or otherwise transporting hazardous materials, pollution liability coverage for covered autos shall be provided by form CA 99 48 03 06 or CA 00 12 03 06 and the Motor Carrier Act Endorsement (MCS90) shall be attached.

d. Umbrella and Excess Liability. When the limits of the Commercial General Liability, Auto, and/or Employers Liability policies procured are insufficient to meet the limits specified, the Contractor shall procure and maintain Commercial Umbrella and/or Excess Liability policies with limits in excess of the primary, provided, however, that the total amount of insurance coverage is at least equal to the requirements set forth above. Such policies shall follow the same form as the primary. Any insurance maintained by the University or additional insured shall be considered excess of and shall not contribute with any other insurance procured or maintained by the Contractor including primary, umbrella and excess liability regardless of the “other insurance” clause contained in either party’s policy.

e. Owner's Protective Liability Insurance. A policy issued to and covering the liability for damages imposed by law upon the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, with respect to all operations under the Contract by the Contractor and its subcontractors, and/or their interest in the Project and the property upon which work under the Contract is to be performed, including omissions and supervisory acts of the former. Said insurance policy limits shall be no less than $1,000,000 each occurrence and $2,000,000 general aggregate.

f. Asbestos Abatement Insurance. A liability insurance policy issued to and covering the liability, of the Contractor and/or subcontractor engaged in the removal, handling or wrapping of asbestos, if any of such work is to be performed under the Contract, for bodily injury, illness, sickness or property damage caused by exposure to asbestos in an amount not less than $1,000,000 per occurrence and $2,000,000 aggregate. The Contractor and/or its aforesaid subcontractor shall either obtain an endorsement to the aforesaid required insurance policy adding the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, as additional parties insured thereunder or shall obtain a separate owner's protective liability insurance policy for such parties with coverage similar to that required by the first sentence of this subdivision. In addition, any Contractor or subcontractor engaged in the removal, handling, or wrapping of asbestos shall, to the fullest extent permitted by law, hold harmless and indemnify the State University Construction Fund, the Dormitory Authority of the State of New York the State of New York and the State University of New York, their trustees, officers, agents or employees, for any claims or liabilities in connection with illness or sickness arising from work performed, not performed, or which should have been performed. The Contractor shall have said hold-harmless and indemnification conditions stipulated in all Contracts with subcontractors.

Section 5.07 Builder's Risk

(1) The Contractor shall procure and maintain, at its own cost and expense, until final acceptance of all work covered by this Agreement or until the Project has been turned over for use by the State University of New York, whichever event occurs earlier, a builder’s risk insurance policy covering all risks, with fire, extended coverage, vandalism and malicious mischief coverage. In the event the loss occurs at an occupied facility, the policy shall permit occupancy without the consent of the insurance company. The policy shall cover the cost of removing debris, including demolition as may be legally necessary by operation of any law, ordinance, or regulation, and property of the State held in their care, custody and/or control.

(2) The policy shall be in an amount equal to the Project’s insurable value, i.e., the Contract consideration less the cost of the Contractor's Performance and Labor and Material Bonds; the cost of trees, shrubbery, lawn grass, plants and the maintenance of the same; the cost of demolition; the cost of excavation; the cost of foundations, piers or other supports which are below the undersurface of the lowest basement floor, or where there is no basement, which are below the surface of the ground, concrete and masonry work; the cost of underground flues, pipes or wiring; the cost of earthmoving, grading and the cost of paving, roads, walks, parking lots or

athletic fields; and the cost of bridges, tunnels, dams, piers, wharves, docks, retaining walls and radio and/or television towers and antennas.

(3) The policy may contain a provision for a $500 deductible for each loss to a Project having an insurable value of less than $1,500,000 and a $1,000 deductible for each loss to a Project having an insurable value of $1,500,000 or more.

(4) The University, the Contractor and its subcontractors, as their interests may appear, shall be named as the parties insured under said policy.

(5) The Contractor shall have the sole responsibility to promptly report any loss to the insurer and/or its representatives and to furnish the latter with all necessary details relating to the occurrence of the loss and the amount thereof. The University, the Contractor and all subcontractors of the Contractor waive all rights, each against the others, for damages caused by fire or other perils covered by insurance provided under the terms of this Section, except such rights as they may have to the proceeds of insurance received; provided, however, this waiver shall not apply to any manufacturer, supplier or similar agent under any guarantee or warranty.

(6) The Contractor shall not violate or permit to be violated any condition of such policy and shall at all times satisfy the fire safety requirements of the University and the insurance company issuing the same.

(7) The procurement and maintenance of said policy shall in no way be construed or be deemed to relieve the Contractor from any of the obligations and risks imposed upon it by this Agreement or to be a limitation on the nature or extent of such obligations and risks.

(8) Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the University with an updated replacement certificate of insurance and endorsements. The Contractor shall advise the University of any letter or notification that cancels, materially changes, or non- renews the policy and Contractor shall require the insurance carrier(s) to copy the University on any letter or notification that cancels, materially changes, or non- renews the policy. Before the Contractor shall be entitled to have any progress payment rendered on account of the work which is to be insured pursuant to this Section, it shall furnish to the University a certificate in duplicate of the insurance herein required. Such insurance must be procured from an insurance carrier approved by the University, licensed to do business in the State of New York (“admitted” carrier), and rated at least “A-” by A.M. Best Company.

Section 5.08 Effect of Procurement of Insurance
Neither the procurement nor the maintenance of such insurance shall in any way affect or limit the obligations, responsibilities or liabilities of the Contractor hereunder.

Section 5.09 No Third Party Rights
Nothing in this Section or in this Agreement shall create or give to third parties, except the Dormitory Authority of the State of New York, the State of New York and the State University Construction Fund any claim or right of action against the Contractor, the Consultant, the State University of New York, the State University Construction Fund, the Dormitory Authority of the State of New York, or the State of New York and beyond such as may legally exist irrespective of this Section or this Agreement.

Article VI
Minority and Women’s Business Enterprises (MWBEs) / Equal Employment Opportunity (EEO) Provisions

The University is required to implement the provisions of New York State Executive Law Article 15-A and 5 NYCRR Parts 142-145 (“MWBE Regulations”) for all State contracts as defined therein, with a value (1) in excess of $25,000 for labor, services, equipment, materials, or any combination of the foregoing or (2) in excess of $100,000 for real property renovations and construction.

The requirements for the MWBE and EEO programs are set forth in "Exhibit A-1" which is attached hereto and made a part hereof, and shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and, in the event any such provision is not inserted or is not correctly inserted, then, upon the application of either party, this Agreement shall forthwith be physically amended to make such insertion or correction.

Article VII
Provisions Required by Law

Section 7.01 Provisions Deemed Inserted
Each and every provision required by law to be inserted in the Contract, including, but not limited to, the applicable provisions set forth in Exhibit "A" which is attached hereto and made a part hereof, shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and, in the event any such provision is not inserted or is not correctly inserted, then, upon the application of either party, this Agreement shall forthwith be physically amended to make such insertion or correction.

Section 7.02 Wage Rates
The Contractor shall post the appropriate prevailing wage schedules in a conspicuous place at the construction site. The Department of Labor shall provide the Contractor with posters relating to prevailing wage rates and same shall be displayed by the Contractor in a conspicuous place at the construction site. The Contractor shall also distribute wallet cards, to be provided by the Department of Labor, to all workers engaged at the construction site containing information relating to wage rates and telephone numbers to call if a worker believes his or her rights are being violated. The Contractor shall provide each worker with a written notice, informing them of the applicable prevailing wage requirements, and the Contractor must obtain a signed statement or declaration from such worker attesting to the fact that he or she has been given this information. Further, the Contractor is required to keep certified copies of its payrolls at the construction site.

Article VIII
Vendor Responsibility

(1) The Contractor shall at all times during the Agreement term remain responsible. The Contractor shall provide the University with written notice as required by this Article of any issues impacting its responsibility, which shall minimally include updated responses to the it's filed vendor responsibility questionnaire. The Contractor agrees, if requested by the University, to present evidence of its continuing legal authority to do business in New York State, integrity, experience, ability, prior performance and organizational and financial capacity.

(2) The University, at its sole discretion, reserves the right to suspend any or all activities under this Agreement, at any time, when the University discovers information that calls into question the responsibility of the Contractor. In the event of such suspension, the Contractor will be given written notice outlining the particulars of such suspension. Upon issuance of such notice, the Contractor must comply with the terms of the suspension order. Agreement activity may resume at such time as the University issues a written notice authorizing a resumption of performance under the Agreement.

(3) Upon written notice to the Contractor, and a reasonable opportunity to be heard with appropriate University officials or staff, the Contractor may be terminated by the University at the Contractor's expense where the Contractor is determined by the University to be non-responsible. In such event, the University may complete the contractual requirements in any manner that the University may deem advisable and pursue available legal or equitable remedies for breach.

In no case shall termination of the Contract by the University be deemed a breach by the University thereof, nor shall the University be liable for any damages or lost profits or otherwise, which may be sustained by Contractor as a result of such termination.

Article IX
Use of Service-Disabled Veteran-Owned Business Enterprises in Contract Performance

Article 17-B of New York State Executive Law acknowledges that Service-Disabled Veteran-Owned Businesses (SDVOBs) strongly contribute to the economies of the State and the nation. As defenders of our nation and in recognition of their economic activity in doing business in New York State, the Contractor for the Project and Work defined in this Agreement, agrees to, at no additional cost to the University, fully comply and cooperate with the University's

implementation of New York State Executive Law Article 17-B and provide opportunities for SDVOBs in the fulfillment of the requirements of this Agreement. SDVOBs can be readily identified on the directory of certified businesses at: http://www.ogs.ny.gov/Core/docs/CertifiedNYS_SDVOB.pdf.

In accordance with the Memorandum of Understanding (MOU) dated as of August 15, 2019 by and between the Governor, the Office of State Comptroller (State Comptroller), the University and other entities, certain University contracts (Covered Contracts) are subject to review by the State Comptroller.

As such a Covered Contract, the State shall have no liability under this Agreement and this Agreement is not valid, effective or binding until it has been approved by the State Comptroller and filed in his or her office; provided however that if the State Comptroller does not approve or reject this Agreement within the time period specified in the MOU, then this Agreement shall be valid and enforceable without such approval.

This Agreement may be amended only upon the mutual written consent of the Parties, and with the approval of the New York Attorney General and the Office of the State Comptroller if such approval is required.

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

Agency Certification:
In addition to the acceptance of this contract, I also certify that original copies of this signature page will be attached to all other exact copies of this contract.

Contract Number: *Insert Contract Number*

Insert Contractor Name	**STATE UNIVERSITY OF NEW YORK**
Sign:_____ Date:_____	Sign:_____ Date:_____
Print: _____	Print: _____
Title:_____	Title:_____
APPROVED BY ATTORNEY GENERAL:	**APPROVED BY OFFICE OF THE STATE COMPTROLLER:**
_____ Date:_____	_____ Date:_____
By:	By:

If Corporation, affix Corporate Seal

ACKNOWLEDGMENTS

(ACKNOWLEDGMENT BY AN INDIVIDUAL)

STATE OF NEW YORK)
) ss.
COUNTY OF)

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

_____Notary Public

(ACKNOWLEDGMENT BY A PARTNERSHIP)

STATE OF NEW YORK)
) ss.
COUNTY OF)

On this _____ day of _____, 20_____, before me personally came_____

_____, to me known and known to me to be the person who executed the above instrument, who, being duly sworn by me, did for themselves depose and say that they are a member of the firm of _____, consisting of themselves and _____, that he/she executed the foregoing instrument in the firm name _____, and that he/she had authority to sign the same, and that he/she did duly acknowledge to me that he/she executed the same as the act and deed of the aforementioned firm for the purposes mentioned therein.

_____Notary Public

(ACKNOWLEDGMENT BY A CORPORATION)

STATE OF)
) ss.
COUNTY OF)

On this _____ day of_____, 20_____, before me personally came_____ , to me known, who, being duly sworn, did depose and say that he/she reside in _____; that he/she is the _____of the _____, the corporation described in and which executed the above instrument; and that he/she/they signed his/her/their name(s) thereto by authority of the board of directors of said corporation.

_____
Notary Public

Schedule I, II, III

SCHEDULE I
Unit Prices

Refer to Section 4.04 of the Agreement for additional information.

Work or Material Description	Amount in Words	Amount in Figures
None		

SCHEDULE II Allowance(s)

Refer to Section 4.05 of the Agreement for additional information. The amount(s) indicated below shall be included in the Total Bid amount and their total indicated on the Proposal in the space provided.

Work or Material Description	Amount in Words	Amount in Figures
Siemens BMS per proposal dated 11/17/21	**Forty-one thousand two hundred dollars**	**$41,200.00**

SCHEDULE III Field Order Allowance

Refer to Section 4.05A of the Agreement for additional information. The amount indicated below shall be included in the Total Bid amount and indicated on the Proposal in the space provided

Twenty-five thousand three hundred forty dollars	$25,340.00
(in words)	(in figures

Standard Contract Clauses

State University of New York

EXHIBIT A

March 16, 2020

The parties to the attached contract, license, lease, amendment or other agreement of any kind (hereinafter, "contract") agree to be bound by the following clauses which are hereby made a part of the contract (the word "Contractor" herein refers to any party other than the State or State University of New York, whether a Contractor, licensor, licensee, lessor, lessee or any other party; the State University of New York shall hereinafter be referred to as "SUNY"):

1. **EXECUTORY CLAUSE.** In accordance with Section 41 of the State Finance Law, the State shall have no liability under this contract to the Contractor or to anyone else beyond funds appropriated and available for this contract.

2. **PROHIBITION AGAINST ASSIGNMENT**. In accordance with Section 138 of the State Finance Law, this contract may not be assigned by the Contractor or its right, title or interest therein assigned, transferred, conveyed, sublet or otherwise disposed of without the State's previous written consent, and attempts to do so are null and void. Notwithstanding the foregoing, such prior written consent of an assignment of a contract let pursuant to Article XI of the State Finance Law may be waived at the discretion of SUNY and with the concurrence of the State Comptroller where the original contract was subject to the State Comptroller's approval, where the assignment is due to a reorganization, merger or consolidation of the Contractor's business entity or enterprise. SUNY retains its right to approve an assignment and to require that any Contractor demonstrate its responsibility to do business with SUNY. The Contractor may, however, assign its right to receive payments without SUNY's prior written consent unless this contract concerns Certificates of Participation pursuant to Article 5-A of the State Finance Law.

3. **COMPTROLLER'S APPROVAL.** In accordance with Section 112 of the State Finance Law and Section 355 of the Education Law, if this contract exceeds $250,000, or, if this is an amendment for any amount to a contract which, as so amended, exceeds said statutory amount, or if, by this contract, the State agrees to give something other than money when the value or reasonably estimated value of such consideration exceeds $25,000, it shall not be valid, effective or binding upon the State, and the State shall bear no liability, until it has been approved by the State Comptroller and filed in his or her office, or the pertinent pre-audit review period has elapsed. However, such pre-approval shall not be required for any contract established as a centralized contract through the Office of General Services or for a purchase order or other transaction issued under such centralized contract.

4. **WORKERS' COMPENSATION BENEFITS.** In accordance with Section 142 of the State Finance Law, this contract shall be void and of no force and effect unless the Contractor shall provide and maintain coverage during the life of this contract for the benefit of such employees as are required to be covered by the provisions of the Workers' Compensation Law.

5. **NON-DISCRIMINATION REQUIREMENTS.** To the extent required by Article 15 of the Executive Law (also known as the Human Rights Law) and all other State and Federal statutory and constitutional non-discrimination provisions, the Contractor will not discriminate against any employee or applicant for employment, nor subject any individual to harassment, because of age, race, creed, color, national origin, sexual orientation, gender identity or expression, military status, sex, disability, predisposing genetic characteristics, familial status, marital status, or domestic violence victim status or because the individual has opposed any practices forbidden under the Human Rights Law or has filed a complaint, testified, or assisted in any proceeding under the Human Rights Law. Furthermore, in accordance with Section 220-e of the Labor Law, if this is a contract for the construction, alteration or repair of any public building or public work or for the manufacture, sale or distribution of materials, equipment or supplies, and to the extent that this contract shall be performed within the State of New York, Contractor agrees that neither it nor its subcontractors shall, by reason of race, creed, color, disability, sex, or national origin: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. If this is a building service contract as defined in Section 230 of the Labor Law, then, in accordance with Section 239 thereof, Contractor agrees that neither it nor its subcontractors shall by reason of race, creed, color, national origin, age, sex or disability: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. Contractor is subject to fines of $50.00 per person per day for any violation of Section 220-e or Section 239 as well as possible termination of this contract and forfeiture of all moneys due hereunder for a second or subsequent violation

6. **WAGE AND HOURS PROVISIONS.** If this is a public work contract covered by Article 8 of the Labor Law or a building service contract covered by Article 9 thereof, neither Contractor's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said statutes, except as otherwise provided in the Labor Law and as set forth in prevailing wage and supplement schedules issued by the State Labor Department. Furthermore, Contractor and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the Labor Law. Additionally, effective April 28, 2008, if this is a public work contract covered by Article 8 of the Labor Law, the Contractor understands and agrees that the filing of payrolls in a manner consistent with Subdivision 3-a of Section 220 of the Labor Law shall be a condition precedent to payment by the State of any State- -approved sums due and owing for work done upon the project.

7. **NON-COLLUSIVE BIDDING CERTIFICATION.** In accordance with Section 139-d of the State Finance Law, if this contract was awarded based upon the submission of competitive bids, Contractor affirms, under penalty of perjury, that its bid was arrived at independently and without collusion aimed at restricting competition. Contractor further affirms that, at the time Contractor submitted its bid, an authorized and responsible person executed and delivered to SUNY a non-collusive bidding certification on Contractor's behalf.

8. **INTERNATIONAL BOYCOTT PROHIBITION.** In accordance with Section 220-f of the Labor Law and Section 139-h of the State Finance Law, if this contract exceeds $5,000, the Contractor agrees, as a material condition of the contract, that neither the Contractor nor any substantially owned or affiliated person, firm, partnership or corporation has participated, is participating, or shall participate in an international boycott in violation of the federal Export Administration Act of 1979 (50 USC App. Sections 2401 *et seq*.) or regulations thereunder. If such Contractor, or any of the aforesaid affiliates of Contractor, is convicted or is otherwise found to have violated said laws or regulations upon the final determination of the United States Commerce Department or any other appropriate agency of the United States subsequent to the contract's execution, such contract, amendment or modification thereto shall be rendered forfeit and void. The Contractor shall so notify the State Comptroller within five (5) business days of such conviction, determination or disposition of appeal (2 NYCRR § 105.4).

9. **SET-OFF RIGHTS.** The State shall have all of its common law, equitable and statutory rights of set-off. These rights shall include, but not be limited to, the State 's option to withhold for the purposes of set-off any moneys due to the Contractor under this contract up to any amounts due and owing to the State with regard to this contract, any other contract with any State department or agency, including any contract for a term commencing prior to the term of this contract, plus any amounts due and owing to the State for any other reason including, without limitation, tax delinquencies, fee delinquencies or monetary penalties relative thereto. The State shall exercise its set-off rights in accordance with normal State practices including, in cases of set-off pursuant to an audit, the finalization of such audit by SUNY, its representatives, or the State Comptroller.

10. **RECORDS.** The Contractor shall establish and maintain complete and accurate books, records, documents, accounts and other evidence directly pertinent to performance under this contract (hereinafter, collectively, "the Records"). The Records must be kept for the balance of the calendar year in which they were made and for six (6) additional years thereafter. The State Comptroller, the Attorney General and any other person or entity authorized to conduct an examination, as well as SUNY and any other agencies involved in this contract, shall have access to the Records during normal business hours at an office of the Contractor within the State of New York or, if no such office is available, at a mutually agreeable and reasonable venue within the State, for the term specified above for the purposes of inspection, auditing and copying. SUNY shall take reasonable steps to protect from public disclosure any of the Records which are exempt from disclosure under Section 87 of the Public Officers Law (the "Statute") provided that: (i) the Contractor shall timely inform an appropriate SUNY official, in writing, that said Records should not be disclosed; and (ii) said Records shall be sufficiently identified; and (iii) designation of said Records as exempt under the Statute is reasonable. Nothing contained herein shall diminish, or in any way adversely affect, SUNY's or the State's right to discovery in any pending or future litigation.

11. **IDENTIFYING INFORMATION AND PRIVACY NOTIFICATION.**

(a) Identification Number(s). Every invoice or New York State Claim for Payment submitted to SUNY by a payee, for payment for the sale of goods or services or for transactions (e.g., leases, easements, licenses, etc.) related to real or personal property must include the payee's identification number. The number is any or all of the following: (i) the payee's Federal employer identification number, (ii) the payee's Federal social security number, and/or (iii) the payee's Vendor Identification Number assigned by the Statewide Financial System. Failure to include such number or numbers may delay payment. Where the payee does not have such number or numbers, the payee, on its invoice or Claim for Payment, must give the reason or reasons why the payee does not have such number or numbers.

(b) Privacy Notification. (1) The authority to request the above personal information from a seller of goods or services or a lessor of real or personal property, and the authority to maintain such information, is found in Section 5 of the State Tax Law. Disclosure of this information by the seller or lessor to SUNY or the State is mandatory. The principal purpose for which the information is collected is to enable the State to identify individuals, businesses and others who have been delinquent in filing tax returns or may have understated their tax liabilities and to generally identify persons affected by the taxes administered by the Commissioner of Taxation and Finance. The information will be used for tax administration purposes and for any other purpose authorized by law. (2) The personal information is requested by the purchasing unit of SUNY contracting to purchase the goods or services or lease the real or personal property covered by this contract or lease. The information is maintained in the Statewide Financial System by the Vendor Management Unit within the Bureau of State Expenditures, Office of the State Comptroller, 110 State Street,

Albany, New York 12236.

12. **EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITIES AND WOMEN.** In accordance with Section 312 of the Executive Law and 5 NYCRR Part 143, if this contract is: (i) a written agreement or purchase order instrument, providing for a total expenditure in excess of $25,000.00, whereby a contracting agency is committed to expend or does expend funds in return for labor, services, supplies, equipment, materials or any combination of the foregoing, to be performed for, or rendered or furnished to the contracting agency; or (ii) a written agreement in excess of $100,000.00 whereby a contracting agency is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; or (iii) a written agreement in excess of $100,000.00 whereby the owner of a State assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon for such project, then the following shall apply and by signing this agreement the Contractor certifies and affirms that it is Contractor's equal employment opportunity policy that:

(a) The Contractor will not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability or marital status, shall make and document its conscientious and active efforts to employ and utilize minority group members and women its workforce on State contracts and will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. Affirmative action shall mean recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation;

(b) at SUNY's request, Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein; and

(c) the Contractor shall state, in all solicitations or advertisements for employees, that, in the performance of the State contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

Contractor will include the provisions of "a," "b," and "c" above, in every subcontract over $25,000.00 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon (the "Work") except where the Work is for the beneficial use of the Contractor. Section 312 does not apply to: (i) work, goods or services unrelated to this contract; or (ii) employment outside New York State. The State shall consider compliance by a contractor or sub-contractor with the requirements of any federal law concerning equal employment opportunity which effectuates the purpose of this clause. SUNY shall determine whether the imposition of the requirements of the provisions hereof duplicate or conflict with any such federal law and if such duplication or conflict exists, SUNY shall waive the applicability of Section 312 to the extent of such duplication or conflict. Contractor will comply with all duly promulgated and lawful rules and regulations of the Department of Economic Development's Division of Minority and Women's Business Development pertaining hereto.

13. **CONFLICTING TERMS.** In the event of a conflict between the terms of the contract (including any and all attachments thereto and amendments thereof) and the terms of this Exhibit A, the terms of this Exhibit A shall control.

14. **GOVERNING LAW.** This contract shall be governed by the laws of the State of New York except where the Federal supremacy clause requires otherwise.

15. **LATE PAYMENT.** Timeliness of payment and any interest to be paid to Contractor for late payment shall be governed by Article 11-A of the State Finance Law to the extent required by law.

16. **NO ARBITRATION.** Disputes involving this contract, including the breach or alleged breach thereof, may not be submitted to binding arbitration (except where statutorily authorized) but must, instead, be heard in a court of competent jurisdiction of the State of New York.

17. **SERVICE OF PROCESS.** In addition to the methods of service allowed by the State Civil Practice Law & Rules ("CPLR"), Contractor hereby consents to service of process upon it by registered or certified mail, return receipt requested. Service hereunder shall be complete upon Contractor's actual receipt of process or upon the State's receipt of the return thereof by the United States Postal Service as refused or undeliverable. Contractor must promptly notify the State, in writing, of each and every change of address to which service of process can be made. Service by the State to the last known address shall be sufficient. Contractor will have thirty (30) calendar days after service hereunder is complete in which to respond.

18. **PROHIBITION ON PURCHASE OF TROPICAL HARDWOODS.** The Contractor certifies and warrants that all wood products to be used under this contract award will be in accordance with, but not limited to, the specifications and provisions of State Finance Law §165 (Use of Tropical Hardwoods), which prohibits purchase and use of tropical hardwoods, unless specifically exempted, by the State or any governmental agency or political subdivision or public benefit corporation. Qualification for an exemption under this law will be the responsibility of the contractor to establish to meet with the approval of the State.

In addition, when any portion of this contract involving the use of woods, whether supply or installation, is to be performed by any subcontractor, the prime Contractor will indicate and certify in the submitted bid proposal that the subcontractor has been informed and is in compliance with specifications and provisions regarding use of tropical hardwoods as detailed in Section 165 of the State Finance Law. Any such use must meet with the approval of the State, otherwise, the bid may not be considered responsive. Under bidder certifications, proof of qualification for exemption will be the responsibility of the Contractor to meet with the approval of the State.

19. **MACBRIDE FAIR EMPLOYMENT PRINCIPLES.** In accordance with the MacBride Fair Employment Principles (Chapter 807 of the Laws of 1992) , the Contractor hereby stipulates that the Contractor either (a) has no business operations in Northern Ireland, or (b) shall take lawful steps in good faith to conduct any business operations in Northern Ireland in accordance with the MacBride Fair Employment Principles (as described in Section 165of the New York State Finance Law), and shall permit independent monitoring of compliance with such principles.

20. **OMNIBUS PROCUREMENT ACT OF 1992.**
It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority and women-owned business enterprises as bidders, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York State subcontractors and suppliers is available from:

NYS Department of Economic Development
Division for Small Business

Albany, NY 12245
Tel: 518-292-5100
Fax: 518-292-5884
email: opa@esd.ny.gov

A directory of certified minority and women-owned business enterprises is available from:

NYS Department of Economic Development
Division of Minority and Women's Business Development
633 Third Avenue
New York, NY 10017
212-803-2414

email: mwbecertification@esd.ny.gov
https://ny.newnycontracts.com/FrontEnd/VendorSearchPublic.asp

The Omnibus Procurement Act of 1992 (Chapter 844 of the Laws of 1992, codified in State Finance Law § 139-i and Public Authorities Law § 2879(3)(n)–(p)) requires that by signing this bid proposal or contract, as applicable, Contractors certify that whenever the total bid amount is greater than $1 million:

(a) The Contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors, including certified minority and women-owned business enterprises, on this project, and has retained the documentation of these efforts to be provided upon request to SUNY;

(b) The Contractor has complied with the Federal Equal Employment Opportunity Act of 1972 (P.L. 92-261), as amended;

(c) The Contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The Contractor agrees to document these efforts and to provide said documentation to the State upon request; and

(d) The Contractor acknowledges notice that the State may seek to obtain offset credits from foreign countries as a result of this contract and agrees to cooperate with the State in these efforts.

21. **RECIPROCITY AND SANCTIONS PROVISIONS.** Bidders are hereby notified that if their principal place of business is located in a country, nation, province, state or political subdivision that penalizes New York State vendors, and if the goods or services they offer will be substantially produced or performed outside New York State, the Omnibus Procurement Act of 1994 and 2000 amendments (Chapter 684 and Chapter 383, respectively, codified in State Finance Law § 165(6) and Public Authorities Law § 2879(5)) require that they be denied contracts which they would otherwise obtain.
NOTE: As of October 2019, the list of discriminatory jurisdictions subject to this provision includes the states of South Carolina, Alaska, West Virginia, Wyoming, Louisiana and Hawaii.

22. **COMPLIANCE WITH BREACH NOTIFICATION AND DATA SECURITY LAWS.** Contractor shall comply with the provisions of the New York State Information Security Breach and Notification Act (General Business Law § 899-aa; State Technology Law § 208) and commencing March 21, 2020 shall also comply with General Business Law § 899-bb.

23. **COMPLIANCE WITH CONSULTANT DISCLOSURE LAW.** If this is a contract for consulting services, defined for purposes of this requirement to include analysis, evaluation, research, training, data processing, computer programming, engineering, environmental health and mental health services, accounting, auditing, paralegal, legal or similar services, then in accordance with Section 163(4)(g) of the State Finance Law (as amended by Chapter 10 of the Laws of 2006), the Contractor shall timely, accurately and properly comply with the requirement to submit an annual employment report for the contract to SUNY, the Department of Civil Service and the State Comptroller.

24**. PURCHASES OF APPAREL AND SPORTS EQUIPMENT**. In accordance with State Finance Law Section 165(7), SUNY may determine that a bidder on a contract for the purchase of apparel or sports equipment is not a responsible bidder as defined in State Finance Law Section 163 based on (a) the labor standards applicable to the manufacture of the apparel or sports equipment, including employee compensation, working conditions, employee rights to form unions and the use of child labor; or (b) bidder's failure to provide information sufficient for SUNY to determine the labor conditions applicable to the manufacture of the apparel or sports equipment.

25. **PROCUREMENT LOBBYING**. To the extent this contract is a "procurement contract" as defined by State Finance Law §§ 139-j and 139-k, by signing this contract the Contractor certifies and affirms that all disclosures made in accordance with State Finance Law §§ 139-j and 139-k are complete, true and accurate. In the event such certification is found to be intentionally false or intentionally incomplete, the State may terminate the contract by providing written notification to the Contractor in accordance with the terms of the contract.

26. **CERTIFICATION OF REGISTRATION TO COLLECT SALES AND COMPENSATING USE TAX BY CERTAIN STATE CONTRACTORS, AFFILIATES AND SUBCONTRACTORS**. To the extent this contract is a contract as defined by Tax Law § 5-a, if the Contractor fails to make the certification required by Tax Law § 5-a or if during the term of the contract, the Department of Taxation and Finance or SUNY discovers that the certification, made under penalty of perjury, is false, then such failure to file or false certification shall be a material breach of this contract and this contract may be terminated, by providing written notification to the Contractor in accordance with the terms of the contract, if SUNY determines that such action is in the best interests of the State.

27. **IRAN DIVESTMENT ACT**. By entering into this contract, Contractor certifies in accordance with State Finance Law §165-a that it is not on the "Entities Determined to be Non-Responsive Bidders/Offerers pursuant to the New York State Iran Divestment Act of 2012" ("Prohibited Entities List") posted at:

https://ogs.ny.gov/list-entities-determined -be-non-responsive-biddersofferers-pursuant-nys-iran-divestment-act-2012

Contractor further certifies that it will not utilize on this contract any subcontractor that is identified on the Prohibited Entities List. Contractor agrees that should it seek to renew or extend this contract, it must provide the same certification at the time the contract is renewed or extended. Contractor also agrees that any proposed Assignee of this contract will be required to certify that it is not on the Prohibited Entities List before the contract assignment will be approved by the State.

During the term of the contract, should SUNY receive information that a person (as defined in State Finance Law §165-a) is in violation of the above-referenced certifications, SUNY will review such information and offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment activity which is in violation of the Act within 90 days after the determination of such violation, then SUNY shall take such action as may be appropriate and provided for by law, rule, or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

SUNY reserves the right to reject any bid, request for assignment, renewal or extension for an entity that appears on the Prohibited Entities List prior to the award, assignment, renewal or extension of a contract, and to pursue a responsibility review with respect to any entity that is awarded a contract and appears on the Prohibited Entities list after contract award.

28**. ADMISSIBILITY OF REPRODUCTION OF CONTRACT**. Notwithstanding the best evidence rule or any other legal principle or rule of evidence to the contrary, the Contractor acknowledges and agrees that it waives any and all objections to the admissibility into evidence at any court proceeding or to the use at any examination before trial of an electronic reproduction of this contract, in the form approved by the State Comptroller, if such approval was required, regardless of whether the original of said contract is in existence.

THE FOLLOWING PROVISIONS SHALL APPLY ONLY TO THOSE CONTRACTS TO WHICH A HOSPITAL OR OTHER HEALTH SERVICE FACILITY IS A PARTY

29. Notwithstanding any other provision in this contract, the hospital or other health service facility remains responsible for insuring that any service provided pursuant to this contract complies with all pertinent provisions of Federal, state and local statutes, rules and regulations. In the foregoing sentence, the word "service" shall be construed to refer to the health care service rendered by the hospital or other health service facility.

30. (a) In accordance with the 1980 Omnibus Reconciliation Act (Public Law 96-499), Contractor hereby agrees that until the expiration of four years after the furnishing of services under this agreement, Contractor shall make available upon written request to the Secretary of Health and Human Services, or upon request, to the Comptroller General of the United States or any of their duly authorized representatives, copies of this contract, books, documents and records of the Contractor that are necessary to certify the nature and extent of the costs hereunder.

(b) If Contractor carries out any of the duties of the contract hereunder, through a subcontract having a value or cost of $10,000 or more over a twelve-month period, such subcontract shall contain a clause to the effect that, until the expiration of four years after the furnishing of such services pursuant to such subcontract, the subcontractor shall make available upon written request to the Secretary of Health and Human Services or upon request to the Comptroller General of the United States, or any of their duly authorized representatives, copies of the subcontract and books, documents and records of the subcontractor that are necessary to verify the nature and extent of the costs of such subcontract.

(c) The provisions of this section shall apply only to such contracts as are within the definition established by the Health Care Financing Administration, as may be amended or modified from time to time.

31. Hospital Retained Authority: Hospital Retained Authority: The Hospital retains direct, independent authority over the appointment and/or dismissal, in its sole discretion, of the facility's management level employees (including but not limited to, the Facility/Service Administrator/Director, the Medical Director, the Director of Nursing, the Chief Executive Officer, the Chief Financial Officer and the Chief Operating Officer) and all licensed or certified health care staff. The Hospital retains the right to adopt and approve, at its sole discretion, the facility's operating and capital budgets. The Hospital retains independent control over and physical possession of the facility's books and records. The Hospital retains independent control over and physical possession of the facility's operating policies and procedures. The Hospital retains full authority and responsibility for, and control over, the operations and management of the facility. The Hospital retains the right and authority to independently adopt, approve and enforce, in its sole discretion, policies affecting the facility's delivery of health care services. The Hospital retains the right to independently adopt, approve and enforce, at its sole discretion, the disposition of assets and authority to incur debts. The Hospital retains the right to approve, at its sole discretion, contracts for administrative services,

management and/or clinical services. The Hospital retains the right to approve, at its sole discretion, any facility debt. The Hospital retains the right to approve, at its sole discretion, settlements of administrative proceeding or litigation to which the facility is a party. No powers specifically reserved to the Hospital may be delegated to, or shared by, the Contractor or any other person. In addition, if there is any disagreement between the parties to this Agreement regarding control between the Hospital and the Contractor, the terms of this Section shall control.

1. DEFINITIONS. The following terms shall be defined in accordance with Section 310 of the Executive Law:

STATE CONTRACT herein referred to as "State Contract", shall mean: (a) a written agreement or purchase order instrument, providing for a total expenditure in excess of twenty-five thousand dollars ($25,000.00), whereby the State University of New York ("University") is committed to expend or does expend funds in return for labor, services including but not limited to legal, financial and other professional services, supplies, equipment, materials or a combination of the foregoing, to be performed for, or rendered or furnished to the University; (b) a written agreement in excess of one hundred thousand dollars ($100,000.00) whereby the University is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; (c) and (d) a written agreement in excess of one hundred thousand dollars ($100,000.00) whereby the University as an owner of a state assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon for such project.

SUBCONTRACT herein referred to as "Subcontract", shall mean any agreement for a total expenditure in excess of $25,000 providing for services, including non-staffing expenditures, supplies or materials of any kind between a State agency and a prime contractor, in which a portion of the prime contractor's obligation under the State contract is undertaken or assumed by a business enterprise not controlled by the prime contractor.

WOMEN-OWNED BUSINESS ENTERPRISE herein referred to as "WBE", shall mean a business enterprise, including a sole proprietorship, partnership or corporation that is: (a) at least fifty-one percent (51%) owned by one or more United States citizens or permanent resident aliens who are women; (b) an enterprise in which the ownership interest of such women is real, substantial and continuing; (c) an enterprise in which such women ownership has and exercises the authority to control independently the day-to-day business decisions of the enterprise; (d) an enterprise authorized to do business in this state and independently owned and operated; (e) an enterprise owned by an individual or individuals, whose ownership, control and operation are relied upon for certification, with a personal net worth that does not exceed fifteen million dollars ($15,000,000), as adjusted annually on the first of January for inflation according to the consumer price index of the previous year; and (f) an enterprise that is a small business pursuant to subdivision twenty of this section.

A firm owned by a minority group member who is also a woman may be certified as a minority-owned business enterprise, a women-owned business enterprise, or both, and may be counted towards either a minority-owned business enterprise goal or a women-owned business enterprise goal, in regard to any Contract or any goal, set by an agency or authority, but such participation may not be counted towards both such goals. Such an enterprise's participation in a Contract may not be divided between the minority-owned business enterprise goal and the women-owned business enterprise goal.

MINORITY-OWNED BUSINESS ENTER- PRISE herein referred to as "MBE", shall mean a business enterprise, including a sole proprietorship, partnership or corporation that is: (a) at least fifty-one percent (51%) owned by one or more minority group members; (b) an enterprise in which such minority ownership is real, substantial and continuing; (c) an enterprise in which such minority ownership has and exercises the authority to control independently the day-to-day business decisions of the enterprise; (d) an enterprise authorized to do business in this state and independently owned and operated; (e) an enterprise owned by an individual or individuals, whose ownership, control and operation are relied upon for certification, with a personal net worth that does not exceed fifteen million dollars ($15,000,000.00), as adjusted annually on the first of January for inflation according to the consumer price index of the previous year; and (f) an enterprise that is a small business pursuant to subdivision twenty of this section.

MINORITY GROUP MEMBER shall mean a United States citizen or permanent resident alien who is and can demonstrate membership in one of the following groups: (a) Black persons having origins in any of the Black African racial groups; (b) Hispanic persons of Mexican, Puerto Rican, Domini- can, Cuban, Central or South American of either Indian or Hispanic origin, regardless of race; (c) Native American or Alaskan native persons having origins in any of the original peoples of North America. (d) Asian and Pacific Islander persons having origins in any of the Far East countries, South East Asia, the Indian Subcontinent or Pacific Islands.

CERTIFIED ENTERPRISE **OR** ***BUSINESS*** shall mean a business verified as a minority or women-owned business enterprise pursuant to section 314 of the Executive Law. A business enterprise which has been

approved by the New York Division of Minority & Women Business Development ("DMWBD") for minority or women-owned enterprise status subsequent to verification that the business enterprise is owned, operated, and controlled by minority group members or women, and that also meets the financial requirements set forth in the regulations.

2. TERMS. The parties to the attached State Contract agree to be bound by the following provisions which are made a part hereof (the word "Contractor" herein refers to any party other than the University:

1(a) Contractor and its Subcontractors shall undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. For these purposes, affirmative action shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation.

(b) Prior to the award of a State Contract, the Contractor shall submit an equal employment opportunity (EEO) policy statement to the University within the time frame established by the University.

(c) As part of the Contractor's EEO policy statement, the Contractor, as a precondition to entering into a valid and binding State Contract, shall agree to the following in the performance of the State Contract: (i) The Contractor will not discriminate against any employee or applicant for employment, will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination, and shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on State Contracts;(ii) The Contractor shall state in all solicitations or advertisements for employees that, in the performance of the State Contract, all qualified applicants will be afforded equal employment opportunities without discrimination; (iii) At the request of the University the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union, or representative will not discriminate, and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein.

(d) Form 108 - Staffing Plan To ensure compliance with this Section, the Contractor shall submit a staffing plan to document the composition of the proposed workforce to be utilized in the performance of the Contract by the specified categories listed, including ethnic background, gender, and Federal occupational categories. Contractors shall complete the Staffing plan form and submit it as part of their bid or proposal or within a reasonable time, but no later than the time of award of the contract.

(e) Form 112 - Workforce Employment Utilization Report ("Workforce Report")

(i) Once a contract has been awarded and during the term of Contract, Contractor is responsible for updating and providing notice to SUNY of any changes to the previously submitted Staffing Plan. This information is to be submitted on a quarterly basis during the term of the contract to report the actual workforce utilized in the performance of the contract by the specified categories listed including ethnic background, gender, and Federal occupational categories. The Workforce Report must be submitted to report this information.

(ii) Separate forms shall be completed by Contractor and any subcontractor performing work on the Contract.

(iii) In limited instances, Contractor may not be able to separate out the workforce utilized in the performance of the Contract from Contractor's and/or subcontractor's total workforce. When a separation can be made, Contractor shall submit the Workforce Report and indicate that the information provided related to the actual workforce utilized on the Contract. When the workforce to be utilized on the contract cannot be separated out from Contractor's and/or subcontractor's total workforce, Contractor shall submit the Workforce Report and indicate that the information provided is Contractor's total workforce during the subject time frame, not limited to work specifically under the contract.

(f) Contractor shall comply with the provisions of the Human Rights Law, all other State and Federal statutory and constitutional non-discrimination provisions. Contractor and subcontractors shall not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

(g) The Contractor shall include the provisions of this section in every Subcontract in such a manner that the requirements of the provisions will be binding upon each Subcontractor as to work in connection with the State Contract, including the requirement that Subcontractors shall undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination, and, when requested, provide to the Contractor information on the ethnic background, gender, and Federal occupational categories of the

employees to be utilized on the State Contract.

(h) To ensure compliance with the requirements of this paragraph, the University shall inquire of a Contractor whether the work force to be utilized in the performance of the State Contract can be separated out from the Contractor's and/or Subcontractors' total work force and where the work of the State Contract is to be performed. For Contractors who are unable to separate the portion of their work force which will be utilized for the performance of this State Contract, Contractor shall provide reports describing its entire work force by the specified ethnic background, gender, and Federal Occupational Categories, or other appropriate categories which the agency may specify.

(i) The University may require the Contractor and any Subcontractor to submit compliance reports, pursuant to the regulations relating to their operations and implementation of their affirmative action or equal employment opportunity program in effect as of the date the State Contract is executed.

(j) If a Contractor or Subcontractor does not have an existing affirmative action program, the University may provide to the Contractor or Subcontractor a model plan of an affirmative action program. Upon request, the Director of DMWBD shall provide a contracting agency with a model plan of an affirmative action program.

(k) Upon request, DMWBD shall provide the University with information on specific recruitment sources for minority group members and woman, and contracting agencies shall make such information available to Contractors

3. Contractor must provide the names, addresses and federal identification numbers of certified minority- and women-owned business enterprises which the Contractor intends to use to perform the State Contract and a description of the Contract scope of work which the Contractor intends to structure to increase the participation by Certified minority- and/or women-owned business enterprises on the State Contract, and the estimated or, if known, actual dollar amounts to be paid to and performance dates of each component of a State Contract which the Contractor intends to be performed by a certified minority- or woman-owned business enterprise. In the event the Contractor responding to University solicitation is joint venture, teaming agreement, or other similar arrangement that includes a minority- and women owned business enterprise, the Contractor must submit for review and approval: i. the name, address, telephone number and federal identification of each partner or party to the agreement; ii. the federal identification number of the joint venture or entity established to respond to the solicitation, if applicable; iii. A copy of the joint venture, teaming or other similar arrangement which describes the percentage of interest owned by each party to the agreement and the value added by each party; iv. A copy of the mentor-protégé agreement between the parties, if applicable, and if not described in the joint venture, teaming agreement, or other similar arrangement.

4. PARTICIPATION BY MINORITY GROUP MEMBERS AND WOMEN. The University shall determine whether Contractor has made conscientious and active efforts to employ and utilize minority group members and women to perform this State Contract based upon an analysis of the following factors:

(a) Whether Contractor established and maintained a current list of recruitment sources for minority group members and women, and whether Contractor provided written notification to such recruitment sources that contractor had employment opportunities at the time such opportunities became available.

(b) Whether Contractor sent letters to recruiting sources, labor unions, or authorized representatives of workers with which contractor has a collective bargaining or other agreement or understanding requesting assistance in locating minority group members and women for employment.

(c) Whether Contractor disseminated its EEO policy by including it in any advertising in the news media, and in particular, in minority and women news media.

(d) Whether Contractor has attempted to provide information concerning its EEO policy to Subcontractors with which it does business or had anticipated doing business.

(e) Whether internal procedures exist for, at a minimum, annual dissemination of the EEO policy to employees, specifically to employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions. Such dissemination may occur through distribution of employee policy manuals and handbooks, annual reports, staff meetings and public postings.

(f) Whether Contractor encourages and utilizes minority group members and women employees to assist in recruiting other employees.

(g) Whether Contractor has apprentice training programs approved by the N.Y.S. Department of Labor which provides for training and hiring of minority group members and women.

(h) Whether the terms of this section have been incorporated into each Subcontract which is entered into by the Contractor.

5. PARTICIPATION BY MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES. Based upon an analysis of the following factors, the University shall determine whether Contractor has made good faith efforts to provide for meaningful participation by minority-owned and women-owned business enterprises which have been certified by DMWBD:

(a) Whether Contractor has actively solicited bids for Subcontracts from qualified

M/WBEs, including those firms listed on the Directory of Certified Minority and Women- Owned Business Enterprises, and has documented its good faith efforts towards meeting minority and women owned business enterprise utilization plans by providing, copies of solicitations, copies of any advertisements for participation by certified minority- and women-owned business enterprises timely published in appropriate general circulation, trade and minority- or women-oriented publications, together with the listing(s) and date(s) of the publications of such advertisements; dates of attendance at any pre-bid, pre-award, or other meetings, if any, scheduled by the University, with certified minority- and women-owned business enterprises, and the reasons why any such firm was not selected to participate on the project.

(b) Whether Contractor has attempted to make project plans and specifications available to firms who are not members of associations with plan rooms and reduce fees for firms who are disadvantaged.

(c) Whether Contractor has utilized the services of organizations which provide technical assistance in connection with M/WBE participation.

(d) Whether Contractor has structured its Subcontracts so that opportunities exist to complete smaller portions of work.

e) Whether Contractor has encouraged the formation of joint ventures, partnerships, or other similar arrangements among Subcontractors.

(f) Whether Contractor has requested the services of the Department of Economic Development (DED) to assist Subcontractors' efforts to satisfy bonding requirement.

(g) Whether Contractor has made progress payments promptly to its Subcontractors.

(h) Whether the terms of this section have been incorporated into each Subcontract which is entered into by the Contractor. It shall be the responsibility of Con- tractor to ensure compliance by every Subcontractor with these provisions.

6. MWBE Utilization Plan.

(a) The Contractor represents and warrants that Contractor has submitted an MWBE Utilization Plan prior to the execution of the contract.

(b) MWBE Utilization Plan (Form 7557-107).

Contractors are required to submit a Utilization Plan on Form 7557-107 with their bid or proposal. Complete the following steps to prepare the Utilization Plan:

i. list NYS Certified minority- and women-owned business enterprises which the Contractor intends to use to perform the State contract;
ii. insert a description of the contract scope of work which the Contractor intends to structure to increase the participation by NYS Certified minority- and women-owned enterprises on the State contract;
iii. insert the estimated or, if known, actual dollar amounts to be paid to and performance dates of each component of a State contract which the Contractor intends to be performed by a NYS Certified minority- or women-owned business; and

(c) Any modifications or changes to the agreed participation by NYS Certified MWBEs after the Contract Award and during the term of the contract must be reported on a revised MWBE Utilization Plan and submitted to the SUNY University-wide MWBE Program Office.

(d) The University will review the MWBE Utilization Plan and will issue the Contractor a written notice of acceptance or deficiency within twenty (20) day of its receipt. A notice of deficiency shall include the:

i. list NYS Certified minority- and women-owned business enterprises which the Contractor intends to use to perform the State contract;
ii. name of any MWBE which is not acceptable for the purpose of complying with the MWBE participation goals;
iii. reasons why it is not an acceptable element of the Contract scope of work which the MWBE Program Office has determined can be reasonably structured by the Contractor to increase the likelihood of participation in the Contract by MWBEs; and
iv. other information which the MWBE Program Office determines to be relevant to the MWBE Utilization Plan.

(e) The Contractor shall respond to the notice of deficiency within seven (7) business days of receipt by submitting to the University a written remedy in response to the notice of deficiency.

i. If the written remedy that is submitted is not timely or is found to be inadequate, the University-wide MWBE Program Office shall notify the Contractor and direct the Contractor to submit, within five (5) business days, a request for partial or total waiver of MWBE participation goals on forms provided by the University-wide MWBE Program Office.
ii. Failure to file the waiver form in a timely manner may be grounds for disqualification of the bid or proposal.

(f) The University may disqualify a Contractor as being non-responsive under the following circumstances:

i. If a Contractor fails to submit a MWBE Utilization Plan;
ii. If a Contractor fails to submit a written remedy to a notice of deficiency in a MWBE Utilization Plan;
iii. If a Contractor fails to submit a request for waiver; or

iv. If the MWBE Program Office determines that the Contractor has failed to document Good Faith Efforts.

(g) Contractor agrees to use such MWBE Utilization Plan for the performance of MWBEs on the Contract pursuant to the prescribed MWBE goals set forth in Section III-A of this Appendix.

(h) Contractor further agrees that a failure to submit and/or use such MWBE Utilization Plan shall constitute a material breach of the terms of the Contract. Upon the occurrence of such a material breach, SUNY shall be entitled to any remedy provided herein, including but not limited to, a finding of Contractor non-responsiveness.

7. Waivers.
(a) For Waiver Requests Contractor should use (Form 7557-114) – Waiver Request.

(b) If the Contractor, after making good faith efforts, is unable to comply with MWBE goals, the Contractor may submit a Request for Waiver form documenting good faith efforts by the Contractor to meet such goals. If the documentation included with the waiver request is complete the University shall evaluate the request and issue a written notice of acceptance or denial within twenty (20) days of receipt.

(c) If University, upon review of the MWBE Utilization Plan and updated Quarterly MWBE Contractor Compliance Reports determines that Contractor is failing or refusing to comply with the Contract goals and no waiver has been issued in regards to such non-compliance, the University may issue a notice of deficiency to the Contractor. The contractor must respond to the notice of deficiency within seven (7) business days of receipt. Such response may include a request for partial or total waiver of MWBE Contract Goals.

8. MWBE Contractor Compliance Report.
Contractor is required to submit an MWBE Contractor Compliance Report (Form 7557-112) to the University by the 5th day following each end of quarter over the term of the Contract documenting the progress made towards achievement of the MWBE goals of the Contract. Compliance Reports for construction contracts (Form 7557-110) must be submitted on a monthly basis.

9. GOALS. (a) GOALS FOR MINORITY AND WOMEN WORK FORCE PARTICIPATION.

(i) The University shall include relevant work force availability data, which is provided by the DMWBD, in all documents which solicit bids for State Contracts and shall make efforts to assist Contractors in utilizing such data to determine expected levels of participation for minority group members and women on State Contracts.

(ii) Contractor shall exert good faith efforts to achieve such goals for minority and women's participation. To successfully achieve such goals, the employment of minority group members and women by Contractor must be substantially uniform during the entire term of this State Contract. In addition, Contractor should not participate in the transfer of employees from one employer or project to another for the sole purpose of achieving goals for minority and women's participation.

(b) **GOALS FOR MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES PARTICIPATION.** For all State Contracts in excess of $25,000.00 whereby the University is committed to expend or does expend funds in return for labor, services including but not limited to legal, financial and other professional services, supplies, equipment, materials or an combination of the foregoing or all State Contracts in excess of $100,000.00 whereby the University is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon, Contractor shall exert good faith efforts to achieve a participation goal of ____25_ percent (__25___%) for Certified Minority-Owned Business Enterprises and __5___ percent (__5___%) for Certified Women-Owned Business Enterprises.

10. ENFORCEMENT. The University will be responsible for enforcement of each Contractor's compliance with these provisions. Contractor, and each Subcontractor, shall permit the University access to its books, records and accounts for the purpose of investigating and determining whether Contractor or Subcontractor is in compliance with the requirements of Article 15-A of the Executive Law. If the University determines that a Contractor or Subcontractor may not be in compliance with these provisions, the University may make every reasonable effort to resolve the issue and assist the Contractor
or Subcontractor in its efforts to comply with these provisions. If the University is unable to resolve the issue of noncompliance, the University may file a complaint with the DMWBD.

Failure to comply with all of the requirements herein may result in a finding of non-responsiveness, non-responsibility and/or a breach of contract, leading to the withholding of funds or such other actions, remedies or enforcement proceedings as allowed by the Contract.

11. DAMAGES FOR NON COMPLIANCE.
Where the University determines that Contractor is not in compliance with the requirements of the Contract and Contractor refuses to comply with such requirements, or if Contractor is found to have willfully and intentionally failed to comply with the MWBE participation goals, Contractor shall be obligated to pay

liquidated damages to the University. Such liquidated damages shall be calculated as an amount equaling the difference between:

a. All sums identified for payment to MWBEs had the Contractor achieved the contractual MWBE goals; and

b. All sums actually paid to MWBEs for work performed or materials supplied under the Contract.

In the event a determination has been made which requires the payment of liquidated damages and such identified sums have not been withheld by the University, Contractor shall pay such liquidated damages to the University within sixty (60) days after such damages are assessed, unless prior to the expiration of such sixtieth day, the Contractor has filed a complaint with the Director of the Division of Minority and Woman Business Development pursuant to Subdivision 8 of Section 313 of the Executive Law in which event the liquidated damages shall be payable if Director renders a decision in favor of the University.

SIEMENS

Ingenuity for life

PROPOSAL
SUNY Music Studio

PREPARED BY
Siemens Industry, Inc.

PREPARED FOR

DELIVERED ON
November 17, 2021

SIEMENS
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Table of Contents

SIEMENS
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Contact Information

Proposal #:	6371346
Date:	November 17, 2021

Sales Executive:	Brian Greda
Branch Address:	8 Fernwood Rd Florham Park, New Jersey 07932
Telephone:	973.332.0789
Email Address:	brian.greda@siemens.com

Customer Contact:	
Customer:	
Address:	
Services shall be provided at:	

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Scope of Work

Siemens is proud to present our turnkey building management system (BMS) solution for Project SUNY Purchase Music Studio.

Furnish and install the Siemens Building Management System (BMS) in accordance with the Mechanical drawings and specifications dated 9/14/21 by Collado Engineers.

Siemens to perform the following scope of work:

- VAV boxes (2) - Stand alone DDC control of room temperature.
- Exhaust Fan (1) - Install room temperature sensor for local control of fan operation.
- RTU (1) - installation of Manufacturer's room sensor with occupied override function
- New DDC controller with BACnet MSTP
- BACnet MSTP integration to RTU and VAV boxes.
- Graphics for new equipment.
- SUNY IT to provide IP drop to DDC controller

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Inclusions

1. Labor to provide Siemens standard submittals / record documents
    - System architecture (Siemens BACnet IP & MSTP)
    - System flow diagrams
    - Control installation / wiring diagrams
    - Control & Component Panel layouts
    - Equipment / Instrumentation datasheets
2. Labor to provide installation and wiring, to include:
    - BMS control and interlock wiring
3. Labor to provide Siemens standard startup & checkout
    - Point database verification
    - Point-to-point
    - Loop checks
    - Sequence verification
4. Labor to provide Siemens project management, to include the following:
    - BMS project scope only and associated meetings and coordination as required by project schedule (not full-time project manager)
    - Project meeting attendance
    - Project documentation requirements
    - Coordination with trades
    - Subcontractor management
    - Material ordering and delivery coordination
    - Project turnover documentation support
5. Labor to provide 2 hours to support Commissioning Agent, to include
    - Commissioning of BMS
    - Commissioning / Validation of BMS
6. 1-year parts and labor warranty upon beneficial use of systems

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Exclusions

1. Removing, replacing, cutting, patching, or painting of ceilings or walls
2. Overtime
3. After hours work
4. Asbestos abatement, and work within asbestos areas
5. Additional testing due to others
6. Costs associated with multiple trips to the jobsite due to incompletion by others
7. Damage by other contractors
8. Any consequential damages, loss of use, loss of revenue, and any third-party consequential damages
9. Performance or Payment bonds
10. Per project aggregate general liability insurance
11. Professional liability insurance
12. 120VAC Power wiring to all new terminal box controllers
13. Furnishing and/or wiring to fire, smoke or combo fire/smoke dampers
14. Wiring for fire alarm shutdown of HVAC equipment
15. RTU thermostats
16. Access doors
17. Temporary or standby labor and services

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Clarifications

1. VAV box manufacturer to furnish controls transformers and fan relays
2. Control wiring shall be run in conduit where exposed. Control wiring shall be run using plenum rated cable without conduit in concealed accessible locations and above lift-out ceiling
3. All wiring above 24V will be provided by Division 26
4. The owner will need to provide IP drops to the Siemens DDC panels

Sell Price

Total Quote Price	**$41,200.00**

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Payment Terms

Payment Terms Acceptance Agreement

The total price of: $41,200.00 and the estimated return on investment are based on the items outlined in this proposal. ANY statements made herein regarding savings that may be achieved by implementing the services offered in this proposal are estimates only. No warranty, either expressed or implied, shall be construed to arise from such statements, nor shall such statements be construed as constituting a guarantee by Siemens that such savings will occur if the services are implemented.

Terms and Conditions Disclaimer

The Customer acknowledges that when approved by the Customer and accepted by Siemens Industry, Inc.: (i) the Proposal and the Contract Terms and Conditions, (together with any other documents incorporated into the forgoing) shall constitute the entire agreement of the parties with respect to its subject matter (collectively, hereinafter referred to as the "Agreement") and (ii) in the event of any conflict between the terms and conditions of the Proposal and the terms and conditions of The Contract Terms and Conditions, the Contract Terms and Conditions shall control.

BY EXECUTION HEREOF, THE SIGNER CERTIFIES THAT (S)HE HAS READ ALL OF THE TERMS AND CONDITIONS AND DOCUMENTS, THAT SIEMENS OR ITS REPRESENTATIVES HAVE MADE NO AGREEMENTS OR REPRESENTATIONS EXCEPT AS SET FORTH THEREIN, AND THAT (S)HE IS DULY AUTHORIZED TO EXECUTE THE SIGNATURE PAGE ON BEHALF OF THE CUSTOMER.

This Proposal is based on the Siemens Industry, Inc. Standard Terms and Conditions and the "Scope of Work" and are to be considered part of this proposal. Proposal is valid for thirty (30) days from the delivery date of November 17, 2021. Payment is due within 30 days of invoice date.

Payment Terms: 25% mobilization in advance, progress payments
Total: $41,200.00

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Terms & Conditions Link(s)

Terms and Conditions (Click to download)
Terms & Conditions (Projects) (http://go.siemens.net/15156302)
Terms & Conditions (Products Only) (http://go.siemens.net/15492770)

As a result of the global Covid-19 Virus outbreak, temporary delays in delivery, labor or services from Siemens and its sub-suppliers or subcontractors may occur. Among other factors, Siemens' delivery is subject to the correct and punctual supply from sub-suppliers or subcontractors, and Siemens reserves the right to make partial deliveries or modify its labor or services. While Siemens shall make every commercially reasonable effort to meet the delivery or service or completion date mentioned above, such date is subject to change.

Attachment A

Riders (Click on rider below to download)
SI Monitoring Rider (http://go.siemens.net/31208927)
SI Online Backup and Data Protection (http://go.siemens.net/25876317)
SI UBM or Utility Procurement (http://go.siemens.net/35813877)
SI Software License Warranty (http://go.siemens.net/59206587)
SI Consulting Rider (http://go.siemens.net/33041159)

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Signature Page

Proposed by:

Siemens Industry, Inc.

Company

Brian Greda

Name

6371346

Proposal #

$41,200.00

Proposal Amount

November 17, 2021

Date

Accepted by:

Company

Name (Printed)

Signature

Title

Date

Purchase Order #

Network Cable Installation Specification

Version 6.1

November 23, 2021

Table of Contents

Part 1: Introduction

1.1) Introduction

Purchase College (SUNY) located in Purchase, NY, maintains the following specification (hereafter referred to as “Specification”, “the Specification”, or “this Specification”) as a set of requirements for any installation of cables that shall support any Data, Telephone, Audio/Video, and Security (alarm, surveillance, and door access systems) services on the Purchase College campus.

1.2) The Terms “Owner” and “the Owner”

The Terms “Owner” and “the Owner” shall represent Purchase College, State University of New York (SUNY) of 735 Anderson Hill Rd., Purchase, NY 10577.

1.3) Applicability of this Specification and the Term “Contractor”

This Specification may be presented in a number of ways, including but not limited to the following:

1.3.1) This Specification may be attached to a request for quotation or request for proposal, in which case this document shall specify requirements for proposed work upon which a vendor shall base its quotation. In this case the terms “Contractor” and “the Contractor” shall represent the vendor who is providing cost quotation/proposal upon which an agreement to perform the work may be reached. By use of the terms “Contractor” and “the Contractor”, Owner conveys no promise or intention that such an agreement will be reached.

1.3.2) This Specification may accompany an order for installation services and materials, in which case it shall serve as requirements by which vendor is to provide requested services and materials should the vendor accept the order. In this case the terms “Contractor” and “the Contractor” shall represent the selected vendor in its obligation to perform the actual work.

1.4) Format

This Specification consists of the following five parts:

Part 1: Introduction
Part 2: General,
Part 3: Materials,
Part 4: Execution
Part 5: Documentation

With some projects an additional part may be added:
Part 6: Scope of Work

Part 2: General

2) General

2.1) Schedule

Contractor shall complete all work according to any Schedule Requirements specified in the Scope of Work (if provided) and the original RFQ/RFP/Project.

Contractor shall accompany any request for quote with a proposed schedule in writing, including all of the Project Milestones specified below and the Schedule Requirements specified in the Scope of Work (if provided) and the original RFQ/RFP/Project..

If work is awarded to contractor, then proposed schedule of Contractor shall become the Schedule absent other written agreement by Owner. Contractor shall adhere strictly to the Schedule and convey any proposed adjustments to the Schedule and all Project Milestones as a Transmittal to Owner Project Manager.

Written approval from Owner Project Manager must be obtained by Contractor prior to change of Schedule according to any proposed adjustments. If written approval from Owner Project Manager is not obtained by Contractor, then the Schedule remains unchanged and Contractor is obligated to perform according to Schedule.

Project Milestones are as follows:

2.1.1) Date Order Must be Received By
2.1.2) Materials Delivery Date (if different from the start date)
2.1.3) Start of Work Date
2.1.4) Start Date of Work on Communication Rooms
2.1.5) Start Date of Pathway Installation (incl. core drilling, riser installation, raceway installation)
2.1.6) Completion of Risers Date
2.1.7) Completion of Path Installation Date
2.1.8) Start of Fiber-Optic Cable Installation Date
2.1.9) Fiber-Optic Testing and Labeling Date
2.1.10) Completion of Fiber-Optic Cable Installation Date
2.1.11) Start of Other Cable Installation Date
2.1.12) Completion of Cable Pulling/Rough-in Date
2.1.13) Completion of Category 6 / 6A Cable Installation Date
2.1.14) Completion of Telecommunications Feeder Installation Date
2.1.15) Completion of Other Cable Installation Date
2.1.16) Documentation Delivery Date
2.1.17) Project Total Completion Date

2.2) Contractor References

Contractor shall supply along with their bid a list of references of comparable installations, including contact name and telephone number. Owner may elect to perform a site visit to one or more references. Contractor shall note at least one reference that is able to accommodate a site visit by Owner.

2.3) Designated Contacts

2.3.1) Owner Designated Contacts

Owner shall specify the name, mailing address, email address, fax, and telephone numbers for the following persons, hereafter referred to as “Owner Designated Contacts”.

Changes to any Owner Designated Contacts before or during the relevant period of this work shall be communicated to all Designated Contacts by the Owner Project Manager.

Contractor shall communicate exclusively with the Owner Designated Contacts defined below in regard to any matter pertaining to the work described herein.

2.3.1.1) Owner Project Manager

Sean Connolly
Capital Facilities Planning

Purchase College
735 Anderson Hill Rd., Purchase NY 10577
(914)251-6916
sean.connolly@purchase.edu

2.3.1.2) Owner Technical Contacts

Joseph Kennedy
Campus Technology Services
Purchase College
735 Anderson Hill Rd., Purchase NY 10577
(914)251-6916
joseph.kennedy@purchase.edu

William Redding
University Police Department
Purchase College
735 Anderson Hill Rd., Purchase NY 10577
(914)251-6905
William.Redding@purchase.edu

2.3.1.3) Owner Billing Contact

Elizabeth Pleva
Purchasing and Accounts Payable Office
Purchase College
735 Anderson Hill Rd., Purchase NY 10577
Phone: (914)251-6070
Fax: (914)251-6075

2.3.1.4) Owner Parking and Transportation Contact

Christine Onderdonk
Parking and Transportation Office
CCN Building, Rm. 1014
Purchase College
735 Anderson Hill Rd., Purchase NY 10577
(914)251-6177
christine.onderdonk@purchase.edu

2.3.1.5) Owner Certified Payroll Records Contact

Anne Marie Russillo
Capital Facilities Planning Office
Purchase College
735 Anderson Hill Rd., Purchase NY 10577
(914)251-4480

2.3.1.6) Owner Capital Projects Contact

Anne Marie Russillo
Capital Facilities Planning
Purchase College
735 Anderson Hill Rd., Purchase NY 10577
(914)251-4480

2.3.2) Contractor Designated Contacts

Contractor shall specify the name, mailing address, email address, fax, and telephone numbers for the following persons, hereafter referred to as “Contractor Designated Contacts”.

Changes to any Contractor Designated Contacts before or during the relevant period of this work shall be communicated to all Designated Contact by the Contractor Project Manager.

2.3.2.1) Contractor Project Manager
2.3.2.2) Contractor Field Contact
2.3.2.3) Contractor Sales Contact
2.3.2.4) Contractor Billing Contact
2.3.2.5) Contractor President / CEO

2.3.3) Coordination by Contractor with Owner Designated Contacts

Contractor shall simultaneously forward copies to the Owner Project Manager of any correspondence between Contractor (or any of its employees or designees) and Owner (or any of its employees or designees).

Contractor shall forward copies of meeting minutes to the Owner Project Manager within one business day following any meeting with Owner (or any of its employees or designees).

Contractor shall submit all required documentation; all test results, all quotations, all matters of dispute, and all questions pertaining to this document in writing via the mailing address of the Owner Project Manager. Contractor shall send electronic copy of same to both the Owner Project Manager and the Owner Technical Contact via email.

Contractor shall submit all technical questions to the Owner Technical Contact via email, with copy to Owner Project Manager.

Contractor shall submit all matters of billing to the mailing address of the Owner Billing Contact, with copy to Owner Project Manager.

Contractor shall submit all certified payroll records to the Owner Certified Payroll Records Contact, and notify Owner Project Manager when these are sent.

Contractor shall submit all questions regarding parking and transportation on Owner premises, all requests for permission to park vehicles on owner premises, and all disputes related to parking/ticketing/towing on Owner premises to the Owner Parking and Transportation Contact

2.4) Quality Assurance and Contractor Qualifications:

Contractor must have and maintain the following qualifications:

2.4.1) Contractor’s personnel are trained and experienced in the installation and testing of cabling systems according to all parts of all referenced standards bodies, certification organizations, and laws/codes listed in the “Technical References” section of this document.

2.4.2) Contractor’s personnel are trained and experienced in cable support techniques.

2.4.3) Contractor’s personnel are trained and experienced in fire stopping methods.

2.4.4) Contractor’s on-site personnel must be fully conversant with and capable of the installation of large scale Category 6 / 6A cabling systems for high-speed data and voice, and telecommunications cabling systems to support both analog and digital voice communications.

2.4.5) Contractor’s on-site personnel must be trained and certified in the installation of Category 6 / 6A and equivalent-cabling systems at the level required to provide the cabling system manufacturer extended performance warranty with a minimum of a 20-year term.

2.4.6) Contractor's on-site supervisory personnel have completed training/testing and are certified in BICSI "Installer 2, Copper (INSTC)".

2.4.7) Contractor's on-site personnel must have completed at least three comparable installations of telecommunications cabling systems supporting analog and digital voice communications within the last year.

2.4.8) Contractor's on-site personnel must be fully conversant with and capable of the installation of large scale Single-mode Fiber-Optic (SMF) cabling systems supporting high-speed data and voice, if scope requires SMF installation.

2.4.9) Contractor's on-site personnel must have completed at least three comparable installations of SMF cabling systems supporting 10GBASE-LR Ethernet within the last year.

2.4.10) Contractor's on-site supervisory personnel have completed training/testing, and are certified in BICSI "Installer 2, Optical Fiber (INSTF)".

2.4.11) Contractor's on-site personnel must be trained and certified in installing Corning Single-mode Fiber and equivalent cabling system at the level required to provide the cabling system manufacturer extended performance warranty with a minimum of a 25 year term.

2.4.12) Contractor's on-site personnel must be fully conversant with and capable of the installation of large scale Security cabling systems supporting analog and digital signals.

2.4.13) Contractor's on-site personnel must have completed at least three comparable installations of cabling systems supporting installation of Security cable within the last year.

2.4.14) Contractor's on-site personnel must be trained and certified in installing Security cabling systems supporting analog and digital signals.

2.5) Technical References

The provision and installation of the cable plant is to adhere to the strictest codes, standards, and practices. All products, processes, and standards of work must conform to the current versions of all applicable standards, certification guidelines, and codes as defined by the following organizations and as otherwise cited herein:

American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
Edison Testing Laboratories (ETL)
Building Industry Consulting Service International (BICSI)
Association of Cabling Professionals (ACP)
Electronic Industries Association (EIA)
Federal Communications Commission (FCC)
International Electrotechnical Commission (IEC)
Institute of Electrical and Electronics Engineers (IEEE)
International Standards Organization (ISO)
National Electrical Code (NEC / NFPA 70)
National Electrical Contractors Association (NECA)
National Electrical Manufacturers Association (NEMA)
National Electrical Safety Code (NESC)
National Fire Protection Association (NFPA)
New York State Uniform Fire Prevention and Building Code
Telecommunication Industries Association (TIA)
Underwriters Laboratories (UL)

In the event of a conflict between standards or codes, Contractor shall adhere to the most stringent standard or code.

In the event of a conflict between this Specification and any standard, code, or practice whereby this Specification is the most stringent, Contractor shall adhere to this Specification.

In the event of a conflict between this Specification and any standard, code, or practice whereby this Specification is not the most stringent, Contractor will immediately inform Owner Technical Contact and identify the conflict.

2.6) Submittals and Approvals

Unless otherwise specified, all submittals must be sent by Contractor via email as electronic file in Adobe® PDF format to Owner Project Manager and Owner Technical Contact via email. Submittal emails sent to Owner Technical Contact and Owner Project manager must be less than 10 Megabytes in size. No more than six (6) Adobe® PDF files shall be attached to a single submittal email. No more than one (1) product or one (1) method shall be detailed in each Adobe® PDF file.

Any variance from this Specification or from this Scope of Work (if provided) and the original RFQ/RFP/Project must be explicitly approved in writing by both the Owner Technical Contact and the Owner Project Manager. An approval from one of either the Owner Technical Contact or Owner Project Manager shall not suffice as approval.

Owner reserves the right to deny any request for approval. If an approval request is denied or an approval is not received, then Contractor shall comply with this Specification and Scope of Work.

2.6.1) Materials and Practices

All non-miscellaneous materials Contractor intends to provide and/or install must be submitted by contractor and approved in writing by the Owner Technical Contact prior to Contractor providing and/or installing.

The use of any materials and practices that are specified in this specification do not waive Contractor's requirement for submittal and approval prior to provision and/or installation. If Contractor wishes to use a specific manufacturer and part number specified in this specification, then Contractor must still submit manufacturer's product cut sheet to the Owner Technical Contact and Owner Project Manager for approval of material. Submitted cut sheets shall have specific product part number and specific product options encircled by Contractor to clearly identify the product and all options Contractor intends to provide/install.

If specific manufacturer and part number are unspecified in this specification, or if Contractor wishes to propose an equivalent component or practice to one that is specified, then a Contractor must submit formal request for approval to the Owner Technical Contact and Owner Project Manager for approval, and must include electronic copies of all of the following as applies to material or practice:

2.6.1.1) Performance data
2.6.1.2) Cut sheets
2.6.1.3) Shop drawings
2.6.1.4) All supporting documentation.

Submitted cut sheet shall have specific product part number and specific product options encircled

Proposed alternate component or practice must not invalidate any manufacturer warranty on any installed components, any installed cable plants, or any installed systems.

2.6.2) Change Orders

Requests for Change Orders Proposals may be sent in writing by Owner Project Manager to Contractor at any time following Award and prior to Completion. Request shall describe a proposed Change Order scope in detail and may reference discussions in field.

Contractor shall respond within ten (10) days by sending a Change Order Proposal to Owner Project Manager that shall include a Proposed Change Order Cost Quotation and a Proposed Change Order Schedule Impact Statement.

2.6.2.1) Proposed Change Order Cost Quotation

Contractor shall submit Proposed Change Order Cost Quotation to Owner Project manager which includes detailed line item unit pricing, quantity, and extended pricing for each type of material and labor that would be required to execute the Proposed Change Order.

2.6.2.1.1) Unit Pricing

Unit prices for materials and labor shall be based on calculable values from the first applicable source according to the following ordered list:

2.6.2.1.1.1) Materials and Labor: Contractor's base-bid proposal
2.6.2.1.1.2) Labor: Prevailing wage labor rates

If a required material is not quoted as part of base-bid, then unit price shall be Contractor's gross cost to purchase one unit of that material from supplier at projected quantity, plus 20%

2.6.2.1.2) Quantities

Quantities of materials shall be based on need pertaining to Proposed Change Order and shall not project greater than 10% surplus quantity where such a surplus is typically required for estimation of work. All surplus materials shall be furnished to Owner at end of proposed work, unless otherwise instructed in writing by Owner Project Manager.

Quantities of labor units for a required work or trade shall be based on calculable quantities from Contractor's base-bid proposal.

If a required work or trade is not quoted as part of base-bid, then unit based on the first applicable source of the latest editions of the following ordered list of industry-standard guides for estimating:

2.6.2.1.2.1) National Electrical Contractors Association (NECA), Manual of Labor Units
2.6.2.1.2.2) Mechanical Contractors Association of America (MCAA), Labor Estimating Manual
2.6.2.1.2.3) U.S. Army Corps of Engineers, Modification Impact Evaluation Guide
2.6.2.1.2.4) Walker's Building Estimator's Reference Book

2.6.2.2) Proposed Change Order Schedule Impact Statement

Proposed Change Order Schedule Impact Statement shall summarize the greatest potential impact to Schedule as a result of execution of the proposed Change Order by Contractor, and shall propose a new Schedule including an adjustment of all Project Milestones as defined herein, that would be adopted should Owner Project Manager approve of Change Order in writing.

2.6.2.3) Change Order Approval

Approval of Change Order Proposal may take place at sole option of Owner, and shall be sent in writing by Owner Project Manager at any time following Award and prior to Completion.

A Purchase Order shall accompany any approval of Proposed Change Order. Contractor shall not act on approval of Change Order Proposal unless Purchase Order is received.

2.6.3) Field-Directed Changes

Field-Directed Changes shall be defined as minor changes to the Scope of Work (if provided) and the original RFQ/RFP/Project that would result in zero additional cost to Owner or would result in a credit to Owner, and also would have zero impact on Schedule or would result in earlier completion of Schedule, as agreed by both Owner Project Manager and Contractor.

Requests for Field-Directed Change may be sent in writing by Owner Project Manager to Contractor at any time following Award and prior to Completion. Request shall describe Field-Directed Change scope in detail and may reference discussions in field.

Contractor shall respond to Owner Project Manager within two (2) days with a Field-Directed Change Response, which shall either:

2.6.3.1) Confirm that Requested Field-Directed Change is properly classified, and that Field-directed change is agreed by all parties to result in:

2.6.3.1.1) zero cost and schedule impact to Owner, or else

2.6.3.1.2) provide details of credit amount and/or earlier completion of schedule, including a Schedule Impact Statement that demonstrates earlier completion.

2.6.3.2) Dispute that the Requested Field-Directed Change is properly classified as such, and that there are cost and/or schedule implications of executing such a change.

2.6.4) Schedule Impact Statement.

Field-Directed Changes shall not be made by Contractor unless Owner Project Manager directs Contractor in writing to perform a Field-Directed Change. Direction shall be accompanied by detailed description of the Field-Directed change. If Contractor agrees that said Field-Directed Change shall be at zero additional cost or result in a credit to Owner, then Contractor shall respond within

2.6.5) Construction Change Directives

Construction Change Directives shall not be permitted, nor any change that is associated with additional cost in advance of a Purchase Order being issued.

2.7) Notification of Errors, Inquires and Interpretation

It shall be the responsibility of the Contractor to notify owner of any errors in this Specification and to make recommendations to Owner Project Manager and Owner Technical Contact in writing for any additional requirements deemed necessary. If Owner finds the errors significant or a change in the requirements necessary, then Owner will notify Contractor in writing of the change in this Specification. No deviations from this Specification shall be made without approval from Owner Technical Contact and Owner Project Manager.

2.8) Hazards

Contractor must immediately notify Owner Project Manager by telephone, by email, and in writing of any Hazards to any person(s), any Hazards to animal(s), any Hazards to the environment, and any Hazards to asset(s), when a Hazard is not managed or manageable by contractor as part of standard means, standard methods, and standard safety procedures. Contractor shall immediately notify Owner Project Manager in writing of any such hazard that exist in this Specification, in the proposed Scope of Work (if provided) and the original RFQ/RFP/Project, in any proposed Change Order, or in any Field-Directed Change. Contractor shall avoid the Hazard until written or email reply is received from Owner Project Manager instructing Contractor regarding the identified Hazard.

2.9) Parking and Operation of Vehicles on Campus

Contractor will operate vehicles responsibly under campus rules and regulations and will not park vehicles in unauthorized areas. Illegally parked vehicles will be towed at vehicle owner's expense.

It will be the responsibility of the Contractor to contact the Parking and Transportation Office at (914)251-6177 to arrange for temporary visitor parking permits.

Contractor shall not park or operate motor vehicles on grass or other non-paved surfaces unless explicit written permission is granted by the Parking and Transportation Office.

2.10) Proper Contractor Identification

Employees of Contractor while on site shall wear a uniform shirt. Employees of Contractor shall carry identification badge or identification cards and shall be instructed to submit same to scrutiny upon request by campus personnel.

2.11) Subcontracts

All requirements that apply to Contractor or Employees of Contractor shall also apply to any Subcontractor that Contractor uses to execute the requirements of this Specification. It is Contractor's sole responsibility to ensure that all work is executed according to this Specification, whether performed directly by Contractor, or by Contractor's Subcontractor. Upon request, Contractor must provide a list of all proposed subcontractors along with detailed information regarding their financial and technical abilities.

2.12) Certified payroll records must be submitted by the Contractor to Owner Certified Payroll Records Contact.

Part 3: Materials

3) Materials

The following requirements apply to all materials provided, installed, and/or used by Contractor.

3.1) General

Contractor shall supply all materials, unless otherwise noted.

All materials, equipment, tools and methods shall be of standard manufacture, shall have undergone thorough tests, shall have been proven in actual use, and shall not be custom-designed for this project.

Communications Rooms and Spaces (herein referred to as “Communications Room”, “CR”, “Closet”, or plural derivatives of same) shall refer to any central location where Data, Telecommunications, Security, and/or Audio/Video cables are collectively run to, including interior spaces containing Open Equipment Racks, Equipment Cabinets, Splice Enclosures, and furniture- or wall-mounted Patch Panels.

3.2) Category 6 and Category 6A

All Category 6 / 6A cable, jacks, plugs, patch panels, and patch cables must be rated to meet or exceed performance specifications for Category 6 / 6A components as defined in ANSI/TIA-568-C and ISO/IEC 11801 performance requirements for Category 6 / 6A, and shall be ETL verified to Category 6 / 6A, and must be certified by manufacturer at a frequency range of 1Mhz through 600Mhz.

Installed Category 6 / 6A system and components shall support 100BASE-TX Ethernet as per IEEE 802.3u, 1000BASE-T Ethernet as per IEEE 802.3ab, 1000BASE-TX Ethernet as per TIA-854, 2.5GBASE-T and 5GBASE-T Ethernet as per IEEE 802.3bz, 10GBASE-T Ethernet as per IEEE 802.3an, Voice-Over-IP telephony (VOIP) as per TIA-TR41, digital telephony as per TIA-810-B, analog telephony as per TIA 470-C, Power over Ethernet as per IEEE 802.3af, IEEE802.3at, and IEEE802.3bt standards.

Installed materials must form an integrated system and must integrate with existing network. Components and interconnections must match for optimum future performance. All components must be produced by the same manufacturer or be warranted by an exclusive partnership.

3.2.1) Warranty on Installed Category 6 / 6A Cabling System

Manufacturer warranty on installed Category 6 / 6A Cabling System shall be extended to Owner for a period of not less than 20 years and shall provide immediate remediation or replacement of installed cabling system by manufacturer, if cabling system does not meet the requirements of this Specification, including but not limited to testing parameters, at any point during the warrantee period.

Contractor shall submit manufacturer warranty information on proposed Category 6 / 6A cabling system, along with copies of manufacturer certification credentials for Contractor, with Contractor’s bid.

3.2.2) Category 6 / 6A Cable

Category 6 / 6A Cable shall be 24 AWG, 4-pair, with a blue jacket. Plenum-rated cable shall be used where cabling runs through an air-handling space as per NEC/NFPA70. Individual conductors shall be 100% FEP insulated. Cable jacketing shall be lead-free.

Cable shall be independently verified for flammability compliance to NEC article 800 and NFPA 70; CMR ANSI/UL 1666.

Cable shall be dispensed from a plastic reel in a cardboard box packaged by manufacturer.

3.2.2.1) Category 6 Cable

Outer cable jacket diameter shall not exceed 0.25 inches.

Unless otherwise noted, Category 6 cable shall be Unshielded Twisted Pair (UTP).

3.2.2.2) Category 6A Cable

Outer cable jacket diameter shall not exceed 0.285 inches.

Unless otherwise noted, Category 6A cable shall be Foil-shielded Unscreened Twisted Pair (F/UTP).

3.2.2.3) Outside Service Plant Cable (“Category 6A OSP Cable”)

Category 6A OSP Cable shall be 4-pair Foil-shielded Unscreened Twisted Pair (F/UTP).cable. Category 6A OSP Cable shall consist of a core of four balanced twisted pairs surrounded by water-blocking gel, surrounded by a dielectric inner jacketed core, covered by dry water block material , surrounded by aluminum tape shield, surrounded by a sunlight and abrasion resistant black polyethylene outer jacket. OSP Category 6A Cable shall be suitable for direct-buried, underground conduit, and lashed aerial applications.

OSP Category 6A Cable must meet or exceed ANSI/TIA-568-C and ISO/IEC 11801 Class E_A performance requirements for Category 6A, and shall be ETL verified to Category 6A.

3.2.3) Category 6 / 6A Terminations

3.2.3.1) Modular Jacks for Category 6 / 6A Permanent Links

Modular jacks used in Data/Telecommunications Outlets and Patch Panels shall be un-keyed, RJ-45 (8-position – 4-pair) and shall meet EIA/TIA-568 requirements for Category 6 / 6A component performance.

Modular jacks shall fit in a .790" X .582" opening. Modular jacks shall be terminated using PDS 110-style insulation displacement pc board connectors, color-coded for both T568A and T568B wiring. The 110-style connectors shall be capable of terminating 22-24 AWG solid wire. The 110 Contacts shall be paired (with additional space between pairs) to improve crosstalk performance. Each jack shall be provided with a bend-limiting strain relief. The strain relief shall provide a “silo” to limit the bend radius at the point of termination.

Each jack shall have an integrate dust cover or separate approved dust covers must be provided.

Modular jacks shall be colored orange

3.2.3.2) Modular Plugs for Category 6 / 6A Single-Connector Modified Permanent Links

Where Single-Connector Modified Permanent Links are called for, station/device end shall be terminated in 8-Position 8-Conductor “RJ45” shielded modular plug with dual-pronged blades designed to be crimped onto and create secure contact with the specified/approved solid-conductor cable. Modular plugs for Category 6 / 6A Outside Service Plant (OSP) Cable shall be designed to operate as part of an installed Category 6A cabling system.

3.2.3.3) Modular Plugs for Category 6A Outside Service Plant (OSP) Cable

Outside Service Plant Data Cable shall terminate on both ends in 8-Position 8-Conductor “RJ45” shielded modular plugs with dual-pronged blades designed to be crimped onto and create secure contact with the specified/approved solid-conductor cable. Modular plugs for Category 6 / 6A Outside Service Plant (OSP) Cable shall be designed operate as part of an installed Category 6A cabling system.

3.2.4) Category 6 / 6A Station/Device Outlets

3.2.4.1) Standard Faceplates

Standard faceplates shall be non-metallic, constructed of a single molded piece, and shall be of angled type such that the front of installed modular jacks face downward 45-degrees when faceplate is installed with faceplate longest dimension up/down.

Standard faceplates shall be single-gang, and shall accept four modular jacks (“four-port”). Blanks shall be installed in any unused port/space on the faceplate.

Faceplates and blanks shall be colored ivory, unless otherwise specified.

Faceplates shall have insert-type labels capable of accepting and retaining printed non-adhesive paperboard labels of minimum 10-point thickness. Paperboard labels must be of suitable width and height to meet labeling requirements, as defined herein, with label text positioned centered on and parallel to each port to which label text pertains.

A transparent snap-in flexible plastic label cover shall retain the label, and shall have a small hole at side to permit label cover removal.

3.2.4.2) Biscuit Surface-Mount Box (“Biscuit”)

Biscuit shall be constructed of high-impact flame-retardant plenum-rated thermoplastic and shall be colored white. Biscuits are acceptable only where specified in Scope section for use in outlets above ACT ceilings that are air-handling spaces.

Biscuit shall provide two Category 6A modular jack ports.

Biscuit shall have insert-type label capable of accepting and retaining printed non-adhesive paperboard labels of minimum 10-point thickness. Paperboard labels must be of suitable width and height to meet labeling requirements, as defined herein, with label text positioned centered on and parallel to each port to which label text pertains.

3.2.5) Category 6 / 6A Patch Panels

Category 6 / 6A Patch panels shall be angled, shall be 1.75” high, shall occupy one 19” rack unit (1RU), and shall provide twenty-four (24) individually-replaceable Category 6 / 6A Modular Jacks for termination of cabling. Patch panels shall be colored black.

The front of each patch panel shall be capable of accepting and retaining printed non-adhesive paperboard labels of minimum 10-point thickness. Paperboard labels must be of suitable width and height to meet labeling requirements, as defined herein, with label text positioned centered on and parallel to each port to which label text pertains.

A transparent snap-in flexible plastic label cover shall retain the label, and shall have a small hole at side to permit label cover removal.

3.2.6) Horizontal 19-inch Lacing Bar for Patch Panel Rear Cable Strain Relief

Each installed rack-mounted Category 6 / 6A Patch Panel shall have, projecting to rear of rack from rear of patch panel, a 6-inch deep x 19-inch wide x 0.7-inch high L-shaped horizontal lacing bar installed on rack.

Horizontal 19-inch Lacing Bar for Patch Panel Rear Cable Strain Relief shall have lacing slots of 0.150-inch x 0,9-inch, suitable for attaching hook-and-loop fasteners to secure and reduce strain on solid-conductor cables entering patch panel.

Horizontal 19-inch Lacing Bar for Patch Panel Rear Cable Strain Relief shall be constructed of 18-gauge cold rolled steel, and shall have powder-coat black finish.

Horizontal 19-inch Lacing Bar for Patch Panel Rear Cable Strain Relief shall attached to 19-inch equipment rails in two places (one left rail, one right rail) via equipment mounting screws at rear of front-face of rack.

3.2.7) Category 6A Lightning Protectors (for use with OSP Category 6A Cable)

Category 6A Lightning Protectors shall be designed and laboratory-tested for use with 10/100/1000/10000 Base-T Ethernet networks in indoor and outdoor environments between -40 degrees Fahrenheit and +158 degrees Fahrenheit. Category 6A Lightning Protectors shall meet or exceed the UL497B surge protection requirements for 10/100/1000/10000 Base-T Ethernet lines.

Category 6A Lightning Protectors shall present two Category 6A 8P8C shielded modular jacks, with shield isolated from the safety ground. Category 6A Lightning Protectors modular jacks shall accept 8P8C shielded modular plugs for inline installation in a single permanent link. Category 6A Lightning Protectors shall be compatible with 802.3bt Power-over-Ethernet (PoE) devices, and shall support PoE modes A and B as per 802.3bt.

Category 6A Lightning Protectors clamping voltage shall be no more than 15 Volts for wire-to-wire, 90 Volts for wire-to-ground, and 90 Volts for shield-to-ground.

Outdoor Category 6A Lightning Protectors shall have a weatherproof ABS enclosure with gasketed cover and concealed mounting holes. Ground clamp provided outside the Category 6 Lightning Protector enclosure shall accept a 10-gauge ground cable.

Indoor non-rack mounted Single Channel Category 6A Lightning Protectors shall be DTK-MRJPOES manufactured by DITEK or approved equal.

Indoor non-rack mounted Eight-Channel Category 6A Lightning Protectors shall be DTK-WM8NETS manufactured by DITEK or approved equal.

Outdoor non-rack mounted Single Channel Category 6A Lightning Protectors shall be DTK-MRJPOEX manufactured by DITEK or approved equal.

3.2.7.1) Rack-mount Category 6A Lightning Protectors (for use in interior spaces, only)

Rack-mount Category 6A Lightning Protectors are only to be used where specified in interior spaces or whether-protected exterior cabinets.

Rack-mount Category 6A Lightning Protectors shall provide lightning and surge protection for up to 24 POE 802.3bt lines, with low line to line and line to ground capacitance to minimize distortion of high-speed signals.

Rack-mount Category 6A Lightning Protectors shall provide protection for both common and differential mode surges.

Rack-mount Category 6A Lightning Protectors shall be compatible with 802.3bt Power-over-Ethernet (PoE) devices. It shall support both PoE mode A and B for power.

Rack-mount Category 6A Lightning Protectors shall provide lightning protection for twelve (24) Category 6A cables via 48 shielded (24 in / 24 out) RJ-45 jacks.

Rack-mount Category 6A Lightning Protectors Category 6A Lightning Protectors shall be DTK-RM24NETS manufactured by DITEK, or approved equal.

3.2.8) Category 6 / 6A Patch Cables

Patch Cables shall be gray in color, unless otherwise noted.

Patch cables shall be constructed using 50-micron gold-plated RJ45 (8-position 8-conductor) modular plugs.

Patch Cable shall be constructed using 24 gauge stranded cable.

Patch Cable assemblies shall utilize colored cable and "snag-less" slim cable boots that are clear and integrated with the RJ45 connector.

Each Patch Cable assembly shall be individually certified to Category 6 / 6A performance specification according to TIA-568-C and ISO/IEC 11801, and shall be backed by a 20-year component warranty provided by the manufacturer to Owner.

3.3) Category 3 Telecommunications Feeder/Backbone

All Telecommunications Feeder Cables, Telecommunications Patch Panels, and Connection Blocks shall be rated Category 3, shall comply with or exceed specifications as defined in TIA-568-B, and must be certified by manufacturer at a frequency range of 1Mhz through 16Mhz.

Installed Category 3 Telecommunications Feeder components shall support analog telephony as per TIA 470-C and digital telephony as per TIA-810-B.

Installed materials shall form an integrated system and shall integrate with existing telecommunications network. Components and interconnections must match for optimum future performance. All components shall be produced by the same manufacturer or be warranted by an exclusive partnership.

3.3.1) Telecommunications Feeder Cable

Telecommunications Feeder Cable shall be type ARMM and shall consist of 100-pair of #24 AWG solid conductor cables wrapped individually in expanded polyethylene insulation. Telecommunications Feeder Cable shall be wrapped in ALVYN sheath-corrugated polymer-coated aluminum shield adhering to a flame-retardant grey PVC jacket. Cable shall be UL/NEC rated. Cable jacketing shall be lead-free.

Color-coding of insulation on individual pairs of conductors shall conform to TIA-568-B and PIC standard color codes for telecommunications backbone cable.

Telecommunications Feeder Cable shall be ETL verified to Category 3 transmissions requirements as defined in the TIA-568-A standard.

Typical electrical characteristics shall be as follows at 20-degree Celsius:

3.3.1.1) Max DC Resistance of 27.3 Ohms/kft
3.3.1.2) Insulation Resistance of 5000 Megohms-kft
3.3.1.3) Mutual Capacitance of 83 nF/mile at 1 kHz(nom)
3.3.1.4) Nominal Attenuation of 6.9 dB/kft at 772 kHz
3.3.1.5) Characteristics Impedance of 100 Ohms at 1 MHz(nom)

3.3.2) Telecommunications Feeder Patch Panels

Telecommunications Feeder Patch Panels shall be 1.75 inches high, shall occupy one 19” rack units (4RU), and provide 24 RJ45 (8-position – 8-pair) modular jack ports on front of panel, with PDS 110-style insulation displacement connectors on rear of panel that accommodate between 26 and 23 gauge wire. Modular jack ports on front of panel may be configured in groups of between four and six ports.

Telecommunications Feeder Patch Panels shall be fully loaded with RJ-45 jacked, colored black.

Telecommunications Feeder Patch Panel Ports shall be clearly factory-labeled on front of patch panel with consecutive numbers between 1 (at leftmost port) and 24 (at rightmost port).

Telecommunications Feeder Patch Panels shall have integrated lacing lattice at rear of panel to manage wire pairs and permit re-punching IDC for each pair in-place.

Telecommunications Feeder Patch Panels shall be colored black.

Telecommunications Feeder Patch Panels shall be CommScope “Telephone Patch Panel, Category 3, RJ45, 19 in, 25-port, black” part number 1711213-2, or approved equal.

3.3.3) Telecommunications Connection Block

Telecommunications Connection Blocks for distribution shall be type 66M split 50-pair insulation displacement punch-down blocks. Connection blocks shall provide 6 pins per row and shall be designed for termination of 22-26 AWG solid or 20-26 AWG stranded conductors. Blocks shall be molded of flame-retardant thermoplastic with quick-connect clips.

3.3.4) Telecommunications Gas Protector Panel

Gas Protector Panels shall be CIRCA Telecom (serial #205226, CIRCA 1900A1-100) gas protector panel, or approved equal.

3.3.5) Telecommunications Patch Cables

Telecommunications Patch Cables shall be Category 6 Patch Cables, as defined herein.

Category 6 Patch Cables shall be colored Violet.

3.4) Fiber-Optics

All Fiber-Optic network cable, jacks, patch panels, and patch cables shall be designed for Single-mode optical transmission.

Installed Fiber-Optic network shall support standards 1000BASE-LX, 10GBASE-LR, 40GBASE-LR4, and 100GBASE-LR4.

Installed materials must form an integrated system and must integrate with existing Fiber-Optic network. Components and interconnections must match for optimum future performance. All components must be produced by the same manufacturer or be warranted by an exclusive partnership.

All components of the Fiber-Optic cable plant shall be produced by Corning Cable Systems, or approved equal.

3.4.1) Warranty on Installed Cabling system

Manufacturer warranty on installed Fiber-Optic Cabling System shall be extended to Owner **for a period of not less than 25 years** and shall provide immediate remediation or replacement of installed cabling system by manufacturer, if cabling system does not meet the requirements of this Specification, including but not limited to testing parameters, at any point during the warrantee period.

Contractor shall submit manufacturer warranty information on proposed Fiber-Optic Cabling System, along with copies of manufacturer certification credentials for Contractor and Contractor’s employees, with Contractor’s bid.

3.4.2) Fiber-Optic Cable

All Fiber-Optic cable shall contain Single-mode fibers surrounded by a lead-free flame-retardant outer jacket. Fiber-Optic cable shall provide an 8-9 micron core transmission medium with 125 micron cladding, and introduce no more than .4 dB/km of attenuation (nominal).Color of Fiber-Optic strand cladding and buffer tubes shall conform to TIA-598-C.

Outer jacket of all Fiber-Optic cable, including armored and non-armored Fiber-Optic cable, shall be colored yellow.

All Fiber-Optic cable shall be gel-free.

All Fiber-Optic cable shall be pre-terminated at factory in Multi-Fiber Push-On (MPO) Connectors. Pulling eyes shall be attached by faculty at both ends of cable.

3.4.2.1) Intra-building Single-mode Fiber-Optic Cable

All intra-building Single-mode Fiber-Optic cable shall contain 24-strands strands of 900 µm tight-buffered fibers. Fibers shall be surrounded by dielectric strength members and a lead-free flame-retardant outer jacket. Outer jacket of all intra-building Single-mode Fiber-Optic cable shall be colored Yellow.

Indoor Single-mode Fiber-Optic cable shall be:

3.4.2.1.1) Plenum-rated Armored Single-mode Fiber-Optic cable -- Corning MIC Interlocking Armored Plenum Cable, Corning part number 024E88-33131-A3
3.4.2.1.2) Riser-rated Armored Single-mode Fiber-Optic cable -- Corning MIC Interlocking Armored Riser Cable, Corning part number 024E81-33131-A1
3.4.2.1.3) Plenum-rated (non-armored) Single-mode Fiber-Optic cable – Corning MIC Plenum Cable, Corning part number 024E88-33131-29
3.4.2.1.4) Riser-rated (non-armored) Single-mode Fiber-Optic cable – Corning MIC Riser Cable, Corning part number 024E81-33131-24

3.4.2.2) Inter-building Single-mode Fiber-Optic Cable

Unless otherwise noted, all inter-building Single-mode Fiber-Optic cable shall contain 24-strands strands of fiber in two 3.0 mm buffer tubes. Buffer tubes shall be surrounded by water-swellable tape, dielectric strength members, and a lead-free UV-resistant flame-retardant outer jacket.

Inter-building Single-mode Fiber-Optic cable shall be as:

3.4.2.2.1) Plenum-rated Armored inter-building Single-mode Fiber-Optic cable – Corning FREEDM Plenum Loose Tube Cable with Interlocking Armor, part number 024E8P-31131-A3
3.4.2.2.2) Riser-rated Armored inter-building Single-mode Fiber-Optic cable – Corning FREEDM Loose Tube Cable with Interlocking Armor, part number 024EWF-14101-AA1
3.4.2.2.3) Riser-rated (non-armored) inter-building Single-mode Fiber-Optic cable – Corning FREEDM Loose Tube Indoor/Outdoor Cable, part number 024EWF-T4103A20
3.4.2.2.4) Plenum-rated (non-armored) inter-building Single-mode Fiber-Optic cable – Corning FREEDM Loose Tube Indoor/Outdoor Cable, part number

3.4.3) Fiber-Optic Grounding

Armored cable shall be grounded.

Armored cable grounding assembly shall be Corning part number FDC-CABLE-GRND (Armored Cable Grounding Kit)

3.4.4) Fiber-Optic Connectors

Fiber-Optic connectors shall have Ultra Physical Contact (UPC) polish/finish. Fiber-Optic connector ferrules shall be constructed of ceramic.

Fiber-Optic connectors shall present no more than 0.2 dB of typical insertion loss and 0.5 dB of maximum insertion loss, as measured by manufacturer at wavelengths of 1310 nm and 1550 nm, FOTP-171.

Fiber-Optic connectors on patch panels shall be compliant with TIA/EIA 604-2 (“SC”) connectors.

3.4.5) Fiber-Optic Patch Panel

Fiber-Optic patch panels shall meet requirements of TIA-568-C and TIA606, suitable for loose tube, tight-buffered, and optical fiber ribbon cables. Fiber-Optic patch panels shall be rack-mountable in standard EIA 19” (48 cm) equipment racks (1.75-in EIA hole spacing). Fiber-Optic patch panels shall be capable of being rack-mounted with either a 4.5” (11.4 cm) frontal projection to allow entry of Fiber-Optic patch cable sot front compartment, or flush to rack rails (0” projection). Fiber-Optic patch panels shall offer multiple locations for jumper egress, and a slide-out drawer for easy connector access.

Fiber-Optic patch panel shall provide integrated bend radius limiting, cable anchor, and strand fan-out in rear connector housing. Protection for patch cable connectors, D-rings for patch cable routing, and side egress for patch cables shall be provided on front of housing.

Fiber-Optic patch panels installed in building Communications Rooms shall consume two rack spaces (3.5-in high), shall have up to 64 fiber total capacity (SC or ST connectors).

Fiber-Optic Patch Panels shall be manufactured by Corning Cable Systems and shall be of model “CCH”.

3.4.6) Fiber-Optic Cable Management

Fiber-Optic cable management shall be one rack unit (1.75-in) high.

Fiber-Optic cable management shall be Corning Cable Systems part number CJP-01U.

3.4.7) Fiber-Optic Patch Cables (Jumpers)

Fiber-Optic patch cable assemblies shall be Single-mode, 2-fiber jumper cable, and shall provide one duplex SC connector to one duplex un-keyed LC connector.

Fiber-Optic patch cable assembly cable shall be engineered to present lowest attenuation at bends up to and including a minimal bend radius of 30mm (1.2 inches).

Fiber-Optic patch cable assembly cable outer jacket shall be yellow in color, and shall allow separation of individual fibers and duplex connectors in field to allow conversion to two separate 1-fiber jumpers. Each separable 1-fiber cable shall be minimum of 2mm in diameter.

SC and LC connectors shall allow coupling and decoupling in duplex or single connector configuration.

LC connector duplex clip shall allow pairs to be swapped in the field such that cable may be field-configurable as either a straight-through or crossover cable.

Connector ferrules shall be constructed of ceramic. Connectors shall be factory-installed, shall have Ultra Physical Contact (UPC) polish/finish, and shall present no more than 0.15 dB of typical insertion loss and 0.4 dB of maximum insertion loss, as measured by manufacturer at wavelengths of 1310 nm and 1550 nm.

Fiber-Optic patch cable assemblies shall be factory-built and factory-tested to produce no more than 1 dB attenuation at wavelengths of 1310 nm and 1550 nm.

Fiber-Optic patch cable assemblies shall be Corning Cable Systems part number 0472-02-R5120-002-M.

3.4.8) Fiber-Optic Splice Enclosures

Fiber-Optic Splice Enclosures shall be Corning Cable Systems part number SCF-6C28-01-144 or approved equal.

Fiber splice trays shall by type 2S trays, and shall permit for 24 RTF fusion splices.

Fiber-Optic splice trays shall be Corning Cable Systems part number M67-092.

3.5) Audio/Video

3.5.1) Audio/Video systems (“Audio/Video”) may include but not be limited to audio systems, video systems, and control systems installed in classrooms, conference rooms, and performance areas.

3.5.2) All Category 6 / 6A cable and components used to interconnect Audio/Video components shall meet all requirements for Category 6 / 6A cable and components, defined herein.

3.5.3) All Fiber-Optic cable and components used to interconnect Audio/Video components shall meet all requirements for Fiber-Optic cable and components, defined herein.

3.6) Security

3.6.1) Security systems (“Security”) may include but not be limited to security alarm systems (motion, door contact, panic button) systems, video surveillance systems, electronic door access control systems, and/or audio security systems (e.g. intercom, glass-break sensor, and/or shot detection) systems.

3.6.2) All Category 6 / 6A cable and components used to interconnect Security components shall meet all requirements for Category 6 / 6A cable and components, defined herein.

3.6.3) All Fiber-Optic cable and components used to interconnect Security/Surveillance components shall meet all requirements for Fiber-Optic cable and components, defined herein.

3.6.4) Other Security Cable

Except where noted, all cabling and components for security for Security shall be Category 6 data

3.6.4.1) Signal Cable for Security

3.6.4.2) Power Cable for Security

Power cable used for surveillance network shall be two conductor 18 AWG twisted pair, with stranded bare copper conductors, encased in a black jacket.

3.7) Pathways and Spaces

3.7.1) Termination Devices

3.7.1.1) Metallic Recessed-Mount Device Boxes

Metallic Recessed-Mount Device Boxes shall be constructed of 0.0625-inch-thick galvanized steel, and shall be “four-square” extra-deep type, with minimum dimensions of 3.5-inch deep x 4-inch wide x 4-inch high.

Metallic Recessed-Mount Device Boxes shall have eight (8) 3/4-inch side Knockouts.

Metallic Recessed-Mount Device boxes above symsum-board ceiling shall be supported by am 8-inch max depth adjustable height box hanger. Box hanger shall be Garvin BHT481A, or approved equal.

3.7.1.2) Metallic Surface-Mount Device Boxes

Metallic Surface-Mount Device Boxes shall be constructed of 0.0625-inch-thick galvanized steel, and shall be “four-square” extra-deep type, with minimum dimensions of 3.5-inch deep x 4-inch wide x 4-inch high.

Metallic Surface-Mount Device Boxes shall have eight (8) 3/4-inch side Knockouts.

3.7.1.3) Non-Metallic Surface-Mount Device Boxes

Non-Metallic Surface-mount device boxes shall be constructed entirely of PVC, and shall be ivory in color.

NM surface-mount device boxes shall be 2 7/8” inches deep, and shall be single-gang, 3 inches wide by, 4 7/8” high.

NM surface mount boxes shall be of same manufacturer and compatible with approved raceway, and shall have knockouts/twist-outs for selected raceway model.

NM surface-mount device boxes shall be designed to be secured to wall mechanically using screws or bolts.

3.7.2) Low Voltage Faceplate Mounting Brackets

Low-Voltage Faceplate Mounting Brackets shall be constructed of minimum 0.0303 inch thick galvanized steel, and shall be mounted to wall using a minimum of two fold-back tabs as well as drywall screws.

Unless otherwise noted, Low-Voltage Faceplate Mounting Brackets shall be single-gang.

Unless otherwise noted, Low-Voltage Faceplate Mounting Brackets shall be used for retrofit applications, only.

Low-Voltage Faceplate Mounting Brackets must allow faceplate to be mounted flush to wall, with no greater than a 1/16” gap between faceplate and wall.

3.7.3) Floor Boxes (In-Floor Device Box)

In-floor device boxes shall be constructed of galvanized steel, and shall be installed with parts to permit concrete pour around box. Box

In-floor device box shall have mechanically-fastened self-sealing flip-open covers installed flush with floor that prevent water and dust ingress when covers are closed. Cover shall be able to be secured by turning integrated screw when not in use.

Unless otherwise noted, in-floor device boxes shall offer two divided compartments per NEC requirements permitting both low-voltage communications cabling and 120-Volt electrical power to be terminated in the same device box.

Floor box shall permit installation of at least two (2) standard single-gang faceplates for communications, and at least two (2) single-gang faceplates for electrical power. Single-gang faceplates when installed must face up at no less than 45 degree angle. At least three inches of space must be provide between center of single-gang faceplate cover to permit patch cables and power cords to be connected.

Standard Category 6 / 6A faceplates must be able to be used in singe-gang slots, with insert labels visible while cover is on.

3.7.4) Poke-Throughs

Poke-throughs shall fit into nominal 4” cored hole, and shall be fire-rated for four hours when installed in compatible unprotected reinforced concrete floors or fire-rated for three hours when installed in compatible floors employing steel floor units with concrete top floors. An adjustable fire barrier shall be integral to the poke-through that may accommodate floors between 2 ¼ inches to 7 inches in thickness. Poke-throughs shall be suitable for new or retrofit installations, shall be suitable for use in air handling spaces, and shall be appropriate for installation on carpeted or tiled floors.

3.7.4.1) Recessed Poke-throughs shall provide minimum four (4) Category 6 / 6A modular jacks, and minimum two (2) NEMA 5-20R electrical power receptacles fed by two separate 20 Amp 125V power circuits.

3.7.4.2) Furniture Feed Poke-throughs shall provide a minimum 1-1/2” opening for low voltage Category 6 / 6A cable conduits, and minimum 3/4” opening for electrical power cable conduits. Both low voltage and power openings shall allow watertight connection using standard Liquid-tight Flexible Metal Conduit (LFMC) adapters, and shall be furnished with threaded/gasketed blank plugs of same finish as cover that prevent scrub water infiltration and provide a flush finish of plate should furniture feed conduit be disconnected in the future.

Poke-through cover shall be gasketed to prevent scrub water infiltration around perimeter of poke through, and shall permit replacement of gasketed cover with a furniture feed cover

Poke-throughs shall provide flip-up gasketed covers over each data/communications and power receptacle, to exclude scrub-water and dirt/debris when closed. Poke-through receptacles shall be positioned face-up atop a flange that shall raise the receptacles a minimum of 0.5 inches in height, further discouraging scrub-water infiltration even when covers are opened.

Poke-throughs shall exceed UL514A and UL514C testing standards, and UL scrub water exclusion requirements.

3.7.5) Ladder Cable Tray

All cable trays installed in Communications Rooms will be ladder-style cable tray. Unless otherwise noted, Ladder Cable Tray shall be 18 inches wide, and powder-coat painted black.

Ladder Cable Tray shall have stringers and cross members that are 1.5 inches wide by 0.375 inches high made from tubular steel with 0.065 wall thickness. Cross members shall be welded to stringer 4-1/2 inches from end of a single tray section, and thereafter at 9 inch intervals in that section. When properly installed, stringers will be positioned under cross members, creating a flat load area on top of Ladder Cable Tray.

Maximum load shall be at least 132 pounds per foot when manufacturer-approved supports for Ladder Cable Tray are installed at 5-foot intervals.

Ladder Cable Tray shall be installed according to manufacturer specification, using proper radius fittings and fasteners prescribed by manufacturer. Ladder Cable Tray shall be grounded per NEC and manufacturer standards and bonded to the equipment rack in Communications Rooms.

Ladder Cable Tray shall be sized to contain cables as specified in Scope of Work (if provided) and the original RFQ/RFP/Project, and shall account for 10% spare capacity while not exceeding 40% fill/capacity ratio as per TIA.

Ladder Cable Tray shall be “Cable Runway” manufactured by Chatsworth Products, or approved equal.

3.7.6) Basket Cable Tray

Unless otherwise noted, all intra-building cable trays will be 8”-wide welded wire mesh Basket Cable Tray with a 2” usable load depth. Finish of Basket Cable Tray shall be pre-galvanized zinc finish, applied to steel wire prior to fabrication, and meeting the minimum properties of ASTM A 641.

Basket Cable Tray shall be made of high strength steel wires and formed into a standard 2 inch by 4 inch wire mesh pattern with intersecting wires welded together. All mesh sections must have at least one bottom longitudinal wire along entire length of straight section, which shall measure nominally ten (10) feet in length.

Basket Cable Tray shall have T-weld on top rail in order to avoid sharp surfaces or protrusions on tray surface. Wire Diameter on all mesh sections of Basket Cable Tray must be a minimum of 0.196 inch.

Basket Cable Tray manufacturer must have a demonstrated history of production and distribution of product offering for a minimum period of 3 years in the US.

Basket Cable Tray shall be installed as per manufacturer’s specification. All fittings shall be field-formed, from straight sections, in accordance with manufacturer’s instructions.

Basket Cable Tray shall be classified by UL as an Equipment Ground Conductor (ECG) when spliced as recommended. All splicing assemblies shall likewise be UL approved as ECG.

Basket Cable Tray shall be sized to contain cables as specified in Scope of Work (if provided) and the original RFQ/RFP/Project, and shall account for 10% spare capacity while not exceeding 40% fill/capacity ratio as per TIA.

Basket Cable Tray shall be “Flextray” manufactured by Cooper B-Line, or approved equal.

3.7.7) J-Hooks

J-Hooks shall provide wide base design and smooth beveled edges to provide a three-inch (3”) bending radius for current and future high-performance data cables, and shall comply with TIA standards for Cat 6A, and Cat 7 cable installations.

J-Hooks, when mounted, shall swivel to support various directional runs of cables.

J-Hooks shall have wire retainer providing 360 degree containment for installed cables.

Magnetic or hammer-on mounting clips are not acceptable for use in mounting J-Hooks.

J-Hooks shall be UL listed for use in environmental air handling spaces per 2008 NEC code requirements 300-22(c).

J-Hooks shall be: “Cat HP J-Hook” by Erico/CADDY; or “HPH J-Hooks” by Platinum Tools; or approved equal.

3.7.8) Loop/Strap Cable Hangers

Loop/Strap Cable Hangers (“Hangers”) shall be constructed of flexible non-metallic material where they contact installed cable, and shall provide sturdy support of Category 6 and Category 6A cable without sagging, bending, or damaging the cable. Loop/Strap Hangers shall be mountable in a variety of ways and be rotatable to any angle.

Loop/Strap Hangers shall be UL listed for use in environmental air handling spaces per 2008 NEC code requirements 300-22(c).

Where Loop/Strap Hangers are directed by Scope of Work (if provided) and the original RFQ/RFP/Project for use in open areas, they shall be UV (Ultraviolet light) resistant-rated.

Loop/Strap Hangers shall be available in a variety of sizes to accommodate a 2-inch and 5-inch diameter bundle of cable.

Magnetic or hammer-on mounting clips are not acceptable for use in mounting Loop/Strap Hangers.

Loop/Strap Cable Hangers (“Hangers”) shall be: “The LOOP” by Arlington, Part Number TL20, TL25, TL50; or “Cat 425 Adjustable Cable Support” by CADDY; or approved equal.

3.7.9) Conduit

All conduits to be installed by Contractor, unless otherwise specified, shall be Electrical Metallic Tubing.

3.7.9.1) Electrical Metallic Tubing

Electrical Metallic Tubing (EMT) must be ANSI C80.3 galvanized conduit.

EMT fittings and conduit bodies installed in interior spaces must be NEMA FB 1 steel setscrew type.

EMT fittings, conduit bodies, and junction boxes installed in exterior spaces must be weatherproof compression type.

Conduit system bushing and connectors must have nylon insulated throats.

3.7.10) Surface-Mount Non-Metallic Raceway (“Raceway”)

Raceway and fittings shall be constructed entirely of PVC, and shall be colored Ivory. minimum 8’ lengths. Raceway shall be designed to be secured to walls mechanically using screws or bolts. Raceway product series must include the following finishing fittings:

3.7.10.1) cover clip / union
3.7.10.2) internal 90-degree bend
3.7.10.3) external 90-degree bend
3.7.10.4) flat 90-degree bend
3.7.10.5) end-cap

Fittings shall have a minimum of 1.3 inches interior bend radius, and shall be suitable to maintain rating of selected Category 6 / 6A cable.

Raceway shall be Wiremold NM2000 series or approved equal.

3.8) Innerduct

All innerduct shall be constructed of corrugated High Density Polyethylene (HDPE) and shall be colored orange.

3.9) Pull Tape

Pull tape shall be composed of longitudinal aramid strands tied together with a 90-degre cross-weave of polyester strands. Pull cord shall have a minimum tensile strength of 1250 pounds, and shall maintain less than 4% tensile elongation at yield.

Pull tape shall have lubrication coating applied at factory, and shall have a coefficient of less than 0.12 (twelve hundredths).

Pull tape shall have footage marked clearly on tape by manufacturer.

Pull tape shall meet or exceed pull line requirement as defined in Bellcore GR-356-CORE “Generic Requirements for Optical Cable Innerduct and Accessories”.

3.10) Pull Cord

Pull cord shall be composed of continuous polyethylene fibers and shall have a tensile strength of at least 200 pounds.

3.11) Cable Fasteners

Velcro brand hook-and-loop fasteners, or equivalent shall be used to secure cables. Contractor shall not use nylon or plastic zip strip, tie wrap, cable tie, (etc.) or similar fasteners on cables during construction and installation of the Data/Telecommunications Cabling System.

3.12) Free-Standing Equipment Cabinets (“Cabinets”)

Free-Standing Equipment Cabinets (“Cabinets”) shall be four-post free-standing EIA 19” cabinets, specifically designed for high-density cabling system applications. Cabinets shall include steel side panels each end of a series of bayed cabinets. Each cabinet shall include steel locking doors on front and rear. Installed cabinets shall provide NEMA 12 rating of protection against dust, falling dirt, and dripping non-corrosive liquids.

Cabinets shall be rated IP 51, and classified UL 50 Type 1, UL 50 Type 2, and UL 50 Type 12. Cabinets shall be certified by Underwriters Laboratories to be in compliance with UL 50 (Standard for Safety for Enclosures for Electrical Equipment), and to maintain integrity of a UL Type 12 enclosure.

Cabinets shall include integrated plinths (base) to raise bottom of cabinet a minimum of 4” from floor when installed. Plinths shall have side, front, and rear covers.

Cabinets shall be constructed of steel and shall provide a minimum of 2500 pound static load capacity when properly installed. Cabinet mounting rails/panels shall be constructed of 12-gauge zinc-plated steel. Cabinet frame, roof, base, and sidewalls shall be constructed of 16-gauge steel. Cabinet doors shall be constructed of 14-gauge steel.

Cabinet rails depth shall be fully adjustable. All rack mounting rails shall be factory machine-tapped with 10/32” factory-tapped holes in EIA-310-D Universal pattern.

Cabinet exterior shall be dip coat primed, and powder-painted RAL 7035 light gray at factory.

Cabinet door handles shall be tamper-proof with integrated locks, keyed alike.

Unless otherwise specified, cabinets shall be 82 inches high, 28 inches wide, and 31.5” deep, and provide 42 rack units (RU) of equipment mounting space.

If integrated cabinet system air conditioner is specified, then air conditioner shall be manufactured by the same manufacturer as the cabinet, and shall be compatible with cabinet. Cabinet shall maintain its NEMA 12 rating when the air conditioner is installed. Air conditioner shall accept 230V input and provide a minimum of 3500 BTU of continuous cooling in sustained ambient temperatures of 55 degrees Celsius.

Cabinets shall be Hoffman base model number PDCP2078GAC or approved equal. Solid doors shall be Hoffman part number PDS207G.

Integrated cabinet system air conditioner shall be Hoffman part number CR290426G002 or approved equal.

One baying kit shall be supplied with each cabinet.

Additional Hoffman components are required to meet this Specification.

Contractor shall coordinate with Hoffman product specialist and Owner Technical Contact to ensure proper cabinet configuration and order. Contractor shall submit Bill of Materials to Owner Technical Contact and Owner Project Manager for approval prior to order placement.

3.12.1) Mounting Hardware for Cabinets

Contractor shall furnish a quantity of one hundred (100) compatible equipment mounting bolts for each cabinet supplied.

3.12.2) Power Distribution Units for Cabinets

Contractor shall install two (2) Power Distribution Units (PDUs) per each cabinet supplied by Contractor.

PDUs for cabinets shall each have a single 30 amp 125 volt input via a NEMA L5-30P (male) plug, and shall distribute power to a total of twenty-four (24) NEMA 5-15/20R ("T-slot") female receptacle outputs.

PDUs shall each be between 42" and 49" in height, between 2" and 3" in width, and less than 2.5" inches in depth. Input power cable shall be 7' long.

Two 20 Amp circuit breakers shall be integrated into PDU chassis and shall each be wired to twelve (12) NEMA 5-15/20R outputs.

3.12.3) Vertical Cable Management Panels for Cabinets

One Vertical Cable Management Panels shall be provided and installed by Contractor on each post of each cabinet provided by Contractor (four per cabinet).

Vertical Cable Management Panels installed in cabinet shall be molded out of plastic and shall incorporate bend radius control throughout the fingers, pass-through holes, and transitions between horizontal and vertical pathways. Integral cable retainers shall be molded on the end of each finger. Four snap-on adjustable cable retainers, manufactured specifically to fit the selected model of cable management, shall be attached to duct fingers to provide additional retention of cables within channel.

Vertical Cable Management Panels provided with cabinet shall be double-sided. Front and rear dual-hinged cover shall open minimum of 110-degrees in the left or right position. Front duct shall be 83" high X 6" deep X 4.9" wide. Rear duct shall be 83" high X 6" deep X 4.9" wide.

Vertical Cable Management Panels provided with cabinets shall be colored black.

3.12.4) Horizontal Cable Management Panels for Cabinets

One Horizontal Cable Management Panel shall be supplied and installed per each Free-Standing Equipment Cabinet installed, to permit patch cables to pass from left to right side of Cabinet at center of Cabinet.

Horizontal Cable Management Panels shall be double-sided.

Horizontal Cable Management Panels shall mount to any standard EIA 19” wide rack, and when mounted to rack shall provide two fingered ducts -- one in front of rack, and one in rear of rack. Front dual-hinged removable cover shall open 180-degrees in the up or down position. Rear cover shall snap on. Front duct shall be 7” high X 5.5” deep. Rear duct shall be 7” high X 7.6” deep. Pass-through holes shall permit routing cables from front duct to rear duct.

Horizontal Cable Management Panels shall be molded out of plastic and shall incorporate bend radius control throughout the fingers, pass-through holes, and transitions between horizontal and vertical pathways. Integral cable retainers shall be molded on the end of each finger. Four snap-on adjustable cable retainers shall be attached to duct fingers to provide additional retention of cables within channel. Snap-on adjustable cable retainers must be manufactured specifically to fit the selected model of Horizontal Cable Management Panels.

Horizontal Cable Management Panels shall be colored black.

Horizontal Cable Management Panels shall be PANDUIT part number NM4 or approved equal.

3.13) Wall-Mounted Cabinets (“Wall-Mounted Cabinets”)

Wall-Mounted Cabinets shall be constructed of 16 gauge steel with black powder-coated finish. Wall-Mounted Cabinets shall have four equipment mounting rails – two in front and two in rear. Wall-Mounted Cabinet equipment mounting rails shall be constructed of 11 gauge steel with black powder-coated finish, shall be 19 inches apart with fully adjustable depth position, and shall provide 26 rack units of usable rack space. All rack mounting rails shall be factory machine-tapped with #12/24 factory-tapped holes in EIA-310-D Universal pattern. Wall-Mounted Cabinets shall have solid front door. Wall-Mounted Cabinet shall have a rear hinged section with pre-drilled/cut keyholes slots that permits mounting to wall, and allows full access to rear of cabinet when mounted. Rear section of cabinet shall have minimum three (3) 3-inch diameter and eight (8) ¾-inch diameter conduit entry knockouts on top and bottom panels. Wall-Mounted Cabinet side panels shall be vented via ventilation slots/louvers. Wall-Mounted Cabinet top shall have 250 CFM exhaust fan. Wall-Mounted Cabinet dimensions shall be 48 inches high, by 21 inches wide, by 26 inches deep.

Wall-Mounted Cabinet shall be Hubbell base part number HSQ48S36.

Wall-Mounted Cabinet shall include an installed top-mounted Fan Kit With Tray containing two (2) 57 CFM fans, Hubbell part number HWKF120..

Wall-Mounted Cabinet shall include an installed 1-RU Power Strip (PDU) with casing constructed of steel, with one (1) NEMA 5-15P input on six-foot stranded cord, and ten (10) rear-facing NEMA 5-15R outlets. Power Strip (PDU) shall be Hubbell part number HPWPWR.

Wall-Mounted Cabinet rear rails shall be Hubbell part number WMC48RAILS or approved equal, installed.

3.13.1) Mounting Hardware for Wall-Mounted Cabinets

Contractor shall furnish a quantity of one hundred (100) compatible #12/24 equipment mounting bolts for each cabinet supplied.

3.14) Open Equipment Racks (“Racks”, “Open Racks”)

Open Equipment Racks shall be two-post free-standing EIA 19” wide racks, specifically designed for high-density cabling system applications. Racks shall be constructed of steel and shall provide a minimum of 1500 pound static load capacity. Rack shall be colored black with powder-painted at factory.

Rack posts shall be factory machine-tapped on front and rear with #12/24 factory-tapped holes in EIA-310-D Universal pattern.

Rack posts shall contain built-in cable routing channels with hand-hole access openings on sides. The depth of the built-in cable routing channels shall be 16.5”. Rack shall provide open access to cable routing channels from top, bottom, and inside of rack. The cable routing channel outside walls shall provide built-in cable tie points for affixing ¾”-wide hook-and-loop fasteners directly to sidewalls while dressing cable.

Racks shall have integrated rungs on top of rack behind rack face to permit support and routing of cables to patch panel rear. Integrated rungs shall be of sufficient radius to maintain proper bend radius of cable.

Racks shall have integrated top trough with built-in waterfall in front of posts to provide bend radius control and efficient routing for patch cables.

Unless otherwise specified, racks shall be seven feet high (7’ H), and provide 45 rack units (45 RU) of equipment mounting space.

Seven-foot-high Open Racks shall be Legrand part number MM10716, or approved equal.

Eight-foot-high Open Racks shall be Legrand part number MM10816, or approved equal.

3.14.1) Mounting Hardware for Open Racks

Contractor shall furnish a quantity of one hundred (100) compatible #12/24 bolts for each rack supplied.

3.14.2) Power Distribution Units for Open Racks

Contractor shall install two (2) Power Distribution Units (PDUs) on each Open Rack provided and/or installed by Contractor.

PDUs for Open Racks shall each have a single 30 amp 125 volt input via a NEMA L5-30P (male) plug, and shall distribute power to a total of twenty-four (24) NEMA 5-15/20R ("T-slot") female receptacle outputs.

Two 20 Amp circuit breakers shall be integrated into PDU chassis, and shall each be wired to twelve (12) NEMA 5-15/20R outputs.

PDUs for open racks shall each be between 42" and 49" in height, between 2" and 3" in width, and less than 2.5" inches in depth. Input power cable shall be 7' long.

PDUs for open racks shall be mounted vertically on rear of Open Rack and secured to factory-tapped holes on rear face of Open Rack using PDU-manufacturer-supplied brackets.

PDU must have mounting brackets that permit mounting PDU to pre-tapped holes in the Open Rack as described herein. Adjustable mounting brackets are acceptable if brackets securely fasten PDU to rack. Tapping of rear face of Open Rack shall not be permitted. Use of pre-tapped 19-inch EIA-pattern equipment mounting holes to mount PDU shall not be permitted.

One PDU shall be installed on each (left and right) side of rear face of Open Rack, four inches away from (clear) of EIA Universal equipment mounting holes of Open Rack.

Each PDUs for Open Racks shall be mounted such that output receptacles face laterally inward, toward nearest of the two rear 19-inch equipment-mounting rails of Open Rack. PDU shall not block ability to mount or remove equipment on rear rails when installed and fully-populated with 3-inch deep plugs in each output receptacle of PDU.

3.14.3) Vertical Cable Management Panels for Open Racks

One vertical cable management panels shall be provided and installed by Contractor on each post of each rack provided by Contractor.

Vertical cable management provided with racks shall be colored black, with a solid black front cover with hinge on both sides to permit opening of panel from right or left without removal of panel. Vertical cable management provided with racks shall be manufactured by same manufacturer of rack to fit selected rack. Vertical cable management provided with racks shall include snap-on bend-radius-limiting cable management spools and bend-limiting clips. Vertical cable management provided with racks shall provide an 8.25-inch-wide channel between racks for front and back routing of equipment cables and patch cords.

Seven-foot-high vertical cable management panels for seven-foot-high open racks shall be Ortronics part number MM10VMD712 or approved equal.

Eight -foot-high vertical cable management panels for eight-root-high open racks shall be Ortronics part number MM10VMD812 or approved equal.

3.14.4) Horizontal Cable Management Panels for Open Racks

One (1) 4RU Horizontal Cable Management Panel shall be supplied and installed per each Open Equipment Rack installed, to permit patch cables to pass from left to right side of rack at center of rack height.

Horizontal Cable Management Panels shall mount to any standard EIA 19” wide rack, and when mounted to front of rack shall provide two fingered ducts -- one facing front of rack, and one facing rear of rack. Dual-hinged removable covers shall open 180-degrees in the up or down position. Pass-through holes shall permit routing cables from front duct to rear duct.

Horizontal Cable Management Panels shall be molded out of plastic and shall incorporate bend radius control throughout the fingers, pass-through holes, and transitions between horizontal and vertical pathways. Integral cable retainers shall be molded on the end of each finger. Four snap-on adjustable cable retainers shall be attached to duct fingers to provide additional retention of cables within channel. Snap-on adjustable cable retainers must be manufactured specifically to fit the selected model of Horizontal Cable Management Panels.

Horizontal Cable Management Panels shall be colored black.

Horizontal Cable Management Panels shall be PANDUIT part number NM4 or approved equal.

3.15) Labels

All label text shall conform to the Cable Installation Labeling Convention, defined herein.

All labels shall meet the legibility requirements of UL 969, and shall be preprinted using a mechanical means of printing (e.g., laser printer) using the label content of an approved Circuit Endpoint Table Spreadsheet submittal.

3.15.1) Data/telecommunications Outlet Labels

Data/telecommunications faceplates shall be labeled using compatible non-adhesive labels. A transparent snap-in flexible plastic label cover shall retain the label, and shall provide a small hole at side to permit label cover removal.

Data/telecommunications outlets and data/telecommunications outlet ports shall be labeled according to the Cable Installation Labeling Convention, defined herein.

3.15.2) Labels for Patch Panels (all types)

Patch Panels shall be labeled using compatible non-adhesive labels. A transparent snap-in flexible plastic label cover shall retain the label, and shall provide a small hole at side to permit label cover removal

Patch panels and patch panel ports shall be labeled according to the Cable Installation Labeling Convention, defined herein, and shall meet the legibility requirements of UL 969. Font shall be Bold 8-point Courier (fixed width), and label content shall be left-justified.

3.15.3) Cable Marking Labels

Cable marking labels shall be composed of vinyl substrate with a white printing area and a clear “tail” that self laminates the printed area when wrapped around the cable.

Cable marking labels shall meet the legibility, defacement, exposure, and adhesion requirements of UL 969, and shall be preprinted using a mechanical means of printing (e.g., laser printer).

If cable jacket is white, provide cable label with printing area that is any other color than white, preferably orange or yellow – so that the labels are easily distinguishable.

Cables shall be labeled on both ends according to the Cable Installation Labeling Convention, defined herein.

3.15.4) Fiber-Optic Cable Warning Labels

Fiber-Optic cable warning labels shall alert to the presence of Fiber-Optic cable within innerduct and conduit.

Fiber-Optic cable warning labels shall be colored yellow, and shall clearly state in black print applied by manufacturer: “WARNING” and “FIBER-OPTIC CABLE”.

Fiber-Optic cable warning labels shall also advise reader in clearly legible print to “CONTACT: CTS NETOPS AT (914)251-6465” for information.

Fiber-Optic cable warning labels shall be manufactured to attach directly to innerduct, conduit, and Fiber-Optic cable via mechanical means, rather than adhesive.

3.16) Communications Room Backboard

Communications Room Backboard (“Backboard”) shall be constructed of 3/4” thick type A/C fire-rated plywood. Backboard shall be stamped clearly on the “good” finished side (the “A” side) by manufacturer, showing that it has been treated with fire-retardant chemical and meets Class A requirements for NFPA Life Safety Code (NFPA 101). Backboard shall be entirely unpainted. At least one fire-retardant treatment stamp must be clearly visible on installed Backboard at all times, regardless of what is mounted on the backboard.

Whole 4’ x 8’ sections of plywood shall be cut to fit the specified area of Backboard. Scrap or remnant wood is not acceptable. Plywood must be free of dirt and dust.

Plywood shall be cut and mounted such that specified size and area of Backboard is covered continuously, with as few joints and as few cuts as possible.

3.16.1) Steel Strut Used as Standoff for Communications Room Backboard

Steel strut Used as Standoff for Communications Room Backboard shall be 1-5/8 inch wide by 2-7/16″ deep, and shall be constructed of 12 Gage, low-carbon cold formed steel.

Steel strut used as standoff for Communications Room Backboard shall have mounting holes drilled every 1-7/8” inch on center at its face.

3.17) Electrical Grounding Busbar for Communications Rooms

Unless existing, Contractor shall install one UL-listed electrical grounding busbar in Communications Rooms, to be used as the Telecommunications Main Grounding Busbar (TMGB) in data/telecommunications located closest to entrance facility, and as Telecommunications Grounding Busbar (TBB) in all other Communications Rooms as per TIA/EIA J-STD-607-A.

Grounding busbars for Communications Rooms shall be 0.25” deep x 4" high x 12" wide copper grounding busbar with a minimum of eighteen (18) 0.437” holes at a minimum of 1” separation.

Grounding busbars for Communications Rooms shall be insulated from each of its supports by a minimum of two inches (2”) of UL standoff insulators.

Grounding busbars for Communications Rooms shall be mounted at bottom of plywood backboard via two stainless steel mounting brackets, and four stainless steel assembly bolts and lock washer.

Grounding busbars for Communications Rooms shall be suitable for indoor or outdoor installations.

Electrical Grounding Busbar shall be Storm Copper SCGB-5KT Ground Bar Kit, or approved equal.

3.18) Firestopping

Use only Firestopping products that have been tested for specific fire resistance rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire rating involved for each separate instance.

Firestopping products shall form a seal around cables that shall remain soft and pliable to allow removal, repair, and the addition of cables (“re-enterability”) without power tools, and without any danger of damaging existing cable traversing the penetration

Firestopping products shall be UL-Listed.

3.18.1) Firestopping

Materials used for Firestopping shall remain soft and pliable to allow removal, repair, and the addition of cables (“re-enterability”) without power tools, and without any danger of damaging existing cable traversing the penetration.

Firestopping Materials shall not re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during or after construction.

Firestopping Putty/Caulk/ Foam shall be colored red.

3.18.2) Fire Rated Cable Pathway Devices (Firestop Assemblies)

Fire Rated Cable Pathway Devices shall be comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill while retaining all Firestopping properties.

Fire rated pathway devices shall:

3.18.2.1) Meet the hourly rating of the floor or wall penetrated.
3.18.2.2) Permit the allowable cable load to range from 0% to 100% visual fill while retaining intumescent/firestopping properties, thereby eliminating the need to calculate allowable fill ratios.
3.18.2.3) Permit multiple devices to be ganged together to increase overall cable capacity.
3.18.2.4) Allow for retrofit to install around existing cables.
3.18.2.5) Include an optional means to lengthen the device to facilitate installation in thicker barriers without degrading fire or smoke sealing properties or inhibiting ability of device to permit cable moves, add-ons, or changes.
3.18.2.6) Not require any additional action on the part of the installer to open or close the pathway device or activate the internal smoke and fire seal, such as, but not limited to:
3.18.2.6.1) Opening, closing, or adjustment of doors.
3.18.2.6.2) Twisting an inner liner.
3.18.2.6.3) Removal or replacement of any material such as, but not limited to, sealant, caulk, putty, pillows, bags, foam plugs, foam blocks, or any other material.

Fire Rated Cable Pathways shall be Specified Technologies Inc. (STI) EZ-PATH™ Fire Rated Pathway or approved equal.

3.18.3) Firestopping for Data/Telecommunications Cabinet Penetrations

Firestopping used on data/telecommunications cabinet penetrations shall provide a fire- and smoke-proof seal to and from space within cabinet.

3.19) Wireless Access Point Mounting Brackets

3.19.1) Suspended-Ceiling-Mount Wireless Access Point Mounting Bracket

Suspended-Ceiling-Mount WAP Bracket shall be Cisco AIR-AP-T-RAIL-R, Part Number 700-19209-04. Suspended-Ceiling-Mount Wireless Access Point Bracket shall be provided by Purchase College.

3.19.2) Indoor Wall-Mount Wireless Access Point Mounting Bracket

Indoor Wall-Mount Wireless Access Point Mounting Bracket shall be constructed of 18 gauge steel, and be constructed sturdily with a hostile environment in mind. Door concealing faceplate must lock, and all Wall-Mount WAP Mounting Brackets must be keyed alike. Two keys shall be furnished for each Wall-Mount WAP Mounting Bracket provided. Surface of WAP Mounting Bracket shall be finished with textured white powder coat.

Indoor Wall-Mount Wireless Access Point Enclosures shall be Oberon Wireless model 1012-00 or approved equal.

3.20) Ceiling Access Hatches

Ceiling Access Hatches shall be plenum-rated, shall be constructed of steel, and shall have a hinged door. Ceiling Access Hatches shall provide a 2-foot by 2-foot square opening in ceiling when opened. Hinged door on Ceiling Access Hatches shall be square and shall be secured mechanically via coin-slot drive in each corner of hinged door.

Part 4: Execution

4) Execution

4.1) Quality of Work

All work shall be performed to the highest industry standards. All equipment and materials are be installed in a neat and secure manner in accordance with applicable industry technical standards, local code standards, and product manufacturer's installation instructions and standards.

4.2) Pre-Bid and Pre-Installation Surveys

Prior to placing any cabinet, rack, wireless access point enclosure, conduit, cable tray, raceway, feeder, or cable, the Contractor shall survey the site to see that job conditions do not impose any obstructions that would interfere with the safe and satisfactory placement of the cables or equipment. Necessary changes to the plans may be determined by Contractor’s site survey, and such changes require written approval by Owner Project Manager.

Building plans and documentation are not guaranteed to be entirely accurate or to scale, and are provided for informational purposes only. Contractor must verify all measurements in the field.

Unless otherwise noted, Contractor may freely access public areas of campus during normal hours of operation in order to verify measurements and existing conditions.

Contractor is urged to perform a site visit and verify measurements and existing conditions prior to placing a bid in respond to any request for quote or request for proposal.

4.3) Access and Physical Security

Contractor may require access to locked doors or alarmed areas. Contractor shall coordinate access with Owner Project Manager.

If a security alarm is tripped, then Contractor must immediately notify the University Police Department at (914)251-6900.

Contractor shall comply with all of Owner's policies regarding access to non-public areas.

Contractor may be provided with a chaperone by Owner while working in residence facilities, museum, art galleries, and other restricted areas of the campus.

4.4) Coordination with Other Trades

In order to conform to the overall project event schedule, Contractor shall survey the work areas regularly, and coordinate work with other applicable trades and with the Owner Project Manager.

4.5) Regular Meeting with Owner Project Manager

Owner Project Manager and Contractor Project Manager shall meet weekly, or more frequently as determined by Owner Project Manager. Owner Technical Contact and/or Contractor Field Contact, or any other party that Owner or Contractor deem necessary may be present.

4.6) Damage or Loss

During installation, and prior to final acceptance, the Contractor shall protect finished and unfinished work against damage and loss. In the event of such damage or loss, the Contractor shall replace or repair such work at no additional cost to Owner. As cable is installed, care must be taken to avoid nicks, kinks or other damage to the cable.

4.7) Existing Cables and Equipment

Contractor shall perform work without disturbing existing cables and equipment. If Contractor must disturb existing cables in order to perform work, then Contractor must obtain prior written permission to do so from Owner.

4.8) Clean-up

Contractor is required to clean up work areas of debris and dust generated by Contractor, as specified herein.

4.8.1) End of day

Contractor shall broom-clean all work areas of job site prior to leaving job site the end of each workday. Contractor shall restore suspended-ceilings in occupied areas to their former condition by the end of each workday. If suspended-ceiling tiles are damaged or broken, then Contractor shall replace tiles.

4.8.2) End of project

Following the completion of construction in an area, Contractor shall vacuum-clean and wipe-down all dust and debris generated by the work.

4.8.3) Communications Rooms

4.8.3.1) New Communications Rooms

New Communications Rooms and Cabinets shall be delivered to college in clean condition with all surfaces dust-free and debris-free.

Door sweeps and seals shall be installed on any door in New Communications Room to prevent dust from entering.

4.8.3.2) Existing Communications Rooms and Cabinets

Existing Communications Rooms and Cabinets shall be cleaned by Contractor with HEPA-Filter dry Vacuum prior to commencing work in Communications Room, and shall be maintained as dust-free and debris-free for duration of project.

Tools, cloths, boots, and ladders shall be cleaned prior to entering any existing Communications Room or Cabinet.

Sticky mat and door sweep shall be required at Communications Room to prevent dust from entering.

4.9) Splices

All cables shall be “home run” between patch panel and termination point.

No intermediate splice points are permitted for cables of any type.

Splicing of any cables of any type is prohibited, except where
Fiber-Optic fusion splices or Category 3 telephone splices are specified.

4.10) Technical Requirements

4.10.1) Data/Telecommunications Cabling System

Installed Category 6 / 6A system and components shall support 100BASE-TX Ethernet as per IEEE 802.3u, 1000BASE-T Ethernet as per IEEE 802.3ab, 1000BASE-TX Ethernet as per TIA-854, 2.5GBASE-T and 5GBASE-T Ethernet as per IEEE 802.3bz, 10GBASE-T Ethernet as per IEEE 802.3an, Voice-Over-IP telephony (VOIP) as per TIA-TR41, digital telephony as per TIA-810-B, analog telephony as per TIA 470-C, and Power over Ethernet as per the IEEE 802.3af, IEEE802.3at, and IEEE802.3bt standards.

Installation of Data/Telecommunications Cabling System must satisfy requirements set forth in all parts and addenda of ANSI/TIA/EIA-568-C, and TIA-569-A, ISO/IEC 11801, and IEC 61156.

Contractor shall furnish and install cables, terminals, connectors, patch panels, and miscellaneous hardware required for delivery of a complete and working cable plant.

4.11) Cabinets and Racks

4.11.1) Securing Cabinets and Racks to Floor and to Each Other

Cabinets and racks installed by Contractor must be securely anchored and bolted to the floor. Wherever one cabinet or rack is installed directly adjacent to another cabinet or rack, the cabinets or racks must be securely connected using manufacture-approved baying kit.

4.11.2) Knockouts

Where knockouts in cabinet sheet metal are specified or are necessary, knockout will be fitted with a bushed steel chase nipple to prevent cable from contacting sharp surfaces of cut sheet metal, and to allow proper packing of fire-stop material at cabinet penetration. All unused knockouts in cabinet are to be covered with knockout seals, regardless of whether or not knockout was open prior to Contractor performing work.

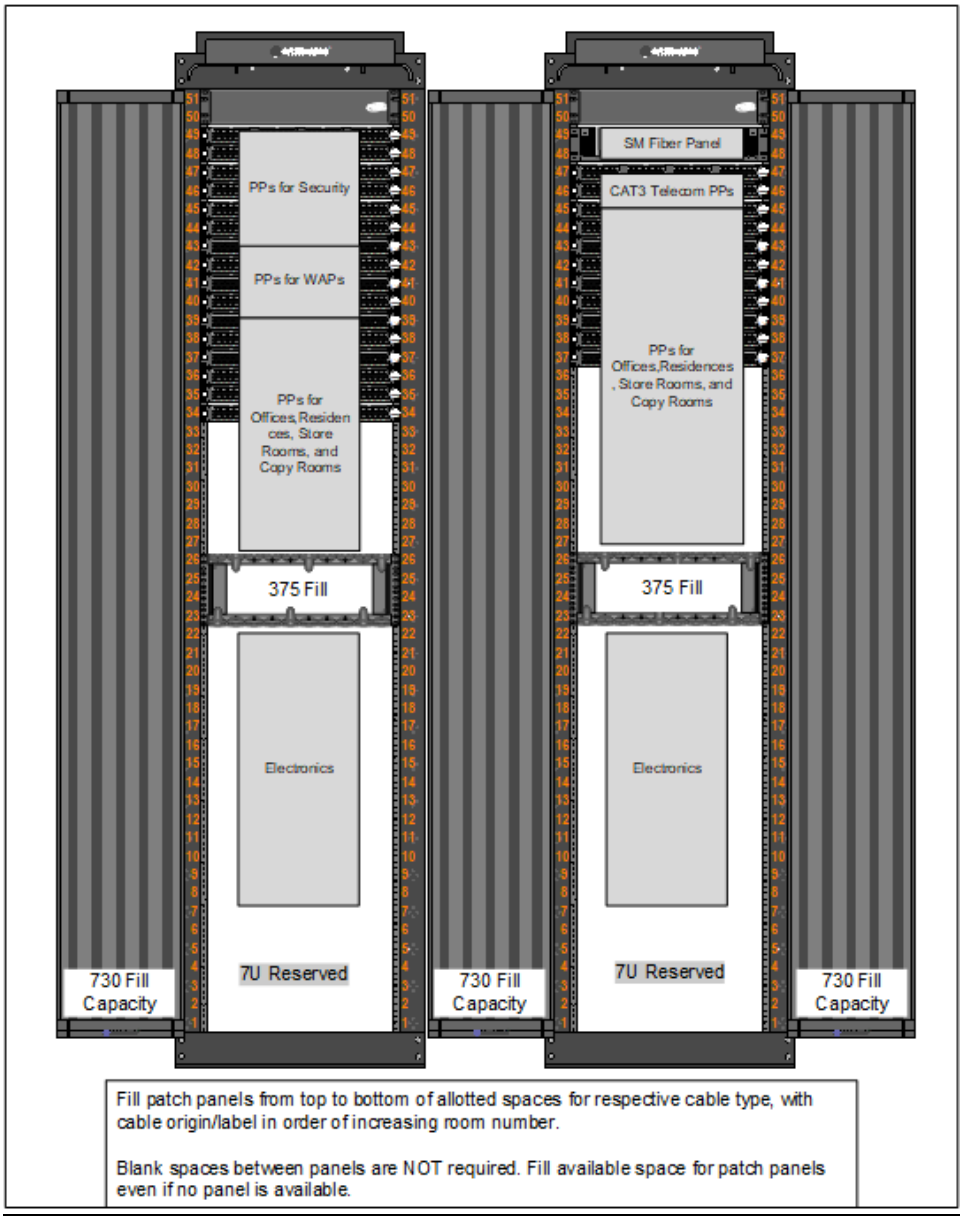
4.11.3) Fire-stop for Cabinet Penetrations

Contractor shall insure that fire-stop material is installed at all knockouts or other entrances to any cabinet in which Contractor performs work, regardless of whether or not Contractor disturbed fire-stop while performing work, and regardless of whether or not fire-stop was present prior to Contractor performing work.

Contractor shall install fire-stop in any new cabinet penetration that contractor creates. Contractor shall insure that every cabinet penetration has firestop installed prior to the completion of the job.

4.11.4) Cabinet or Rack Layout

See following sample rack elevation. Actual rack elevation drawings shall be provided by Owner Project Manager prior to cable dress/termination in each Communications Room, per project schedule, to ensure rack elevations are complete and accurate.


PPs for Security
PPs for WAPs
PPs for Offices,Residences, Store Rooms, and Copy Rooms
375 Fill
Electronics
7U Reserved
730 Fill Capacity
730 Fill Capacity
SM Fiber Panel
CAT3 Telecom PPs
PPs for Offices,Residences, Store Rooms, and Copy Rooms
375 Fill
Electronics
7U Reserved
730 Fill Capacity
Fill patch panels from top to bottom of allotted spaces for respective cable type, with cable origin/label in order of increasing room number.
Blank spaces between panels are NOT required. Fill available space for patch panels even if no panel is available.

4.12) Drip Loops

For all cables Contractor installs, Contractor will create minimum 6” radius drip loops before cabinets, racks, and connection blocks. Drip loops shall not be located anywhere above or within four feet (4’) of cabinets, equipment, patch panels, and connection blocks, and shall direct any water traveling on cables away from such equipment.

4.13) Communications Room Backboard

Communications Room Backboard (“Backboard”) shall be provided in whole 4’x8’ sections cut to maximum size and fit in the designated location.

Backboard shall be mounted such that bottom edge of plywood is 36” AFF and top edge of plywood is 84” AFF.

Six 22-inch lengths of 12-gauge back-to-back 1-5/8” x 4-7/8” steel strut shall be mounted horizontally behind each whole piece of plywood to create a 4-7/8-inch accessible gap (standoff) for routing cable between the Backboard and the wall, with one length of strut mounted roughly at each of the four corners and one length mounted roughly on center of both of the two longest sides of the plywood. Smaller cut sections of plywood shall be mounted using fewer lengths/pieces of steel strut, as appropriate.

Each length of strut shall be mechanically affixed to studs, to blocking, to masonry, or to structural steel behind the finished wall using two ½-inch Grade 8 carbon-steel bolts/washers/anchors.

Prior to installation, bolts and strut must be filed and deburred as to not to nick or cut cables that are routed behind backboard in the future.

Adequate materials, methods, and fasteners shall be utilized to insure proper support of the weight of the backboard assembly plus 600 pounds of static load on each 4’x8’ section of backboard.

Wood screws used in mounting equipment, cable, and supports to backboard shall not exceed the thickness of the backboard. Screws and other sharp objects must not protrude out rear of backboard where they may nick or cut cables that are routed behind backboard in the future.

Existing light fixtures, electrical outlets, switches, and other items fixed to designated wall shall be avoided, or plywood must be cut around such items such that access to items is not hindered in any way.

The “good” finished side (the “A” side) of the fire-rated A/C plywood shall face away from mounting wall, and shall display manufacturer’s stamps confirming that it has been treated with fire-retardant chemical.

Plywood backboard shall be entirely unpainted and installed so that stamps show clearly for all future fire inspections. At least one stamp in its entirety must be clearly visible on plywood at all times, regardless of what is mounted on the backboard.

4.14) Grounding

All components of the Data/Telecommunications Cabling System shall be properly grounded and bonded as per ANSI/TIA/EIA 607, and all applicable electrical codes. Electrical ground busbars shall be available on plywood backboards in all Communications Rooms

A complete connection to ground shall be formed from each structural metallic part of the cable plant to and through all others which parallel the route that a signal is designed to travel. Appropriate gauge copper ground cable as per code and standards shall be used to connect all components. Paint-piercing screws, grounding lugs, and split-bolt connectors shall be utilized as appropriate to insure proper connections.

All connections to the Grounding busbars for Communications Rooms shall all be made via UL-rated two-hole compression lugs – one-hole compression lugs are not acceptable. Each compression lug shall be crimped a minimum of twice to insure good connection to lug. Grounding busbars for Communications Rooms and associated lugs shall be cleaned prior to fastening of conductors, and an anti-oxidant shall be applied to contact area to control corrosion and reduce contact resistance.

Grounding busbars for Communications Rooms shall be installed no more than ten feet from electrical panel located in same Communications Room that serves the data/telecommunications system. A minimum gauge of #6 AWG cable designed for use in grounding/bonding applications shall be used to interconnect grounding/bonding components and shall have a green insulating jacket that meets the fire ratings of its pathway. Any cable used to ground/bond newly-installed components shall be installed without splices.

A Telecommunications Bonding Backbone cable of at minimum #3/0 AWG cable designed for use in grounding/bonding applications shall be supplied and installed by Contractor to interconnect the Main Telecommunications Grounding Busbar and all Telecommunications Ground Busbar(s)as per ANSI/TIA/EIA J-STD-607-A, if one does not exist.

4.15) Keys to Cabinets, Furniture, and WAP Mounting Brackets

Keys to cabinets, Furniture, and WAP Mounting Brackets may be retained by Contractor until Final Completion, at which time all keys must be returned to Owner.

Contractor shall not make copies of any key and shall account for all keys received or purchased prior to Final Completion.

Contractor shall immediately provide keys to Owner upon written request by Owner at any point during construction.

4.16) Service Slack

4.16.1) Data/telecommunications Outlet Service Slack

Each installed data/telecommunications cable shall provide a minimum of eight inches (8”) of service slack in the station outlet gang box at modular jack termination point, or as much as is allowed considering available space in gang box. Service slack shall be arranged in a loop and tucked in gang box, with consideration for the specified maximum bend radius of installed cable.

4.16.2) Additional Service Slack for Wireless Access Point Data Outlets

Each installed data cable designated for Wireless Access Point (WAP) connection shall have thirty feet (30’) of service slack coiled above nearest accessible ceiling to WAP outlet, and fastened to nearest J-Hook or other approved support using hook-and-loop fasteners.

4.16.3) Additional Service slack for Security Cables

Each installed cable designated for Security shall have thirty feet (30’) of service slack coiled above nearest accessible ceiling to Security termination, and fastened to nearest J-Hook or other approved support using hook-and-loop fasteners.

4.16.4) Additional Service Slack for Spare Cables

Each installed data/telecommunications cable designated as a “Spare Cable” shall have fifty feet (50’) of service slack coiled above nearest accessible ceiling, and hung on nearest J-Hook or other approved support using hook-and-loop fasteners.

4.16.5) Communications Room Service Slack

4.16.5.1) Category 6 / 6A Cable

At each Communications Room, Category 6 / 6A cables shall be combed, secured to Communications Room Backboard using hook-and-loop fasteners, and arranged in an S-curve such that ten feet (10’) of service slack is provided in the Communications Room.

With written approval, Contractor may alternatively lay service slack in Communications Room on adjoined cable trays that are dedicated for the purposes of dressing service slack. Service slack on cable tray shall be combed and secured to cable tray using hook-and-loop fasteners.

An additional three feet (3’) of service slack shall be provided in the cabinet or rack via a small “C-curve” secured to side rail of cabinet or rack with hook-and-loop fasteners, directly before cable enters rear of slotted duct cable management.

4.16.5.2) Telecommunications Feeder Cable Service Slack

At each Communications Room and telecommunications distribution frame, Telecommunications Feeder Cable shall be neatly secured to Communications Room Backboard using hook-and-loop fasteners, and arranged in a C-curve such that six feet (6') of service slack is provided.

With written approval, Contractor may alternatively lay Telecommunications Feeder Cable service slack in Communications Room on adjoined cable trays that are dedicated for the purpose of dressing service slack. Service slack on cable tray shall be secured to cable tray using hook-and-loop fasteners.

An additional four feet (4') of service slack on Telecommunications Feeder Cable shall be provided in cabinet or rack, arranged in a "C-curve" secured to side rail of cabinet or rack with hook-and-loop fasteners.

4.16.5.3) Fiber-Optic Cable Service Slack

At each Communications Room, Fiber-Optic cable shall be neatly secured to Backboard using hook-and-loop fasteners, and arranged in a coil such that fifty feet (50') of service slack is provided in each Communications Room.

With written approval, contractor may alternatively lay Fiber-Optic cable service slack in a coil in Communications Room on adjoined cable trays that are dedicated for the purpose of dressing service slack. Service slack on cable tray shall be secured to cable tray using hook-and-loop fasteners.

An additional ten feet (10') of service slack on Fiber-Optic cable shall be provided in the cabinet or rack in an "S-curve" secured to side rail of cabinet or rack with hook-and-loop fasteners.

4.17) Strain Relief and Cable Dressing

The Contractor shall provide and install hook-and-loop fasteners ties, riser cable support grips and strain relief based upon field conditions to maintain orderly cable organization

Contractor shall neatly dress cable in Communications Rooms and securely bundle them at every two-foot interval using prescribed cable fastener. Separate cable fasteners shall be used to attach cable bundle to cable tray, cabinet, cable management, or other cable support in the room.

Contractor shall install Horizontal 19-inch Lacing Bar for Patch Panel Rear Cable Strain Relief for all installed patch panels. Plastic strain relief bars that mount directly to patch panel are not acceptable. Strain relief will be installed in such a way that patch panel may be serviced with strain relief in place.

Strain relief boots and termination caps shall be installed on the station outlet modular jack and patch panel modular jack, if provided as part of the selected jack assembly.

4.18) Data/telecommunications Cabling System

4.18.1) Data/telecommunications Outlets

4.18.1.1) Outlet Placement

Standard wall data/telecommunications outlets shall be installed on the wall entirely above baseboard or cove base, at approximately 15 inches AFF.

Outlet placement shall match the height and orientation of existing electrical and communications outlets that are installed at a minimum of 8 inches in height and maximum of 24 inches in height on center. Existing outlets installed below 8 inches in height and above 24 inches in height on center shall not be used as a guide to place new outlets.

4.18.1.1.1) Wall outlets from to which an EMT conduit or stub are connected shall be installed in Metallic Recessed-Mount Device Boxes.

4.18.1.1.2) Wall outlets retrofitted into sheetrock walls shall utilize Low Voltage Faceplate Mounting Brackets.

4.18.1.2) Termination

All Category 6 / 6A termination assemblies shall employ the TIA-568-B wiring configuration for color-coding of pinout/position.

In order to maintain the electrical and data transmission characteristics of Category 6 / 6A cables, the following practices must be observed during the termination of all Category 6 / 6A cabling:

4.18.1.2.1) Only remove the minimum amount of cable sheath necessary to properly terminate the wires.

4.18.1.2.2) Cable conductors are arranged in pairs. Each pair has a specific twist associated with that pair. Maintain the pair twist at all times. Do not untwist and then attempt to re-twist cable pairs while terminating. Separate the conductors in a pair only as much as absolutely necessary to terminate the cable onto the connector. For all twisted pair cables the maximum untwisted length is not to exceed 0.5 inches.

4.18.1.2.3) Never remove insulation from the conductors. All of the terminations in this project shall be of the insulation displacement (IDC) type.

4.18.1.2.4) Leave the minimum amount of conductor after termination in an IDC connector. If necessary, use a cable scissor to trim extra length. Under no circumstances shall the excess length exceed 0.125 inches above the terminator block face edge.

4.18.2) Telecommunications Feeder Cable

Contractor shall terminate Telecommunications Feeder Cables on PDS 110-style insulation displacement connectors on the rear of 19” rack-mount Telecommunications Feeder Patch Panels at Communications Room end. Contractor shall terminate one pair of conductors on each port of 19” rack-mount telecommunications feeder patch panel.

Contractor shall terminate all pairs of Telecommunications Feeder Cables in corresponding order on 66M Connection Blocks mounted on backboard at the telecommunications distribution frame end. Connection Blocks shall be mounted to backboard or to distribution frame as specified by Owner.

All terminations shall be made in color order according to TIA/PIC standards.

4.18.3) Telecommunications Gas Protector Panel

If specified, Contractor shall install an intermediary gas protector panel for Communications Room on Communications Room Backboard.

4.19) Fiber-Optic Cable

Fiber-Optic cable shall be run within innerduct or dedicated ¾” EMT for the entirety of the cable length between Communications Rooms.

A conduit less than or equal to 1.5” in diameter that a Fiber-Optic cable is run through shall be deemed non-re-enterable. Additional cables shall not be pulled through this conduit following testing/certification of Fiber-Optic cable, in order to insure performance of the Fiber-Optic cable.

When run through conduit greater than 1.5” in diameter or on cable tray, Fiber-Optic cable shall be run within innerduct.

When otherwise run above suspended-ceilings, in mechanical rooms, and in mechanical spaces, Fiber-Optic cable shall be run in dedicated ¾” EMT.

When otherwise run below suspended-ceilings and in occupied areas that require aesthetics to be maintained, Fiber-Optic cable shall be run in raceway that is specifically designed to maintain bend radius of the Fiber-Optic cable.

4.19.1) Non-Armored Fiber-Optic Cable

No exceptions shall be made in any circumstance regarding the above use of innerduct/EMT/raceway with non-armored Fiber-Optic cable.

4.19.2) Armored Fiber-Optic Cable

Exceptions may be made under certain circumstances regarding the above use of innerduct/EMT/raceway with armored Fiber-Optic cable, but only if explicit written permission is granted from both Owner Project Manager and Owner Technical Contact.

4.19.3) Patch Panels and Termination

Termination of Fiber-Optic cable at Fiber-Optic patch panels shall confirm to TIA-568-C. SC duplex connectors shall be used for all Single-mode fiber termination.

The highest level of workmanship and attention to detail shall be exercised during installation and termination of Fiber-Optic cable.

Only cable manufacturer compatible tools and materials such as crimpers, fan-outs, and connectors shall be used in terminating Fiber-Optic cable termination.

4.19.4) Splicing and Fusion Splicing

Where fusions splices of Fiber-Optic cable are specified, contractor shall use fusion splicing tool from same manufacturer as cable being fused, to insure optimal results. Each fusion splice shall be tested at point of fuse, and less than 0.1 dB

Mechanical splices of Fiber-Optic cable are not permitted.

4.20) Pathways and Spaces

4.20.1) Pathways

Cable pathways will be constructed of appropriate cable supports such as J-Hooks, Loop/Strap Cable Hangers, Basket Cable Tray, raceways, or conduits.

J-Hooks, Loop/Strap Cable Hangers, or Basket Cable Tray may be used to support cable above suspended-ceiling, where there is no requirement for a specific type of cable support at that location.

Cable supports installed above suspended-ceilings shall be supported from the building structure and not from the existing ceiling support cables, grid, rods, or acoustical tees. Cable supports installed above suspended-ceiling shall be installed below plenum partition, if enough space exists between ceiling and plenum partition. If insufficient space exists between ceiling and plenum partition to install cable supports, then alternate pathway or method must be proposed by Contractor and approved in writing by Owner.

Threaded support rods shall extend a minimum of one inch (1") below cable tray wherever space allows to accommodate extension hardware that may be need to be added in the future.

Conduit, cable tray, innerduct, and raceway installation shall be continuous and connected appropriately to all boxes, cabinets, and other pathway components. Manufacturer's fitting must be used for all transitions. Caps and gaskets shall be used to prevent dirt and moisture from entering installed conduit, innerduct, and raceway where appropriate. Nylon bushings shall be used on all stubs and points of connection to prevent sharp edges from damaging cable and pull tape.

Pathway shall be constructed with Owner's hostile environment in mind. Unless noted, cables must not be exposed when run below finished ceilings -- all cables shall be run within conduit, within raceway, in walls, or above ceilings. Cables run in Mechanical Rooms shall be run in conduit. Raceway may be used as an alternate path when it is desirable to avoid certain ceiling spaces, though any use of conduit or raceway not explicitly prescribed in the scope of work (if provided) and the original RFQ/RFP/Project must be approved in writing by Owner prior to bid submission.

Headroom shall be maintained when installing conduit, cable tray, raceway, J-Hooks, cable hangers, and cable.

4.20.1.1) Metallic Recessed-Mount Device Boxes

Metallic Recessed-Mount Device Boxes shall be generally used for Category 6 / 6A outlets on gypsum-board (sheetrock) walls, and Category 6A Wireless Access Point (WAP) and outlets installed in gypsum-board ceilings – when either are installed during new construction or during gut-renovations.

During new construction and gut-renovations, Metallic Recessed-Mount Device Box shall be installed with 3/4-inch EMT run to box while finished wall is not yet built, and structure/studs are exposed. The 3/4-inch EMT shall stub to nearest accessible cable tray or nearest accessible ACT/open ceiling.

Cables shall not be installed in Metallic Recessed-Mount Device Boxes until gypsum-board has been installed. Once cables are installed and until room has been completely painted, a temporary cover shall be placed on box to prevent paint and primer from contaminating cable jacket. If ceiling is to be sprayed or painted, then cables above ceiling shall be temporarily wrapped with protective plastic covering to prevent paint and primer or other spray-on materials from contaminating cable jacket

4.20.1.1.1) General Category 6 / 6A outlets

Metallic Recessed-Mount Device Boxes for general Category 6 outlets shall be reduced with single-gang raised reducing ring, unless otherwise noted.

4.20.1.1.2) Category 6A for Wireless Access Point (WAP) or Surveillance Camera installation in gypsum-board ceilings

The following assembly shall be mechanically fastened together:

4.20.1.1.2.1) One (1) Metallic Recessed-Mount Device box (facing downward),
4.20.1.1.2.2) One (1) Flat single-gang reducing ring below,
4.20.1.1.2.3) One (1) Standard Category 6A faceplate, specified herein, facing downward,
4.20.1.1.2.4) One (1) Galvanized steel extension collar that is 2-1/8” deep x 4-inch wide x 4-inch high, and
4.20.1.1.2.5) One (1) Single-gang raised reducing ring (facing downward)

Metallic Recessed-Mount Device box in the above assembly shall be supported in ceiling by 8-inch max depth adjustable height box hanger, specified herein.

WAP may be connected with assembly in place, and WAP bracket mounted to single-gang raised reducing ring, following all priming and painting.

Raised reducing ring and extension collar shall be removable to permit removing faceplate, in order to be able to service Category 6A outlets.

4.20.1.2) Metallic Surface-Mount Device Boxes

Metallic Surface-Mount Device Boxes shall be used for Category 6 / 6A outlets in industrial areas, in Mechanical Equipment Rooms, and above ACT ceilings.

Metallic Surface-Mount Device Boxes shall be reduced with single-gang flat reducing ring, unless otherwise noted.

4.20.1.3) Non-Metallic Surface-Mount Device Boxes

Non-Metallic Surface-mount device boxes shall be constructed entirely of PVC, and shall be ivory in color.

NM surface-mount device boxes shall be 2 7/8” inches deep, and shall be single-gang, 3 inches wide by, 4 7/8” high.

NM surface mount boxes shall be of same manufacturer and compatible with approved raceway, and shall have knockouts/twist-outs for selected raceway model.

NM surface-mount device boxes shall be designed to be secured to wall mechanically using screws or bolts.

4.20.1.4) J-Hooks and Loop/Strap Cable Hangers

J-Hooks and/or Loop/Strap Cable Hangers shall be installed no more than six feet apart. When transitioning from J-Hook to another approved cable support, conduit, or through a penetration, then Cable Hanger shall be at most four feet from alternate cable support or conduit.

4.20.1.5) Basket Cable Tray and Ladder Cable Tray

Contractor shall install anchors, threaded rod, clamps and bars as needed to properly install and secure cable tray. Contractor shall use support methods, splice methods, fittings, and materials that are recommended by the cable tray manufacturer to continuously connect sections of cable tray and fittings. Cable tray shall be bonded per NEC and manufacturer standards and to the same ground as equipment rack. Contractor shall provide a minimum 12-inch working clearance above and on either side of encompassing cable tray to permit access for installing and maintaining cables. Contractor shall install cable tray in accordance with recognized industry practices, and in accordance with all of the following:

4.20.1.5.1) NEMA VE-2 2000
4.20.1.5.2) NEC and applicable portions of NFPA 70
4.20.1.5.3) NECA’s “Standards of Installation” pertaining to general electrical installation practices

4.20.2) Avoidance of Electromagnetic Interference Sources

All conduit, cable tray, and cables containing metallic elements -- including, but not limited to dielectric/non-metallic cable housed in metallic armor -- shall be routed in such a way as to maintain the following distances from sources of electromagnetic interference:

6 inches from power lines 2KVA or less.
12 inches from fluorescent lighting such as fluorescent/HID lamps
60 inches from transformers, motors, or power lines of 5KVA and up

4.20.3) Innerduct

All cables running within conduit of 3” (three inch) or greater outer diameter that is at 0% fill (unused) initially, and is expected to be filled to less than 25% upon completion of job must be run within innerduct supplied and installed by Contractor.

When installing innerduct in an unused conduit, Contractor shall simultaneously pull the maximum number of 1” and/or 1.25” diameter innerduct capable of fitting in the conduit, such that the maximum number of innerducts is provided for future use.

Pull tape shall be installed in each innerduct.

4.20.4) Conduit

Conduit shall be run in parallel, wherever practical, and secured to existing steel channel and steel beams using conduit straps or clamps. Existing steel channel or trapeze may be used if additional load can be supported at appropriate safety factor.

Unless specified, conduit fill ratio must never exceed 40% or the fill ratio specified by the firestopping assembly, whichever is lesser. For conduit of over 50 feet of length with no intermediate pull point, the fill ratio must never exceed 30%.

There shall not be more than 100 feet in length of conduit between pull boxes or conduit ends. Each 30-degrees of bend shall be considered as 10 feet of conduit when determining pull box placement.

There shall not be between two pull boxes or conduit ends more than a 180 degree cumulative total of bends.

Pull boxes shall not be used in place of bends. Conduit ends must be aligned in parallel on opposite sides within each pull box, such that they permit a straight pull through a pull box. Angled pulls and U-pulls through pull boxes are not permitted.

Example:

A length of conduit originating from a pull box, containing one 90-degree bend (counted as 30 feet of a 100 foot total budget), must not contain more than 70 feet of straight conduit (30 + 70 = 100 feet) before terminating in a pull box.

4.20.5) Raceway

Surface-mount raceway (raceway) shall be provided and installed in such a manner to optimize aesthetics. Appropriate raceway fittings such as unions, bends, and end-caps must be provided and installed by Contractor. In-field mitering of raceway in lieu of using fittings is not permitted.

Raceway and fittings used for data/telecommunications cable must be appropriate for a Category 6 / 6A installation, maintaining minimum bend radius and other properties of the Category 6 / 6A cable contained within.

Raceway fill shall not exceed 80% of the raceway manufacturer's recommendations, such that 20% spare capacity remains available in the raceway for future use without exceeding manufacturer's recommendations.

Raceway shall be mechanically mounted as per manufacturer's instructions using screws, anchors, and/or bolts. Raceway shall not be mounted with adhesive.

Raceway shall run vertically near the corners of room and horizontally at same height of data/telecommunications outlets. Raceway shall not run near the middle of walls. Installed raceway shall not cover or prevent access to any existing service, outlet, control, or access panel. Raceway covers must be installed and secured properly.

4.20.6) Pulling Tension

No cable shall be installed with a pulling tension exceeding the maximum recommended by the manufacturer. Pulling tension shall be monitored with a tension gauge (tensiometer) to ensure the maximum tension rating of cable is not exceeded.

A suitable breakaway link (swivel) should be used as a failsafe to insure maximum pulling tension of cable is not exceeded. Breakaway link/swivel shall be used as a failsafe in this respect, and not as a primary means of controlling cable tension.

If multiple cables are to be pulled at one time, the Contractor shall make the necessary allowances to back off the pulling tension of the bundle.

As necessary, for cable pulls in conduit, the Contractor shall use only an approved lubricant compatible with the cable outer jacket insulation, innerduct, and pull tape.

4.20.7) Pull tape

Contractor shall install new pull tape in all conduits 2" or greater in trade size installed by contractor, and in all pre-existing conduits 2" or greater in trade size utilized by Contractor.

Pull tape installed in conduits and innerducts shall be lubricated with a lubricant appropriate for the selected pull tape, innerduct, and installed cable, as necessary to prevent burn-through of pull tape.

All installed pull tape shall be tied securely on both ends of the conduit to a fixed object that is attached to or part of the conduit system. Pull tape installed in a conduit or cable tray shall include 4' of slack on both ends. Slack shall be rolled and tied neatly.

4.20.8) Pull Cord

Contractor shall install pull cord in all conduits less than 2" in trade size installed or utilized by Contractor, all raceways installed or utilized by Contractor, all cable tray installed or utilized by contractor, and all walls fished by Contractor.

4.20.9) Ceiling Access Hatches

Plaster and gypsum board shall be removed, and finished ceiling structural support cut and reinforced as required in each location in order to properly install Ceiling Access Hatches.

Finished ceiling shall be temporarily supported using suitable jack post as required during installation of Ceiling Access Hatches.

4.20.10) Bend Radii

4.20.10.1) Conduits

The minimum inside radius for conduits 2-inch in diameter or less shall be six times the internal diameter of the conduit. Conduits having diameter greater than two inches shall have a minimum inside radius of ten times the internal diameter of the conduit.

4.20.10.2) Basket Cable Tray and Ladder Cable Tray

Radius shields shall be installed at all cable tray lateral bends, and must maintain a minimum 6 inch radius in interior of tray.

Waterfall/radius-drop fittings shall be installed at all cable tray vertical transitions, where cables transition more than six inches (6”) vertically without support. Waterfall/radius-drop fittings shall have minimum of 3 inch radius.

4.20.10.3) Cables

All cables shall be installed with a bend radius greater than or equal to the bend radius recommended by the cable manufacturer to maintain cable rating and transmission properties.

As necessary, cable guides shall be used to maintain recommended bend radii during pulling.

Cables shall be secured using prescribed cable fasteners so as to prevent migration and maintain proper bend radius after initial installation.

Contractor shall secure the cable bundle at each J-Hook and Loop/Strap Cable Hanger with a prescribed cable fastener.

4.21) Labeling

All outlets, patch panel ports, cable ends, and firestopping locations shall be clearly labeled according the Cable Installation Labeling Convention.

A blank Circuit Endpoint Table Spreadsheet (Microsoft Excel spreadsheet form) shall be provided by Owner Technical Contact upon request by Contractor. The Circuit Endpoint Table Spreadsheet can be used as an aid for quickly creating labels that are in compliance with the Cable Installation Labeling Convention.

Contractor must complete and submit an electronic copy of the Circuit Endpoint Table Spreadsheet based on as-built termination locations and the Cable Installation Labeling Convention.

Following receipt of Contractor submittal, Owner Technical Contact shall review and respond to submittal with either “APPROVED”, “APPROVED AS NOTED”, or “REJECTED”. Notes shall direct Contractor specifically and/or generally on corrections that must be made to the spreadsheet before it is resubmitted by Contractor.

4.21.1) Cable Installation Labeling Convention

The Cable Installation Labeling Convention shall be used to identify all components of installed systems, including but not limited to equipment, cable, termination points (such as modular jacks, patch panel ports, or other connectors), and firestop installation, in all documentation, test results, and labeling.

Cable Installation Labeling Convention is an ANSI/TIA-606-A -compatible identification standard.

There are a total of six fields in each name: five identifying fixed-length fields used to identify *where* an item is located and *what* the item is, followed by one *variable length* field used to identify a port on the item.

These six fields can be split up into two parts: the first part identifying a general location and the second part describing specific location of and on an object within that location.

4.21.1.1) General Location Fields

The first three fields describe the general location of an item. This will describe the building, room, suite, and possibly a general location within a room (e.g. a Rack or Cabinet within the room, grid coordinates within room, etc.). These three fields are a total of exactly eight characters in length (2+4+2).

1) Building Code field (two letters)

Examples of Building Code field:
“NS” for Natural Sciences
“MF” for the Center for Media, Film, and Theater
“MT” for Maintenance Tunnels

2) Room or Suite Number field (four digits, typically)

Examples of Room or Suite Number field:
“1023” for room number 1023
“L120” for room number L120
“0055” for apartment 55

3) Location in Suite/Room field (letter+digit, or "-" for either/both)

Use "-" (hyphen) in place of letter or digit if there is no pertinent information for either, and "--" (two hyphens) if no pertinent information for both.

Examples of Location in Suite/Room field:
"K6" for network and server room grid coordinates,
"-2" for rack #2 in a room with three racks in it,
"L-" for living room in a residence suite,
"A-" for bedroom A in a residence suite,
"B-" for bedroom B in a residence suite,
or a placeholder of two hyphens ("--") if not pertinent.

An optional line break (newline/carriage return) may appear after the three General Location Fields where label does not allow all six fields to be legibly printed on a single line.

4.21.1.2) Item Identification

The last three fields identify a specific location of a particular type of item within the general location; specify the unique identification number of that particular type of item in the location; and specify a particular port on that particular item. This part contains three fields and totals four or more characters in length:

4) Item Type Code field (two letters)

Examples of Item Type Code field:
"MJ" for Modular Jack faceplate
"PP" for Patch Panel
"MP" for Modular Plug (Single-Connector Modified Permanent Link)

5) Index number of Item within room or rack field (two digits)

Examples of Item within room or rack field:
"03" for the third item of its type in the location

6) [Optional] Port Number field**: (optional: "-"+ variable length and content)

** The Index Number field is always separated from the Port Number field by a hyphen (e.g. "03-9" or "03-4" or "3-C")

Always pad numeric fields that may be two digits with a leading zero (e.g. "-00", "-01", ... "-10", "-11", etc.), when there is only one significant digit (0-9), in order to permit ease of reading in table format and ease of electronic searching.

Always pad alphabetic data that may be two letters with extra leading hyphen (e.g. "—A", "—B", … "-AA", "-AB", etc.), when there is only one significant letter (A-Z), in order to permit ease of reading in table format and ease of electronic searching.

Examples of Item within room or rack field:
"-4" for modular jack "4", where jacks are numbered 1-4
"-09" for panel port "9", where ports are numbered 1-24
"-C" for device port "C", where ports are numbers A-Z
"—C" for device port "C", where ports numbered A-ZZ
"-B5" for Fiber-Optic patch panel six-pack "A" port "5"
"-B05 for Fiber-Optic patch panel twelve-pack "A" port "5"

[See illustration next page]

Building Code

Format

Two UPPERCASE alphabetic characters

Contents

Code as follows:

AD	Administration
CN	Campus Center North
CS	Campus Center South
DA	Dance
FM	Facilities Management
HU	Humanities
LI	Library
MF	Ctr for Media Film and Theater
MU	Music
NM	Neuberger Museum
NS	Natural Sciences
SS	Social Science
ST	Student Services Building
MS	Mechanical Services below ST
MT	Maintenance Tunnel
PA	Performing Arts Center
PE	Physical Education
VA	Visual Arts
R*	Residence area "*" (e.g. "RA") Use Dormitory or Apartment street code assigned by ResLife

Room or Suite Number

Format

(Typically) Four numeric characters, or as according to building plans. Pad with leading zeros if plans indicate less than 4-digit room number.

Contents

Room number in four-digits
(e.g. "SS0021")
OR

Apartment building/unit numbers
(e.g. "RG0053")

Notes

This field MUST be padded with leading zeros to create four-digit number.

Alphabetical character in room identifier shall be removed and moved to next field ("Sub-Room")

Sub-Room / Cabinet

Format

One UPPERCASE alphabetic character or a hyphen, followed by one numeric character or a hyphen

Contents

Sub-room in suite (A, B, C, or "L" for living room) or hyphen
(e.g. "RJ0041**A**-")
OR

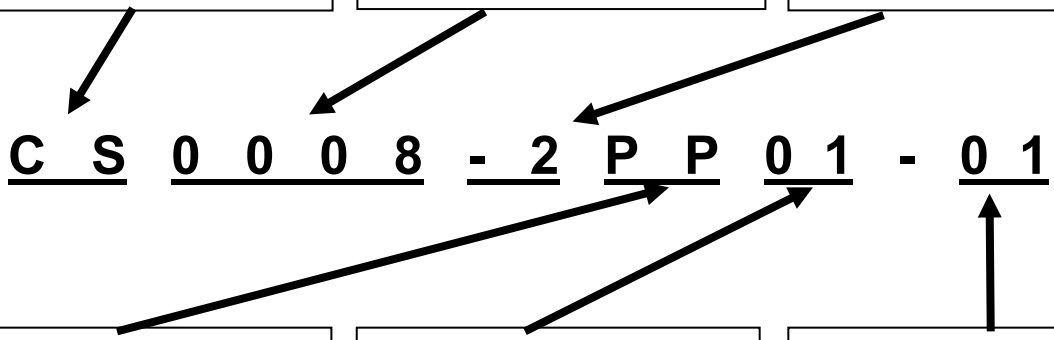
Coordinates or serial number of cabinet or rack in room
(e.g. " SS0027F**5**")

OR

Two hyphens, if nothing relevant
(e.g. "LI1014**--**")

Notes

Hyphens ("-") can be used in one or both characters of this field if field information is irrelevant (e.g. a simple, single room) in order to make this field exactly two characters in length.



Item Type Code

Format

Two UPPERCASE alphabetic characters

Contents

Code as follows examples below:

MJ	Modular Jack faceplate/box
PP	Patch Panel
MP	Modular Plug (SCMPL/OSP)
FL	Firestopping location
SV	Server
WS	Workstation
SW	Switch
RO	Router
MC	Media Converter
PS	Power Supply / UPS
TE	Terminal
MO	Modem
AB	AB, ABC, ABCD Switch
KV	KVM Switch
AP	Wireless Access device
VS	Video Surveillance
AC	Access Control (reader/sensor)

etc…

Item Index Number

Format

Two numeric characters

Contents

Unique index number of item in the room, cabinet, or rack

Notes

Index numbers shall unless otherwise specified begin at "01" for equipment of a certain type located at the top of a rack or cabinet and increment for lower equipment of same type in same rack or cabinet.

Port Number

Format

Optional field. May contain any number of characters in any format. Possible values depend on item.

Contents

Used to specify port number

Notes

Always separate from previous field with a hyphen. Use values as labeled by manufacturer on an item, if available (e.g. a certain manufacturer's faceplate may have molded plastic labels of "A", "B", "C", while another might use "1", "2", "3"). If manufacturer does not print labels on ports, then number ports starting at one (1) on top left and proceeding all the way to right, and then down.

4.21.2) Data/telecommunications Outlet Labels

Contractor shall label data/telecommunications outlet faceplates with appropriate far-end (patch panel) termination address for each modular jack, as in the following example:

Example:

NS2055A-
PP01-24

(Showing room NS2055, Cabinet “A”, Patch Panel #01, port 24)

Where a label insert slot or space is available on faceplate, insert a compatible non-adhesive label, and provide and install manufacturer-supplied clear plastic cover over label slot.

4.21.3) Patch Panel Labels

Contractor shall label patch panel ports using compatible labels and label covers.

Contractor shall label patch panel ports with appropriate far-end (Outlet) termination address as in the following example:

Example:

NS1010B-
MJ06-4

(Showing room “NS1010B”, Modular Jack faceplate “06”, Jack “4”)

Where a label insert slot or space is available on patch panel, insert a compatible non-adhesive label, and provide and install manufacturer-supplied clear plastic cover over label slot.

4.21.4) Cable Marking Labels

All cables shall have wrap labels affixed to cable at both ends between three inches (3”) and five inches (5”) from each termination point. The three-inch space is very important to permit future re-termination of cable without need to remove and re-label each cable.

Contractor shall label each cable end with the appropriate near and far-end termination address, as in the following example:

Example:

NS1010B-MJ06-4
NS2055A-PP01-24

(Label on outlet-side of cable run between NS1010B-MJ06-4 and NS255A-PP01-24)

NS2055A-PP01-24
NS1010B-MJ06-4

(Label on panel-side of cable run between NS1010B-MJ06-4 and NS255A-PP01-24)

If label media does not permit all text on a single label, then applying two (2) labels to cable shall be acceptable, such that text read left-to-right reads in the same order.

4.21.5) Labeling of Firestopping Locations

Contractor shall neatly and legibly mark firestopping locations with firestopping location name, according to this convention, using permanent marker on or adjacent to the firestopping material, in a conspicuous location.

If Contractor cannot mark firestopping location name on firestopping materials, then Contractor shall mark firestopping location name on the firestopping barrier or assembly, directly adjacent to firestopping material.

Contractor shall consider aesthetics of surrounding area when labeling/marking firestopping locations.

Example:

4.21.6) Fiber-Optic Cable Warning Labels

Fiber-Optic cable warning labels shall be placed on all innerduct containing Fiber-Optic cable, within two feet of location where innerduct enters or exits conduit.

4.22) Safety and Code Requirements

Contractor will adhere to all applicable local, state, and federal laws and codes.

4.23) Firestopping

Contractor shall provide and install Firestopping materials at all penetrations of fire-rated barriers, both existing and created by Contractor, through which any cable, conduit, or sleeve installed by the Contractor passes.

Contractor shall provide and install Firestopping materials in the interior of all conduits, sleeves, and raceways that are installed or utilized by Contractor and that traverse a fire-rated barrier. Threaded metal caps may be utilized, as per applicable codes, to close-off unused conduits and/or sleeves.

Firestopping materials shall be installed according to code, according to certification listing, and according to firestopping manufacturer instructions. Firestopping materials used must meet the hourly rating of the floor or wall penetrated.

4.23.1) Firestopping product type

The type of firestopping utilized in each case shall be determined based on this Specification, on firestopping manufacturer instructions, on code, on certification listing, and on application including but not limited to:

4.23.1.1) Barrier or assembly in which the firestopping is being installed
4.23.1.2) Size of penetration
4.23.1.3) Materials (e.g. cables, conduit, Basket Cable Tray, etc.) that shall traverse or adjoin the penetration

4.23.2) Fire Rated Pathway Devices

4.23.2.1) Fire Rated Pathway Devices shall be the preferred method of firestopping and shall be installed in all locations where frequent cable moves, add-ons and changes will occur.
4.23.2.2) Cable trays shall terminate at each barrier and resume on the opposite side such that cables pass independently through fire-rated pathway devices. Cable tray shall be rigidly supported independent from fire-rated pathway devices on each side of barrier.
4.23.2.3) Install through-penetration firestop systems in accordance with Performance Criteria and in accordance with the conditions of testing and classification as specified in the published design.

4.23.3) Firestop Putty, Firestop Caulk, and Firestop Foam

Where it is not practical to use a Fire Rated Pathway Device, Firestop Putty/Caulk/Foam may be used.

4.23.3.1) Before beginning installation, verify that substrate conditions previously installed under other sections are acceptable for installation of firestopping in accordance with manufacturer’s installation instructions and technical information.
4.23.3.2) Surfaces shall be free of dirt, grease, oil, scale, laitance, rust, release agents, water repellants, and any other substances that may inhibit optimum adhesion.
4.23.3.3) Provide masking and temporary covering to protect adjacent surfaces.

4.23.4) Firestopping Pillows

Pillow-type firestopping may be used in conduits if and where code permits. If firestopping pillows are utilized, then all firestopping pillow manufacturer instructions and certification listing must be adhered to, including but not limited to those pertaining to compression ratio, cable bundling, and hose-stream dislodgement prevention. Proper compression ratio must be maintained as per certification listing and manufacturer instructions. Cable bundles must be shaped properly as per certification listing and manufacturer instructions in order to prevent smoke penetration between cables. Wire mesh or other material must be installed on larger openings to prevent dislodgement of pillow as per certification listing and manufacturer instructions.

Contractor shall submit compression ratio calculations to the Owner Project Manager for each penetration in which a firestopping pillow is used by Contractor, including:

4.23.4.1) any penetration in which a new firestopping pillow is installed by Contractor
4.23.4.2) any existing penetration used by contractor in which an existing firestopping pillow has been disturbed by Contractor
4.23.4.3) any penetration where a cable has been added or removed by Contractor

4.23.5) Firestopping of Data/Telecommunications Cabinet Penetrations

Contractor shall create and maintain fire, smoke, and watertight seal of firestopping for data/telecommunications cabinet penetrations.

4.24) Testing and Certification Requirements

4.24.1) Independent Testing and Certification Requirement

Contractor shall arrange to have a qualified 3rd-Party independent inspecting and testing agency perform field testing and submit certification and observation reports for each and every cable installed by Contractor, including 100% of installed Fiber-Optic cable strands, 100% of installed Category 6 / 6A Cable permanent links, 100% of installed telephone feeder/trunk cable pairs, and 100% of installed security/surveillance cables.

Field test certification and observation reports shall indicate and interpret test results relative to compliance with performance requirements of the installed systems, and as defined herein.

This Independent Testing and Certification Requirement may at the option of Owner be waived in the Scope of Work (if provided) and the original RFQ/RFP/Project or in a Transmittal signed by both the Owner Project Manager and Purchase College Technical Contact. If the Independent Testing and Certification Requirement is waived in such a way, then all certification and testing requirements shall be maintained save that for the requirement of having an independent 3rd-Party perform the testing and certification: Contractor shall submit field test certification reports, as defined herein, from a qualified employee for 100% of cables installed by Contractor.

4.24.2) All Testing to be witnessed and/or reviewed by Owner

The Owner Project Manager and the Owner Technical Contact shall be invited to witness and/or review field-testing.

The Owner Project Manager and the Owner Technical Contact shall be notified of the start date of the testing phase five (5) business days before testing commences.

The Owner Project Manager will select a random sample of 5% of the installed cables. Owner may test these randomly selected cables. The results obtained may be compared to the data provided by the installation contractor. If more than 2% of the sample results differ in terms of the pass/fail determination, then Contractor under supervision of Owner Technical Contact’s representative shall repeat 100% testing at no cost to the Owner.

4.24.3) Ground / Bond Testing

Test all installed or modified grounded components of cable systems as per NFPA 70B, Chapter 18 to ensure electrical continuity of bonding and grounding connections, and to demonstrate compliance with specified maximum grounding resistance.

4.24.4) Category 6 / 6A Cable Testing

100% of the Category 6 / 6A cables in the installation shall be tested in accordance with the Telecommunications Industry Association (TIA) standard ANSI/TIA/EIA-568-C, and with this Specification.

The installed twisted-pair links shall be tested from the patch panel or termination block, to the data/telecommunications outlet against the “Permanent Link” performance limits specification as defined in ANSI/TIA/EIA-568-C.

4.24.4.1) Technician Qualifications

All tests shall be executed by trained technicians who have successfully attended an appropriate training program and have obtained a certificate as proof thereof. Appropriate training programs include but are not limited to installation certification programs provided by BICSI or the ACP.

4.24.4.2) Test Equipment Accuracy

The test equipment (tester) shall comply with or exceed the accuracy requirements for enhanced level II (Level II-E) field testers as defined in TIA-568; Annex I: Section I.4. The tester including the appropriate interface adapter must meet the specified accuracy requirements. The accuracy requirements for the permanent link test configuration (baseline accuracy plus adapter contribution) are specified in Table I.4 of Annex I of TIA/EIA-568-B.2. (Table I.5 in this TIA document specifies the accuracy requirements for the Channel configuration.)

The tester shall be within the calibration period recommended by the vendor in order to achieve the vendor-specified measurement accuracy. The contractor shall provide proof that the interface has been calibrated within the period recommended by the vendor.

The tester interface adapters must be of high quality and the cable shall not show any twisting or kinking resulting from coiling and storing of the tester interface adapters. In order to deliver optimum accuracy preference is given to a permanent link interface adapter for the tester that can be calibrated to extend the reference plane of the Return Loss measurement to the permanent link interface. To ensure that normal handling on the job does not cause measurable Return Loss change, the adapter cord cable shall not be of twisted-pair construction.

4.24.4.3) The Pass or Fail condition for the link-under-test is determined by the results of the required individual tests (detailed in “Performance Test Parameters”, below). Any Fail, Fail*, or marginal pass (“Pass*”) result yields a Fail for the link-under-test. In order to achieve an overall Pass condition, the results for each individual test parameter must pass - the accuracy margin of the testing device.

A Pass or Fail result for each parameter is determined by comparing the measured values with the specified test limits for that parameter. The test result of a parameter shall be marked with an asterisk (*) when the result is closer to the test limit than the accuracy of the field tester. The field tester manufacturer must provide documentation as an aid to interpret results marked with asterisks. (Reference TIA-568; Annex I: Section I.2.2)

4.24.4.4) Performance Test Parameters

The test parameters for Category 6 / 6A are defined in ANSI/TIA/EIA standard TIA-568-B.1; The test of each Category 6 / 6A link shall contain all of the following parameters as detailed below. In order to pass the link test all measurements must meet or exceed the limit value determined in the TIA-568.1 standard at each frequency in the range as prescribed by the standards referenced herein.

All test measurement points at all frequency ranges required are to be recorded in the test results information as detailed in Section 4.25.1.3) ("Database Detailed Information")

4.24.4.4.1) Wire Map [as defined in TIA/EIA-568-B.1]

4.24.4.4.2) Length [as defined in TIA/EIA-568-B.1]

4.24.4.4.3) Insertion Loss (Attenuation) [as defined in TIA/EIA-568-B.1]

4.24.4.4.4) NEXT Loss, pair-to-pair [as defined in TIA/EIA-568-B.1]

4.24.4.4.5) PSNEXT Loss [as defined in TIA/EIA-568-B.1]

4.24.4.4.6) ELFEXT Loss, pair-to-pair [as defined in TIA/EIA-568-B.1]

4.24.4.4.7) PSELFEXT Loss [as defined in TIA/EIA-568-B.1]

4.24.4.4.8) Return Loss [as defined in TIA/EIA-568-B.1]

4.24.4.4.9) ACR (Attenuation to crosstalk ratio) [This parameter is not demanded by the standards but may be required in order to obtain the premise wiring vendor's warranty. Premise wiring vendor's parameters shall prevail.]

This calculation yields 12 combinations – six from each end of the link.

Test results shall identify the wire pair combination that exhibits the worst-case margin and the wire pair combination that exhibits the worst value for ACR.

These wire pair combinations must be identified for the tests performed from each end. Each reported case shall include the frequency at which it occurs as well as the test limit value at this frequency.

4.24.4.4.10) PSACR [This parameter is not required by the standards but may be required in order to obtain the premise wiring vendor's warranty. Premise wiring vendor's parameters shall prevail.]

This calculation yields 8 combinations – one for each wire pair from both ends of the link.

Test results shall identify the wire pair that exhibits the worst-case margin and the wire pair that exhibits the worst value for PSACR. These wire pairs must be identified for the tests performed from each end. Each reported case shall include the frequency at which it occurs as well as the test limit value at this frequency.

4.24.4.4.11) Propagation Delay [as defined in TIA/EIA-568-B.1; Section 11.2.4.10]

4.24.4.4.12) Delay Skew [as defined in TIA/EIA-568-B.1]

4.24.4.4.13) DC Loop Resistance [as defined by TIA/EIA-568-C.2]

4.24.4.4.14)DC Resistance Unbalance within a pair [as defined by TIA/EIA-568-C.2]

4.24.5) Telecommunications Feeder Cable Testing

100% of the Category 3 cables in the installation shall be tested in accordance with the Telecommunications Industry Association (TIA) standard ANSI/TIA/EIA-568-B and with this Specification.

All pairs of the installed Telecommunications Feeder Cable shall be tested and shall be confirmed meet or exceed Category 3 specification as per TIA-568-B.

The installed Telecommunications Feeder Cable shall be tested from the telecommunications feeder patch panel, to the MDF connection block against performance limits specification as defined in ANSI/TIA/EIA-568-B.Technician Qualifications

All tests shall be executed by trained technicians who have successfully attended an appropriate training program and have obtained a certificate as proof thereof. Appropriate training programs include but are not limited to installation certification programs provided by BICSI or the ACP (Association of Cabling Professionals).

4.24.5.1) Test Equipment Accuracy

The test equipment (tester) shall comply with or exceed the accuracy requirements for enhanced level II (Level II-E) field testers as defined in TIA-568; Annex I: Section I.4. The tester including the appropriate interface adapter must meet the specified accuracy requirements

The tester shall be within the calibration period recommended by the vendor in order to achieve the vendor-specified measurement accuracy. The contractor shall provide proof that the interface has been calibrated within the period recommended by the vendor.

The tester interface adapters must be of high quality and the cable shall not show any twisting or kinking resulting from coiling and storing of the tester interface adapters. I

4.24.5.2) The Pass or Fail condition for the link-under-test is determined by the results of the required individual tests. Any Fail or Fail* result yields a Fail for the link-under-test. In order to achieve an overall Pass condition, the results for each individual test parameter must Pass or Pass*.

A Pass or Fail result for each parameter is determined by comparing the measured values with the specified test limits for that parameter. The test result of a parameter shall be marked with an asterisk (*) when the result is closer to the test limit than the accuracy of the field tester. The field tester manufacturer must provide documentation as an aid to interpret results marked with asterisks.

4.24.5.3) Performance Test Parameters

The test parameters for Category 3 are defined in ANSI/TIA/EIA standard TIA-568-B; The test of each Category 3 link shall contain all parameters as required by TIA-568-B for Category 3 installed permanent link. In order to pass the link test all measurements must meet or exceed the limit value determined in the TIA-568.B standard at each frequency in the range from 1 MHz through 16 MHz.

4.24.6) Fiber-Optic Cable Testing

This Section includes the minimum requirements for the test certification and administration of backbone and horizontal optical fiber cabling.

Contractor shall notify the Owner Project Manager and the Owner Technical Contact of any additional tests that are deemed necessary to guarantee a fully functional system as described under this Specification. The contractor shall carry out and record any additional measurement results at no additional charge.

4.24.6.1) Testing Scope

4.24.6.1.1) Testing shall be carried out in accordance with this Specification. This includes testing the attenuation and polarity of the installed cable plant with an optical loss test set (OLTS) and the installed condition of the cabling system and its components with an optical time domain reflectometer (OTDR). The condition of the fiber end faces shall also be verified.

4.24.6.1.2) Testing shall be performed on each cabling link (connector to connector).

4.24.6.1.2.1) Testing shall not include any active devices or passive devices within the link or channel other than cable, connectors, and splices, i.e. link attenuation does not include such devices as optical bypass switches, couplers, repeaters, or optical amplifiers.

4.24.6.1.3) All tests shall be documented including OLTS dual wavelength attenuation measurements for multimode and singlemode links and channels and OTDR traces and event tables for multimode and singlemode links and channels.

4.24.6.1.3.1) Documentation shall also include optical length measurements and pictures of the connector endface.

4.24.6.2) Quality Assurance

4.24.6.2.1) All testing procedures and field-test instruments shall comply with applicable requirements of:

4.24.6.2.1.1) ANSI Z136.2, ANS For Safe Use Of Optical Fiber Communication Systems Utilizing Laser Diode And LED Sources

4.24.6.2.1.2) ANSI/EIA/TIA 455 50B, Light Launch Conditions For Long-Length Graded-Index Optical Fiber Spectral Attenuation Measurements

4.24.6.2.1.3) ANSI/TIA/EIA-455-59A, Measurement of Fiber Point Discontinuities Using an OTDR

4.24.6.2.1.4) ANSI/TIA/EIA 455 60A, Measurement of Fiber or Cable Length Using an OTDR

4.24.6.2.1.5) ANSI/TIA/EIA 455 61A, Measurement of Fiber or Cable Attenuation Using an OTDR

4.24.6.2.1.6) ANSI/TIA/EIA 526 7, Optical Power Loss Measurements of Installed Singlemode Fiber Cable Plant

4.24.6.2.1.7) ANSI/TIA/EIA 526 14 A, Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant

4.24.6.2.1.8) ANSI/TIA/EIA-568-B.1, Commercial Building Telecommunications Cabling Standard, Part 1, General Requirements

4.24.6.2.1.9) ANSI/TIA/EIA 568 B.3, Optical Fiber Cabling Components Standard

4.24.6.2.1.10) TIA/EIA TSB-140, Additional Guidelines for Field-Testing Length, Loss and Polarity of Optical Fiber Cabling Systems

4.24.6.2.1.11) ANSI/TIA/EIA-606-A, Administration Standard for Commercial Telecommunications Infrastructure, in addition to the requirements specified by Owner.

4.24.6.2.2) Trained technicians who have successfully attended an appropriate training program, which includes testing with an OLTS and an OTDR and have obtained a certificate as proof thereof shall execute the tests. These certificates may have been issued by any of the following organizations or an equivalent organization:

4.24.6.2.2.1) Manufacturer of the Fiber-Optic cable and/or the Fiber-Optic connectors

4.24.6.2.2.2) Manufacturer of the test equipment used for the field certification

4.24.6.2.2.3) Training organizations (e.g., BICSI, A Telecommunications Association headquarters in Tampa, Florida; ACP [Association of Cabling Professionals™] Cabling Business Institute located in Dallas, Texas).

4.24.6.3) Submittals

Contractor shall supply the following to Owner Project Manager upon request:

4.24.6.3.1) Manufacturers catalog sheets and specifications for Fiber-Optic field-test instruments including optical loss test sets (OLTS; power meter and source), optical time domain reflectometer (OTDR) and inspection scope.

4.24.6.3.2) A schedule (list) of all optical fibers to be tested.

4.24.6.3.3) Sample test reports.

4.24.6.4) Acceptance of Test Results

4.24.6.4.1) Unless otherwise specified by the Owner Technical Contact, each cabling link shall be demonstrated via test result database to be in compliance with the test limits as specified in ANSI/TIA/EIA-568-B.1.

4.24.6.4.1.1) Optical loss testing

4.24.6.4.1.1.1) Backbone (multimode and singlemode) link

The link attenuation shall be calculated by the following formulas as specified in ANSI/TIA/EIA-568-B.1.

4.24.6.4.1.1.1.1) Link Attenuation (dB) = Cable_Attn (dB) + Connector_Attn (dB) + Splice_Attn (dB)
4.24.6.4.1.1.1.2) Cable_Attn (dB) = Attenuation_Coefficient (dB/km) * Length (Km)
4.24.6.4.1.1.1.3) Connector_Attn (dB) = number_of_connector_pairs * connector_loss (dB)
4.24.6.4.1.1.1.4) Maximum allowable connector_loss = 0.75 dB
4.24.6.4.1.1.1.5) Splice_Attn (dB) = number_of_splices * splice_loss (dB)
4.24.6.4.1.1.1.6) Maximum allowable splice_loss = 0.3 dB

4.24.6.4.1.1.1.7) The values for the Attenuation Coefficient (dB/km) as listed in referenced specifications.

4.24.6.4.1.1.2) Horizontal (multimode) link

4.24.6.4.1.1.2.1) The acceptable link attenuation for a multimode horizontal optical fiber cabling system is based on the maximum 90 m (295 ft) distance.

4.24.6.4.1.1.2.2) The horizontal link may be tested using a fixed upper limit for attenuation of 2.0 dB. This value is based on the loss of two (2) connector pairs, one pair at the telecommunications outlet/connector and one pair at the horizontal cross-connect, plus 90 m (295 ft) of optical fiber cable.

4.24.6.4.1.1.2.3) A horizontal link in an Open Office Cabling network with a consolidation point may be tested using a fixed upper limit for attenuation of 2.75 dB.

4.24.6.4.1.1.3) Centralized (multimode) link

4.24.6.4.1.1.3.1) The acceptable link attenuation for a multimode centralized optical fiber cabling system is based on the maximum 300 m (984 ft) distance.

4.24.6.4.1.1.3.2) The centralized link may be tested using a fixed upper limit for attenuation of 3.3 dB. This value is based on the loss of three (3) connector pairs, one pair at the telecommunications outlet/connector, one pair at the consolidation point and one pair at the horizontal cross-connect, plus 300 m (984 ft) of optical fiber cable.

4.24.6.4.1.1.3.3) A horizontal link in an Open Office Cabling network with a consolidation point may be tested using a fixed upper limit for attenuation of 4.1 dB.

4.24.6.4.1.2) OTDR testing

4.24.6.4.1.2.1) Reflective events (connections) shall not exceed 0.75 dB.

4.24.6.4.1.2.2) Non-reflective events (splices) shall not exceed 0.3 dB.

4.24.6.4.1.3) Magnified end face inspection

4.24.6.4.1.3.1) Fiber connections shall be visually inspected for end face quality.

4.24.6.4.1.3.2) Scratched, pitted or dirty connectors shall be diagnosed and corrected.

4.24.6.4.2) All installed cabling links and channels shall be field-tested and pass the test requirements and analysis as described in this Specification. Any link or channel that fails these requirements shall be diagnosed and corrected. Any corrective action that must take place shall be documented and followed with a new test to prove that the corrected link or channel meets performance requirements. The final and passing result of the tests for all links and channels shall be provided in the test results documentation in accordance with this Specification.

4.24.6.4.3) Acceptance of the test results shall be given in writing after the project is fully completed and tested in accordance with Contract Documents and to the satisfaction of the Owner.

Note: High Bandwidth applications such as 1000BASE-SX, 10GBASE-S, and FC1200 impose stringent channel loss limits. Where practical, certification shall consider loss length limits that meet maximum channel (transmitter to receiver) loss.

4.24.6.5) Optical Fiber Cable Tester Device Requirements

4.24.6.5.1) The field-test instrument shall be within the calibration period recommended by the manufacturer.

4.24.6.5.2) Optical loss test set (OLTS)

4.24.6.5.2.1) Multimode optical fiber light source
4.24.6.5.2.2) Provide dual LED light sources with central wavelengths of 850 nm (±30 nm) and 1300 nm (±20 nm)
4.24.6.5.2.3) Output power of –20 dBm minimum.
4.24.6.5.2.4) The light source shall meet the launch requirements of ANSI/EIA/TIA 455 50B, Method A. This launch condition can be achieved either within the field test equipment or by use of an external mandrel wrap (as described in clause 11 of ANSI/TIA/EIA-568-B.1) with a Category 1 light source.

4.24.6.5.3) Singlemode optical fiber light source

4.24.6.5.3.1) Provide dual laser light sources with central wavelengths of 1310 nm (±20 nm) and 1550 nm (±20 nm).
4.24.6.5.3.2) Output power of –10 dBm minimum.

4.24.6.5.4) Power Meter

4.24.6.5.4.1) Provide 850 nm, 1300/1310 nm, and 1550 nm wavelength test capability.
4.24.6.5.4.2) Power measurement uncertainty of ± 0.25 dB.

4.24.6.5.4.3) Store reference power measurement.
4.24.6.5.4.4) Save at least 100 results in internal memory.
4.24.6.5.4.5) PC interface (serial or USB).

4.24.6.5.5) Optional length measurement

4.24.6.5.5.1) It is preferable to use an OLTS that is capable of measuring the optical length of the fiber using time-of-flight techniques.

4.24.6.5.6) Optical Time Domain Reflectometer (OTDR)

4.24.6.5.6.1) Multimode OTDR
4.24.6.5.6.1.1) Wavelengths of 850 nm (± 20 nm) and 1300 nm (± 20 nm).
4.24.6.5.6.1.2) Event deadzones of 3.7 m maximum at 850 nm and 1300 nm.
4.24.6.5.6.1.3) Attenuation deadzones of 10 m maximum at 850 nm and 13 m maximum at 1300 nm.
4.24.6.5.6.1.4) Distance range not less than 2000 m.
4.24.6.5.6.1.5) Dynamic range at least 10 dB at 850 nm and 1300 nm

4.24.6.5.6.2) Singlemode OTDR
4.24.6.5.6.2.1) Wavelengths of 1310 nm (± 20 nm) and 1550 nm (± 20 nm).
4.24.6.5.6.2.2) Event deadzones of 3.5 m maximum at 1310 nm and 1550 nm.
4.24.6.5.6.2.3) Attenuation deadzones of 10 m maximum at 1310 nm and 12 m maximum at 1550 nm.
4.24.6.5.6.2.4) Distance range not less than 10000 m.
4.24.6.5.6.2.5) Dynamic range at least 10 dB at 1310 nm and 1550 nm

4.24.6.5.7) Fiber Microscope

4.24.6.5.7.1) Magnification of 200X or 400X for endface inspection.
4.24.6.5.7.2) Test equipment shall be capable of saving and reporting the endface image.

4.24.6.5.8) Integrated OLTS, OTDR and fiber microscope
4.24.6.5.8.1) Test equipment that combines into one instrument an OLTS, an OTDR and a fiber microscope may be used.

4.24.6.6) Administration

4.24.6.6.1) Administration of the documentation shall include test results of each fiber link and channel.

4.24.6.6.2) The test result information for each link shall be recorded in the memory of the field-test instrument upon completion of the test.

4.24.6.6.3) The test result records saved within the field-test instrument shall be transferred into a Microsoft Windows™-based database utility that allows for the maintenance, inspection and archiving of these test records.

4.24.6.7) Execution of Optical Fiber Cable Testing

4.24.6.7.1) All outlets, cables, patch panels and associated components shall be fully assembled and labeled prior to field-testing. Any testing performed on incomplete systems shall be redone on completion of the work.
4.24.6.7.2) All tests performed on optical fiber cabling that use a laser or LED in a test set shall be carried out with safety precautions in accordance with ANSI Z136.2.
4.24.6.7.3) Field-test instruments shall have the latest software and firmware installed.
4.24.6.7.4) Link and channel test results from the OLTS and OTDR shall be recorded in the test instrument upon completion of each test for subsequent uploading to a PC in which the administrative documentation (reports) may be generated.
4.24.6.7.5) Fiber endfaces shall be inspected at 200X or 400X magnification. 200X magnification is suitable for inspecting multimode and singlemode fibers. 400X magnification may be used for detailed examination of singlemode fibers. Scratched, pitted or dirty connectors shall be diagnosed and corrected.
4.24.6.7.5.1) Endface images shall be recorded in the memory of the test instrument for subsequent reporting.
4.24.6.7.6) Testing shall be performed on each cabling segment (connector to connector).
4.24.6.7.7) Testing shall be performed on each cabling channel (equipment to equipment) that is planned for use per the Owner's instructions.
4.24.6.7.8) Testing of the cabling shall be performed using high-quality test cords of the same fiber type as the cabling under test. The test cords for OLTS testing shall be between 1 m and 5 m in length. The test cords for OTDR testing shall be approximately 100 m for the launch cable and at least 25 m for the receive cable.
4.24.6.7.9) Optical loss testing
4.24.6.7.9.1) Backbone link
4.24.6.7.9.1.1) Multimode backbone links shall be tested at 850 nm and 1300 nm in accordance with ANSI/EIA/TIA-526-14A, Method B, One Reference Jumper or the equivalent method.
4.24.6.7.9.1.2) Singlemode backbone links shall be tested at 1310 nm and 1550 nm in accordance with ANSI/TIA/EIA-526-7, Method A.1, One Reference Jumper or the equivalent method.
4.24.6.7.9.1.3) Link attenuation does not include any active devices or passive devices other than cable, connectors, and splices, i.e. link attenuation does not include such devices as optical bypass switches, couplers, repeaters, or optical amplifiers.

4.24.6.7.9.1.4) Use the One Reference Jumper Method specified by ANSI/TIA/EIA-526-14A, Method B and ANSI/TIA/EIA-526-7, Method A.1 or the equivalent method. The user shall follow the procedures established by these standards or application notes to accurately conduct performance testing.

4.24.6.7.9.2) Horizontal (multimode) link

4.24.6.7.9.2.1) The horizontal optical fiber cabling link segments need to be tested at only one wavelength. Because of the short length of cabling, attenuation deltas due to wavelength are insignificant. The horizontal link shall be tested at 850 nm or 1300 nm in one direction in accordance with ANSI/EIA/TIA-526-14A, Method B, One Reference Jumper method or the equivalent method.

4.24.6.7.9.3) Centralized (multimode) link

4.24.6.7.9.3.1) The centralized optical fiber cabling link segments need to be tested at only one wavelength. Because of the short length of cabling, attenuation deltas due to wavelength are insignificant. The horizontal link shall be tested at 850 nm or 1300 nm in one direction in accordance with ANSI/EIA/TIA-526-14A, Method B, One Reference Jumper method or the equivalent method. Testing at 850 nm is recommended unless otherwise specified by the Owner.

4.24.6.7.10) OTDR Testing

4.24.6.7.10.1) Backbone, horizontal and centralized links shall be tested at the appropriate operating wavelengths for anomalies and to ensure uniformity of cable attenuation and connector insertion loss.

4.24.6.7.10.1.1) Backbone multimode: 850 nm and 1300 nm

4.24.6.7.10.1.2) Backbone singlemode: 1310 nm and 1550 nm

4.24.6.7.10.1.3) Horizontal multimode: 850 nm or 1300 nm

4.24.6.7.10.1.4) Centralized multimode: 850 nm or 1300 nm (850 nm recommended unless otherwise specified by the end user)

4.24.6.7.10.2) Each fiber link and channel shall be tested in one direction.

4.24.6.7.10.3) A launch cable shall be installed between the OTDR and the first link connection.

4.24.6.7.10.4) A receive cable shall be installed after the last link connection.

4.24.6.7.11) Magnified Endface Inspection

4.24.6.7.11.1) Fibers shall be inspected at 250X or 400X magnification. 250X magnification is suitable for inspecting multimode and singlemode fibers. 400X magnification may be used for detailed examination of singlemode fibers.

4.24.6.7.12) Length Measurement

4.24.6.7.12.1) The length of each fiber shall be recorded.

4.24.6.7.12.2) It is preferable that the optical length be measured using an OLTS or OTDR.

4.24.6.7.13) Polarity Testing

4.24.6.7.13.1) Paired duplex fibers in multi-fiber cables shall be tested to verify polarity in accordance with subclause 10.3 of ANSI/TIA/EIA 568 B.1. The polarity of the paired duplex fibers shall be verified using an OLTS.

4.24.7) Security/Surveillance Power Cable Testing

100% of the Security/Surveillance cables in the installation shall be tested.

All conductors of the installed Security/Surveillance cable shall be tested and shall be confirmed continuous.

The installed Security/Surveillance cable shall be tested from the point of termination, to the Security/Surveillance patch panel.

4.24.8) Additional Requirements

4.24.8.1) The test results documentation shall be available for inspection by the Owner Project Manager and the Owner Technical Contact during the installation period and shall be passed to the Owner Project Manager and the Owner Technical Contact representative within 5 working days of completion of tests on cabling served by a Communications Room or of backbone cabling. The installer shall retain a copy to aid preparation of as built information.

4.24.8.2) Circuit IDs reported by the test instrument shall match the Cable Marking Label on the patch panel end of the tested cable, in accordance with the Cable Installation Labeling Convention, described in this Specification.

4.25) Documentation

4.25.1) Category 6 / 6A Test Results

Contractor will supply test results from test equipment for all cables that Contractor installs.

The test results information for each link shall be recorded in the electronic memory of the field tester equipment upon completion of the test.

The test results records saved by the field tester shall be transferred into a Microsoft Windows™-based database utility that allows for the maintenance, inspection, archiving, and plain-text exporting of these test records. A guarantee must be made that the measurement results are transferred to the PC unaltered (i.e., “as saved in the field-test instrument”) and that these results cannot be modified at a later time. Testers that transfer the numeric measurement data from the tester to the PC in a non-printable format in this regard offer superior protection. The file format, CSV (comma separated value), does not provide adequate protection of these records and shall not be used.

The database for the completed job and all source tester data files shall be stored and delivered on CD-ROM prior to Owner acceptance of the tested cable. This CD-ROM shall include the software tools required to view, inspect, and print any selection of the test reports.

A paper hard copy shall be submitted, containing a test results summary of each installed link.

4.25.1.1) Hard Copy

A paper copy of the test results shall be provided that lists all the links that have been tested with the following summary information:

4.25.1.1.1) The identification of the link in accordance with the Cable Installation Labeling Convention, described in this Specification
4.25.1.1.2) The overall Pass/Fail evaluation of the link-under-test including the NEXT Headroom (overall worst case) number
4.25.1.1.3) The date and time the test results were saved in the memory of the tester

4.25.1.2) Database General Information

General Information to be provided in the electronic database with the test results information for each link:

4.25.1.2.1) The identification of the customer site as specified by Owner
4.25.1.2.2) The identification of the link in accordance with the Cable Installation Labeling Convention, described in this Specification
4.25.1.2.3) The overall Pass/Fail evaluation of the link-under-test
4.25.1.2.4) The name of the standard selected to execute the stored test results
4.25.1.2.5) The cable type and the value of NVP used for length calculations
4.25.1.2.6) The date and time the test results were saved in the memory of the tester
4.25.1.2.7) The brand name, model and serial number of the tester
4.25.1.2.8) The identification of the tester interface
4.25.1.2.9) The revision of the tester software and the revision of the test standards database in the tester
4.25.1.2.10) The test results information must contain information on each of the required test parameters that are listed in Section 0 (“Performance Test Parameters”) and as further detailed below under paragraph 4.25.1.3) (“Database Detailed Information”)

4.25.1.3) Database Detailed Information

The detailed test results data to be provided in the electronic database for each tested Category 6 / 6A link must contain the following information:

For each of the frequency-dependent test parameters, the minimum test results documentation shall be stored for each wire-pair or wire-pair combination as observed from each end of the link. The minimum test results documentation for each test parameter shall be in compliance with the information in Section 0 (“Performance Test Parameters”)

4.25.1.3.1) The name of the test limit selected to execute the stored test results
4.25.1.3.2) The name of the personnel performing the test
4.25.1.3.3) The date and time the test results were saved in the memory of the tester
4.25.1.3.4) The manufacturer, model and serial number of the field-test instrument
4.25.1.3.5) The version of the test software and the version of the test limit database held within the test instrument
4.25.1.3.6) Length: Identify the wire-pair with the shortest electrical length, the value of the length rounded to the nearest foot and the test limit value
4.25.1.3.7) Propagation delay: Identify the pair with the shortest propagation delay, the value measured in nanoseconds (ns) and the test limit value
4.25.1.3.8) Delay Skew**:** Identify the pair with the largest value for delay skew, the value calculated in nanoseconds (ns) and the test limit value
4.25.1.3.9) Insertion Loss (Attenuation): Minimum test results documentation as explained in Section 0 (“Performance Test Parameters”) for the wire pair with the worst insertion loss
4.25.1.3.10) Return Loss: Minimum test results documentation as explained in Section 0 (“Performance Test Parameters”). Identify as detected from each end of the link, the wire pair that exhibits the worst-case margin and the wire pair with the worst RL. Each reported case shall include the frequency at which it occurs as well as the test limit value at this frequency.
4.25.1.3.11) NEXT, ELFEXT, ACR: Minimum test results documentation as explained in Section 0 (“Performance Test Parameters”). Identify as measured from each end of the link, the wire pair combination that exhibits the worst case margin and the wire pair combination that delivers the worst case value. Each reported case shall include the frequency at which it occurs as well as the test limit value at this frequency.
4.25.1.3.12) PSNEXT, PSELFEXT, and PSACR: Minimum test results documentation as explained in Section 0 (“Performance Test Parameters”). Identify as detected from each end of the link, the wire pair that exhibits the worst-case margin and the wire pair with the worst value. Each reported case shall include the frequency at which it occurs as well as the test limit value at this frequency.
4.25.1.3.13) Link length, propagation delay, and delay skew shall also be reported for each wire pair as well as the test limit for each of these parameters.

4.25.2) Telecommunications Feeder Cable Test Results

Contractor will supply test results from test equipment for all Telecommunications Feeder Cables that Contractor installs.

The test results information for each pair of the installed Telecommunications Feeder Cable shall be recorded in the electronic memory of the field tester equipment upon completion of the test.

The test results records saved by the field tester shall be transferred into a Microsoft Windows™-based database utility that allows for the maintenance, inspection, archiving, and plain-text exporting of these test records. A guarantee must be made that the measurement results are transferred to the PC unaltered (i.e., “as saved in the field-test instrument”) and that these results cannot be modified at a later time. Testers that transfer the numeric measurement data from the tester to the PC in a non-printable format in this regard offer superior protection. The file format, CSV (comma separated value), does not provide adequate protection of these records and shall not be used.

The database for the completed job and all source tester data files shall be stored and delivered on CD-ROM prior to Owner acceptance of the tested cable. This CD-ROM shall include the software tools required to view, inspect, and print any selection of the test reports.

A paper hard copy shall be submitted, containing a test results summary of each installed pair.

4.25.2.1) Hard Copy

A paper copy of the test results shall be provided that lists all the pairs that have been tested with the following summary information:

4.25.2.1.1) The identification of the pair in accordance with the Cable Installation Labeling Convention, described in this Specification
4.25.2.1.2) The overall Pass/Fail evaluation of the pair-under-test
4.25.2.1.3) The date and time the test results were saved in the memory of the tester

4.25.2.2) Database General Information

General Information to be provided in the electronic database with the test results information for each pair:

4.25.2.2.1) The identification of the customer site as specified by Owner
4.25.2.2.2) The identification of the pair in accordance with the Cable Installation Labeling Convention, described in this Specification
4.25.2.2.3) The overall Pass/Fail evaluation of the link-under-test
4.25.2.2.4) The name of the standard selected to execute the stored test results
4.25.2.2.5) The cable type
4.25.2.2.6) The date and time the test results were saved in the memory of the tester
4.25.2.2.7) The brand name, model and serial number of the tester
4.25.2.2.8) The identification of the tester interface
4.25.2.2.9) The revision of the tester software and the revision of the test standards database in the tester
4.25.2.2.10) The test results information must contain information on each of the required test parameters as detailed below under “Database Detailed Information”

4.25.2.3) Database Detailed Information

The detailed test results data to be provided in the electronic database for each tested Category 3 pair must contain the following information:

For each of the frequency-dependent test parameters, the minimum test results documentation shall be stored for each wire-pair or wire-pair combination as observed from each end of the pair. The minimum test results documentation for each test parameter shall be in compliance with TIA568-B specification for Category 3 cable.

4.25.2.3.1) The name of the test limit selected to execute the stored test results
4.25.2.3.2) The name of the personnel performing the test
4.25.2.3.3) The date and time the test results were saved in the memory of the tester
4.25.2.3.4) The manufacturer, model and serial number of the field-test instrument
4.25.2.3.5) The version of the test software and the version of the test limit database held within the test instrument
4.25.2.3.6) Insertion Loss (Attenuation)
4.25.2.3.7) Return Loss: Identify as detected from each end of the pair, the wire pair that exhibits the worst-case margin and the wire pair with the worst RL. Each reported case shall include the frequency at which it occurs as well as the test limit value at this frequency.

4.25.3) Fiber-Optic Cable Test Results

Contractor will supply test results from test equipment for all Fiber-Optic cables that Contractor installs.

The test results information for each terminated or fused strand shall be recorded in the electronic memory of the field tester equipment upon completion of the test.

The test results records saved by the field tester shall be transferred into a Microsoft Windows™-based database utility that allows for the maintenance, inspection, archiving, and plain-text exporting of these test records. A guarantee must be made that the measurement results are transferred to the PC unaltered (i.e., “as saved in the field-test instrument”) and that these results cannot be modified at a later time. Testers that transfer the numeric measurement data from the tester to the PC in a non-printable format in this regard offer superior protection. The file format, CSV (comma separated value), does not provide adequate protection of these records and shall not be used.

The database for the completed job and all source tester data files shall be stored and delivered on CD-ROM prior to Owner acceptance of the tested cable. This CD-ROM shall include the software tools required to view, inspect, and print any selection of the test reports.

A paper hard copy shall be submitted, containing a test results summary of each strand.

4.25.3.1) Hard Copy

A paper copy of the test results shall be provided that lists all the links that have been tested with the following summary information:

4.25.3.1.1) The identification of the strand in accordance with the Cable Installation Labeling Convention, described in this Specification
4.25.3.1.2) The overall Pass/Fail evaluation of the strand-under-test
4.25.3.1.3) The date and time the test results were saved in the memory of the tester

4.25.3.2) Database General Information

General Information to be provided in the electronic database with the test results information for each link:

4.25.3.2.1) The identification of the customer site as specified by Owner
4.25.3.2.2) The identification of the pair in accordance with the Cable Installation Labeling Convention, described in this Specification
4.25.3.2.3) The overall Pass/Fail evaluation of the strand-under-test
4.25.3.2.4) The name of the standard selected to execute the stored test results
4.25.3.2.5) The cable type
4.25.3.2.6) The date and time the test results were saved in the memory of the tester
4.25.3.2.7) The brand name, model and serial number of the tester
4.25.3.2.8) The identification of the tester interface
4.25.3.2.9) The revision of the tester software and the revision of the test standards database in the tester
4.25.3.2.10) The test results information must contain information on each of the required test parameters as detailed below under “Database Detailed Information”

4.25.3.3) Database Detailed Information

Detailed test results documentation data is to be provided in an electronic database for each tested optical fiber and shall contain the following information:

4.25.3.3.1) The identification of the customer site as specified by Owner
4.25.3.3.2) The name of the test limit selected to execute the stored test results
4.25.3.3.3) The name of the personnel performing the test
4.25.3.3.4) The date and time the test results were saved in the memory of the tester
4.25.3.3.5) The manufacturer, model and serial number of the field-test instrument
4.25.3.3.6) The version of the test software and the version of the test limit database held within the test instrument
4.25.3.3.7) Circuit ID - as reported by the test instrument and matching the label on test tested cable, in accordance with the Cable Installation Labeling Convention, described in this Specification
4.25.3.3.8) The fiber strand identification number
4.25.3.3.9) The length for each optical fiber
4.25.3.3.10) Optionally the index of refraction used for length calculation when using a length capable OLTS
4.25.3.3.11) Test results to include OLTS attenuation link and channel measurements at the appropriate wavelength(s) and the margin (difference between the measured attenuation and the test limit value).
4.25.3.3.12) Test results to include OTDR link and channel traces and event tables at the appropriate wavelength(s).
4.25.3.3.13) The length for each optical fiber as calculated by the OTDR.
4.25.3.3.14) The overall Pass/Fail evaluation of the link-under-test for OLTS and OTDR measurements
4.25.3.3.14.1) A picture or image of each fiber end-face
4.25.3.3.15) A pass/fail status of the end-face based upon visual inspection.

Part 5: Documentation

5) **As-Built Documentation**

Contractor shall provide as-built documentation in electronic format, describing all work performed. As-built documentation shall follow apparent documentation standards and formats of existing data wiring documentation and building plans, submitted to Contractor by Owner.

5.1) Circuit Endpoint Table

Contractor shall submit a completed “Circuit Endpoint Table.xls” document, entering as-built labeling information for 100% of installed cables into this Microsoft Excel document. A blank “Circuit Endpoint Table.xls” form shall be provided to Contractor by Owner upon request.

Contractor shall submit completed spreadsheet to Owner as both electronic document (Microsoft Excel spreadsheet), and as hard-copy.

5.2) As-Built Drawings

Contractor shall provide a full set of as-built drawings in electronic format as a Microsoft Visio document, in file format of most recent commercially-available version of Microsoft Visio.

As-built drawings shall convey an accurate depiction of the entire installation superimposed on a drawing of the building. As-built drawings must be to scale.

All edits and additions by Contractor shall be placed in a new layer, which shall have a name clearly identifying Contractor name, and date of job completion.

The as-built drawings shall include, but shall not be limited to, the following information for all materials installed by Contractor and for all existing materials used by Contractor:

5.2.1) Inside Service Plant (ISP) drawings, depicting all installed materials, as well as any existing materials utilized, along with building envelope, walls, and features. These shall include, but not be limited to:

5.2.1.1) Station outlet location and label
5.2.1.2) Details of cable path
5.2.1.3) Locations of cable termination points
5.2.1.4) Locations of pull boxes
5.2.1.5) Locations and diameter of conduits/sleeves
5.2.1.6) Locations and manufacturer/model number of raceways
5.2.1.7) Locations of penetrations and installed firestopping
5.2.1.8) Block diagrams
5.2.1.9) Frame and cable labeling
5.2.1.10) Locations of cabinets/racks
5.2.1.11) Equipment room layouts and frame installation details

5.2.2) Outside Service Plant (OSP) drawings, depicting all installed materials, as well as any existing materials utilized, along with campus building envelopes and landmarks. This shall include, but not be limited to:

5.2.2.1) Photographic aerial image of campus or accurate plan that includes:
5.2.2.1.1) Label/name of each utilized or installed manhole, handhole, and pole as per existing documentation or else as directed by Owner Technical Contact,
5.2.2.1.2) Label/name of each utilized or installed manhole any label evident in the utilized manhole or on its cover
5.2.2.1.3) Precise locations of each utilized manhole, handhole, and pole, as determined by the Global Positioning System (GPS), expressed as longitude and latitude in DMS (degrees◦ minutes' seconds"), and accurate to one-hundredth of a minute.
5.2.2.1.4) Location of any trench with type of:
5.2.2.1.4.1) Conduit(s) Installed
5.2.2.1.4.2) Backfill(s) Used
5.2.2.1.5) Location(s) of any Conduit(s) used

5.2.2.2) Cable schematic diagram, with:
5.2.2.2.1) Label/name of each utilized or installed manhole, handhole, and pole as per existing documentation or else as directed by Owner Technical Contact,
5.2.2.2.2) Label/name of each utilized or installed manhole any label evident in the utilized manhole or on its cover
5.2.2.2.3) Precise locations of each utilized manhole, handhole, and pole, as determined by the Global Positioning System (GPS), expressed as longitude and latitude in DMS (degrees◦ minutes' seconds"), and accurate to one-hundredth of a minute.

5.2.2.2.4) Measured pull distances between manholes, as evident from markings on installed pull tape and/or cable jacket
5.2.2.2.5) The type of cable that was installed between manholes, handholes and poles. e.g. 24-strand-SM-fiber, OSP-CAT6, etc., etc.
5.2.2.2.6) The cable labels installed on ends of cables shown

5.2.2.3) Manhole fold-out drawings for any installed manhole(s), and for any manhole(s) in which splice enclosure has been installed

5.2.3) The as built drawings shall also include accurate depiction of all field-directed changes made up to construction completion. These shall include, but not limited to:
5.2.3.1) field-directed changes to pull schedule
5.2.3.2) field-directed changes to cross connect and patching schedule
5.2.3.3) horizontal cable routing changes
5.2.3.4) backbone cable routing or location changes
5.2.3.5) associated detail drawings

5.3) Firestopping Locations

Contractor shall provide a table of as-built firestopping locations in Microsoft Excel format as in the following example:

Example:

	A	B	C	D
1	**Location**	**Description**	**Manufacturer**	**Material**
2	LI1005C-FL01	Above Cable tray	Hilte	Intumescent putty
3	LI1005C-FL02	Around 4" Conduit	Hilte	Mortar
4	LI1005C-FL03	Inside 4" conduit	Hilte	Vermiculite Pillow
…				
…				
…				
37	LI0003F-PP01-22	3" Cabinet penetration	PRC-DeSoto	PR-855 Chase Foam

5.4) Submission of Manufacturer Warranty Information

Contractor shall submit Manufacturer Warranty documents on installed cable plant upon completion of installation. Warranty documents must state specific terms of Warranty, including:

5.4.1) Start date
5.4.2) Length of Warranty (years)
5.4.3) Contact information
5.4.4) What is Covered
5.4.5) Exclusions

5.5) Punch Lists

Owner Project Manager and Owner Technical Contact shall inspect all work with Contractor at a punch list inspection tours, to take place as determined by Owner Project Manager.

Additional punch list inspection tours shall be performed as deemed necessary by Owner Project Manager, whereby prior punch list items shall be inspected, and additional punch list items may be generated.

The punch lists shall be conveyed in writing by Owner Project Manager to Owner Technical Contact, and to Contractor.

Contractor shall provide all materials and labor to repair, replace, or complete each punch list item that is within the Scope of Work (if provided) and the original RFQ/RFP/Project.

Contractor shall respond to all punch list items in writing, either by stating that the item has been addressed/completed or by claiming that the item is outside of the Scope of Work (if provided) and the original RFQ/RFP/Project..

Final payment shall not be released by Owner until after such a time that all punch list items have been completed to the satisfaction of Owner Project Manager and Owner Technical Contact.

5.6) Unused materials

At completion of work, Contractor shall deliver to Owner Technical Contact any materials of significant value that were included in Contractor's cost quotation/proposal for the work, but neither delivered, installed, nor credited by Contractor to Owner.

This shall include, but not be limited to:

5.6.1) Spooled/reeled/boxed copper cable greater than 150' in length
5.6.2) Unused or trimmed Fiber-Optic cable greater than 1000' in length
5.6.3) Unused jacks and faceplates
5.6.4) Unused patch panels
5.6.5) Unused patch cables
5.6.6) Unused racks/cabinets
5.6.7) Unused cable management
5.6.8) Unused conduit, raceway and cable tray, greater than 5' in length
5.6.9) Unused conduit, raceway, and cable tray fittings
5.6.10) Unused fire stopping
5.6.11) Unused wireless access point brackets/enclosures

*** **END OF DOCUMENT** ***

CTS Preferred Materials

1) **Faceplate**
   - 1.1) Angled Single-Gang QuickPort Wall plate with ID Windows, 4-Port, Ivory
     - 1.1.1) Manufacturer: Leviton
     - 1.1.2) Part Number: 42081-4IS (-4=4port, S=Ivory)
     - 1.1.3) URL: https://www.leviton.com/en/products/42081-4is
2) **Modular Jacks**
   - 2.1) CAT 6
     - 2.1.1) Leviton Atlas-X1 Cat 6 UTP QuickPort Jack, Orange
       - 2.1.1.1) Manufacturer: Leviton
       - 2.1.1.2) Part Number: 61UJK-RO6
       - 2.1.1.3) URL: https://www.leviton.com/en/products/61ujk-ro6
   - 2.2) CAT 6A
     - 2.2.1) Atlas-X1 Cat 6A UTP QuickPort Jack, Orange
       - 2.2.1.1) Manufacturer: Leviton
       - 2.2.1.2) Part Number: 6AUJK-RO6
       - 2.2.1.3) URL: https://www.leviton.com/en/products/6aujk-ro6
3) **Patch Panels**
   - 3.1) CAT 6/CAT 6A
     - 3.1.1) Angled
       - 3.1.1.1) Angled QuickPort Patch Panel, 24-port, 1RU, with magnifying lens
         - 3.1.1.1.1) Manufacturer: Leviton
         - 3.1.1.1.2) Part Number: 49256-L24
         - 3.1.1.1.3) URL: https://www.leviton.com/en/products/49256-l24
     - 3.1.2) Flat
       - 3.1.2.1) QuickPort Patch Panel with Magnifying Lens Label Holder, 24-Port, 1RU
         - 3.1.2.1.1) Manufacturer: Leviton
         - 3.1.2.1.2) Part Number: 49255-L24
         - 3.1.2.1.3) URL: https://www.leviton.com/en/products/49255-l24
4) **Patch cords**
   - 4.1) CAT 6
     - 4.1.1) Atlas-X1™ Cat 6 Slimline Boot UTP Patch Cords
       - 4.1.1.1) Manufacturer: Leviton
       - 4.1.1.2) Part Number: 6D560-xxS (Length=xx, S=Gray)
       - 4.1.1.3) URL: https://www.leviton.com/en/products/6d560
   - 4.2) CAT 6A
     - 4.2.1) Cat 6A UTP Patch Cords
       - 4.2.1.1) Manufacturer: Leviton
       - 4.2.1.2) Part Number: 6AS10-XXS (Length=XX, S=Gray)
       - 4.2.1.3) URL: https://www.leviton.com/en/products/commercial/network-solutions/patch-cords-cable-assemblies/copper-patch-cords/cat-6a-utp

5) **Cable Management**

5.1) Horizontal

5.1.1) Angled

5.1.2) Front Horizontal CM

5.1.2.1) NetManager High Capacity Horizontal Cable Manager

5.1.2.1.1) Manufacturer: Panduit

5.1.2.1.2) Part Number: NM4

5.1.2.1.3) URL: https://www.panduit.com/en/products/cabinets-thermal-management-racks-enclosures/cable-managers-accessories/horizontal-cable-managers/nm4.html

5.1.2.2) Rear CM

5.1.2.2.1) Recessed Angled Cable Management Bar, rear (4 hook and loop fasteners included)

5.1.2.2.2) Manufacturer: Leviton

5.1.2.2.3) Part Number: 4W006-AMB

5.1.2.2.4) https://www.leviton.com/en/products/4w006-amb

5.1.2.2.5)

5.1.3) Flat

5.1.3.1) Front

5.1.3.1.1) NetManager High Capacity Horizontal Cable Manager

5.1.3.1.2) Manufacturer: Panduit

5.1.3.1.3) Part Number: NM2

5.1.3.1.4) URL: https://www.panduit.com/en/products/cabinets-thermal-management-racks-enclosures/cable-managers-accessories/horizontal-cable-managers/nm2.html

5.1.3.2) Rear

5.1.3.2.1) Cable Management Bar

5.1.3.2.1.1) Manufacturer: Leviton

5.1.3.2.1.2) Part Number: 49005-CMB

5.1.3.2.1.3) URL: https://www.leviton.com/en/products/49005-cmb

5.2) Vertical Cable Management

5.2.1) Height: 7ft

5.2.1.1) MM10 Vertical Cable Management Cage - with door - 12 in x 13 in x 7 ft

5.2.1.1.1) Manufacturer: Legrand/Ortronics

5.2.1.1.2) Part Number: MM10VMD712

5.2.1.1.3) URL: https://legrand.us/data-communications/racks/shelves-filler-panels-accessories/p/mm10vmd712

5.2.2) Height: 8ft

5.2.2.1) MM10 Vertical Cable Management Cage - with door - 12 in x 13 in x 8 ft

5.2.2.1.1) Manufacturer: Legrand/Ortronics

5.2.2.1.2) Part Number: MM10VMD812

5.2.2.1.3) URL: https://legrand.us/data-communications/racks/shelves-filler-panels-accessories/p/mm10vmd812

6) **Racks/Enclosures**
   - **6.1) Racks**
     - 6.1.1) Mighty Mo 10 Cable Management Rack
       - 6.1.1.1) Height: 8ft
         - 6.1.1.1.1) Manufacturer: Legrand/Ortronics
         - 6.1.1.1.2) Part Number: MM10716
         - 6.1.1.1.3) URL: https://legrand.us/data-communications/racks/2-post-4-post-racks//p/mm10816
       - 6.1.1.2) Height: 7ft
         - 6.1.1.2.1) Manufacturer: Legrand/Ortronics
         - 6.1.1.2.2) Part Number: MM10716
         - 6.1.1.2.3) URL: https://legrand.us/data-communications/racks/2-post-4-post-racks//p/mm10716
   - **6.2) Cabinets**
     - 6.2.1) Wall-Mount
       - 6.2.1.1) QuadCab 26 RU Cabinet
         - 6.2.1.1.1) Manufacturer: Hubbell
         - 6.2.1.1.2) Part Number: HSQ48S36
         - 6.2.1.1.3) URL: https://www.hubbell.com/hubbell/en/Products/Data-Communications/Racks-and-Enclosures/Wall-Mount-Cabinets/QUADCAB/HSQ48S36/p/1743914

7) **Mounting Brackets**
   - **7.1) WiFi**
     - 7.1.1) Locking Right-Angle Wi-Fi Access Point Wall Mount
       - 7.1.1.1) Manufacturer: Oberon
       - 7.1.1.2) Part Number: 1012-00
       - 7.1.1.3) URL: https://oberoninc.com/products/1012-00/

8) **Electrical**
   - 8.1) Ground Bus-bar
     - 8.1.1) Manufacturer: Wakefield Vette
       - 8.1.1.1) Part Number: SCGB-5KT
       - 8.1.1.2) URL: http://www.wakefield-vette.com/products/standard-ground-bars-and-kits.aspx
     - 8.1.2) Manufacturer: Storm Power
       - 8.1.2.1) Part Number: SCGB-5KT
       - 8.1.2.2) URL: https://stormpowercomponents.com/grounding-2/ground-bars-grounding-bus-bar-kits/
   - 8.2) Power Distribution Unit
     - 8.2.1) 2.9kW Single-Phase Metered PDU, 120V Outlets (24 5-15/20R), L5-30P, 10 ft. (3.05 m) Cord, 0U Vertical

8.2.1.1) Manufacturer: Tripp-Lite
8.2.1.2) Part Number: PDUMV30
8.2.1.3) URL: https://www.tripplite.com/2-9kw-single-phase-metered-pdu-120v-outlets-24-5-15-20r-l5-30p-10ft-cord-0u-vertical~PDUMV30

8.3) UPS
8.3.1) Smart-UPS X 3000VA Rack/Tower LCD 100-127V with Network Card
8.3.1.1) Manufacturer: APC
8.3.1.2) Part Number: SMX3000RMLV2UNC
8.3.1.3) URL: https://www.apc.com/shop/us/en/products/APC-Smart-UPS-X-3000VA-Rack-Tower-LCD-100-127V-with-Network-Card/P-SMX3000RMLV2UNC

8.4) Ethernet Surge Protection
8.4.1) Equipment side
8.4.1.1) Indoor
8.4.1.1.1) Single channel
8.4.1.1.1.1) Manufacturer: DITEK
8.4.1.1.1.2) Part Number: DTK-MRJPOES
8.4.1.1.1.3) URL: https://www.diteksurgeprotection.com/products/network-protection/264-dtk-mrjpoes
8.4.1.1.2) 8 Channels
8.4.1.1.2.1) Manufacturer: DITEK
8.4.1.1.2.2) Part Number: DTK-WM8NETS
8.4.1.1.2.3) URL: https://www.diteksurgeprotection.com/products/network-protection/303-dtk-wm8nets
8.4.1.2) Outdoor
8.4.1.2.1) Single-Channel
8.4.1.2.1.1) Manufacturer: DITEK
8.4.1.2.1.2) Part Number: DTK-MRJPOEX
8.4.1.2.1.3) URL: https://www.diteksurgeprotection.com/products/network-protection/271-dtk-mrjpoex
8.4.2) Rack/Cabinet Head-end
8.4.2.1) Indoor
8.4.2.1.1) 24 Channels
8.4.2.1.1.1) Manufacturer: DITEK
8.4.2.1.1.2) Part Number: DTK-RM24NETS
8.4.2.1.1.3) URL: https://www.diteksurgeprotection.com/products/network-protection/289-dtk-rm24nets

Purchase College
Campus Keying Requirements

Keys and Keying:

1. All locksets and cylinders shall be keyed into the existing Campus Master Key System for this project. Allow for 100% expansion. For the protection of the Campus, all cylinders shall be keyed at the factor where permanent records shall be established and maintained.

2. Cylinders, permanent and removable cores, and keys to be Campus standard – by Best Access Systems '**Premium Series'** (**no substitutions allowed**).

3. Conduct conference on-site at the Campus to comply with all requirements set forth in project documents and verify Campus requirements. In addition to the Campus, Architect, and Contractor, conference participants shall also include; Hardware Sub-Contractor, Hardware Consultant, and Campus Representatives. Incorporate keying conference decisions, but not limited to, the following:

    a) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
    b) Preliminary key system schematic diagram.
    c) Requirements for key control system.
    d) Arrangements for delivery of keys.

4. During construction, all new locksets shall be construction masterkeyed. Provide temporary construction cores. The General Contractor shall receive ten (10) construction masterkeys. Under no circumstance shall the General Contractor receive any permanent building masterkeys or change keys unless authorized by the Campus Representative.

5. All permanent cores and keys shall be requested directly by the Campus to the manufacturer. The General Contractor shall be responsible for all payments to the manufacturer and shall supply the Campus with all necessary information (account number, etc.), in order for the Campus to order final cores and keys.

6. All construction cores will be returned to General Contractor once Campus has received and installed final cores.

7. Standard Lock Cylinders: BHMA A156.5, Grade 1.

8. Cylinders: Manufacturer's standard tumbler type, constructed from brass, or bronze, stainless steel, or nickel silver, complying with the following:

    a) Number of Pins: Seven (7)

    b) Bored-Lock Type: Cylinders with tailpieces to suit locks.

1. High-Security Grade: BHMA A156.5, Grade 1A, listed and labeled as complying with pick- and drill-resistant testing requirements in UL-437 (SuffixA).

c) Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Removable Cores: Core insert, removable by use of a special key; for use only with core manufacturer's cylinder and door hardware.

9. Keying system shall be factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference, and as follows:

a) Master Key System: Cylinders are operated by a change key and a master key.

b) Existing System: Re-key Campus' existing master key system into new keying system.

c) Keyed Alike: Key all cylinders to same change key.

10. All masterkeys shall be identified with a registry number, and shall **not** be stamped with MASTER or letter M.

11. All keys shall be stamped "DO NOT DUPLICATE".

12. Furnish:
    a) Cylinder Change Key: Three (3) per building.
    b) Master Keys: Two (2) per building.
    c) Key Blanks: Two (2) per door.

13. All keying shall be thoroughly checked with the Campus Representative. Final keying requirements shall be submitted in writing, for final approval by the Campus Representative.

CTS Pathways and Spaces Design Guide

V1.0
10/23/2019

I. References

Refer to latest version of ANSI/TIA-569 (currently, in 2019 version "-D") and BICSI TDMM.

Our buildings are not to be considered "multitenant", even if there are multiple tenants (e.g. LIU, NYU, etc.) Exceptions may apply, such as spaces designed specifically for the tenancy of multiple retailers.

II. Expansion Capacity

Every type of foreseeable expansion shall be considered in the base requirements of Pathways and Spaces.

A minimum of 40% of Additional Expansion Capacity beyond any foreseeable expansion shall be considered in the design of all Pathways and Spaces. All requirements must consider such Additional Expansion Capacity.

III. Thermal Characteristics

Pathway and Space Thermal characteristics shall be considered, including possible separation of cables within pathways. This consideration must include an increase of 50 percent of heat dissipation of equipment and cables, above and beyond the aforementioned Expansion Capacity, to accommodate for future PoE devices and cabling.

IV. Firestopping

Firestopping requirements must comply with ANSI/TIA-569-D annex regarding fire stopping. Sleeve shall be installed in all penetrations of structural elements made for the purpose of passing communications cabling.

Re-enterable firestop bricks, muffins, and putty are acceptable for use in firestopping penetrations and conduits.

If 20 or more cables of any type pass through a wall penetration, then an appropriately-sized re-enterable firestop device assembly (e.g. STI EZ-PATH, HILTI) shall be installed in the penetration.

V. Spaces

a. Entrance Room

Purchase College does not generally require a Service Entrance Room/Facility unless foreseeable equipment or services entering the building require a demarcation point within 50 feet of building

entrance (and it is not feasible to locate a Communications Room within the 50 feet). Feeder and fiber optic cables preferably run directly into a Communications Rooms, if no requirement for an Entrance Room exists.

b. **Distribution Rooms**

Purchase College does not generally require Distribution Rooms. Station cabling of all types shall "home run" directly into a Communications Room wherever possible and practical. In this case, telephone distribution and cross-connection shall be made in a Communications Room.

c. **Lightning Protection**

Where required, Lightning Protection shall be provided on backboard of Entrance Room, or, if no Entrance Room is provided then on backboard of Communications Room.

d. **Communications Rooms (Equipment Rooms)**

The Communications Room(s) shall be located centrally in the building, as to *minimize the number of Communications Rooms within the building while maintaining distance limitations of cable originating in the Communications Room*. Communications Rooms need not be "stacked" vertically in the building.

The Communications Room shall be sized to meet known requirements such as the function of the room, the numbers of equipment and racks needed, and the number of equipment outlets that the room will serve.

Rooms shall be per ANSI/TIA "*Minimum Floor Space Based on Number of Outlets Served*", or as per agreement with Purchase College CTS:

ANSI/TIA Minimum Floor Space Based on Number of Outlets Served

Equipment outlets served	Minimum floor space m^2 (ft^2)	Typical dimensions m (ft)
Up to 100	9 (100)	3 X 3 (10 X 10)
101 to 200	13.5 (150)	3 X 4.5 (10 X 15)
201 to 800	36 (400)	6 X 6 (20 X 20)
801 to 1600	72 (800)	6 X 12 (20 X 40)
1601 to 2400	108 (1200)	9 X 12 (30 X 40)

Each Communications Room shall serve station and device cabling for a single zone in the building. A zone is not necessarily restricted to only one floor of the building. A zone may include multiple parts of multiple floors (though typically not more than one floor up/down) served by that zone's Communications Room. Two or more zones may exist on one floor such that different Communications Rooms serve different parts of the same floor.

Please be aware when locating Communications Rooms that security devices typically exist at the peripheries of building exterior (e.g. on building roofs/parapets, and high up on building exterior walls). These devices typically exist on the extreme end of distance limit for associated cabling, and therefore dictate the bounds within which a Communications Room may exist.

e. **Communications Room Backboard**

Communications Room Backboard ("Backboard") shall be constructed of 3/4" thick type A/C fire-rated plywood. Backboard shall be stamped clearly on the "good" finished side (the "A" side) by manufacturer, showing that it has been treated with fire-retardant chemical and meets Class A requirements for NFPA Life Safety Code (NFPA 101). Backboard shall be entirely unpainted. At least one fire-retardant treatment stamp must be clearly visible on installed Backboard at all times, regardless of what is mounted on the backboard.

Whole 4' x 8' sections of plywood shall be cut to fit the specified area of Backboard. Scrap or remnant wood is not acceptable. Plywood must be free of dirt and dust.

Plywood shall be cut and mounted such that specified size and area of Backboard is covered continuously, with as few joints and as few cuts as possible.

Steel strut Used as Standoff for Communications Room Backboard shall be 1-5/8 inch wide by 2-7/16" deep, and shall be constructed of 12 Gage, low-carbon cold formed steel with mounting holes drilled every 1-7/8" inch on center at its face.

f. Electrical Grounding Busbar for Communications Rooms

One UL-listed electrical grounding busbar shall be installed in each Communications Rooms, to be used as the Telecommunications Main Grounding Busbar (TMGB) in data/telecommunications located closest to entrance facility, and as Telecommunications Grounding Busbar (TBB) in all other Communications Rooms as per TIA/EIA J-STD-607-A.

Grounding busbars for Communications Rooms shall be 0.25" deep x 4" high x 12" wide copper grounding busbar with a minimum of eighteen (18) 0.437" holes at a minimum of 1" separation, suitable for indoor or outdoor installations.

Grounding busbars for Communications Rooms shall be insulated from each of its supports by a minimum of two inches (2") of UL standoff insulators.

Grounding busbars for Communications Rooms shall be mounted at bottom of plywood backboard via two stainless steel mounting brackets.

g. **Security**

All Entrance rooms, Distribution Rooms, and Communications Rooms shall be located and designed in such a way that they are physically secured. Doors to these rooms shall include electronic strike and key-card access control system per campus security standards.

All Security devices must integrate directly with existing centralized campus security system. Inclusion of a different access control system is not acceptable.

All Communications Spaces must be accessible by Communications and Emergency Personnel, ONLY. A Communications Room shall not be used as a means to get to any space, service, chase, or facility in the building.

Storage in Communications Rooms, Entrance rooms, and Distributions Rooms of any item(s) not directly related to Communications Services is strictly prohibited.

All Building Mechanical and Electrical maintenance devices not exclusively serving Communications/Entrance/Distribution Rooms must be located elsewhere in the building. In no event shall any cleanout, floor drain, high-temperature water, domestic water, electrical power, natural gas, fuel, heating, or coolant lines not exclusively serving a Communications/Entrance/Distribution room be permitted to be located within the bounds of the room.

Likewise rooms and corridors above or adjacent to Communications/Entrance/Distribution room shall not contain any service lines, drains, valves, cleanouts, traps, or devices that may cause fluid to leak into Communications Spaces.

Exceptions may apply with certain low-pressure domestic water lines in dormitories, certain renovations, or other areas where it is not possible to avoid Communications Rooms. In these cases the use of a drip pan and/or other methods may be considered to prevent fluid from affecting the sensitive electronics and infrastructure contained in the room.

h. **Temperature and Humidity Requirements**

Temperature and humidity specifications provided for distributor rooms, distributor enclosures, entrance rooms or spaces, access provider spaces, service provider spaces, and common distributor rooms are as follows

- Temperature: 18 – 27°C (64 – 81°F)
- Maximum relative humidity (RH): 60%
- Minimum dew point: 5.5°C (42°F)
- Maximum dew point: 15°C (59°F)

i. Power Requirements

Provide dedicated electrical power panel inside each Communications Room, with 3-phase 100 Amp feeder sourced as close as possible to Automatic Transfer Switch distribution panel.

Each Communications Room Electrical panel shall provide power to local CRAC (Computer Room Air Conditioner) condenser and evaporator units, as well as the following:

1) Two dedicated 120 Volt 30 Amp circuits/outlets (L5-30R) ***in each equipment rack*** installed in Communications Room. If there are three racks, then *six* circuits and *six* outlets.
2) One dedicated 120 Volt 20 Amp circuits/outlets (L5-20R) ***on each wall***, mounted on backboard in quad-receptacle outlets. If there are four walls, then four circuits and four quad outlets.
3) Ceiling-attached ambient lighting suitable for detailed task workspace, with single switch at entrance to room. (NOTE that all lighting in room may be on a single circuit)
4) Task lighting (one 2xT8 equivalent LED shoplight) mounted on wall behind each equipment rack, with single switch below bank of lighting. (NOTE that all lighting in room may be on a single circuit)
5) Convenience electrical outlets every six feet of wall space, mounted below backboard. (NOTE that convenience outlets may be on same circuit).

j. **Cross Connection and Splicing**

All telephone distribution and cross-connection shall be made in a Communications Room.

For any cable or circuit originating outside the building, the cable shall run in metallic conduit (EMT, IMC, or RMC) within the building to the destination Communications Room, Distribution Room, or Entrance Room. All cables between Entrance room and destination Communications Room shall be run in metallic conduit.

Cross connection of data/tel station cabling with telephone feeder cables is made within free-standing data/tel equipment racks, at the rack-mount telecommunications feeder patch panel (24-port RJ45/IDC110) mounted in one of the data/tel racks. The telecommunications feeder cable shall run from rack-mount telecommunications feeder patch panel to campus MDF location or (for retrofit and small renovations) to nearest IDF within same building that contains an adequate number of spare pairs – to be determined by Purchase College CTS.

Splicing of fiber-optic cable is not permitted except where fiber optic cable is spliced to the main campus fiber optic distribution ring.

VI. **Pathways**

a. **Diversity**

Diversity shall be maintained for all circuits and infrastructure serving more than 500 users or devices.

Diverse entrance routes and pathways to Entrance Room or Communications Rooms shall be maintained for all circuits and infrastructure serving more than 1000 users or devices.

b. **Cable Tray (main pathway)**

Flexible wire basket cable tray (FlexTray or approved equal) shall be used as main pathway where support of 40 or more cables is required. Cable tray shall be sized appropriately, with preference for

2-inch sidewalls.

c. Conduit

EMT shall be used above all inaccessible ceilings to support cables between access hatches or accessible ceiling sections.

Conduit fill ratio must never exceed 40% or the fill ratio specified by the firestopping assembly, whichever is lesser.

Conduit, cable tray, innerduct, and raceway installation shall be continuous and connected appropriately to all boxes, cabinets, and other pathway components. Manufacturer's fitting must be used for all transitions. Caps and gaskets shall be used to prevent dirt and moisture from entering installed conduit, innerduct, and raceway where appropriate. Nylon bushings shall be used on all stubs and points of connection to prevent sharp edges from damaging cable and pull tape.

Pathway shall be constructed with Owner's hostile environment in mind. Unless noted, cables must not be exposed when run below finished ceilings. All cables shall be run within conduit, within raceway, in walls, or above ceilings. Cables run in Mechanical Rooms shall be run in conduit. Surface-mount raceway ("Raceway") may be used as an alternate path when it is desirable to avoid certain ceiling spaces, though any use of conduit or raceway not explicitly prescribed in the scope of work must be approved in writing by Owner prior to bid submission.

Headroom shall be maintained when installing conduit, cable tray, raceway, J-Hooks, cable hangers, and cable.

Existing steel channel or trapeze may be used for supporting conduit if additional load can be supported at appropriate safety factor.

All cables running within conduit of 3" (three inch) or greater outer diameter that is at 0% fill (unused) initially, and is expected to be filled to less than 25% upon completion of job must be run within innerduct. The maximum number of 1" and/or 1.25" diameter innerduct capable of fitting in the conduit shall be preinstalled, such that the maximum number of innerducts is provided for future use.

All conduit, cable tray, and cables containing metallic elements -- including, but not limited to dielectric/non-metallic cable housed in metallic armor -- shall be routed in such a way as to maintain the following distances from sources of electromagnetic interference:

6 inches from power lines 2KVA or less.
12 inches from fluorescent lighting such as fluorescent/HID lamps
60 inches from transformers, motors, or power lines of 5KVA and up

There shall not be more than 100 feet in length of conduit between pull boxes or conduit ends. Each 30-degrees of bend shall be considered as 10 feet of conduit when determining pull box placement.

There shall not be between two pull boxes or conduit ends more than a 180 degree cumulative total of bends.

Pull boxes shall not be used in place of bends. Conduit ends must be aligned in parallel on opposite sides within each pull box, such that they permit a straight pull through a pull box. Angled pulls and U-

pulls through pull boxes are not permitted.

Example:

A length of conduit originating from a pull box, containing one 90-degree bend (counted as 30 feet of a 100 foot total budget), must not contain more than 70 feet of straight conduit (30 + 70 = 100 feet) before terminating in a pull box.

d. Raceway

Surface-mount raceway (raceway) shall be designed to be used in such a manner to optimize aesthetics. Appropriate raceway fittings such as unions, bends, and end-caps must be provided and installed by Contractor. In-field mitering of raceway in lieu of using fittings is not permitted.

Raceway and fittings used for data/telecommunications cable must be appropriate for a Category 6 / 6A installation, maintaining minimum bend radius and other properties of the Category 6 / 6A cable contained within.

Raceway fill shall not exceed 80% of the raceway manufacturer's recommendations, such that 20% spare capacity remains available in the raceway for future use without exceeding manufacturer's recommendations.

Raceway shall be mechanically mounted as per manufacturer's instructions using screws, anchors, and/or bolts. Raceway shall not be mounted with adhesive.

Raceway shall run vertically near the corners of room and horizontally at same height of data/telecommunications outlets.

e. J-hooks

J-Hooks, Loop/Strap Cable Hangers, or Basket Cable Tray may be used to support cable above accessible ceiling in concealed spaces, where there is no requirement for a specific type of cable support at that location.

VII. Fire Suppression

Where fire suppression is required in Communications/Distribution/Entrance Rooms, a Preaction System shall be installed such that sprinkler heads in each room may be specifically activated based on Double Interlock criteria.

Drip loops at all entrances to rooms shall be specified to prevent water from fire suppression system from affecting terminations and equipment in the Communications/Distribution/Entrance Rooms.

Wireless RF Design and Implementation - New Construction and Renovation Specification

Campus Technology Services
SUNY Purchase College
September 29, 2021

1. Introduction

Wireless service is considered a utility-like service for Purchase College Students, Faculty, and Staff. As such, it must be both pervasive and reliable. Wireless RF is inherently susceptible to a variety of factors that make the design and implementation of a reliable wireless network necessitate detailed RF surveys. Specifically, depending on user density, bandwidth requirements, building construction, as well as RF spectrum interference, the specifics of access point locations and quantities will vary. A site survey must be conducted both before and after a project in order to confirm complete wireless coverage.

All indoor areas of the new construction or renovation footprint will have wireless service. Outdoor areas may also need to be covered depending on the project requirements, CTS must be consulted. For all renovation and new construction projects a predictive site- survey (software-modeled), an on-site pre-install RF site survey, and post-install RF site survey must be conducted by a qualified wireless RF engineering contractor.[1]

2. Wireless Network Requirements

1. 802.11g/n/ac support

[1]Cisco CWNA or a CWNP CWNA certification (or higher) is acceptable.
2https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-3/...chapter_010.html

2. 2.4GHz and 5GHz support
3. User density follows room occupancy plus any fixed Wi-Fi devices in the survey areas.
4. Estimate 3 devices per-user as standard and 5 devices per-user within residential areas.
5. The ability to roam between APs without network interruption
6. 10Mbps concurrent throughput per-connected device
7. Assume a client ratio of 35% 2.4GHz and 65% 5GHz

3. Specification

This specification details the requirements for the implementation of wireless networks in three phases: Design Phase (Pre-Construction), Implementation Phase (Pre-Install), Verification Phase (Post-Install). This approach is inherently iterative in that each phase produces a more accurate design contributing to the final implementation.

4. Design Phase (Pre-Construction)

When required for planning and budgetary purposes and only when conducting an initial on-site RF survey is not possible, the following shall be adhered to with regard to the design and installation of the wired cable plant to support the wireless infrastructure.

Predictive Survey

Using architectural (CAD) plans of the proposed construction project and the construction manual as reference, the wireless RF engineer shall conduct a predictive software-modeled RF survey. Specifically, AirMagnet Survey, Ekahau

[1]Cisco CWNA or a CWNP CWNA certification (or higher) is acceptable.
2https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-3/...chapter_010.html

Site Survey, or a CTS approved equivalent will be used by the engineer. All relevant construction materials must be represented in the attenuation characteristics of the predictive survey. The same software tool used in this phase will also for all other analysis throughout the course of the project. The resulting documentation from this survey shall be submitted to CTS for review and approval.

Cable Plant

At a minimum, wireless wired cable plant design shall conform to TIA TSB-162-A or ISO/IEC TR 24704 such that a ”grid” of no larger than 18.3 meters (60 feet) squares are overlaid onto the coverage areas. This allows for a wireless ”cell” radius of 13 meters or 42 ft (*see Figure 1*). This will not be superseded by the actual wireless survey results. Cabling must be installed to confirm to the “grid” whether access points will be placed there or not.

As per TIA TSB-162A, the minimum cabling that must be installed is **CAT6A**. There shall be **(2) CAT6A** cables installed in each access point location. For approved cable vendors and detailed wiring requirements, see the Purchase College Cable Specification.

These guidelines are subject to supplemental cabling being required after construction has been completed if the on-site pre-survey or post-surveys require it.

[1]Cisco CWNA or a CWNP CWNA certification (or higher) is acceptable.
2https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-3/...chapter_010.html

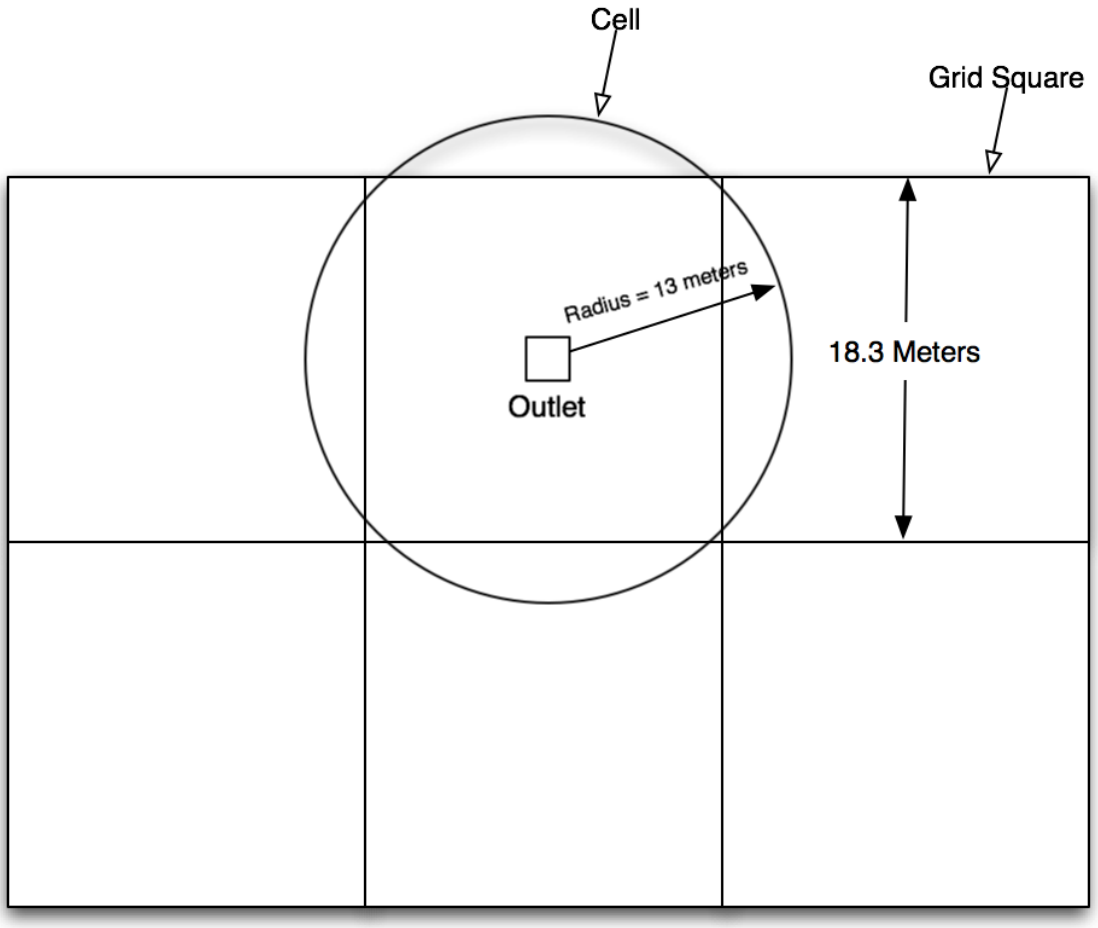


Figure 1

5. Implementation Phase (Pre-Install)

Initial On-site RF Survey

This critical phase will determine the initial access point placement. While in cases where a predictive survey was done there will be a quantity and placement estimate, this on-site survey will determine the actual AP quantity and physical placement. The RF engineer will use the access point on a stick method to survey 100% of the areas where wireless coverage is required. The engineer shall survey and account for any environmental variables that will impede the signal through the survey and by conducting a spectrum analysis. Care must be taken to identify

[1]Cisco CWNA or a CWNP CWNA certification (or higher) is acceptable.
2https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-3/...chapter_010.html

existing sources of interference including 3rd party access points, microwaves, transmitters, etc. and to relocate access points if those sources of interference cannot be removed. Changes to construction materials or plans must be accounted for. The resulting documentation from this survey shall be submitted to CTS for review and approval.

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6. Verification Phase (Post-Install)

Second On-site RF Survey

This phase will determine whether or not the access point placement and installation has met the stated requirements in Section 2. After the wireless access points have been logically provisioned by CTS staff, the RF engineer will conduct another site survey and throughput analysis for 100% of the coverage area. The resulting documentation from this survey shall be submitted to CTS for review and approval.

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7. Wireless Access Point Equipment and Installation

Wireless Access Points

1. Cisco 2802i Wireless Access Point (default)
2. Cisco 2802e Wireless Access Point (alternate). No alternatives will be used unless approved by CTS.

Installation

Wireless access points will be mounted in locations as per the RF survey generated by the RF engineering contractor during the Implementation Phase (Pre-Install). Specifically, regardless of location, all APs will be mounted in accordance with manufacturer recommendations. The Cisco Access Point Mounting Instructions[2] can be referenced. All cabling shall adhere to the Purchase College Network Cable

[1] Cisco CWNA or a CWNP CWNA certification (or higher) is acceptable.
[2] https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-3/...chapter_010.html

Installation Specification.

[1]Cisco CWNA or a CWNP CWNA certification (or higher) is acceptable.
2https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-3/...chapter_010.html

SYMBOL LIST

ELECTRICAL AND IT DEVICES

	DUPLEX RECEPTACLE RATED AT 20-AMPS, 120 VOLTS.
	ISOLATED GROUND DUPLEX RECEPTACLE RATED AT 20-AMPS, 120 VOLTS IN ONE 4"X4" BOX.. MANUFACTURER: PASS AND SEYMOUR MODEL: IG5362
TL	ISOLATED GROUND L5-20 TWISTLOCK RECEPTACLE MOUNTED OVERHEAD IN CEILING. MANUFACTURER: PASS AND SEYMOUR MODEL: IGL520R
	ISOLATED GROUND DOUBLE DUPLEX RECEPTACLE RATED AT 20 AMPS, 120 VOLTS IN ONE 4"X4" BOX. MANUFACTURER: PASS AND SEYMOUR MODEL: IG5362
	RECESSED FLUSH FLOOR BOX. REPLACE INCLUDED RECEPTACLE WITH DUPLEX ISOLATED GROUND RECEPTACLE. MANUFACTURER: PASS AND SEYMOUR FLOOR BOX MODEL: PS862TRTAL IG RECEPTACLE MODEL: IG5362
J	CEILING MOUNTED JUNCTION BOX (J-BOX) WITH HOMERUN CIRCUIT AND FLEXIBLE CONNECTION TO EQUIPMENT. USE SEALTITE FOR OUTDOOR CONNECTIONS.
J	WALL MOUNTED JUNCTION BOX (J-BOX) WITH HOMERUN CIRCUIT AND FLEXIBLE CONNECTION TO EQUIPMENT. USE SEALTITE FOR OUTDOOR CONNECTIONS.
	FLUSH FLOOR MOUNTED JUNCTION BOX FOR AV.
VAV	VAV DAMPER WITH 120V, 20AMP, SINGLE POLE TOGGLE

ELECTRICAL DISTRIBUTION

	CONDUIT
	PULL BOX
	FUSED DISCONNECT SWITCH. FUSE TO BE EQUAL TO OR LESS THAN THE WIRING AMPACITY.
	UNFUSED DISCONNECT SWITCH; SWITCH SIZE TO BE GREATER THAN OR EQUAL TO OVER CURRENT PROTECTION. U.O.N.
M	MOTOR, NUMBER INDICATES HORSEPOWER RATING
	CIRCUIT BREAKER
T	TRANSFORMER
WAP	WIRELESS ACCESS POINT. PROVIDE CAT6A CABLE, HITACHI SUPRA 10G ENHANCED UTP OR APPROVED EQUAL
CR	CARD READER. REFER TO DETAIL ON E-302
A / 001	SECTION A
PP-KIT/21,23,25 (PANEL DESIGNATION; CIRCUIT NUMBER)	HOMERUN NOTATION

LIGHTING CONTROLS
BASIS OF DESIGN: ACUITY CONTROLS
ALTERNATE ACCEPTABLE MANUFACTURERS: WATTSTOPPER OR DOUGLAS LIGHTING CONTROLS

MS a	CEILING-MOUNTED MOTION SENSOR. REFER TO E-300 FOR LIGHTING CONTROL TYPICAL WIRING DIAGRAM MODEL: nCM PDT 9 RJB LOWERCASE LETTER INDICATES LIGHTING FIXTURES CONTROLLED
PP OS a	POWER PACK. REFER TO E-300 FOR LIGHTING CONTROL TYPICAL WIRING DIAGRAM. 'VS' INDICATES NON-DIMMING VACANCY-TYPE MODEL (nPP16 SA) 'VSD' INDICATES 0-10V DIMMING VACANCY-TYPE MODEL (nPP16 D SA) 'MLV' INDICATES MAGNETIC LOW VOLTAGE DIMMING MODEL (nSP5 PCD MLV) 'ELV' INDICATES ELECTRONIC LOW VOLTAGE DIMMING MODEL (nSP5 PCD ELV 120) *'MLV' AND 'ELV' POWER PACKS SHALL BE PROGRAMMED FOR VACANCY-TYPE OPERATION. LOWERCASE LETTER INDICATES LIGHTING FIXTURES CONTROLLED.
$ D a	WALL SWITCH. REFER TO E-300 FOR LIGHTING CONTROL TYPICAL WIRING DIAGRAM. STANDARD MODEL: nPODMA 'D' INDICATES SINGLE-POLE DIMMING MODEL (nPODMA DX WH) '2PD' INDICATES TWO-POLE DIMMING MODEL (nPODMA 2P DX WH) '4PD' INDICATES FOUR-POLE DIMMING MODEL (nPODMA 4P DX WH) LOWERCASE LETTER INDICATES LIGHTING FIXTURES CONTROLLED.
VS a	COMBINATION WALL VACANCY SENSOR AND NON-DIMMING SWITCH. REFER TO E-300 FOR LIGHTING CONTROL TYPICAL WIRING DIAGRAM. MODEL: WSX PDT SA WH LOWERCASE LETTER INDICATES LIGHTING FIXTURES CONTROLLED.
VSD D	COMBINATION WALL VACANCY SENSOR AND DIMMING SWITCH. REFER TO E-300 FOR LIGHTING CONTROL TYPICAL WIRING DIAGRAM. MODEL: WSX PDT D SA WH LOWERCASE LETTER INDICATES LIGHTING FIXTURES CONTROLLED.
DMX	DMX LIGHTING CONTROLLER. REFER TO E-301 FOR DMX LIGHTING CONTROL WIRING DIAGRAM. MODEL: EZSOLO MVOLT WH

ABBREVIATIONS

@	"AT" OR "EACH AT"
A	AMPERE
AC	ABOVE COUNTER
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
AT	AMPERE TRIP
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
°C	DEGREE CELSIUS
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
CLOS	CLOSET
COMM	COMMUNICATION
CONT	CONTINUATION
CT	CURRENT TRANSFORMER
CU	COPPER
DB	DECIBEL
DEG	DEGREE
DN	DOWN
DP	DISTRIBUTION PANELBOARD
DWG	DRAWING
EA	EACH
EC	ELECTRICAL CONTRACTOR
°F	DEGREE FAHRENHEIT
FDS	FUSED DISCONNECT SWITCH
FIXT	FIXTURE
FL	FLOOR
FT	FEET OR FOOT
G	GROUND
GFI	GROUND FAULT INTERUPTER
HP	HORSEPOWER
HV	HIGH VOLTAGE
HZ	HERTZ
INST	INSTANTANEOUS
JB	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
LTG	LIGHTING
LV	LOW VOLTAGE
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCM	THOUSAND CIRCULAR MILS
MIN	MINIMUM
MLO	MAIN LUGS ONLY
N	NEUTRAL
NTS	NOT TO SCALE
PB	PULLBOX
ø	PHASE
PWR	POWER
RECEPT	RECEPTACLE
REQ	REQUIRED
RM	ROOM
SECT	SECTION
SP	SINGLE POLE
SPEC	SPECIFICATION
SW	SWITCH
SYS	SYSTEMS
TBD	TO BE DETERMINED
TD	TIME DELAY
TEL	TELEPHONE
TEMP	TEMPERATURE
TV	TELEVISION
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT OR VOLTAGE
VA	VOLT AMPERE
W	WATT
WP	WEATHERPROOF

ELECTRICAL GENERAL NOTES

1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWING IN LAYING OUT WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM AND SPACE CONDITIONS.
2. HORIZONTAL OR CROSS RUNS IN PARTITIONS AND WALLS ARE NOT PERMITTED.
3. PROVIDE PULLBOXES AS INDICATED, REQUIRED BY CODE AND WHEREVER NECESSARY TO FACILITATE PULLING OF WIRE. COORDINATE PULLBOX LOCATIONS WITH OTHER TRADES.
4. COVERS OF JUNCTION AND PULLBOXES SHALL BE READILY ACCESSIBLE.
5. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT; MINIMUM 18 IN. IN LENGTH AND 50% SLACK. DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
6. COORDINATE ALL EXPOSED CONDUIT RUNS WITH ARCHITECT PRIOR TO EXPOSED CONDUIT INSTALLATION.
7. WIRE COLOR CODING: AS PER CODE. WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION FOR OVERLAP COLOR TAPING OF CONDUCTORS (MINIMUM LENGTH 6") IN ACCESSIBLE LOCATIONS. COLOR CODING, ONCE SELECTED, MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT.
8. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK) OR MACHINE SCREWS (METAL). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART.
9. ALL LIGHT FIXTURES AND INSTRUMENTS THAT ARE REMOVED SHOULD BE CAREFULLY DISPOSED OF. COORDINATE REMOVAL ALL EQUIPMENT WITH FACILITIES MANAGER.
10. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
11. LOCATIONS INDICATED FOR LOCAL WALL SWITCHES ARE SUBJECT TO MODIFICATIONS AT OR NEAR DOORS. COORDINATE WITH ARCHITECT AND INSTALL SWITCH ON SIDE OPPOSITE HINGE. VERIFY FINAL HINGE LOCATIONS IN FIELD PRIOR TO SWITCH OUTLET INSTALLATION.
12. POWER INTERRUPTIONS AND CORE DRILLING ONLY PERMITTED AS APPROVED BY FACILITIES MANAGER.
13. ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE RATED NEMA-3R.
14. PRIOR TO CORING FOR CONDUIT PENETRATIONS, XRAY SLAB AND SUBMIT TO FACILITIES MANAGER FOR APPROVAL.
15. USE MC CABLE WHEREVER ELECTRICAL CONDUITS CROSS OVER ISOLATED CEILING OR WALLS.

⚠1
16. CONTRACTOR SHALL REFER TO THE LATEST "CAMPUS NETWORK CABLE INSTALLATION SPECIFICATION" DOCUMENT FOR INFORMATION REGARDING THE INSTALLATION OF TELECOMMUNICATIONS CABLING AND PATHWAYS, AND ACCESS CONTROLS. CONTRACTOR TO PROVIDE ALL LABELING AND TESTING AS PER CAMPUS NETWORK CABLE INSTALLATION SPECIFICATION.

LIGHTING FIXTURE SCHEDULE

FIXTURE SYMBOL	FIXTURE TAG	FIXTURE DESCRIPTION	MANUFACTURER	MODEL NUMBER	LAMP TYPE	VOLTS	WATTS	DIMMING
A	A	RECESSED DOWNLIGHT FIXTURE	WAC LIGHTING	HOUSING: HR-3LED-H17A TRIM: R3ASAT-F830-HZWT	LED	UNV	15.5	0-10V
B	B	RECESSED MULTI-POINT SPOTLIGHT FIXTURE	WAC LIGHTING	HOUSING: MT-4LD211NE-F-930-BK TRIM: MT-4LD216T-WT	LED	UNV	46	ELV
C	C	RECESSED MONOPOINT SPOTLIGHT FIXTURE	WAC LIGHTING	MO-1014F-930-BK	LED	120V	14	ELV
D	D	WALL WASH LIGHT FIXTURE	CHAUVET DJ	SLIMPAR T6BT	LED	UNV	15	DMX
S1	S1	LED TAPE LIGHTING FIXTURE	PLT	2835-60-IP65-WW2450NHC 3K 24V 90CRI *MOUNTED IN KLUS LIPOD CHANNEL WITH LIGER-22 FROSTED COVER AND MAGNITUDE M150L24DC-AR DIMMABLE LED DRIVER	LED	120V	3.5W/FT.	NONE
S2	S2	LED TAPE LIGHTING FIXTURE	PLT	2835-60-IP65-WW2450NHC 3K 24V 90CRI *WITH MAGNITUDE M150L24DC-AR DIMMABLE LED DRIVER	LED	120V	3.5W/FT.	MLV
S3	S3	LED TAPE LIGHTING FIXTURE	PLT	5050-60-IP65-RGB2450 NANO RGB 24V 90CRI LED TAPE LIGHT WITH MEAN WELL LRS-350-24 SE SERIES POWER SUPPLY, SUPERBRIGHTLEDS.COM EZD-RGBW3-WM WALL SWITCH AND EZD-4C8A CONTROLLER. REFER TO E-300 FOR S3 FIXTURE CONTROLS WIRING DIAGRAM.	LED	120	4.5W/FT.	RGB
S4	S4	LED TAPE LIGHTING FIXTURE	PLT	2835-60-IP65-WW2450NHC 3K 24V 90CRI *MOUNTED IN KLUS LIPOD CHANNEL WITH LIGER-22 FROSTED COVER AND MAGNITUDE M150L24DC-AR DIMMABLE LED DRIVER	LED	120V	3.5W/FT.	MLV
	--	EMERGENCY LIGHTING FIXTURE	THE LIGHTING SOURCE	MINI-SQ-L-W-SDT NOTE: DEDICATED EMERGENCY LIGHT. CONNECT TO UNSWITCHED LIGHTING CIRCUIT SERVING SPACE.	LED	UNV	6	NONE
EM	--	CORRIDOR EMERGENCY DOWNLIGHT FIXTURE	THE EXIT LIGHT CO	EL-RG6 W/B6V4A BATTERY NOTE: DEDICATED EMERGENCY LIGHT. CONNECT TO UNSWITCHED LIGHTING CIRCUIT SERVING SPACE.	HALOGEN	UNV	8	NONE
	--	WALL-MOUNTED EDGE-LIT EXIT SIGN FIXTURE	THE EXIT LIGHT COMPANY	ELSM-R	LED	UNV	5	NONE

NYS ECC 2020 COMPLIANCE (LIGHTING)

ROOM	ROOM AREA (SQ. FT.)	WATTAGE	WATTS/SQ. FT.	ALLOWABLE WATTS	ALLOWABLE WATTS/SQ. FT.	LIGHTING CONTROLS
SOUND LOCK	37	61	1.65	24.5	0.66	MANUAL-ON CONTROLS (VACANCY SENSORS WITH MANUAL OVERRIDE SWITCHES)
RECORDING BOOTH	62	62	1.00	26	0.42	MANUAL-ON CONTROLS (VACANCY SENSORS WITH MANUAL OVERRIDE SWITCHES)
IT CLOSET	10	10.5	1.05	4.6	0.46	MANUAL-ON CONTROLS (VACANCY SENSORS WITH MANUAL OVERRIDE SWITCHES)
CONTROL ROOM	400	368.5	0.92	532	1.33	MANUAL-ON CONTROLS (VACANCY SENSORS WITH MANUAL OVERRIDE SWITCHES)
LIVE ROOM	CONNECTED LIGHTING POWER IN THIS ROOM IS EXEMPT AS PER SECTION C405.3.1.					MANUAL-ON CONTROLS (VACANCY SENSORS WITH MANUAL OVERRIDE SWITCHES)
	TOTAL:	502	--	587.1	--	--

ELECTRICAL DRAWING LIST

SYMBOLS

Revisions

REVISION #	DATE	REVISION	APPROVED
-	7/8/21	FINAL REVIEW SET	
-	9/14/21	ISSUED FOR BID	
1	11/22/21	ADDENDUM 3	

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PROJECT

Purchase College
Studio A
Renovations

DRAWING NAME

ELECTRICAL SYMBOLS LIST, ABBREVIATIONS, LIGHTING SCHEDULE, ENERGY CODE COMPLIANCE TABLE, GENERAL NOTES AND DRAWING LIST

SEAL & SIGNATURE

SCALE N/A

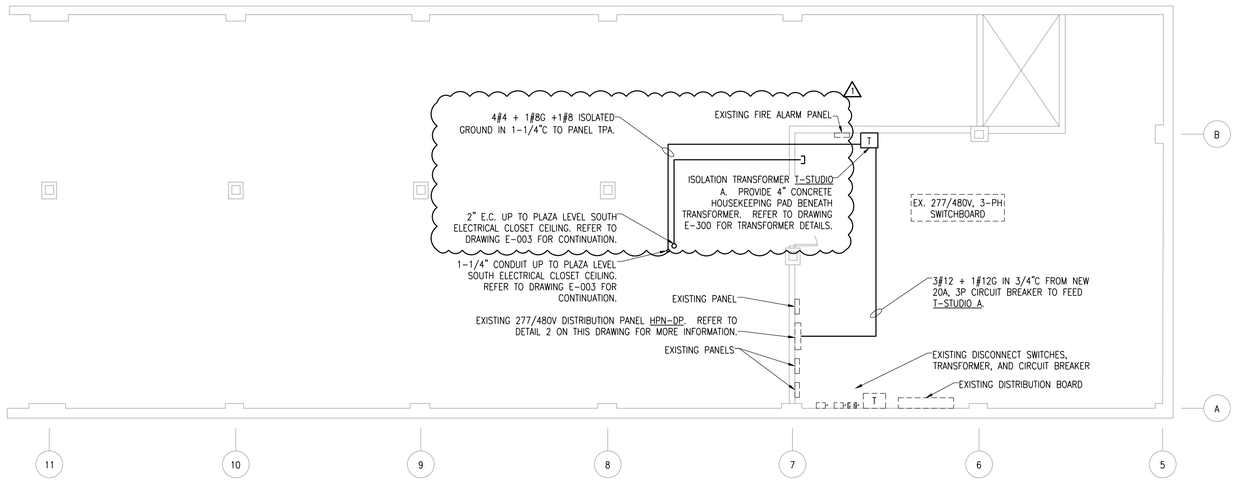
DATE

CAD FILE#

DRAWING NUMBER

E-001.00

SHEET 1 of 12



1 ELECTRICAL SUB-BASEMENT PLAN
SCALE: 1/8" = 1'-0"

2 DISTRIBUTION PANEL HPN-DP DETAIL
SCALE: N/A

SYMBOLS

Revisions

REVISION #	DATE	REVISION	APPROVED
-	7/8/21	FINAL REVIEW SET	
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1	11/22/21	ADDENDUM 3	

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MEP CONSULTANT

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White Plains, NY 10601
(914) 332-7658

PROJECT

Purchase College
Studio A
Renovations

DRAWING NAME

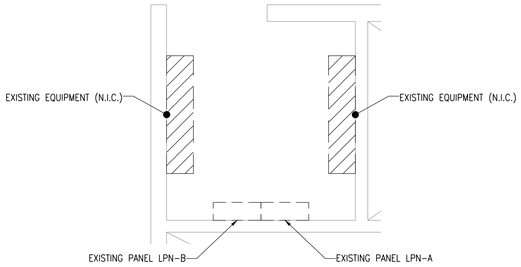
ELECTRICAL SUB-BASEMENT PLAN

SEAL & SIGNATURE

SCALE AS NOTED
DATE
CAD FILE

DRAWING NUMBER
E-002.00

SHEET
2 of 12

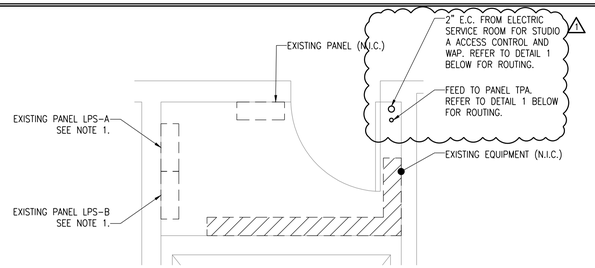


2 NORTH ELECTRICAL CLOSET DETAIL

SCALE: 1/2" = 1'-0"

NOTES:

1. (3) BRANCH CIRCUIT SUPPLYING EXISTING PLUGMOLD IN STUDIO A ARE SUPPLIED BY PANELS LPN-A AND LPN-B. ONE OF THESE CIRCUITS IS LPN-A/24. CONTRACTOR SHALL TRACE THE REMAINING CIRCUITS AND UPDATE DIRECTORIES, THESE CIRCUITS SHALL BE DISCONNECTED AND CUT BACK.



3 SOUTH ELECTRICAL CLOSET DETAIL

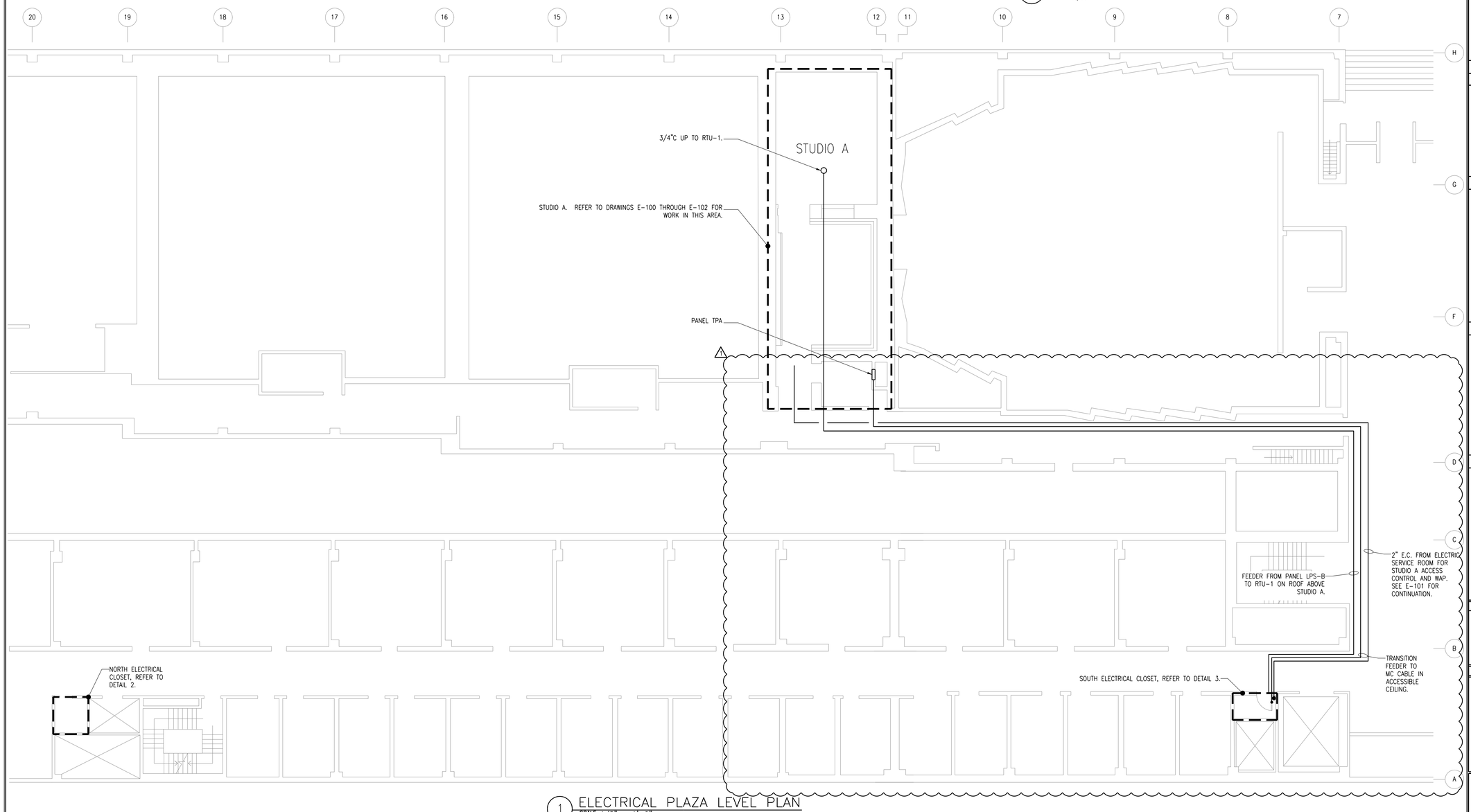
SCALE: 1/2" = 1'-0"

NOTES:

1. REMOVE ASCO 920 REMOTE CONTROL SWITCHES FROM LPS-A AND LPS-B AND CONNECT SPLIT BUS DIRECTLY TO MAIN BUS. REFER TO DETAIL 4.

4 PANEL LPS-A & LPS-B DETAIL

SCALE: N/A



1 ELECTRICAL PLAZA LEVEL PLAN

SCALE: 1/8" = 1'-0"

SYMBOLS

Revisions

REVISION #	DATE	REVISION	APPROVED
-	7/8/21	FINAL REVIEW SET	
-	9/14/21	ISSUED FOR BID	
1	11/22/21	ADDENDUM 3	

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ELECTRICAL PLAZA LEVEL PLAN

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SCALE: AS NOTED

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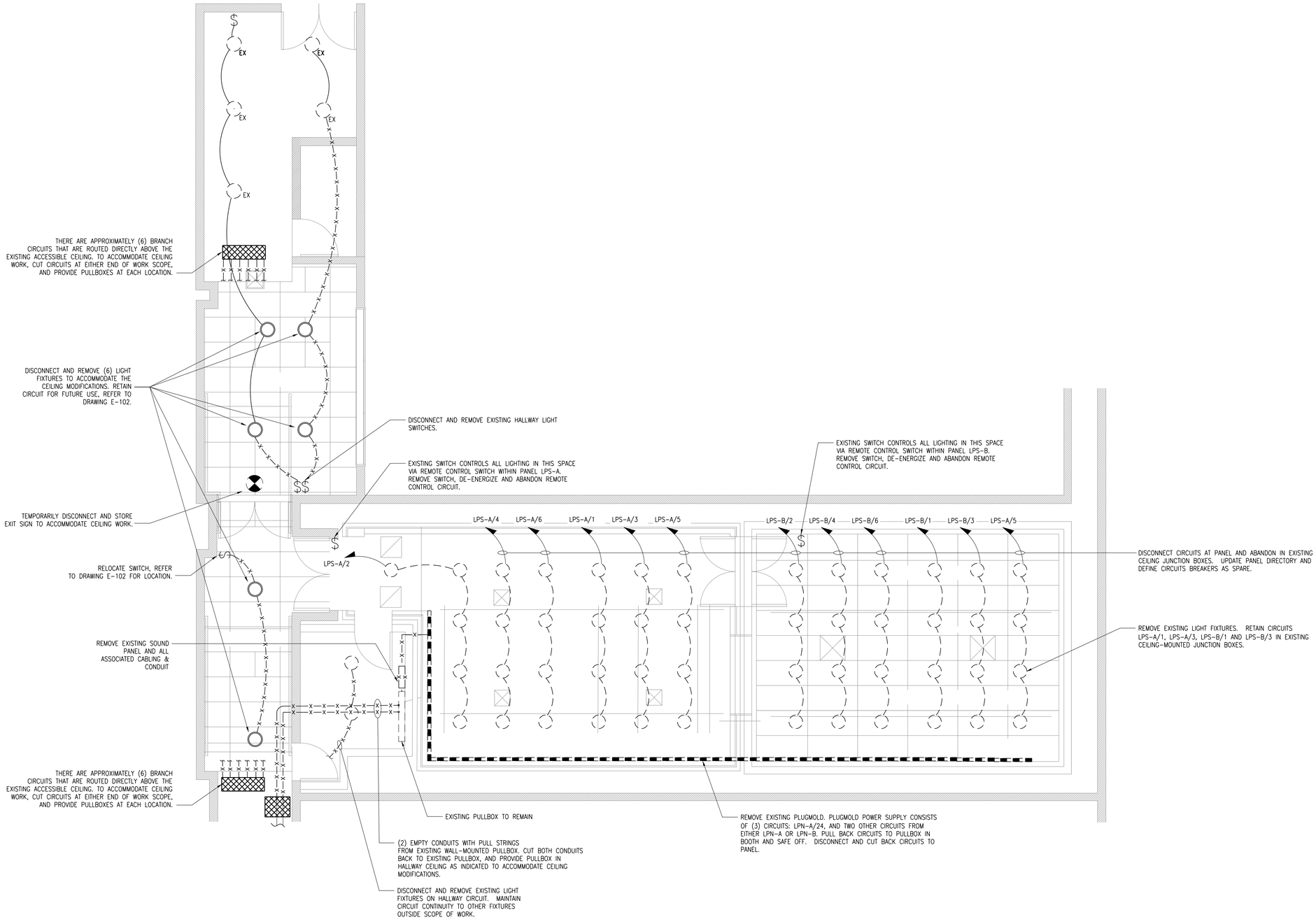
CAD FILE#:

DRAWING NUMBER: E-003.00

SHEET: 3 of 12



SYMBOLS

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DRAWING NAME

ELECTRICAL DEMOLITION PLAN

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SCALE 1/4"=1'-0"

DATE

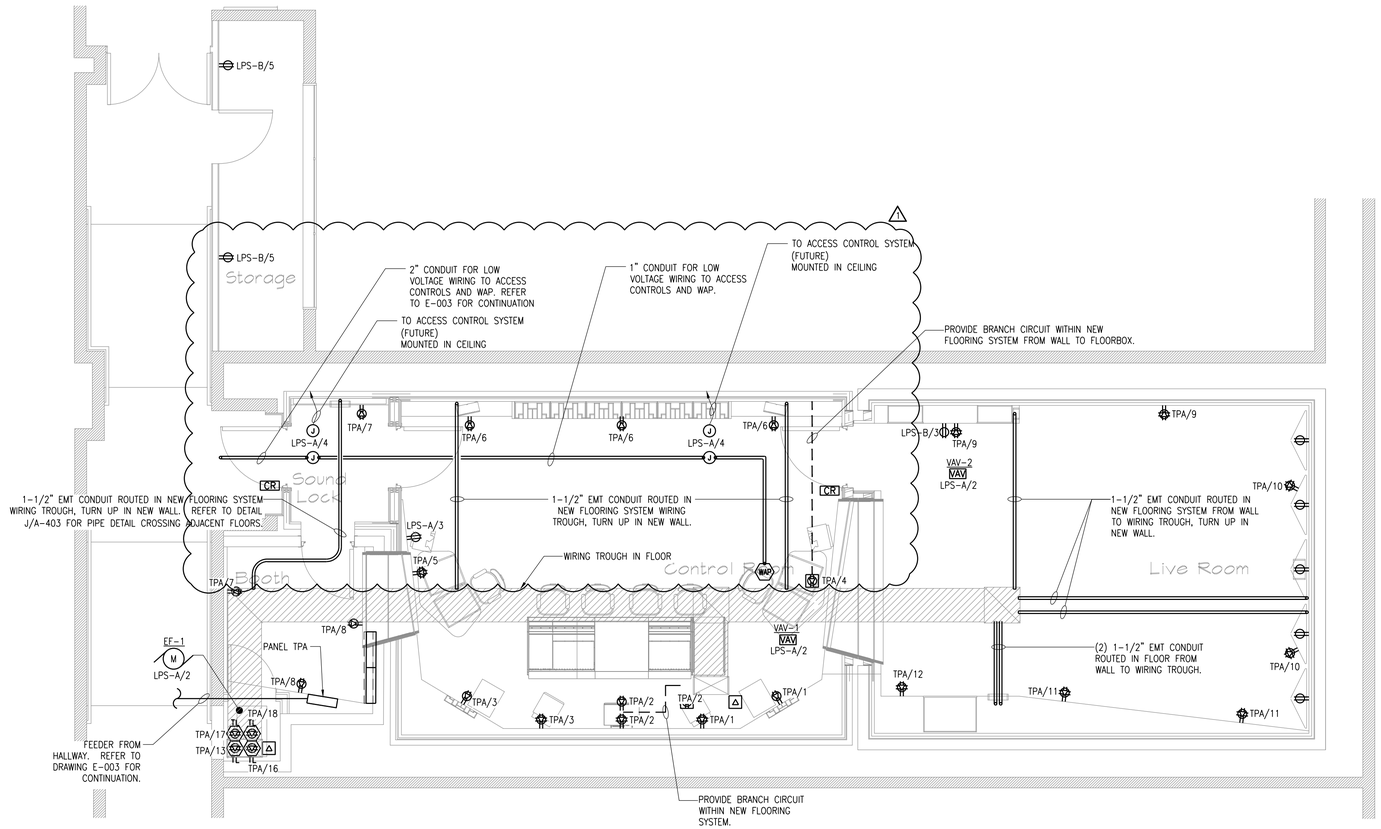
CAD FILE#

DRAWING NUMBER

E-100.00

SHEET

4 of 12



ELECTRICAL NOTES:

1. REFER TO DRAWINGS A-103 AND A-403 FOR CONDUIT ROUTING DETAILS IN NEW FLOORING SYSTEM.
2. REFER TO ARCHITECTURAL DRAWINGS FOR ACOUSTICAL TREATMENT REQUIREMENTS.
3. DEVICE LOCATIONS AND PENETRATIONS SHALL BE COORDINATED WITH ARCHITECT.

SYMBOLS

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DRAWING NAME

ELECTRICAL POWER PLAN

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SCALE 1/4"=1'-0"

DATE

CAD FILE

DRAWING NUMBER

E-101.00

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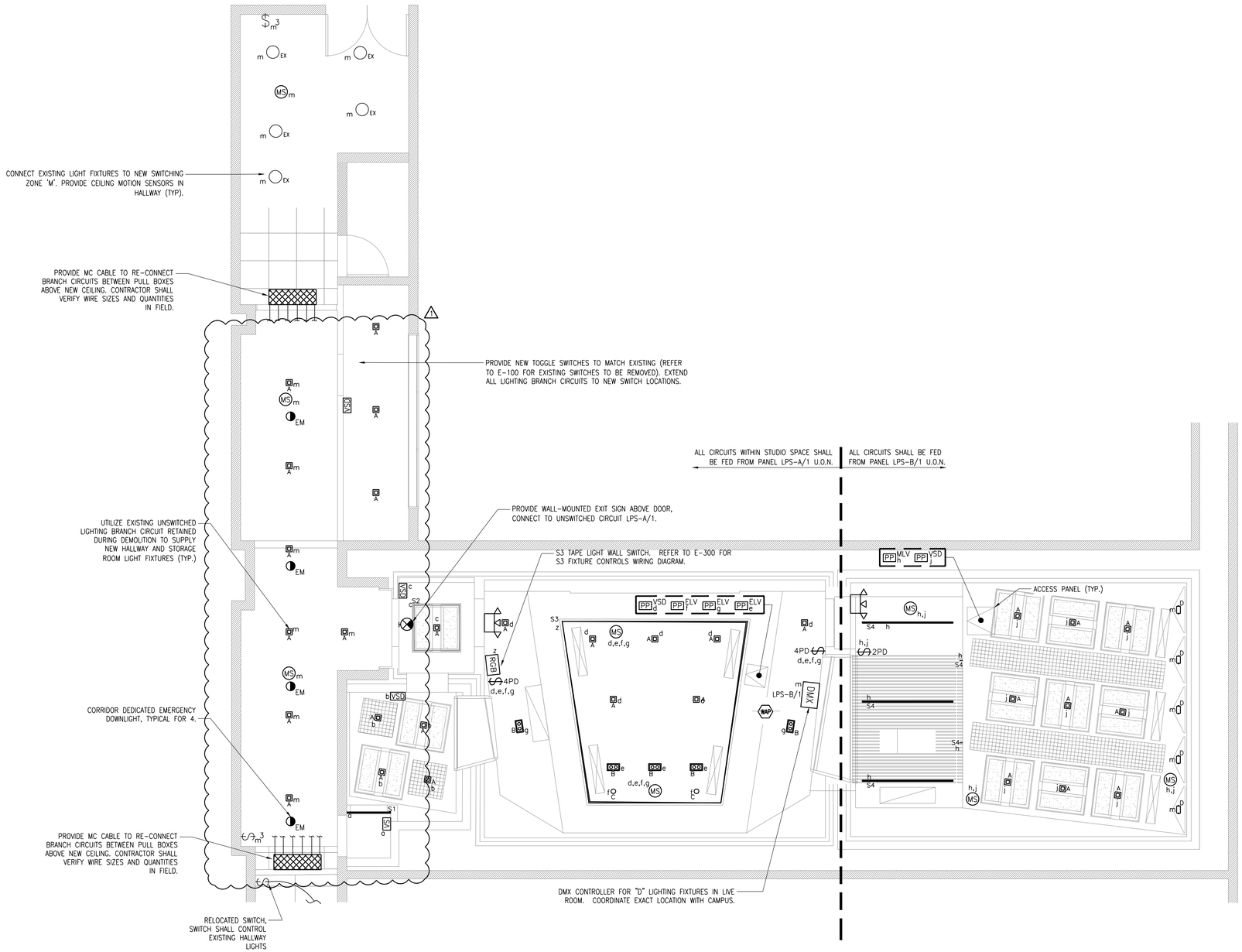
5 of 12



NOTE: REFER TO DRAWING A-201 FOR CEILING ARCHITECTURAL DETAILS.

SYMBOLS

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ELECTRICAL LIGHTING PLAN

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SCALE 1/4"=1'-0"

DATE

CAD FILE#

DRAWING NUMBER

E-102.00

SHEET

6 OF 12

STUDIO A ON PLAZA LEVEL BELOW

RTU-1
M
WP LPS-B/2,4,6

D1

SYMBOLS

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PROJECT

Purchase College
Studio A
Renovations

DRAWING NAME

ELECTRICAL ROOF PLAN

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SCALE 1/4"=1'-0"
DATE
CAD FILE#
DRAWING NUMBER
E-103.00
SHEET
7 of 12

PANEL NO. LPS-A SECTION – | EXISTING PANEL | ☐ RECESSED | ☐ MAIN LUG ONLY
VOLTS 120/208 PH 3 W 4 G 1 | ☒ SURFACE MOUNTED | ☒ MAIN CB
MAIN CB 225A BUS 225A MIN. INTERRUPTING RATING – SYMM. | ☐ FEED THRU LUG

CKT NO.	GFCI BKR	TRIP (AMPS)	DESCRIPTION OF LOAD	LOAD (KVA)	PER PHASE KVA A	B	C	LOAD (KVA)	DESCRIPTION OF LOAD	TRIP (AMPS)	GFCI BKR	CKT NO.
1	☐	20	(1) STUDIO A LIGHTING	0.71	0.91			0.2	EF-1, VAV-1 AND VAV-2 (1)	20	☐	2
3	☐	20	(1) CONTROL ROOM CONVENIENCE RECEPT.	0.18		0.98		0.8	ACCESS CONTROL POWER SUPPLIES (1)	20	☐	4
5	☐	20	(1) STORAGE CLOSET RECEPT.	0.36			0.36	0	SPARE (4)	20	☐	6
7	☐		EXISTING SPACE	0	0			0	EXISTING SPACE		☐	8
9	☐		EXISTING SPACE	0		0		0	EXISTING SPACE		☐	10
11	☐		EXISTING SPACE	0			0	0	EXISTING SPACE		☐	12
			ASCO 920 REMOTE CONTROL SWITCH (5)		#	#	#		ASCO 920 REMOTE CONTROL SWITCH (5)			
					#	#	#					
13	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	14
15	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	16
17	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	18
19	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	20
21	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	22
23	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	24
25	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	26
27	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	28
29	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	30
31	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	32
33	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	50	☐	34
35	☐	20	EXISTING CIRCUIT	0			0	0			☐	36
37	☐	20	EXISTING CIRCUIT	0	0			0			☐	38
39	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	40
41	☐			0			0	0			☐	42
43	☐	50	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	44
45	☐			0		0		0			☐	46
47	☐	20	EXISTING CIRCUIT	0			0	0			☐	48
					0.91	0.98	0.36					

PANEL NO. LPS-B SECTION – | EXISTING PANEL | ☐ RECESSED | ☐ MAIN LUG ONLY
VOLTS 120/208 PH 3 W 4 G 1 | ☒ SURFACE MOUNTED | ☒ MAIN CB
MAIN CB 225A BUS 225A MIN. INTERRUPTING RATING – SYMM. | ☐ FEED THRU LUG

CKT NO.	GFCI BKR	TRIP (AMPS)	DESCRIPTION OF LOAD	LOAD (KVA)	PER PHASE KVA A	B	C	LOAD (KVA)	DESCRIPTION OF LOAD	TRIP (AMPS)	GFCI BKR	CKT NO.
1	☐	20	(1) STUDIO A LIGHTING	0.3	2.6			2.3			☐	2
3	☐	20	(1) LIVE ROOM CONVENIENCE RECEPTACLE	0.18		2.48		2.3	RTU-1 3/8 + 1/8G IN 3/4"C (2)	35	☐	4
5	☐	20	(4) SPARE	0			2.3	2.3			☐	6
7	☐		EXISTING SPACE	0	0			0	EXISTING SPACE		☐	8
9	☐		EXISTING SPACE	0		0		0	EXISTING SPACE		☐	10
11	☐		EXISTING SPACE	0			0	0	EXISTING SPACE		☐	12
			ASCO 920 REMOTE CONTROL SWITCH (5)		#	#	#		ASCO 920 REMOTE CONTROL SWITCH (5)			
					#	#	#					
13	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	14
15	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	16
17	☐	20	EXISTING CIRCUIT	0			0	0			☐	18
19	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	20
21	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	22
23	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	24
25	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	26
27	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	28
29	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	30
31	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	32
33	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	34
35	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	36
37	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	38
39	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	40
41	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	42
43	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	44
45	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	46
47	☐		EXISTING SPACE	0			0	0	EXISTING SPACE		☐	48
					2.6	2.48	2.3					

PANEL NO. LPN-A SECTION – | EXISTING PANEL | ☐ RECESSED | ☐ MAIN LUG ONLY
VOLTS 120/208 PH 3 W 4 G 1 | ☒ SURFACE MOUNTED | ☒ MAIN CB
MAIN CB 100A BUS 100A MIN. INTERRUPTING RATING – SYMM. | ☐ FEED THRU LUG

CKT NO.	GFCI BKR	TRIP (AMPS)	DESCRIPTION OF LOAD	LOAD (KVA)	PER PHASE KVA A	B	C	LOAD (KVA)	DESCRIPTION OF LOAD	TRIP (AMPS)	GFCI BKR	CKT NO.
1	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING SPACE		☐	2
3	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING SPACE		☐	4
5	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	6
7	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	8
9	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	10
11	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	12
13	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	14
15	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	16
17	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	18
19	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	20
21	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	22
23	☐	20	EXISTING CIRCUIT	0			0	0	SPARE (3)	20	☐	24
25	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING SPACE		☐	26
27	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING SPACE		☐	28
29	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING SPACE		☐	30
					0	0	0					

PANEL NO. LPN-B SECTION – | EXISTING PANEL | ☐ RECESSED | ☐ MAIN LUG ONLY
VOLTS 120/208 PH 3 W 4 G 1 | ☒ SURFACE MOUNTED | ☒ MAIN CB
MAIN CB 100A BUS 100A MIN. INTERRUPTING RATING – SYMM. | ☐ FEED THRU LUG

CKT NO.	GFCI BKR	TRIP (AMPS)	DESCRIPTION OF LOAD	LOAD (KVA)	PER PHASE KVA A	B	C	LOAD (KVA)	DESCRIPTION OF LOAD	TRIP (AMPS)	GFCI BKR	CKT NO.
1	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	2
3	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	4
5	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	6
7	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	8
9	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	10
11	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	12
13	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	14
15	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	16
17	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	20	☐	18
19	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	20
21	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING CIRCUIT	20	☐	22
23	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING CIRCUIT	30	☐	24
25	☐	20	EXISTING CIRCUIT	0	0			0	EXISTING CIRCUIT	20	☐	26
27	☐	20	EXISTING CIRCUIT	0		0		0	EXISTING SPACE		☐	28
29	☐	20	EXISTING CIRCUIT	0			0	0	EXISTING SPACE		☐	30
					0	0	0					

PANEL NO. PANEL TPA SECTION – | ☒ RECESSED | ☒ MAIN LUG ONLY
VOLTS 120/208 PH 3 W 4 G 1 IG 1 | ☐ SURFACE MOUNTED | ☐ MAIN CB
MAIN CB – BUS 100A MIN. INTERRUPTING RATING – SYMM. | ☐ FEED THRU LUG

CKT NO.	GFCI BKR	TRIP (AMPS)	DESCRIPTION OF LOAD	LOAD (KVA)	PER PHASE KVA A	B	C	LOAD (KVA)	DESCRIPTION OF LOAD	TRIP (AMPS)	GFCI BKR	CKT NO.
1	☐	20	MON/SUB LEFT	1.1	1.9			0.8	MON CTR/DISPLAY	20	☐	2
3	☐	20	MON/SUB RIGHT	1.1		1.9		0.8	CREDENZA LEFT	20	☐	4
5	☐	20	CREDENZA RIGHT	0.8			1.1	0.3	CONTROL ROOM CONV.	20	☐	6
7	☐	20	SOUND LOCK ISO	0.3	0.6			0.3	ISO BOOTH	20	☐	8
9	☐	20	LIVE ROOM CONV. 1	0.3		0.6		0.3	LIVE ROOM CONV. 2	20	☐	10
11	☐	20	LIVE ROOM CONV. 3	0.3			0.6	0.3	LIVE ROOM CONV. 4	20	☐	12
13	☐	20	EQUIP RACK 1	1.7	1.7			0	SPARE	20	☐	14
15	☐	20	SPARE	0		1.7		1.7	EQUIP RACK 2	20	☐	16
17	☐	20	EQUIP RACK 3	1.3			2.6	1.3	EQUIP RACK 4	20	☐	18
19	☐	20	SPARE	0	0			0	SPARE	20	☐	20
21	☐	20	SPARE	0		0		0	SPARE	20	☐	22
23	☐	20	SPARE	0			0	0	SPARE	20	☐	24
25	☐	20	SPARE	0	0			0	SPARE	20	☐	26
27	☐	20	SPARE	0		0		0	SPARE	20	☐	28
29	☐	20	SPARE	0			0	0	SPARE	20	☐	30
					4.2	4.2	4.3					

NOTES:

1. PANEL TPA IS AN ISOLATED GROUND PANEL. PROVIDE SEPARATE ISOLATED GROUND BUS IN PANEL.
2. ALL PANEL TPA CIRCUITS SHALL CONSIST OF 2#12 + 1#12EGC + 1#12 ISOLATED GROUND. ISOLATED GROUND SHALL TERMINATE TO IG RECEPTACLE GROUND TERMINALS SEPERATELY FROM EQUIPMENT GROUNDING CONDUCTOR.

ELECTRICAL KEY NOTES:

(1) INDICATES NEW CIRCUIT UTILIZING EXISTING CIRCUIT BREAKER. REUSE EXISTING CIRCUITING IN STUDIO A AND EXTEND AS NECESSARY.

(2) REPLACE (3) EXISTING 1P, 20A CIRCUIT BREAKERS WITH (1) 3P, 35A CIRCUIT BREAKER AND PROVIDE NEW CIRCUIT TO FEED RTU-1.

(3) INDICATES EXISTING STUDIO A PLUGMOLD CIRCUIT. UPDATE DIRECTORY AS SPARE

(4) UPDATE DIRECTORY AS SPARE.

(5) REMOVE ASCO REMOTE CONTROL SWITCH. SEE DETAIL 4 ON DRAWING E-003.

SYMBOLS

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DRAWING NAME

ELECTRICAL PANEL SCHEDULES

SEAL & SIGNATURE

SCALE AS NOTED

DATE

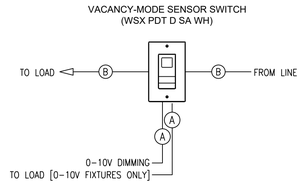
CAD FILE#

DRAWING NUMBER

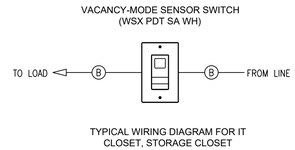
E-200.00

SHEET

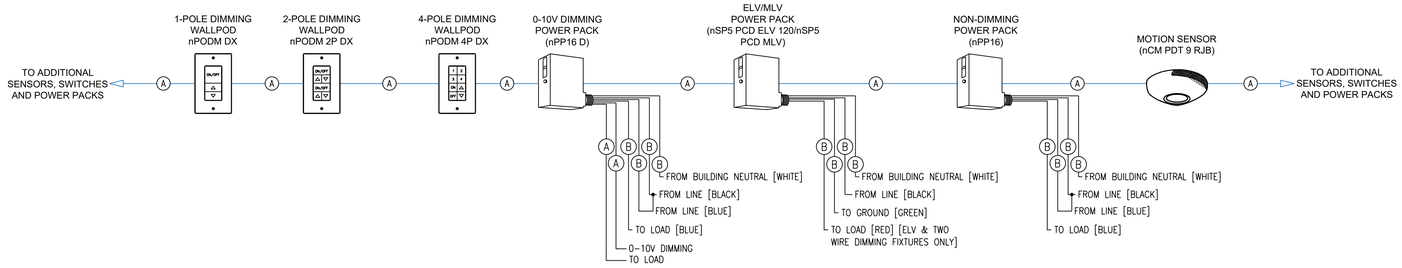
8 of 12



TYPICAL WIRING DIAGRAM BOOTH AND SOUND LOCK



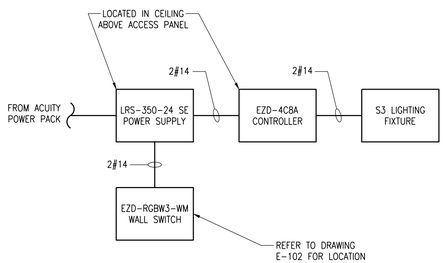
TYPICAL WIRING DIAGRAM FOR IT CLOSET, STORAGE CLOSET



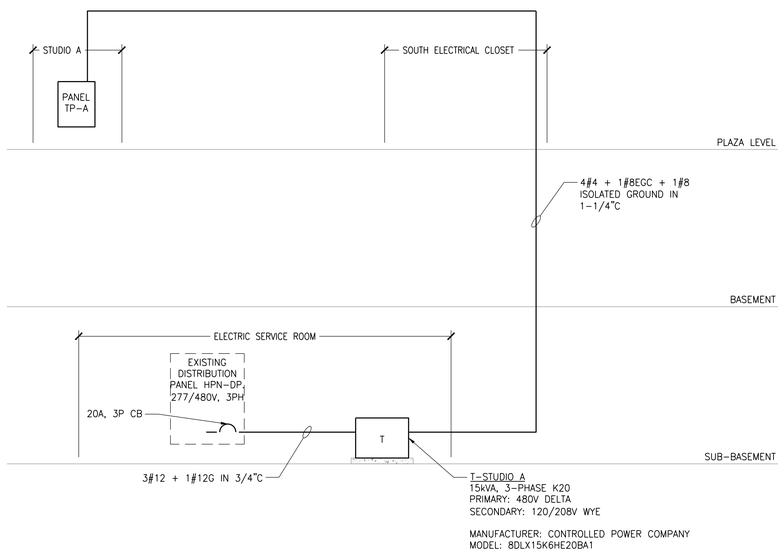
WIRE LEGEND	
A	CAT 5 (LOW VOLTAGE)
B	CLASS 1 (LINE VOLTAGE)

TYPICAL WIRING DIAGRAM FOR CONTROL ROOM, LIVE ROOM, AND CORRIDOR (NO DIMMING IN CORRIDOR).

LIGHTING CONTROL TYPICAL WIRING DIAGRAM



S3 FIXTURE CONTROLS WIRING DIAGRAM



ELECTRICAL RISER DIAGRAM

SYMBOLS

Revisions

REVISION #	DATE	REVISION	APPROVED
-	7/8/21	FINAL REVIEW SET	
-	9/14/21	ISSUED FOR BID	

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PROJECT

Purchase College
Studio A
Renovations

DRAWING NAME

ELECTRICAL DETAILS (SHEET 1)

SEAL & SIGNATURE

SCALE N/A

DATE

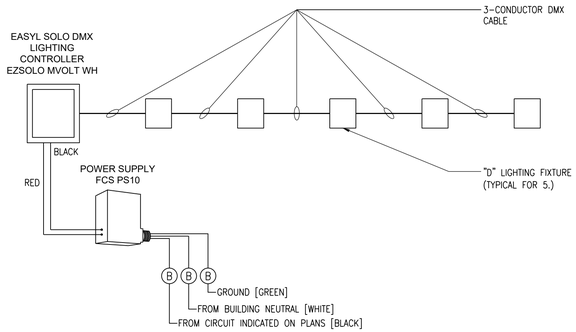
CAD FILE#

DRAWING NUMBER

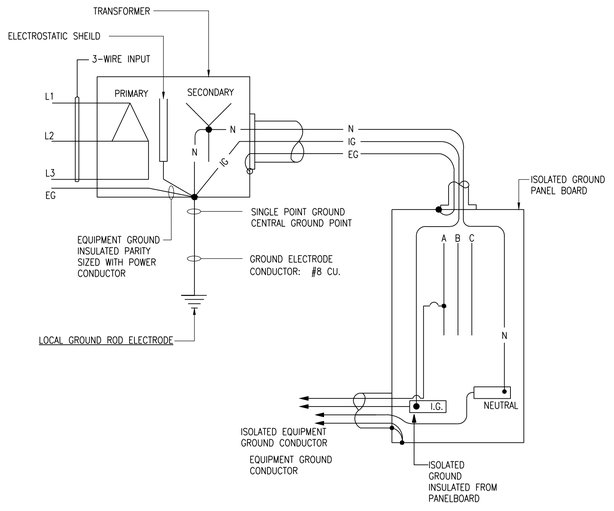
E-300.00

SHEET

9 of 12



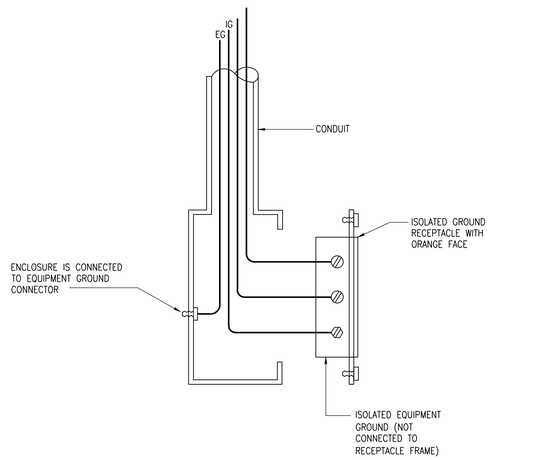
DMX LIGHTING CONTROL WIRING DIAGRAM



LEGEND:

N – NEUTRAL
IG – ISOLATED GROUND
EG – EQUIPMENT GROUND

ISOLATED GROUND PANELBOARD WIRING DETAIL



NOTES:

1. PROVIDE DEDICATED ISOLATED GROUND, EQUIPMENT GROUND AND NEUTRAL CONDUCTOR FOR EACH CIRCUIT SERVING TELEVISION BROADCAST EQUIPMENT, AUDIO VISUAL EQUIPMENT AND SOUND SYSTEM EQUIPMENT.

LEGEND:

ϕ – PHASE CONDUCTOR

N – NEUTRAL CONDUCTOR

EG – EQUIPMENT GROUND CONDUCTOR

IG – ISOLATED EQUIPMENT GROUND CONDUCTOR CONNECTED TO "SINGLE POINT GROUND" AT LOCAL TRANSFORMER OR RDU

ISOLATED GROUND RECEPTACLE WIRING DETAIL

SYMBOLS

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SHEET

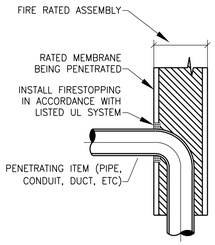
10 of 12

GENERAL GUIDELINE FOR SELECTING APPROPRIATE FIRESTOPPING SYSTEMS:

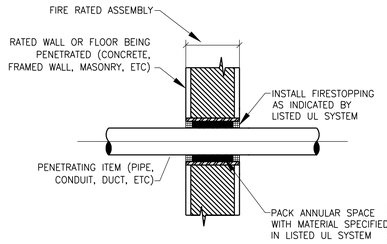
DETERMINE SYSTEM COMPONENTS:
- –TYPE OF PENETRATION (MEMBRANE OR THROUGH)
- –PENETRATING ITEM
- –ASSEMBLY BEING PENETRATED
- –MINIMUM AND MAXIMUM ANNULAR SPACES, POINTS OF CONTACT

DETERMINE RATING REQUIREMENTS:
- –F–RATING, T–RATING, L–RATING, AND W–RATING

FOR EACH PENETRATION, SELECT A SYSTEM LISTED BY AN APPROVED TESTING AGENCY (UL, FM, ETC) THAT MEETS ALL OF THE ABOVE PARAMETERS



MEMBRANE PENETRATION



THROUGH PENETRATION

F–RATING: THE AMOUNT OF TIME (IN HOURS) BEFORE FLAMES CAN PASS THROUGH A PENETRATION FROM THE SIDE OF A WALL OR FLOOR EXPOSED TO FLAMES TO THE UNEXPOSED SIDE

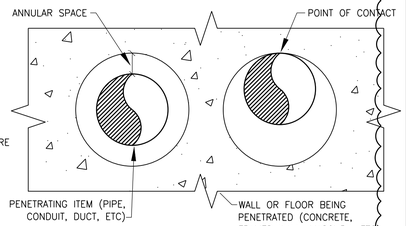
T–RATING: THE AMOUNT OF TIME (IN HOURS) BEFORE THE SURFACE OF AN ASSEMBLY AND/OR PENETRATING ITEM ON THE SIDE OF A WALL OR FLOOR NOT EXPOSED TO FLAMES RISES TO A TEMPERATURE OF 325°F

L–RATING: THE AMOUNT OF AIR/SMOKE (IN CUBIC FEET PER MINUTE PER SQUARE FOOT) THAT CAN LEAK THROUGH THE PENETRATION

W–RATING: A FIRESTOPPING PRODUCT'S ABILITY TO RESIST THE PASSAGE OF WATER THROUGH FLOOR ASSEMBLIES

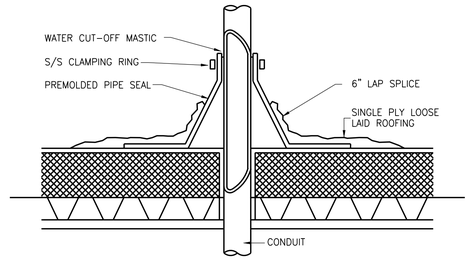
REFER TO PROJECT SPECIFICATIONS FOR RATINGS AND ADDITIONAL FIRESTOPPING REQUIREMENTS

DEFINITIONS AND NOTES



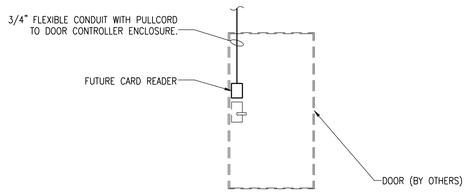
ANNULAR SPACE

FIRESTOPPING PENETRATIONS GUIDELINE

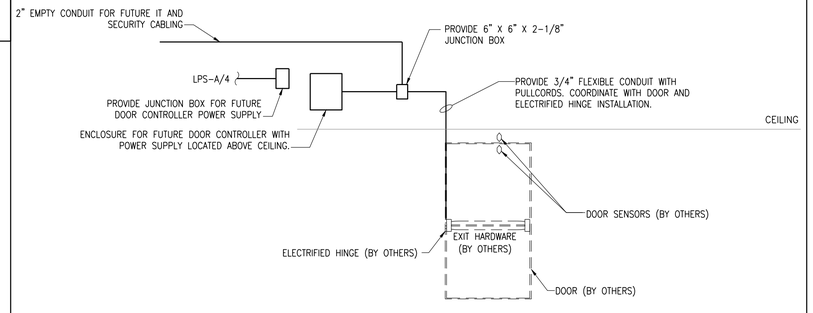


CONDUIT ROOF PENETRATION DETAIL

OUTSIDE



INSIDE



NOTE: COORDINATE WITH CAMPUS IT AND SECURITY PERSONNEL

ACCESS CONTROL SYSTEM DETAILS

SYMBOLS

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1	11/22/21	ADDENDUM 3	

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11 of 12

ELECTRICAL WORK

1.GENERAL:

A. THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR.

C. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED. MAINTAIN HEADROOM AND SPACE CONDITIONS.

D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

E. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL.

F. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.

G. DISCONNECT OR REMOVE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.

H. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

I. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.

J. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AS REQUIRED.

K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

L. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

M. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

N. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

O. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INDICATE ANY DISCREPANCIES BETWEEN THE CONTRACT DRAWINGS AND ACTUAL FIELD CONDITIONS PRIOR TO SUBMITTAL OF BID. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING CONDUIT (SIZES, CLEARANCES, ETC) AND CONDITIONS.

P. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

Q. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

2. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMITY WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

3. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWING SUBMITTED:

1) PROJECT NAME AND LOCATION
2) NAME OF ARCHITECT AND ENGINEER
3) ITEM IDENTIFICATION
4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1) CONTRACTOR SHALL SUBMIT A PDF FILE TO ARCHITECT THROUGH PREVIOUSLY DISCUSSED AND APPROVED METHOD (EMAIL, SUBMITTAL EXCHANGE PROGRAM, ETC). SUBMITTAL WILL THEN BE FORWARDED TO RELEVANT PARTIES FOR REVIEW.
2) UNLESS OTHERWISE DISCUSSED & AGREED, PROVIDE ALL EQUIPMENT SUBMITTALS AND SHOP DRAWINGS AT ONE TIME, THE SAME TIME; AT LEAST, THREE WEEKS BEFORE A RESPONSE IS REQUIRED.
3) PROVIDE A SEPARATE TRANSMITTAL FOR EACH SUBMITTAL ITEM. TRANSMITTALS SHALL INDICATE PRODUCT BY SPECIFICATION SECTION NAME AND NUMBER. SEPARATE ALL SUBMITTALS INTO APPROPRIATE SPECIFICATION SECTION NUMBER. DO NOT COMBINE SPECIFICATION SECTIONS.
4) DO NOT SUBMIT ENTIRE MANUFACTURER'S CATALOG; IT WILL NOT BE REVIEWED. SUBMIT ONLY PAGES WHICH ARE PERTINENT TO THE PROJECT. ALL OPTIONS WHICH ARE INDICATED ON THE PRODUCT DATA SHALL BECOME PART OF THE CONTRACT AND SHALL BE REQUIRED WHETHER SPECIFIED ARE NOT.
5) MARK EACH COPY OF STANDARD PRINTED DATA TO IDENTIFY PERTINENT PRODUCTS, REFERENCED TO SPECIFICATION SECTION AND ARTICLE NUMBER.
6) SHOW REFERENCE STANDARDS, PERFORMANCE CHARACTERISTICS AND CAPACITIES; WIRING AND PIPING DIAGRAMS AND CONTROLS; COMPONENT PARTS; FINISHES; DIMENSIONS AND REQUIRED CLEARANCES.
7) MODIFY MANUFACTURER'S STANDARD SCHEMATIC DRAWINGS AND DIAGRAMS TO SUPPLEMENT STANDARD INFORMATION AND TO PROVIDE INFORMATION SPECIFICALLY APPLICABLE TO THE WORK. DELETE INFORMATION NOT APPLICABLE.
8) THE ENGINEER WILL REVIEW THE ORIGINAL SUBMITTAL AND ONE RESUBMITTAL FOR THE SAME PRODUCT. ADDITIONAL RESUBMITTALS WILL BE REVIEWED ON A HOURLY RATE, PAYABLE BY THE CONTRACTOR.
9) PARTIAL SUBMITTALS OR SUBMITTALS NOT PROPERLY FORMATTED AS INDICATED ABOVE, ARE SUBJECT TO RETURN WITHOUT REVIEW FOR THE CONTRACTOR TO CORRECT.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1) SWITCHES
2) CIRCUIT BREAKERS
3) PANELBOARDS (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).
4) TRANSFORMERS
5) RACEWAYS
6) WIRE AND CABLE
7) RECEPTACLES
8) LIGHTING FIXTURES
9) TESTED AND LISTED FIRESTOPPING SYSTEMS

4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

5. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

B. DEFINITIONS:

1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
3) "FURNISH" OR "SUPPLY: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
5) "WIRING": RACEWAY, FITTINGS, WIRE, BOXES AND RELATED ITEMS.
6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

C. QUALITY ASSURANCE

1) QUALITY AND GAUGE OF MATERIALS: NEW, BEST OF THEIR RESPECTIVE KINDS, FREE FROM DEFECTS AND LISTED BY UNDERWRITERS LABORATORIES, INC., OR OTHER NATIONALLY APPROVED TESTING AGENCY AND BEARING THEIR LABEL. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.
3) CURRENT CHARACTERISTICS:
   a. DISTRIBUTION: 277/480 VOLT (AND 120/208 VOLT), 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.
4) HEIGHTS OF OUTLETS: FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:
   a. RECEPTACLES: 1 FT-6 IN. UNLESS OTHERWISE NOTED BY ARCHITECT
   b. WALL SWITCHES: 4 FT-0 IN.

EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

E. PRODUCT DELIVERY, STORAGE AND HANDLING

1) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

F. MATERIALS

1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.
2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.
3) INSERTS AND SUPPORTS:
   a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
   - SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
   - MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
   - CLIP FORM NAILS FLUSH WITH INSERTS.
   - MAXIMUM LOADING 75 PERCENT OF RATING.
   b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.
   c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.
   d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

G. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

H. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

I. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

J. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F.

KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE-QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

D. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE.
2) 240 VOLTS, 100-AMP FRAME: 18,000 AMPS, 2 AND 3 POLES.

F. TRANSFORMERS SHALL BE OPEN-VENTILATED, DRY TYPE, CLASS H INSULATION, 115 °C TEMPERATURE RISE. WINDINGS SHALL BE COPPER. PRIMARY AND SECONDARY VOLTAGES SHALL BE AS NOTED. PRIMARY TAPS (6-2 1/2% TAPS, 2 ABOVE AND 4 BELOW RATED VOLTAGE) SHALL BE PROVIDED. ADJUST FOR REQUIRED VOLTAGE.

G. BALANCE THE LOAD OVER PHASES WHEN NEW CIRCUITS ARE ADDED TO NEW OR EXISTING PANELS. PROVIDE MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGGING SHALL NOT BE PERMITTED. MOUNTING HEIGHT SHALL BE A MAXIMUM OF 6 FT-6 IN. FROM FLOOR TO TOP SWITCH UNIT. UPDATE DIRECTORIES ON EXISTING PANELBOARDS WHERE CIRCUITING IS CHANGED.

H. TESTS: OPEN AND CLOSE LOAD BREAK SWITCHING DEVICES UNDER LOAD.

7. RACEWAYS:

A. PROVIDE RACEWAYS COMPLETE WITH BOXES, FITTINGS AND ACCESSORIES. CONDUIT OR TUBING SIZES REFERRED TO IN SPECIFICATIONS AND ON DRAWINGS ARE NOMINAL DIAMETERS. MINIMUM DIAMETER SHALL BE 3/4 IN.

B. MATERIALS

1) RACEWAYS:
   a. RIGID STEEL CONDUIT: FULL-WEIGHT PIPE, GALVANIZED, THREADED.
   b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS.
   c. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
   d. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
2) FITTINGS AND ACCESSORIES:
   a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.
   b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.
   c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.
   d. BUSHINGS: METALLIC INSULATED TYPE.
3) BOXES:
   a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.
   b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED.

C. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB. FOR ABOVE FLOOR FITTINGS, POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED.

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK AND MACHINE SCREWS ON METAL. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, CRC-COLD GALVANIZED.

EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS.

FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.

RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

D. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

E. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

F. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

8. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.

CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM.

OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

C. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 °C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS, PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).

D. METAL CLAD CABLE CABLE (MC) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS. WHEN USED IN LIEU OF WIRING IN CONDUIT, STATE IN PROPOSAL THAT PRICE IS BASED UPON THE USE OF BX.

E. COLOR CODING SHALL BE AS FOLLOWS:

1) 120/208 VOLT SYSTEM:
   BLACK FOR A PHASE
   RED FOR B PHASE
   BLUE FOR C PHASE
2) 277/480 VOLT SYSTEM:
   BROWN FOR A PHASE
   ORANGE FOR B PHASE
   YELLOW FOR C PHASE
3) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.

WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.

F. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING, INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.

G. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.

H. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 °F.

I. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.

J. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.

9. DEVICES:

A. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.

B. INSERTION RECEPTACLES SHALL BE SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT. GROUNDED, EXCEPT AS NOTED. MEETING NEMA STANDARDS, PUBLICATION WD-1-1971. SIMILAR TO PASS & SEYMOUR NOS. 26342W (20 AMP) AND 26242W (15 AMP).

1) SINGLE, EXCEPT AS NOTED:

   a. 20 AMP STRAIGHT BLADE, SIMILAR TO PASS & SEYMOUR NO. 5361W.

   b. 125 VOLT, 2 POLE, 3 WIRE, GROUNDED.

2) SPECIAL USE: NONINTERCHANGEABLE TYPES AND RATINGS.

D. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

E. COLORS: COORDINATE COLORS WITH ARCHITECT.

F. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

10. LIGHTING FIXTURES:

A. PROVIDE FIXTURES ("LUMINARIES"), COMPONENTS AND LAMPS. FIXTURES SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.

B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.

C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.

11. LIGHTING CONTROLS:

A. BASIS OF DESIGN FOR ALL LIGHTING CONTROL SYSTEMS AND DEVICES IS ACUITY LIGHTING CONTROLS. OTHER ACCEPTABLE MANUFACTURERS ARE:

   a. SENSOR SWITCH LIGHTING CONTROLS
   b. WATTSTOPPER LIGHTING CONTROLS
   c. DOUGLAS LIGHTING CONTROLS
   d. OTHER APPROVED EQUAL.

B. ALL OCCUPANCY/VACANCY SENSORS SHALL BE WIRED TYPE UNLESS OTHERWISE NOTED. ROOMS CONTAINING MOVING EQUIPMENT, SUCH AS MECHANICAL ROOMS, PUMP ROOMS, ETC. SHALL BE EQUIPPED WITH PIR SENSORS. ALL OTHER SPACES SHALL BE PROVIDED WITH DUAL TECHNOLOGY SENSORS.

C. PROVIDE COMBINATION WALL SWITCH OCCUPANCY/VACANCY SENSORS AS INDICATED ON DRAWINGS. ALL COMBINATION SWITCH SENSORS SHALL BE LINE VOLTAGE TYPE.

D. ALL POWER PACKS SHALL BE CAPABLE OF SUPPORTING LIGHTING LOADS AS INDICATED ON DRAWINGS. POWER PACKS SHALL BE COMPATIBLE WITH LOAD DIMMING TYPE, WHERE REQUIRED (0-10V, ELV, 2-WIRE DIMMING, ETC.). ALL POWER PACKS SHALL BE LOCATED IN ACCESSIBLE LOCATIONS, AWAY FROM PUBLIC VIEW WHEREVER POSSIBLE.

E. IDENTIFY ALL LIGHTING CONTROL EQUIPMENT WITH LOAD SERVED.

F. ALL LIGHTING CONTROL COMPONENTS, INCLUDING BUT NOT LIMITED TO SENSORS, SWITCHES, AND POWER PACKS, SHALL BE TESTED FOR PROPER OPERATION. THIS INCLUDES TIME DELAYS AND DIMMING FUNCTIONALITY. ALL SENSORS SHALL BE ADJUSTED TO ACHIEVE OPTIMAL COVERAGE AS REQUIRED.

12. GROUNDING

A. PROVIDE ALL COMPONENTS REQUIRED FOR A COMPLETE GROUNDING SYSTEM CONSISTING OF GROUND ELECTRODES IN ACCORDANCE WITH THE 2017 NEC WITH NYC AMENDMENTS.

B. THE GROUNDING SYSTEM RESISTANCE SHALL BE LESS THAN 25 OHMS. PROVIDE ADDITIONAL GROUND ELECTRODES, IF REQUIRED, TO ACHIEVE THIS CRITERIA (MINIMUM 6 FEET AWAY).

C. SUBMIT SHOP DRAWINGS OF GROUNDING SYSTEM COMPONENTS, SYSTEM CONFIGURATION AND TEST REPORTS.

D. GROUND ELECTRODES SHALL BE COPPER-CLAD STEEL MINIMUM ¾ INCH DIAMETER AND 10 FEET LONG.

E. GROUND CONNECTORS SHALL BE TIN-PLATED ALUMINUM ALLOY, UL APPROVED AND STAMPED FOR USE WITH EITHER ALUMINUM OR COPPER CONDUCTORS.

F. GROUND CABLES SHALL BE BARE OR GREEN COLOR CODED, INSULATED, ANNEALED STRANDED TINNED COPPER WIRE AS INDICATED ON DRAWINGS.

G. PROVIDE CONTINUOUS GROUND PATH FOR ALL ELECTRICAL CIRCUITS, FROM POINT OF UTILIZATION BACK TO SOURCE THROUGH GROUND WIRES, CONDUIT RUNS, AND RELATED ITEMS.

H. ALL GROUND WIRES AND BONDING JUMPERS SHALL BE STRANDED COPPER INSTALLED IN CONDUIT. ALL GROUND WIRES SHALL BE WITHOUT JOINTS AND SPLICES OVER ITS ENTIRE LENGTH.

I. MECHANICAL EQUIPMENT SHALL BE BONDED TO THE BUILDING EQUIPMENT GROUNDING SYSTEM, INCLUDING FANS, PUMPS, ETC.

J. PROVIDE GROUNDING TYPE BUSHINGS FOR CONDUIT TERMINATED THROUGH MULTIPLE CONCENTRIC KNOCKOUTS NOT FULLY KNOCKED OUT, ON INSIDE OF PANELBOARDS AND LOAD CENTERS, GROUND BUSHING WITH #12 BARE COPPER TO PANELBOARD GROUND BUS.

13. FIRESTOPPING

A. QUALITY ASSURANCE:
12) USE FIRESTOPPING SYSTEMS THAT HAVE BEEN TESTED IN ACCORDANCE WITH ASTM E814 OR UL 1479. LISTING BY UL (DIR), UL (FDR), FM (AG), OR ITS (DIR) IN THEIR CERTIFICATION DIRECTORIES WILL BE CONSIDERED EVIDENCE OF SUCCESSFUL TESTING.
13) MANUFACTURER QUALIFICATIONS: COMPANY SPECIALIZING IN MANUFACTURING THE PRODUCTS FOR USE IN FIRE RATED ASSEMBLIES WITH MINIMUM THREE YEARS DOCUMENTED EXPERIENCE.

A. FIRESTOPPING ASSEMBLY REQUIREMENTS
1) FOR MEMBRANE AND THROUGH PENETRATIONS, PROVIDE FIRESTOPPING MATERIALS TO CREATE A LISTED SYSTEM, FOR THE ASSEMBLY BEING PENETRATED AND FIELD CONDITIONS, THAT HAVE THE FOLLOWING PROPERTIES, EXCEPT AS OTHERWISE PERMITTED BY THE BUILDING CODE:
   a. FIRE RESISTANCE: PROVIDE SYSTEMS THAT HAVE BEEN TESTED TO SHOW F-RATING EQUAL TO REQUIRED FIRE RATING OF PENETRATED ASSEMBLY.
   b. TEMPERATURE RISE: PROVIDE SYSTEMS THAT HAVE BEEN TESTED TO SHOW T-RATING EQUAL TO OR GREATER THAN THE F-RATING.
   c. AIR LEAKAGE: PROVIDE SYSTEMS THAT HAVE BEEN TESTED TO SHOW L-RATING IS EQUAL TO OR GREATER THAN THE L-RATING OF JOINTS IN ASSEMBLY BEING PENETRATED.
   d. WATERTIGHTNESS: PROVIDE SYSTEMS THAT HAVE BEEN TESTED TO MEET A CLASS 1 W-RATING FOR FLOOR PENETRATIONS.

C. FIELD CONDITIONS
1) COMPLY WITH FIRESTOPPING MANUFACTURER'S RECOMMENDATIONS FOR TEMPERATURE AND CONDITIONS DURING AND AFTER INSTALLATION; MAINTAIN MINIMUM TEMPERATURE BEFORE, DURING, AND FOR THREE DAYS AFTER INSTALLATION OF MATERIALS.
2) PROVIDE VENTILATION IN AREAS WHERE SOLVENT-CURED MATERIALS ARE BEING INSTALLED.

D. INSPECTION OF FIRESTOPPING SYSTEMS
1) METHOD OF INSPECTION SHALL BE AT THE DISCRETION OF THE SPECIAL INSPECTOR. CONTRACTOR SHALL PROVIDE ALL REQUIRED INFORMATION, COORDINATE WITH SPECIAL INSPECTOR AT LEAST 10 DAYS IN ADVANCE OF FIRE STOP INSTALLATION, AND ARRANGE SITE ACCESS. CONTRACTOR SHALL COMPLETELY REMOVE AND RESTORE ALL FIRESTOPPING THAT HAS UNDERGONE DESTRUCTIVE TESTING. NO CLAIMS FOR ADDITIONAL COST OR TIME WILL BE ALLOWED.
2) VISUAL INSPECTION: SPECIAL INSPECTOR SHALL BE ONSITE DURING INSTALLATION AND RANDOMLY WITNESS A MINIMUM OF 10% OF EACH TYPE OF FIRE STOP BEING INSTALLED.
3) DESTRUCTIVE TESTING: VERIFICATION OF FIRESTOPPING AFTER INSTALLATION HAS TAKEN PLACE. A MINIMUM OF 2%, BUT NOT LESS THEN ONE, OF EACH TYPE OF FIRE STOP SHALL BE INSPECTED PER FLOOR OR EACH AREA OF A FLOOR WHEN A FLOOR AREA IS LARGER THAN 10,000 SQ. FT.

SYMBOLS

Revisions

REVISION #	DATE	REVISION	APPROVED
-	7/8/21	FINAL REVIEW SET	
-	9/14/21	ISSUED FOR BID	

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PROJECT

Purchase College Studio A Renovations

DRAWING NAME

ELECTRICAL SPECIFICATIONS

SEAL & SIGNATURE

SCALE N/A

DATE

CAD FILE#

DRAWING NUMBER

E-400.00

SHEET

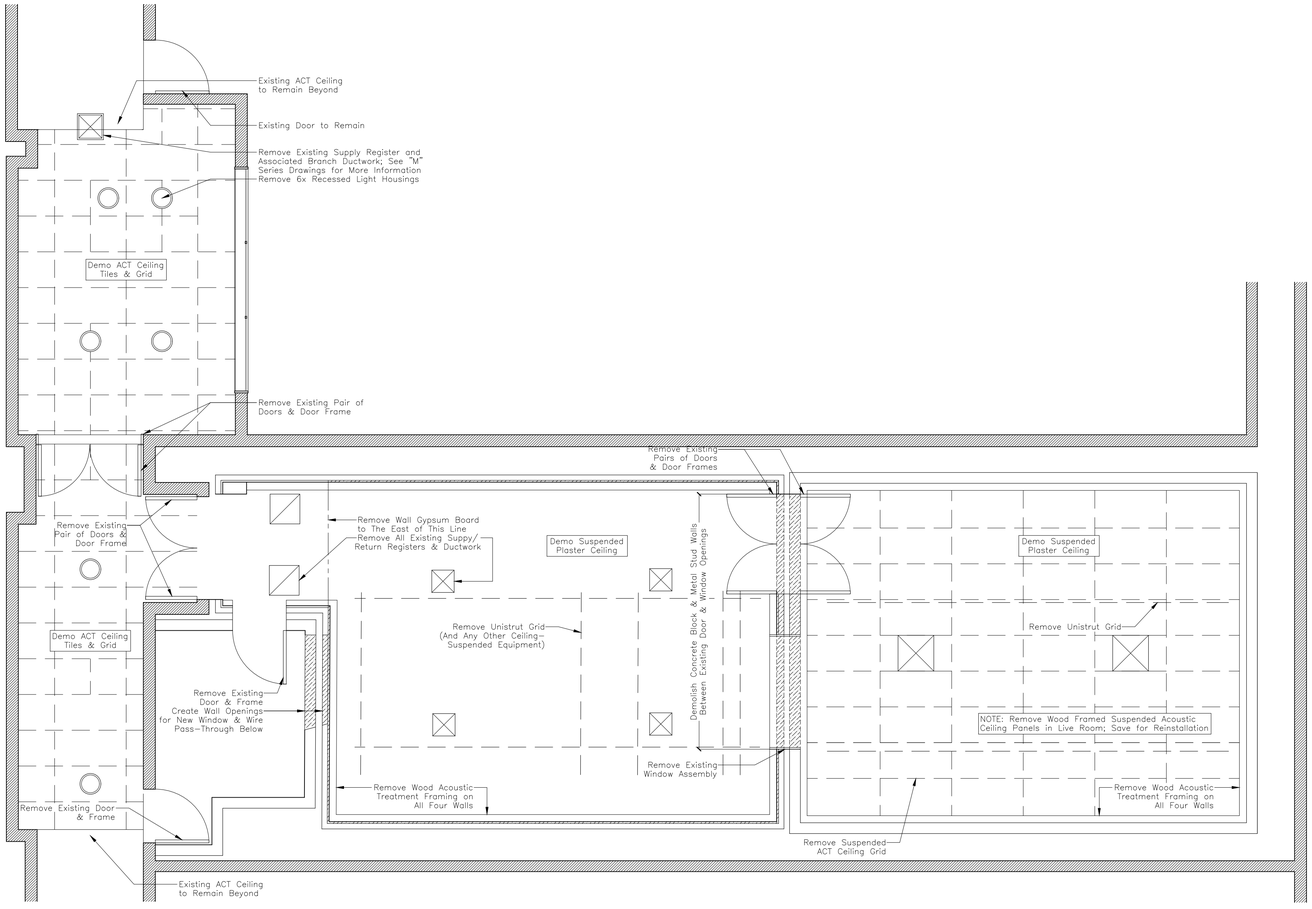
12 of 12

Purchase College - Studio A Finish Matrix

Revision: Addendum 3
Date: 11/19/21

Area	Finish Area	Sub Area	Material	Color/Style
Live Room	Flooring	All	4-3/4"x9/16" Kentwood Floors Avenue Engineered	Antiqued Acacia Natural Country
	Baseboard	All	4-1/2"x3/4" Paint Grade Poplar	BM HC-167 Amherst Gray
	W2 Walls	North/East	Paint on Drywall	BM HC-169 Coventry Gray
	W4 Wall	West, Inside Door Opening	Paint on Drywall	BM HC-169 Coventry Gray
	T10/T11 Walls	North/South	Stretched Fabric	Guilford of Maine Marin 1300-1147 Dolphin
	T10/T11 Cabinetry	North/South	Cabinet Enamel	BM HC-167 Amherst Gray
	T12 Wall	West Fabric, L/R of Wdw.	Stretched Fabric	Guilford of Maine Marin 1300-1147 Dolphin
	T12 Wall	West Fabric Behind Slats	Stretched Fabric	CF Stinson Aperture APT79 Abracadabra
	T12 Wall	West Slats (Above Wdw.)	Paint Grade Poplar	BM HC-167 Amherst Gray
	T13 Wall	South	Stretched Fabric	CF Stinson Aperture APT76 Sargasso
	T13 Slats	South	Clear Birch/Birch Veneers	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	T14 Panels	East	Baltic Birch Multilam Plywood	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	T14 Brackets	East	Painted Metal	Flat Black
	Ceiling	C1 Drywall	Paint on Drywall	BM 2144-70 Snowfall White
	Ceiling	C5 Omniffusors	Clear Birch/Birch Veneers	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	Ceiling	C6 Wood Frame	Refinish Existing Wood Frames	2 Coats Clear Satin Polyeurethane
	Ceiling	C6 Fabric Panel	Fabric-Wrapped Panel	CF Stinson Aperture APT76 Sargasso
	Ceiling	C3 Soffit	Stretched Fabric	CF Stinson Aperture APT76 Sargasso
	Ceiling	C4 Fabric Behind Slats	Stretched Fabric	CF Stinson Aperture APT79 Abracadabra
	Ceiling	C4 Slats	Paint Grade Poplar	BM HC-167 Amherst Gray
	Door Frame	West	Painted Metal	BM HC-167 Amherst Gray
	Door Leaf	West	Painted Metal	BM HC-167 Amherst Gray
	Windows	West Case/Stops	Baltic Birch Multilam Plywood	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	Windows	Fabric Between Glass	Stretched Fabric	CF Stinson Aperture APT79 Abracadabra
Control Room	Flooring	All	4-3/4"x9/16" Kentwood Floors Avenue Engineered	Antiqued Acacia Natural Country
	Baseboard	All	4-1/2"x3/4" Paint Grade Poplar	BM HC-167 Amherst Gray
	T4 Wall	North, L/R of Diffuser	Stretched Fabric	Guilford of Maine Marin 1300-1147 Dolphin
	T4 Wall	North, Inside Spkr. Niches	Stretched Fabric	CF Stinson Intermix INX71 Granite
	T4/T5 Walls	North, Above/Below Diffuser	Stretched Fabric	CF Stinson Intermix INX71 Granite
	T5 Diffusers	North	Clear Birch/Birch Veneers	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	T5 Casework	North	Baltic Birch Multilam Plywood	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	W1 Walls	East/West (Around Doors)	Paint on Drywall	BM HC-169 Coventry Gray
	T3 Walls	East/West	Stretched Fabric	Guilford of Maine Marin 1300-1147 Dolphin
	T2 Walls	South	Stretched Fabric	Guilford of Maine Marin 1300-1147 Dolphin
	T2 Abffusors	South	Fabric-Wrapped Panel	CF Stinson Intermix INX71 Granite
	T1 Wall	South	Stretched Fabric	Guilford of Maine Cape Cod 3073-7062 Surf
	Ceiling	C1 Drywall	Paint on Drywall	BM 2144-70 Snowfall White
	Ceiling	C2 Cloud	Stretched Fabric	CF Stinson Aperture APT60 Alpine

	Ceiling	C3 Soffits	Stretched Fabric	CF Stinson Aperture APT76 Sargasso
	Door Frames	South	Painted Metal	BM HC-167 Amherst Gray
	Door Leaves	South	Painted Metal	BM HC-167 Amherst Gray
	Windows	East/West Case/Stops	Baltic Birch Multilam Plywood	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	Windows	Fabric Between Glass	Stretched Fabric	CF Stinson Aperture APT79 Abracadabra
Iso Booth	Flooring	All	4-3/4"x9/16" Kentwood Floors Avenue Engineered	Antiqued Acacia Natural Country
	Baseboard	All	4-1/2"x3/4" Paint Grade Poplar	BM HC-167 Amherst Gray
	Wall	North	Paint on CMU	BM HC-169 Coventry Gray
	T9 Panel	North	Fabric-Wrapped Panel	CF Stinson Intermix INX71 Granite
	T6-T8 Walls	South, East, West	Stretched Fabric	Guilford of Maine Marin 1300-1147 Dolphin
	Ceiling	C1 Drywall	Paint on Drywall	BM 2144-70 Snowfall White
	Ceiling	C5 Omniffusors	Clear Birch/Birch Veneers	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	Ceiling	C6 Wood Frame	Refinish Existing Wood Frames	2 Coats Clear Satin Polyeurethane
	Ceiling	C6 Fabric Panel	Fabric-Wrapped Panel	CF Stinson Aperture APT76 Sargasso
	Ceiling	C9 (In Equip. Closet)	Armstrong Calla Tegular Tiles in Suprafine Grid	White
	Door Frames	North/South	Painted Metal	BM HC-167 Amherst Gray
	Door Leaves	North/South	Painted Metal	BM HC-167 Amherst Gray
	Window	East Case/Stops	Baltic Birch Multilam Plywood	Stain to Match Exstg. C6 Frames; 2 Coats Clear
	Windows	Fabric Between Glass	Stretched Fabric	CF Stinson Aperture APT79 Abracadabra
Sound Lock	Flooring	All	4-3/4"x9/16" Kentwood Floors Avenue Engineered	Antiqued Acacia Natural Country
	Baseboard	All	4-1/2"x3/4" Paint Grade Poplar	BM HC-167 Amherst Gray
	Walls	South, East, West	Paint on Drywall	BM HC-169 Coventry Gray
	T7 Wall	North	Stretched Fabric	CF Stinson Aperture APT76 Sargasso
	Ceiling	C8 Drywall	Paint on Drywall	BM 2144-70 Snowfall White
	Ceiling	C7 Wood Frame	Refinish Existing Wood Frames	2 Coats Clear Satin Polyeurethane
	Ceiling	C7 Fabric Panel	Fabric-Wrapped Panel	CF Stinson Aperture APT76 Sargasso
	Door Frames	South, East, West	Painted Metal	BM HC-167 Amherst Gray
	Door Leaves	South, East, West	Painted Metal	BM HC-167 Amherst Gray
Corridor	Flooring	All	Vinyl Tile	Match Existing
	Baseboard	All	Vinyl Base	Match Existing
	Walls	All	Paint on Drywall/CMU	Match Existing
	Ceiling	C9 Ceiling	Armstrong Calla Tegular Tiles in Suprafine Grid	White
	Door Frames	East	Painted Metal	Match Existing
	Door Leaves	East	Painted Metal	Match Existing
Storage	Flooring	All	Vinyl Tile	Match Existing
	Baseboard	All	Vinyl Base	Match Existing
	Walls	All	Paint on Drywall	Match Existing
	Ceiling	C9 Ceiling	Armstrong Calla Tegular Tiles in Suprafine Grid	White
	Door Frame	West	Painted Metal	Match Existing
	Door Leaf	West	Painted Metal	Match Existing
	Window Frame	East	Painted Metal	Match Existing



SYMBOLS

A / A12 — SECTION OR ELEVATION DESIGNATION / REFER TO PAGE

EXISTING BUILDING DEMISING WALL

EXISTING PARTITION TO REMAIN

EXISTING PARTITION TO DEMOLISH

ELEMENT ABOVE

ELEMENT HIDDEN OR BELOW

Revisions

REVISION #	DATE	REVISION	APPROVED
01	07/13/21	100% CD	GM
02	11/19/21	Addendum 3	GM

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PROJECT

Purchase College Studio A Renovations

Purchase, NY

DRAWING NAME

AS BUILT & DEMOLITION PLAN

SEAL & SIGNATURE

SCALE 1/4"=1'-0"

DATE 11/19/2021

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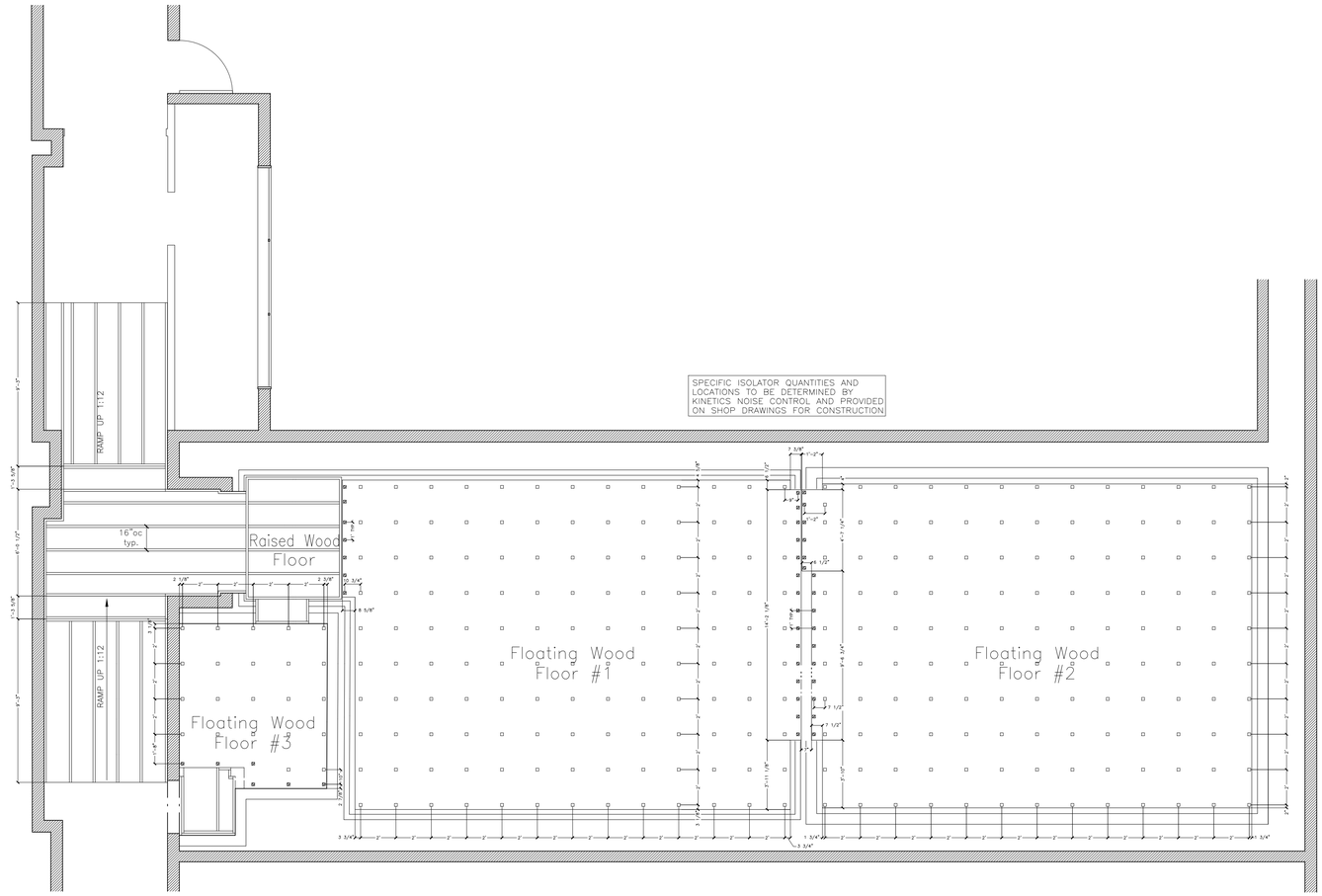
SHEET



SYMBOLS

- A / A12 — SECTION OR ELEVATION DESIGNATION; REFER TO PAGE
- EXISTING BUILDING DEMISING WALL
- EXISTING PARTITION TO REMAIN
- NEW FURRING AND GYP. BOARD
- A / A43 — DETAIL DESIGNATION; REFER TO PAGE
- KINETICS KIP PAD (ADDT'L AT PERIMETER PER KNC)
- KINETICS KIP PAD (INTEGRAL TO RIM SYSTEM)

Revisions

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Purchase College Studio A Renovations

Purchase, NY

DRAWING NAME

RAISED PLATFORM PLAN

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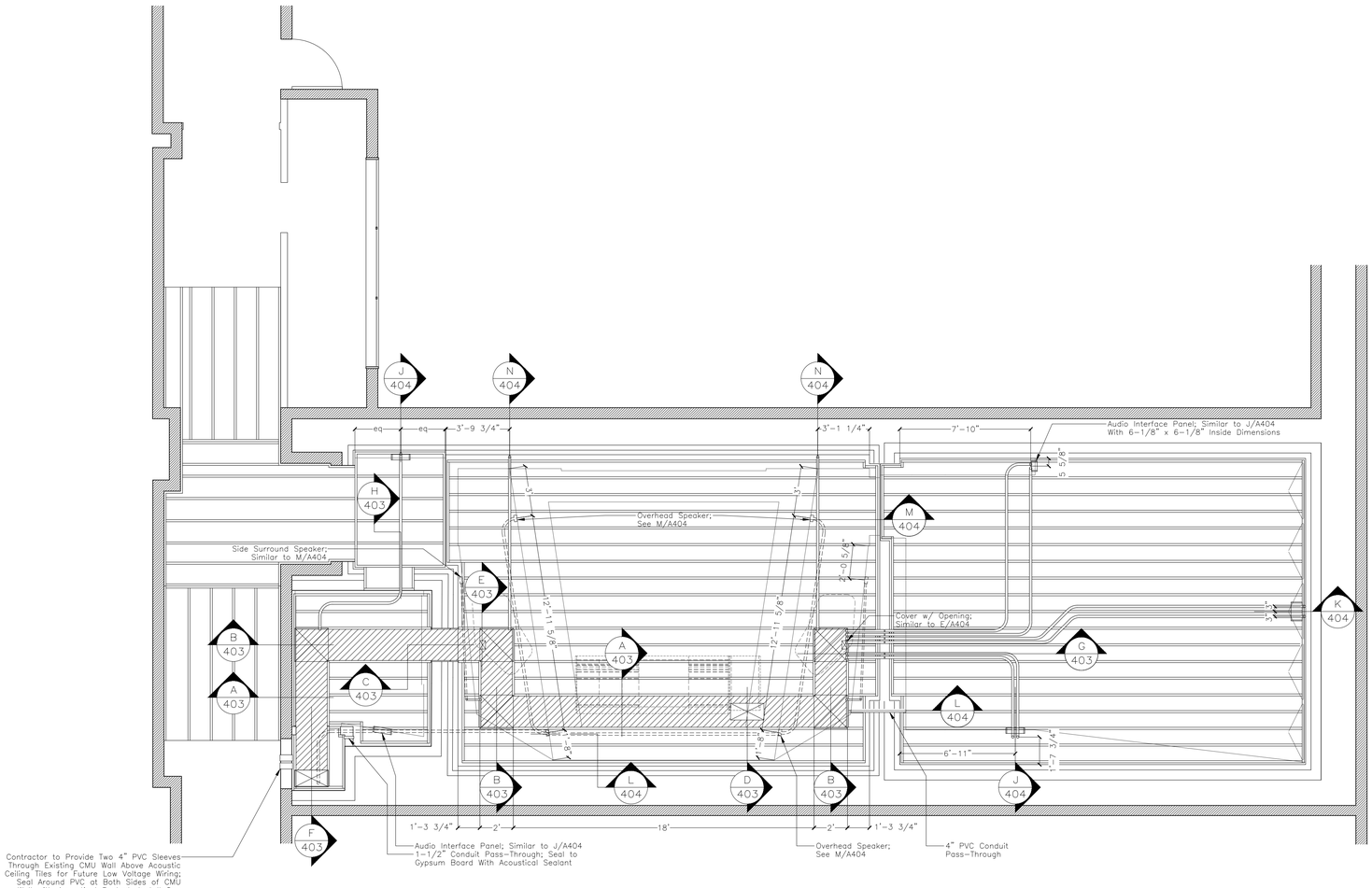

SYMBOLS

- SECTION OR ELEVATION DESIGNATION (A / A12)
- REFER TO PAGE
- EXISTING BUILDING DEMISING WALL
- EXISTING PARTITION TO REMAIN
- NEW FURRING AND GYP. BOARD
- DETAIL DESIGNATION (A / A43)
- REFER TO PAGE
- KINETICS KIP PAD
- WIRE TROUGH IN FLOOR SYSTEM
- REMOVABLE COVER OVER WIRE TROUGH IN FLOOR SYSTEM
- OPEN UNCOVERED AREA OF WIRE TROUGH
- FLR. MT'D QUAD IG RECEPTACLE SEE ELECTRICAL PLAN
- INDICATES WIRE RUN DIRECTION
- I.G. GROUND BUSS BOX. SEE ELECTRICAL PLAN
- PIPE (EMT OR PVC) FROM FLOOR TROUGH SYSTEM. SEE NOTES.

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Purchase, NY

DRAWING NAME

AUDIO TROUGH & PIPING PLAN

SEAL & SIGNATURE

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CAD FILE#

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A-103.00

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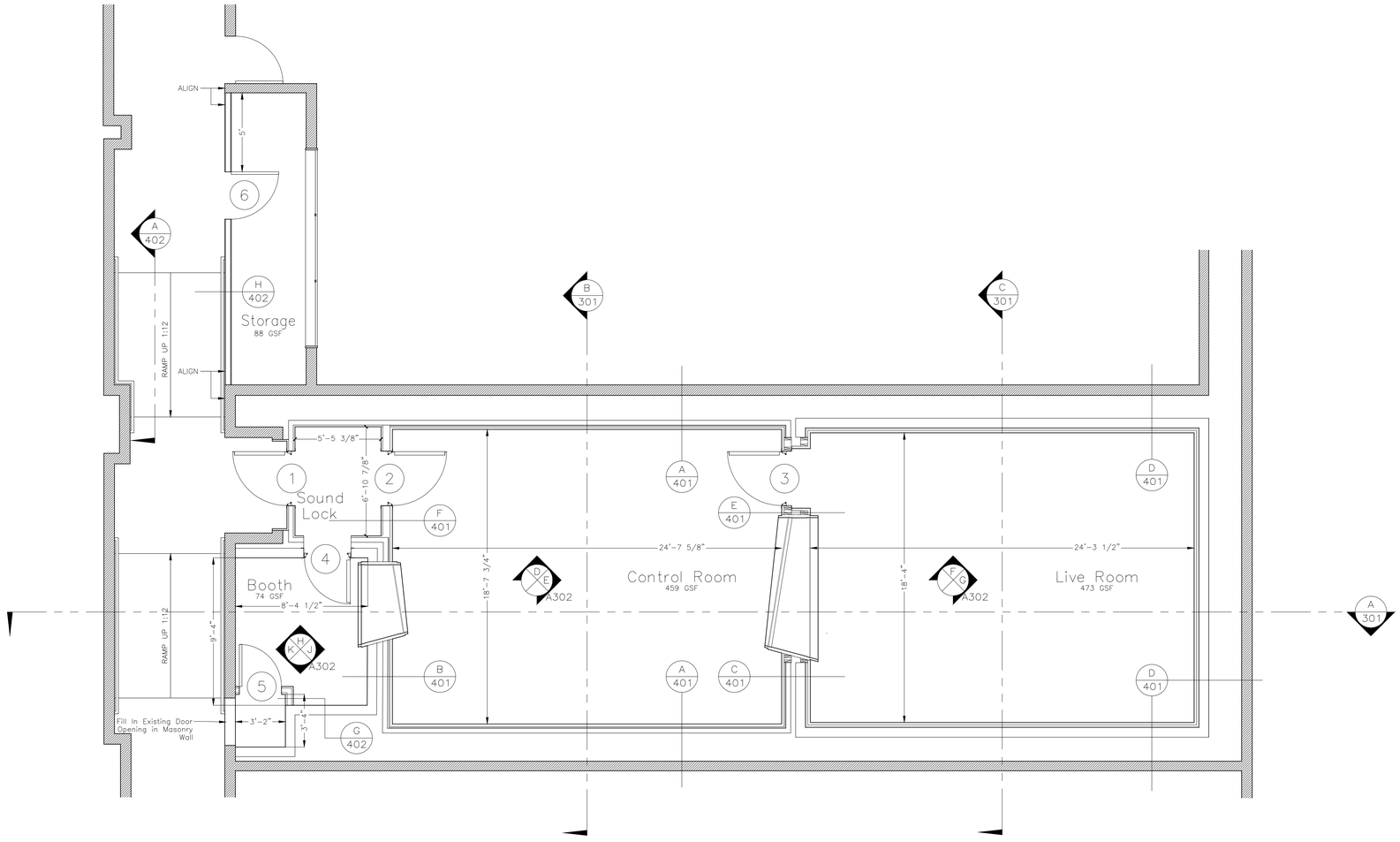

SYMBOLS

- A / A12 — SECTION OR ELEVATION DESIGNATION; REFER TO PAGE
- EXISTING BUILDING DEMISING WALL
- EXISTING PARTITION TO REMAIN
- 2 / A41 — DETAIL DESIGNATION; REFER TO PAGE
- NEW PARTITION, SEE DETAIL
- ELEMENT ABOVE
- ELEMENT HIDDEN OR BELOW
- INSULATION AS NOTED
- DOOR OPENING REFERENCE
- B — WINDOW TYPE DESIGNATION
- DIM — DIMENSION TO STUDLINE
- DIM — DIMENSION TO SURFACE

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DRAWING NAME

CONSTRUCTION PLAN

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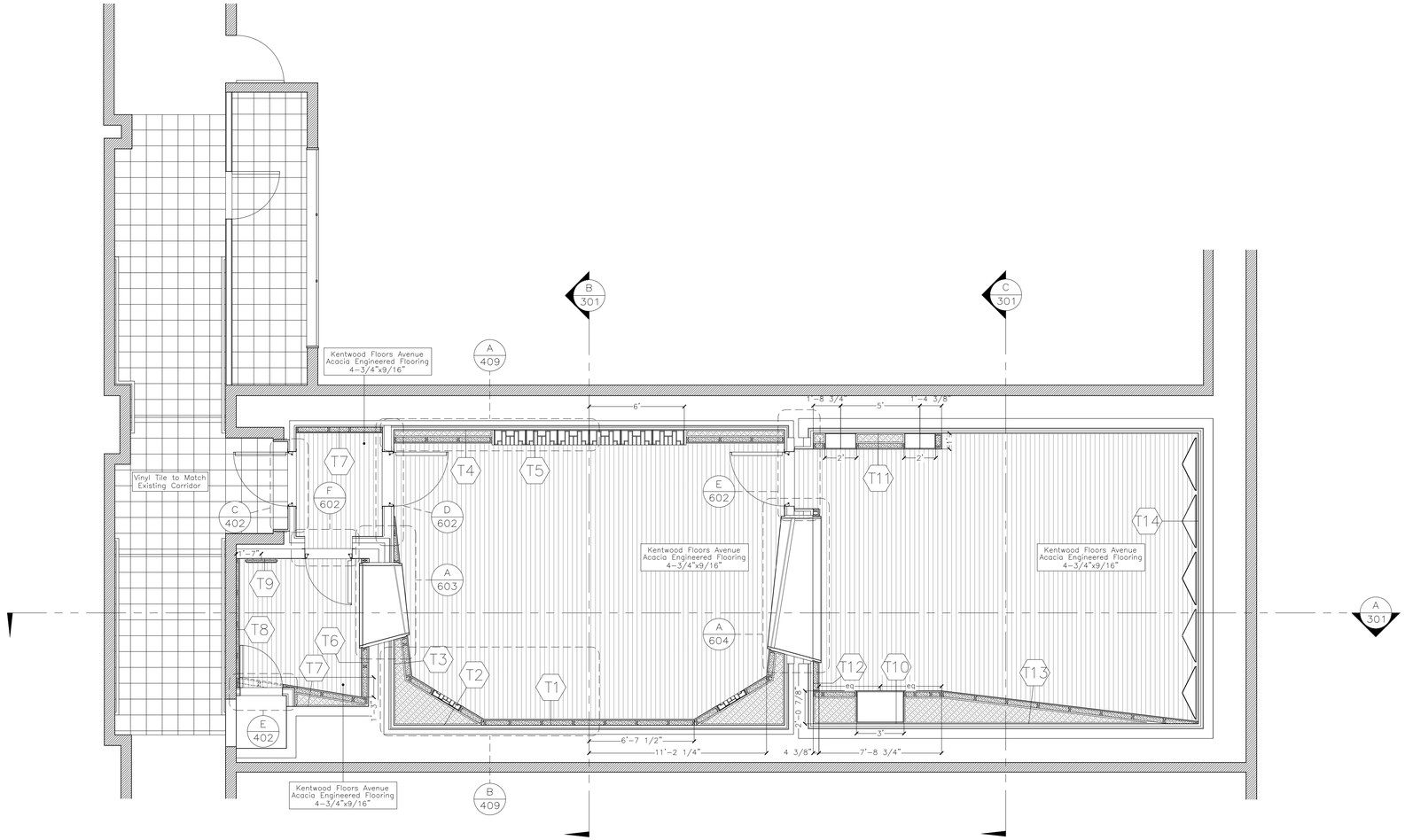
DRAWING NUMBER
A-104.00
SHEET

Acoustic Finish and Treatments Schedule

TREATMENT	DESCRIPTION	DETAIL(S)	MANUFACTURER/SUPPLIER
T1	Fixed Depth Absorptive Treatment. 2x4 Finish Wall Framing 24"oc. 4" #703 Unfaced Rigid Insulation Friction Fit in Framing Bays. Stretched Fabric on Fabric Track Applied to Framing.	A405/T1	Contractor
T2	Varying Depth w/ Solar 2 Abffusor. 2x4 Finish Wall Framing 24"oc. Loosely Fill Cavity Behind Framing with 3" Unfaced Batt Insulation. 4" #703 Unfaced Rigid Insulation Friction Fit in Framing Bays. RPG Fabric Covered Abfussor Installed in Finished Framing as Shown. Stretched Fabric on Fabric Track Applied to Framing.	A405/T2	Solar 2/Contractor
T3	Varying Depth Absorptive Treatment. 2x4 Finish Wall Framing 24"oc. Loosely Fill Cavity Behind Framing with 3" Unfaced Batt Insulation. 4" #703 Unfaced Rigid Insulation Friction Fit in Framing Bays. Stretched Fabric on Fabric Track Applied to Framing.	A405/T3	Contractor
T4	See T3.	A406/T4	Contractor
T5	Solar2 QRD & Omniffusor Diffusers. Diffusers Installed in 2x 3/4" MultiLam Plywood Framed Finish. Plywood Finish Around all 4 Sides of Diffractal Units. See Detail for Diffractal Unit Sizing. Plywood Finish Installed in T3 Varying Depth Absorptive Treatment.	A406/T5	Solar 2/Contractor
T6	See T1.	A406/T6	Contractor
T7	See T3.	A407/T7	Contractor
T8	Fixed Depth Absorptive Treatment. 2x4 Finish Wall Framing 24"oc on Flat. 2" #703 Unfaced Rigid Insulation Friction Fit in Framing Bays. Stretched Fabric on Fabric Track Applied to Framing.	A407/T8	Contractor
T9	Fabric Wrapped Absorber Panel Attached Directly to Partition as Shown.	A407/T9	Contractor
T10	See T3.	A408/T10	Contractor
T11	Varying Depth Helmholtz Slat Treatment. 2x4 Finish Wall Framing 24"oc. Loosely Fill Cavity Behind Framing with 3" Unfaced Batt Insulation. 4" #703 Rigid Insulation Friction Fit in Framing Bays. Stretched Fabric Stapled Directly to Finish Framing. Install Solid Wood Slats Directly to Finish Framing as Shown in Detail(s). Run Fabric Horizontally to Conceal Seam Behind Wood Slats. See Detail For Spacing.	A408/T11	Contractor
T12	See T1.	A408/T12	Contractor
T13	See T3.	A411/T13	Contractor
T14	Acoustic Pyramid Diffuser Finish – Wood Panels on Metal Brackets	A411-A413	Contractor

NOTE: All wall and ceiling surfaces that are not called out for acoustic treatments shall be prepared for paint and painted. All walls that are not called out for acoustic treatments shall be finished with 5-1/2" paint grade poplar baseboard in Studio areas and vinyl base (to match existing) in the Corridor. See Finish Matrix for all paint colors, fabrics styles/colors, and wood species/finishes. All HVAC GRDs should match the surface they are installed in.



SYMBOLS

A / A12 — SECTION OR ELEVATION DESIGNATION, REFER TO PAGE

T9 — FINISH CALLOUT

ELEMENT ABOVE

ELEMENT HIDDEN OR BELOW

Revisions

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PROJECT

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Purchase, NY

DRAWING NAME

FINISH PLAN

SEAL & SIGNATURE

SCALE 1/4"=1'-0"

DATE 11/19/2021

CAD FILE#

DRAWING NUMBER

A-105.00

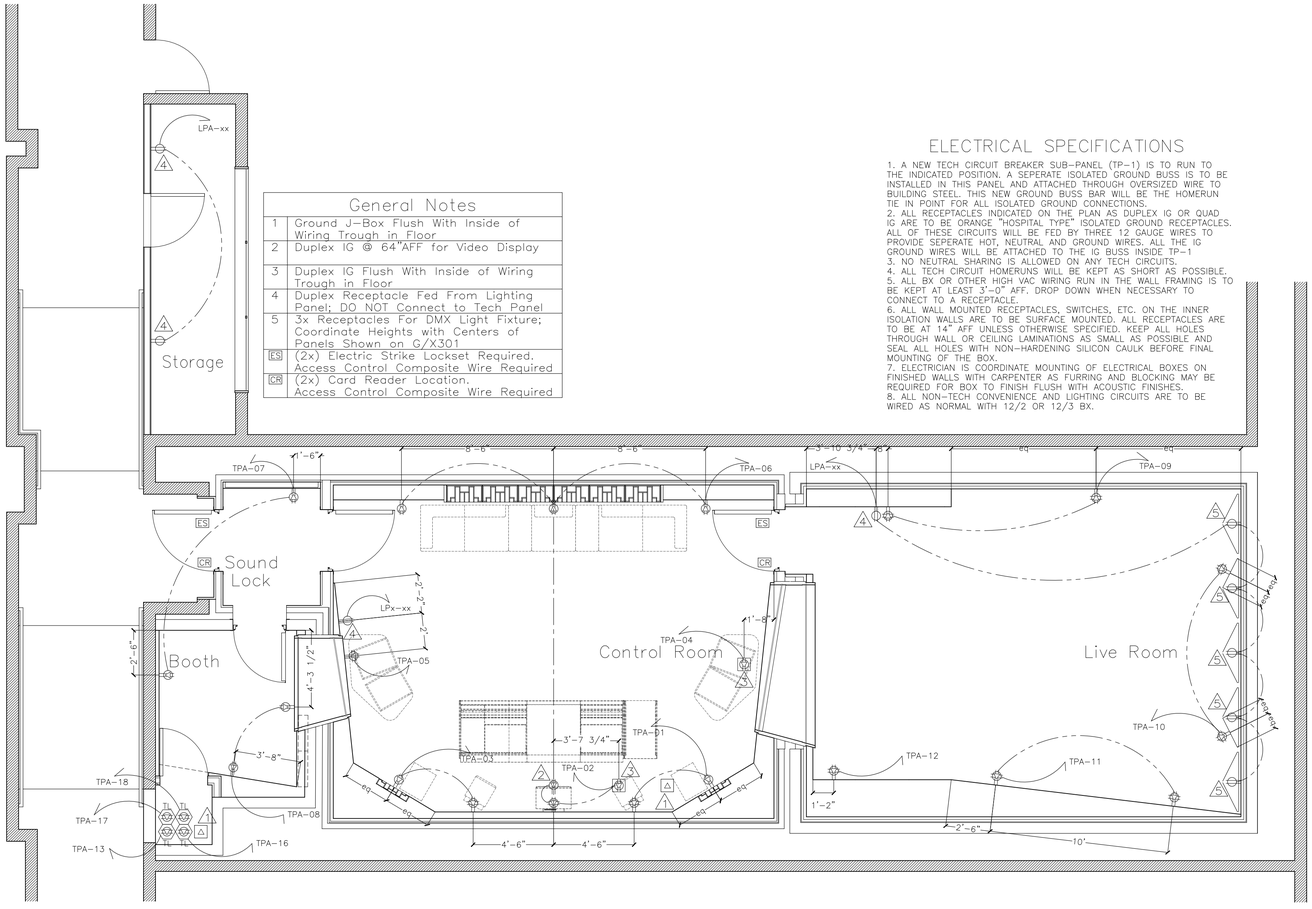
SHEET

TECH POWER PANEL TPA

SERVICE	PHASE	POLES	WIRES	SIZE	ISOLATED GROUND	BALANCED POWER
120/208V	3	3	5	100A	YES	NO

CKT #	DESIGNATION	BREAKER TRIP	POLE	VOLT	KVA LOAD	WIRE SIZE		CKT #	DESIGNATION	BREAKER TRIP	POLE	VOLT	KVA LOAD	WIRE SIZE
TPA–1	MON/SUB LEFT	20A	1	120	1.1	#12	A	TPA–2	MON CTR/DISPLAY	20A	1	120	0.8	#12
TPA–3	MON/SUB RIGHT	20A	1	120	1.1	#12	B	TPA–4	CREDENZA LEFT	20A	1	120	0.8	#12
TPA–5	CREDENZA RIGHT	20A	1	120	0.8	#12	C	TPA–6	CONTROL RM CONV	20A	1	120	0.3	#12
TPA–7	SOUND LOCK/ISO	20A	1	120	0.3	#12	A	TPA–8	ISO BOOTH	20A	1	120	0.3	#12
TPA–9	LIVE RM CONV 3	20A	1	120	0.3	#12	B	TPA–10	LIVE RM CONV 2	20A	1	120	0.3	#12
TPA–11	LIVE RM CONV 5	20A	1	120	0.3	#12	C	TPA–12	LIVE RM CONV 4	20A	1	120	0.3	#12
TPA–13	EQUIP RACK 1	20A	1	120	1.7	#12	A	TPA–14	––spare––	20A	1	120		
TPA–15	––spare––	20A	1	120			B	TPA–16	EQUIP RACK 2	20A	1	120	1.7	#12
TPA–17	EQUIP RACK 3	20A	1	120	1.3	#12	C	TPA–18	EQUIP RACK 4	20A	1	120	1.3	#12
TPA–19							A	TPA–20						
TPA–21							B	TPA–22						
TPA–23							C	TPA–24						
TPA–25							A	TPA–26						
TPA–27							B	TPA–28						
TPA–29							C	TPA–30						

A = 4.2 KVA B = 4.2 KVA C = 4.3 KVA TOTAL KVA FOR PANEL = 12.7 KVA



General Notes

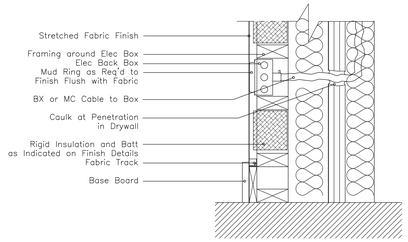
1	Ground J–Box Flush With Inside of Wiring Trough in Floor
2	Duplex IG @ 64"AFF for Video Display
3	Duplex IG Flush With Inside of Wiring Trough in Floor
4	Duplex Receptacle Fed From Lighting Panel; DO NOT Connect to Tech Panel
5	3x Receptacles For DMX Light Fixture; Coordinate Heights with Centers of Panels Shown on G/X301
ES	(2x) Electric Strike Lockset Required. Access Control Composite Wire Required
CR	(2x) Card Reader Location. Access Control Composite Wire Required

ELECTRICAL SPECIFICATIONS

1. A NEW TECH CIRCUIT BREAKER SUB–PANEL (TP–1) IS TO RUN TO THE INDICATED POSITION. A SEPERATE ISOLATED GROUND BUSS IS TO BE INSTALLED IN THIS PANEL AND ATTACHED THROUGH OVERSIZED WIRE TO BUILDING STEEL. THIS NEW GROUND BUSS BAR WILL BE THE HOMERUN TIE IN POINT FOR ALL ISOLATED GROUND CONNECTIONS.
2. ALL RECEPTACLES INDICATED ON THE PLAN AS DUPLEX IG OR QUAD IG ARE TO BE ORANGE "HOSPITAL TYPE" ISOLATED GROUND RECEPTACLES. ALL OF THESE CIRCUITS WILL BE FED BY THREE 12 GAUGE WIRES TO PROVIDE SEPERATE HOT, NEUTRAL AND GROUND WIRES. ALL THE IG GROUND WIRES WILL BE ATTACHED TO THE IG BUSS INSIDE TP–1
3. NO NEUTRAL SHARING IS ALLOWED ON ANY TECH CIRCUITS.
4. ALL TECH CIRCUIT HOMERUNS WILL BE KEPT AS SHORT AS POSSIBLE.
5. ALL BX OR OTHER HIGH VAC WIRING RUN IN THE WALL FRAMING IS TO BE KEPT AT LEAST 3'–0" AFF. DROP DOWN WHEN NECESSARY TO CONNECT TO A RECEPTACLE.
6. ALL WALL MOUNTED RECEPTACLES, SWITCHES, ETC. ON THE INNER ISOLATION WALLS ARE TO BE SURFACE MOUNTED. ALL RECEPTACLES ARE TO BE AT 14" AFF UNLESS OTHERWISE SPECIFIED. KEEP ALL HOLES THROUGH WALL OR CEILING LAMINATIONS AS SMALL AS POSSIBLE AND SEAL ALL HOLES WITH NON–HARDENING SILICON CAULK BEFORE FINAL MOUNTING OF THE BOX.
7. ELECTRICIAN IS COORDINATE MOUNTING OF ELECTRICAL BOXES ON FINISHED WALLS WITH CARPENTER AS FURRING AND BLOCKING MAY BE REQUIRED FOR BOX TO FINISH FLUSH WITH ACOUSTIC FINISHES.
8. ALL NON–TECH CONVENIENCE AND LIGHTING CIRCUITS ARE TO BE WIRED AS NORMAL WITH 12/2 OR 12/3 BX.

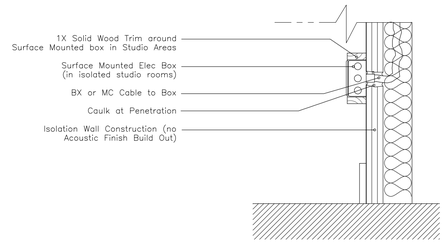
ELECTRICAL RECEPTACLE IN FABRIC FINISH WALL

SCALE: 1 1/2" = 1'–0"



SURFACE MOUNTED ELECTRICAL RECEPTACLE

SCALE: 1 1/2" = 1'–0"



SYMBOLS

- STANDARD DUPLEX RECEPTACLE
- GFI — GROUND FAULT INDICATING DUPLEX RECEPTACLE
- ISOLATED GROUND DUPLEX RECEPTACLE
- TL — ISOLATED GROUND L5–20 TWISTLOCK RECEPTACLE
- TL — ISOLATED GROUND L5–20 TWISTLOCK RECEPTACLE MOUNTED OVERHEAD IN CEILING
- 30 — 30AMP ISOLATED GROUND CIRCUIT. USE #10 WIRE AND 30AMP BREAKER AT PANEL.
- ISOLATED GROUND QUAD RECEPTACLE
- FLOOR MT'D ISOLATED GROUND QUAD RECEPT.
- DIRECTION OF WIRE RUN TO RECEPT.
- GROUND J –BOX
- T1/D1 — TELCO/DATA JACK NUMBER OF CAT6 WIRES TO EACH
- HOMERUN CIRCUITING
- CKT X — CIRCUIT DESIGNATION

Revisions

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Purchase College Studio A Renovations

Purchase, NY

DRAWING NAME

ELECTRICAL PLAN

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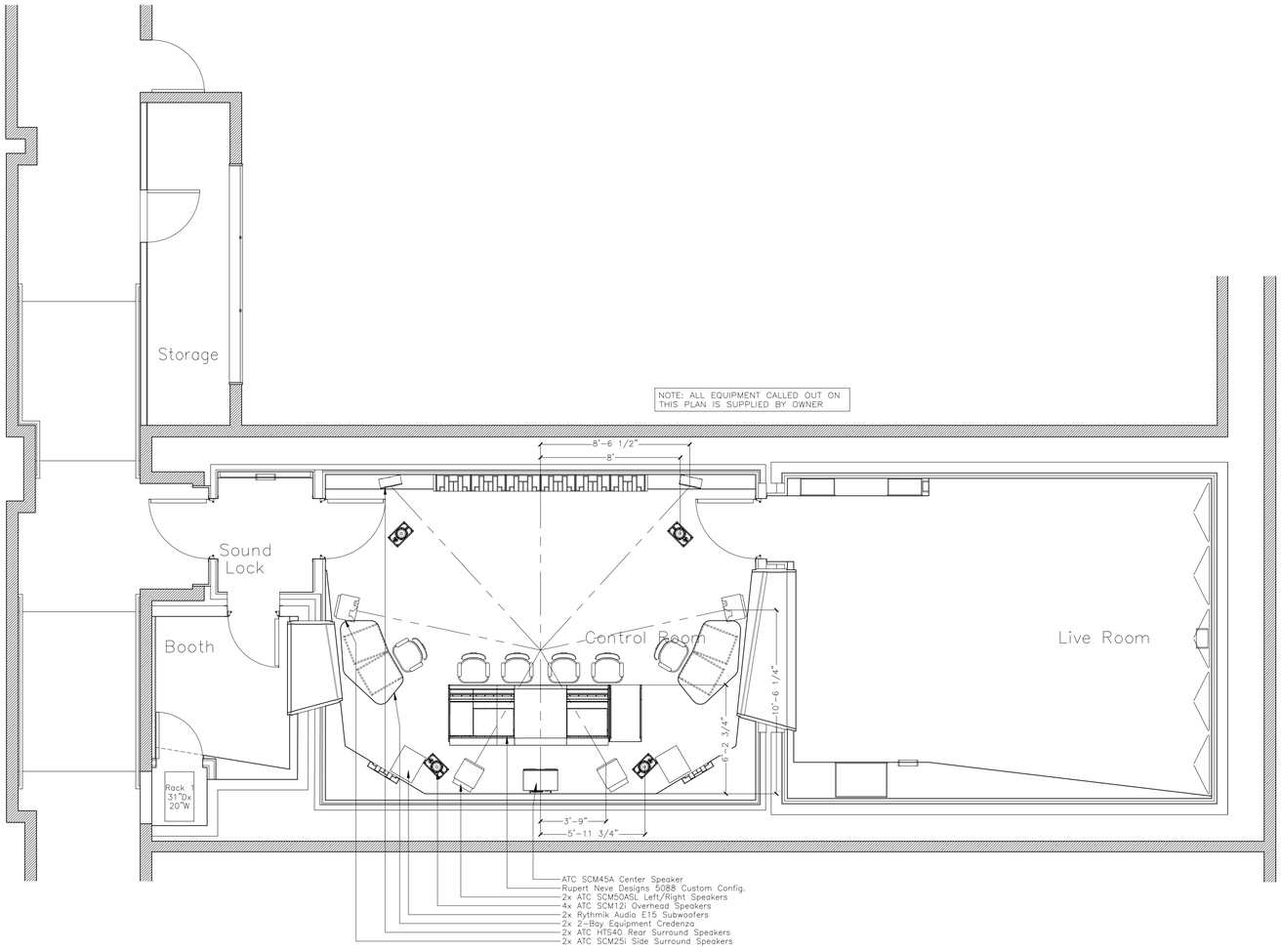

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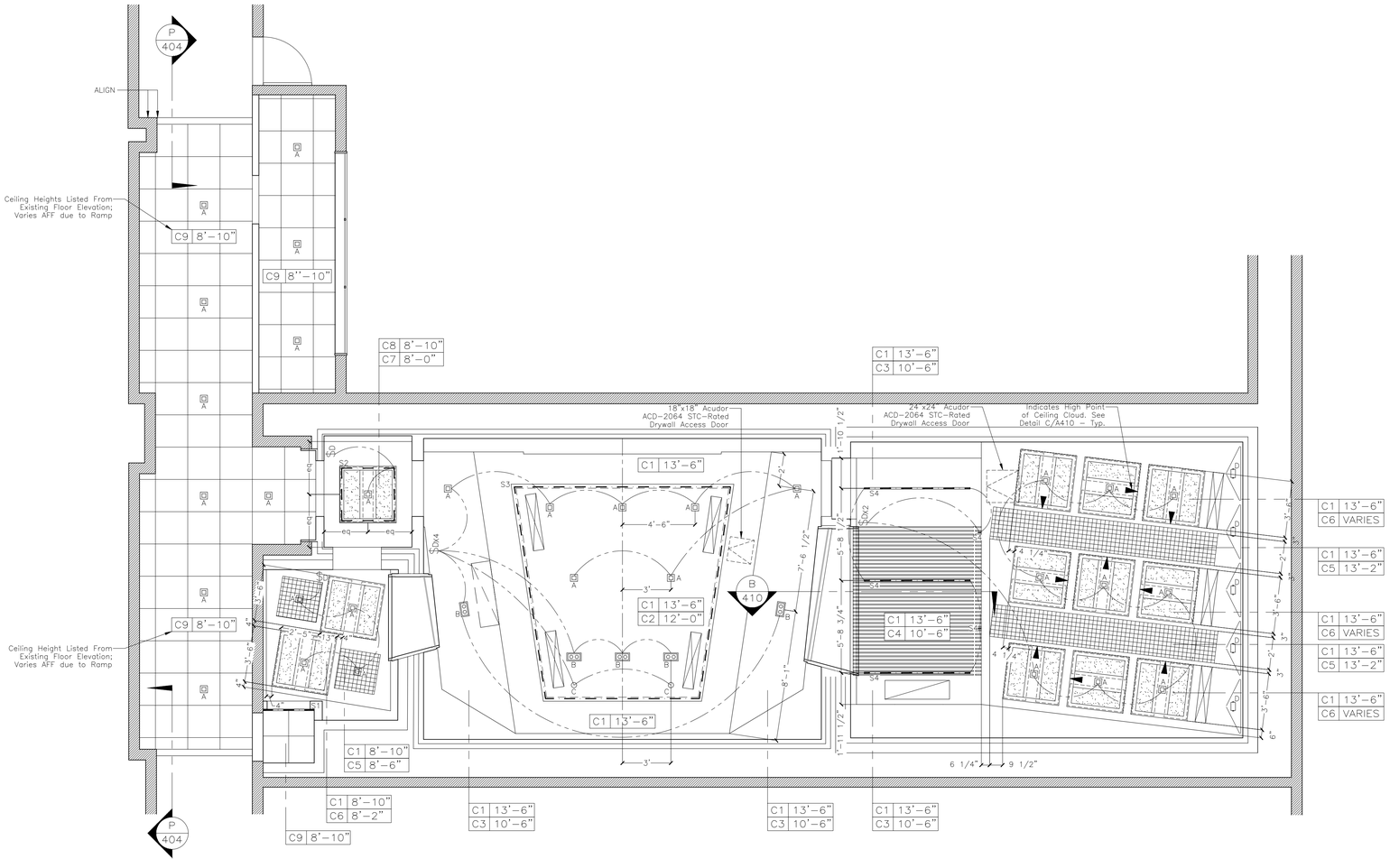
LIGHTING FIXTURE SCHEDULE

FIXTURE	MANUFACTURER AND MODEL	LAMP INFO	COLOR INFO	CUT OUT
A	WAC Aether 3.5" 0°–30° Adjustable Trim Square; R3ASAT–F930–HZWT Trim And HR–3LED–H17A IC Rated Housing.	15.5W 3K LED	Haze/White	4 5/8"
B	WAC 2–Light 4" LED Precision Multiples; MT–4LD216T–WT Trim And MT–4LD211NE–F–930–BK ELV Dimming IC Rated Housing.	2x 23W 3K LEDs	White/Black	9 3/4" x 5 1/8"
C	WAC Exterminator II Monopoint Luminaire; MO–1014F–930–BK	14W 3K LED	Black	--na--
D	Chauvet DJ SlimPAR 16BT RGB Wash Light (14 Total Fixtures); Provide Hardware as Req. to Mount to Square Tubing Behind T14 Panels; Refer to E Series Drawings for DMX Control	6x 2.5W RGB LEDs	Black	--na--
S1	PLT 2835–60–IP65–WW2450NHC 3K 24V 90CRI LED Tape Light (≈3') Mounted in KLUS LIPOD Channel with LIGER–22 Frosted Cover. Magnitude M40L24DC–AR Dimmable LED Driver.	3.5W/ft. 3K LEDs	--na--	--na--
S2	PLT 2835–60–IP65–WW2450NHC 3K 24V 90CRI LED Tape Light (≈14' Total) With Magnitude M60L24DC–AR Dimmable LED Driver.	3.5W/ft. 3K LEDs	--na--	--na--
S3	PLT 5050–60–IP65–RGB2450 Nano RGB 24V 90CRI LED Tape Light (≈50' Total) Mounted in KLUS MICRO–ALU Channel With Mean Well LRS–350–24 Power Supply; Refer to E Series Drawings for Controls.	4.5W/ft. RGB LEDs	--na--	--na--
S4	PLT 2835–60–IP65–WW2450NHC 3K 24V 90CRI LED Tape Light (≈26' Total) Mounted in KLUS LIPOD Channel with LIGER–22 Frosted Cover. Magnitude M150L24DC–AR Dimmable LED Driver.	3.5W/ft. 3K LEDs	--na--	--na--

Ceiling Type Schedule

C1	3 Layers Laminations, 7/8" Drywall Furring Channel, 1–1/2" "C" Channel, & Kinetics Gotham Ceiling Isolation Hangers	See A401
C2	Stretched Fabric Wood Framed Acoustic "Cloud" With Cove Light Lip Detail	See A410
C3	Stretched Fabric Wood Framed Acoustic Soffit	See A405
C4	Wood Slat Ceiling Inset Into C3 Wood Framed Acoustic Soffit	See A410
C5	Surface Mounted Omniffusor Style Acoustic Diffuser	See A407
C6	Refinished Wood Frames Salvaged From Existing Studio; New Fabric–Wrapped Panel Inserts & Openings for Recessed Lighting	See A410
C7	Similar to C6 With LED Uplighting Detail	See A410
C8	5/8" Type–X Gypsum Board Ceiling (2 Layers at Sound Lock) on 7/8" Drywall Furring Channel & 1–1/2" "C" Channel	See A402
C9	Armstrong Calla Acoustic Ceiling Tiles in Suspended 2'x2' Square Grid	See A402



SYMBOLS

- C4 | 9'–0" — CEILING DESIGNATION / HEIGHT ABOVE FINISHED FLOOR
- HVAC SUPPLY REGISTER, CEILING MT'D
- HVAC RETURN REGISTER, CEILING MT'D
- HVAC SUPPLY REGISTER, SIDE MT'D
- HVAC RETURN REGISTER, SIDE MT'D
- SPRINKLER HEAD LOCATION
- THERMOSTAT
- RECESSED LIGHT FIXTURE. SEE SCHEDULE
- TRACK FIXTURE. SEE SCHEDULE
- SCONSE FIXTURE. SEE SCHEDULE
- $ LIGHT SWITCH 48" AFF
- $D DIMMED LIGHT SWITCH 48" AFF

Revisions

REVISION #	DATE	REVISION	APPROVED
01	07/13/21	100% CD	GM
02	11/19/21	Addendum 3	GM

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New York, NY 10024

PROJECT

Purchase College Studio A Renovations

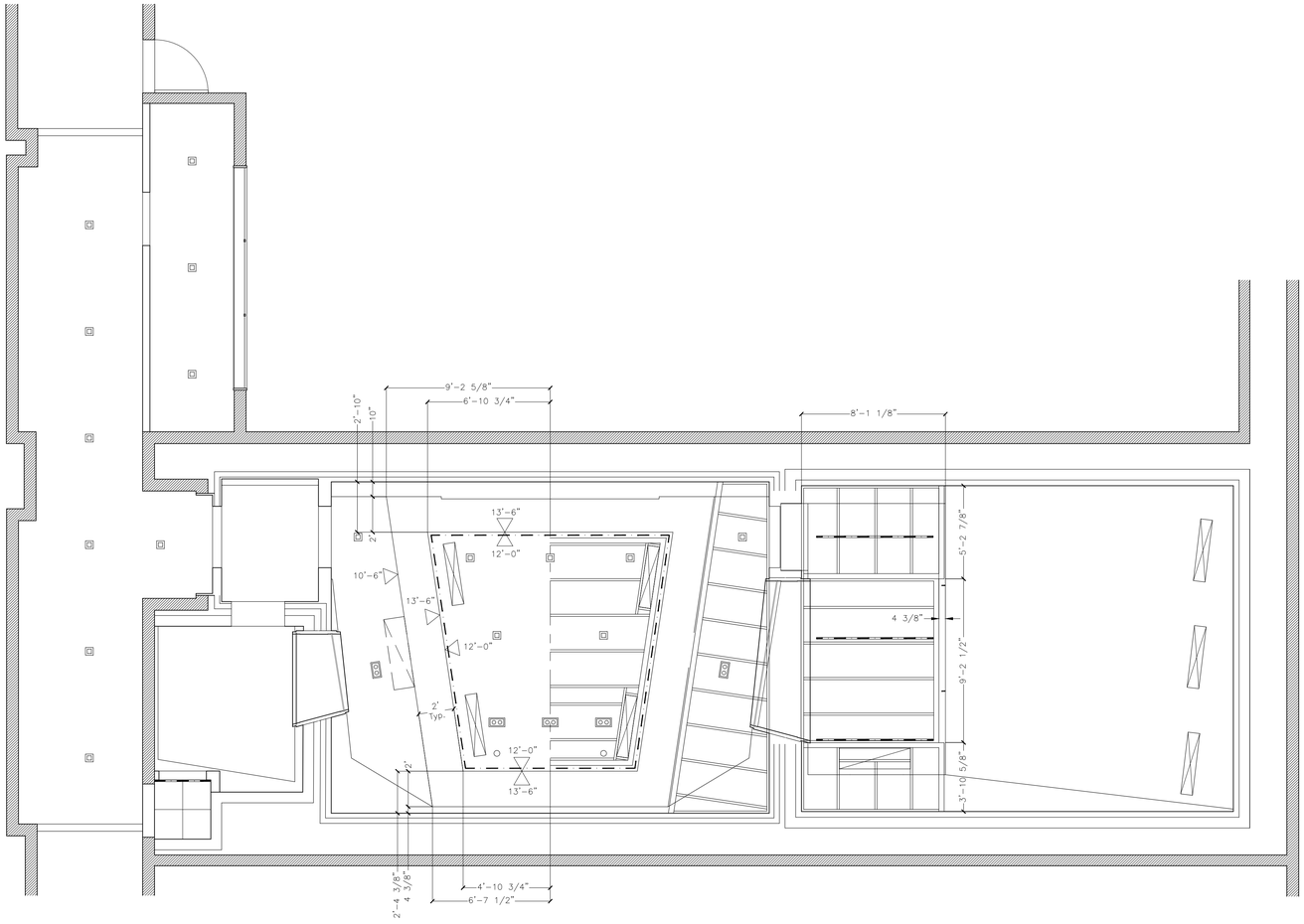
Purchase, NY

DRAWING NAME

REFLECTED CEILING PLAN

SEAL & SIGNATURE

SCALE 1/4"=1'-0"
DATE 11/19/2021
CAD FILE#
DRAWING NUMBER A-201.00
SHEET



SYMBOLS

- SPOT ELEVATION INDICATION
- HVAC SUPPLY REGISTER, CEILING MT'D
- HVAC RETURN REGISTER, CEILING MT'D
- HVAC SUPPLY REGISTER, SIDE MT'D
- HVAC RETURN REGISTER, SIDE MT'D
- SPRINKLER HEAD LOCATION
- THERMOSTAT

Revisions

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Purchase, NY

DRAWING NAME

REFLECTED SOFFIT FRAMING

SEAL & SIGNATURE

SCALE 1/4"=1'-0"

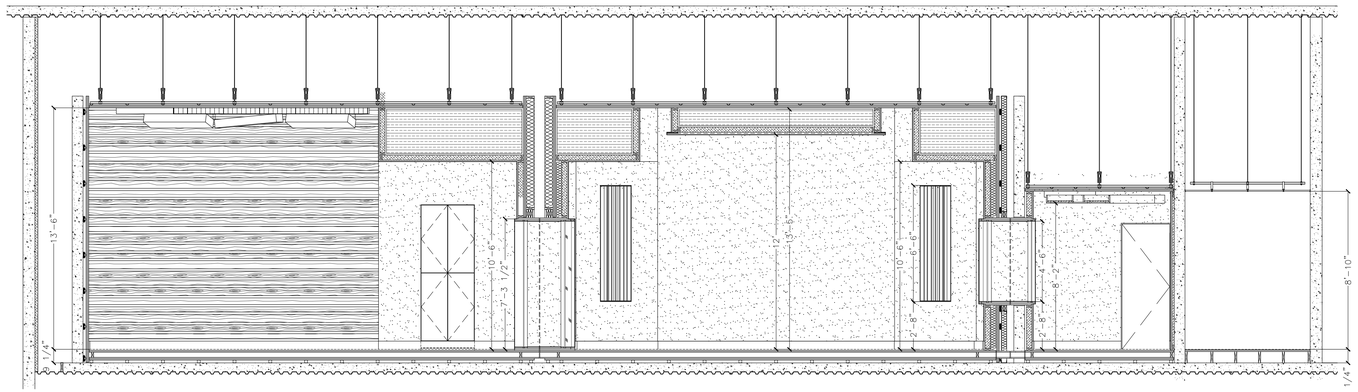
DATE 11/19/2021

CAD FILE#

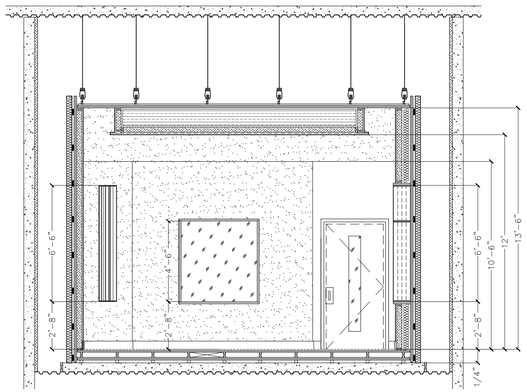
DRAWING NUMBER

A-202.00

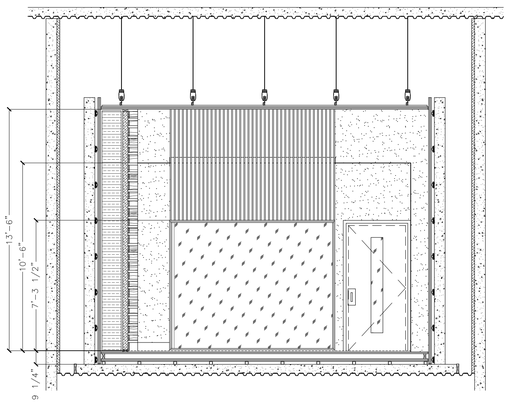
SHEET



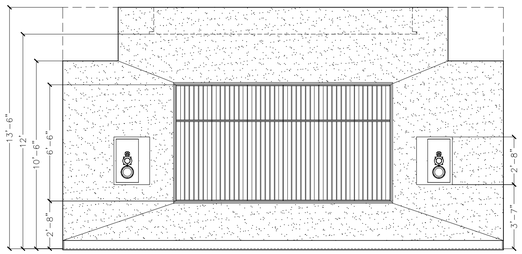
A Section
South



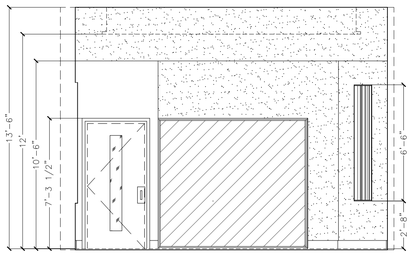
B Section Control Room
West



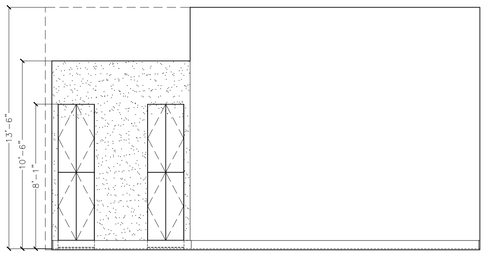
C Section Live Room
West



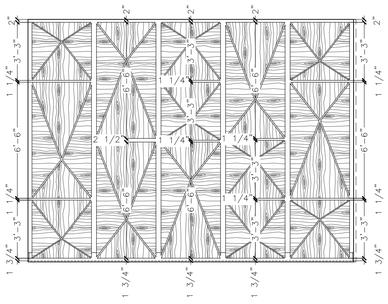
D Elevation Control Room
North



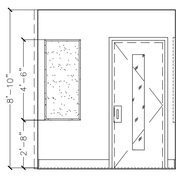
E Elevation Control Room
East



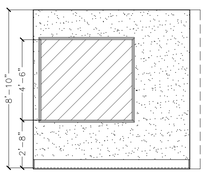
F Elevation Live Room
North



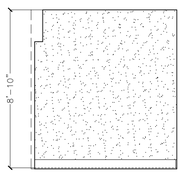
G Elevation Live Room
East



H Elevation Booth
North



J Elevation Booth
East



K Elevation Booth
West

SYMBOLS

Revisions

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PROJECT

Purchase College Studio A Renovations

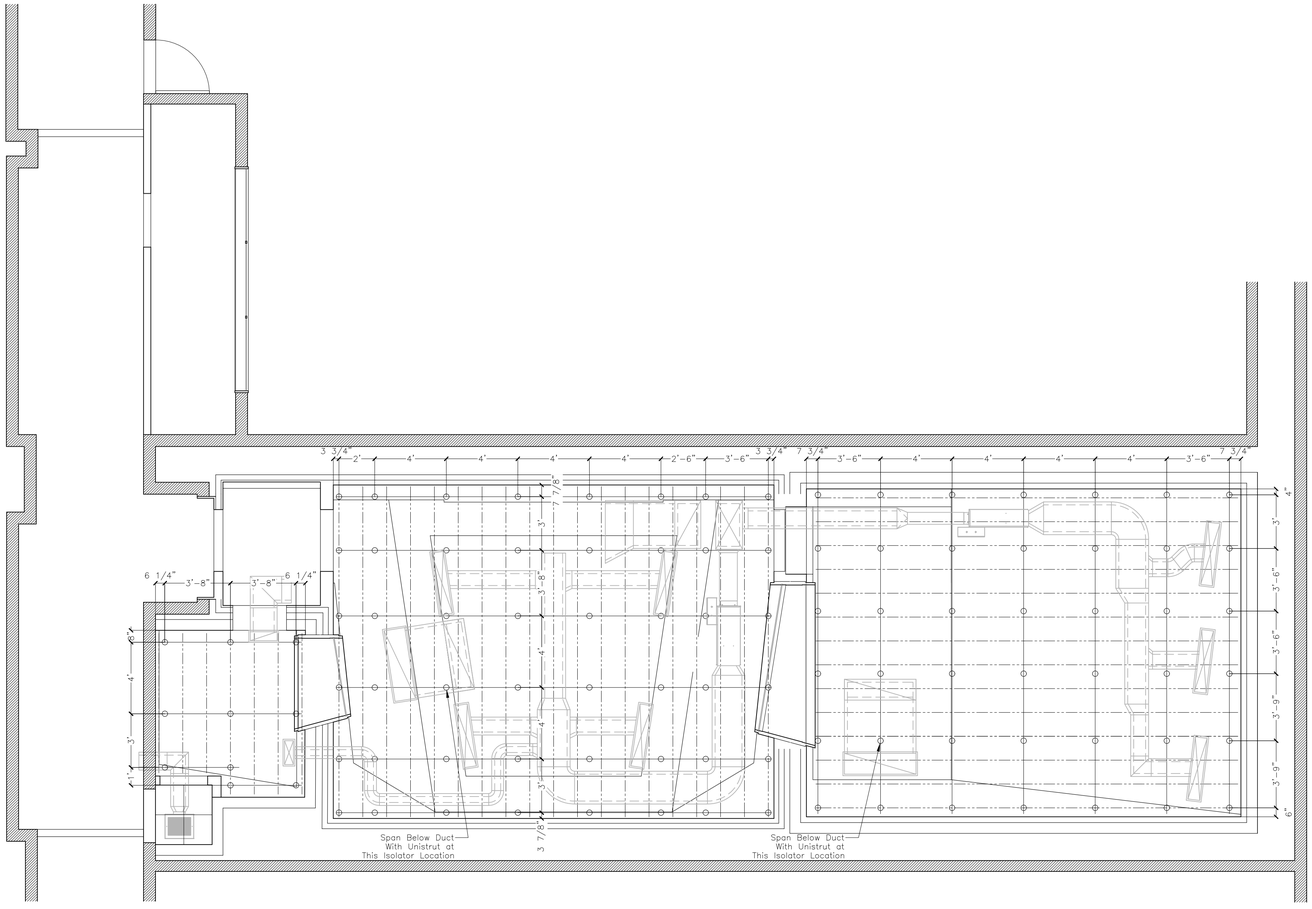
Purchase, NY

DRAWING NAME

SECTIONS & ELEVATIONS

SEAL & SIGNATURE

SCALE 1/4"=1'-0"
DATE 11/19/2021
CAD FILE#
DRAWING NUMBER
A-301.00
SHEET



SYMBOLS

DIRECTION OF 1-1/2" COLD ROLLED STEEL CHANNEL

DIRECTION OF 7/8" DRYWALL FURRING CHANNEL

KINETICS GOTHAM SPRING ISOLATION CEILING HANGER (CAPACITIES PER KINETICS SHOP DRAWINGS)

Revisions

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DRAWING NAME

REFLECTED CEILING FRAMING

SEAL & SIGNATURE

SCALE 1/4"=1'-0"

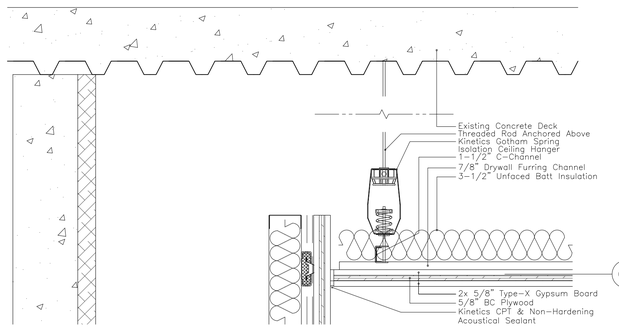
DATE 11/19/2021

CAD FILE#

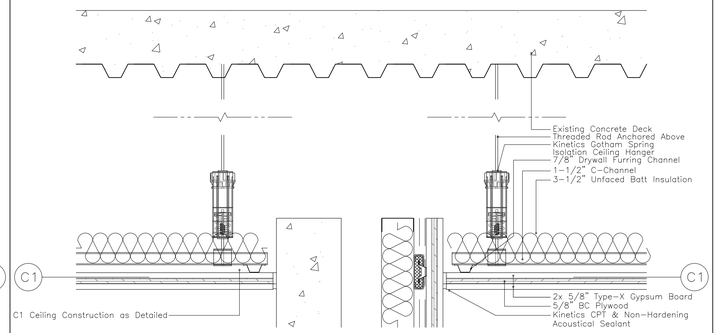
DRAWING NUMBER

A-203.00

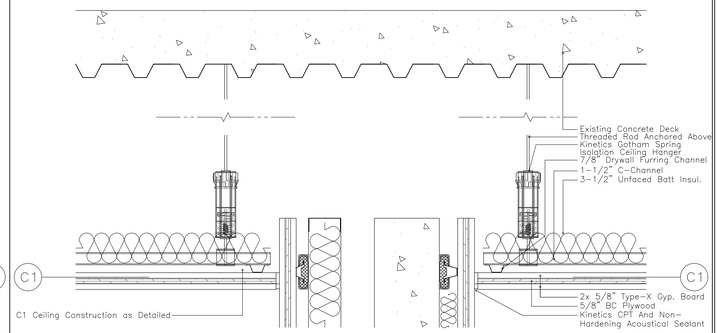
SHEET



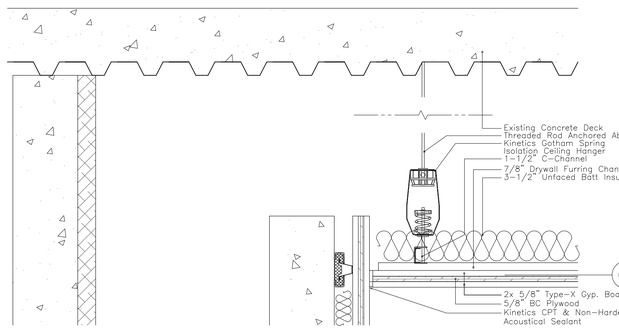
A Shell Construction



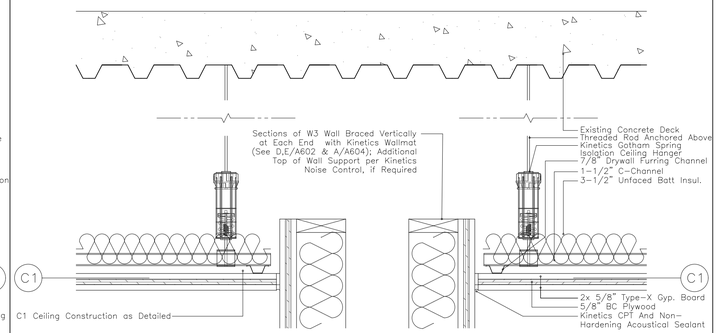
B Shell Construction



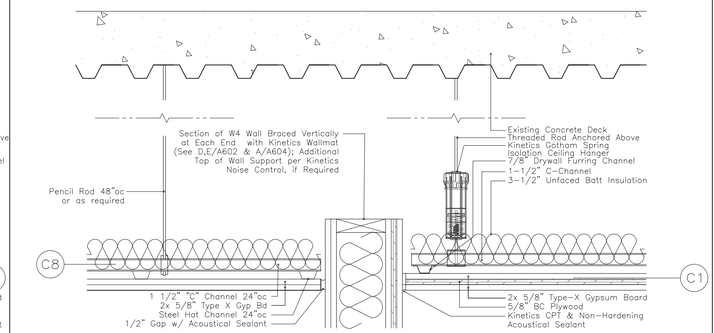
C Shell Construction



D Shell Construction



E Shell Construction



F Shell Construction

SYMBOLS

ACOUSTIC CONSTRUCTION NOTES

1. WHERE INDICATED, DRYWALL IS TO BE SEALED AT CEILING, FLOOR AND VERTICAL JOINTS USING ACOUSTIC SEALANT BEAD NOT LESS THAN 1/2"

2. ALL DRYWALL CORNER JOINTS ARE OVERLAPPED AS SHOWN IN PRINCIPAL ON THE DRAWING DETAILS. ALL DRYWALL BOARDS ARE TO BE STAGGERED FROM PRECEEDING LAYER AND JOINTS TAPED. ALL LAYERS OF LAMINATIONS ARE SCREWED AND GLUED W/ CONSTRUCTION ADHESIVE TO THE PRECEEDING LAYER.

3. ACCURATE CUTTING OF DRYWALL IS ESSENTIAL. PATCHING IS NOT ACCEPTABLE.

4. WHERE RESILIENT CHANNEL IS SPECIFIED, USE USG RC-1 RESILIENT CHANNEL INSTALLED IN ACCORDANCE WITH USG STANDARDS. INSTALL CHANNEL WITH "FREE LEG" UP.

5. UNDER NO CIRCUMSTANCES IS THERE TO BE ANY RIGID CONTACT BETWEEN THE FLOATING INNER SHELL OF THE ISOLATED ROOMS AND THE REST OF THE BUILDING STRUCTURE. WHERE AIR CONDITIONING DUCTS, SPRINKLER PIPES OR ELECTRICAL CONDUITS MUST PENETRATE THE WALL OR CEILING, A FRAMED OPENING MUST BE MADE OVERSIZED TO ALLOW FOR A SEALED SOFT JOINT.

6. THE ACOUSTIC DESIGNER MUST HAVE THE RIGHT OF REVIEW AND APPROVAL OVER ANY CHANGES MADE TO THESE SPECIFICATIONS. INSPECTION MUST BE COMPLETED OF ALL MAJOR SYSTEMS BEFORE THEY ARE COVERED BY THE NEXT PHASE OF CONSTRUCTION. THE CONTRACTOR MUST NOTIFY THE ACOUSTIC DESIGNER AS THESE MAJOR ELEMENTS ARE COMPLETED.

7. ALL TIMBER FRAMING AND PLYWOOD LAMINATIONS ARE TO BE FIRE TREATED AS PER LOCAL BUILDING CODES.

RIGID INSULATION SPECIFICATIONS

#703 OWENS CORNING=3lb/cf UNFACED RIGID FIBERGLASS INSULATION. SUITABLE SUBSTITUTES FROM ALTERNATE MANUFACTURER IS ACCEPTABLE WITH PRIOR APPROVAL

#705 OWENS CORNING=6lb/cf UNFACED RIGID FIBERGLASS INSULATION. SUITABLE SUBSTITUTES FROM ALTERNATE MANUFACTURER IS ACCEPTABLE WITH PRIOR APPROVAL

Revisions

REVISION #	DATE	REVISION	APPROVED
01	07/13/21	100% CD	GM
02	11/19/21	Addendum 3	GM

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New York, NY 10024

PROJECT

Purchase College Studio A Renovations

Purchase, NY

DRAWING NAME

DETAILS—SHELL CONSTRUCTION

SEAL & SIGNATURE

SCALE 1 1/2"=1'-0"
DATE 11/19/2021
CAD FILE#

DRAWING NUMBER
A-401.00
SHEET

(A) Ramp Detail

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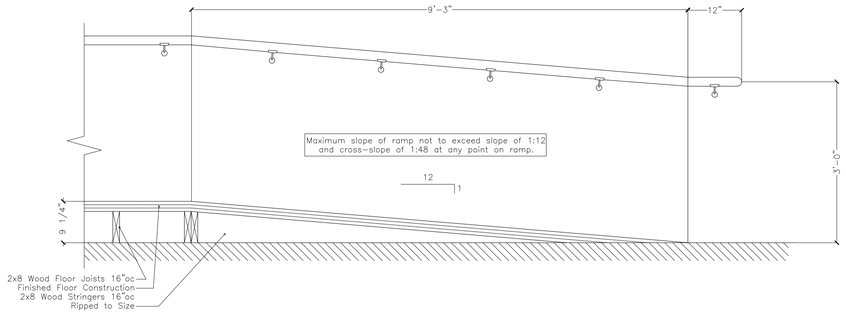
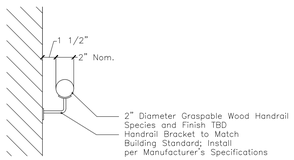
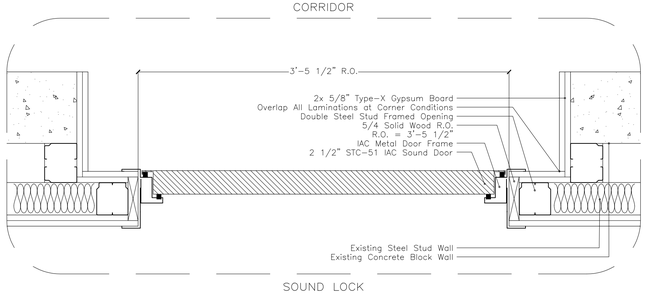
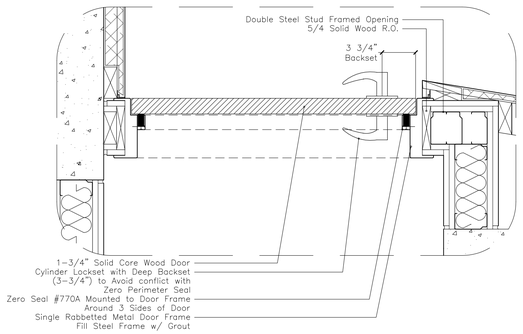


(B) Ramp Handrail Detail

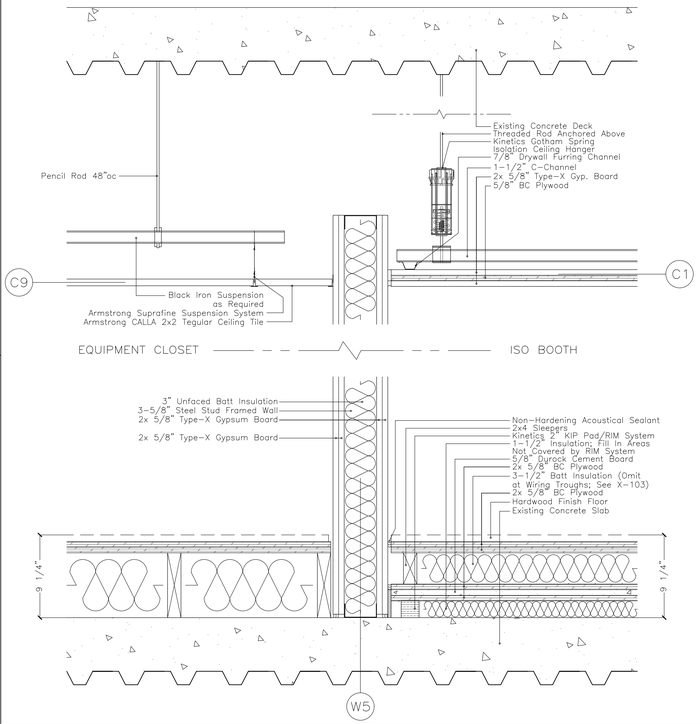




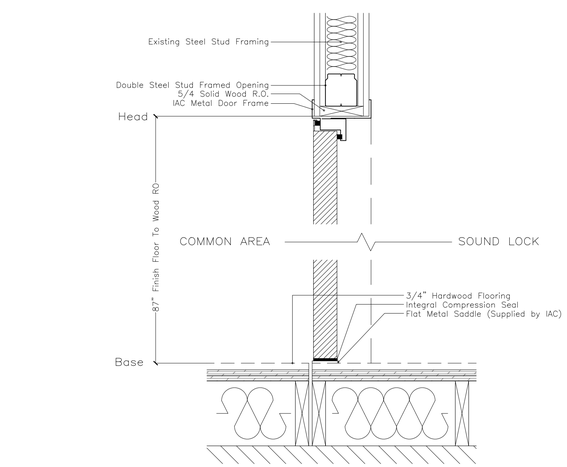
(C) Plan Section at Door #1



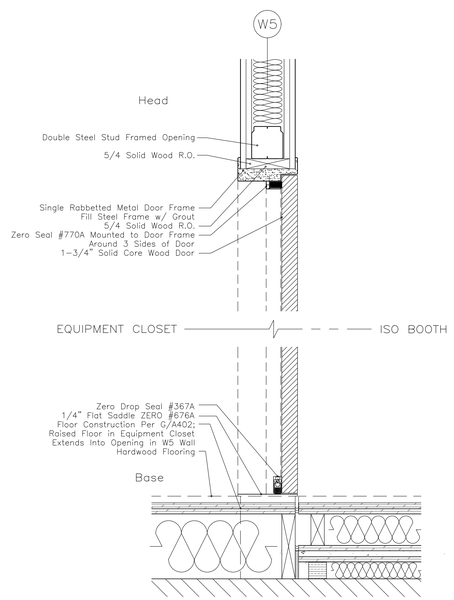
(E) Plan Section at Door #5



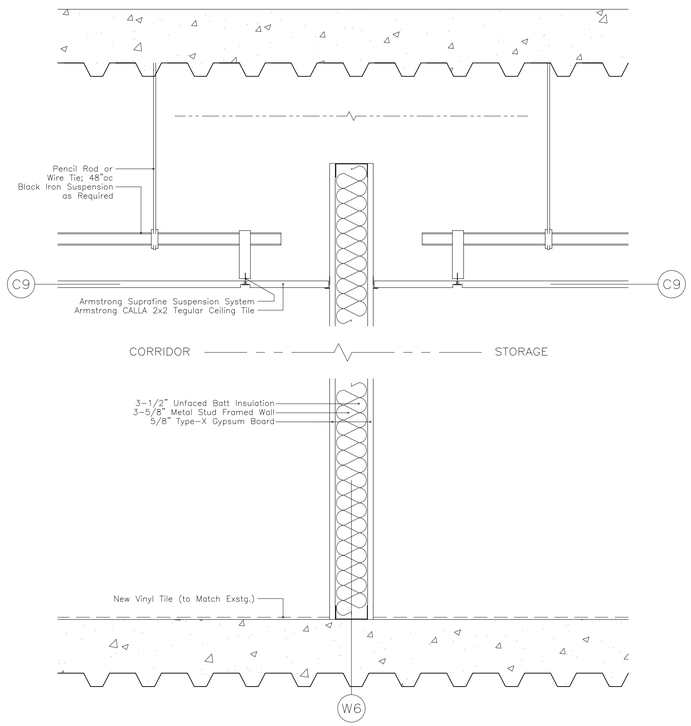
(G) Shell Construction



(D) Section at Door #1



(F) Section at Door #5



(H) Shell Construction

SYMBOLS

ACOUSTIC CONSTRUCTION NOTES

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New York, NY 10024

PROJECT

Purchase College Studio A Renovations

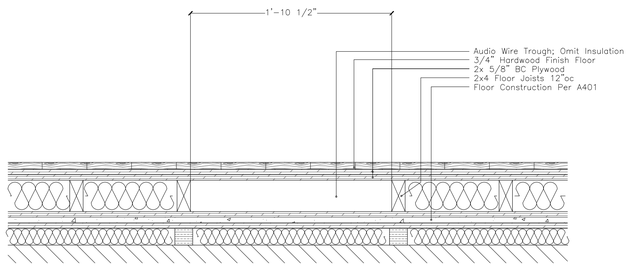
Purchase, NY

DRAWING NAME

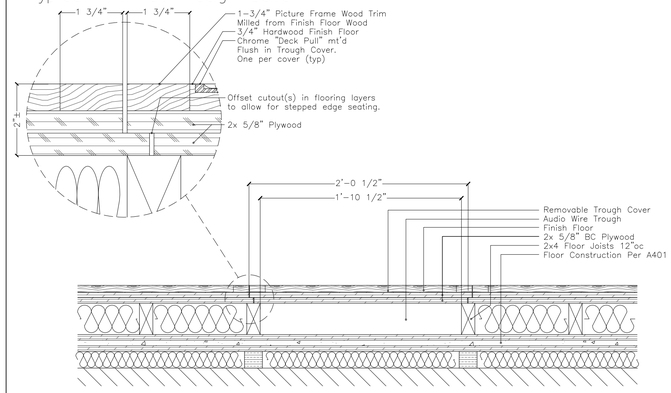
DETAILS-MISC

SEAL & SIGNATURE

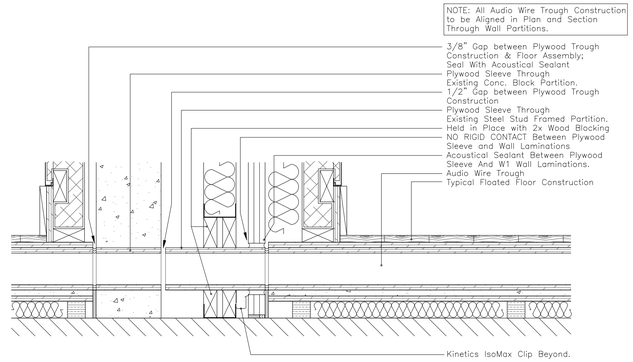
SCALE 1 1/2"=1'-0"
DATE 11/19/2021
CAD FILE#
DRAWING NUMBER
A-402.00
SHEET



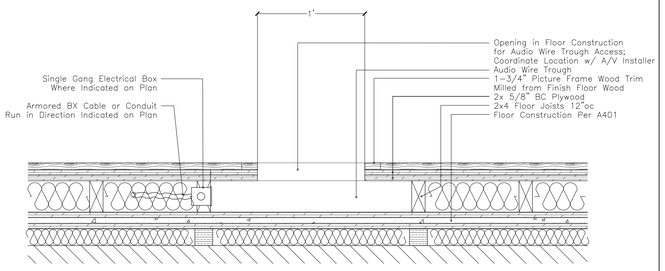
A Trough Detail



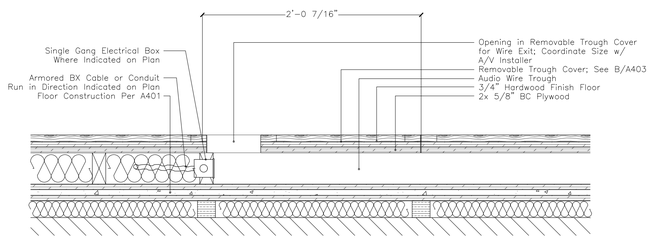
B Removable Trough Cover



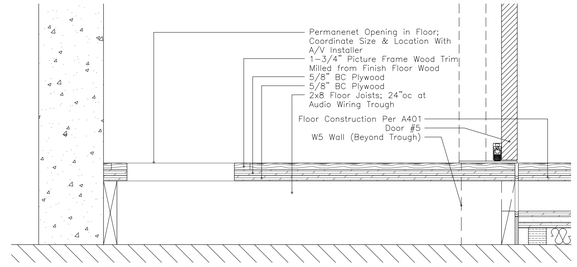
C Audio Trough Crossing Adjacent Floated Floors



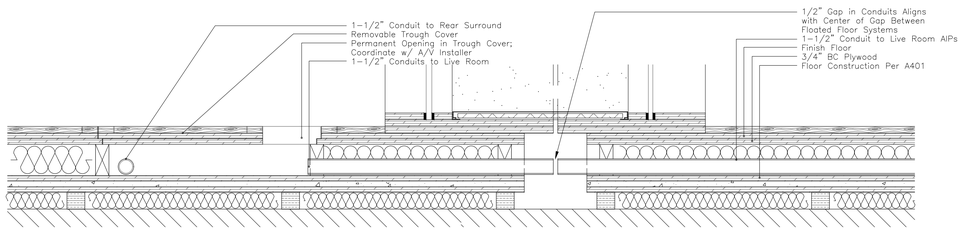
D Detail at Opening in Trough



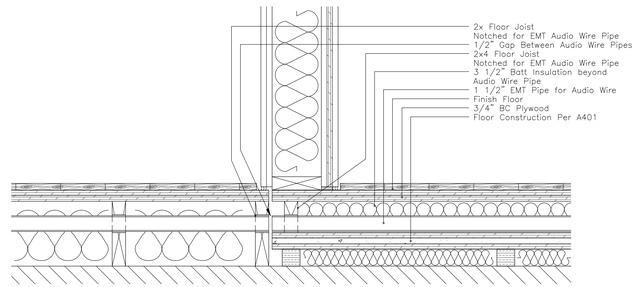
E Removable Trough Cover w/Wire Exit



F Detail at Opening in Trough



G Audio Pipes Exiting Trough at Removable Cover



H Audio Pipe Exiting Isolated Floor

SYMBOLS

Revisions

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New York, NY 10024

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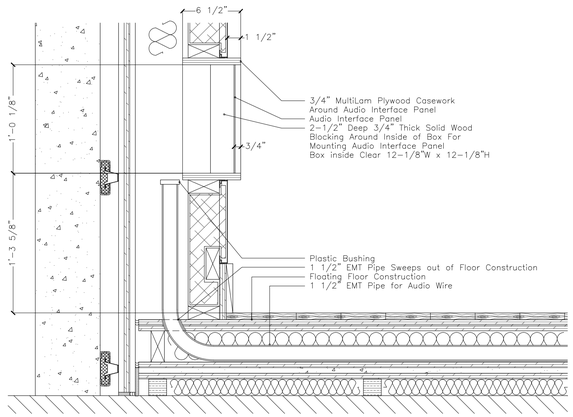
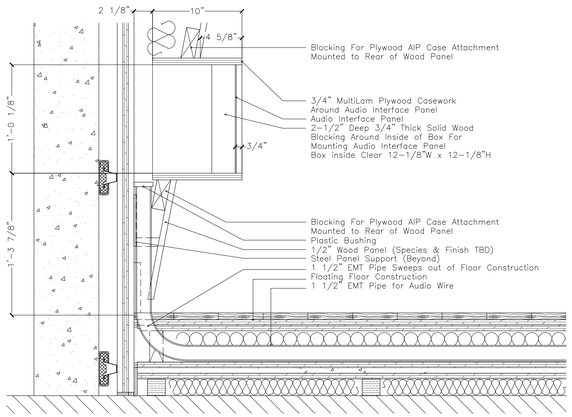
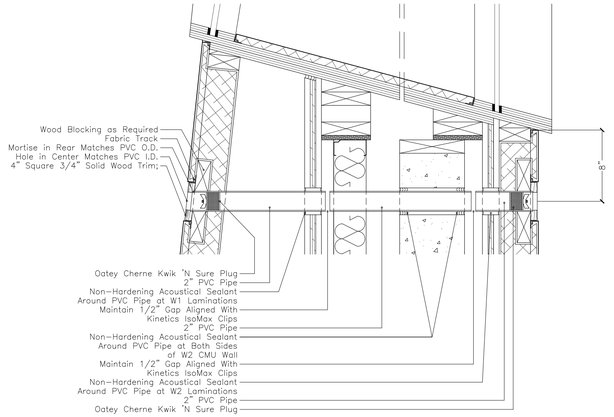


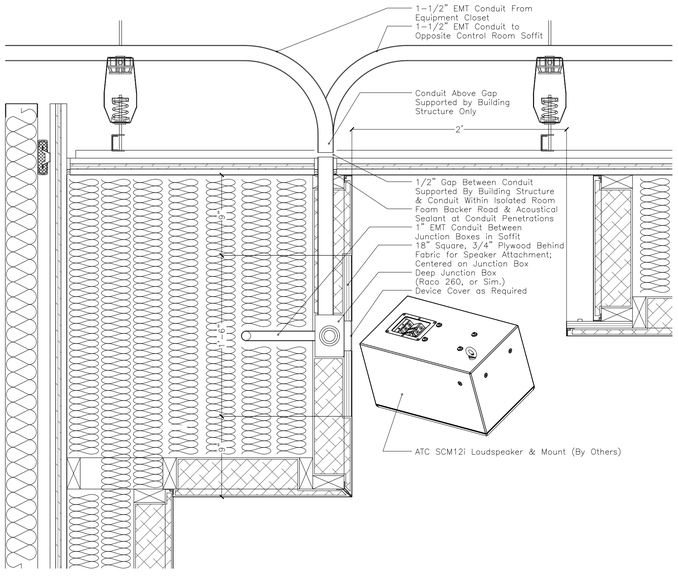
J Audio Interface Panel in Fabric Wall



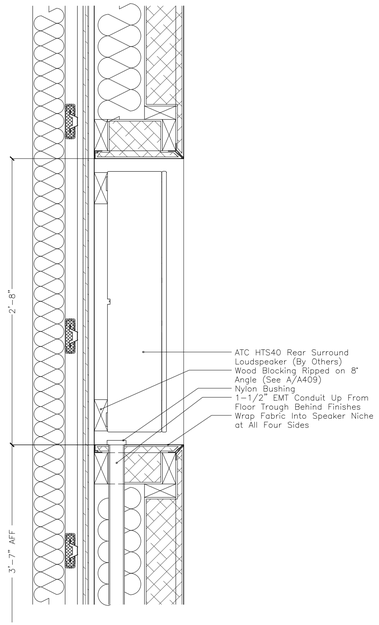
K Audio Interface Panel in T13 Wood Panel



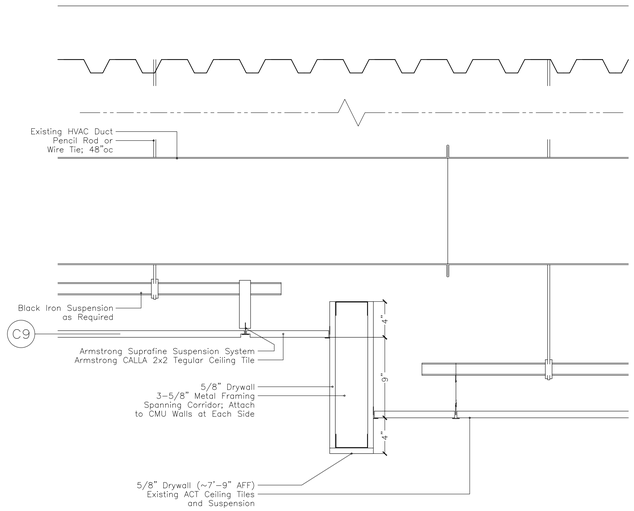
L Cable Pass-Through



M Detail at Overhead Speaker



N Detail at Rear Surround Speaker



P Section at Corridor Ceiling Transition

SYMBOLS

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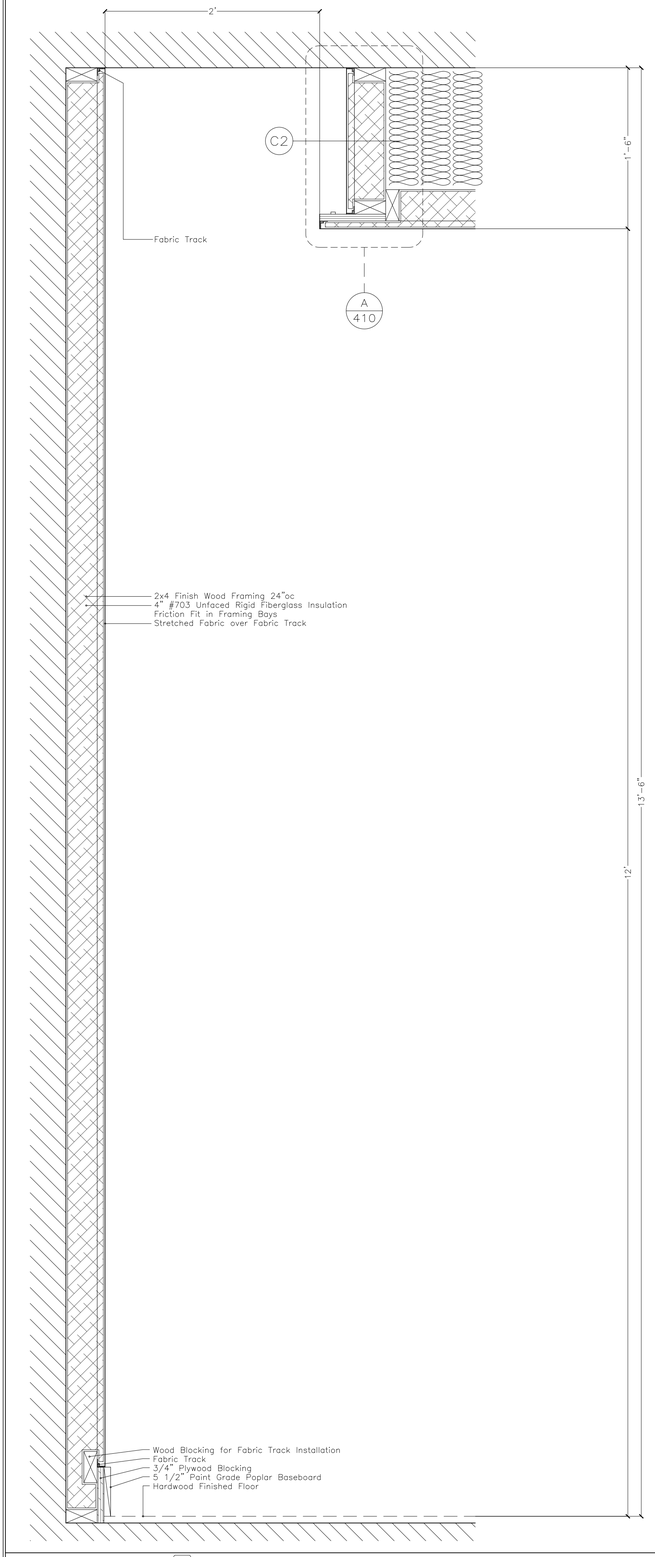
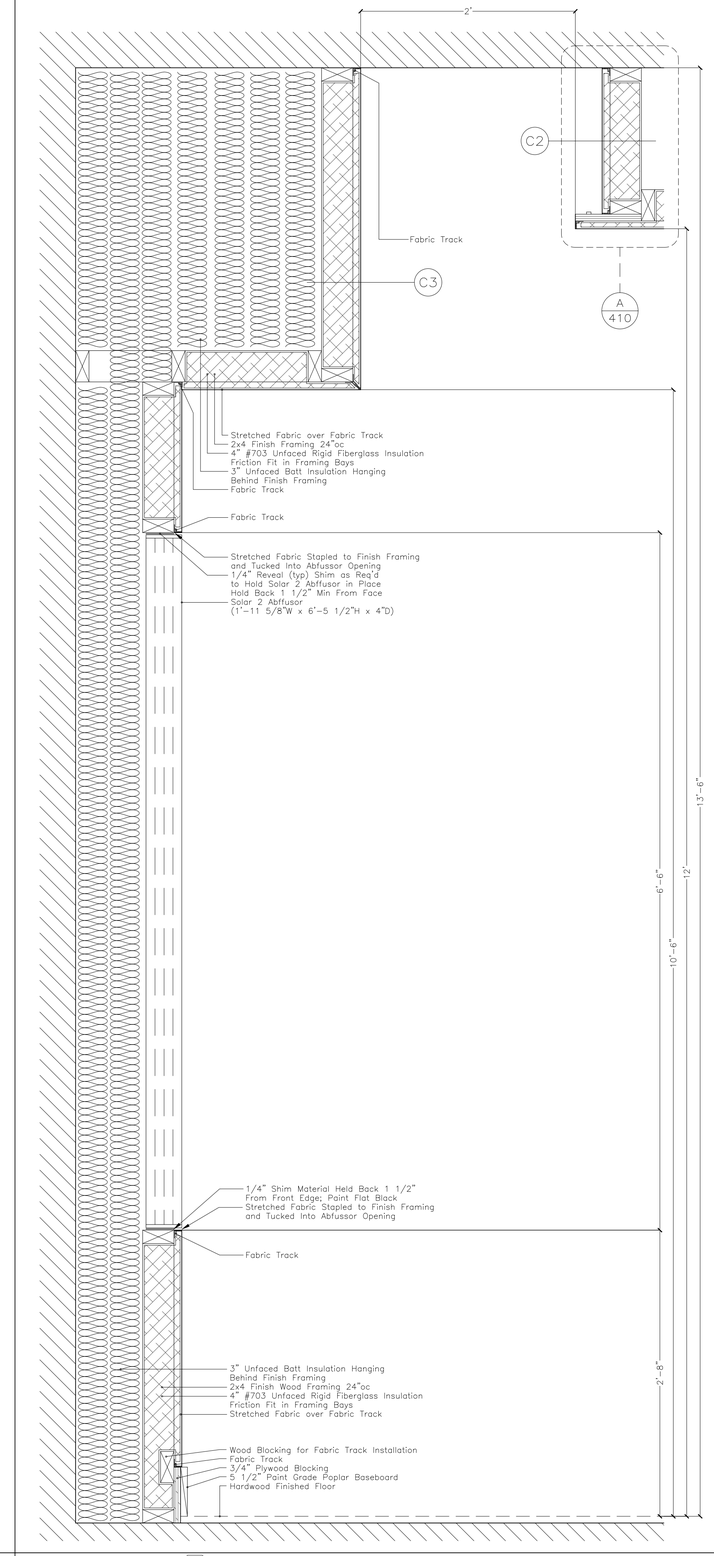
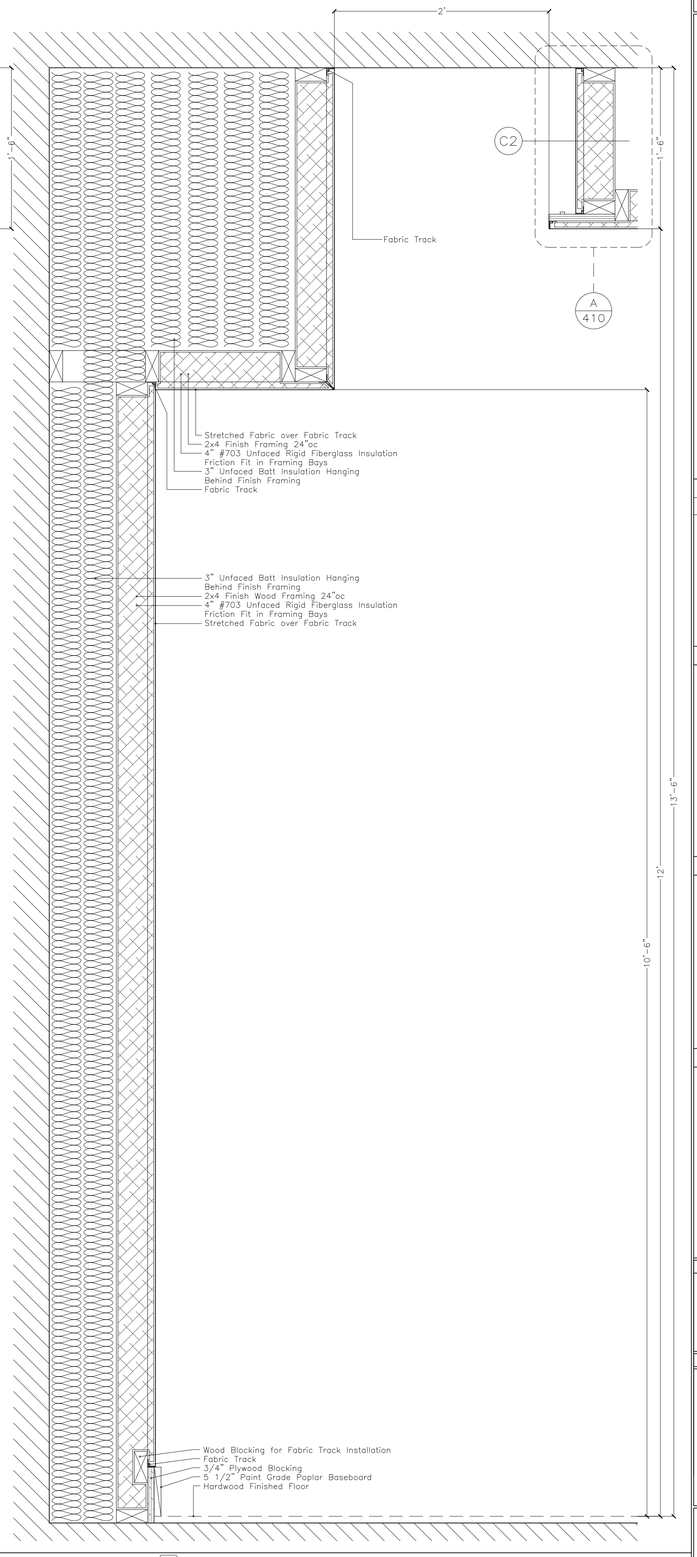


T1 Fixed Depth Acoustic Treatment



T2 Varying Depth w/Abfussor



T3 Varying Depth Acoustic Treatment

SYMBOLS

ACOUSTIC CONSTRUCTION NOTES

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4. WHERE RESILIENT CHANNEL IS SPECIFIED, USE USG RC-1 RESILIENT CHANNEL INSTALLED IN ACCORDANCE WITH USG STANDARDS. INSTALL CHANNEL WITH "FREE LEG" UP.

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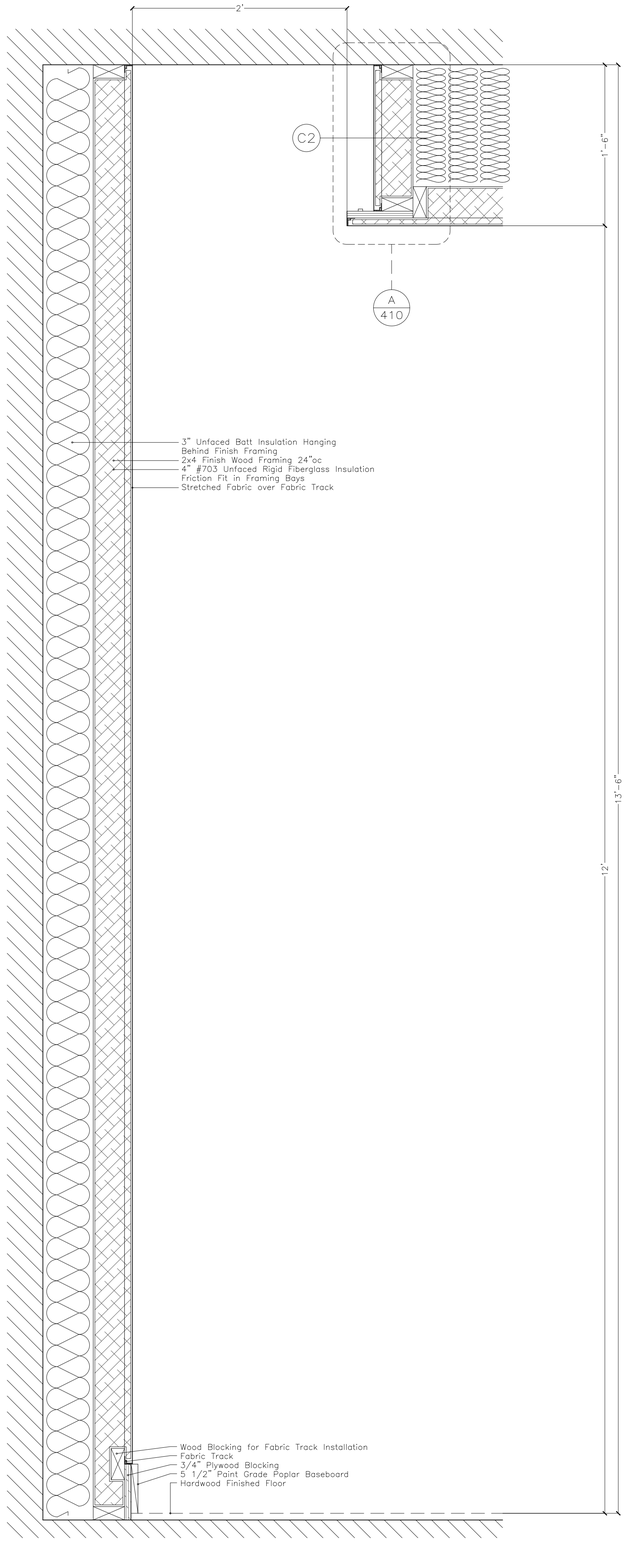
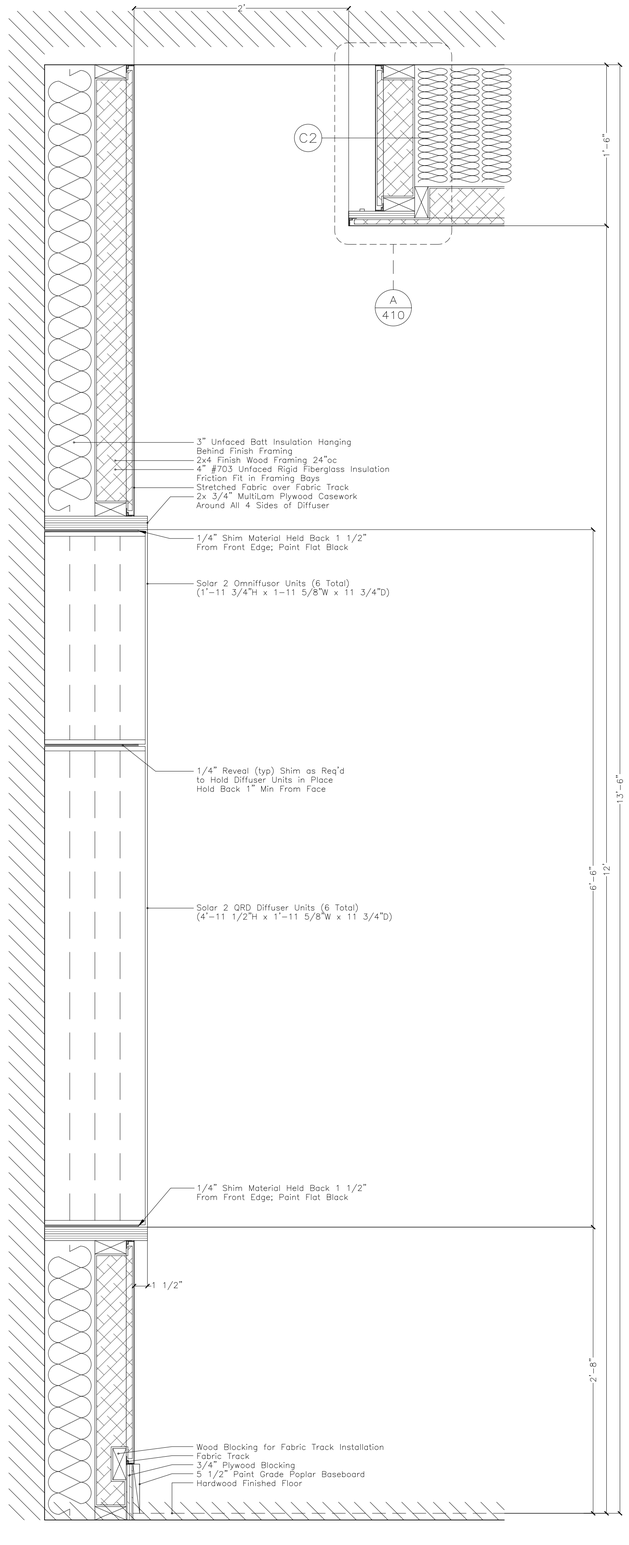
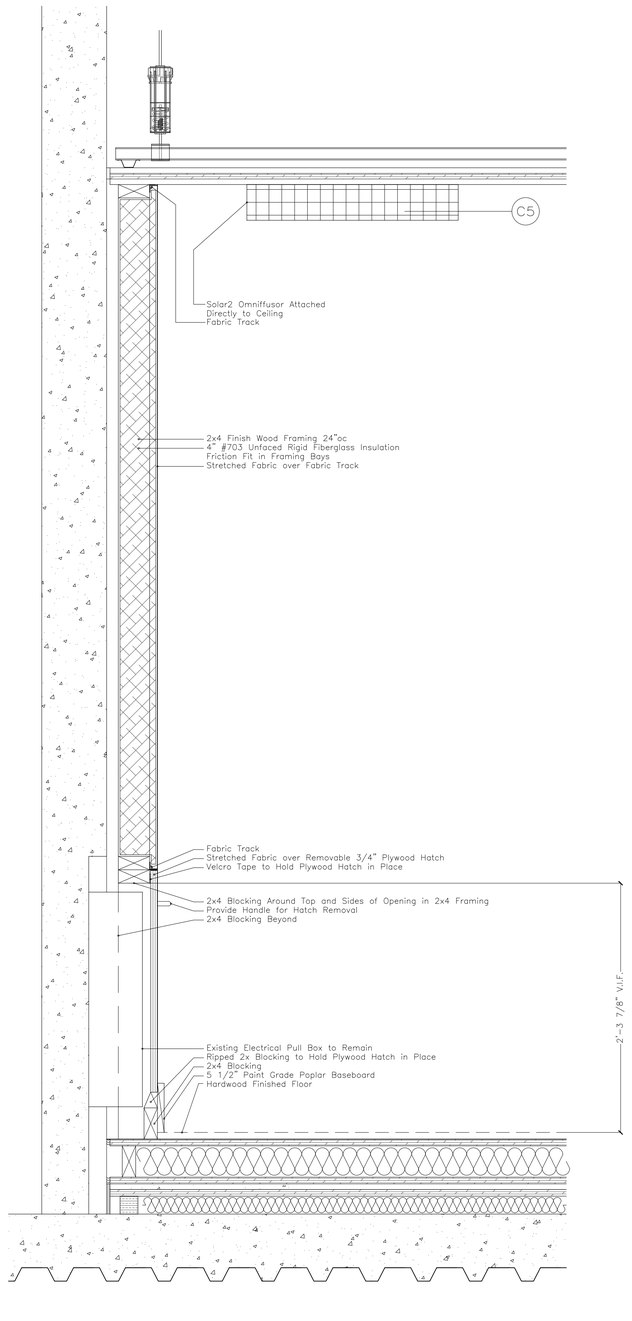


T4 Varying Depth Acoustic Treatment



T5 RPG QRD Diffractal Units



T6 Fixed Depth Acoustic Treatment

SYMBOLS

ACOUSTIC CONSTRUCTION NOTES

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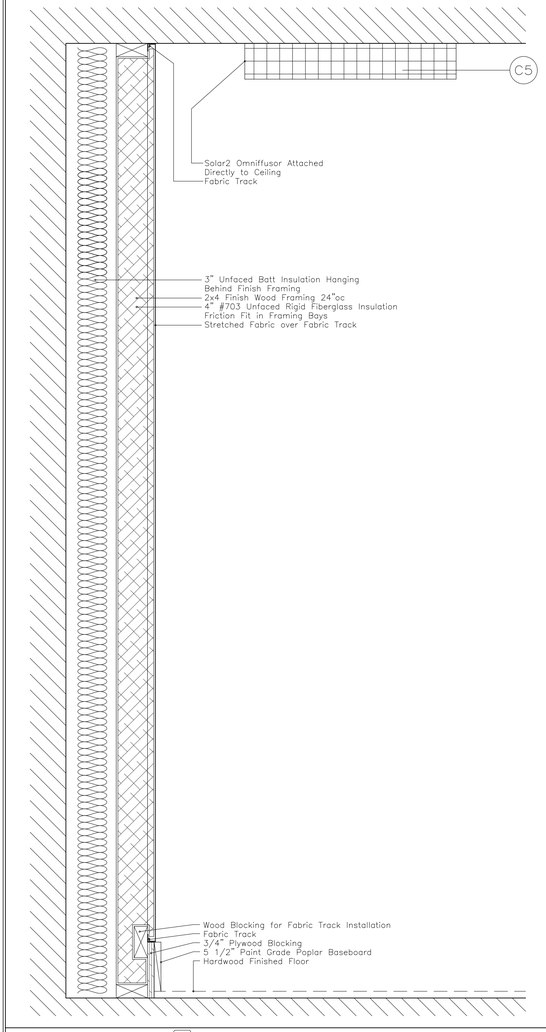
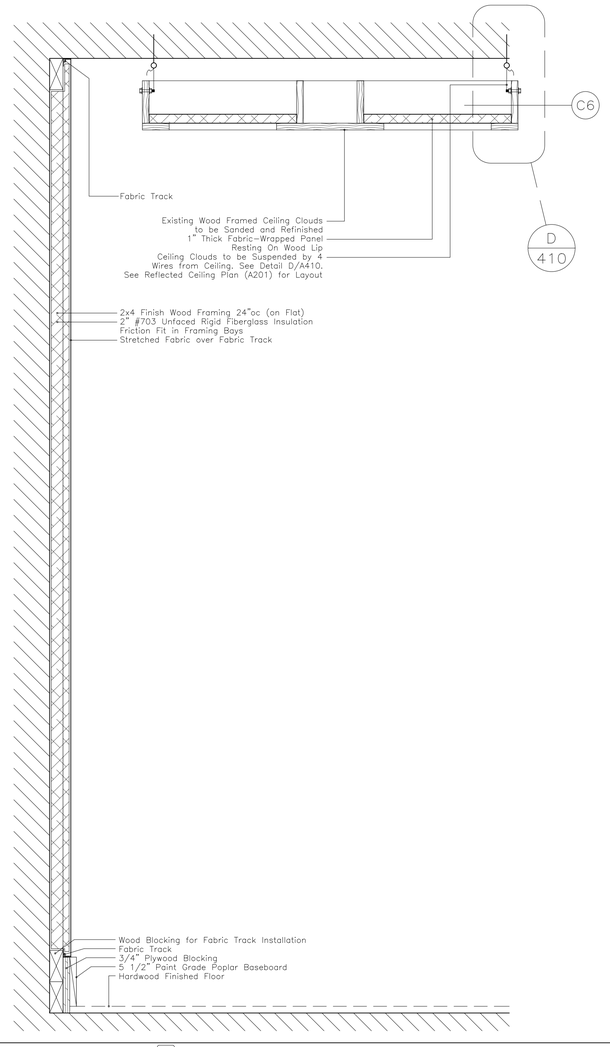
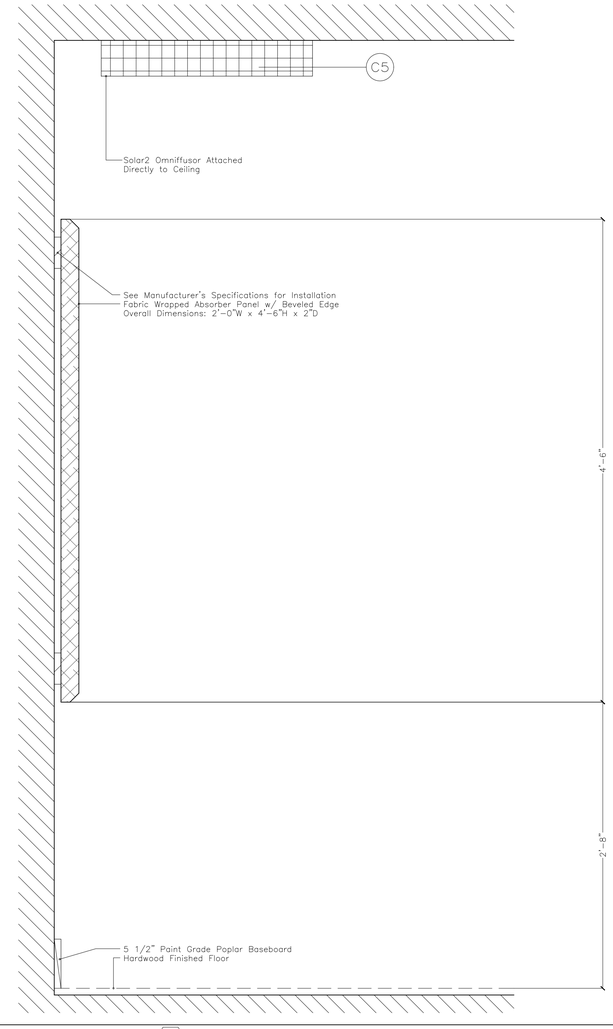


T7 Varying Depth Acoustic Treatment



T8 Fixed Depth Acoustic Treatment



T9 Fabric Wrapped Absorber Panel

SYMBOLS

ACOUSTIC CONSTRUCTION NOTES

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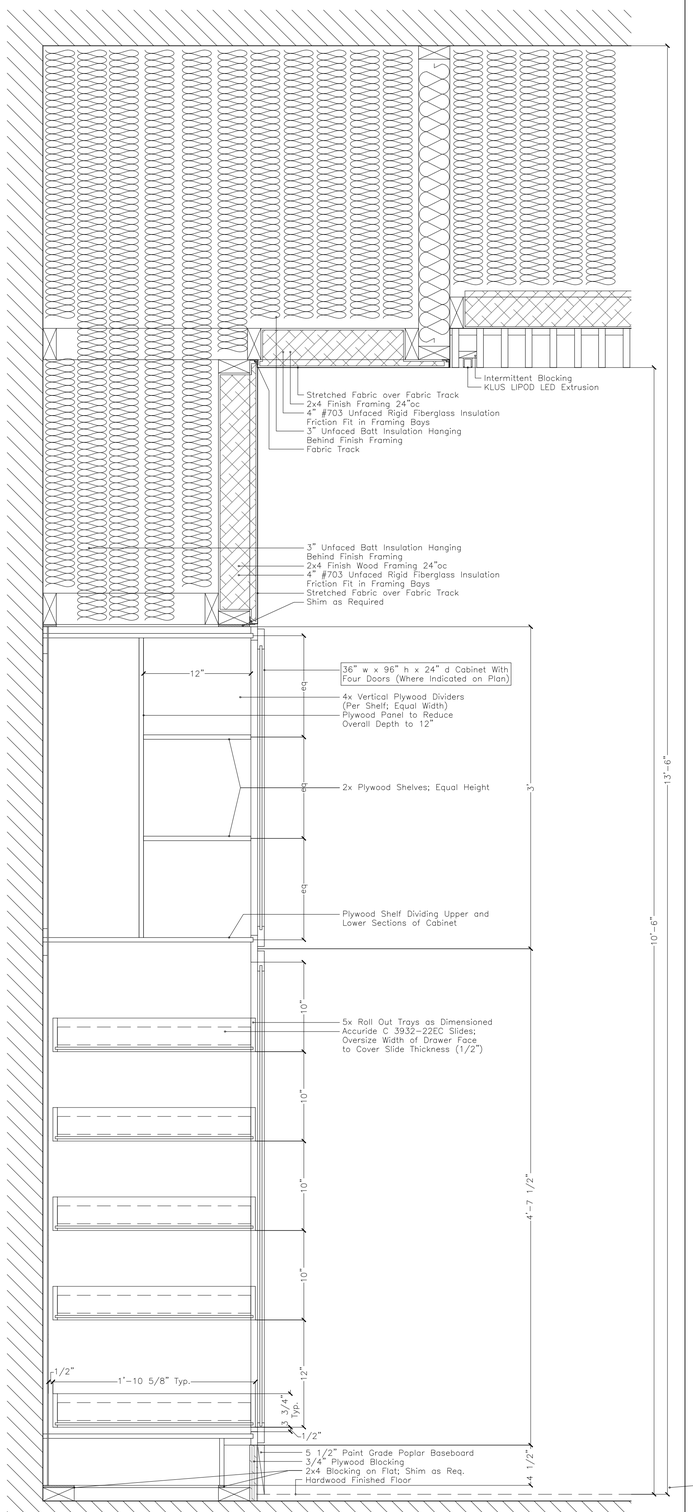
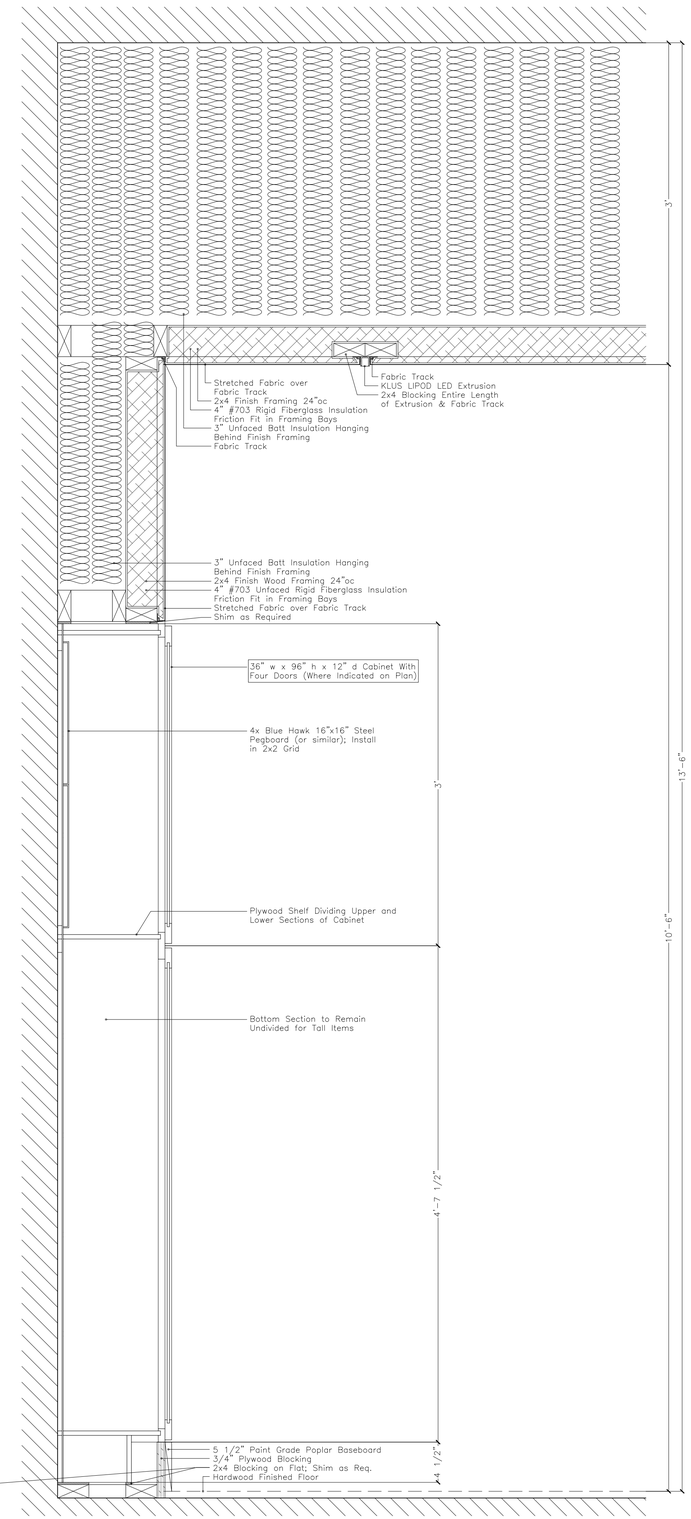
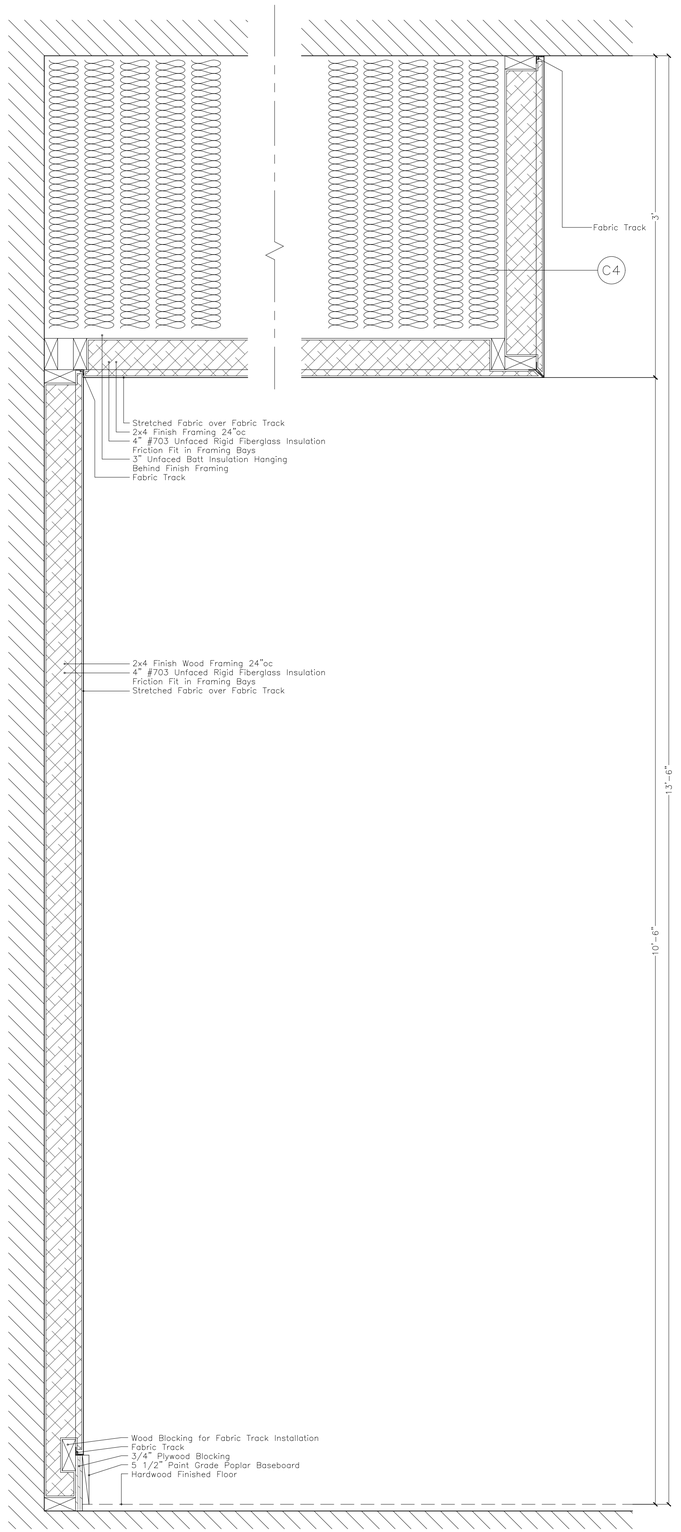


T10 24" Deep Treatment w/ Inset Cabinet



T11 12" Deep Treatment w/ Inset Cabinet



T12 Fixed Depth Acoustic Treatment

SYMBOLS

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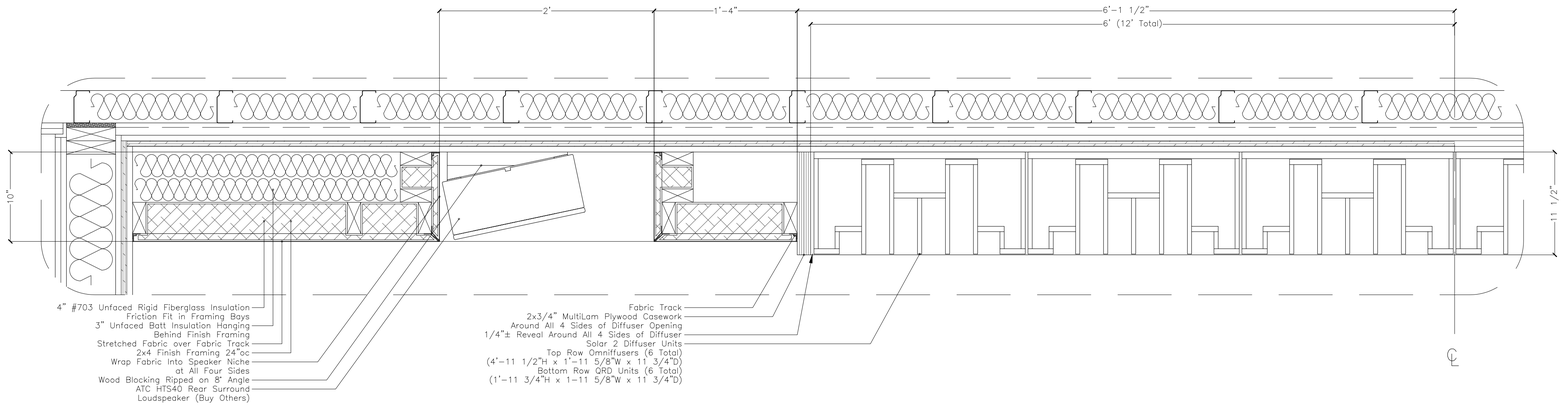
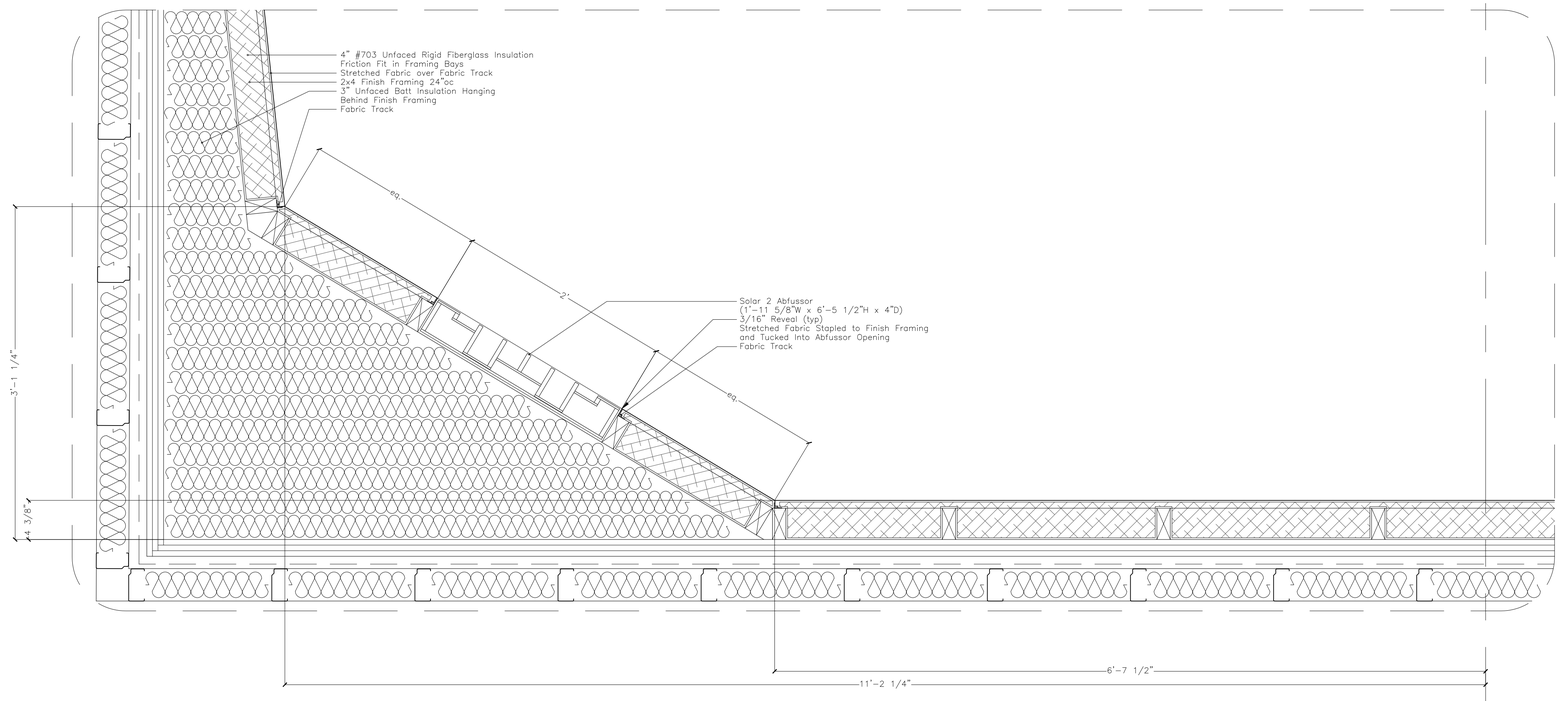


Ⓐ Control Room Rear Wall Plan Detail



Ⓑ Control Room Front Wall Plan Detail

SYMBOLS

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#705 OWENS CORNING=6lb/cf UNFACED RIGID FIBERGLASS INSULATION. SUITABLE SUBSTITUTES FROM ALTERNATE MANUFACTURER IS ACCEPTABLE WITH PRIOR APPROVAL

Revisions

REVISION #	DATE	REVISION	APPROVED
01	07/13/21	100% CD	GM
02	11/19/21	Addendum 3	GM

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961 Route 6
Mahopac NY, 10541

ARCHITECT

LYNN FRITZLEN ARCHITECT
Office: The Yard 33 W 60th St. 2nd Floor
New York, NY 10023
Mailing: 140 Riverside Drive Suite 6E,
New York, NY 10024

PROJECT

Purchase College Studio A Renovations

Purchase, NY

DRAWING NAME

DETAILS–ACOUSTIC TREATMENTS

SEAL & SIGNATURE

SCALE 1 1/2"=1'-0"
DATE 11/19/2021
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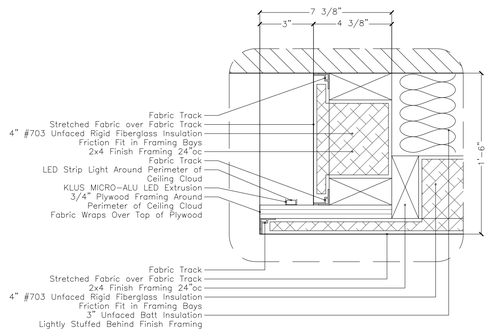
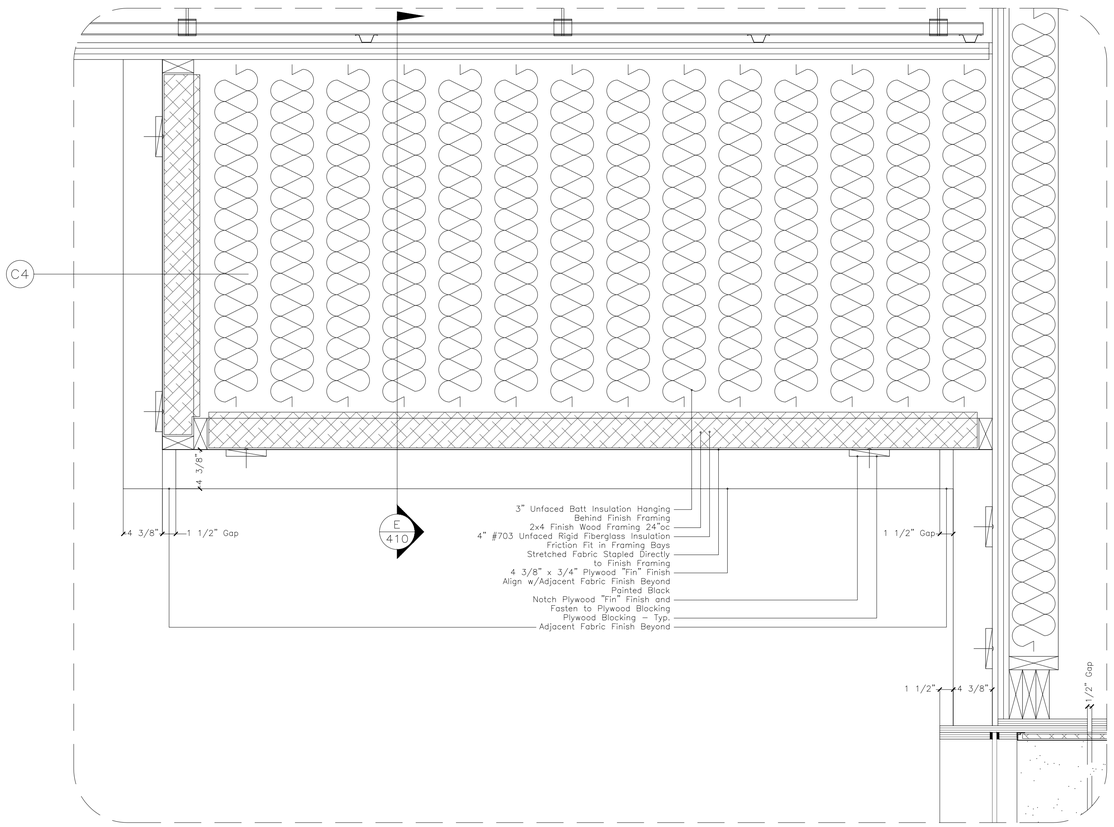
A-409.00
SHEET

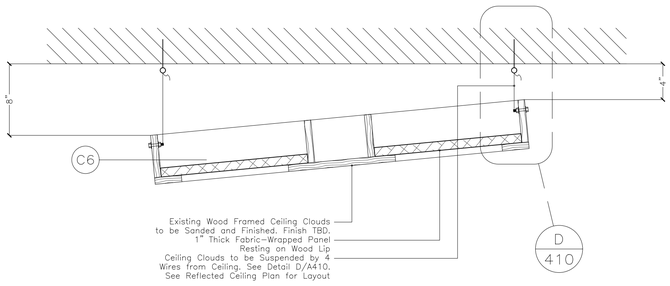
A Section Detail at Control Rm Ceiling Cloud



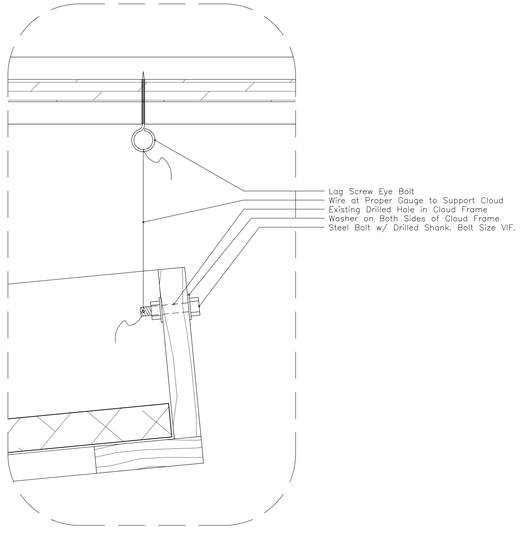
B Section Detail at Live Room Soffit



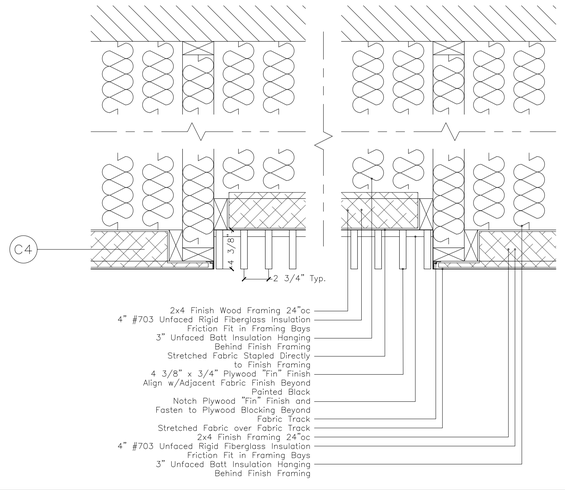
C Ceiling Cloud Section Detail



D Ceiling Cloud Suspension Detail



E Live Room Soffit Fin Finish Section Detail



SYMBOLS

ACOUSTIC CONSTRUCTION NOTES

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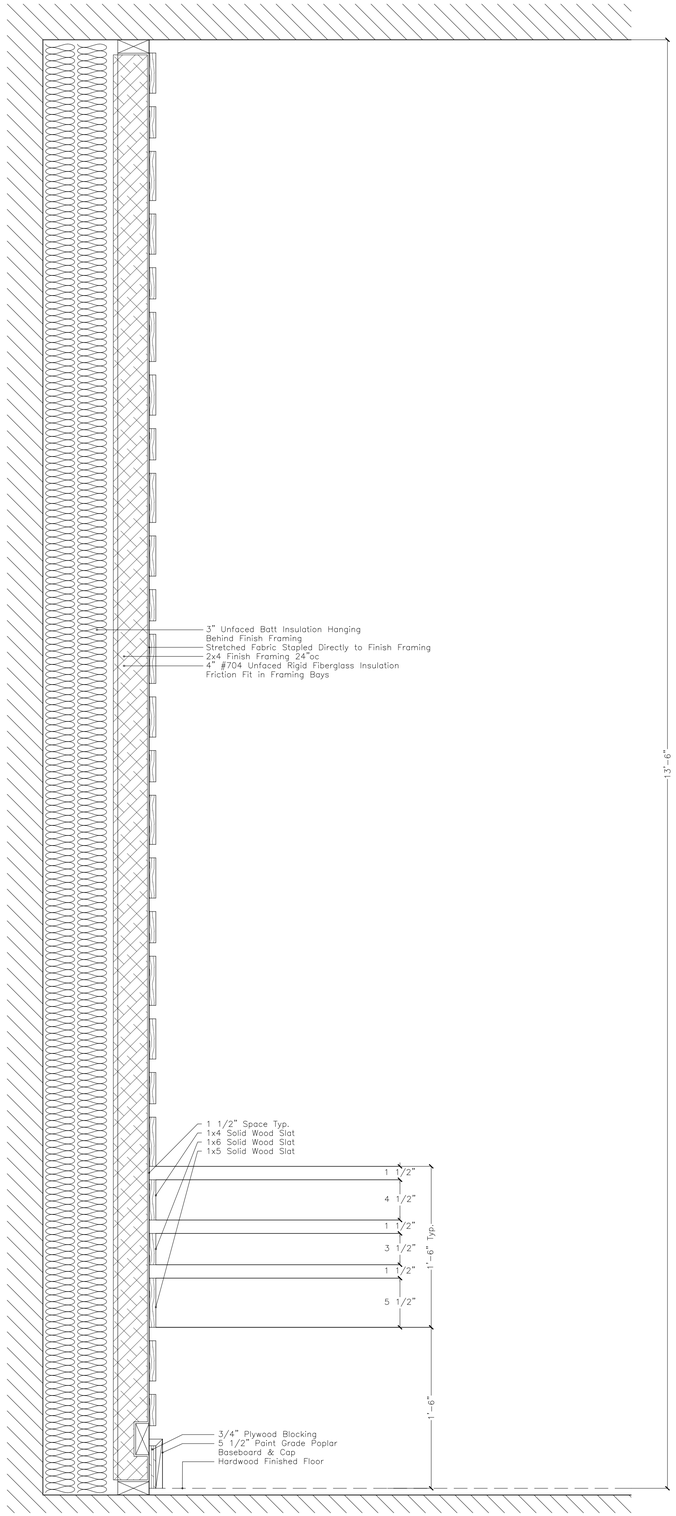
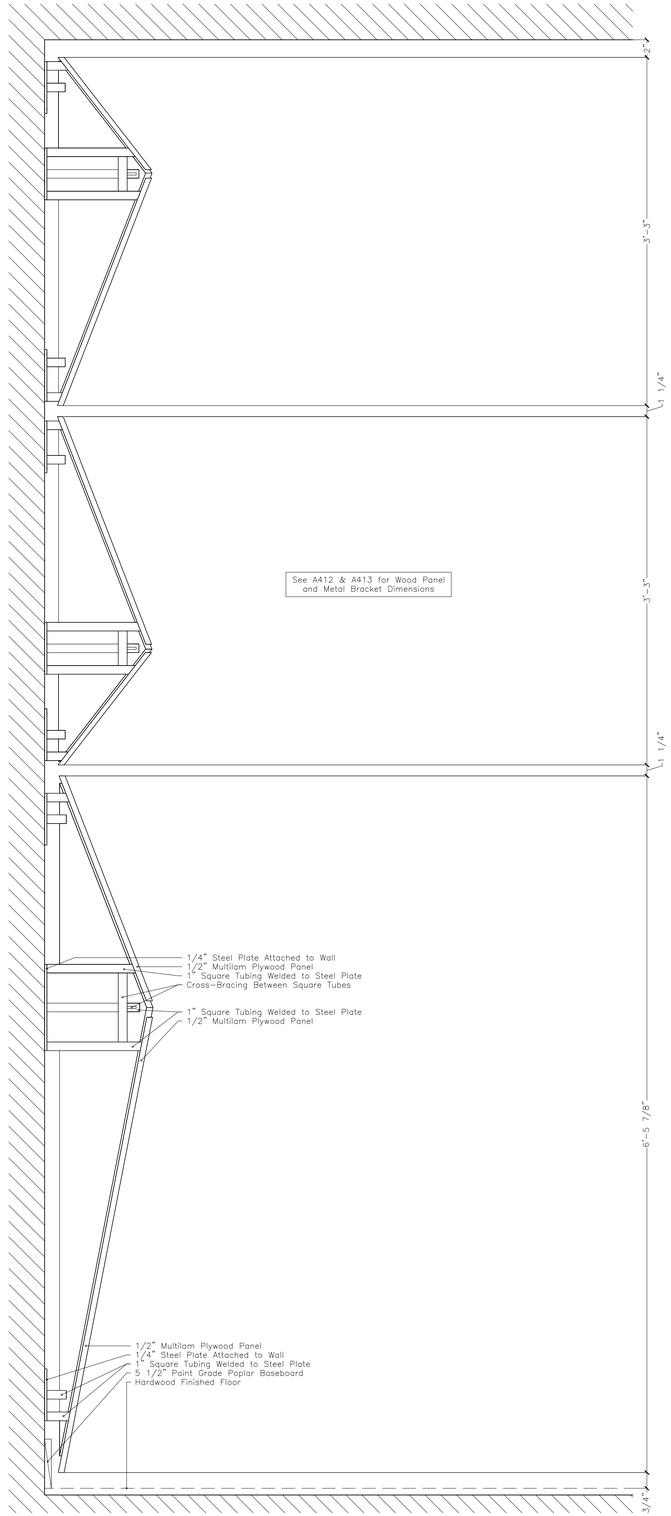
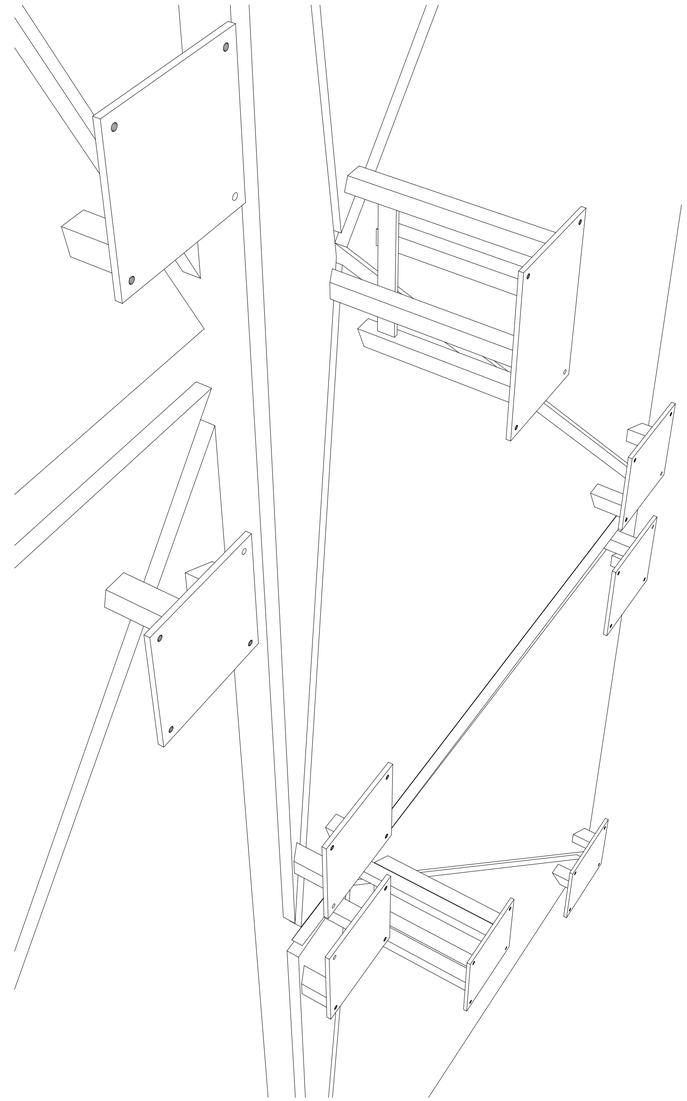


T13 Varying Depth Helmholtz Slat Treatment



T14 Backlit Pyramid Diffuser Treatments



A Isometric View Behind T14 Panels

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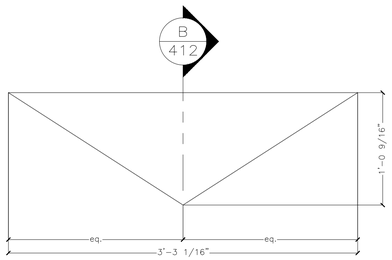
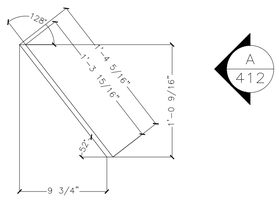
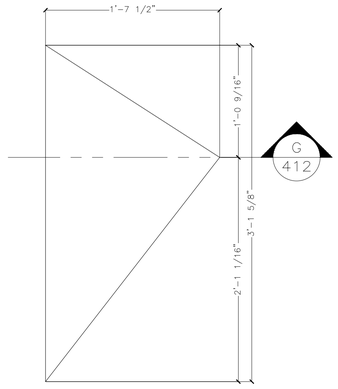
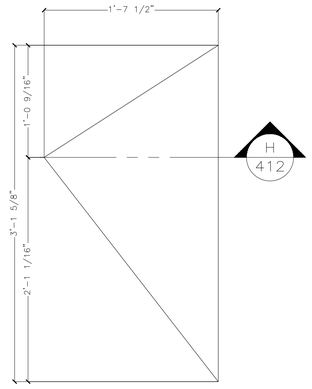
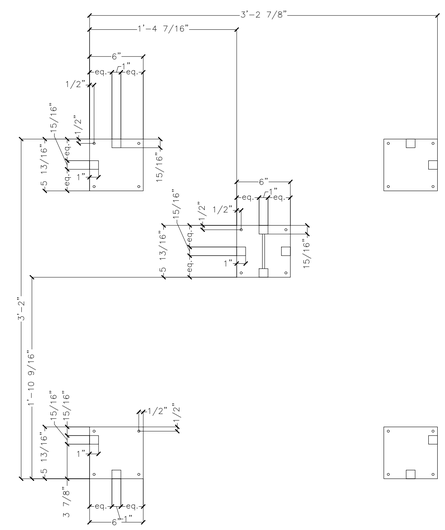










Ⓐ Top Triangle Elevation

Ⓑ Top Triangle Section

Ⓒ Side Triangle Left Elevation

Ⓓ Side Triangle Right Elevation

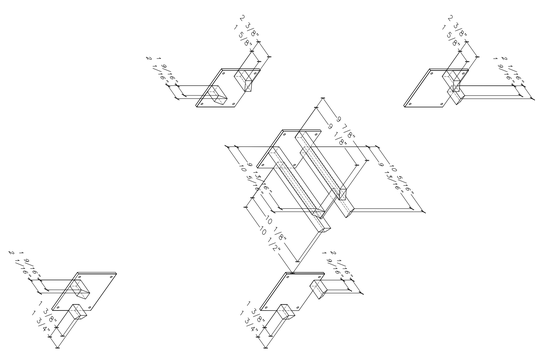
Ⓔ Bottom Triangle Elevation

Ⓕ Bottom Triangle Section

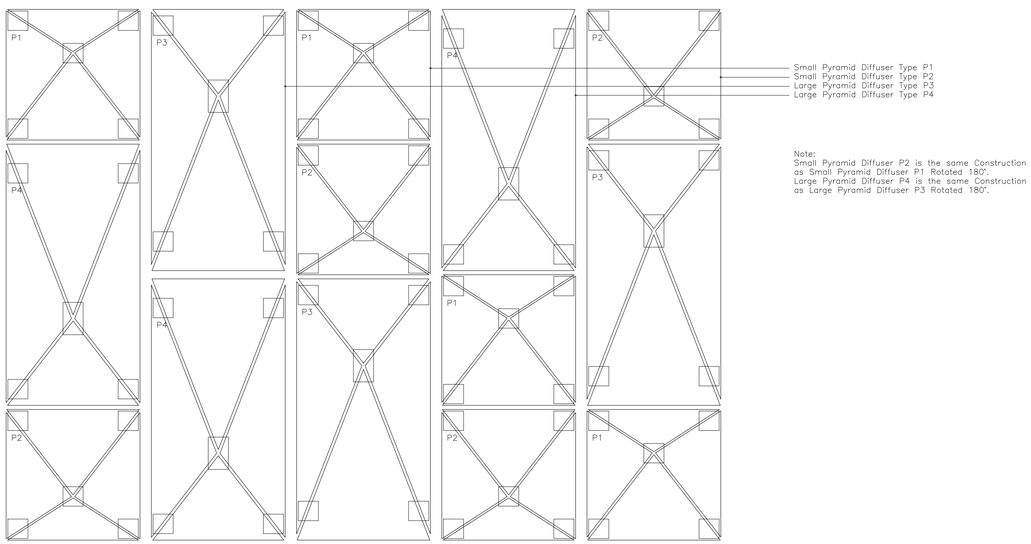
Ⓖ Side Triangle Left Section

Ⓗ Side Triangle Right Section

Ⓙ Bracket Layout Elevation Detail



Ⓚ Bracket Perspective Detail



Ⓛ Pyramid Finish Elevation – Not to Scale

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DETAILS–PYRAMID DIFFUSERS (TYPE P1 & P2)

SEAL & SIGNATURE

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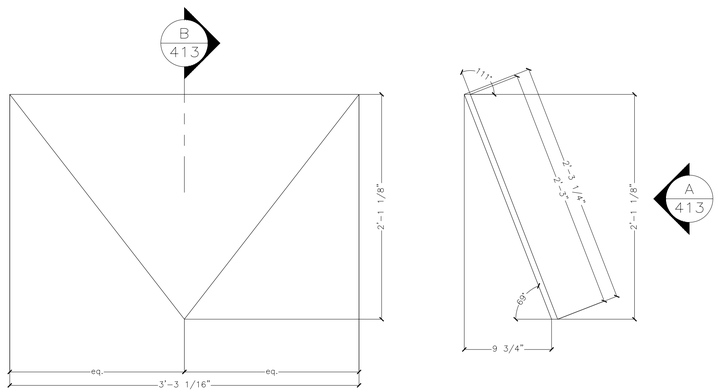
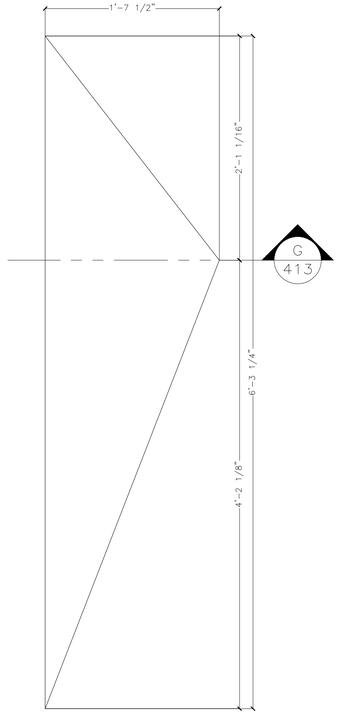
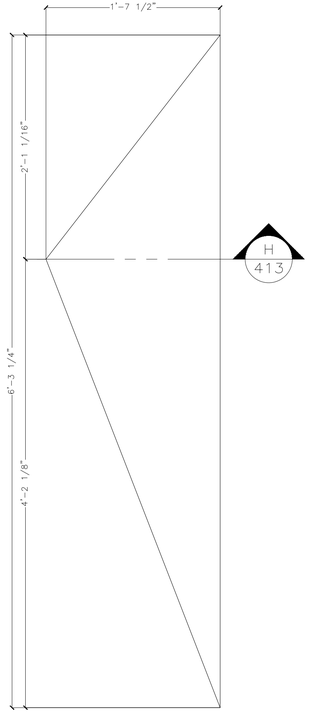


A Elevation – Top Triangle

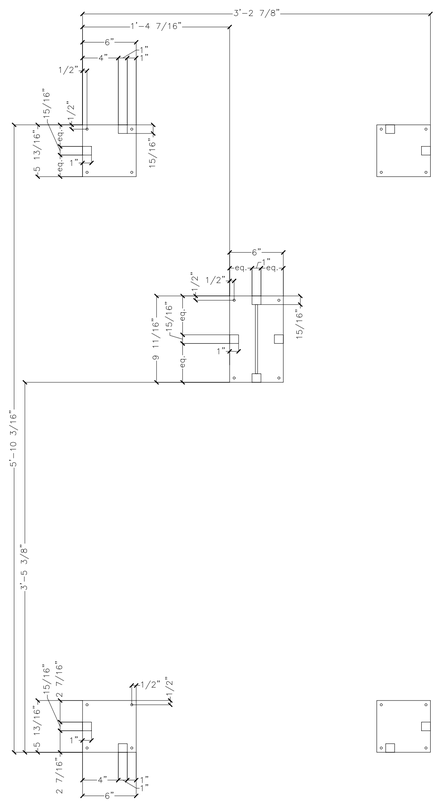
B Section – Top Triangle



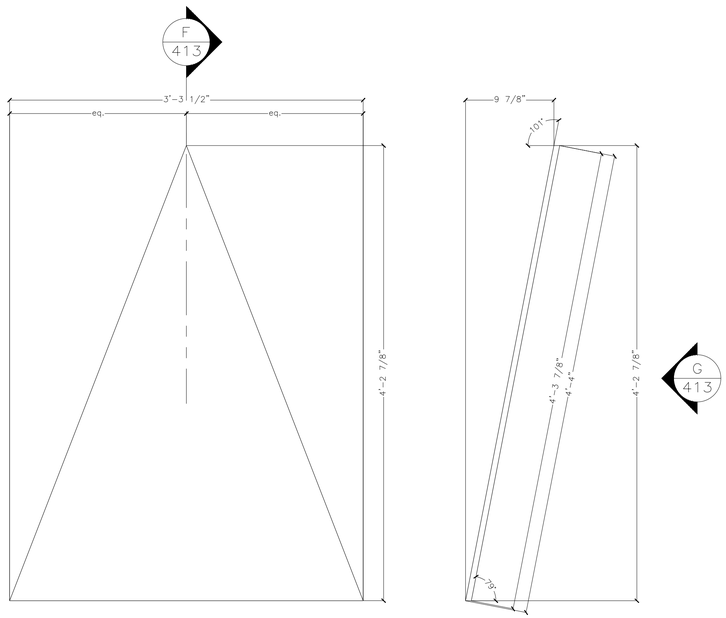
C Elevation – Side Triangle Left



D Elevation – Side Triangle Right

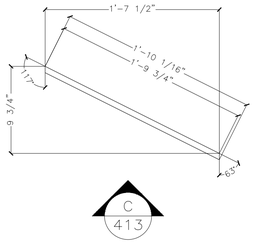


E Bracket Layout Elevation Detail

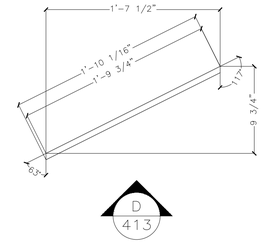


F Elevation – Bottom Triangle

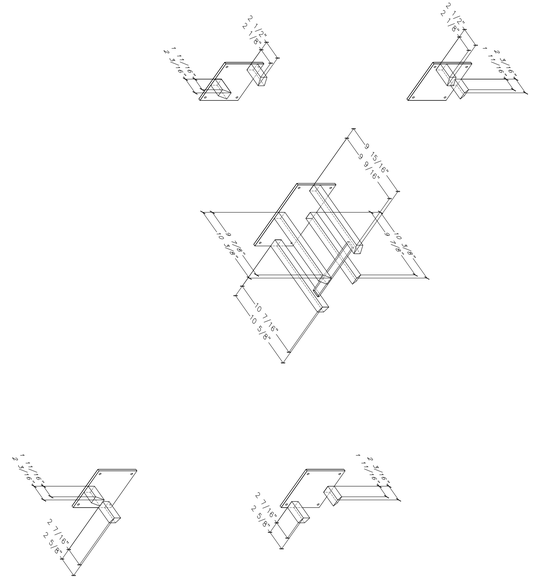
G Section – Bottom Triangle



H Section – Side Triangle Left



J Section – Side Triangle Right



K Bracket Perspective Detail

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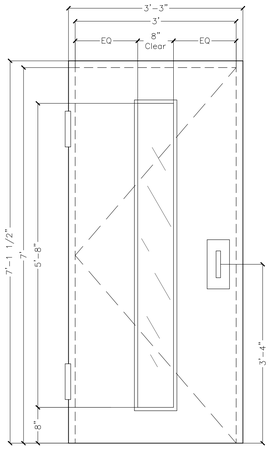
DOOR SCHEDULE

DOOR #	DIMENSIONS			MATERIALS			DETAIL			GLAZING	HARDWARE														TYPE	RATING	NOTES
	WD	HT	THK	DOOR MATERIAL	FRAME MATERIAL	GROUT FILLED	JAMB	HEAD	THRESH		DOOR CLOSER	DROP SEAL	PERIMETER SEALS	METAL THRESHOLD	LEVER MORTISED PRIVACY	LEVER MORTISED DEAD BOLT	PUSH/PULL PLATE	BALL BEARING BUTT HINGES	CAM HINGES	FLOOR STOP	KICK PLATE	ELECTRIC STRIKE/CARD READER			
1	3'-0"	7'-0"	2-1/2"	Metal IAC STC-51	Integral Metal		C/402	D/402	D/402	Factory Glazing	X			X	X				X	X	X	X		A		Sargent Passport P1 802.11 Rim Exit Device with inside panic rail DUO magstripe and multiCLASS reader (less cylinder housing and core); Model #70-P1-8877-IMPS-ETL
2	3'-0"	7'-0"	2-1/2"	Metal IAC STC-51	Integral Metal		A/602	D/602	D/602	Factory Glazing	X			X			X		X	X	X			A		
3	3'-0"	7'-0"	2-1/2"	Metal IAC STC-51	Integral Metal		B/602	E/602	E/602	Factory Glazing	X			X	X				X	X	X	X	X	A		Sargent Passport 1000 P1 802.11 Mortised Lockset with DUO magstripe and multiCLASS reader (less cylinder housing and core); Model #70-P1-8276-IMPS-LNL-26D 90° Hold Open Option for Closer
4	2'-6"	7'-0"	2-1/2"	Metal IAC STC-51	Integral Metal		C/602	F/602	F/602	Factory Glazing	X			X			X		X	X	X			B		
5	2'-8"	7'-0"	1-3/4"	Solid Core Wood	Metal	Yes	E/402	F/402	F/402		X	X	X		X			X		X				C		3-3/4" Backset Required for Lockset
6	3'-0"	7'-0"	1-3/4"	Hollow Metal	Metal						X					X		X		X				D		

(A) 3070 2 1/2" IAC STC-51 Metal Sound Door

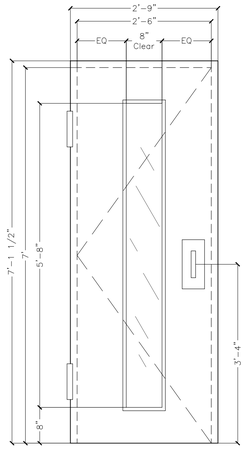
SCALE: 3/4"=1'-0"



NOTE: Rough Opening for IAC Doors is to be 41 1/2"W x 87"H Exact and Plumb Solid Wood RO.

(B) 2670 2 1/2" IAC STC-51 Metal Sound Door

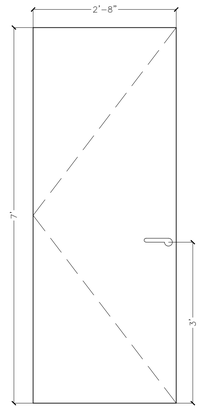
SCALE: 3/4"=1'-0"



NOTE: Rough Opening for IAC Doors is to be 41 1/2"W x 87"H Exact and Plumb Solid Wood RO.

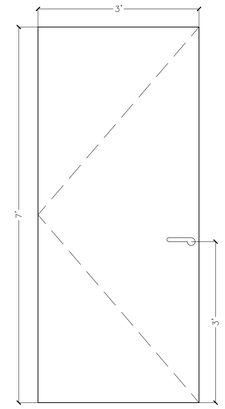
(C) 1 3/4" 2870 Solid Core Wood Door

SCALE: 3/4"=1'-0"



(D) 1 3/4" 3070 Hollow Metal Door

SCALE: 3/4"=1'-0"



SYMBOLS

Revisions

REVISION #	DATE	REVISION	APPROVED
01	07/13/21	100% CD	GM
02	11/19/21	Addendum 3	GM

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New York, NY 10024

PROJECT

Purchase College Studio A Renovations

Purchase, NY

DRAWING NAME

DOOR SCHEDULE AND

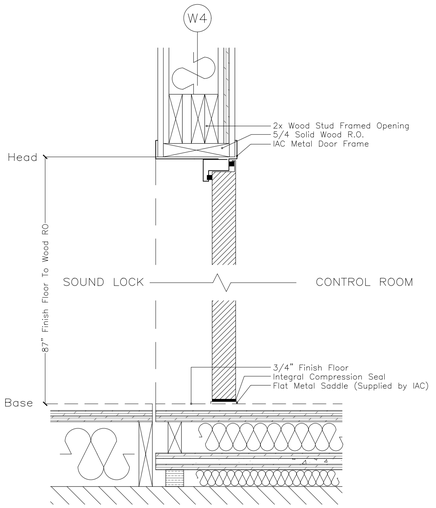
SEAL & SIGNATURE

SCALE: As Noted
DATE: 11/19/2021
CAD FILE#:

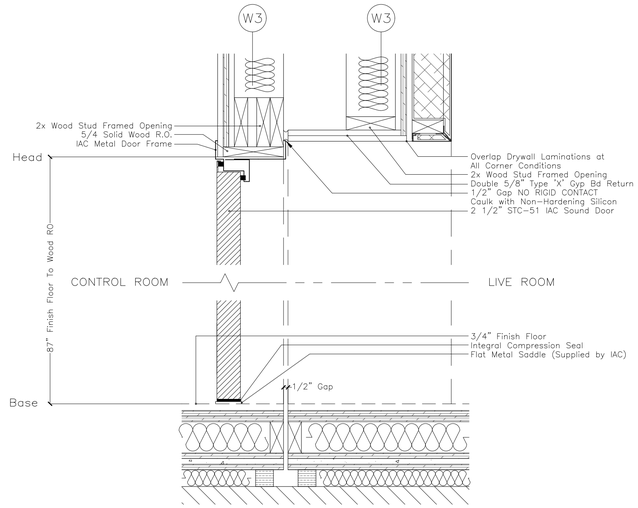
DRAWING NUMBER

A-601.00

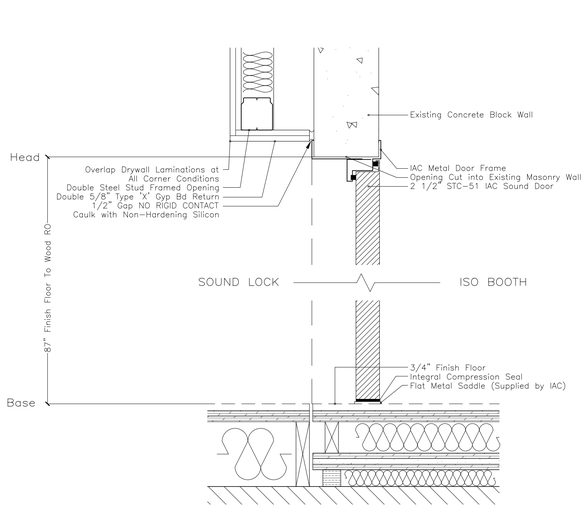
SHEET



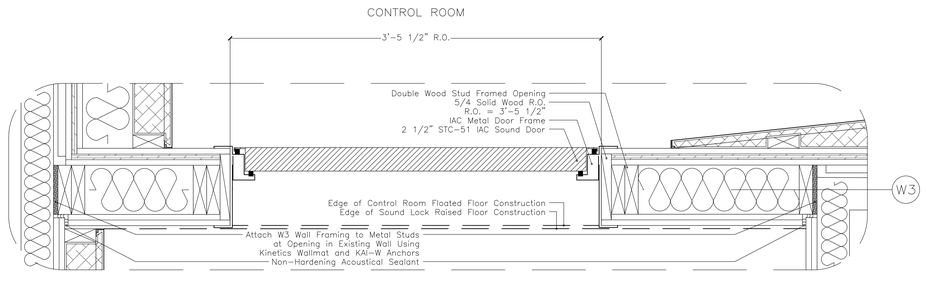
A Section at Door #2



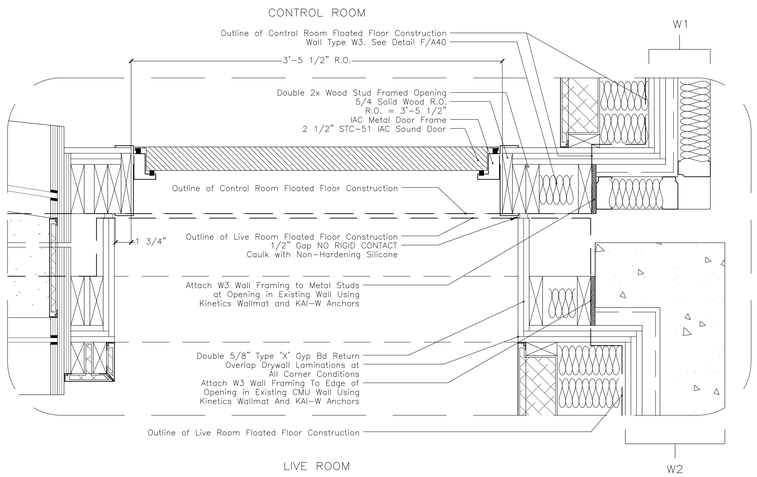
B Section at Door #3



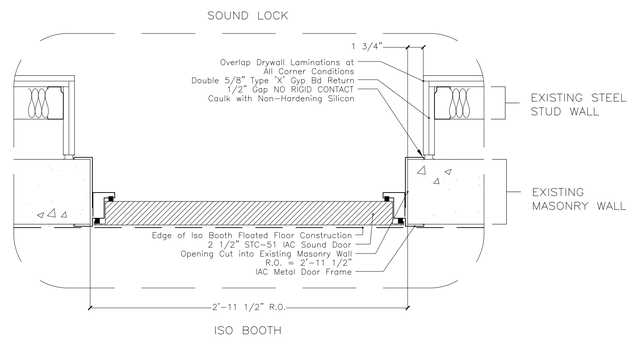
C Section at Door #4



D Plan Section at Door #2



E Plan Section at Door #3



F Plan Section at Door #4

SYMBOLS

ACOUSTIC CONSTRUCTION NOTES

1. WHERE INDICATED, DRYWALL IS TO BE SEALED AT CEILING, FLOOR AND VERTICAL JOINTS USING ACOUSTIC SEALANT BEAD NOT LESS THAN 1/2".

2. ALL DRYWALL CORNER JOINTS ARE OVERLAPPED AS SHOWN IN PRINCIPAL ON THE DRAWING DETAILS. ALL DRYWALL BOARDS ARE TO BE STAGGERED FROM PRECEEDING LAYER AND JOINTS TAPED. ALL LAYERS OF LAMINATIONS ARE SCREWED AND GLUED W/ CONSTRUCTION ADHESIVE TO THE PRECEEDING LAYER.

3. ACCURATE CUTTING OF DRYWALL IS ESSENTIAL. PATCHING IS NOT ACCEPTABLE.

4. WHERE RESILIENT CHANNEL IS SPECIFIED, USE USG RC-1 RESILIENT CHANNEL INSTALLED IN ACCORDANCE WITH USG STANDARDS. INSTALL CHANNEL WITH "FREE LEG" UP.

5. UNDER NO CIRCUMSTANCES IS THERE TO BE ANY RIGID CONTACT BETWEEN THE FLOATING INNER SHELL OF THE ISOLATED ROOMS AND THE REST OF THE BUILDING STRUCTURE. WHERE AIR CONDITIONING DUCTS, SPRINKLER PIPES OR ELECTRICAL CONDUITS MUST PENETRATE THE WALL OR CEILING, A FRAMED OPENING MUST BE MADE OVERSIZED TO ALLOW FOR A SEALED SOFT JOINT.

6. THE ACOUSTIC DESIGNER MUST HAVE THE RIGHT OF REVIEW AND APPROVAL OVER ANY CHANGES MADE TO THESE SPECIFICATIONS. INSPECTION MUST BE COMPLETED OF ALL MAJOR SYSTEMS BEFORE THEY ARE COVERED BY THE NEXT PHASE OF CONSTRUCTION. THE CONTRACTOR MUST NOTIFY THE ACOUSTIC DESIGNER AS THESE MAJOR ELEMENTS ARE COMPLETED.

7. ALL TIMBER FRAMING AND PLYWOOD LAMINATIONS ARE TO BE FIRE TREATED AS PER LOCAL BUILDING CODES.

RIGID INSULATION SPECIFICATIONS

#703 OWENS CORNING=3lb/cf UNFACED RIGID FIBERGLASS INSULATION. SUITABLE SUBSTITUTES FROM ALTERNATE MANUFACTURER IS ACCEPTABLE WITH PRIOR APPROVAL
#705 OWENS CORNING=6lb/cf UNFACED RIGID FIBERGLASS INSULATION. SUITABLE SUBSTITUTES FROM ALTERNATE MANUFACTURER IS ACCEPTABLE WITH PRIOR APPROVAL

Revisions

REVISION #	DATE	REVISION	APPROVED
01	07/13/21	100% CD	GM
02	11/19/21	Addendum 3	GM

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New York, NY 10024

PROJECT

Purchase College Studio A Renovations

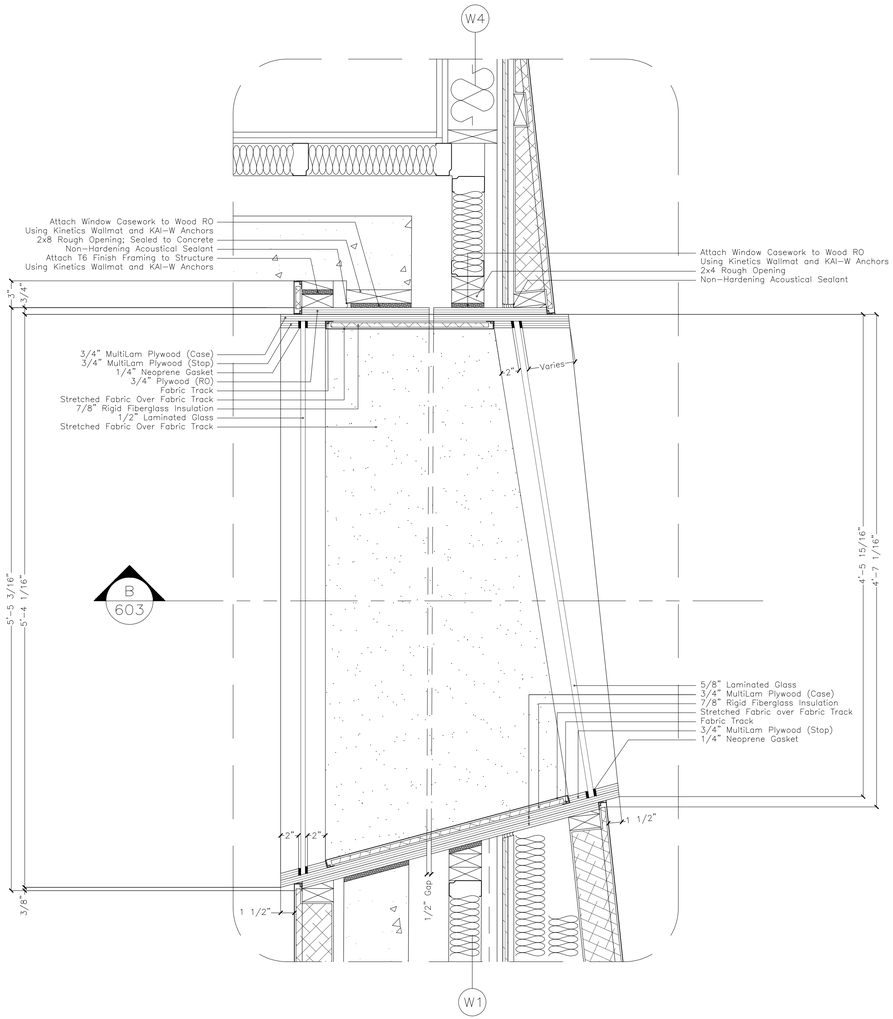
Purchase, NY

DRAWING NAME

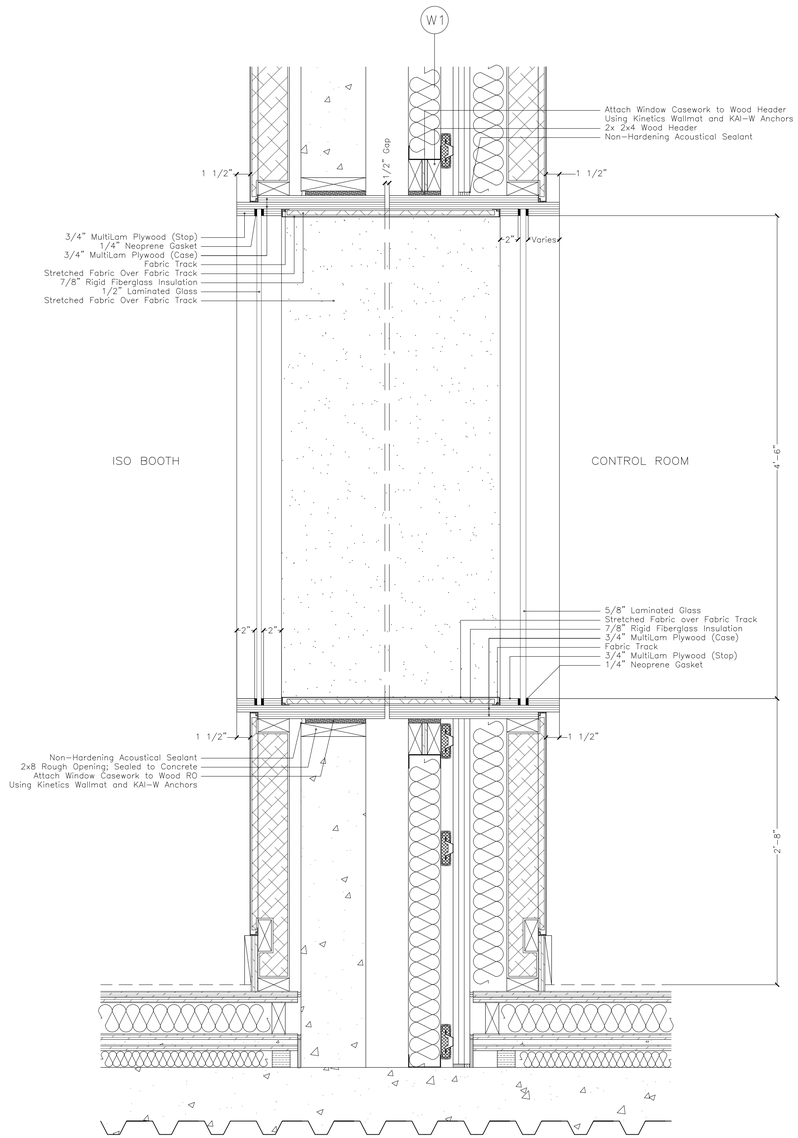
DETAILS-DOORS

SEAL & SIGNATURE

SCALE	1 1/2"=1'-0"
DATE	11/19/2021
CAD FILE#	
DRAWING NUMBER	A-602.00
SHEET	



A Window Plan Detail



B Window Section Detail

SYMBOLS

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PROJECT

Purchase College Studio A Renovations

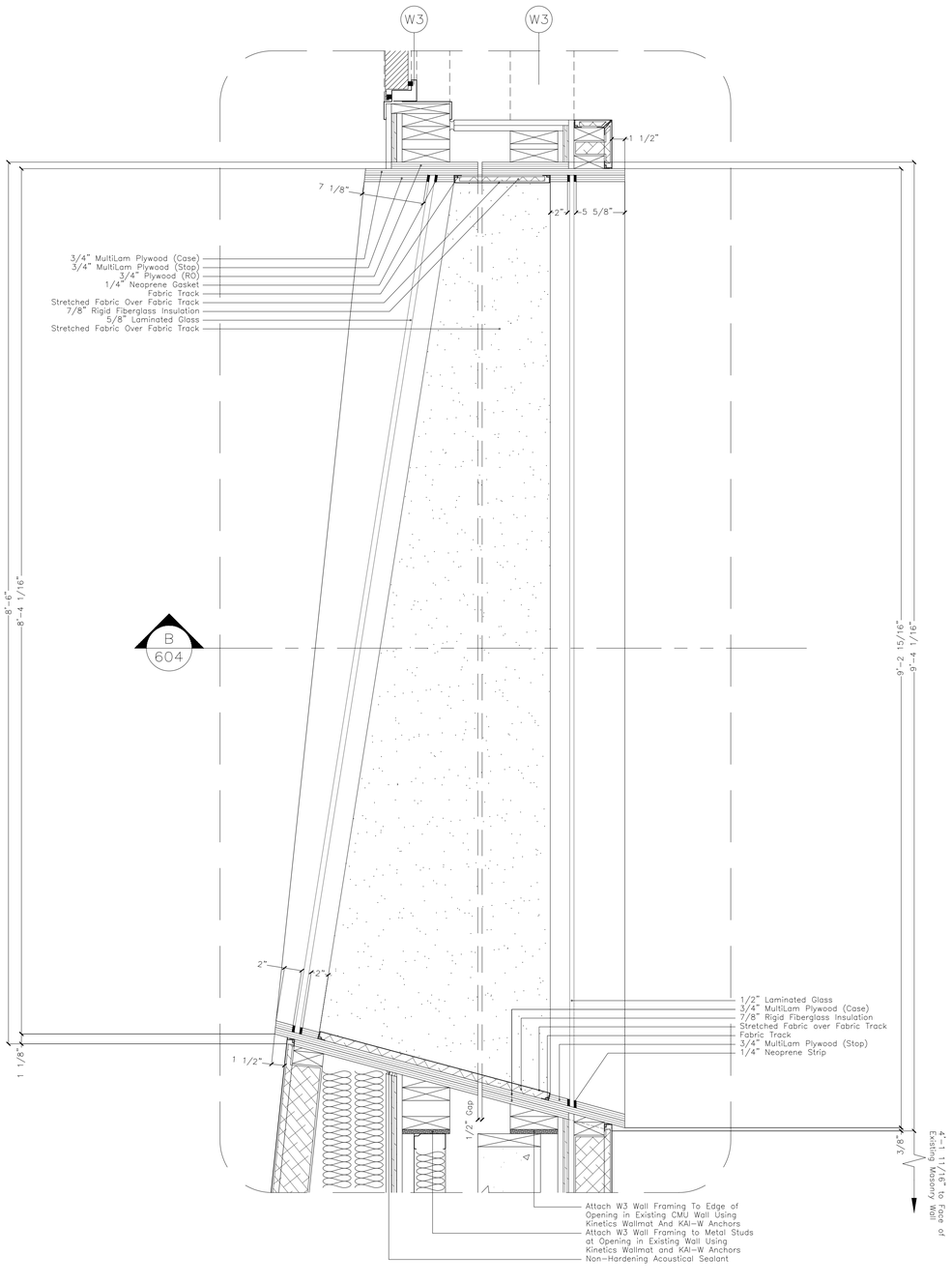
Purchase, NY

DRAWING NAME

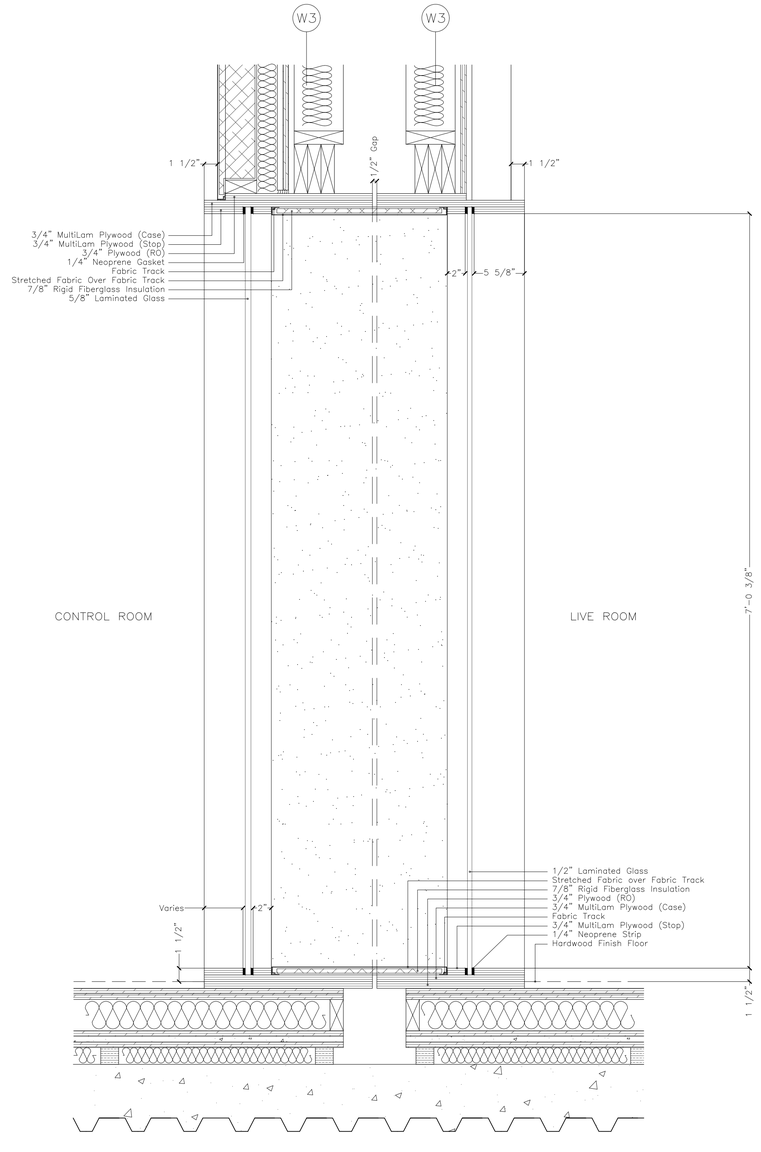
DETAILS—WINDOWS

SEAL & SIGNATURE

SCALE 1 1/2"=1'-0"
DATE 11/19/2021
CAD FILE#
DRAWING NUMBER
A-603.00
SHEET



A Window Plan Detail



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PROJECT

Purchase College Studio A Renovations

Purchase, NY

DRAWING NAME

DETAILS-WINDOWS

SEAL & SIGNATURE

SCALE 1 1/2"=1'-0"
DATE 11/19/2021
CAD FILE#
DRAWING NUMBER A-604.00
SHEET