

# **FACILITY DESIGN PLAN**

## **Devereaux Library Renovation**

### **SOUTH DAKOTA MINES**

#### **Introduction:**

South Dakota Mines requests approval of the Facility Design Plan for the Renovation of the Devereaux Library. The Preliminary Facility Statement and Facility Program Plan were approved at the Board's December 2019 meeting. The Building Committee met on November 17<sup>th</sup> and approved the Facility Design Plan. The estimated cost of the project is \$5.85M which has increased from the Facility Program Plan. The main causes of the increase in costs are the additional work to the library floor (now only on one floor), elevator shaft, and further refinement of the mechanical/electrical/plumbing design. A small addition to the building was approved during the 2020 session with HB1046. However, after further design work, it was determined that the current location of the elevator could be modified to best use space and the walls of the building could be opened to provide more natural light to improve the overall building which was the intent of the addition. There are also recently addressed drainage issues around the building that will not have to be changed.

The Devereaux Library is a 57,615 square foot building constructed in 1970. The garden level of the building was renovated in 2016 to house the Department of Industrial Engineering and the third floor was renovated in 2004 for use by the library. Major updates are necessary on the first and second floors to bring the building up to modern standards, meet ADA requirements, and complete needed maintenance/repair. The third floor also needs updates to lighting and architectural for the library operation. The programmatic emphasis of this building will change based on best practices in higher education for library spaces. The building will be transformed into a student hub to provide centralized services for student success (i.e. testing, tutoring, mentoring, IT help desk, and career and professional services), along with the much-needed library services. With the library space located only on the top floor of the building, space was available for a math lab and makerspace on the 2<sup>nd</sup> floor to further enhance the student success initiative on the Mines campus. The changes in use to student success is anticipated to help improve enrollment, retention, and graduation rates.

#### **a. Architectural, mechanical, and electrical schematic design:**

The renovation will take place within the current Devereaux Library. The Devereaux Library is located on the central north side of the South Dakota Mines campus in Rapid City, South Dakota. Schematic drawings prepared by Strang and CO-OP Architecture showing site plans, floor plans, elevations and renderings are attached.

#### **b. Changes from facility program plan:**

There will no longer be an addition for the elevator for the project to best use space. The elevator location will be left in place, but the shaft will have to be increased to meet ADA requirements. The structural architect determined that the walls could be opened to bring additional natural light into the building instead of the addition. The

library portion of the building will exist on the top floor only, which is a change from the program plan. A math lab and maker space have been added to the second floor with this change.

The project will also request to pursue an exemption from LEED certification. SDCL 5-14-33 requires all buildings to be LEED certified; however, the law also allows for exemptions in certain situations. The project scope does not allow for the entire building envelope to be updated, so the heating and cooling loads are unable to be reduced making LEED Silver unobtainable.

**c. Impact to existing building or campus-wide heating/cooling/electrical systems:**

The electrical service to the building will be updated. The cooling and heating systems are already connected to the efficient central plant which both have adequate capacity available. There may be some additional load with the window change and meeting current day ventilation requirements. Overall, the operating and utility costs should decrease with more efficient equipment and LED lighting. The building will continue to be connected to the campus Building Management system.

**d. Total project cost estimates:**

The cost estimate is \$5.85M with bid and construction contingency. The project will be funded from \$4M in system maintenance and repair bonds, \$1M FY20 General M&R funds, \$500K FY22 HEFF M&R funds, and \$1M in donations from the South Dakota Mines Center for Alumni Relations & Advancement (CARA). The following is the breakdown of the project estimate:

<b>CURRENT PROJECT FUNDING</b>	<b>\$6,500,000</b>
Total Construction Cost	\$4,888,000
Geotechnical/Testing/Miscellaneous	\$30,000
Building Commissioning	\$48,000
Lead & Asbestos Removal	\$50,000
OSE Fees	\$40,000
Architect/Engineer Fees	\$394,000
Construction Contingency (~5%)	\$250,000
Bidding Contingency (~3%)	\$150,000
<b>ESTIMATED PROJECT COSTS</b>	<b>\$5,850,000</b>
Furniture, Fixture, & Equipment (FF&E)	\$645,000
<b>TOTAL ESTIMATED PROJECT COSTS</b>	<b>\$6,495,000</b>

Several alternates have been identified to ensure project stays within budget.

Alternate #1 - Lower Level Bathroom

Alternate #2 - Reduction of Exterior Glazing

**e. Changes from cost estimate for operational or M&R expenses:**

There are no changes from the facility program plan.



1 SE Corner - Rendered  
12" = 1'-0"

CO

Arch

OP

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Phone: 605-716-3652

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STRANG

DESIGN SYNCHRONICITY

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Phone: 608-276-9200

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CO-OP PROJECT NO: 1936

PRELIMINARY  
NOT FOR  
CONSTRUCTION

ISSUE:	
10-30-20	DESIGN DEVELOPMENT

REVISION SCHEDULE:		
REV. #	REV. DSC.	REV. DATE

PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
RENDERING - SE CORNER

A1



① South Elevation - Rendered  
12" = 1'-0"

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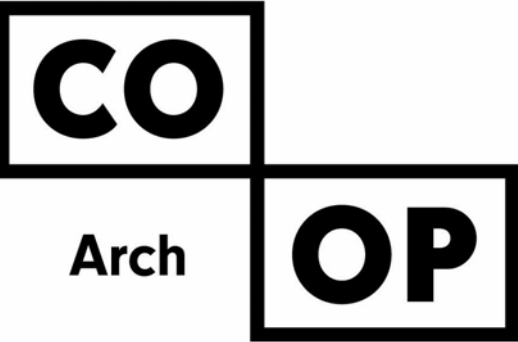
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PHASE 1  
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SHEET TITLE:

RENDERING - SOUTH  
ELEVATION



① SW Corner - Rendered  
12" = 1'-0"



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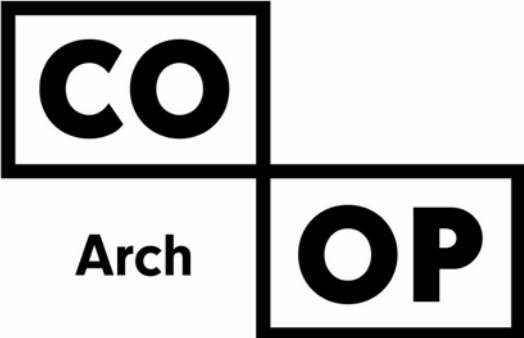
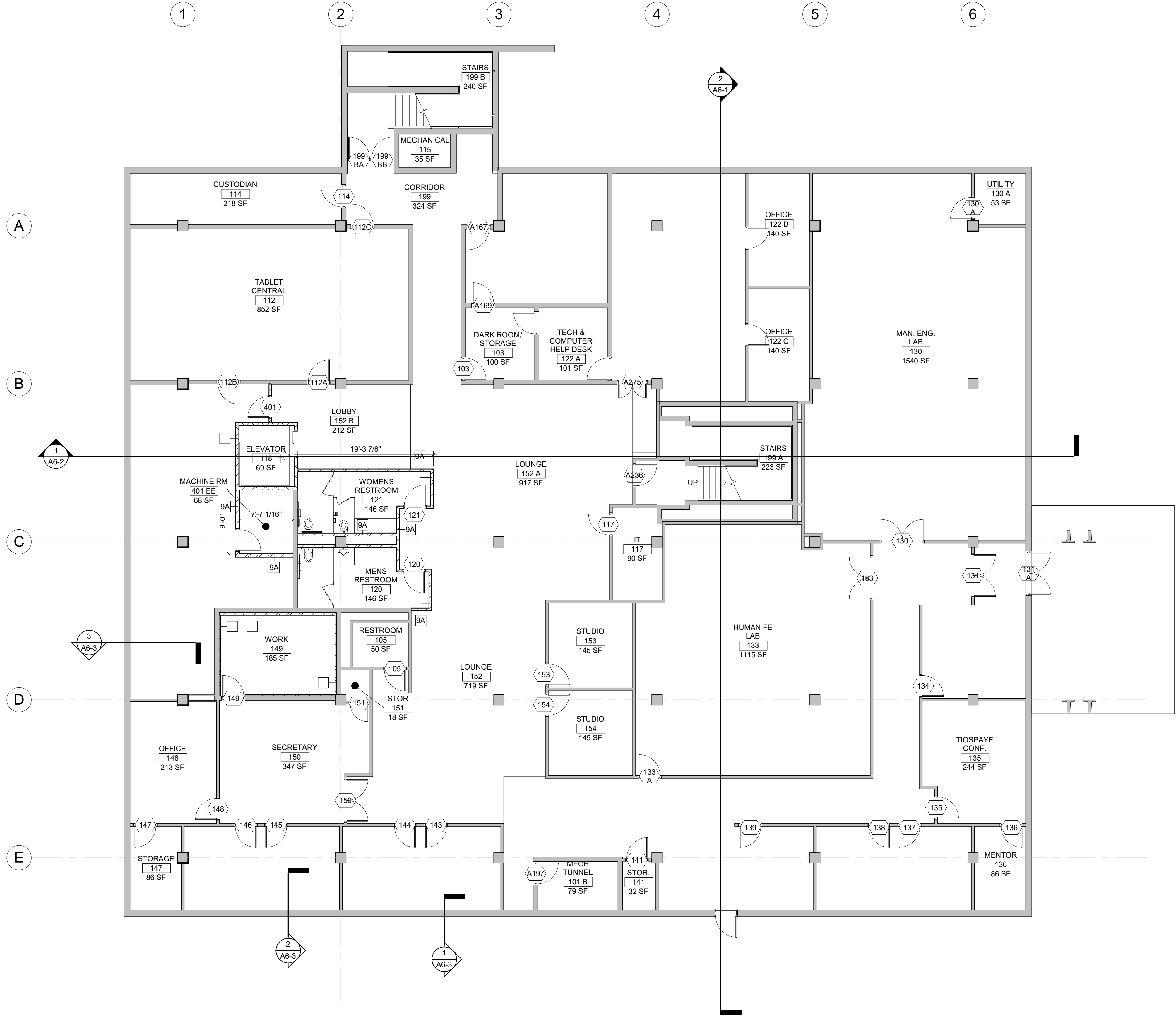
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RENDERING - SW CORNER



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- GENERAL NOTES
1.

2.

3.

4. SEE MECHANICAL FOR ALL FLOOR DRAIN SIZES AND LOCATIONS U.N.O. SET FLOOR DRAINS MINIMUM 3/4" BELOW FINISHED FLOOR. PROVIDE EVEN SLOPE FROM WALL TO DRAIN W/ A MAXIMUM SLOPE OF 1/4" PER FOOT.

5. VERIFY DRYWALL CONTROL JOINT LOCATIONS W/ ARCHITECT ON SITE PRIOR TO INSTALLATION. THIS INCLUDES, BUT IS NOT LIMITED TO, CONTROL JOINTS AT 30'-0" O.C. MAX. IN LONG WALL EXPANSES. CONTROL JOINTS AT DOOR JAMBS EXTENDING FROM DOOR HEAD TO CEILING. CONSIDERATION SHALL ALSO BE GIVEN TO LOCATING CONTROL JOINTS FROM FLOOR TO CEILING AT EITHER EDGE OF LARGE WINDOW OPENINGS.

6.

7. COORDINATE ALL CHASE SIZES AND LOCATIONS W/ MECHANICAL. PROVIDE CHASES AT ALL EXPOSED MECHANICAL & ELECTRICAL WITH ADJACENT WALL MATERIAL AS REQUIRED.

8. COORDINATE ALL SHEAR WALL LOCATIONS W/ STRUCTURAL PLANS.

9. THE AIR & MOISTURE WEATHER BARRIER IS TO BE CONTINUOUS FROM THE BASE OF THE WALLS UP TO & TYING INTO THE ROOF BARRIER SYSTEM.

10.



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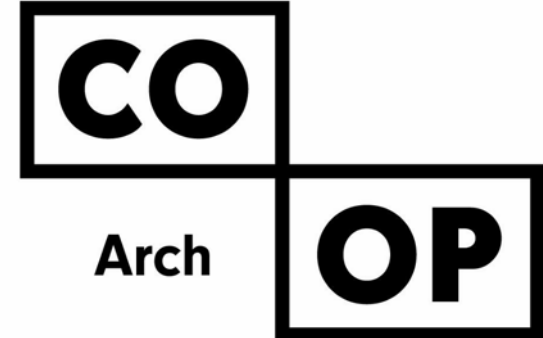
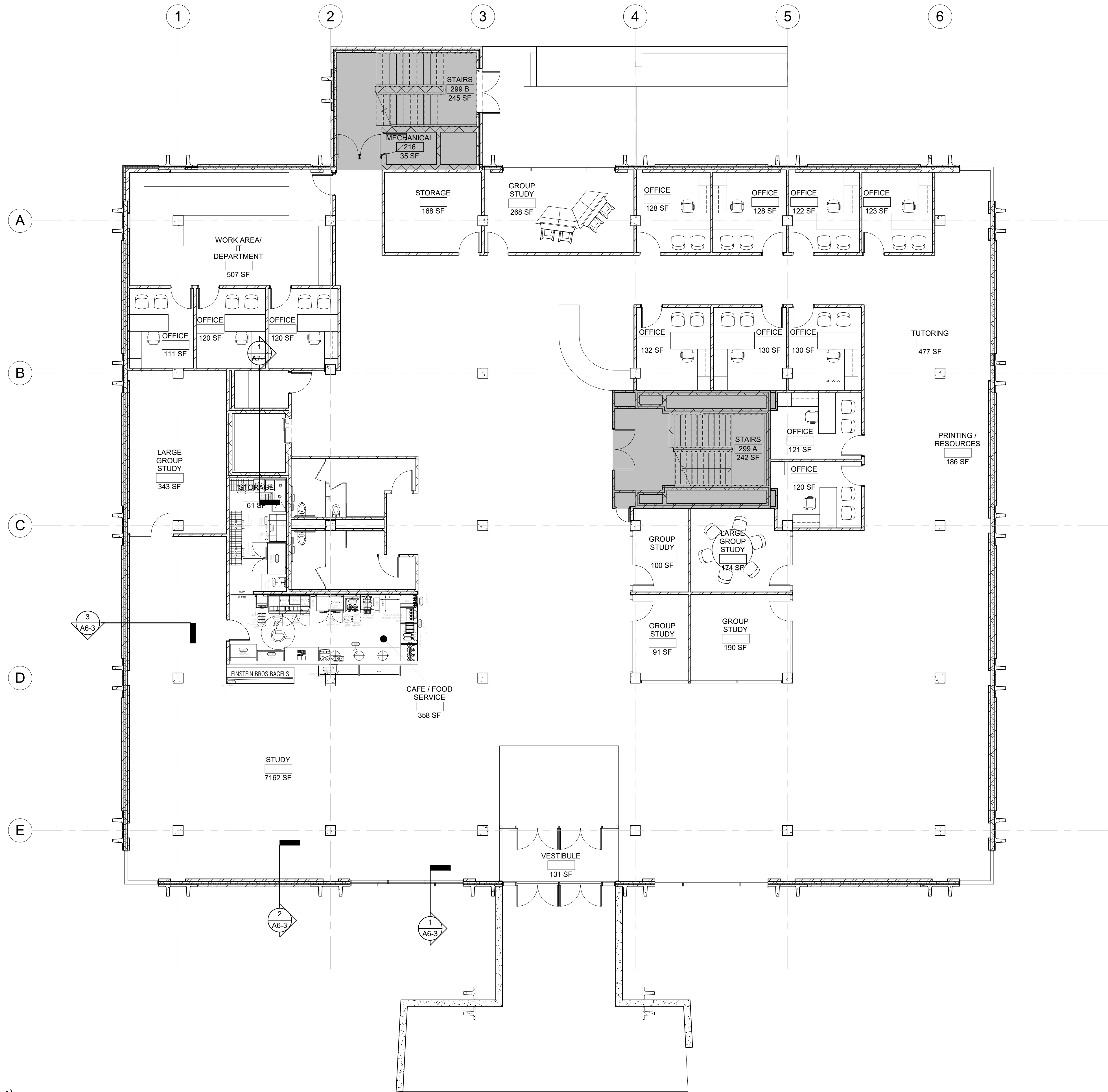
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LOWER LEVEL PLAN



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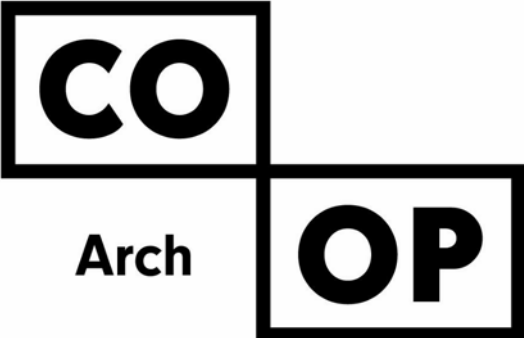
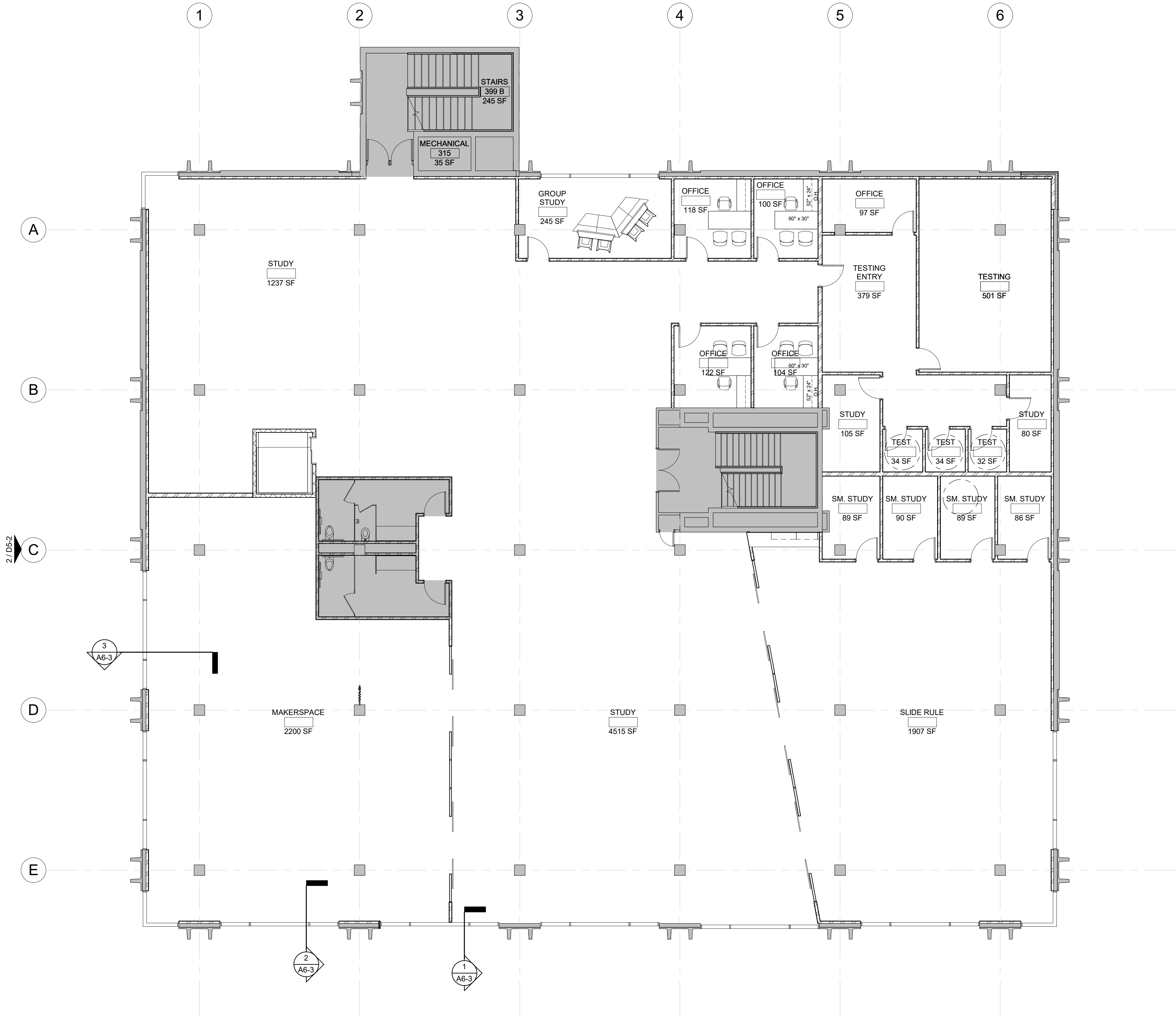
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SHEET TITLE:  
FIRST FLOOR FURNITURE PLAN

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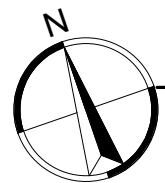
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SHEET TITLE:  
SECOND FLOOR FURNITURE  
PLAN

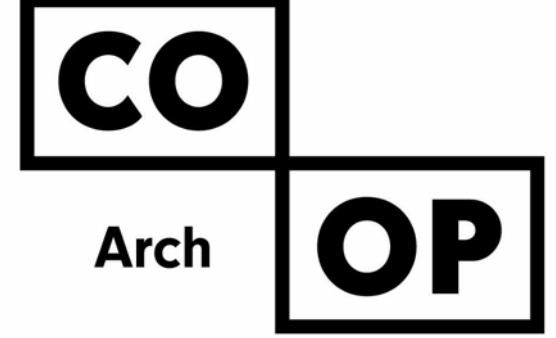
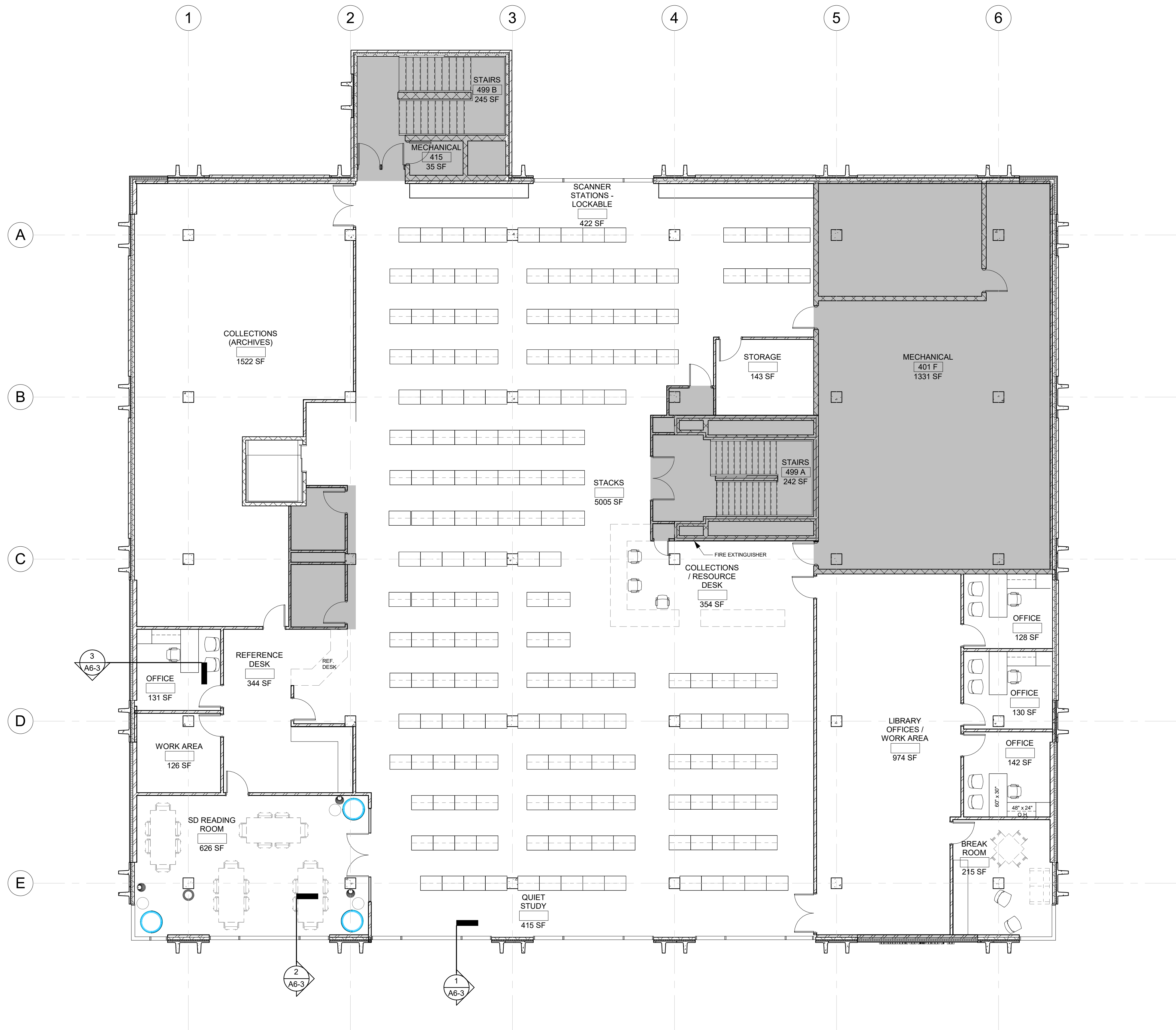
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THIRD FLOOR FURNITURE PLAN

1/8" = 1'-0"



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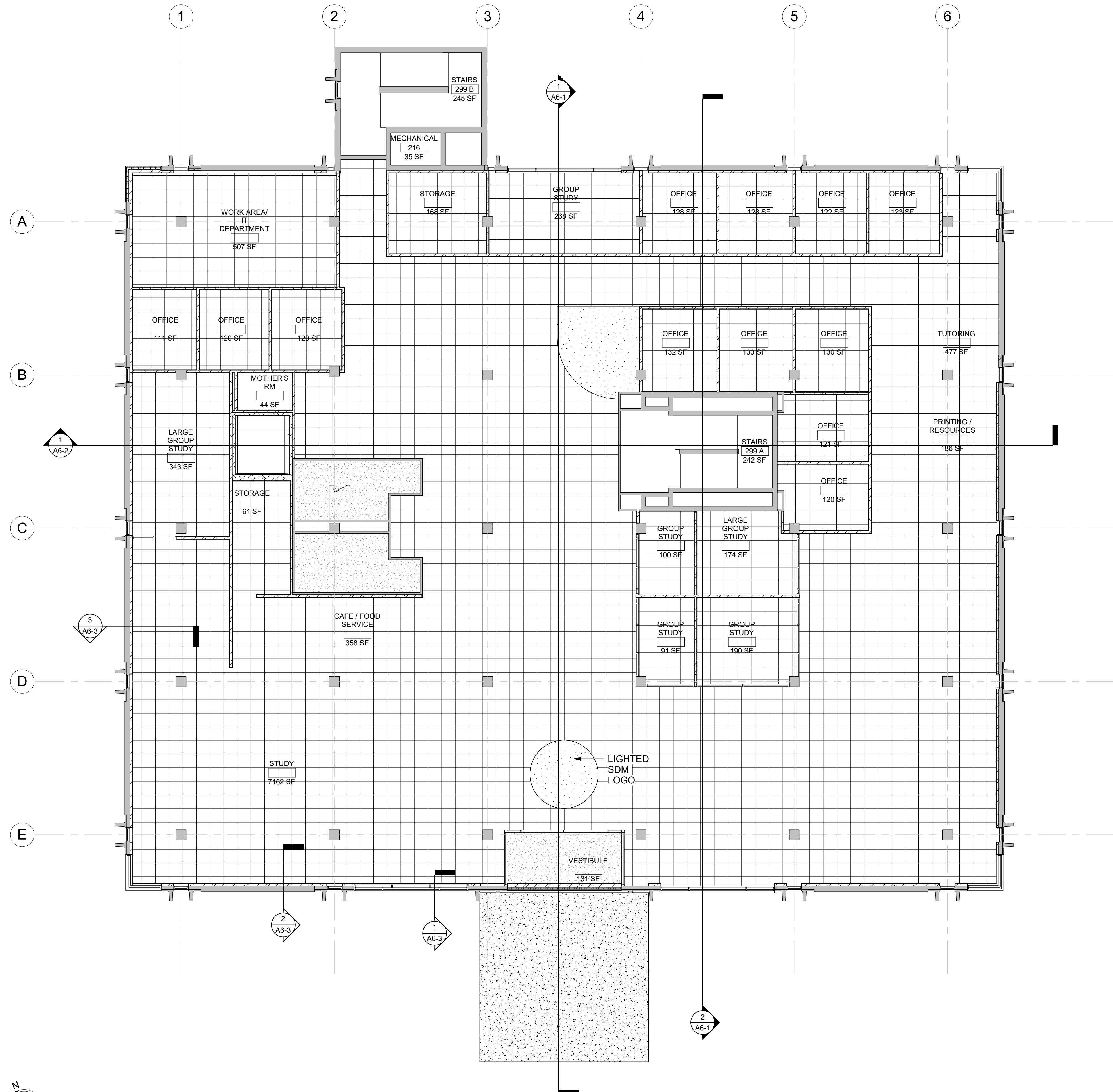
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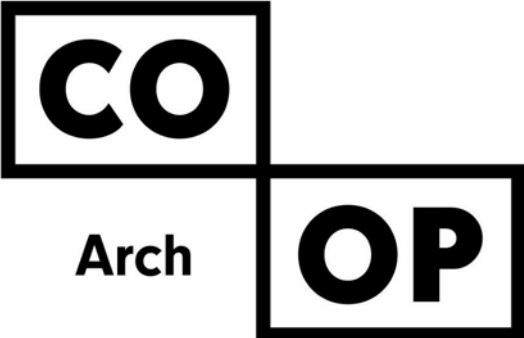
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THIRD FLOOR FURNITURE PLAN

A1-3.1



KEYNOTE SCHEDULE



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- GENERAL NOTES
1. SEE CIVIL, STRUCTURAL, MECHANICAL, AND ELECTRICAL FOR ADDITIONAL INFORMATION AND COORDINATION.
  2. ALL DIMENSIONS ARE FROM FACE OF FRAMING U.N.O.
  3. RESTROOM WALLS ARE SOUND INSULATED AND EXTEND TO THE DECK.
  4. VERIFY DRYWALL CONTROL JOINT LOCATIONS w/ARCHITECT ON SITE PRIOR TO INSTALLATION. THIS INCLUDES, BUT IS NOT LIMITED TO, CONTROL JOINTS AT 30'-0" O.C. MAX. IN LONG WALL EXPANSES. CONTROL JOINTS AT DOOR JAMBS EXTENDING FROM DOOR HEAD TO CEILING. CONSIDERATION SHALL ALSO BE GIVEN TO LOCATING CONTROL JOINTS FROM FLOOR TO CEILING AT EITHER EDGE OF LARGE WINDOW OPENINGS.
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  6. PROVIDE WATER-RESISTANT GYPSUM BOARD PANELS AT ALL BATHROOM WALLS AND ANY WALLS EXPOSED TO MOISTURE.
  7. PROVIDE GLASS-MATT FACED GYPSUM SHEATHING BEHIND TILE FINISHES AT ALL SHOWERS AND BATHTUBS.



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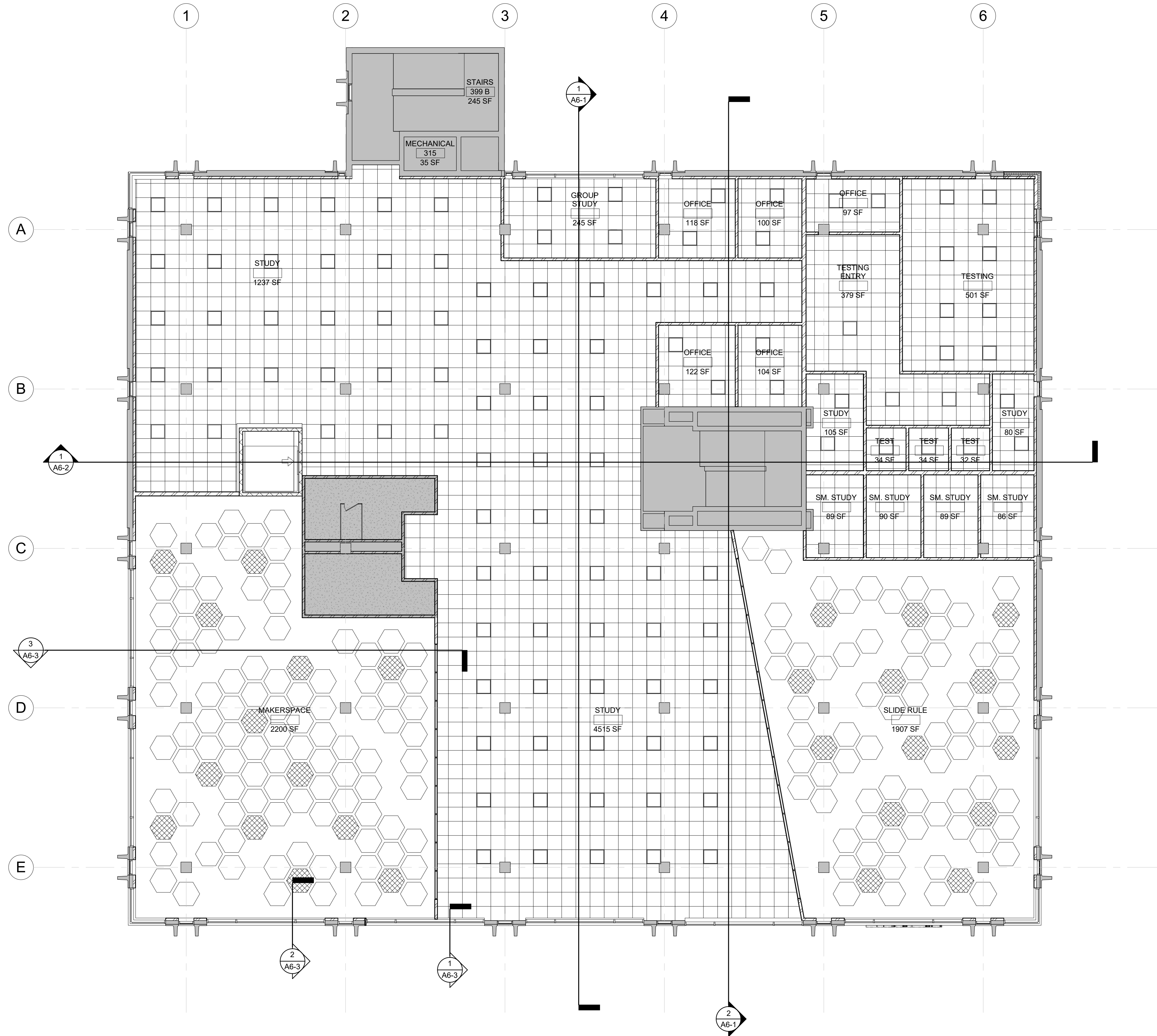
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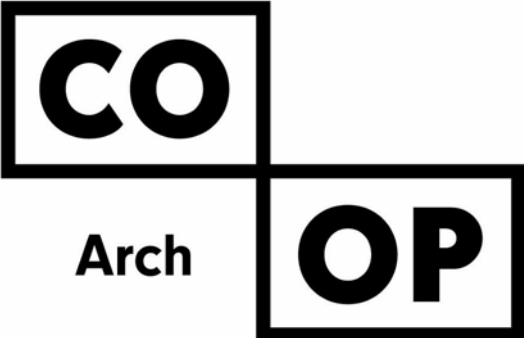
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SHEET TITLE:  
FIRST FLOOR REFLECTED  
CEILING PLAN

A3-2



KEYNOTE SCHEDULE



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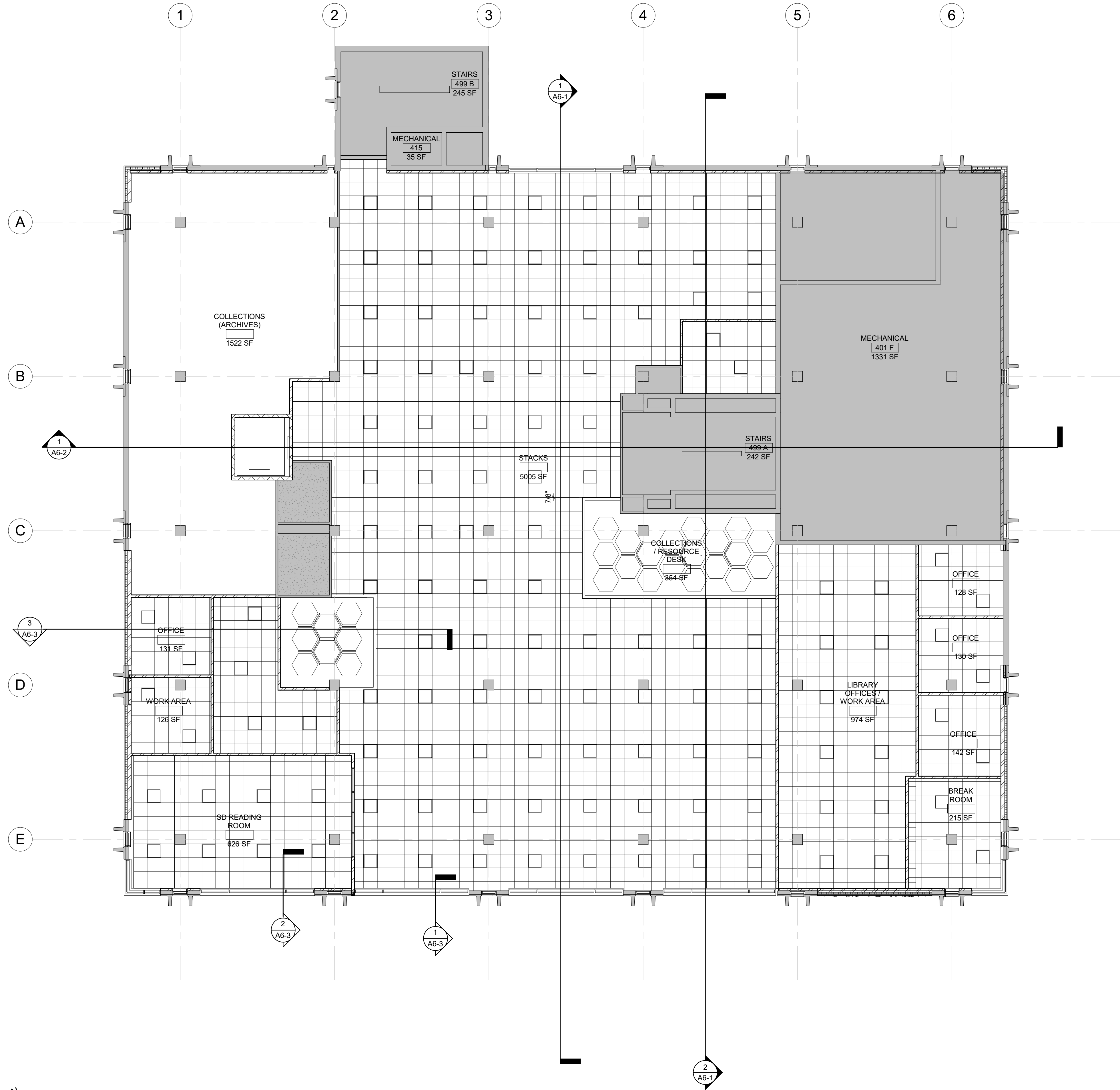
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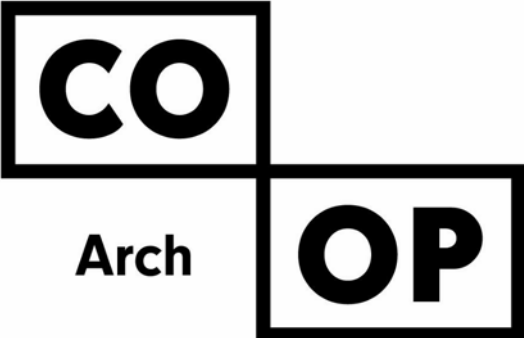
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SECOND FLOOR REFLECTED  
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A3-3



KEYNOTE SCHEDULE



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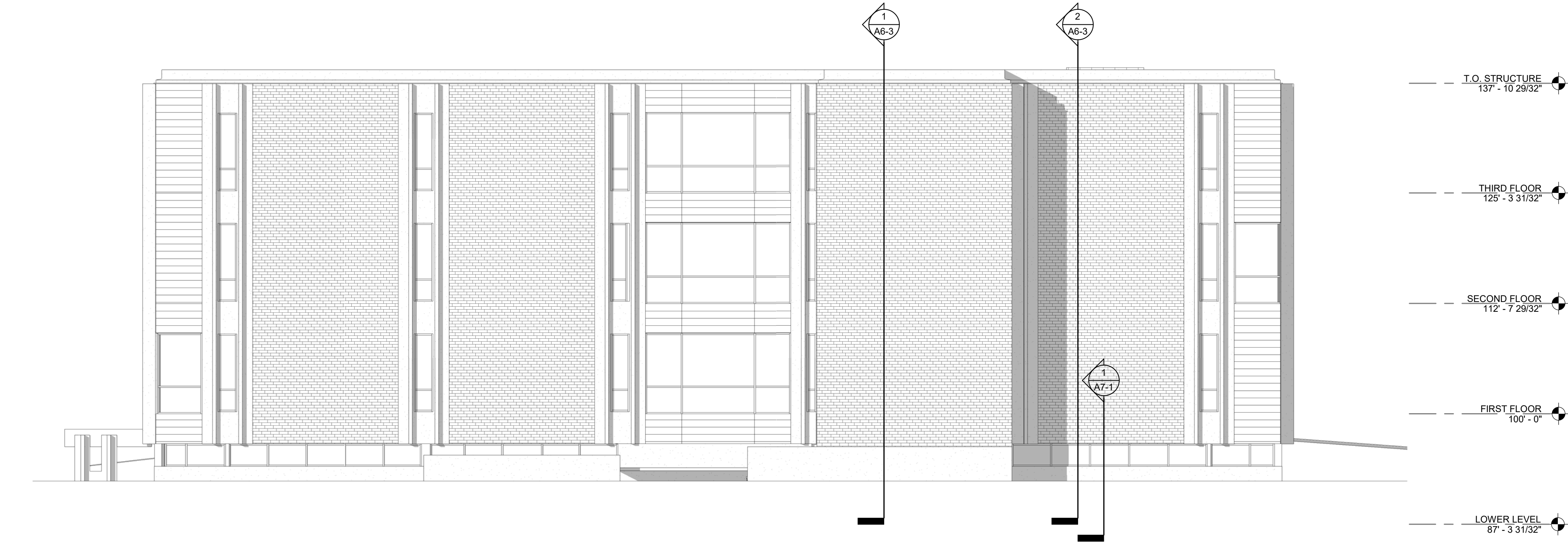
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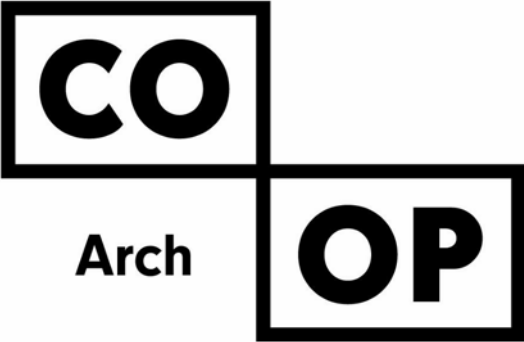
SHEET TITLE:  
THIRD FLOOR REFLECTED  
CEILING PLAN



1 NORTH ELEVATION  
1/8" = 1'-0"

KEYNOTE SCHEDULE

- GENERAL NOTES
- SEE SITE PLAN FOR ADDITIONAL INFORMATION REGARDING CONSTRUCTION LIMITS, STAGING, LAWN IRRIGATION, SOD & LANDSCAPING.
  - SEE CIVIL, STRUCTURAL, MECHANICAL, AND ELECTRICAL FOR ADDITIONAL INFORMATION AND COORDINATION.
  - THE AIR & MOISTURE WEATHER BARRIER IS TO BE CONTINUOUS FROM THE BASE OF THE WALLS UP TO & TYING INTO THE ROOF BARRIER SYSTEM.



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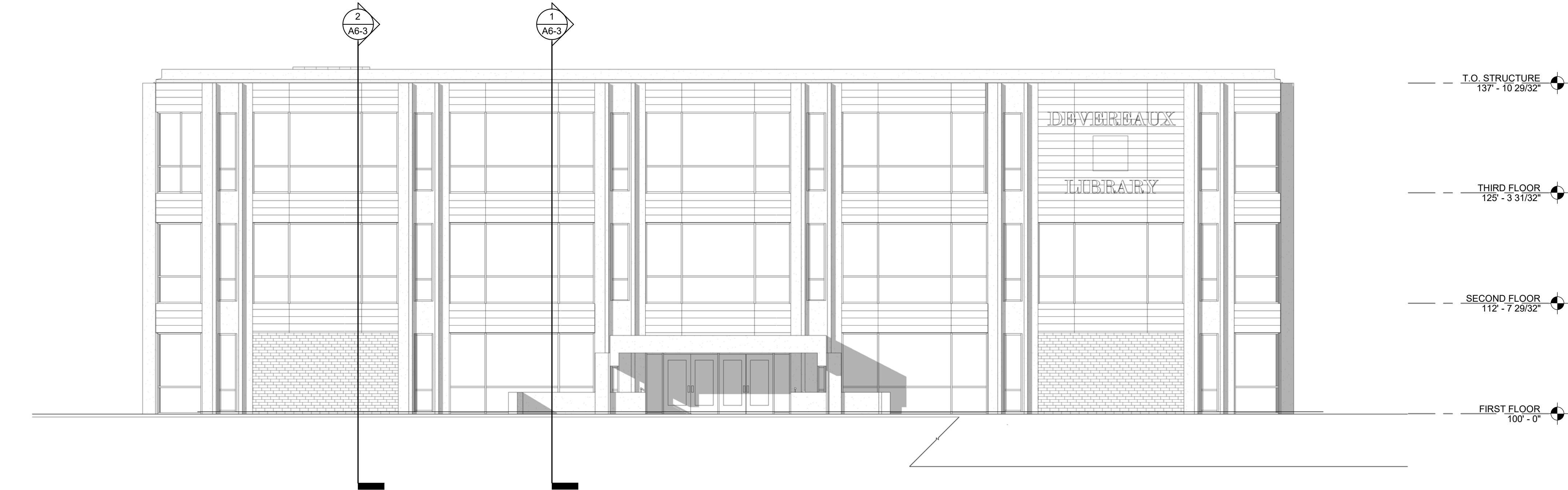
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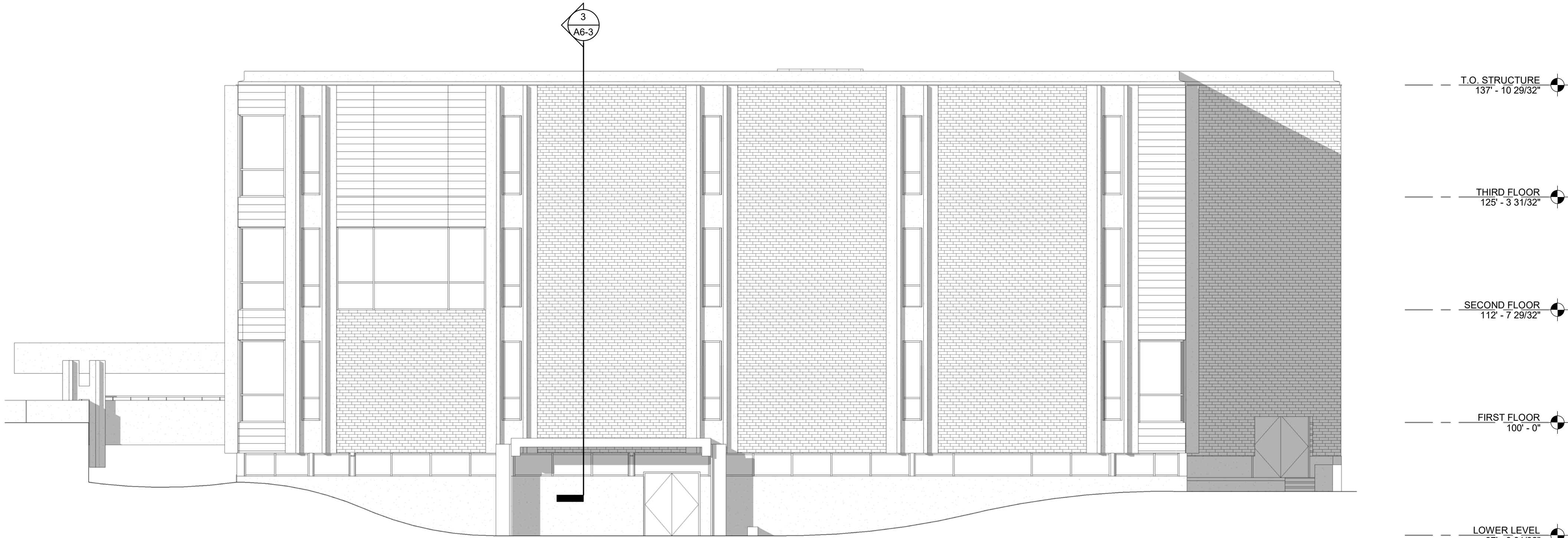
PROJECT:  
SDSMT DEVEREAUX LIBRARY  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
EXTERIOR ELEVATIONS

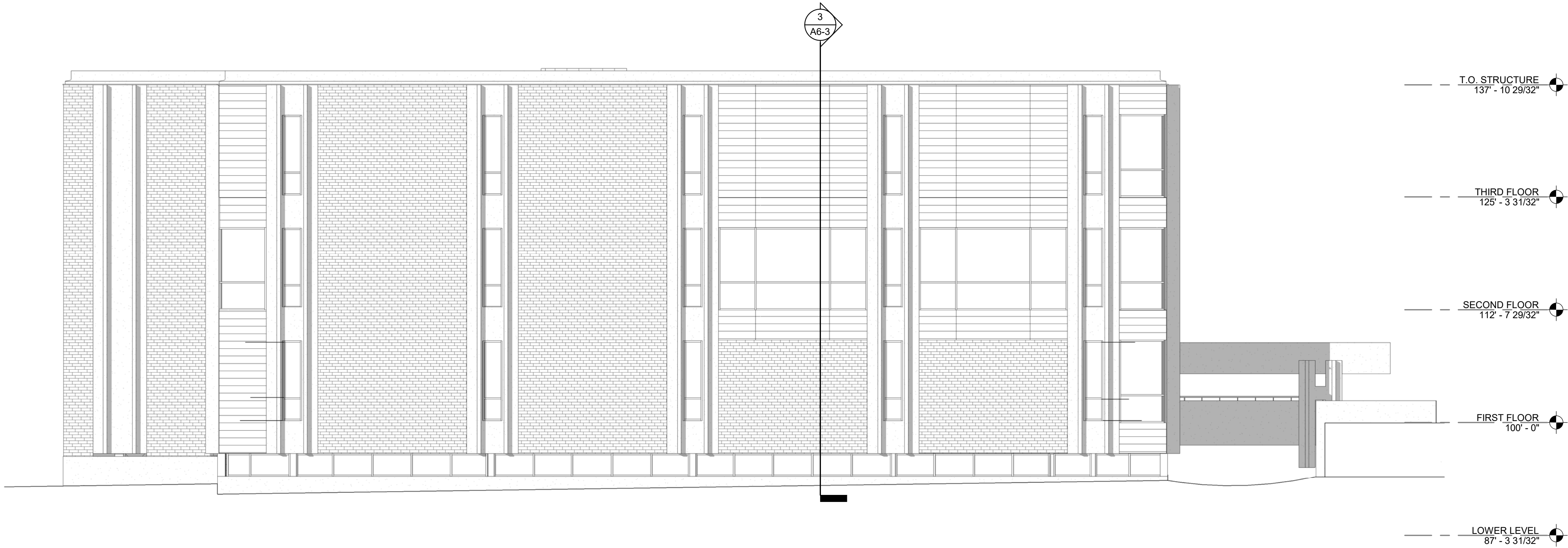
A5-1



2 SOUTH ELEVATION  
1/8" = 1'-0"



1 EAST ELEVATION  
1/8" = 1'-0"

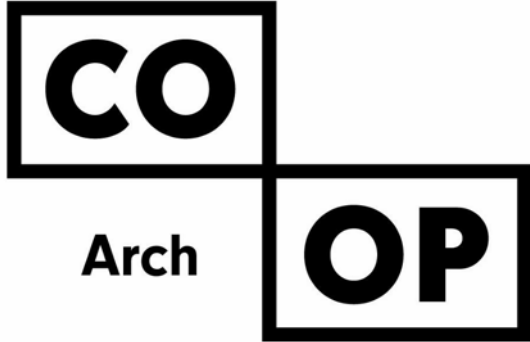


2 WEST ELEVATION  
1/8" = 1'-0"

KEYNOTE SCHEDULE

GENERAL NOTES

1. SEE SITE PLAN FOR ADDITIONAL INFORMATION REGARDING CONSTRUCTION LIMITS, STAGING, LAWN IRRIGATION, SOD & LANDSCAPING.
2. SEE CIVIL, STRUCTURAL, MECHANICAL, AND ELECTRICAL FOR ADDITIONAL INFORMATION AND COORDINATION.
3. THE AIR & MOISTURE WEATHER BARRIER IS TO BE CONTINUOUS FROM THE BASE OF THE WALLS UP TO & TYING INTO THE ROOF BARRIER SYSTEM.



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CO-OP PROJECT NO: 1936

PRELIMINARY  
NOT FOR  
CONSTRUCTION

ISSUE:

11-04-2020 DESIGN DEVELOPMENT

REVISION SCHEDULE:

REV. #	REV. DSC.	REV. DATE
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PROJECT:

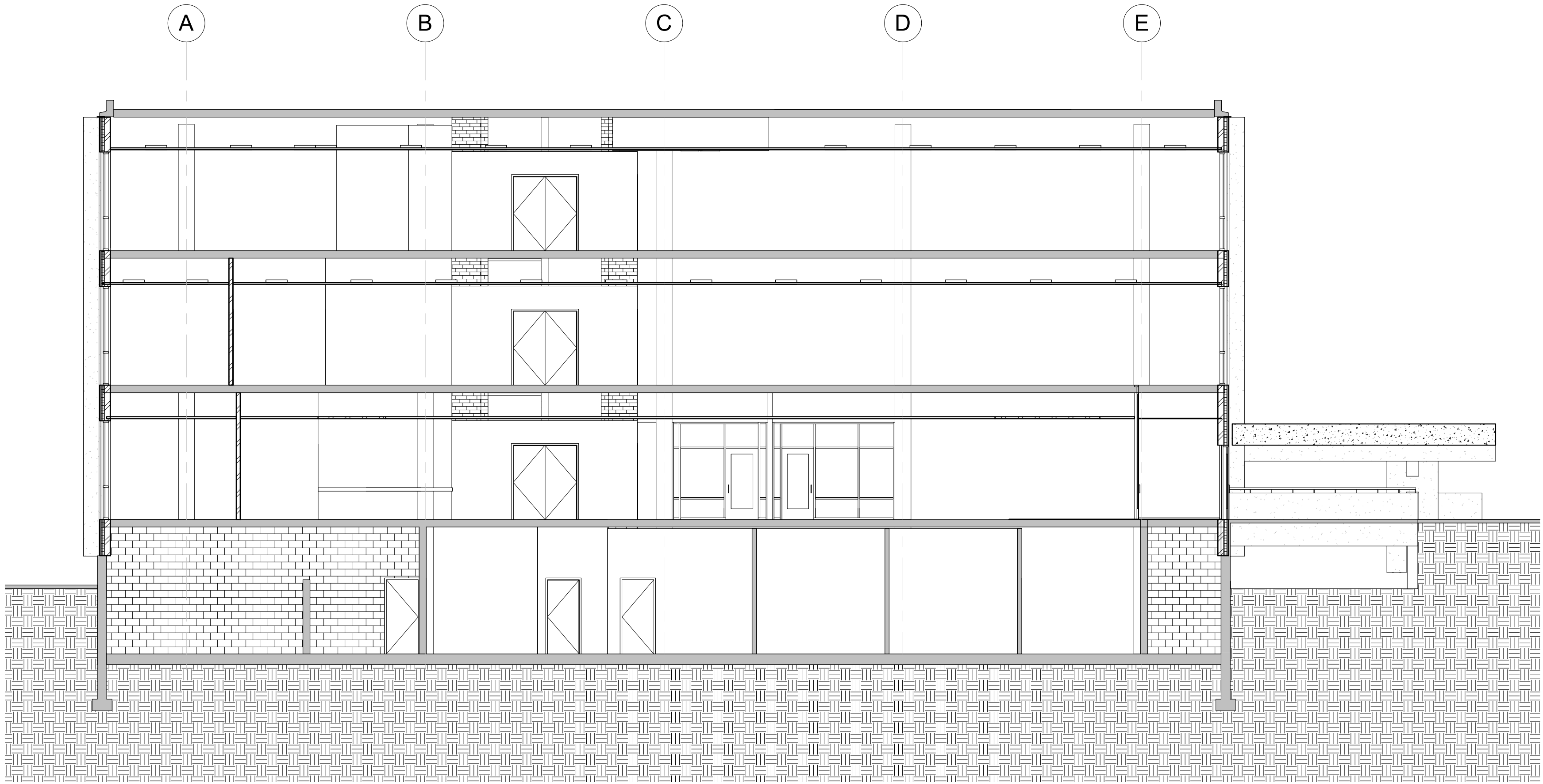
SDSMT DEVEREAUX LIBRARY

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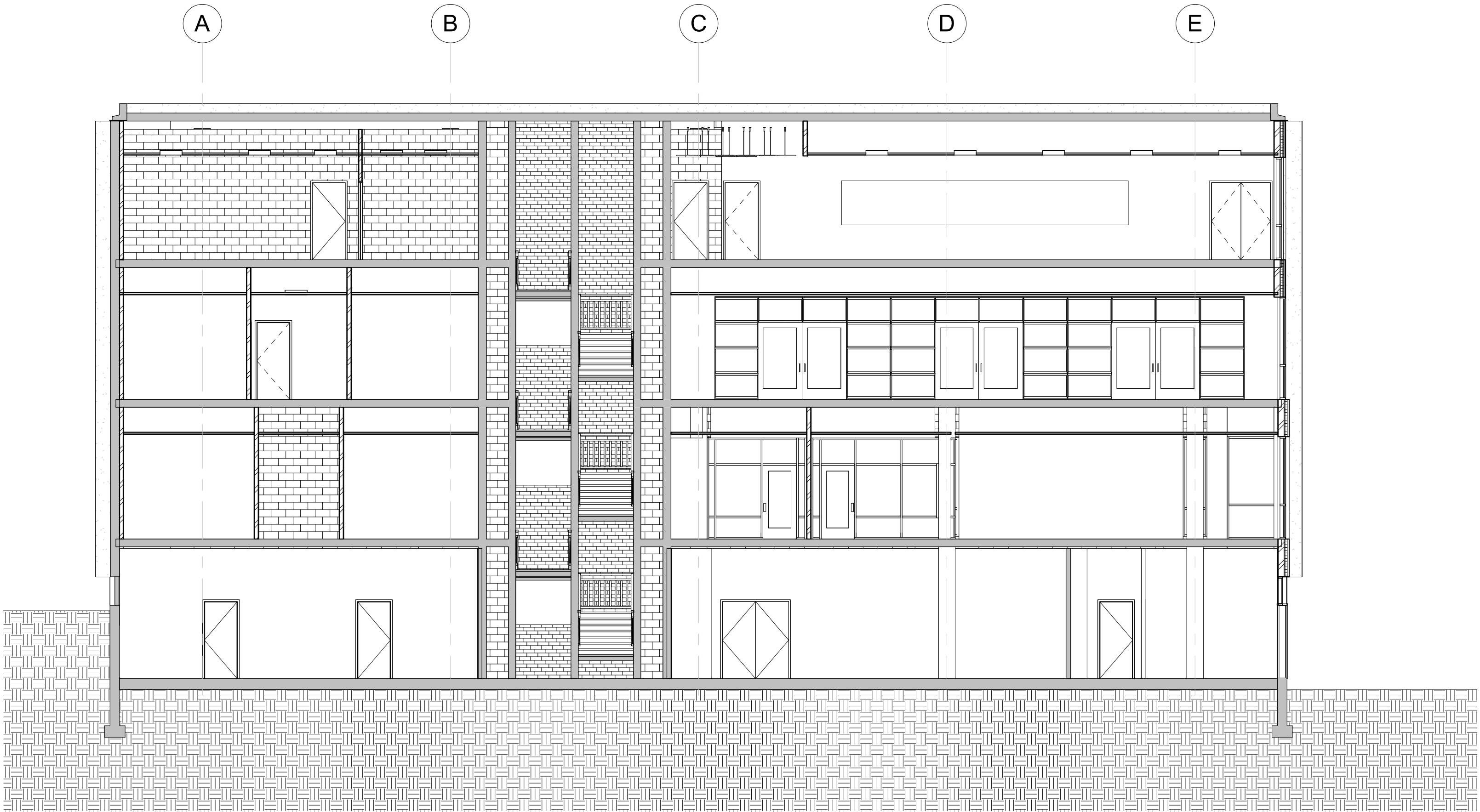
SHEET TITLE:

EXTERIOR ELEVATIONS

A5-2

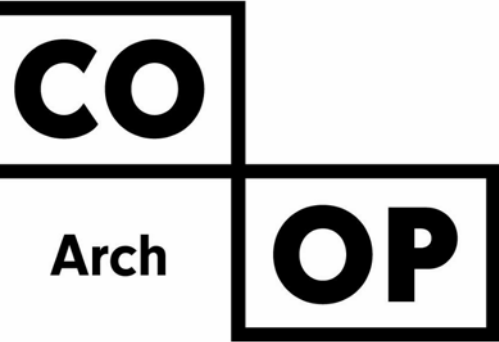


Section 1  
1/8" = 1'-0"



Section 6  
1/8" = 1'-0"

KEYNOTE SCHEDULE



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11-04-2020 DESIGN DEVELOPMENT

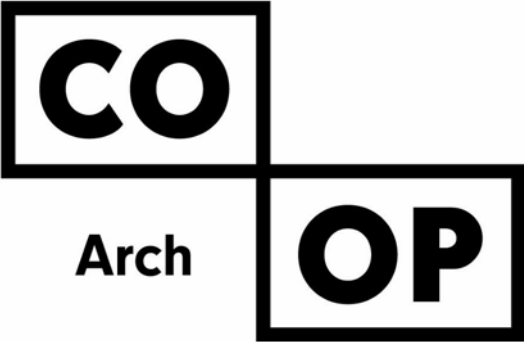
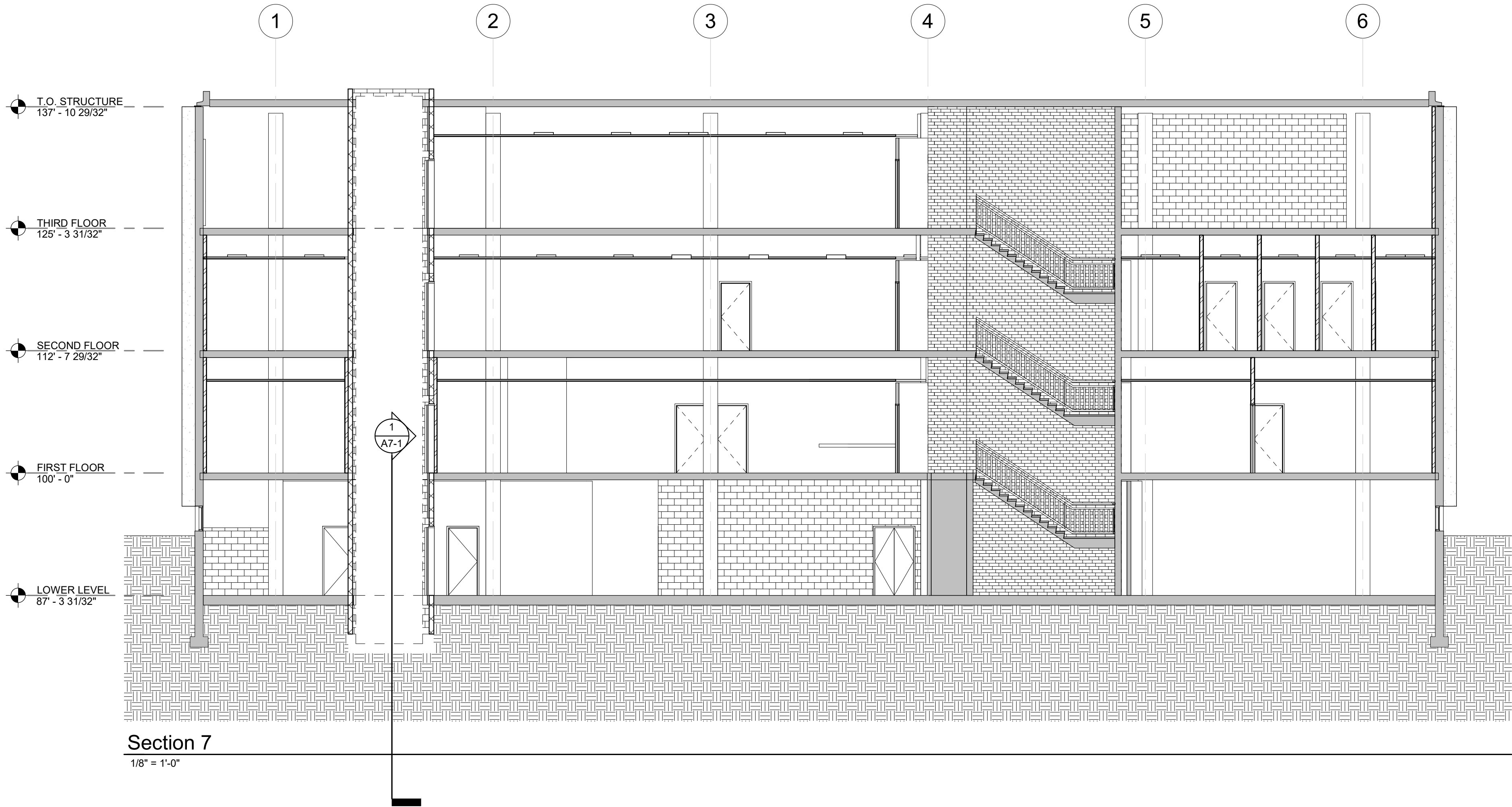
REVISION SCHEDULE:  
REV. # REV. DSC. REV. DATE

PROJECT:  
SDSMT DEVEREAUX LIBRARY  
SOUTH DAKOTA SCHOOL OF  
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RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
BUILDING SECTIONS & DETAILS

A6-1

KEYNOTE SCHEDULE



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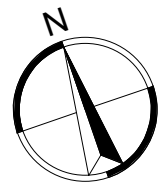
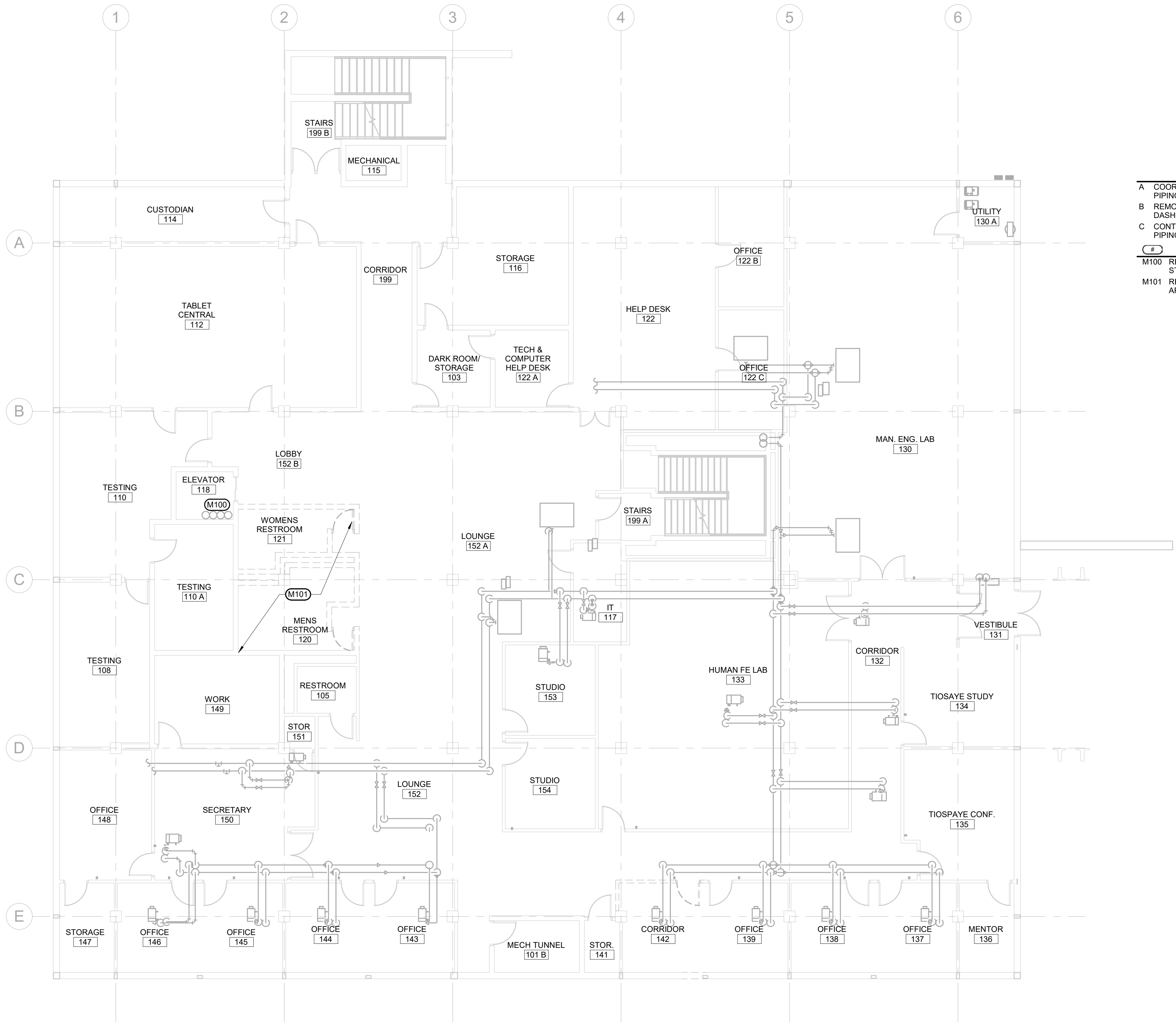
ISSUE:  
11-04-2020 DESIGN DEVELOPMENT

REVISION SCHEDULE:  
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SHEET TITLE:  
BUILDING SECTIONS & DETAILS

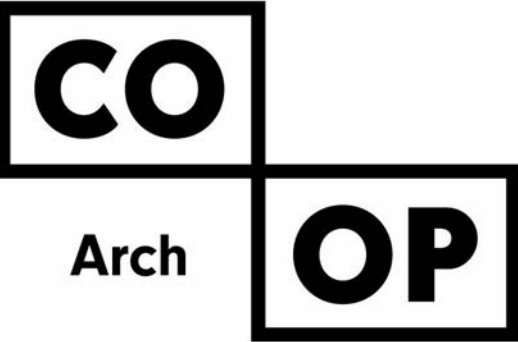
A6-2



LOWER LEVEL PIPING DEMOLITION PLAN

1/8" = 1'-0"

- GENERAL MECHANICAL NOTES**
- A COORDINATE PHASING AND REMOVAL OF EXISTING PIPING, FIXTURES, AND EQUIPMENT WITH OWNER.
  - B REMOVE EXISTING PIPING, ETC. WHERE INDICATED DASHED. CAP PIPING DURING CONSTRUCTION.
  - C CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING PIPING AND EQUIPMENT.
- MECHANICAL SPECIFIC NOTES**
- M100 REMOVE EXISTING 4" SAN, 1-1/2" CW, 4" VENT, AND 4" ST PIPING FROM EXISTING ELEVATOR SHAFT.
  - M101 REMOVE EXISTING PLUMBING FIXTURES WITHIN THIS AREA.



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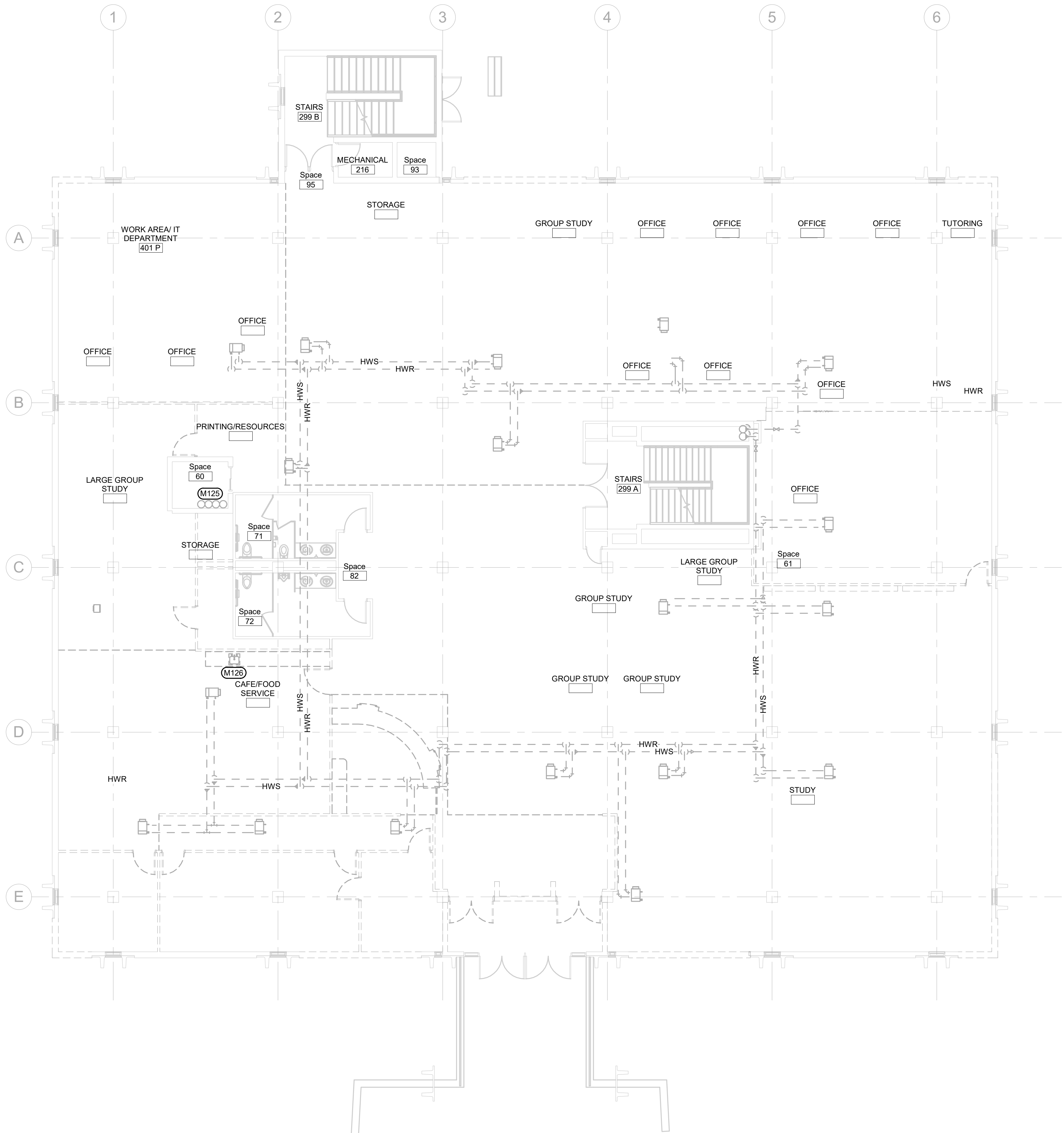
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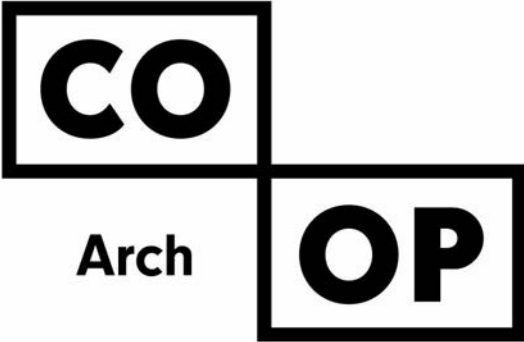
SHEET TITLE:

LOWER LEVEL PIPING  
DEMOLITION PLAN

M1-0



- GENERAL MECHANICAL NOTES**
- A COORDINATE PHASING AND REMOVAL OF EXISTING PIPING, FIXTURES, AND EQUIPMENT WITH OWNER.
  - B REMOVE EXISTING PIPING, ETC. WHERE INDICATED DASHED. CAP PIPING DURING CONSTRUCTION.
  - C CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING PIPING AND EQUIPMENT.
- MECHANICAL SPECIFIC NOTES**
- M125 REMOVE EXISTING 4" SAN, 1-1/2" CW, 4" VENT, AND 4" ST PIPING FROM EXISTING ELEVATOR SHAFT.
  - M126 REMOVE EXISTING PLUMBING FIXTURES WITHIN THIS AREA.



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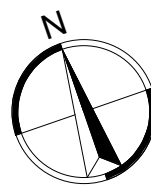
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Issue Date Project Status

**REVISION SCHEDULE:**  
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**SHEET TITLE:**  
FIRST FLOOR PIPING  
DEMOLITION PLAN

M1-1



FIRST FLOOR PIPING DEMOLITION PLAN  
1/8" = 1'-0"

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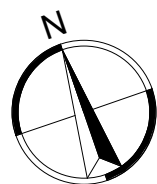
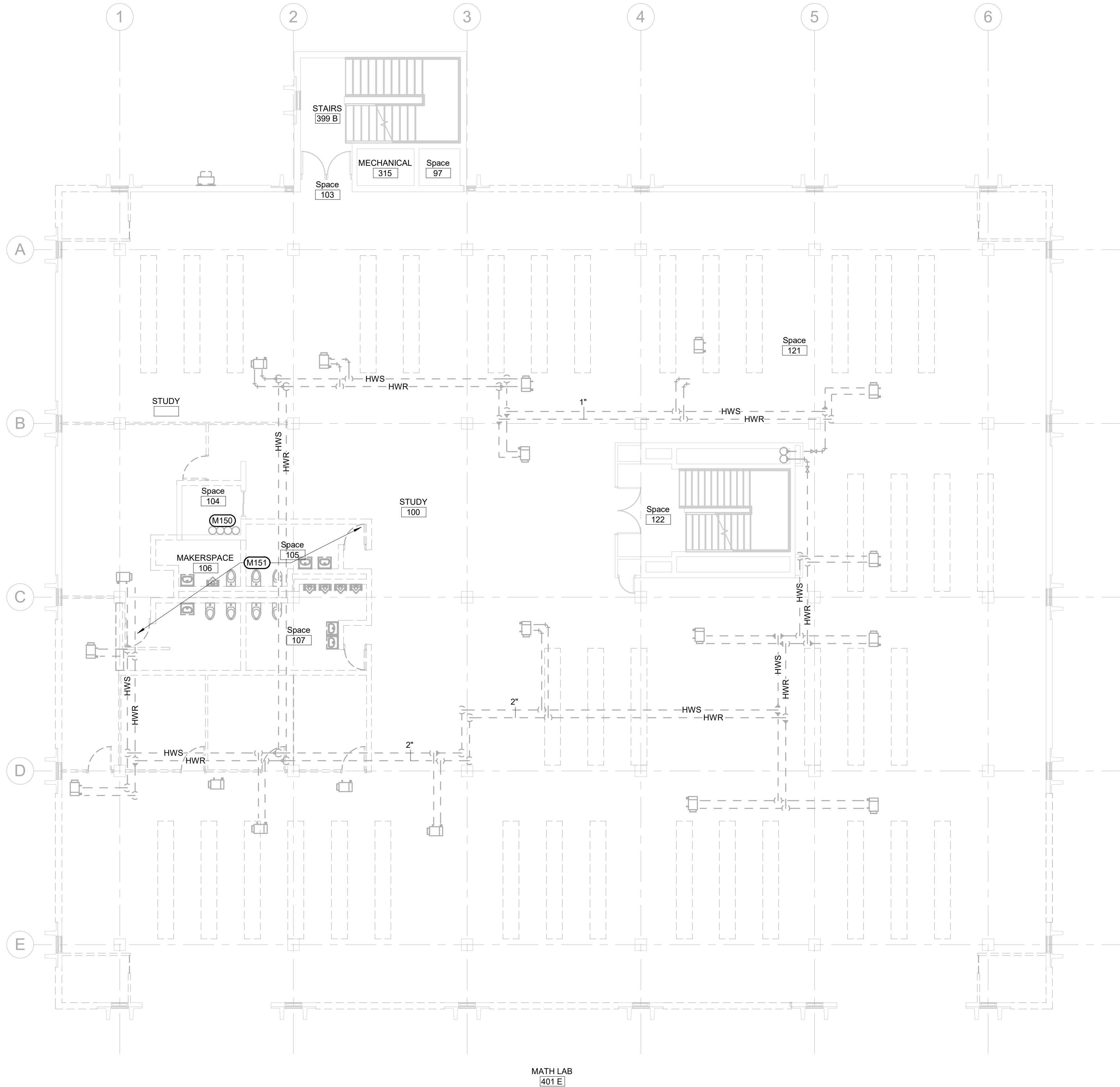
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PHASE 1  
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RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

SECOND FLOOR PIPING  
DEMOLITION PLAN

M1-2



SECOND FLOOR PIPING DEMOLITION PLAN

1/8" = 1'-0"

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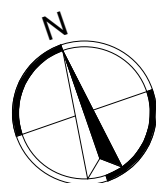
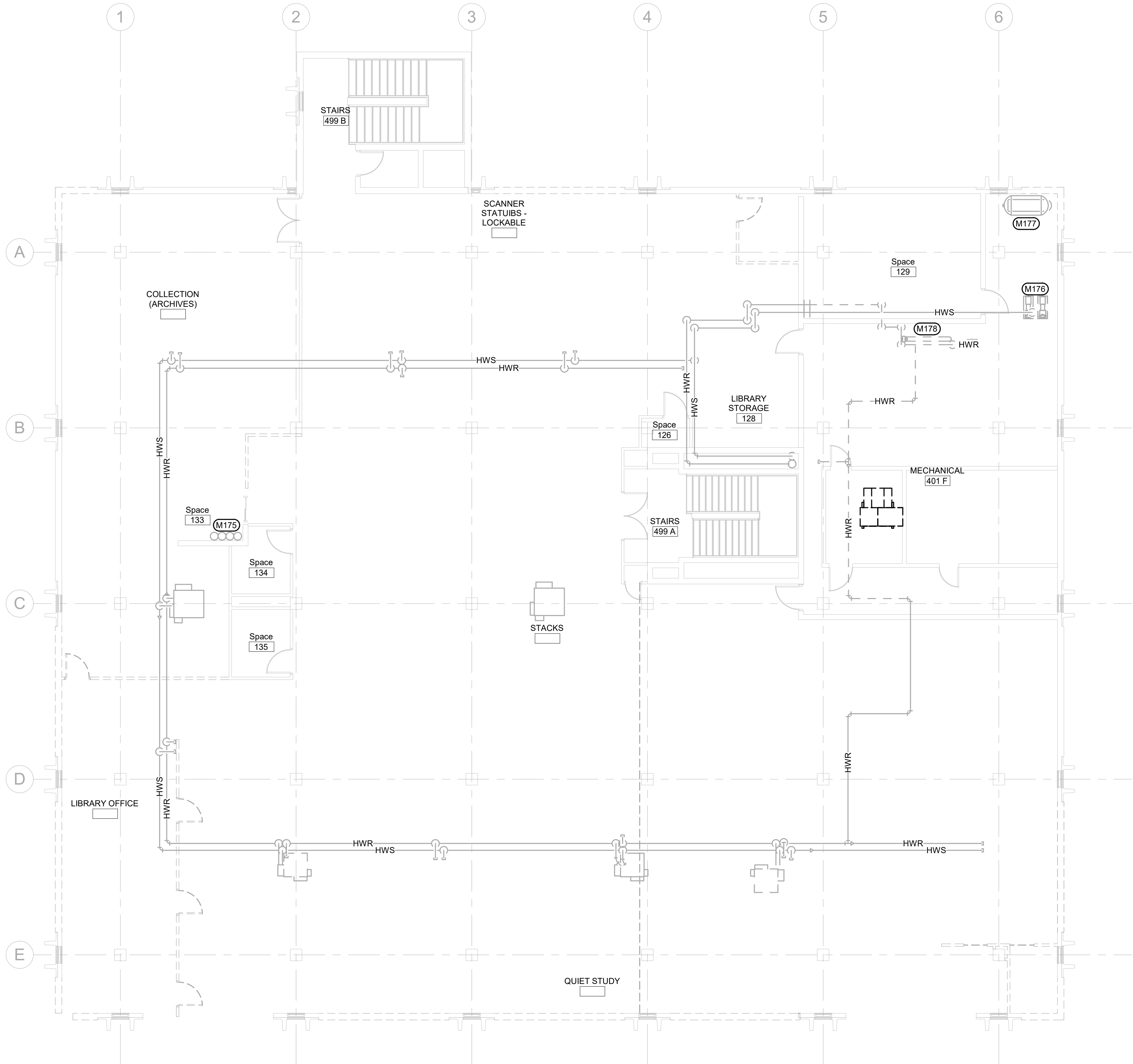
PROJECT:

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PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
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SHEET TITLE:

THIRD FLOOR PIPING  
DEMOLITION PLAN

M1-3



THIRD FLOOR PIPING DEMOLITION PLAN

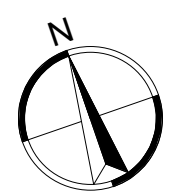
1/8" = 1'-0"

GENERAL MECHANICAL NOTES

- A COORDINATE PHASING AND REMOVAL OF EXISTING PIPING, FIXTURES, AND EQUIPMENT WITH OWNER.  
B REMOVE EXISTING PIPING, ETC. WHERE INDICATED DASHED. CAP PIPING DURING CONSTRUCTION.  
C CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING PIPING AND EQUIPMENT.

MECHANICAL SPECIFIC NOTES

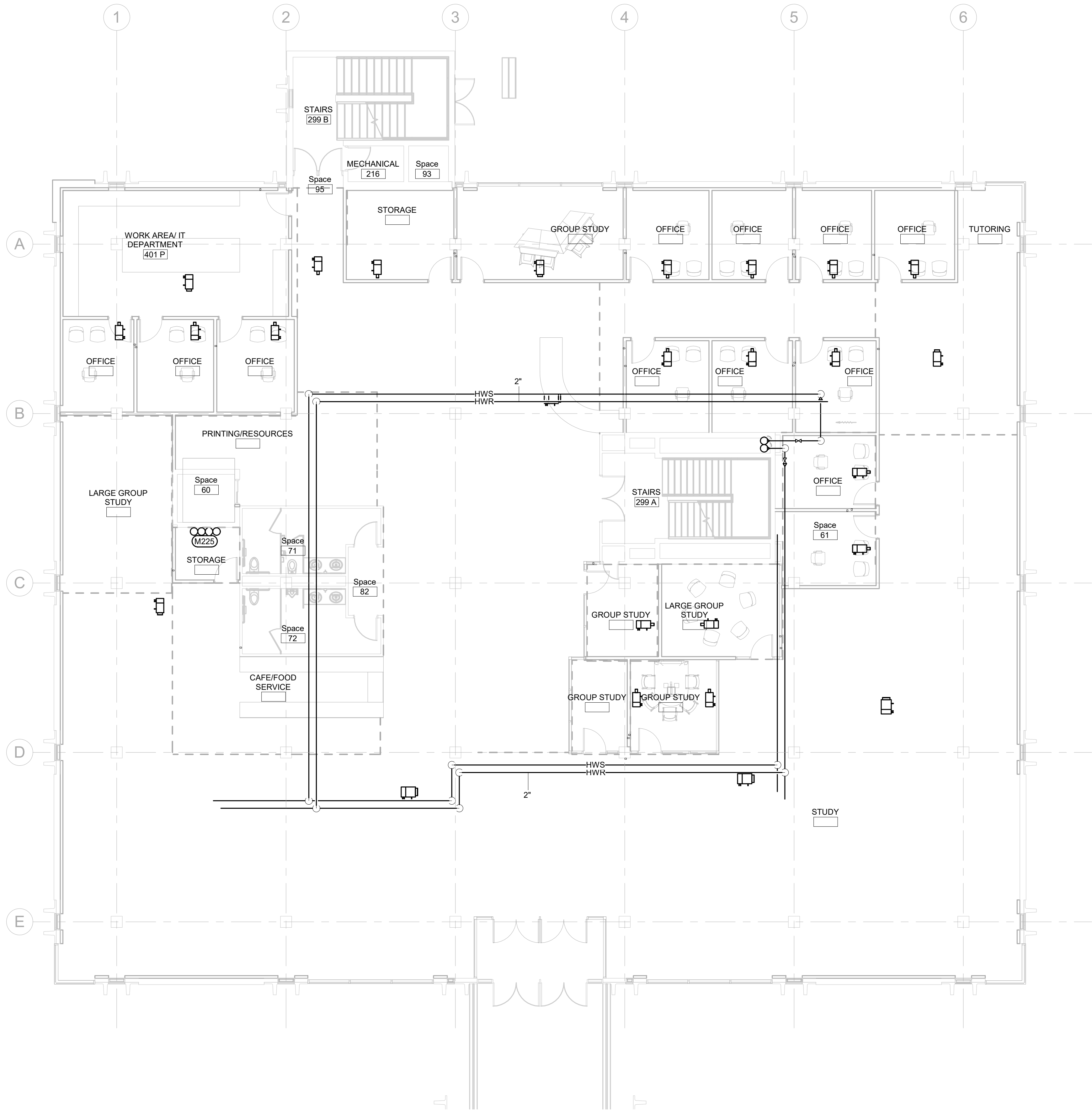
- M175 REMOVE EXISTING 4" SAN, 1-1/2" CW, 4" VENT, AND 4" ST PIPING FROM EXISTING ELEVATOR SHAFT.  
M176 REMOVE EXISTING CHILLED WATER AND HEATING WATER PUMPS.  
M177 REMOVE EXISTING EXPANSION TANKS.  
M178 REMOVE EXISTING STEAM TO HOT WATER CONVERTER.



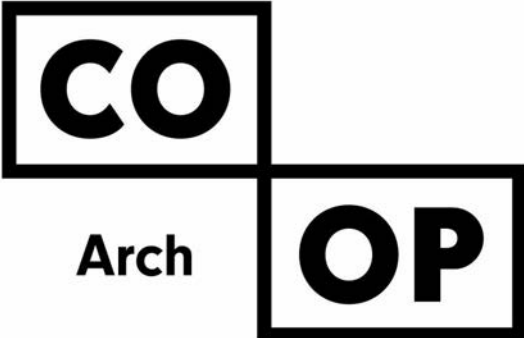
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1/8" = 1'-0"

M2-0



- GENERAL MECHANICAL NOTES**
- A CONTRACTOR TO CONFIRM SIZE AND LOCATION OF EXISTING PIPING.
  - B WORK ON THIS PROJECT WILL BE PHASED. THE MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING THAT AREAS OUTSIDE THE CURRENT PHASE OF WORK CONTINUE TO BE SERVED BY HEATING, COOLING, DOMESTIC WATER, SANITARY, ETC. SO AS NOT TO INTERRUPT OWNER WORK FLOW. ALL OUTAGES OF DOMESTIC WATER SHALL BE COORDINATED IN ADVANCE WITH OWNER AND WILL BE REQUIRED TO OCCUR DURING TIMES OF LOW USE. THIS WILL REQUIRE THE CONTRACTOR TO WORK OTHER THAN NORMAL WORK HOURS AT NO ADDITIONAL COST TO THE OWNER.
  - C THE MECHANICAL CONTRACTOR IS TO EXTEND, MODIFY AND/OR RELOCATE ANY PIPING, THAT CONTINUES TO SERVE THE SPACE, AS NEEDED SO THAT ALL NEW ARCHITECTURAL, MECHANICAL AND ELECTRICAL WORK SHOWN IN THE REMODEL PLANS CAN BE INSTALLED.
  - D ALL PIPING INSULATION SERVING SERVING DOMESTIC COLD WATER PIPING AND CHILLED WATER PIPING SHALL BE INSTALLED WITH UNBROKEN VAPOR BARRIERS AS PER SPECIFICATIONS. CONTRACTOR TO USE METAL SADDLES AND STRAPS ON EXTERIOR OF INSULATION FOR SUPPORT OF PIPING AT HANGERS, UNISTRUT, ETC.
  - E ISOLATE ALL COPPER PIPES FROM BEARING ON FERROUS HANGERS, ETC. WITH ELECTRICALLY INSULATING MATERIALS AS SPECIFIED. USE DIELECTRIC UNIONS IN CONNECTION OF ALL COPPER PIPING TO FERROUS PIPING AS SPECIFIED.
- MECHANICAL SPECIFIC NOTES**
- M225 INSTALL NEW 4" SAN, 1-1/2" CW, 4" VENT, AND 4" ST PIPING. CONNECT TO EXISTING WITHIN THIS AREA.



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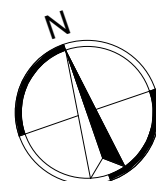
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REV. # REV. DSC. REV. DATE

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RAPID CITY, SOUTH DAKOTA

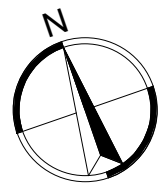
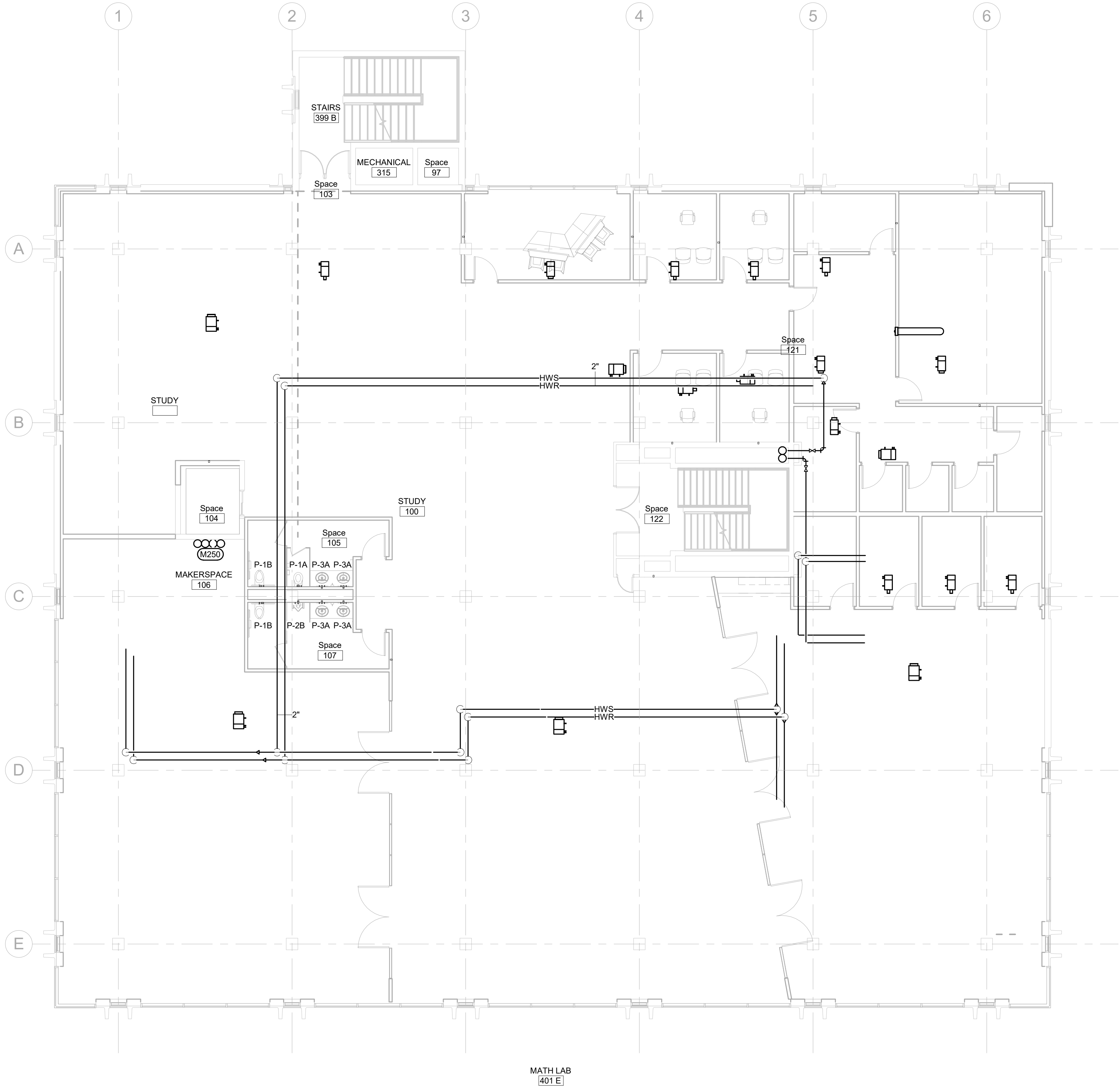
SHEET TITLE:  
FIRST FLOOR PIPING PLAN

M2-1



FIRST FLOOR PIPING PLAN

1/8" = 1'-0"

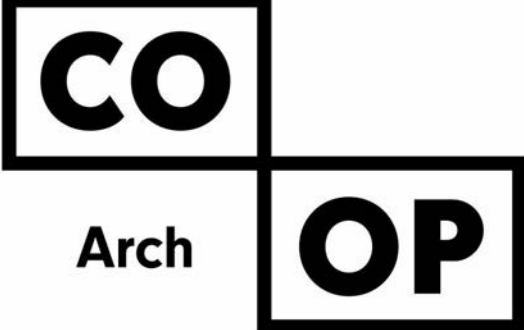


SECOND FLOOR PIPING PLAN

1/8" = 1'-0"

- GENERAL MECHANICAL NOTES**
- A CONTRACTOR TO CONFIRM SIZE AND LOCATION OF EXISTING PIPING.
  - B WORK ON THIS PROJECT WILL BE PHASED. THE MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING THAT AREAS OUTSIDE THE CURRENT PHASE OF WORK CONTINUE TO BE SERVED BY HEATING, COOLING, DOMESTIC WATER, SANITARY, ETC. SO AS NOT TO INTERRUPT OWNER WORK FLOW. ALL OUTAGES OF DOMESTIC WATER SHALL BE COORDINATED IN ADVANCE WITH OWNER AND WILL BE REQUIRED TO OCCUR DURING TIMES OF LOW USE. THIS WILL REQUIRE THE CONTRACTOR TO WORK OTHER THAN NORMAL WORK HOURS AT NO ADDITIONAL COST TO THE OWNER.
  - C THE MECHANICAL CONTRACTOR IS TO EXTEND, MODIFY AND/OR RELOCATE ANY PIPING, THAT CONTINUES TO SERVE THE SPACE, AS NEEDED SO THAT ALL NEW ARCHITECTURAL, MECHANICAL AND ELECTRICAL WORK SHOWN IN THE REMODEL PLANS CAN BE INSTALLED.
  - D ALL PIPING INSULATION SERVING SERVING DOMESTIC COLD WATER PIPING AND CHILLED WATER PIPING SHALL BE INSTALLED WITH UNBROKEN VAPOR BARRIERS AS PER SPECIFICATIONS. CONTRACTOR TO USE METAL SADDLES AND STRAPS ON EXTERIOR OF INSULATION FOR SUPPORT OF PIPING AT HANGERS, UNISTRUT, ETC.
  - E ISOLATE ALL COPPER PIPES FROM BEARING ON FERROUS HANGERS, ETC. WITH ELECTRICALLY INSULATING MATERIALS AS SPECIFIED. USE DIELECTRIC UNIONS IN CONNECTION OF ALL COPPER PIPING TO FERROUS PIPING AS SPECIFIED.

- MECHANICAL SPECIFIC NOTES**
- # M250 INSTALL NEW 4" SAN, 1-1/2" CW, 4" VENT, AND 4" ST PIPING. CONNECT TO EXISTING WITHIN THIS AREA.



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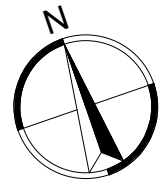
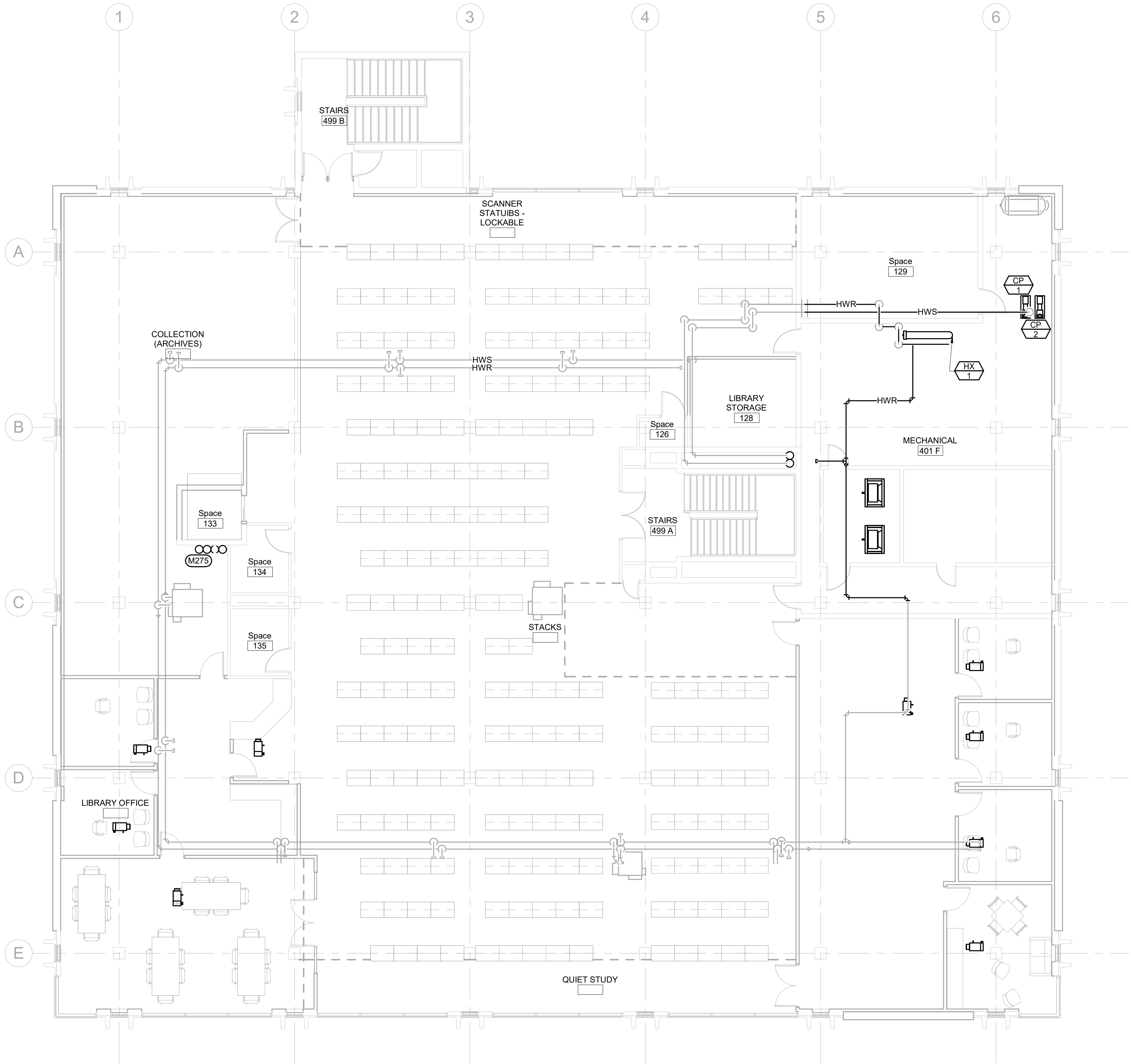
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RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

SECOND FLOOR PIPING PLAN

M2-2



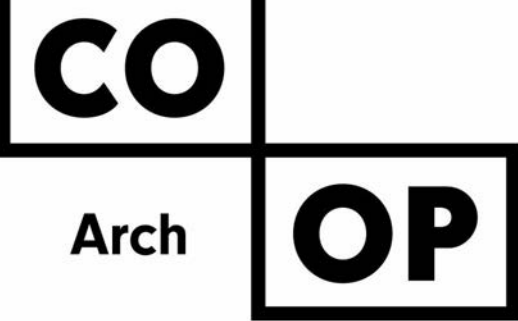
THIRD FLOOR PIPING PLAN  
1/8" = 1'-0"

GENERAL MECHANICAL NOTES

- A. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF EXISTING PIPING.
- B. WORK ON THIS PROJECT WILL BE PHASED. THE MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING THAT AREAS OUTSIDE THE CURRENT PHASE OF WORK CONTINUE TO BE SERVED BY HEATING, COOLING, DOMESTIC WATER, SANITARY, ETC. SO AS NOT TO INTERRUPT OWNER WORK FLOW. ALL OUTAGES OF DOMESTIC WATER SHALL BE COORDINATED IN ADVANCE WITH OWNER AND WILL BE REQUIRED TO OCCUR DURING TIMES OF LOW USE. THIS WILL REQUIRE THE CONTRACTOR TO WORK OTHER THAN NORMAL WORK HOURS AT NO ADDITIONAL COST TO THE OWNER.
- C. THE MECHANICAL CONTRACTOR IS TO EXTEND, MODIFY AND/OR RELOCATE ANY PIPING, THAT CONTINUES TO SERVE THE SPACE, AS NEEDED SO THAT ALL NEW ARCHITECTURAL, MECHANICAL AND ELECTRICAL WORK SHOWN IN THE REMODEL PLANS CAN BE INSTALLED.
- D. ALL PIPING INSULATION SERVING SERVING DOMESTIC COLD WATER PIPING AND CHILLED WATER PIPING SHALL BE INSTALLED WITH UNBROKEN VAPOR BARRIERS AS PER SPECIFICATIONS. CONTRACTOR TO USE METAL SADDLES AND STRAPS ON EXTERIOR OF INSULATION FOR SUPPORT OF PIPING AT HANGERS, UNISTRUT, ETC.
- E. ISOLATE ALL COPPER PIPES FROM BEARING ON FERROUS HANGERS, ETC. WITH ELECTRICALLY INSULATING MATERIALS AS SPECIFIED. USE DIELECTRIC UNIONS IN CONNECTION OF ALL COPPER PIPING TO FERROUS PIPING AS SPECIFIED.

MECHANICAL SPECIFIC NOTES

- M275. INSTALL NEW 4" SAN, 1-1/2" CW, 4" VENT, AND 4" ST PIPING. CONNECT TO EXISTING WITHIN THIS AREA.



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RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

THIRD FLOOR PIPING PLAN

M2-3

CO

Arch

OP

1108 S. Main St. 102  
Aberdeen, SD 57401  
Phone: 605-725-4852

601 Kansas City St. 7  
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Phone: 605-716-3652

300 N. Phillips Ave. 120  
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W238N1610 Busse Rd. 102  
Waukesha, WI 53188  
Phone: 262-875-6760

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CO-OP PROJECT NO: 1936

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NOT FOR  
CONSTRUCTION

ISSUE:

Issue Date Project Status

REVISION SCHEDULE:

REV. # REV. DSC. REV. DATE

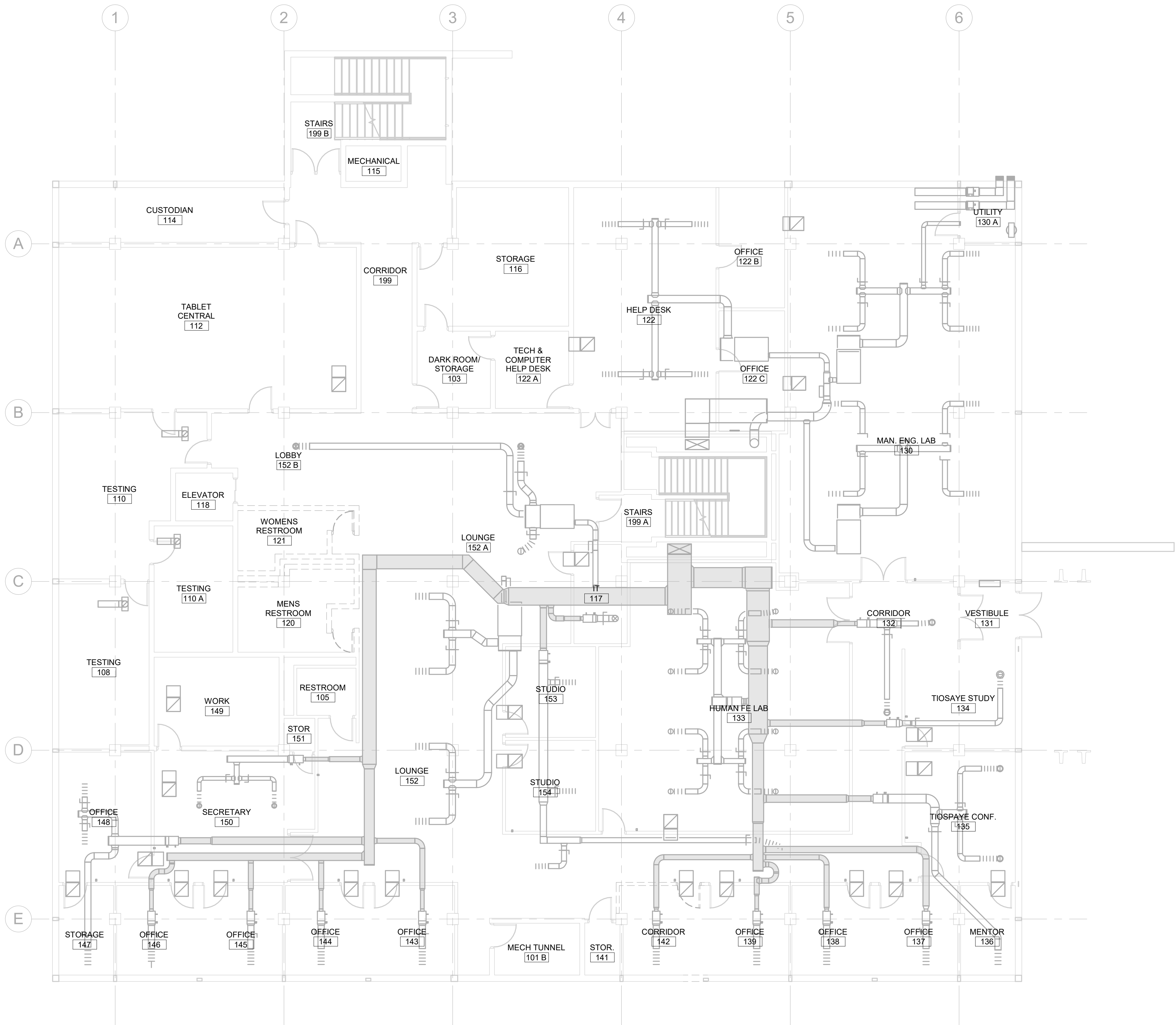
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

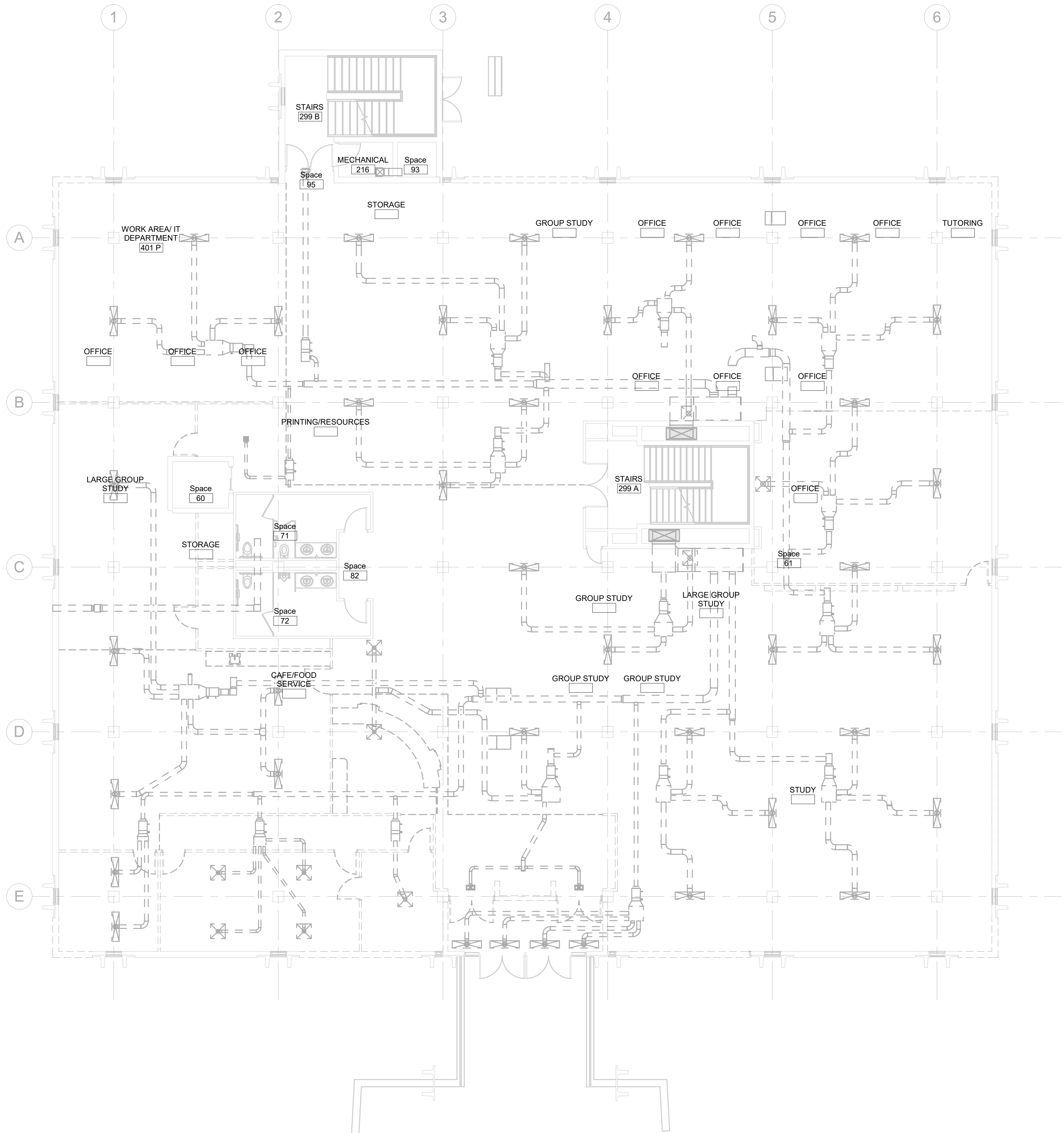
LOWER LEVEL HVAC  
DEMOLITION PLAN

M3-0



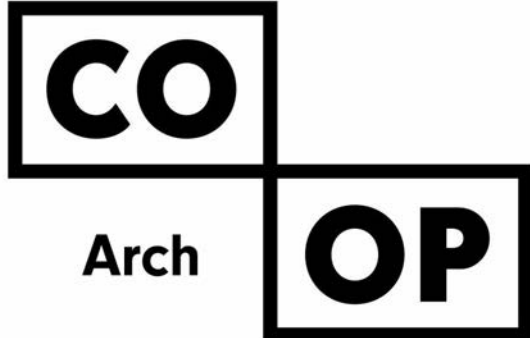
LOWER LEVEL HVAC DEMOLITION PLAN

1/8" = 1'-0"



- GENERAL MECHANICAL NOTES**
- A COORDINATE PHASING AND REMOVAL OF EXISTING DUCTWORK AND EQUIPMENT WITH OWNER.
- B REMOVE EXISTING GRILLES, REGISTERS, DUCTWORK, ETC. WHERE INDICATED DASHED. CAP DUCTWORK DURING CONSTRUCTION. THIS CONTRACTOR TO ASSIST IN REMOVAL AND REINSTALLATION OF DUCTWORK THAT RESTRICTS THE WORK OF OTHER TRADES.
- C CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING DUCTWORK.

**MECHANICAL SPECIFIC NOTES**



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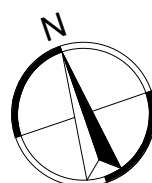
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

FIRST FLOOR HVAC  
DEMOLITION PLAN

M3-1



FIRST FLOOR HVAC DEMOLITION PLAN

1/8" = 1'-0"

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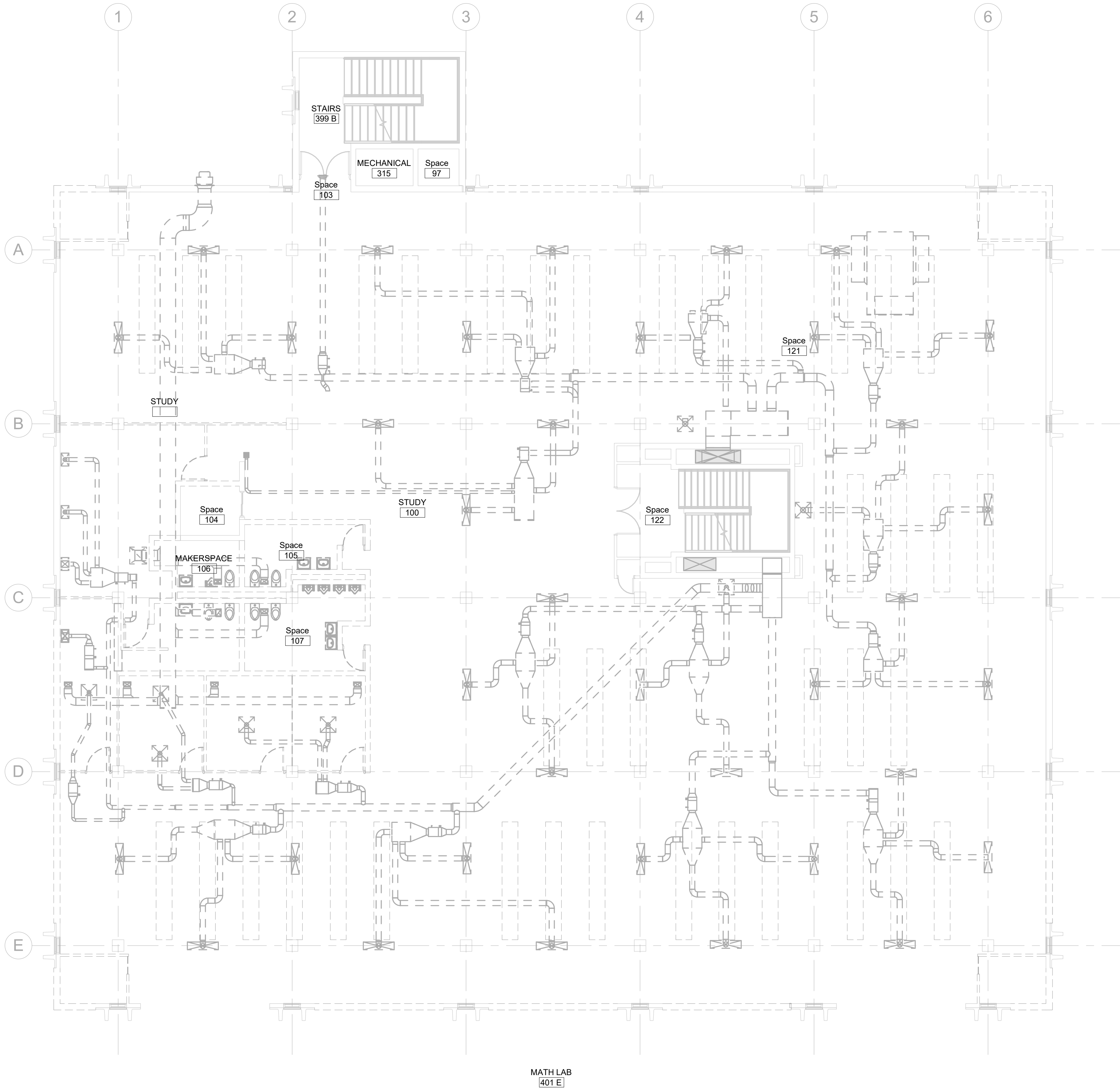
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

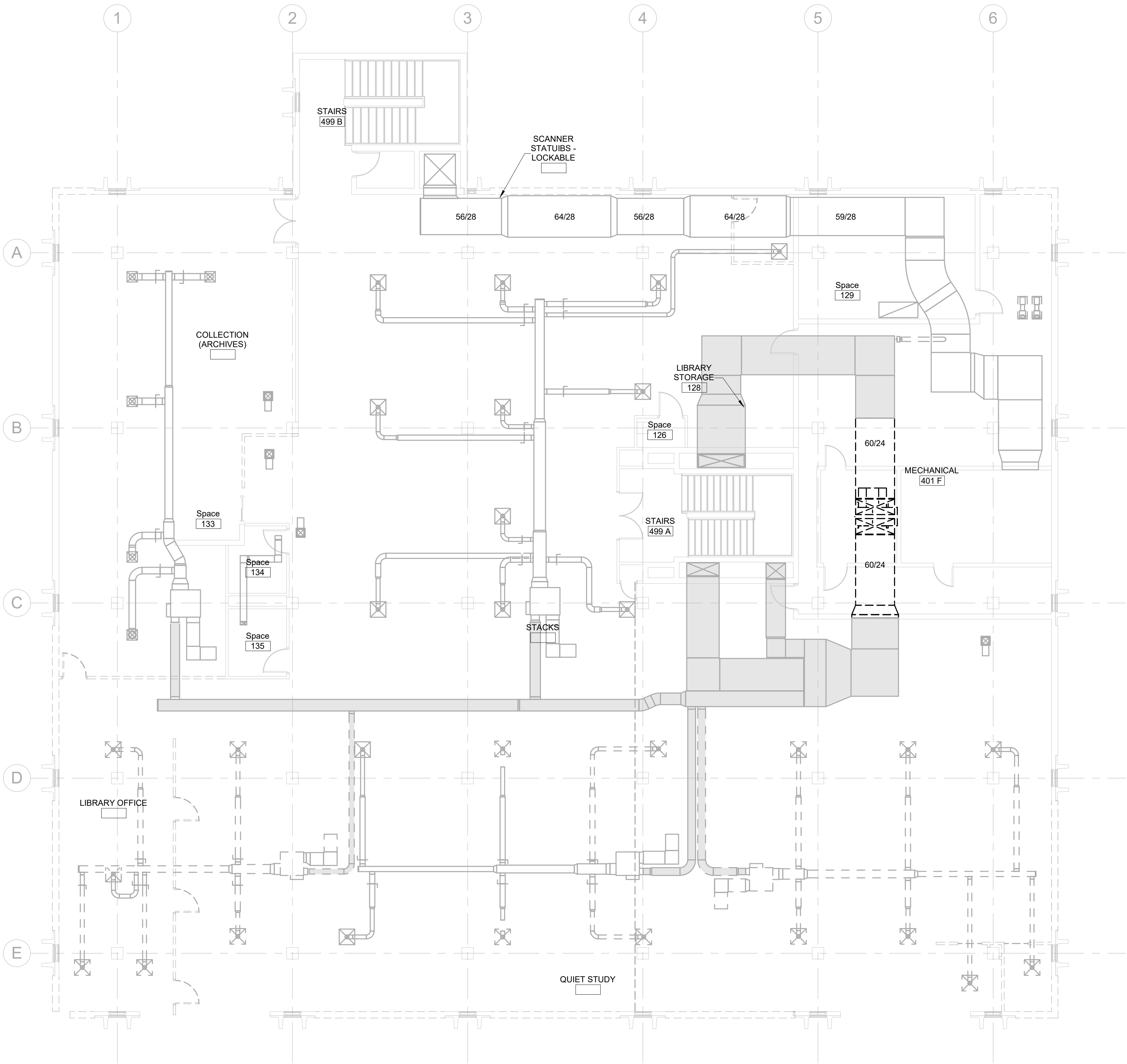
SHEET TITLE:

SECOND FLOOR HVAC  
DEMOLITION PLAN

M3-2



- GENERAL MECHANICAL NOTES**
- A. COORDINATE PHASING AND REMOVAL OF EXISTING DUCTWORK AND EQUIPMENT WITH OWNER.
  - B. REMOVE EXISTING GRILLES, REGISTERS, DUCTWORK, ETC. WHERE INDICATED DASHED. CAP DUCTWORK DURING CONSTRUCTION. THIS CONTRACTOR TO ASSIST IN REMOVAL AND REINSTALLATION OF DUCTWORK THAT RESTRICTS THE WORK OF OTHER TRADES.
  - C. CONTRACTOR TO CONFIRM LOCATIONS OF EXISTING DUCTWORK.
- MECHANICAL SPECIFIC NOTES**



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- MECHANICAL SPECIFIC NOTES**

 **THIRD FLOOR HVAC DEMOLITION PLAN**  
1/8" = 1'-0"

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DESIGN SYNCHRONICITY

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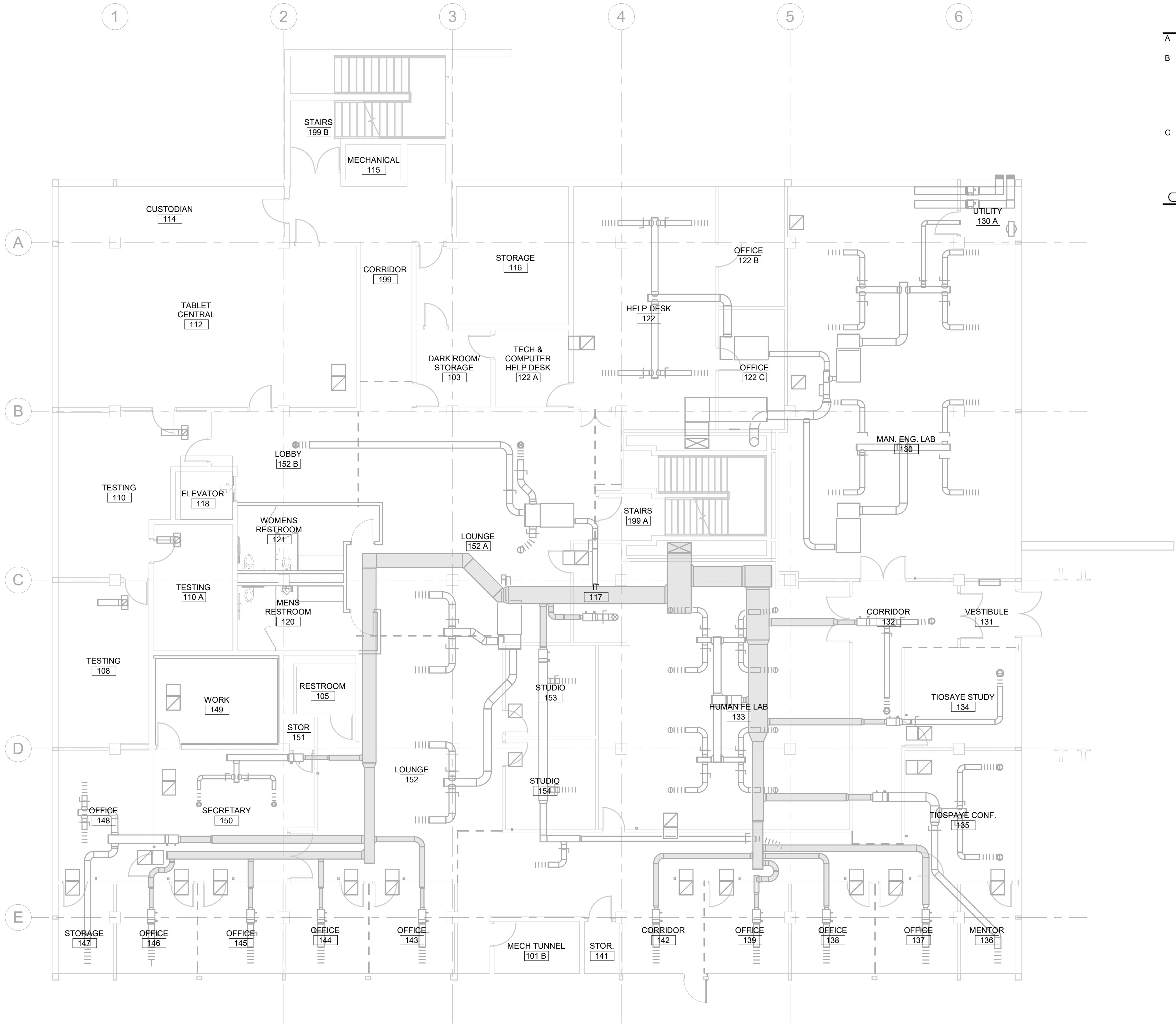
ISSUE:		
Issue Date	Project Status	

REVISION SCHEDULE:		
REV. #	REV. DSC.	REV. DATE

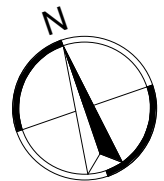
PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
THIRD FLOOR HVAC  
DEMOLITION PLAN

M3-3

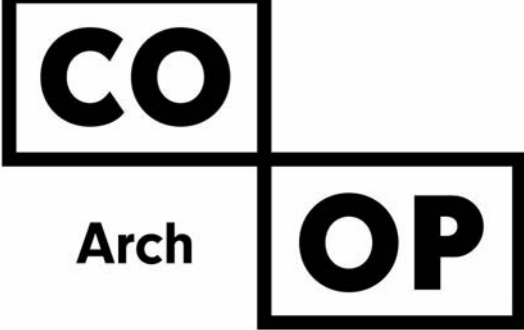


- GENERAL MECHANICAL NOTES**
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- B WORK ON THIS PROJECT WILL BE PHASED. THE MECHANICAL CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING THAT AREAS OUTSIDE THE CURRENT PHASE OF WORK CONTINUE TO BE SERVED BY HEATING, COOLING, ETC. SO AS NOT TO INTERRUPT OWNER WORK FLOW. THIS WILL REQUIRE THE CONTRACTOR TO WORK OTHER THAN NORMAL WORK HOURS AT NO ADDITIONAL COST TO THE OWNER.
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- MECHANICAL SPECIFIC NOTES**



LOWER LEVEL HVAC PLAN

1/8" = 1'-0"



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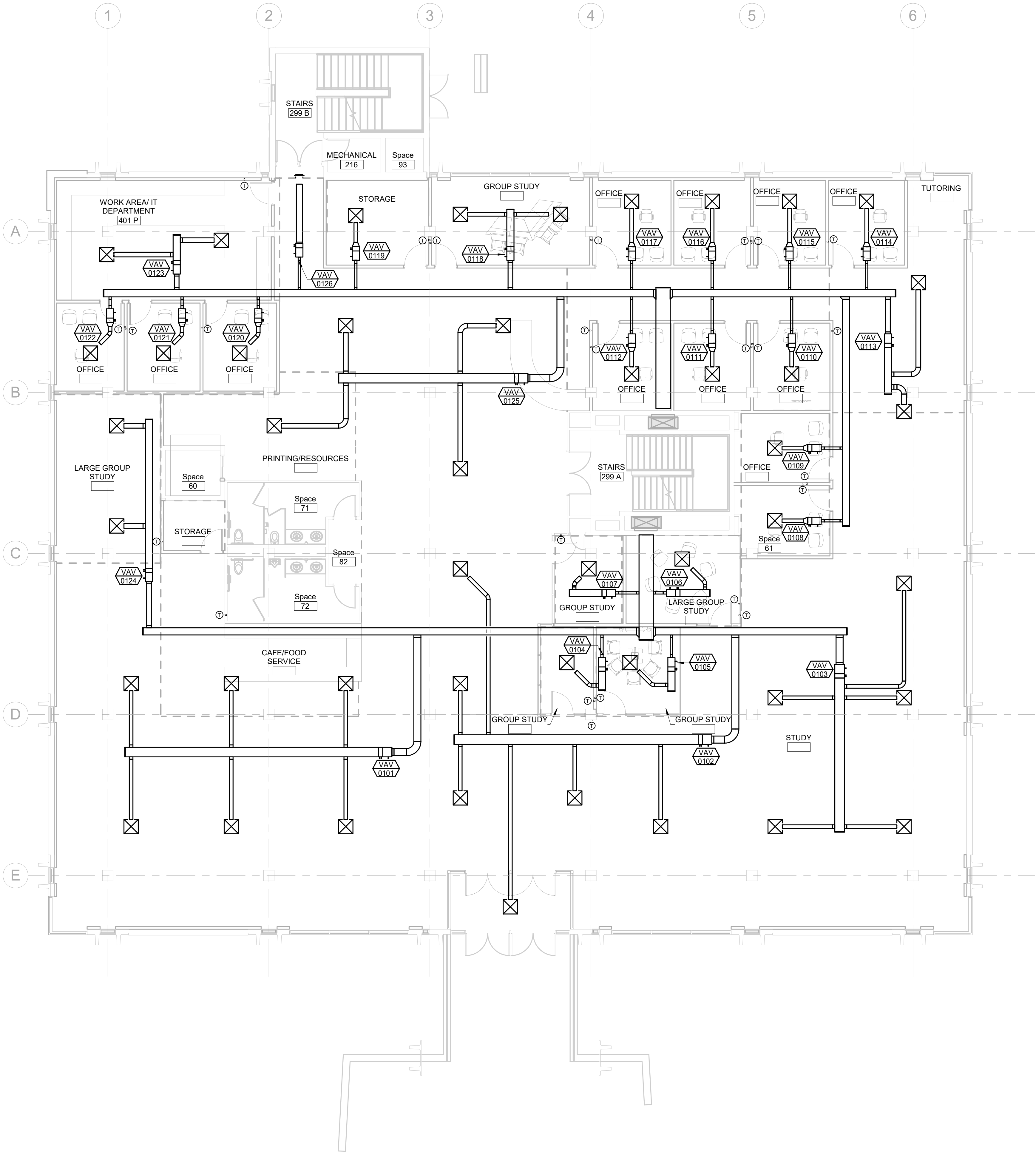
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
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RAPID CITY, SOUTH DAKOTA

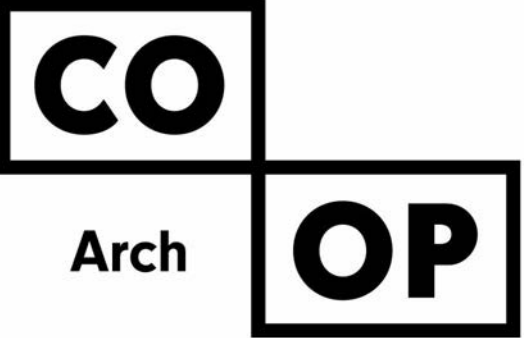
SHEET TITLE:

LOWER LEVEL HVAC PLAN

M4-0



- GENERAL MECHANICAL NOTES**
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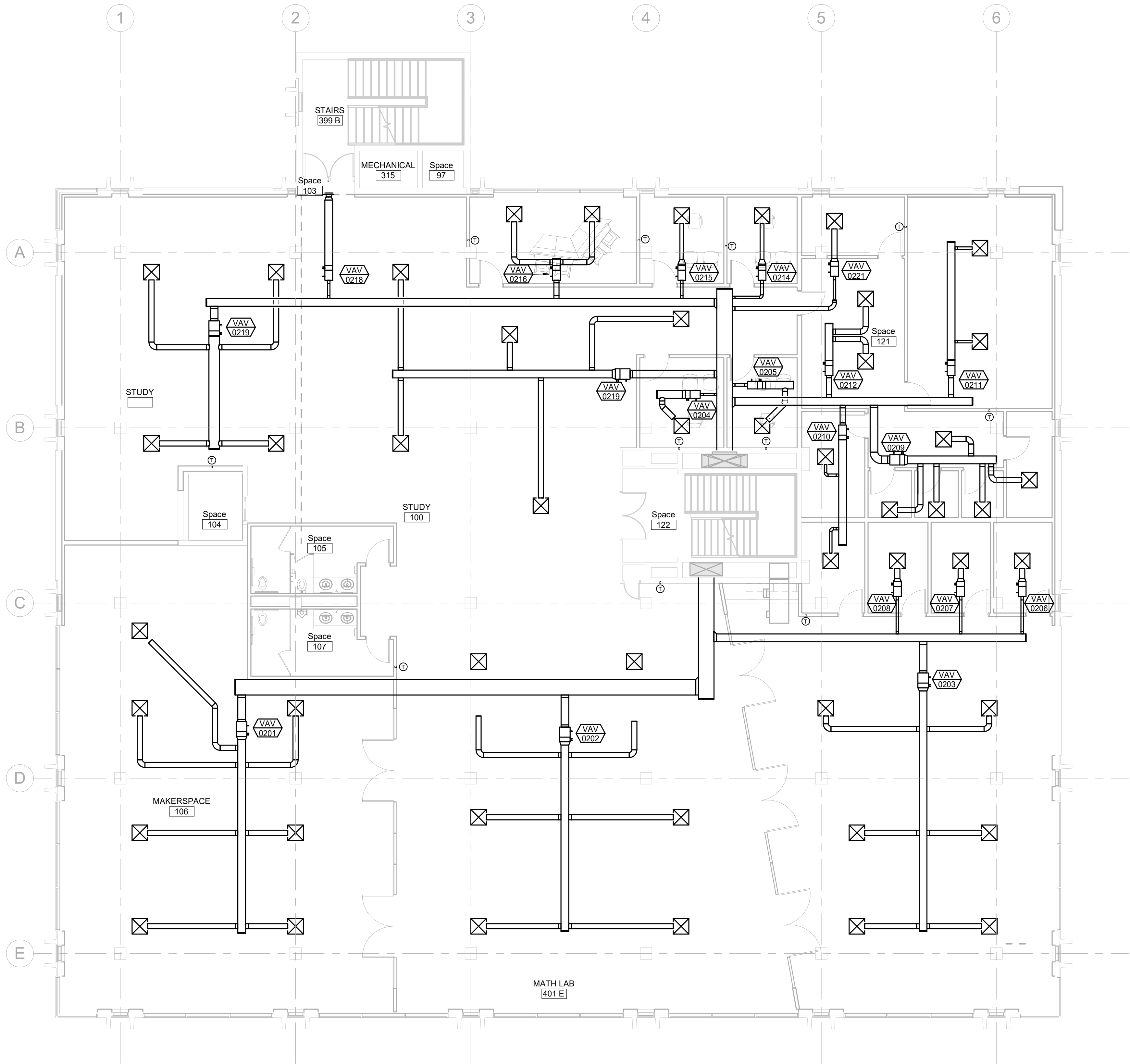
ISSUE:  
Issue Date Project Status

REVISION SCHEDULE:  
REV. # REV. DSC. REV. DATE

PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
FIRST FLOOR HVAC PLAN

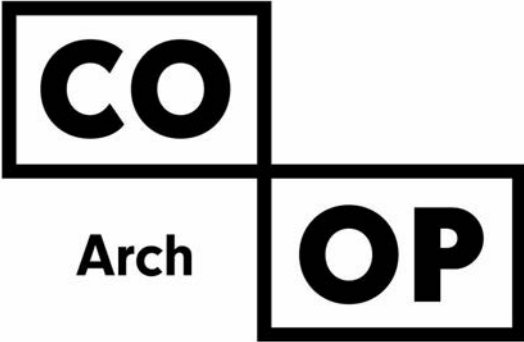
M4-1



- GENERAL MECHANICAL NOTES**
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**MECHANICAL SPECIFIC NOTES**

 **SECOND FLOOR HVAC PLAN**  
1/8" = 1'-0"



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CO-OP PROJECT NO: 1936

**PRELIMINARY  
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CONSTRUCTION**

**ISSUE:**

Issue Date Project Status

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REV. # REV. DSC. REV. DATE

**PROJECT:**

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

**SHEET TITLE:**

SECOND FLOOR HVAC PLAN

**M4-2**

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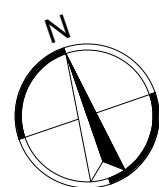
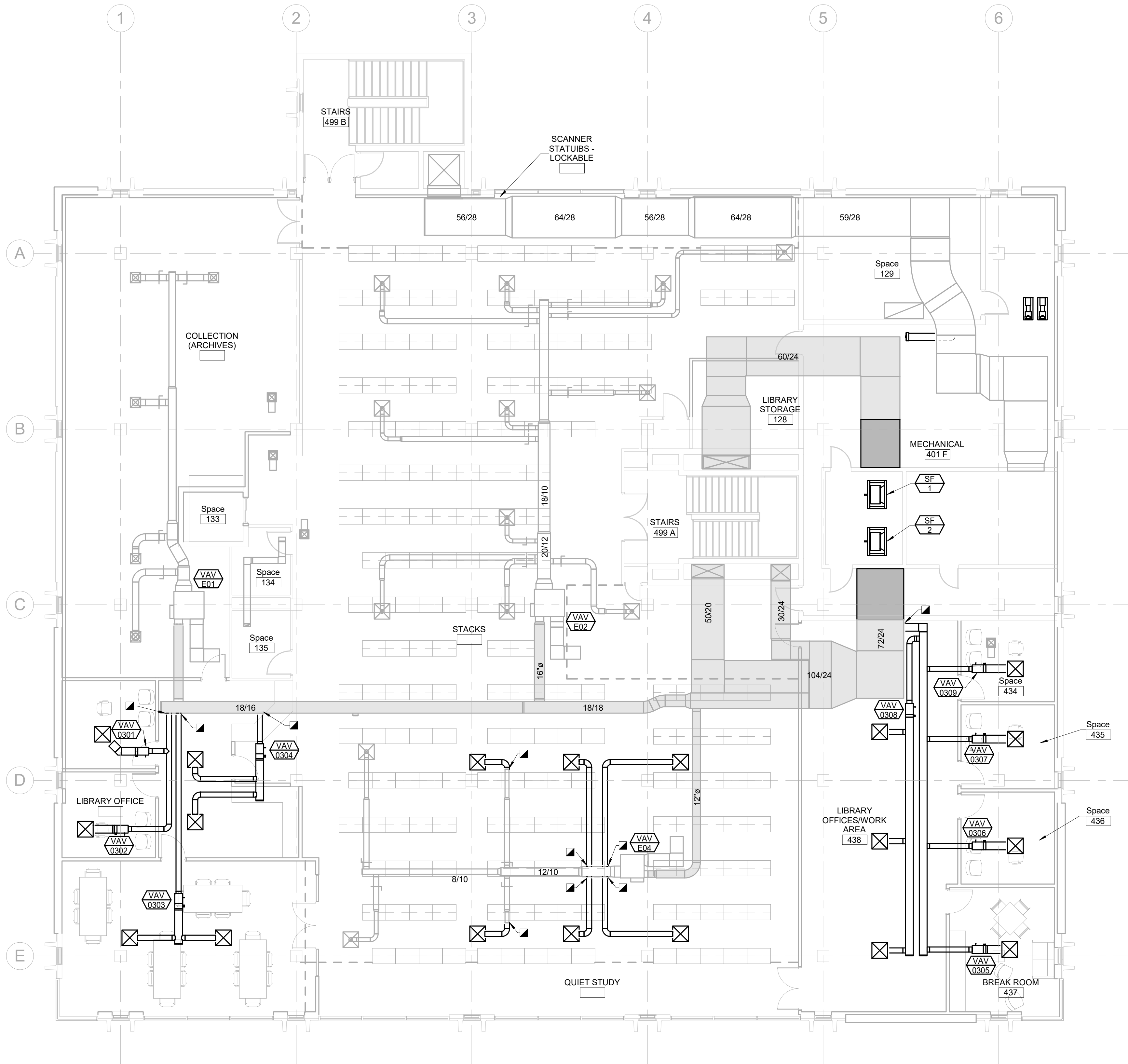
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

THIRD FLOOR HVAC PLAN

M4-3



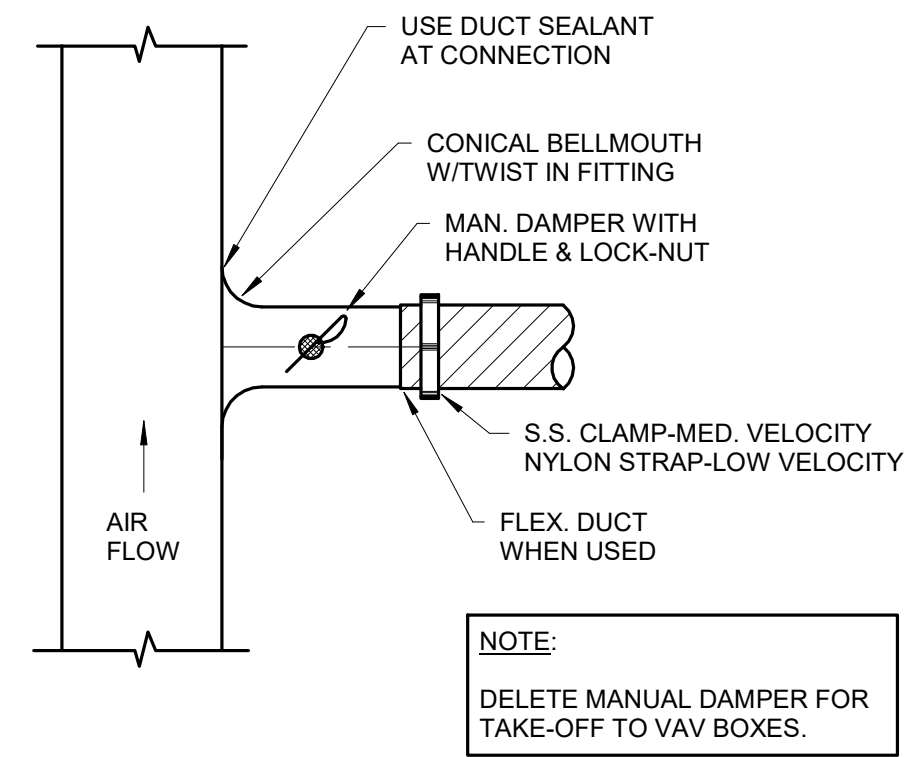
THIRD FLOOR HVAC PLAN

1/8" = 1'-0"

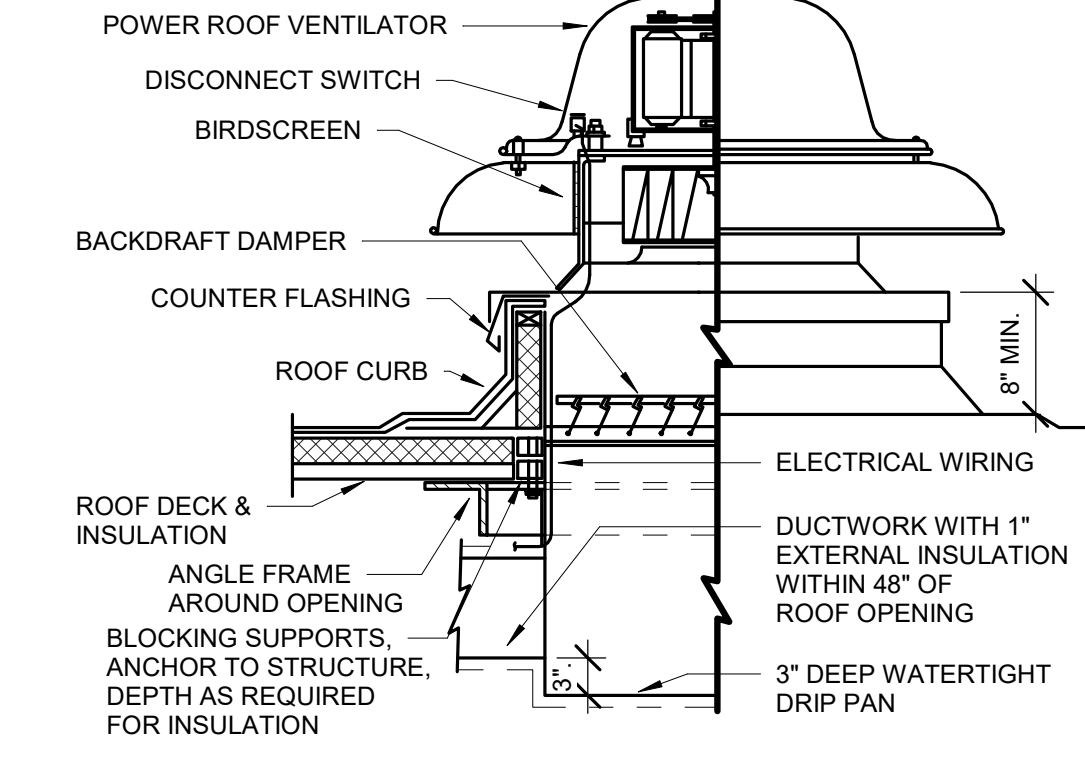
GENERAL MECHANICAL NOTES

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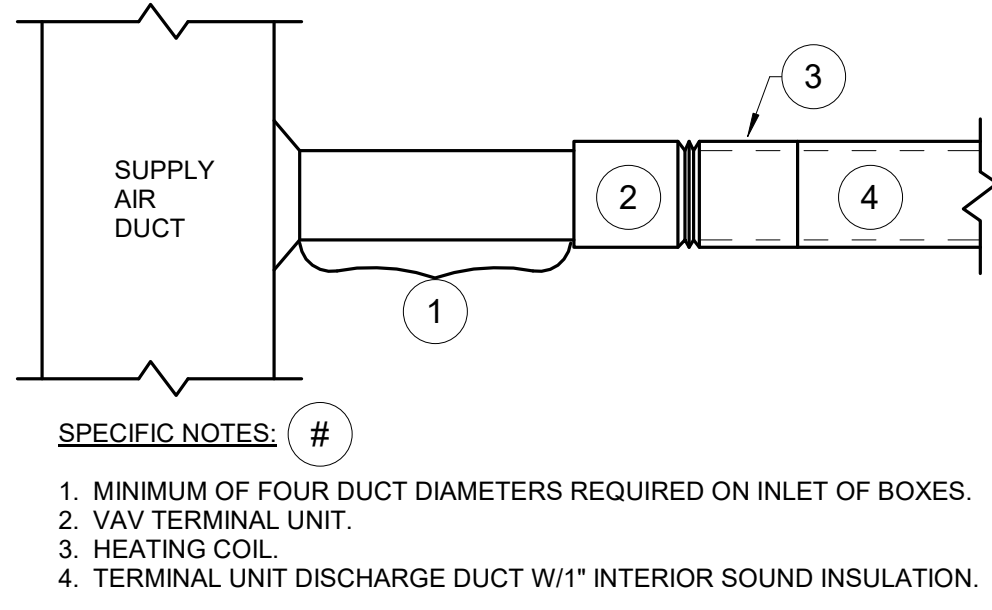
MECHANICAL SPECIFIC NOTES



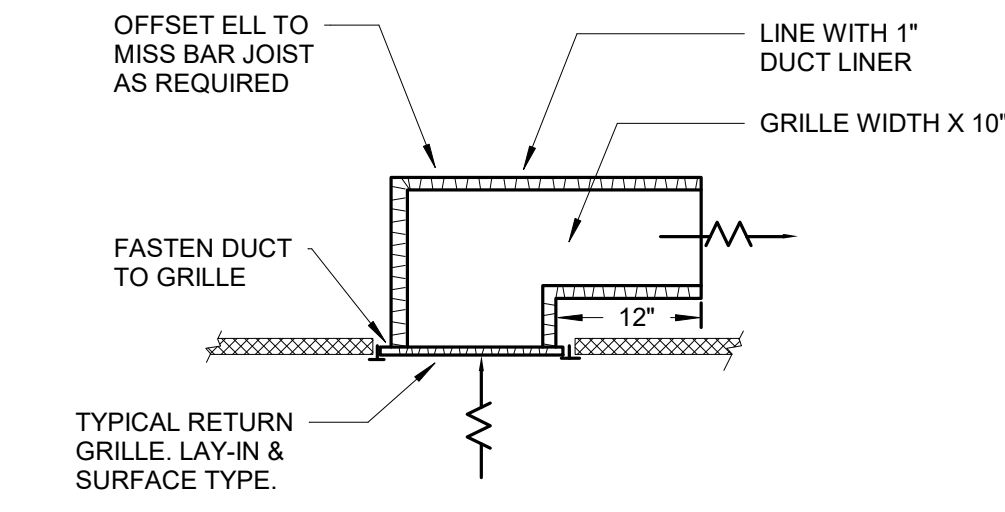
1 ROUND DUCT TAKE-OFF DETAIL  
NO SCALE



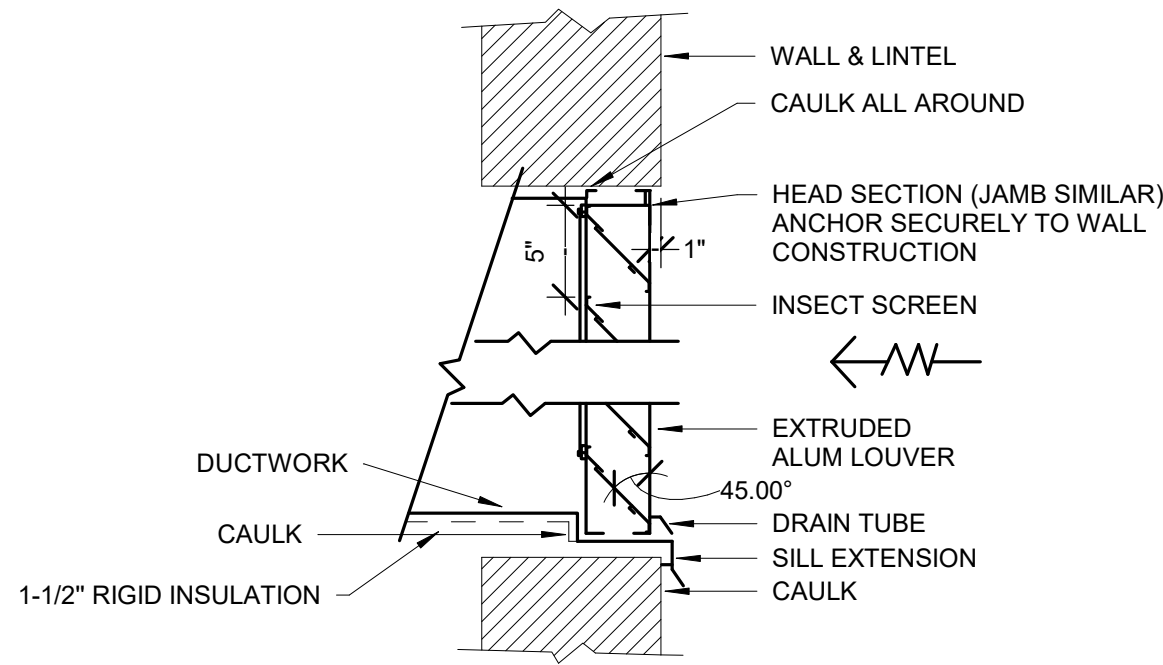
2 POWER ROOF VENTILATOR DETAIL  
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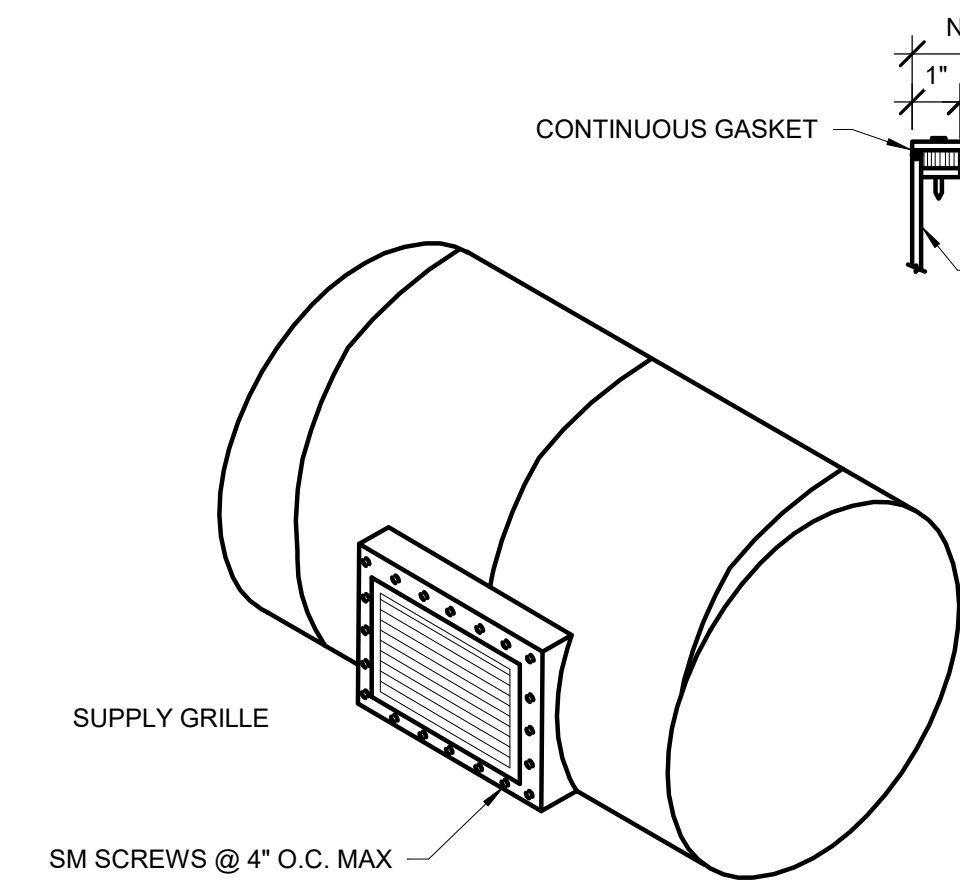
3 VAV TERMINAL UNIT DETAIL  
NO SCALE



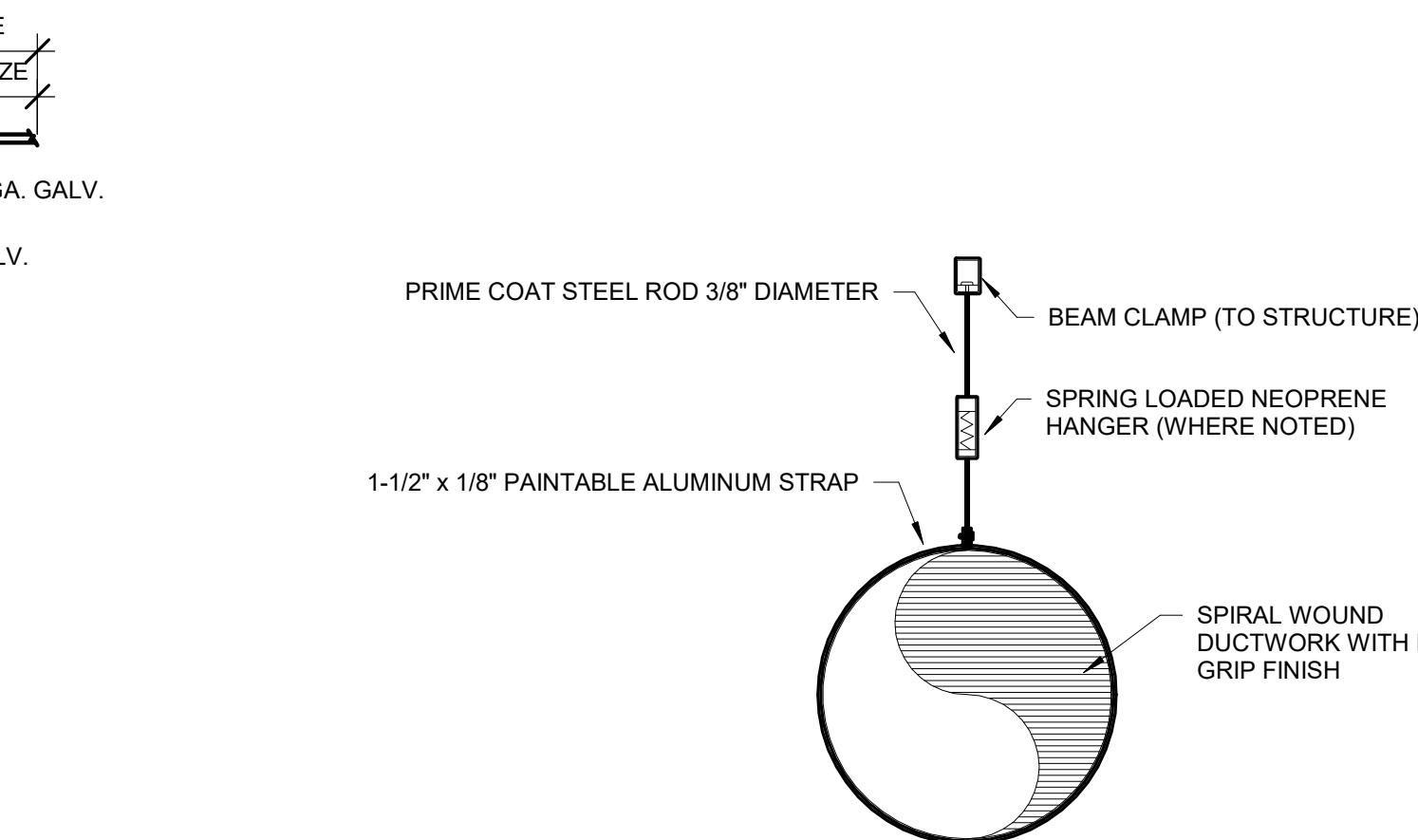
4 INSULATED RETURN ELBOW DETAIL  
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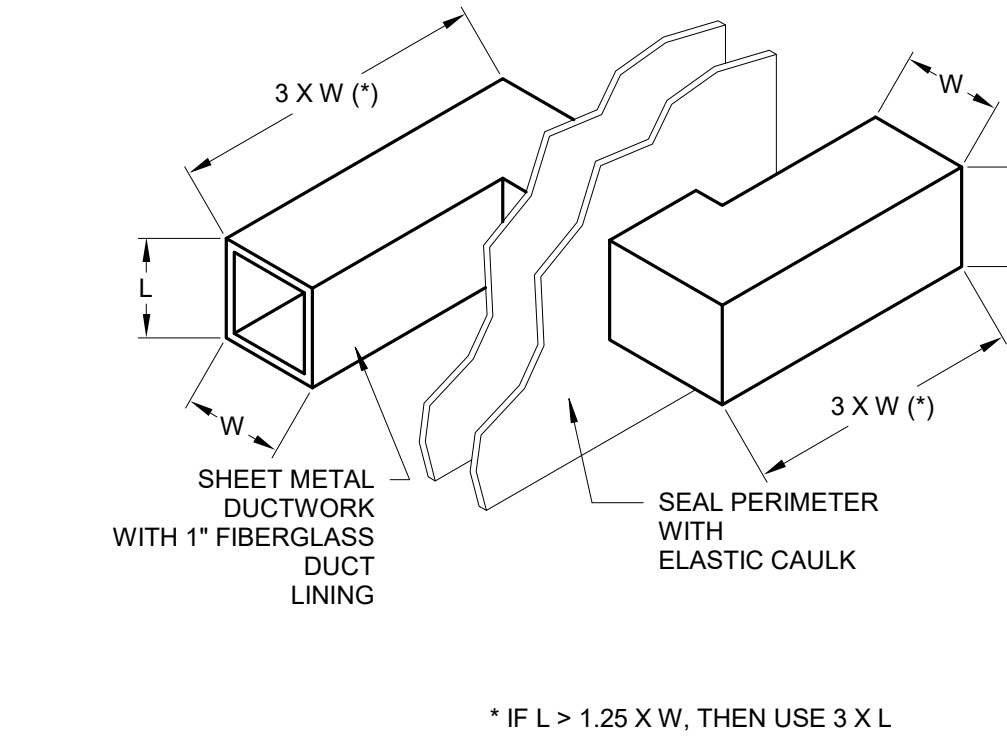
5 LOUVER-INTAKE AIR DETAIL  
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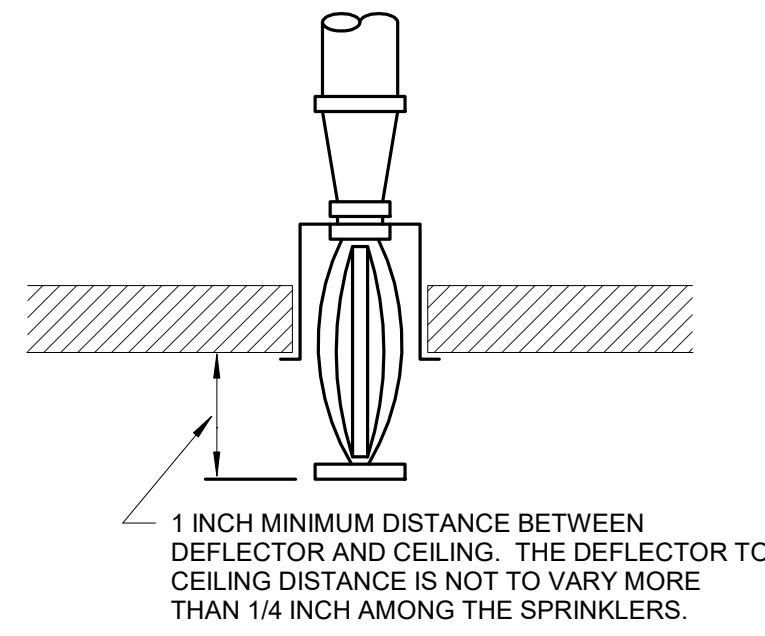
6 ROUND DUCT BOOT DETAIL  
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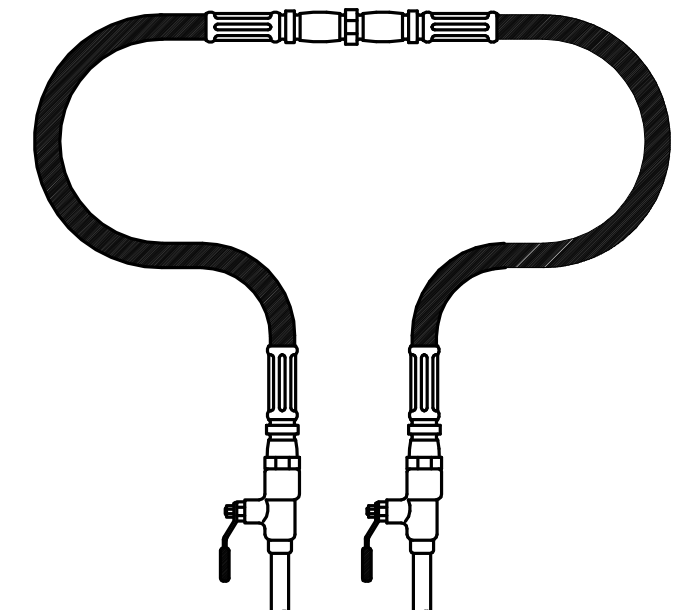
7 SPIRAL DUCT SUPPORT DETAIL  
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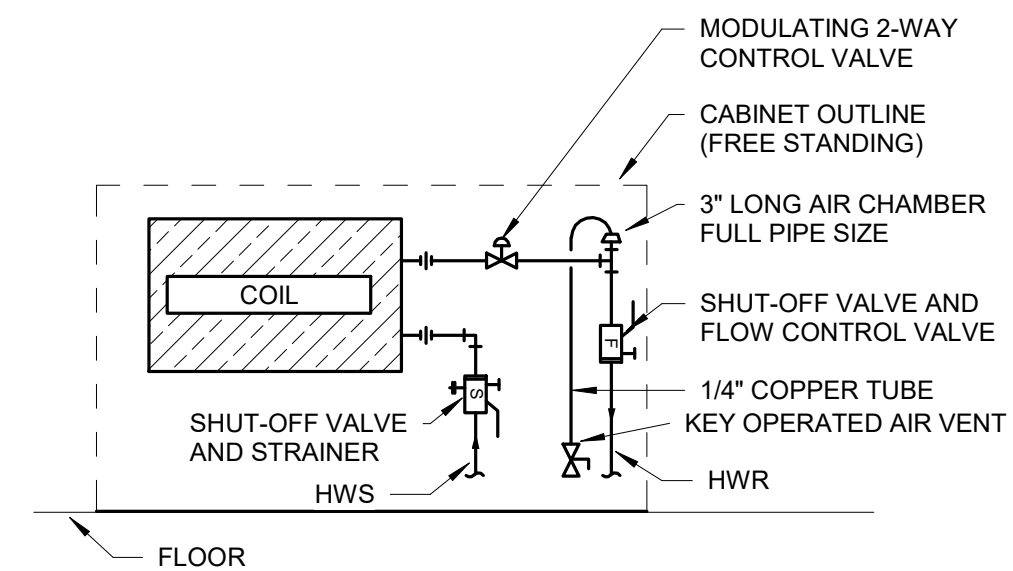
8 RETURN AIR TRANSFER DUCT DETAIL  
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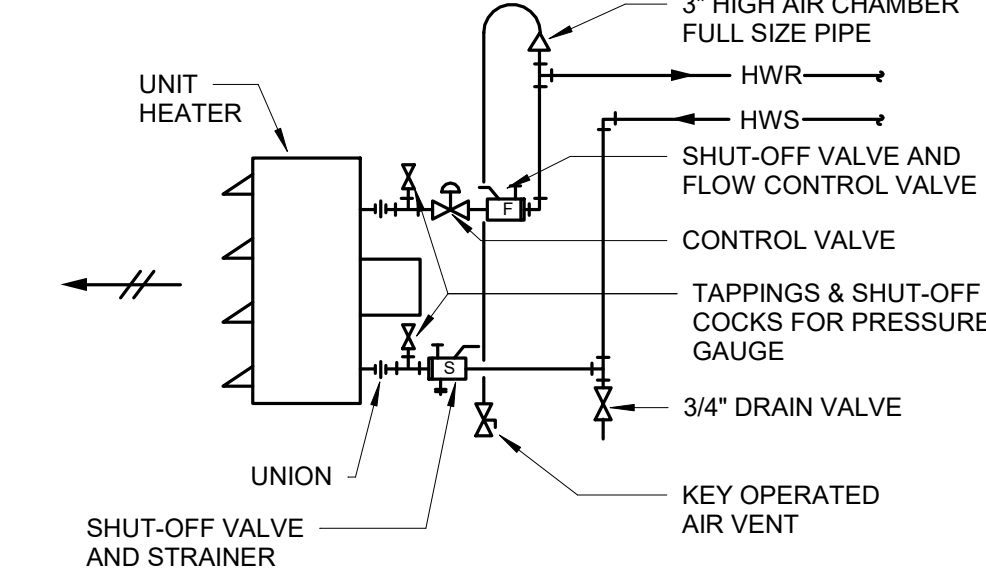
9 RECESSED SPRINKLER DETAIL  
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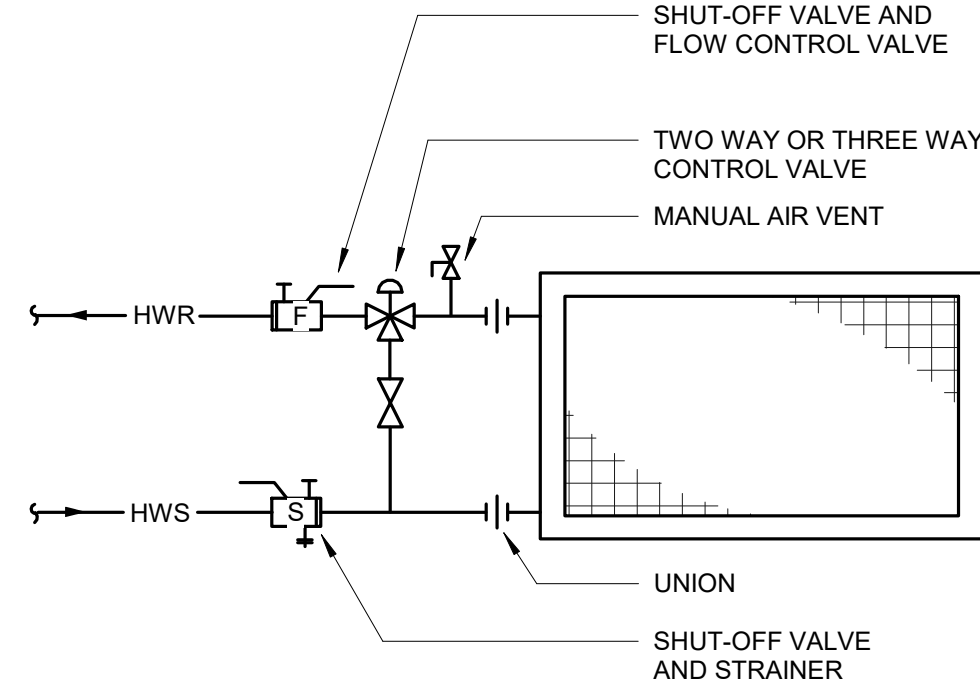
10 TEMPORARY CONNECTIONS FOR SYSTEM FLUSHING  
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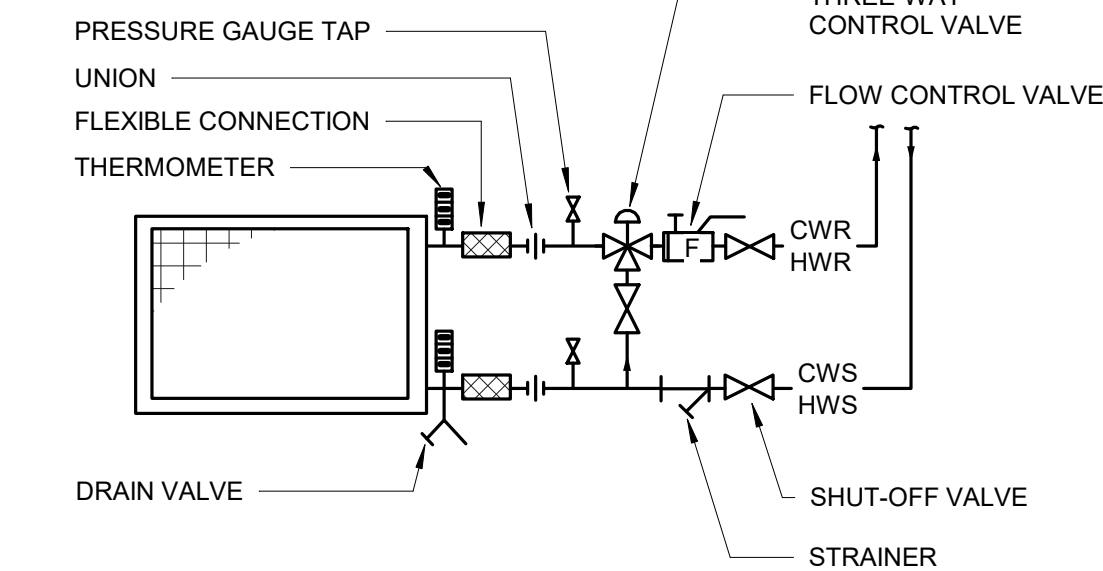
11 CABINET UNIT HEATER PIPING DETAIL  
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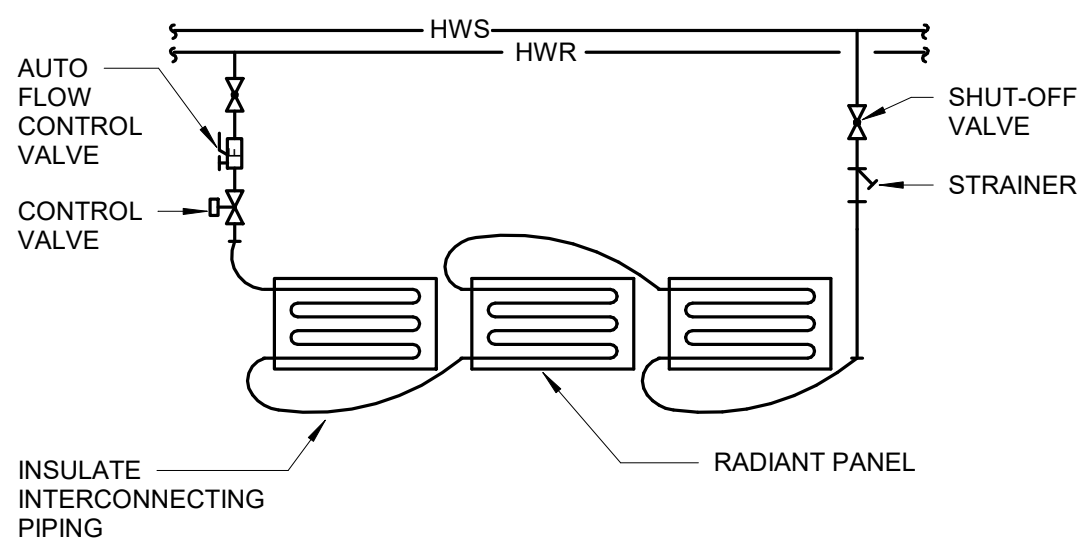
12 HOT WATER UNIT HEATER DETAIL  
NO SCALE



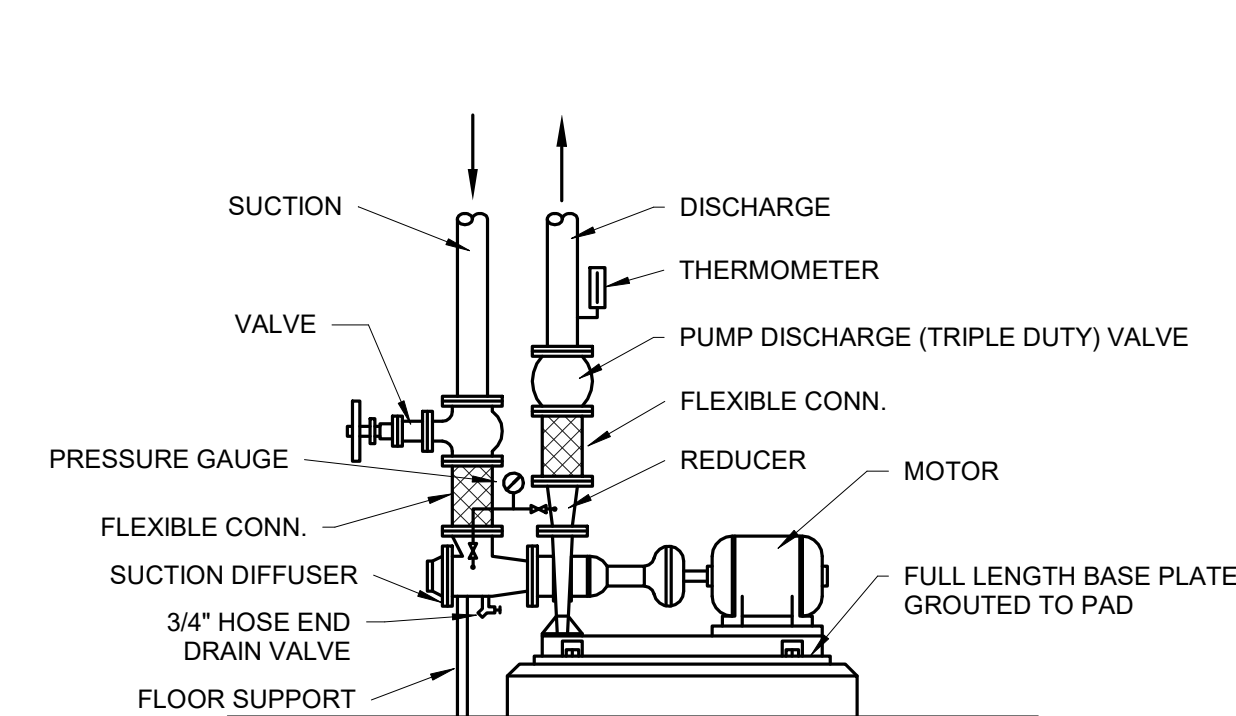
13 REHEAT COIL PIPING DETAIL  
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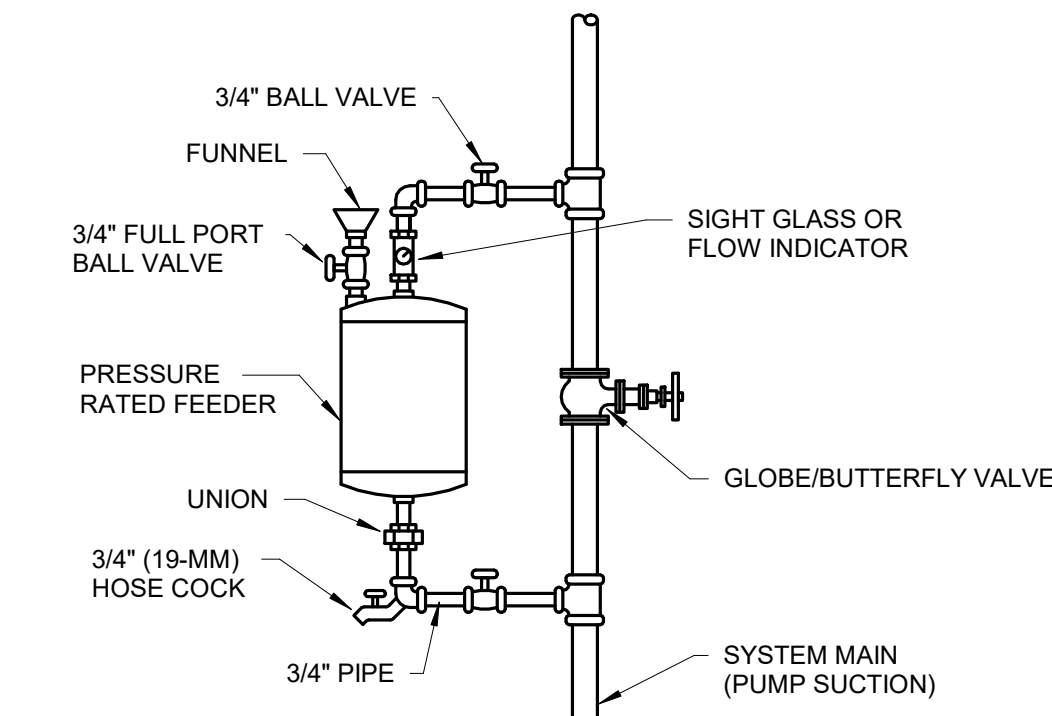
14 WATER COIL PIPING DETAIL  
NO SCALE



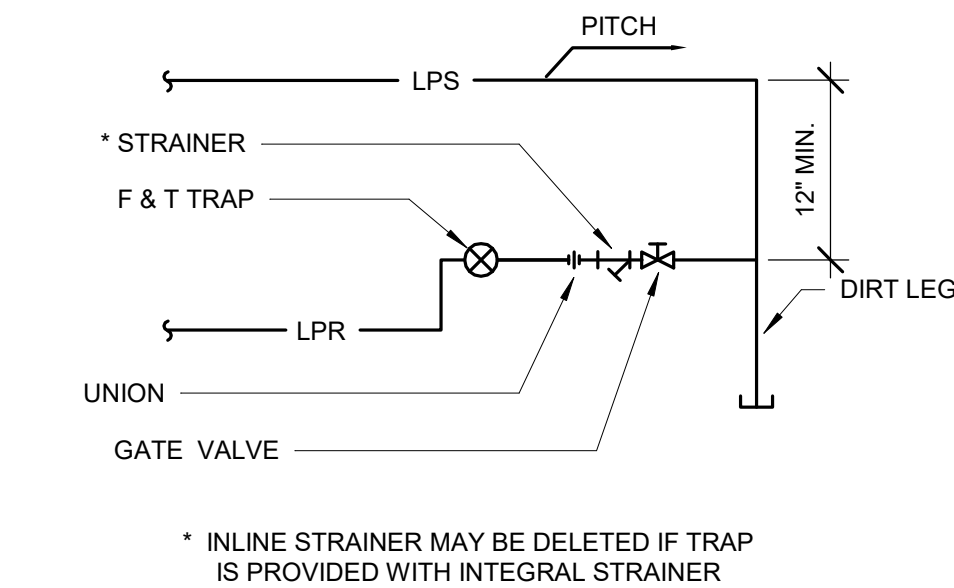
15 RADIANT PANEL PIPING DIAGRAM  
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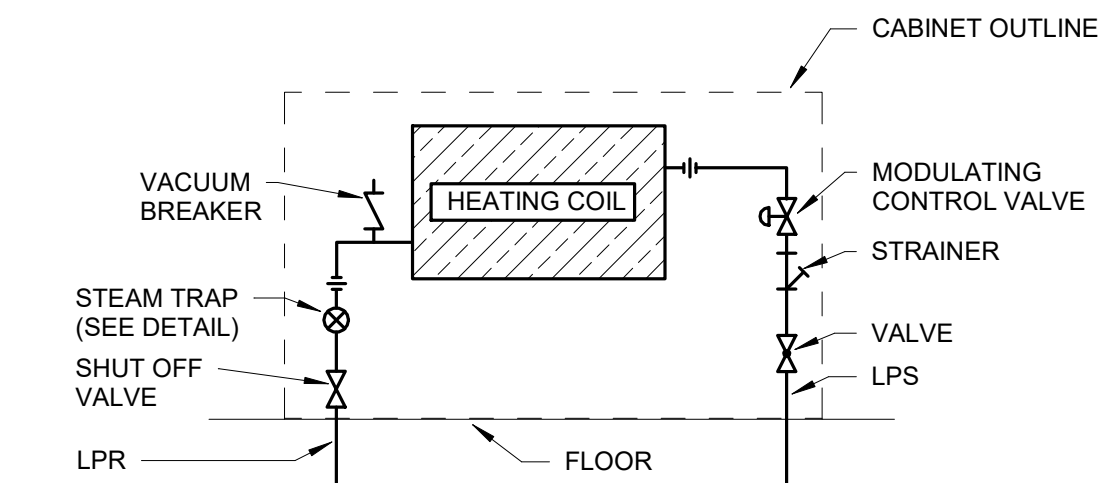
16 TYPICAL SINGLE SUCTION PUMP SCHEMATIC  
NO SCALE



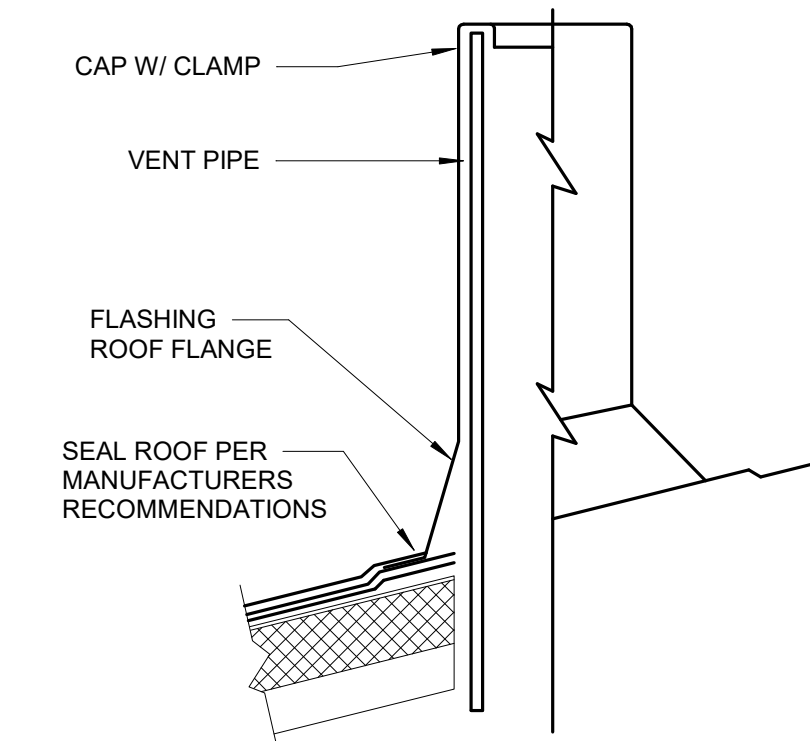
17 CHEMICAL FEEDER DETAIL  
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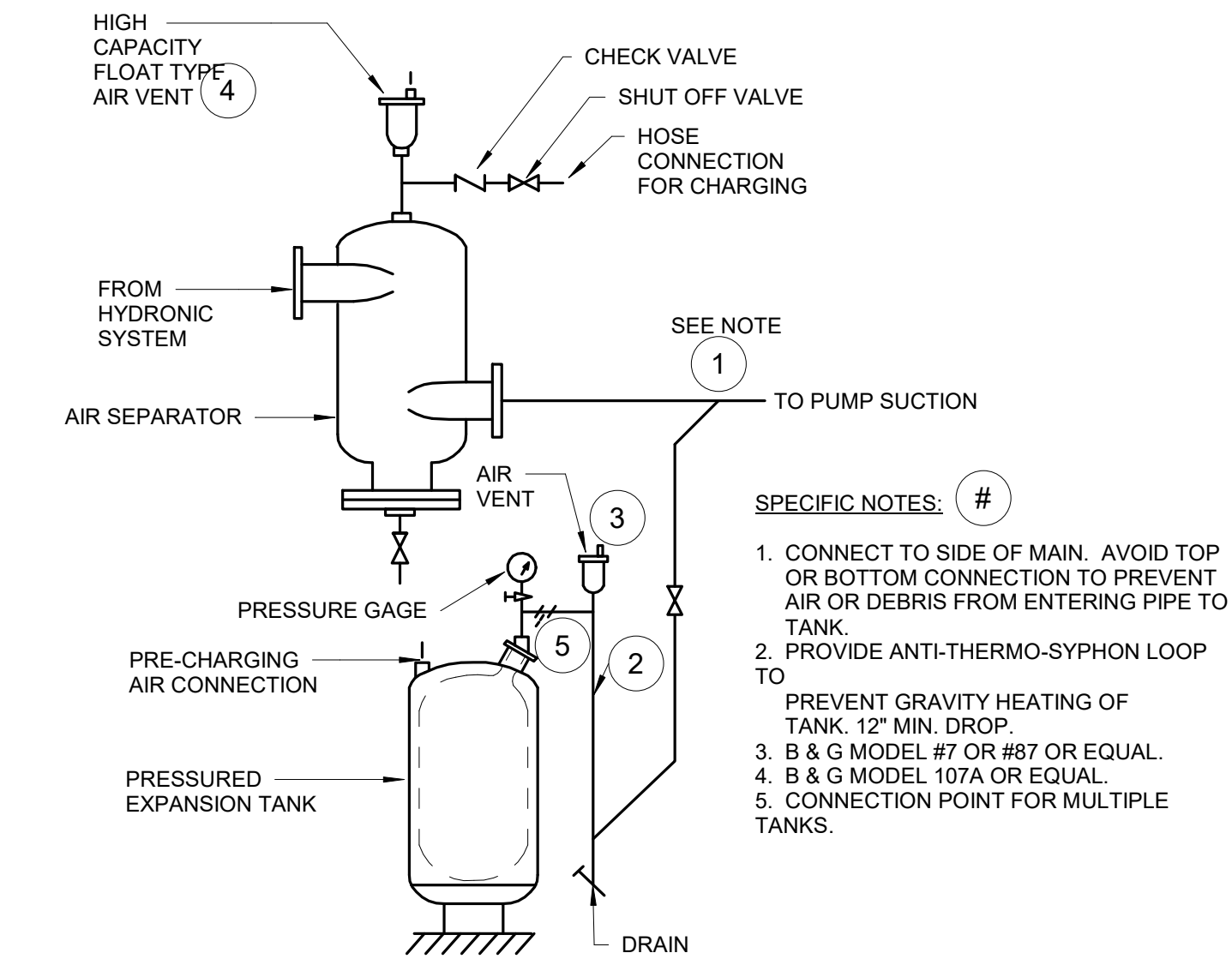
18 LOW PRESSURE STEAM TRAP  
NO SCALE



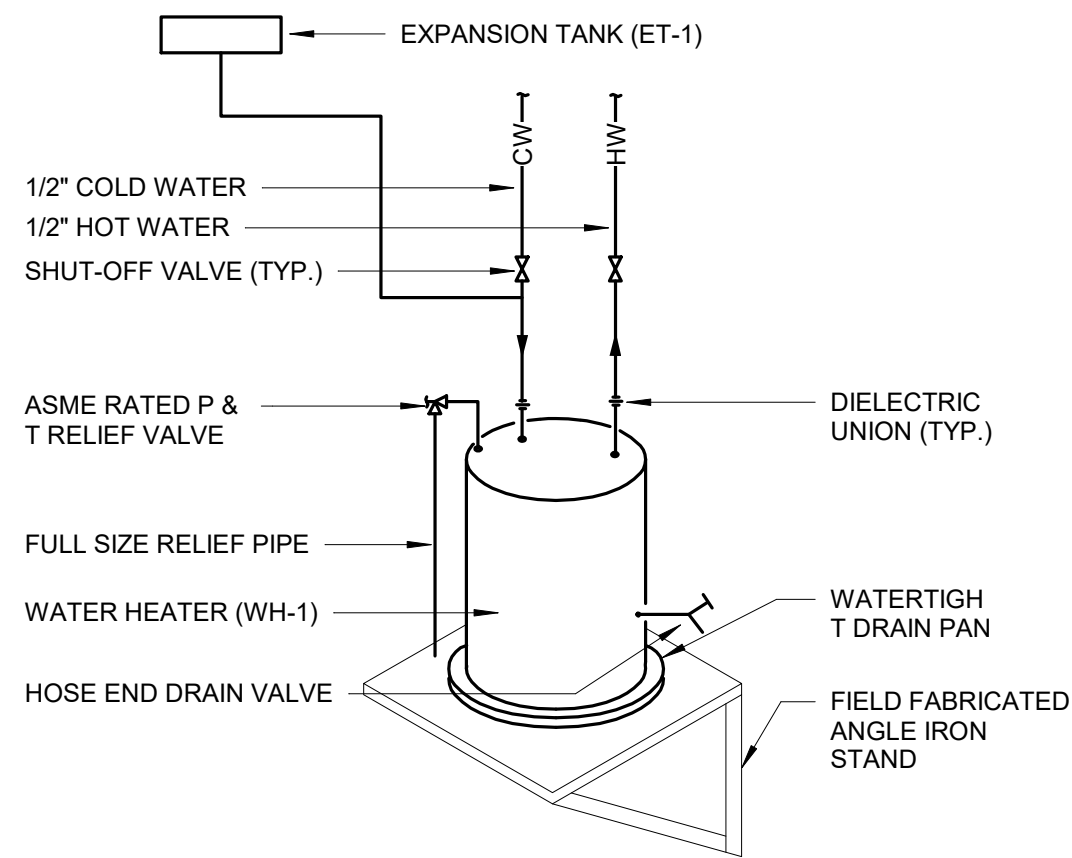
19 CONVECTOR PIPING DETAIL  
NO SCALE



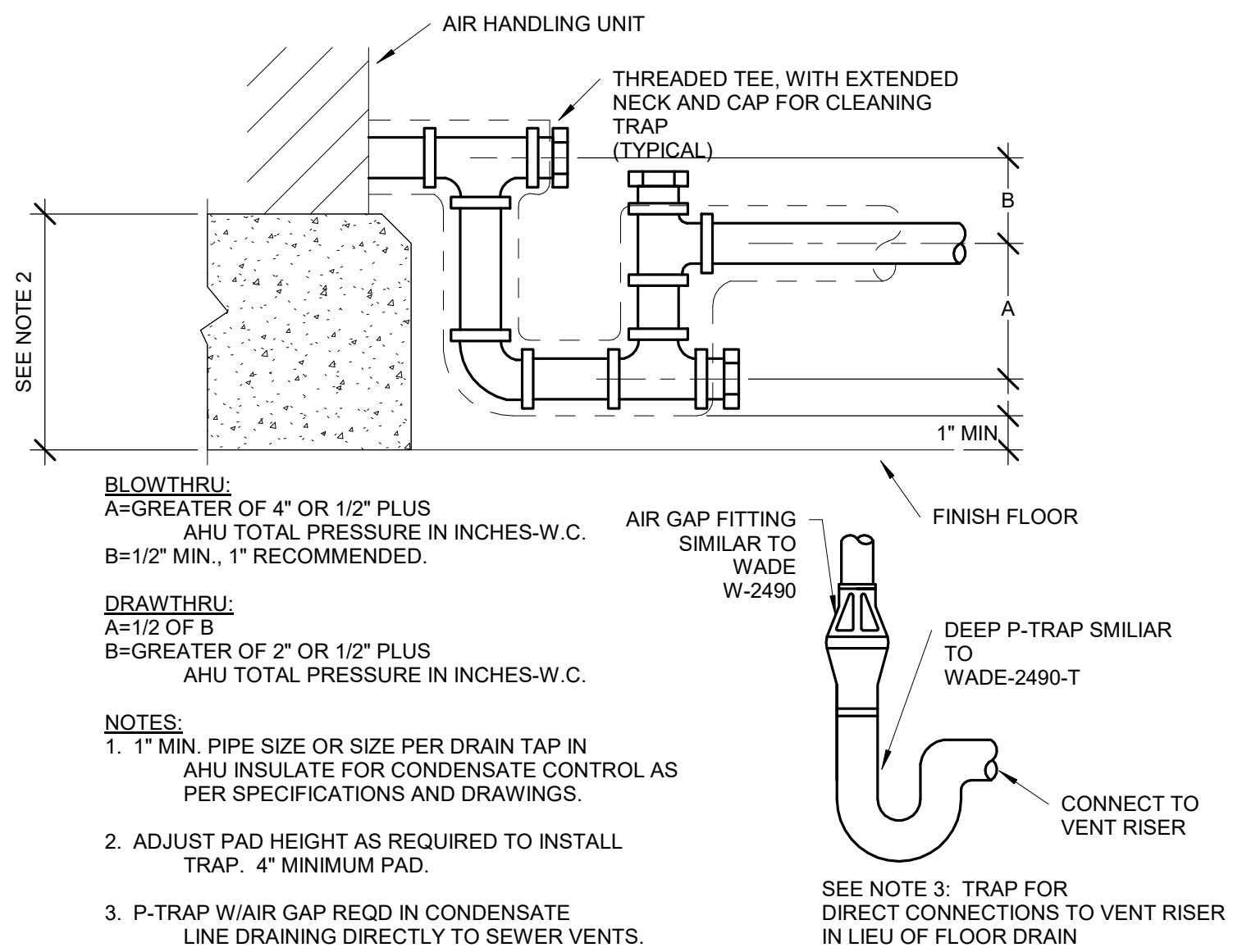
20 PLUMBING VENT DETAIL  
NO SCALE



1 VERTICAL DIAPHRAM EXPANSION TANK DETAIL  
NO SCALE



2 WATER HEATER PIPING DETAIL  
NO SCALE



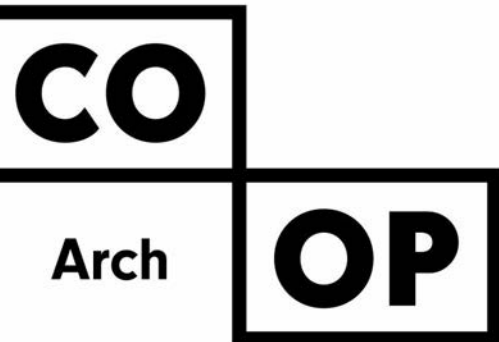
3 AHU DRAIN TRAP DETAIL  
NO SCALE

## MECHANICAL SYMBOLS

—CW— COLD WATER PIPE	—HW— HOT WATER PIPE	—RHW— CIRCULATING HOT WATER PIPE
—CW— UNDERGROUND COLD WATER PIPE	—HW— UNDERGROUND HOT WATER PIPE	—RHW— UNDERGROUND CIRCULATING HOT WATER PIPE
—PD— PUMP DISCHARGE	—SAN— ABOVE FLOOR WASTE PIPE	—V— VENT PIPE
—HPS— HIGH PRESSURE STEAM	—ST— ABOVE FLOOR STORM PIPE	—LPS— LOW PRESSURE STEAM
—HPR— HIGH PRESSURE RETURN	—OST— ABOVE FLOOR OVERFLOW STORM PIPE	—LPR— LOW PRESSURE RETURN
—PC— PUMPED CONDENSATE PIPE	—PD— PUMP DISCHARGE	—HG— HOT GAS
—G— NATURAL GAS	—MPS— MEDIUM PRESSURE STEAM	—FD— FIRE DEPT. HOSE VALVE
—HWS— HOT WATER HEATING SUPPLY	—MPR— MEDIUM PRESSURE RETURN	—RS— RECESSED SPRINKLER HEAD
—CWS— CHILLED WATER SUPPLY PIPE	—HWR— HOT WATER HEATING RETURN	—FA— FLOW ALARM
—HPWS— HEAT PUMP WATER SUPPLY	—CWR— CHILLED WATER RETURN PIPE	—PT— PRESSURE/TEMPERATURE TAP
—GLWS— GROUND LOOP WATER SUPPLY	—HPWR— HEAT PUMP WATER RETURN	—PG— PRESSURE GAUGE
—FOS— FUEL OIL SUPPLY	—GLWR— GROUND LOOP WATER RETURN	—SP— STATIC PRESSURE SENSOR
—FOV— FUEL OIL VENT	—FOR— FUEL OIL RETURN	—TM— THERMOMETER
—RL— REFRIGERANT LIQUID PIPE	—FOG— FUEL OIL GAUGE	—ST— STRAINER
—D— EQUIPMENT DRAIN	—RS— REFRIGERANT SUCTION PIPE	—ST— STEAM TRAP
—F— FIRE SPRINKLER PIPE	—SP— STAND PIPE	—BFP— BACK FLOW PREVENTER
—P— PENDANT TYPE SPRINKLER HEAD	—U— UPRIGHT SPRINKLER HEAD	—FCV— FLOW CONTROL VALVE
—CS— CONCEALED SPRINKLER HEAD	—PI— POST INDICATOR VALVE	—SV— STRAINER VALVE
—PC— PIPE CONNECTION	—AV— AIR VENT	—PSD— PRESSURE SENSOR DIFFERENTIAL
—ED— ELBOW DOWN	—FMD— FLOW MEASURING DEVICE	—T— THERMOSTAT
—EU— ELBOW UP	—EJ— EXPANSION JOINT, PIPE GUIDE	—TN— NIGHT THERMOSTAT
—TD— TEE DOWN	—CO— CAPPED OUTLET	—TWC— THERMOSTAT W/LOCKABLE COVER
—PD— PIPE PITCH DOWN	—SOV— SHUT OFF VALVE	—H— HUMIDISTAT
—D— DIRECTION OF FLOW	—BV— BALANCING VALVE	—FS— FLOW SWITCH
—PA— PIPE ANCHOR	—CV— CONTROL VALVE	—DH— DEMOLITION HATCHING
—RI— REDUCER OR INCREASER	—3W— 3-WAY CONTROL VALVE	
—U— UNION	—PRV— PRESSURE REDUCING VALVE	
—FPC— FLEXIBLE PIPE CONNECTION	—PRV— PRESSURE RELIEF VALVE	
—WH— WALL HYDRANT	—DWT— DOMESTIC WATER TEMPERING VALVE	
—HB— HOSE BIB	—CV— CHECK VALVE	
—CO— CLEAN OUT ABOVE FLOOR	—CS— CURB STOP	
—WCO— WALL CLEAN OUT		
—CO— CLEAN OUT IN FLOOR		
—FD— FLOOR DRAIN		
—FS— FLOOR SINK		
—RE— RADIATION ELEMENT		
—RAD— RADIATION DESIGNATION		
—RD— ROOF DRAIN		
—ORD— OVERFLOW ROOF DRAIN		
—AD— AREA DRAIN		
—C— CONNECT TO EXIST. SERVICE		

## VENTILATION SYMBOLS

—S— SUPPLY DUCT (UP & DOWN)	—M— MANUAL VOLUME DAMPER
—R— RETURN DUCT (UP & DOWN)	—B— BRANCH DUCT INTO SIDE OF MAIN DUCT
—E— EXHAUST DUCT (UP & DOWN)	—R/D— DUCT RISE OR DROP IN DIRECTION OF AIR FLOW
—SE— STANDARD RADIUS ELBOW R EQUAL W (MINIMUM)	—D— DUCT DIMENSION- WIDTH x DEPTH
—T— DUCT TURN WITH TURN VANES	—I— DUCT INSULATION (SEE SPECIFICATION)
—F— FLEXIBLE DUCT CONNECTION	—T/S— DUCT TURN AND AIR SPLIT TYPE TAKEOFF (NON-ADJUSTABLE)
—S— SPIRAL DUCTWORK	—S— GRILLE, REGISTER & DIFFUSER DESIGNATION
—L— LOW PRESURE DUCTWORK MAX 2" W.G. PRESSURE	—S— SUPPLY, RETURN, EXHAUST, & TRANSFER
—M— MEDIUM PRESSURE DUCTWORK 2"-6" W.G. PRESSURE	—E— EQUIPMENT DESIGNATION
—F— F - FIRE DAMPER	—M— M - MOTORIZED DAMPER
—S— S - SMOKE DAMPER	—B— BACKDRAFT DAMPER
—C— C - COMBINATION FIRE SMOKE DAMPER	—F— FLEX DUCT (5' MAXIMUM)



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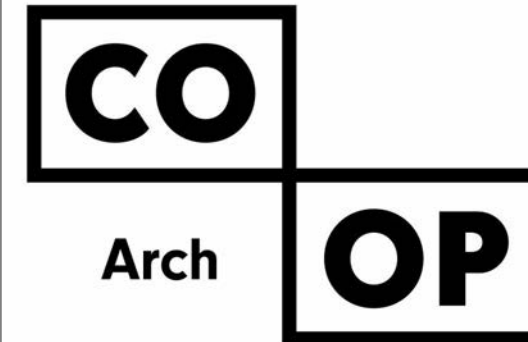
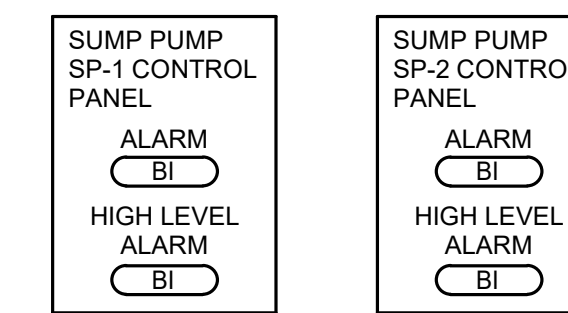
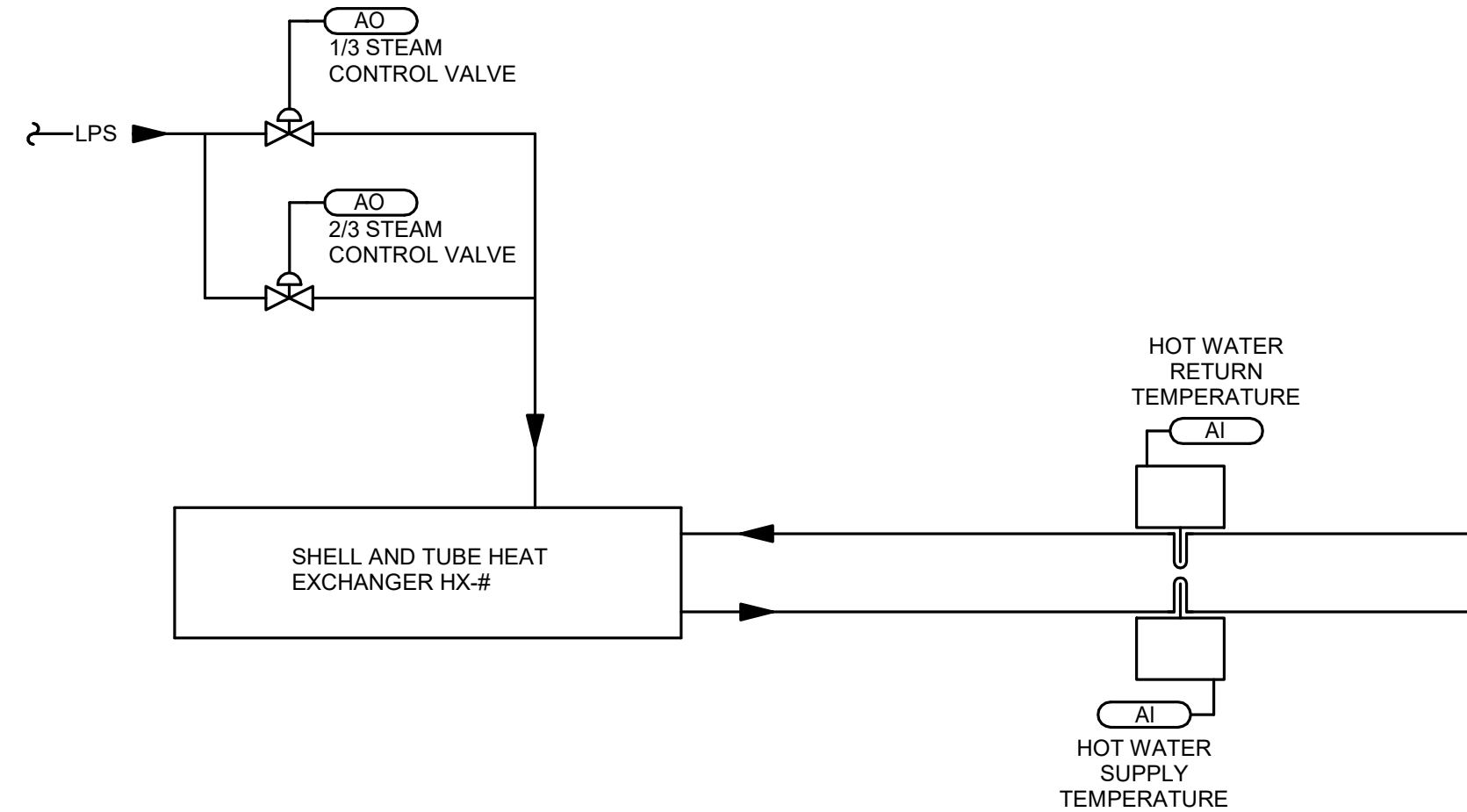
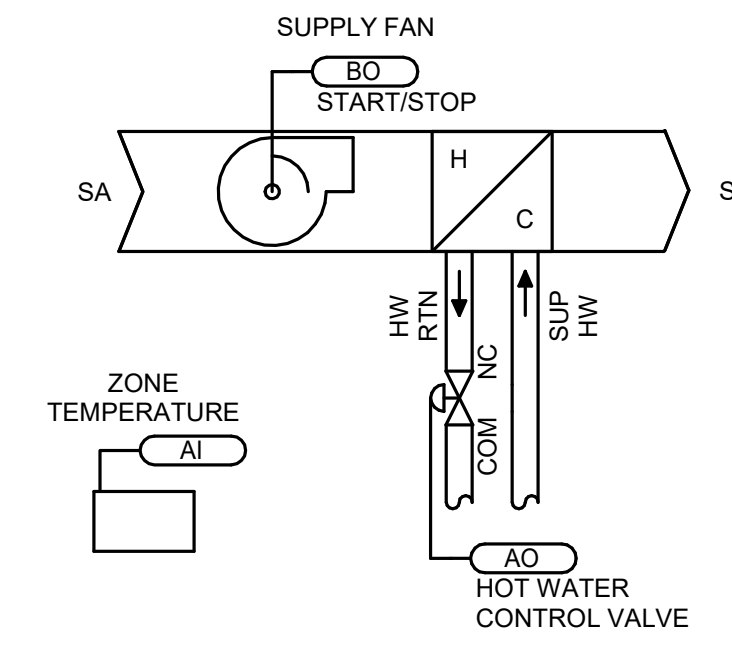
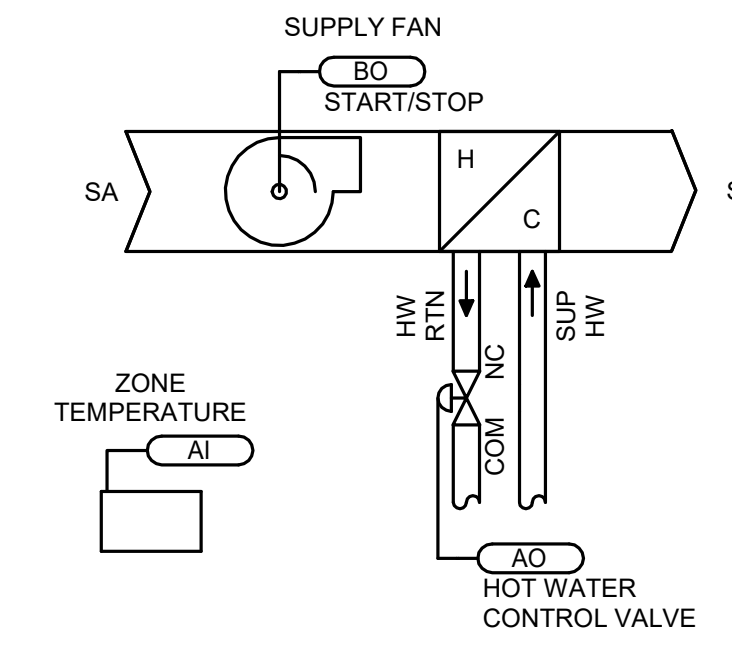
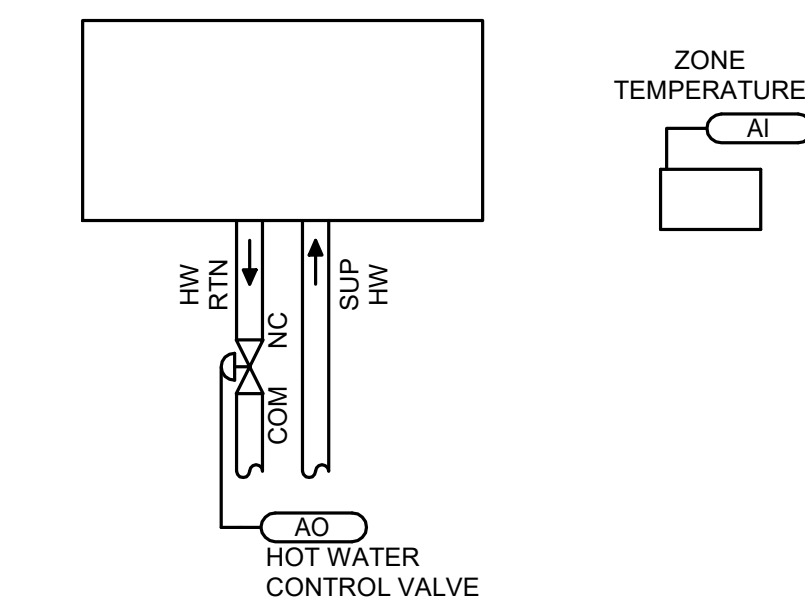
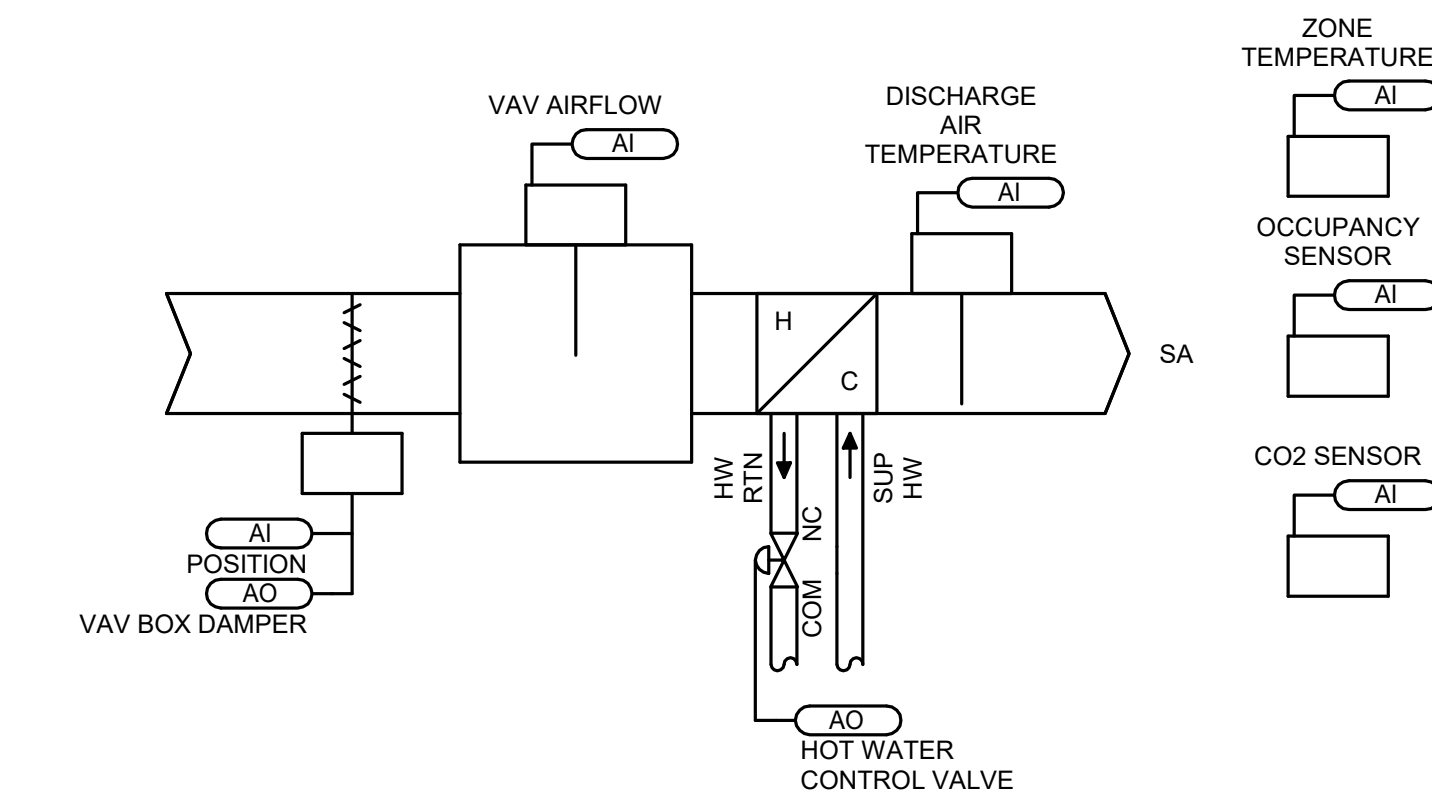
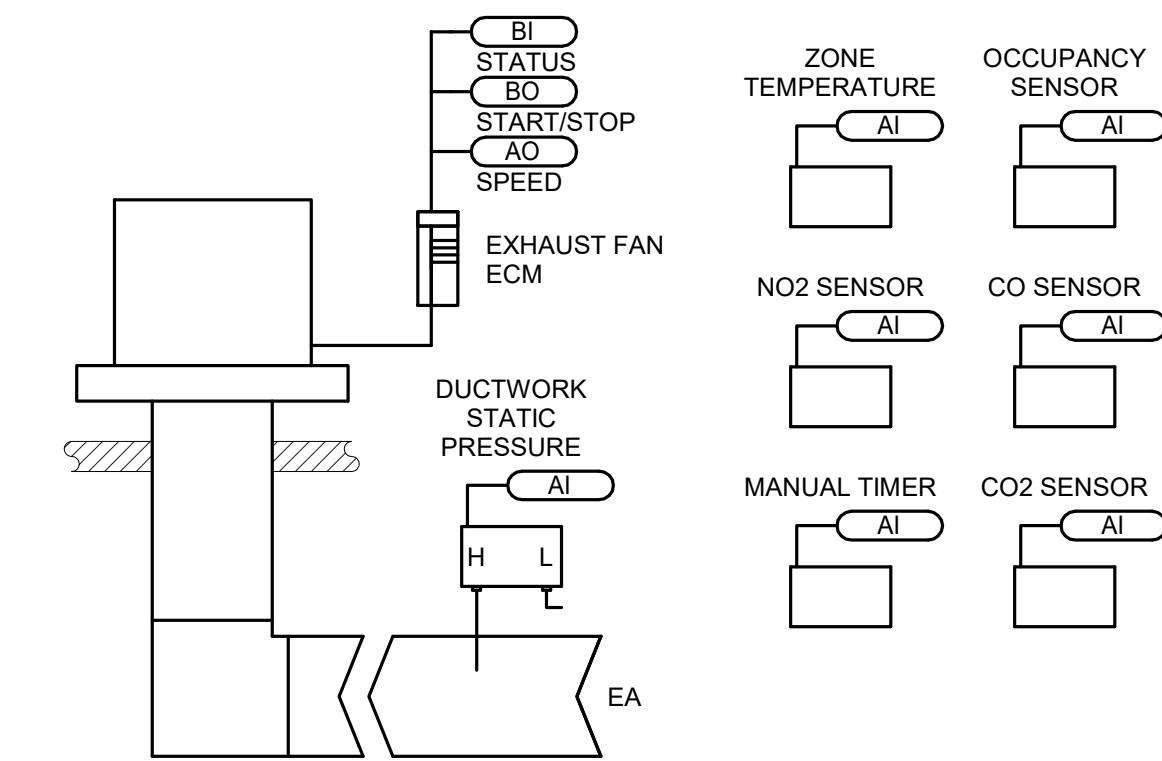
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REV. # REV. DSC. REV. DATE

PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
MECHANICAL DETAILS &  
SYMBOLS

M5-1



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SDSMT DEVEREAUX LIBRARY  
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RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
MECHANICAL DIAGRAMS

M5-2

PLUMBING FIXTURE SCHEDULE										
UNIT TYPE	UNIT NUMBER	MANUFACTURER	MODEL	FIXTURE TYPE	WASTE	VENT	SUPPLY			TRIM/REMARKS
							CW	HW		
P	1A	AMERICAN STANDARD	AFWALL 3351.101	WATER CLOSET (WALLHUNG FV HET) 1.2 GPF	4"	2"	1 1/4"			OLSONITE #95, WHITE OPEN FRONT SS CHECK HINGE, ADA ELONGATED BOWL SIPHON JET, SLOAN CROWN OPTIMA SMOOTH 1.2, BATTERY OPERATED, 1.2 GPF, ADA COMPLIANT, MINIMUM 800 MAP FLUSH PERFORMANCE **
P	1B	AMERICAN STANDARD	AFWALL 3351.101	WATER CLOSET (WALLHUNG FV HET) 1.2 GPF MOUNT AT ADA HEIGHT	4"	2"	1 1/4"			OLSONITE #95, WHITE OPEN FRONT SS CHECK HINGE, ADA ELONGATED BOWL SIPHON JET, SLOAN CROWN OPTIMA SMOOTH 1.2, BATTERY OPERATED, 1.2 GPF, ADA COMPLIANT, MINIMUM 800 MAP FLUSH PERFORMANCE **
P	2B	AMERICAN STANDARD	WASHBRO OK FLOWISE 6590.001E C	URINAL (FV) 0.125 GPF MOUNT AT ADA HEIGHT	2"	1 1/2"	3/4"			WHITE SIPHON JET, SLOAN ROYAL, 186-0.125 SMOOTH, BATTERY OPERATED AUTOMATIC FLUSH VALVE, 0.125 GPF, ADA COMPLIANT
P	3A	AMERICAN STANDARD	AQUALYN 0476.028	LAVATORY (COUNTER TYPE) 0.5 GPM	2"	1 1/2"	1/2"	1/2"		SLOAN EBF85 BATTERY OPERATED SENSOR OPERATED FAUCET, 0.5 GPM AERATOR, GRID DRAIN, HANDI-TRAP SUPPLY/DRAIN PROTECTION, ADA, POWERS LFG480 THERMOSTATIC MIXING VALVE WITH INTEGRAL CHECK VALVES

STEAM CONVERTER SCHEDULE																	
UNIT TYPE	UNIT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	GPM	WATER PRES. DROP	EWI	LWT	BTUH	#/HR STEAM	STEAM PRES.	FOULING FACTOR	AREA (SF)	TRAP CAPACITY	% GLYCOL	COMMENTS
HX	1	ARMSTRONG	WS-1003-200-1-CSSSS NN-20		HEATING WATER	0	0.00 RH2O	110 °F	140 °F	0	0	0 RH2O	0	2	0	0	-

COMMENTS:

1 HOT WATER SOLUTION BASED ON 30% PROPYLENE GLYCOL.

2 PROVIDE VACUUM BREAKER.

3 PROVIDE MOUNTING RACK(S) FOR CONVERTORS.

4 MAX WATER VELOCITY OF 4.5 FT/SEC.

5 MINIMUM HEAT TRANSFER AREA OF 40.9 SQ. FT.

VARIABLE AIR VOLUME BOX SCHEDULE																		
UNIT TYPE	UNIT NUMBER	MANUFACTURER	MODEL	PRIMARY CFM			INLET STATIC	INLET CONNECTION	REHEAT SECTION							NC	COMMENTS	
				COOLING		HEATING MAXIMUM			GPM	BTUH	EWT/LWT	ROWS	WPD	APD	% GLYCOL			
				MAX	MIN													
VAV	0101	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0102	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0103	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0104	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0105	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0106	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0107	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0108	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0109	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0110	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0111	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0112	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0113	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0114	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0115	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0116	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0117	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0118	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0119	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0120	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0121	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0122	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0123	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0124	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0125	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0126	KRUEGER	LMHS 4	275	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0201	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0202	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0203	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0204	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0205	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0206	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0207	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0208	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0209	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0210	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0211	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0212	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0214	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0215	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0216	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0218	KRUEGER	LMHS 4	160	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0219	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0219	KRUEGER	LMHS 12	230	10	125	1.00 in-wg	12"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0221	KRUEGER	LMHS 4	0	175	125	0.75 in-wg	4"	0	0	180/140	4	0	0.00 in-wg	1	20		
VAV	0301	TUTTLE & BAILEY	SDV	0	175		0.75 in-wg	8"	0	0	180/140	1	0	0.00 in-wg		20		
VAV	0302	TUTTLE & BAILEY	SDV	0	175		0.75 in-wg	8"	0	0	180/140	1	0	0.00 in-wg		20		
VAV	0303	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0304	KRUEGER	LMHS 8	230	10	125	1.00 in-wg	8"	1	1	1	4	2.307	1.00 in-wg	1	1		
VAV	0305	TUTTLE & BAILEY	SDV	0	175		0.75 in-wg	8"	0	0	180/140	1	0	0.00 in-wg		20		
VAV	0306	TUTTLE & BAILEY	SDV	0	175		0.75 in-wg	8"	0	0	180/140	1	0	0.00 in-wg		20		
VAV	0307	TUTTLE & BAILEY	SDV	0	175		0.75 in-wg	8"	0	0	180/140	1	0	0.00 in-wg		20		
VAV	0308	TUTTLE & BAILEY	SDV	0	175		0.75 in-wg	8"	0	0	180/140	1	0	0.00 in-wg		20		
VAV	0309	TUTTLE & BAILEY	SDV	0	175		0.75 in-wg	8"	0	0	180/140	1	0	0.00 in-wg		20		
VAV	E01	KRUEGER	KQFS 5	2100	0		0.75 in-wg	12"	1	0	180/140	1	0.339	0.35 in-wg	0	-		
VAV	E02	KRUEGER	KQFS 5	2800	0		0.75 in-wg	13"	1	0	180/140	1	0.339	0.35 in-wg	0	-		
VAV	E03	KRUEGER	KQFS 3	1450	0		0.75 in-wg	10"	1	0	180/140	1	0.339	0.35 in-wg	0	-		
VAV	E04	KRUEGER	KQFS 3	1450	0		0.75 in-wg	10"	1	0	180/140	1	0.339	0.35 in-wg	0	-		
VAV	E05	KRUEGER	KQFS 3	1450	0		0.75 in-wg	10"	1	0	180/140	1	0.339	0.35 in-wg	0	-		

COMMENTS:

1 CAPACITY BASED ON 30% PROPYLENE GLYCOL.

2 CAPACITY BASED ON 55 DEG. EAT.

3 PROVIDE WITH DISCONNECT SWITCH.

4 FAN SHALL HAVE SCR SPEED CONTROL.

FAN SCHEDULE													
UNIT TYPE	UNIT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	VIBRATION ISOLATION	CFM	S.P.D.	VOLTAGE	HP	SONES	PHASES	COMMENTS
SF	1	LOREN COOK COMPANY	300PLCD17		SUPPLY		20000	4.00 in-wg	0	20	0	0	
SF	2	LOREN COOK COMPANY	300PLCD17		SUPPLY		20000	4.00 in-wg	0	20	0	0	

COMMENTS:

1 PROVIDE WITH STANDARD PREWIRED DISCONNECT.

2 PROVIDE WITH THERMAL OVERLOAD.

3 PROVIDE WITH MOTORIZED DAMPER.

4 PROVIDE WITH RUBBER ISOLATORS.

5 PROVIDE WITH ROOF CURB.

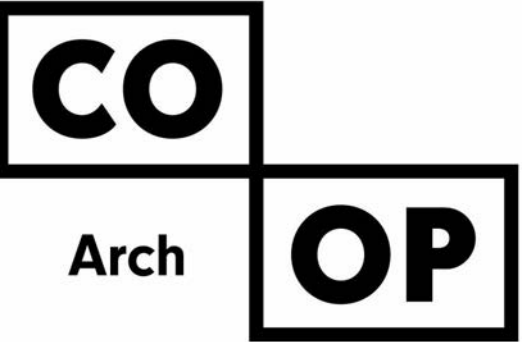
6 PROVIDE WITH ANODIZED ALUMINUM OR PLASTIC GRILLE.

7 PROVIDE WITH WALL CAP, ROOF CAP, EAVE VENT WITH BACK DRAFT DAMPER.

8 INLINE FAN WITH STANDARD PLUG DISCONNECT, ALUMINUM WALL CAP.

9 PROVIDE WITH STD DISCONNECT NEMA 3, VENTED ROOF CURB, GREASE TERMINATOR. FAN TO BE UL 762 RATED FOR GREASE EXHAUST.

10 PROVIDE VARIABLE SPEED SWITCH.



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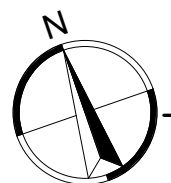
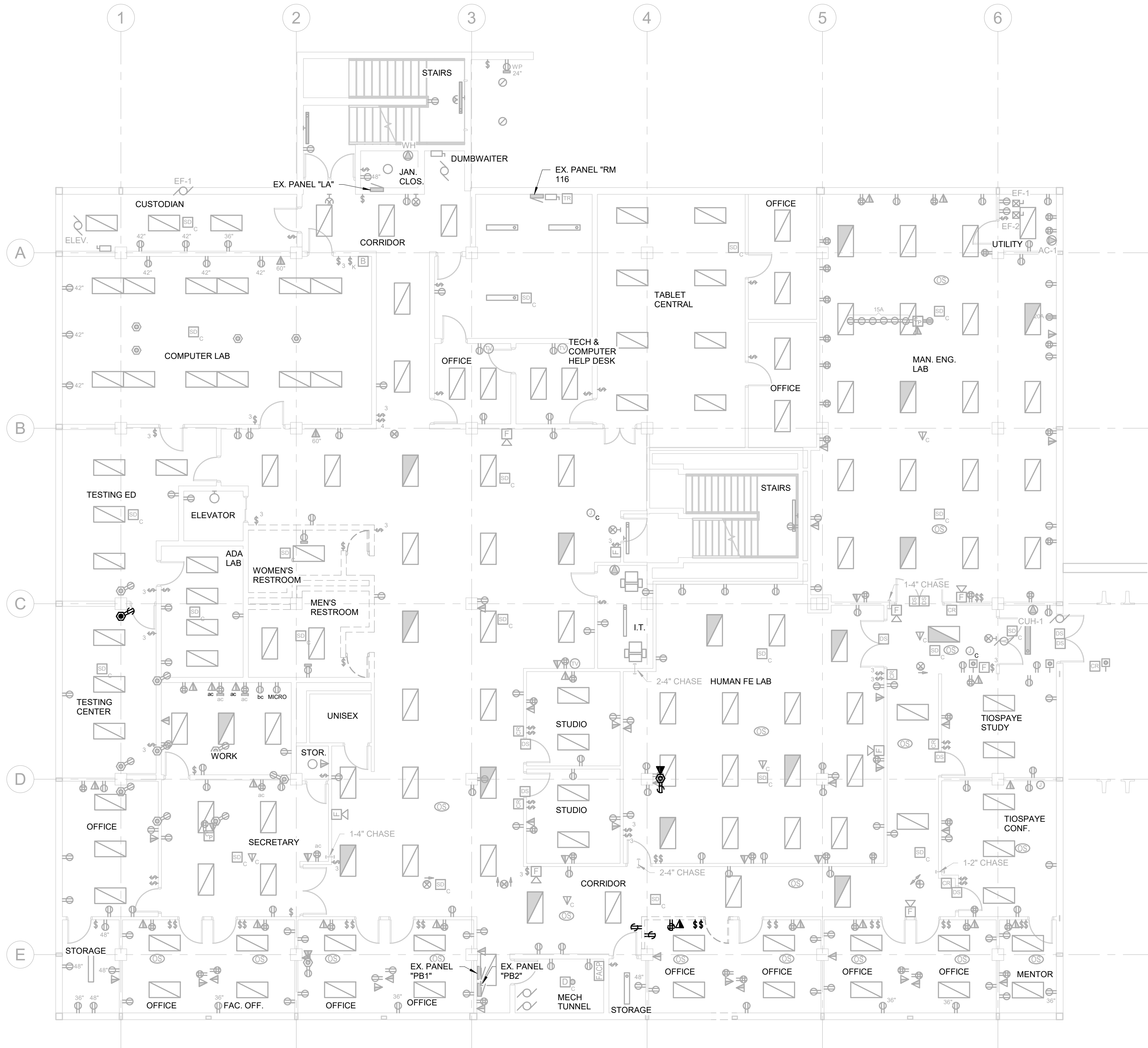
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PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

LOWER LEVEL ELECTRICAL  
DEMOLITION PLAN

E1-0



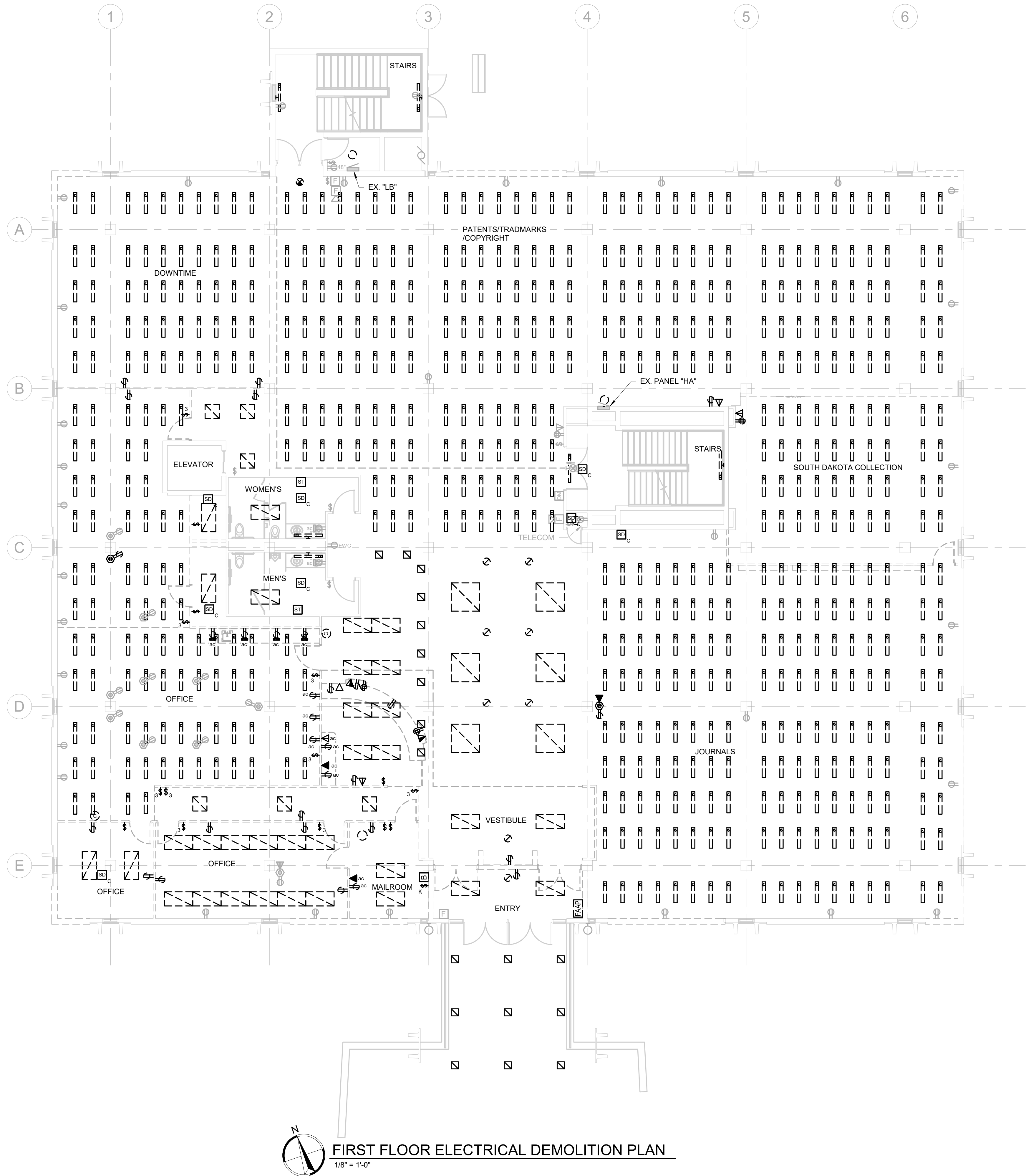
LOWER LEVEL ELECTRICAL DEMOLITION PLAN

1/8" = 1'-0"

ELECTRICAL MISCELLANEOUS NOTES

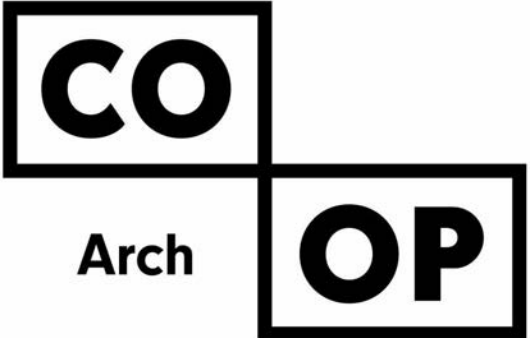
A  
B  
C  
D

ELECTRICAL SPECIFIC NOTES



ELECTRICAL MISCELLANEOUS NOTES	
A	
B	
C	
D	

#	ELECTRICAL SPECIFIC NOTES
---	---------------------------



1108 S. Main St. 102  
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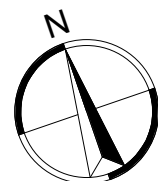
ISSUE:	
Issue Date	Project Status

REVISION SCHEDULE:		
REV. #	REV. DSC.	REV. DATE

PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
FIRST FLOOR ELECTRICAL  
DEMOLITION PLAN

E1-1

 FIRST FLOOR ELECTRICAL DEMOLITION PLAN  
1/8" = 1'-0"

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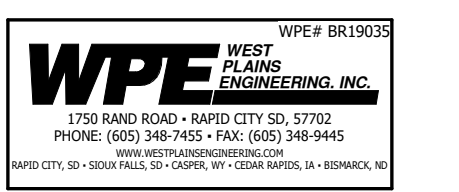
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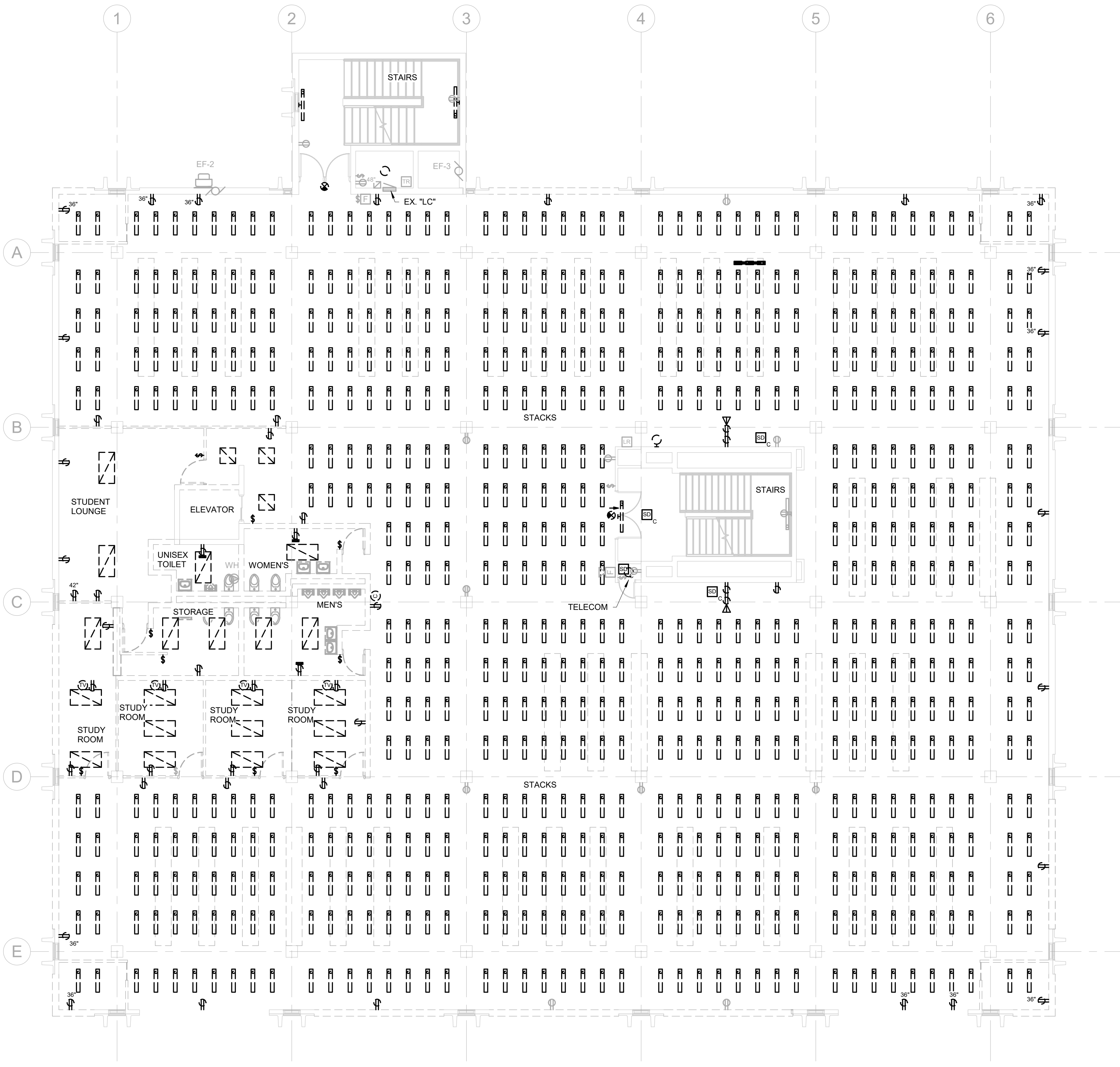
ISSUE:		
Issue Date	Project Status	

REVISION SCHEDULE:		
REV. #	REV. DSC.	REV. DATE

PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
SECOND FLOOR ELECTRICAL  
DEMOLITION PLAN

E1-2



 **SECOND FLOOR ELECTRICAL DEMOLITION PLAN**  
1/8" = 1'-0"

- ELECTRICAL MISCELLANEOUS NOTES
- A
- B
- C
- D
- E
- #
- ELECTRICAL SPECIFIC NOTES

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REVISION SCHEDULE:

REV. # REV. DSC. REV. DATE

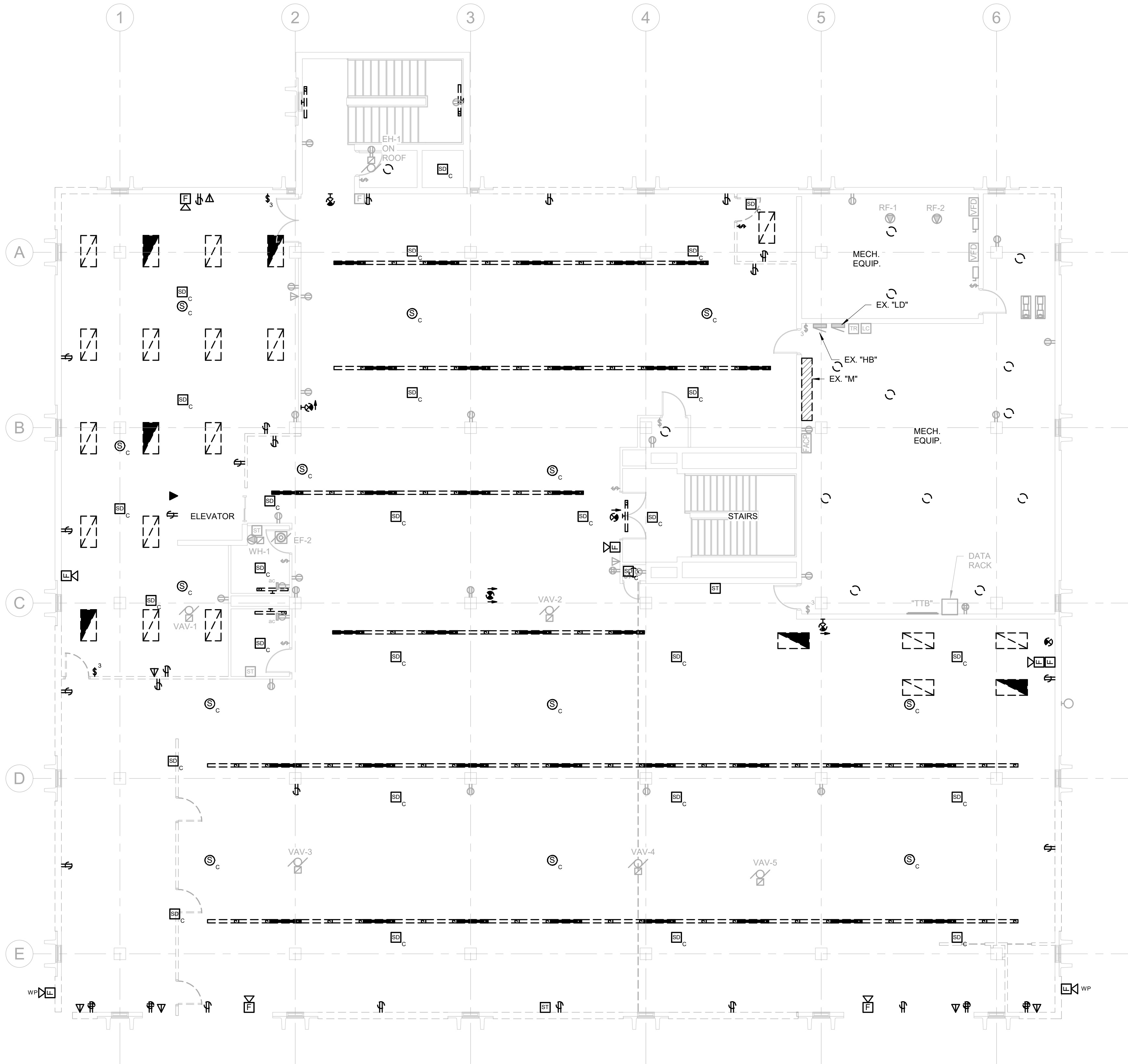
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

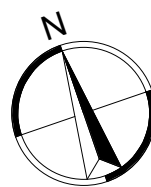
THIRD FLOOR ELECTRICAL  
DEMOLITION PLAN

E1-3



ELECTRICAL MISCELLANEOUS NOTES	
A	
B	
C	
D	

ELECTRICAL SPECIFIC NOTES	
1	

 **THIRD FLOOR ELECTRICAL DEMOLITION PLAN**  
1/8" = 1'-0"

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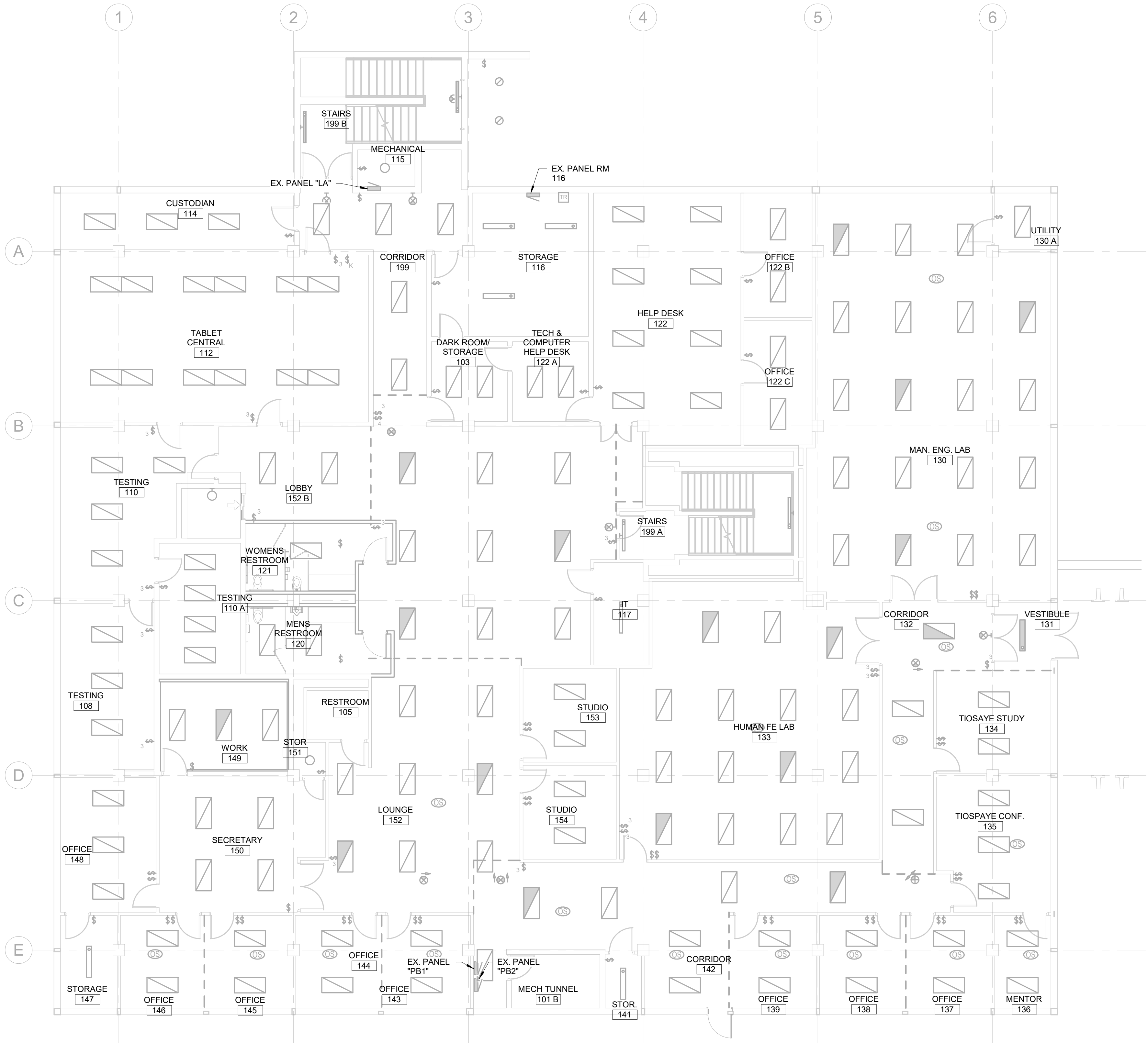
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

LOWER LEVEL LIGHTING PLAN

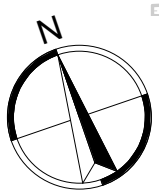
E2.0



ELECTRICAL MISCELLANEOUS NOTES

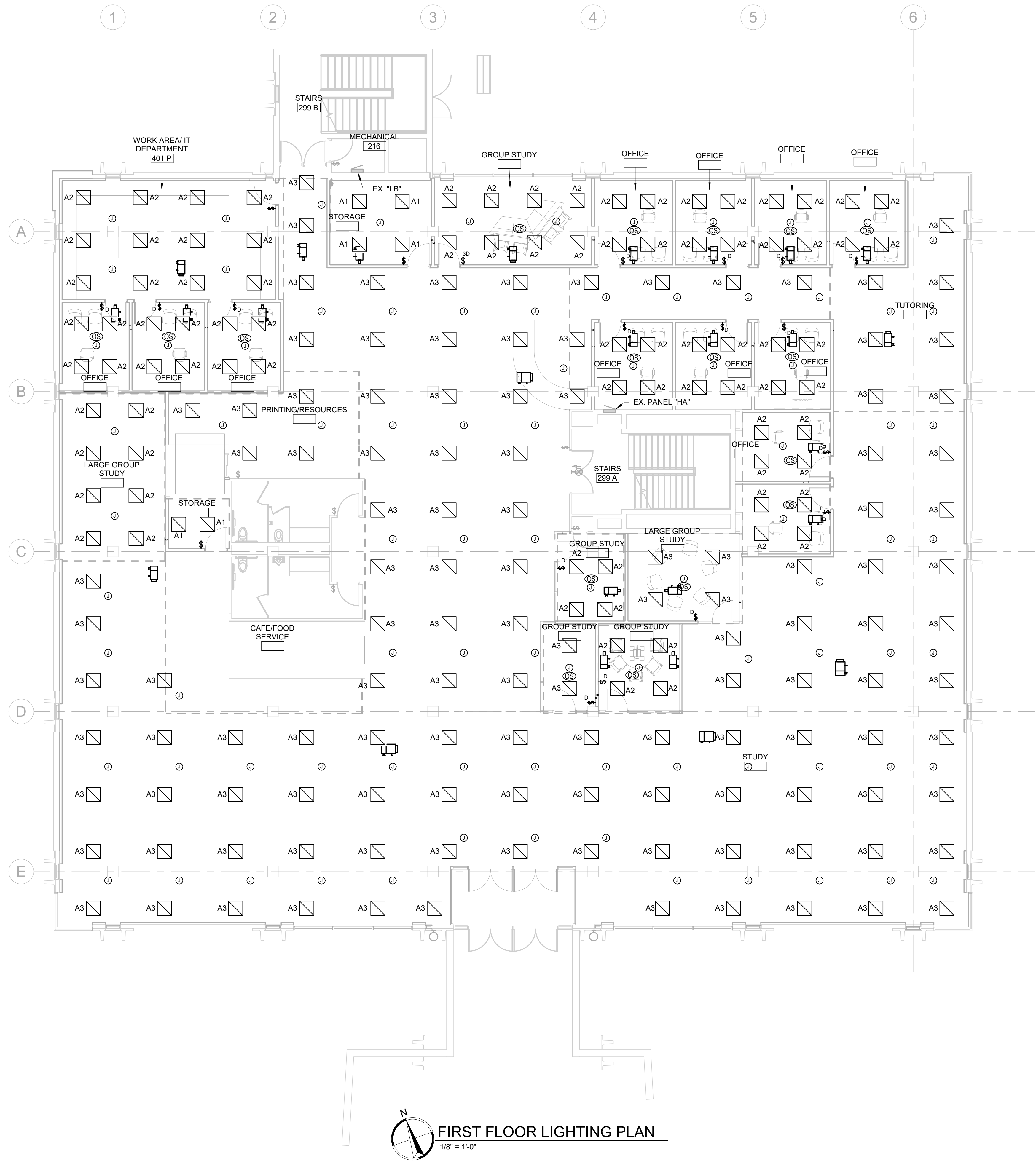
A  
B  
C  
D

ELECTRICAL SPECIFIC NOTES



LOWER LEVEL LIGHTING PLAN

1/8" = 1'-0"



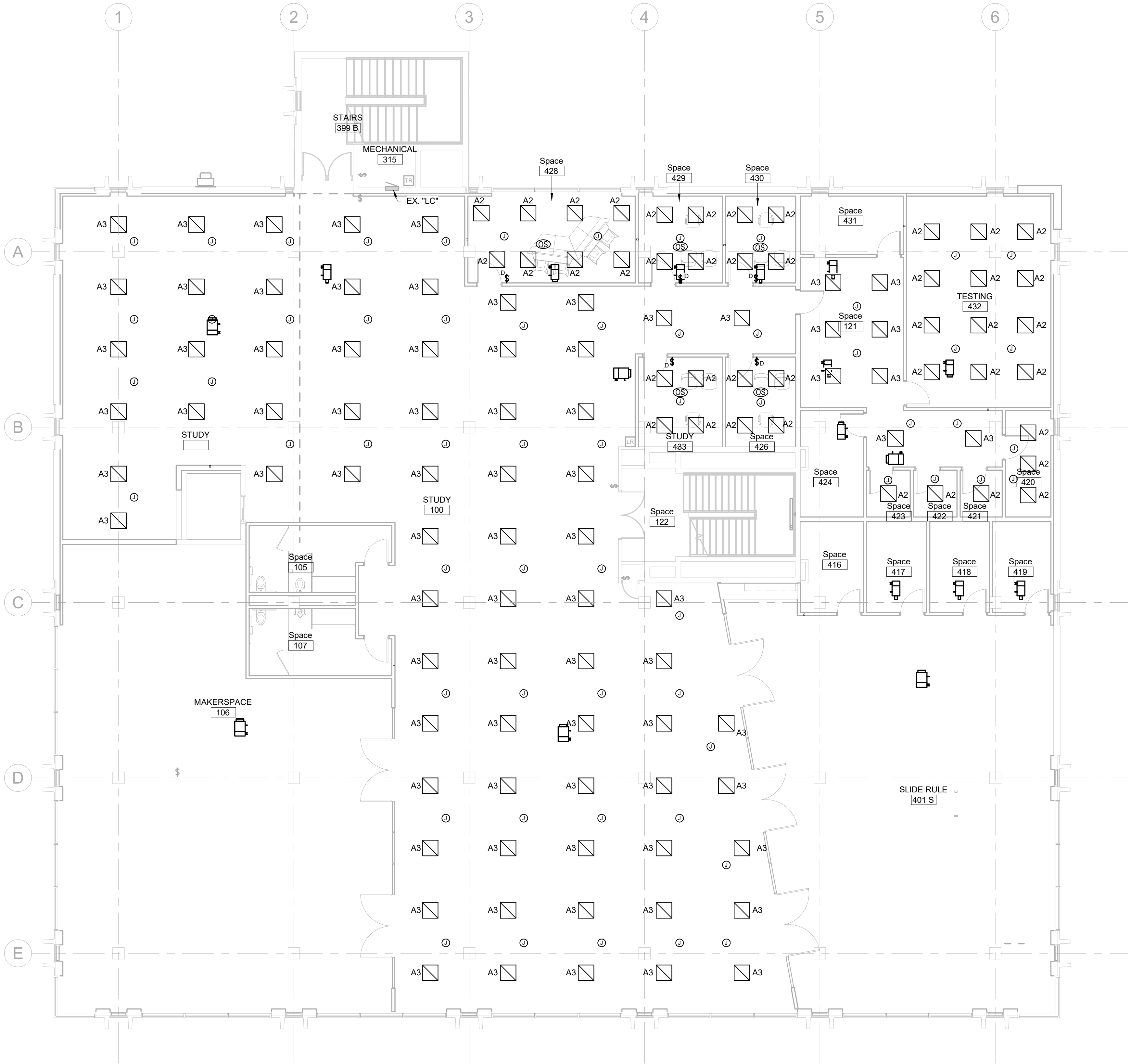
ELECTRICAL MISCELLANEOUS NOTES

A  
B  
C  
D

#

ELECTRICAL SPECIFIC NOTES

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 **SECOND FLOOR LIGHTING PLAN**  
1/8" = 1'-0"

**ELECTRICAL MISCELLANEOUS NOTES**

A  
B  
C  
D

**ELECTRICAL SPECIFIC NOTES**

**CO**

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**ISSUE:**

Issue Date	Project Status
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**REVISION SCHEDULE:**

REV. #	REV. DSC.	REV. DATE
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**PROJECT:**  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

**SHEET TITLE:**  
SECOND FLOOR LIGHTING  
PLAN

**E2.2**

CO

Arch

OP

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ELECTRICAL MISCELLANEOUS NOTES

A  
B  
C  
D

ELECTRICAL SPECIFIC NOTES

#



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ISSUE:

Issue Date Project Status

REVISION SCHEDULE:

REV. # REV. DSC. REV. DATE

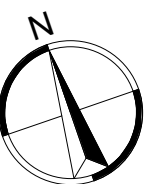
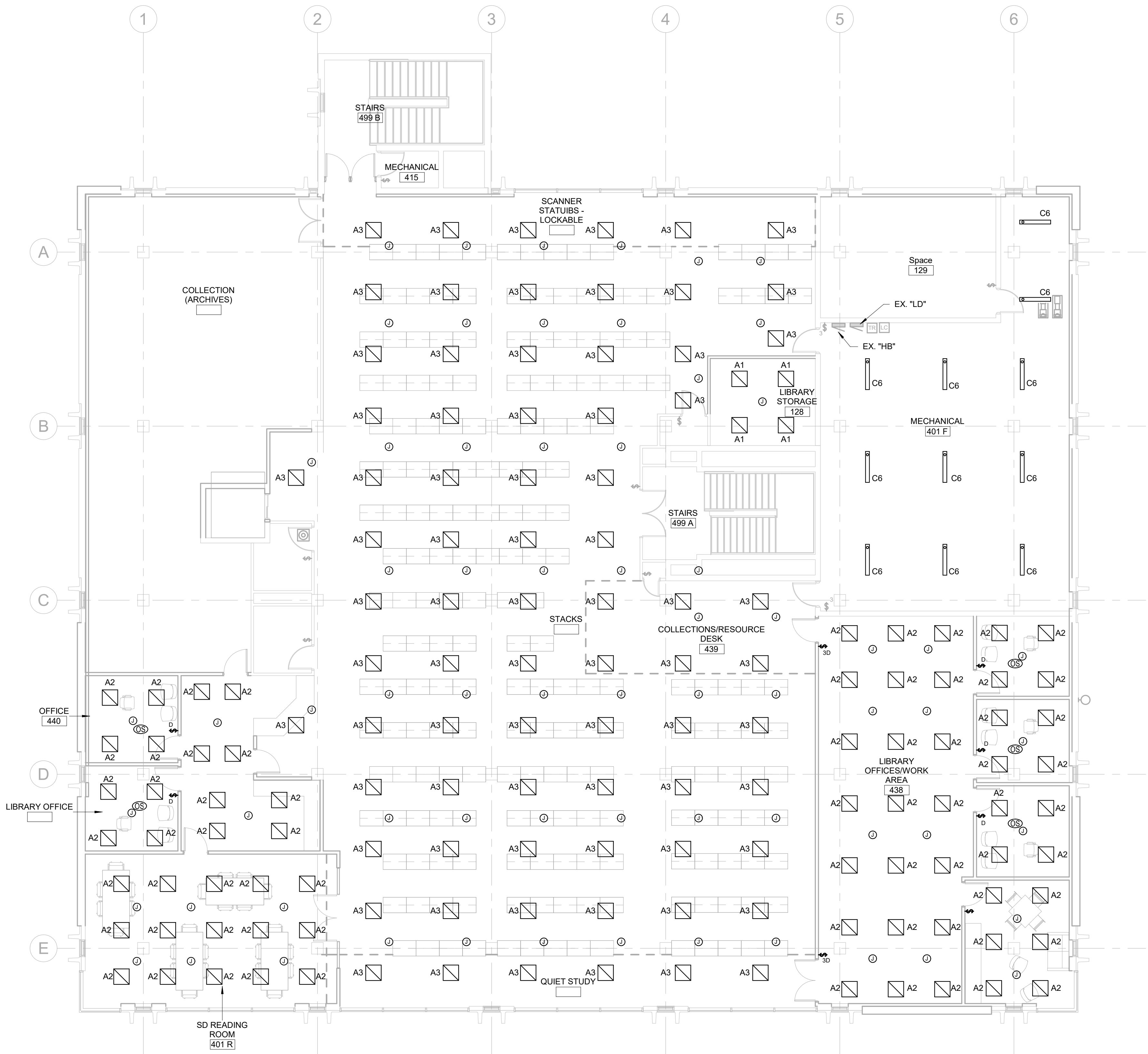
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

THIRD FLOOR LIGHTING PLAN

E2.3



THIRD FLOOR LIGHTING PLAN

1/8" = 1'-0"

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REVISION SCHEDULE:

REV. # REV. DSC. REV. DATE

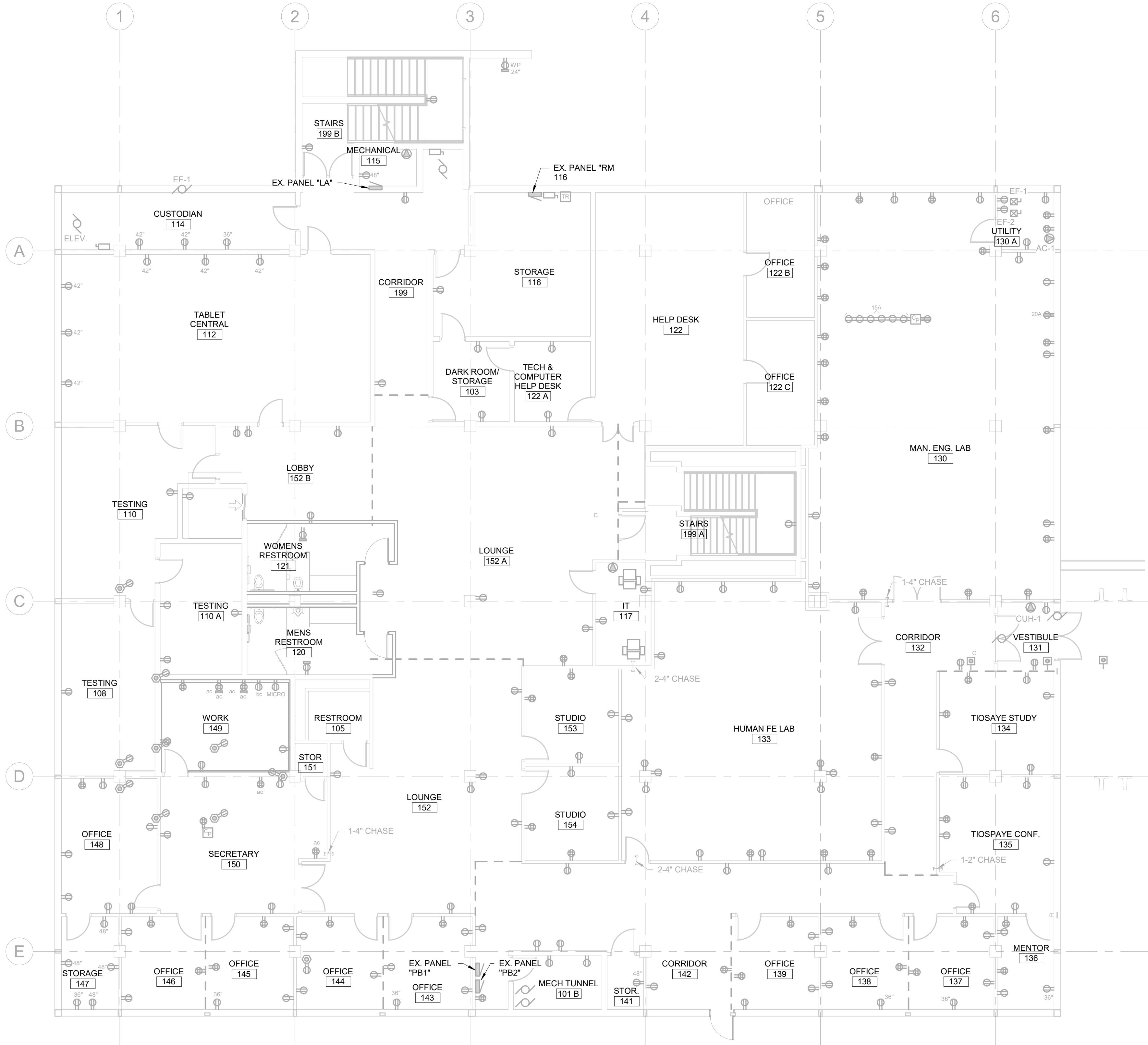
PROJECT:

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PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

LOWER LEVEL POWER PLAN

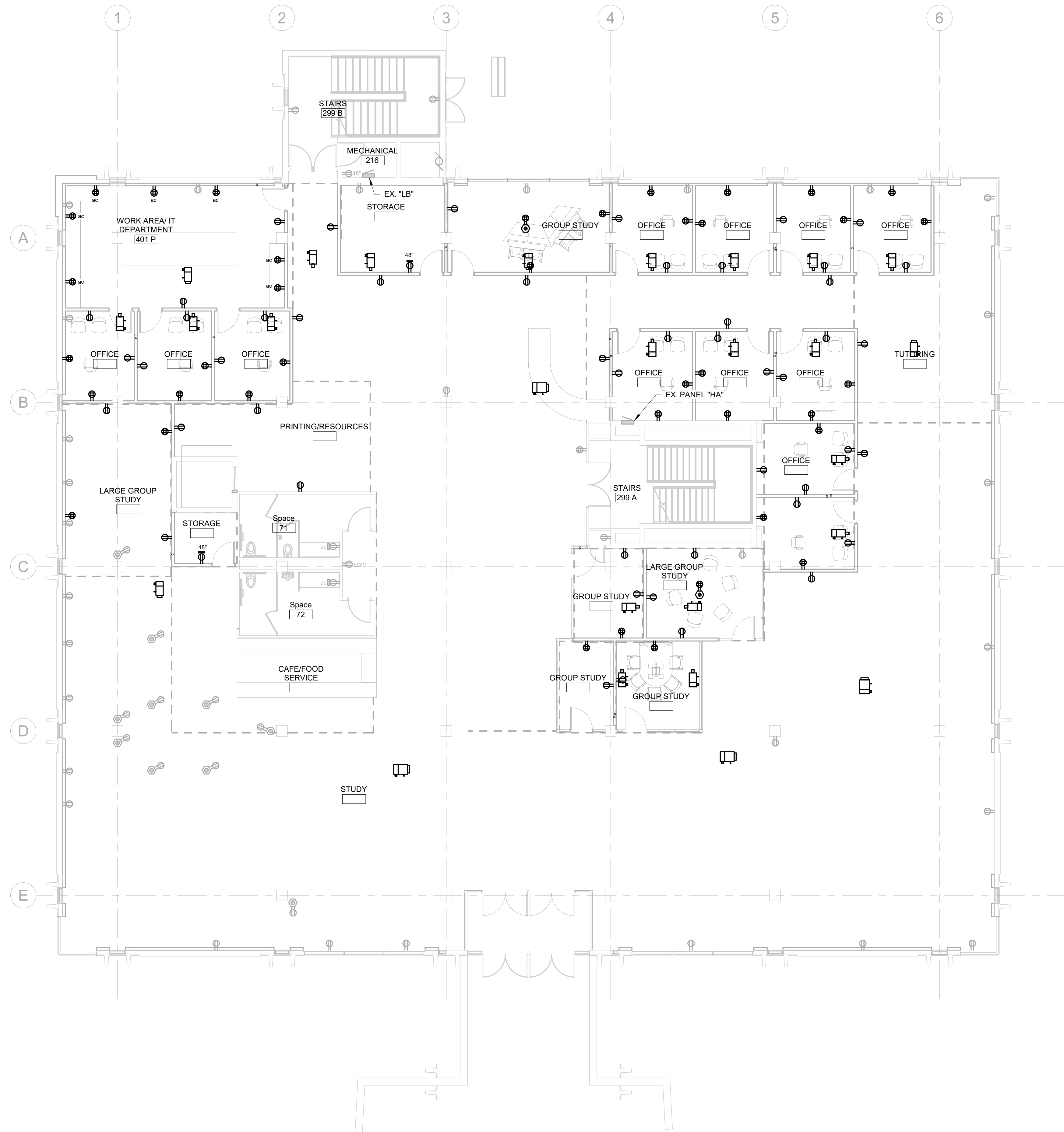
E3.0



ELECTRICAL MISCELLANEOUS NOTES

A  
B  
C  
D

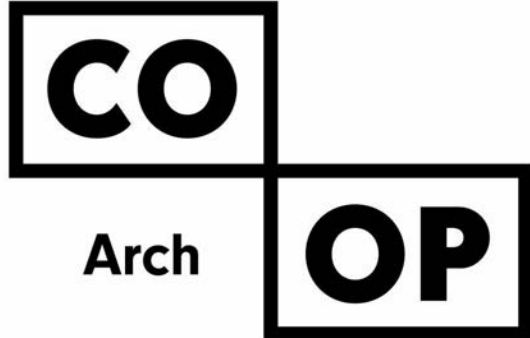
ELECTRICAL SPECIFIC NOTES



ELECTRICAL MISCELLANEOUS NOTES	
A	
B	
C	
D	

#	ELECTRICAL SPECIFIC NOTES
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 **FIRST FLOOR POWER PLAN**  
1/8" = 1'-0"



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ISSUE:

Issue Date	Project Status
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REVISION SCHEDULE:

REV. #	REV. DSC.	REV. DATE
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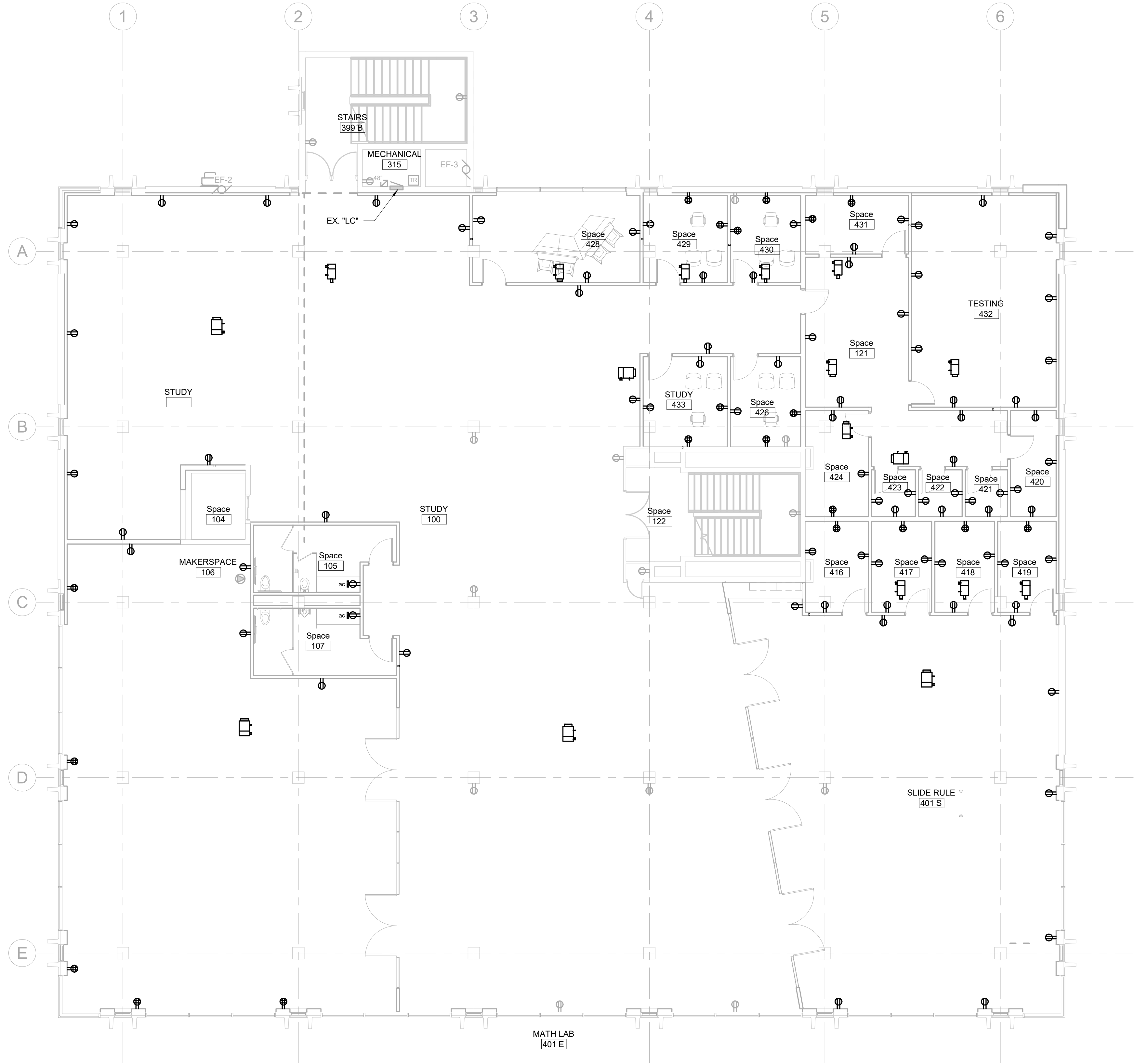
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

FIRST FLOOR POWER PLAN

E3.1

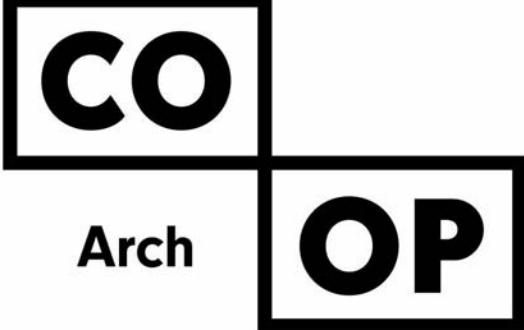
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 **SECOND FLOOR POWER PLAN**  
1/8" = 1'-0"

ELECTRICAL MISCELLANEOUS NOTES	
A	
B	
C	
D	

#	ELECTRICAL SPECIFIC NOTES
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**PROJECT:**  
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PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

**SHEET TITLE:**  
SECOND FLOOR POWER PLAN

**E3.2**

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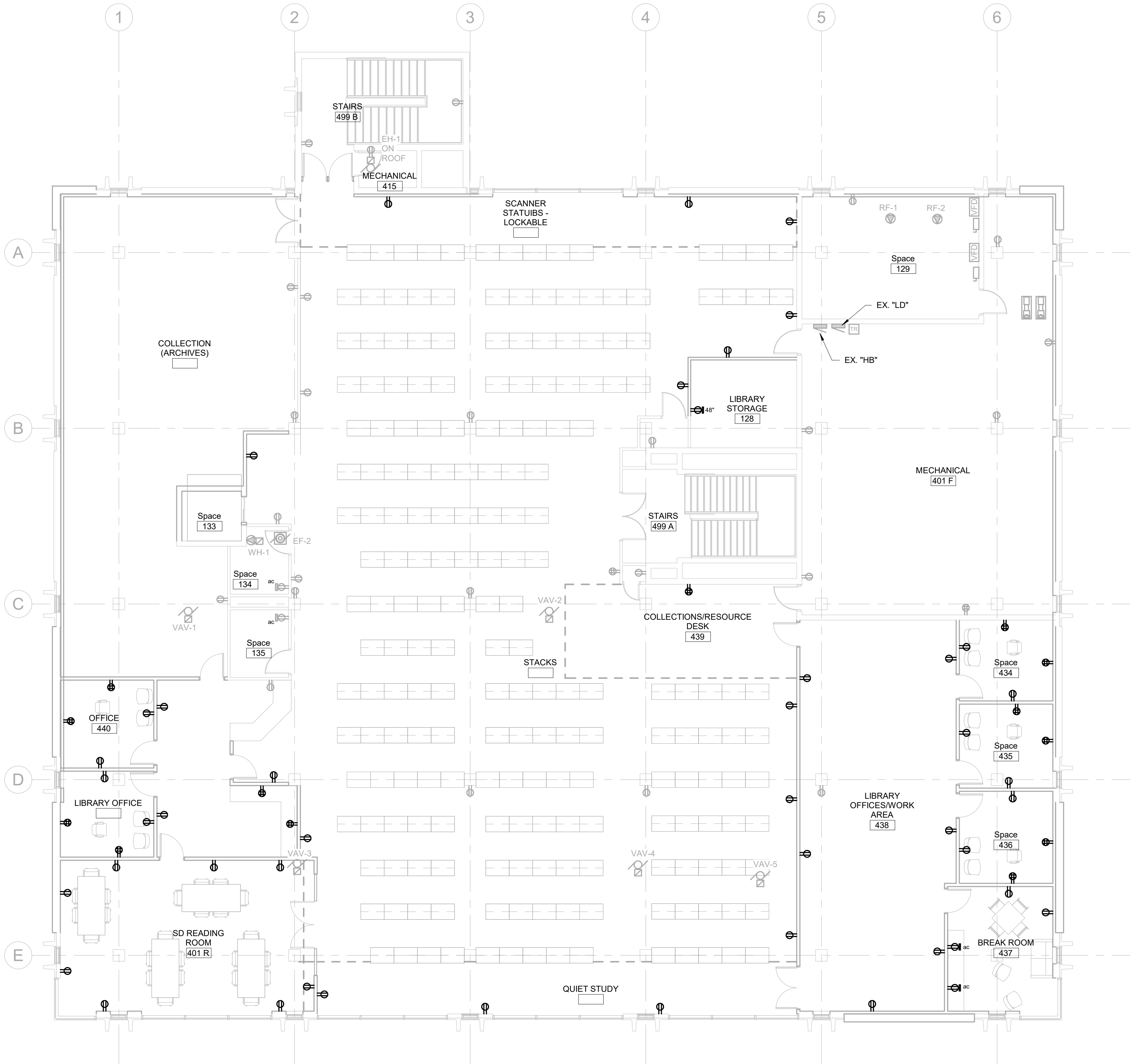
PROJECT:

SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

THIRD FLOOR POWER PLAN

E3.3

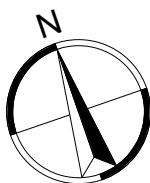


ELECTRICAL MISCELLANEOUS NOTES

A  
B  
C  
D

#

ELECTRICAL SPECIFIC NOTES



THIRD FLOOR POWER PLAN

1/8" = 1'-0"

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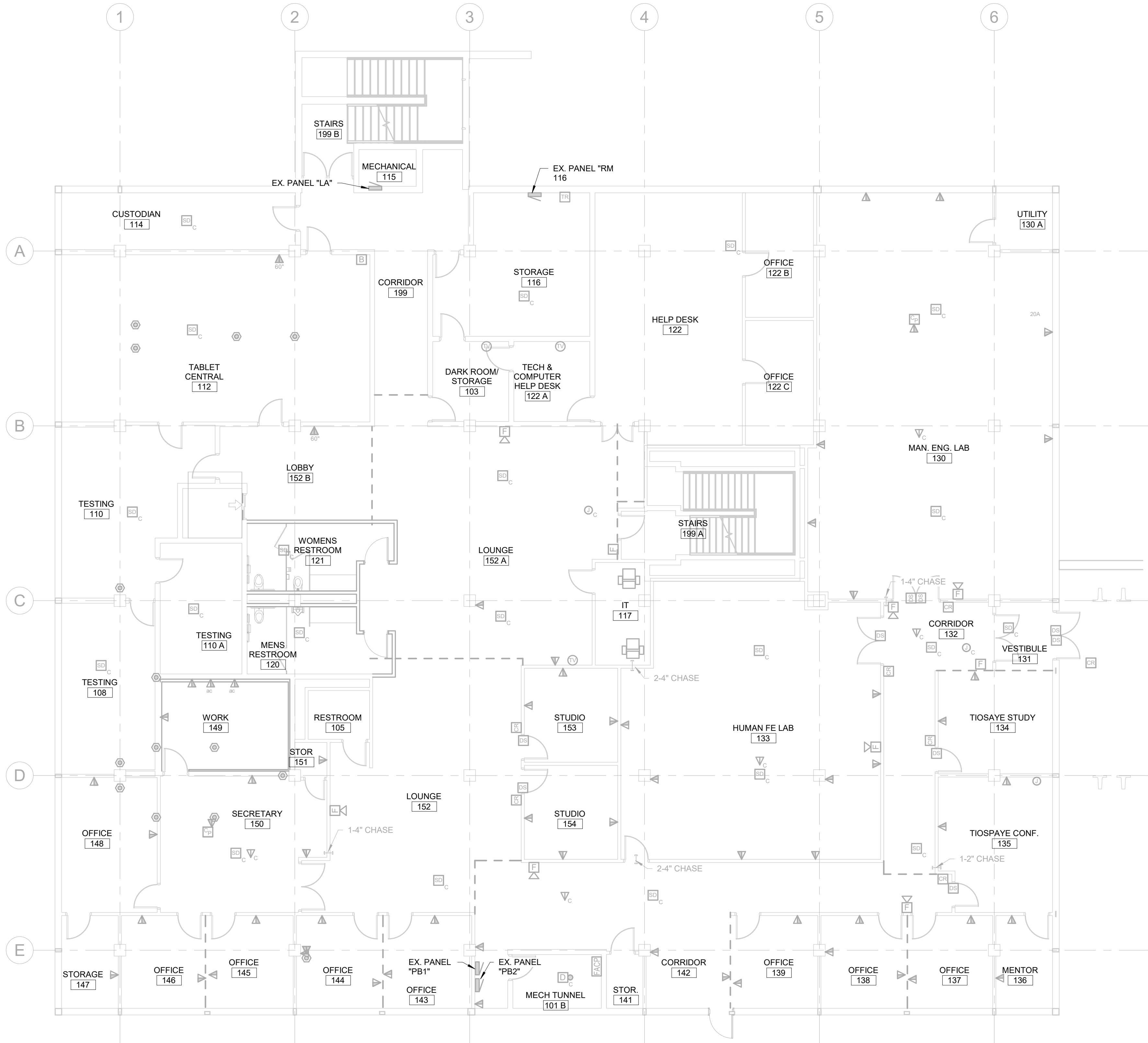
PROJECT:

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PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

LOWER LEVEL SIGNAL PLAN

E4.0

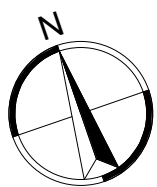


ELECTRICAL MISCELLANEOUS NOTES

A  
B  
C  
D

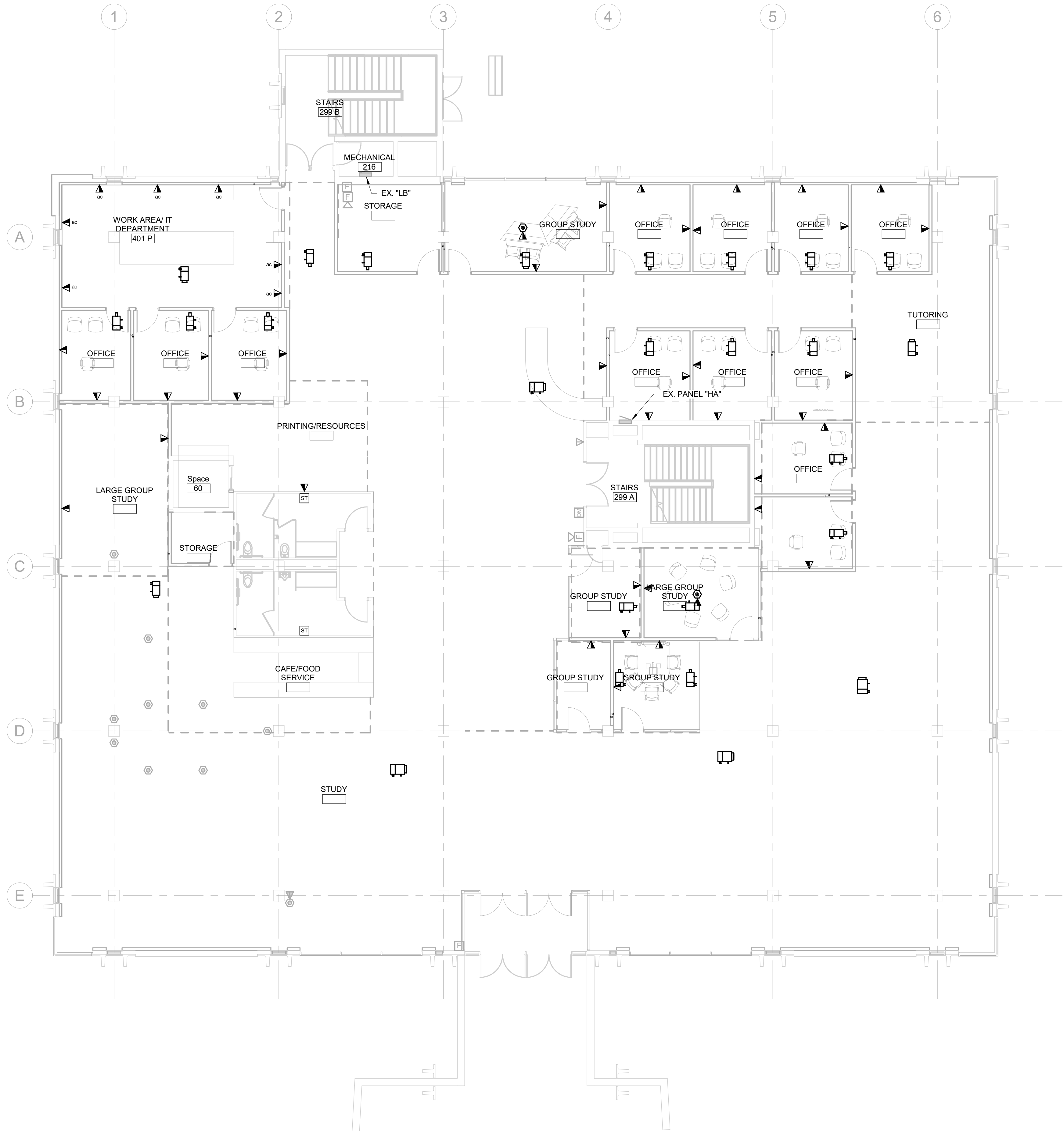
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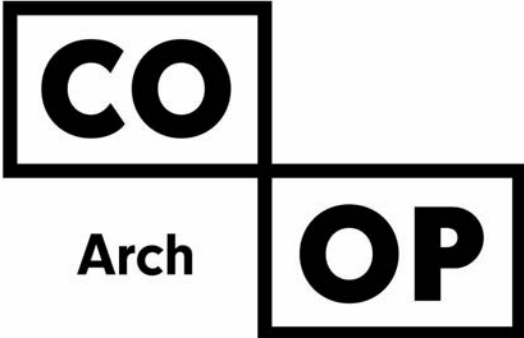
LOWER LEVEL SIGNAL PLAN

1/8" = 1'-0"



ELECTRICAL MISCELLANEOUS NOTES	
A	
B	
C	
D	

#	ELECTRICAL SPECIFIC NOTES
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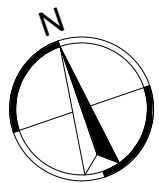
ISSUE:	
Issue Date	Project Status

REVISION SCHEDULE:		
REV. #	REV. DSC.	REV. DATE

PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:  
FIRST FLOOR SIGNAL PLAN

E4.1



FIRST FLOOR SIGNAL PLAN

1/8" = 1'-0"

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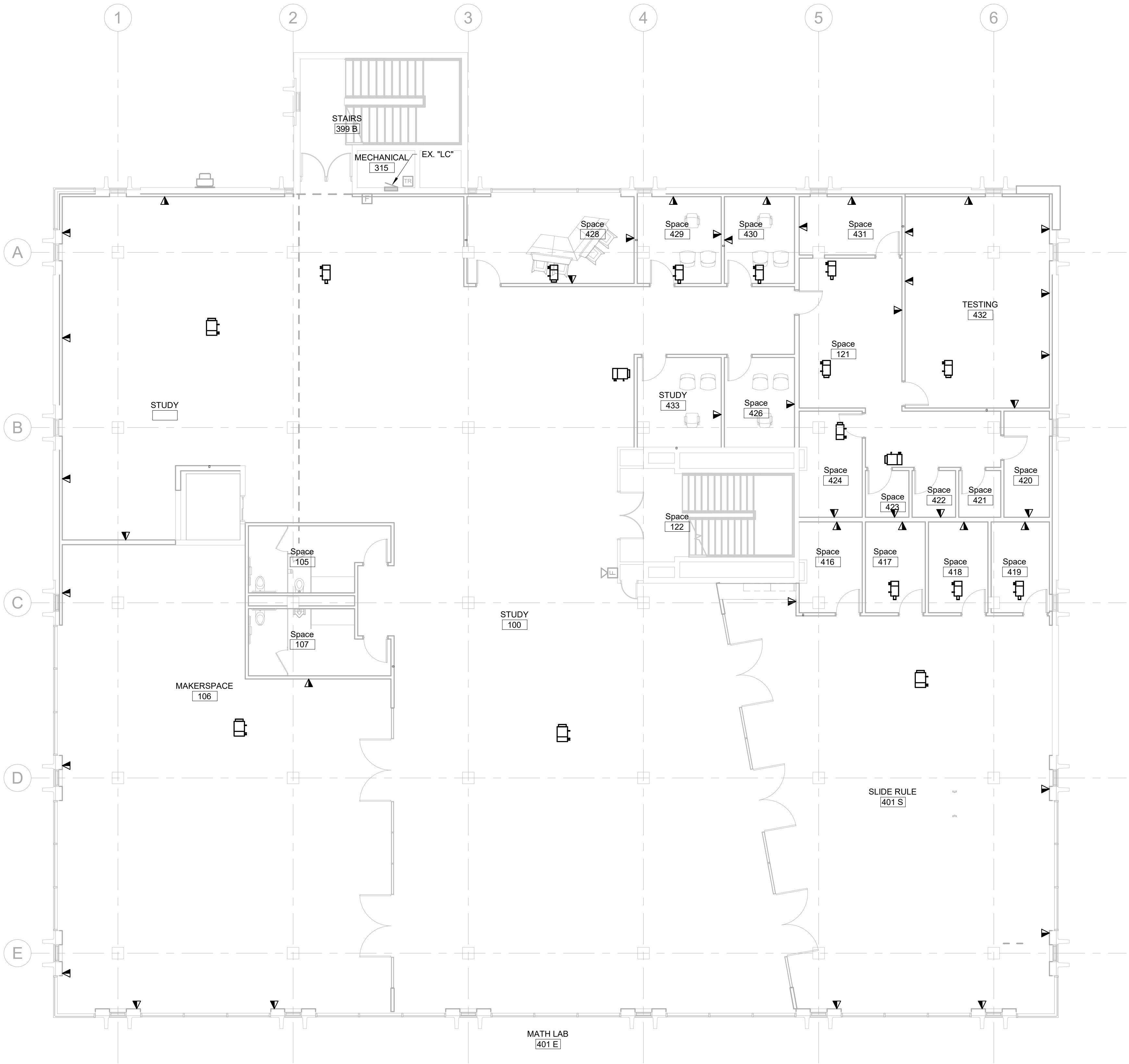
PROJECT:

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PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

SHEET TITLE:

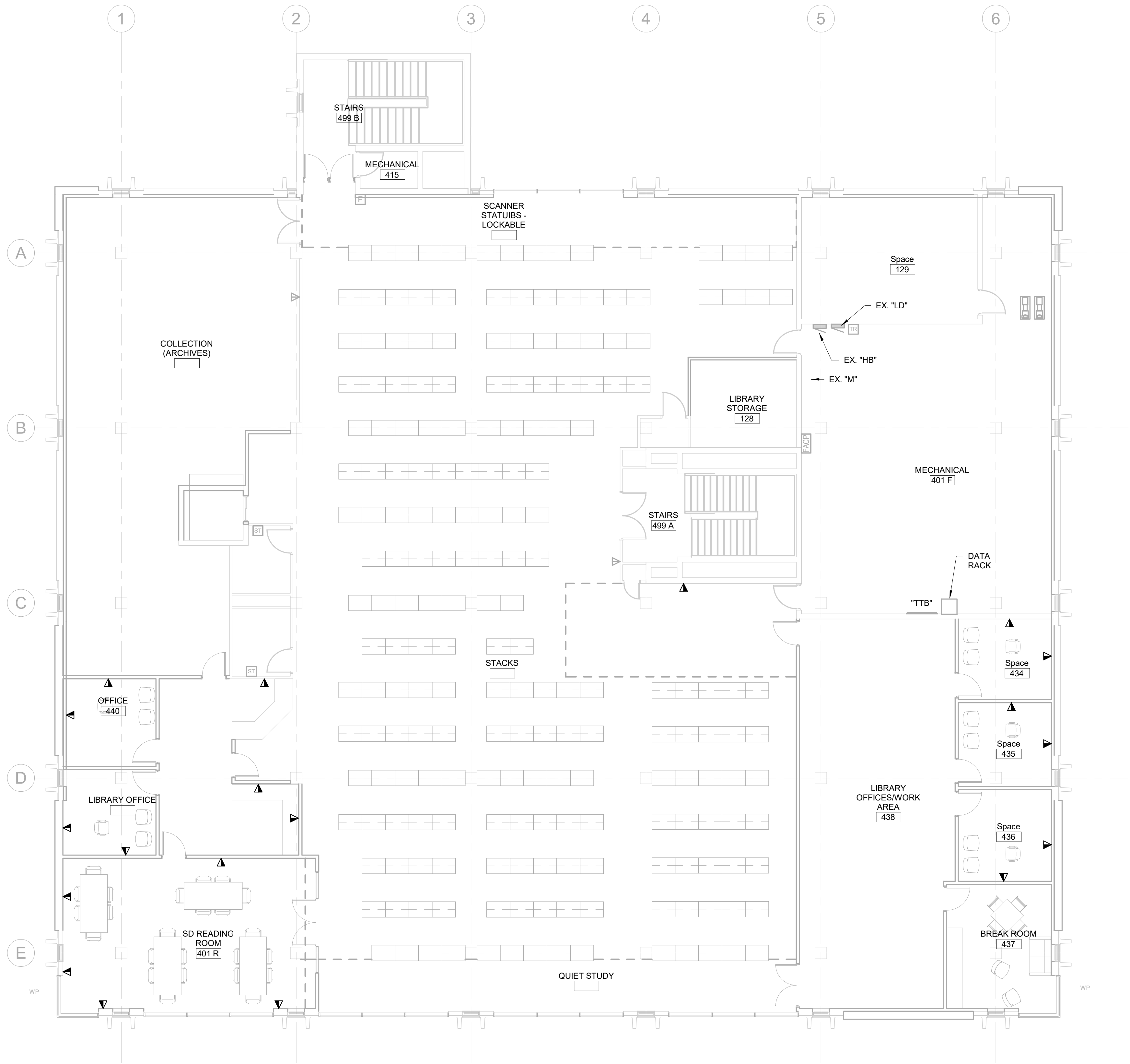
SECOND FLOOR SIGNAL PLAN

E4.2



ELECTRICAL MISCELLANEOUS NOTES	
A	
B	
C	
D	

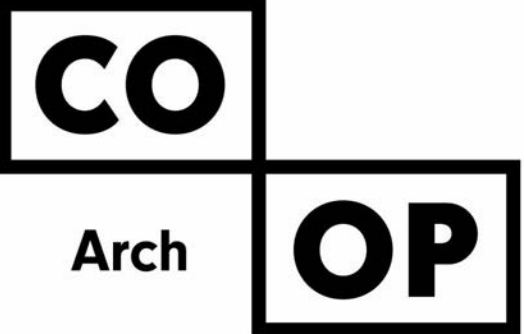
#	ELECTRICAL SPECIFIC NOTES
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ELECTRICAL MISCELLANEOUS NOTES

A  
B  
C  
D

ELECTRICAL SPECIFIC NOTES



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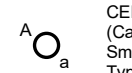

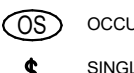

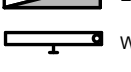
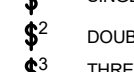
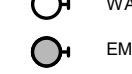

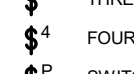


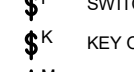
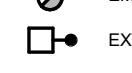
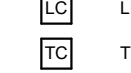
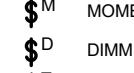
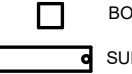

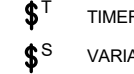

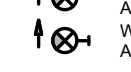
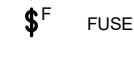
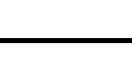
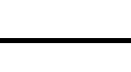
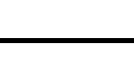
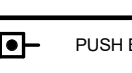
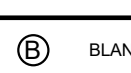

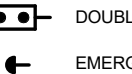

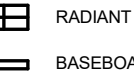

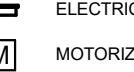
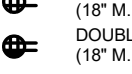
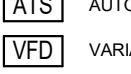
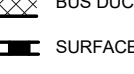
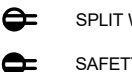



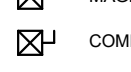
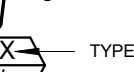
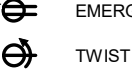




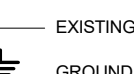

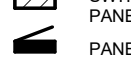
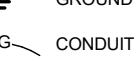

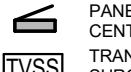
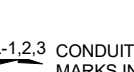

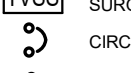
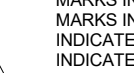

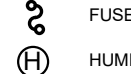
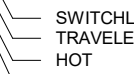


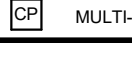
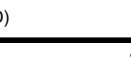
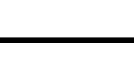
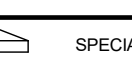

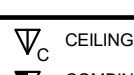
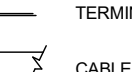


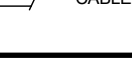
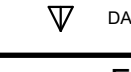
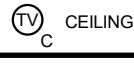


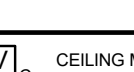
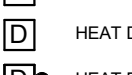


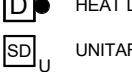
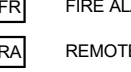
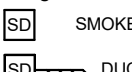
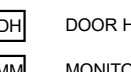
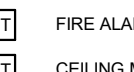
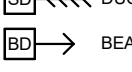
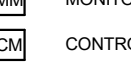
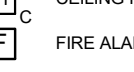
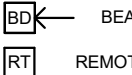
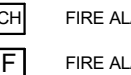
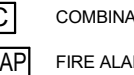
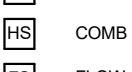
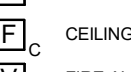

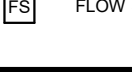

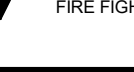

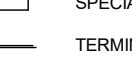
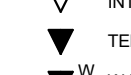
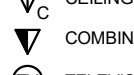
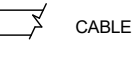


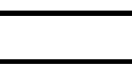
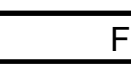
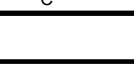
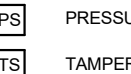
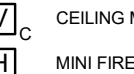

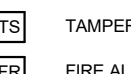

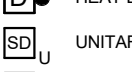
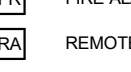
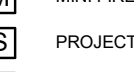
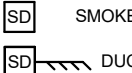
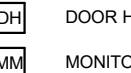
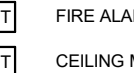
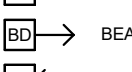


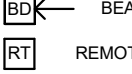
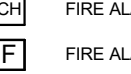
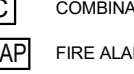

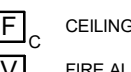
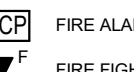
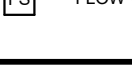
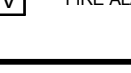
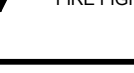
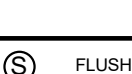

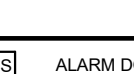
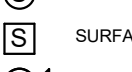
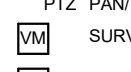


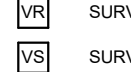
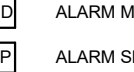
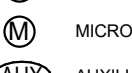
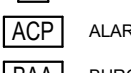
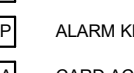
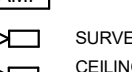


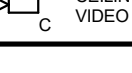
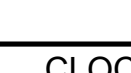
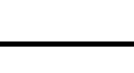
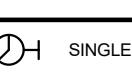
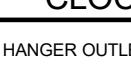
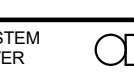
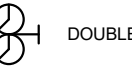


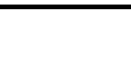
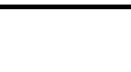
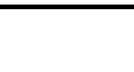















PROJECT:  
SDSMT DEVEREAUX LIBRARY  
PHASE 1  
SOUTH DAKOTA SCHOOL OF  
MINES AND TECHNOLOGY  
RAPID CITY, SOUTH DAKOTA

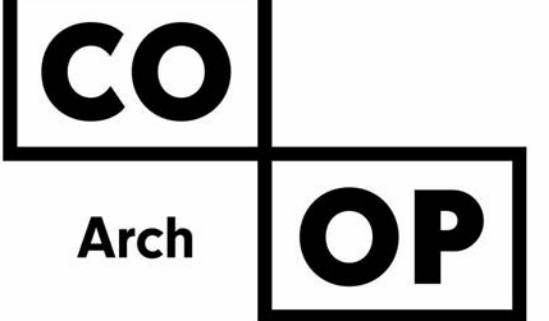
SHEET TITLE:  
THIRD FLOOR SIGNAL PLAN

E4.3

THIRD FLOOR SIGNAL PLAN  
1/8" = 1'-0"

ELECTRICAL ABBREVIATIONS			
A STANDARD LIST. NOT ALL WORDS APPEAR IN THESE DRAWINGS.			
SEE SPECIFICATION SECTION "EQUIPMENT WIRING" FOR ADDITIONAL INFORMATION AND REQUIREMENTS.			
A or AMP	AMPERE	LA	LIGHTNING ARRESTOR
A/C	AIR CONDITIONING	LT	LIGHT
A/E or AE	ARCHITECT & ENGINEER	LTG	LIGHTING
ac	ABOVE COUNTER	LTS	LIGHTS
AC	ALTERNATING CURRENT		
ADA	AMERICANS WITH DISABILITIES ACT	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCB	MAIN CIRCUIT BREAKER
AFG	ABOVE FINISH GRADE	MCC	MOTOR CONTROL CENTER
AFI or AFCI	ARC FAULT CIRCUIT INTERRUPTER	MCM	THOUSAND CIRCULAR MILS
AHJ	AUTHORITY HAVING JURISDICTION	MDP	MAIN DISTRIBUTION PANEL
AHU	AIR HANDLING UNIT	MECH	MECHANICAL
AIC	AMPERES INTERRUPTING CURRENT	MFS	MAIN FUSIBLE SWITCH
AL	ALUMINUM	MH	METAL HALIDE
ANN	ANNUNCIATOR	MLO	MAIN LUG ONLY
AS	AUTOMATIC SENSORS	MSB	MAIN SWITCHBOARD
AWG	AMERICAN WIRE GAUGE	MTD	MOUNTED
		MTS	MOTOR THERMAL SWITCH
		MV	MERCURY VAPOR
		MW	MICROWAVE
bc	BELOW COUNTER	NA or N/A	NOT APPLICABLE
BC	BELOW COUNTER	NC	NORMALLY CLOSED
BH	BASKETBALL HOOP OPER	NEC	NATIONAL ELECTRICAL CODE
BL	BLEACHER ELECTRIC OPERATOR	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
BRD or BD	BOARD		
BUH	BLAST UNIT HEATER		
		NEU, NEUT or N	NEUTRAL
C or COND	CONDUIT	NF	NON-FUSED
C/B or CB	CIRCUIT BREAKER	NL	NIGHT LIGHT
CAT	CATEGORY	NO	NORMALLY OPEN
CCT or CKT	CIRCUIT		
CM	CARBON MONOXIDE SENSOR	OFF, OF, or OFC	OFFICE
CO	CARBON MONOXIDE	OH	OVERHEAD
COMB	COMBINATION	OH	OVERHEAD DOOR
CONF	CONFERENCE		
CP	CEILING PROJECTOR	P	POLE
CTC	CABLE TERMINATION CABINET	PA	PUBLIC ADDRESS
Cu or CU	COPPER	PB	PUSH BUTTON
CUH	CONDENSING UNIT	PH	PHASE
		PLBG	PLUMBING
DC	DIRECT CURRENT	PML	PANEL
DC	DISTRIBUTION CABINET	PR or pr	PAIR
DP	DISTRIBUTION PANEL	PRV	POWER ROOF VENTILATOR
DISC	DISCONNECT	PS	PULL SWITCH
DISP	DISPOSAL	PTS	PROJECTION SCREEN
DOL	DOCK LEVELER	PZ	PAN TILT ZOOM
DN or DWN	DOWN	PVC	POLYVINYL CHLORIDE
DR	DOOR	PWR	POWER
DW	DISHWASHER	RCP	REFLECTED CEILING PLAN
DWG	DRAWING	REC or RECEPT	RECEPTACLE
		REF or REFRIG	REFRIGERATOR
EC	ELECTRICAL CONTRACTOR	RH	RADIANT HEAT
EC	ELECTRICAL CABINET	RH	RANGE HOOD
EF	EXHAUST FAN	RLY	RELAY
EH	ELECTRICAL HEAT	RM	ROOM
ELEC	ELECTRIC OR ELECTRICAL	RMS	ROOT MEAN SQUARE
EHD	ELECTRIC HAND DRYER		
EM or EMERG	EMERGENCY	SCC	SHORT CIRCUIT CURRENT
EMT	ELECTRICAL METALLIC TUBING	SD	SMOKE DETECTOR
ENT	ELECTRICAL NON-METALLIC TUBING	SFR	SAFETY RECEPTACLE
EUH	ELECTRIC UNIT HEATER	SFTY	SAFETY
EW	ELECTRIC WATER COOLER	SHLD	SHIELD OR SHIELDED
EXP	EXISTING	SIG	SIGNAL
		SMR	SURFACE MOUNT RACEWAY
F or FUS	FUSE OR FUSIBLE	SN	SOLID NEUTRAL
FA	FIRE ALARM	SP	SUMP PUMP
FAAP	FIRE ALARM ANNUNCIATOR PANEL	SPECS	SPECIFICATIONS
FACP	FIRE ALARM CONTROL PANEL	SPKR	SPEAKER
FBO	FURNISHED BY OTHERS	SPP	SPLIT WIRE RECEPTACLE
FL, FLU or FLUOR	FLUORESCENT	SW	SWITCH
FLA	FULL LOAD AMPERES	SWBD	SWITCH BOARD
FVNR	FULL VOLTAGE, NON-REVERSING		
FVR	FULL VOLTAGE, REVERSING	TC	TEMPERATURE CONTROL
		TC	TELEPHONE CABINET
GC	GENERAL CONTRACTOR	TOC	TEMPERATURE CONTROL CONTRACTOR
GD	GARBAGE DISPOSAL	TEL	TELEPHONE
GEN	GENERATOR	TL	TWIST LOCK
GFI or GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TR, TRANS or TRFM	TRANSFORMER
GRC	GALVANIZED RIGID CONDUIT	TTB	TELEPHONE TERMINATION BOARD
GND or GRND	GROUND	TV	TELEVISION
		TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
H & AC	HEATING & AIR CONDITIONING	TYP	TYPICAL
H & V	HEATING & VENTILATING	UG	UNDERGROUND
HA	HANDICAP ACCESS DOOR	UH	UNIT HEATER
HD	HAND DRYER	UV	UNIT VENTILATOR
HID	HIGH INTENSITY DISCHARGE		
HP	HORSE POWER	V	VOLT
HPS	HIGH PRESSURE SODIUM	VFD	VARIABLE FREQUENCY DRIVE
HTG	HEATING		
HTR	HEATER	W	WATT
HVAC	HEATING, VENTILATION & AIR CONDITIONING	WI	WITH
HZ	HERTZ (CYCLES/SEC)	W/O	WITHOUT
		WP	WEATHERPROOF
IC	INTERRUPTING CURRENT	WTR or H2O	WATER
IGR	ISOLATED GROUND RECEPTACLE	WS	WINDOW SHADE
IMC	INTERMEDIATE METAL CONDUIT	XFMR	TRANSFORMER
INC	INCANDESCENT	Y	WYE CONNECTION
ISO	ISOLATED OR ISOLATION	ø	PHASE
		Δ	DELTA
J, JB or J-BOX	JUNCTION BOX		
KCMIL	THOUSAND CIRCULAR MILS		
KV	KILOVOLT		
KVA	KILOVOLT - AMPERE		
KVAR	KILOVOLT - AMPERE REACTIVE		
KW	KILOWATT		
KWH	KILOWATT - HOUR		

ELECTRICAL SYMBOLS		
THESE SYMBOLS COMPRISE A STANDARD LIST. NOT ALL SYMBOLS MAY APPEAR ON THIS PROJECT.		
ALL MOUNTING HEIGHTS ARE TO CENTER OF DEVICE ABOVE FINISHED FLOOR. MOUNTING HEIGHTS INDICATED ON ARCH WALL ELEVATIONS OR AS NOTED SPECIFICALLY ON THE DRAWINGS OR IN THE SPECIFICATIONS SHALL TAKE PRECEDENCE OVER MOUNTING HEIGHTS LISTED BELOW.		
LIGHTING		
 CEILING SURFACE MOUNT FIXTURE: (Capital letter indicates fixture type. Small letter indicates switching. Typical for all fixture types)	 RECESSED FIXTURE	 OCCUPANCY SENSOR
 EMERGENCY CEILING SURFACE MOUNT FIXTURE	 EMERGENCY RECESSED FIXTURE	 SINGLE POLE SWITCH (48" M.H.)
 WALL FIXTURE	 FLOOD LIGHT	 DOUBLE POLE SWITCH (48" M.H.)
 EMERGENCY WALL FIXTURE	 TRACK LIGHT	 THREE-WAY SWITCH (48" M.H.)
 RECESSED FIXTURE	 PHOTO ELECTRIC CELL	 FOUR-WAY SWITCH (48" M.H.)
 EMERGENCY RECESSED FIXTURE	 LIGHTING CONTACTOR (54" M.H.)	 SWITCH WITH PILOT (48" M.H.)
 EXTERIOR POLE LIGHT	 TIME CLOCK (60" M.H.)	 KEY OPERATED SWITCH (48" M.H.)
 BOLLARD LIGHT	 EMERGENCY LIGHTING W/BATTERY PACK	 MOMENTARY CONTACT SWITCH (60" M.H.)
 SURFACE MOUNT FIXTURE	 CEILING EXIT LIGHT (FACE/S) SHADED, ARROW INDICATES CHEVRON	 DIMMER SWITCH (48" M.H.)
 EMERGENCY SURFACE MOUNT FIXTURE	 WALL EXIT LIGHT (FACE/S) SHADED, ARROW INDICATES CHEVRON	 TIMER SWITCH (60" M.H.)
		 VARIABLE SPEED SWITCH
		 FUSED SWITCH
POWER		
 PUSH BUTTON STATION (62" M.H.)	 BLANK OUTLET	 REMOTE HVAC SENSOR
 DOUBLE PUSH BUTTON STATION	 JUNCTION BOX	 RADIANT HEAT PANEL
 EMERGENCY SHUTDOWN PUSH-BUTTON	 PULL BOX	 BASEBOARD OR COVE ELEC. HEAT
 ISOLATED GROUND RECEPTACLE (18" M.H.)	 MOTOR	 ELECTRIC UNIT HEATER
 DUPLEX CONVENIENCE RECEPTACLE (18" M.H.)	 DISCONNECT SWITCH	 ELECTRIC CABINET UNIT HEATER
 SINGLE RECEPTACLE (18" M.H.)	 GENERATOR ANNUNCIATOR PANEL	 MOTORIZED DAMPER
 DOUBLE DUPLEX CONVENIENCE RECEPTACLE (18" M.H.)	 AUTOMATIC TRANSFER SWITCH	 BUS DUCT
 DOUBLE DUPLEX CONVENIENCE RECEPTACLE (18" M.H.)	 VARIABLE FREQUENCY DRIVE	 SURFACE MOUNT RACEWAY
 SPLIT WIRED DUPLEX RECEPTACLE (18" M.H.)	 COMBINATION VARIABLE FREQUENCY DRIVE DISCONNECT	 CEILING PADDLE FAN
 SAFETY CONVENIENCE RECEPTACLE	 MAGNETIC STARTER	
 POWER RECEPTACLE	 COMBINATION STARTER/DISCONNECT	 TYPE OF EQUIPMENT - SEE SCHEDULES
 EMERGENCY DUPLEX RECEPTACLE	 MOTOR THERMAL SWITCH	 EQUIPMENT NUMBER
 TWIST LOCK RECEPTACLE	 TRANSFORMER	 ROOFTOP EQUIPMENT/CIRCUITING
 GFI DUPLEX CONVENIENCE RECEPTACLE	 ELECTRIC METER	 EXISTING EQUIPMENT/CIRCUITING
 GFI DOUBLE DUPLEX CONVENIENCE RECEPTACLE	 SWITCHBOARD/DISTRIBUTION PANEL SECTION	 GROUND
 SPECIAL PURPOSE OUTLET OR CONNECTION	 PANELBOARD OR LOAD CENTER	 CONDUIT IN FLOOR OR UNDERGROUND
 CORD/PLUG	 PANELBOARD OR LOAD CENTER (EXISTING TO REMAIN)	
 CORD REEL	 TRANSIENT VOLTAGE SURGE SUPPRESSER	 PNL-1,2,3 CONDUIT IN WALL OR CEILING SPACE. CROSS MARKS INDICATE NUMBER OF WIRES. NO MARKS INDICATE TWO WIRES. ARROWS INDICATE HOME RUNS TO PANEL. NUMBERS INDICATE PANEL AND CIRCUIT IN PANEL.
 CEILING DUPLEX RECEPTACLE	 CIRCUIT BREAKER	 TRAVELER
 FLUSH FLOOR DUPLEX RECEPTACLE	 FUSE	 HOT
 FLUSH FLOOR DOUBLE DUPLEX RECEPTACLE	 HUMIDISTAT	 NEUTRAL WIRE
 FLUSH FLOOR MULTI-SERVICE OUTLET (WITH DEVICES INDICATED)	 THERMOSTAT	 INDICATES SEPARATE GROUND WIRE TO BE INSTALLED IN RACEWAY
 MULTI-SERVICE POLE (WITH DEVICES INDICATED)		
TELECOM		
 SPECIAL EQUIPMENT CABINET-AS NOTED	 INTERCOM	 CEILING MOUNT DATA OUTLET
 TERMINATION BOARD - AS NOTED	 TELEPHONE/VOICE OUTLET (18" M.H.)	 COMBINATION VOICE/DATA OUTLET (18" M.H.)
 CABLE TRAY	 WALL PHONE (48" M.H.)	 TELEVISION OUTLET (18" M.H.)
	 DATA OUTLET (18" M.H.)	 CEILING MOUNT TELEVISION OUTLET
FIRE ALARM		
 FIRE ALARM MANUAL STATION (48" M.H.)	 PRESSURE SWITCH	 CEILING MOUNT FIRE ALARM VOICE/STROBE
 HEAT DETECTOR (RATE OF RISE)	 TAMPER SWITCH	 MINI FIRE ALARM HORN
 HEAT DETECTOR (FIXED TEMP. ONLY)	 FIRE ALARM CUT-OFF RELAY	 MINI FIRE ALARM HORN/STROBE
 UNITARY TYPE SMOKE DETECTOR	 REMOTE ANNUNCIATOR	 PROJECTION HORN
 SMOKE DETECTOR	 DOOR HOLDER	 FIRE ALARM STROBE (60" M.H.)
 DUCT SMOKE DETECTOR	 MONITOR MODULE	 CEILING MOUNT FIRE ALARM STROBE
 BEAM DETECTOR TRANSMITTER	 CONTROL MODULE	 FIRE ALARM BELL (68" M.H.)
 BEAM DETECTOR RECEIVER	 FIRE ALARM CHIME/STROBE	 COMBINATION FIRE/SMOKE DAMPER
 REMOTE TEST STATION	 FIRE ALARM HORN/STROBE (60" M.H.)	 FIRE ALARM ANNUNCIATOR PANEL
 COMB HEAT/SMOKE DETECTOR	 CEILING MOUNT FIRE ALARM HORN/STROBE	 FIRE ALARM CONTROL PANEL
 FLOW SWITCH	 FIRE ALARM VOICE/STROBE (60" M.H.)	 FIRE FIGHTER PHONE JACK
SOUND AND SECURITY		
 FLUSH SPEAKER	 SURVEILLANCE VIDEO CAMERA - PTZ	 ALARM DOOR SWITCH
 SURFACE SPEAKER	 SURVEILLANCE VIDEO MONITOR	 DOOR RELEASE MECHANISM
 PAGING HORN	 SURVEILLANCE VIDEO RECORDER	 ALARM MOTION DETECTOR
 VOLUME CONTROL (48" M.H.)	 SURVEILLANCE VIDEO SWITCHER	 ALARM SHUNT PAD
 MICROPHONE OUTLET (18" M.H.)	 ALARM CONTROL PANEL	 ALARM KEYPAD
 AUXILIARY OUTLET	 BURGLAR ALARM ANNUNCIATOR	 CARD ACCESS
 AMPLIFIER	 ANTENNA (AS NOTED)	 SECURITY INTERCOM (54" M.H.)
 SURVEILLANCE VIDEO CAMERA	 ALARM PANIC SWITCH	 REQUEST EXIT PUSH BUTTON
 CEILING MOUNTED SURVEILLANCE VIDEO CAMERA		
CLOCKS AND BELLS		
 SINGLE FACE CLOCK	 CLOCK HANGER OUTLET	 WIRELESS CLOCK SYSTEM TRANSMITTER/RECEIVER
 DOUBLE FACE CLOCK		 BELL (68" M.H.)



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strang-inc.com



CO-OP PROJECT NO: 1936

PRELIMINARY  
NOT FOR  
CONSTRUCTION

ISSUE:

Issue Date Project Status

**SDSM&T Devereaux Library  
Building Assessment  
Rapid City, SD  
OSE#  
WPE # BR19035**

**November 03, 2020**

## Electrical Assessment

### 1.1 Interior Lighting

The 1<sup>st</sup> and 2<sup>nd</sup> floor interior lighting consists of a mix of 32 watt T8 fluorescent light fixtures with some 17 watt T8 light fixtures and some recessed incandescent light fixtures. The light fixtures were upgraded to T8 lamps from the old 40 watt T12 lamps that were originally installed in the building. The majority of the light fixtures on these floors are single lamp fixtures with an acrylic lens. These light fixtures are recessed into the ceiling construction. Light fixtures in other support spaces are a recessed acrylic lensed troffer type. Lighting in the entry/lobby area consists of 4 foot by 4 foot recessed fixtures with some recessed incandescent can lights. The light fixtures are provided with minimal controllability. The lighting in the collections areas are controlled via lighting relay panels on each floor and switched from a multiple switch bank in a single location on each floor. The rest of the lighting on these floors is controlled on a room by room basis via wall switches. Exit signs appear at egress points but the majority of them are not an LED energy efficient type. Very little emergency lighting is provided for egress needs. Where emergency lighting is provided, it is by way of wall mounted “bug eye” style fixtures which do not effectively provide egress lighting through stacks.

The interior lighting on the 3<sup>rd</sup> floor consists of a mixture of 32 watt T8 and 54 watt T5HO fluorescent light fixtures. The light fixtures were upgraded as part of a renovation project that took place in 2004. The light fixtures on this floor consist of rows of 45 watt T5HO, linear, indirect, pendant lights that are located over the collections and study areas. Light fixtures in the archives area are a recessed, acrylic lensed fixture type. The light fixtures in the mechanical spaces are still original fixtures to the building but have been upgrade to 32 watt, T8 lamps. The lighting in the collections/study areas are controlled via a wall switch located next to the stairs. The rest of the lighting on this floor is controlled on a room by room basis via wall switches. Exit signs appear at egress points and are an LED energy efficient type. These exits signs were installed during the 2004 project. Emergency lighting is provided via specific light fixtures that are furnished with emergency ballasts and battery packs.

The interior lighting in the basement consists of 28 watt T5 fluorescent light fixtures and LED exit signage. The basement lighting was installed new during the Industrial Engineering Renovation project that was completed in 2016. Emergency egress lighting is accomplished on this floor via specific light fixtures that are furnished with emergency ballasts and battery packs. Occupancy sensors are provided throughout much of the office, corridor, lobby, and lab spaces. Multilevel switching lighting control is also provided throughout a majority of the offices and lab spaces.

Most of the lighting on the 1st and the 2nd floor is dated and not consistent with the needs of the facility and it is our recommendation that it be replaced. General lighting shall be replaced with newer more energy efficient LED light fixtures. Occupancy sensors shall be provided to control the lights at restrooms and offices to also save on energy costs. The library has expressed dissatisfaction with the linear pendant style light fixtures on the 3rd floor that are above the collections/study areas. These linear pendant light fixtures shall be replaced with new 2x2 recessed style light fixtures in accordance with the school’s lighting standards. The basement lighting is in good working condition. Although not

necessarily needed; If the school wishes, the lighting could be changed out to new, more energy efficient LED type fixtures. Appropriate egress lighting shall be provided throughout the building. All exit signs will be upgraded to new LED style exit signs to provide energy savings. All new lighting shall be in accordance with ASHRAE 90.1 (Energy Standards for Buildings). Section 9 outlines lighting standards to assist in energy efficient design. It is not anticipated that LEED will be pursued on this project; however, if LEED is pursued a lighting control system with daylight harvesting will be provided for the project.

## 1.2 Electrical Service

The existing building is served by an 800Amp, 480Y/277Volt, three-phase, 4-wire electrical service. The service is fed by an underground feeder originating from a pad-mount transformer, located outside of the building. The electrical service consists of an exterior main service disconnect switch that feeds a main switchboard with fused switches located on the third floor. The switchboard appears to be original to the building. There are several branch circuit panelboards, located at each floor, throughout the building that are also of a similar age as that of the main switchboard.

The main switchboard and branch circuit panelboards that are serving the facility are old and at end of life. Parts are hard to find. If a failure was to occur, there could be significant down time while searching for replacement parts. The main switchboard and older branch circuit panelboards shall be replaced. The new main switchboard shall be a circuit breaker type and fully coordinated for arc fault with downstream branch circuit panelboards it will be serving. New branch circuit panelboards shall be provided as circuit breaker type. All new power distribution feeders shall consist of copper conductors in metallic conduit.

## 1.3 Branch Circuiting/Loads

With exception to the basement level, most of the branch wiring, wiring devices, and raceway systems appear to be of similar age as the building. There have been additional wiring devices and circuits added over the years utilizing surface raceway. Many of the wiring devices in the basement area were installed new during the Industrial Engineering Renovation project that was completed in 2016. The majority of the existing branch wiring, wiring devices, and raceway systems appear in fair condition.

Additional branch circuits for general purpose receptacles, computer workstations will be added to any renovated spaces. This will provide the occupants with the needed power for their day to day activities. The design of any remodeled areas will be worked out in conjunction with the occupants so that their electrical needs are being met. Branch circuit wiring shall be by way of copper conductors in metallic conduit. Minimum wire size shall be 12 AWG for 20A circuits. Circuits longer than 75 feet shall have the conductors' upsized in order to reduce voltage drop at devices served. All circuits will include a dedicated equipment grounding conductor pulled with the current carrying conductors. Dedicated neutral will be provided for all single pole circuit breakers to meet new code requirements. It is not anticipated that LEED will be pursued on this project; however, if LEED is pursued receptacle plug load control will be provided that will control 50% or more of all 120 volt receptacles by an automatic control

device. This is typically accomplished via a time of day controller, occupant sensor, or a signal from another control or alarm that indicates the area is unoccupied.

## 1.4 Food Service – Einstein Bagels

The library is being provided with a new food service program, Einstein Bagels. The electrical design shall plan for the electrical installation of the food service equipment, lighting, communications, and specific systems in accordance with the Einstein Bagels standards and requirements. A dedicated electrical branch circuit panelboard is planned to be provided for this area to power the new food service equipment. New GFCI type receptacles shall be provided in kitchen and food preparation space.

## 1.5 Special Systems

The buildings communication cabling appears to be in fair condition for the use of the facility. Additional communications jacks have been added as well as wireless access points.

Additional communications rough-in and wiring shall be installed to provide for any renovated space. Offices, work areas, and conference rooms shall be furnished with new telephone and data jacks to provide for the occupant's requirements. New telecommunications cabling will be plenum rated CAT 6 cable matching the school's standards for cabling. As such all new connectivity equipment such as switches and patch panels shall also be specified as CAT 6 compliant. Cabling shall be ran utilizing open wiring methods such as cable tray, and j-hooks above accessible ceiling spaces. If no accessible ceiling is provided, cabling shall be routed back to the communications closets in conduit.

The building is equipped with a fire alarm system that covers the majority of the building with automatic detection. The basement level is equipped with fire alarm devices that were installed as new during the Industrial Engineering Renovation project that was completed in 2016. Manual pull stations have been provided at the exits and the fire alarm notification has been provided by horn/strobes. The fire alarm control panel is located on the third floor and is an intelligent, addressable panel that was installed approximately fifteen years ago.

Existing fire alarm devices will be removed and new fire alarm devices will be added to allow for the renovated and reorganized spaces throughout the first, second, and third floors. New notification devices will be provided throughout to meet decibel and visual requirements per code.

Electrical rough-in shall be provided at doors for new access control devices. Electrical rough-in shall be provided in the form of electrical boxes and conduit in the wall for card readers, and conduit stubbed into the door frames for door switches and electric strikes. These doors shall be identified and coordinated with the school for exact locations.

## Mechanical Study

### 2.0: Plumbing System

The majority of the plumbing systems in the Devereaux Library have remained untouched since it was built in 1968. There have been minor modifications to the bathrooms on first, second, and fourth floors have brought parts of the facility up to current ADA standards. As the building has a flat roof, the building utilizes roof drains and storm drain piping.

The majority of the sanitary and domestic piping within the facility are original to the building and are approximately fifty-one years old. In areas where the piping is accessible, the domestic, sanitary, and storm system, shall be replaced.

### 2.1: Hydronic System

The original heating hydronic system serving the Devereaux Library was a steam to heating water converter that utilized steam from the central plant. The facility also originally had an absorption chiller that utilized the steam central plant heat and a fluid cooler located in the penthouse to produce chilled water. The heating system has remained relatively unchanged with a few heating devices being changed out. The chilled water system was converted over to an air cooled chiller part way through the life of the library and in 2004 was added to the chilled water central plant.

The majority of the heating and chilled water piping within the facility are original to the building and are approximately fifty-one years old. The hydronic pumps are making a significant amount of noise when operating. The piping (where accessible within the remodeled areas), steam heat exchanger, and pumps shall be replaced as part of this project.

### 2.2: HVAC System

The HVAC system in the Devereaux Library was originally a high pressure constant volume reheat system with a large built up air handling unit on third floor. Heating was provided by high pressure reheat boxes with zone control thermostats in the basement, first, and second floors. The reheat boxes are essentially a box with a hot water coil that tempers the air delivered to the space. The third floor was originally heated by hot water unit heaters. Throughout the years, the building and HVAC system have been modified extensively. Prior to 2004, a VFD was added to the AHU supply fan to reduce some overall fan energy. In 2004, return fans with VFDs were added to the building. The independent return fans, one serving the basement and first while the other serves second and third floors, were added to help control building pressurization issues. At the same time, series fan powered VAV boxes were added in the remodel of the third floor. This allowed the VFD on the supply fan to modulate to maintain airflow while providing for some energy reduction. In 2010, an energy conservation project added VAV shut off style boxes before each reheat box on the basement, first and second floors. This allowed even greater energy efficiencies.

The air handling unit's centrifugal supply fan installation is not ideal. The unit is a large 50 HP unit that discharges vertically. Typically a section of ductwork 2-1/2 times the outlet diameter is suggested for reduce loss from turbulence. The unit discharges vertically with a minimal amount of ductwork. This installation has remained unchanged from its initial install in 1968. This fan will be replaced with a dual plug/plenum fans.

The building has a unique HVAC supply and return duct system. Each floor except the third has a continuous lighting grid with built in return slots. Supply diffusers are installed in the lighting grid dividers. This is a built in place system that complicates maintenance. As part of this project, the ceiling grid will be replaced with a more standard system and new diffusers will be installed.

The library was built in 1968. So the existing air handler and high pressure reheat boxes are fifty-one years old. Surprisingly, the maintenance staff has reported that the existing system is relatively problem free. The VAV system will be upgraded in areas where work will be occurring.

### 2.3 Food Service – Einstein Bagels

The library is being provided with a new food service program, Einstein Bagels. The mechanical design shall plan for the plumbing and HVAC installation of the food service equipment in accordance with the Einstein Bagels standards and requirements.