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ADDENDUM NO. 3

To the Drawings and Project Manual dated 12 July 2018

for

MIDWESTERN STATE UNIVERSITY
MOFFETT LIBRARY RENOVATION
PHASE II

3410 Taft Boulevard Wichita Falls, Texas 76308

Addendum Date: 2 August 2018

NOTICE TO PROPOSERS:

This addendum is hereby made part of the Project Specifications and Drawings dated July 12, 2018.

The Project Specifications and Drawings shall be supplemented or amended as specified herein.

This Addendum contains changes to the requirement of the Project Specifications. Such changes shall be incorporated into the Contract Documents and shall apply to work with the same meaning and force as if they had been included in the original Documents. Whenever this Addendum modifies a portion of a paragraph of the Project Specifications, the remainder of the paragraph affected shall remain in force. Added information is shown as Bold, deleted information is shown as strikethrough.

This Addendum contains changes to the requirement of the Drawings. Such changes shall be incorporated into the Contract Documents and shall apply to work with the same meaning and force as if they had been included in the original Documents. Whenever this Addendum modifies a portion of any drawing, the remainder of the drawing affected shall remain in force. Added, deleted or revised information is shown as "clouded".

The conditions and terms of the basic Contract Documents shall govern work unless otherwise described in this Addendum. Whenever the conditions of work, and the quality or quantity of materials, or workmanship are not fully described in this Addendum, the conditions of work included in the basic Contract Documents for similar items of work shall apply to the work described in this Addendum.

If no similar items of work are included in the basic Contract Document, the best quality of material and workmanship shall apply and all work shall be subject to the written acceptance of the Architect.

I. REVISIONS TO PROJECT MANUAL/SPECIFICATIONS

A. ALL SPECIFICATIONS

Item: **Addendum One** (**1**) and **Addendum Two** (**2**).

Description:

1. ADD: These two (2) Addendums have previously been issued by MSU through their Purchasing Department. An electronic copy of these Addendums can be found at www.mwsu.edu/purchasing.

2. ADD: At a minimum, the following materials, finishes, systems, etc. will be required to have Shop Drawings (including Color Samples for approval if applicable) and/or Mock-ups:

a. Carpet Tile (Floor Finish): oval geometry in the circulation path, herringbone installation – Shop Drawings and Mock-up.

b. Walk-off Carpet Tiles (Floor Finish): located in Building entrance, custom graphics from manufacturer - color sample for color logo and Shop Drawings; long lead time.

c. Area Rugs (Floor Finish): located in the Reading Room, custom cut from manufacturer – Shop Drawings; may have long lead time.

d. "Stikwood" (Wall Finish): located at the "outside" of the Study Pods – Shop Drawings and Mock-up; long lead time.

e. Fabric-wrapped Panels (Wall Finish): located in the Reading Room, north and south walls – Shop Drawings; long lead time.

f. Digital-Printed Wallcovering (Wall Finish): located in common areas and "inside" all Study Pods, custom from Manufacturer – Shop Drawings; will require coordination with the Manufacturer; long lead time.

g. Marker Wallcovering (Wall Finish): located at all Study Pods and selected spaces – Shop Drawings and Mock-up; long lead time.

h. Dichronic Glass (Wall Finish): located in the Group Study Rooms and Study Pods – Shop Drawings; included in the Curtainwall and Storefront Systems; long lead time.

i. Chandelier (Ceiling Finish): nine (9) total, located in the Reading Room and Taft Bay Window – Shop Drawings and Mock-up; long lead time.

j. Reflected Ceiling Plans: Shop Drawings coordinated between all trades regarding lighting and device locations.

k. Baffles (Ceiling Finish): located in the circulation path, custom cut from manufacturer – Shop Drawings, longer lead time might apply on custom shape.

l. Open Stair: metal mesh that extends from floor to ceiling – Shop Drawings; long lead time might apply on selected finishes.

B. SPECIFICATION SECTION 00100 – NOTICE TO SUB-CONTRACTORS AND MATERIAL SUPPLIERS, SECTION 00200 – INSTRUCTIONS TO PROPOSERS, and **ADDENDUM TWO (2)**.

Item: Pages **00100-1** and **00200-1**

Description:

1. DELETE: The indication of Bids being delivered to Steve Shelley.

2. ADD: As clarification and as per **Addendum Two** (**2**), the Bids shall be delivered to Joseph R. Mrugalski in the Purchasing/Contract Management Department.

Item: Page **00100-1**.

Description:

1. ADD: As clarification, a Bid Bond will only be required on Bids over $100,000.

Item: Page **00100-2**.

Description:

1. DELETE: The indication of questions being directed to Holzman Moss Bottino Architecture (HMBA), Harper Perkins Architects (HPA), or M&F Litteken.

2. ADD: As per **Addendum Two** (**2**), questions shall be directed to Joe Mrugalski of the MSU Purchasing Department through email at www.joe.mrugalski@mwsu.edu.

Item: Page **00200-1**.

Description:

1. ADD: As clarification, the cost for a Performance and/or Payment Bond shall not be included in the Bid associated with a particular Bid Package. The cost for a Performance and/or Payment Bond shall be indicated on the **PROPOSAL FORM**, Section **00400**, page **00400-3**. As indicated in this Section **00200**, Payment Bonds are only required on Bids over $25,000 and Performance Bonds required for Bids over $100,000.

C. SPECIFICATION SECTION 00400 – PROPOSAL FORM

Item: The complete Section.

Description:

1. ADD: Specification Section **00400 – PROPOSAL FORM** attached with this Addendum. **Alternate #8** has been added to this Form.

D. SPECIFICATION SECTION 01100 – SUMMARY and **ADDENDUM ONE** (**1**).

Item: **ADDENDUM ONE (1)**.

Description:

1. DELETE: The indication of Substantial Completion occurring no later than 5:00 p.m. on August 16, 2019.

2. ADD: The current scheduled Substantial Completion will be no later than 5:00 p.m. on March 2, 2020. Refer to the "**Phase 2 MSU Moffett Library Project Schedule 1.0**" in Chart and Tabular forms included with this Addendum

Item: To **Bid Package 11** (**FLOOR COVERING**) under **Part 2.1**(**B**)(**11**)(**C**) on pages **011000-8** & **9**.

Description:

1. DELETE: The indication of the Flooring in the original 1960's portion of the Building (generally the eastern half) being removed by the Owner as part of a separate ACBM Abatement Contract and not included as part of this work.

2. ADD: This Bid Package shall include the removal of the existing ACM floor tile in the original 1960's portion of the Building using the Resilient Floor Covering Institute (RFCI) Recommended Work Practices.

Item: To **Bid Package 21** (**BOOK STACK RELOCATION**) under **Part 2.1**(**B**)(**21**) on page **011000-11**.

Description:

1. ADD: In addition to the Items listed, this Bid Package shall **also** include the following: relocation of empty "Special Collections" display case and cabinets from the 3rd Floor to the 2nd Floor; relocating the Reference Section cabinets to temporary locations during construction and then to their final location; relocation of an antique Printing Press (currently located in the "Reading Room") from the 1st Floor to the 2nd Floor; and miscellaneous Display Case located throughout the Building.

E. SPECIFICATION SECTIONS 01100 – SUMMARY and 051200 – STRUCTURAL STEEL

Item: To **Bid Package 4** (Structural Steel – Materials Only) under **Part 2.1**(**B**) on pages **01100-7** and **Part 1.1 – SUMMARY** on page **051200-1**.

Description:

1. ADD: The following Steel Escalation Clause: The successful bidders required to submit steel/metals shop drawings shall submit them two weeks from when their contract is executed (i.e., signed and implemented). The architect/engineer will review them within two weeks of the submission date. Failure to meet submission schedule would negate the following Price Escalation clause. Subs shall submit an escalation percentage tied to a fixed market indicator such as the National Scrap Steel Price for such situations where the approval time exceeds two weeks. It should be noted Owner will pay for on-site stored materials where proper documentation such as invoices is provided.

Item: To **Part 1.3 – QUALITY ASSURANCE** on page **051200-2**.

Description:

1. ADD: The State of Texas has passed a statute, Senate Bill #1289, that requires State Agencies to purchase iron and steel made in the United States for certain governmental entity projects. This project falls under this statute. The Specifications calling for steel to be used in this project construction will fall under this statute. A "pdf" file of this Bill available for download from the Texas Legislature Website at http://www.capitol.state.tx.us/tlodocs/85R/billtext/pdf/SB01289F.pdf#navpanes=0.

F. SPECIFICATION SECTION 012300 – ALTERNATES

Item: The complete Section.

Description:

1. ADD: Specification Section **012300 – ALTERNATES** attached with this Addendum. **Alternate #8** has been added to this Section.

G. SPECIFICATION SECTION 017823 – OPERATION AND MAINTENANCE DATA

Item: The complete Section.

Description:

1. ADD: Specification Section **071823 – OPERATION AND MAINTENANCE DATA** attached with this Addendum.

H. SPECIFICATION SECTION 024119 – SELECTIVE STRUCTURE DEMOLITION

Item: To **Part 3.4**, **SELECTIVE DEMOLITION, GENERAL** on page **024119-6**.

Description:

1. ADD: Under (**A**)(**9**), the Construction Manager-at-Risk (CM@R) will have trash chutes and bins available for the removal and disposal of demolished items and materials.

I. SPECIFICATION SECTION 042000 – UNIT MASONRY

Item: The complete Section.

Description:

1. DELETE: The Specification Section in its entirety.

2. ADD: Specification Section **042000 – UNIT MASONRY** attached with this Addendum. Under Part **2.1**(**B**)(**5**) on page **042000-7**, the face brick blend (#888 "Midwestern Blend") has been specified and is to be used for this project. Mock-up panels will be required for final review and approval.

3. ADD: As clarification, existing face brick that is salvaged and cleaned shall be used for the new Ramp occurring on the north side of the Building. For the new east Ramp (included as part of **Alternate #1**), the face brick shall be new and of the blend specified in this Section.

J. SPECIFICATION SECTION 084113 – ALUMINUM ENTRANCES & STOREFRONTS

Item: The complete Section.

Description:

1. DELETE: The Specification Section in its entirety.

2. ADD: Specification Section **084113 – ALUMINUM ENTRANCES & STOREFRONTS** attached with this Addendum. Under Part **2.3** on page **084113-5**, the Hardware for the Entrances have been specified and shall be included as a part of the **ALUMINUM ENTRANCES & STOREFRONTS** scope of work.

K. SPECIFICATION SECTION 087100 – DOOR HARDWARE

Item: The complete Section.

Description:

1. DELETE: The Specification Section in its entirety.

2. ADD: Specification Section **087100 – DOOR HARDWARE** attached with this Addendum. Under Hardware Set "**HW-12**", the indication of "Wall Actuators" being included as part of this Hardware Set. The Actuators will be included in Specification Section 084113, **ALUMINUM ENTRANCES & STOREFRONTS**, and will be included in that scope of work. Under Hardware Sets "**HW-1**", "**HW-3**", "**HW-4**", "**HW-7**", and "**HW-9**", a wrap around with escutcheon trim has been added to all existing doors receiving a new mortise lockset.

L. SPECIFICATION SECTION 088000 – GLASS AND GLAZING

Item: To **Part 2.2**(**C**) **on page 088000-7**.

Description:

1. ADD: The Low "E" Coated Glass shall be equal to *Oldcastle Building Envelope* Product "Solarban 70XI (2)" with "Clear" OB and "Starphire" IB substrate colors – all products by *PPG*.

2. ADD: As clarification, the current specified *Viracon* Low "E" Coated Glass is an acceptable substitution to the specified *Oldcastle Building Envelope* Product specified above.

Item: To **Part 2.2**(**D**) **on page 088000-7**.

Description:

1. ADD: A Sales Representative for the specified Dichronic Laminated Glass is Gloria Johnson of Specified Products, phone: (713) 957-0391; email: gloria@specified.com.

M. SPECIFICATION SECTION 096800 – CARPETING

Item: To **Part 2.1**(**B**)(**7**) **on page 096800-3**.

Description:

1. ADD: As clarification, the color of Carpet "**CPT1A**" shall be *Millikan* "Sepio Rampart", #RAM19-133, "Zaffre".

Item: To **Part 2.1**(**C**)(**6**) **on page 096800-4**.

Description:

1. ADD: As clarification, the color of Carpet "**CPT1B**" shall be *Millikan* "Quadrus Liftoff", #LIF27-52, "Shockwave".

N. SPECIFICATION SECTION 097200 – WALLCOVERING

Item: To **Part 1.7 on page 097200-2**.

Description:

1. DELETE: The requirement for extra material – no extra digital image wallcovering material is required for this project.

Item: To **Part 2.1 on page 097200-2**.

Description:

1. ADD: As clarification, wall covering "**WC2**" (wall covering with digital images) is to be provided at locations as depicted on Sheets "**A-601**", "**A-602**", and "**A-604**" of the Drawings.

O. SPECIFICATION SECTION 099000 – PAINTING AND FINISHING

Item: Texture finish on walls.

Description:

1. ADD: In general, the original side of the facility (east half) was constructed in the 1960's and the wall texture is "slick" with no texture as there are mainly plaster walls. The 1985 Addition has drywalls that contains texture. The texture finish on new walls shall match the finish of existing walls in a particular half of a Building. Refer to the Floor Plans on Sheets "**A-101**", "**A-102**", and "**A-103**" for the indication of an expansion joint running north-south in the Building that serves as a dividing line between the two halves.

P. SPECIFICATION SECTIONS 270500 – COMMON WORK RESULTS FOR COMMUNICATIONS; 270526 – GROUNDING AND BONDING FOR COMMUNICATION SYSTEMS; 271100 – COMMUNICATION ROOM FITTINGS; 271300 – COMMUNICATIONS BACKBONE CABLING; 271500 – COMMUNICATION HORIZONTAL CABLING; AND 274000 – AUDIO VIDEO SYSTEMS.

Item: The complete Sections.

Description:

1. DELETE: The Specification Sections in their entirety.

2. ADD: Specification Sections attached with this Addendum. All Panduit references were removed and Siemon products were specified.

Q. SPECIFICATION SECTION 101400 – SIGNAGE

Item: To **Part 2.4 on page 101400-5**.

Description:

1. ADD: It shall be the option of the Supplier/Contractor to provide cast or precision cut aluminum letters and numbers that are prefinished and premanufactured letters in lieu of the specified steel laser cut letters. The letters and numbers shall have the manufacturer's standard painted finish. The color and letter font shall be selected by the Owner/Architect from a full range of colors/fonts. Acceptable Manufacturers, subject to final Submittal review and approval, are *A.R.K. Ramos* and *Southwell*.

II. REVISIONS TO DRAWINGS

A. ARCHITECTURAL DRAWING and **MECHANICAL DRAWING** - Sheet "**A-103**" and "**M-203**".

ADD: All work associated with "**Mechanical 3MECH10**" and "**Mechanical 3MECH11**" (including MEP items) shall be included as part of **Alternate #1**.

B. ELECTRICAL DRAWINGS - Sheets "**ED-103**", "**E-103**", and "**E-203**".

ADD: All electrical work on this Floor shall be included in Alternate #4, except for the installation of FPE Panel (Base Bid) and electrical power connections associated with "**Mechanical 3MECH10**" and "**Mechanical 3MECH11**" (**Alternate #1**).

C. ARCHITECTURAL DRAWINGS - Sheets "**A-101**", "**A-102**", and "**A-103**".

Replace the Drawings with the revised Sheets attached in this Addendum. Clarification has been made regarding the Book Stack Work Points/Start Points. Dimensions have been added for clearances between Stacks and existing Columns.

D. ARCHITECTURAL DRAWING - Sheets "**I-110**".

Replace the Drawing with the revised Sheet attached in this Addendum. Clarification has been made regarding the size of the area rugs in "**Reading Room 108L**".

E. ARCHITECTURAL DRAWINGS - Sheets "**I-001**", "**I-002**", "**I-101**", "**I-102**",and "**I-103**".

Replace the Drawings with the revised Sheets attached in this Addendum. Clarification has been made regarding Material Finish "**PT4**" (paint) and where this finish is being used in the Building.

F. ARCHITECTURAL DRAWINGS and **DEMOLITION DRAWING** - Sheet "**A-101**", "**A-851**", and "**D-101**".

Replace the Drawings with the revised Sheets attached in this Addendum. The access into "**Toilet 1RR3**" shall be the existing door opening remaining at the existing location. The "**DOOR SCHEDULE**" (opening "**1RR3**") has been revised to reflect this change.

G. ARCHITECTURAL DRAWINGS - Sheet "**A-101**".

Replace the Drawing with the revised Sheet attached in this Addendum. Existing cabinetwork in "**Tech Services 102**" has been identified and shall remain.

H. ARCHITECTURAL DRAWINGS and DEMOLITION DRAWINGS - Sheets "**A-101**", "**A-201**", "**A-851**", "**A-951**", "**D-101**", "**D-201**", "**I-001**", and "**1-101**".

Replace the Drawings with the revised Sheets attached in this Addendum. There has been the addition of four (4) new Office spaces on the First Floor: "**Serial Librarian 102F**", "**Catalog Assistant 102A**", "**Coll. Dev. Librarian 110C**" and "**ILL Office 110B**". New walls have been added that extend to 6" above the existing ceiling grid – the grid will have to be modified to allow for these new walls. New doors have been added to these Offices and the "**DOOR SCHEDULE**" (openings "**102A**", "**102F**", "**110B**", and "**110C**") has been revised to reflect these changes. Refer Item "**U**" below regarding Mechanical and Electrical Revisions associated with these spaces.

I. ARCHITECTURAL DRAWINGS - Sheets "**A-211**", "**A-212**", and "**A-213**".

Replace Drawings with the revised Sheets attached in this Addendum. Clarification has been made to the ceiling that are included as part of **Alternate #7**.

J. ARCHITECTURAL DRAWINGS and **DEMOLITION DRAWINGS** - Sheets "**A-102**", "**A-422**", "**D-101**", "**D-102**", and "**D-601**".

Replace the Drawings with the revised Sheets attached in this Addendum. A portion of the stone cladding on existing columns is being removed and shall be salvaged and reused at locations as indicated on the Plans.

K. DEMOLITION DRAWINGS - Sheet "**D-101**", "**D-102**", "**D-103**", "**D-104**", "**D-601**", "**I-001**", and "**I-002**".

Replace the Drawings with the revised Sheets attached in this Addendum. The existing wood base and trim are to remain unless noted otherwise and shall be finished as per the Finish Schedules.

L. ARCHITECTURAL DRAWING and **STRUCTURAL DRAWING** - Sheets "**A-424**" and "**S-402**".

Replace the Drawings with the revised Sheets attached in this Addendum. Clarification has been made regarding the mounting detail for the Chandeliers.

M. ARCHITECTURAL DRAWINGS - Sheets "**A-501**" and "**A-703**".

Replace the Drawings with the revised Sheets attached in this Addendum. Clarification has been made regarding the Railing types and locations.

N. ARCHITECTURAL DRAWING - Sheet "**A-801**".

Replace the Drawing with the revised Sheet attached in this Addendum. Clarifications have been made on the Plans regarding the material on the exterior face of the new walls/storefront system. In addition, clarifications were made on the Wall Section regarding the structural steel stud framing.

O. ARCHITECTURAL DRAWING - Sheet "**A-802**".

Replace the Drawing with the revised Sheet attached in this Addendum. Clarification was made on Wall Section "**6/A-802**" and opening head detail "**7/A-802**" regarding the steel stud track/framing at the window heads. In addition, clarifications were made regarding flashing at opening detail"**9/A-802**" (Sill).

P. ARCHITECTURAL DRAWING - Sheet "**A-619**".

Replace the Drawing with the revised Sheet attached in this Addendum. Revisions have been made regarding the provision of all new aluminum framing and glazing in the existing north and south arched openings. Notation has been added to openings "**1VESTA**", "**1VESTB**", "**1VESTC**", and "**1VESTD**" regarding their scope of work under the **Base Bid** and **Alternate #8**.

Q. ARCHITECTURAL DRAWING - Sheet "**A-421**".

Replace the Drawing with the revised Sheet attached in this Addendum. Clarification has been made regarding the provision of new painted wood trim in detail "**6/A-421**" after the removal of the existing glazing and aluminum storefront framing/entrance in the existing openings.

R. ARCHITECTURAL DRAWING - Sheet "**A-501**", detail "**15/A-501**".

ADD: It shall be the Contractor's option to provide tread height solid granite steps in lieu of the 2" granite steps indicated in the detail. This would be similar to the existing stairs that are remaining in place adjacent to these new Stairs at the location of the previously removed concrete ramp.

S. DEMOLITION DRAWING - Sheet "**D-101**".

ADD: As clarification, regarding the removal of the existing ramp on the west side of the Building (south of the Main Entry), the condition of the face brick adjacent to the ramp and expansion joint is unknown. If face brick is present, clean as necessary to remove caulk, mastic, etc. If exposed concrete is revealed, clean as necessary and leave as exposed concrete finish.

T. ARCHITECTURAL DRAWING - Sheet "**A-102**".

ADD: As clarification, all work associated with "**Special collection Office 206**", "**Special Collection Exhibition 207**", and "**Special Collection Storage/Workroom 207A**" is the top priority to complete first once the commencement of work begins for this Phase. The completion of these areas will allow items/furnishings to be moved from other locations in the Building and thus allowing work to begin in those areas.

U. MECHANICAL AND ELECTRICAL DRAWINGS - Sheets "**M-201**", "**E-101**", "**E-102**", and "**E-214**".

Replace the Drawings with the revised Sheets attached in this Addendum. There has been the addition of four (4) new Office spaces on the First Floor: "**Serial Librarian 102F**", "**Catalog Assistant 102A**", "**Coll. Dev. Librarian 110C**" and "**ILL Office 110B**". New HVAC, and Electrical Lighting and Power.

V. ARCHITECTURAL DRAWINGS - Sheets **"I-002",** "**A-601**", "**A-602**", and "**A-603**".

ADD: As clarification, wood trim "**WDT1**" as specified in the "Material Finish Legend" is a standard wood trim from *Koroseal* and is specified in Section **097210**, **DRY ERASE WALL COVERING**, on Page 097210-3 under Part 2.2(D).

W. ARCHITECTURAL AND ELECTRICAL DRAWINGS - Sheets "**A-201**", "**A-202**", "**A-203**", "**E-101**", "**E-201**", "**E-202**", "**E-203**", and "**E-214**".

Replace the Drawings with the revised Sheets attached in this Addendum. Light fixtures have been added to the Vestibules at the entrances into the Restroom areas on each Floor. In addition, light fixtures have been added to the IT Closets on the south side of the Building on the 1st and 2nd Floors.

X. TECHNOLOGY DRAWINGS - Sheets "**T-001**", "**T-101**", "**T-102**", "**T-103**", and "**T-601**".

Replace the Drawings with the revised Sheets attached in this Addendum. The summary of the revisions are as follows:

Sheet "**T-001**": Revised general notes and equipment schedule to provide Siemon products that shall be installed by Siemon certified personnel; Removed "Cat 6A" reference; Revised "Labeling and Color Coding" notes.

Sheet "**T-101**": Added notes to relocate existing exterior antenna & wap; Added speakers to classrooms 113G & 113F; Added backbox for projector controls in classrooms 113G & 113F; Added general note 9; Removed "Cat 6A" references.

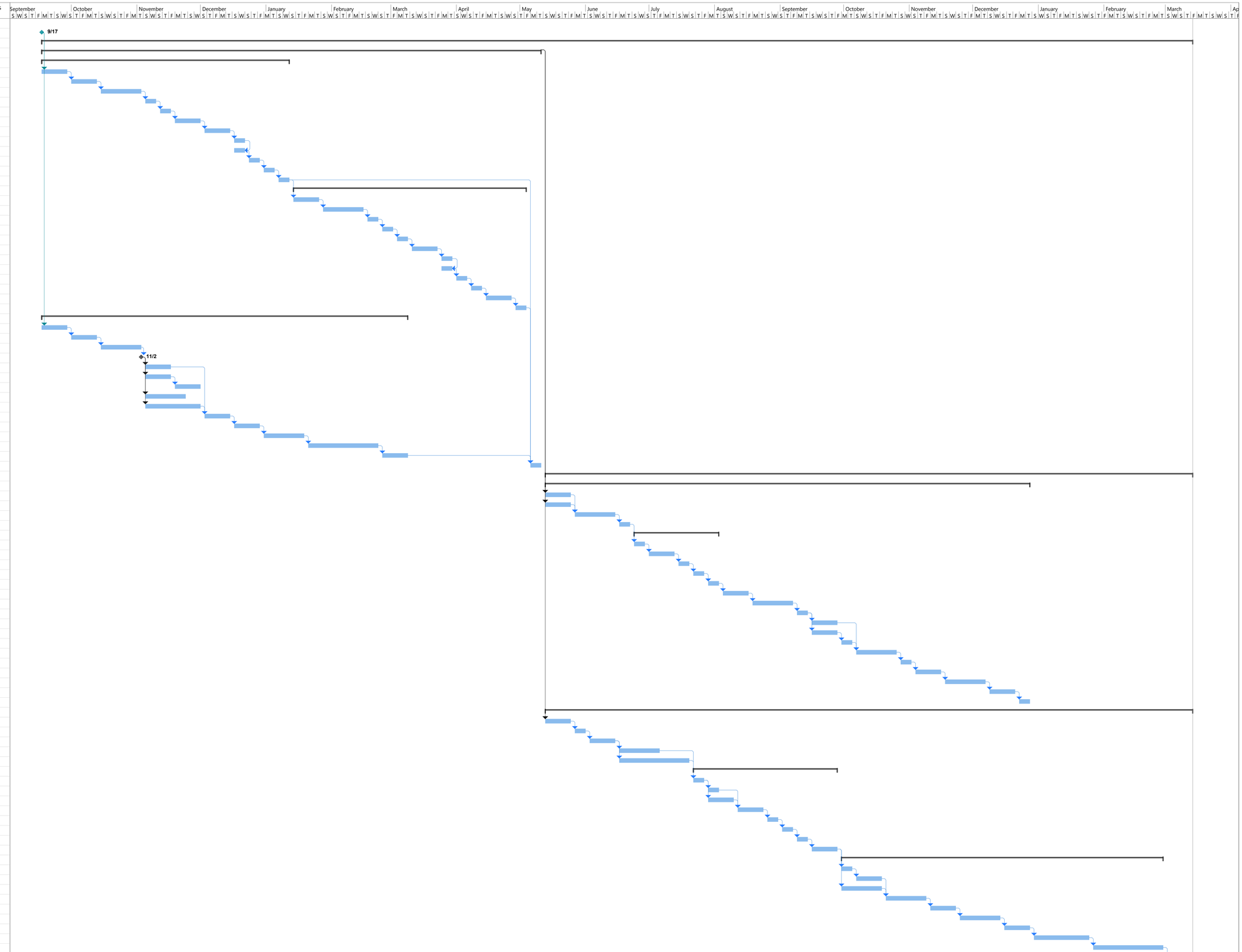
Sheet "**T-102**": Added speaker to computer room 208; Added backbox for projector controls in room 208; Added general not 9; Removed "Cat 6A" references.

Sheet "**T-103**": Added general note 9; Removed "Cat 6A" reference.

Sheet "**T-601**": Revised note by symbol 1 for detail 5.

END OF ADDENDUM NO. 1

ID	Task Name	Duration	Start	Finish	Predecessors
1					
2	Notice to Proceed	0 days	Mon 9/17/18	Mon 9/17/18	
3	**Phase 2**	**390 da...**	**Mon 9/17/18**	**Fri 3/13/20**	
4	**Phase 2A (2nd West/3rd)**	**170 da...**	**Mon 9/17/18**	**Fri 5/10/19**	
5	**3rd Floor North**	**85 days**	**Mon 9/17/18**	**Fri 1/11/19**	
6	Temporary Facilities	10 days	Mon 9/17/18	Fri 9/28/18	2
7	Stack Relocation 1	10 days	Mon 10/1/18	Fri 10/12/18	6
8	ACM Flooring Demo	15 days	Mon 10/15/18	Fri 11/2/18	7
9	Demolition	5 days	Mon 11/5/18	Fri 11/9/18	8
10	Drywall	5 days	Mon 11/12/18	Fri 11/16/18	9
11	M/E Rough In	10 days	Mon 11/19/18	Fri 11/30/18	10
12	Paint	10 days	Mon 12/3/18	Fri 12/14/18	11
13	Ceilings (Base Bid)	5 days	Mon 12/17/18	Fri 12/21/18	12
14	M/E Devices	5 days	Mon 12/17/18	Fri 12/21/18	13FF
15	Floor Covering	5 days	Mon 12/24/18	Fri 12/28/18	14
16	Doors/Graphics/Accessories	5 days	Mon 12/31/18	Fri 1/4/19	15
17	Punchlist	5 days	Mon 1/7/19	Fri 1/11/19	16
18	**3rd Floor South**	**80 days**	**Mon 1/14/19**	**Fri 5/3/19**	
19	Stack Relocation 2	10 days	Mon 1/14/19	Fri 1/25/19	17
20	ACM Flooring Demo	15 days	Mon 1/28/19	Fri 2/15/19	19
21	Demolition	5 days	Mon 2/18/19	Fri 2/22/19	20
22	Drywall	5 days	Mon 2/25/19	Fri 3/1/19	21
23	M/E Rough In	5 days	Mon 3/4/19	Fri 3/8/19	22
24	Paint	10 days	Mon 3/11/19	Fri 3/22/19	23
25	Ceilings (Base Bid)	5 days	Mon 3/25/19	Fri 3/29/19	24
26	M/E Devices	5 days	Mon 3/25/19	Fri 3/29/19	25FF
27	Floor Covering	5 days	Mon 4/1/19	Fri 4/5/19	26
28	Doors/Graphics/Accessories	5 days	Mon 4/8/19	Fri 4/12/19	27
29	Stack Relocation 3	10 days	Mon 4/15/19	Fri 4/26/19	28
30	Punchlist	5 days	Mon 4/29/19	Fri 5/3/19	29
31	**2nd Floor West**	**125 da...**	**Mon 9/17/18**	**Fri 3/8/19**	
32	Temporary Facilities	10 days	Mon 9/17/18	Fri 9/28/18	2
33	Stack Relocation 1	10 days	Mon 10/1/18	Fri 10/12/18	32
34	Demolition	15 days	Mon 10/15/18	Fri 11/2/18	33
35	Decommission Elevator	0 days	Fri 11/2/18	Fri 11/2/18	34
36	Elevator Floor Infill	10 days	Mon 11/5/18	Fri 11/16/18	35
37	Framing	10 days	Mon 11/5/18	Fri 11/16/18	35
38	Aluminum Storefront	10 days	Mon 11/19/18	Fri 11/30/18	37
39	M/E Rough In	15 days	Mon 11/5/18	Fri 11/23/18	35
40	Paint	20 days	Mon 11/5/18	Fri 11/30/18	35
41	Ceilings (Base Bid)	10 days	Mon 12/3/18	Fri 12/14/18	40,36
42	M/E Devices	10 days	Mon 12/17/18	Fri 12/28/18	41
43	Floor Covering	15 days	Mon 12/31/18	Fri 1/18/19	42
44	Doors/Graphics/Accessories	25 days	Mon 1/21/19	Fri 2/22/19	43
45	Punchlist	10 days	Mon 2/25/19	Fri 3/8/19	44
46	MSU Personnel Relocation	5 days	Mon 5/6/19	Fri 5/10/19	45,17,30
47	**Phase 2B**	**220 da...**	**Mon 5/13/19**	**Fri 3/13/20**	
48	**2nd Floor East**	**165 da...**	**Mon 5/13/19**	**Fri 12/27/19**	
49	Stack Relocation 4 (or 2)	10 days	Mon 5/13/19	Fri 5/24/19	4
50	Special Collections Relocation	10 days	Mon 5/13/19	Fri 5/24/19	4
51	ACM Flooring Demo	15 days	Mon 5/27/19	Fri 6/14/19	49,50
52	Demolition	5 days	Mon 6/17/19	Fri 6/21/19	51
53	**2nd Floor East - North**	**30 days**	**Mon 6/24/19**	**Fri 8/2/19**	
54	M/E Rough In	5 days	Mon 6/24/19	Fri 6/28/19	52
55	Paint	10 days	Mon 7/1/19	Fri 7/12/19	54
56	Ceilings (Base Bid)	5 days	Mon 7/15/19	Fri 7/19/19	55
57	M/E Devices	5 days	Mon 7/22/19	Fri 7/26/19	56
58	Floor Covering	5 days	Mon 7/29/19	Fri 8/2/19	57
59	Stack Relocation 5	10 days	Mon 8/5/19	Fri 8/16/19	58
60	ACM Flooring Demo	15 days	Mon 8/19/19	Fri 9/6/19	59
61	Drywall	5 days	Mon 9/9/19	Fri 9/13/19	60
62	Aluminum Storefront	10 days	Mon 9/16/19	Fri 9/27/19	61
63	M/E Rough In	10 days	Mon 9/16/19	Fri 9/27/19	61
64	Paint	5 days	Mon 9/30/19	Fri 10/4/19	63
65	Ceilings (Base Bid)	15 days	Mon 10/7/19	Fri 10/25/19	64,62
66	M/E Devices	5 days	Mon 10/28/19	Fri 11/1/19	65
67	Floor Covering	10 days	Mon 11/4/19	Fri 11/15/19	66
68	Doors/Graphics/Accessories	15 days	Mon 11/18/19	Fri 12/6/19	67
69	Stack Relcoation 6	10 days	Mon 12/9/19	Fri 12/20/19	68
70	Punchlist	5 days	Mon 12/23/19	Fri 12/27/19	69
71	**1st Floor**	**220 da...**	**Mon 5/13/19**	**Fri 3/13/20**	
72	Temporary Facilities	10 days	Mon 5/13/19	Fri 5/24/19	4
73	Selective Demolition	5 days	Mon 5/27/19	Fri 5/31/19	72
74	Stack Relcoation 7	10 days	Mon 6/3/19	Fri 6/14/19	73
75	ACM Abatement by MSU	15 days	Mon 6/17/19	Fri 7/5/19	74
76	ACM Flooring Demo	25 days	Mon 6/17/19	Fri 7/19/19	74
77	**1st Floor - East**	**50 days**	**Mon 7/22/19**	**Fri 9/27/19**	
78	Chandelier Structure	5 days	Mon 7/22/19	Fri 7/26/19	75,76
79	Furrdowns	5 days	Mon 7/29/19	Fri 8/2/19	78
80	M/E Rough In	10 days	Mon 7/29/19	Fri 8/9/19	78
81	Paint	10 days	Mon 8/12/19	Fri 8/23/19	79,80
82	Ceilings (Base Bid)	5 days	Mon 8/26/19	Fri 8/30/19	81
83	M/E Devices	5 days	Mon 9/2/19	Fri 9/6/19	82
84	Floor Covering	5 days	Mon 9/9/19	Fri 9/13/19	83
85	Stack Relcoation 8	10 days	Mon 9/16/19	Fri 9/27/19	84
86	**1st Floor - West**	**110 da...**	**Mon 9/30/19**	**Fri 2/28/20**	
87	Drywall	5 days	Mon 9/30/19	Fri 10/4/19	85
88	Aluminum Storefront	10 days	Mon 10/7/19	Fri 10/18/19	87
89	M/E Rough In	15 days	Mon 9/30/19	Fri 10/18/19	85
90	Paint	15 days	Mon 10/21/19	Fri 11/8/19	88,89
91	Ceilings (Base Bid)	10 days	Mon 11/11/19	Fri 11/22/19	90
92	Ceilings - Baffles	15 days	Mon 11/25/19	Fri 12/13/19	91
93	M/E Devices	10 days	Mon 12/16/19	Fri 12/27/19	92
94	Floor Covering	20 days	Mon 12/30/19	Fri 1/24/20	93
95	Doors/Graphics/Accessories	25 days	Mon 1/27/20	Fri 2/28/20	94
96	Punchlist	10 days	Mon 3/2/20	Fri 3/13/20	95



Project: MSU Moffett Library Phase 2 R
Date: Tue 7/31/18

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

Phase 2 MSU Moffett Library Project Schedule 1.0 - Tabular

Task Name	Duration	Start	Finish
Notice to Proceed	0 days	Mon 9/17/18	Mon 9/17/18
Phase 2	**390 days**	**Mon 9/17/18**	**Fri 3/13/20**
Phase 2A (2nd West/3rd)	**170 days**	**Mon 9/17/18**	**Fri 5/10/19**
3rd Floor North	**85 days**	**Mon 9/17/18**	**Fri 1/11/19**
Temporary Facilities	10 days	Mon 9/17/18	Fri 9/28/18
Stack Relocation 1	10 days	Mon 10/1/18	Fri 10/12/18
ACM Flooring Demo	15 days	Mon 10/15/18	Fri 11/2/18
Demolition	5 days	Mon 11/5/18	Fri 11/9/18
Drywall	5 days	Mon 11/12/18	Fri 11/16/18
M/E Rough In	10 days	Mon 11/19/18	Fri 11/30/18
Paint	10 days	Mon 12/3/18	Fri 12/14/18
Ceilings (Base Bid)	5 days	Mon 12/17/18	Fri 12/21/18
M/E Devices	5 days	Mon 12/17/18	Fri 12/21/18
Floor Covering	5 days	Mon 12/24/18	Fri 12/28/18
Doors/Graphics/Accessories	5 days	Mon 12/31/18	Fri 1/4/19
Punchlist	5 days	Mon 1/7/19	Fri 1/11/19
3rd Floor South	**80 days**	**Mon 1/14/19**	**Fri 5/3/19**
Stack Relocation 2	10 days	Mon 1/14/19	Fri 1/25/19
ACM Flooring Demo	15 days	Mon 1/28/19	Fri 2/15/19
Demolition	5 days	Mon 2/18/19	Fri 2/22/19
Drywall	5 days	Mon 2/25/19	Fri 3/1/19
M/E Rough In	5 days	Mon 3/4/19	Fri 3/8/19
Paint	10 days	Mon 3/11/19	Fri 3/22/19
Ceilings (Base Bid)	5 days	Mon 3/25/19	Fri 3/29/19
M/E Devices	5 days	Mon 3/25/19	Fri 3/29/19
Floor Covering	5 days	Mon 4/1/19	Fri 4/5/19
Doors/Graphics/Accessories	5 days	Mon 4/8/19	Fri 4/12/19
Stack Relocation 3	10 days	Mon 4/15/19	Fri 4/26/19
Punchlist	5 days	Mon 4/29/19	Fri 5/3/19
2nd Floor West	**125 days**	**Mon 9/17/18**	**Fri 3/8/19**
Temporary Facilities	10 days	Mon 9/17/18	Fri 9/28/18
Stack Relocation 1	10 days	Mon 10/1/18	Fri 10/12/18
Demolition	15 days	Mon 10/15/18	Fri 11/2/18
Decommission Elevator	0 days	Fri 11/2/18	Fri 11/2/18
Elevator Floor Infill	10 days	Mon 11/5/18	Fri 11/16/18
Framing	10 days	Mon 11/5/18	Fri 11/16/18
Aluminum Storefront	10 days	Mon 11/19/18	Fri 11/30/18
M/E Rough In	15 days	Mon 11/5/18	Fri 11/23/18
Paint	20 days	Mon 11/5/18	Fri 11/30/18
Ceilings (Base Bid)	10 days	Mon 12/3/18	Fri 12/14/18
M/E Devices	10 days	Mon 12/17/18	Fri 12/28/18
Floor Covering	15 days	Mon 12/31/18	Fri 1/18/19
Doors/Graphics/Accessories	25 days	Mon 1/21/19	Fri 2/22/19
Punchlist	10 days	Mon 2/25/19	Fri 3/8/19
MSU Personnel Relocation	5 days	Mon 5/6/19	Fri 5/10/19
Phase 2B	**220 days**	**Mon 5/13/19**	**Fri 3/13/20**

Phase 2 MSU Moffett Library Project Schedule 1.0 - Tabular

Task Name	Duration	Start	Finish
2nd Floor East	**165 days**	**Mon 5/13/19**	**Fri 12/27/19**
Stack Relocation 4 (or 2)	10 days	Mon 5/13/19	Fri 5/24/19
Special Collections Relocation	10 days	Mon 5/13/19	Fri 5/24/19
ACM Flooring Demo	15 days	Mon 5/27/19	Fri 6/14/19
Demolition	5 days	Mon 6/17/19	Fri 6/21/19
2nd Floor East - North	**30 days**	**Mon 6/24/19**	**Fri 8/2/19**
M/E Rough In	5 days	Mon 6/24/19	Fri 6/28/19
Paint	10 days	Mon 7/1/19	Fri 7/12/19
Ceilings (Base Bid)	5 days	Mon 7/15/19	Fri 7/19/19
M/E Devices	5 days	Mon 7/22/19	Fri 7/26/19
Floor Covering	5 days	Mon 7/29/19	Fri 8/2/19
Stack Relocation 5	10 days	Mon 8/5/19	Fri 8/16/19
ACM Flooring Demo	15 days	Mon 8/19/19	Fri 9/6/19
Drywall	5 days	Mon 9/9/19	Fri 9/13/19
Aluminum Storefront	10 days	Mon 9/16/19	Fri 9/27/19
M/E Rough In	10 days	Mon 9/16/19	Fri 9/27/19
Paint	5 days	Mon 9/30/19	Fri 10/4/19
Ceilings (Base Bid)	15 days	Mon 10/7/19	Fri 10/25/19
M/E Devices	5 days	Mon 10/28/19	Fri 11/1/19
Floor Covering	10 days	Mon 11/4/19	Fri 11/15/19
Doors/Graphics/Accessories	15 days	Mon 11/18/19	Fri 12/6/19
Stack Relcoation 6	10 days	Mon 12/9/19	Fri 12/20/19
Punchlist	5 days	Mon 12/23/19	Fri 12/27/19
1st Floor	**220 days**	**Mon 5/13/19**	**Fri 3/13/20**
Temporary Facilities	10 days	Mon 5/13/19	Fri 5/24/19
Selective Demolition	5 days	Mon 5/27/19	Fri 5/31/19
Stack Relcoation 7	10 days	Mon 6/3/19	Fri 6/14/19
ACM Abatement by MSU	15 days	Mon 6/17/19	Fri 7/5/19
ACM Flooring Demo	25 days	Mon 6/17/19	Fri 7/19/19
1st Floor - East	**50 days**	**Mon 7/22/19**	**Fri 9/27/19**
Chandelier Structure	5 days	Mon 7/22/19	Fri 7/26/19
Furrdowns	5 days	Mon 7/29/19	Fri 8/2/19
M/E Rough In	10 days	Mon 7/29/19	Fri 8/9/19
Paint	10 days	Mon 8/12/19	Fri 8/23/19
Ceilings (Base Bid)	5 days	Mon 8/26/19	Fri 8/30/19
M/E Devices	5 days	Mon 9/2/19	Fri 9/6/19
Floor Covering	5 days	Mon 9/9/19	Fri 9/13/19
Stack Relcoation 8	10 days	Mon 9/16/19	Fri 9/27/19
1st Floor - West	**110 days**	**Mon 9/30/19**	**Fri 2/28/20**
Drywall	5 days	Mon 9/30/19	Fri 10/4/19
Aluminum Storefront	10 days	Mon 10/7/19	Fri 10/18/19
M/E Rough In	15 days	Mon 9/30/19	Fri 10/18/19
Paint	15 days	Mon 10/21/19	Fri 11/8/19
Ceilings (Base Bid)	10 days	Mon 11/11/19	Fri 11/22/19
Ceilings - Baffles	15 days	Mon 11/25/19	Fri 12/13/19
M/E Devices	10 days	Mon 12/16/19	Fri 12/27/19

Phase 2 MSU Moffett Library Project Schedule 1.0 - Tabular

Task Name	Duration	Start	Finish
Floor Covering	20 days	Mon 12/30/19	Fri 1/24/20
Doors/Graphics/Accessories	25 days	Mon 1/27/20	Fri 2/28/20
Punchlist	10 days	Mon 3/2/20	Fri 3/13/20

SECTION 00400

PROPOSAL FORM

PROPOSAL OF:_____
(Proposer's Name)

REQUEST FOR PROPOSAL
FOR
MIDWESTERN STATE UNIVERSITY
MOFFETT LIBRARY RENOVATION PROJECT (PHASE II)

Proposals are to be sent via email or hand delivered to:
Joseph R. Mrugalski, Purchasing & Contract Management Department
3410 Taft Blvd, Daniel Building, Room 202
Wichita Falls, TX 76308
joe.mrugalski@mwsu.edu
940-397-4110

The undersigned, having examined the Drawings, Specifications and related Documents, the site of the proposed Work, being familiar with all of the conditions relating to the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, services, equipment and appliances required in connection with or incidental to the construction of each item listed below in strict accordance with the following Specifications and Drawings:

SPECIFICATION SECTIONS: Bidding Requirements, contract documents, and conditions of the Contract, Sections Div. 1, Div. 2, Div. 3, Div. 4, Div. 5, Div. 6, Div. 7, Div. 8, Div. 9, Div. 10, Div. 12, Div. 23, Div. 26, Div. 28, and Div. 31

ARCHITECTURAL	A-020, A-030, D-101, D-102, D-103, D-201, D-202, D-203, D-601, C-021, C-022, C-023, A-101, A-102, A-103, A-104, A-191, A-201, A202, A-203, A-204, A-211, A-212, A-213, A-401, A-421, A-422, A-423, A-424, A-501, A-601, A-602, A-603, A-604, A-619, A-701, A-702, A-703, A-801, A-802, A803, A-851, I-001, I-002, I-103, I-110, I-121, I-122, I-123, I-191, I-192, I-193, I-194, I-195	Dated 7-12-18
STRUCTURAL	S-101, S-201, S202, S-203, S-204, S-205, S-301, S-302, S-401, S-402	Dated 7-03-18
MECHANICAL	M-001, M-101, M-102, M-201, M-202, M-203	Dated 7-03-18
ELECTRICAL	E-100, E-101, E-102, E-103, E-104, E-201, E202, E-203, E-204, E-205, ED-101, ED-102, ED-103	Dated 7-03-18
TECHNOLOGY	T-001, T-101, T-102, T-103, T-601, T-602	Dated 7-03-18

Prepared by Holzman Moss Bottino Architecture, 90 Broad Street (Suite 1803), New York, New York, 10004; and Harper Perkins Architects Inc., 4724 Old Jacksboro Highway, Wichita Falls, Texas 76302-3599.

COMPLETION DATE: The Proposer acknowledges the anticipated time frame must be coordinated with the Construction Manager. Each sub-contractor must perform under construction schedule to benefit Midwestern State University. Provide total number of days required to complete your trade. Construction Manager will compile time and provide a schedule to be maintained.

Number of Days: _____

The undersigned propose to accomplish the following bid packages for the stated price:
(Bid Packages are specified in Section 011000, SUMMARY, and available thru the Construction Manager, M & F Litteken Company)

BASE PROPOSAL:

Description of Scope	Amount Proposed	(Circle one)
Bid Package No. _____	Amount $ _____	(furnish, install turnkey)
Bid Package No. _____	Amount $ _____	(furnish, install turnkey)
Bid Package No. _____	Amount $ _____	(furnish, install turnkey)
Bid Package No. _____	Amount $ _____	(furnish, install turnkey)
Bid Package No. _____	Amount $ _____	(furnish, install turnkey)

ALTERNATES:

Description of Scope	Amount Proposed	(circle one)
Alternate #1 _____	Amount $ _____	(furnish, install turnkey)
ADD or DELETE (circle one)		
Alternate #2 _____	Amount $ _____	(furnish, install turnkey)
ADD or DELETE (circle one)		
Alternate #3 _____	Amount $ _____	(furnish, install turnkey)
ADD or DELETE (circle one)		
Alternate #4 _____	Amount $ _____	(furnish, install turnkey)
ADD or DELETE (circle one)		
Alternate #5 _____	Amount $ _____	(furnish, install turnkey)
ADD or DELETE (circle one)		
Alternate #6 _____	Amount $ _____	(furnish, install turnkey)
ADD or DELETE (circle one)		
Alternate #7 _____	Amount $ _____	(furnish, install turnkey)
ADD or DELETE (circle one)		

Alternate #8 _____ Amount $ _____ (furnish, install turnkey)
ADD or DELETE (circle one)

PAYMENT BONDS (required if Bids over $25,000):

Bid Package No. _____ Amount $ _____

Bid Package No. _____ Amount $ _____

Bid Package No. _____ Amount $ _____

PERFORMANCE BONDS (required if Bids over $100,000):

Bid Package No. _____ Amount $ _____

Bid Package No. _____ Amount $ _____

Bid Package No. _____ Amount $ _____

LIQUIDATED DAMAGES: If the Contractor shall fail to fully complete the work within the time specified (subject however to extensions of time duly granted in the manner and for the cause specified in the GENERAL CONDITIONS) the Contractor shall be charged by the Owner as liquidated and ascertained damages the sum of Five Hundred Dollars ($500.00) per day for each calendar day that the work remains incomplete beyond the time fixed for the completion, it being hereby expressly and mutually agreed that from the nature of the case it would be impracticable and extremely difficult to fix the actual damage which would or will be suffered in the event that the Contractor should fail to fully complete the Work within the time specified, and it being further agreed that said charge herein provided for is reasonable and proper in the premises. The amount so charged may be deducted by the Owner from any money which might otherwise be or become payable to the Contractor.

UNIT PRICES: The following unit prices shall be submitted by the Proposer for the purpose of establishing the sums to be added to our deducted from the contract amount on the account of an increase or decrease in quantity of the following items:

Item (Unit)	WHEN ADDED	WHEN DEDUCTED
A. Painting (Square Feet)	$_____	$_____
B. Concrete Sidewalk (Square Feet)	$_____	$_____

SUBSTITUTIONS: The undersigned warrants to the Owner and the Architect by submitting this proposal, that he and all his suppliers and sub-contractors have used the items specified in the Project Manual and as indicated on the Drawings and that each has read and understands the paragraph entitled SUBSTITUTIONS in SECTION 01600 – PRODUCT REQUIREMENTS, in the Project Manual.

EXTRA WORK: The undersigned agrees that, should any change in the work, or extra work, be ordered, where the unit prices set out above are not applicable, the following applicable percentage shall be added to material land labor cost to cover overhead and profit. The contractor acknowledges that these percentages will be a determinant in the award of the contract.

A. Allowance of the Contractor for overhead and profit for extra work performed by the Contractor's own forces:

_____%

B. Allowance of the Contractor for overhead and profit for extra work performed by a Sub-Contractor and the Contractor's own forces:

_____%

GUARANTEE: The undersigned furnish herewith guarantee total of base proposal lump sum amount and attaches same to the proposal for the period of sixty (60) days after the schedule closing time for the receipt of the proposals, and that if this proposal is accepted, the undersigned will enter into a formal contract (prepared by the Owner) and that the required performance bond and payment bond will be given. In the event of the withdrawal of this proposal within the period stipulated above, or the failure of the undersigned to enter into a contract and give the required bond within ten (10) days after the undersigned had received notice of the acceptance of this proposal, the undersigned shall be liable to the Owner for the full amount of the guarantee as liquidated damages to the Owner on account of the default of the undersigned.

WAGE SCALE: The undersigned acknowledges the Wage Scale as published in accordance with VCS 5159A and payment of wages in accordance with this scale and statutes are a condition of the contract.

ADDENDA: The undersigned hereby acknowledges receipt of the following listed Addenda to the Drawings and Specifications, all of the provisions and requirements of which Addenda have been taken into consideration in the preparation of the foregoing proposal.

_____

_____

_____

_____

_____

_____

_____

_____

_____

FELONY CONVICTION NOTICE

Senate Bill 1 passed by the State of Texas Legislators, Section 44.034, Notification of Criminal History Subsection (a) states a person or business entity that enters into a contract with a school district must give advance notice to the district if the person or owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony.

Subsection (b) states "a school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract".

This notice is not required of a publicly held corporation.

I, the undersigned agent for the firm named below, certify that the information concerning notification of felony conviction has been reviewed by me and the following information furnished is true to the best of my knowledge.

Sub-Contractor / Vendor's Name: _____

Authorized company Official's Name: (Please Print) _____

A. My firm is not owned by anyone who has been convicted of a felony nor listed as a sexual predator.

Signature of Company Official: _____

B. My firm is owned by individual(s) who has/have been convicted of a felony or listed as a sexual predator.

Signature of Company Official: _____

Felony: No____ Yes____ Details of Conviction: _____

Sexual Predator: No____ Yes____ Details of Conviction: _____

C. My firm employees the following individual(s) who has/have not been convicted of a felony or identified as a sexual predator. (Provide a complete list of all employees that will be associated with this project. Provide additional pages as required.

Signature of Company Official: _____

- Name of Employee:_____

Felony: No____ Yes____ Details of Conviction: _____

Sexual Predator: No____ Yes____ Details of Conviction: _____

- Name of Employee: _____

Felony: No____ Yes____ Details of Conviction: _____

Sexual Predator: No____ Yes____ Details of Conviction: _____

CERTIFICATION SHEET

All specifications and terms of the Proposal have been read.

Our company accepts the specifications and conditions unless otherwise accepted in writing to the Purchasing Agent, Midwestern State University, 3410 Taft Blvd, Wichita Falls, Texas.

COMPANY NAME:		
MAILING ADDRESS:		
City:	State:	Zip:
Telephone:	Fax:	Date:

NAME OF REPRESENTATIVE AUTHORIZED TO SIGN FOR BIDDER:

_____ _____

(Please Print) (Please Sign)

In order for a proposal to be considered, the following information must be provided. **Failure to complete will result in rejection of the Proposal.**

As defined by Texas House 620, a "nonresident bidder" means a bidder whose principal place of business is not in Texas, but excludes a contractor whose ultimate parent company or majority owner has its principal place of business in Texas.

I certify that my company is a "resident bidder":

SIGNATURE: _____ DATE: _____

IF YOU QUALIFY AS A "nonresident bidder", you must furnish the following information:

What is your resident state? (The state your principal place of business is located.)

_____ _____ _____

City State Zip Code

_____ _____

Name of Company Address

(a) Does your "residence state" require bidders whose principal place of business is in Texas to underbid bidders whose residence state is the same as yours by a prescribed amount or percentage to receive a comparable contract? "Residence state" means that state in which the principal place of business is located.

YES ` NO `

(b) What is that amount or percentage? _____%

I certify that the above information is correct.

_____ _____

Signature Title

_____

(Please Print Name)

This page must be completed and submitted with proposal.

Proposals are to be sent via email or hand delivered to:
Joseph R. Mrugalski, Purchasing & Contract Management Department
3410 Taft Blvd, Daniel Building, Room 202
Wichita Falls, TX 76308
joe.mrugalski@mwsu.edu
940-397-4110

PROPOSE TO PROVIDE AND STATEMENT OF NONCOLLUSION

I / we propose to provide the merchandise and/or services proposed within this document and if awarded the proposal, do agree to abide by all conditions of the proposal. Furthermore, the undersigned affirms that they are truly authorized to execute this contract, that this company, corporation, firm, partnership or individual has not prepared this proposal in collusion with any other Proposer, and that the contents of this proposal as to prices, terms or conditions of said proposal have not been communicated by the undersigned or any employee or agent to any other person engaged in this type of business prior to the official opening of this bid.

_____
Vendor Name

_____
Vendor Address

_____
Signature of Company Representative

_____
Printed Name of Company Representative

_____
Date

This page must be completed and submitted with proposal.

RESPECTFULLY SUBMITTED

CORPORATIONS ONLY FILLIN THE FOLLOWING:	PROPOSERS (OTHER THAN CORPORATIONS) FILL IN THE FOLLOWING:
_____ (Legal name of Corporation)	_____ (Legal name of Proposing Firm)
_____ (State of Incorporation)	_____ (Address)
_____ (Address)	
_____ (Typed Name of Officer)	_____ (Typed Name of Officer)
_____ (Signature of Officer)	_____ (Signature of Officer)
_____ (Title of Officer)	_____ (Title Name of Officer)
_____ (Date)	_____ (Date)
_____ (Typed Name of Officer)	_____ (Typed Name of Officer)

WITNESS:

_____
(Name of Witness typed in)

_____
(Signature of Witness)

_____
(Address of Witness)

_____
(Date)

(Signature of Proposer, including corporation officer, must be witnessed and proposal dated to be valid)

END OF SECTION

SECTION 012300

ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

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

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

1.4 PROCEDURES

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

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

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

Proposers Bidding Procedure Note: Each of the Alternates is "stand alone" for each item listed below. Provide a Proposal number that includes a bid for that Alternate item that can be added or deleted from the Base Bid. On your Proposal indicate if the Alternate item is an: Addition or Deletion. Also refer to "ADD ALTERNATES LIST" on Sheet "A-020" of the Drawings for more information,

SCHEDULE OF ALTERNATES:

A. ALTERNATE #1: Provide all work associated with "Taft Bay Window 108L" on the east side of the Building (existing exterior entry porch) including the new Mechanical Closet & Equipment on the 3rd Floor above the space and the new exterior ramp on the south end. Refer to the Architectural and Mechanical/Electrical Drawings and the Project Manual for more information.

B. ALTERNATE #2: Provide all work associated with "Bay Window 101A" and "Bay Window 113" on the west side of the Building. Refer to the Architectural, Structural, and Mechanical/Electrical Drawings and Project Manual for more information.

C. ALTERNATE #3: Provide Dichroic glazing with colored glass PVB interlayer in lieu of the specified Dichroic glazing with film in the areas specified in the Finish Schedule. Refer to the Drawings and Section 088000, "Glass and Glazing", of the Project Manual.

D. ALTERNATE #4: The 3rd Floor shall receive new Wall & Floor finishes, Ceilings, and all Electrical Power and Lighting (the new Mechanical Closet & Equipment to serve the "Taft Bay Window" on the east side of the Building is included as part of Alternate #1). The Book Stacks will still be relocated as scheduled. Refer to the Architectural and Mechanical/Electrical Drawings for more information.

E. ALTERNATE #5: LED Downlight Fixtures shall be provided in lieu of the custom-made Chandelier fixtures shown on Sheet "**A-424**" of the Drawings. Refer to the Architectural and Electrical Drawings for more information.

F. ALTERNATE #6: In lieu of "open" type handrailing on the east side of the new ramp adjacent to the Taft Bay Window on the east side of the Building, provide a face brick wall with handrailing. This face brick wall shall be similar to the one located at the new ramp on the north side of the Building – refer Sheet "**A-501**" for more information.

G. ALTERNATE #7: In lieu of reusing the existing suspended acoustical ceiling grid (replace damaged tiles) and light fixtures (relocating some fixtures), remove the existing and provide new suspended acoustical ceilings and LED light fixtures – refers Sheet "A-201A", "A-202A", A-203A", and Electrical Drawings for more information.

H. ALTERNATE #8: At "**Vestibule 1VEST1**", the existing aluminum storefront framing, aluminum entrance, and glazing in opening "**1VESTA**", "**1VESTB**", "**1VESTC**", and "**1VESTD**" shall be removed completely. At each opening, provide new aluminum storefront framing (Kawneer "Trifab450"), aluminum entrance, and tinted tempered glazing. Provide hardware at each opening as specified in Section **084113**, **ALUMINUM ENTRANCES AND STOREFRONTS**. Refer to Sheet "**A-619**" for more information.

END OF SECTION

SECTION 017823

OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the operation and maintenance data as specified herein.

1. Operation and maintenance documentation directory.
2. Operation manuals for systems, subsystems, and equipment.
3. Product maintenance manuals.
4. Systems and equipment maintenance manuals.

1.3 RELATED SECTIONS

A. Submittal Procedures - Section 013300.

B. Closeout Procedures - Section 017700.

1.4 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.5 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

    a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    b. Enable inserted reviewer comments on draft submittals.

2. Three (3) paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two (2) copies.

C. Initial Manual Submittal: Submit draft copy of each manual at least thirty (30) days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fifteen (15) days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within fifteen (15) days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:

1. List of documents.

2. List of systems.

3. List of equipment.

4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.

2. Table of contents.

3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.

2. Name and address of Project.

3. Name and address of Owner.

4. Date of submittal.

5. Name and contact information for Contractor.

6. Name and contact information for Construction Manager.

7. Name and contact information for Architect.

8. Name and contact information for Commissioning Authority.

9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.

10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

F. Manuals, Digital Copy: Submit manuals in digital form.

1. PDF format: Provide PDF with Recognize Text run so they are reserchable.

a. If two or more PDF's are necessary to accommodate data of a system, organize data in each pdf into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each PDF with title "OPERATION AND MAINTENANCE MANUAL," Project title or name, subject matter of contents. Indicate volume number for multiple-volume sets.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.

2. Performance and design criteria if Contractor has delegated design responsibility.

3. Operating standards.

4. Operating procedures.

5. Operating logs.

6. Wiring diagrams.

7. Control diagrams.

8. Piped system diagrams.

9. Precautions against improper use.

10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.

2. Manufacturer's name.

3. Equipment identification with serial number of each component.

4. Equipment function.

5. Operating characteristics.

6. Limiting conditions.

7. Performance curves.

8. Engineering data and tests.

9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.

2. Equipment or system break-in procedures.

3. Routine and normal operating instructions.

4. Regulation and control procedures.

5. Instructions on stopping.

6. Normal shutdown instructions.

7. Seasonal and weekend operating instructions.

8. Required sequences for electric or electronic systems.

9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.

2. Manufacturer's name.

3. Color, pattern, and texture.

4. Material and chemical composition.

5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.

2. Types of cleaning agents to be used and methods of cleaning.

3. List of cleaning agents and methods of cleaning detrimental to product.

4. Schedule for routine cleaning and maintenance.

5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.

3. Identification and nomenclature of parts and components.

4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.

2. Troubleshooting guide.

3. Precautions against improper maintenance.

4. Disassembly; component removal, repair, and replacement; and reassembly instructions.

5. Aligning, adjusting, and checking instructions.

6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.

2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.

2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.

2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 042000

UNIT MASONRY

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the brick veneer masonry work as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:

1. Face brick.

2. Concrete block back-up walls.

3. Metal joint reinforcing, anchors, ties, weeps, closures and related accessories for masonry.

4. Control and expansion joints in masonry, filled with joint fillers.

5. Through-wall flashing.

6. Cavity drainage material.

7. Chases, recesses, pockets and openings in masonry as required for installation of work by others.

8. Building in of items furnished by others into masonry, including access doors, door frames, anchors, sleeves and inserts, and other similar items to be embedded in masonry.

9. Grouting in of metal items built into masonry work.

10. Protection, pointing and cleaning of masonry.

1.3 RELATED SECTIONS

A. Cast-in-Place Concrete - Section 033000.

B. Thermal Insulation - Section 072100.

C. Sheet Metal Flashing - Section 076200.

D. Firestops and Smokeseals - Section 078413.

E. Joint Sealers - Section 079200.

1.4 SUBMITTALS

A. Submit Shop Drawings for the following:

1. Anchoring details.

2. Control and expansion joint locations and details.

3. Special brick shapes, if required.

4. Flashing at typical lintels indicating relationship of flashing to lintel hangers.

B. Submit Samples for the following:

1. Each type of face brick in sufficient number and color (not less than 5) to show full range of color, texture and shade. Submit certification that brick meets ASTM standards specified herein.

a. Submit samples of all special shapes required showing color range and sizes.

2. Joint reinforcing, each type, width and proposed location (labeled).

3. Anchors, wedges and ties, each type, width and proposed location (labeled).

4. Joint filler, each type.

5. Flashing, including splice sample, 12" long.

6. Mortar color, 12" long cured sample.

C. Submit technical and installation information for the following:

1. Mortar materials, each material and mortar type.

2. Certification of mortar mix.

3. Flashing material, descriptive literature.

4. Concrete block, joint reinforcing, anchors, ties and joint filler; submit manufacturer's technical and descriptive literature.

5. Block manufacturer shall submit certifications of compliance with ASTM C 90, C 331 and UL 618 prior to any job site delivery. Field sampling of concrete block may be tested by an Independent Testing Laboratory retained by the Owner according to the requirements of ASTM C 140.

D. Cleaning Procedures: Submit proposed procedures and materials for cleaning masonry work; including certification that cleaner will not adversely affect gaskets, sealants, etc.

1.5 QUALITY ASSURANCE

A. Conform to the following non-cumulative tolerances (any masonry work not meeting these standards shall be re-built as directed by the Architect).

1. Variation from the plumb:

a. In lines and surfaces of columns, walls and arrises:
1). In 10 feet 1/8"
2). In any story of 25 feet maximum 1/4"
b. For external corners, expansion joints and other conspicuous lines:
1). In any story of 25 feet maximum 1/4"

2. Variation from the level or the grades indicated on the drawings; for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines:

a. In any bay or 20 feet maximum 1/4"

3. Variation of the linear building lines from established position in plan related portion of columns and partitions:

a. In any bay or 20 feet maximum 1/4"

4. Variation in cross-sectional dimensions of columns and in thickness of walls:

a. Minus 1/8"
b. Plus 1/8"

5. Variation in dimensions of masonry openings:

a. Horizontal dimension -0" + 1/16"
b. Vertical dimension +0" - 1/16"

B. Testing for Efflorescence: Test selected face brick for efflorescence in accordance with ASTM C 67. If, at the end of the test period, the samples of brick or mortar show efflorescence, the materials represented shall be rejected and new materials shall be re-tested. This process shall be repeated until no efflorescence appears. Testing shall be done by an independent testing laboratory at the expense of the Contractor; submit test results in writing to the Architect.

C. Work of this Section shall conform to the requirements of the following:

1. 2016 "Building Code Requirements for Masonry Structures," (TMS 402/602-16).

2. 2016 "Specification for Masonry Structures," (TMS 602-16).

3. Brick Industry Association (BIA) "Technical Notes on Brick Construction."

D. Pre-Construction Conference: Prior to installation of masonry and associated work, Contractor shall arrange a meeting with Masonry Subcontractor, installers of related work, and other entities concerned with masonry wall performance, including the

Architect and Owner. Contractor shall record discussions and agreements and furnish copy to each participant. Provide at least seventy-two (72) hours' advance notice to participants prior to convening conference. Review methods and procedures related to masonry work, including, but not limited to, the following:

1. Review masonry requirements (drawings, specifications and other Contract Documents).

2. Review required submittals, both completed and yet to be completed.

3. Review and finalize construction schedule related to masonry work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

4. Review required inspection, testing, certifying and material usage accounting procedures.

5. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.

6. Coordinate work with air/vapor barrier membrane and related flashing, review details to avoid conflicts.

1.6 PRODUCT HANDLING

A. General: Deliver, store, handle and protect all materials from damage, moisture, dirt and intrusion of foreign matter. Store all masonry units and mortar materials on raised platforms and under ventilated and waterproof cover. Store packaged materials in manufacturer's unopened containers, marked with manufacturer's name and product brand name. Immediately reseal containers after partial use. Remove and replace damaged materials.

B. Masonry Units: Pack, deliver and store to prevent breakage, cracking, chipping, spalling or other damage. Store, protect and ventilate units at project site.

C. Aggregate: Store with provisions for good drainage.

D. Reinforcement and Anchors: Store and protect so that when placed, joint reinforcement and anchors will be free of soil, dirt, ice, loose rust, scale, or other coatings which would destroy or reduce bond with mortar, and will not be disfigured or bent out of shape.

1.7 JOB CONDITIONS

A. In cold weather, when the outside temperature is below forty (40) deg. F., conform to the requirements of "Cold Weather Masonry Construction and Protection Recommendations" publication by Brick Industry Association (BIA). No anti-freeze admixtures are permitted.

1. In addition, conform to the following:

a. Masonry materials must be warmed as required.

b. Brickwork must be protected a minimum of 24 hours after installation so as to maintain enough heat for hydration of the cement in the mortar.

B. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg. F. and above. In addition, conform to the following:

1. Masonry materials must be cool.

2. Mortar must be used within 2 hours of initial mixing.

C. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24" down both sides and hold cover securely in place.

2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24" down face next to unconstructed wythe and hold cover in place.

D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.

2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

1.8 ATTIC STOCK

A. Provide additional 10% of dry mortar mix labeled, packaged and delivered to location determined by Owner for attic stock.

B. Provide additional 5% of brick labeled, packaged and delivered to location determined by Owner for attic stock.

PART 2 PRODUCTS

2.1 MATERIALS

A. Standard Concrete Block

1. Portland cement, ASTM C 150, Type 1, low alkali (less than 0.6%), single source for entire project.

2. Aggregates, ASTM C 331, lightweight expanded shale, clay or slate aggregates, manufactured by the rotary kiln process equal to "Solite," "Norlite," or "Haydite."

    a. Block scheduled to receive painted finish shall contain normal weight aggregate meeting ASTM C 33 in addition to lightweight aggregate in order to receive a smooth, uniform finish.

3. Concrete Masonry Units: Load bearing lightweight aggregate concrete masonry units conforming to the requirements of ASTM C 90, Type 1.

    a. Block behind face brick and block for rated walls shall be 75% solid units.
    b. All other block may be hollow units.

4. The producer of the concrete masonry units shall furnish certification from an independent testing laboratory confirming that all 8" or larger masonry units meet all of the UL 618 requirements for two (2) hours or better (as required), referencing full scale fire test reports (ASTM E 119). All 4" and 6" units shall conform to "National Bureau of Standards" and "National Research Council" full scale fire tests.

5. Sizes and Shapes: Nominal face size 8" x 16" by thickness as indicated on drawings, with stretcher units, jamb units, header units, square corner units (at ends and corners of exposed or painted work), sash units (at control joints within masonry wall), lintel units and other special shapes and sizes required to complete the work.

6. Finish: For exposed or painted block surfaces, in addition to ASTM requirements, block shall have uniformly dense, flat, fine grain texture, with no cracks, chips, spalls, or other defects which would impair appearance. For concealed CMU, surfaces shall be free from deleterious materials that would stain plaster or corrode metal.

7. Curing: All concrete block shall be steam cured, and air dried for not less than thirty (30) days before delivery.

8. Density of concrete block shall not exceed one hundred and five (105) lbs. per cubic foot.

9. Shrinkage: Shrinkage of concrete blocks shall not exceed 0.065% when tested in accordance with ASTM C 426-16, Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.

10. Water Content

    a. At the time of delivery to the job site, concrete masonry units shall have a value, in weight of contained water, of not more than thirty (30) percent of the fully saturated content for the unit tested.

b. Ship all units from the factory, and store at the job site, with all necessary protection to prevent increase of water content from rain and other sources.

B. Brick

1. Size: Unless otherwise indicated, provide 3-5/8" deep x 2-1/4" high x 7-5/8" long modular bricks.

2. Facing Brick: ASTM C 216, Grade SW, Type FBX, equal to the following:

   a. Cloud Ceramics Modular Velour face brick in 40% Driftwood Blend, 40% Terracotta Blend, 10% Cimarron Blend, 5% Cameo Blend, and 5% Old Rose Blend.

3. Where brick is fully concealed provide common brick conforming to ASTM C 62, Grade SW.

4. Provide all special molded shapes as indicated on the drawings.

5. Provide masonry blend #888 “Midwestern Blend” as specified below:

   a. 14% – Blend 450
   b. 7% – Blend 405
   c. 20% – Blend 456
   d. 17% – Blend 455
   e. 14% – Blend 449
   f. 13% – Blend 162
   g. 7% – Blend 001
   h. 8% – Blend 276

6. For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncored units with all exposed surfaces finished.

C. Joint Reinforcing for Masonry Walls: For anchoring face brick to CMU back-up, provide welded "ladder" design, of 3/16" dia. gauge steel rods with adjustable 3/16" wire rectangular pintle anchors fastened to reinforcement 16" o.c. Provide special formed prefabricated pieces at corners and intersections of walls or partitions. Anchors to extend at least 2" into face of brick. Show anchor locations on approved shop drawings. Joint reinforcing shall be equal to Ladder Type 270 with "Lox All Adjustable Anchor" made by Hohmann & Barnard or equal manufacturer noted below in Para. C.5.

1. Reinforcing assembly shall have hot dip galvanized steel finish conforming to ASTM A 153 with zinc coating of 1.5 oz. of zinc per sq. ft. after fabrication.

2. Wire used in assembly noted above shall be cold drawn steel wire conforming to ASTM A 82.

3. Approved Joint Reinforcing Manufacturers

a. Hohmann & Barnard
b. Wire-Bond
c. Heckmann Building Products
d. National Wire Products Industries, Inc.

D. Anchors and Ties

1. Dovetail Anchor Slots: Hot-dip galvanized steel, 16 gauge equal to No. 100 Dovetail Anchor Slot made by Heckmann Building Products, No. 305 anchor slot made by Hohmann & Barnard, or approved equal by other manufacturers in Para. C.5.

2. Flexible Metal Ties for Dovetail Slots: Hot-dip galvanized, 16 gauge by 1" wide by Heckmann Building Products Inc., or approved equal manufacturer noted above in Para. C.5.

   a. No. 106 Dovetail Corrugated Anchor.
   b. No. 129 Dovetail Triangle Tie.

3. Wire Mesh: Hot-dip galvanized sixteen (16) gage steel wire, square mesh, width 3" by length to suit condition; No. 268 by Heckmann Building Products, or approved equal by manufacturer noted above in Para. C.5.

4. For anchoring face brick to concrete back-up where there are no dovetail slots provided, provide "CMU/Concrete Screw Wing-Nut Pos-I-Tie" with five (5) gauge hot-dip galvanized (ASTM A 153, Class B-2) wire pintle tie made by Heckmann Building Products, or approved equal by manufacturer noted above in Para. C.5.

5. For anchoring masonry to structural steel, provide hot-dip galvanized steel, as listed, or approved equal by manufacturer noted above in Para. C.5:

   a. Made by Heckmann Building Products. Galvanizing shall conform to ASTM A 153, with zinc coating of 1.5 oz. of zinc per sq. ft.
      1). No. 195 Column Anchors
      2). No. 197 Column Anchors
      3). No. 315 Weld-On Anchor Rods with No. 316 Triangle Ties
      4). No. 315-B Weld-On Anchor Straps with No. 316 Triangle Ties
   b. Made by Hohmann & Barnard or approved equal. Galvanizing shall conform to ASTM A 153, with zinc coating of 1.5 oz. of zinc per sq. ft.
      1). No. 355 Column Anchors
      2). No. 356 Column Anchors
      3). No. 357 Beam Anchors
      4). No. 359 F anchor straps with VWT tie.

E. Reinforcing Bars and Rods: ASTM A 615, Grade 60. See Drawings for size.

F. Control and Expansion Joint Fillers

1. Vertical Installation Within Concrete Masonry Wall: Extruded high-grade neoprene rubber, cross shape, for use with concrete masonry sash units, which

shall provide a force fit in the grooves of the sash block, and shall have 1/2" diameter tubular ends (compressed 25% when installed in 3/8" wide joint).

a. Provide the following sizes:
   1). 2-5/8" wide control joint fillers for 4" block walls.
   2). 4-5/8" wide for 6" block walls.
   3). 6-5/8" wide for 8", 10" and 12" block walls.
b. Provide backer rod and sealant joint over joint filler as per drawings and Section 079200 of these specifications.

2. Isolation Joint Filler at Abutting Construction and at Intersecting CMU Walls: Compressible and resilient closed cell neoprene gasket with pressure sensitive adhesive backing, thickness 30% greater than thickness of joint. Acceptable joint filler shall be "Everlastic, Type NN-1" by Williams Products, Inc., or approved equal. Recess joint filler and install backer rod and sealant as per drawings and Section 079200 of these specifications.

3. Within Face Brick: Provide filler rod and sealant installed by Section 079200. Filler depth shall be 2 times joint width.

   a. Compressible filler between top of brick and bottom of shelf angle shall be "Soft Joint Sealant" made by Polytite, or approved equal.

4. Within Expansion Joint at Face Brick: Manufacturer's standard preformed, pre-compressed, open-cell polyurethane foam sealant impregnated with a water based, non-drying polymer modified acrylic water repellent. Provide "Seismic Colorseal" installed to twenty-five 25 percent compression, as manufactured by Emseal or approved equal.

   a. Properties: Permanently elastic, mildew resistant, non-migratory, non-staining, and compatible with joint substrates and other joint sealants. Density: 8.4 to 9.1 lb./cu. ft.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type 1, standard color, one source.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: Clean, washed, buff colored sand, graded per ASTM C 144.

D. Aggregate for Grout: ASTM C 404.

E. Water: Clean, fresh and suitable for drinking.

2.3 MORTAR MIX

A. Exterior Face Brick Construction: Mortar mixes shall meet ASTM C 270, Type N, cement/lime mortar. Colors of mortars shall use coloring agent made by Davis Colors, Lehigh Cement or approved equal. Color of mortar to meet with Architect's approval.

The Contractor may use pre-packaged colored mortar equal to "Color Mortar Blend" made by Glen-Gery.

1. Color of mortar must meet with Architect's approved sample and mock-up panel.

B. Exterior Block Back-Up Construction: Provide Portland cement/lime mortar as noted above conforming to ASTM C 270, Type N.

C. Reinforced Concrete Block: Provide Portland cement/lime mortar conforming to ASTM C 270, Type S.

D. Mortar for Cement Cants: One (1) part Portland cement and four (4) parts sand, by volume.

E. Grout for Unit Masonry: Comply with ASTM C 476 for grout for use in construction of unit masonry. Use grout of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Grout shall have a minimum compressive strength of 3000 psi when tested in accordance with ASTM C 1019.

F. Mixing

1. General: Add cement just before mixing and mix dry. Use sufficient amount of water as necessary to produce workable mix. Mix in small batches to make plastic mass.

2. Mixing: Machine mix all mortars in approved type mixer with device to accurately and uniformly control water. Add hydrated lime dry. Mix dry materials not less than two (2) minutes. Add water, then mix not less than three (3) minutes, not to exceed five (5) minutes. Mix only amount of mortar that can be used before initial set. Do not use mortar which has reached its initial set or two (2) hours after initial mixing, whichever comes earlier. Mortar may not be re-tempered. Clean mixer for each batch, whenever mortar type is changed, and at end of each day's work.

3. Acceleration or other admixtures not permitted.

4. Mortar shall have a flow after suction of not less than seventy-five (75) percent of that immediately after mixing as determined by ASTM C 91.

G. Admixtures

1. No air-entraining admixtures or cementitious materials containing air-entraining admixtures shall be used in the mortar.

2. No antifreeze compounds or other substances shall be used in the mortar to lower the freezing point.

3. Calcium chloride or admixtures containing calcium chloride shall not be used in mortar.

2.4 MASONRY ACCESSORIES

A. Weep Holes: Provide clear plastic weep holes 3/8" wide and 1-1/2" high by four (4) inches long equal to No. 342 made by Hohmann & Barnard or approved equal manufacturer listed above.

B. Through-Wall Flashing: Provide sheet membrane flashing as part of exterior wall membrane system. Provide sealants and tapes as recommended by the manufacturer. Provide preformed corner sections "end dams" with system when flashing is discontinuous..

1. Provide flashing for surface adhered applications at sheathed areas with 26 ga. stainless steel termination bar.

2. Wall flashing shall have 26 ga. stainless steel drip edge adhered to edge of flashing, drip edge shall be set in sealant as specified in Section 079200.

C. Cavity Drainage Material: Provide 10" high HDPE "Mortar Net" open mesh mortar net of width to fit masonry cavity shown on drawings, manufactured by Mortar Net USA, Ltd., or equal "Mortar Maze," made by Advanced Building Products.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

1. Verify that masonry may be completed in accordance with all pertinent codes and regulations, the referenced standards, and the original design.

2. Do not start any work until mock-ups are approved by the Architect.

B. Discrepancies: In the event of discrepancy, immediately notify the Architect in writing. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved. Starting of work by the Contractor means acceptance by the Contractor of the substrate.

3.2 COORDINATION

A. Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this Section.

3.3 PREPARATION

A. Brick: Wet brick having an initial rate of absorption greater than 30 grams per 30 square inches when tested per ASTM C 67. Wet bricks by allowing water to run on the cubes or pallets of brick, or placing them in a large tank of water.

1. Except for absorbent units specified to be wetted, lay masonry units dry.

B. Concrete Block: Do not wet concrete block units.

3.4 INSTALLATION

A. General

1. Build walls to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown.

2. Build chases and recesses as shown or required for the work of other trades.

3. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

4. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and off-sets. Avoid the use of less than half size units at corners, jambs and wherever possible.

5. Lay up walls plumb and true with courses level, accurately spaced and coordinated with other work.

6. Pattern Bond: Lay exposed masonry patterns as noted on drawings. Lay concealed concrete block with all units in a wythe bonded by lapping not less than two (2) inches. Bond and interlock each course of each wythe at corners. Do not use units of less than four (4) inches horizontal face dimensions at corners or jambs.

7. Walls shall be plumb, true to line and free from defects such as open cells, voids, dry joints and other similar defects.

8. Do not use any brick that do not meet chippage and tolerances of the applicable ASTM standard noted herein for the grade, type or class of brick.

B. Mortar Bedding and Jointing: All joints between bricks shall be completely filled with mortar. Bed joints shall be beveled per BMI recommendations, with the brick then shoved in place. At cavity wall construction, care shall be taken that no excess mortar goes into masonry cavity. Head joints shall be completely filled with mortar and shall be formed by applying a full coat of mortar to the entire end or the entire side, as the case requires, and then shoving the mortar covered end and/or side of the brick tightly against the bricks previously laid; the practice of “slushing” by throwing mortar into the head joints will not be permitted. All brick shall be laid without disturbing the brick previously laid. Brick shall be laid within a minute or so after the mortar is placed. Dry or butt joints will not be permitted. Grouting shall be done only as necessary. Do not slush head joints.

1. After brick placement, mortar squeezed out of bed joints shall be cut off before tooling.

2. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on exterior walls and in all courses of piers, columns and pilasters, where solid CMU is used and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.

    a. To ensure alignment of brick and block coursing, adjust block back-up by cutting block to insure alignment of coursing or use adjustable anchorage.

3. Tool exposed joints slightly concave after the mortar joint is thumbprint hard. Concealed joints shall be struck flush.

4. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

C. Stopping and Resuming Work: Rake back 1/2 brick length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

D. Built-In Work

1. As the work progresses, build in items specified under this and other Sections of these specifications. Fill in solidly with masonry around built-in items.

2. Mortar in door frames, access doors, louvers and other metal items embedded or built into masonry work solidly with mortar as the masonry units are laid up.

3. Grout under lintels, bearing plates, and steel bearing on masonry with solid bed grout.

4. Sleeves, pipes, ducts and all other items which pass through masonry walls shall be caulked with interior grade sealant meeting requirements of Section 079200, so as to be air tight and prevent air leakage. Refer to Section 078413 for packing of voids in rated masonry walls.

5. Fill vertical cells of masonry units solid with grout which have anchoring, reinforcing rods, supporting or hanging devices embedded in the cell including stone anchors and window or curtain wall anchors.

6. Fill vertical cells of masonry units solid with mortar on each side of door frames to sixteen (16) inches beyond.

7. Unless otherwise noted, fill vertical cells of masonry units solid with grout which are below steel bearing plates, steel beams, and ends of lintels, to eight (8) inches beyond bearing and from floor to bearing.

8. Place wire mesh in horizontal joint below masonry unit cells to be filled with mortar, to prevent mortar from dropping into unfilled cells below.

9. Masonry indicated as being reinforced shall have all voids filled solid with grout. Grout shall be consolidated in place by vibration or other methods which insure

complete filling of cells. When the least clear dimension of the grouted cell is less than two (2) inches, the maximum height of grout pour shall not exceed twelve (12) inches. When the least clear dimension is two (2) inches or more, maximum height of grout pour shall not exceed forty-eight (48) inches. When grouting is stopped for one (1) hour or longer, the grout pour shall be stopped 1-1/2" below the top of a masonry unit. Vertical bar reinforcing shall be accurately placed and held in position while being grouted, and shall be in place before grouting starts. All such reinforcing shall have a minimum clear cover of 5/8". Lap all bars a minimum of forty (40) bar diameters and provide steel spacer ties (not to exceed 192 bar diameter) to secure and position all vertical steel and prevent displacement during grouting. Provide continuous horizontal reinforcement embedded in mortar joints every second course.

E. Cutting and Patching: All exposed masonry which requires cutting or fitting shall be cut accurately to size with motorized carborundum or diamond saw, producing cut edges.

1. Do not saw cut any masonry openings in face brick construction without Architect's approval and after a procedure has been reviewed and approved.

2. Holes made in exposed masonry units for attachment of handrail brackets and similar items shall be neatly drilled to proper size.

3. All masonry which requires patching in exposed work, if approved by Architect, shall be patched neatly with mortar to match appearance of masonry as closely as possible and to the Architect's satisfaction. Rake back joints and use pointing mortar to match as required.

F. Cavity Walls

1. Two wythes of masonry cavity walls shall be securely tied together by horizontal joint reinforcement and ties anchored to reinforcement, as herein specified, spaced every other block course.

   a. Where cavity back-up is concrete use ties specified herein spaced sixteen (16) inches o.c. both directions.

2. Cavity between facing and backing wythe shall be kept clean and clear of all mortar droppings, and no mortar ledges shall project into the cavity. Temporary wood strips, cut to width of cavity and fitted with lift-up wires, shall be laid on the joint reinforcement and carefully lifted out before placement of the next layer of reinforcement. Any projecting mortar shall be spread over the back of the outer wythe immediately following the setting of the masonry unit.

   a. Cavity drainage material shall be installed at the bottom of each cavity over the flashing to protect weep holes.

3. Concrete block back-up at cavity wall construction shall be anchored to slab at top with dovetail anchors spaced sixteen (16) inches o.c.

4. Anchor CMU back-up with anchors as specified herein.

5. Refer to Section 072100, "Thermal Insulation," for material and installation of cavity wall insulation.

G. Ties and Anchors for Masonry Construction

1. Provide ties and anchors as shown or specified, but not less than one metal tie, spaced not to exceed sixteen (16) inches o.c. horizontally and/or vertically. Provide additional ties within 1'-0" of all openings and adjacent to expansion joints and spaced not more than 16" apart around perimeter of openings.

2. Anchoring Masonry to Structure: Provide an open space not less than 1/2" in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.

3. Anchoring Partitions and Infill Abutting Existing Construction: Install buck anchors in bed joints 16" o.c. vertically. Build one bent end into the masonry. Expansion bolt other bent end to existing construction.

H. Control and Expansion Joints

1. Provide expansion, control and isolation joints in masonry as shown. Build in related items as the masonry work progresses.

2. CMU Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 40'-0" o.c. In addition, locate joints at points of natural weakness in the masonry work, including the following:

   a. At structural column or joint between bay.
   b. Above control joints in the supporting structure.
   c. Above major openings at end of lintels upward and below at ends of sills downward. Place at one side of jamb for openings not less than 6'-0" wide and at both sides for openings over 6'-0" wide.
   d. At reduction of wall thickness.
   e. Where masonry abuts supporting structure.
   f. If additional joints are required, indicate same on approved shop drawings.

3. Brick Veneer Expansion Joint Spacing: Vertical expansion joints in brick veneer construction shall be located maximum 20'-0" o.c. unless otherwise noted in addition to expansion joints located within 2'-0" of each corner of the building.

I. Lintels

1. Install loose steel lintels furnished by Section 055000, allowing eight (8) inch bearing at ends.

2. For concrete block walls, use specially formed U-shaped concrete block lintel units with reinforcing bars in accordance with the following table, filled with grout.

Number and Size of Reinforcing Bars Required at Concrete Block Lintels		
Maximum Clearance Span	Wall Width	Rebar No. - Size
2'-0" to 6'-0" 6'-0" to 8'-0"	6"	2 - #3 2 - #4
2'-0" to 6'-0" 6'-0" to 8'-0"	8"	2 - #3 2 - #4
2'-0" to 6'-0" 6'-0" to 8'-0"	12"	3 - #3 3- #4

3. U-shaped concrete block lintels shall extend a minimum of 8" at each side of opening.

3.5 FLASHING/WEEP HOLES

A. General: Install embedded flashing and weep holes in masonry at relieving angles, shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated. Space weeps 16" o.c. unless otherwise shown on drawings.

B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing.

C. Flashing shall be placed, generally, at bottoms of cavity wall construction, over all wall openings, window jambs, at sills of window, and in other locations where indicated on the drawings. Flashing shall overlap a minimum of 6". At bottoms of cavity walls, the flashing shall be built extending from the exterior face of the brick, up and into the mortar joint 2" at the inner wythe of the CMU back-up. Extreme care shall be exercised in placing the masonry materials not to damage the flashing. Flashing damaged during the masonry erection shall be repaired or replaced by the Contractor at no additional cost to the Owner. Discontinuous flashing shall terminate with an end dam in a head joint, rising at least 1".

D. When spanning an air space, flashing shall be supported with a mortar wash, insulation or treated wood blocking.

E. Where flashing is penetrated by anchors, patch flashings at penetration using adhesive and mastic recommended by the manufacturer to insure watertight seal.

F. Install flashing in accordance with manufacturer's instructions, using adhesive, primer, thinner, cleaner and mastic as recommended by flashing manufacturer.

1. Flashing shall overlap adjacent piece of flashing a minimum of 6".

G. Provide drip edge when flashing extends beyond face of brick.

3.6 CANTS

A. Provide specified mortar for cement cants at beams and other projections in elevator shafts, where adjoining wall is of masonry construction. Cants shall slope twenty (20) degrees from the horizontal.

3.7 CLEANING, PROTECTION, ADJUSTMENT

A. Protection

1. The Contractor shall take adequate precautions for the protection of all surfaces against mortar spatter, and shall immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.

2. Excess mortar shall be wiped off the masonry surfaces as the work progresses.

3. Wood coverings shall be placed over all such masonry surfaces as are likely to be damaged during the progress of the entire project.

4. Protective measures shall be performed in a manner satisfactory to the Architect.

5. Damaged masonry units shall be replaced to satisfaction of the Architect.

6. Exterior masonry walls shall be draped with waterproof covering until copings are in place, to prevent water penetration in cavity.

B. Cleaning of Masonry: Upon completion, all exposed masonry shall be thoroughly cleaned following recommendations of the BIA Technical Note No. 20. Before applying any cleaning agent to the entire wall, it shall be applied to a sample wall area of approximately 4' x 4' in a location approved by the Architect. No further cleaning work may proceed until the sample area has been approved by the Architect, after which time the same cleaning materials and method shall be used on the remaining wall area. If stiff brushes and water do not suffice, the surface shall be thoroughly saturated with clear water and then scrubbed with a solution of an approved detergent masonry cleaner, equal to "Vana Trol" made by ProSoCo Inc. or equal made by Diedrich or approved equal, mixed as per manufacturer's directions, followed immediately by a thorough rinsing with clear water. All lintels and other corrodible parts shall be thoroughly protected during cleaning.

1. Unless otherwise required by cleaning agent manufacturer use only low pressure device (30 to 50 psi) for application of cleaning agent and water rinsing.

C. Pointing: Point any defective joint with mortar identical with that specified for that joint.

END OF SECTION

SECTION 084113

ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the aluminum entrances and storefronts as indicated on the drawings and/or specified herein, including the following:

1. Exterior entrance systems.

2. Interior entrance systems.

3. Exterior storefront systems.

4. Interior storefront systems.

1.3 RELATED SECTIONS

A. Sealants - Section 079200.

B. Aluminum curtain wall - Section 084413.

C. Finish hardware - Section 087100.

D. Glass and glazing - Section 088000.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements.

B. Shop Drawings: Provide large scale shop drawings for fabrication, installation and erection of all parts of work. Provide plans, elevations, and details of anchorages, connections and accessory items. Provide installation templates for work installed by others. Show interfaces and relationships to work of other trades.

C. Field Measurements: Take necessary field measurements before preparation of shop drawings and fabrication. Do not delay progress of job. If field measurements are not possible prior to fabrication, allow for field cutting and fitting.

D. Initial Selection Samples: Submit samples showing complete range of colors, textures, and finishes available for each material used.

E. Verification Samples: Submit representative samples of each material that is to be exposed in completed work. Show full color ranges and finish variations expected. Provide samples having minimum size of 144 sq. in.

F. Calculations: Provide professionally prepared calculations and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied; refer to Article 1.5, para. D for further description.

G. Test Reports: Provide certified test reports for specified tests.

1.5 QUALITY ASSURANCE

A. Source: For each material type required for work of this Section, provide primary materials that are products of one manufacturer. Provide secondary or accessory materials that are acceptable to manufacturers of primary materials.

B. Installer: A firm with a minimum of three years' experience in type of work required by this Section and which is acceptable to manufacturers of primary materials.

C. Design Criteria: Drawings indicate sizes, member spacings, profiles, and dimensional requirements of work of this Section. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in the Architect's sole judgment, such deviations do not materially detract from the design concept or intended performances.

D. Engineering: Provide services of a Professional Engineer, registered in the jurisdiction in which the Project will be built, to design and certify that work of this Section meets or exceeds performance requirements specified.

1.6 TESTS AND PERFORMANCE REQUIREMENTS

A. Manufacturer's Standard Tests: Provide manufacturer's standard test data showing compliance with specified requirements.

B. Testing and performance data applies to exterior assemblies.

C. Test Sequence: Test sequence is optional, except that air infiltration tests shall precede water resistance tests.

D. Air Infiltration Test: Test unit in accordance with ASTM E 283, as follows:

1. Static Air Pressure Difference: 6.24 psf for fixed storefront units, and 1.567 psf for doors.

2. Performance: Maximum air leakage shall not exceed the following:

a. Fixed Storefront Units: 0.06 cfm per sq. ft. of window area.
b. Door Units: 0.50 cfm per sq. ft. of single doors, 1.00 cfm per sq. ft. for doors hinged in pairs.

E. Water Leakage Test: Test fixed framing system in accordance with ASTM E 331.

1. Test Pressure: 6.24 psf.

2. Performance: No leakage as defined in test method at specified test pressure.

F. Uniform Load Deflection Test: Test units in accordance with ASTM E 330, at following static air pressure difference (Design Wind Pressure), or loads prescribed by code for this project site, whichever is greater. Apply pressure first to exterior side (positive) and then interior side (negative).

1. Design Wind Pressure: 30 pounds per square foot minimum.

2. Test Procedure: Procedure A as specified in ASTM E 330.

3. Performance: Deflection in each member measured at locations of greatest deflection shall not exceed L/175 at specified Design Wind Pressure.

G. Uniform Load Structural Test: Test units in accordance with ASTM E 330 at following static air pressure difference. Apply high-pressure load first on one side and then on other side. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or activating mechanisms.

1. Static Air Pressure: Minimum 1.5 times the Design Wind Pressure.

2. Permanent Deformation in Any Member: Not to exceed 0.2% of member span.

H. Condensation Resistant Factor: Not less than 45 for fixed storefront units, and not less than 48 for doors; per AAMA 1502.7.

I. Thermal Movement: Provide storefront systems that allow for expansion and contraction of members throughout an ambient temperature range of 120 deg F.

J. Seismic Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding the effects of earthquake motions calculated according to requirements of authorities having jurisdiction or ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 9, "Earthquake Loads," whichever are more stringent.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Store under cover and protect from weather damage.

B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.8 WARRANTIES

A. Provide written warranty, signed by manufacturer, agreeing to repair or replace work that exhibits defects in materials or workmanship. "Defects" is defined to include, but not limited to, leakage of water, abnormal aging or deterioration, abnormal deterioration

or fading of finishes, and failure to perform as required. Include requirement for removal and replacement of covering and connected adjacent work.

1. Warranty Period: Three (3) years from date of Substantial Completion; except finish shall be warranted for a period of fifteen (15) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS/PRODUCTS

A. Provide storefronts and entrance systems of one of the following manufacturers that meet or exceed requirements of these specifications:

1. Kawneer Company, Inc.

2. Wausau Metals Corporation.

3. EFCO.

4. Vistawall.

B. Products:

1. Exterior frame system shall be equal to Series 451T, manufactured by Kawneer Company, Inc.; or approved equal manufacturer listed above.

2. Interior frame system shall be equal to Tri-Fab II 450 manufactured by the Kawneer Co. Inc. or approved equal manufacturer listed above.

3. Doors for interior and exterior application shall be "Medium Stile 350" with the “Paneline” exit device as manufactured by the Kawneer Co. Inc. or approved equal manufacturer listed above.

2.2 MATERIALS AND ACCESSORIES

A. Aluminum Members: Provide 6063-T5 alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish. Comply with ASTM B 221 for extrusions, and ASTM B 209 for sheet/plate. Provide 0.125" thick extrusions for door stiles and storefront framing. Provide 0.050" thick aluminum for glazing moldings. Provide pre-finished metal flashing to match frame finish and dams to prevent water infiltration.

1. Structural aluminum shapes shall conform to ASTM B 308.

B. Fasteners: Provide non-magnetic stainless steel fasteners, warranted by manufacturer to be non-corrosive and compatible with aluminum components.

C. Concealed Flashing: Dead-soft stainless steel, 26 gauge minimum, or extruded aluminum 0.062" minimum, of an alloy and type selected by manufacturer for compatibility with other components.

D. Brackets and Reinforcements: Non-magnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.

E. Concrete/Masonry Inserts: Cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.

F. Bituminous Coatings: Cold-applied asphalt mastic compounded for 30-mil thickness per coat.

G. Compression Weatherstripping: Manufacturer's standard replaceable stripping of molded neoprene or PVC gaskets complying with ASTM D 2287.

H. Sliding Weatherstripping: Manufacturer's standard replaceable stripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing.

2.3 HARDWARE

A. Door Pull: Kawneer classic style #CPN that is compatible with the "Paneline" exit device.

B. Hinges: Kawneer standard offset pivot hinges. Reuse the existing floor check hinges.

C. Threshold: Kawneer standard aluminum mill finish threshold, ½"H. x 4"W. Remove and replace the existing threshold.

D. Weatherstripping: Kawneer standard weatherstripping system – provide with a bottom door sweep.

E. Door Controller (for use by Handicapped Users): Horton Automatics "HD-Swing" Series 4100LE Surface Applied Operator with Header Case. Provide with Kan-Tech "T.REX PIR Request to Exit" and 300 MHz Wireless Transmitters/Receivers by MultiCode with stainless steel Push Activation Plates with Blue Handicap Logo & "Push to Open" Text. Connect to existing electrical power supply at each opening.

2.4 FABRICATION

A. Sizes and Profiles: Required sizes for door and frame units, including profile requirements, are indicated on Drawings. Any variable dimensions are indicated, together with maximum and minimum dimensions required to achieve design requirements and coordination with other work.

B. Prefabrication: To greatest extent possible, complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.

1. Preglaze door and frame units to greatest extent possible, in coordination with installation and hardware requirements.

2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.

3. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work in manner which prevents damage to exposed finish surfaces. For hardware, perform these operations prior to application of finishes.

C. Welding: Comply with recommendations of American Welding Society to avoid discoloration; grind exposed welds smooth and restore mechanical finish.

D. Reinforcing: Install reinforcing as necessary for performance requirements; separate dissimilar metals with bituminous paint or other separator to prevent corrosion.

E. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.

F. Fasteners: Conceal fasteners.

G. Provide EPDM/vinyl blade gasket weatherstripping in bottom exterior door rail, adjustable for contact with threshold.

H. At interior doors and other locations without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

I. Provisions shall be made in the framing for minimum edge clearance, nominal edge cover, and nominal pocket width for the thickness and type of glazing installed, and shall be in accordance with the FGMA Glazing Manual.

J. Pocket glazed framing shall provide:

	Single Glass	Insulating Glass
1. Nominal edge cover (or bite) framing only	5/16"	½"
2. Min. nominal edge clearance	1/8"	¼"
3. Min. face clearance	1/8"	5/32"

2.5 STOREFRONT FRAMING

A. General: Provide inside-outside matched resilient flush glazed system with provisions for glass replacement. Shop fabricate and preassemble frame components where possible.

B. Thermal-Break Construction: Fabricate exterior aluminum storefront framing system with integrally concealed, low conductance thermal barrier, located between exterior materials and exposed interior members, in manner which eliminates direct metal-to-metal contact. Provide manufacturer's standard construction which has been in use for similar projects for at least three years.

C. For glass and glazing, refer to Section 088000.

2.6 ALUMINUM DOORS

A. Aluminum entrance doors shall be medium stile factory-glazed aluminum doors, manufactured by same manufacturer as storefront framing.

B. Aluminum entrance doors shall be stile and rail type swing doors. Aluminum shall be extruded aluminum conforming to ASTM B 221, 0.125" thick for door stiles and 0.050" thick for glazing molding.

1. Sections shall be of sizes and profiles indicated; shall present straight, sharply defined lines and arrises; and shall be free from defects impairing strength, durability, and appearance.

2. Fasteners where exposed shall be aluminum stainless steel or plated steel conforming to ASTM A 164.

C. Each door shall be factory glazed set in neoprene glazing gasket, refer to Section 088000 for glass.

D. Doors shall meet the following resistance to corner racking when tested by the Dual Moment Load Test.

1. Test section shall consist of a standard top door corner assembly. Side rail section shall be 24" long and top rail section shall be 12" long.

2. Anchor "top rail" positively to test bench so that corner protrudes 3" beyond bench edge.

3. Anchor a lever arm positively to "side rail" at a point 19" from inside edge of "top rail." Attach weight support pad at a point 19" from inner edge of "side rail."

4. Test section shall withstand a load of 235 lbs. on the lever arm before reaching the point of failure, which shall be considered a rotation of the lever arm in excess of 45 deg.

E. Air Infiltration (applies only to single acting offset pivot or butt hung entrances): Air infiltration shall be tested in accordance with ASTM E 283, at a pressure differential of 1.567 psf. A single 3'-0" x 7'-0" entrance door and frame shall not exceed 0.50 cfm per linear foot of perimeter crack. A pair of 6'-0" x 7'-0" entrance doors and frame shall not exceed 1.0 cfm per linear foot of perimeter crack.

F. For door hardware, refer to Section 087100.

G. Door bottom rail of exterior doors shall have an EPDM blade gasket sweep strip applied with concealed fasteners.

H. Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and fillet welds. Glazing stops shall be hook-in type with EPDM glazing gaskets.

I. The door weatherstripping on a single acting offset pivot or butt hung exterior door and frame (single or pairs) shall be thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.

J. The door weatherstripping on a double acting, center pivoted door and frame (single or pairs) shall be pile cloth. The door bottom rail shall be weathered with an EPDM blade gasket sweep strip applied with concealed fasteners.

K. The meeting stiles on pairs of doors shall be equipped with an adjustable astragal.

2.7 FINISH

A. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed aluminum surfaces and to cut ends of aluminum to comply with coating and resin manufacturer's written instructions.

1. Fluoropolymer Two-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat, containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.

a. Color: Dark bronze.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions where aluminum entrances and storefronts are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

A. Install aluminum entrance doors and storefront framing in openings prepared under other Sections plumb, square, level, in exact alignment with surrounding work, with proper clearances, and securely and positively anchored to building structure, to meet performance requirements specified herein, in accordance with manufacturer’s published instructions and approved submittals.

B. Use only skilled mechanics for erection, under supervision of manufacturer's representative.

C. Provide protection against galvanic action. Isolate dissimilar materials with bituminous coating or non-absorptive dielectric tape.

D. Install aluminum entrance doors, storefront frame, and finish hardware. Carefully fit and adjust doors and hardware to frames and weatherstripping. After erection check and adjust operating hardware for smooth and proper operation.

E. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Section 079200.

F. Erection Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances.

1. Variation from Plane: Limit variation from plane or location shown to 1/8" in 12'-0"; ¼" over total length.

2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16". Where surfaces meet at corners, limit offset from true alignment to 1/32".

3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8".

3.3 FIELD QUALITY CONTROL

A. Testing Agency: If instructed to do so by the Owner and Architect, Contractor shall engage a qualified independent testing agency to perform testing indicated for storefronts.

B. Test fixed frames for water infiltration per AAMA 501.2; latest edition. Test within the first 10% of work complete, area to be a minimum of 100 SF of wall and including a perimeter where frames adjoin adjacent construction. Interior finishes must not interfere with observation of test area or be removed from test area. Not appropriate for operable doors.

1. This test (AAMA 501.2) shall be performed infield on new construction.

C. Repair or remove Work that does not meet requirements or that is damaged by testing; replace to conform to specified requirements.

3.4 PROTECTION AND CLEANING OF ALUMINUM

A. Protect finished metal surfaces from damage during fabrication, shipping, storage, and erection, and from then until acceptance by Owner.

B. Clean metal surfaces promptly after installation, exercising care to avoid damage. Remove excess sealant, dirt, and other substances. Lubricate hardware and other moving parts.

3.5 PROTECTION AND CLEANING OF GLASS

A. Replace glass that is broken, cracked or chipped prior to time of final acceptance of Project by Owner.

B. Clean glass surfaces promptly after installation, exercising care to avoid damage to same.

END OF SECTION

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:
   1. Mechanical door hardware for the following:
      a. Swinging doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Details of electrified door hardware, indicating the following:
   1. Wiring Diagrams: For power, signal, and control wiring and including the following:
      a. Details of interface of electrified door hardware and building safety and security systems.
      b. Schematic diagram of systems that interface with electrified door hardware.
      c. Point-to-point wiring.
      d. Risers.
      e. Elevations doors controlled by electrified door hardware.
   2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

C. Other Action Submittals:
   1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
      a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
      b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.

c. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.

d. Content: Include the following information:

1) Identification number, location, hand, fire rating, size, and material of each door and frame.

2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.

3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.

4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.

5) Fastenings and other pertinent information.

6) Explanation of abbreviations, symbols, and codes contained in schedule.

7) Mounting locations for door hardware.

8) List of related door devices specified in other Sections for each door and frame.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Architectural Hardware Consultant.

B. Product Certificates: For electrified door hardware, from the manufacturer.

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

C. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Warranty: Special warranty specified in this Section.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.

2. Scheduling Responsibility: Preparation of door hardware and keying schedules.

3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:
   1. For door hardware, an Architectural Hardware Consultant (AHC).

C. Source Limitations: Obtain each type of door hardware from a single manufacturer as much as possible.
   1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.

E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
   1. Air Leakage Rate: Maximum air leakage of0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

F. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

G. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and Texas Accessibility Guidelines.
   1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
   2. Comply with the following maximum opening-force requirements:
      a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
      b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
   3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
   4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

H. Keying Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." In addition to Owner, Construction Manager, Contractor, and Architect, conference participants shall also include supplier's Architectural Hardware Consultant and Owner's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Requirements for key control system.
4. Requirements for access control.
5. Address for delivery of keys.

I. Preinstallation Conference: Conduct conference at Project site.
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

1.7 DELIVERY, STORAGE, AND HANDLING

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

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

C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

D. Deliver keys and permanent cores to Owner by registered mail overnight package service, or in person.

1.8 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

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

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

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

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including excessive deflection, cracking, or breakage.
      b. Faulty operation of doors and door hardware, caused by product defects.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
   2. Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
      a. Exit Devices: Three years from date of Substantial Completion.
      b. Manual Closers: 10 years from date of Substantial Completion.

1.10 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Provide parts and supplies that are the same as those used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" to comply with requirements in this Section.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products only.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required no substitutions. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

2.2 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. McKinney; an ASSA ABLOY Group Company.

2.3 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in door hardware schedule.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
   1. Mortise Locks: Minimum 3/4-inch latchbolt throw.
   2. Deadbolts: Minimum 1-inch bolt throw.

C. Lock Backset: 2-3/4 inches, unless otherwise indicated.

D. Lock Trim:
   1. Description: As indicated on Drawings.
   2. Levers: Wrought.
   3. Full Plate Escutcheons: Wrought.
   4. Dummy Trim: Match lock trim and escutcheons.
   5. Operating Device: Lever with Full Plate escutcheons.

E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

F. Mortise Locks: BHMA A156.13; Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.

G. Push-Pull Latches: Bored, BHMA A156.2; Series 4000 Mortise, BHMA A156.13; Grade 1; with paddle handles that retract latchbolt; capable of being mounted vertically or horizontally.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.

2.4 LOCK CYLINDERS

A. Provide to all locking devices 6 pin interchangeable core.

B. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
   1. Manufacturer: Same manufacturer as for locking devices.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the:
   a. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.

C. Standard Lock Cylinders: BHMA A156.5; Grade 1; permanent cores that are interchangeable; face finished to match lockset.

D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.5 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
   1. Great-Grand Master Key System: Change keys, a master key, a grand master key, and a great-grand master key operate cylinders.
   2. Existing System:
      a. Master key or grand master key locks to Owner's existing system. Verify and insure to match existing.

B. Keys: Nickel silver.
   1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
      a. Notation: "DO NOT DUPLICATE.
   2. Quantity: In addition to one extra key blank for each lock, provide the following:
      a. Cylinder Change Keys: Three.
      b. Master Keys: Five.
      c. Grand Master Keys: Five.
      d. Great-Grand Master Keys: Five.

2.6 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. LCN Closers; an Ingersoll-Rand company.

2.7 MECHANICAL STOPS AND HOLDERS

A. Wall- and Floor-Mounted Stops: BHMA A156.16; Stainless Steel base metal.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. National Guard Products (NGP).

2.8 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. Glynn-Johnson; an Ingersoll-Rand company.

2.9 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. National Guard Products.

2.10 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- thick, finish as indicated; with manufacturer's standard machine or self-tapping screw fasteners.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. IVES Hardware; an Ingersoll-Rand company.

2.11 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
   1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
   1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
   2. Fire-Rated Applications:

a. Wood or Machine Screws: For the following:
   1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
   2) Strike plates to frames.
   3) Closers to doors and frames.
b. Steel Through Bolts: For the following unless door blocking is provided:
   1) Surface hinges to doors.
   2) Closers to doors and frames.
   3) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.12 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

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

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

3.2 PREPARATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights unless otherwise indicated or required to comply with governing regulations.
   1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
   2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.
   1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
   2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
   1. Furnish permanent cores to Owner for installation.

E. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

F. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

3.4 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
   1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to

operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DOOR HARDWARE SCHEDULE: The Hardware Schedule represents the hardware per leaf. Any door not scheduled shall have hardware and similar door and similar function. All doors shall be provided with Hardware as a part of the Basic Bid.

LEGEND

ASSA = ASSA ABLOY
CR = CORBIN RUSSWIN
LCN = LCN
MK = MCKINNEY
PE = PEMKO
RO = ROCKWOOD
VO = VON DUPRIN

HW – 1 (SINGLE DOOR - STORAGE ROOM, CUSTODIAL, MECHANICAL)

DOORS #102E, 103A, 103B, 113E, 1CUST3, 1MECH1, 207Aa, 207Ab, 2CUST3, 2CUST4, 309, 310A, 310B, 312A, 312B, 315A, 315B, 316, 3MECH10, 3MECH11, 3STO5, 3STRW4

1½	PAIR BUTTS	MPB68 - 4 ½ X 4 ½	MK	26D
1	MORTISE LOCK	ML2057 x LWM	CR	626
1	CLOSER	4040 XP REG/PA TBWMS	LCN	AL
1	WALL BUMPER	406	RO	US32D
3	DOOR SILENCERS	608-RKW	RO	GREY

NOTE: ALSO PROVIDE A 10” HIGH METAL KICK PLATES FOR OPENINGS #113E, #1CUST3, #2CUST3, #2CUST4, #309, #310A, #310B, #312A, #312B, #315A, #315B, & #316 –

KICK PLATES SHALL BE EQUAL TO *ASSA ABLOY* "ROCKWOOD" #K1050; .050" THICKNESS, US26D/626 FINISH.

NOTE: ON EXISTING DOORS, ALSO PROVIDE A WRAP-AROUND EQUAL TO *DON JO* #4U2CW WITH ESCUTCHEON TRIM, FINISH TO MATCH LOCKSET.

HW – 2 (SINGLE DOOR – EXIT TO STAIRS)

DOORS #2STRW1, 2STRW2, 2STRW3, 3STRW2, 3STRW3

1½	PAIR BUTTS	MPB68 - 4 ½ X 4 ½ FTMS	MK	26D
1	EXIT DEVICE	98L-BE-F x 996-R/V-BE-425-SNB	VO	26D
1	CLOSER	4040 XP REG/PA TBWMS	LCN	AL
1	WALL BUMPER	406	RO	US32D
1	SMOKE SEAL	S88 BL 17'	PE	BLACK
1	THRESHOLD	205AV 36"	PE	AL
1	KICK PLATE	"ROCKWOOD" K1050	ASSA	US26D/626

HW – 3 (OFFICE)

DOORS #102, 102A, 102B, 102C, 102F, 104, 106, 106A, 107, 108A, 108B, 109A, 109d, 110a, 110B, 110b, 110C, 110c, 111, 111A, 111B, 113, 113B, 113C, 113D, 114, 200A, 201, 202, 203, 204A, 204B, 205, 206, 207A, 207B, 211, 216, 216A, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 237A, 238, 238A, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 251A, 252, 253, 284A, 284B, 284C

1½	PAIR BUTTS	MPB68 - 4 ½ X 4 ½	MK	26D
1	MORTISE LOCK	ML2051 x LWM	CR	626
1	PERMANENT CORE	8000 KY3 VKC1	CR	626
1	CLOSER	4040 XP REG/PA TBWMS	LCN	AL
1	WALL BUMPER	406	RO	US32D
3	DOOR SILENCERS	608-RKW	RO	GREY

NOTE: ALSO PROVIDE A 10" HIGH METAL KICK PLATES FOR OPENINGS #110B, #111, #111A, #111B, #113E, #216, #217, #218, #219, #220, #221, #222, #223, #224, #225, #226, #227, #228, #229, #230, #231, #232, #233, #234, #235, #236, #237, #238, #239, #240, #241, #242, #243, #244, #245, #246, #247, #248, #249, #250, #251, #252, #253, #284A, #284B, & #284C – KICK PLATES SHALL BE EQUAL TO *ASSA ABLOY* "ROCKWOOD" #K1050; .050" THICKNESS, US26D/626 FINISH.

NOTE: ON EXISTING DOORS, ALSO PROVIDE A WRAP-AROUND EQUAL TO *DON JO* #4U2CW WITH ESCUTCHEON TRIM, FINISH TO MATCH LOCKSET.

HW – 4 (TOILET ROOM – PRIVATE)

DOORS: #102D, 1RR3, 2TOIL2

1½	PAIR BUTT	MPB68 – 4 ½ X 4 ½	MK	26D
1	MORTISE LOCK	ML2060 x LWM x CL6	CR	626
1	CLOSER	4040 XP x P REG/PA TBWMS	LCN	AL
1	WALL BUMPER	406	RO	US32B
3	DOOR SILENCERS	608-RKW	RO	GREY

NOTE: ON EXISTING DOORS, ALSO PROVIDE A WRAP-AROUND EQUAL TO *DON JO* #4U2CW WITH ESCUTCHEON TRIM, FINISH TO MATCH LOCKSET.

HW – 5 (PAIR DOORS – EXIT TO STAIRS)

DOORS #1STRW2A, 1STRW3A, 3STRW2, 3STRW3

3	PAIR BUTTS	MPB68 - 4 ½ X 4 ½ FTMS	MK	26D
1	FIRE-RATED MULLION	9954 87”	VO	SP28
2	FIRE EXIT DEVICES	98L-BE-F x 996-R/V-BE-425-SNB	VO	US26D
2	CLOSERS	4040 XP REG/PA TBWMS	LCN	AL
2	WALL BUMPERS	406	RO	US32D
1	SMOKE SEAL	S88 BL 20’	PE	BLACK
1	MULLION GASKETING	510BL 120	PE	

NOTE: ALSO PROVIDE A 10” HIGH METAL KICK PLATES FOR OPENINGS #1STRW2A & #1STRW3A – KICK PLATES SHALL BE EQUAL TO *ASSA ABLOY* “ROCKWOOD” #K1050; .050” THICKNESS, US26D/626 FINISH

HW – 6 (PAIR DOORS –STAIRS TO EXTERIOR)

DOORS #1STRW2B, 1STRW3B

3	PAIR BUTTS	MPB99 - 4 ½ X 4 ½ NRP FTMS	MK	26D
1	FIRE-RATED MULLION	9954 87”	VO	SP28
2	FIRE EXIT DEVICES	98EO-F-425-SNB	VO	US26D
2	CLOSERS	4040 XP REG/PA TBWMS	LCN	AL
2	FLOOR STOP	1258M	TR	626
2	RISER	1257R	TR	628
1	RAINDRIP	346C 76”	PE	
2	WEATHERSTRIP	306AV 36”	PE	
2	DORR BOTTOM SWEEP	3452AV 36”	PE	
2	THRESHOLD	2005AV 36”	PE	AL

HW – 7 (PAIR DOORS - STORAGE ROOM, MECHANICAL)

DOORS #105A, 208Aa

3	PAIR BUTTS	MPB68 - 4 ½ X 4 ½ FTMS	MK	US26D
2	FLUSH BOLTS	557	RO	US26D
1	MORTISE LOCK	ML2057 x LWM	CR	626
1	CLOSER	4040 XP REG/PA TBRST	LCN	AL
2	WALL BUMPERS	406	RO	US32D
1	DUST PROOF STIKE	570	RO	US26D
6	DOOR SILENCERS	608-RKW	RO	GREY

NOTE: ALSO PROVIDE A 10" HIGH METAL KICK PLATES FOR OPENING #105A – KICK PLATES SHALL BE EQUAL TO *ASSA ABLOY* "ROCKWOOD" #K1050; .050" THICKNESS, US26D/626 FINISH.

NOTE: ON EXISTING DOORS, ALSO PROVIDE A WRAP-AROUND EQUAL TO *DON JO* #4U2CW WITH ESCUTCHEON TRIM, FINISH TO MATCH LOCKSET.

HW – 8 (EXTERIOR EXIT)

DOORS #1VEST3B, 1STRW3B

1½	PAIR BUTTS	MPB99 - 4 ½ X 4 ½ NRP FTMS	MK	26D
1	EXIT DEVICES	98EO-425-SNB	VO	US26D
1	CLOSERS	4040 XP REG/PA TBWMS	LCN	AL
1	FLOOR STOP	1258M	TR	626
1	RISER	1257R	TR	628
1	RAINDRIP	346C 40"	PE	
1	WEATHERSTRIP	306AV 36"	PE	
1	DOOR BOTTOM SWEEP	3452AV 36"	PE	
1	THRESHOLD	2005AV 36"	PE	AL
3	DOOR SILENCERS	608-RKW	RO	GREY

HW – 9 (CLASSROOM – INTRUDER)

DOORS #113F, 113G, 208A, 208B

1½	PAIR BUTTS	MPB68 - 4 ½ X 4 ½	MK	26D
1	MORTISE LOCK	ML2052 x LWM	CR	626
1	PERMANENT CORE	8000 KY3 VKC1	CR	626
1	CLOSER	4040 XP REG/PA TBWMS	LCN	AL
1	WALL BUMPER	406	RO	US32D
3	DOOR SILENCERS	608-RKW	RO	GREY
1	KICK PLATE	"ROCKWOOD" K1050	ASSA	US26D/626

NOTE: ON EXISTING DOORS, ALSO PROVIDE A WRAP-AROUND EQUAL TO *DON JO* #4U2CW WITH ESCUTCHEON TRIM, FINISH TO MATCH LOCKSET.

HW – 10 (INTERIOR EXIT)

DOORS #1VEST3A, 1CORR4

1½	PAIR BUTTS	MPB68 - 4 ½ X 4 ½ FTMS	MK	26D
1	FIRE EXIT DEVICE	98L-BE-F x 996-R/V-BE-425-SNB	VO	US26D
1	CLOSER	4040 XP REG/PA TBWMS	LCN	AL
1	WALL BUMPER	406	RO	US32D
1	SMOKE SEAL	S88 BL 17’	PE	BLACK

HW – 11 (SINGLE ALUMINUM ENTRANCE/EXIT)

DOORS #108L, 211, 216A, 237A, 238A, 251A

1	PERMANENT CORE	8000 KY3 VKC1	CR	626

REMAINDER OF HARDWARE BY ALUMINUM ENTRANCE SUPPLIER

HW – 12 (PAIR ALUMINUM ENTRANCE/EXIT)

DOORS #1VESTA, 1VESTB, 1VESTC, 1VESTD

2	PERMANENT CORES	8000 KY3 VKC1	CR	626

REMAINDER OF HARDWARE BY ALUMINUM ENTRANCE SUPPLIER

END OF SECTION

SECTION 270500

COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Communications equipment coordination and installation.
2. Sleeves for pathways and cables.
3. Sleeve seals.
4. Grout.
5. Common communications installation requirements.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For sleeve seals.

1.5 COORDINATION

A. Coordinate arrangement, mounting, and support of communications equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting pathways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for communications items that are behind finished surfaces or otherwise concealed.

1.6 PRICING

A. The contractor shall prepare and present to Midwestern State University or their representative pricing which shall include the list of equipment and labor in tabular form including; part numbers, item description, unit pricing, number of units, extended pricing and totals.

PART 2 - PRODUCTS

2.1 SLEEVES FOR PATHWAYS AND CABLES

A. Steel Pipe Sleeves: Hilti CP 653 Speed Sleeve.

2.2 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

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

   a. Hilti USA
   b. STI, Inc.

2. Sealing Elements: EPDM or NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of pathway or cable.
3. Pressure Plates: Stainless steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 4 inches above finished floor level.

G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and pathway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint.

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials.

K. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly.

END OF SECTION

SECTION 270526

GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

A. Grounding conductors.
B. Grounding connectors.
C. Grounding busbars.
D. Grounding rods.
E. Grounding labeling.

1.3 DEFINITIONS

A. BCT: Bonding conductor for telecommunications.

B. EMT: Electrical metallic tubing.

C. TGB: Telecommunications grounding busbar.

D. TMGB: Telecommunications main grounding busbar.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For communications equipment room signal reference grid. Include plans, elevations, sections, details, and attachments to other work.

1.5 INFORMATIONAL SUBMITTALS

A. As-Built Data: Plans showing as-built locations of grounding and bonding infrastructure, including the following:

A. Ground rods.
B. Ground and roof rings.
C. BCT, TMGB, TGBs, and routing of their bonding conductors.

B. Qualification Data: For Installer, installation supervisor, and field inspector.

C. Qualification Data: For testing agency and testing agency's field supervisor.

D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

A. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Result of the ground-resistance test, measured at the point of BCT connection.
b. Result of the bonding-resistance test at each TGB and its nearest grounding electrode.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel **certified by Siemon on staff**.

A. Installation Supervision: Installation shall be under the direct supervision, who shall be present at all times when Work of this Section is performed at Project site.
B. Field Inspector: **Currently registered by Siemon to** perform the on-site inspection.

1.8 PRICING

A. The contractor shall prepare and present to Midwestern State University or their representative pricing which shall include the list of equipment and labor in tabular form including; part numbers, item description, unit pricing, number of units, extended pricing and totals.

PART 2 - PRODUCTS

2.1 SYSTEM COMPONENTS

A. Comply with J-STD-607-A.

2.2 CONDUCTORS

A. Comply with UL 486A-486B.

B. Cable Tray or Ladder Tray Grounding Jumper:

A. Green #8 AWG insulated bonding jumper (12” max) with appropriate lugs or manufactured braided copper grounding jumper equal to B-Line #CAM-GJ, T&B #BD12, OZ/Gedney type “FB” or Mono-Systems.

B. Not smaller than No. 6 AWG and not longer than 12 inches. If jumper is a wire, it shall have a crimped grounding lug with two holes and long barrel for two crimps. If jumper is a flexible braid, it shall have a one-hole ferrule. Attach with grounding screw or connector provided by cable tray manufacturer.

C. Not smaller than No. 10 AWG and not longer than 12 inches. If jumper is a wire, it shall have a crimped grounding lug with one hole and standard barrel for one crimp. If jumper is a flexible braid, it shall have a one- or two-hole ferrule. Attach with grounding screw or connector provided by cable tray manufacturer.

C. Equipment Frame Bonding Conductor

A. **Chatsworth**
B. **Panduit**
C. **Or Equal**

D. Bonding Conductor (BC)

A. Green insulated copper bonding conductor, size as required by NEC.
B. The BC shall be, as a minimum, the same size as the TBB.

E. Telecommunications Bonding Backbone (TBB)

A. Green insulated copper conductor, minimum size of No. 6 AWG. The TBB shall be sized at 2 kcmil per linear foot of conductor length up to a maximum size of 3/0 AWG. Insulation shall meet fire ratings of its pathway.
   a. Table 1 1)
      1) Sizing of the TBB
      2) TBB length (ft) TBB Size (AWG)
         a) Less than 13 6
         b) 14-20 4
         c) 21-26 3
         d) 27-33 2
         e) 34-41 1
         f) 42-52 1/0
         g) 53-66 2/0

   b. Greater than 66 3/0

2.3 GROUNDING BUSBARS

A. Telecommunications Main Grounding Busbar (TMGB) Chatsworth #10622-012 ground busbar with Chatsworth #10622-000 busbar insulators or equivalent in Erico.

B. Telecommunications Grounding Busbar (TGB) Chatsworth #10622-012 ground busbar with Chatsworth #10622-000 busbar insulators or equivalent in Erico.

C. TMGB: Predrilled, wall-mounted, rectangular bars of hard-drawn solid copper, 1/4 by 4 inches in cross section, length as indicated on Drawings. The busbar shall be NRTL listed for use as TMGB and shall comply with J-STD-607-A.

A. Predrilling shall be with holes for use with lugs specified in this Section.
B. Mounting Hardware: Stand-off brackets that provide a 4-inch clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel.
C. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

D. TGB: Predrilled rectangular bars of hard-drawn solid copper, 1/4 by 2 inches in cross section, length as indicated on Drawings. The busbar shall be for wall mounting, shall be NRTL listed as complying with UL 467, and shall comply with J-STD-607-A.

A. Predrilling shall be with holes for use with lugs specified in this Section.
B. Mounting Hardware: Stand-off brackets that provide at least a 2-inch
C. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

E. Rack and Cabinet Grounding Busbars: Rectangular bars of hard-drawn solid copper, accepting conductors ranging from No. 14 to No. 2/0 AWG, NRTL listed as complying with UL 467, and complying with J-STD-607-A. Predrilling shall be with holes for use with lugs specified in this Section.

A. Cabinet-Mounted Busbar: Terminal block, with stainless-steel or copper-plated hardware for attachment to the cabinet.
B. Rack-Mounted Horizontal Busbar: Designed for mounting in 19- inch equipment racks. Include a copper splice bar for transitioning to an adjoining rack, and stainless-steel or copper-plated hardware for attachment to the rack.
C. Rack-Mounted Vertical Busbar: 72 or 36 inches long, with stainless-steel or copper-plated hardware for attachment to the rack.

2.4 GROUNDING JOINTS AND SPLICES

A. Grounding conductor joints/splices shall be mechanical type, copper alloy, with a minimum of two bolts and a separate section for each conductor equal to Burndy “QPX”, OZ/Gedney “XTP” or “PMX” or Penn-Union “VX” or copper compression type with two (2) indents equal to Burndy, T&B or Blackburn.

B. Grounding conductor terminations (lugs) shall be single barrel, mechanical screw type, copper alloy with machined contact surfaces equal to OZ type “SL”, T&B, or Burndy or copper compression type with two (2) indents equal to Burndy, T&B or Blackburn.

2.5 LABELING

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the ac grounding electrode system and equipment grounding for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of the electrical system.

B. Inspect the test results of the ac grounding system measured at the point of BCT connection.

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

D. Proceed with connection of the BCT only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Bonding shall include the ac utility power service entrance, the communications cable entrance, and the grounding electrode system. The bonding of these elements shall form a loop so that each element is connected to at least two others.

B. Comply with NECA 1.

C. Comply with J-STD-607-A.

3.3 APPLICATION

A. Conductors: Install solid conductor for No. 8 AWG and smaller and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

A. The bonding conductors between the TGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.
B. The bonding conductors between the TMGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.

B. Underground Grounding Conductors: Install bare copper conductor, No. 2 AWG minimum.

C. Conductor Terminations and Connections:

A. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
B. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
C. Connections to Ground Rods at Test Wells: Bolted connectors.
D. Connections to Structural Steel: Welded connectors.

D. Conductor Support:

A. Secure grounding and bonding conductors at intervals of not less than 36 inches .

E. Grounding and Bonding Conductors:

A. Install in the straightest and shortest route between the origination and termination point, and no longer than required. The bend radius shall not be smaller than eight times the diameter of the conductor. No one bend may exceed 90 degrees.
B. Install without splices.
C. Support at not more than 36-inch. intervals.
D. Install grounding and bonding conductors in 3/4-inch PVC conduit until conduit enters a telecommunications room. The grounding and bonding conductor pathway through a plenum shall be in EMT. Conductors shall not be installed in EMT unless otherwise indicated.

a. If a grounding and bonding conductor is installed in ferrous metallic conduit, bond the conductor to the conduit using a grounding bushing that complies with requirements in Section 270528 "Pathways for Communications Systems," and bond both ends of the conduit to a TGB.

3.4 GROUNDING BUSBARS

A. Indicate locations of grounding busbars on Drawings. Install busbars horizontally, on insulated spacers 2 inches minimum from wall, 84 inches above finished floor unless otherwise indicated.

B. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

3.5 CONNECTIONS

A. Bond metallic equipment in a telecommunications equipment room to the grounding busbar in that room, using equipment grounding conductors not smaller than No. 6 AWG.

B. Stacking of conductors under a single bolt is not permitted when connecting to busbars.

C. Assemble the wire connector to the conductor, complying with manufacturer's written instructions and as follows:

A. Use crimping tool and the die specific to the connector.
B. Pretwist the conductor.
C. Apply an antioxidant compound to all bolted and compression connections.

D. Primary Protector: Bond to the TMGB with insulated bonding conductor.

E. Interconnections: Interconnect all TGBs with the TMGB with the telecommunications backbone conductor. If more than one TMGB is installed, interconnect TMGBs using the grounding equalizer conductor. The telecommunications backbone conductor and grounding equalizer conductor size shall not be less than 2 kcmils/linear foot of conductor length, up to a maximum size of No. 3/0 AWG 168 kcmils unless otherwise indicated.

F. Telecommunications Enclosures and Equipment Racks: Bond metallic components of enclosures to the telecommunications bonding and grounding system. Install vertically mounted rack grounding busbar unless the enclosure and rack are manufactured with the busbar. Bond the equipment grounding busbar to the TGB No. 2 AWG bonding conductors.

G. Structural Steel: Where the structural steel of a steel frame building is readily accessible within the room or space, bond each TGB and TMGB to the vertical steel of the building frame.

H. Electrical Power Panelboards: Where an electrical panelboard for telecommunications equipment is located in the same room or space, bond each TGB to the ground bar of the panelboard.

I. Shielded Cable: Bond the shield of shielded cable to the TGB in communications rooms and spaces. Comply with TIA/EIA-568-B.1 and TIA/EIA-568-B.2 when grounding screened, balanced, twisted-pair cables.

J. Rack- and Cabinet-Mounted Equipment: Bond powered equipment chassis to the cabinet or rack grounding bar. Power connection shall comply with NFPA 70; the equipment grounding conductor in the power cord of cord- and plug-connected equipment shall be considered as a supplement to bonding requirements in this Section.

K. Access Floors: Bond all metal parts of access floors to the TGB.

L. Equipment Room Signal Reference Grid: Provide a low-impedance path between telecommunications cabinets, equipment racks, and the reference grid, using No. AWG bonding conductors.

A. Install the conductors in grid pattern on 4-foot centers, allowing bonding of one pedestal from each access floor tile.
B. Bond the TGB of the equipment room to the reference grid at two or more locations.
C. Bond all conduits and piping entering the equipment room to the TGB at the perimeter of the room.

D. Waveguides and Coaxial Cable:

a. Bond cable shields at the point of entry into the building to the TGB and to the cable entrance plate, using No. 2 AWG bonding conductors.
b. Bond coaxial cable surge arrester to the ground or roof ring using bonding conductor size recommended by surge-arrester manufacturer.

3.6 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.

B. Comply with IEEE C2 grounding requirements.

C. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches extends above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

D. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect grounding conductors to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.

3.7 IDENTIFICATION

A. Labels shall be preprinted or computer-printed type.

A. Label TMGB(s) with "fs-TMGB," where "fs" is the telecommunications space identifier for the space containing the TMGB.
B. Label TGB(s) with "fs-TGB," where "fs" is the telecommunications space identifier for the space containing the TGB.
C. Label the BCT and each telecommunications backbone conductor at its attachment point: "WARNING! TELECOMMUNICATIONS BONDING CONDUCTOR. DO NOT REMOVE OR DISCONNECT!"

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

A. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
B. Test the bonding connections of the system using an ac earth ground-resistance tester, taking two-point bonding measurements in each telecommunications equipment room containing a TMGB and a TGB and using the process recommended by BICSI TDMM. Conduct tests with the facility in operation.

a. Measure the resistance between the busbar and the nearest available grounding electrode. The maximum acceptable value of this bonding resistance is 100 milliohms.

C. Test for ground loop currents using a digital clamp-on ammeter, with a full-scale of not more than 10 A, displaying current in increments of 0.01 A at an accuracy of plus/minus 2.0 percent.

a. With the grounding infrastructure completed and the communications system electronics operating, measure the current in every conductor connected to the TMGB. Maximum acceptable ac current level is 1 A.

D. Excessive Ground Resistance: If resistance to ground at the BCT exceeds 5 ohms, notify Architect promptly and include recommendations to reduce ground resistance.

E. Grounding system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION

SECTION 27 11 00

COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Telecommunications mounting elements.
2. Backboards.
3. Telecommunications equipment racks and cabinets.
4. Grounding.

B. Related Requirements:

1. Section 271300 "Communications Backbone Cabling" for voice and data cabling associated with system panels and devices.
2. Section 271500 "Communications Horizontal Cabling" for voice and data cabling associated with system panels and devices.
3. Section 280513 "Conductors and Cables for Electronic Safety and Security" for voice and data cabling associated with system panels and devices.

1.3 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. LAN: Local area network.

C. RCDD: Registered Communications Distribution Designer.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for equipment racks and cabinets.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
3. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.

B. Seismic Qualification Certificates: For equipment frames from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions. Base certification on the maximum number of components capable of being mounted in each rack type. Identify components on which certification is based.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by Siemon on staff.

1. Layout Responsibility: Preparation of Shop Drawings shall be under the direct supervision of a Siemon certified technician.
2. Installation Supervision: Installation shall be under the direct supervision of a Registered Siemon Technician, who shall be present at all times when Work of this Section is performed at Project site.
3. Field Inspector: Currently registered by Siemon to perform the on-site inspection.

1.7 PRICING

A. The contractor shall prepare and present to Midwestern State University or their representative pricing which shall include the list of equipment and labor in tabular form including; part numbers, item description, unit pricing, number of units, extended pricing and totals.

PART 2 - PRODUCTS

2.1 BACKBOARDS

A. Backboards: Plywood, fire-retardant treated, ¾” around the perimeter of the room. Comply with requirements for plywood backing panels specified in Section 061000 "Rough Carpentry." Install A/C grade plywood from 6” A.F.F. to structure above. Install up against the door facing. Provide gang box extenders for the receptacles and switches.

2.2 EQUIPMENT FRAMES

A. Siemon

B. General Frame Requirements:

1. Distribution Frames: Freestanding and wall-mounting, modular-steel units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.
2. Module Dimension: Width compatible with EIA 310-D standard, 19-inch panel mounting.
3. Finish: Manufacturer's standard, baked-polyester powder coat.

C. Floor-Mounted Racks: Modular-type, steel construction.

1. Vertical and horizontal cable management channels, top and bottom cable troughs, grounding lug, and a power strip.
2. Baked-polyester powder coat finish.

D. Cable Management for Equipment Frames:

1. Metal, with integral wire retaining fingers.
2. Baked-polyester powder coat finish.
3. Vertical cable management panels shall have front and rear channels, with covers.
4. Provide horizontal crossover cable manager at the top of each relay rack, with a minimum height of two rack units each.

2.3 POWER STRIPS

A. Power Strips: Comply with UL 1363.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Rack mounting.
3. LED indicator lights for power and protection status.
4. LED indicator lights for reverse polarity and open outlet ground.
5. Circuit Breaker and Thermal Fusing: When protection is lost, circuit opens and cannot be reset.
6. Circuit Breaker and Thermal Fusing: Unit continues to supply power if protection is lost.
7. Close-coupled, direct plug-in line cord.

8. Rocker-type on-off switch, illuminated when in on position.
9. Peak Single-Impulse Surge Current Rating: 33 kA per phase.
10. Protection modes shall be line to neutral, line to ground, and neutral to ground. UL 1449 clamping voltage for all three modes shall be not more than 330 V.

2.4 GROUNDING

A. Comply with requirements in Section 270526 "Grounding and Bonding for Communications Systems" for grounding conductors and connectors.

B. Telecommunications Main Bus Bar:

1. Connectors: Mechanical type, cast silicon bronze, solderless -type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
2. Ground Bus Bar: Copper, minimum 1/4 inch thick by 4 inches wide with 9/32-inch holes spaced 1-1/8 inches apart.
3. Stand-Off Insulators: Comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

C. Comply with J-STD-607-A.

2.5 LABELING

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.

C. Shall be preprinted or computer printed type. Hand written labels are not acceptable.

D. Where insert type labels are used provide clear plastic cover over label.

E. Outside plant labels shall be totally waterproof even when submerged.

F. Approved Manufacturer:
1. Brady Corporation
2. Equivalent

G. Equipment Room Copper, Fiber, and Coax Backbone Cable Labels

1. Brady#WML-1231-292

H. Equipment Room Copper, Fiber, and Coax Horizontal Cable Labels

1. Brady#WML-317-292

I. Work Area Copper, Fiber, and Coax Riser Cable Labels
1. Brady #WML-317-292

J. Patch Panel Labels

1. Brady #CL-111-619

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

A. Contact telecommunications service provider and arrange for installation of demarcation point, protected entrance terminals, and a housing when so directed by service provider.

B. Comply with requirements in Section 270528 "Pathways for Communications Systems" for materials and installation requirements for underground and buried pathways.

3.2 INSTALLATION

A. Comply with NECA 1.

B. Comply with BICSI TDMM for layout and installation of communications equipment rooms.

C. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

D. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local exchange carrier.

1. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
2. Record agreements reached in meetings and distribute them to other participants.
3. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.
4. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in the equipment room.

E. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

3.3 SLEEVE AND SLEEVE SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 270544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling." Provide Hilti Speed Sleeves for all penetrations.

3.4 FIRESTOPPING

A. Comply with requirements in Section 078413 "Penetration Firestopping."

B. Comply with TIA-569-B, Annex A, "Firestopping."

C. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.5 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground. Mount at 84” above finished grade.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

   1. Bond the shield of shielded cable to the grounding bus bar in communications rooms and spaces.

3.6 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

B. Comply with requirements in Section 099123 "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

C. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 2, Class 3] [Class 4] level of administration including optional identification requirements of this standard].

D. The size, color, and contrast of all labels should be selected to ensure that the identifiers are easily read. Labels should be visible during the installation of and normal maintenance of the infrastructure.

E. Labels should be resistant to the environmental conditions at the point of installation (such as moisture, heat, or ultraviolet light), and should have a design life equal to or greater than that of the labeled component.

F. All labels shall be printed or generated by a mechanical device.

3.7 TELECOMMUNICATION IDENTIFIERS

A. All voice and data outlets and patch panels shall be clearly marked using permanent means. Voice and data outlets shall by labeled with: Room number "dot" drop number. E.g. for 3 drops in room 101, the drops shall be labeled "101.1, 101.2, & 101.3"

B. Outlet numbers shall be marked by permanent means on each cable at the outlet and at the TR.

C. Wall jacks feature a removable color ID flag to indicate type of service. Blue flags shall be installed for Data drops, and Red jacks shall be installed for Analog/TDM ports.

3.8 LABELING PROCEDURES

A. Visibility and durability

1. The size, color, and contrast of all labels should be selected to ensure that the identifiers are easily read. Labels should be visible during the installation of and normal maintenance of the infrastructure.

2. Labels should be resistant to the environmental conditions at the point of installation (such as moisture, heat, or ultraviolet light), and should have a design life equal to or greater than that of the labeled component.

3. Labels are generally of either the adhesive or insert type. All labels must be legible, resistant to defacement, and maintain adhesion to the application surface.

4. Outside plant labels shall be totally waterproof, even when submerged.

5. Labels applied directly to a cable shall have a clear vinyl wrapping applied over the label and around the cable to permanently affix the label.

6. Other types of labels, such as tie-on labels, may be used. However, the label must be appropriate for the environment in which it is used, and must be used in the manner intended by the manufacturer.

B. Mechanical generation

1. All cable and faceplate labels shall be printed or generated by a mechanical device.

END OF SECTION

SECTION 271300

COMMUNICATIONS BACKBONE CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Pathways.
2. UTP cable.
3. 62.5/125-micrometer, optical fiber cabling.
4. Coaxial cable.
5. Cable connecting hardware, patch panels, and cross-connects.
6. Cabling identification products.

1.3 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

C. EMI: Electromagnetic interference.

D. IDC: Insulation displacement connector.

E. LAN: Local area network.

F. RCDD: Registered Communications Distribution Designer.

G. UTP: Unshielded twisted pair.

1.4 BACKBONE CABLING DESCRIPTION

A. Backbone cabling system shall provide interconnections between communications equipment rooms, main terminal space, and entrance facilities in the telecommunications cabling system structure. Cabling system consists of backbone cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for backbone-to-backbone cross-connection.

B. Backbone cabling cross-connects may be located in communications equipment rooms or at entrance facilities. Bridged taps and splitters shall not be used as part of backbone cabling.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Backbone cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

1. For all cable, include the following installation data for each type used:

   a. Nominal OD.
   b. Minimum bending radius.
   c. Maximum pulling tension.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
3. Cabling administration drawings and printouts.
4. Wiring diagrams to show typical wiring schematics including the following:

   a. Cross-connects.
   b. Patch panels.
   c. Patch cords.

5. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
6. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:

   a. Vertical and horizontal offsets and transitions.
   b. Clearances for access above and to side of cable trays.
   c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
   d. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.

C. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

D. Source quality-control reports.

E. Field quality-control reports.

F. Maintenance Data: For splices and connectors to include in maintenance manuals.

G. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by Siemon on staff.

1. Layout Responsibility: Preparation of Shop Drawings and Cabling Administration Drawings by a Siemon certified technician.
2. Installation Supervision: Installation shall be under the direct supervision of a Siemon certified technician, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by Siemon shall supervise on-site testing.

B. Testing Agency Qualifications: An NRTL.

1. Testing Agency's Field Supervisor: Currently certified by Siemon shall supervise on-site testing.

C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.

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

E. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

F. Grounding: Comply with ANSI-J-STD-607-A.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cable to determine the continuity of the strand end to end. Use optical fiber flashlight or optical loss test set.

2. Test optical fiber cable while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector, including the loss value of each. Retain test data and include the record in maintenance data.
3. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

1.11 PRICING

A. The contractor shall prepare and present to Midwestern State University or their representative pricing based on plenum rated Category 6 type cable for voice and data. Pricing shall include the list of equipment and labor in tabular form including; part numbers, item description, unit pricing, number of units, extended pricing and totals. The pricing shall breakdown the material and labor into the following categories; workstation (voice, data and pathways), copper riser, fiber riser, ER build-out, TR build-out and project management.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

1. Support brackets with cable tie slots for fastening cable ties to brackets.
2. Lacing bars, spools, J-hooks, and D-rings.
3. Straps and other devices.

    a. Siemon RouteIT
    b. Erico Caddy
    c. Cooper B-Line

C. Ladder Trays:

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

    a. Siemon
    b. Chatsworth Products

2. Cable Tray Materials: Metal, suitable for indoors and protected against corrosion by electroplated zinc galvanizing, complying with ASTM B 633, Type 1, not less than 0.000472 inch thick.
    a. Ladder Cable Trays: Nominally 12 to 18 inches wide, and a rung spacing of 12 inches.

D. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems.

2.2 BACKBOARDS

A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements for plywood backing panels specified in Division 06 Section "Rough Carpentry."

2.3 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Siemon # 9C6P4-E3-xx-RXA (02 for data cables & 06 for analog/TDM drops)

B. Description: Solid copper 24 AWG, 100-ohm, multi-pair UTP, formed into 25-pair binder groups covered with a gray thermoplastic jacket.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with TIA/EIA-568-B.1 for performance specifications.
3. Comply with TIA/EIA-568-B.2
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:

    a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.

    b. Cables shall meet the required UL rating(s) based on the installation requirements.

2.4 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Siemon
2. Or Equal

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connecting Blocks: 110-style IDC for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.

D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.

1. Number of Terminals per Field: One for each conductor in assigned cables.

E. Patch Panel: Siemon MAX HD6-24 or MAX HD6-48.

F. Coordinate subparagraph below with Drawings for quantity of fields.

1. Number of Jacks per Field: One for each four-pair.

G. Jacks and Jack Assemblies: Siemon MAX6 angled jacks

H. Cords are generally available in lengths to 20 feet (6 m) and longer in 24-inch (600-mm) increments.

I. Patch Cords: Factory-made, four-pair cables in shall be 60 inches and 84 inches in length at Main, Intermediate and Horizontal cross-connects (MC, IC and HC respectively). 80% of the cables shall be 60 inches and 20% shall be 84 inches. At the Work Area Outlet (WAO) the cables shall be 120 inches.

1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
2. Patch cords shall have color-coded boots for circuit identification.

2.5 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

1. Owens Corning
2. Or Equal

B. Description: Composite Multimode/Single-mode cable. Multimode, laser optimized 62.5/150-micrometer, OM3 multi strand-fiber optical fiber cable intended for outdoor use.

1. Comply with ICEA S-83-596 for mechanical properties.
2. Comply with TIA/EIA-568-B.3 for performance specifications.
3. Comply with TIA/EIA-492AAAA-B for detailed specifications.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:

    a. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.
    b. Riser Rated, Nonconductive: Type OFNR, complying with UL 1666.
    c. Plenum Rated, Conductive: Type OFCP, complying with NFPA 262.
    d. Riser Rated, Conductive: Type OFCR, complying with UL 1666.

5. Conductive cable shall be aluminum armored type.
6. Maximum Attenuation: 3.50 dB/km at 850 nm; 1.5 dB/km at 1300 nm.
7. Minimum Modal Bandwidth: 160 MHz-km at 850 nm; 500 MHz-km at 1300 nm.

C. Jacket:

1. Jacket Color: Aqua for 62-150 -micrometer cable and yellow for single mode cable.
2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-B.
3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches.

2.6 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Siemon

B. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.

1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.

C. Patch Cords: Factory-made, dual-fiber cables in 36-inch lengths.

D. Cable Connecting Hardware:

1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-B.3.
2. Quick-connect, simplex and duplex, Type to comply with equipment termination connectors. Insertion loss not more than 0.75 dB.
3. Type UPC connectors may be used in termination racks, panels, and equipment packages.

2.7 GROUNDING

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems." for grounding conductors and connectors.

B. Comply with ANSI-J-STD-607-A.

2.8 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test cables on reels according to TIA/EIA-568-B.1.

C. Factory test UTP cables according to TIA/EIA-568-B.2.

D. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.

E. Cable will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.

3.2 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.

1. Install plenum cable in environmental air spaces, including plenum ceilings.
2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 INSTALLATION OF PATHWAYS

A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A.

B. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Communications Equipment Room Fittings." Drawings indicate general arrangement of pathways and fittings.

C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

D. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

F. Pathway Installation in Communications Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard when entering room from overhead.
4. Extend conduits 3 inches above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

G. Backboards: Install backboards with 96-inch dimension vertical. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.

3.4 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.

5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
10. In the communications equipment room, install a 6-foot long service loop on each end of cable.
11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-B.2.
2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

D. Optical Fiber Cable Installation:

1. Comply with TIA/EIA-568-B.3.
2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.

E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway, a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

F. Group connecting hardware for cables into separate logical fields.

G. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.

c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.5 FIRESTOPPING

A. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.6 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.7 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

1. Color-code cross-connect fields and apply colors to voice and data service backboards, connections, covers, and labels.

B. See Division 27 Section "Communications Horizontal Cabling" for additional identification requirements. See Evaluations for discussion about TIA/EIA standard as it applies to this Section. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A and shall be approved by Tarrant County College District prior to implementation.

C. Comply with requirements in Division 27 Section "Communications Horizontal Cabling" for cable and asset management software.

D. Cable Schedule: Install in a prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

E. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.

F. Cable and Wire Identification:

1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

   a. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device with name and number of particular device as shown.
   b. Label each unit and field within distribution racks and frames.

5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

G. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA 606-A, for the following:

1. Cables use flexible vinyl or polyester that flexes as cables are bent.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Visually inspect UTP and optical fiber jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.
2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
3. Test UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.

    a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

4. Optical Fiber Cable Tests:

    a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
    b. Link End-to-End Attenuation Tests:

        1) Horizontal and multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
        2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.

C. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

D. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION

SECTION 27 15 00

COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Pathways.
2. UTP cabling.
3. Multiuser telecommunications outlet assemblies.
4. Cable connecting hardware, patch panels, and cross-connects.
5. Telecommunications outlet/connectors.
6. Cabling system identification products.
7. Cable management system.

1.3 DEFINITIONS

A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.

B. BICSI: Building Industry Consulting Service International.

C. Channel Cable Tray: A fabricated structure consisting of a one-piece, ventilated-bottom or solid-bottom channel.

D. Consolidation Point: A location for interconnection between horizontal cables extending from building pathways and horizontal cables extending into furniture pathways.

E. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

F. EMI: Electromagnetic interference.

G. IDC: Insulation displacement connector.

H. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).

I. LAN: Local area network.

J. MUTOA: Multiuser telecommunications outlet assembly, a grouping in one location of several telecommunications outlet/connectors.

K. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.

L. RCDD: Registered Communications Distribution Designer.

M. Solid-Bottom or Nonventilated Cable Tray: A fabricated structure consisting of longitudinal side rails and a bottom without ventilation openings.

N. Trough or Ventilated Cable Tray: A fabricated structure consisting of longitudinal side rails and a bottom having openings for the passage of air.

O. UTP: Unshielded twisted pair.

1.4 HORIZONTAL CABLING DESCRIPTION

A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.

1. Refer to project drawings for outlet locations and number of cables per outlet. If number is not identified a minimum of two cables shall be provided to each outlet.
2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
3. Bridged taps and splices shall not be installed in the horizontal cabling.
4. Splitters shall not be installed as part of the optical fiber cabling.

B. A work area includes the components that extend from the telecommunications outlet/connectors to the station equipment.

C. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment. The maximum allowable length does not include an allowance for the length of 16 feet in the horizontal cross-connect.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

1. For all cable, include the following installation data for each type used:

a. Nominal OD.
b. Minimum bending radius.
c. Maximum pulling tension.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
3. Cabling administration drawings and printouts.
4. Wiring diagrams to show typical wiring schematics, including the following:

    a. Cross-connects.
    b. Patch panels.
    c. Patch cords.

5. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
6. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:

    a. Vertical and horizontal offsets and transitions.
    b. Clearances for access above and to side of cable trays.
    c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
    d. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.

C. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.

D. Source quality-control reports.

E. Field quality-control reports.

F. Maintenance Data: For splices and connectors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Contracting Company: Company must be a Certified Siemon Partner.

B. Installer Qualifications: Cabling Installer must have personnel certified by Siemon on staff.

1. Layout Responsibility: Preparation of Shop Drawings, Cabling Administration Drawings, and field testing program development by personnel certified by Siemon .
2. Installation Supervision: Installation shall be under the direct supervision of a Siemon Certified Technician who shall be present at all times when work of this section is performed at project site.
3. Testing Supervisor: Currently certified by Siemon to supervise on-site testing.

C. Testing Agency Qualifications: An NRTL.

1. Testing Agency's Field Supervisor: Currently certified by Siemon to supervise on-site testing.

D. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.

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

F. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

G. Grounding: Comply with ANSI-J-STD-607-A.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cables to determine the continuity of the strand end to end. Use optical fiber flashlight or optical loss test set.
2. Test optical fiber cables while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector; including the loss value of each. Retain test data and include the record in maintenance data.
3. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

1.11 Pricing

A. The contractor shall prepare and present to Midwestern State University or their representative pricing based on plenum rated Category 6 type cable for voice and data. Pricing shall include the list of equipment and labor in tabular form including; part numbers, item description, unit pricing, number of units, extended pricing and totals. The pricing shall breakdown the material and labor into the following categories; workstation (voice, data and pathways), copper riser, fiber riser, ER build-out, TR build-out and project management.

PART 2 - PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

1. Support brackets with cable tie slots for fastening cable ties to brackets.
2. Lacing bars, spools, J-hooks, and D-rings.

a. Siemon RouteIT

C. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."

1. Standard work area outlet rought-in will include a 1” conduit to a double gang back box with a single gang reducer plate.

2.2 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Siemon # 9C6P4-E3-xx-RXA (02 for Data Cables & 06 for Analog/TDM cables)

B. Description: 100-ohm, 4-pair UTP, formed into 25-pair, binder groups covered with a blue flame-retardant PVC jacket.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with ANSI/TIA/EIA-568-B.2-1 and IEC 61156-5.
3. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:

a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.
b. Communications, Riser Rated: Type CMR, complying with UL 1666.

2.3 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Siemon Corp.

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.

1. Number of Terminals per Field: One for each conductor in assigned cables.

D. Patch Panel: Siemon MAX HD6-24 or MAX HD6-48

Coordinate subparagraph below with Drawings for quantity of fields.

1. Number of Jacks per Field: Two for each four-pair UTP cable indicated.

E. Jacks and Jack Assemblies: Siemon MAX6 angled jacks with Siemon MAX modular faceplates. Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals and shall comply with the rating of the communications cable routed to the assembly. Cords are generally available in lengths to 20 feet (6 m) and longer in 24-inch (600-mm) increments.

F. Patch Cords: Factory-made, four-pair cables in shall be 60 inches. Siemon # MC6-05-06-28

1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
2. Patch cords shall have color-coded boots for circuit identification.

2.4 TELECOMMUNICATIONS OUTLET/CONNECTORS

A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-B.1.

B. Workstation Outlets: Four-port-connector assemblies mounted in single faceplate.

1. Plastic Faceplate: High-impact plastic. Siemon MAX modular faceplates

2.5 GROUNDING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Erico International

B. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

C. Comply with ANSI-J-STD-607-A.

2.6 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

C. The contractor is responsible for coordinating with Midwestern State University for campus specific labeling requirements.

2.7 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.

C. Factory test UTP cables according to TIA/EIA-568-B.2.

D. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.

E. Factory-sweep test coaxial cables at frequencies from 5 MHz to 1 GHz. Sweep test shall test the frequency response, or attenuation over frequency, of a cable by generating a voltage whose frequency is varied through the specified frequency range and graphing the results.

F. Cable will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.

1. Install plenum rated cable in all areas.
2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF PATHWAYS

A. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Communications Equipment Room Fittings." Drawings indicate general arrangement of pathways and fittings.

B. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

C. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

D. Install manufactured conduit sweeps and long-radius elbows whenever possible.

E. Pathway Installation in Communications Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard when entering room from overhead.
4. Extend conduits 3 inches above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.3 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. MUTOA shall not be used as a cross-connect point.
4. Consolidation points may be used only for making a direct connection to telecommunications outlet/connectors:

   a. Do not use consolidation point as a cross-connect point, as a patch connection, or for direct connection to workstation equipment.
   b. Locate consolidation points for UTP at least 49 feet from communications equipment room.

5. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
6. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
7. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
8. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
9. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
10. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
11. In the communications equipment room, install a 6-foot long service loop on each end of cable.
12. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-B.2.
2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

D. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

E. Group connecting hardware for cables into separate logical fields.

F. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.4 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.5 IDENTIFICATION

A. Cable and Wire Identification:

1. Coordinate with Midwestern State University, for campus specific labeling requirements.
2. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
3. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
4. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
5. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

    a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
    b. Label each unit and field within distribution racks and frames.

6. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

B. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.

1. Cables use flexible vinyl or polyester that flex as cables are bent.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for

compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.

2. Visually confirm Category 6, marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test UTP backbone copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.

    a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

5. UTP Performance Tests:

    a. Test for each outlet and MUTOA. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:

        1) Wire map.
        2) Length (physical vs. electrical, and length requirements).
        3) Insertion loss.
        4) Near-end crosstalk (NEXT) loss.
        5) Power sum near-end crosstalk (PSNEXT) loss.
        6) Equal-level far-end crosstalk (ELFEXT).
        7) Power sum equal-level far-end crosstalk (PSELFEXT).
        8) Return loss.
        9) Propagation delay.
        10) Delay skew.
6. Coaxial Cable Tests: Conduct tests according to Division 27 Section "Master Antenna Television System."
7. Final Verification Tests: Perform verification tests for UTP and optical fiber systems after the complete communications cabling and workstation outlet/connectors are installed.

    a. Voice Tests: These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen and receive a dial tone. If a test number is available, make and receive a local, long distance, and digital subscription line telephone call.
    b. Data Tests: These tests assume the Information Technology Staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.

C. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

D. End-to-end cabling will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.7 DEMONSTRATION

A. The contractor shall train the Owner's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

END OF SECTION

SECTION 27 40 00

AUDIO -VIDEO SYSTEMS

PART 1 –GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

Section includes: furnishing, installing, testing and documenting audio-visual systems for Early College High School South Campus.

A. Audio-Visual Systems shall consist of multiple systems with various configurations per the AV Room Type Device Schedules and the design specifications and drawings.

B. These systems include some or all of the following:

1. Wall mounted, ceiling mounted and ceiling hung speaker systems.
2. Mounting of flat screen video displays and projectors.
3. Audio input/output panels, microphones, wireless microphone systems, mixers, switchers, audio processors and amplifiers.
4. Video input/output panels, PTZ cameras, DVD players, switchers and scalers.
5. Video conferencing codecs, microphones, cameras, mounts and cables.
6. Programmable audio-visual remote and automated control system and associated support devices for controlling: audio and videos systems, etc.
8. Floor, wall and desktop connection hubs for audio, video, broadband, LAN, remote control signaling, computer and power connections.
9. Cabling, termination, connector and pull junction boxes.
10. Commissioning, Testing and warranty.

1.3 OVERVIEW

A. The work detailed by these specifications and drawings has been specified to meet certain requirements for performance. Some information, such as exact equipment models, layout, wire routing, additional conduit and power requirements, etc. has been omitted. It shall be the responsibility of the Contractor to translate these specifications and drawings into a complete design package containing all necessary elements for a complete turnkey installation including all material, labor, warranties, shipping and permits.

B. General elements of the work shall consists of but not limited to:

1. Procure all permits and license required to complete this installation.
2. Submission of Part 3.14 Pricing Forms for all equipment, materials and labor.
3. Attend pre-construction/pre-submittal meeting with Owner and Consultant to review design package for the Audio-Video Systems.
4. Prepare schedule of work.
5. Submittal preparation and processing prior to ordering equipment.
6. Attend submittal review meeting.
7. Provide materials necessary to complete the Audio-Video Systems.
8. Perform camera pre-installation sign-off walk through with Owner and Consultant.
9. Installation of cameras and camera cabling
10. Provide all required software and licenses to the Owner.
11. Contractor shall provide continuous on-site supervision of the installation technicians. On-site supervision shall include: daily supervision of the work, updating work site progress drawings to reflect changes and installations details, preparing weekly progress reports and attendance at site coordination meetings as directed by the Owner and Consultant.
12. The Contractor shall provide all miscellaneous hardware including cable management devices, termination cabinets, wire and cable labeling materials, fasteners, hangers and brackets as required.

13. The contractor shall provide all materials, equipment, labor and all other incidental material, tools, appliances and transportation as required for a complete and functional video system (VS) as described herein and supplementary drawings.

14. Coordinate receipt of Owner furnished equipment.

15. Perform installation according to contract documents and manufacturers recommendations.

16. Protect new facilities finishes and equipment.

18. Clean the work area at the end of each day.

19. Provide system software and programming and other materials necessary for the Audio-Video Systems to function by standard industry practices.

20. Program Audio-Video Systems and load with user define text and specified operations per design specifications and drawings.

21. All touch panel and internet controls must have "User interface" (Basic functionality) and Lockable / password "Admin user interface" (Advance functionality). Coordinate all programming with Owner and Consultant for approval.

22. Providing (2) final programming changes for all systems within warranty period after acceptance date.

23. Perform initial testing, programming and adjustments with written reports.

24. Make final adjustments, calibrations and programming modifications as directed by the Owner and Consultant.

25. Demonstrate all systems for final acceptance.

26. Preparation of O&M manuals and as-built documents for Owner's use.

27. Providing training for Owner's staff, facility personnel and technical staff.

28. Providing warranty service for a period of one year from acceptance date.

29. Provide extended system support.

30. 6-Months prior to "Owner Move-In" date, Owner and AV Design Consultant reserve the right to review and modify the AV systems design and specifications. The Contractor shall arrange date and task with Owner and AV Design Consultant. Contractor shall not proceed with installation (including wiring) and material procurement till Owner review is conducted. The Contractor shall provide an itemized bid outlining AV equipment, labor, and mark-up costs. The Contractor shall permit the Owner and/or AV Design Consultant to modify the AV system

design and products without incurring additional cost, fees, and mark-ups. The Contractor shall allow the Owner to exchange products of equal cost without incurring additional cost, fees and mark-ups. Should the Contractor deem product exchange and/or labor cost is significantly higher in cost, the Contractor shall provide Owner/AV Design Consultant an itemized "Change Order Form" for review and approval. Owner/AV Design Consultant reserve the right to deem the Contractor's "Change Order" admissible.

1.4 DEFINITIONS

A. AVS: Audio-Visual System.

B. OWNER: Midwestern State University as described herein and supplementary drawings.

C. OFOI: Owner Furnished Owner Installed.

D. CONTRACTOR: Contractor or subcontractor providing and installing the Audio-Visual System.

E. PROVIDE: Furnish, install, commission, test and warrant.

G. WORK: Action required furnishing, installing, commissioning, testing and warranting the Audio-Visual Systems.

H. COMPONENT: Any individual item of equipment or material which is an element of the Audio-Visual Infrastructure System.

I. ZONE – Separate parallel signal path with independent processing and alternate program capabilities.

J. AGC: Automatic gain control.

K. CCD: Charge-coupled device.

L. CTS -D: Certified Technology Specialist-Design

M. MPEG: Moving picture experts group.

N. NTSC: National Television System Committee. O. UPS: Uninterruptible power supply.

P. PoE: Power over Ethernet

1.5 PERFORMANCE REQUIREMENTS

A. These specialized AVS systems are designed to efficiently support the Owner's various facilities and activity areas in a manner, which can be proficiently managed by the staff. Work shall include the complete turnkey installation and commissioning of these systems per the following specifications and drawings.

1.6 SUBMITTALS

A. Product Data:

1. List all system components including manufacturer and model number.

2. Manufacturer's literature sheets for all materials and equipment, including warranty information, recommended preventative maintenance and spare part inventory recommendations. Literature containing more than one device shall be clearly marked to delineate item(s) included in the Work.

3. Clearly indicate color or special finishes.

4. Correlate products with 274000 Specification and use in Project.

5. Contractor's on-site CTS -D supervisor shall review, approve and sign off all submittal documents.

B. Pricing Forms: Contractor shall submit completed pricing form that includes an itemized listing of all equipment, materials and labor required for the installation of the system as specified herein for Change Order pricing. The listing shall contain: item description, item model number, quantity, unit cost and extended labor, material and installation cost required to provide a complete and functional system. Note that Schematics show rooms both with and without Video Conferencing functionality; provide itemized pricing by room for both options.

C. Programming:

1. Provide and coordinate with the Owner all possible control functionalities based on project drawing and specifications.

2. Provide screen shots / templates and a narrative description of all "User Interfaces" and "Admin Interfaces" functionality. Contractor must have written approval of control lay-out and functionality prior to installation of programming. Provide Owner with a full functioning control system.

3. The Contractor shall provide a certified Extron Control Specialist to perform all audio-visual control system programming.

D. Shop Drawings:

1. Contractor's on-site CTS -D supervisor shall review, approve and sign off all shop drawings, coordination drawings As Built Drawings documents.

2. Reproducing Contract Documents for shop drawing is not acceptable.

3. Shop drawings to include the following:

a. Drawing legend sheet describing all symbols used on the drawings.

b. Floor plans with all devices and wiring raceway depicted.

c. Wire runs with tags for type, gauge, quantities and cable identifiers.

d. System riser diagram indicating all field devices, riser paths and room designations.

e. Block diagram for each system showing all equipment and signal pathways.

f. Point schedules defining interconnection of all inputs and outputs for all equipment including data connections and other systems with cable identifiers.

g. Elevations of equipment racks and teaching consoles. h. Fabrication shop drawings for all custom components.

i. Diagrams for power, signal, control wiring and grounding.

j. Include plans, elevations, sections, details, and attachments to other work.

E. Coordination Drawings: Reflected ceiling plans, drawn to scale, with ceiling-mounted including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings are shown and coordinated, using input from installers of the items involved. Provide similar elevation drawings for wall-mounted items.

F. Samples: Provide as requested for colors and texture coordination.

G. Partial submittals shall not be acceptable without prior approval by Owner.

H. No portion of the work shall commence or equipment ordered until the Owner has approved the submittals.

I. The Contractor shall not be relieved from any contract-required responsibility by the Owner's approval of submittals.

J. Nothing in the specification shall relieve Contractor of system package design responsibility, including, but not limited to, all equipment furnished under this Contract. The Contractor is, in all cases, solely responsible for the performance of the delivered AVS, and for furnishing complete system documentation for each and every part of the system.

K. Extended AVS Support.

1. Provide pricing for AVS hardware and software support including necessary reconfiguration and data base changes for years 2 through 5.

L. Resubmitting.

1. Make corrections or changes in Submittals as required by the Consultant's stamped instructions and attached comments and resubmit.

2. Identify changes on resubmittals by clouding. Only indicated changes will be reviewed when resubmitted.

3. Added drawings shall be clearly identified.

4. Contractor shall be responsible for project delays caused by rejected submittals.

5. Consultant shall be compensated for additional services for submittals rejected more than twice. The amount of such compensation shall be incorporated by change order and withheld from the Contractor's Application for Payment.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:

1. The Contractor performing the installation shall have a minimum of 5 years experience in the installation of AVS systems of similar size and scope.

2. An Infocomm CTS -D shall supervise and approve all on-site work as a recognized member of the Contractor's installation team. All installation team members must demonstrate knowledge and compliance with all Infocomm, TIA, UL, and NEC methods, standards and codes. Submit resumes of the entire team and completed training courses and certifications.

3. All members of the installation team must be certified by the Manufacturer as having completed the necessary training to complete their part of the installation.

4. Owner's representative may make such investigations as deemed necessary to determine that the Contractor is responsive, responsible and qualified in the area of work contemplated by the Contract. In this regard, the Contractor shall furnish to the Owner such information as requested for this purpose. Information and data may include (but not necessarily be limited to): Date of organization and/or incorporation and number of years engaged in this business under present firm's names; list of major equipment owned by the company; list of principal personnel who will be involved in the execution of this contract with the experience and

qualifications of each person.

5. Contractor shall have local in-house engineering and project management capability consistent with the requirements of this project. The Contractor shall provide a project manager that shall be the same individual throughout the project and shall be the person responsible for system programming, preparation of Operation and Maintenance Manuals, Training, Programs, Schedules and Test Protocols, documentation of system testing, maintenance of record drawings and coordination and scheduling of all labor.

6. Contractor shall be or have direct relations through their subcontractors, an authorized manufacturer's representative for all products they furnish or install.

7. Contractor shall have a local organization capable of providing maintenance and service for the specified system. Facility shall be no more than 100 miles from Owner's site.

8. Contractor shall be capable of providing emergency service on a 24-hour, 7 days a week basis.

9. The Contractor shall provide a certified Extron Control Specialist to perform all audio-visual control system programming.

10. All members of the audio-visual installation team shall be certified and completed the Extron AV Associate program to perform and complete the AV installation.

B. Conflicts:

1. In the event of any conflicts between documents referenced herein and the contents of this specification, the Contractor shall notify in writing to Consultant of any such occurrences before the purchasing of any equipment, materials and/or installation. The Consultant will notify the Contractor of any actions required to resolve these conflicts. Such actions may include but are not limited to: design changes, equipment, materials and/or installation changes. In any event, Contractor shall not supersede specifications and standards from the latest NFPA and NEC publications.

C. The Contractor shall provide all materials, equipment and installation in compliance with the latest applicable standards from ANSI, ASTM, FCC, IEEE, NCTA, NEC, NEMA, NFPA, REA, TIA/EIA, and UL including but not limited to:

1. American National Standards Institute (ANSI).

2. ANSI T1.404 (DS3) and CATV Applications.

3. American Society for Testing And Materials (ASTM).

4. American with Disabilities Act (ADA).

5. EIA/TIA-569 Standard, Commercial Building Standard for Telecommunications Pathways and Spaces.

6. EIA/TIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications.

7. National Cable Television Association (NCTA).

8. NCTA-02 NCTA Recommended Practices for Measurements on Cable Television Systems.

9. National Electrical Code (NEC) (Latest revision and pertinent addendums).

   a. Article 250, Grounding.

   b. Article 300, Part A. Wiring Method.

   c. Article 310, Conductors for General Wiring.

   d. Article 800, Communication Systems.

10. National Fire Protection Association (NFPA) Publications (Latest revisions and pertinent addendums).

11. Underwriters Laboratories (UL).

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. NECA 1 Good Workmanship in Electrical Contracting.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: System components shall be equipped and rated for the environments where installed.

B. Environmental Conditions.

1. Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

   a. Interior, Controlled Environment: System components installed in conditioned interior environments shall be rated for continuous operation in ambient conditions of 36 to 122 deg F (2 to 50 deg C) dry bulb and 20 to 90

percent relative humidity, non-condensing.

b. Interior, Uncontrolled Environment: System components installed in non-conditioned interior environments shall be rated for continuous operation in ambient conditions of 0 to 122 deg F (minus 18 to plus 50 deg C) dry bulb and 20 to 90 percent relative humidity, non-condensing.

c. Exterior Environment: System components installed in locations exposed to weather shall be rated for continuous operation in ambient conditions of minus 30 to plus 122 deg F (minus 34 to plus 50 deg C)] dry bulb and 20 to 90 percent relative humidity, condensing. Rate for continuous operation when exposed to rain as specified in NEMA 250, winds up to 85 mph (137 km/h) and snow cover up to 24 inches (610 mm) thick.

1.9 PROJECT COORDINATION AND PLAN

A. Contractor shall submit a project plan detailing the steps and associated timeframe to meet the General Contractor's schedule requirements. Project plan should include benchmarks for items such as regular project meetings, equipment order and delivery, installations, configuration and calibrations, testing and burn-in, training, substantial completion notification, testing and final acceptance.

B. Contractor assumes total responsibility for coordinating with building trades or other parties as may be identified by the General Contractor.

C. Coordinate size and location of conduit systems, back boxes, and provisions for electrical power to equipment of this Section.

D. The Contractor must obtain written permission from the General Contractor prior to routing and/or installing cable, equipment or service through the facility.

E. Contractor shall prepare the installation schedule to coordinate sequencing, dependencies and priorities of the system installation including work by other trades.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

B. Approved manufacturers:

1. Chief Manufacturing

2. CommScope Properties, LLC.
3. Da-Lite
4. Elmo
5. Epson
6. Extron
7. Furman
8. Middle Atlantic Products
9. Samsung
10. Shure
11. Sony
12. Spectrum Furniture
13. Wiremold

2.2 AUDIO VISUAL TYPES

A. Verify all quantities with AV drawings and Specifications. Provide all necessary elements for a complete turnkey installation including all material, labor, programming, warranties, shipping and permits.

B. Audio Visual Control System to be composed of approved components and software. Provide necessary cables, connector and other components a required for the systems to function per the drawings and specifications.

C. Coordinate with Owner to develop basis for control system GUI "look and feel" for all A/V room types. D. Coordinate and verify all AV programming with Owner prior to installation.

2.3 AVS CONTROL SYSTEMS- Models and count as required by schematic control requirements.

A. Approved manufacturers

1. Extron

a. MLC 226IP AAP Keypad Controller

1) Provide (1) CM-3BLB 3 button expansion

2.4 VIDEO SWITCHER

A. Approved manufacturers

1. Extron

a. IN1608MA

2.5 TRANSMITTER AND RECEIVER

A. Approved manufacturers:

1. Extron

a. DTP HDMI 230 Rx Receiver

2.6 EXTENDERS

A. Approved manufacturers:

1. C2G

a. 29341 USB BOOSTER KIT

2.7 AUDIO SPEAKERS

A. Approved manufacturers:

1. Extron

a. FF220T

2.10 PROJECTOR

A. Approved Products:

1. Panasonic

a. PT-RW430/470

2.15 POWER CONDITIONER & UPS

A. Approved products:

1. APC

a. SCM450RM1U. Provide (1) at each lectern

2. Furman

a. PL8C Power Conditioner. Provide (1) at each Classroom lectern

B. All AV racks and lecterns equipment must be power conditioned protected.

2.19 CABLES

A. All AV is to be provided by AV Contractor.

B. All cables will be plenum rated per NEC.

C. Contractor to provide proper rated cable type per installation OSP, riser, or plenum.

D. All cabling installed underground in concrete slabs, in direct contact with the earth, locations subject to saturation with liquids and unprotected locations exposed to weather proofing compounds and sheathing.

E. Provide types and quantities per drawings and schedules.

F. Conductor Sizing:

1. Insulation shall be rated for a minimum of 300 volts.

2. Wire types and minimum sizes:

a. 70 Volt Speaker Cable - 18AWG, twisted, stranded CMP.
b. Microphone Level Cable - 22 AWG, with 22 AWG drain wire, shielded, twisted, stranded CL2/CL2P.
d. Line Level Cable - 22 AWG, with 22 AWG drain wire, shielded, twisted, stranded CL2/CL2P.
e. Low Voltage Control Cable - 22 AWG twisted, stranded L2/CL2P.
f. CAT-5e/6 shielded

G. Minimum acceptable AVS systems wiring performance standards shall be as follows:

1. Speaker cable - Per ANSI WC57 standard test.
2. CAT-5/6 - Per ANSI/TIA/EIA-568-8.1 standard test.
3. RS 232 - Per ANSI/ WC66 standard test.
4. Line level shielded audio cable - Per ANSI WC66 standard test.
5. Microphone level shielded audio cable - Per ANSI WC66 standard test.
6. Multi-conductor control cable - Per ANSI WC57 standard test.

H. Approved manufacturers:

1. Liberty
2. West Penn Wire/CDT; a division of Cable Design Technologies, Inc.
3. Belden Inc., Electronics Division.

4. Extron

2.21 AV PATHWAY

A. Approved manufacturers:

1. Erico Caddy
2. Cooper B-Line
3. Panduit
4. Or approved equal

B. J-hooks or saddle bags shall be installed 4ft to 5ft apart. Uniform spacing should be avoided to minimize problems with signal degradation.

C. J-hooks or saddle bags shall be supported from decking or building structure using methods approved by the manufacturer.

D. Cable count shall not exceed manufacturer's recommended maximum. Add separate parallel J-hook pathway when cable count requires it.

2.22 CABLE CONNECTORS

A. Approved manufacturers:

1. Liberty

2. Extron

PART 3 - EXECUTION

3.1 CONSTRUCTION MEETINGS

A. The Consultant and/or Owner will hold regular construction meetings to review the installation schedule. It is mandatory that the Contractor's project manager attend each meeting.

3.2 SITE INSPECTION

A. Continuously verify that the site conditions are in agreement with the Contract Documents and the AVS design. Notify Owner's representative immediately of conditions that affect the performance of the installed system.

B. Coordinate any required work that is not specified in the Contract Documents.

3.3 COORDINATION

A. Adequate conduit and back boxes are provided for the specified system installation.

B. Adequate power has been provided for the specified system installation.

C. Verify mounting location of all devices with Owner prior to installation.

3.4 GENERAL

A. The Contractor shall be responsible for providing all wire and cable as required for complete and operational system.

B. All cables must be continuous runs from device location to the final point of termination. No mid run cable splices will be allowed.

C. Make connections and splices with solderless devices that are mechanically and electrically secure in accordance with manufacturer's recommendations.

D. The cable installation techniques shall be such that the mechanical and communications characteristics of the cables are not degraded at the time of installation. Any special environmental requirements for equipment shall be specified.

E. Wiring Method: Install cables in raceways except in accessible indoor ceiling spaces, in hollow gypsum-board partitions, and as otherwise indicated. Conceal raceways and wiring except in unfinished spaces.

F. Distribution of the cabling will be accomplished through cable trays, J-hooks, cable runways, conduit raceways, ducts, core holes, extended columns, false half columns and plenums. Horizontal cable segments will be placed in cable trays and when they leave cable trays will be supported by distribution rings. Where cables converge at equipment room locations, they will be supported by cable runways and distribution rings. All cable placements shall be based on the enclosed drawings.

G. The Contractor shall not place wiring in the same conduit or raceway with wire for electrical power distribution.

H. Connectors to all devices in system shall be protected against moisture. Approval of the method shall not relieve the Contractor of full responsibility for proper application and workmanship of the materials in the manner specifically approved. All connector threads shall be treated with an approved silicone lubricant.

I. The Contractor shall be responsible for providing approved grounds for all AVS system equipment per the manufactures recommendations. The Contractor shall also be responsible for ensuring ground continuity by properly bonding all appropriate cabling, closures, cabinets, service boxes, and framework. All ground connections shall consist of minimum 12 AWG copper wires and shall be supplied from an approved building ground and bonded to the main electrical ground. Contractor must notify the Owner prior to making any changes in submitted system design and/or installation.

J. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

K. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

L. Grounding: Provide independent-signal circuit grounding per practices published by the manufacturer.

3.5 IDENTIFICATION, LABELING AND DOCUMENTATION

A. The Contractor shall label all termination devices, panels, enclosures and equipment rooms. The Contractor will mark each unit with permanently attached markings that will not impair the equipment or present a hazard to maintenance personnel.

B. Place wire identification numbers ¼" on each end of all conductors and or connectors by using sleeve type heat shrinkable markers. Install markers to be readable from left to right or top to bottom. Wire numbers shall be computer printed (Brady TLS2200 with Permasleeve cable marking labels or equivalent). Hand written labels are not acceptable.

C. Mark all spare conductors.

D. Contractor to maintain a progress set of design documents on the Project site. These documents shall be updated daily to reflect the current condition of the work and available for review by the Consultant and Owner when requested.

E. If changes occur prior to acceptance testing altering the documentation previously furnished. The Contractor shall formally update and reissue the relevant documentation to the Consultant and Owner.

F. Consultant and Owner will review all documentation for accuracy and completeness and

may reject substandard submittals.

G. The Contractor shall establish and maintain complete system documentation, including documentation procedures, operational information, configuration information and drawings. Documentation shall include the following:

1. Floor plan drawings indicating device locations, unique system point numbers with device legends indicating manufacturers and model numbers for each device.

2. The unique system point number of a device shall identify either through the software or hardwire connection, the specific device or group of devices associated with the unique point number in the system.

3. Floor plan drawings indicating conduit and wire routing and junction box locations.

4. Wire routing shall include cable identification and terminal strip numbers.

5. Mounting details for all equipment and hardware.

6. Functional block diagrams for each system.

7. Wiring details showing rack elevations, equipment wiring and terminations and inter-rack wiring.

3.6 FIELD QUALITY CONTROL

A. Inspection: Verify that units and controls are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.

B. Pre-testing: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements.

C. Test Schedule: Schedule tests after pre-testing has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.

D. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.

E. Remove and replace malfunctioning items and retest as specified above.

F. Record test results for each piece of equipment.

G. Re-test: Correct deficiencies identified by tests and observations and retest until specified

requirements are met.

3.7 ADJUSTING

A. Programming:

1. Owner may use AV control system 1-3 months after substantial completion / warranty period Contractor must provide the Owner (2) final programming change to any aspect of the AV control systems including, but not limited to:

   a. Touch Panels
   b. Key Pads
   c. Functionality
   d. Control
   e. Lay-out
   f. Added equipment

B. Speaker Systems

1. Equalize speaker systems flat from 80 Hz to 2 KHz with a 2dB per octave roll-off thereafter. Program a high pass filter at 60Hz with 12dB per octave roll off and a low pass filter 15 KHz with 12 dB per octave roll off.

2. Use a minimum of three measurement locations in the system's intended coverage area to calibrate the system response.

3. Verify system gain and amplifier levels.

4. Verify speaker polarity

5. Adjust appropriate speaker delays.

6. Set and adjust limiters.

7. Contractor shall provide for calibration of the system:

   a. Sound analyzer (SmartLive, TEF SoundLab, Meyer's SIM or equivalent) with trained operator for adjusting and verifying delay timing, cabinet aim and equalization.

   b. Suitable calibrated microphone.

8. The Contractor shall coordinate this testing and calibration. It is anticipated that this work will take 1 hour per classroom. It will be necessary to have a quiet room during these times.

9. Contractor to record all measurements, settings and adjustment for inclusion in the O&M manuals.

C. Adjust limit switches on electric operated projection screens.

D. Adjust back focus on all video cameras.

E. Occupancy Adjustments: When requested within 12 months following the of date of Substantial Completion, provide on-site assistance in adjusting systems to suit actual occupied conditions and to optimize performance of the installed equipment. Tasks shall include, but are not limited to, the following:

1. Check cable connections.

2. Check proper operation of equipment.

3. Adjust all presets; consult Owner's personnel.

4. Recommend changes to the AVS to improve Owner' utilization of the system.

5. Provide a written report of adjustments and recommendations.

3.8 TEST EQUIPMENT

A. Sensitive AC voltmeter, -80 dBu sensitivity, 20-30 kHz response, able to measure signal to noise ratio, THD, electrical audio levels within the system. Note that some systems require measurements up to 100 volts and may require an external pad.

B. Sound Pressure Level Meter, ANSI Type II, with A and C weighting filters, fast or time-a averaged.

C. Audio Signal generator, 20-30 kHz, sine wave, pink noise.

D. Analog Video Signal Generator NTSC/PAL, plus computer patterns at all required resolutions and refresh rates required for the systems under test. For systems with composite video, include PLUGE pattern.

E. Digital Video Signal Generator for computer patterns for all resolutions and refresh rates required for the systems under test, HDMI/DVI.

F. The ability to measure STI-PA (source and analyzer).

G. Infrared Thermometer.

H. Testing material with known levels (audio, video, etc): CD's, VHS, DVD's, etc. I.AC/DC Multi-Meter.

J. Cable sets, cable assemblies, adapters as required to sample and measure in-or out of circuit as required.

3.9 STAGING TEST (PRE COMMISSIONING)

A. Sanity Check: Is there any reason why this system should NOT be released for installation? Is everything plumb and square, clean and blemish-free? Prepare document report, certifying the product, performance, and practices are in compliance, and noting any exceptions below. The Staging checklist must be reviewed and signed by someone within the organization, with the proper competencies (CTS -D or CTS -I with Testing and Verification Specialist Certification) to attest that the system being installed has been completely staged, with the exceptions noted, all items on the checklist have been completed, that rack elevations are as specified, that all the equipment is new, and the system is complete and in accordance with the specification in product, practice, and performance. Distribute accordingly.

B. All the equipment can be pulled for repairs or replacement without hindrance to cabling and or other equipment.

C. All cables, input / output plates, devices, equipment inputs/outputs, devices and racks are identified in a consistent, permanent, non-slipping manner, and all identification tags are visible. All labeling have clearly legible, unambiguous identifying labels, and labels are oriented and positioned consistently.

D. Terminations are free from stress due to gravity acting on the form.

E. Terminations have sufficient service loop, allowing a re-termination or two without having to open a form to lay in a new cable.

F. Cable supports are used when unsupported cable lengths exceed 12 inches (depending on size and stiffness of cables).

G. Screw terminals have spade or ring lugs on wires.

H. Cables have “signal separation”; that is, cables carrying voltages varying by 20 dB or more are in different forms separated by at least 4 inches to prevent cross talk.

I. All unbalanced and balanced terminations are in agreement with the equipment manufacturer’s recommendations.

J. List all equipment in the system NOT present, and why.

K. All equipment installed. All mounts for all racks and field equipment (rack mounts, ceiling

mounts, wall mounts, loudspeaker mounts, etc.) have been verified and tested.

L. Racks are “clean” - grease markings removed, etc.

M. All blanks installed.

N. ALL equipment hooked up as per flow diagram: microphones, loudspeakers, video monitors, projectors, PC’s, USB switchers, etc.

O. Audio Tested (all lines marked). Test with sound generator or test CD with pass/ fail result or which device at what frequencies.

1. Balance all inputs and output

2. Proper gain structure

3. Polarity

4. Sound generator and CD

P. Video tested (all lines marked). Test with test video pattern generator with pass/ fail result.

1. When HDMI signals are included in the system, confirm that an acceptable signal is being displayed on the monitor from each source using a HDMI generator with HDCP. All the staged cabling should be either the actual cables and converters to be installed, or using connections and converters that emulate the field conditions with as close to the installed cable lengths as possible. Whenever possible, the actual display to be installed should be tested with the cables and converters as well: 1920x1200@60, 1920x1080@60, 1280x720@60, 1366x768@60, 1024x768@60, 800x600@60, 1600x1200@60.

2. Inspect each, leaving the signal on for three minutes (no “sparklies” or other artifacts). Note: If the signal is going to a codec, HDCP should be turned off (codecs do not support HDCP). If the signal
is going to a display, HDCP should be turned on for a complete HDMI test to verify cables and display input.

Q. Control tested (all lines marked - emulate closures for screens, motors, etc.)

R. IP information provided by client and loaded into system, including IP address, subnet mask, gateway, timeserver, Gatekeeper, etc.

S. Confirm IP information on all devices with a NIC card have IP address, DHCP enabled, or can otherwise be accessed over a LAN before leaving the shop. List IP settings for each

piece of equipment on the network at the bottom of this report, or attached as a separate document.

T. Any web-based system control or monitoring features and other IP functionality of system thoroughly tested.

U. All serial controlled equipment properly configured and communications established.

V. Confirm control system functions as design intent.

W. All programming installed (control system, DSP devices), and properly communicating with the equipment intended. If a control specification is present, it has been thoroughly tested.

X. When system is powered down, system "up" sequence presents the system in a desirable state with no objectionable anomalies.

Y. Thermal gradient inspected; all equipment operating within manufacturers' guidelines.

Z. Inspect camera(s) image quality.

AA. Video – record or photograph any non-conformances, anomalies, etc.

3.10 COMMISSIONING

A. Sanity Check: Is there any reason why this system should NOT be released for installation? Is everything plumb and square, clean and blemish-free? Prepare document report, certifying the product, performance, and practices are in compliance, and noting any exceptions below. The Commissioning Checklist must be reviewed and signed by someone within the organization with the proper competencies (CTS -D or CTS -I with Testing and Verification Specialist Certification) to attest that the system installed is complete, all items on the above checklist have been completed, that rack elevations are as specified, that all equipment is new, and that all engineering, fabrication, programming, installation, testing, and checkout is in accordance with the specification in product, practice and performance. Distribute accordingly.

B. Inspect and verify that all exceptions from the "Staging" checklist have been successfully completed.

C. Full inventory to be all new equipment, in full compliance with the specification, or as modified by approved submission. Record test results as pass/fail, and list exceptions.

D. Record all equipment not present, and why.

E. Thermal gradient inspected; all equipment operating within manufacturers' guidelines.

F. Cable inspection: labeling, cable dress, signal separation, cable stress, serviceability, tie wraps too tight (none on Category cable, only Velcro ties). Cable labeling is positioned and oriented in a consistent manner, are legible and unambiguous.

G. Confirm rack elevation and flow drawings, cable and other labels and engravings are an accurate paper model of the furnished system, and in compliance with latest revised specifications. Record test results as pass/fail.

H. All inputs and outputs of switchers tested are labeled.

I. All channels on amplifiers, especially on multi-channel amplifiers are tested properly labeled.

J. Record ambient noise, A-weighted, slow.

K. Produce a nominal operating level of (65) dB SPL (Sound Pressure Level) for conference speech, (60) dB SPL for program material, "A" weighted at all listeners' ears +/-(2) dB ("Uniformity of Coverage") (or at least (15) dB above the ambient noise, A-weighted, whichever is greater), with the control system volume control indicating "normal" or default setting. Record results for each channel and source.

L. The speech reinforcement system shall be stable (no feedback).

M. For Audio /Video conference systems, at the (65) dB SPL listening level, be able to demonstrate full duplex operation, with no reports of echo or "speech trails" (as detected from the far end). Adjust microphone input gain so as to demonstrate that "standard talker" (60 dB SPL at 1 m), positioned at each talker position in the room, produces a "0 dB" level at the input of the mixer bus of the audio conference DSP device. If there is local reinforcement ("mix-minus"), AGC and ALC may need to be restricted. Record test results as pass/fail. Record level across analog telephone line. Inspect DSP mixer telephone line levels, both transmit and receive, when normal speech is encountered in the room.

N. Equalizers shall be adjusted for best intelligibility, and in accordance with the preferred acoustic level response curves. (For installations with equalizers) Record the "house curve" before equalization, as well as after the equalizers have been tuned, with and without microphone input filters. If requested by the Consultant, produce this documentation for systems without equalizers, as this test may apply to the preamp filter settings in cases where intelligibility can be improved.

O. For wireless microphone systems, with all wireless microphones turned on, confirm that throughout the specified operating area for the transmitter, there are no dropouts, inter-modulation interaction between wireless systems, or RF caused artifacts.

P. Video projector, if any, must have ‘blue screen’ or ‘no image screen’ disabled, or as directed by the user.

Q. When several displays are visible in the same space, demonstrate consistencies in colors across all of them.

R. Confirm acceptable TV levels, and any channel presets are accurate.

S. Displays have On-Screen Displays/Menus Are Disabled, or as specified by the user.

T. Image size relative to furthest viewer ratio: (1:6) Record each, compare to recommended ratio.

U. Displays are focused, centered, and evenly illuminated and mounted at the recommended heights.

V. Display stable images, with no scaling-related visual artifacts when switching between, at a minimum, (1024 x 768), (1280 x 1024), (1920 x 1080) and (1280 x 720) sources, and/or all those specified in the performance criteria for this system. Record test results.

1. When HDMI signals are included in the system, confirm that an acceptable signal is being displayed on the monitor from each source using a HDMI generator with HDCP. All the staged cabling should be either the actual cables and converters to be installed, or using connections and converters that emulate the field conditions with as close to the installed cable lengths as possible. Whenever possible, the actual display to be installed should be tested with the cables and converters as well: 1920x1200@60, 1920x1080@60, 1280x720@60, 1366x768@60, 1024x768@60, 800x600@60, 1600x1200@60.

2. Inspect each, leaving the signal on for three minutes (no “sparklies” or other artifacts). Note: If the signal is going to a codec, HDCP should be turned off (codecs do not support HDCP). If the signal is going to a display, HDCP should be turned on for a complete HDMI test to verify cables and display input.

W. The Control System performs all the functions as indicated on the function list (“control system specification”) provided, with stability, and in sync with the equipment being controlled without the need to reset any item of equipment.

X. Any web-based system control or monitoring features, and other IP functionality of system (time servers, system-generated e-mail, processor, etc.) thoroughly tested.

Y. Be serviceable. This includes accessibility to equipment to be easily pulled for repair by one person, neatly dressed cables, bundled in forms having no excessive pressure on cables at termination points and connectors, utilize service loops, and have each cable number in

agreement with the as-built drawings. This includes the equipment rack itself. All switches and receptacles shall be logically and permanently labeled.

Z. Confirm all nomenclature for consistency: drawings, touch screen, wallplates, floorboxes, patch panels, equipment, etc.

AA. Inspect camera image quality.

1. Camera presets are programmed as specified by the user.

AB. Log all test conference calls (audio and video). Log should include time, line used, number called, success of connection, who we spoke with, success of full duplex, success of auto disconnect, level in the room, note static or jitter/packet loss, etc. Note if auto disconnect functions as specified.

3.11 TRAINING

A. AVS training shall be provided for the operator/user and technical staff. Operator/user training shall minimally consist of 8 ea. 1-hour sessions. Technical operation and maintenance training session shall minimally consist of 8 ea. 1-hour session. Training sessions to be coordinated with the Owner and scheduled throughout the 1-year warranty period.

B. The contractor shall train the Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. This training will be in accordance with the training as outlined in this specification. In addition to the Training Materials provided, the contractor will also furnish Operators Manuals and Users Guides at the time of this training

C. A complete operation and maintenance manuals and preliminary as-built drawings shall be delivered to the Owner one week prior to the training sessions.

D. Operator/user training shall minimally consist of:

1. Provide custom system specific printed reference material for each trainee that documents and explains in layman's terms:

a. System block diagram.

b. Normal day-to-day operation.
c. Operator selectable features.
d. Provide a hands-on training with Q & A session.

2. Provide and review a custom, system specific, quick reference guide for the inexperienced operator.

E. Technical Operations and Maintenance training shall consist of:

1. The technical explanation shall be sufficiently thorough that: staff personnel shall be able to make any programming changes required, analyze malfunctions and make equipment substitutions or bypasses necessary to maintain system operation except for the malfunctioning equipment or circuits.

2. Provide printed reference material for each trainee that documents and explains in technical terms:

a. System block diagram with technical features.

b. Technical operation, adjustments and programming.
c. System features and programming.
d. Review of as-built drawings.
e. Provide a hands-on training with Q & A session.

3.12 WARRANTY

A. The Contractor shall warrant the system for parts and labor for one (1) year. Warranty commences at the time of substantial project completion and acceptance by Owner. Nothing shall be construed to limit this obligation to a shorter period.

B. Warranty service shall be rendered on-site by request of Owner to repair or replace any defective materials, equipment and workmanship without cost to the Owner, unless the Owner has previously given the Contractor a written acceptance of such condition.

C. The Owner shall give prompt notice of the defect(s) either verbally or in writing to Contractor.

D. Perform preventative maintenance during the warranty period, which includes:

E. Cleaning and inspection of all devices every 6 months.

F. Clean and vacuum console and rack equipment every 6 months.

G. Service technician performing service / warranty work shall check-in and out with Owner for each visit.

H. Provide a written report to Owner documenting any work performed during the warranty period within 24 hours of such event. Report shall detail work performed, equipment

repaired or replaced, etc.

I. Provide loner equipment that is equivalent to the malfunction equipment for any equipment not field repairable.

J. Repair or Replacement Service.

1. Repair or replacement service during the warranty period shall be performed 7 days a week, 24 hours a day and with a 4 hour response time.

2. Emergency repair or replacement service during the warranty period shall be performed 7 days a week, 24 hours a day and with a 1 hour response time.

3. If the Contractor cannot restore system operation during the warranty period within 2 business days of the system failure, the Owner reserves the right to require the Contractor to provide on- site manufacturer's service technicians at no additional cost.

4. The Owner reserves the right to expand or add to the system during the warranty period using firm(s) other than the Contractor for such expansion without affecting the Contractor's responsibilities, provided the expansion is performed by an authorized dealer for the affected equipment.

3.13 SUBSTANTIAL COMPLETION

A. Work must meet the following requirements to qualify for the Owner's consideration of Substantial Completion:

1. All AVS devices shall be fully installed, powered, online and fully operational.

2. All sub-system interfaces must be complete and operational.
3. All training complete.

4. Owner may utilize the system for its designed intent.

5. Contractor to provide final programming A/V source code to remain property of Owner. Provided copies of all A/V room types compiled and uncompiled source code, to Owner for backup and future reference as part of the Final Acceptance.

B. Contractor will provide a list of remaining work items and approximate completion date.

C. Contractor will certify in writing that all remaining work is minor in nature and will be completed in less than 30 days.

3.14 TESTING REQUIREMENTS

A. The Contractor shall perform sample tests in the presence of the Consultant and Owner. Performing the testing procedures specified herein assures that the communication cabling and system electronics meets the performance characteristics specified.

B. All testing shall comply with EIA/TIA Standards and that of the equipment manufacturers. If testing indicates that the performance characteristics are not met, the test shall be failed test and any other test that may be affected by the modification and/or repair shall be rerun and verified.

C. Test equipment will be provided by the Contractor to test and to certify the 100% operational condition of all materials and equipment.

D. The Contractor shall prepare and submit all test procedures and data forms for the pre-installation, post installation and subsystem test to Owner. The test procedures shall have Owner approval before the tests.

3.15 SYSTEM CHECK OUT AND VERIFICATION

A. Verify continuity of cabling between field devices and controllers.

B. Commission all devices from field to front end.

C. Contractor supplied “As Built” Drawings shall show conduit routing.

D. Review all as-built documentation and Operation and Maintenance manuals with Owner. Revise and reissue as required.

E. Provide as-built documentation in hard copy, PDF and AutoCAD formats.

F. Demonstrate proper sequences of operation for all devices.

G. Within ten days receipt of the final acceptance notice, the Contractor and Owner’s representatives shall schedule and perform the final inspection. When the work is found acceptable under the contract documents and the contract is fully performed, declare the project complete.

3.16 FINAL ACCEPTANCE OF SYSTEMS

A. All deliverables listed in the plain-language narrative have been satisfactorily delivered.

B. Each area of construction completed and submitted as complete shall meet the following criteria under testing:

1. There are no remaining punch-list items.

2. System must meet all specifications as described in these instructions.

3. Operational prints, manuals, signal logs, an as built prints must be furnished.

4. Visual testing and signal verification will be conducted at random locations to determine that equipment performs satisfactorily.

C. All promised training of designated personnel has taken place.

D. Specifications set forth for construction of the system have been devised in order to insure system compatibility and performance. Compliance to these specifications will be determined during periodic observances of construction. Repeated failure to comply with the specification will be considered before the initial acceptance phase of the plant commences.

E. All promised documentation has been delivered.

F. All complaints have been satisfied.

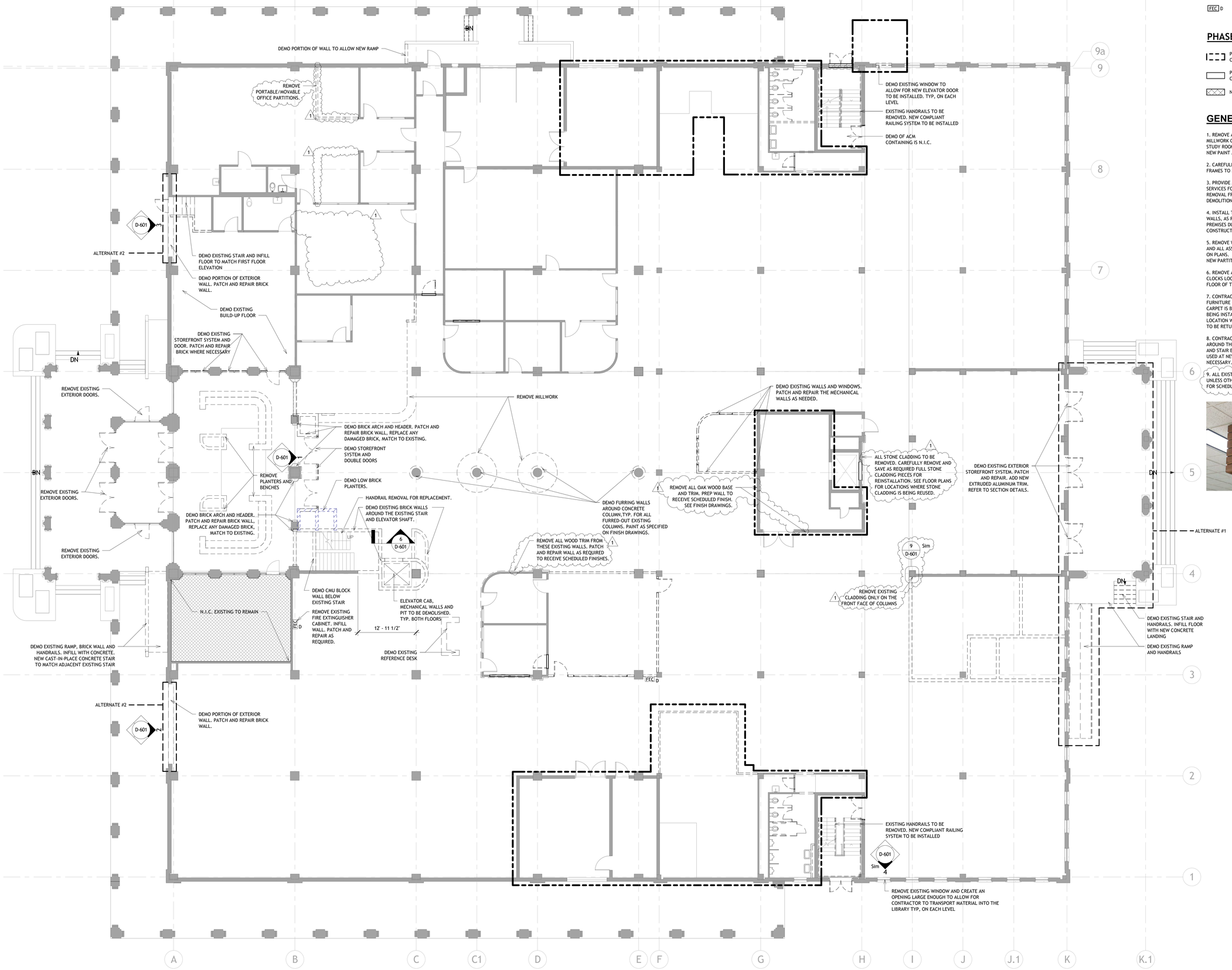
3.17 PRICING FORMS

A. In addition to all other required bid forms, Contractor shall prepare and present to Owner and Owner's representative pricing based on the requirements of 27 40 00.

B. Pricing shall include the list of equipment and labor in tabular form including; part number, item description, unit price, number of units, extended price and totals. The pricing shall breakdown the material and labor in the categories.

C. Contractor shall provide Service Agreement pricing levels for terms of 1, 2 and 3 years. Breakout service pricing levels by response times of within 2 hours, 24 hours or more than 24 hours.

END OF SECTION



1 FIRST FLOOR DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

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LEGEND

- EXISTING TO DEMO
- EXISTING TO REMAIN
- FEC D — FIRE EXTINGUISHER CABINETS - DEMO

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

GENERAL NOTES

1. REMOVE AND DISCARD ALL (100%) FIXED MILLWORK COUNTERS AND BOOKSHELVES IN ALL STUDY ROOMS. PREPARE SURFACES TO RECEIVE NEW PAINT AND FINISHES.

2. CAREFULLY PROTECT EXISTING DOORS AND FRAMES TO REMAIN.

3. PROVIDE ALL LABOR, EQUIPMENT, AND SERVICES FOR ALL DEMOLITION WORK, INCLUDING REMOVAL FROM SITE, AS INDICATED ON DEMOLITION DRAWINGS.

4. INSTALL TEMPORARY DOORS, WINDOWS, AND WALLS, AS REQUIRED FOR PROTECTION OF THE PREMISES DURING THE DEMOLITION AND CONSTRUCTION OF THE PROJECT.

5. REMOVE WALL SYSTEMS OR PARTITION DOORS AND ALL ASSOCIATED STRUCTURES AS INDICATED ON PLANS. PREPARE BROKEN EDGES TO RECEIVE NEW PARTITION AND/OR FINISHES.

6. REMOVE AND RETURN TO THE LIBRARY TWO (2) CLOCKS LOCATED ON THE FIRST AND SECOND FLOOR OF THE LIBRARY. SEE IMAGE BELOW.

7. CONTRACTOR TO MOVE AND PROTECT ALL FURNITURE LOCATED IN SPACES WHERE EXISTING CARPET IS BEING REMOVED AND NEW CARPET IS BEING INSTALLED. COORDINATE STORAGE LOCATION WITH OWNER. ALL STORED FURNITURE TO BE RETURNED TO ITS ORIGINAL LOCATION.

8. CONTRACTOR TO SALVAGE AS MUCH BRICK AROUND THE ELEVATOR SHAFT, BRICK PLANTERS AND STAIR ENCLOSURE. SALVAGED BRICK TO BE USED AT NEW RAMPS AND OTHER AREAS WHERE NECESSARY.

9. ALL EXISTING WOOD BASE AND TRIM TO REMAIN UNLESS OTHERWISE NOTED. SEE FINISH DRAWINGS FOR SCHEDULED FINISHES.

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MIDWESTERN STATE UNIVERSITY

WICHITA FALLS, TEXAS

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PHASE II

ISSUE DATE: 07.12.2018

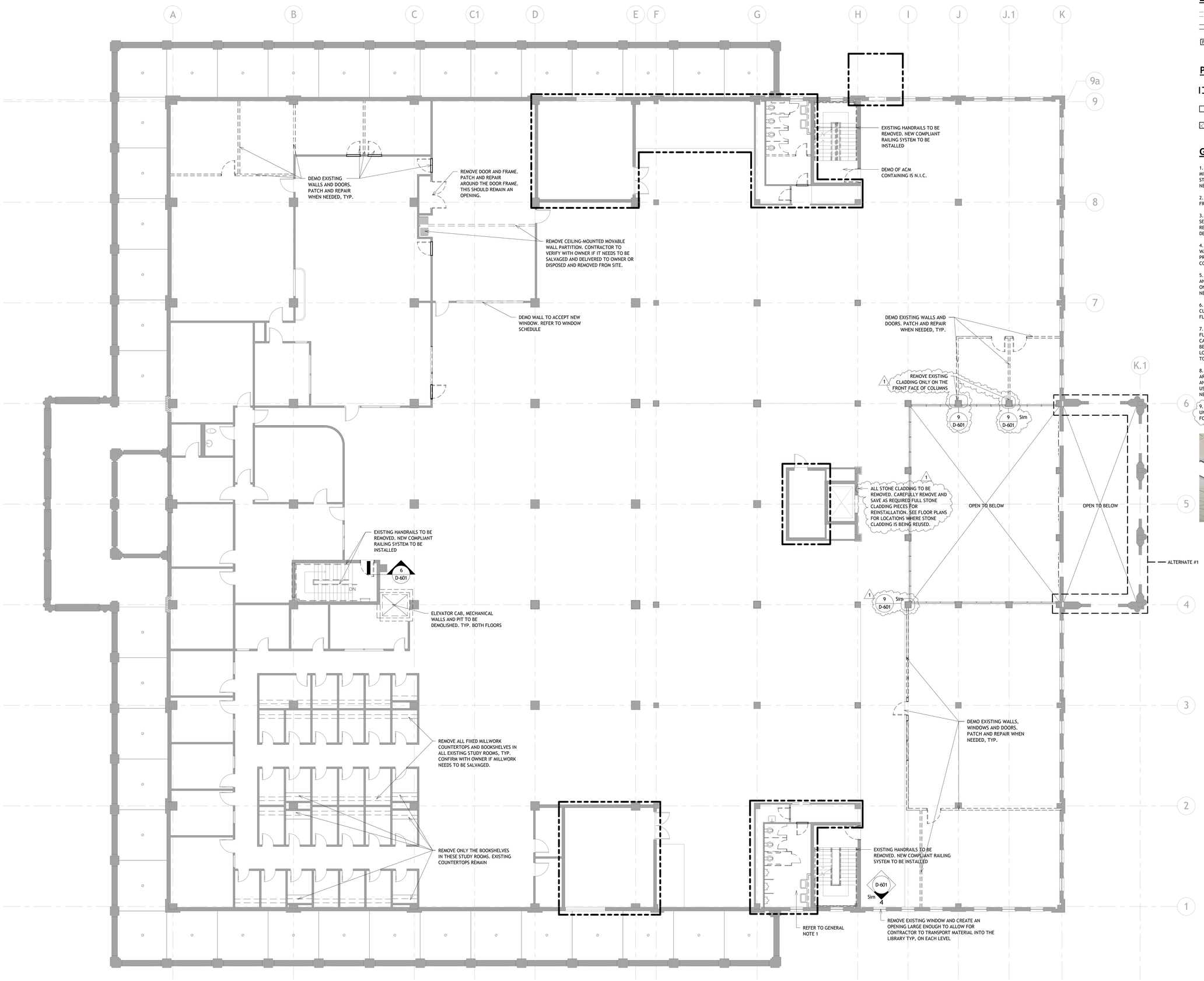
REVISIONS

No.	Date:	Description:
1	08.02.18	ADDENDUM #3

HMBA PROJECT NUMBER: 06113.00

FIRST FLOOR DEMOLITION PLAN

D-101



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1 SECOND FLOOR DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

LEGEND

- EXISTING TO DEMO
- EXISTING TO REMAIN
- FEC D — FIRE EXTINGUISHER CABINETS - DEMO

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

GENERAL NOTES

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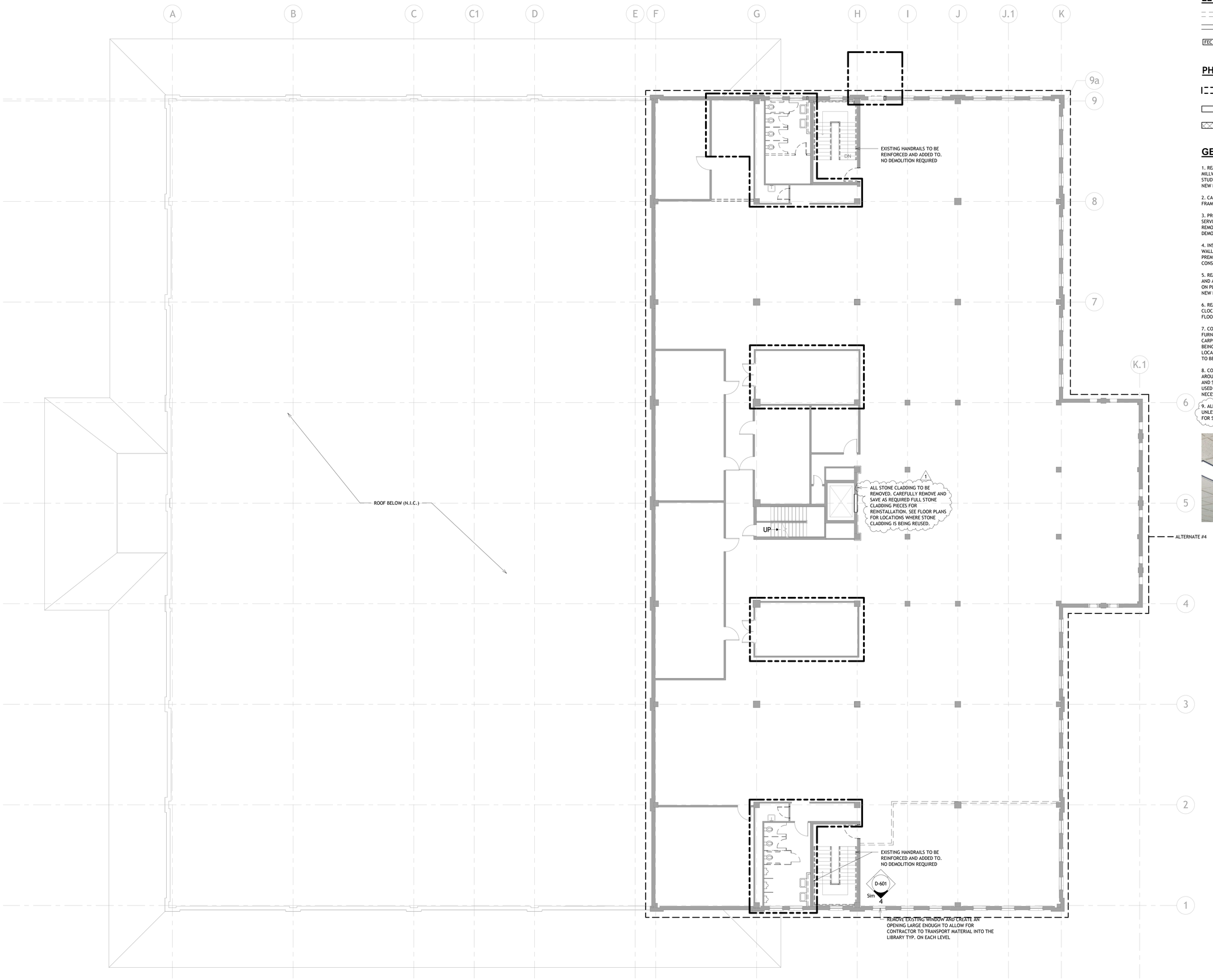
No.	Date:	Description:
1	08.02.18	ADDENDUM #3

HMBA PROJECT NUMBER: 06113.00

SECOND FLOOR DEMOLITION PLAN

D-102



LEGEND

- EXISTING TO DEMO
- EXISTING TO REMAIN
- FEC D — FIRE EXTINGUISHER CABINETS - DEMO

PHASE LEGEND

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- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

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THIRD FLOOR DEMOLITION PLAN

D-103

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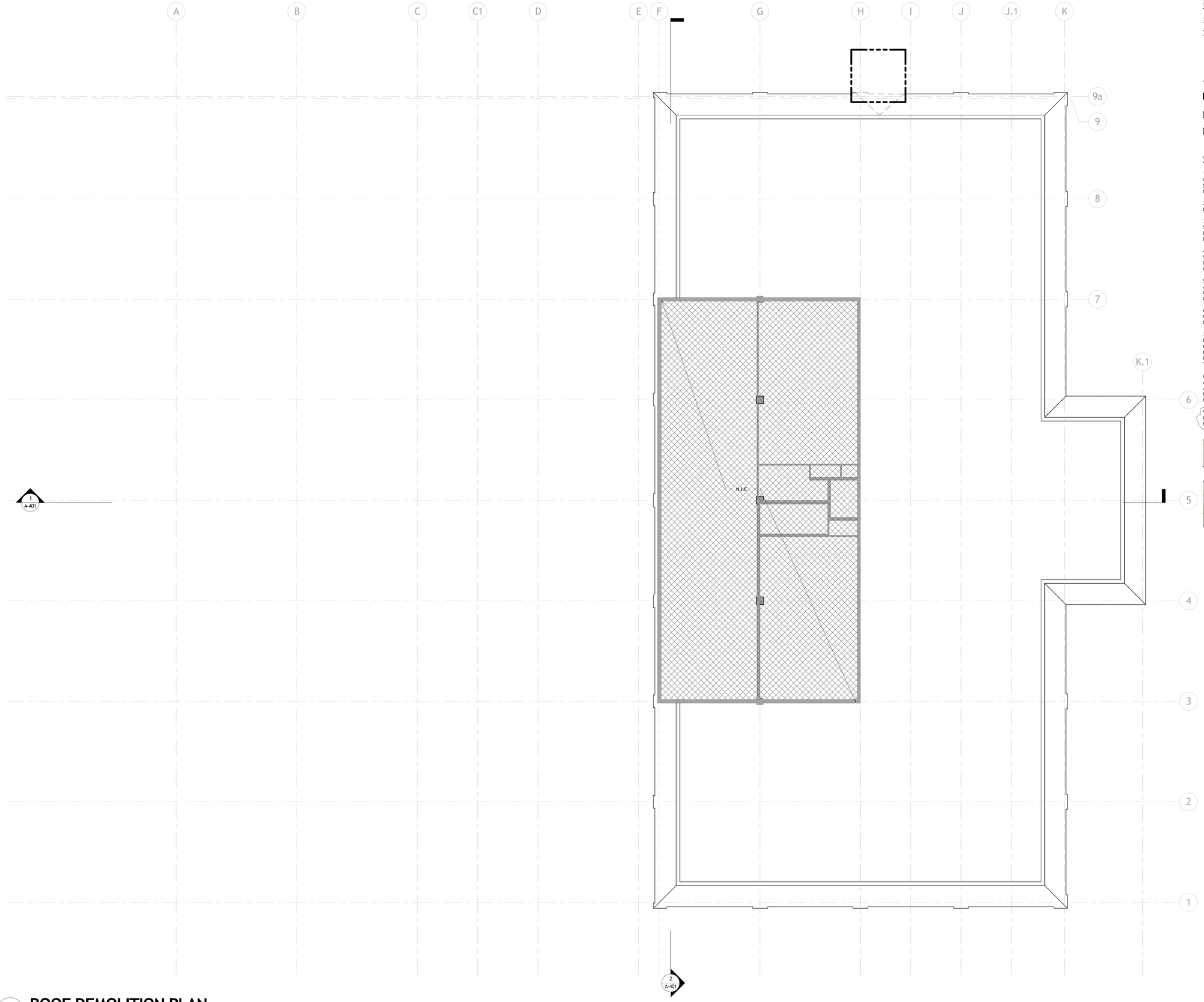
1 THIRD FLOOR DEMOLITION PLAN

SCALE: 1/8" = 1'-0"



1 ROOF DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

8/17/2018 4:25:54 PM

LEGEND

- EXISTING TO DEMO
- EXISTING TO REMAIN
- FEC D — FIRE EXTINGUISHER CABINETS - DEMO

PHASE LEGEND

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MIDWESTERN STATE UNIVERSITY
WICHITA FALLS, TEXAS

SEAL:

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PHASE II
ISSUE DATE: 07.12.2018

REVISIONS

No.	Date:	Description:

HMBA PROJECT NUMBER: 06113.00

ROOF DEMOLITION PLAN

D-104

1 FIRST FLOOR RCP DEMO

SCALE: 1/8" = 1'-0"

7/27/2018 12:02:03 PM

DEMO LEGEND

- EXISTING TO REMAIN
- EXISTING TO BE DEMOLISHED - SALVAGE EXISTING LIGHT FIXTURES FOR REINSTALLATION IN OTHER AREAS
- EXISTING PLASTER / GYP CEILING TO REMAIN

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II

DEMOLITION NOTES:

1. PROVIDE ALL LABOR, EQUIPMENT AND SERVICES FOR ALL DEMOLITION WORK, INCLUDING REMOVAL FROM SITE, AS INDICATED ON DEMOLITION DRAWINGS.
2. BEFORE COMMENCING ANY DEMOLITION WORK, REVIEW WITH THE ARCHITECT THE INTENT REGARDING THE SALVAGE, REUSE AND FINAL DISPOSITION OF ANY EXISTING ITEMS OR EQUIPMENT.
3. CONTRACTOR SHALL REVIEW AND VERIFY DIMENSIONS INDICATED ON DRAWINGS PRIOR TO START OF DEMOLITION.
4. INSTALL TEMPORARY DOORS, WINDOWS AND WALLS AS REQUIRED FOR PROTECTION OF THE PREMISES DURING THE DEMOLITION AND CONSTRUCTION OF THE PROJECT.
5. PROVIDE COVERS AS REQUIRED ON REMAINING ITEMS FOR PROTECTION DURING THE DEMOLITION AND CONSTRUCTION OF THE PROJECT.
6. CAREFULLY PROTECT AND RETURN TO CLIENT ALL EXISTING ACT TILES REMOVED FROM SPECIFIC AREAS IN THE LIBRARY AS SPECIFIED IN THE DRAWINGS. CONTRACTOR AND ARCHITECT TO IDENTIFY TILES TO SALVAGE IN THE FIELD.
7. WHERE PARTITIONS ARE TO BE REMOVED, THE CONTRACTOR SHALL PROVIDE ADEQUATE SCAFFOLDING AND TEMPORARY STRUCTURAL SUPPORT TO MAINTAIN THE INTEGRITY OF REMAINING WALL, PARTITION OR ASSOCIATED CONSTRUCTION.
8. REMOVE WALL SYSTEMS OR PARTITIONS, DOORS AND ALL ASSOC. STRUCTURES. SEE PLAN FOR INTENT OF REMOVAL & CLEARANCE. PREPARE BROKEN EDGES TO RECEIVE NEW PARTITION AND/OR FINISHES.
9. REMOVE EXISTING FRAMING AND SUPPORT STEEL FOR EXISTING BRICK AND WINDOWS ALONG PERIMETER IN ITS ENTIRETY. SEE DRAWINGS BELOW, TYP.
10. REMOVE EXISTING COLUMN COVERS.
11. CAREFULLY REMOVE AND PROTECT ALL EXISTING LAY-IN LIGHTING FIXTURES. REFER TO RCP AND ELECTRICAL DRAWINGS FOR NEW LIGHTING FIXTURES TYPES AND LOCATIONS.
12. PHASE II SCOPE OF WORK INCLUDES EVERYTHING OUTSIDE OF THE DASHED AREAS MARKED AS PHASE I SCOPE OF WORK.
13. REPLACE ANY DAMAGED CEILING GRID AND TILE DURING MEP DEMOLITION WORK. USE SALVAGED CEILING TILES WHERE IS ACCEPTABLE.

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REVISIONS

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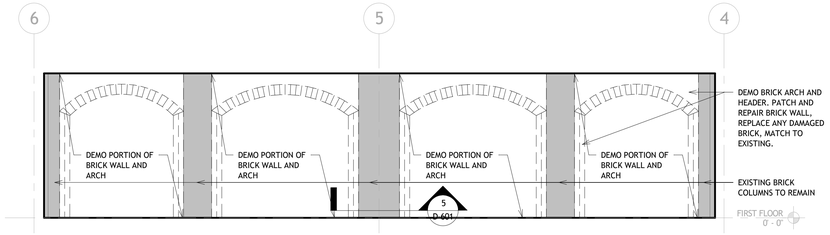
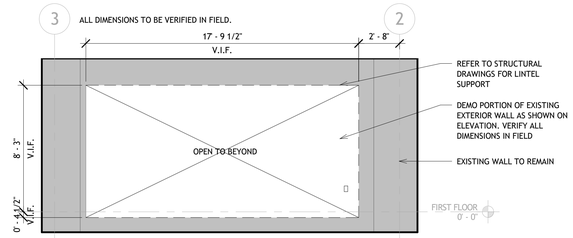
HMBA PROJECT NUMBER: 06113.00

FIRST FLOOR DEMOLITION RCP

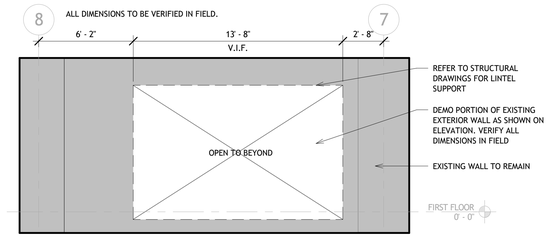
D-201



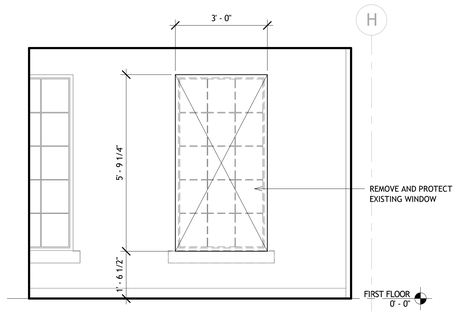
1 EAST ELEVATION OF CIRCULATION ROOM 1VEST2
SCALE: 1/4" = 1'-0"



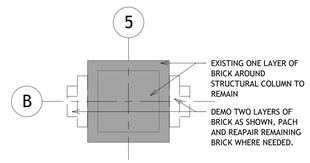
2 SOUTH WALL DEMOLITION
SCALE: 1/4" = 1'-0"



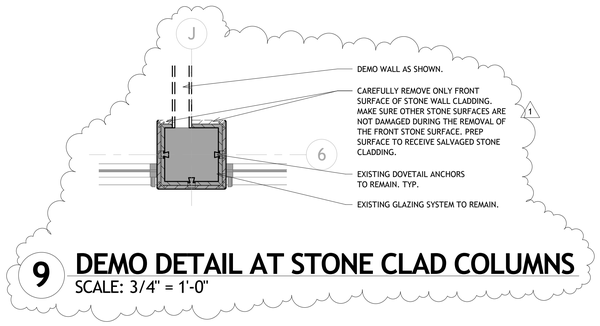
3 NORTH WALL DEMOLITION
SCALE: 1/4" = 1'-0"



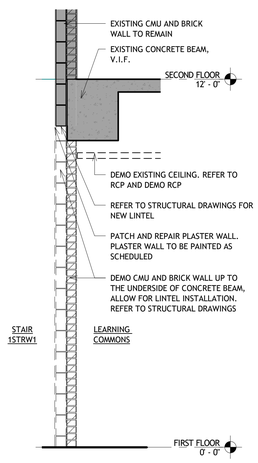
4 TYP. TEMPORARY CONSTRUCTION OPENING ON EACH LEVEL
SCALE: 1/2" = 1'-0"



5 TYPI. DEMO DETAIL AT COLUMNS
SCALE: 1/2" = 1'-0"



9 DEMO DETAIL AT STONE CLAD COLUMNS
SCALE: 3/4" = 1'-0"



6 STAIR WALL DEMO DETAIL
SCALE: 1/2" = 1'-0"

7 GRILLES @ FRONT ENTRANCE DOORS
SCALE: 1/2" = 1'-0"

NOTE: THIS IMAGE IS ONLY FOR REFERENCE. REFER TO FLOOR PLANS FOR MORE INFO.

8 WOOD TRIM DEMOLITION
SCALE: 1/2" = 1'-0"

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DEMOLITION DETAILS

D-601

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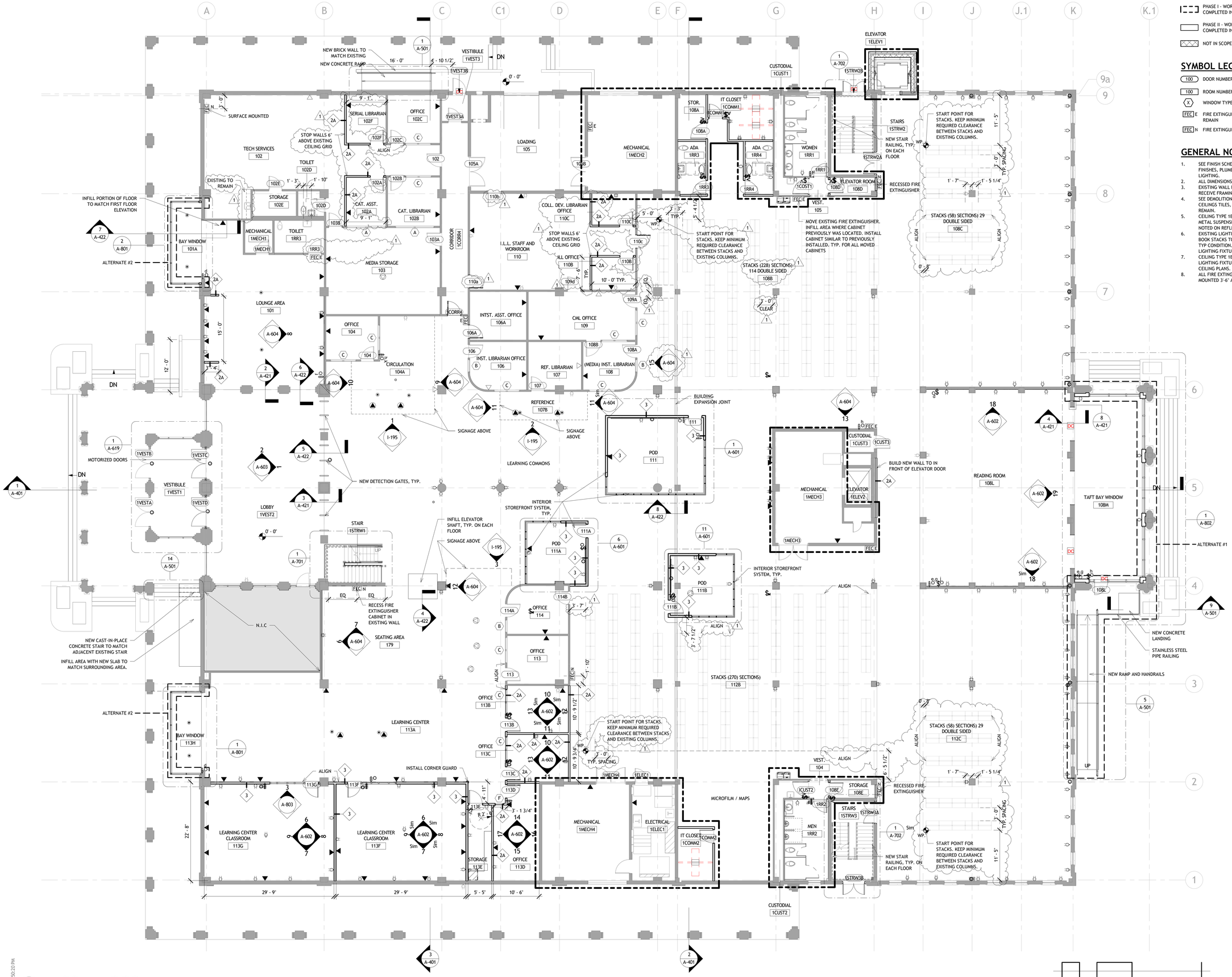

1 FIRST FLOOR

SCALE: 1/8" = 1'-0"

7/30/2018 5:50:20 PM

PHASE LEGEND

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SYMBOL LEGEND

- 100 DOOR NUMBER
- 100 ROOM NUMBER
- X WINDOW TYPE
- FEC E FIRE EXTINGUISHER CABINETS - EXISTING TO REMAIN
- FEC N FIRE EXTINGUISHER CABINETS - NEW

GENERAL NOTES:

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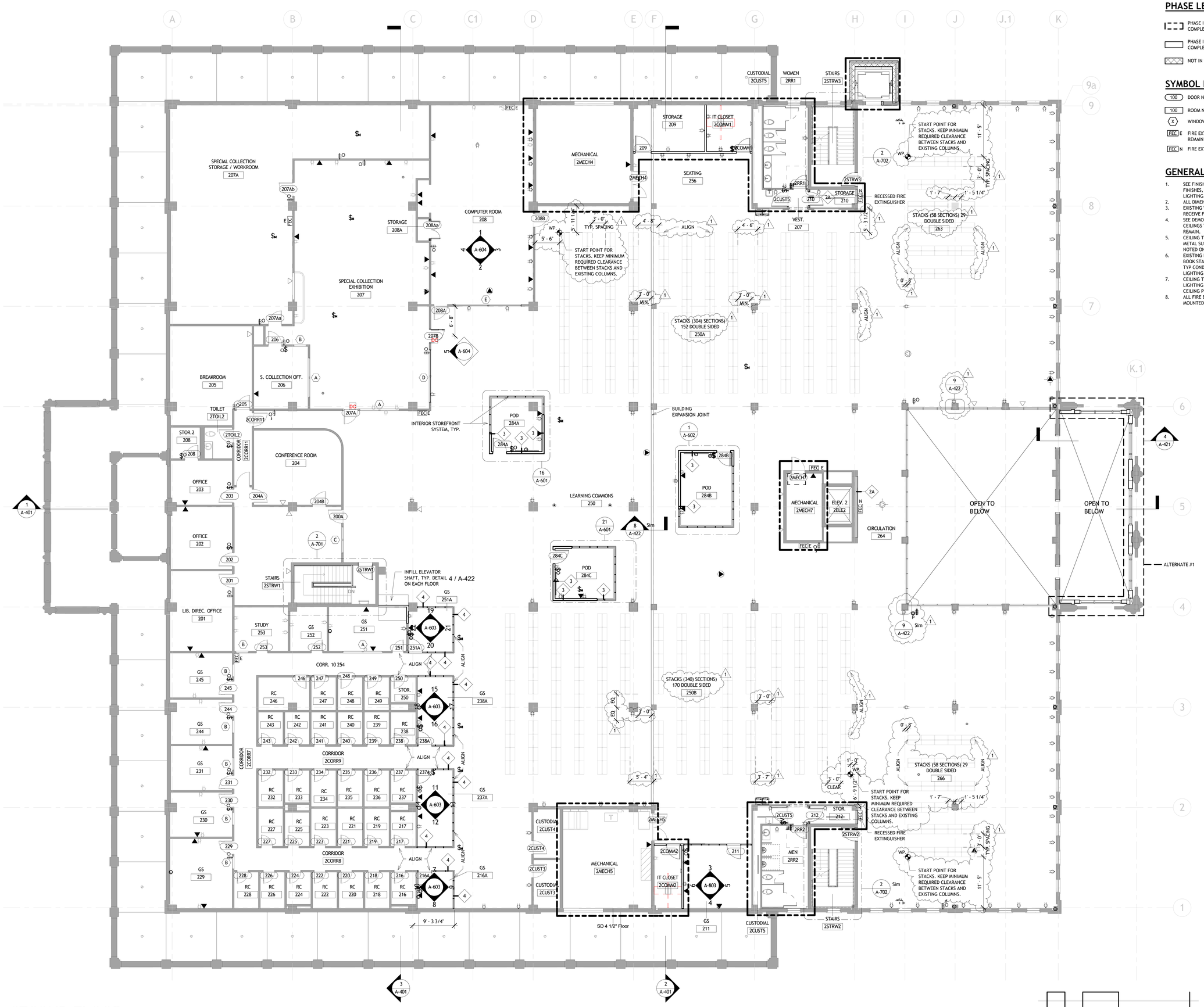
FIRST FLOOR PLAN

A-101



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SECOND FLOOR PLAN

A-102

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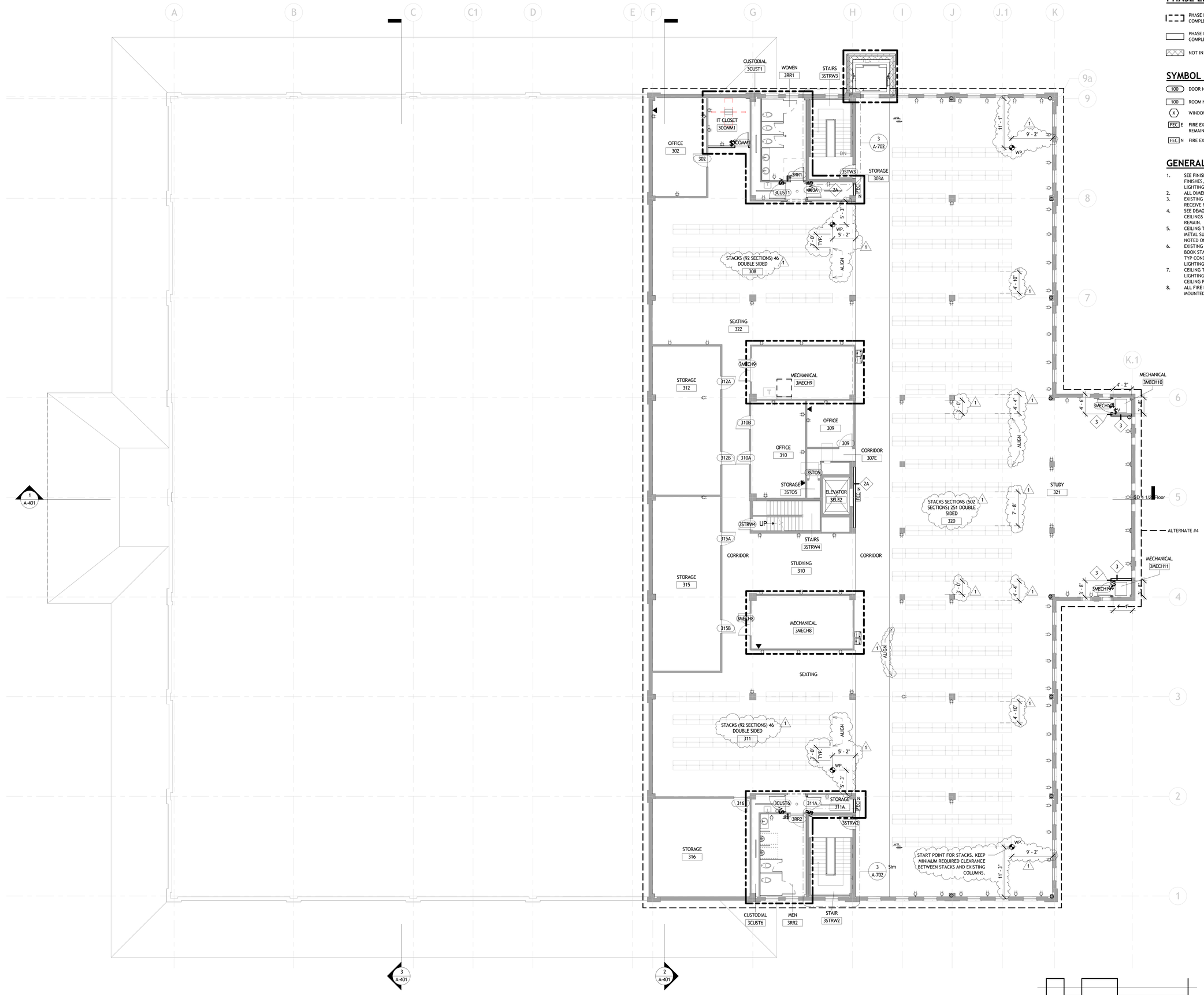
1 SECOND FLOOR

SCALE: 1/8" = 1'-0"



PHASE LEGEND

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- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

SYMBOL LEGEND

- 100 DOOR NUMBER
- 100 ROOM NUMBER
- X WINDOW TYPE
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- FEC N FIRE EXTINGUISHER CABINETS - NEW

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THIRD FLOOR PLAN

A-103

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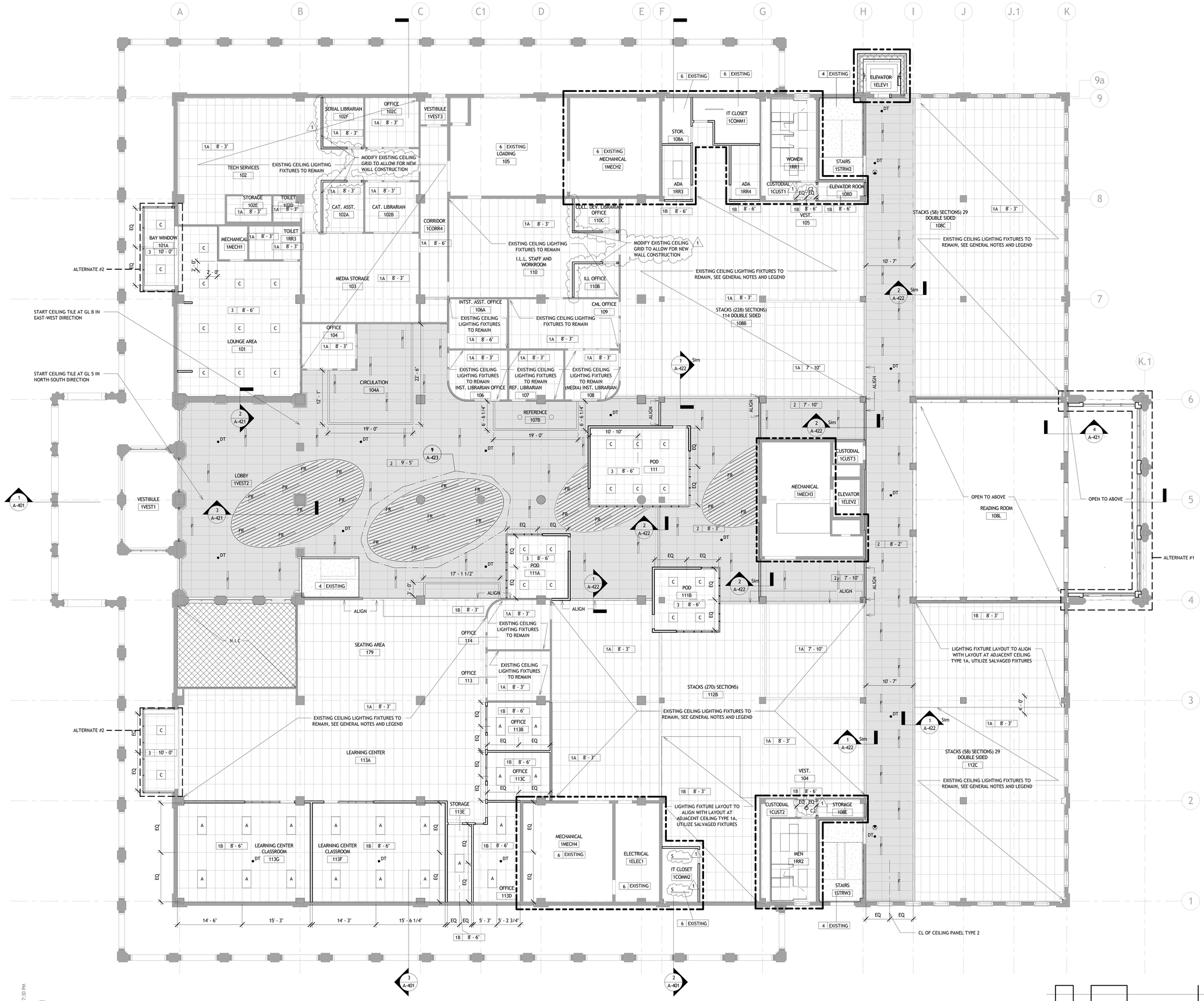
1 THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"



1 FIRST FLOOR RCP

SCALE: 1/8" = 1'-0"

8/17/2018 5:17:30 PM

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

SYMBOL LEGEND

- 100 DOOR NUMBER
- 100 ROOM NUMBER
- X WINDOW TYPE
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- FEC N FIRE EXTINGUISHER CABINETS - NEW

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8. ALL FIRE EXTINGUISHER CABINETS TO BE WALL MOUNTED 3'-6" ABOVE FINISHED FLOOR.

CEILING TYPES

CEILING TYPE — FINISHED CEILING HEIGHT A.F.F

- 1A — EXISTING ACOUSTICAL CEILING PANEL (ACT1A) WITH METAL SUSPENSION SYSTEM, TO REMAIN. REPLACE 50% OF TOTAL ACT TILES WITH NEW TILES TO MATCH EXISTING
- 1B — ACOUSTICAL CEILING PANEL (ACT1B) WITH METAL SUSPENSION SYSTEM
- 2 — ACOUSTICAL CEILING PANEL (ACT2) WITH METAL SUSPENSION SYSTEM
- 3 — ACOUSTICAL CEILING PANEL (ACT3) WITH METAL SUSPENSION SYSTEM
- 4 — EXSITING PLASTER FINISH, TO REMAIN
- 5 — GYPSUM BOARD CEILING
- 6 — NO CEILING, EXPOSED TO UNDERSIDE OF STRUCTURE
- 7 — ACOUSTICAL CEILING PANEL (ACT7) WITH METAL SUSPENSION SYSTEM

LIGHTING FIXTURES TYPES

ALSO SEE ELECTRICAL DRAWINGS

- A — TYPE A - EXISTING 2X4 RECESSED FIXTURE TO REMAIN, TYP. AT BOOK STACKS, SALVAGED FIXTURES TO BE LAID OUT PER A-204. AT CEILING TYPE 1B, SEE RCP FOR LAYOUT.
- EMERGENCY 2X4 RECESSED FIXTURE
- B — TYPE B - EXISTING 1X2 RECESSED FIXTURE TO REMAIN, TYP. AT BOOK STACKS, SALVAGED FIXTURES TO BE LAID OUT PER A-204.
- C — TYPE C - 1'X1' RECESSED FIXTURE
- F — TYPE F - LED STRIP FIXTURE
- WALL MOUNTED LED EDGE-LIT EXIT SIGN
- CEILING PENDANT MOUNTED LED EDGE-LIT EXIT SIGN
- TYPE C1 - ROUND RECESSED LED DOWNLIGHT
- C2 — TYPE C2 - ROUND RECESSED LED DOWNLIGHT
- TYPE D - PENDANT - ALTERNATE #5
- S — TYPE S - LED STRIP FIXTURE

DEVICES, GRILLES, & DIFFUSERS

ALSO SEE MECHANICAL, ELECTRICAL, I.T. DRAWINGS

- WAP — WIRELESS ACCESS POINT
- SUPPLY AIR DIFFUSER
- RETURN AIR GRILLE
- EXIT SIGNS
- DT — DUAL TECH OCCUPANCY SENSOR

AUDIO/ VIDEO

ALSO SEE A/V DRAWINGS

- R# — A/V PLUG BOX DEVICE. SEE DETAIL _____

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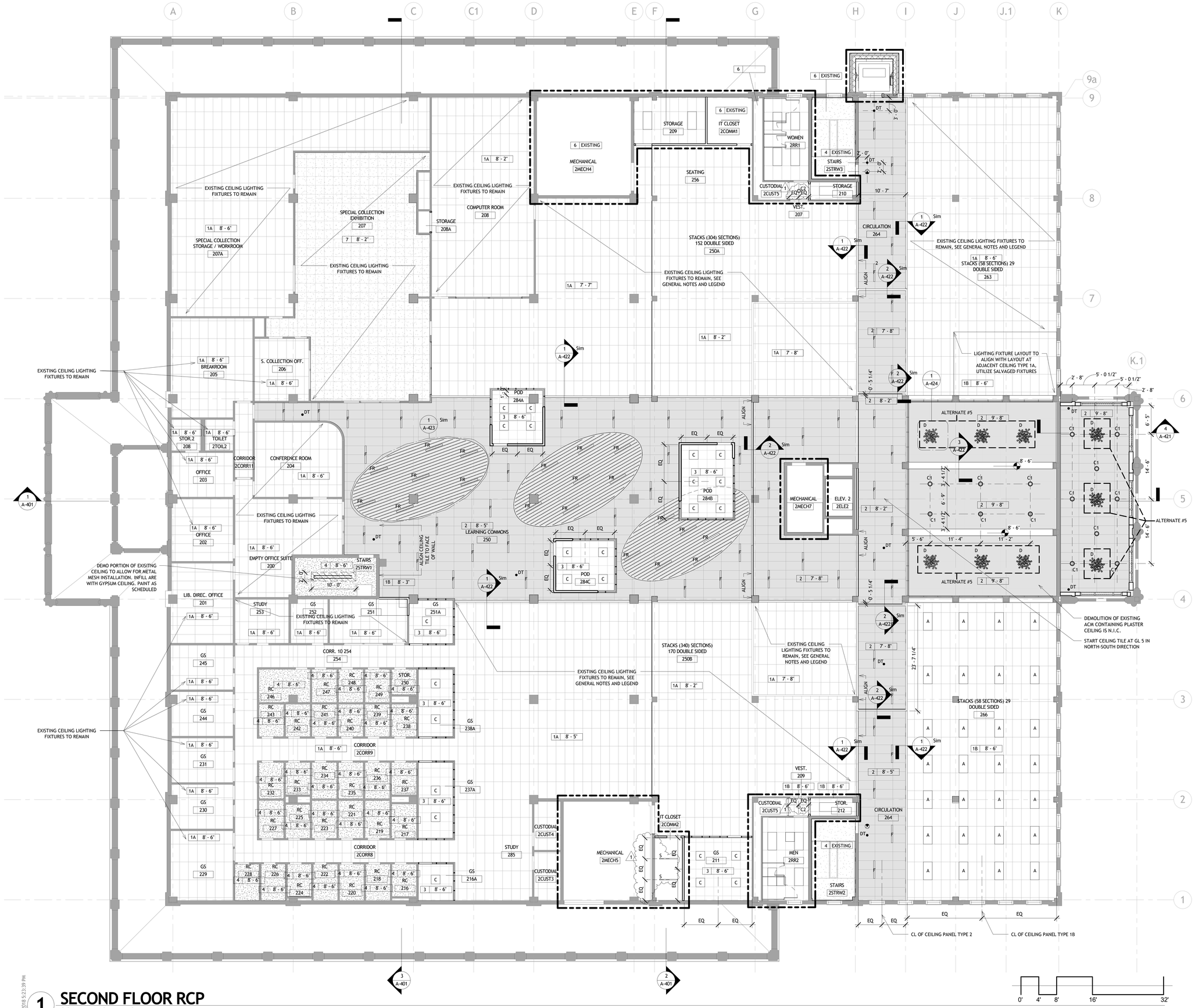
FIRST FLOOR REFLECTED CEILING PLAN

A-201



1 SECOND FLOOR RCP

SCALE: 1/8" = 1'-0"

8/17/2018 5:23:39 PM

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SYMBOL LEGEND

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2. ALL DIMENSIONS ARE TO FINISH FACE OF WALL, UON.
3. EXISTING WALL FRAMING TO REMAIN. NEW WALL TO RECEIVE FRAMING TO MATCH EXISTING.
4. SEE DEMOLITION RCP FOR EXTENTS OF EXISTING CEILINGS TILES, FIXTURES, AND ACT GRIDS TO REMAIN.
5. CEILING TYPE 1B TO MATCH CEILING TYPE 1A IN TILE, METAL SUSPENSION SYSTEM, AND ELEVATION AS NOTED ON REFLECTED CEILING PLANS.
6. EXISTING LIGHTING FIXTURES IN CEILING TYPE 1A AT BOOK STACKS TO BE REARRANGED, SEE A-204 FOR TYP CONDITION. UTILIZE SALVAGED CEILING LIGHTING FIXTURES WHERE REQUIRED.
7. CEILING TYPE 1B TO UTILIZE SALVAGED CEILING LIGHTING FIXTURES, SEE LAYOUT ON REFLECTED CEILING PLANS.
8. ALL FIRE EXTINGUISHER CABINETS TO BE WALL MOUNTED 3'-6" ABOVE FINISHED FLOOR.

CEILING TYPES

CEILING TYPE — FINISHED CEILING HEIGHT A.F.F

1A	EXISTING ACOUSTICAL CEILING PANEL (ACT1A) WITH METAL SUSPENSION SYSTEM, TO REMAIN. REPLACE 50% OF TOTAL ACT TILES WITH NEW TILES TO MATCH EXISTING
1B	ACOUSTICAL CEILING PANEL (ACT1B) WITH METAL SUSPENSION SYSTEM
2	ACOUSTICAL CEILING PANEL (ACT2) WITH METAL SUSPENSION SYSTEM
3	ACOUSTICAL CEILING PANEL (ACT3) WITH METAL SUSPENSION SYSTEM
4	EXSITING PLASTER FINISH, TO REMAIN
5	GYPSUM BOARD CEILING
6	NO CEILING, EXPOSED TO UNDERSIDE OF STRUCTURE
7	ACOUSTICAL CEILING PANEL (ACT7) WITH METAL SUSPENSION SYSTEM

LIGHTING FIXTURES TYPES

ALSO SEE ELECTRICAL DRAWINGS

- A — TYPE A - EXISTING 2X4 RECESSED FIXTURE TO REMAIN, TYP. AT BOOK STACKS, SALVAGED FIXTURES TO BE LAID OUT PER A-204. AT CEILING TYPE 1B, SEE RCP FOR LAYOUT.
- EMERGENCY 2X4 RECESSED FIXTURE
- B — TYPE B - EXISTING 1X2 RECESSED FIXTURE TO REMAIN, TYP. AT BOOK STACKS, SALVAGED FIXTURES TO BE LAID OUT PER A-204.
- C — TYPE C - 1'X1' RECESSED FIXTURE
- F — TYPE F - LED STRIP FIXTURE
- WALL MOUNTED LED EDGE-LIT EXIT SIGN
- CEILING PENDANT MOUNTED LED EDGE-LIT EXIT SIGN
- TYPE C1 - ROUND RECESSED LED DOWNLIGHT
- C2 — TYPE C2 - ROUND RECESSED LED DOWNLIGHT
- TYPE D - PENDANT - ALTERNATE #5
- S — TYPE S - LED STRIP FIXTURE

DEVICES, GRILLES, & DIFFUSERS

ALSO SEE MECHANICAL, ELECTRICAL, I.T. DRAWINGS

- WAP — WIRELESS ACCESS POINT
- SUPPLY AIR DIFFUSER
- RETURN AIR GRILLE
- EXIT SIGNS
- DT — DUAL TECH OCCUPANCY SENSOR

AUDIO/ VIDEO

ALSO SEE A/V DRAWINGS

- R# — A/V PLUG BOX DEVICE. SEE DETAIL _____

HOLZMAN MOSS BOTTINO ARCHITECTURE

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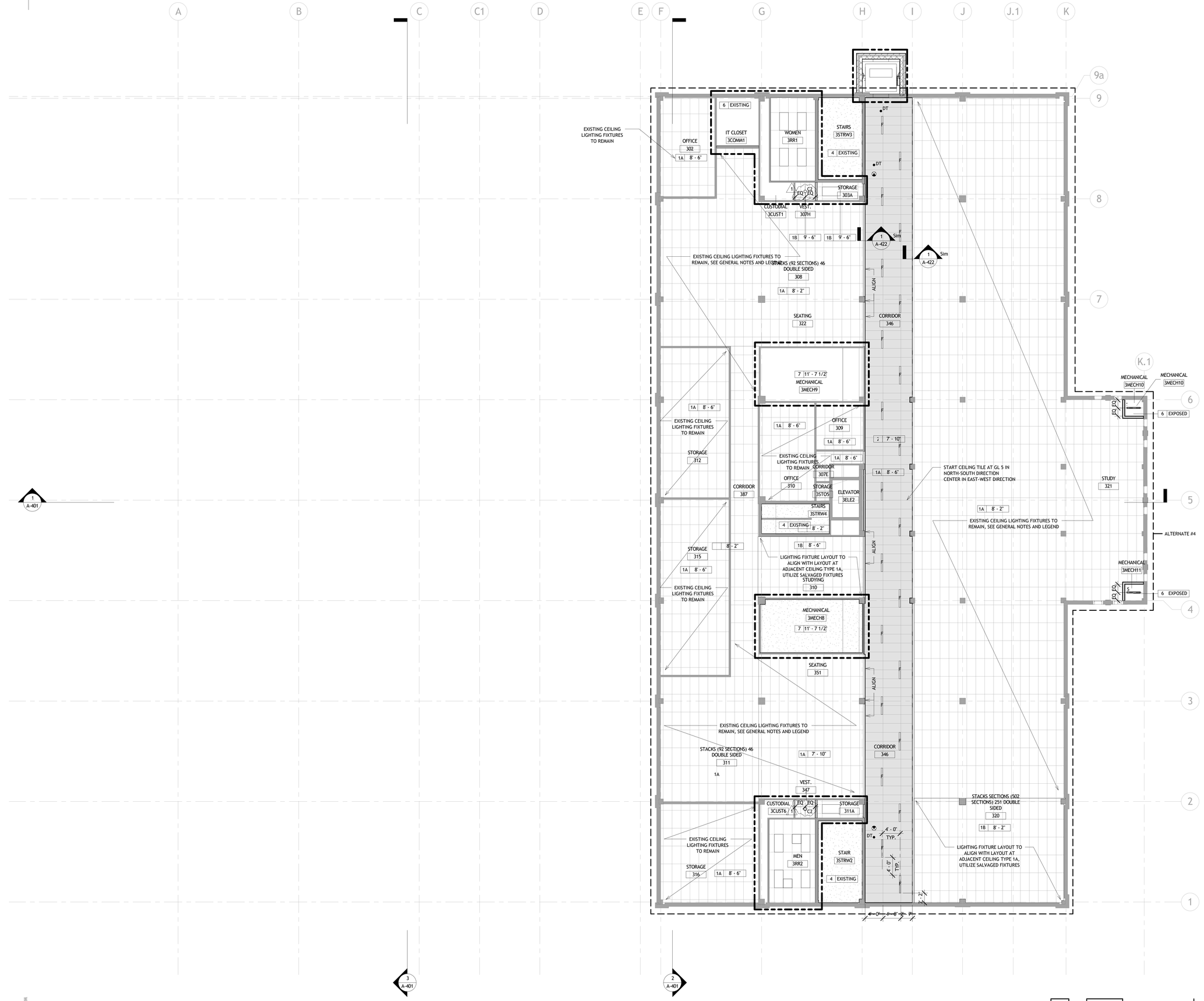
No.	Date:	Description:
1	08.02.18	ADDENDUM #3

HMBA PROJECT NUMBER: 06113.00

SECOND FLOOR REFLECTED CEILING PLAN

A-202



PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

SYMBOL LEGEND

- 100 DOOR NUMBER
- 100 ROOM NUMBER
- X WINDOW TYPE
- FEC E FIRE EXTINGUISHER CABINETS - EXISTING TO REMAIN
- FEC N FIRE EXTINGUISHER CABINETS - NEW

GENERAL NOTES:

1. SEE FINISH SCHEDULE FOR ALL WALL, FLOOR/CEILING FINISHES, PLUMBING FIXTURES, ACCESSORIES, AND LIGHTING.
2. ALL DIMENSIONS ARE TO FINISH FACE OF WALL, UON.
3. EXISTING WALL FRAMING TO REMAIN. NEW WALL TO RECEIVE FRAMING TO MATCH EXISTING.
4. SEE DEMOLITION RCP FOR EXTENTS OF EXISTING CEILINGS TILES, FIXTURES, AND ACT GRIDS TO REMAIN.
5. CEILING TYPE 1B TO MATCH CEILING TYPE 1A IN TILE, METAL SUSPENSION SYSTEM, AND ELEVATION AS NOTED ON REFLECTED CEILING PLANS.
6. EXISTING LIGHTING FIXTURES IN CEILING TYPE 1A AT BOOK STACKS TO BE REARRANGED, SEE A-204 FOR TYP CONDITION. UTILIZE SALVAGED CEILING LIGHTING FIXTURES WHERE REQUIRED.
7. CEILING TYPE 1B TO UTILIZE SALVAGED CEILING LIGHTING FIXTURES, SEE LAYOUT ON REFLECTED CEILING PLANS.
8. ALL FIRE EXTINGUISHER CABINETS TO BE WALL MOUNTED 3'-6" ABOVE FINISHED FLOOR.

CEILING TYPES

CEILING TYPE — FINISHED CEILING HEIGHT A.F.F

1A	EXISTING ACOUSTICAL CEILING PANEL (ACT1A) WITH METAL SUSPENSION SYSTEM, TO REMAIN. REPLACE 50% OF TOTAL ACT TILES WITH NEW TILES TO MATCH EXISTING
1B	ACOUSTICAL CEILING PANEL (ACT1B) WITH METAL SUSPENSION SYSTEM
2	ACOUSTICAL CEILING PANEL (ACT2) WITH METAL SUSPENSION SYSTEM
3	ACOUSTICAL CEILING PANEL (ACT3) WITH METAL SUSPENSION SYSTEM
4	EXSITING PLASTER FINISH, TO REMAIN
5	GYPSUM BOARD CEILING
6	NO CEILING, EXPOSED TO UNDERSIDE OF STRUCTURE
7	ACOUSTICAL CEILING PANEL (ACT7) WITH METAL SUSPENSION SYSTEM

LIGHTING FIXTURES TYPES

ALSO SEE ELECTRICAL DRAWINGS

- A — TYPE A - EXISTING 2X4 RECESSED FIXTURE TO REMAIN, TYP. AT BOOK STACKS, SALVAGED FIXTURES TO BE LAID OUT PER A-204. AT CEILING TYPE 1B, SEE RCP FOR LAYOUT.
- EMERGENCY 2X4 RECESSED FIXTURE
- B — TYPE B - EXISTING 1X2 RECESSED FIXTURE TO REMAIN, TYP. AT BOOK STACKS, SALVAGED FIXTURES TO BE LAID OUT PER A-204.
- C — TYPE C - 1'X1' RECESSED FIXTURE
- F — TYPE F - LED STRIP FIXTURE
- WALL MOUNTED LED EDGE-LIT EXIT SIGN
- CEILING PENDANT MOUNTED LED EDGE-LIT EXIT SIGN
- TYPE C1 - ROUND RECESSED LED DOWNLIGHT
- C2 — TYPE C2 - ROUND RECESSED LED DOWNLIGHT
- TYPE D - PENDANT - ALTERNATE #5
- S — TYPE S - LED STRIP FIXTURE

DEVICES, GRILLES, & DIFFUSERS

ALSO SEE MECHANICAL, ELECTRICAL, I.T. DRAWINGS

- WAP — WIRELESS ACCESS POINT
- SUPPLY AIR DIFFUSER
- RETURN AIR GRILLE
- EXIT SIGNS
- DT — DUAL TECH OCCUPANCY SENSOR

AUDIO/ VIDEO

ALSO SEE A/V DRAWINGS

- R# — A/V PLUG BOX DEVICE. SEE DETAIL _____

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THIRD FLOOR REFLECTED CEILING PLAN

A-203

8/22/2018 5:24:02 PM

1 THIRD FLOOR RCP
SCALE: 1/8" = 1'-0"

ALT 7 - CEILING TYPES

CEILING TYPE	FINISHED CEILING HEIGHT A.F.F
1A	8'-8" — EXISTING ACOUSTICAL CEILING PANEL (ACT1A) WITH METAL SUSPENSION SYSTEM, TO REMAIN. REPLACE 50% OF TOTAL ACT TILES WITH NEW TILES TO MATCH EXISTING
1B	ACOUSTICAL CEILING PANEL (ACT1B) WITH METAL SUSPENSION SYSTEM
1	CEILINGS NOT PART OF ALTERNATE #7

LIGHTING FIXTURES TYPES

ALSO SEE ELECTRICAL DRAWINGS

- E — TYPE E - 1X2 LED RECESSED FIXTURE
- F — TYPE F - 2X4 LED RECESSED FIXTURE
- EMERGENCY 2X4 RECESSED FIXTURE

1 ALT-7 - FIRST FLOOR RCP

SCALE: 1/8" = 1'-0"

0' 4' 8' 16' 32'

7/27/2018 12:01:24 PM

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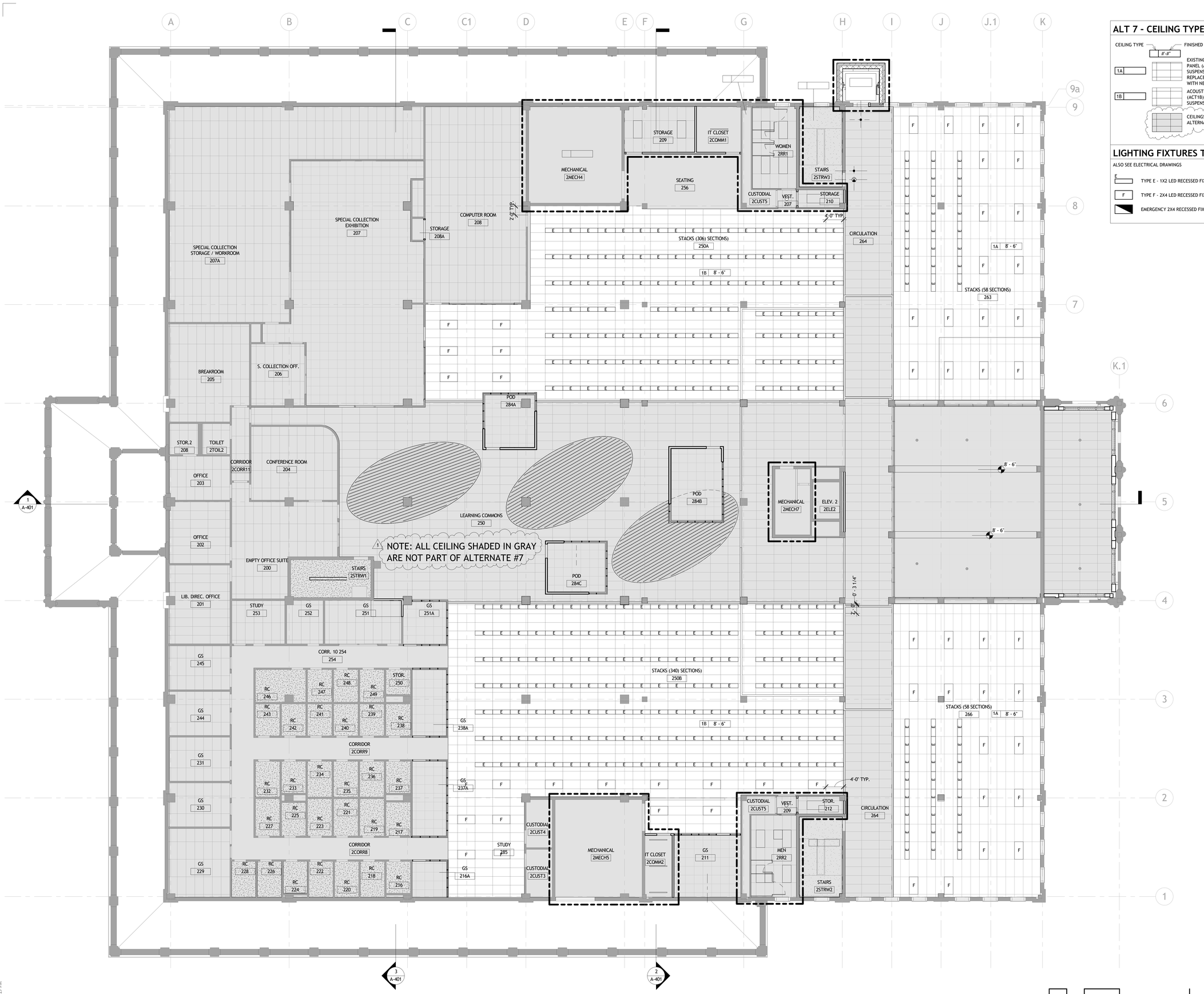
HMBA PROJECT NUMBER: 06113.00

FIRST FLOOR REFLECTED CEILING PLAN - ALT-7

A-211



ALT 7 - CEILING TYPES

CEILING TYPE — FINISHED CEILING HEIGHT A.F.F

- 1A — 8'-6" — EXISTING ACOUSTICAL CEILING PANEL (ACT1A) WITH METAL SUSPENSION SYSTEM, TO REMAIN. REPLACE 50% OF TOTAL ACT TILES WITH NEW TILES TO MATCH EXISTING
- 1B — ACOUSTICAL CEILING PANEL (ACT1B) WITH METAL SUSPENSION SYSTEM
- 1 — CEILINGS NOT PART OF ALTERNATE #7

LIGHTING FIXTURES TYPES

ALSO SEE ELECTRICAL DRAWINGS

- E — TYPE E - 1X2 LED RECESSED FIXTURE
- F — TYPE F - 2X4 LED RECESSED FIXTURE
- EMERGENCY 2X4 RECESSED FIXTURE

1 ALT7 - SECOND FLOOR RCP

SCALE: 1/8" = 1'-0"

7/17/2018 12:01:27 PM

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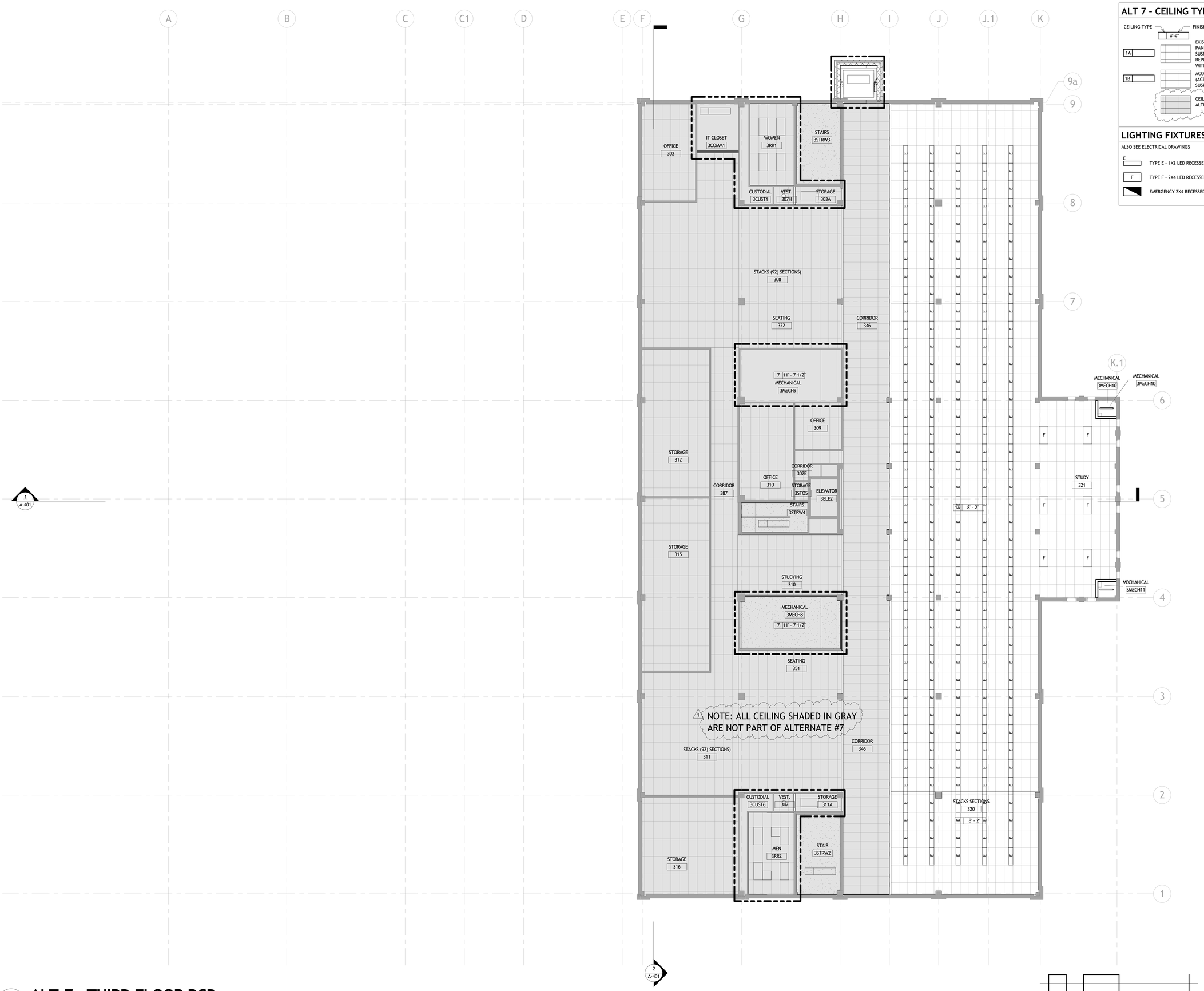
SECOND FLOOR REFLECTED CEILING PLAN - ALT-7

A-212



ALT 7 - CEILING TYPES

CEILING TYPE — FINISHED CEILING HEIGHT A.F.F

8'-8"

1A — EXISTING ACOUSTICAL CEILING PANEL (ACT1A) WITH METAL SUSPENSION SYSTEM, TO REMAIN. REPLACE 50% OF TOTAL ACT TILES WITH NEW TILES TO MATCH EXISTING

1B — ACOUSTICAL CEILING PANEL (ACT1B) WITH METAL SUSPENSION SYSTEM

1 — CEILINGS NOT PART OF ALTERNATE #7

LIGHTING FIXTURES TYPES

ALSO SEE ELECTRICAL DRAWINGS

E — TYPE E - 1X2 LED RECESSED FIXTURE

F — TYPE F - 2X4 LED RECESSED FIXTURE

EMERGENCY 2X4 RECESSED FIXTURE

0' 4' 8' 16' 32'

1 ALT-7 - THIRD FLOOR RCP

SCALE: 1/8" = 1'-0"

7/27/2018 12:01:29 PM

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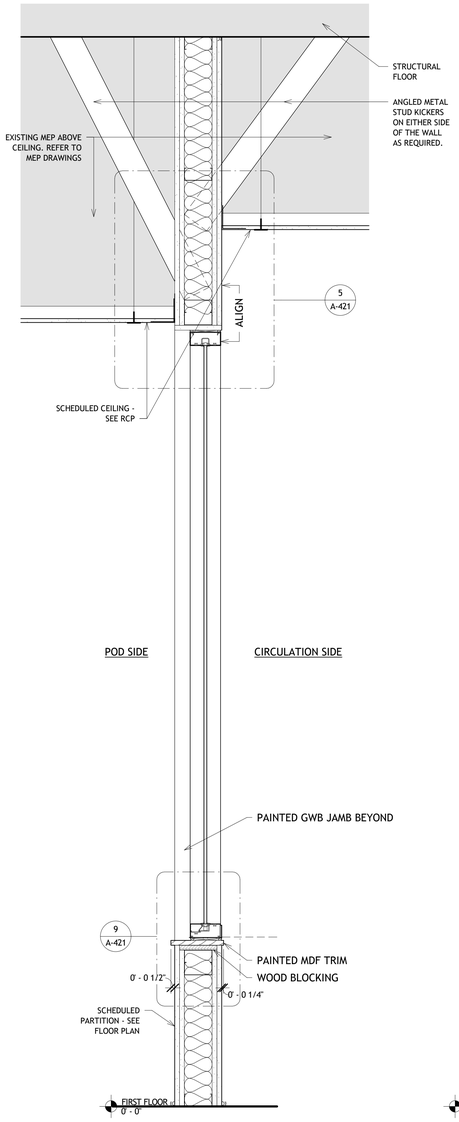
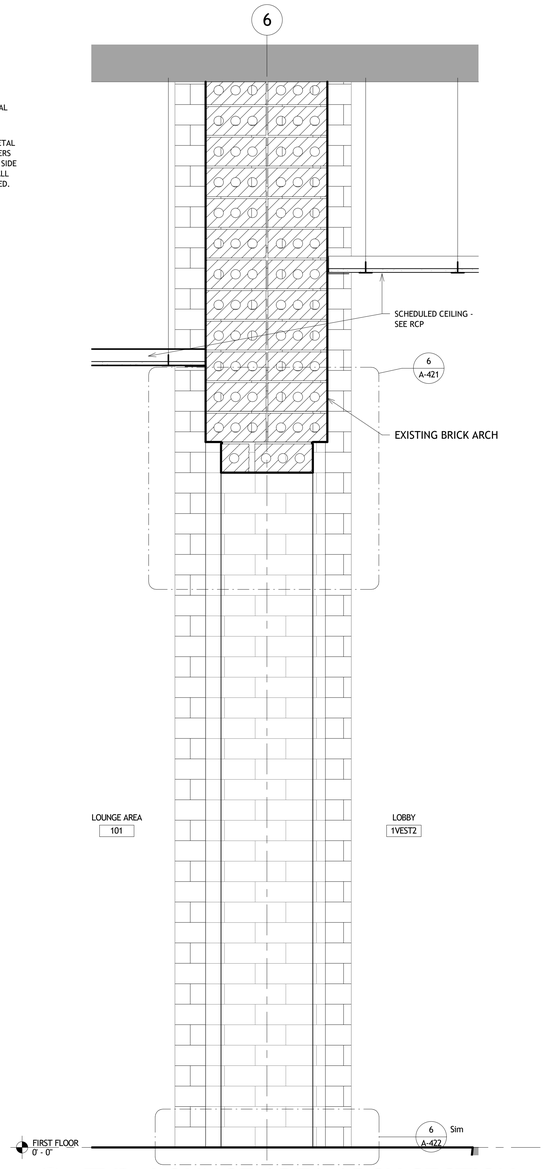
THIRD FLOOR REFLECTED CEILING PLAN - ALT-7

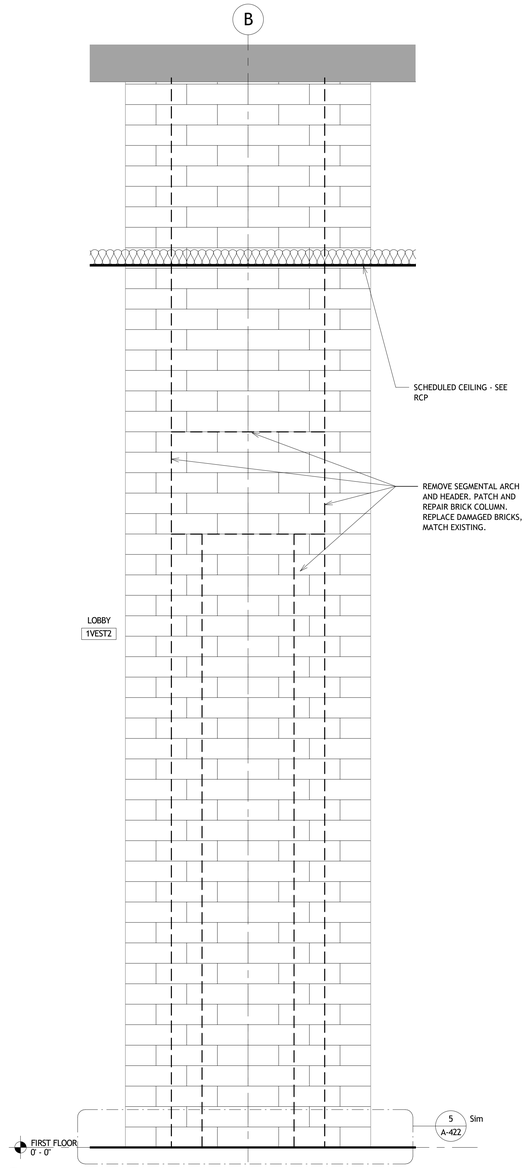
A-213



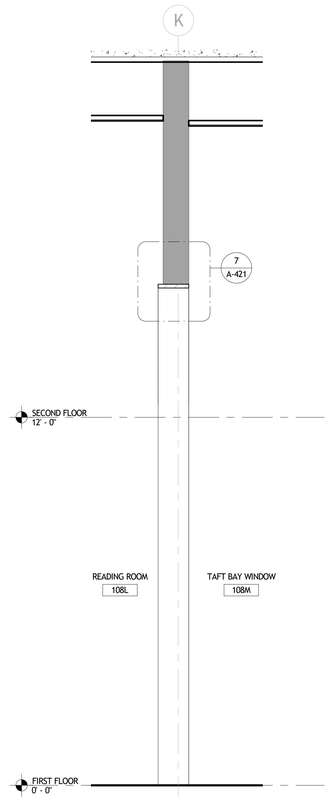
1 TYP. DETAIL @ PODS SF
SCALE: 1 1/2" = 1'-0"



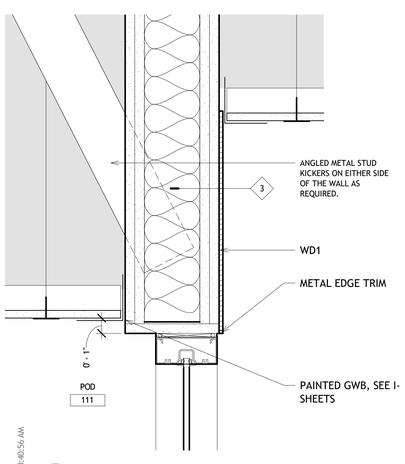
2 TYP. LOUNGE AREA ARCH SECTION
SCALE: 1 1/2" = 1'-0"



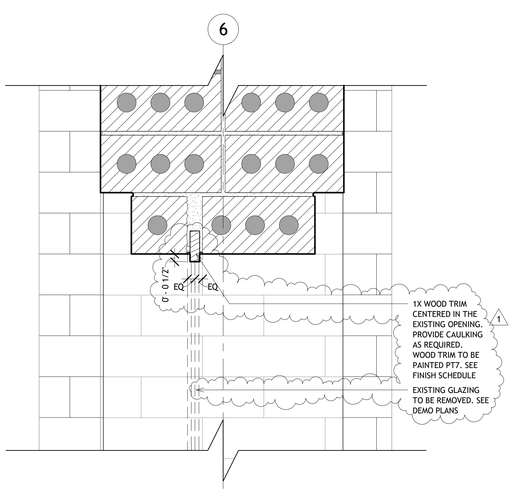
3 TYP. CIRCULATION ARCH SECTION
SCALE: 1 1/2" = 1'-0"



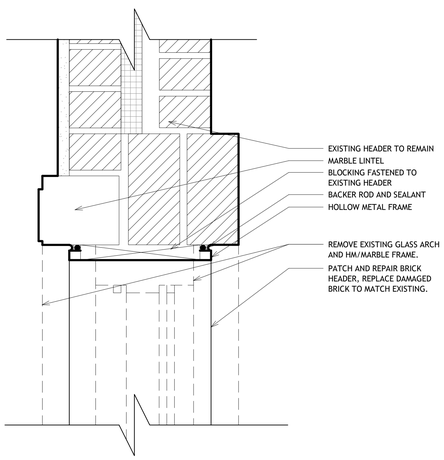
4 TYP. READING ROOM ARCH SECTION
SCALE: 1/2" = 1'-0"



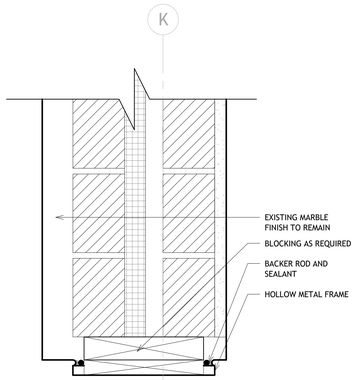
5 TYP. HEADER @ PODS SF
SCALE: 3" = 1'-0"



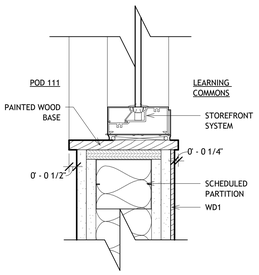
6 TYP. CIRCULATION ARCH HEADER
SCALE: 3" = 1'-0"



7 TYP. READING ROOM ARCH HEADER SECTION
SCALE: 3" = 1'-0"



8 JAMB DETAIL @ ARCH OPENING
SCALE: 3" = 1'-0"



9 SILL DETAIL
SCALE: 3" = 1'-0"

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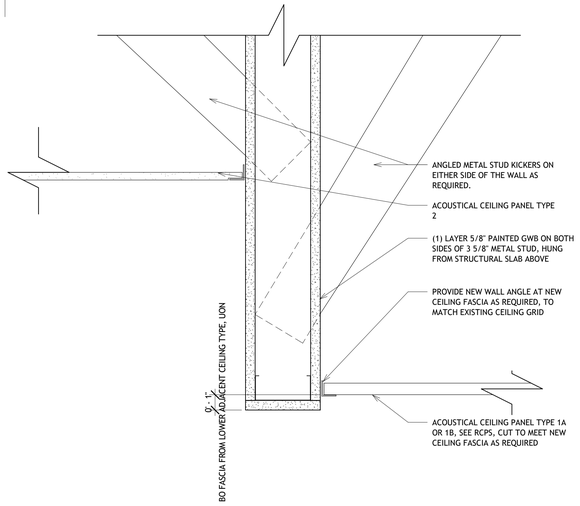
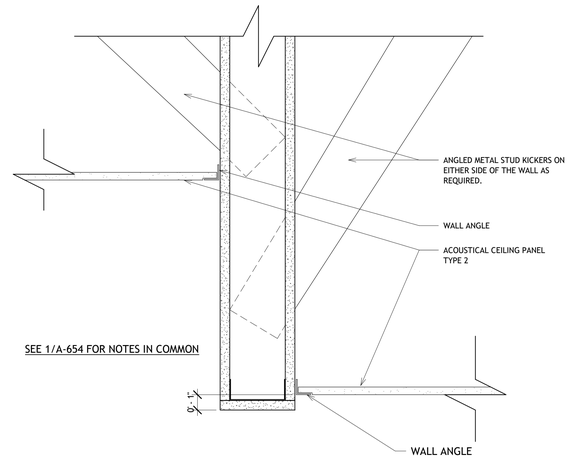
SECTIONS & DETAILS

A-421

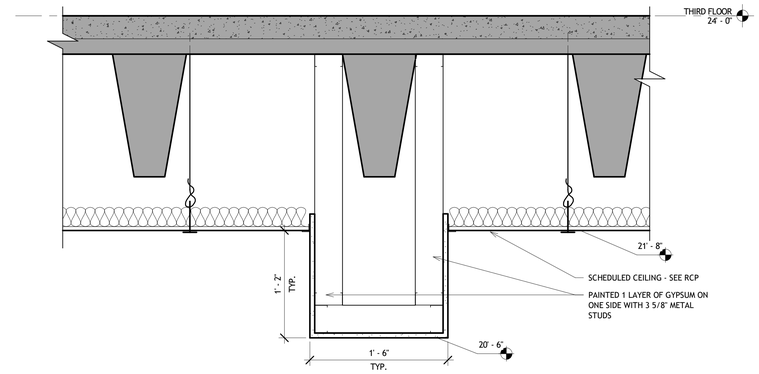
8/27/2018 10:40:56 AM



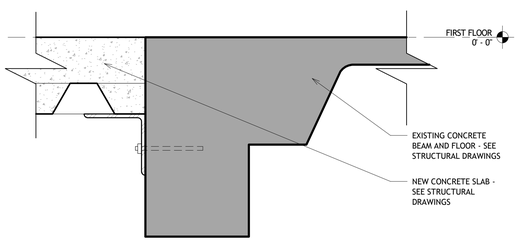
1 CEILING TRANSITION - TYPE 1A & 1B TO 2
SCALE: 3" = 1'-0"



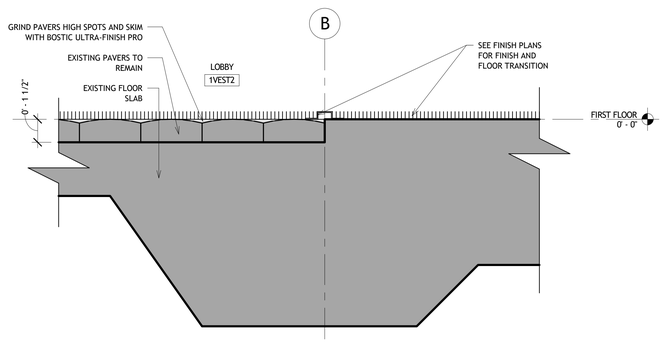
2 CEILING TRANSITION - TYPE 2 TO 2
SCALE: 3" = 1'-0"



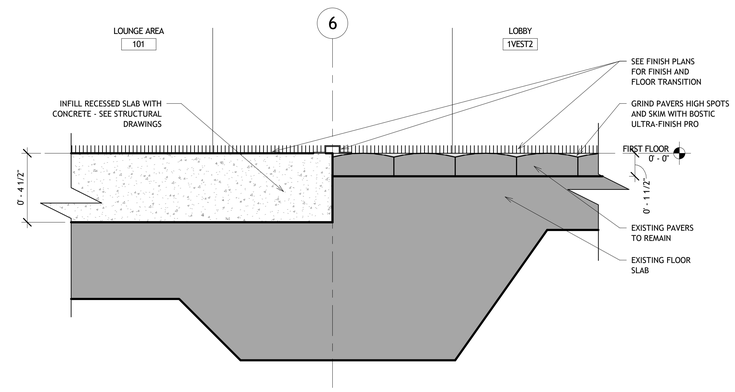
3 CEILING DETAIL @ READING ROOM
SCALE: 1 1/2" = 1'-0"



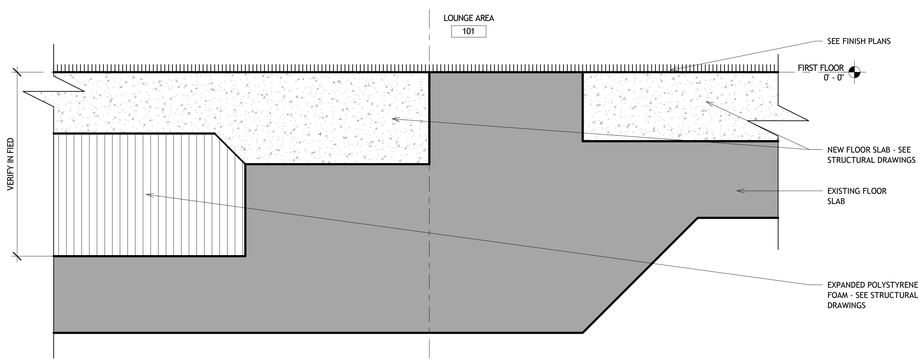
4 FLOOR DETAIL @ ELEVATOR SHAFT INFILL
SCALE: 3" = 1'-0"



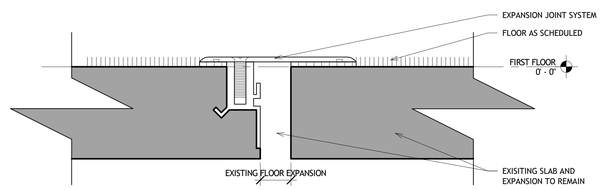
5 FLOOR DETAIL AT CARPET TRANSITION
SCALE: 3" = 1'-0"



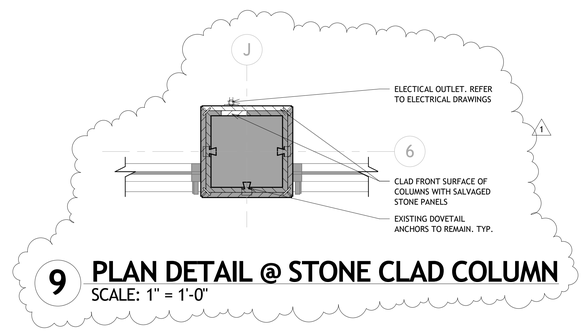
6 FLOOR DETAIL AT FLOOR TRANSITION
SCALE: 3" = 1'-0"



7 FLOOR INFILL AT EXISTING STAIR
SCALE: 3" = 1'-0"



8 EXISTING FLOOR EXPANSION JOINT
SCALE: 6" = 1'-0"



9 PLAN DETAIL @ STONE CLAD COLUMN
SCALE: 1" = 1'-0"

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REVISIONS

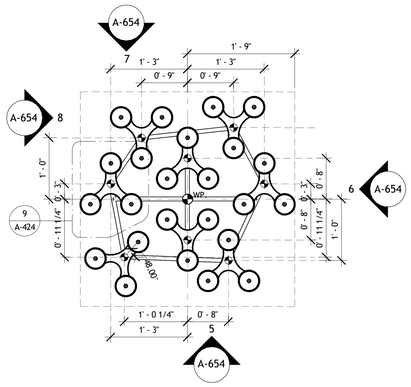
No.	Date:	Description:
1	08.02.18	ADDENDUM #3

HMBA PROJECT NUMBER: 06113.00

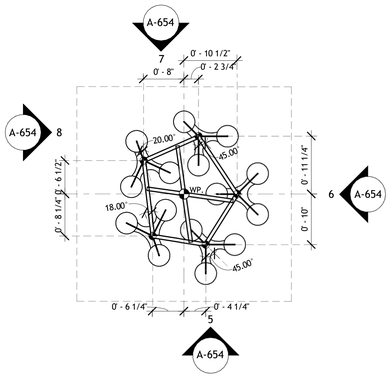
SECTIONS & DETAILS

A-422

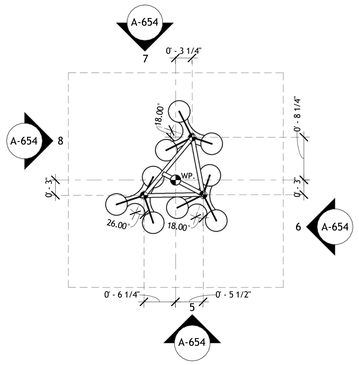
7/27/2018 12:01:30 PM



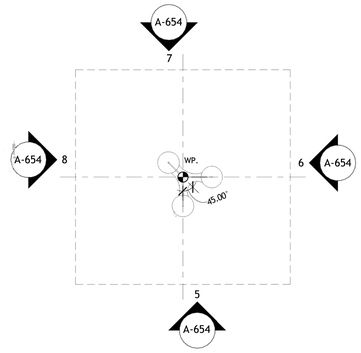
1 PLAN DETAIL AT FOURTH TIER
SCALE: 1" = 1'-0"



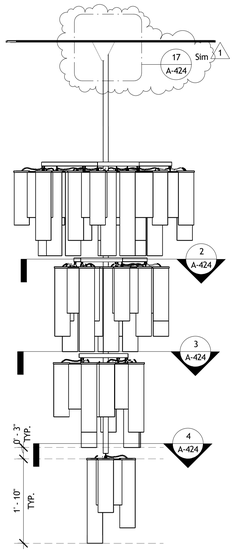
2 PLAN DETAIL AT THIRD TIER
SCALE: 1" = 1'-0"



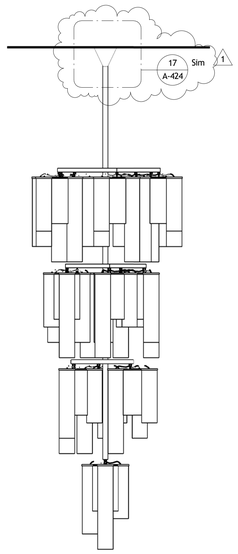
3 PLAN DETAIL AT SECOND TIER
SCALE: 1" = 1'-0"



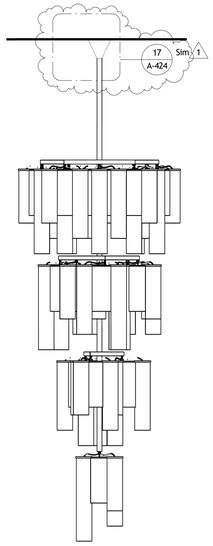
4 PLAN DETAIL AT FIRST TIER
SCALE: 1" = 1'-0"



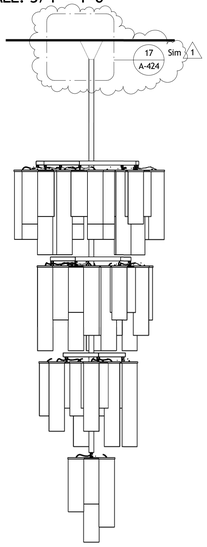
5 CHANDELIER NORTH ELEVATION
SCALE: 3/4" = 1'-0"



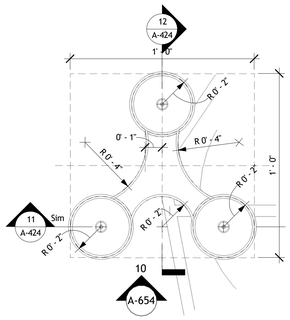
6 CHANDELIER WEST ELEVATION
SCALE: 3/4" = 1'-0"



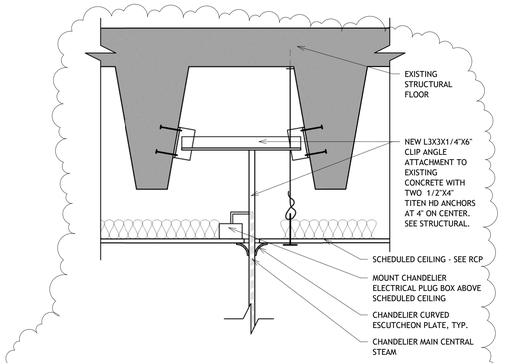
7 CHANDELIER SOUTH ELEVATION
SCALE: 3/4" = 1'-0"



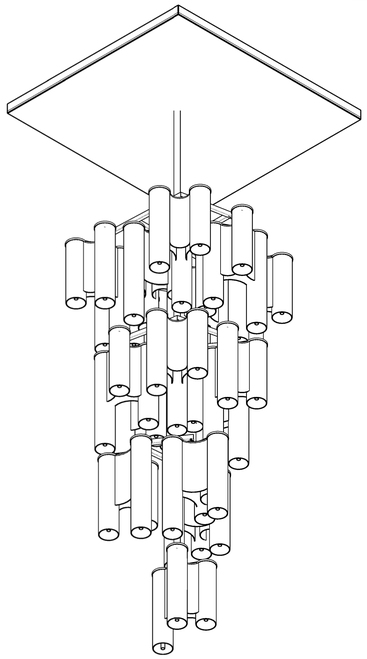
8 CHANDELIER EAST ELEVATION
SCALE: 3/4" = 1'-0"



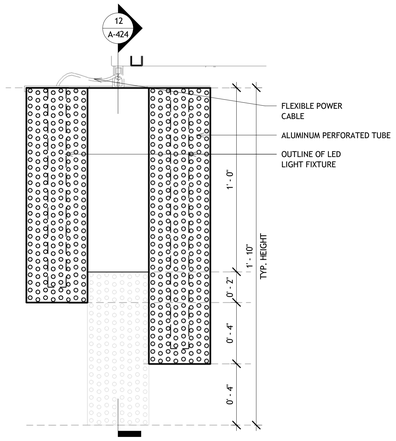
9 TYP. MODULE PLAN DETAIL
SCALE: 3" = 1'-0"



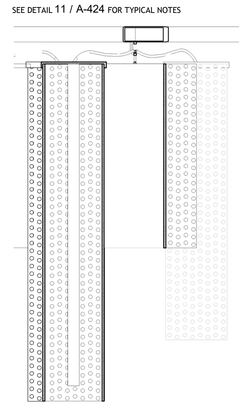
17 DETAIL @ CHANDELIER STEAM
SCALE: 1 1/2" = 1'-0"



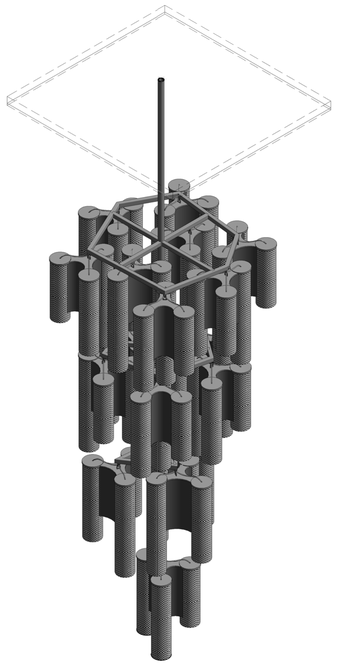
14 CHANDELIER VIEW
SCALE:



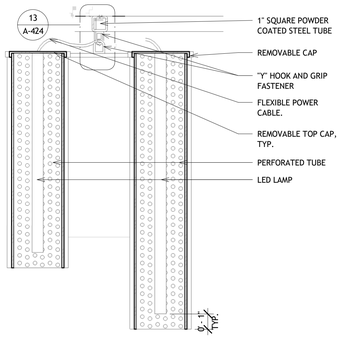
10 TYP. MODULE ELEVATION
SCALE: 3" = 1'-0"



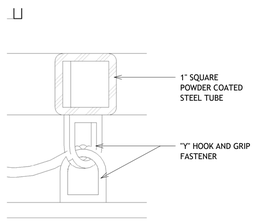
12 TYP. MODULE SECTION DETAIL
SCALE: 3" = 1'-0"



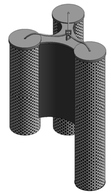
15 CHANDELIER VIEW
SCALE:



11 TYP. MODULE SECTION DETAIL
SCALE: 3" = 1'-0"



13 TYP. MOUNTING DETAIL
SCALE: 12" = 1'-0"



16 MODULE AXON VIEW
SCALE:

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SECTIONS & DETAILS

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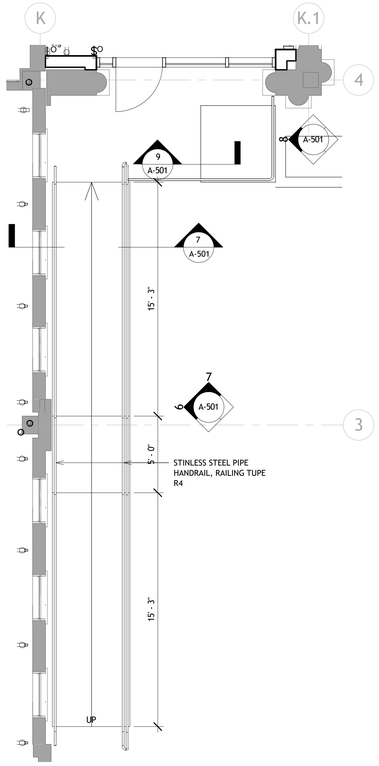
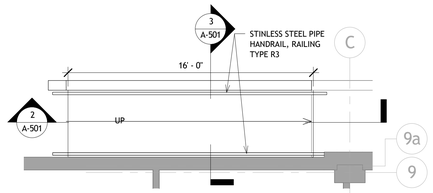
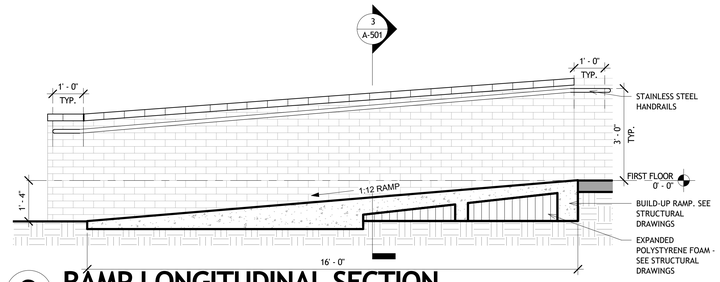
8/17/2018 2:51:23 PM



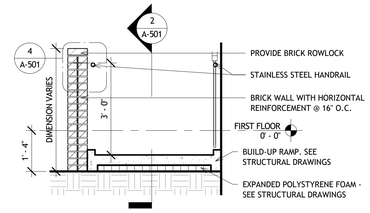
5 PLAN DETAIL @ TAFT RAMP
SCALE: 1/4" = 1'-0"



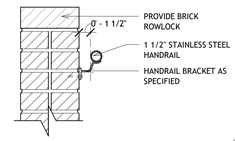
1 PLAN DETAIL AT LOADING DOCK RAMP
SCALE: 1/4" = 1'-0"



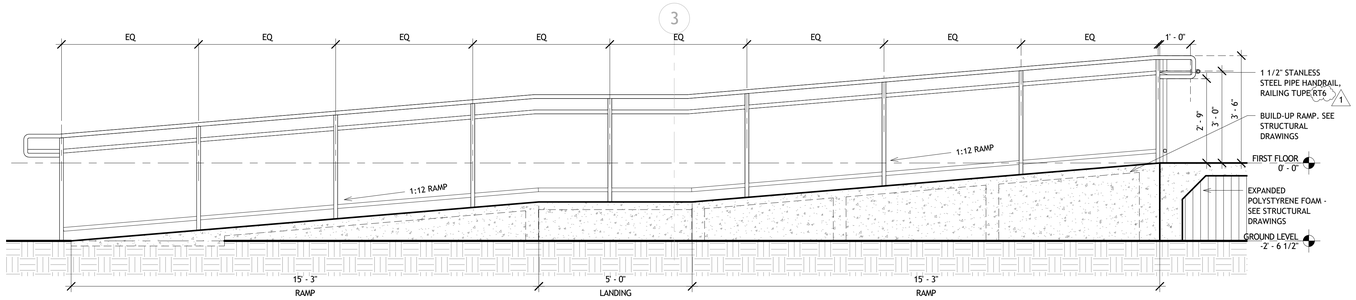
2 RAMP LONGITUDINAL SECTION
SCALE: 1/2" = 1'-0"



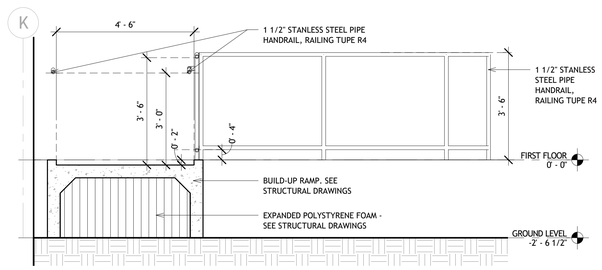
3 RAMP TRANSVERSE SECTION
SCALE: 1/2" = 1'-0"



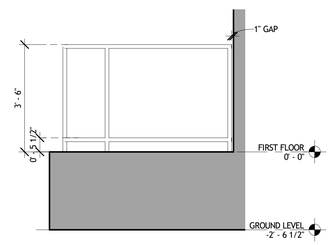
4 HANDRAIL DETAIL RT5
SCALE: 1 1/2" = 1'-0"



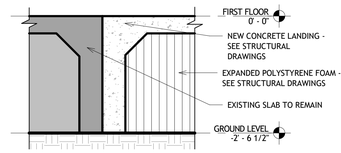
6 TAFT RAMP LONGITUDINAL SECTION / ELEVATION
SCALE: 1/2" = 1'-0"



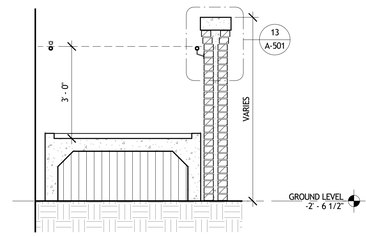
7 RAMP TRANSVERSE SECTION / ELEVATION
SCALE: 1/2" = 1'-0"



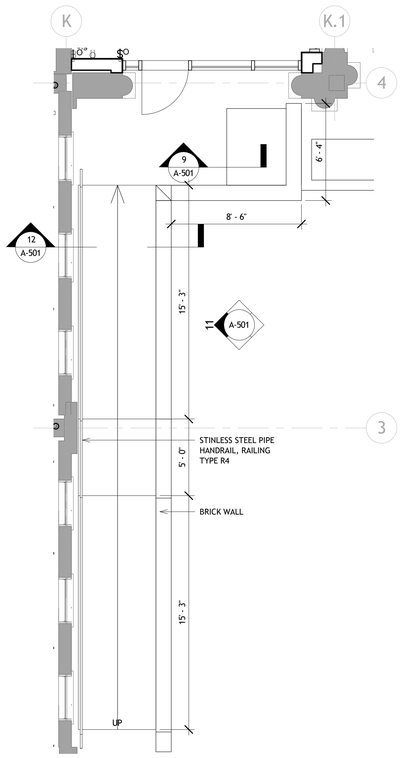
8 RAMP HANDRAIL ELEVATION
SCALE: 1/2" = 1'-0"



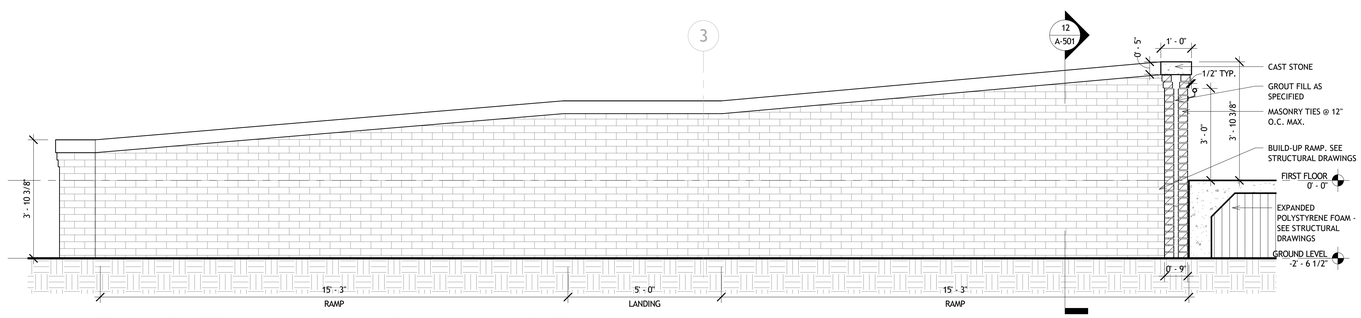
9 DETAIL AT NEW LANDING
SCALE: 3/4" = 1'-0"



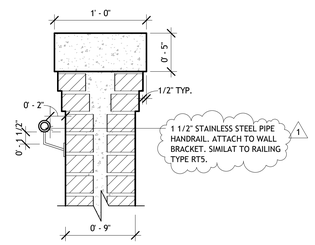
12 ALT-6 - RAMP SECTION DETAIL
SCALE: 1/2" = 1'-0"



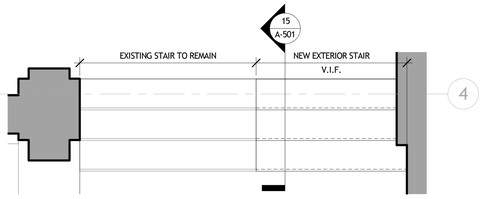
10 ALT-6 - PLAN DETAIL @ TAFT RAMP
SCALE: 1/4" = 1'-0"



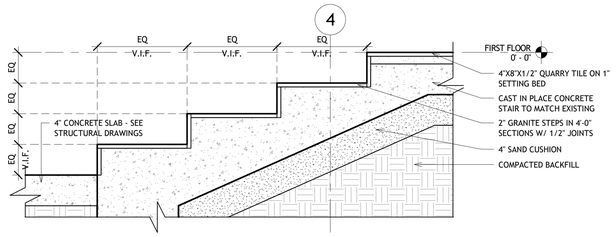
11 ALT-6 - TAFT RAMP LONGITUDINAL SECTION
SCALE: 1/2" = 1'-0"



13 ALT-6 - HANDRAIL DETAIL
SCALE: 1 1/2" = 1'-0"



14 NEW EXTERIOR STAIR
SCALE: 1/2" = 1'-0"



15 NEW EXTERIOR STAIR SECTION DETAIL
SCALE: 1 1/2" = 1'-0"

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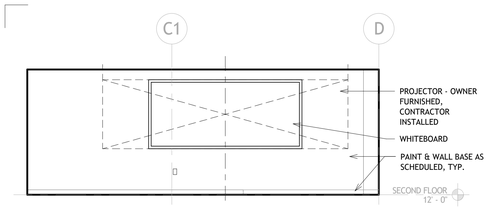
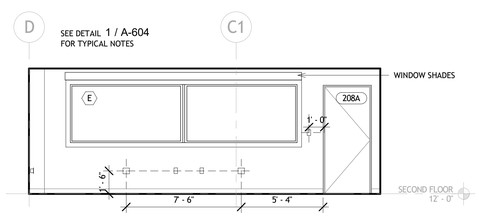
EXTERIOR DETAILS

A-501

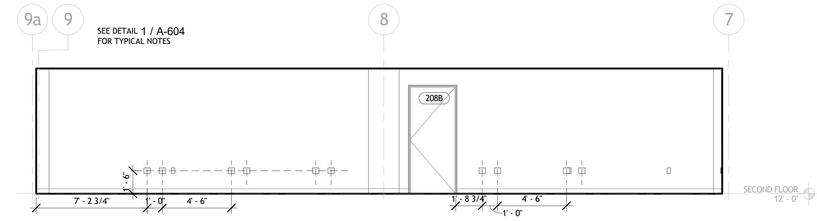
7/27/2018 12:01:55 PM



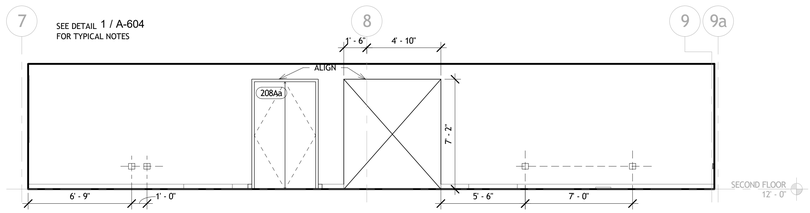
1 208 COMP. ROOM NORTH ELEVATION
SCALE: 1/4" = 1'-0"



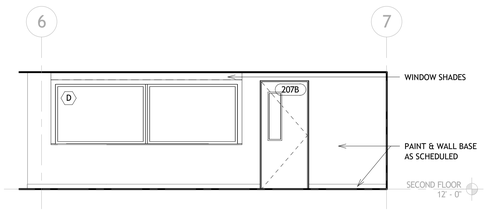
2 208 COMP. ROOM SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



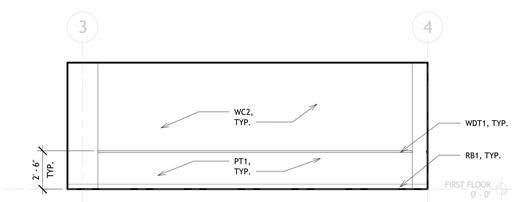
3 208 COMP. ROOM EAST ELEVATION
SCALE: 1/4" = 1'-0"



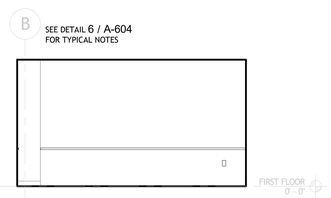
4 208 COMP. ROOM WEST ELEVATION
SCALE: 1/4" = 1'-0"



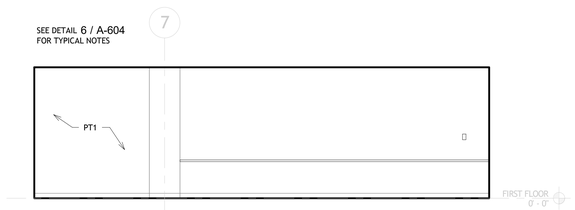
5 207 WEST ELEVATION
SCALE: 1/4" = 1'-0"



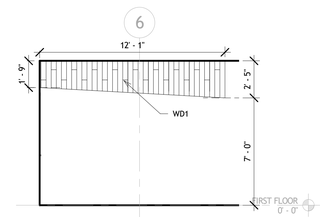
6 113A LEARNING COMMONS WEST ELEVATION
SCALE: 1/4" = 1'-0"



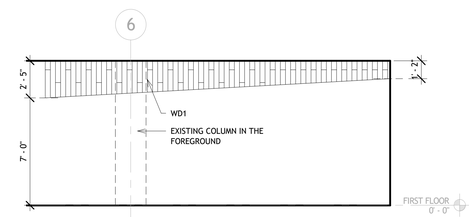
7 113A LEARNING COMMONS NORTH ELE.
SCALE: 1/4" = 1'-0"



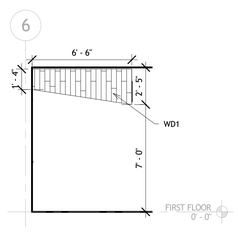
8 101 LOUNGE AREA EAST ELEVATION
SCALE: 1/4" = 1'-0"



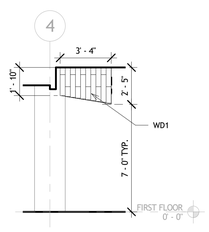
10 CHECK-OUT WEST ELEVATION
SCALE: 1/4" = 1'-0"



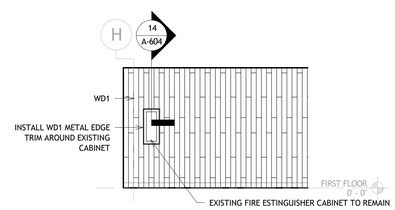
9 CHECK-OUT EAST ELEVATION
SCALE: 1/4" = 1'-0"



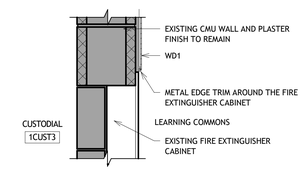
11 REF. 107B EAST/WEST ELE.
SCALE: 1/4" = 1'-0"



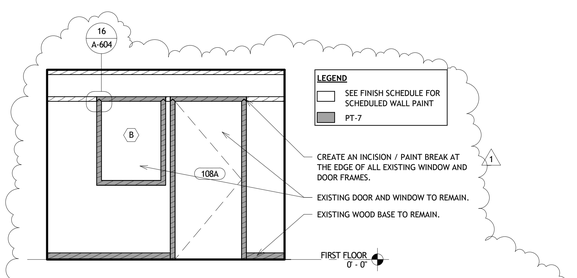
12 LEARNING CENTER EAST/WEST ELE.
SCALE: 1/4" = 1'-0"



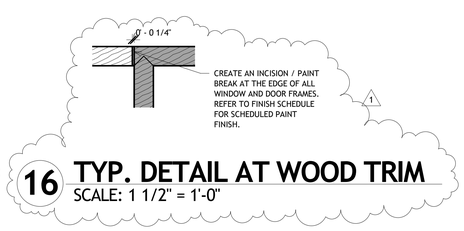
13 ELEVATION AT FIRE ESTINGUISHER CABINET
SCALE: 1/4" = 1'-0"



14 SECTION DETAIL AT CABINET
SCALE: 1 1/2" = 1'-0"



15 TYP. EXISTING WOOD TRIM ELEVATION
SCALE: 3/8" = 1'-0"



16 TYP. DETAIL AT WOOD TRIM
SCALE: 1 1/2" = 1'-0"

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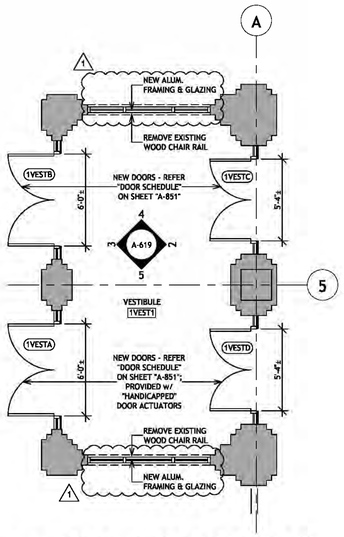
No.	Date:	Description:
1	08.02.18	ADDENDUM #3

HMBA PROJECT NUMBER: 06113.00

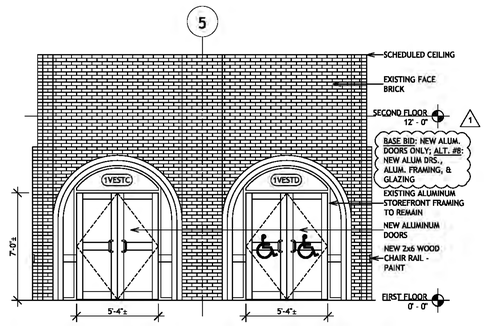
INTERIOR ELEVATIONS

A-604

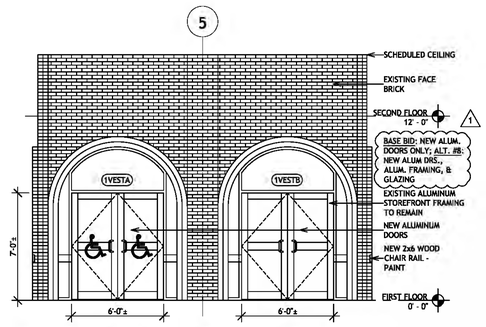
7/30/2018 11:53:13 AM



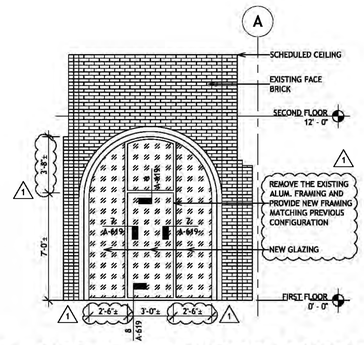
1 VESTIBULE "1VEST1" PLAN DETAIL
SCALE: 1/4" = 1'-0"



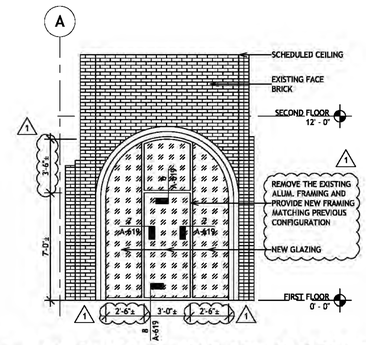
2 VESTIBULE "1VEST1" EAST ELEVATION
SCALE: 1/4" = 1'-0"



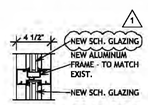
3 VESTIBULE "1VEST1" WEST ELEVATION
SCALE: 1/4" = 1'-0"



4 VESTIBULE "1VEST1" NORTH ELEVATION
SCALE: 1/4" = 1'-0"

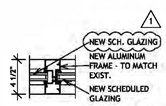


5 VESTIBULE "1VEST1" SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



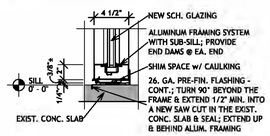
TRANSOM

6 TRANSOM DETAIL
SCALE: 1 1/2" = 1'-0"



MULLION

7 MULLION DETAIL
SCALE: 1 1/2" = 1'-0"



SILL

8 SILL DETAIL
SCALE: 1 1/2" = 1'-0"

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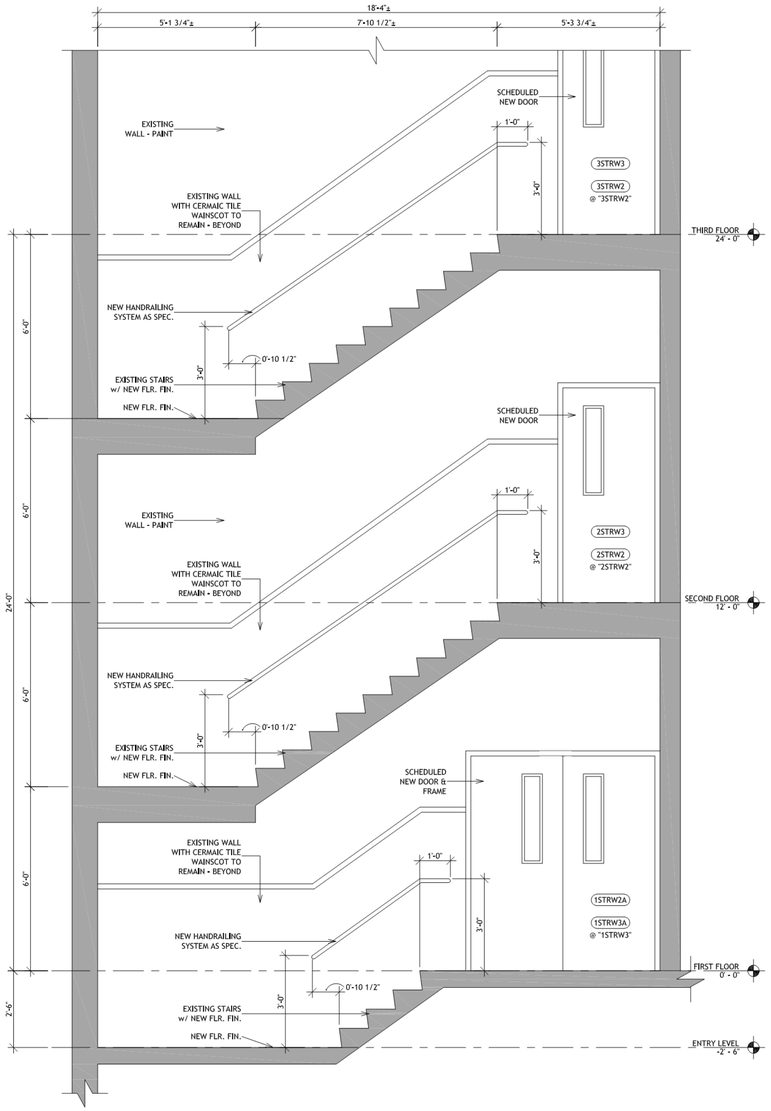
1	ADDENDUM NO. 3	08.02.18

HMBA PROJECT NUMBER: 06113.00

INTERIOR ELEVATIONS

A-619

1/10/2018 12:58:40 PM



1 STAIR SECTION - VIEWING EAST ("2STRW3")

SCALE: 1/2" = 1'-0"

NOTE: "2STRW2" SIM. - OPP. HAND

RAILING TYPE	RAILING LOCATION	RAILING DESCRIPTION	DRAWING REFERENCE
1	STAIR 1STRW1	ORNAMENTAL GLASS RAIL SYSTEM - 1 1/2" NOMINAL STAINLESS STEEL PIPE HANDRAIL AND GUARDRAIL WITH GLASS PANEL	7/A-701
2	STAIR 1STRW1	1 1/2" NOMINAL STAINLESS STEEL PIPE HANDRAIL AND GUARDRAIL WITH WIRE MESH PANELS INFILL	8/A-701
3	STAIR 1STRW1	1 1/2" NOMINAL STAINLESS STEEL PIPE HANDRAIL RETURN TO WALL. COORDINATE WITH WALL FINISH	6/A-701, 15/A-701
4	STAIR 1STRW2, 2STRW3, 3STRW3 2STRW3, 2STRW2, 3STRW2	1 1/2" NOMINAL STAINLESS STEEL PIPE HANDRAIL AND GUARDRAIL WITH CABLE RAIL INFILL	A-702
5	NEW RAMP AT LOADING	1 1/2" NOMINAL STAINLESS STEEL PIPE HANDRAIL RETURN TO NEW BRICK WALL	2,3,4/A-501
6	NEW RAMP AT TAFT BAY WINDOW	1 1/2" NOMINAL STAINLESS STEEL PIPE HANDRAIL AND GUARDRAIL	6/A-501

1 RAILING TYPES AND DESCRIPTIONS

SCALE: 3" = 1'-0"

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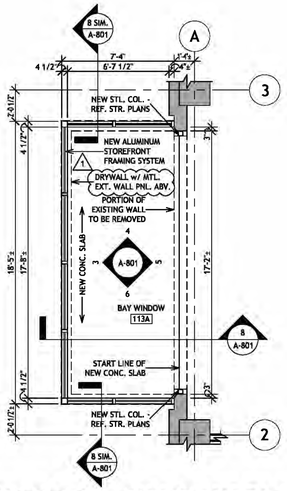
1	08.02.18	ADDENDUM #3

HMBA PROJECT NUMBER: 06113.00

STAIR PLANS & SECTIONS

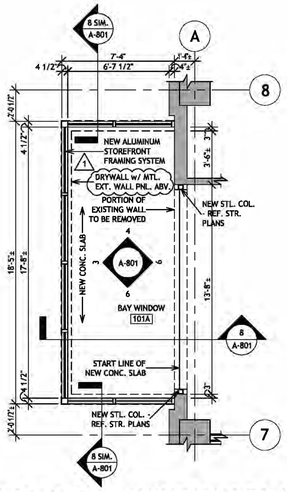
A-703

7/27/2018 12:01:56 PM



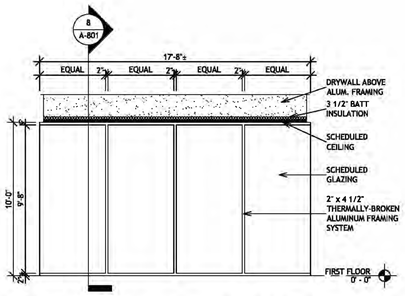
1 WEST BAY WINDOW PLAN (SOUTH)

SCALE: 1/4" = 1'-0"



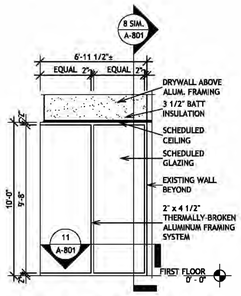
2 WEST BAY WINDOW PLAN (NORTH)

SCALE: 1/4" = 1'-0"



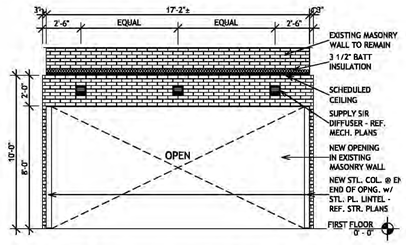
3 BAY WINDOW ELEV. 1

SCALE: 1/4" = 1'-0"



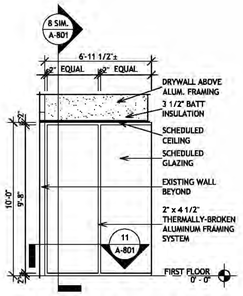
4 BAY WINDOW ELEV. 2

SCALE: 1/4" = 1'-0"



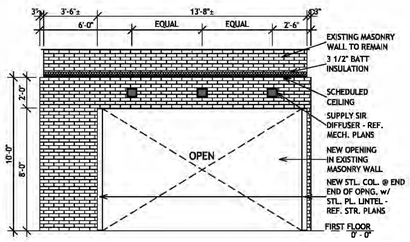
5 BAY WINDOW ELEV. 3

SCALE: 1/4" = 1'-0"



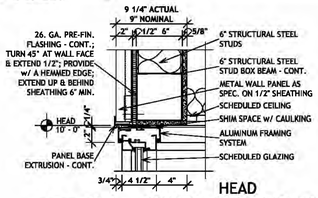
6 BAY WINDOW ELEV. 4

SCALE: 1/4" = 1'-0"



7 BAY WINDOW ELEV. 5

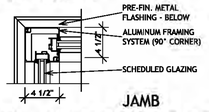
SCALE: 1/4" = 1'-0"



HEAD

9 BAY WINDOW OPENING DETAIL 1

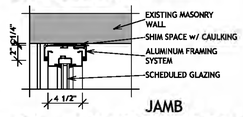
SCALE: 1 1/2" = 1'-0"



JAMB

10 BAY WINDOW OPENING DETAIL 2

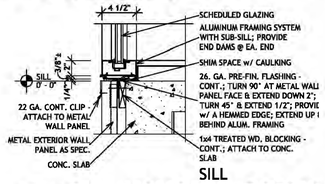
SCALE: 1 1/2" = 1'-0"



JAMB

11 BAY WINDOW OPENING DETAIL 3

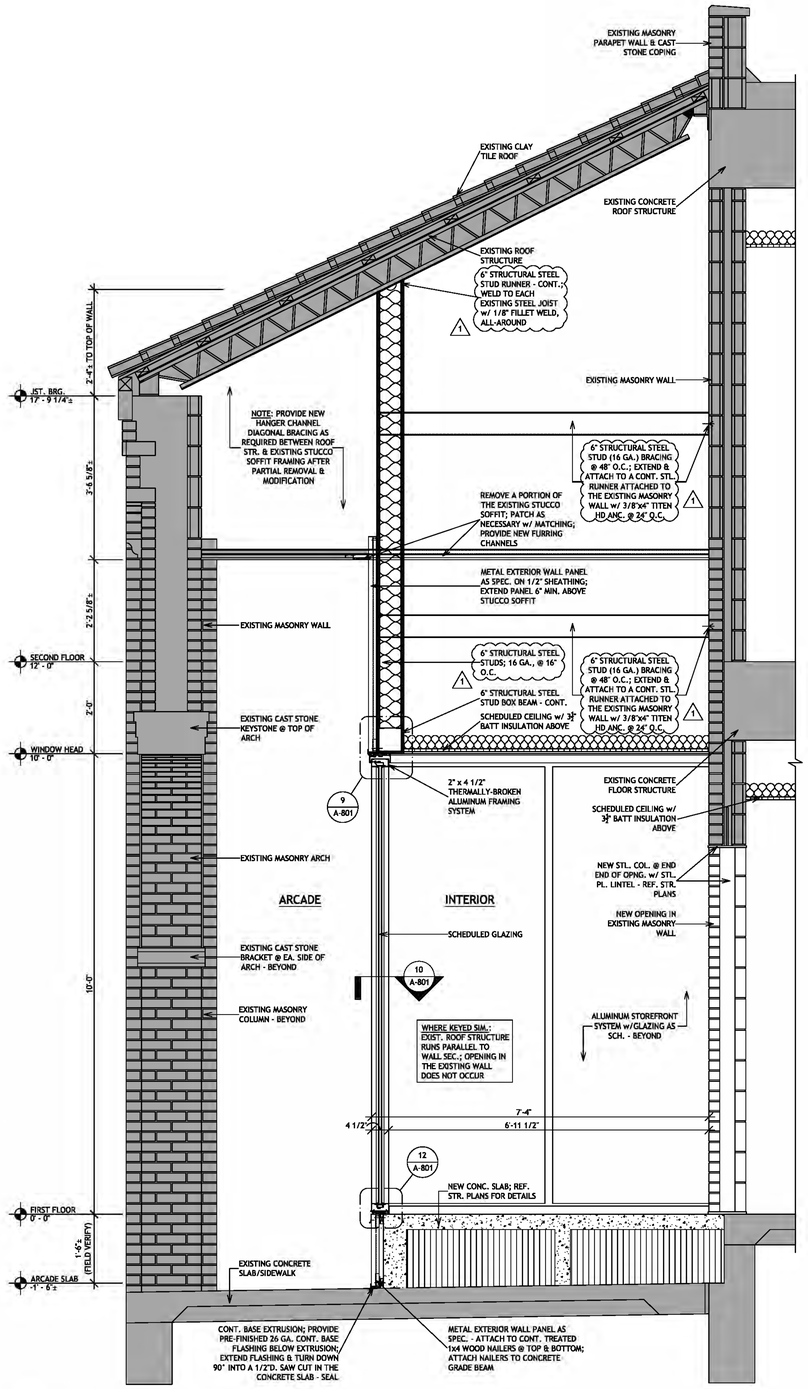
SCALE: 1 1/2" = 1'-0"



SILL

12 BAY WINDOW OPENING DETAIL 4

SCALE: 1 1/2" = 1'-0"



8 BAY WINDOW WALL SEC.

SCALE: 3/4" = 1'-0"

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1	ADDENDUM NO. 3	08.02.18

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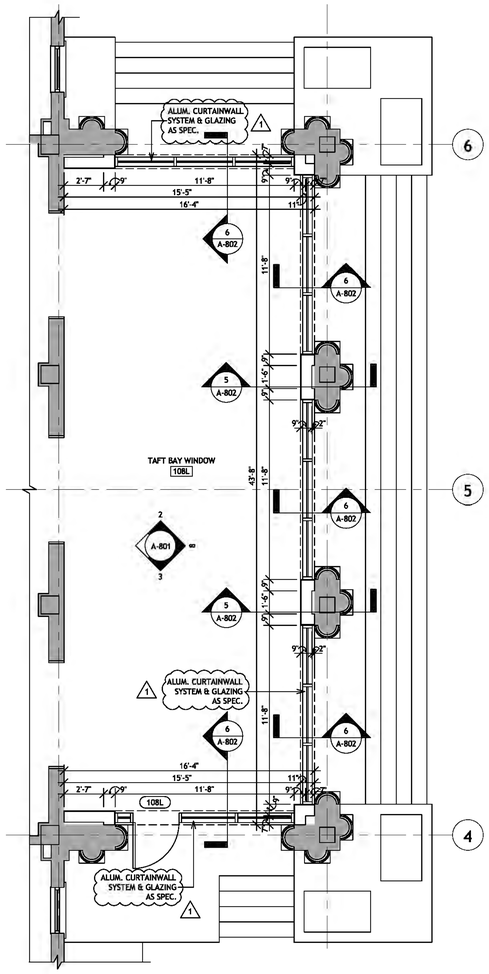
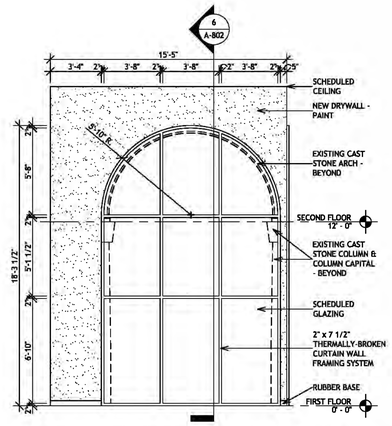
WINDOW ELEVATION & DETAILS

A-801

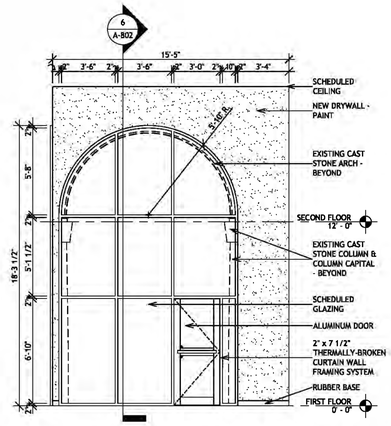
7/10/2018 2:47:20 PM



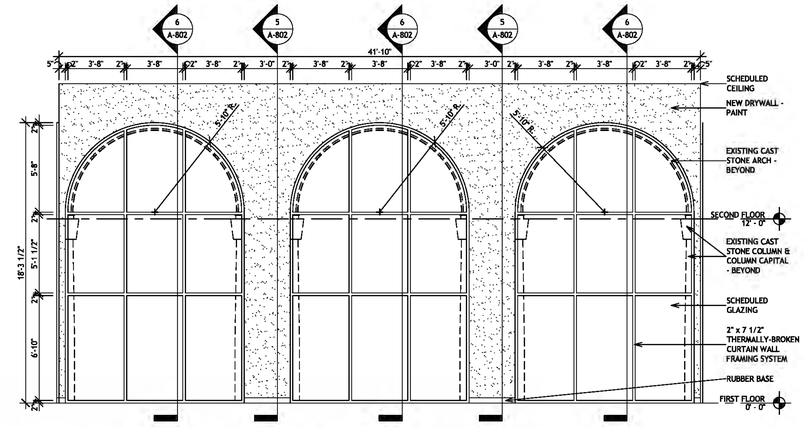
1 TAFT BAY WINDOW PLAN DETAIL
SCALE: 1/4" = 1'-0"



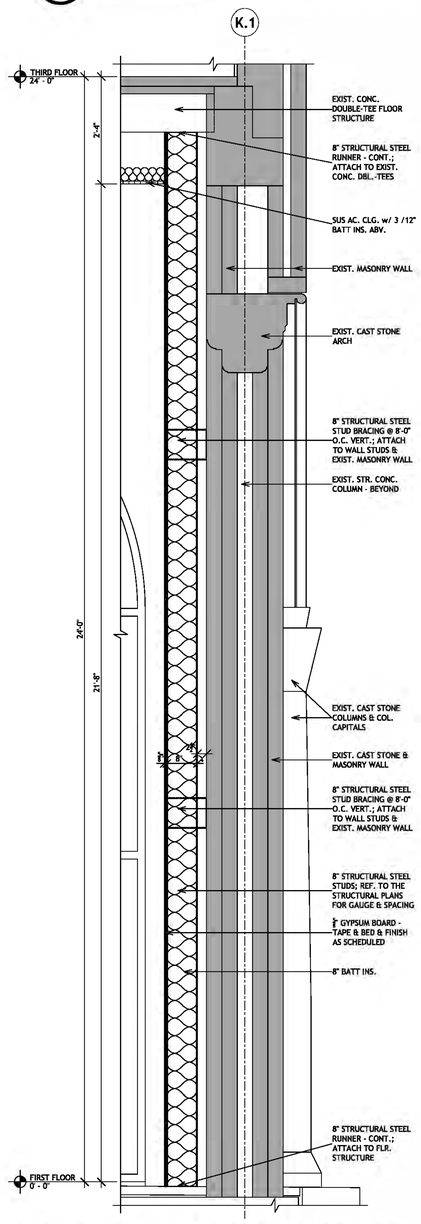
2 BAY WINDOW ELEVATION 1
SCALE: 1/4" = 1'-0"



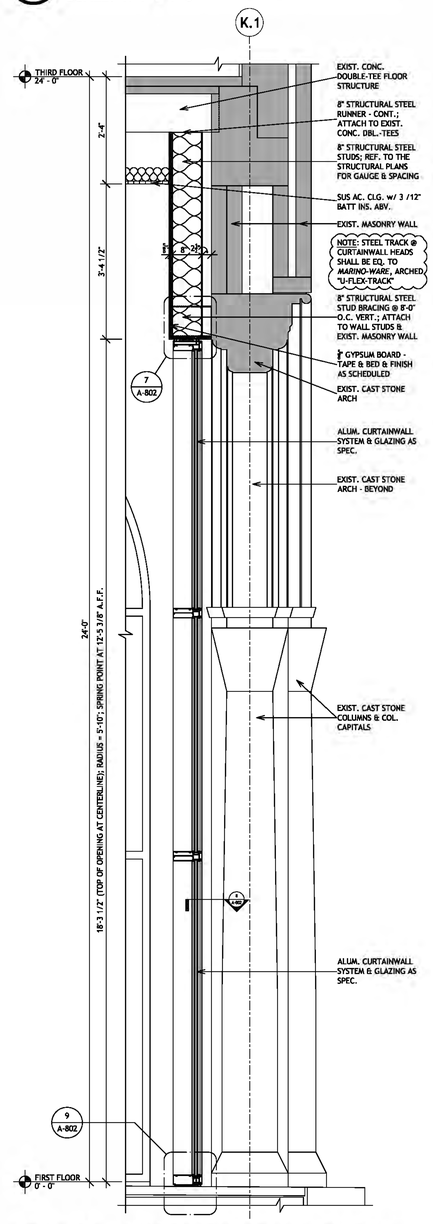
3 BAY WINDOW ELEVATION 2
SCALE: 1/4" = 1'-0"



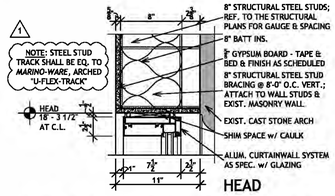
4 BAY WINDOW ELEVATION 3
SCALE: 1/4" = 1'-0"



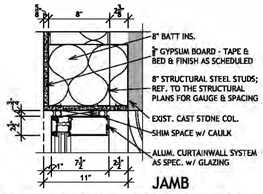
5 BAY WINDOW WALL SEC. 1
SCALE: 3/4" = 1'-0"



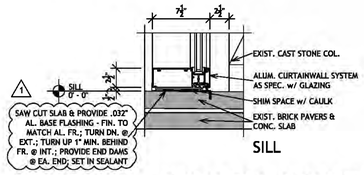
6 BAY WINDOW WALL SEC. 2
SCALE: 3/4" = 1'-0"



7 BAY WINDOW OPENING DETAIL 1
SCALE: 1 1/2" = 1'-0"



8 BAY WINDOW OPENING DETAIL 2
SCALE: 1 1/2" = 1'-0"



9 BAY WINDOW OPENING DETAIL 3
SCALE: 1 1/2" = 1'-0"

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MSU - MOFFETT LIBRARY RENOVATION
MIDWESTERN STATE UNIVERSITY
WICHITA FALLS, TEXAS

SEAL:

100% CD SUBMISSION
ISSUE DATE: 07.12.2018

REVISION	DESCRIPTION	DATE
1	ADDENDUM NO. 3	08.02.18

HMBA PROJECT NUMBER: 06113.00

WINDOW ELEVATION & DETAILS

A-802

1/10/2018 2:47:20 PM

DOOR SCHEDULE - FIRST FLOOR

Tag	Type	Height	Width	Thickness	Door Material	Finish	Frame Type	Frame Material	Frame Finish	Hardware Group	Fire Rating	Wall Condition	Phase Demolished	Comments
102	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	HM	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
102A	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	New Construction	None	
102B	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
102C	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
102D	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	4	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
102E	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
102F	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	New Construction	None	
103A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	HM	PNT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
103B	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
104	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
105A	10	7' - 0"	6'-8" (pair)	1 3/4"	WD	PT	10	HM	PT	7	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
106	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
106A	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	Existing	None	
107	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
108A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
108B	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
108L	9	7' - 0"	3' - 0"	1 3/4"	Aluminum	Prefinished	9	Aluminum	Prefinished	11	NR	New Construction	None	
109A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
109d	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
110a	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	Existing	None	
110B	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	New Construction	None	
110b	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	HM	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
110C	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	New Construction	None	
110c	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	Existing	None	
111	3	7' - 0"	3' - 0"	1 3/4"	WD	PNT	3	HM	PNT	3	NR	New Construction	None	
111A	3	7' - 0"	3' - 0"	1 3/4"	WD	PNT	3	HM	PNT	3	NR	New Construction	None	
111B	3	7' - 0"	3' - 0"	1 3/4"	WD	PNT	3	HM	PNT	3	NR	New Construction	None	
113	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
113B	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT		NR	New Construction	None	
113C	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT		NR	New Construction	None	
113D	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT		NR	New Construction	None	
113E	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT		NR	New Construction	None	
113F	3	7' - 0"	3' - 0"	1 3/4"	WD	PNT	3	HM	PNT	9	NR	New Construction	None	
113G	3	7' - 0"	3' - 0"	1 3/4"	WD	PNT	3	HM	PNT	9	NR	New Construction	None	
114	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
1CUST3	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
1CORR4	3	7' - 0"	3' - 0"	1 3/4"	WD	PNT	3	HM	PNT	10	20 MINUTE	New Construction	None	
1MECH1	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
1RR3	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	HM	PNT	4	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
1STRW2A	7	7' - 0"	6' - 0" (pair)	1 3/4"	WD	PNT	7	HM	PNT	5	20 MINUTE	Existing	None	
1STRW2B	6	7' - 0"	6' - 0" (pair)	1 3/4"	HM	PNT	6	HM	PNT	6	NR	Existing	None	
1STRW3A	7	7' - 0"	6' - 0" (pair)	1 3/4"	WD	PNT	7	HM	PNT	5	20 MINUTE	Existing	None	
1STRW3B	6	7' - 0"	6' - 0" (pair)	1 3/4"	HM	PNT	6	HM	PNT	6	NR	Existing	None	
1VESTA	2	7' - 0"	6' - 0"	1 3/4"	Aluminum	Prefinished	2	Aluminum	Prefinished	12	NR	Existing	None	Provide w/ Auto Dr. Controller & Activation Plates
1VESTB	2	7' - 0"	6' - 0"	1 3/4"	Aluminum	Prefinished	2	Aluminum	Prefinished	12	NR	Existing	None	Provide w/ Auto Dr. Controller & Activation Plates
1VESTC	1	7' - 0"	5'-4"	1 3/4"	Aluminum	Prefinished	1	Aluminum	Prefinished	12	NR	Existing	None	Provide w/ Auto Dr. Controller & Activation Plates
1VESTD	1	7' - 0"	5'-4"	1 3/4"	Aluminum	Prefinished	1	Aluminum	Prefinished	12	NR	Existing	None	Provide w/ Auto Dr. Controller & Activation Plates
1VEST3A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	HM	PT	10	20 MINUTE	Existing	None	
1VEST3B	11	7' - 0"	3' - 0"	1 3/4"	HM	PNT	11	HM	PT	8	60 MINUTE	Existing	None	

1 DOOR SCHEDULE - FIRST FLOOR

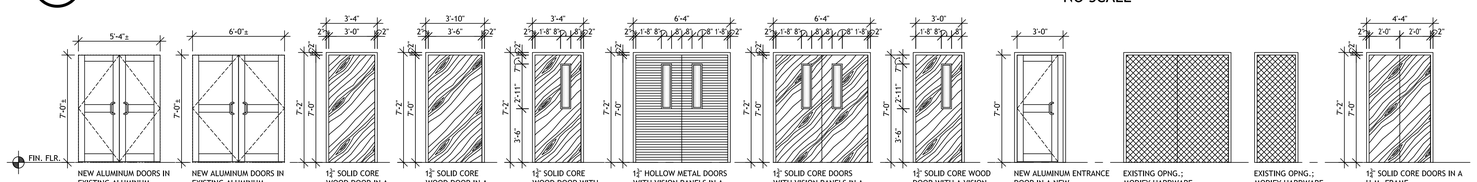
NO SCALE

DOOR SCHEDULE - THIRD FLOOR

Tag	Type	Height	Width	Thickness	Door Material	Finish	Frame Type	Frame Material	Frame Finish	Hardware Group	Fire Rating	Wall Condition	Phase Demolished	Comments
309	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
310A	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
310B	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
312A	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
312B	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
315A	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
315B	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
316	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
3MECH10	3	7' - 0"	3' - 0"	1 3/4"	WD	PT	3	HM	PT	1	NR	New Construction	None	
3MECH11	3	7' - 0"	3' - 0"	1 3/4"	WD	PT	3	HM	PT	1	NR	New Construction	None	
3STO5	11	7' - 0"	2' - 0"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
3STRW2	5	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	2	20 MINUTE	Existing	None	Exist. Door/Frame - New Hdw. & Paint
3STRW3	5	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	WD	PT	2	20 MINUTE	Existing	None	Exist. Door/Frame - New Hdw. & Paint
3STRW4	11	7' - 0"	2' - 6"	1 3/4"	WD	PT	11	WD	PT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint

3 DOOR SCHEDULE - THIRD FLOOR

NO SCALE



4 DOOR ELEVATIONS

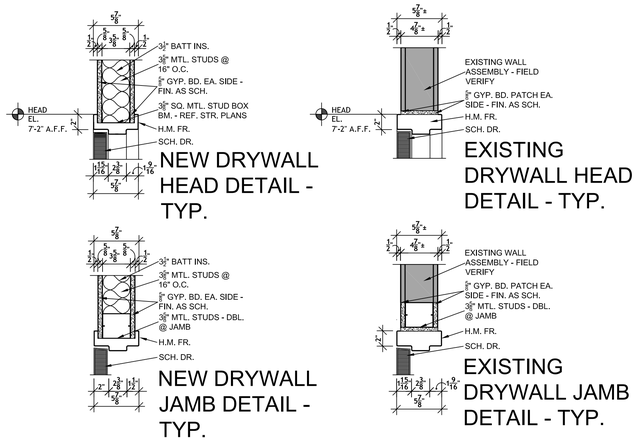
SCALE: 1/4" = 1'-0"

DOOR SCHEDULE - SECOND FLOOR

Tag	Type	Height	Width	Thickness	Door Material	Finish	Frame Type	Frame Material	Frame Finish	Hardware Group	Fire Rating	Wall Condition	Phase Demolished	Comments
200A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
201	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
202	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
203	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
204A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
204B	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
205	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
206	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
207A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
207B	5	7' - 0"	3' - 0"	1 3/4"	WD	PNT	5	HM	PNT	3	NR	Existing	None	
207Aa	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
207Ab	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
208	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	9	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
208A	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	9	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint
208Aa	12	7' - 0"	4' - 0" (pair)	1 3/4"	WD	PNT	12	HM	PNT	7	NR	New Construction	None	
211	9	7' - 0"	3' - 0"	1 3/4"	Aluminum	Prefinished	11	Aluminum	Prefinished	3	NR	New Construction	None	
216	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
216A	9	7' - 0"	3' - 0"	1 3/4"	Aluminum	Prefinished	11	Aluminum	Prefinished	3	NR	New Construction	None	
217	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
218	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
219	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
220	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
221	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
222	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
223	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
224	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
225	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
226	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
227	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
228	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
229	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
230	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
231	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
232	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
233	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
234	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
235	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
236	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
237	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
237A	9	7' - 0"	3' - 0"	1 3/4"	Aluminum	Prefinished	11	Aluminum	Prefinished	3	NR	New Construction	None	
238	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
238A	9	7' - 0"	3' - 0"	1 3/4"	Aluminum	Prefinished	11	Aluminum	Prefinished	3	NR	New Construction	None	
239	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
240	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
241	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
242	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
243	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
244	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
245	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
246	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
247	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
251A	9	7' - 0"	3' - 0"	1 3/4"	Aluminum	Prefinished	11	Aluminum	Prefinished	3	NR	New Construction	None	
252	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
253	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	3	NR	Existing	None	Exist. Door/Frame - New Hdw. & Paint; New VP
284A	3	7' - 0"	3' - 0"	1 3/4"	WD	PT	3	HM	PT	3	NR	New Construction	None	
284B	3	7' - 0"	3' - 0"	1 3/4"	WD	PT	3	HM	PT	3	NR	New Construction	None	
284C	1	7' - 0"	3' - 0"	1 3/4"	WD	PT	3	HM	PT	3	NR	New Construction	None	
2CORR11	1	7' - 0"	3' - 0"	1 3/4"	WD	PT	1	WD	PT	1	NR	Existing	None	
2CUST3	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame Relocated - New Hdw. & Paint
2CUST4	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	1	NR	Existing	None	Exist. Door/Frame Relocated - New Hdw. & Paint
2STRW1	11	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	HM	PT	2	20 MINUTE	Existing	None	Exist. Door/Frame - New Hdw. & Paint
2STRW2	5	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	HM	PT	2	20 MINUTE	New Construction	None	
2STRW3	5	7' - 0"	3' - 0"	1 3/4"	WD	PT	11	HM	PT	2	20 MINUTE	New Construction	None	
2TOIL2	11	7' - 0"	3' - 0"	1 3/4"	WD	PNT	11	WD	PNT	4	NR	Existing	None	Exist. Door/Frame Relocated - New Hdw. & Paint

2 DOOR SCHEDULE - SECOND FLOOR

NO SCALE



4 OPENING DETAILS

SCALE: 1 1/2" = 1'-0"

HOLZMAN MOSS BOTTINO ARCHITECTURE

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107 N. GOLIAD STREET, SUITE 204
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IT / AV CONSULTANT:
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MSU - MOFFETT LIBRARY RENOVATION

MIDWESTERN STATE UNIVERSITY
WICHITA FALLS, TEXAS

SEAL:

100% CD SUBMISSION
ISSUE DATE: 07.12.2018

REVISION	DESCRIPTION	DATE
1	ADDENDUM NO. 3	08.02.18

HMBA PROJECT NUMBER: 06113.00

DOOR SCHEDULE

A-851

1/10/2018 12:58:40 PM

ROOM FINISH SCHEDULE

PHASE II

WTZA	ROOM NO	ROOM Name	FLOOR Finish	FLOOR Base	WALLS North	WALLS East	WALLS South	WALLS West	CEILING Finish	Finish Notes
FIRST FLOOR	1CORR4	CORRIDOR	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	1CUST3	CUSTODIAL	Existing	Existing	PT1	PT1	PT1	PT1	Existing	
FIRST FLOOR	1ELEC1	ELECTRICAL	Existing	Existing	Existing	Existing	Existing	Existing	Existing	
FIRST FLOOR	1ELEV2	ELEVATOR	Existing	Existing	Existing	Existing	Existing	Existing	Existing	
FIRST FLOOR	1MECH1	MECHANICAL	Existing	Existing	Existing	Existing	Existing	Existing	Existing	
FIRST FLOOR	1RR3	TOILET	Existing	Existing	PT1	PT1	PT1	PT1	ACT1A	EXISTING WALL TILE TO REMAIN.
FIRST FLOOR	1STRW1	STAIR	REFER				WD1		Existing	SEE SHEET A-701 FOR STAIR DETAILS. SEE FINISH PLANS FOR FLOORING DETAILS.
FIRST FLOOR	1STRW2	STAIRS	RB4	Existing	PT5	PT5	PT5	PT5	Existing	EXISTING WALL TILE TO REMAIN.
FIRST FLOOR	1STRW3	STAIRS	RB4	Existing	PT5	PT5	PT5	PT5	Existing	EXISTING WALL TILE TO REMAIN.
FIRST FLOOR	1VEST1	VESTIBULE	CPT1A	Existing	Existing	Existing	Existing	Existing	Existing	
FIRST FLOOR	1VEST2	LOBBY	REFER	Existing	Existing	Existing	Existing	Existing	REFER	SEE SHEET I-191 FOR FLOORING DETAILS. SEE RCP FOR CEILING DETAILS.
FIRST FLOOR	1VEST3	VESTIBULE	BBT1	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	101	LOUNGE AREA	CPT2	RB1	PT1	PT1/WC2	Existing	PT1	ACT3	SEE SHEET A-604 FOR FINISH DETAILS.
FIRST FLOOR	102	TECH SERVICES	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	102A	CAT. ASST.	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	102B	CAT. LIBRARIAN	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	102C	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	102D	TOILET	T3	Existing	PT1	PT1	PT1	PT1	ACT1A	EXISTING WALL TILE TO REMAIN.
FIRST FLOOR	102E	STORAGE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	102F	SERIAL LIBRARIAN	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	103	MEDIA STORAGE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	104	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	104	VEST.	CPT2	Existing		Existing	Existing	Existing	Existing	PATCH AND REPAIR AS NEEDED.
FIRST FLOOR	104A	CIRCULATION	REFER	RB1	PT2	PT2		PT1/PT2	ACT2	SEE FINISH PLANS FOR FLOORING DETAILS.
FIRST FLOOR	105	LOADING	Existing	Existing	Existing	Existing	Existing	Existing	Existing	
FIRST FLOOR	105	VEST.	CPT2	Existing	Existing	Existing		Existing	Existing	PATCH AND REPAIR AS NEEDED.
FIRST FLOOR	106	INST. LIBRARIAN OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	106A	INTST. ASST. OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	107	REF. LIBRARIAN	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	107B	REFERENCE	REFER	RB1	PT2				ACT2	SEE FINISH PLANS FOR FLOORING DETAILS.
FIRST FLOOR	108	(MEDIA) INST. LIBRARIAN	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	108B	STACKS (228) SECTIONS) 114 DOUBLE SIDED	CPT2	RB1	REFER			PT2	ACT1A	SEE FINISH PLANS FOR FINISH DETAILS.
FIRST FLOOR	108C	STACKS (58) SECTIONS) 29 DOUBLE SIDED	CPT2	RB1	PT1	PT1	PT2		ACT1A	
FIRST FLOOR	108L	READING ROOM	Existing	Existing	FWP1/PT1	PT1	FWP1/PT 1		Open to Above	SEE SHEET A-602 FOR FINISH DETAILS
FIRST FLOOR	108M	TAFT BAY WINDOW	CPT3	RB1	PT1	PT1	PT1	Existing	CPT2	
FIRST FLOOR	109	CML OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	110	I.L.L. STAFF AND WORKROOM	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	110B	ILL OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	110C	COLL. DEV. LIBRARIAN OFFICE	CPT2	PT1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	111	POD	REFER	RB1	PT6/WC1	PT6	PT6	PT6/WC2	ACT3	SEE SHEET A-601 FOR FINISH DETAILS. SEE FINISH PLANS FOR FLOORING DETAILS.
FIRST FLOOR	111A	POD	REFER	RB1	PT6	PT6/WC1	PT6/WC2	PT6	ACT3	SEE SHEET A-601 FOR FINISH DETAILS. SEE FINISH PLANS FOR FLOORING DETAILS.
FIRST FLOOR	111B	POD	REFER	RB1	PT6/WC2	PT6	PT6	PT6/WC1	ACT3	SEE SHEET A-601 FOR FINISH DETAILS. SEE FINISH PLANS FOR FLOORING DETAILS.
FIRST FLOOR	112B	STACKS (270) SECTIONS)	CPT2	RB1			REFER	PT1	ACT1A	
FIRST FLOOR	112C	STACKS (58) SECTIONS) 29 DOUBLE SIDED	CPT2	RB1	PT2	PT1	PT1		ACT1A	
FIRST FLOOR	113	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	113A	LEARNING CENTER	CPT2	RB1	PT1	PT3	PT3	PT1	ACT1A	
FIRST FLOOR	113B	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1B	
FIRST FLOOR	113C	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1B	
FIRST FLOOR	113D	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1B	
FIRST FLOOR	113E	STORAGE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1B	
FIRST FLOOR	113F	LEARNING CENTER CLASSROOM	CPT2	RB1	PT1	PT1	PT3	PT1	ACT1B	
FIRST FLOOR	113G	LEARNING CENTER CLASSROOM	CPT2	RB1	PT1	PT1	PT3	PT1	ACT1B	
FIRST FLOOR	113H	BAY WINDOW	CPT2	RB1	PT1		PT1	PT1	ACT3	
FIRST FLOOR	114	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
FIRST FLOOR	179	SEATING AREA	CPT2	RB1	PT1/WC2	PT3		PT1/WC2	ACT1A	SEE SHEET A-604 FOR FINISH DETAILS.
SECOND FLOOR	2CORR7	CORRIDOR	CPT2	RB1	PT3	PT1	PT3	PT3	ACT1A	
SECOND FLOOR	2CORR8	CORRIDOR	CPT2	RB1	PT1		PT3	PT3	ACT1A	
SECOND FLOOR	2CORR9	CORRIDOR	CPT2	RB1	PT1		PT1	PT2	ACT1A	
SECOND FLOOR	2CORR11	CORRIDOR	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	2CUST3	CUSTODIAL	BBT1	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	2CUST4	CUSTODIAL	BBT1	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	2STRW1	STAIRS	RB4	RB1	PT5	PT5	WD1	PT5	Existing	SEE SHEET A-701 FOR STAIR DETAILS.
SECOND FLOOR	2STRW2	STAIRS	RB4	RB1	PT5	PT5	PT5	PT5	Existing	
SECOND FLOOR	2STRW3	STAIRS	RB4	RB1	PT5	PT5	PT5	PT5	Existing	
SECOND FLOOR	2TOIL2	TOILET	T3	Existing	PT1	PT1	PT1	PT1	ACT1A	EXISTING WALL TILE TO REMAIN.
SECOND FLOOR	200	EMPTY OFFICE SUITE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	201	LIB. DIREC. OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	202	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	203	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	204	CONFERENCE ROOM	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	205	BREAKROOM	BBT1	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	206	S. COLLECTION OFF.	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	207	SPECIAL COLLECTION EXHIBITION	CPT2	RB1	PT1	PT1	PT1	PT2	ACT1A	
SECOND FLOOR	207	VEST.	CPT2	Existing	Existing	Existing		Existing	Existing	PATCH AND REPAIR AS NEEDED.
SECOND FLOOR	207A	SPECIAL COLLECTION STORAGE / WORKROOM	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	208	STOR.2	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	208	COMPUTER ROOM	CPT2	RB1	PT2	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	208A	STORAGE	CPT2	RB1	PT1	PT1	PT1	PT1	Exposed	
SECOND FLOOR	209	VEST.	CPT2	Existing		Existing	Existing	Existing	Existing	PATCH AND REPAIR AS NEEDED.
SECOND FLOOR	211	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT3	
SECOND FLOOR	216	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	216A	GS	CPT2	RB1	PT1	PT1	PT1	PT3	ACT3	
SECOND FLOOR	217	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	218	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	219	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	220	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	221	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	222	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	223	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	224	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	

WTZA	ROOM NO	ROOM Name	FLOOR Finish	FLOOR Base	WALLS North	WALLS East	WALLS South	WALLS West	CEILING Finish	Finish Notes
SECOND FLOOR	225	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	226	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	227	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	228	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	229	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	230	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	231	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	232	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	233	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	234	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	235	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	236	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	237	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	237A	GS	CPT2	RB1	PT1	PT1	PT1	PT3	ACT3	
SECOND FLOOR	238	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	238A	GS	CPT2	RB1	PT1	PT1	PT1	PT3	ACT3	
SECOND FLOOR	239	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	240	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	241	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	242	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	243	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	244	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	245	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	246	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	247	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	248	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	249	RC	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	250	STOR.	CPT2	RB1	PT1	PT1	PT1	PT1	PT1	
SECOND FLOOR	250	LEARNING COMMONS	REFER	RB1					ACT2/MM 1	SEE FINISH PLANS FOR FINISH DETAILS. SEE RCP FOR CEILING DETAILS.
SECOND FLOOR	250A	STACKS (304) SECTIONS) 152 DOUBLE SIDED	CPT2	RB1					ACT1A	
SECOND FLOOR	250B	STACKS (340) SECTIONS) 170 DOUBLE SIDED	CPT2	RB1					ACT1A	
SECOND FLOOR	251	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	251A	GS	CPT2	RB1	PT1	PT1	PT1	PT3	ACT3	
SECOND FLOOR	252	GS	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	253	STUDY	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
SECOND FLOOR	254	CORR. 10 254	CPT2	RB1	PT3	N/A	PT1	PT3	ACT1A	
SECOND FLOOR	256	SEATING	CPT2	RB1	PT1	PT1		PT1	ACT1A	
SECOND FLOOR	263	STACKS (58 SECTIONS) 29 DOUBLE SIDED	CPT2	RB1	PT1	PT1	PT1		ACT1A	
SECOND FLOOR	264	CIRCULATION	CPT3	RB1	PT1	PT1	PT1	N/A	ACT2	
SECOND FLOOR	266	STACKS (58 SECTIONS) 29 DOUBLE SIDED	CPT2	RB1	PT1	PT1	PT1		ACT1B	
SECOND FLOOR	284A	POD	REFER	RB1	PT6	PT6/WC2	PT6/WC1	PT6	ACT3	
SECOND FLOOR	284B	POD	REFER	RB1	PT6/WC1	PT6	PT6	PT6/WC2	ACT3	SEE SHEET A-601 FOR FINISH DETAILS. SEE FINISH PLANS FOR FLOORING DETAILS.
SECOND FLOOR	284C	POD	REFER	RB1	PT6	PT6	PT6/WC2	PT6/WC1	ACT3	SEE SHEET A-602 FOR FINISH DETAILS. SEE FINISH PLANS FOR FLOORING DETAILS.
SECOND FLOOR	285	STUDY	CPT2	RB1		PT1	PT1		ACT1A	
THIRD FLOOR	3MECH10	MECHANICAL	Existing	RB1	PT1	PT1	PT1	PT1	Exposed	
THIRD FLOOR	3MECH11	MECHANICAL	Existing	RB1	PT1	PT1	PT1	PT1	Exposed	
THIRD FLOOR	3STO5	STORAGE	BBT1	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	3STRW2	STAIR	RB4	RB1	PT5	PT5	PT5	PT5	Existing	
THIRD FLOOR	3STRW3	STAIRS	RB4	RB1	PT5	PT5	PT5	PT5	Existing	
THIRD FLOOR	3STRW4	STAIRS	RB4	Existing	PT1	PT1	PT1	PT1	Existing	
THIRD FLOOR	302	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	307E	CORRIDOR	BBT1	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	307H	VEST.	CPT2	Existing	Existing	Existing		Existing	Existing	PATCH AND REPAIR AS NEEDED.
THIRD FLOOR	308	STACKS (92 SECTIONS) 46 DOUBLE SIDED	CPT2	RB1			REFER	PT1	ACT1A	SEE FINISH PLANS FOR FINISH DETAILS.
THIRD FLOOR	309	OFFICE	BBT1	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	310	OFFICE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	310	STUDYING	CPT2	RB1	PT1		PT1	PT1	ACT1B	
THIRD FLOOR	311	STACKS (92 SECTIONS) 46 DOUBLE SIDED	CPT2	RB1	REFER		REFER	PT1	ACT1A	SEE FINISH PLANS FOR FINISH DETAILS.
THIRD FLOOR	312	STORAGE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	315	STORAGE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	316	STORAGE	CPT2	RB1	PT1	PT1	PT1	PT1	ACT1A	
THIRD FLOOR	320	STACKS SECTIONS (502 SECTIONS) 251 DOUBLE SIDED	CPT2	RB1	PT1	PT1	PT1		REFER	SEE RCP FOR CEILING DETAILS.
THIRD FLOOR	321	STUDY	CPT2	RB1	PT1	PT1	PT1		ACT1A	
THIRD FLOOR	322	SEATING	CPT2	RB1	REFER		REFER	PT1	ACT1A	SEE FINISH PLANS FOR FINISH DETAILS.
THIRD FLOOR	346	CORRIDOR	CPT3	RB1	PT1	PT1	PT1	REFER	ACT2	SEE FINISH PLANS FOR FINISH DETAILS.
THIRD FLOOR	347	VEST.	CPT2	Existing		Existing	Existing	Existing	Existing	PATCH AND REPAIR AS NEEDED.
THIRD FLOOR	351	SEATING	CPT2	RB1	REFER		REFER	PT1	ACT1A	SEE FINISH PLANS FOR FINISH DETAILS.
THIRD FLOOR	387	CORRIDOR	CPT2	RB1		PT1		PT1	ACT1A	

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HOLZMAN MOSS BOTTINO ARCHITECTURE

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REVISIONS

No.	Date:	Description:
1	08.02.18	ADDENDUM #3

HMBA PROJECT NUMBER: 06113.00

FINISH SCHEDULE, NOTES & DETAILS

I-001

MATERIAL FINISH LEGEND

PHASE II

ID	MATERIAL	MANUFACTURER	DESCRIPTION	REMARKS
AR1	AREA RUG	LIORA MANNE	LAMONTAGE OMBRE FOSSETTE; COLOR: FIRE	SEE SHEET I-110 FOR DIMENSIONS 1
BBT1	BIOBASED TILE	ARMSTRONG	MIGRATIONS 12X12 TILE; COLOR: T3507 METAL GRAY	MONOLITHIC INSTALLATION
CPT1A	WALK-OFF MAT CARPET TILE	MILLIKEN	SEPIO RAMPART RAM19-133; SIZE: 50CMX50CM; COLOR: ZAFFRE	MONOLITHIC INSTALLATION
CPT1B	WALK-OFF MAT CARPET TILE	MILLIKEN	QUADRAS IDENTITY	
CPT2	CARPET TILE	MILLIKEN	COLOR FIELD COL126; SIZE: 25CM X 1M; COLOR: OCEAN MIST	SEE CARPET DIAGRAMS
CPT3	CARPET TILE	MILLIKEN	COLOR FIELD COL196-201-199; SIZE: 25CM X 1M; COLOR: BLUE AGAVE	SEE CARPET DIAGRAMS
CPT4	CARPET TILE	MILLIKEN	COLOR FIELD COL111-146-148; SIZE: 25CM X 1M; COLOR: FIRETHORN	SEE CARPET DIAGRAMS
FWP1	FABRIC-WRAPPED PANEL	KOROSEAL	ECO-ART CERCLE; COLOR: AGEAN #19	NO BACKING
PT1	PAINT; EGGSHELL FINISH	SHERWIN WILLIAMS	CUSTOM TO MATCH KELLY MOORE OW203-1 BEYOND PALE	GENERAL BUILDING WHITE
PT2	PAINT; EGGSHELL FINISH	SHERWIN WILLIAMS	SW 6689 OVERJOY	ACCENT 1
PT3	PAINT; EGGSHELL FINISH	SHERWIN WILLIAMS	SW 6381 ANJOU PEAR	ACCENT 2
1 PT4	PAINT; EGGSHELL FINISH	SHERWIN WILLIAMS	SW 9048 SURFIN	AT RESTROOMS SIGNAGE, SEE SHEET I-195
PT5	PAINT; EGGSHELL FINISH	SHERWIN WILLIAMS	SW 6369 TASSEL	AT STAIRS
PT6	PAINT; EGGSHELL FINISH	SHERWIN WILLIAMS	SW 6621 EMOTIONAL	AT PODS
PT7	PAINT; SEMI-GLOSS FINISH	SHERWIN WILLIAMS	SW 6523 DENIM	ALL TRIM & DOORS
PT8	PAINT; SEMI-GLOSS FINISH	SHERWIN WILLIAMS	SW 6501 MANITOU BLUE	AT RESTROOM SIGNAGE
PT9	PAINT; SEMI-GLOSS FINISH	SHERWIN WILLIAMS	SW 7709 COPPER POT	AT STAIRS & ELEVATOR SIGNAGE
RB1	VINYL WALL BASE	ROPPE	700 SERIES STANDARD TOE BASE; COLOR: 665 HORIZON	
RB2	RUBBER FLOOR TRANSITION	ROPPE	1/4" RUBBER CARPET EDGING #38; COLOR: 123 CHARCOAL	AT CPT TO CON TRANSITIONS
RB3	RUBBER STAIR RISERS & TREADS	ROPPE	#95 HAMMERED DESIGN; FIESTA; COLOR: F411 FIEL	
RB4	RUBBER FLOORING	ROPPE	FIESTA; COLOR: F411 FIEL	AT STAIR LANDINGS
T3	PORCELAIN FLOOR TILE	DAL TILE	VERANDA SOLIDS 13X13 TILE; COLOR: P543 ROCK	MONOLITHIC INSTALLATION
WC1	MARKERBOARD WALLCOVERING	KOROSEAL	WALLTALKERS JUST-RITE GRID	TRIM: VINTAGE; COLOR: RED OAK WITH CLEAR VARNISH (WTRS-R1)
WC2	DIGITALLY-PRINTED WALLCOVERING	KOROSEAL	DIGITAL SURFACES OPTION E	
WD1	WOOD	STIKWOOD	RECLAIMED SIERRA GOLD	VERTICAL ASHLAR INSTALLATION
WDT1	WOOD TRIM	KOROSEAL	WALLTALKERS RED OAK WITH CLEAR VARNISH	SEE SPECS FOR DETAILS

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1	08.02.18	ADDENDUM #3

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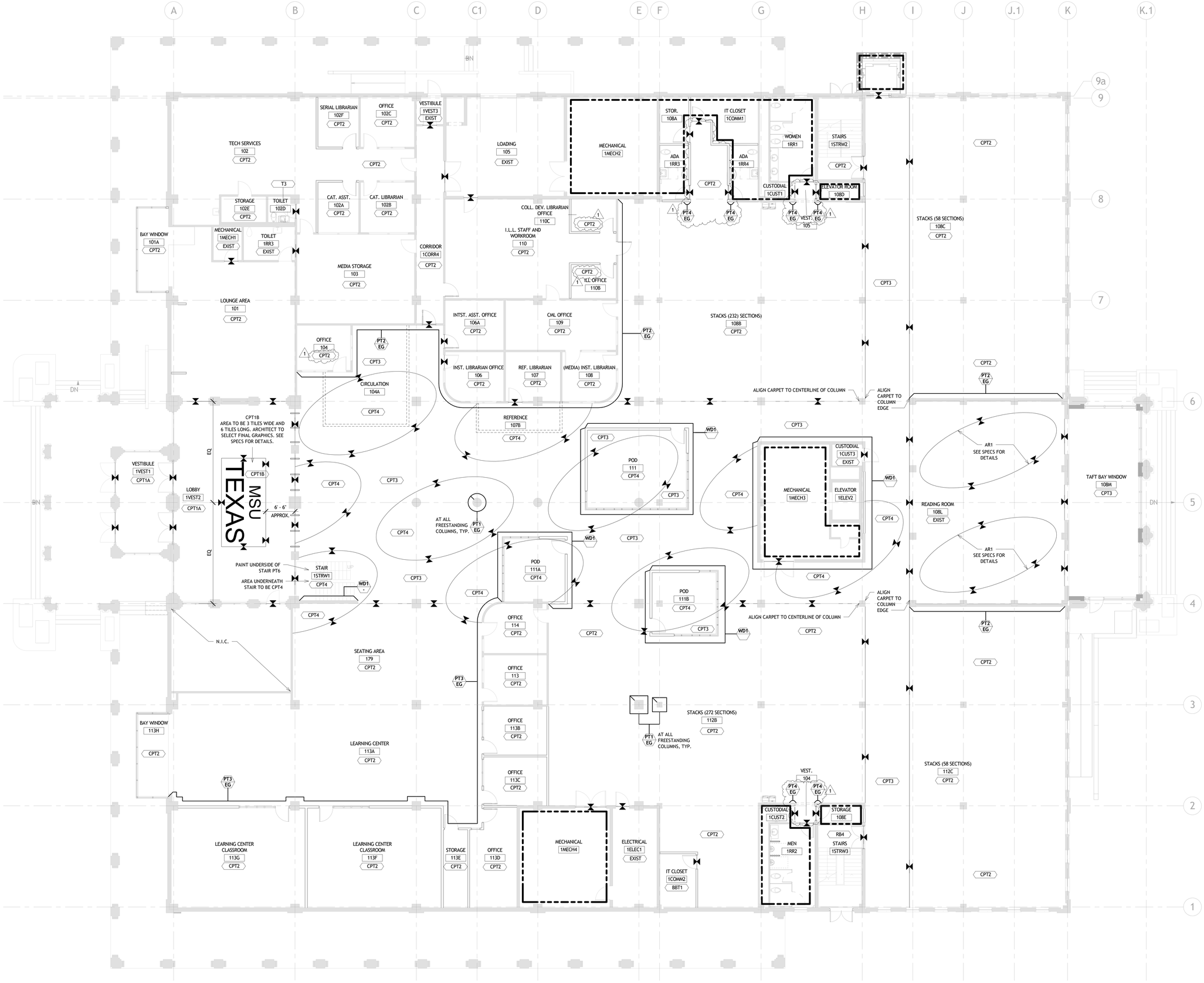
MATERIALS SCHEDULE, NOTES & DETAILS

I-002



1 FIRST FLOOR FLOORING FINISH PLAN

SCALE: 1/8" = 1'-0"

7/27/2018 12:02:10 PM

FINISH LEGEND

ABBREVIATIONS

EXIST: FINISH IS EXISTING TO REMAIN
REFER: CONTRACTOR TO REFER TO ROOM FINISH SCHEDULE AND/OR ELEVATIONS FOR FINISH
FL: FLAT
EG: EGGSHELL
SG: SEMI-GLOSS
G: GLOSS

SYMBOL KEYS

FLOOR FINISH
FLOOR FINISH TRANSITION
WALL FINISH
WALL FINISH SHEEN

GENERAL NOTES:

1. CONTRACTOR TO SUBMIT ALL FINISHES TO ARCHITECTS FOR APPROVAL PRIOR TO INSTALLATION. INSTALLATION OF FINISHES TO COMPLY WITH MANUFACTURER'S SPECIFICATION AND REQUIREMENTS.
2. LEVEL FLOOR AS REQUIRED AT ALL FLOORING MATERIAL TRANSITIONS.
3. FLOORING MATERIAL BREAKS AT DOOR CENTERLINE, UNLESS OTHERWISE NOTED
4. CONTRACTOR TO SUBMIT ACTUAL CARPET DYELOT SAMPLE PRIOR TO PRODUCTION AND INSTALLATION.
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6. RB-1 TO BE INSTALLED ON ALL WALLS AND COLUMNS UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL NOTIFY ARCHITECT OF ANY EXPOSED SURFACES THAT DO NOT HAVE A FINISH SPECIFIED, PRIOR TO SUBMITTING A BID.
8. ALL MEP DEVICE AND DEVICE PLATES TO BE STANDARD WHITE OR OTHERWISE NOTED.
9. ALL EXISITNG WHITE BOARDS TO REMAIN WHERE THEY ARE LOCATED. CONTRACTOR TO REMOVE ALL WALL MOUNTED WHITE BOARDS, APPLY SCHEDULED FINISHES AND MOUNT WHITE BOARDS AT THEY ORIGINAL LOCATIONS.

PAINT FINISHES:

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7. ALL HOLLOW METAL FRAMES & DOORS TO BE PAINTED PT7 IN SEMI-GLOSS FINISH UON.
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PHASE LEGEND

PHASE I - WORK TO BE COMPLETED IN 2018
PHASE II - WORK TO BE COMPLETED IN 2019

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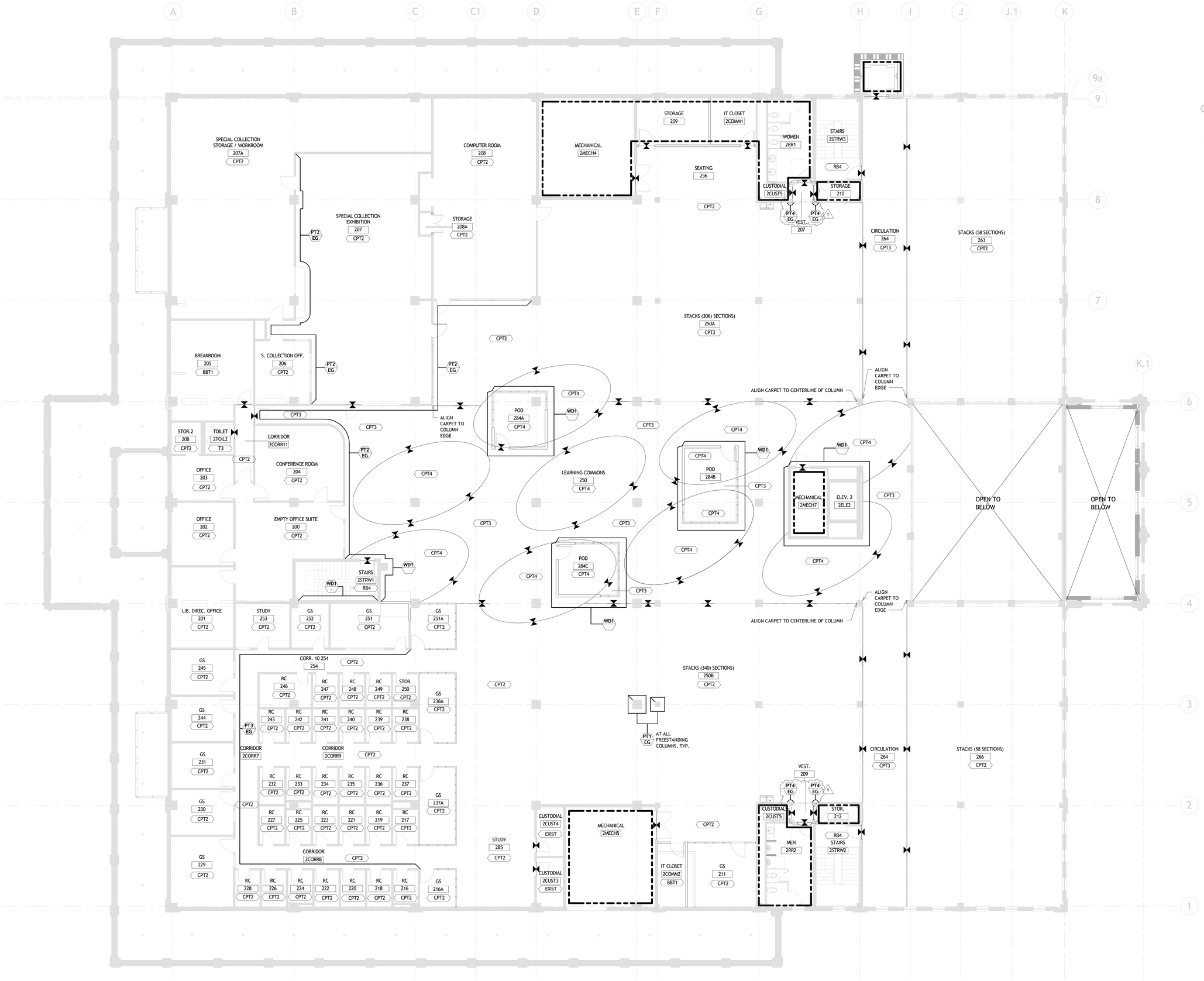
FIRST FLOOR FINISH PLAN

I-101



SECOND FLOOR FLOORING FINISH PLAN

SCALE: 1/8" = 1'-0"

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FINISH LEGEND

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FLOOR FINISH TRANSITION
WALL FINISH
WALL FINISH SHEEN

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PHASE I - WORK TO BE COMPLETED IN 2018
PHASE II - WORK TO BE COMPLETED IN 2019

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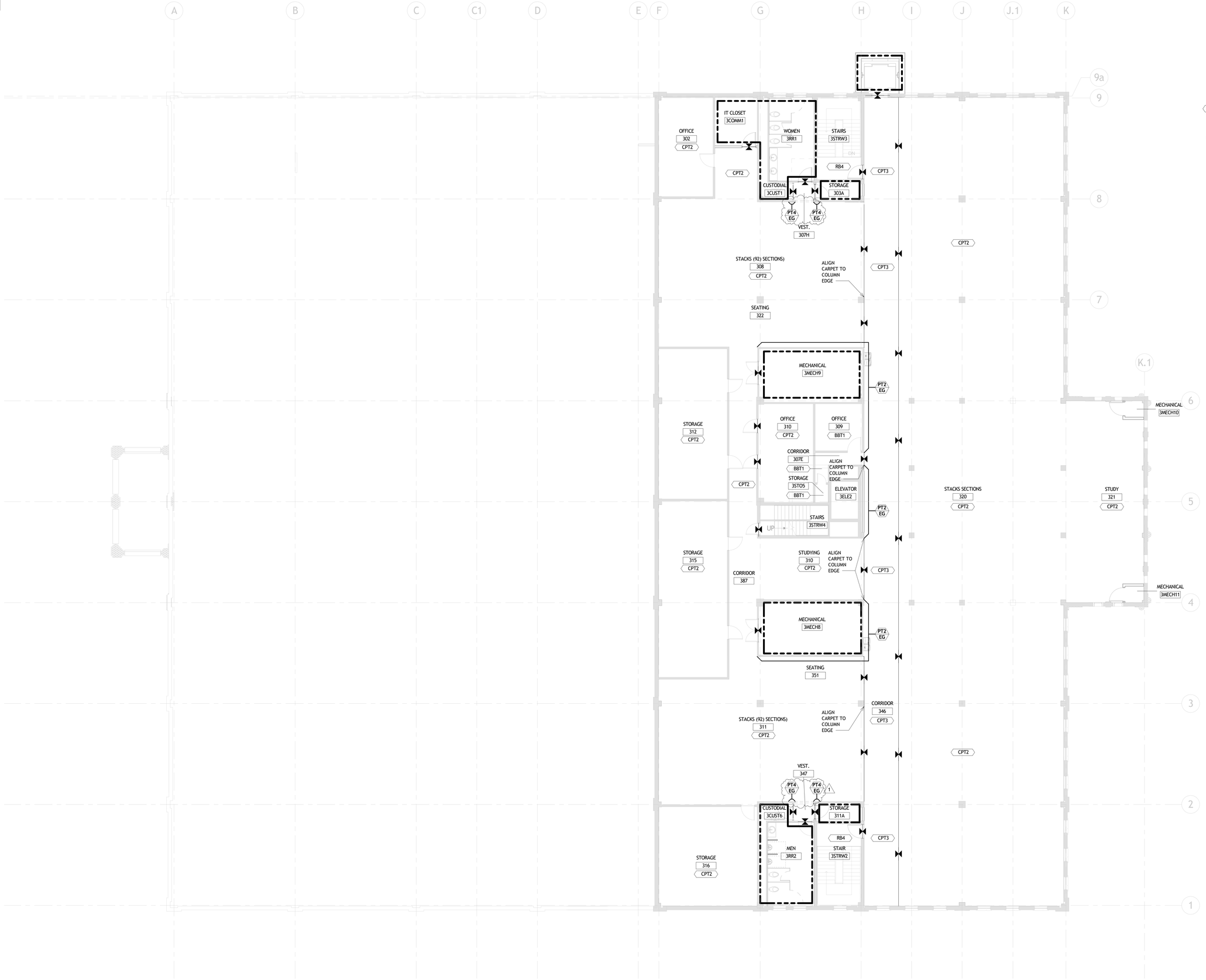
SECOND FLOOR FINISH PLAN

I-102



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THIRD FLOOR FINISH PLAN

I-103

1 THIRD FLOOR FLOORING FINISH PLAN
SCALE: 1/8" = 1'-0"

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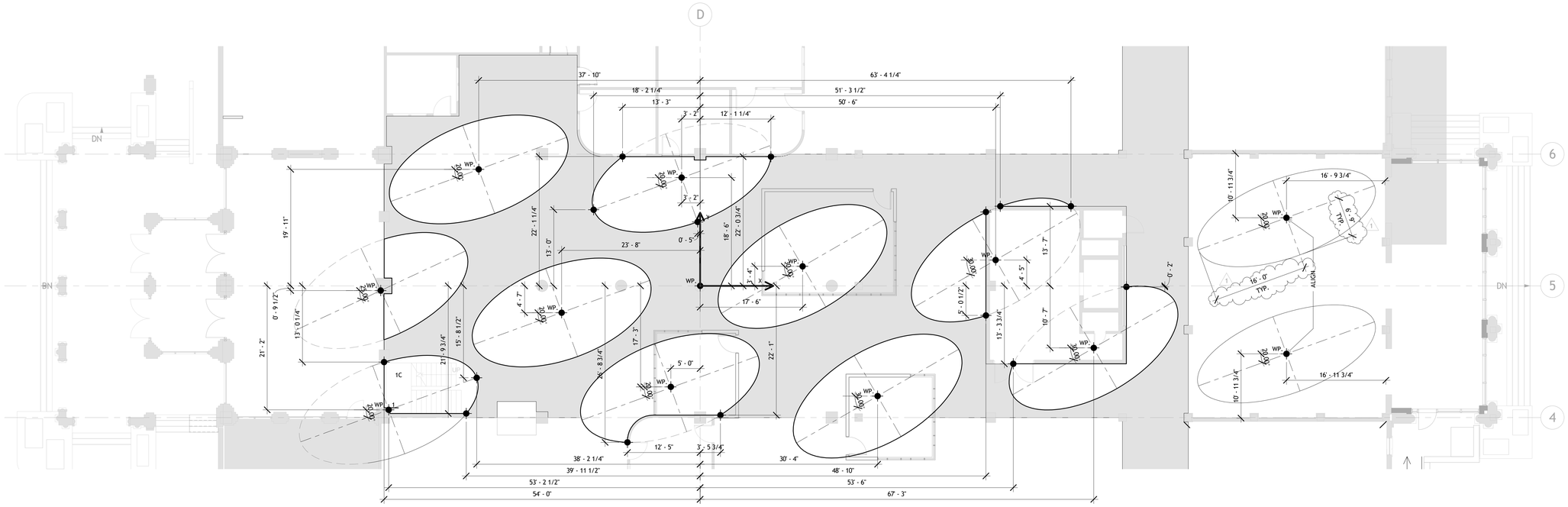
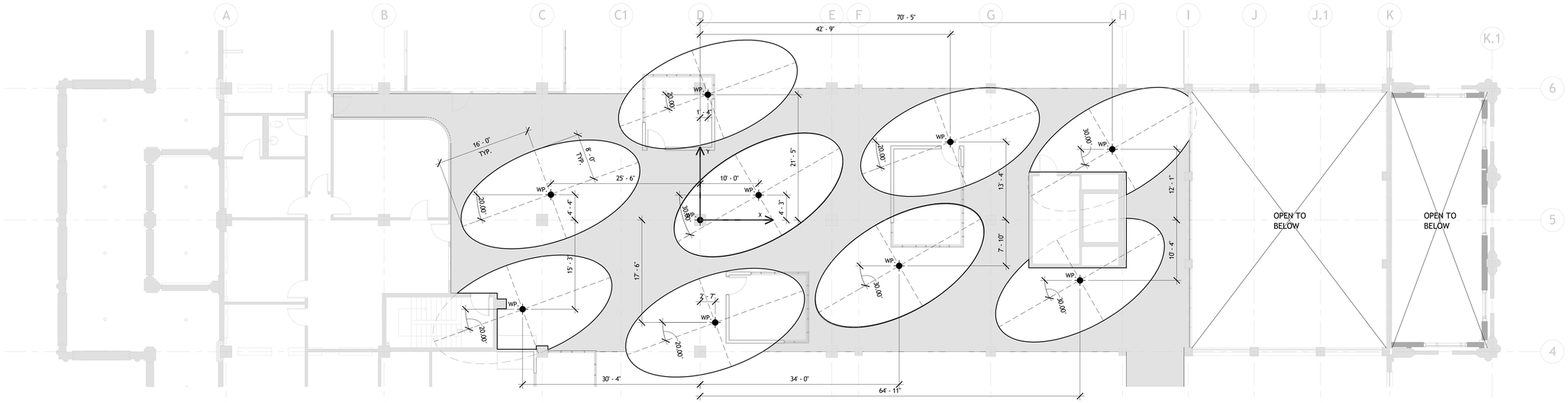


1 FIRST FLOOR FLOORING GEOMETRY PLAN

SCALE: 1/8" = 1'-0"



2 SECOND FLOOR FLOORING GEOMETRY PLAN

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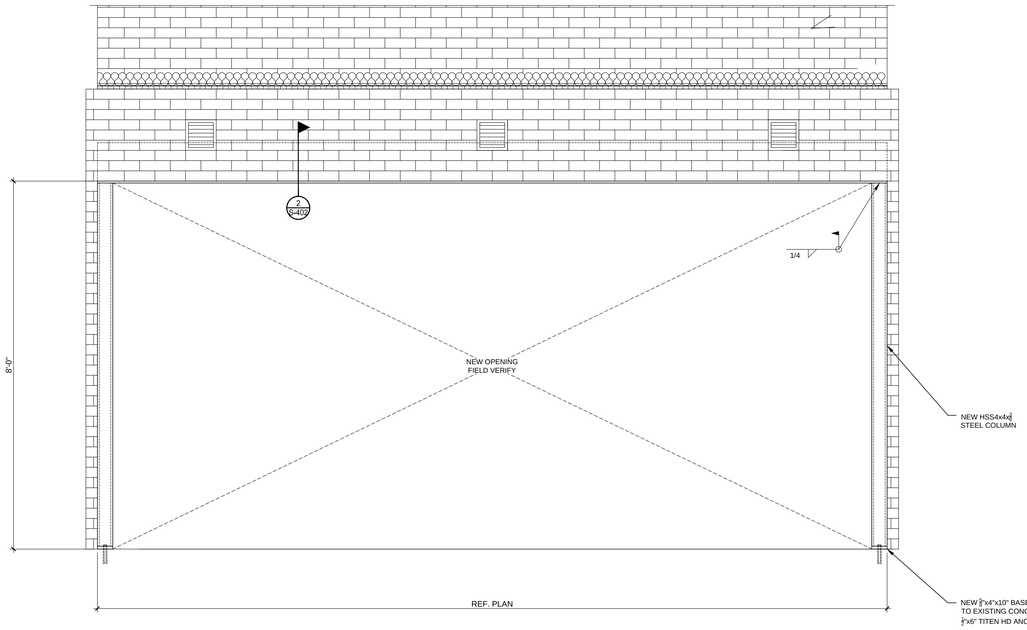
FINISH PLANS GEOMETRY

I-110

7/27/2018 12:02:16 PM



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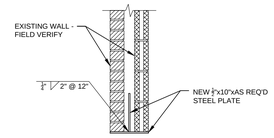

02 **SECTION**
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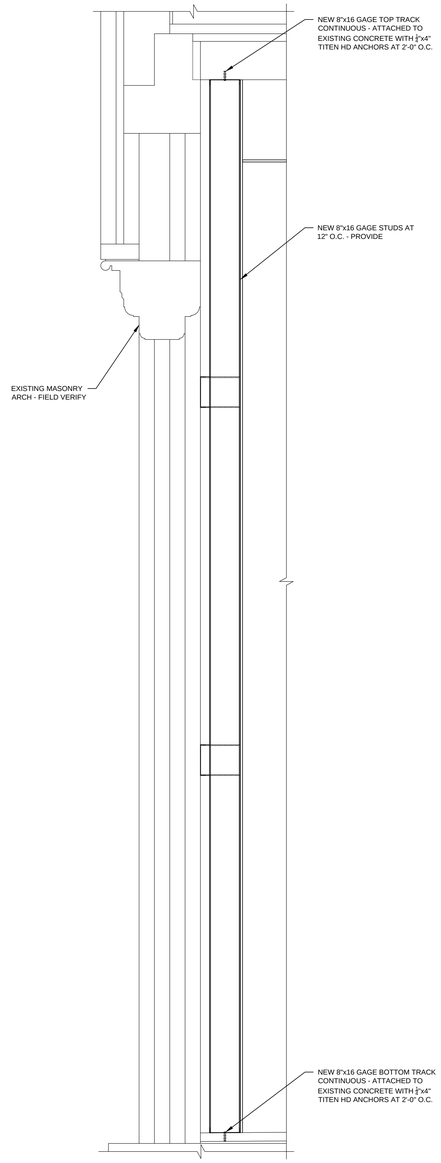

03 **SECTION**
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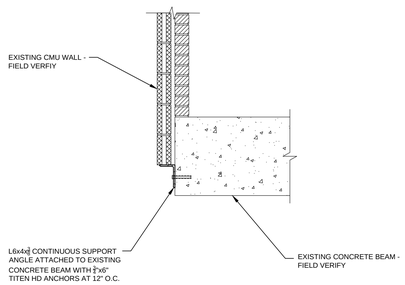
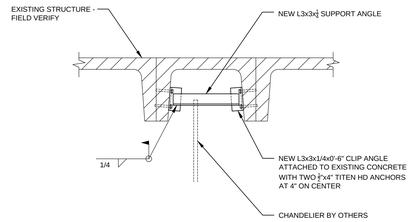


04 **DETAIL AT STAIR LINTEL**
NO SCALE



05 **CHANDELIER ATTACHMENT DETAIL**
NO SCALE

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STATE OF TEXAS
R. TRENT PERKINS
84264
LICENSED
PROFESSIONAL ENGINEER
7/5/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY R. TRENT PERKINS, P.E. 84264

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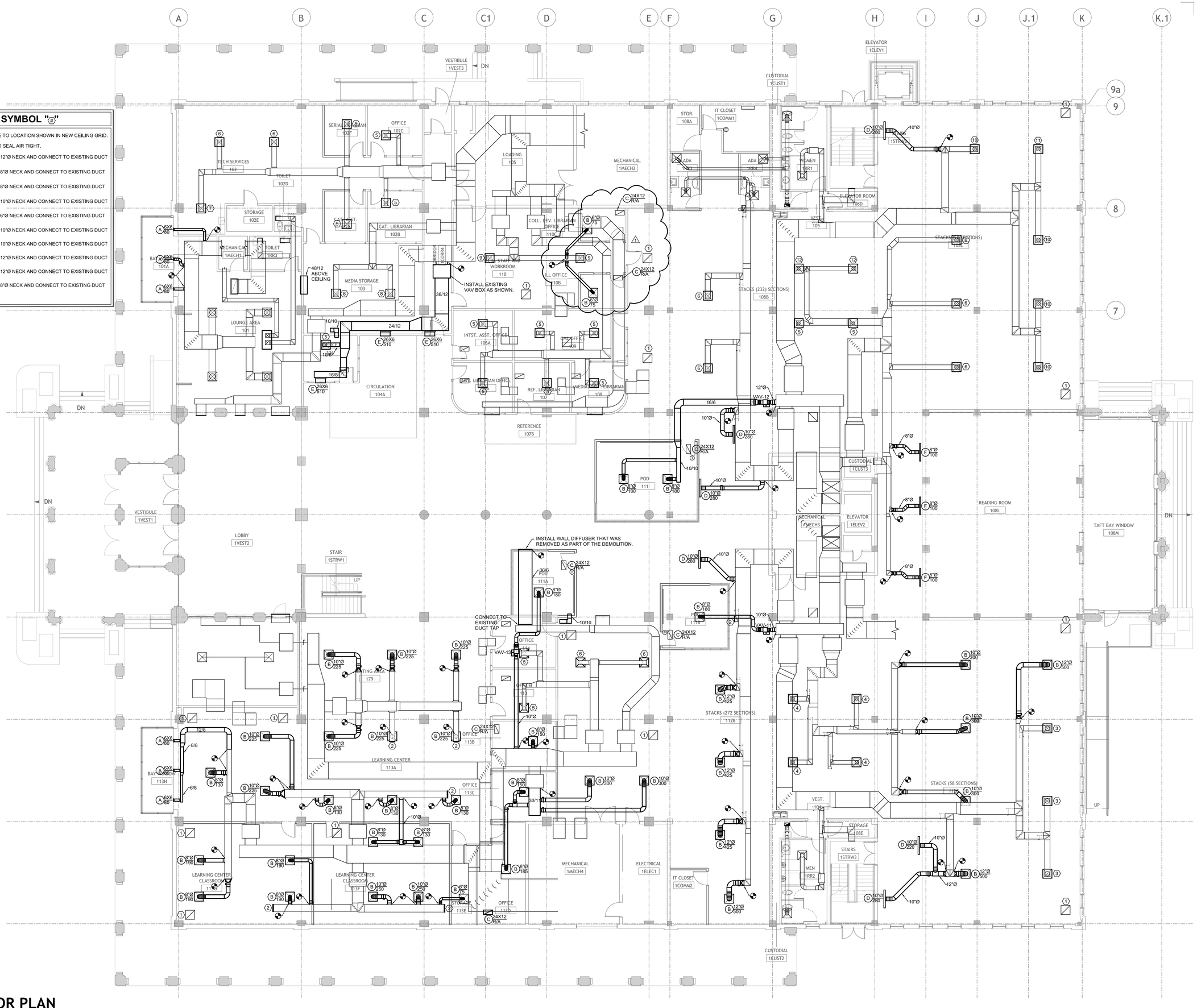
HMBA PROJECT NUMBER: 06113.00

FIRST FLOOR PLAN

S-402

NOTES BY SYMBOL "#"

1. RELOCATE EXISTING RETURN GRILLE TO LOCATION SHOWN IN NEW CEILING GRID.
2. CAP EXISTING DUCT, INSULATED AND SEAL AIR TIGHT.
3. PROVIDE A TYPE "B" DIFFUSER WITH 12"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 500 CFM.
4. PROVIDE A TYPE "B" DIFFUSER WITH 8"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 175 CFM.
5. PROVIDE A TYPE "B" DIFFUSER WITH 8"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 150 CFM.
6. PROVIDE A TYPE "B" DIFFUSER WITH 10"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 300 CFM.
7. PROVIDE A TYPE "B" DIFFUSER WITH 6"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 100 CFM.
8. PROVIDE A TYPE "B" DIFFUSER WITH 10"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 250 CFM.
9. PROVIDE A TYPE "B" DIFFUSER WITH 10"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 400 CFM.
10. PROVIDE A TYPE "B" DIFFUSER WITH 12"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 490 CFM.
11. PROVIDE A TYPE "B" DIFFUSER WITH 12"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 590 CFM.
12. PROVIDE A TYPE "B" DIFFUSER WITH 8"Ø NECK AND CONNECT TO EXISTING DUCT RUNOUT, BALANCE TO 200 CFM.



1 FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0"

1/11/2018 10:32:27 AM

S:\P17210\Mech\P17210-M201 phase 2.dwg - Layout1 07/27/18 09:05:11 hch

SHEET SIZE = ARCH E1 30X42

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270.7.27.2018.17210

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ISSUE DATE: 07.03.2018

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1	Addendum #3	08.02.2018

HMBA PROJECT NUMBER: 06113.00

FIRST FLOOR PLAN

M-201

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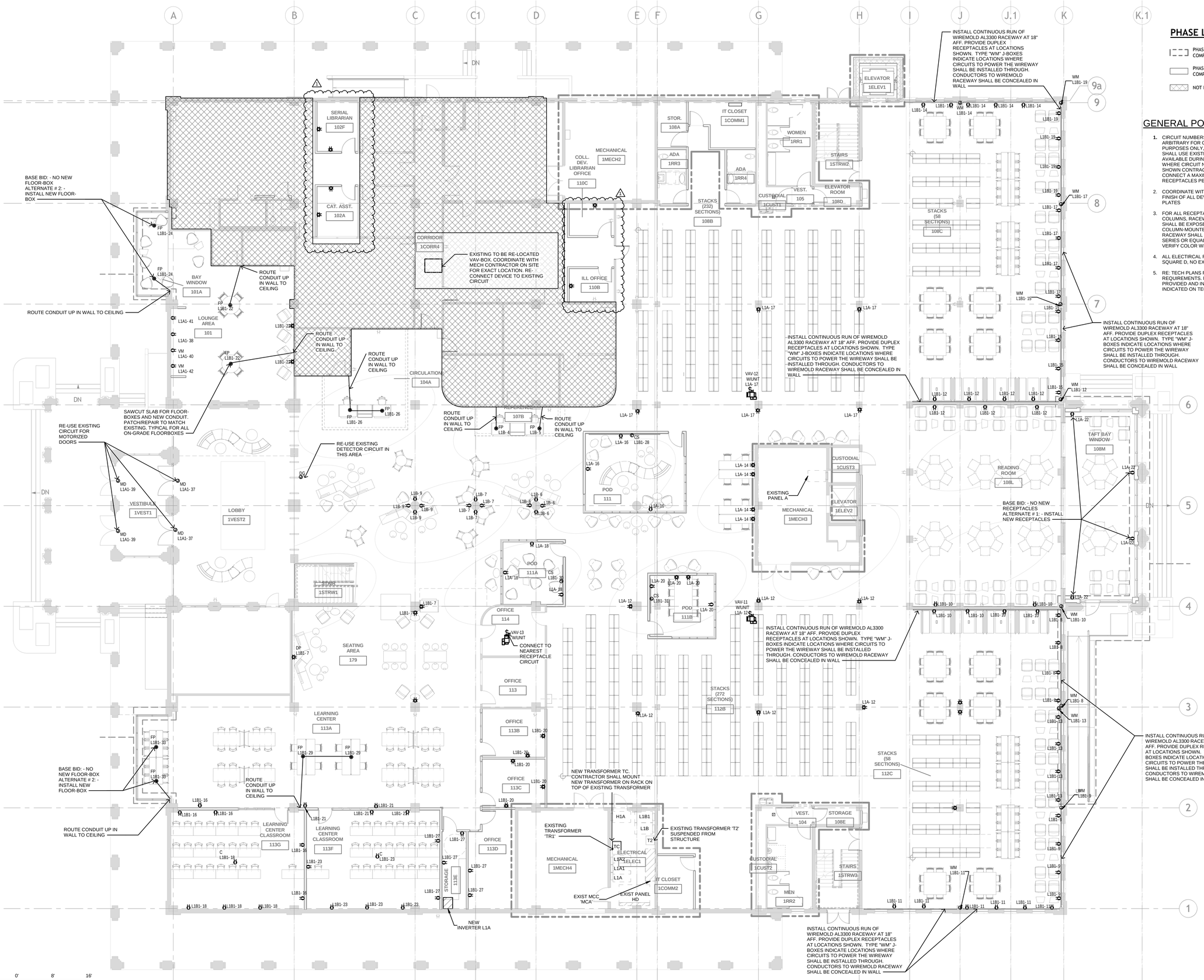

8' 0' 8' 16'
1/8" = 1'-0"

1 ELECTRICAL FIRST FLOOR
1/8" = 1'-0"

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

GENERAL POWER NOTES

1. CIRCUIT NUMBERS SHOWN ARE ARBITRARY FOR GROUPING PURPOSES ONLY, CONTRACTOR SHALL USE EXISTING CIRCUITS MADE AVAILABLE DURING DEMOLITION. WHERE CIRCUIT NUMBERS ARE NOT SHOWN CONTRACTOR SHALL CONNECT A MAXIMUM OF 5 RECEPTACLES PER CIRCUIT.
2. COORDINATE WITH ARCHITECT FOR FINISH OF ALL DEVICES ALL WALL PLATES
3. FOR ALL RECEPTACLES INSTALLED ON COLUMNS, RACEWAY TO RECEPTACLE SHALL BE EXPOSED. TYPICAL FOR ALL COLUMN-MOUNTED RECEPTACLES. RACEWAY SHALL BE WIREMOLD 500 SERIES OR EQUAL STEEL RACEWAY. VERIFY COLOR WITH ARCHITECT.
4. ALL ELECTIRCAL PANELS SHALL BE SQUARE D, NO EXCEPTIONS
5. RE: TECH PLANS FOR ALL ROUGH IN REQUIREMENTS. ROUGH IN SHALL BE PROVIDED AND INSTALLED AS INDICATED ON TECHNOLOGY PLANS

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FIRST FLOOR POWER PLAN

E-101

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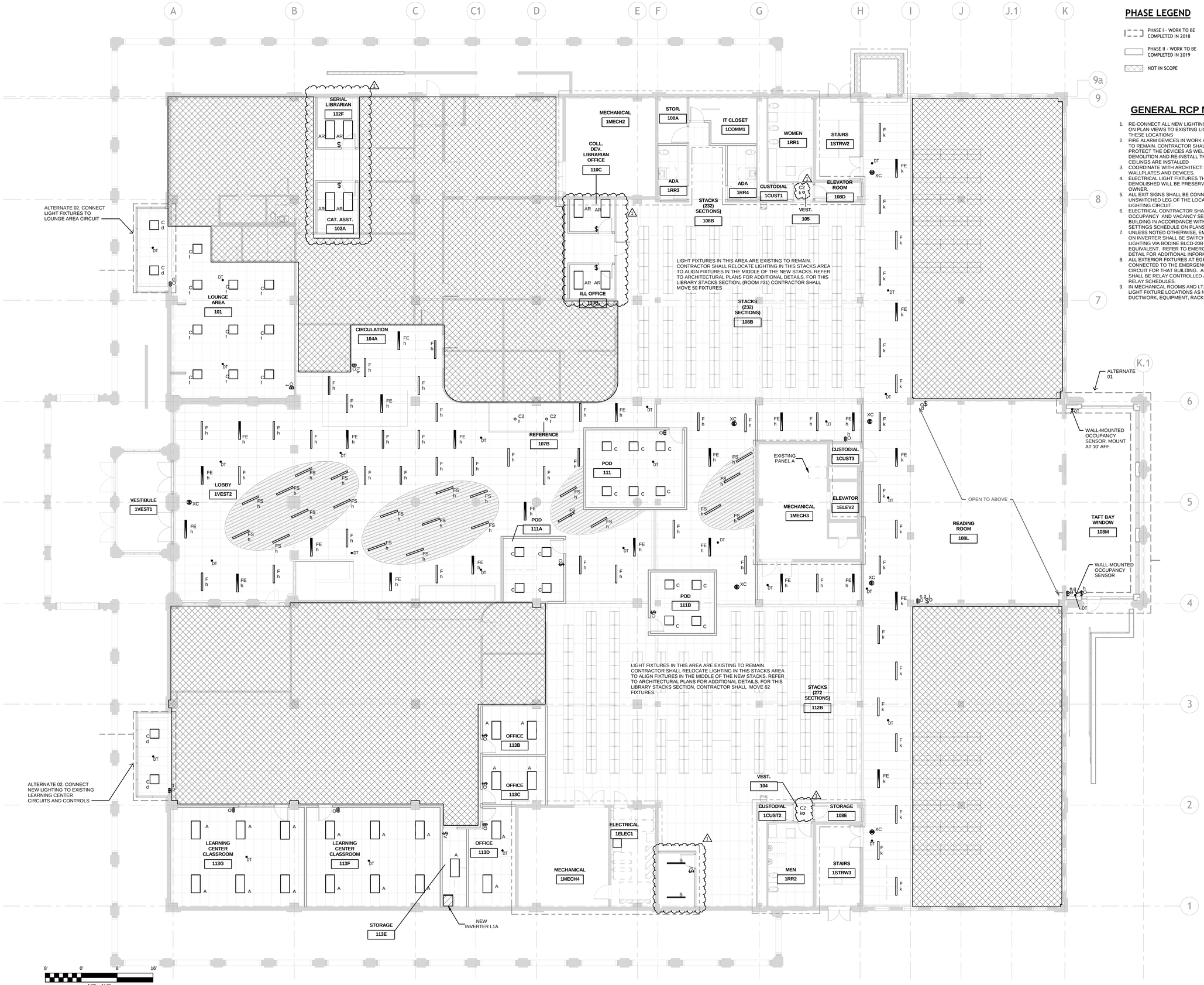

1 FIRST FLOOR LIGHTING PLAN
1/8" = 1'-0"

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

GENERAL RCP NOTES

1. RE-CONNECT ALL NEW LIGHTING FIXTURES SHOWN ON PLAN VIEWS TO EXISTING LIGHTING CIRCUITS IN THESE LOCATIONS
2. FIRE ALARM DEVICES IN WORK AREAS ARE EXISTING TO REMAIN. CONTRACTOR SHALL DISCONNECT AND PROTECT THE DEVICES AS WELL DURING CEILING DEMOLITION AND RE-INSTALL THEM ONCE THE NEW CEILINGS ARE INSTALLED
3. COORDINATE WITH ARCHITECT FOR FINISH OF ALL WALLPLATES AND DEVICES.
4. ELECTRICAL LIGHT FIXTURES THAT ARE TO BE DEMOLISHED WILL BE PRESERVED AND RETURNED TO OWNER.
5. ALL EXIT SIGNS SHALL BE CONNECTED TO AN UNSWITCHED LEG OF THE LOCAL EMERGENCY LIGHTING CIRCUIT.
6. ELECTRICAL CONTRACTOR SHALL SET ALL OCCUPANCY AND VACANCY SENSORS THROUGHOUT BUILDING IN ACCORDANCE WITH OCCUPANCY SENSOR SETTINGS SCHEDULE ON PLANS.
7. UNLESS NOTED OTHERWISE, EMERGENCY LIGHTING ON INVERTER SHALL BE SWITCHED WITH LOCAL LIGHTING VIA BODINE BLCD-20B TRANSFER DEVICE OR EQUIVALENT. REFER TO EMERGENCY LIGHTING DETAIL FOR ADDITIONAL INFORMATION.
8. ALL EXTERIOR FIXTURES AT EGRESS DOORS SHALL BE CONNECTED TO THE EMERGENCY EGRESS LIGHTING CIRCUIT FOR THAT BUILDING. ALL EXTERIOR FIXTURES SHALL BE RELAY CONTROLLED AS INDICATED IN RELAY SCHEDULES.
9. IN MECHANICAL ROOMS AND I.T. CLOSETS, ADJUST LIGHT FIXTURE LOCATIONS AS NECESSARY FOR DUCTWORK, EQUIPMENT, RACKS, ETC.

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FIRST FLOOR LIGHTING PLAN

E-201

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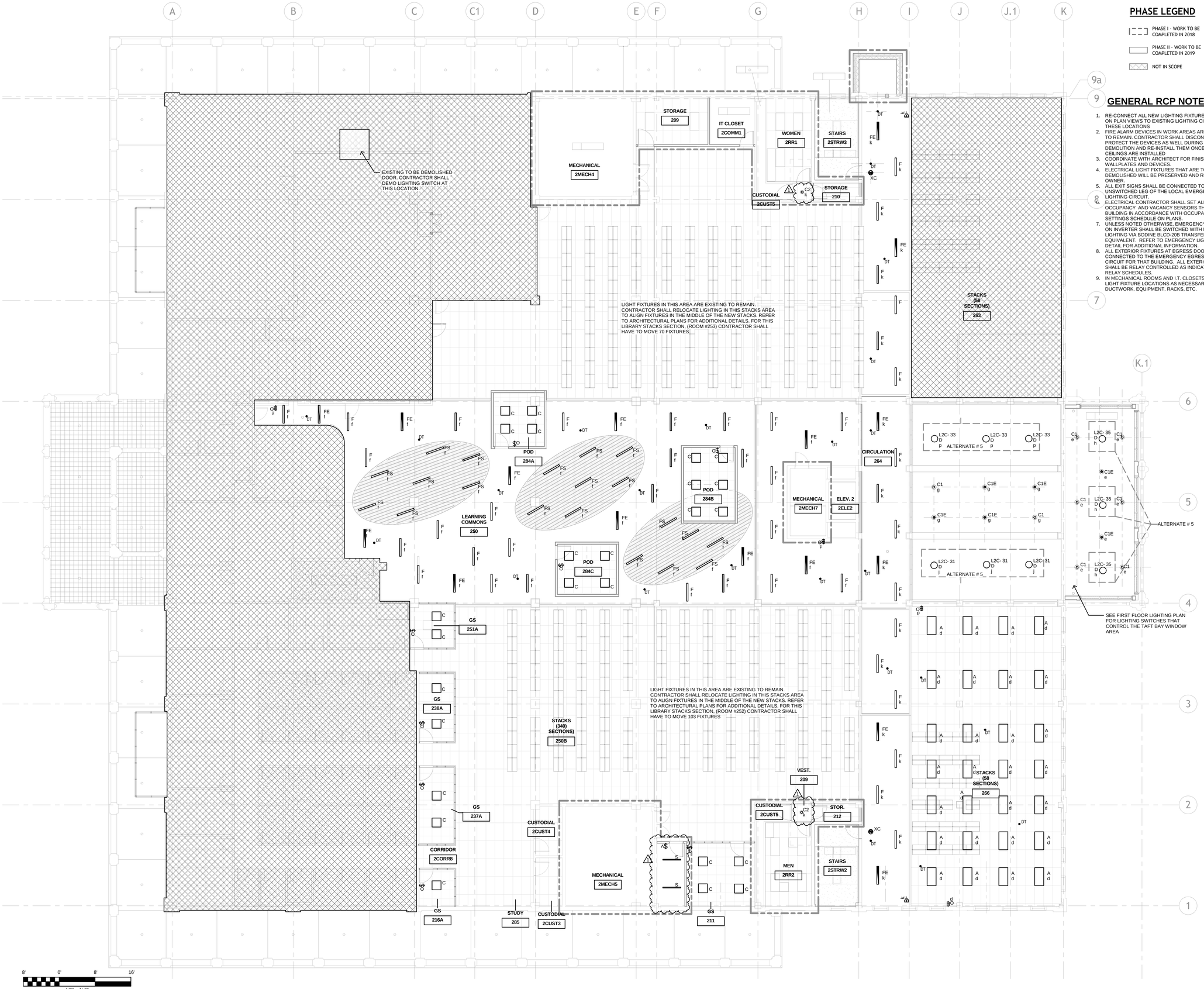

8' 0' 8' 16'
1/8" = 1'-0"

1 SECOND FLOOR LIGHTING PLAN
1/8" = 1'-0"

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

GENERAL RCP NOTES

1. RE-CONNECT ALL NEW LIGHTING FIXTURES SHOWN ON PLAN VIEWS TO EXISTING LIGHTING CIRCUITS IN THESE LOCATIONS
2. FIRE ALARM DEVICES IN WORK AREAS ARE EXISTING TO REMAIN. CONTRACTOR SHALL DISCONNECT AND PROTECT THE DEVICES AS WELL DURING CEILING DEMOLITION AND RE-INSTALL THEM ONCE THE NEW CEILINGS ARE INSTALLED
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4. ELECTRICAL LIGHT FIXTURES THAT ARE TO BE DEMOLISHED WILL BE PRESERVED AND RETURNED TO OWNER.
5. ALL EXIT SIGNS SHALL BE CONNECTED TO AN UNSWITCHED LEG OF THE LOCAL EMERGENCY LIGHTING CIRCUIT.
6. ELECTRICAL CONTRACTOR SHALL SET ALL OCCUPANCY AND VACANCY SENSORS THROUGHOUT BUILDING IN ACCORDANCE WITH OCCUPANCY SENSOR SETTINGS SCHEDULE ON PLANS.
7. UNLESS NOTED OTHERWISE, EMERGENCY LIGHTING ON INVERTER SHALL BE SWITCHED WITH LOCAL LIGHTING VIA BODINE BLCD-20B TRANSFER DEVICE OR EQUIVALENT. REFER TO EMERGENCY LIGHTING DETAIL FOR ADDITIONAL INFORMATION.
8. ALL EXTERIOR FIXTURES AT EGRESS DOORS SHALL BE CONNECTED TO THE EMERGENCY EGRESS LIGHTING CIRCUIT FOR THAT BUILDING. ALL EXTERIOR FIXTURES SHALL BE RELAY CONTROLLED AS INDICATED IN RELAY SCHEDULES.
9. IN MECHANICAL ROOMS AND I.T. CLOSETS, ADJUST LIGHT FIXTURE LOCATIONS AS NECESSARY FOR DUCTWORK, EQUIPMENT, RACKS, ETC.

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SECOND FLOOR LIGHTING PLAN

E-202

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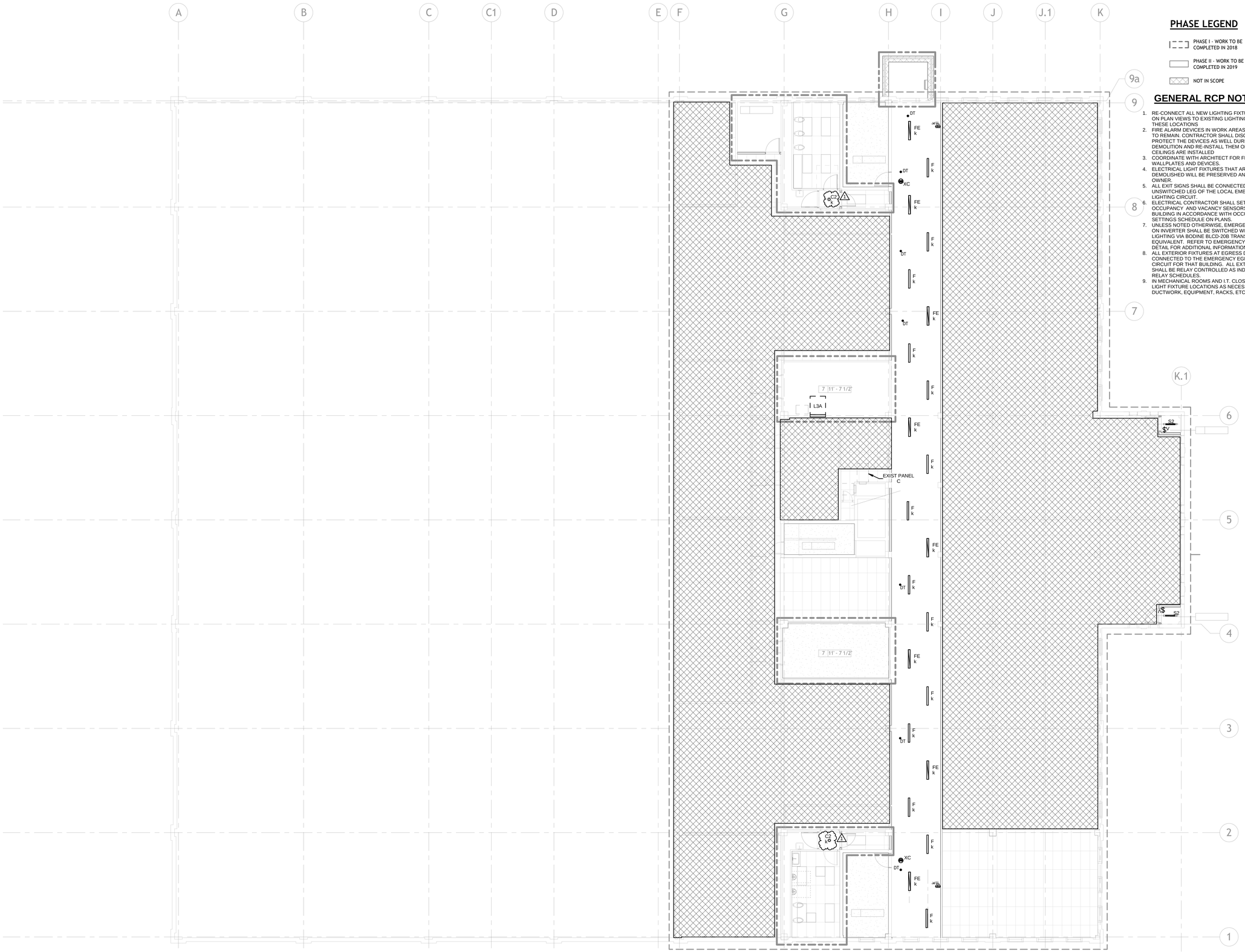

PHASE LEGEND

- PHASE I - WORK TO BE COMPLETED IN 2018
- PHASE II - WORK TO BE COMPLETED IN 2019
- NOT IN SCOPE

GENERAL RCP NOTES

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6. ELECTRICAL CONTRACTOR SHALL SET ALL OCCUPANCY AND VACANCY SENSORS THROUGHOUT BUILDING IN ACCORDANCE WITH OCCUPANCY SENSOR SETTINGS SCHEDULE ON PLANS.
7. UNLESS NOTED OTHERWISE, EMERGENCY LIGHTING ON INVERTER SHALL BE SWITCHED WITH LOCAL LIGHTING VIA BODINE BLCD-20B TRANSFER DEVICE OR EQUIVALENT. REFER TO EMERGENCY LIGHTING DETAIL FOR ADDITIONAL INFORMATION.
8. ALL EXTERIOR FIXTURES AT EGRESS DOORS SHALL BE CONNECTED TO THE EMERGENCY EGRESS LIGHTING CIRCUIT FOR THAT BUILDING. ALL EXTERIOR FIXTURES SHALL BE RELAY CONTROLLED AS INDICATED IN RELAY SCHEDULES.
9. IN MECHANICAL ROOMS AND I.T. CLOSETS, ADJUST LIGHT FIXTURE LOCATIONS AS NECESSARY FOR DUCTWORK, EQUIPMENT, RACKS, ETC.

8' 0' 8' 16'
1/8" = 1'-0"

1 THIRD FLOOR LIGHTING PLAN
1/8" = 1'-0"

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THIRD FLOOR LIGHTING PLAN

E-203

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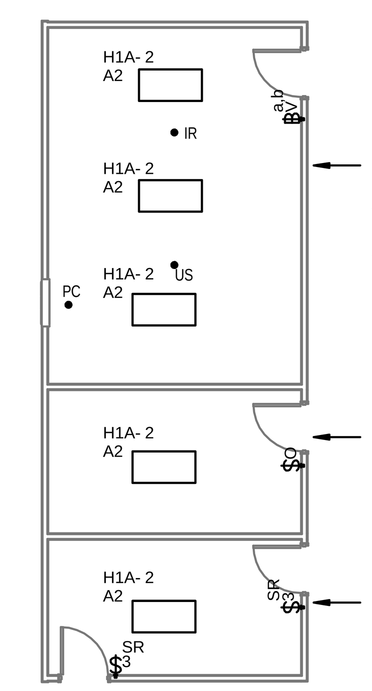
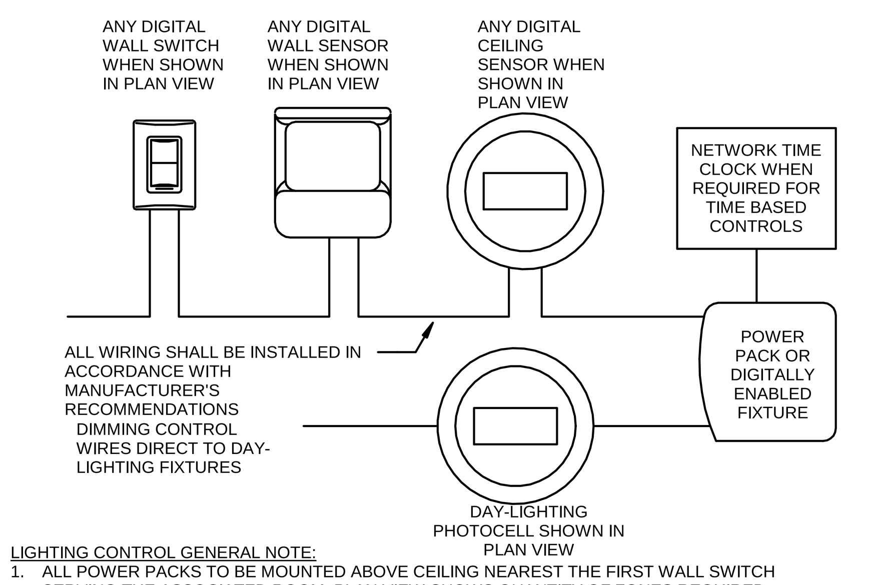


EXAMPLE SHOWS ROOM WITH 3 TYPE A2 LIGHT FIXTURES ON CIRCUIT H1A-2. CONTROL METHOD IS DIGITAL VACANCY CEILING SENSOR WITH A 2 ZONE SWITCH "Bv" FOR ZONES "a' AND "b". WINDOW DAYLIGHTING CONTROL IS REQURED BY "PC" SENSOR PLACED IN DAYLIGHTING ZONE SHOWN BY DASH LINE. ROOM IS CONTROLLED WITH TWO OCCUPANCY SENSOR TYPES "IR" AND TYPE "US". OCCUPANCY SENSORS SHALL BE DUAL TECHNOLOGY (TYPE "DT") UNLESS NOTED AS INFRARED (IR) OR ULTRASONIC (US).

EXAMPLE SHOWS LINE VOLTAGE OCCUPANCY SENSOR WITH ONE TYPE A2 LIGHT FIXTURE ON CIRCUIT H1A-2.

EXAMPLE SHOWS LINE VOLTAGE SWITCH ONLY FOR ROOMS DEEMED SAFETY RELATED FOR WITH AUTOMATIC LIGHTING CONTROLS WOULD PRESENT DANGER TO OCCUPANTS. ROOM WITH 1 TYPE A2 LIGHT FIXTURES ON CIRCUIT H1A-2.



LIGHTING CONTROL GENERAL NOTE:
1. ALL POWER PACKS TO BE MOUNTED ABOVE CEILING NEAREST THE FIRST WALL SWITCH SERVING THE ASSOCIATED ROOM. PLAN VIEW SHOWS QUANTITY OF ZONES REQUIRED MANUFACTURER MAY COMBINE POWER PACKS WHERE POSSIBLE INTO MULTI ZONE POWER PACKS.
2. ALL EMERGENCY BATTERY PACK DECORATIVE FIXTURES ARE TO TURN ON/OFF WITH ASSOCIATED ROOM, BUT OVERRIDE TO ON IF POWER IS LOST.
3. ALL EXIT LIGHTING AND BATTERY PACK ONLY FIXTURES ARE TO BE WIRED TO UN-SWITCHED LEG OF CIRCUITS SHOWN FOR CONSTANT POWER.
4. DETAIL IS GENERIC IN NATURE. PLAN VIEWS WILL INDICATE NUMBER OF ZONES, PROVIDE POWER PACK OR EQUIVALENT FOR EACH ZONE. PLAN VIEW WILL INDICATE LOCATION OF DIGITAL WALL SWITCHES WITH NUMBER OF BUTTONS REQUIRED. ACCEPTABLE MANUFACTURERS ARE WATT STOPPER , LUTRON AND ACUITY CONTROLS. OTHERS WILL BE CONSIDERED WITH PRE-APPROVAL PRIOR TO BIDDING.
5. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A FULLY FUNCTIONAL SYSTEM.
6. EMERGENCY LIGHTING SHOWN SHALL OPERATE WITH NORMAL LIGHTING IN THE AREA AND BE FORCED ON IN THE EVENT OF A POWER LOSS. REFER TO EMERGENCY LIGHTING CONTROL DETAIL.

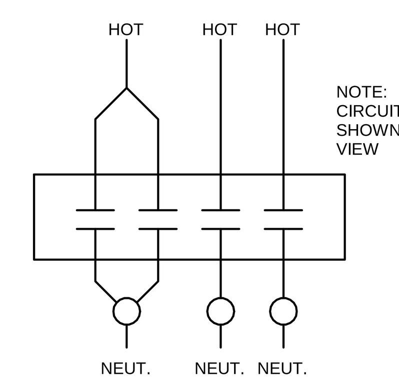
DIGITAL LIGHTING CONTROL DETAIL

EXTERIOR LIGHTING CONTROL:

PROVIDE 365/7 DAY ASTRONOMIC TIME CONTROL WITH OVERRIDE ON/OFF AND MINIMUM 2 DAY PERMANENT SCHEDULE RETENTION. PROVIDE ONE RELAY OR CONTACT PER ZONE REQUIRED.

AREA SECURITY SITE LIGHTING:
TIME SCHEDULE TO BE ONE ZONE ON AT NIGHT ONE ZONE OFF AFTER MIDNIGHT (TWO ZONES, STEP DIMMED).

FIXTURES LIGHTING FACADE AND LANDSCAPE:
TIME SCHEDULE TO BE ON DUSK TO DAWN, STEP DIMMING NOT REQUIRED.



NOTE:
CIRCUIT AS SHOWN IN PLAN VIEW

EXTERIOR LIGHTING DETAIL

LIGHTING CONTROL GENERAL NOTES:

1. SENSOR LOCATIONS ARE MINIMUMS, CONTRACTOR SHALL PROVIDE FOR A MINIMUM OF 10% ADDITIONAL DEVICES TO COVER DARK SPOTS DISCOVERED DURING CONSTRUCTION FROM FIELD INSTALLED OBSTRUCTIONS. CONTRACTOR SHALL ALSO ALLOW FOR A MOVE OF UP TO 5'-0" IN ANY DIRECTION FOR ALL SENSORS AT NO ADDITIONAL COST TO THE OWNER, TO ALLOW FOR FIELD ADJUSTMENT OF SENSOR PLACEMENTS TO ACHIEVE OPTIMUM PERFORMANCE.
2. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING A COMPLETE AND FULLY OPERATIONAL SYSTEM IN ACCORDANCE WITH THE DESIGN INTENT AND CODE REQUIREMENTS.
3. CONTRACTOR SHALL PROVIDE A MINIMUM OF 2 SITE VISITS BY FACTORY TRAINED PERSONNEL TO ADJUST AND TRAIN THE OWNER ON USE AND MAINTENANCE OF ALL LIGHTING CONTROL COMPONENTS.

GENERAL ENERGY CODE REQUIREMENTS :

ALL AREAS LISTED BELOW SHALL HAVE OCCUPANCY SENSOR CONTROL:
- CLASSROOMS/LECTURE/TRAINING ROOMS.
- CONFERENCE/MEETING/MULTIPURPOSE ROOMS
- COPY/PRINT ROOMS
- LOUNGES
- EMPLOYEE LUNCH AND BREAK ROOMS
- PRIVATE OFFICES
- RESTROOMS
- STORAGE ROOMS
- JANITORIAL CLOSETS
- LOCKER ROOMS
- OTHER ENCLOSED SPACES 300 SQ.FT. OR LESS
- WAREHOUSES (WAREHOUSE TO BE SENSORED BY AISLEWAY)

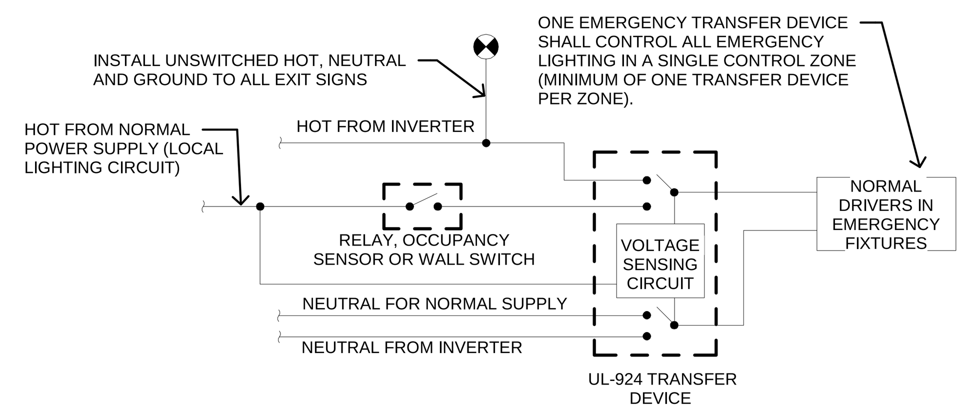
1. FOR OCCUPANCY SENSORS, AUTOMATIC ON TO 100% OUTPUT IS ALLOWED FOR PUBLIC CORRIDORS, LOBBIES AND SIMILAR PUBLIC USE ONLY AREAS. AUTOMATIC SENSORS ON SHALL BE PROGRAMMED TO AUTOMATICALLY TURN ON LIGHTING TO NO MORE THAN 50% IN OTHER SPACES IN ACCORDANCE WITH IECC REQUIREMENTS.
2. AREAS NOT PROVIDED WITH OCCUPANCY SENSORS AS LISTED ABOVE SHALL BE ON TIME BASED SCHEDULE. TIME SWITCH CONTROLS SHALL PROVIDE MAXIMUM 2-HOUR OVERRIDE (MAXIMUM 5000SQ.FT EACH OVERRIDE) WITHIN SPACE CONTROLLED OR HAVE A PILOT LIGHT AND MAP OF LIGHTING CONTROLLED.
3. MALLS, ARCADES, AUDITORIUMS, SINGLE TENANT RETAIL, INDUSTRIAL FACILITIES AND ARENA ARE EXEMPT FROM THE 2-HOUR LIMIT ON OVERRIDE TIME AND MAY CONTROL SPACES UP TO 20,000 SQ.FT.
4. AREAS NOT EXEMPTED FROM TIME BASE CONTROLS SHALL HAVE LIGHT REDUCTION CONTROLS (DIMMER) LOCATED IN SPACE FOR MINIMUM 50% REDUCTION BY OCCUPANT.
5. LIGHTING REDUCTION IS NOT REQUIRED FOR ROOMS WITH ONLY ONE LIGHT FIXTURE, ROOMS USING LESS THAN .6W/SQ.FT. CORRIDORS, EQUIPMENT ROOMS, AND PUBLIC LOBBIES.
6. TIME CONTROLS SHALL HAVE A 7-DAY CLOCK WITH DIFFERENT SCHEDULE EACH DAY, HAVE HOLIDAY SCHEDULING CAPABILITY AND 10 HOUR BACKUP FOR PROGRAMMING.
7. AREAS THAT HAVE SPECIAL EXEMPTIONS THAT MUST BE EVALUATED ON CASE BY CASE BASIS. THESE AREAS INCLUDE SLEEPING AREAS AND PATIENT CARE AREAS, AREAS WHERE AUTOMATIC LIGHTING SHUTOFF WOULD ENDANGER LIFE SAFETY, DWELLING UNITS WITHIN COMMERCIAL BUILDINGS, AND WALK-IN COOLER AND FREEZERS.
8. THE "SR" ZONE SYMBOL IDENTIFIES AREAS WHERE AUTOMATIC LIGHTING CONTROLS WOULD ENDANGER LIFE SAFETY OR ARE EXEMPT FOR EGRESS RELATED LIFE SAFETY REASONS.

EXTERIOR LIGHTING ENERGY CODE REQUIREMENTS :

1. ALL EXTERIOR LIGHTING SHALL BE CONTROLLED AS A FUNCTION OF AVAILABLE LIGHT USING AN ASTRONOMIC TIMECLOCK, PHOTOCELL OR SIMILAR MEANS, UNLESS NOTED OTHERWISE.
2. EXTERIOR LIGHTING SHALL BE REDUCED BY MINIMUM OF 30% AFTER MIDNIGHT AT THE LATEST TO 6AM. OR 1-HOUR AFTER CLOSING AND 1 HOUR BEFORE BUSINESS OPENING. OR ANYTIME OF INACTIVITY OF MORE THAN 15 MINUTES.
3. EXEMPTIONS TO EXTERIOR LIGHTING:
   EMERGENCY EGRESS LIGHTING
   COVERED VEHICLE ENTRANCES TO PARKING STRUCTURES.
   BUILDING FACADE AND LANDSCAPE LIGHTING MAY BE PHOTOCELL ONLY, 30% DIMMING IS NOT REQUIRED.

AFTER COMMISSIONING LIGHTING CONTROLS, CONTRACTOR SHALL PROVIDE A WRITEN TEST REPORT INDICATING THAT ALL LIGHTING CONTROL SYSTEMS HAVE BEEN COMMISSIONED AND TESTED, AND FOUND TO BE FUNCTIONING IN ACCORDANCE WITH CONTRACT DOCUMENT AND CODE REQUIREMENTS. CONTRACTOR SHALL ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, MANUFACTURER'S INSTRUCTIONS AND CODE REQUIREMENTS. FUNCTIONAL TESTING SHALL BE IN ACCORDANCE WITH IECC SECTIONS C408.3.1.1 AND C408.3.1.2 FOR THE APPLICABLE CONTROL TYPES.

EMERGENCY LIGHTING CONTROL NOTES:
1. FOR CIRCUITS WITH DIMMED FIXTURES, TRANSFER DEVICE SHALL HAVE ADDITIONAL INTERNAL RELAY TO BREAK 0-10V DIMMING SIGNAL TO ENSURE DIMMED FIXTURES TURN ON WHEN NORMAL POWER FAILS. "LVS LIGHTING CONTROLS" MODEL "EPC-1-D" IS BASIS OF DESIGN FOR CIRCUITS WITH 0-10V DIMMING. SEE http://www.lvscontrols.com/
2. BODINE 'BLCD-20B' IS THE BASIS OF DESIGN FOR CIRCUITS WITHOUT 0-10V DIMMING.



LIGHTING INVERTER SCHEDULE

INVERTER NAME	VOLTAGE		KVA	RUNTIME (MINUTES)	OUTPUT BREAKERS	
	INPUT	OUTPUT			QUANTITY	AMPS
L1A	277V	277V	2.8	90	3	20

NOTES:
1. MYERS POWER PRODUCTS "IE" SERIES IS BASIS OF DESIGN. CONTRACTOR SHALL PROVIDE MYERS "IE" INVERTER OR APPROVED EQUAL U.N.O.
2. OUTPUT BREAKERS SHALL BE 20A UNLESS NOTED OTHERWISE. 1 CIRCUIT TO EACH FLOOR

LIGHTING FIXTURE SCHEDULE

SCHEDULE NOTES: ALL LIGHT FIXTURES SHALL HAVE A COLOR TEMP OF 4000K

1. PROVIDE ALL REQUIRED MOUNTING HARDWARE AND ACCESSORIES REQUIRED FOR MOUNTING NECESSARY

TYPE	DESCRIPTION	MANUFACTURER	MODEL#	VOLT	LUMENS	VA
A	2X4 LED RECESSED FIXTURE	LITHONIA	2BLT4-48LHE-ADP-EZ1-LP840	277 V	4800	40 VA
AR	EXISTING TO BE RE-USED LIGHTING FIXTURES	EXISTING	EXISTING	277 V		40 VA
B	1X4 LED RECESSED FIXTURE	LITHONIA	BLT4-48LHE-ADP-EZ1-LP840	277 V	4800	36 VA
C	2X2 LED RECESSED FIXTURE	LITHONIA	2BLT2-48LHE-ADP-EZ1-LP840	277 V	4800	40 VA
C1	6" LED DOWNLIGHT - 1% DIM, HIGH LUMEN OUTPUT	GOTHAM	EVO-40-80-6AR-WD-LSS-MVOLT-EZ1	277 V	8000	74 VA
C1E	SAME AS TYPE C1 BUT ON EMERGENCY CIRCUIT	SEE ABOVE	SEE ABOVE	277 V	8000	74 VA
C2	6" LED DOWNLIGHT - 1% DIM, HIGH LUMEN OUTPUT	GOTHAM	EVO-40-30-6AR-WD-LSS-MVOLT-EZ1	277 V	3000	36 VA
D	CUSTOM CHANDELIER PENDANT MADE OUT OF POWDER COATED 4" ID X 16 GAGE ALUMINUM TUBE WITH PERFORATIONS 0.187" SIZE AND 0.312" CENTERS, PATTERN #RS066 PROVIDED BY ACCURATE PERFORATING OR APPROVED EQUAL. ALUMINUM TUBE PERFORATED CODE 40, WELDED SEAM SPIRAL, SMOOTH OUTSIDE SURFACE PROVIDED BY BEVERLIN OR APPROVED EQUAL.	MICHAEL'S LIGHTING INC	LAMP: - LINE DIMMABLE 4000 K LED T10 - BULB. TOTAL OF 53 LAMPS PER FIXTURE	120 V		424 VA
F	SURFACE MOUNT LINEAR LIGHT	FINELITE	HP-4 SM-4'-V-8-40-F-277-SC-	277 V	3705	40 VA
FE	SAME AS TYPE F BUT ON EMERGENCY CIRCUIT	FINELITE	SEE ABOVE	277 V	3705	40 VA
FS	SUSPENDED LINEAR LIGHT. BOTTOM OF FIXTURE SHALL BE FLUSH WITH BOTTOM OF SUSPENDED BAFFLE CEILING	FINELITE	HP-4 D-4'-V-8-40-F-277-SC-	277 V	3705	40 VA
S	LED STRIP FIXTURE	LITHONIA	ZL1N-L48-3000LM-FST-MVOLT-80CRI-WH	277 V		40 VA
S2	2' LED STRIP FIXTURE	LITHONIA	ZL1N-L24-3500LM-FST-MVOLT-40K-80CRI-WH	277 V	3500	40 VA
XC	EDGE LIT LED EXIT	LITHONIA	EDG SERIES	277 V	N/A	5 VA

1

SWITCH SYMBOL LEGEND

SYMBOL / TYPE		SYMBOL DESCRIPTION
฿	F	DIGITAL 1-BUTTON PER ZONE (ON/OFF). PROGRAM TO AUTOMATIC 100% ON, AUTOMATIC OFF AFTER 30 MINUTES. DUAL TECHNOLOGY OCCUPANCY SENSORS AS SHOWN IN PLAN VIEW. LOWER CASE LETTERS ADJACENT TO SWITCH INDICATES ZONES.
฿	O	DIGITAL BUTTON 3-BUTTON PER ZONE (ON/OFF,RAISE,LOWER). PROGRAM TO AUTOMATIC 50% ON, AUTOMATIC OFF AFTER 30 MINUTES. DUAL TECHNOLOGY OCCUPANCY SENSORS AS SHOWN IN PLAN VIEW. LOWER CASE LETTERS ADJACENT TO SWITCH INDICATES ZONES.
$		LINE VOLTAGE TOGGLE SWITCH
$	O	WALL MOUNTED LINE VOLTAGE OCCUPANCY SENSOR, 3-BUTTON (ON/OFF,RAISE,LOWER) DIMMING SENSOR. PROGRAM TO AUTOMATIC 50% ON, AUTOMATIC OFF AFTER 30 MINUTES. DUAL TECHNOLOGY UNLESS OTHERWISE NOTED.
$	V	WALL MOUNTED LINE VOLTAGE VACANCY SENSOR, (ON/OFF). PROGRAM TO MANUAL 100% ON, AUTOMATIC OFF AFTER 30 MINUTES. DUAL TECHNOLOGY UNLESS OTHERWISE NOTED.
●	DT	DUAL TECH OCCUPANCY SENSOR

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STATE OF TEXAS
08/02/18

100% CD SUBMISSION
PHASE II
ISSUE DATE: 07.03.2018

REVISION	DESCRIPTION	DATE
1	Addendum #3	08.02.2018

HMBA PROJECT NUMBER: 06113.00

ELECTRICAL LIGHTING DETAILS

E-214

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TECHNOLOGY GENERAL NOTES, SYMBOLS AND ABBREVIATIONS

NOTE: ALL SYMBOLS AND ABBR'EVIATIONS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS

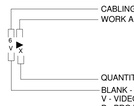
GENERAL NOTES

1. PERFORM ALL WORK IN ACCORDANCE WITH ALL APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION. PROVIDE ALL PERMITS, INSPECTIONS, LICENSES AND FEES. FURNISH ALL LABOR, EQUIPMENT, SUPPLIES AND MATERIALS NECESSARY TO PROVIDE COMPLETE AND OPERATIONAL SYSTEMS.
2. THE DRAWINGS AND SPECIFICATIONS INDICATE THE GENERAL DESIGN AND ARRANGEMENT OF CABLING , SYSTEMS, ETC. INFORMATION SHOWN IS DIAGRAMMATIC IN CHARACTER AND DOES NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DO NOT SCALE THE DRAWINGS FOR DIMENSIONS. TAKE ALL DIMENSIONS, MEASUREMENTS, EQUIPMENT LOCATIONS, LEVELS, ETC FROM THE ARCHITECTURAL DRAWINGS AND FROM THE EQUIPMENT TO BE FURNISHED. CABLING MAY BE RELOCATED OR OFFSET FOR PROPER CLEARANCES OR TO AVOID CONFLICTS WITH OTHER TRADES.
3. BASE FINAL INSTALLATION OF MATERIALS AND EQUIPMENT ON ACTUAL DIMENSIONS AND CONDITIONS AT THE PROJECT SITE. FIELD MEASURE FOR MATERIALS AND EQUIPMENT REQUIRING EXACT FIT. NO EXTRAS WILL BE GIVEN FOR THE CONTRACTORS FAILURE TO FIELD COORDINATE.
4. EACH SUBCONTRACTOR SHALL CONFER AND COOPERATE WITH ALL OTHER TRADES TO COORDINATE THEIR WORK. COORDINATION SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO MATERIALS AND EQUIPMENT ROUTED IN CEILING AND WALL CAVITIES, EQUIPMENT ARRANGEMENT IN MECHANICAL SPACES, INCLUDING EQUIPMENT CLEARANCE REQUIREMENTS, ELEVATIONS AND DIMENSIONS OF STRUCTURAL MEMBERS AND OPENINGS, ETC. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY CONFLICTS PRIOR TO PROCEEDING WITH THE WORK OR RELATED WORK IN QUESTION.
5. THE OWNER OR ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR FOR MEANS, METHODS, TECHNIQUES, CONSTRUCTION SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM THE WORK.
6. THE CONTRACTOR SHALL COORDINATE ELECTRICAL REQUIREMENTS OF TECHNOLOGY AND AUDIO VIDEO EQUIPMENT WITH THE ELECTRICAL CONTRACTOR PRIOR TO THE PURCHASE AND INSTALLATION OF ANY ELECTRICAL GEAR OR CONDUIT.
7. THE CONTRACTOR SHALL FIELD VERIFY SLAB CORES DO NOT CONFLICT WITH FLOOR BEAMS PRIOR TO CORING. COORDINATE ALL FLOOR AND BEAM PENETRATIONS WITH STRUCTURAL PRIOR TO CORING.
8. ALL PIPE PENETRATIONS THROUGH FIRE RATED AND NON RATED BUILDING ELEMENTS WITH AN APPROVED FIRE PROOFING MATERIAL. ALL PENETRATIONS OF ARCHITECTURAL BARRIERS SHALL BE COMPLETELY SEALED AT THE CONCLUSION OF INSTALLATION.
9. PROVIDE PROPER BONDING AND GROUNDING OF HORIZONTAL PATHWAYS IN ACCORDANCE WITH THE APPLICABLE ELECTRICAL CODES AND STANDARDS.
10. IN THE EVENT OF CONFLICTS IN SYMBOLS, THOSE SHOWN HEREON SHALL APPLY TO THE "T" SERIES DRAWINGS ONLY.
11. ALL TECHNOLOGY WIRING SHALL BE SUPPORTED BY J-HOOKS OR CABLE TRAY PER MIDWESTERN STATE UNIVERSITY.
12. PROVIDE AND INSTALL CATEGORY 6 CABLE FOR ALL DATA OUTLET AND FOR SECURITY CAMERAS.
13. PROVIDE AND INSTALL CATEGORY 6 CABLE FOR ALL WIRELESS ACCESS POINTS.
14. REFER TO ARCHITECTURAL DRAWINGS FOR FACE PLATE COLOR, EXCEPT FOR THE POWER BY THE CONTROLS IN THE COMPUTER WORKROOMS WHICH SHALL BE WHITE.
15. CONTRACTOR MUST BE A CERTIFIED SIEMON PARTNER.
16. PROVIDE DEDICATED HILTI SPEED SLEEVES TO THE MDF/IDF ROOMS.

SYMBOL LEGEND

P	CAT 6 PROJECTOR CEILING DATA CONNECTION.
P	EXISTING PROJECTOR CEILING DATA CONNECTION
X	CAT 6 DATA WALL OUTLET. "X" INDICATES NUMBER OF DATA DROPS AT THAT LOCATION. MOUNT 18" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.
X	CAT 6 DATA FLOOR OUTLET. "X" INDICATES NUMBER OF DATA DROPS AT THAT LOCATION. USE "HUBBLE SYSTEM ONE FLOOR BOX" FOR ALL FLOOR DATA.
X	EXISTING FLOOR DATA. "X" INDICATES NUMBER OF DROPS.
AP	CAT 6A ACCESS POINT DATA DROPS . MOUNT ABOVE CEILING.
C	COAX DROP MOUNTED 8' ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.
X	EXISTING DATA DROP. "X" INDICATES NUMBER OF DROPS. MOUNT 18" ABOVE FINISHED FLOOR NOTED OTHERWISE.
T X	CAT 6 TELEPHONE OUTLET. "X" INDICATES NUMBER OF TELEPHONE DROPS AT THAT LOCATION. MOUNT 18" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.
(D)	DEMOLISH
CR	CARD ACCESS READER AT 48"AFF UNLESS NOTED OTHERWISE
TC	TIME CLOCK
MC	MAGNETIC CONTACTOR, SIZE, COIL VOLTAGE AND NUMBER OF POLES AS INDICATED
DC	SECURITY ALARM DOOR CONTACTS
MD	SECURITY MOTION DETECTOR
CCTV	CLOSED CIRCUIT TELEVISION CAMERA, INTERIOR
1	DRAWING NOTE REFERENCE (I.E., NOTES BY SYMBOL)
BB	PROVIDE BACK BOX, MOUNT 44" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED

DRAWING/DETAIL REFERENCE



LABELING AND COLOR CODING

LABELING SHALL CONFORM TO ANSI/TIA/EIA-606(A) STANDARDS. IN ADDITION, PROVIDE THE FOLLOWING:

1. LABEL EACH OUTLET WITH PERMANENT SELF-ADHESIVE LABEL WITH MINIMUM 3/16 IN. HIGH CHARACTERS. LABELS SHALL BE MACHINE-PRINTED. HAND-LETTERED LABELS SHALL NOT BE ACCEPTED. ACCEPTABLE MANUFACTURERS INCLUDE BRADY AND PANDUIT.
2. LABEL EACH CABLE WITH PERMANENT SELF-ADHESIVE LABEL WITH MINIMUM, 1/8 IN. HIGH CHARACTERS. IN THE FOLLOWING LOCATIONS:
   A. INSIDE RECEPTACLE BOX AT THE WAO LOCATION.
   B. BEHIND THE PATCH PANEL OR PUNCH BLOCK IN ALL EQUIPMENT ROOMS.
3. LABEL THE FACE OF ALL COMMUNICATION PATCH PANELS. PROVIDE FACILITY ASSIGNMENT RECORDS IN A PROTECTIVE COVER AT EACH EQUIPMENT ROOM LOCATION THAT IS SPECIFIC TO THE FACILITIES TERMINATED THEREIN.
3. CABLES SERVICING DATA SHALL BE BLUE & CABLES SERVICING ANALOG/TDM CIRCUITS SHALL BE WHITE.
4. USE COLOR-CODED LABELS FOR EACH TERMINATION FIELD THAT CONFORMS TO ANSI/TIA/EIA-606(A) STANDARD COLOR CODES FOR TERMINATION BLOCKS.
   A. ORANGE - RESERVED FOR IDENTIFICATION OF THE COMMUNICATION SERVICE DEMARCATION POINT (DEMARC). ORANGE MAY ONLY BE USED BY THE TELEPHONE COMPANY.
   B. GREEN - USED TO IDENTIFY THE TERMINATION OF NETWORK CONNECTIONS ON THE MSU SIDE OF THE DEMARC.
   C. PURPLE - USED TO IDENTIFY CABLES ORIGINATING FROM COMMON EQUIPMENT, SUCH AS TELEPHONE PBX, LAN HUBS, OR MULTIPLEXER.
   D. WHITE - USED TO IDENTIFY THE FIRST-LEVEL BACKBONE COMMUNICATIONS MEDIA TERMINATION IN THE BUILDING CONTAINING THE MAIN CROSS-CONNECT. THE MAIN CROSS-CONNECT, WHITE MAY BE USED TO IDENTIFY THE SECOND-LEVEL BACKBONE TERMINATIONS.
   E. GRAY - USED TO IDENTIFY THE SECOND-LEVEL BACKBONE COMMUNICATIONS MEDIA TERMINATION IN THE BUILDING CONTAINING THE MAIN CROSS-CONNECT.
   F. BLUE - USED TO IDENTIFY THE TERMINATION OF HORIZONTAL DISTRIBUTION CABLES ROUTING FROM THE TR OR ER TO THE WORK-AREA. A BLUE COLOR CODING IS ONLY REQUIRED AT THE TR OR ER END, NOT AT THE WORK-AREA END OF THE CABLE.
   G. BROWN - USED TO IDENTIFY INTER-BUILDING BACKBONE CABLE TERMINATIONS.
   H. YELLOW - USED TO IDENTIFY TERMINATION OF AUXILIARY CIRCUITS, ALARMS, MAINTENANCE, SECURITY, AND OTHER MISCELLANEOUS CIRCUITS.
5. LABEL CABLES, OUTLETS, PATCH PANELS, AND PUNCH BLOCKS WITH ROOM NUMBER IN WHICH OUTLET IS LOCATED. IF MULTIPLE DROPS EXIST IN A ROOM, LABEL USING ROOM NUMBER DOT DROP NUMBER. E.G. FOR 3 DROPS IN ROOM 101, THE DROPS SHALL BE LABELED 101.1, 101.2, 101.3.INDICATE RISER CABLES BY AN R FOLLOWED BY THE PAIR OR CABLE NUMBER.
6. FLOOR PLANS SHOWING OUTLET LOCATIONS, TYPE, AND CABLE MARKING SHALL BE PROVIDED TO MSU TWO (2) WEEKS PRIOR TO MOVE-IN TO ALLOW THE UNIVERSITIES' PERSONNEL TO CONNECT AND TEST UNIVERSITY-PROVIDED EQUIPMENT IN A TIMELY FASHION.
7. RECORD DOCUMENTS SHALL BE PROVIDED TO THE UNIVERSITY IN ELECTRONIC FORMAT UTILIZING CAD SOFTWARE THAT IS ACCEPTABLE TO THE UNIVERSITY IN ACCORDANCE WITH THE CONTRACTOR'S AGREEMENT WITHIN FOUR (4) WEEKS OF ACCEPTANCE OF PROJECT BY THE DISTRICT.
8. CONTACT MIDWESTERN STATE UNIVERSITY FOR DETAILS REGARDING LABELING WAO. COORDINATE LABELING PROTOCOL WITH MSU.

TECHNOLOGY EQUIPMENT

DESCRIPTION	MANUFACTURER AND MODEL NUMBER
UTP CABLE, CAT 6, PLENUM RATED CMP	FOR DATA: SIEMON # 9C6P4-E3-02-RXA FOR ANALOG/TDM: SIEMON # 9C6P4-E3-06-RXA
CAT 6, 48-PORT PANELS	SIEMON # MAX HD6-48
CAT 6, 24-PORT PANELS	SIEMON # MAX HD6-24
CAT 6 DATA INSERTS – WHITE	SIEMON # MX6-F02
CAT 6 DATA INSERTS – BLACK	SIEMON # MX6-F01
CAT 6 DATA INSERTS – GREY	SIEMON # MX6-F04
CAT 6 DATA INSERTS – IVORY	SIEMON # MX6-F20
CAT 6 DATA INSERTS – LIGHT IVORY	SIEMON # MX6-F80
CAT 6 DATA FACEPLATE	FINAL COLOR OF JACK & FACEPLATE TO BE DETERMINED BY ARCHITECT. SIEMON # MX-FP-X-YY-ZZ X: "S" INDICATES SINGLE GANG, "D" INDICATED DOUBLE GANG. YY: INDICATES NUMBER OF DROPS. E.G. "03" EQUAL 3 DROPS. ZZ: INDICATES COLOR OF FACEPLATE. REFER TO DATA INSERTS ABOVE FOR NUMBER/COLOR REFERENCE.
CAT 6, 28 AWG PATCH CORDS – PROVIDE (2) 5' DATA CABLE PER HORIZONTAL RUN	SIEMON # MC6-05-06-28
6-PORT TYPICAL FACEPLATE – SOME APPLICATIONS MAY REQUIRE 6-PORT TYPES, VERIFY WITH DRAWINGS AND OUTLET DESIGNATIONS	SIEMON # MX-FP-S-06-02. COORDINATE WITH ARCHITECT FOR COLOR BEFORE PURCHASE.
FIRE RATED PATHWAY	HILTI SPEED SLEEVE #CP653 OR EQUAL, FIELD VERIFY DEPTH

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100% CD SUBMISSION

PHASE II

ISSUE DATE: 07.03.2018

REVISION	DESCRIPTION	DATE
1	ADDENDUM #3	08.03.2018

HMBA PROJECT NUMBER: 06113.00

ABBREVIATIONS AND SYMBOLS

T-001

8/2/2018 5:22:16 PM

1 TECHNOLOGY FIRST FLOOR
1/8" = 1'-0"

DEMOLITION NOTES

1. REMOVE ALL DATA CABLING AND SUPPORTING HARDWARE PER NEC. DO NOT ABANDON CABLES ABOVE CEILING PER NEC.
2. RELOCATE EXISTING WAP'S AS NECESSARY TO MATCH NEW LAYOUT. PROVIDE ADDITIONAL "LIKE KIND" WAP'S THROUGHOUT REST OF LIBRARY. PATCH AND REPAIR ANY HOLES OR DAMAGE CAUSED BY DEMO/RELOCATION.
3. EXISTING DEVICES MARKED "(D)" SHALL BE DEMOLISHED. OTHERWISE REPLACE WITH NEW. WHERE DEVICES ARE NOT BEING REPLACED, COVER WITH BLANK FACEPLATE. COLOR SHALL BE APPROVED BY ARCHITECT.

T-101 NOTES BY SYMBOL

1	CEILING DATA FOR PROJECTOR TO BE LOCATED ABOVE GRID CEILING
2	LOCATE FLOOR BOX BELOW CIRCULATION DESK. USE EXISITING SLAB POKE-THRU IF POSSIBLE.
3	A/V PROJECTOR CONTROLS ARE EXISTING AND TO REMAIN
4	TELEPHONE DROP FOR EXISTING ELEVATOR. COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT.
5	COORDINATE EXACT LOCATION OF DATA DROP WITH POWER MONITORING EQUIPMENT
6	COORDINATE EXACT LOCATION OF DATA DROP WITH ELEVATOR PHONE
7	PROVIDE 12 STRANDS OF OM3 FIBER FROM MDF ROOM #1COMM1 TO IDF ROOM #1COMM2
8	ROUTE 12 STRANDS OF OM3 FIBER FROM MDF ROOM TO IDF ROOM #2COMM1 ON SECOND FLOOR.
9	ROUTE 6 STRANDS OF OM3 FIBER FROM IDF ROOM TO IDF ROOM #2COMM2 ON SECOND FLOOR.
10	RE-ROUTE EXISTING DEMARC TO NEW MDF ROOM #1COMM1. REFER TO T-602 FOR MORE INFORMATION. FILL ALL HOLES AND VOIDS ASSOCIATED WITH DEMARC RELOCATION. LEAVE AN ASTHETICALLY PLEASING APPEARANCE.
11	RELOCATE EXISTING SECURITY CAMERAS TO FIT LAYOUT OF NEW CIELING GRID.
12	REMOVE EXISTING DOOR CONTATCS.
13	RELOCATE EXISTING WALL MOUNTED WAP TO NORTH SIDE OF ADJACENT COLUMN
14	RELOCATE EXISTING WALL MOUNTED ANTENNA TO NORTH SIDE OF ADJACENT COLUMN

GENERAL NOTES

1. ALL EXISTING DATA CABLING SHALL BE REMOVED AND REPLACED WITH BRAND NEW CABLES THROUGHOUT ENTIRE BUILDING. ROUTE ALL CABLING TO NEW IDF/MDF ROOM.
2. ALL DATA SHALL BE PLENUM RATED CATEGORY 6. PROVIDE A 6' SERVICE LOOP.
3. ALL WAP CABLING SHALL BE PLENUM RATED CATEGORY 6. ROUTE ABOVE CEILING AND PROVIDE A 6' SERVICE LOOP. △1
4. COORDINATE RACEWAYS WITH THE ELECTRICAL CONTRACTOR.
5. ELECTRICAL CONTRACTOR TO PROVIDE ALL CONDUITS WITH ALL CONTRACTORS TO ENSURE CONDUIT PLACEMENT DOES NOT CONFLICT WITH THE LOCATION OF OTHER TRADES.
6. ELECTRICAL CONTRACTOR TO PROVIDE ALL CONDUITS WITH 200 LB PULL CORDS AND PLASTIC BUSHINGS.
7. ALL WIRING AND CONDUIT SIZES SHALL BE BASED ON THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE.
8. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.
9. ARCHITECT SHALL VERIFY FINAL COLOR OF ALL DATA JACKS/FACEPLATES. △1

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PHASE II

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FIRST FLOOR TECHNOLOGY PLAN

T-101

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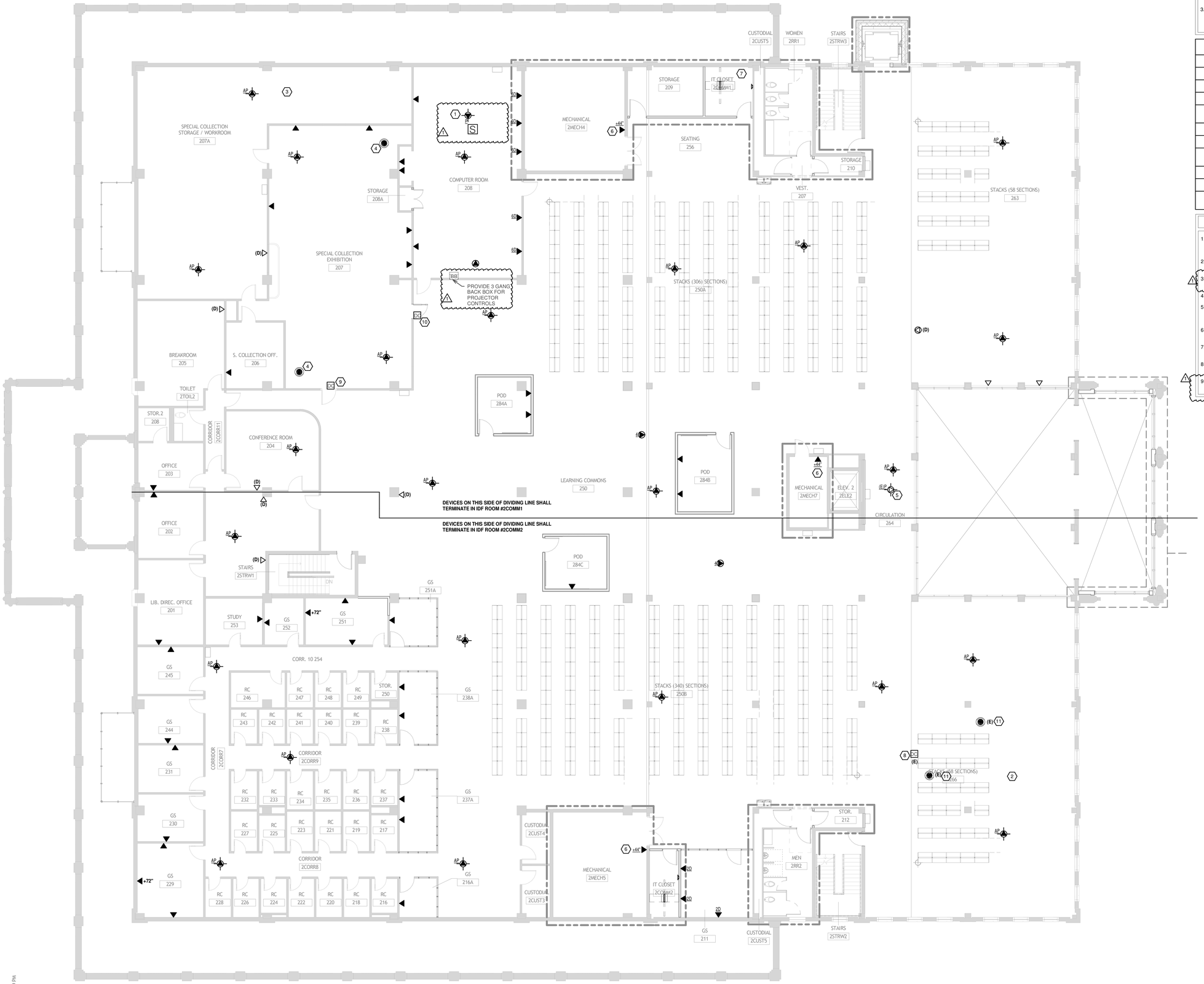

1 TECHNOLOGY SECOND FLOOR
1/8" = 1'-0"

DEMOLITION NOTES

1. REMOVE ALL DATA CABLING AND SUPPORTING HARDWARE PER NEC. DO NOT ABANDON CABLES ABOVE CEILING PER NEC.
2. RELOCATE EXISTING WAP'S AS NECESSARY TO MATCH NEW LAYOUT. PROVIDE ADDITIONAL "LIKE KIND" WAP'S THROUGHOUT REST OF LIBRARY. PATCH AND REPAIR ANY HOLES OR DAMAGE CAUSED BY DEMO/RELOCATION.
3. EXISTING DEVICES MARKED "(D)" SHALL BE DEMOLISHED. OTHERWISE REPLACE WITH NEW. WHERE DEVICES ARE NOT BEING REPLACED, COVER WITH BLANK FACEPLATE. COLOR SHALL BE APPROVED BY ARCHITECT.

T-102 NOTES BY SYMBOL

1	CEILING DATA FOR PROJECTOR TO BE LOCATED ABOVE GRID CEILING
2	REMOVE ALL EXISTING DATA DROPS FROM EXISTING "SPECIAL COLLECTION" AND "RARE BOOKS" ROOMS
3	REMOVE ALL DATA DROPS FROM WALLS BEING DEMOLISHED IN ROOMS 208A, 209, 210, & 211.
4	COORDINATE EXACT LOCATION WITH OWNER/REPRESENTATIVE PRIOR TO INSTALLATION.
5	EXISTING CEILING MOUNTED PROJECTOR IS EXISTING AND TO REMAIN. RE-POSITION AS NECESSRY TO MATCH NEW CEILING LAYOUT.
6	COORDINATE EXACT LOCATION OF DATA DROP WITH POWER MONITORING EQUIPMENT
7	ROUTE 6 STRANDS OF OM3 FIBER FROM MDF ROOM TO IDF ROOM #3COMM1 ON THIRD FLOOR.
8	RELOCATE EXISTING DOOR CONTACT AND KEYPAD IN OLD SPECIAL COLLECTIONS ROOM TO NEW SPECIAL COLLECTIONS ROOM.
9	LOCATION OF RE-LOCATED DOOR CONTACT AND KEY PAD FROM OLD SPECIAL COLLECTIONS ROOM.
10	PROVIDE DOOR CONTACT AND "LIKE KIND" KEY PAD TO MATCH OTHER ENTRY DOOR
11	EXISTING SPECIAL COLLECTIONS SECURITY CAMERAS ARE TO BE RELOCATED TO NEW SPECIAL COLLECTIONS ROOM. REFER TO NOTE BY SYMBOL 12 FOR MORE INFO.

GENERAL NOTES

1. ALL EXISTING DATA CABLING SHALL BE REMOVED AND REPLACED WITH BRAND NEW CABLES THROUGHOUT ENTIRE BUILDING. ROUTE ALL CABLING TO NEW IDF/MDF ROOM.
2. ALL DATA SHALL BE PLENUM RATED CATEGORY 6. PROVIDE A 6' SERVICE LOOP.
3. ALL WAP CABLING SHALL BE PLENUM RATED CATEGORY 6. ROUTE ABOVE CEILING AND PROVIDE A 6' SERVICE LOOP.
4. COORDINATE RACEWAYS WITH THE ELECTRICAL CONTRACTOR.
5. ELECTRICAL CONTRACTOR TO PROVIDE ALL CONDUITS WITH ALL CONTRACTORS TO ENSURE CONDUIT PLACEMENT DOES NOT CONFLICT WITH THE LOCATION OF OTHER TRADES.
6. ELECTRICAL CONTRACTOR TO PROVIDE ALL CONDUITS WITH 200 LB PULL CORDS AND PLASTIC BUSHINGS.
7. ALL WIRING AND CONDUIT SIZES SHALL BE BASED ON THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE.
8. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.
9. ARCHITECT SHALL VERIFY FINAL COLOR OF ALL DATA JACKS/FACEPLATES.

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SECOND FLOOR TECHNOLOGY PLAN

T-102

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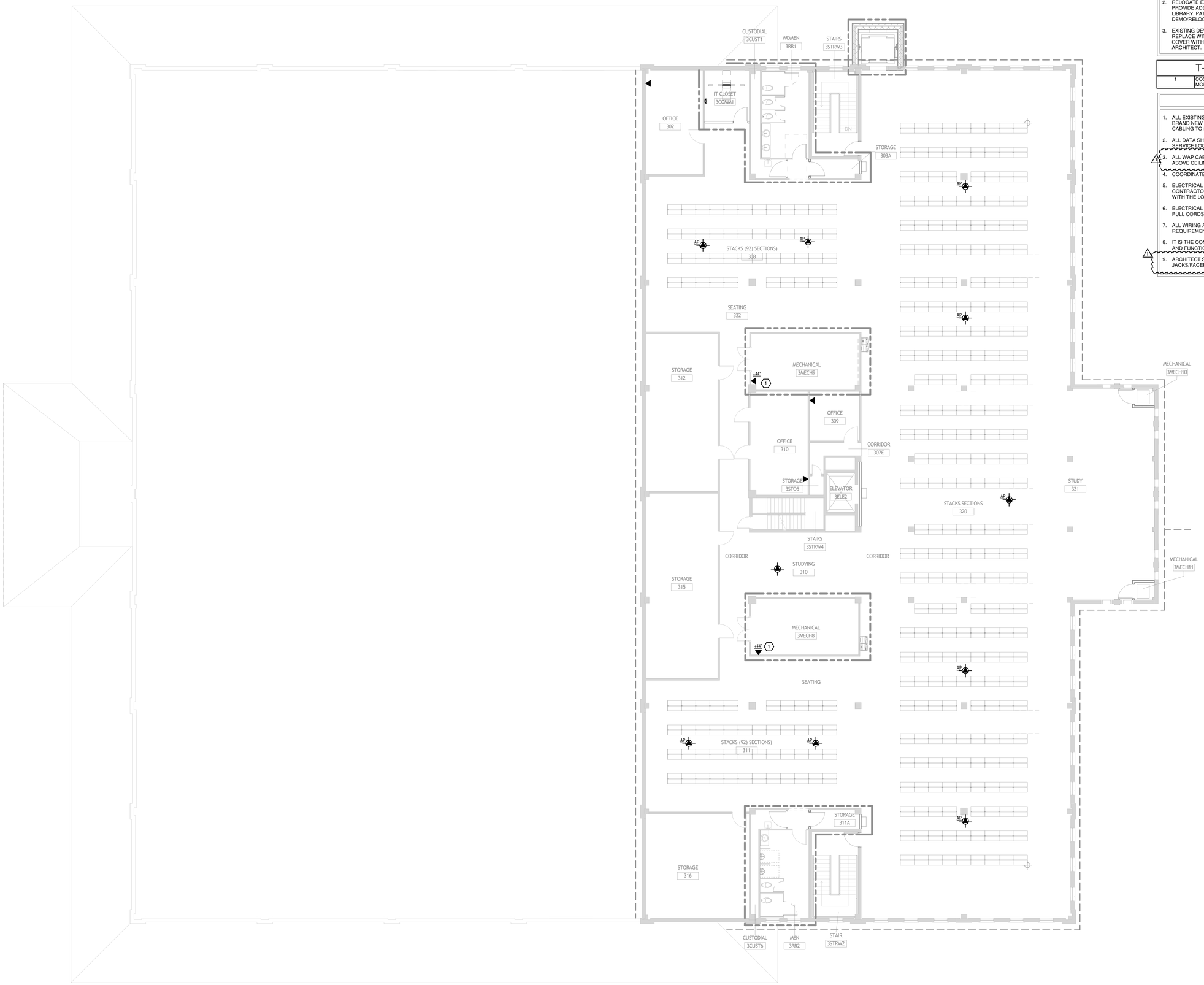

1 TECHNOLOGY THIRD FLOOR
1/8" = 1'-0"

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DEMOLITION NOTES

1. REMOVE ALL DATA CABLING AND SUPPORTING HARDWARE PER NEC. DO NOT ABANDON CABLES ABOVE CEILING PER NEC.
2. RELOCATE EXISTING WAP'S AS NECESSARY TO MATCH NEW LAYOUT. PROVIDE ADDITIONAL "LIKE KIND" WAP'S THROUGHOUT REST OF LIBRARY. PATCH AND REPAIR ANY HOLES OR DAMAGE CAUSED BY DEMO/RELOCATION.
3. EXISTING DEVICES MARKED "(D)" SHALL BE DEMOLISHED. OTHERWISE REPLACE WITH NEW. WHERE DEVICES ARE NOT BEING REPLACED, COVER WITH BLANK FACEPLATE. COLOR SHALL BE APPROVED BY ARCHITECT.

T-103 NOTES BY SYMBOL

1	COORDINATE EXACT LOCATION OF DATA DROP WITH POWER MONITORING EQUIPMENT

GENERAL NOTES

1. ALL EXISTING DATA CABLING SHALL BE REMOVED AND REPLACED WITH BRAND NEW CABLES THROUGHOUT ENTIRE BUILDING. ROUTE ALL CABLING TO NEW IDF/MDF ROOM.
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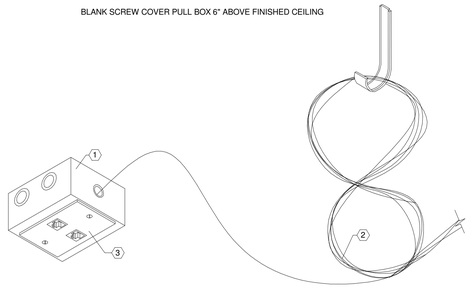
THIRD FLOOR TECHNOLOGY PLAN

T-103

NOTES BY SYMBOL "#"

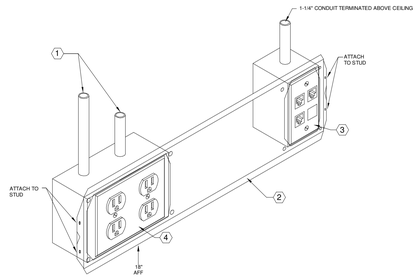
1. PROVIDE A DOUBLE GANG BOX WITH A SINGLE GANG REDUCER PLATE. PROVIDE BUSHINGS TO PROTECT CABLE.
2. PROVE A 6' SERVICE LOOP OF CABLING IN A FIGURE 8'. COIL UP ABOVE CEILING SPACE AT WIRELESS BOX.
3. PROVIDE A TWO PORT PLENUM-GRADE FACEPLATE



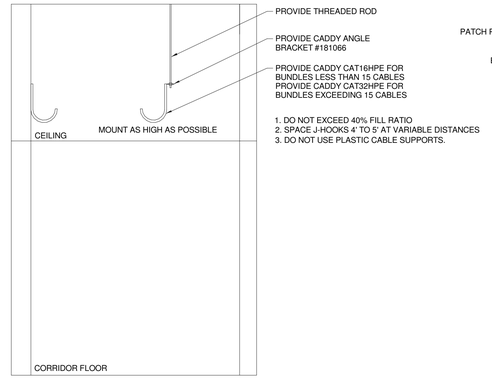
1 WIRELESS OUTLET DETAIL
NO SCALE

NOTES BY SYMBOL "#"

1. CONDUIT NUMBER, SIZE AND DESTINATION PER AV DRAWINGS.
2. PROVIDE MOUNTING BRACKET TO ENSURE BOTH THE WAO AND THE ELECTRICAL RECEPTACLE ARE ALIGNED AND NO FARTHER THAN 18" APART.
3. DATA/VOICE INFORMATION OUTLET/FACEPLATE/CONDUIT AS SPECIFIED IN T-SERIES DRAWINGS.
4. TECHNICAL AV POWER OUTLET/FACEPLATE/CONDUIT AS SPECIFIED IN E-SERIES DRAWINGS.

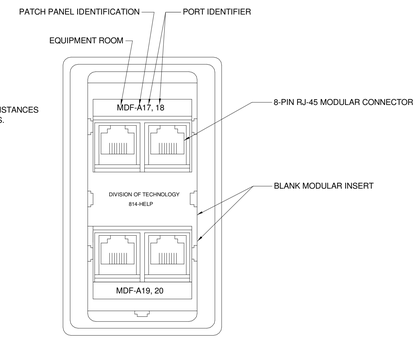


2 TYPICAL WAO WITH RECEPTACLE DETAIL
NO SCALE



1. DO NOT EXCEED 40% FILL RATIO
2. SPACE J-HOOKS 4' TO 5' AT VARIABLE DISTANCES
3. DO NOT USE PLASTIC CABLE SUPPORTS.

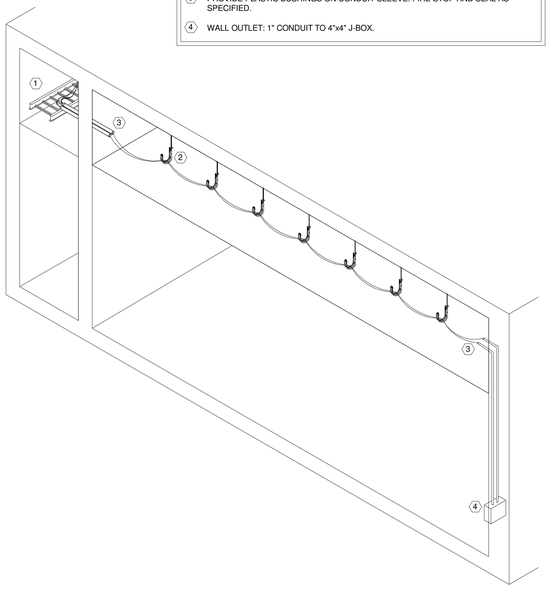
3 CORRIDOR CABLE ROUTING WITH J-HOOK
NO SCALE



4 DATA WALL OUTLET
NO SCALE

NOTES BY SYMBOL "#"

1. LADDER TRAY IN MDF/IDF ROOM.
2. PROVIDE J-HOOK CABLE SUPPORT EVERY 4' TO 5' VARYING THE DISTANCES.
3. PROVIDE PLASTIC BUSHINGS ON CONDUIT SLEEVE. FIRE STOP AND SEAL AS SPECIFIED.
4. WALL OUTLET: 1" CONDUIT TO 4"x4" J-BOX.



5 TYPICAL PATHWAY FROM BASKET TRAY TO CLASSROOMS DETAIL
NO SCALE

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TECHNOLOGY DETAILS

T-601

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