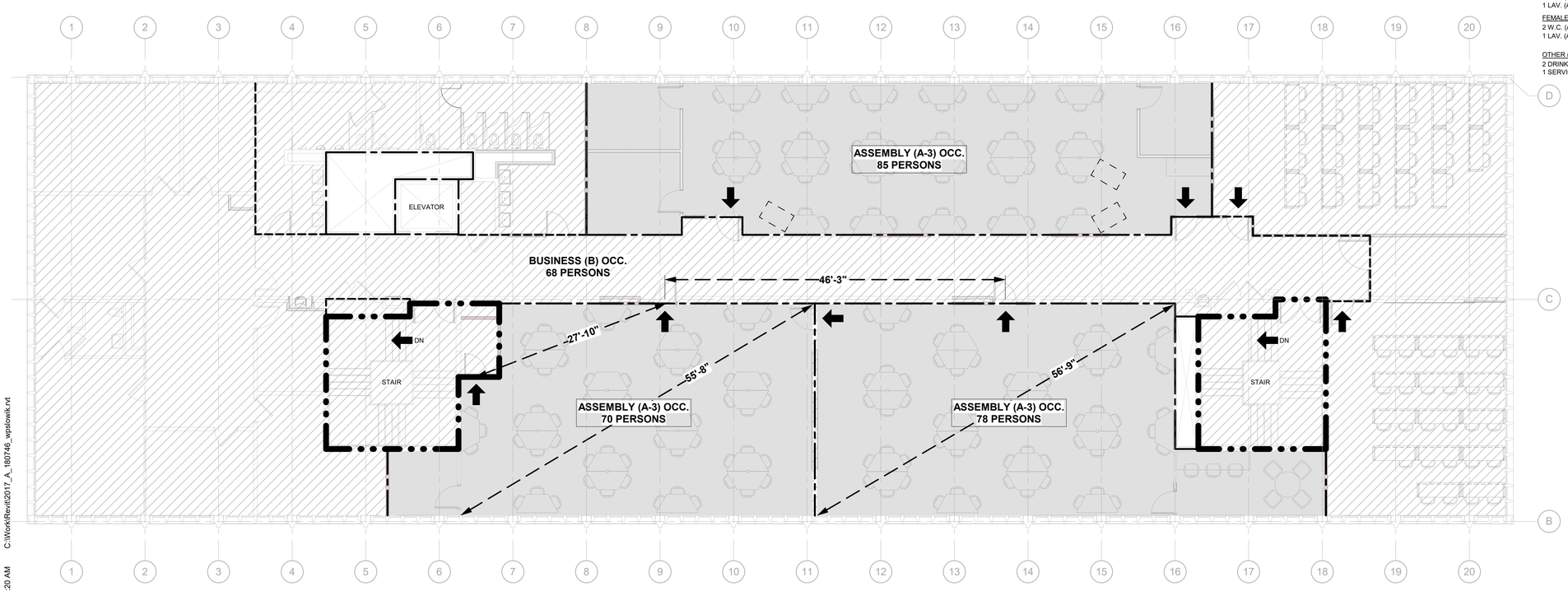


## SECOND FLOOR LIFE SAFETY PLAN

SCALE: 1/8" = 1'-0"

NORTH

0 4 8 16

## BUILDING CODE INFORMATION:

THE DRAWINGS HAVE BEEN PREPARED IN ACCORDANCE WITH THE FOLLOWING CODES, NOTIFY THE ARCHITECT OF ANY CONFLICTS

### CODES

2015 MICHIGAN REHABILITATION CODE (AS AMENDED) - Chapters 7 & 8
2015 MICHIGAN MECHANICAL CODE (AS AMENDED)
2015 MICHIGAN PLUMBING CODE (AS AMENDED)
2014 NATIONAL ELECTRIC CODE (NEC) (AS AMENDED - MICHIGAN AMENDMENTS PART 8 RULES)
2015 MICHIGAN ENERGY CODE
INTERNATIONAL ENERGY CONSERVATION CODE - 2009, SECTION 501.1
ANSI/ASHRAE/IESNA STANDARD 90.1-2007 (AS AMENDED)
2015 INTERNATIONAL FIRE CODE
2012 NFPA LSC
WSU FIRE SAFETY MANUAL
BARRIER FREE REQUIREMENTS:
AMERICANS WITH DISABILITIES ACT (ADA)
MBC-2015, CHAPTER 11
ICC A117.1-2009, EXCEPT SECTIONS 611 & 707

A3

### STANDARDS

WAYNE STATE UNIVERSITY CONSTRUCTION DESIGN STANDARDS - SECOND REVISION, SEP. 2012
WAYNE STATE UNIVERSITY C&IT DESIGN STANDARDS

| ITEM | CODE SECTION (INCL. AMENDMENTS) |
|---|---|
| **CLASSIFICATION OF WORK** | |
| ALTERATION LEVEL 2 | (MRC-CHAPTER 5) |
| **BUILDING USE GROUP** | |
| MIXED USE, SEPARATED USES<br>B BUSINESS<br>A-3 ASSEMBLY | (MBC-SEC: 304) |
| **TYPE OF CONSTRUCTION** | |
| CONSTRUCTION TYPE IIB - ASSUMED (PARTIALLY SPRINKLERED) | (MBC-SEC: 602) |

### FIRE RESISTANCE RATINGS OF STRUCTURAL ELEMENTS

| ITEM | RATING (HOURS) | UL NO. | REMARKS |
|---|---|---|---|
| STRUCTURAL FRAME | 0 | --- | (TABLE 601) |
| BEARING WALLS - EXT. | 0 | --- | (TABLE 601) |
| INT. | 0 | --- | (TABLE 601) |
| NONBEARING WALLS - EXT. | 0 | --- | (TABLE 601) |
| INT. | 0 | --- | (TABLE 601) |
| FLOOR CONSTRUCTION | 0 | --- | (TABLE 601) |
| ROOF CONSTRUCTION | 0 | --- | (TABLE 601) |
| SHAFT ENCLOSURES | 0 | --- | (SEC. 707.4) |
| STAIR ENCLOSURES | 0 | --- | (SEC. 707.4) |

### OCCUPANCY

SECOND FLOOR

| | | |
|---|---|---|
| BUSINESS (B) OCCUPANCY | 6,702 S.F./100 PER OCCUP. | = 68 OCCUPANTS |
| ASSEMBLY (A-3) OCCUPANCY | 4,706 S.F./20 PER OCCUP. | = 233 OCCUPANTS |
| | TOTAL | = 301 OCCUPANTS |

EGRESS COMPONENTS (TABLE 1005.1)

OCCUPANCY: MIXED USE SEPARATED STAIRWAYS 0.2" OTHER COMPONENTS 0.15"

SECOND FLOOR: 302 PEOPLE x 0.15"/PERSON = 45.3 INCHES
PROVIDED: 2 DOORS @ 63 INCHES CLEAR = 126 INCHES

STAIRS: 302 PEOPLE x 0.2"/PERSON = 60.4 INCHES (36 MIN.)
PROVIDED: 2 STAIRS @ 65 INCHES CLEAR = 130 INCHES

### PLUMBING FIXTURE COUNT

MINIMUM NUMBER OF PLUMBING FACILITIES (TABLE 403.1)

A-3 OCCUPANCY: 233 OCCUPANTS - 117 EACH GENDER
B OCCUPANCY: 68 OCCUPANTS - 34 EACH GENDER

| MALE (REQUIRED - A-3) | MALE (PROVIDED) |
|---|---|
| 1 W.C. (A-3) + 2 W.C. (B)<br>1 LAV. (A-3) + 1 LAV. (B) | 2 W.C.<br>3 LAV.<br>3 URINALS |
| **FEMALE (REQUIRED A-3)** | **FEMALE (PROVIDED)** |
| 2 W.C. (A-3) + 2 W.C. (B)<br>1 LAV. (A-3) + 1 LAV. (B) | 5 W.C.<br>3 LAV. |
| **OTHER (REQUIRED)** | **OTHER (PROVIDED)** |
| 2 DRINKING FOUNTAIN<br>1 SERVICE SINK | 2 DRINKING FOUNTAIN<br>1 SERVICE SINK |

## LIFE SAFETY NOTES:

1. CLEAR UNOBSTRUCTED EGRESS TO BE MAINTAINED. ALL CONSTRUCTION MATERIALS AND EQUIPMENT SHALL BE STAGED WITHIN CONSTRUCTION AREAS OR DESIGNATED AREA AND NOT IN EGRESS CORRIDORS.
2. MAINTAIN TEMPORARY 1 HOUR FIRE BARRIER BETWEEN CONSTRUCTION AREA AND ADJACENT OCCUPIED SPACES. PROVIDE DUST BARRIERS/CONTROL MEASURES FOR DUST GENERATING ACTIVITIES. DOORS TO CONSTRUCTION AREAS TO REMAIN CLOSED AT ALL TIMES TO SEPARATE CONSTRUCTION FROM ANY OCCUPIED AREAS. THE SECOND FLOOR IS UNOCCUPIED DURING PROJECT SCHEDULE. PROVIDE SIGNS INDICATING CONSTRUCTION ON STAIRWELL DOORS.
3. CONSTRUCTION CONTRACTOR TO PROVIDE FIRE EXTINGUISHER WITHIN THE CONSTRUCTION SITE AT ALL TIMES DURING PROJECT.
4. PLAN INDICATES BOTH NEW AND EXISTING RATED PARTITIONS. SEE FLOOR PLAN ON SHEET A101 FOR NEW RATED PARTITION LOCATIONS. MAINTAIN RATING AT EXISTING STAIR TOWERS AND MECHANICAL SHAFTS.

## LIFE SAFETY LEGEND

- EXIT
- SMOKE-TIGHT PARTITION
- 1-HOUR FIRE RATED WALL ASSEMBLY
- 2-HOUR FIRE RATED WALL ASSEMBLY

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**WSU Project: 022-313456**

| REVISIONS | | |
|---|---|---|
| 08/23/2018 | A3 | ADDENDUM 3 |

| | |
|---|---|
| 8/13/2018 | BIDS |

Drawn By WPS / HMW
Designer WPS
Reviewer
Manager MM5

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PROJECT NO.
180746

SECOND FLOOR LIFE SAFETY PLAN

# LS101

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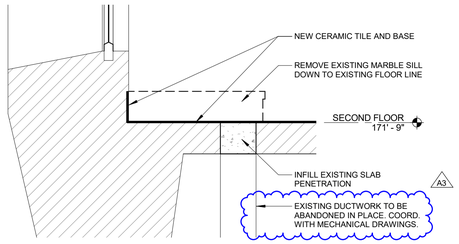
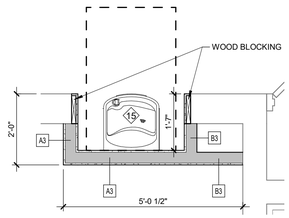



## 3 BATHROOM SILL DETAIL

SCALE: 1 1/2" = 1'-0"

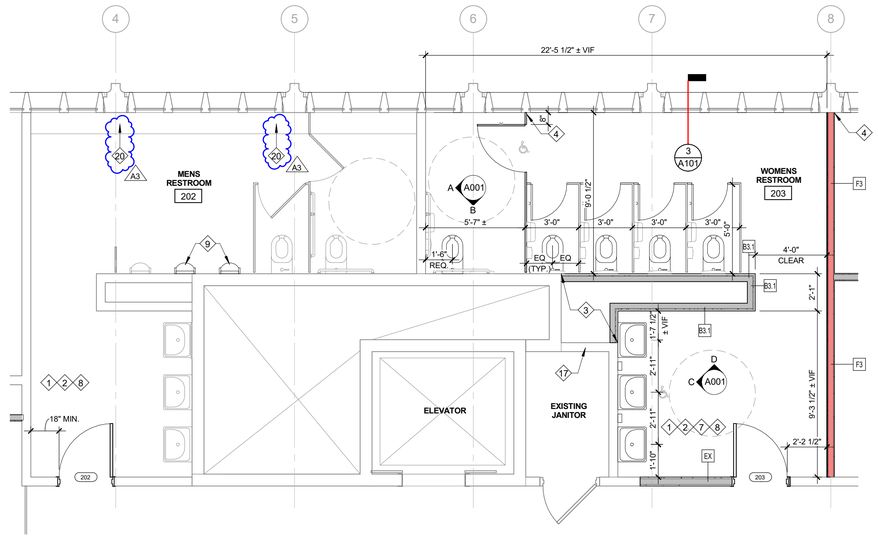
0 0.5 1 2




## 2 ENLARGED B.F. FOUNTAIN PLAN

SCALE: 1/2" = 1'-0"

0 1 2 4




## 1 ENLARGED RESTROOM PLAN

SCALE: 1/4" = 1'-0"

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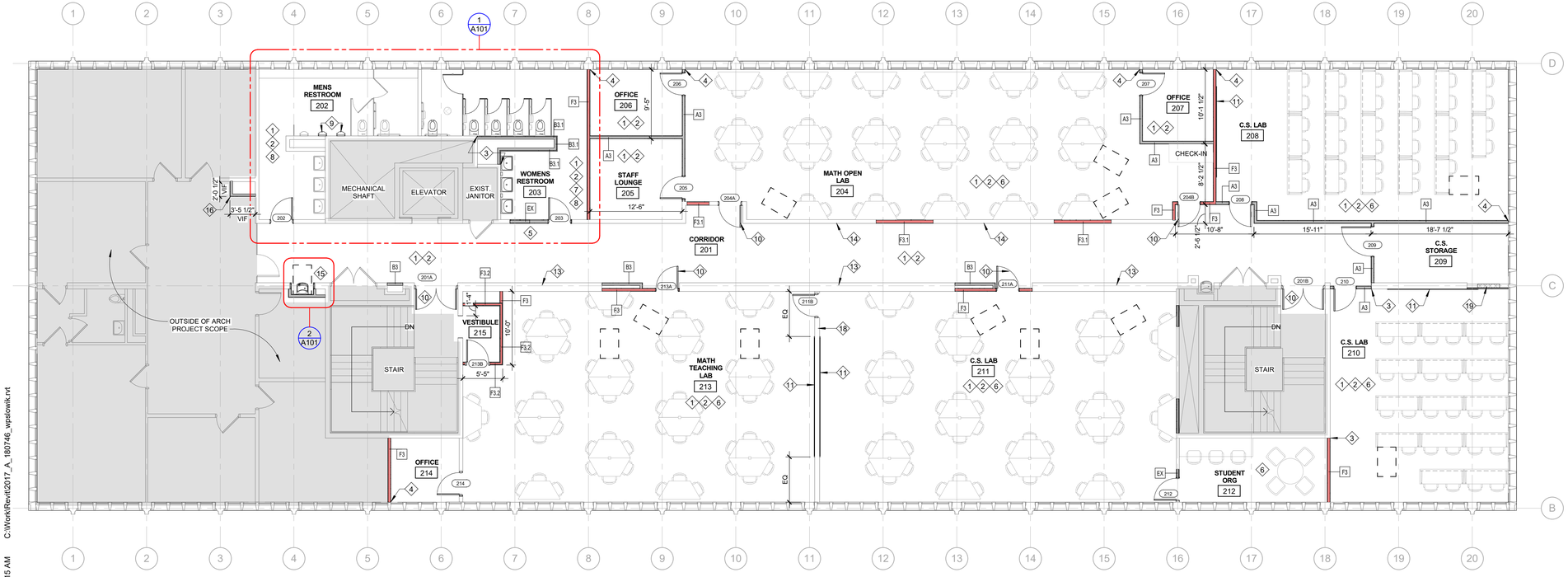


## SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"

0 4 8 16

NORTH

### FLOOR PLAN SYMBOL LEGEND

- INTERIOR WALL TYPE; SEE SHEET A201
- EXTERIOR WALL TYPE
- DOOR NUMBER
- BARRIER FREE/ADA ACCESSIBLE
- 1 HOUR FIRE RATING
- METAL STUD WALL
- CMU WALL
- CAST IN PLACE OR PRECAST CONCRETE
- EXISTING WALL
- EXISTING DOOR
- FLOOR DRAIN; SEE MECHANICAL

### 1 ARCHITECTURAL KEY NOTES

1. PATCH AND REPAIR EXISTING WALLS AFFECTED BY DEMOLITION OR SCOPE OF WORK TO MATCH ADJACENT CONSTRUCTION AND FINISH. PREP WALLS TO RECEIVE NEW FINISHES AS INDICATED IN THE FINISH SCHEDULE.
2. PATCH AND REPAIR ANY EXPOSED CONCRETE FLOOR AFFECTED BY DEMOLITION OR SCOPE OF WORK TO MATCH ADJACENT CONSTRUCTION AND FINISH. PATCH AND REPAIR ANY CRACKS IN CONCRETE SLAB WITH APPROPRIATE PATCHING MATERIAL. PREP FLOOR TO RECEIVE NEW FINISHES AS INDICATED IN THE FINISH SCHEDULE.
3. ALIGN NEW PARTITION WITH EXISTING PARTITIONS TO REMAIN.
4. CENTER NEW PARTITION ON EXISTING WINDOW MULLION.
5. MATCH EXISTING WALL CONSTRUCTION TO PROVIDE FLUSH CONDITION AT ADJACENT PARTITIONS.
6. ALL NEW FURNITURE AND ACCESSORIES PROVIDED AND INSTALLED BY OWNER. FURNITURE INDICATED ON PLAN IS FOR REFERENCE/SPACE PLANNING ONLY UNLESS OTHERWISE INDICATED. SEE ELECTRICAL PLANS FOR MORE INFORMATION ON FURNTURE POWER AND LOW VOLTAGE REQUIREMENTS.
7. PROVIDE AND INSTALL TOILET AND SINK RESTROOM FIXTURES. SEE MECHANICAL AND PLUMBING PLANS.
8. PROVIDE AND INSTALL RESTROOM ACCESSORIES PER ELEVATIONS AND BARRIER FREE DETAILS.
9. REPLACE TWO EXISTING INTEGRATED FLOOR URINALS WITH WALL-MOUNTED URINALS TO MATCH EXISING. PATCH WALL & FLOOR TO MATCH ADJACENT FINISHES.
10. NEW FIRE RATED DOOR. SEE DOOR SCHEDULE.
11. PROVIDE AND INSTALL NEW MAGNETIC GLASS MARKERBOARD. COORDINATE EXACT SIZE(S) AND LOCATION(S) WITH OWNER.
13. EXISTING CAST CONCRETE WALL TO DECK. SEAL ALL PENETRATIONS WITH FIRE RATED CAULK APPROVED FOR CONCRETE MATERIAL.
14. EXISTING METAL STUD AND GYP WALL TO DECK. SEAL ALL PENETRATIONS WITH FIRE RATED CAULK APPROVED FOR GYP MATERIAL.
15. PROVIDE AND INSTALL BARRIER FREE DRINKING FOUNTAIN WITH BOTTLE FILLER. SEE PLUMBING AND ELECTRICAL DRAWINGS.
16. NEW MINIMUM ENCLOSURE FOR DUCTWORK TO WOMEN'S RESTROOM CEILING. IF POSSIBLE, LOCATE ON WEST SIDE OF WALL INSIDE OFFICE. COORDINATE WITH MECHANICAL DRAWINGS AND EXISTING CONDITIONS.
17. PROVIDE AND INSTALL NEW ACCESS PANEL INTO NEW CHASE.
18. EXISTING CMU WALL TO DECK. SEAL ALL PENETRATIONS WITH FIRE RATED CAULK APPROVED FOR CONCRETE MATERIAL.
19. INFILL EXISTING DOOR OPENING AND PROVIDE FURRING ON CLASSROOM-SIDE OF WALL TO PROVIDE FLUSH CONDITION.
20. REMOVE EXISTING FLOOR REGISTERS. DUCTWORK TO BE ABANDONED. PROVIDE BLANKING PLATES TO MATCH EXISTING FLOOR REGISTER FINISH. A3


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**WSU Project: 022-313456**

REVISIONS

| | | |
|---|---|---|
| 08/23/2018 | A3 | ADDENDUM 3 |

| | |
|---|---|
| 8/13/2018 | BIDS |

Drawn By WPS / HMW
Designer WPS
Reviewer MDH
Manager MM5

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PROJECT NO.
180746

SECOND FLOOR PLAN

# A101

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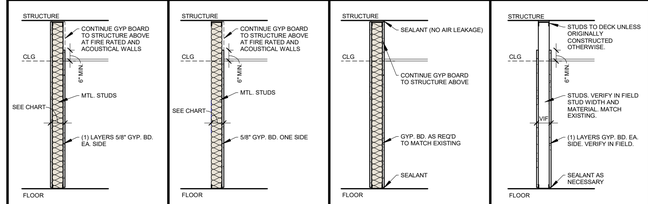
# WALL TYPES

## CONSTRUCTION




TYPICAL **A3**

TYPICAL **B3**

TYPICAL **F3**

| TYPE | FIRE RATING |
|---|---|
| F3 | 1 HOUR |
| F3.1 | 1 HOUR |
| F3.2 | 2 HOUR |

AT RATED ASSEMBLIES ONLY

SEE LIFE SAFETY PLANS FOR LOCATIONS OF RATINGS AND DURATION REQUIREMENTS

TYPICAL **EX**

WALL TAG WITH "EX" SUFFIX INDICATES TO MATCH EXISTING CONSTRUCTION. VERIFY IN FIELD EXISTING CONSTRUCTION OF WALL.

## LEGEND

WALL TAG WITH 'A' SUFFIX INDICATES WALL CONTAINS INSULATED WALL CAVITY.

### A

TYPE CHART

| TAG | STUD SIZE | TOTAL WIDTH |
|---|---|---|
| A3 | 3 5/8" | 4 7/8" |

### B

TYPE CHART

| TAG | STUD SIZE | TOTAL WIDTH |
|---|---|---|
| B3 | 3 5/8" | 4 1/4" |
| B3.1 | 3 5/8" | 5 1/4" |

### F

TYPE CHART

| TAG | STUD SIZE | TOTAL WIDTH |
|---|---|---|
| F3 | 3 5/8" | 0' - 4 7/8" |
| F3.1 | 3 5/8" | 0' - 6" |
| F3.2 | 2 1/2" | 0' - 5" |

## WALL TYPE NOTES

WALL TYPE LEGEND

1. PROVIDE DEFLECTION TRACKS OR CLIPS FOR ALL PARTITIONS ABUTTING STRUCTURE ABOVE.
2. EXTEND RATED PARTITIONS THROUGH THE INTERIOR FACE OF EXTERIOR WALL GYPSUM BOARD AND SEAL TO THE INSIDE FACE OF THE EXTERIOR BUILDING WALL SHEATHING.
3. INTERIOR METAL STUD PARTITIONS ARE DIMENSIONED FROM FACE OF GYPSUM BOARD OR TILE BACKER BOARD.
4. MAINTAIN THE FIRE-PROTECTION RATINGS FOR ALL OPENINGS IN RATED PARTITIONS.
5. CONSTRUCT ALL CORRIDOR WALLS TO RESIST THE PASSAGE OF SMOKE. I.E., TO BE SMOKE TIGHT.
6. WHERE THICKNESS VARIES BETWEEN TWO PARTITIONS IN AN UNINTERRUPTED CONTINUOUS WALL PLANE -OFFSET STUDS AND ALIGN FACE OF PARTITIONS.
7. METAL STUD FRAMING: MIN. 24 GAGE @ 16" O.C., U.N.O.
8. UL DESIGN NUMBERS REFER TO THE UNDERWRITERS LABORATORIES FIRE RESISTANCE DIRECTORY-LATEST EDITION.
9. FIRE RATED PARTITIONS SHALL HAVE FIRESTOP SEALANT AT THE HEAD, SILL, THROUGH PENETRATIONS, OPENINGS AND JUNCTURES WITH DISSIMILAR MATERIALS.
10. BEHIND WALL TILE PROVIDE 5/8" CEMENT BOARD IN LIEU OF GYP. BOARD. HOLD TOP OF CEMENT BOARD 1/2" BELOW TOP OF TILE AS DETAILED.
11. EXTEND ALL WALLS TIGHT TO DECK ABOVE UNLESS NOTED OR DETAILED OTHERWISE.
12. ALL RECESSED DEVICES SHALL BE OFF-SET BY MINIMUM OF ONE STUD CAVITY. DO NOT INSTALL BACK TO BACK OR WITHIN SAME STUD CAVITY.
13. PROVIDE BLOCKING IN WALL REQ'D TO SUPPORT BUILT-IN ITEMS, FIXTURES, MILLWORK, AND OTHER WALL SUPPORTED ITEMS.
14. SEE LIFE SAFETY PLANS FOR LOCATION AND DURATION OF RATED ASSEMBLIES.

## FIRE AND SMOKE RATED WALL IDENTIFICATION

1. ALL RATED *FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS* AND *SMOKE PARTITIONS* OR ANY OTHER WALL REQUIRED TO HAVE PROTECTED OPENINGS OR PENETRATIONS SHALL HAVE RED PAINTED STENCIL LETTERS (3" TALL MIN. WITH 3/8" WIDE STROKE) READING SPECIFIC RATING (I.E.: 1-HOUR FIRE BARRIER) APPLIED TO WALL AROUND INTERIOR PERIMETER OF THE ROOM, EACH SIDE OF WALL, AND LOCATED ABOVE ACCESSIBLE CEILINGS. STENCIL TO BE SPACED A MAX. OF 12'-0" APART, BUT NO LESS THAN TWICE PER WALL FOR WALLS LONGER THAN 8'-0" IN LENGTH, AT LEAST ONCE FOR WALLS LESS THAN 8'-0" LONG, AND NO MORE THAN 8'-0" FROM WALL BEGINNING AND END; EXCEPT WHERE TOP OF WALL EXPOSED TO VIEW.

| NO. | LOCATION | DOOR QTY | PANEL SIZE W | PANEL SIZE H | PANEL SIZE T | TYPE | MATERIAL | EXT FINISH | INT FINISH | GLASS | FRAME TYPE | MATERIAL | EXT FINISH | INT FINISH | HEAD | JAMB | LABEL | HDW | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SECOND FLOOR | | | | | | | | | | | | | | | | | | | |
| 201A | CORRIDOR | 2 | 5' - 6 3/4" | 7' - 6" | 0' - 1 3/4" | F | HM | S | S | FRG | P1 | HM | P | P | 7 | 3 | 90 / B | 04 | 3 |
| 201B | CORRIDOR | 2 | 5' - 6 3/4" | 7' - 6" | 0' - 1 3/4" | F | HM | S | S | FRG | P1 | HM | P | P | 7 | 3 | 90 / B | 04 | 3 |
| 202 | MENS RESTROOM | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | L | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | | 05 | 3 |
| 203 | WOMENS RESTROOM | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | L | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | | 05 | 3 |
| 204A | MATH OPEN LAB | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | N | WD | S | S | FRG | S1 | HM | P | P | 5 | 1 | 45 / E | 06 | 3 |
| 204B | MATH OPEN LAB | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | N | WD | S | S | FRG | S1 | HM | P | P | 5 | 1 | 45 / E | 09 | 3 |
| 205 | STAFF LOUNGE | 1 | 3' - 0" | 7' - 0" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | | 01 | A3 |
| 206 | OFFICE | 1 | 3' - 0" | 7' - 0" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | | 01 | |
| 207 | OFFICE | 1 | 3' - 0" | 7' - 0" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | | 01 | |
| 208 | C.S. LAB | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | N | WD | S | S | FRG | S1 | HM | P | P | 5 | 1 | 20 / S | 07 | 3 |
| 209 | C.S. STORAGE | 1 | 4' - 0" | 7' - 6" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | 20 / S | 02 | 3 |
| 210 | C.S. LAB | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | N | WD | S | S | FRG | S1 | HM | P | P | 5 | 1 | 20 / S | 08 | 3 |
| 211A | C.S. LAB | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | N | WD | S | S | FRG | S1 | HM | P | P | 5 | 1 | 45 / E | 09 | 3 |
| 211B | C.S. LAB | 1 | 3' - 0" | 7' - 0" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 8 | 4 | 45 / E | 03 | A3 |
| 212 | STUDENT ORG | 1 | 3' - 0" | 7' - 0" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | | 01 | |
| 213A | MATH TEACHING LAB | 1 | 3' - 0" | 7' - 6" | 0' - 1 3/4" | N | WD | S | S | FRG | S1 | HM | P | P | 5 | 1 | 45 / E | 09 | 3 |
| 213B | MATH TEACHING LAB | 1 | 3' - 0" | 7' - 0" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 6 | 2 | 90 / B | 06 | |
| 214 | OFFICE | 1 | 3' - 0" | 7' - 0" | 0' - 1 3/4" | F | WD | S | S | -- | S1 | HM | P | P | 5 | 1 | | 01 | |
| THIRD FLOOR | | | | | | | | | | | | | | | | | | | |
| 301 | MECHANICAL EQUIPMENT | 1 | 4' - 0" | 7' - 6" | 0' - 1 3/4" | F | HM | P | P | -- | S1 | HM | P | P | 9 | 10 | | 02 | 3 |

A3

### ABBREVIATIONS

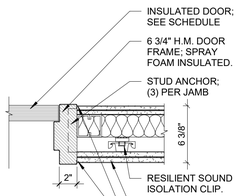
| | |
|---|---|
| HM | HOLLOW METAL |
| L | LOUVERED |
| P | PAINT |
| S | STAIN |
| FRG | FIRE RATED GLAZING |
| WD | WOOD |

### GENERAL NOTES:

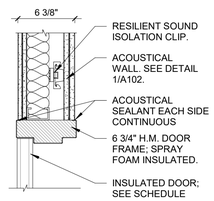
A. PAINT EXISTING TO REMAIN DOORS AND FRAMES TO MATCH ADJACENT WALL COLOR. REFER TO FINISH LEGEND FOR MORE INFORMATION.
B. STAIN WOOD DOORS TO MATCH EXISTING DOORS TO REMAIN IN AREAS NOT IN SCOPE.

### DOOR SCHEDULE NOTES:

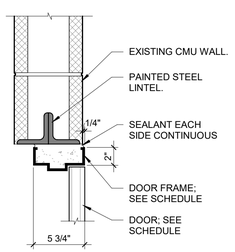
1. USE EXISTING OPENING FOR NEW CORRIDOR DOORS AND FRAMES.
2. INSULATED DOOR AND FRAME.
3. MATCH EXISTING HEIGHT AT DOORS ADJACENT TO CORRIDOR. A3



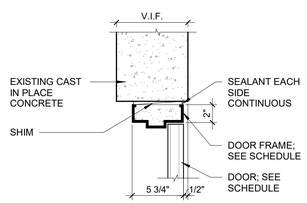

10 JAMB DETAIL MECH
SCALE: 1 1/2" = 1'-0"



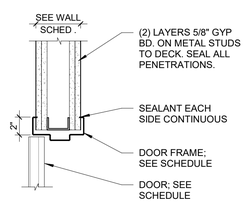

9 HEAD DETAIL MECH
SCALE: 1 1/2" = 1'-0"



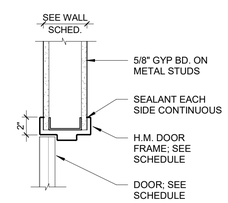

8 HEAD DETAIL CMU
SCALE: 1 1/2" = 1'-0"



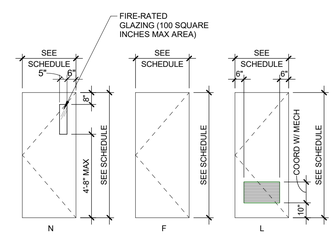

7 HEAD DETAIL CONCRETE
SCALE: 1 1/2" = 1'-0"



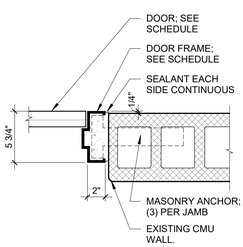

6 HEAD DETAIL 2HR FIRE RATED
SCALE: 1 1/2" = 1'-0"



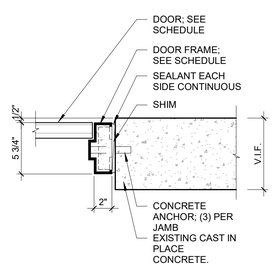

5 HEAD DETAIL
SCALE: 1 1/2" = 1'-0"



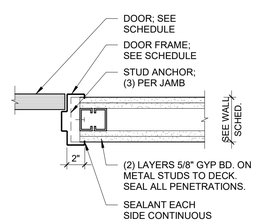

DOOR TYPES
SCALE: NOT TO SCALE



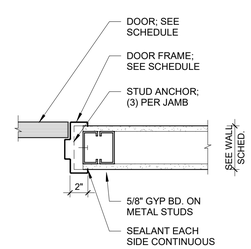

4 JAMB DETAIL CMU
SCALE: 1 1/2" = 1'-0"



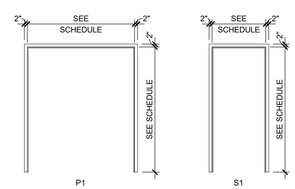

3 JAMB DETAIL CONCRETE
SCALE: 1 1/2" = 1'-0"



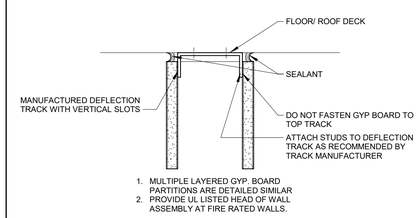

2 JAMB DETAIL 2HR FIRE RATED
SCALE: 1 1/2" = 1'-0"




1 JAMB DETAIL
SCALE: 1 1/2" = 1'-0"




FRAME TYPES
SCALE: NOT TO SCALE




1. MULTIPLE LAYERED GYP. BOARD PARTITIONS ARE DETAILED SIMILAR
2. PROVIDE UL LISTED HEAD OF WALL ASSEMBLY AT FIRE RATED WALLS.

DEFLECTION TRACK
SCALE: NOT TO SCALE

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Drawn By WPS / HMW
Designer WPS
Reviewer MDH
Manager MM5

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PROJECT NO.
180746

WALL TYPES & DOOR SCHEDULE

**A201**

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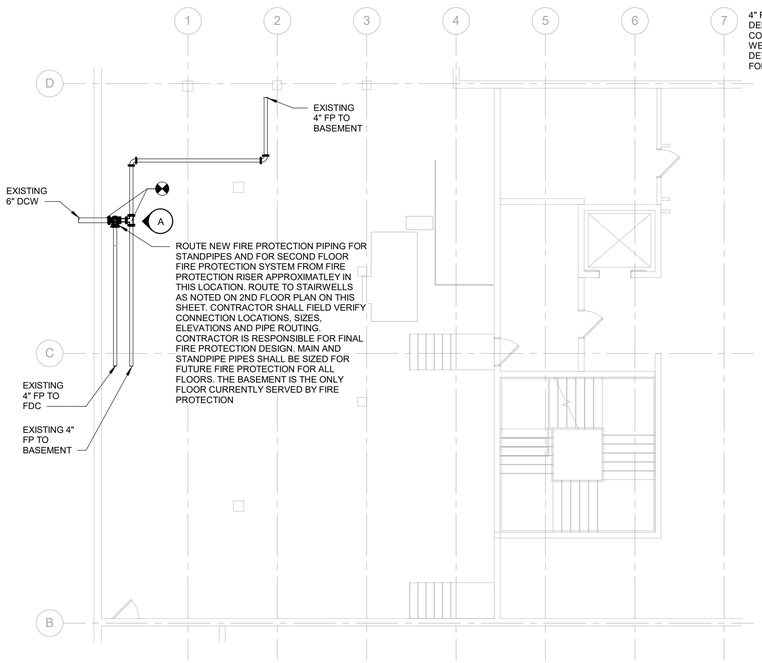
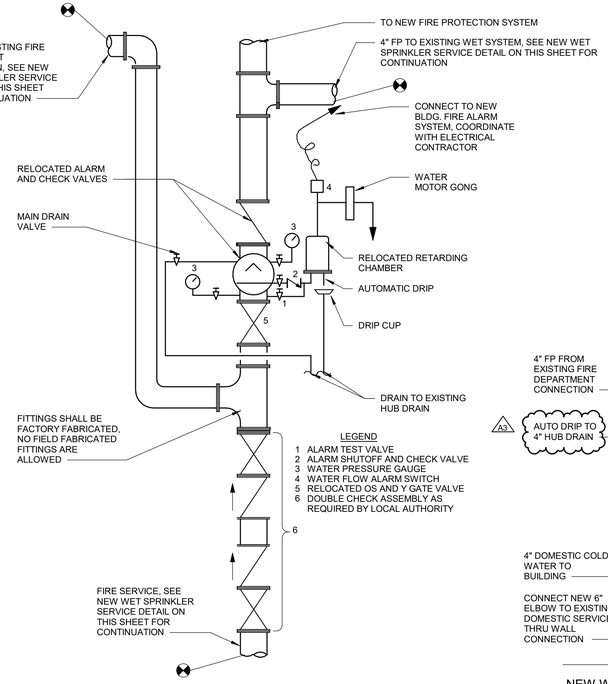



NORTH

## BASEMENT FIRE PROTECTION PLAN - PARTIAL

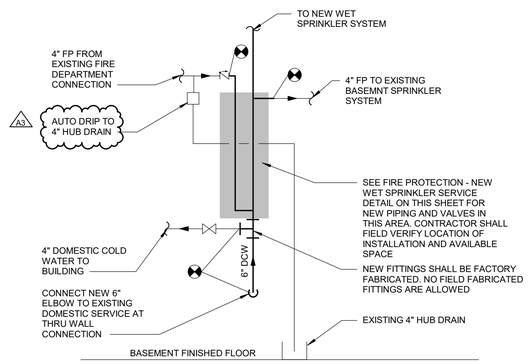
SCALE: 1/8" = 1'-0"

0 4 8 16



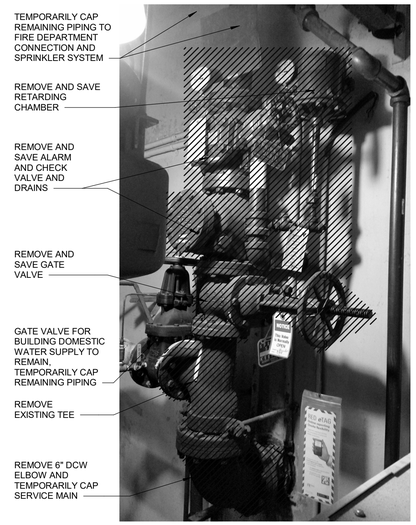

FIRE PROTECTION - NEW WET SPRINKLER SERVICE

NO SCALE



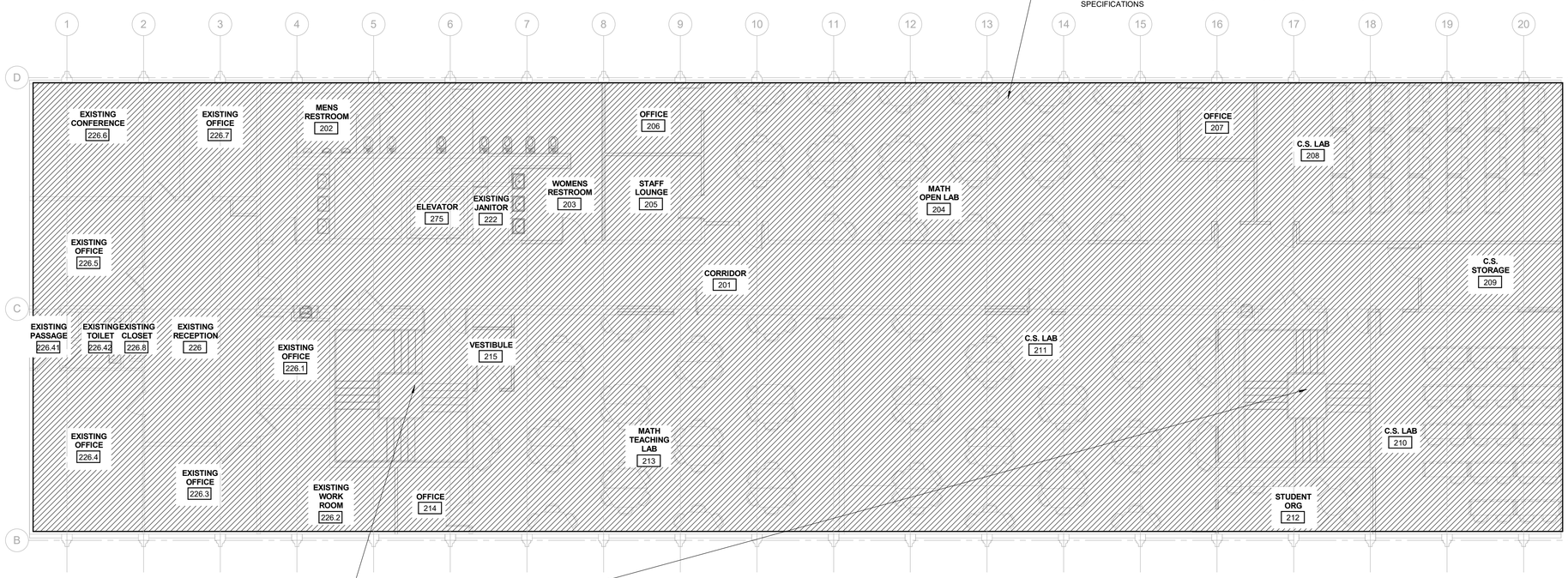

NEW WET SPRINKLER AND DOMESTIC WATER SERVICE DETAIL

NO SCALE




A EXISTING AUTOMATIC SPRINKLER RISER AND DOMESTIC WATER SERVICE MAIN CONNECTION

PROVIDE WET FIRE PROTECTION SYSTEM FOR ENTIRE PROJECT AREA ACCORDING TO NFPA, LATEST EDITIONS. CONTRACTOR IS RESPONSIBLE FOR FINAL SYSTEM DESIGN. MAINS AND STAND PIPES SHALL BE SIZED FOR FUTURE FIRE PROTECTION FOR ALL FLOORS OF BUILDING. BASEMENT IS THE ONLY FLOOR CURRENTLY SERVED BY FIRE PROTECTION. PROVIDE INSPECTOR'S TEST VALVES AND DRAINS AS REQUIRED BY NFPA, LATEST EDITIONS AND IN ACCORDANCE WITH PROJECT SPECIFICATIONS




PROVIDE CLASS I STANDPIPE WITH 2-1/2" HOSE CONNECTION IN EACH STAIRWELL AND ON EACH LEVEL ACCORDING TO NFPA, LATEST EDITIONS. PROVIDE CAPPED BLIND FLANGES FOR FUTURE FIRE PROTECTION CONNECTIONS FOR ALL FLOORS ABOVE AND BELOW SECOND FLOOR. CONTRACTOR SHALL DETERMINE STANDPIPE LOCATION ACCORDING TO NFPA, LATEST EDITIONS

NORTH

## SECOND FLOOR FIRE PROTECTION PLAN

SCALE: 1/8" = 1'-0"

0 4 8 16

## NOTES

1. REMOVE ALL PORTIONS OF WORK IDENTIFIED BY CROSS HATCHING UNLESS NOTED OTHERWISE.
2. FIELD DETERMINE EXACT LOCATIONS AND REMOVE PORTIONS OF PIPING AND EQUIPMENT SHOWN BY CROSS-HATCHING. SCHEDULE SHUT-DOWNS WITH OWNER. CAP ALL OPEN PIPE ENDS AT END OF WORK DAY. REFER TO OTHER DRAWINGS FOR COORDINATION OF EXTENT OF DEMOLITION WITH NEW WORK.
3. UTILITIES PASSING FROM ONE PHASE TO ANOTHER THAT ARE ACTIVELY SERVING OCCUPIED AREAS SHALL REMAIN IN SERVICE IN THEIR PRESENT POSITION, OR SHALL BE REROUTED AND RECONNECTED TO THE EXTENT NECESSARY TO INSTALL THE NEW WORK OF THE CURRENT CONSTRUCTION PHASE.
4. OPENINGS LEFT BY DEMOLITION IN WALLS AND FLOORS SHALL BE PATCHED TO MATCH SURROUNDING SURFACES.
5. WHERE DEMOLITION REQUIRES THE REMOVAL OF CEILINGS, PROVIDE REMOVAL AND REINSTALLATION OF CEILINGS. DAMAGED CEILING TILES AND GRID SHALL BE REPLACED.
6. FIRESTOP SHALL BE PROVIDED IN NEW AND EXISTING HOLES AND PENETRATIONS IN RATED WALLS IN AREAS OF NEW AND DEMOLITION WORK. (A3)
7. PROVIDE ISOLATION, DRAIN AND FILLING OF PIPING SYSTEMS AS REQUIRED TO PERFORM THE WORK OF DEMOLITION.
8. REMOVE ALL POWER AND CONTROL WIRING AND DEVICES ASSOCIATED WITH EQUIPMENT BEING REMOVED.
9. ALL EXISTING CONDITIONS NOT SHOWN, CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
10. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR SYSTEM DESIGN CALCULATIONS AND FINAL PIPE SIZES AND FOR COMPLIANCE WITH ALL STATE AND LOCAL CODES.
12. CEILING GRID AND TILES SHALL BE REMOVED AND REPLACED AS REQUIRED TO ACCESS THE WORK. DAMAGED GRID AND TILE SHALL BE REPLACED TO MATCH EXISTING.
13. (A3)
14. FINAL FIRE PROTECTION PIPING ROUTING, AS DESIGNED BY FIRE PROTECTION CONTRACTOR, SHALL BE COORDINATED WITH OTHER TRADES BEFORE PROCEEDING. DUCTWORK AND STORM, SANITARY AND VENT PIPING LOCATION SHALL TAKE PRECEDENCE OVER FIRE PROTECTION
15. PIPING.

    ABOVE CEILING AREAS OF WOOD CONSTRUCTION AND OTHER COMBUSTIBLES AREASHALL BE SPRINKLED AS REQUIRED BY NFPA, LATEST EDITIONS.
16. A WET PIPE SPRINKLER SYSTEM SHALL BE PROVIDED TO COVER THE ENTIRE 2ND FLOOR AREA SHOWN. SPRINKLE FOR A LIGHT HAZARD OCCUPANCY AT A DENSITY OF 0.1 GPM/SQ.FT OVER THE MOST REMOTE
17. 1500 SQ.FT. AS REQUIRED BY NFPA, LATEST EDITIONS.

    CITY WATER FLOW TEST RESULTS ON 07-27-2018 AT WATERMAIN HYDRANT AT S.W. CORNER OF CASS AND VACATED MERRICK INDICATED 50 PSI STATIC, 41 PSI RESIDUAL WITH 1190 GPM FLOW.
18. OPENINGS IN WALLS AND SLABS SHALL BE CORE DRILLED AS REQUIRED FOR NEW PIPING. LOCATION OF REINFORCING STEEL SHALL BE
19. COORDINATED TO AVOID DAMAGE. PENETRATING RADAR SHALL BE USED TO LOCATE REINFORCING STEEL WITHIN CONCRETE.

    ADEQUATE ACCESS TO VALVES AND SPRINKLER HEADS SHALL BE PROVIDED. REQUIREMENTS SHALL BE COORDINATED.
20. ALL WORK NECESSARY TO ENSURE THAT NO PIPING OR SPRINKLER HEADS WILL FREEZE SHALL BE PROVIDED. DRY PENDENT TYPE HEADS, WARM AIR VENTILATION PATHWAYS OR OTHER APPROVED MEANS SHALL BE USED TO ACHIEVE A FREEZE PROOF INSTALLATION.
21. WHERE NEW CONNECTIONS TO EXISTING PIPE ARE INDICATED, SYSTEM SERVICE INTERRUPTION IS TO BE MINIMIZED AND COORDINATED WITH OWNER. THIS INCLUDES SHUTDOWNS FOR THE FIRE PROTECTION SYSTEM AND BUILDING DOMESTIC WATER SYSTEM. OWNER REQUIRES A MINIMUM OF SEVEN DAYS NOTICE PRIOR TO SHUTDOWNS.

    REFER TO SPECIFICATION FOR ACCEPTABLE VALVE TYPES PER APPLICATION.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Drawn By JKB
Designer JKB
Reviewer PMO
Manager MM5

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FIRE PROTECTION PLANS AND DETAILS

**F101**


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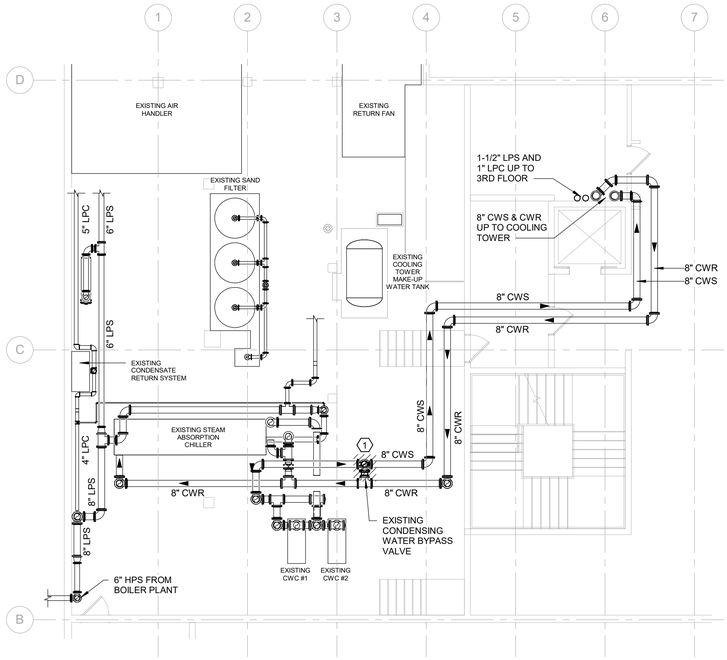
## NOTES

1. ALL EXISTING CONDITIONS NOT SHOWN, CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
2. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.
3. DUCTWORK AND EQUIPMENT SHOWN LIGHTLY IS EXISTING AND SHALL REMAIN.

## (#) DEMOLITION NOTES

1. REMOVE EXISTING CONDENSING WATER BYPASS VALVE AND CAP OPENINGS AT TEE'S.
2. REMOVE EXISTING DUCTWORK FROM EXISTING TERMINAL BOX AS SHOWN. TERMINAL BOX SHALL REMAIN TO BE REUSED. PATCH AND SEAL WALL PENETRATION. (A3)
3. REMOVE EXISTING DUCTWORK UP THROUGH FLOOR TO 2ND FLOOR LEVEL.
4. REMOVE FLOOR GRILLE LOCATED ON 2ND FLOOR AND CAP DUCTWORK. FILL AND PATCH FLOOR, REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.

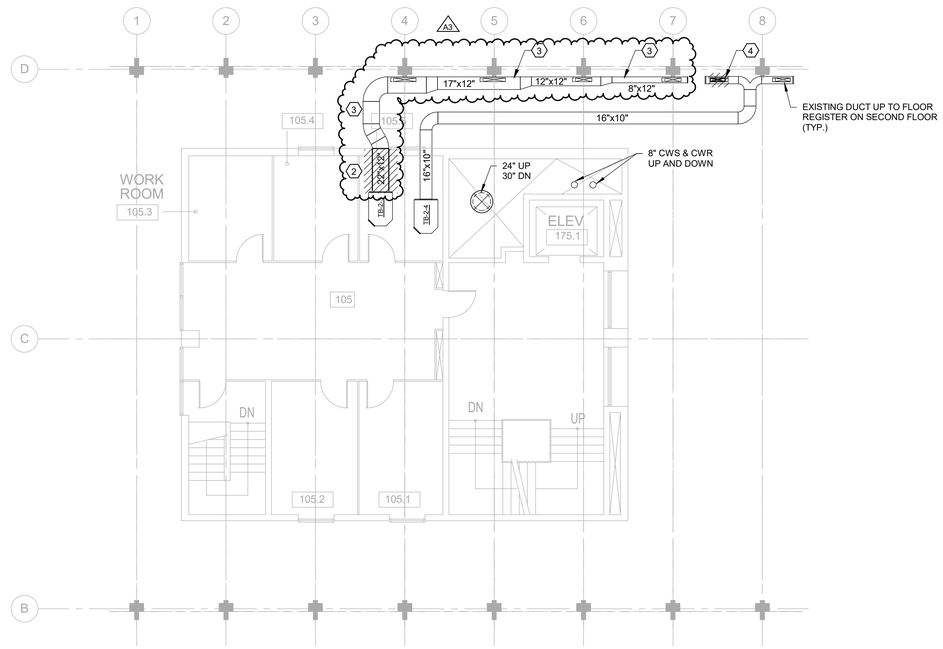



NORTH

## BASEMENT MECHANICAL DEMOLITION - PARTIAL

SCALE: 1/8" = 1'-0"

0 4 8 16




NORTH

## MEZZANINE LEVEL MECHANICAL DEMOLITION - PARTIAL

SCALE: 1/8" = 1'-0"

0 4 8 16

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**WSU Project: 022-313456**

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Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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BASEMENT AND MEZZANINE FLOOR MECHANICAL DEMOLITION PLANS

# MD101

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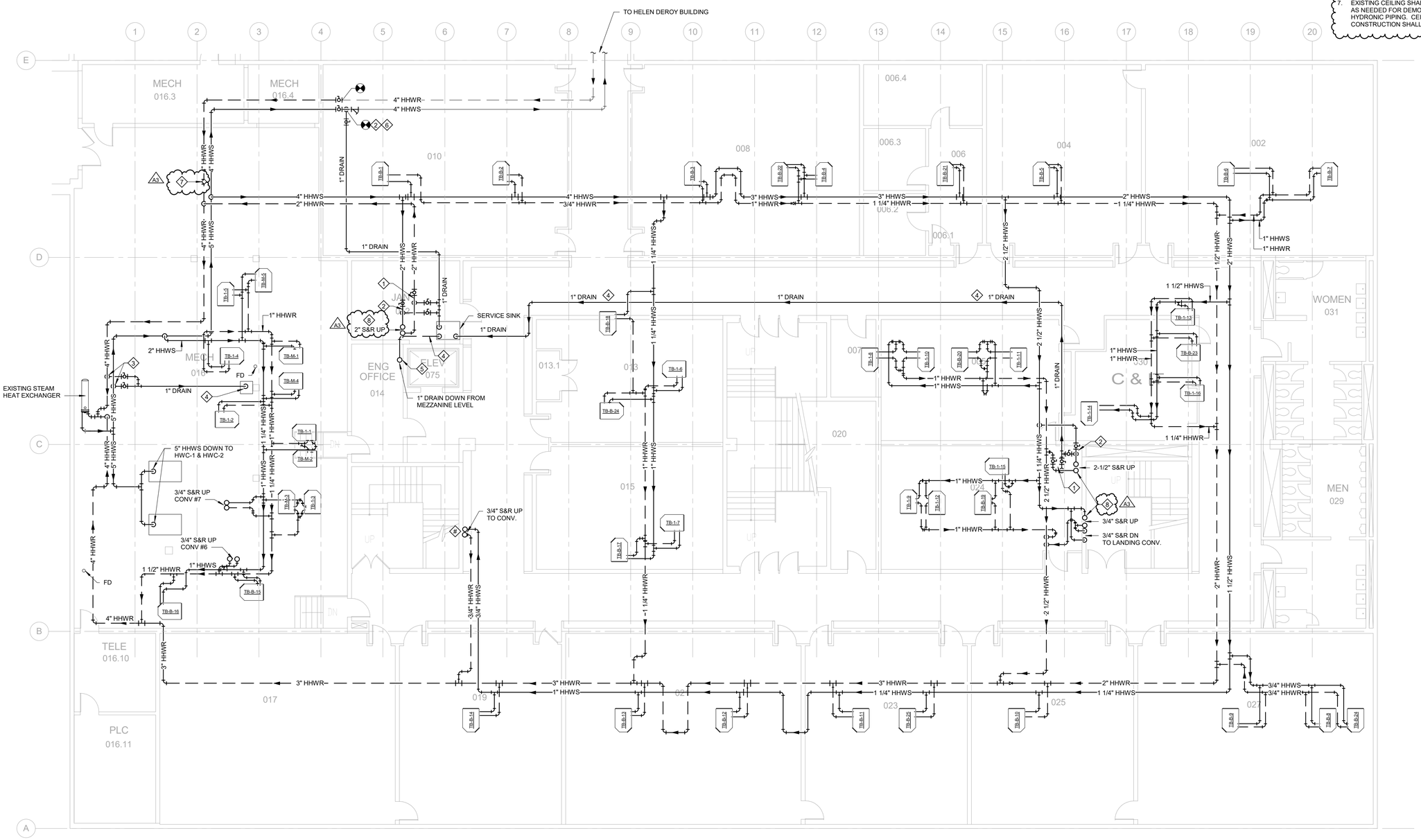
## KEY NOTES

1. INSTALL ISOLATION VALVE ON HEATING HOT WATER RETURN (HHWR) PIPING. CONNECT 1" DRAIN INTO HHWR PIPING DOWNSTREAM OF ISOLATION VALVE. INSTALL ISOLATION VALVE ON DRAIN.
2. INSTALL ISOLATION VALVE ON HEATING HOT WATER SUPPLY (HHWS) PIPING. CONNECT 1" DRAIN INTO HHWS PIPING DOWNSTREAM OF ISOLATION VALVE. INSTALL ISOLATION VALVE ON DRAIN.
3. CONNECT 1" DRAIN INTO HHWR AND 1" DRAIN INTO HHWS PIPING. INSTALL ISOLATION VALVE ON EACH DRAIN. ROUTE OVERHEAD TO EXISTING SERVICE SINK.
4. ROUTE 1" DRAIN TO EXISTING SERVICE SINK AND TERMINATE 1" ABOVE RIM.
5. 1" DRAIN DOWN THROUGH PLUMBING CHASE FROM MEZZANINE LEVEL.
6. INSTALL WYE STRAINER ON HEATING HOT WATER SUPPLY (HHWS) PIPING.
7. INSTALL HYDRONIC BALANCING VALVE.
8. HYDRONIC RISER PIPING SHALL BE REPLACED FROM BASEMENT LEVEL TO 6" ABOVE 1ST FLOOR SLAB. PATCH AND REPAIR WALLS AS NECESSARY TO ACCESS PIPING ON OTHER FLOORS, FINISH TO MATCH ADJACENT.

## NOTES

1. ALL EXISTING CONDITIONS NOT SHOWN, CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
2. NEW PIPING SHOWN IS REPLACING EXISTING PIPING THAT IS TO BE DEMOLISHED AS PART OF PROJECT.
3. (A3) PIPING TO TERMINAL BOXES AND CONVECTORS SHALL BE REPLACED UP TO THE EXISTING ISOLATION VALVES.
4. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.
5. EXISTING TERMINAL BOX LOCATIONS, PIPE SIZES AND LOCATIONS, AND VALVE LOCATIONS ARE TAKEN DIRECTLY FROM EXISTING DRAWINGS.
6. (A3) REMOVAL OF NORTH MECHANICAL CHASE IS NEEDED FOR PROPER INSTALLATION OF NEW MECHANICAL PIPING. WALL OF CHASE SHOULD BE PROPERLY REPAIRED, PATCHED, AND PAINTED TO MATCH EXISTING WALL AFTER DEMOLITION. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION.
7. EXISTING CEILING SHALL BE REMOVED AND REINSTALLED AS NEEDED FOR DEMOLITION AND INSTALLATION OF HYDRONIC PIPING. CEILING TILES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED TO MATCH EXISTING.




## BASEMENT HYDRONIC HEATING PIPING REPLACEMENT PLAN - ALTERNATE 1

NORTH

SCALE: 1/8" = 1'-0"

0 4 8 16

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Reviewer PMO
Manager MM5

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BASEMENT HYDRONIC HEATING PIPING REPLACEMENT PLAN

**M101**

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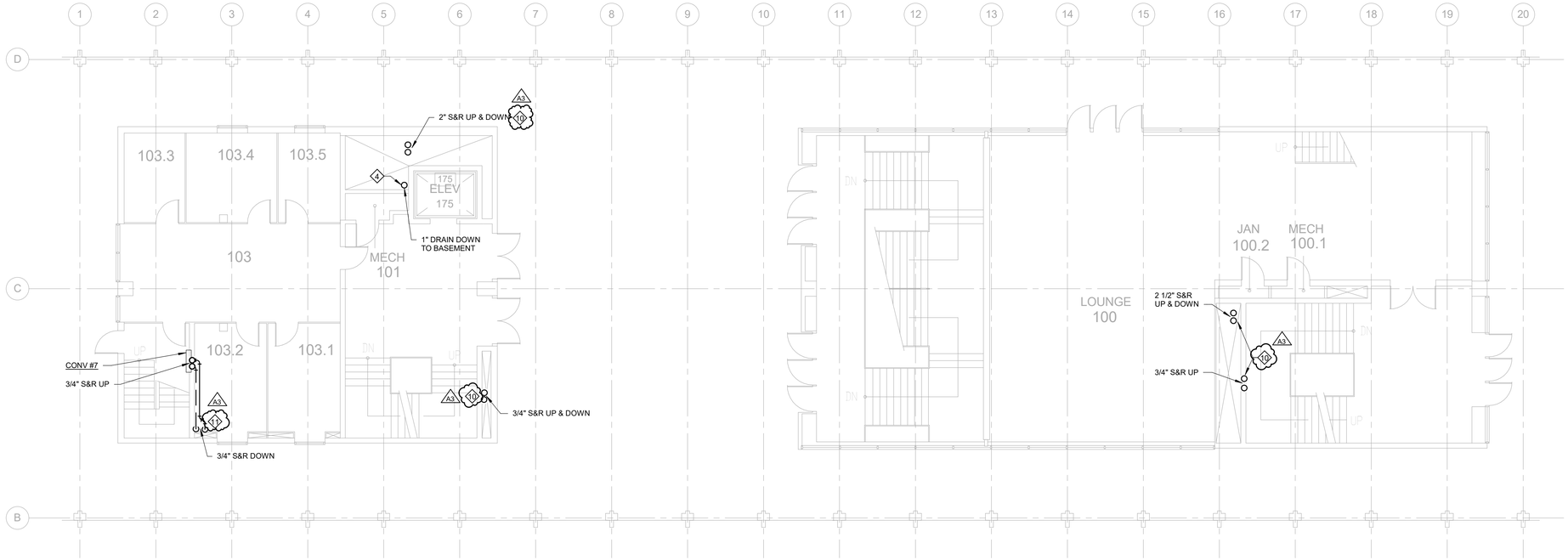


NORTH

## FIRST FLOOR HYDRONIC HEATING PIPING REPLACEMENT PLAN - ALTERNATE 1

SCALE: 1/8" = 1'-0"

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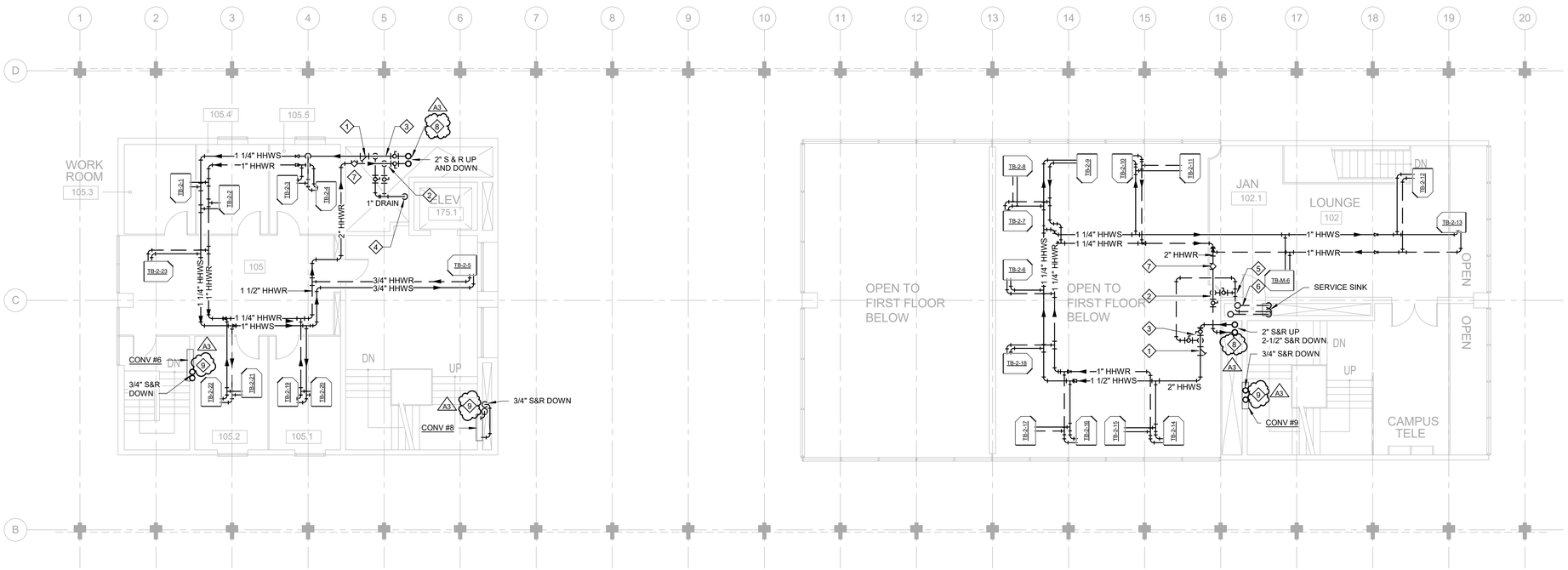


NORTH

## MEZZANINE HYDRONIC HEATING PIPE REPLACEMENT PLAN

SCALE: 1/8" = 1'-0"

0 4 8 16

## NOTES

1. ALL EXISTING CONDITIONS NOT SHOWN, CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
2. NEW PIPING SHOWN IS REPLACING EXISTING PIPING THAT IS TO BE DEMOLISHED AS PART OF PROJECT.
3. (A3) PIPING TO TERMINAL BOXES AND CONVECTORS SHALL BE REPLACED UP TO THE EXISTING ISOLATION VALVES.
4. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.
5. EXISTING TERMINAL BOX LOCATIONS, PIPE SIZES AND LOCATIONS, AND VALVE LOCATIONS ARE TAKEN DIRECTLY FROM EXISTING DRAWINGS.
6. (A3) REMOVAL OF NORTH MECHANICAL CHASE IS NEEDED FOR PROPER INSTALLATION OF NEW MECHANICAL PIPING. WALL OF CHASE SHOULD BE PROPERLY REPAIRED, PATCHED, AND PAINTED TO MATCH EXISTING WALL AFTER DEMOLITION. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION.
7. EXISTING CEILING SHALL BE REMOVED AND REINSTALLED AS NEEDED FOR DEMOLITION AND INSTALLATION OF HYDRONIC PIPING. CEILING TILES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED TO MATCH EXISTING.

## KEY NOTES

1. INSTALL WYE STRAINER ON HEATING HOT WATER SUPPLY (HHWS) PIPING.
2. INSTALL ISOLATION VALVE ON HEATING HOT WATER RETURN (HHWR) PIPING. CONNECT 1" DRAIN INTO HHWR PIPING DOWNSTREAM OF ISOLATION VALVE. INSTALL ISOLATION VALVE ON DRAIN.
3. INSTALL ISOLATION VALVE ON HEATING HOT WATER SUPPLY (HHWS) PIPING. CONNECT 1" DRAIN INTO HHWS PIPING DOWNSTREAM OF ISOLATION VALVE. INSTALL ISOLATION VALVE ON DRAIN.
4. ROUTE 1" DRAIN DOWN THROUGH PLUMBING CHASE TO BASEMENT LEVEL SERVICE SINK.
5. ROUTE 1" DRAINS TO EXISTING SERVICE SINK AND TERMINATE 1" ABOVE RIM.
6. TWO (2) 1" DRAIN LINES DOWN FROM FLOORS ABOVE. ROUTE TO EXISTING SERVICE SINK AND TERMINATE 1" ABOVE RIM.
7. INSTALL HYDRONIC BALANCING VALVE.
8. (A3) HYDRONIC RISER PIPING SHALL BE REPLACED FROM 6" BELOW MEZZANINE FLOOR SLAB TO 6" ABOVE 2ND FLOOR SLAB. PATCH AND REPAIR WALLS AS NECESSARY TO ACCESS PIPING ON OTHER FLOORS, FINISH TO MATCH ADJACENT.
9. HYDRONIC RISER PIPING SHALL BE REPLACED FROM 6" ABOVE MEZZANINE FLOOR SLAB TO CONVECTOR ISOLATION VALVE.
10. HYDRONIC RISER PIPING SHALL BE REPLACED FROM 6" BELOW 1ST FLOOR SLAB TO 6" ABOVE MEZZANINE FLOOR SLAB. PATCH AND REPAIR WALLS AS NECESSARY TO ACCESS PIPING ON OTHER FLOORS, FINISH TO MATCH ADJACENT.
11. HYDRONIC RISER PIPING SHALL BE REPLACED FROM 6" ABOVE FIRST FLOOR SLAB TO CONVECTOR ISOLATION VALVE.

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Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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FIRST FLOOR AND MEZZANINE HYDRONIC HEATING PIPING REPLACEMENT PLANS

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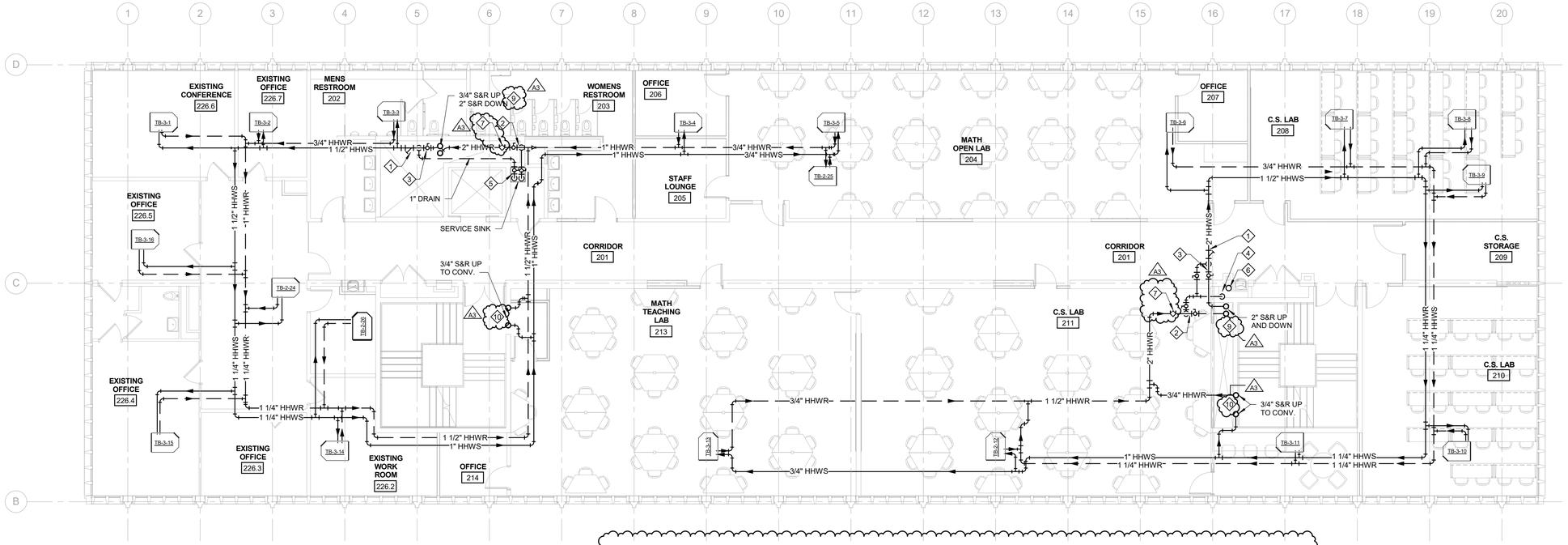
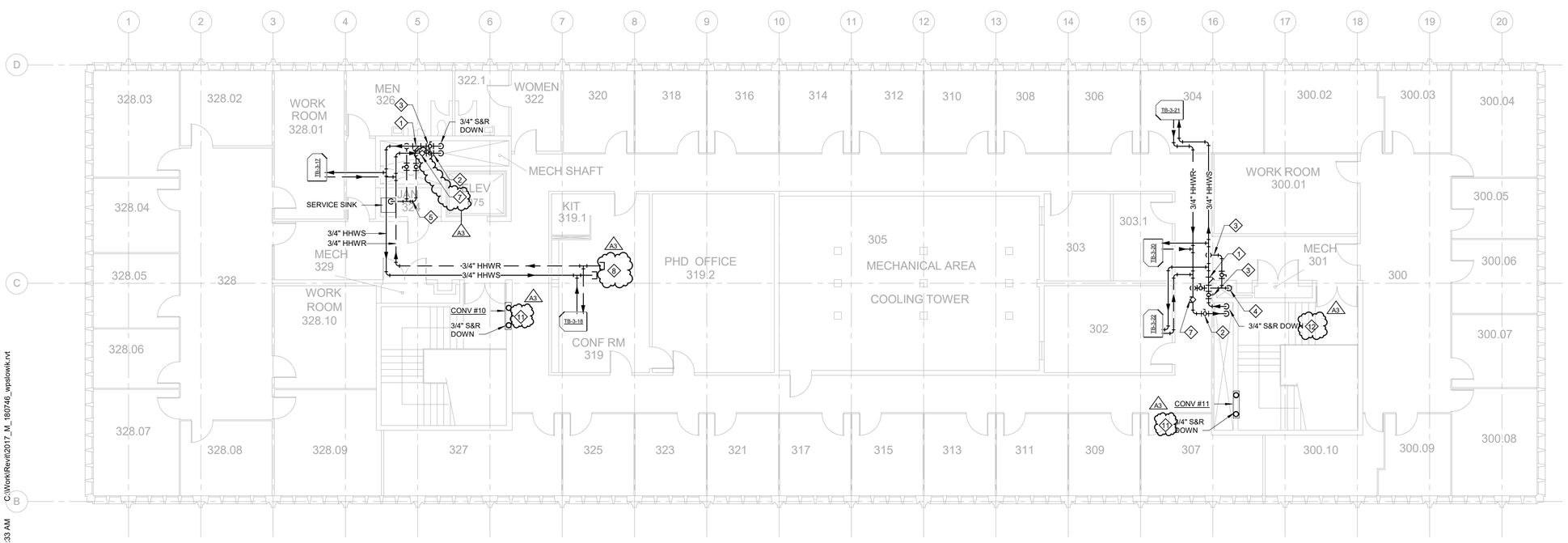



## SECOND FLOOR HYDRONIC HEATING PIPING REPLACEMENT PLAN

NORTH

SCALE: 1/8" = 1'-0"

0 4 8 16




## THIRD FLOOR HYDRONIC HEATING PIPING REPLACEMENT PLAN - ALTERNATE 2

NORTH

SCALE: 1/8" = 1'-0"

0 4 8 16

## NOTES

1. ALL EXISTING CONDITIONS NOT SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
2. NEW PIPING SHOWN IS REPLACING EXISTING PIPING THAT IS TO BE DEMOLISHED AS PART OF PROJECT.
3. PIPING TO TERMINAL BOXES AND CONVECTORS SHALL BE REPLACED UP TO THE EXISTING ISOLATION VALVES. (A3)
4. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.
5. EXISTING TERMINAL BOX LOCATIONS, PIPE SIZES AND LOCATIONS, AND VALVE LOCATIONS ARE TAKEN DIRECTLY FROM EXISTING DRAWINGS.
6. REMOVAL OF NORTH MECHANICAL CHASE IS NEEDED FOR PROPER INSTALLATION OF NEW MECHANICAL PIPING. WALL OF CHASE SHOULD BE PROPERLY REPAIRED, PATCHED, AND PAINTED TO MATCH EXISTING WALL AFTER DEMOLITION. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION. (A3)
7. EXISTING CEILING SHALL BE REMOVED AND REINSTALLED AS NEEDED FOR DEMOLITION AND INSTALLATION OF HYDRONIC PIPING. CEILING TILES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED TO MATCH EXISTING.

## KEY NOTES

1. INSTALL WYE STRAINER ON HEATING HOT WATER SUPPLY (HHWS) PIPING.
2. INSTALL ISOLATION VALVE ON HEATING HOT WATER RETURN (HHWR) PIPING. CONNECT 1" DRAIN INTO HHWR PIPING UPSTREAM OF ISOLATION VALVE. INSTALL ISOLATION VALVE ON DRAIN.
3. INSTALL ISOLATION VALVE ON HEATING HOT WATER SUPPLY (HHWS) PIPING. CONNECT 1" DRAIN INTO HHWS PIPING UPSTREAM OF ISOLATION VALVE. INSTALL ISOLATION VALVE ON DRAIN.
4. ROUTE 1" DRAIN DOWN THROUGH PLUMBING CHASE TO MEZZANINE LEVEL SERVICE SINK.
5. ROUTE 1" DRAINS TO EXISTING SERVICE SINK AND TERMINATE 1" ABOVE RIM.
6. 1" DRAIN DOWN FROM THIRD FLOOR CONTINUED DOWN TO MEZZANINE LEVEL SERVICE SINK AND TERMINATE 1" ABOVE RIM.
7. INSTALL HYDRONIC BALANCING VALVE. (A3)
8. TERMINAL BOX (TB-3-19) SHALL BE REMOVED (REFER TO MD102). REMOVE ASSOCIATED HYDRONIC PIPING AND CAP. TERMINAL BOX (TB-3-18) PIPING SHALL REMAIN IN SERVICE.
9. HYDRONIC RISER PIPING SHALL BE REPLACED FROM 6" BELOW 2ND FLOOR SLAB TO 6" ABOVE 3RD FLOOR SLAB. PATCH AND REPAIR WALLS AS NECESSARY TO ACCESS PIPING ON OTHER FLOORS, FINISH TO MATCH ADJACENT.
10. HYDRONIC RISER PIPNIG SHALL BE REPLACED FROM 2ND FLOOR TO 6" ABOVE 3RD FLOOR SLAB. PATCH AND REPAIR WALLS AS NECESSARY TO ACCESS PIPING ON OTHER FLOORS, FINISH TO MATCH ADJACENT.
11. HYDRONIC RISER PIPING SHALL BE REPLACED FROM 6" ABOVE 3RD FLOOR SLAB TO CONVECTOR ISOLATION VALVE.
12. HYDRONIC RISER PIPING SHALL BE REPLACED FROM 6" ABOVE 3RD FLOOR SLAB.

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# Wayne State University

5201 Cass Ave, Detroit, MI 48202

Prentis Building Computer Lab Relocation

**WSU Project: 022-313456**

REVISIONS

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| 8/23/2018 | A3 | ADDENDUM NO. 3 |

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| 8/13/2018 | BIDS |

Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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PROJECT NO.
180746

SECOND AND THIRD FLOOR HYDRONIC HEATING PIPING REPLACEMENT PLANS

# M103

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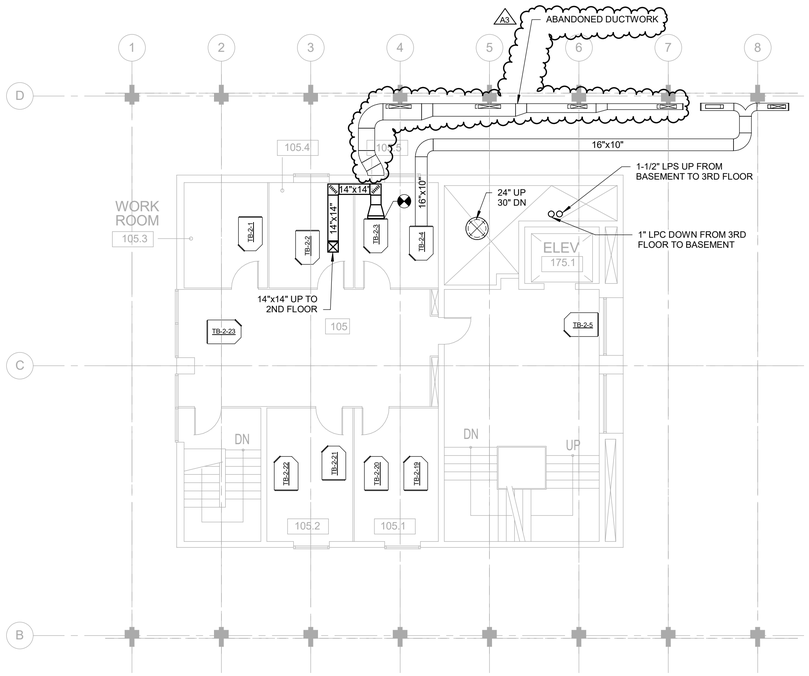
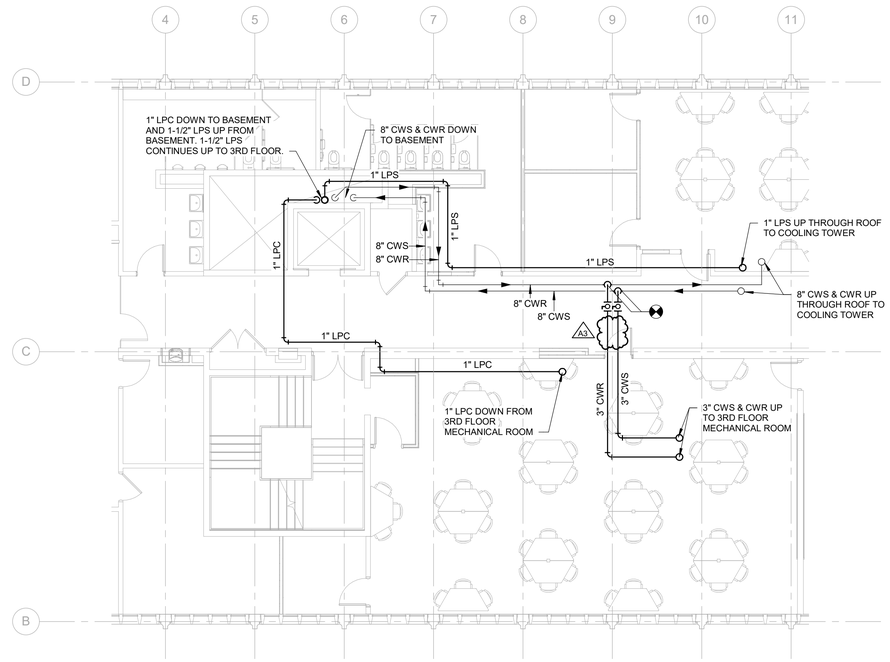



## MEZZANINE LEVEL MECHANICAL PLAN - PARTIAL

NORTH

SCALE: 1/8" = 1'-0"

0 4 8 16




## SECOND FLOOR MECHANICAL PIPING PLAN - PARTIAL

NORTH

SCALE: 1/8" = 1'-0"

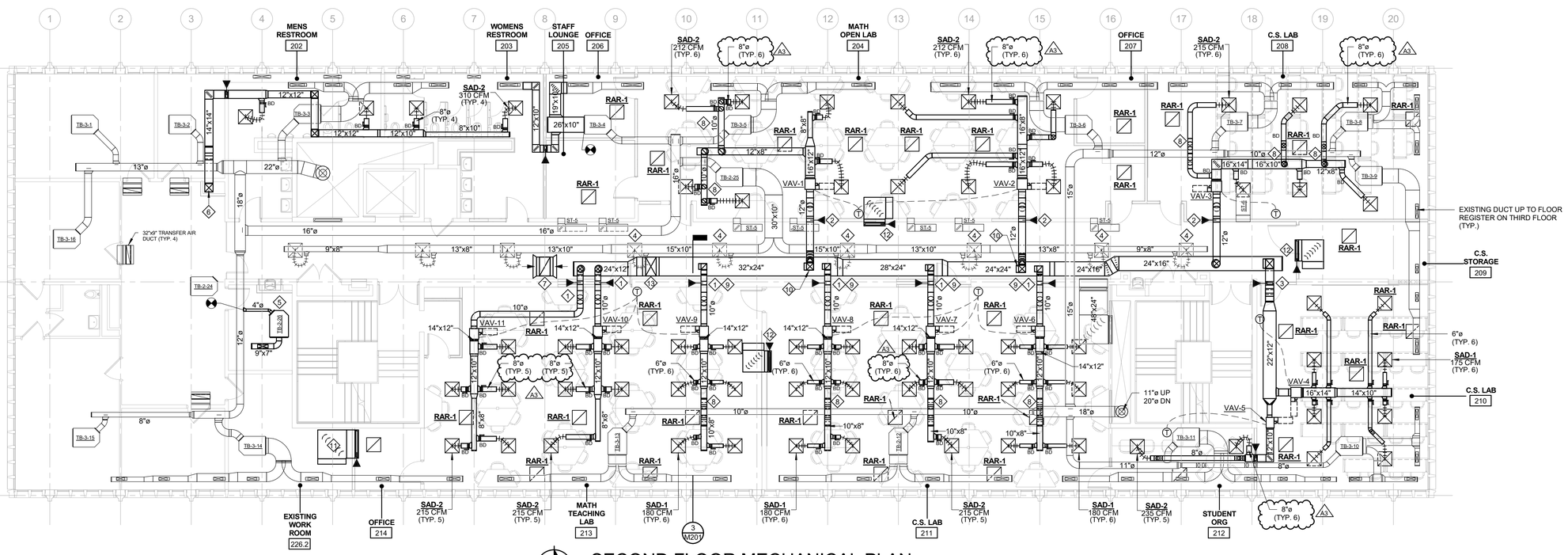
0 4 8 16

### NOTES

1. ALL EXISTING CONDITIONS NOT SHOWN, CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
2. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.

### KEY NOTES

1. 10"ø DUCT THROUGH WALL WITH FIRE DAMPER. DUCTWORK SHALL BE RUN TIGHT TO CEILING INSIDE ANNULAR SPACE BETWEEN CONCRETE JOISTS.
2. 12ø DUCT THROUGH WALL WITH FIRE DAMPER. DUCTWORK SHALL BE RUN TIGHT TO CEILING INSIDE ANNULAR SPACE BETWEEN CONCRETE JOISTS.
3. 14"x16" DUCT THROUGH WALL WITH FIRE DAMPER. DUCTWORK SHALL BE RUN TIGHT TO CEILING INSIDE ANNULAR SPACE BETWEEN CONCRETE JOISTS.
4. RELOCATE AND REINSTALL EXISTING CEILING DIFFUSER AS NEEDED FOR INSTALLATION OF NEW DUCTWORK. DIFFUSERS SHALL BE THOROUGHLY CLEANED BEFORE REINSTALLATION.
5. RELOCATE AND REINSTALL EXISTING TERMINAL BOX AS NEEDED FOR INSTALLATION OF NEW WALL. EXISTING PIPING, DUCTWORK, AND WIRING SHALL BE RELOCATED AND RECONNECTED.
6. 14"x14" SUPPLY DUCT UP FROM FLOOR BELOW. DUCTWORK SHALL BE ROUTED UP THROUGH NEW CHASE TO ABOVE CEILING AS SHOWN.
7. A3 32"x24" RETURN AIR TEE WITH 40"x24" FLARED INLETS. 32"x18" RETURN AIR UP TO 3RD FLOOR MECHANICAL ROOM.
8. WHERE NEW DUCTWORK CROSSES EXISTING DUCTWORK, ROUTE NEW DUCT ABOVE EXISTING DUCTWORK INSIDE ANNULAR SPACE BETWEEN CONCRETE JOISTS.
9. TAP OFF OF MAIN DUCT USING RECTANGULAR 10"x10" DUCTWORK, MITERED ELBOW WITH TURNING VANES. TRANSITION TO 10" ROUND DUCT FOR WALL PENETRATION.
10. TAP OFF OF MAIN DUCT USING RECTANGULAR 12"x12" DUCTWORK, MITERED ELBOW WITH TURNING VANES. TRANSITION TO 12" ROUND DUCT FOR WALL PENETRATION.
11. A3 48"x18" TRANSFER AIR DUCT THROUGH WALL WITH FIRE DAMPER. DUCTWORK SHALL BE ACOUSTICALLY LINED WITH CLOSED CELL INSULATION, REFER TO SPECIFICATIONS.
12. 32"x18" TRANSFER AIR DUCT, WITH FIRE DAMPER. DUCTWORK SHALL BE ACOUSTICALLY LINED WITH CLOSED CELL INSULATION, REFER TO SPECIFICATIONS.
13. 32"x18" SUPPLY AIR DOWN FROM 3RD FLOOR MECHANICAL ROOM.




## SECOND FLOOR MECHANICAL PLAN

NORTH

SCALE: 1/8" = 1'-0"

0 4 8 16

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Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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MEZZANINE AND SECOND FLOOR MECHANICAL PLANS

**M105**

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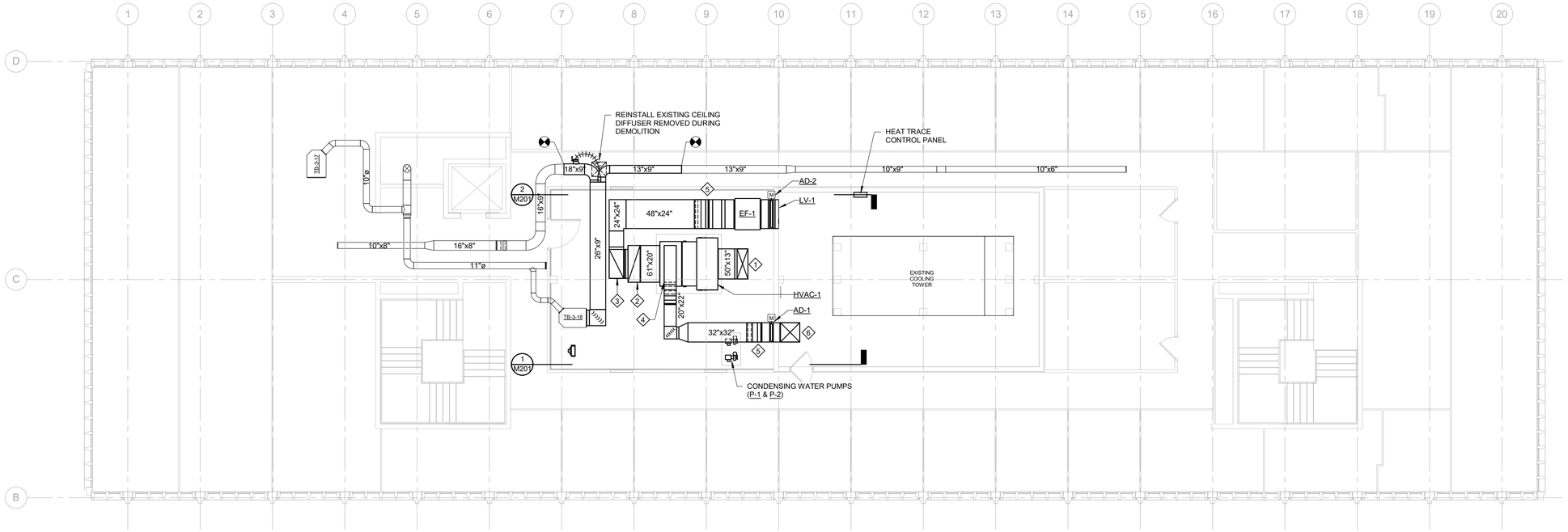
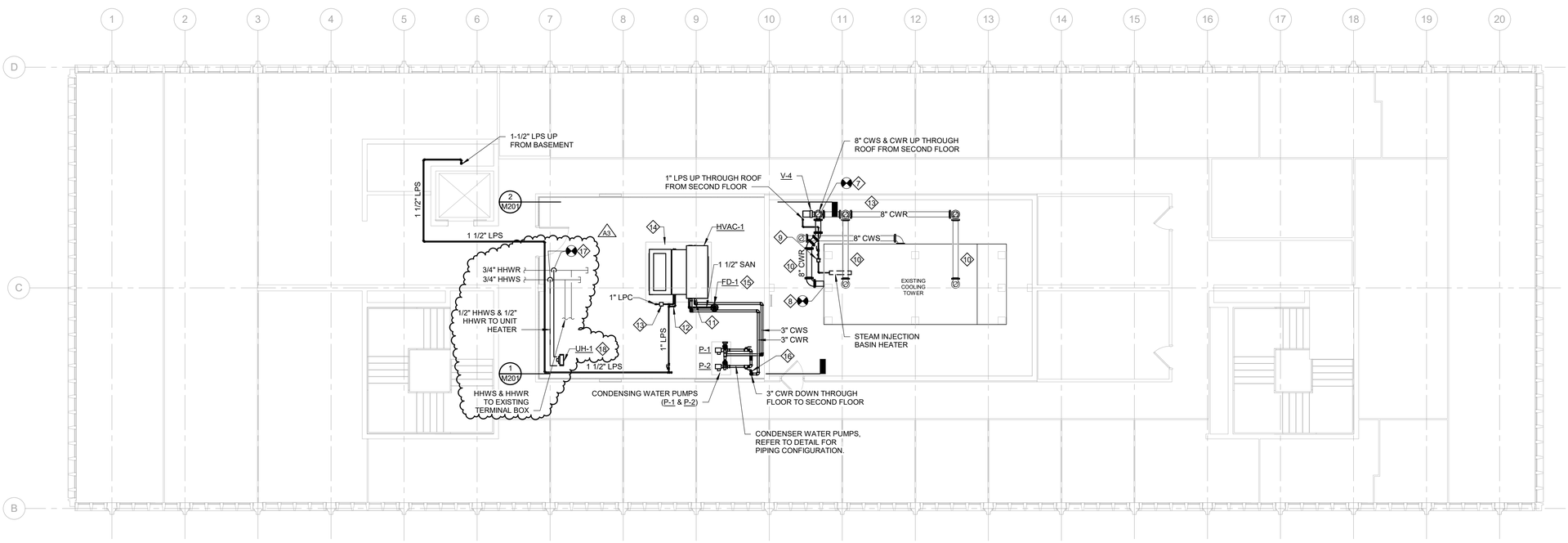



## THIRD FLOOR MECHANICAL PLAN

SCALE: 1/8" = 1'-0"

NORTH

0 4 8 16




## THIRD FLOOR MECHANICAL ROOM PIPING PLAN

SCALE: 1/8" = 1'-0"

NORTH

0 4 8 16

## NOTES

1. ALL EXISTING CONDITIONS NOT SHOWN, CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
2. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.
3. ALL EXISTING AND NEW EXTERIOR CONDENSING WATER PIPING (CWS & CWR) SHALL BE HEAT TRACED AND INSULATED.
4. ALL EXTERIOR STEAM PIPING SHALL BE HEAT TRACED AND INSULATED. ALL INTERIOR STEAM PIPING SHALL BE INSULATED.

## KEY NOTES

1. 50"x13" SUPPLY AIR DISCHARGE FROM HVAC-1. TRANSITION TO 18"x32" TO PENETRATE FLOOR DOWN TO FLOOR BELOW.
2. 60"x20" RETURN AIR TO HVAC-1. TRANSITION TO 18"x32" TO PENETRATE FLOOR DOWN TO FLOOR BELOW.
3. 48"x24" RELIEF AIR CONNECTED INTO 60"x20" RETURN AIR DUCT. TRANSITION TO 24"x24" AND ROUTE UP TO CEILING., THEN TRANSITION BACK TO 48"x24" AT MECHANICAL ROOM WALL.
4. 20"x22" OUTSIDE AIR TO HVAC-1. DUCTWORK SHALL BE ROUTED TIGHT TO CEILING INSIDE ANNULAR SPACE BETWEEN CONCRETE JOISTS.
5. DUCTWORK SHALL BE ROUTED TIGHT CEILING. TRANSITION DOWN TO MAKE EQUIPMENT CONNECTION AND WALL PENETRATION TO THE EXTERIOR.
6. 32"x32" OUTSIDE AIR THROUGH WALL AND UP TO ROOF LEVEL. REFER TO ROOF LEVEL PLAN FOR CONTINUATION.
7. INSTALL NEW 3-WAY COOLING TOWER BYPASS VALVE ON EXISTING 8" CONDENSING WATER RETURN.
8. A3 CONNECT 8" CONDENSING WATER RETURN FROM BYPASS VALVE INTO EXISTING COOLING TOWER COLD WATER BASIN. INSTALL NEW 8" FLANGED CONNECTION TO COLD WATER BASIN.
9. 1" LPS TO CONTROL VALVE AND STEAM INJECTION BASIN HEATER. INSTALL NEW STEAM INJECTION HEATER IN COOLING TOWER BASIN PER DETAIL 8 / M501. INSULATE AND HEAT TRACE 1" LPS PIPING.
10. INSULATE AND HEAT TRACE ALL EXISTING AND NEW EXTERIOR CWS AND CWR PIPING.
11. 3" CWS AND CWR CONNECTED INTO HVAC-1. REFER TO COOLING TOWER AND CONDENSING WATER PIPING DIAGRAM ON M602 FOR ADDITIONAL DETAILS.
12. 1" LPS TO HVAC-1 STEAM HEATING COIL CONTROL VALVE (CONTROL VALVE INTEGRAL TO HVAC-1).
13. 1" LPC FROM HVAC-1 STEAM HEATING COIL. INSTALL STEAM TRAP PER DETAIL 2 / M502. 1" LPC DOWN THROUGH FLOOR TO SECOND FLOOR.
14. CONCRETE EQUIPMENT PAD, 9'-0" L x 9'-0" W x 4" T.
15. INSTALL NEW FLOOR DRAIN FD-1. 1-1/2" CONDENSATE DRAIN FROM HVAC-1 TO FLOOR DRAIN. TERMINATE PIPE 1" ABOVE RIM OF DRAIN. HVAC UNIT HAS INTERNAL P-TRAP, DO NOT INSTALL P-TRAP EXTERNAL FROM UNIT.
16. 2" SANITARY VENT UP FROM FLOOR BELOW CONTINUES UP TO ROOF. TRANSITION TO 3" AND VENT THROUGH ROOF.
17. A3 CONNECT NEW 1/2" HHWS & 1/2" HHWR PIPING INTO EXISTING 3/4" HHWS & HHWR PIPING.
18. INSTALL NEW HYDRONIC UNIT HEATER (UIH-1), MOUNT BOTTOM OF HEATER 8'-0" ABOVE FINISHED FLOOR. REFER TO DETAIL 10 / M502 FOR PIPING DETAIL.

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Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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180746

THIRD FLOOR MECHANICAL PLANS

# M106

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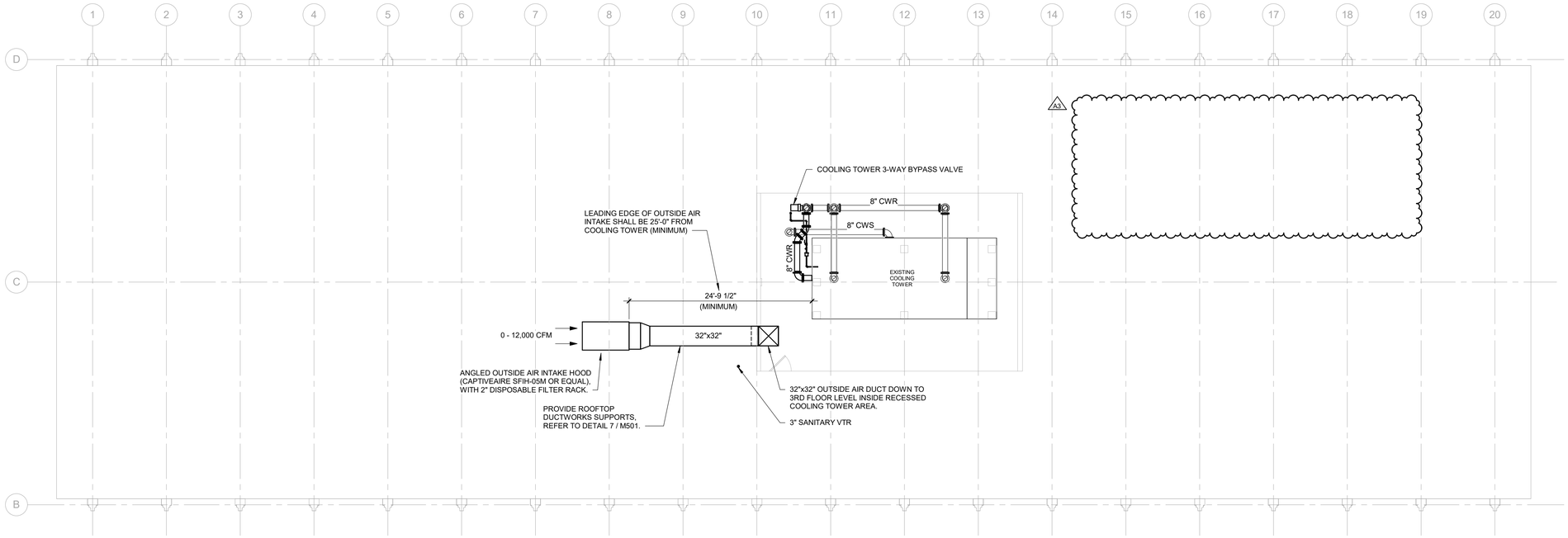


NORTH

## ROOF LEVEL MECHANICAL PLAN

SCALE: 1/8" = 1'-0"

0 4 8 16

## NOTES

1. ALL EXISTING CONDITIONS NOT SHOWN. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
2. EXISTING CONDITIONS SHOWN ARE BASED ON MINORU YAMASAKI AND ASSOCIATES DRAWINGS (PROJECT 6015), DATED 5-7-1962.

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Drawn By
Designer
Reviewer
Manager MM5

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ROOF LEVEL MECHANICAL PLAN

**M107**

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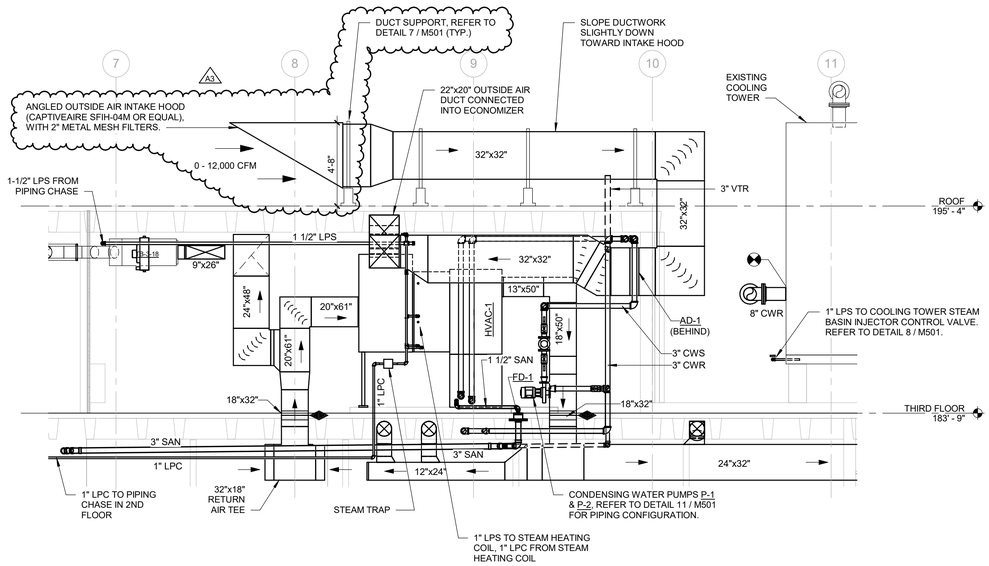
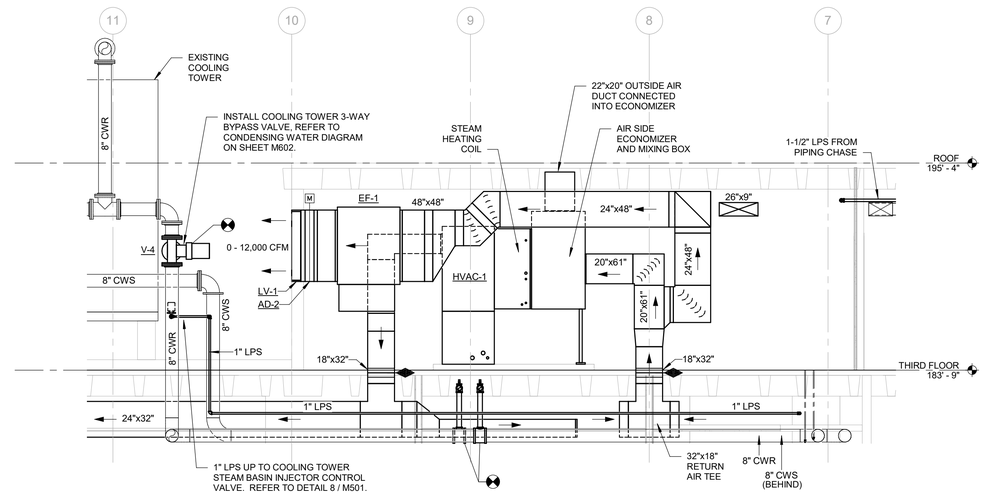



1 SECTION
SCALE: 1/4" = 1'-0"
0 2 4 8




2 SECTION
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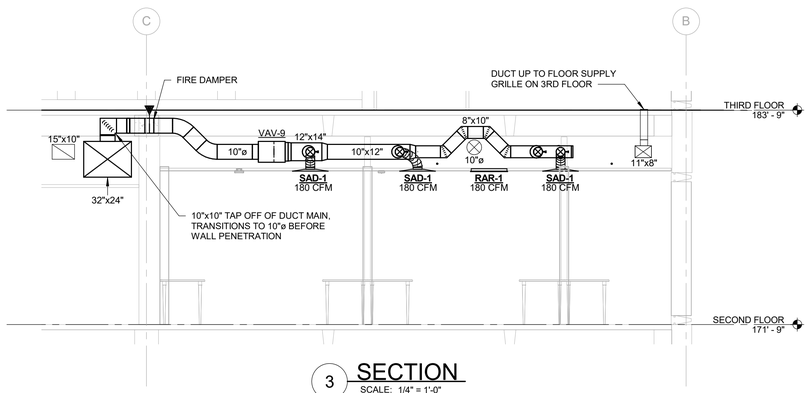


3 SECTION
SCALE: 1/4" = 1'-0"
0 2 4 8

NOTE:
- SECTION CUT TYPICAL FOR VAV-6, VAV-7, VAV-8, AND VAV-9.

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Designer SKU
Reviewer PMO
Manager MM5

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MECHANICAL SECTIONS

# M201

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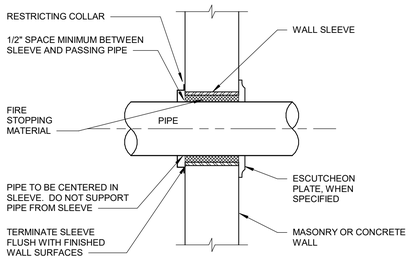
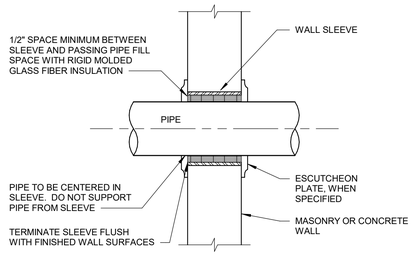


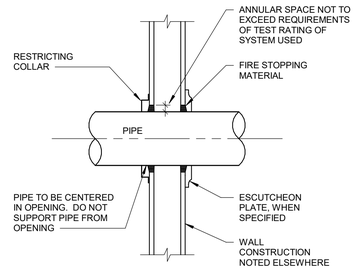

NOTE
USE TYPE 5 WALL SLEEVE FOR ALL PIPING PASSING THROUGH NEW FIRE RATED INTERIOR MASONRY OR CONCRETE WALLS.

1 WALL SLEEVE DETAIL - TYPE 5
NO SCALE



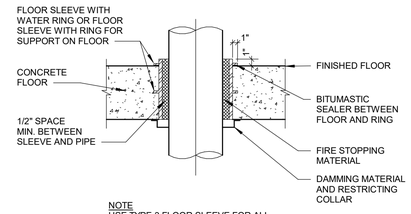

NOTE
USE TYPE 6 WALL SLEEVE FOR ALL PIPING PASSING THROUGH NEW INTERIOR NON-FIRE RATED MASONRY OR CONCRETE WALLS.

2 WALL SLEEVE DETAIL - TYPE 6
NO SCALE



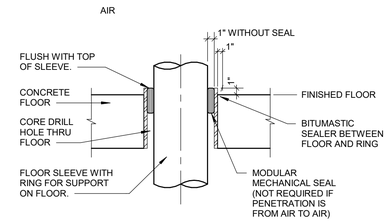

NOTE
USE TYPE 4 WALL PENETRATION FOR ALL PIPING PASSING THROUGH NEW FIRE RATED INTERIOR STUD WALLS.

3 WALL PENETRATION DETAIL - TYPE 4
NO SCALE



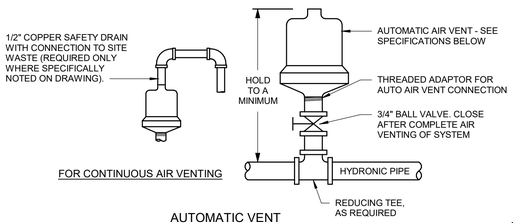

NOTE
USE TYPE 3 FLOOR SLEEVE FOR ALL PIPING PASSING THROUGH NEW OR EXISTING FIRE RATED CONCRETE FLOORS.

4 FLOOR SLEEVE DETAIL - TYPE 3
NO SCALE

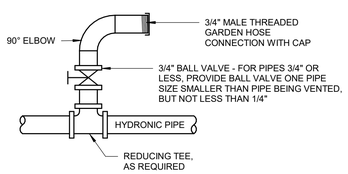



NOTE:
USE TYPE 2 FLOOR SLEEVE FOR ALL PIPING PASSING THROUGH CORED HOLE IN EXISTING NON-FIRE RATED CONCRETE FLOORS.

5 FLOOR SLEEVE DETAIL - TYPE 2
NO SCALE



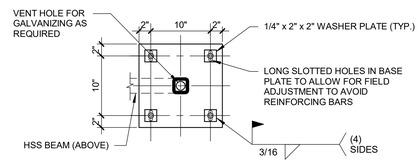

AUTOMATIC VENT



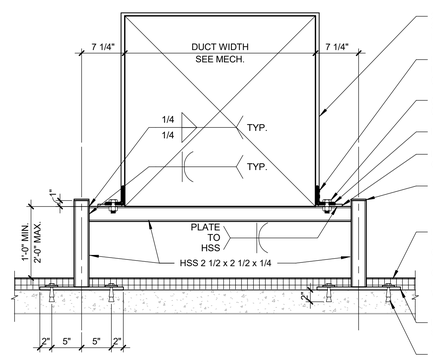

MANUAL VENT

NOTES:
1. AUTOMATIC AIR VENTS ARE REQUIRED AT EACH HIGH POINT IN HYDRONIC PIPING LOCATED TO COMPLETELY VENT AIR FROM WATER SYSTEMS.
2. FOR PIPE SIZES 2-1/2" AND LARGER, PROVIDE BELL & GOSSETT MODEL 78 AIR VENT, OR ARMSTRONG NO.75, RATED FOR 150 PSI.
3. FOR PIPE SIZES 2" AND LESS, PROVIDE BELL & GOSSETT MODEL 87 AIR VENT, OR ARMSTRONG NO.75, RATED FOR 150 PSI.
4. WHEN AUTOMATIC AIR VENT INSTALLATION IS NOT POSSIBLE, OR WHEN MANUAL VENTS ARE INDICATED, PROVIDE A BALL VALVE AND HOSE THREAD CONNECTION.

6 WATER SYSTEM AIR VENT DETAILS
NO SCALE




BASE PLATE PLAN

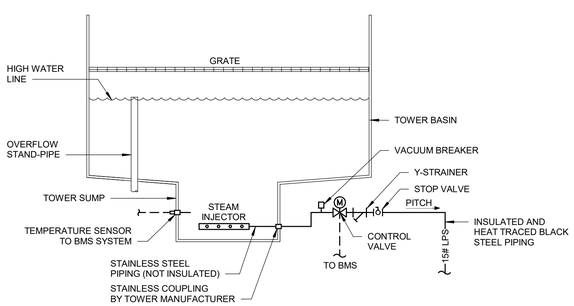



FRAME ELEVATION

2" x 20 GA. COLD-FORMED STEEL STRAP (GALVANIZED). PULL TIGHT. Fy = 33 KSI.
FASTEN STRAP TO ANGLE WITH (4) POWDER-ACTUATED FASTENERS (SHANK DIA.=0.145", HEAD DIA.=0.3")
(2) 5/8" DIAMETER A325 BOLTS (GALVANIZED)
L3x3x1/4 x 0'-8 1/2" LONG
PLATE 3/8" x 4" x 0'-8 1/2" LONG, CENTER ON HSS
1/4" MIN. CAP PLATE
REMOVE ROOFING AS REQUIRED FOR BASE PLATE INSTALLATION. COORDINATE WITH OWNER AND ROOFING INSTALLING CONTRACTOR FOR PATCHING AND REPAIR INFORMATION TO MAINTAIN WARRANTY.
BASE PLATE 1/2" x 1'-2" x 1'-2" LONG. SEE BASE PLATE PLAN.
1/2" DIAMETER HILTI KWIK BOLT TZ, GALVANIZED CARBON STEEL ANCHOR WITH 2" EMBEDMENT

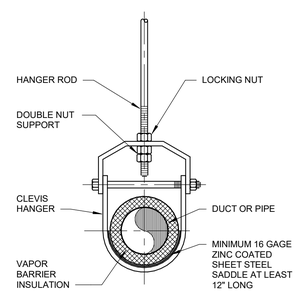
7 ROOFTOP DUCTWORK SUPPORT DETAIL

NOTES:
1. ALL STEEL HOT DIPPED GALVANIZED.
2. EXPOSED HOLES IN MEMBERS ADDED FOR VENTING DURING GALVANIZING SHALL BE SEALED TIGHT WITH A NON-CORROSIVE AND DURABLE MATERIAL.
3. HSS SHAPES TO BE ASTM A500 GR B, Fy = 46.0 KSI.
4. PLATES AND ANGLES TO BE ASTM A36, Fy= 36 KSI.
5. FIELD LOCATE EXISTING REINFORCING BARS IN CONCRETE SLAB AND AVOID DAMAGING WHEN INSTALLING ANCHORS. COORDINATE REINFORCING BAR LOCATIONS WITH STEEL DETAILER TO ADJUST HOLES IN BASE PLATES AS REQUIRED. MAINTAIN A MINIMUM EDGE DISTANCE OF 1 1/2" ON BOLT HOLES. BASE PLATE SIZE MAY BE INCREASED UP TO 2" TO ACCOMMODATE DESIRED BOLT HOLE LOCATION. DO NOT MAKE PLATE SMALLER THAN SHOWN.
6. ALL WELDING TO SATISFY AWS REQUIREMENTS.
7. ABSENT WELD SIZE IN WELD SYMBOL MEANS USE MINIMUM SIZE BASED ON CONNECTED PARTS PER AISC REQUIREMENTS.
8. ABSENT WELD LENGTH IN WELD SYMBOL MEANS WELD FULL LENGTH OF JOINT.




8 COOLING TOWER STEAM BASIN HEATER DETAIL
NO SCALE

NOTES:
1. TOWER BASIN HEATER SHALL MAINTAIN MINIMUM 40°F WATER TEMPERATURE (ADJUSTABLE)




SINGLE HORIZONTAL RUNS WITH VAPOR BARRIER INSULATION

9 TYPICAL CLEVIS HANGER
NO SCALE

NOTE:
TO KEEP SHIMS IN PLACE ALLOW NON-SHRINKING GROUT TO FLOW AROUND HOLD DOWN LUGS

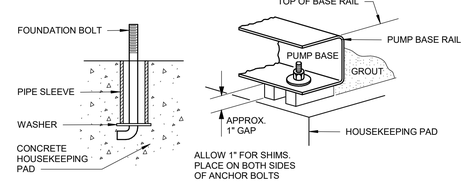
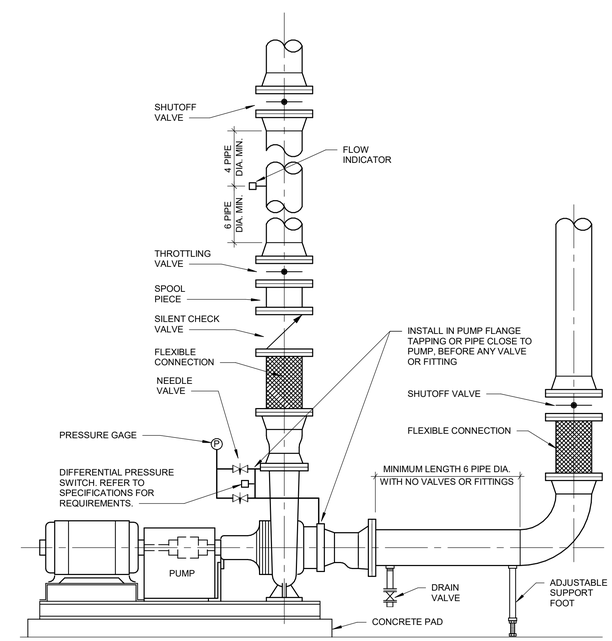



FIGURE 1 FIGURE 2

INSTALLATION NOTES
1. INSTALL FOUNDATION BOLTS IN NEW CONCRETE HOUSEKEEPING PAD (SEE FIGURE 1).
2. PLACE PUMP ON HOUSEKEEPING PAD SUPPORTING IT WITH SHIMS TOTALING 1" IN THICKNESS. SHIMS SHOULD BE PUT ON BOTH SIDES OF EACH ANCHOR BOLT AS A MEANS OF LEVELING THE BASE (SEE FIGURE 2).
3. AFTER PUMP HAS BEEN LEVELED, SECURELY BOLTED TO FLOOR AND PROPERLY ALIGN PER SPECIFICATION. NON-SHRINKING GROUT IS TO BE POURED INTO PUMP BASE. TO HOLD SHIMS IN PLACE ALLOW THE GROUT TO FLOW AROUND THEM (SEE FIGURE 2).

10 PUMP BASE INSTALLATION DETAIL
NO SCALE




NOTES
1. FOR PIPE SIZES 2" AND SMALLER, CIRCUIT SETTER MAY BE USED IN LIEU OF FLOW INDICATOR AND THROTTLING VALVE.
2. FLOW INDICATOR MAY BE ON RETURN SIDE, SEE SYSTEM SCHEMATIC.

11 BASE MOUNTED PUMP WITHOUT SUCTION DIFFUSER
NO SCALE

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Drawn By SKU
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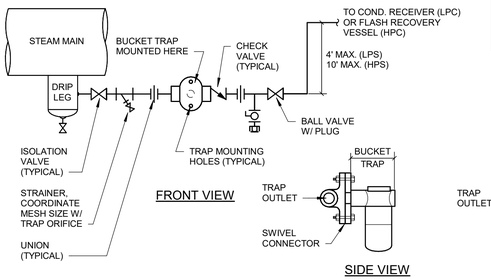
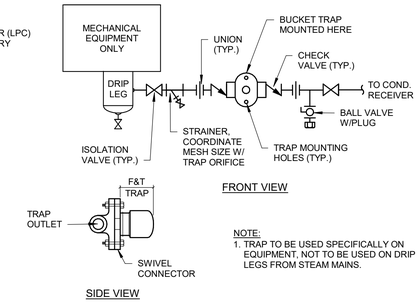
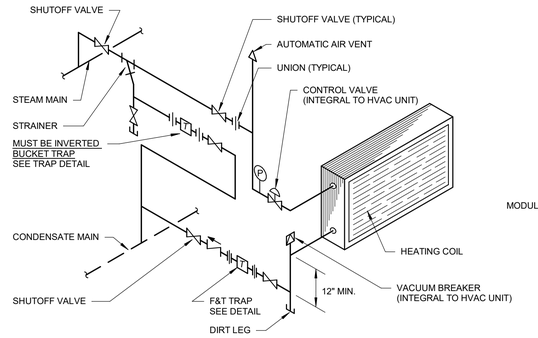



1 BUCKET STEAM TRAP ASSEMBLY DETAIL
NO SCALE

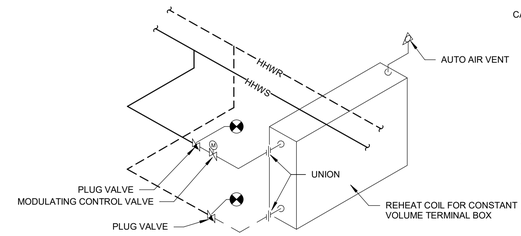



NOTE:
1. TRAP TO BE USED SPECIFICALLY ON EQUIPMENT, NOT TO BE USED ON DRIP LEGS FROM STEAM MAINS.

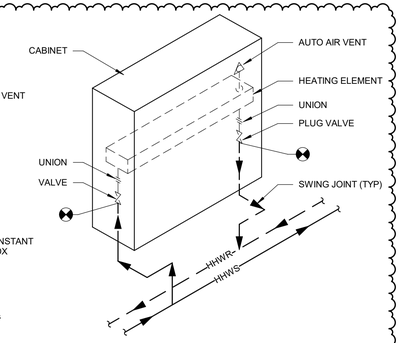
2 F&T STEAM TRAP ASSEMBLY DETAIL
NO SCALE



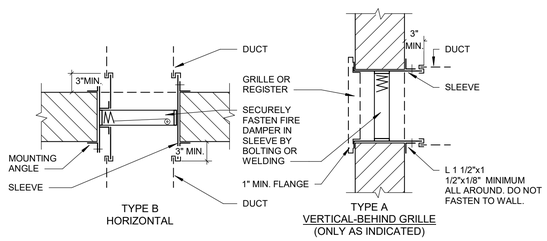

3 STEAM HEATING COIL PIPING DIAGRAM
NO SCALE

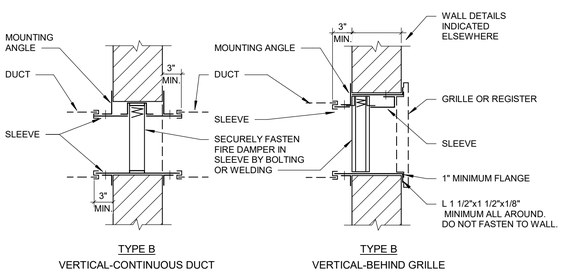



4 EXISTING RE-HEAT COIL FOR TERMINAL BOXES PIPING DETAIL
NO SCALE



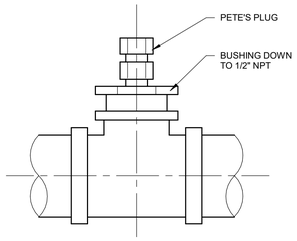

5 EXISTING CONVECTOR PIPING DETAIL
NO SCALE



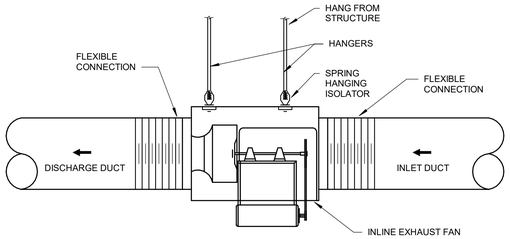




NOTES
1. USE TYPE B UNLESS NOTED OTHERWISE.
2. OPENINGS ARE TO BE 1/8" PER FOOT OF DAMPER SIZE LARGER THAN DAMPER IN BOTH DIRECTIONS; MINIMUM OF 1/4".
3. SLEEVES ARE TO BE OF GALVANIZED STEEL, GAGE AS REQUIRED BY SMACNA STANDARD OR LOCAL FIRE OFFICIAL, WHICHEVER REQUIREMENT IS MORE STRINGENT.

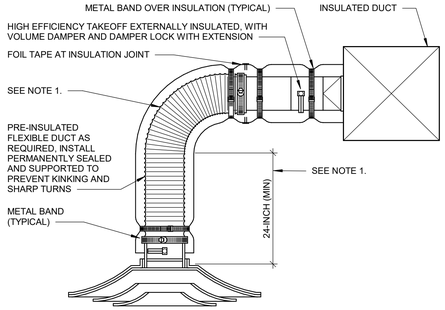
6 FIRE DAMPER DETAILS
NO SCALE




7 PETE'S PLUG INSTALLATION DETAIL
NO SCALE

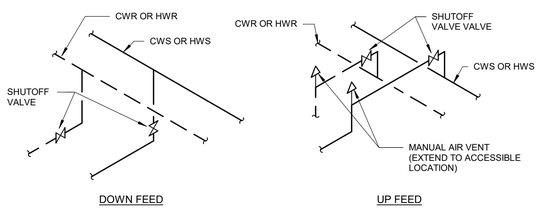



8 INLINE EXHAUST FAN
NO SCALE



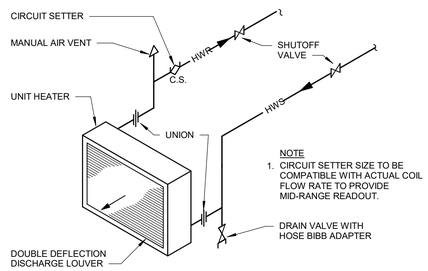

NOTES:
1. EXTEND RIGID METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 5'-0". PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.

9 LAY-IN CEILING DIFFUSER DETAIL
NO SCALE




NOTES
1. MAKE ALL TAKE OFFS WITH SWING JOINTS.
2. DOWN FEED TO BE USED UNLESS INDICATED OTHERWISE.

10 PIPING TAKE OFF DETAILS
NO SCALE




NOTE
1. CIRCUIT SETTER SIZE TO BE COMPATIBLE WITH ACTUAL COIL FLOW RATE TO PROVIDE MID-RANGE READOUT.

11 HORIZONTAL HOT WATER UNIT HEATER PIPING DIAGRAM
NO SCALE

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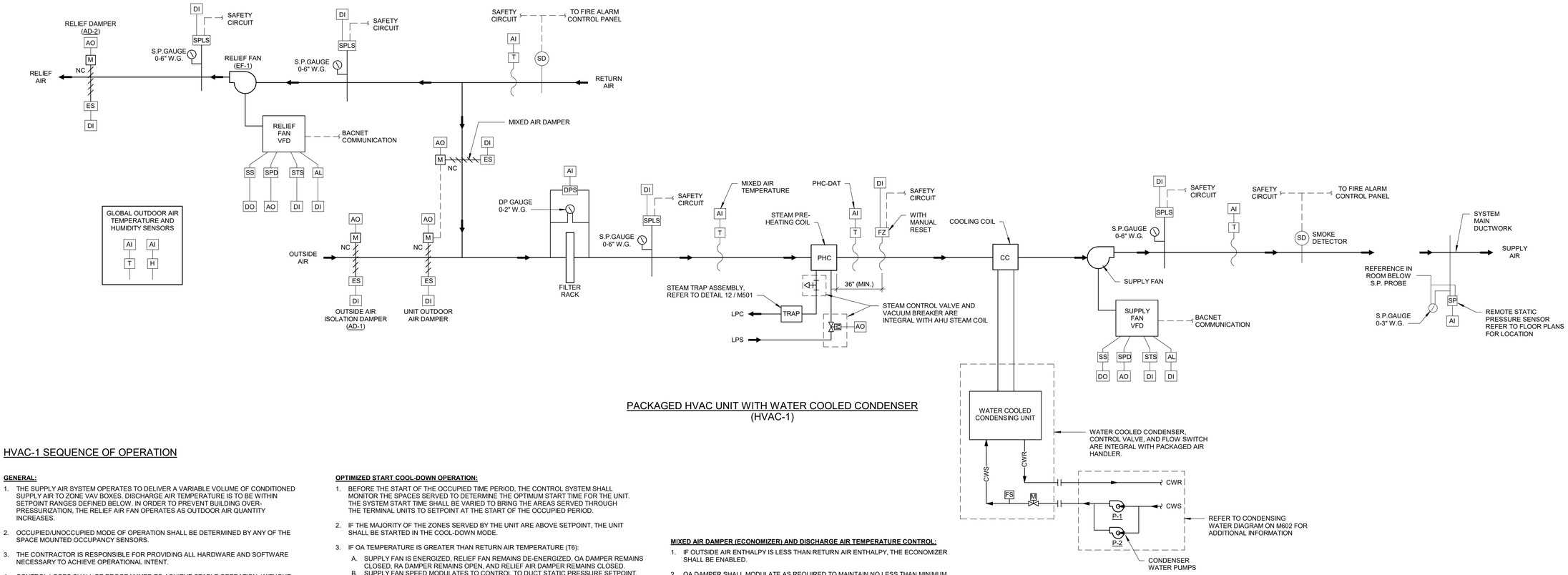


PACKAGED HVAC UNIT WITH WATER COOLED CONDENSER
(HVAC-1)

## HVAC-1 SEQUENCE OF OPERATION

**GENERAL:**

1. THE SUPPLY AIR SYSTEM OPERATES TO DELIVER A VARIABLE VOLUME OF CONDITIONED SUPPLY AIR TO ZONE VAV BOXES. DISCHARGE AIR TEMPERATURE IS TO BE WITHIN SETPOINT RANGES DEFINED BELOW. IN ORDER TO PREVENT BUILDING OVER-PRESSURIZATION, THE RELIEF AIR FAN OPERATES AS OUTDOOR AIR QUANTITY INCREASES.
2. OCCUPIED/UNOCCUPIED MODE OF OPERATION SHALL BE DETERMINED BY ANY OF THE SPACE MOUNTED OCCUPANCY SENSORS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL HARDWARE AND SOFTWARE NECESSARY TO ACHIEVE OPERATIONAL INTENT.
4. CONTROL LOOPS SHALL BE PROGRAMMED TO ACHIEVE STABLE OPERATION, WITHOUT VALVE OR DAMPER OVERSHOOT.
5. CONTROL DAMPERS SHALL BE PROVEN OPEN BY LIMIT SWITCHES PRIOR TO FAN STARTING. INTERLOCK CONTROL DAMPERS TO ONE ANOTHER.
6. IN EVENT OF INITIATING TIMED OVERRIDE, MAINTAIN OCCUPIED SEQUENCE OF OPERATION FOR A MINIMUM OF 2 HOUR PERIOD.

**COMMUNICATION WITH EXISTING CENTRAL AIR SYSTEM:**

1. THE EXISTING BUILDING MANAGEMENT SYSTEM SHALL MONITOR THE NEW AIR HANDLING SYSTEM (HVAC-1) OPERATION.
2. WHILE THE EXISTING CENTRAL AIR SYSTEM IS IN HEATING MODE, IF A SPACE CALLS FOR HVAC-1 TO PROVIDE COOLING, THE EXISTING TERMINAL BOX HEATING COIL VALVE SHALL FULLY CLOSE AND HEATING SHALL BE DISABLED. HEATING MODE SHALL REMAIN DISABLED UNTIL THE SPACE BECOMES UNOCCUPIED OR THE SPACE TEMPERATURE FALLS 5F (ADJ.) BELOW THE SETPOINT.

**EXISTING TERMINAL BOX ROOM ASSIGNMENTS FOR HEATING COIL LOCKOUT**

| EXISTING TERMINAL BOX | TB-2-6 | TB-2-7 | TB-2-8 | TB-2-9 | TB-2-10 | TB-2-11 | TB-2-12 |
|---|---|---|---|---|---|---|---|
| NEW ROOM NUMBER | 204 | 204 | 204 | 204 | 204 | 208 | 208 |

| EXISTING TERMINAL BOX | TB-2-13 | TB-2-14 | TB-2-15 | TB-2-16 | TB-2-17 | TB-2-18 | TB-2-19 |
|---|---|---|---|---|---|---|---|
| NEW ROOM NUMBER | 208 | 210 | 212 | 211 | 211 | 213 | 213 |

**OPERATION MODES:**

AHU START / STOP:

1. A SYSTEM START / STOP POINT SHALL BE PROVIDED FOR MANUAL START-UP AND SHUTDOWN OF SYSTEM VIA BMS.
2. WITH THE SUPPLY FAN VFD HAND/OFF/AUTO SWITCH IN THE AUTO POSITION, THE SUPPLY FAN IS AUTOMATICALLY STARTED AND STOPPED BASED ON THE TIME OF DAY OCCUPANCY SCHEDULE AS PROGRAMMED THROUGH THE BMS SYSTEM.
3. AT SYSTEM STARTUP, PROVIDE NECESSARY TIME DELAYS AND RAMP-UP DURATIONS FOR ALL CONTROLLED DEVICES TO PROVIDE STABLE START-UP AND AVOID NUISANCE TRIPPING (I.E. FREEZESTAT, HIGH / LOW STATIC PRESSURE SWITCH).
4. WHEN SYSTEM IS DE-ENERGIZED, CONTROL DEVICES SHALL RESPOND AS FOLLOWS:
   A. SUPPLY FAN SHALL DE-ENERGIZE.
   B. RELIEF FAN SHALL DE-ENERGIZE.
   C. OUTDOOR AIR DAMPER SHALL CLOSE.
   D. RETURN AIR DAMPER SHALL OPEN.
   E. STEAM HEATING COIL SHALL REMAIN ACTIVE AT OA TEMPERATURES BELOW 40F TO MAINTAIN A CABINET TEMPERATURE OF 55F, AND DE-ACTIVATE AT OA TEMPERATURE 40F OR ABOVE.
   F. RELIEF AIR DAMPER SHALL CLOSE.

**SYSTEM SUPPLY AND RELIEF AIRFLOW:**

1. THE CONTROLLER SHALL MONITOR OUTDOOR, RELIEF, RETURN AND SUPPLY AIRFLOW.
2. SUPPLY FAN SPEED SHALL BE MODULATED BY THE CONTROLLER TO MAINTAIN SUPPLY AIR STATIC PRESSURE SETPOINT. STATIC PRESSURE SETPOINT VALUE SHALL BE DETERMINED BY THE AIR BALANCE CONTRACTOR DURING SYSTEM BALANCING.
3. RELIEF FAN IS AVAILABLE TO RUN WHEN THE SUPPLY FAN STARTS. RELIEF FAN SPEED SHALL BE MODULATED BY THE CONTROLLER TO MAINTAIN A FLOW EQUAL TO OA FLOW CFM. WHEN THE OA DAMPER IS AT A MINIMUM OR CLOSED, THE RELIEF FAN SHALL BE OFF.
   A. THE RELIEF FAN SHALL MODULATE BASED ON OUTSIDE AIR DAMPER POSITION (PERCENTAGE OPEN) TO MATCH FLOW.
   B. ANY TIME THE OUTSIDE AIR DAMPER IS NOT IN THE MINIMUM POSITION, THE RELIEF FAN SHALL START AND THE DRIVE FREQUENCY (HZ) SHALL BE 10% LESS THAN THE SUPPLY FAN DRIVE FREQUENCY.
4. SUPPLY AND RELIEF FAN STATIC PRESSURE LIMIT SWITCHES SHALL PROVIDE HARDWIRED SAFETY (SEE SAFETY SHUTDOWN SEQUENCE).

**OPTIMIZED START COOL-DOWN OPERATION:**

1. BEFORE THE START OF THE OCCUPIED TIME PERIOD, THE CONTROL SYSTEM SHALL MONITOR THE SPACES SERVED TO DETERMINE THE OPTIMUM START TIME FOR THE UNIT. THE SYSTEM START TIME SHALL BE VARIED TO BRING THE AREAS SERVED THROUGH THE TERMINAL UNITS TO SETPOINT AT THE START OF THE OCCUPIED PERIOD.
2. IF THE MAJORITY OF THE ZONES SERVED BY THE UNIT ARE ABOVE SETPOINT, THE UNIT SHALL BE STARTED IN THE COOL-DOWN MODE.
3. IF OA TEMPERATURE IS GREATER THAN RETURN AIR TEMPERATURE (T6):
   A. SUPPLY FAN IS ENERGIZED, RELIEF FAN REMAINS DE-ENERGIZED, OA DAMPER REMAINS CLOSED, RA DAMPER REMAINS OPEN, AND RELIEF AIR DAMPER REMAINS CLOSED.
   B. SUPPLY FAN SPEED MODULATES TO CONTROL TO DUCT STATIC PRESSURE SETPOINT. HEATING VALVE SHALL REMAIN CLOSED.
   C. COOLING COIL IS MODULATED TO MAINTAIN 55F DAT FROM UNIT.
4. IF OA TEMPERATURE IS LESS THAN RETURN AIR TEMPERATURE:
   A. SUPPLY FAN IS ENERGIZED, RELIEF FAN IS ENERGIZED, OA DAMPER IS OPENED, RA DAMPER IS CLOSED, RELIEF AIR DAMPER IS OPENED.
   B. SUPPLY FAN SPEED MODULATES TO CONTROL TO DUCT STATIC PRESSURE SETPOINT.
   C. RELIEF FAN SPEED MODULATES TO CONTROL RELIEF AIR FLOW TO MATCH OUTDOOR AIRFLOW MINUS THE DESIRED OFFSET SPEED.
   D. HEATING COIL SHALL REMAIN INACTIVE.
   E. COOLING COIL IS MODULATED TO MAINTAIN 55F DAT FROM UNIT.
5. WHEN 75% OF ASSOCIATED ZONES REACH SETPOINT, THE OPTIMIZED START MODE IS COMPLETE AND UNIT ENTERS OCCUPIED MODE OF OPERATION.

**STATIC PRESSURE RESET:**

1. SUPPLY DUCT STATIC PRESSURE SETPOINT SHALL BE RESET BASED ON ALL ASSOCIATED TERMINAL UNIT DAMPER POSITIONS.
2. STATIC PRESSURE SETPOINT SHALL BE RESET TO MAINTAIN MOST OPEN TERMINAL UNIT DAMPER AT 95% OPEN.
3. AS MOST OPEN DAMPER POSITION FALLS BELOW 95% OPEN, GRADUALLY REDUCE DUCT STATIC PRESSURE SETPOINT.
4. AS MOST OPEN DAMPER RISES ABOVE 95% OPEN, GRADUALLY RAISE DUCT STATIC PRESSURE SETPOINT. DUCT STATIC PRESSURE SETPOINT SHALL HAVE AN ADJUSTABLE HIGH LIMIT (DETERMINED BY TAB AS REQUIRED TO ACHIEVE DESIGN AIRFLOW) AND AN ADJUSTABLE LOW LIMIT (0.75-INCHES W.G. LESS THAN HIGH LIMIT).

**COOLING MODE (WATER COOLED CONDENSER):**

1. IN COOLING MODE WHEN SUPPLY FAN IS ENABLED, DX COOLING SHALL CYCLE TO MAINTAIN A LEAVING AIR TEMPERATURE OF 55F (ADJ.).
2. THE CONDENSING WATER CONTROL VALVE SHALL OPEN AND THE CONDENSING WATER PUMP SHALL BE ENERGIZED WHENEVER THE UNIT CONTROLLER CALLS FOR MECHANICAL COOLING AND SHALL MODULATE TO MAINTAIN CONDENSER TEMPERATURE.
3. A CONDENSING WATER FLOW SWITCH SHALL DETECT WATER FLOW PRIOR TO ALLOWING MECHANICAL COOLING. COMPRESSOR OPERATION SHALL LOCK OUT IF FLOW SWITCH IS NOT SATISFIED. COMPRESSOR OPERATION SHALL AUTOMATICALLY RESTORE UPON WATER FLOW BEING PROVEN.
4. WHEN SUPPLY FAN IS DISABLED, DX COOLING SHALL BE DISABLED.

**PRE-HEATING MODE (STEAM COIL):**

1. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 40F (ADJ.), STEAM COIL VALVE SHALL MODULATE TO MAINTAIN AHU PHC-DAT SETPOINT OF 55F (ADJ.).
2. UPON A CALL FOR COOLING, THE STEAM COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE PHC-DAT SETPOINT.
3. WHEN IN UNOCCUPIED MODE, THE STEAM HEATING COIL SHALL REMAIN ACTIVE AT OA TEMPERATURES BELOW 40F TO MAINTAIN A CABINET TEMPERATURE OF 55F, AND DE-ACTIVATE AT OA TEMPERATURE 40F OR ABOVE.

**OUTDOOR AIR DAMPER (CO2 CONTROL):**

1. IN OCCUPIED MODE, OUTDOOR AIR ISOLATION DAMPER SHALL FULLY OPEN.
2. IN OCCUPIED MODE, UPON A SIGNAL FROM RETURN AIR CO2 SENSOR THAT RETURN AIR CO2 LEVEL EXCEEDS MAXIMUM OCCUPIED SETTING OF 700 PPM (ADJ.) ABOVE AMBIENT AS MEASURED BY GLOBAL OUTDOOR AIR CO2 SENSOR, OUTDOOR AIR DAMPER SHALL
3. RAMP OPEN. DAMPER SHALL OPEN INCREMENTALLY EVERY 5 MINUTES (ADJ.) UP TO DAMPER POSITION THAT CORRESPONDS TO SCHEDULED DESIGN MAXIMUM OUTDOOR AIRFLOW RATE (DAMPER POSITION AS DETERMINED IN TAB PROCESS).
4. IF OUTDOOR AIR DAMPER IS OPEN TO POSITION DETERMINED IN TAB PROCESS THAT CORRESPONDS TO SCHEDULED DESIGN MAXIMUM OUTDOOR AIRFLOW RATE AND CO2 LEVEL STILL EXCEEDS MAXIMUM CO2 SETTING FOR MORE THAN 15 MINUTES, BMS SHALL
5. SIGNAL HIGH CO2 LEVEL ALARM.

   AFTER CO2 LEVEL DROPS BELOW MAXIMUM SETTING, OUTDOOR AIR AND RETURN AIR
6. DAMPERS SHALL GRADUALLY RESET TO PRIOR POSITIONS AND ALARM SHALL BE DEACTIVATED.
7. WHEN SUPPLY FAN IS DISABLED OR UNIT IS IN UNOCCUPIED MODE, THERE SHALL BE NO CO2 CONTROL, AND OUTDOOR AIR ISOLATION DAMPER (AD-1) AND RELIEF AIR DAMPER (AD-2) SHALL FULLY CLOSE.

**MIXED AIR DAMPER (ECONOMIZER) AND DISCHARGE AIR TEMPERATURE CONTROL:**

1. IF OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY, THE ECONOMIZER SHALL BE ENABLED.
2. OA DAMPER SHALL MODULATE AS REQUIRED TO MAINTAIN NO LESS THAN MINIMUM DESIGN OA FLOW WHEN SYSTEM IS IN NORMAL OCCUPIED MODE.
3. WHEN ONLY MINIMUM OUTSIDE AIRFLOW IS REQUIRED, OAD SHALL MODULATE TO MAINTAIN AIRFLOW AT WHILE RAD REMAINS FULL OPEN.
4. AS THE CALL FOR OUTSIDE AIRFLOW INCREASES TO MAINTAIN DAT, OAD MODULATES OPEN TO INCREASE OA FLOW ABOVE THE MINIMUM SETPOINT. RAD REMAINS FULLY OPEN.
5. WHEN THE OAD IS FULLY OPEN AND ADDITIONAL OA IS REQUIRED TO SATISFY THE DAT SETPOINT, RAD SHALL START TO MODULATE CLOSED.
6. AFTER THE RAD IS FULLY CLOSED, DAT SHALL BE MAINTAINED BY THE DX COOLING COIL.
7. COOLING COIL SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT AFTER FULL ECONOMIZER HAS BEEN UTILIZED.
8. FOR ALL DISCHARGE AIR TEMPERATURE CONTROL SEQUENCES, PROVIDE NECESSARY DEADBANDS AND TIME DELAYS TO PREVENT SIMULTANEOUS HEATING AND COOLING OPERATION. IF DISCHARGE AIR TEMPERATURE IS MORE THAN 3F FROM SETPOINT, COOLING COIL SHALL OPERATE AS NEEDED TO REGARDLESS OF DAMPER POSITION.

**UNOCCUPIED MODE:**

1. IN THE UNOCCUPIED MODE OF OPERATION, THE SUPPLY AIR AND RETURN AIR FANS SHALL NORMALLY BE OFF.
2. STEAM HEATING COIL SHALL REMAIN ACTIVE AT OA TEMPERATURES BELOW 40F TO MAINTAIN A CABINET TEMPERATURE OF 55F, AND DE-ACTIVATE AT OA TEMPERATURE 40F OR ABOVE.
3. COOLING COIL SHALL REMAIN DE-ACTIVATED.

**SAFETY SHUTDOWN AND MISCELLANEOUS MONITORING:**

1. HARD-WIRED SAFETY CIRCUIT ACTIVATION:
   A. SUPPLY AND RETURN FANS SHALL STOP AND ALL DAMPERS SHALL RETURN TO THE UNOCCUPIED POSITION.
1. FREEZESTAT(S) SHALL ACTIVATE SAFETY CIRCUIT WHEN TEMPERATURE SENSED IS 35F OR BELOW. CONTROLLER SHALL MONITOR FREEZESTAT STATUS AND SIGNAL AN ALARM IF FREEZESTAT TRIPS. WHEN FREEZESTAT ALARM IS ACTIVATED, THE CONTROLLER SHALL MODULATE THE HEATING VALVE TO MAINTAIN COOLING COIL DAT AT 50F (UNTIL FREEZESTAT IS MANUALLY RESET).
2. STATIC PRESSURE LIMIT SWITCHES SHALL STOP THE SUPPLY AND RELIEF FANS, RESPECTIVELY, TO PREVENT THE STATIC PRESSURE FROM EXCEEDING ITS HIGH AND LOW LIMIT SETPOINTS. THE CONTROLLER SHALL MONITOR THE PRESSURE SWITCHES AND SIGNAL AN ALARM WHEN TRIPPED.
3. DUCT SMOKE DETECTORS SHALL ACTIVATE SAFETY CIRCUIT THROUGH FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
4. FILTER STATUS SHALL BE MONITORED BY THE CONTROLLER THROUGH DIFFERENTIAL PRESSURE TRANSMITTERS. WHEN DP REACHES SETPOINT, THE CONTROLLER SHALL ACTIVATE A DIRTY FILTER ALARM.
5. THE FOLLOWING ALARMS SHALL BE SENT TO THE BMS. TIME DELAYS SHALL BE INCORPORATED TO MINIMIZE NUISANCE ALARMS.
   A. SUPPLY FAN VFD FAULT / FAILURE
   B. RELIEF FAN VFD FAULT / FAILURE
   C. SUPPLY FAN STATUS ALARM
   D. RELIEF FAN STATUS ALARM
   E. CONDENSER WATER PUMP STATUS ALARM
   F. FREEZESTAT TRIP
   G. HIGH/LOW DISCHARGE/SUCTION DUCT STATIC PRESSURE (SUPPLY AND RELIEF FANS)
   H. HIGH FILTER PRESSURE DROP
   I. DISCHARGE AIR TEMPERATURE 5F ABOVE OR BELOW SETPOINT
   J. DAMPER PROOF (ALL DAMPERS)
   K. DUCT STATIC PRESSURE 0.25 IN WC ABOVE OR BELOW SETPOINT

| HVAC-1 | POINT NAME | OUTPUT DO | OUTPUT AO | INPUT DI | INPUT AI | CRITICAL ALARM | SYSTEM GRAPHICS | TREND | HARDWIRED SAFETY CIRCUIT | RUN TIME | ALARM LOW LIMIT | ALARM HIGH LIMIT | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GLOBAL** | | | | | | | | | | | | | |
| OUTDOOR AIR TEMP | T1 | | | | x | | x | x | | | | | |
| OUTDOOR AIR HUMIDITY | H1 | | | | x | | x | x | | | | | |
| **PREHEAT COIL** | | | | | | | | | | | | | |
| PREHEAT COIL VALVE | V1 | | x | | | | x | x | | | | | |
| PREHEAT COIL LEAVING AIR TEMPERATURE | T3 | | | | x | x | x | x | | | | | |
| **COOLING COIL** | | | | | | | | | | | | | |
| CONDENSING WATER PUMP STATUS | ST3 | | x | | | | x | x | | | | | |
| | | | | | | | x | | | | | | |
| **FANS** | | | | | | | | | | | | | |
| SUPPLY FAN 1 S/S | SS1 | x | | | | | x | | x | | | | |
| SUPPLY FAN 1 COMMAND | FS1 | | x | | | | x | x | | | | | |
| SUPPLY FAN 1 STATUS | ST1 | | | x | | x | x | | | x | | | |
| SUPPLY FAN 1 VFD ALARM | AL1 | | | x | | | x | | | | | | |
| SUPPLY FAN LOW PRESSURE LIMIT SWITCH | SPL1 | | x | | | | x | | | | -5 IN WC | | |
| SUPPLY FAN HIGH PRESSURE LIMIT SWITCH | SPL2 | | x | | | | x | | | | | +5 IN WC | |
| **RELIEF FAN** | | | | | | | | | | | | | |
| RELIEF FAN 1 S/S | SS2 | x | | | | | x | | | | | | |
| RELIEF FAN 1 COMMAND | FS2 | | x | | | | x | x | | | | | |
| RELIEF FAN 1 STATUS | ST2 | | | x | | x | x | | | x | | | |
| RELIEF FAN 1 VFD ALARM | AL2 | | | x | | | x | | | | | | |
| RELIEF FAN LOW PRESSURE LIMIT SWITCH | SPL4 | | x | | | | x | | | | -5 IN WC | | |
| RELIEF FAN HIGH PRESSURE LIMIT SWITCH | SPL3 | | x | | | | x | | | | | +5 IN WC | |
| **ECONOMIZER DAMPERS** | | | | | | | | | | | | | |
| OUTSIDE AIR ISOLATION DAMPER COMMAND | D1 | | x | | | | x | x | | | | | |
| OUTSIDE AIR ISOLATION DAMPER STATUS | ES1 | | | x | | | x | | x | | | | |
| MIXED AIR DAMPER COMMAND | D2 | | x | | | | x | x | | | | | |
| MIXED AIR DAMPER STATUS | ES2 | | | x | | | x | | x | | | | |
| UNIT OUTSIDE AIR ISOLATION DAMPER COMMAND | D3 | | x | | | | x | x | | | | | |
| UNIT OUTSIDE AIR ISOLATION DAMPER STATUS | ES3 | | | x | | | x | | x | | | | |
| RELIEF AIR DAMPER COMMAND | D4 | | x | | | | x | x | | | | | |
| RELIEF AIR DAMPER STATUS | ES4 | | | x | | | x | | x | | | | |
| **MISCELLANEOUS POINTS** | | | | | | | | | | | | | |
| SUPPLY DUCT STATIC PRESSURE | SP1 | | | | x | | x | x | | | SETPOINT MINUS 0.3 IN WC | SETPOINT PLUS 0.3 IN WC | |
| FILTER DIFFERENTIAL PRESSURE | DP1 | | | | x | | x | | | | | 1 IN WC | |
| FREEZESTAT | FZ1 | | | | x | x | x | | x | | 35°F | | PROVIDE MULITPLE FREEZESTATS AS NEEDED FOR COIL COVERAGE. |
| MIXED AIR TEMPERATURE | T2 | | | | x | x | x | x | | | | | |
| AHU DISCHARGE AIR TEMPERATURE | T3 | | | | x | x | x | x | | | SETPOINT MINUS 5°F | SETPOINT PLUS 5°F | ALARM ONLY WHEN UNIT IS OPERATING. |
| RETURN AIR TEMPERATURE | T4 | | | | x | x | x | x | | | | | |

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Prentis Building Computer Lab Relocation
**WSU Project: 022-313456**

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| 8/23/2018 | A3 | ADDENDUM NO. 3 |

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| 8/13/2018 | BIDS |

Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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PROJECT NO.
180746

MECHANICAL CONTROLS DIAGRAMS

**M601**

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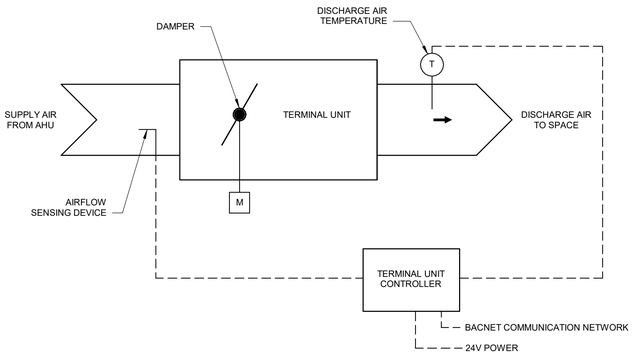



## VARIABLE AIR VOLUME TERMINAL BOX CONTROL DIAGRAM
NO SCALE
(FOR NEW VAV TERMINAL UNITS ONLY)

**GENERAL**

- TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE TO A RANGE SPECIFIED THROUGH THE FRONT END WITH LOCAL ADJUSTMENT ON ROOM SENSOR. TYPICAL SETPOINT ADJUSTMENT RANGES: +/- 2°F.

**OPERATIONAL MODES**

OCCUPIED:

- THE ROOM CONTROL SYSTEM WITH INPUT FROM A SPACE SENSOR SHALL MODULATE THE VAV SUPPLY DAMPER TO MAINTAIN THE DESIRED SPACE TEMPERATURE.
- UPON A RISE IN SPACE TEMPERATURE ABOVE SETPOINT THE SUPPLY DAMPER WILL MODULATE TOWARD THE MAXIMUM COOLING AIRFLOW SETPOINT.
- WHEN SPACE TEMPERATURE IS WITHIN ITS DEADBAND RANGE, THE SUPPLY DAMPER SHALL MAINTAIN THE CURRENT AIRFLOW SETPOINT.
- UPON A DROP IN SPACE TEMPERATURE BELOW SETPOINT, THE SUPPLY DAMPER WILL MODULATE TOWARD THE MINIMUM AIRFLOW SETPOINT.
- OCCUPIED COOLING SETPOINT SHALL BE 76°F (ADJUSTABLE).

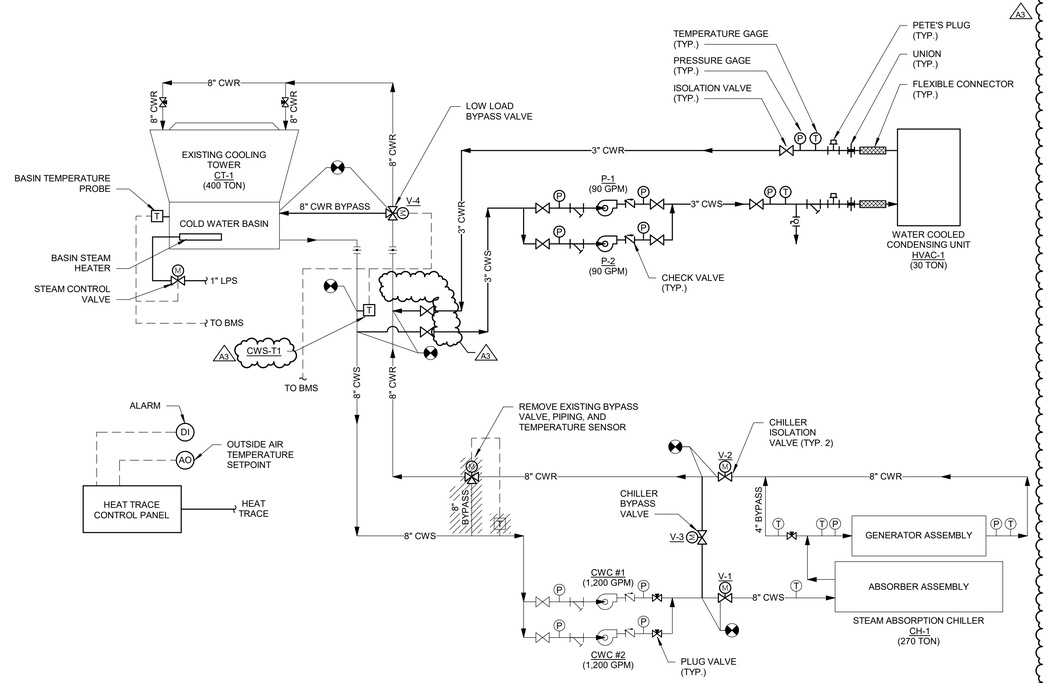
UNOCCUPIED:

- THE ROOM CONTROL SYSTEM SHALL MODULATE THE VAV SUPPLY DAMPER TO THE MINIMUM AIRFLOW SETPOINT.
- COOLING SETPOINT SHALL BE DISABLED.

NOTES:

A. THE TERMINAL BOX CONTROLLER, DAMPER ACTUATOR AND AIR FLOW PROBE ARE PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR. THESE DEVICES SHALL BE SHIPPED TO THE MANUFACTURER. ALL OTHER FIELD MOUNTED CONTROL DEVICES ARE FURNISHED, MOUNTED AND WIRED BY THE TEMPERATURE CONTROL CONTRACTOR.

| TEMPERATURE SETPOINT SCHEDULE | | |
|---|---|---|
| OCCUPANCY STATE | HEATING | COOLING |
| OCCUPIED | N/A | 76 |
| UNOCCUPIED | N/A | N/A |




## COOLING TOWER & CONDENSING WATER FLOW DIAGRAM
NO SCALE

NOTES:
1. ALL EXISTING AND NEW EXTERIOR CONDENSING WATER PIPING (CWS & CWR) SHALL BE HEAT TRACED AND INSULATED.
2. ALL EXTERIOR STEAM PIPING SHALL BE HEAT TRACED AND INSULATED. ALL INTERIOR STEAM PIPING SHALL BE INSULATED.

A3

## UPDATED CONDENSING WATER SYSTEM SEQUENCE OF OPERATION:

**SUMMER MODE:**

- CHILLER (CH-1) AND COOLING TOWER (CT-1) SHALL BE ENABLED.
- THE LOW LOAD BYPASS VALVE (V-4) SHALL DIRECT ALL FLOW THROUGH THE COOLING TOWER FILL MEDIA.

**CHILLER OPERATING:**

- UPON CALL FOR ACTIVATION OF CHILLER (CH-1), THE CHILLER ISOLATION VALVES (V-1 & V-2) SHALL FULLY OPEN, AND BYPASS VALVE (V-3) SHALL FULLY CLOSE TO DIRECT FLOW THROUGH THE CHILLER. WHEN VALVES ARE PROVEN OPEN BY END SWITCH, THE ASSOCIATED CONDENSING WATER PUMPS (CWC #1 & CWC #2) SHALL ENERGIZE.
- UPON CONDENSING WATER SUPPLY (CWS) TEMPERATURE INCREASING ABOVE THE SETPOINT OF 85F (ADJ.), THE COOLING TOWER BYPASS VALVE SHALL OPEN TO DIRECT CONDENSING WATER TO THE COOLING TOWER MEDIA.
- THE COOLING TOWER FAN SHALL ENERGIZE AND THE SPEED SHALL BE MODULATED TO MAINTAIN THE CWS SETPOINT OF 85F (ADJ.).
- UPON CALL FOR DEACTIVATION OF CHILLER (CH-1):
  1. THE CONDENSING WATER PUMPS (CWC #1 & CWC #2) AND COOLING TOWER FAN SHALL REMAIN ACTIVE FOR 3 MINUTES (ADJ.) AFTER CHILLER CYCLES OFF.
  2. AFTER THE TIME DELAY, THE CONDENSING WATER PUMPS AND COOLING TOWER FAN SHALL DE-ENERGIZE, CHILLER ISOLATION VALVES (V-1, V-2) SHALL CLOSE AND BYPASS VALVE (V-3) SHALL OPEN TO BYPASS THE CHILLER. THE COOLING TOWER BYPASS VALVE (V-4) SHALL CLOSE TO DIRECT ALL FLOW THROUGH BYPASS.

**CHILLER & HVAC-1 OPERATING:**

- UPON CALL FOR THE ACTIVATION OF HEATING VENTILATING AND AIR CONDITIONING UNIT (HVAC-1), THE ASSOCIATED CONDENSING WATER PUMPS (P-1 & P-2) SHALL ENERGIZE (PRIMARY/STANDBY)
  1. THE LOW LOAD BYPASS VALVE SHALL MODULATE TO DIRECT ALL FLOW TO THE COOLING TOWER COLD WATER BASIN IF CHILLER (CH-1) IS NOT OPERATING. IF CHILLER IS OPERATING, THE BYPASS VALVE SHALL DIRECT ALL FLOW TO THE COOLING TOWER MEDIA.
- UPON CALL FOR ACTIVATION OF CHILLER (CH-1), THE CHILLER ISOLATION VALVES (V-1 & V-2) SHALL FULLY OPEN, AND BYPASS VALVE (V-3) SHALL FULLY CLOSE TO DIRECT FLOW THROUGH THE CHILLER. WHEN VALVES ARE PROVEN OPEN BY END SWITCH, THE ASSOCIATED CONDENSING WATER PUMPS (CWC #1 & CWC #2) SHALL ENERGIZE.
  1. THE LOW LOAD BYPASS VALVE (V-4) SHALL CLOSE TO DIRECT ALL FLOW TO THE COOLING TOWER FILL MEDIA.
- UPON CALL FOR DEACTIVATION OF CHILLER (CH-1):
  1. THE CONDENSING WATER PUMPS (CWC #1 & CWC #2) AND COOLING TOWER FAN SHALL REMAIN ACTIVE FOR 3 MINUTES (ADJ.) AFTER CHILLER CYCLES OFF.
  2. AFTER THE TIME DELAY, THE CONDENSING WATER PUMPS AND COOLING TOWER FAN SHALL DE-ENERGIZE, CHILLER ISOLATION VALVES (V-1, V-2) SHALL CLOSE AND BYPASS VALVE (V-3) SHALL OPEN TO BYPASS THE CHILLER. THE COOLING TOWER BYPASS VALVE (V-4) SHALL CLOSE TO DIRECT ALL FLOW THROUGH BYPASS.
- IF CHILLER (CH-1) IS NOT OPERATING AND CONDENSING WATER SUPPLY (CWS) TEMPERATURE INCREASES ABOVE THE SETPOINT OF 85F FOR 15 MINUTES (ADJ.), AS MEASURED BY THE TEMPERATURE SENSOR (CWS-T1), THE CONDENSING WATER PUMPS (CWC #1 & CWC #2) SHALL ENERGIZE.
  1. THE LOW LOAD BYPASS VALVE (V-4) SHALL CYCLE TO DIRECT ALL FLOW TO THE COOLING TOWER FILL MEDIA.
- IF AFTER THE FULL FLOW OF WATER IS DIRECTED TO THE TOWER MEDIA, AND THE CWS TEMPERATURE IS STILL ABOVE ITS SETPOINT, THE COOLING TOWER FAN SHALL ENERGIZE AND THE SPEED SHALL BE MODULATED TO MAINTAIN THE CWS SETPOINT OF 85F (ADJ.).
- UPON CWS TEMPERATURE FALLING BELOW THE SETPOINT OF 85F (ADJ.) THE COOLING TOWER FAN SHALL MODULATE DOWN TO FULL STOP. IF THE CWS TEMPERATURE CONTINUES TO DROP, THE LOW LOAD BYPASS VALVE SHALL OPEN TO DIRECT FLOW TO THE TOWER BASIN. IF AFTER 15 MINUTES OF FULL BYPASS THE CWS TEMPERATURE IS STILL BELOW 85F (ADJ.), THE CONDENSING WATER PUMPS (CWC #1 & CWC #2) SHALL SHUT OFF.

**WINTER MODE:**

- CHILLER (CH-1) SHALL BE DISABLED AND COOLING TOWER (CT-1) SHALL BE ENABLED.
- THE LOW LOAD BYPASS VALVE (V-4) SHALL MODULATE BASED ON TEMPERATURE CONDITIONS.

**HVAC-1 OPERATING & CHILLER DISABLED:**

- UPON CALL FOR THE ACTIVATION OF HEATING VENTILATING AND AIR CONDITIONING UNIT (HVAC-1), THE ASSOCIATED CONDENSING WATER PUMPS (P-1 & P-2) SHALL ENERGIZE (PRIMARY/STANDBY)
  1. THE LOW LOAD BYPASS VALVE SHALL MODULATE TO DIRECT ALL FLOW TO THE COOLING TOWER COLD WATER BASIN.
- IF CONDENSING WATER SUPPLY (CWS) TEMPERATURE INCREASES ABOVE THE SETPOINT OF 85F FOR 5 MINUETS (ADJ.) THE CONDENSING WATER PUMPS (CWC #1 & CWC #2) SHALL ENERGIZE, THE CHILLER ISOLATION VALVES (V-1 & V-2) SHALL REMAIN FULLY CLOSED, AND BYPASS VALVE (V-3) SHALL REMAIN FULLY OPEN TO BYPASS THE CHILLER.
  1. THE LOW LOAD BYPASS VALVE (V-4) SHALL CYCLE TO DIRECT FLOW TO THE COOLING TOWER FILL MEDIA.
- THE COOLING TOWER FAN SHALL REMAIN DE-ENERGIZED UNLESS AFTER 5 MINUTES (ADJ.) THE CWS TEMPERATURE REMAINS ABOVE THE SETPOINT OF 85F. AFTER THE TIME DELAY, THE COOLING TOWER FAN SHALL ENERGIZE AND THE SPEED MODULATED UNTIL THE CWS SETPOINT OF 85F (ADJ.) IS REACHED.
- UPON CWS TEMPERATURE FALLING BELOW THE SETPOINT OF 85F FOR 5 MINUTES (ADJ.) THE CONDENSING WATER PUMPS (CWC #1 & CWC #2) AND COOLING TOWER FAN SHALL DE-ENERGIZE. SEE PREVIOUS SUMMER MODE SEQUENCE FOR SAME SITUATION.
- ALARM: IF CONDENSING WATER SUPPLY (CWS) TEMPERATURE IS ABOVE THE SETPOINT FOR 15 MINUTES (ADJ.) AN ALARM SHALL BE SENT TO BMS.

**STEAM BASIN HEATER:**

- THE CONTROL SYSTEM SHALL MONITOR THE COOLING TOWER COLD WATER BASIN TEMPERATURE AND MODULATE THE STEAM CONTROL VALVE TO MAINTAIN THE BASIN WATER TEMPERATURE OF 45F (ADJ.).
- COOLING TOWER COLD WATER BASIN TEMPERATURE SHALL BE MONITORED AND SETPOINT ADJUSTABLE BY BMS.

**ALARMS:**

- IF CONDENSING WATER SUPPLY (CWS) TEMPERATURE IS ABOVE THE SETPOINT FOR 15 MINUTES (ADJ.) AN ALARM SHALL BE SENT TO BMS.
- IF COOLING TOWER BASIN TEMPERATURE FALLS BELOW THE SETPOINT OF 45F (ADJ.) AN ALARM SHALL BE SENT TO BMS.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Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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PROJECT NO.
180746

MECHANICAL CONTROLS DIAGRAMS

**M602**


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## SELF-CONTAINED HVAC UNIT W/ WATER COOLED CONDENSER

| ID TAG | AREA SERVED | MANUFACTURER (BASIS OF DESIGN) | MODEL | SUPPLY CFM | OUTSIDE AIR CONTROL | PACKAGED CONDENSER TYPE | GPM | MAX WPD (FT HD) | EWT (F) | LWT (F) | COOLING COIL ENTERING AIR (F DB) | ENTERING AIR (F WB) | LEAVING AIR (F DB) | LEAVING AIR (F WB) | SENSIBLE CAPACITY (MBH) | TOTAL CAPACITY (MBH) | STEAM HEATING COIL EAT (F) | LAT (F) | CAPACITY (MBH) | TYPE | STEAM PRESSURE (PSI) | SUPPLY FAN MOTOR HP | MOTOR MAX BHP | RPM | TSP (IN WC) | ESP (IN WC) | ELECTRICAL VOLTS | PHASE | TOTAL FLA | TOTAL MCA | IEER | WEIGHT (LBS) | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HVAC-1 | SECOND FLOOR MATH LABS | TRANE | SCWGU3063 | 12000 | CO2 LEVEL | WATER COOLED | 90 | 14 | 85 | 95 | 80 | 67 | 57.5 | 57.25 | 300 | 370 | 60 | 88.0 | 367 | STEAM | 5.0 | 15 | 14.5 | 1500 | 2.7 | 2.0 | 208 | 3 | 0 | 0 | 17.8 | 3500 | 1-12 |

NOTES:
1. UNIT SHALL BE PURCHASED BY WAYNE STATE UNIVERSITY, AND INSTALLED BY CONTRACTOR. CONTRACTOR SHALL COORDINATE WITH CLIENT FOR SPECIFIC UNIT PURCHASED.
2. SUPPLY FAN SHALL BE VFD RATED.
3. PROVIDE WITH CO2 BASED OUTSIDE AIR CONTROL.
4. PROVIDE WITH AIR-SIDE ECONOMIZER. COMPARATIVE ENTHALPY BASED CONTROL.
5. PROVIDE WITH FACTORY INSTALLED INTERMEDIATE PIPING PACKAGE WITH CONDENSING WATER PRESSURE CONTROL VALVE AND TWO-WAY MODULATING VALVE.
6. PROVIDE 2" DISPOSABLE FILTER RACK, MERV 8.
7. STAINLESS STEEL DRIP PAN.
8. HORIZONTAL DISCHARGE CONFIGURATION.
9. LEFT HAND CONNECTIONS (INSTALLING CONTRACTOR SHALL FIELD VERIFY CONNECTION LOCATIONS).
10. VFD SHALL BE PROVIDED BY UNIT MANUFACTURER AND INSTALLED BY CONTRACTOR.
11. FACTORY CONTROL MODULE WITH BACNET COMMUNICATION INTERFACE (TRANE INTELLIPRO).
12. UNIT MANUFACTURER SHALL BE TRANE (BASIS OF DESIGN) OR APPROVED EQUAL. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

## FAN SCHEDULE

| ID TAG | LOCATION | SERVICE | MANUFACTURER | MODEL | FAN TYPE | CFM | ESP (IN WC) | WHEEL MATERIAL | WHEEL TYPE | DRIVE TYPE | SOUND SONES | DBA | MOTOR HP | MAX MOTOR BHP | FAN RPM | ELECTRICAL VOLTAGE | ELECTRICAL PHASE | MOTOR CONTROLLER MOTOR STARTER | MOTOR CONTROLLER DISCONNECT SWITCH | MOTOR CONTROLLER VFD | MAX WEIGHT (LBS) | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF-1 | 3RD FLOOR MECHANICAL ROOM | EXHAUST | GREENHECK | BSQ-360 | I | 10000 | 1.00 | ALUMINUM | C | VF | 21 | 71 | 5.00 | 3.3 | 598 | 208 | 3 | - | M | M | 700 | 1 |

NOTES
1. BUILDING PRESSURE RELIEF FOR HVAC-1.

FAN TYPE
UB - UP BLAST
I - INLINE
D - DOMED
U - UTILITY
S - SIDEWALL
C- CEILING

WHEEL TYPE
A - AXIAL
C - CENTRIFUGAL
P - PROPELLER

DRIVE TYPE
D - DIRECT
B - BELT
VF - VARIABLE FREQUENCY

MOTOR CONTROLLER
E - SEE ELECTRICAL CONTRACTOR
M - BY MECHANICAL CONTRACTOR
S - BY EQUIPMENT SUPPLIER

## PUMP SCHEDULE

| ID TAG | LOCATION | SERVICE | MANUFACTURER | MODEL | TYPE | GPM | TDH (FT) | MIN EFFICIENCY (%) | MINIMUM NOZZLE SUCTION (IN) | MINIMUM NOZZLE DISCHARGE (IN) | IMPELLER SIZE (IN) | MAX RPM | MOTOR HP | MOTOR BHP MAX | VOLTAGE | PHASE | MOTOR CONTROLLER VFD | MOTOR CONTROLLER DISCONNECT | WEIGHT | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-1 | 3RD FLOOR MECHANICAL ROOM | HVAC-1 CONDENSING WATER | BELL & GOSSETT | E-1531-2AD | ES | 90 | 40 | 74 | 2.5 | 2 | 6.5 | 1800 | 2 | 1.25 | 208 | 1 | M | M | 140 | |
| P-2 | 3RD FLOOR MECHANICAL ROOM | HVAC-1 CONDENSING WATER | BELL & GOSSETT | E-1531-2AD | ES | 90 | 40 | 74 | 2.5 | 2 | 6.5 | 1800 | 2 | 1.25 | 208 | 1 | M | M | 140 | |

TYPE
ES - END SUCTION
VIL - VERTICAL IN LINE
VSC - SPLIT CASE
HSC - HORIZONTAL SPLIT CASE
C - CIRCULATOR

MOTOR CONTROLLER
E - BY ELECTRICAL CONTRACTOR
M - BY MECHANICAL CONTRACTOR
S - BY EQUIPMENT SUPPLIER

## VAV TERMINAL UNIT SCHEDULE

| ID TAG | LOCATION | SERVICE | MANUFACTURER | MODEL | SIZE | CFM (MIN) | CFM (MAX) | VOLTAGE | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| VAV-1 | 204 - OPEN LAB | SUPPLY | TITUS | DESV | 12" | 190 | 1275 | 24 | |
| VAV-2 | 204 - OPEN LAB | SUPPLY | TITUS | DESV | 12" | 190 | 1275 | 24 | |
| VAV-3 | 208 - CS LAB | SUPPLY | TITUS | DESV | 12" | 190 | 1300 | 24 | |
| VAV-4 | 210 - CS LAB | SUPPLY | TITUS | DESV | 12" | 190 | 1400 | 24 | |
| VAV-5 | 212 - STUDENT ORG | SUPPLY | TITUS | DESV | 8" | 90 | 475 | 24 | |
| VAV-6 | 211 - CS LAB | SUPPLY | TITUS | DESV | 10" | 145 | 1085 | 24 | |
| VAV-7 | 211 - CS LAB | SUPPLY | TITUS | DESV | 10" | 145 | 1085 | 24 | |
| VAV-8 | 211 - CS LAB | SUPPLY | TITUS | DESV | 10" | 145 | 1085 | 24 | |
| VAV-9 | 213 - MATH TEACHING LAB | SUPPLY | TITUS | DESV | 10" | 145 | 1085 | 24 | |
| VAV-10 | 213 - MATH TEACHING LAB | SUPPLY | TITUS | DESV | 10" | 145 | 1085 | 24 | |
| VAV-11 | 213 - MATH TEACHING LAB | SUPPLY | TITUS | DESV | 10" | 145 | 1085 | 24 | |

## AUTOMATIC DAMPER SCHEDULE

| ID TAG | LOCATION | SERVICE | MFG | MODEL | BLADE TYPE | MAX CFM | OPERATOR TYPE | WIDTH | HEIGHT | ELECTRICAL VOLTAGE | ELECTRICAL PHASE | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AD-1 | 3RD FLOOR MECHANICAL ROOM | OUTSIDE AIR INTAKE | GREENHECK | ICD-45 | INSULATED - THERMALLY BROKEN | 12000 | MOTORIZED | 32" | 32" | 120 | 1 | |
| AD-2 | 3RD FLOOR MECHANICAL ROOM | BUILDING EXHAUST | GREENHECK | ICD-45 | INSULATED - THERMALLY BROKEN | 12000 | MOTORIZED | 48" | 48" | 120 | 1 | |

## LOUVER SCHEDULE

| ID TAG | MANUFACTURER | MODEL | WIDTH (IN) | HEIGHT (IN) | DEPTH (IN) | FREE AREA (SF) | SERVICE | CFM | MAX APD (IN WC) | MATERIAL | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LV-1 | GREENHECK | ESD-635 | 48 | 48 | 6 | 9.40 | EXHAUST | 12000 | 0.22 | ALUMINUM | |

## REGISTER, GRILLE AND DIFFUSER SCHEDULE

| ID TAG | MANUFACTURER | MODEL | NECK SIZE (IN) | FACE SIZE (IN) | MAX APD (IN WC) | MAX NC | THROW PATTERN | MATERIAL | FINISH | DAMPER (Y/N) | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RAR-1 | TITUS | PXP | N/A | 24 x 24 | 0.05 | 20 | N/A | STEEL | WHITE | No | |
| SAD-1 | TITUS | TMS | 6" | 24 x 24 | 0.05 | 30 | 4-WAY | STEEL | WHITE | No | |
| SAD-2 | TITUS | TMS | 8" | 24 x 24 | 0.05 | 30 | 4-WAY | STEEL | WHITE | No | |

## UNIT AND CABINET HEATER SCHEDULE

| ID TAG | LOCATION | MFG | MODEL | CFM | MBH | GPM | EWT (F) | LWT (F) | WPD (FT) | MOTOR HP | VOLTS | PHASE | AMPS (FLA) | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UH-1 | 3RD FLOOR MECHANICAL ROOM | MODINE | HSB/HC 47 | 730 | 30.9 | 3.2 | 170 | 150 | 0.4 | 0.1 | 120 | 1 | 0.9 | |

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Prentis Building Computer Lab Relocation
**WSU Project: 022-313456**

REVISIONS

| | | |
|---|---|---|
| 8/23/2018 | A3 | ADDENDUM NO. 3 |

8/13/2018 BIDS

Drawn By SKU
Designer SKU
Reviewer PMO
Manager MM5

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PROJECT NO.
180746

MECHANICAL SCHEDULES

**M901**

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## ELECTRICAL SYMBOL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| S | SINGLE POLE MANUAL LIGHTING SWITCH |
| $S_2$ | TWO POLE MANUAL LIGHTING SWITCH |
| $S_3$ | THREE-WAY MANUAL LIGHTING SWITCH |
| $S_4$ | FOUR-WAY MANUAL LIGHTING SWITCH |
| $S_D$ | MANUAL DIMMER LIGHTING SWITCH |
| $S_P$ | SINGLE POLE MANUAL LIGHTING SWITCH WITH PILOT LIGHT |
| $S_T$ | MANUAL TIMER LIGHTING SWITCH |
| $S_F$ | SINGLE POLE MANUAL FUSED SWITCH |
| $S_M$ | SINGLE POLE MANUAL MOTOR STARTER |
| $S_{MP}$ | SINGLE POLE MANUAL MOTOR STARTER WITH PILOT LIGHT |
| $S_{LV}$ | SINGLE POLE LOW VOLTAGE SWITCH |
| $S_{OC}$ | OCCUPANCY SENSOR WALL SWITCH |
| $S_{OSD}$ | OCCUPANCY SENSOR DIMMER WALL SWITCH |
| OS | CEILING MOUNTED OCCUPANCY SENSOR |
| OS | WALL MOUNTED OCCUPANCY SENSOR |
| PP | POWER PACK FOR OCCUPANCY SENSOR |
| RP | RELAY PACK FOR OCCUPANCY SENSOR |
| ELU | UL 924 EMERGENCY LIGHTING CONTROL UNIT |
| PS | CLG MTD DAYLIGHT HARVESTING PHOTO SENSOR |
| | SIMPLEX RECEPTACLE |
| | DUPLEX RECEPTACLE |
| | DUPLEX RECEPTACLE (ABOVE COUNTER) |
| | DOUBLE DUPLEX RECEPTACLE |
| | DOUBLE DUPLEX RECEPTACLE (ABOVE COUNTER) |
| | SPECIAL RECEPTACLE (AS NOTED) |
| C | CEILING MOUNTED SIMPLEX RECEPTACLE |
| C | CEILING MOUNTED DUPLEX RECEPTACLE |
| C | CEILING MOUNTED DOUBLE DUPLEX RECEPTACLE |
| C | CEILING MOUNTED SPECIAL RECEPTACLE |
| | SIMPLEX RECEPTACLE (CONTROLLED) |
| | DUPLEX RECEPTACLE (CONTROLLED) |
| | DUPLEX RECEPTACLE (CONTROLLED - ABOVE COUNTER) |
| | DOUBLE DUPLEX RECEPTACLE (CONTROLLED) |
| | DOUBLE DUPLEX RECEPT (CONTROLLED - ABOVE COUNTER) |
| C | CEILING MOUNTED SIMPLEX RECEPTACLE (CONTROLLED) |
| C C | CEILING MOUNTED DUPLEX RECEPTACLE (CONTROLLED) |
| C C | CLG MTD DOUBLE DUPLEX RECEPTACLE (CONTROLLED) |
| | POWER AND DATA POKE-THRU FLOOR DEVICE |
| FB | POWER AND DATA FLOOR BOX |
| TV | VIDEO MONITOR POWER AND DATA WALL BOX |
| C | CONTACTOR |
| J | CEILING MOUNTED JUNCTION BOX |
| J | WALL MOUNTED JUNCTION BOX |
| J | FLOOR MOUNTED JUNCTION BOX |
| PC | PHOTOCELL |
| PB | PUSHBUTTON |
| TC | TIME CLOCK |
| XL | LOW VOLTAGE TRANSFORMER |
| T | THERMOSTAT |
| H | HUMIDISTAT |
| | SPECIAL CONNECTION (AS NOTED) |
| | PANELBOARD (480Y/277V) OR (480V) |
| | PANELBOARD (208Y/120V) OR (120/240V) |
| | SINGLE PHASE MOTOR CONNECTION |
| | THREE PHASE MOTOR CONNECTION |
| J | NON FUSIBLE DISCONNECT SWITCH |
| J ZPX/Y | FUSIBLE DISCONNECT SWITCH (Z=No. POLES; X=SWITCH SIZE; Y=FUSE SIZE; MOUNT AT 5'-0" AFF, UNO) |
| X N | MOTOR STARTER N=STARTER SIZE; X=STARTER TYPE, (RV: REDUCED VOLTAGE; BLANK: FULL VOLTAGE); MOUNT AT 5'-0" AFF, UNO |
| J X N | COMBINATION MOTOR STARTER / DISCONNECT SWITCH N=STARTER SIZE; X=STARTER TYPE, (RV: REDUCED VOLTAGE; BLANK: FULL VOLTAGE); MOUNT AT 5'-0" AFF, UNO |
| | GROUND ROD |
| | CONDUIT UNDER FLOOR |
| | CONDUIT ABOVE FLOOR |
| | SURFACE OR RECESSED LUMINAIRE |
| | SURFACE OR RECESSED DIRECTIONAL LUMINAIRE |
| | WALL MOUNTED LUMINAIRE |
| | TRACK MOUNTED LUMINAIRE |
| | EMERGENCY LUMINAIRE |
| | NIGHT LIGHT LUMINAIRE |
| | EMERGENCY NIGHT LIGHT LUMINAIRE |
| | BATTERY POWERED EMERGENCY LIGHTING UNIT |
| | CEILING MOUNTED EXIT SIGN |
| | WALL MOUNTED EXIT SIGN |
| | SITE LUMINAIRE AND POLE |

## FIRE ALARM SYMBOL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| FACP | MAIN FIRE ALARM CONTROL PANEL |
| FAAP | FIRE ALARM REMOTE ANNUNCIATOR PANEL |
| NACP | NOTIFICATION APPLIANCE CONTROL PANEL |
| F | MANUAL PULL STATION |
| H | HEAT DETECTOR; CEILING MOUNTED |
| H H | HEAT DETECTOR; WALL MOUNTED |
| S | SMOKE DETECTOR; CEILING MOUNTED |
| S H | SMOKE DETECTOR; WALL MOUNTED |
| S EL | ELEVATOR SMOKE DETECTOR |
| D | DUCT-TYPE SMOKE DETECTOR |
| BD H | BEAM-TYPE SMOKE DETECTOR; WALL MOUNTED |
| RT | REMOTE TEST STATION; CEILING MOUNTED |
| RT H | REMOTE TEST STATION; WALL MOUNTED |
| A | AUDIO DEVICE, CEILING MOUNTED |
| | AUDIO DEVICE; WALL MOUNTED |
| L | VISUAL DEVICE; CEILING MOUNTED |
| L | VISUAL DEVICE; WALL MOUNTED |
| AV | COMBINATION AUDIO/VISUAL DEVICE; CEILING MOUNTED |
| L | COMBINATION AUDIO/VISUAL DEVICE; WALL MOUNTED |
| SD | SMOKE DAMPER |
| FS | FIRE PROTECTION SPRINKLER FLOW SWITCH |
| TS | FIRE PROTECTION SPRINKLER TAMPER SWITCH |
| PV | FIRE PROTECTION POST INDICATOR VALVE |
| CF | FIRE PROTECTION CO2 SYSTEM FLOW SWITCH |
| P | FIRE FIGHTER'S PHONE OUTLET |
| B | FIRE ALARM BELL |
| M | MAGNETIC DOOR HOLDER |
| | FIRE ALARM INTERLOCK / CONTROL CONNECTION |

## SYSTEMS SYMBOL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| | VOICE / DATA OUTLET, SEE DETAIL ON E501 |
| W | OUTLET FOR WALL MOUNTED TELEPHONE |
| | DATA OUTLET; CEILING MOUNTED |
| AP | WIRELESS ACCESS POINT OUTLET; CEILING MOUNTED |
| M | MICROPHONE OUTLET; WALL MOUNTED |
| M | MICROPHONE OUTLET; CEILING MOUNTED |
| PD | POWER / DATA POLE |
| FB | POWER / DATA FLOOR BOX |
| S | SPEAKER OUTLET; CEILING MOUNTED |
| S | SPEAKER OUTLET; WALL MOUNTED |
| TV | VIDEO MONITOR OUTLET; WALL MOUNTED |
| T | CLOCK OUTLET; WALL MOUNTED |
| I | INTERCOM OUTLET; WALL MOUNTED |
| V | VOLUME CONTROL OUTLET; WALL MOUNTED |
| | CABLE TRAY |
| | VERTICAL CONDUIT SLEEVE; THROUGH FLOOR |
| | HORIZONTAL CONDUIT SLEEVE; IN ACCESSIBLE CEILING SPACE |

## SECURITY SYMBOL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| C | CAMERA OUTLET; CEILING OR PENDANT MOUNTED |
| C | CAMERA OUTLET; WALL MOUNTED |
| KP | KEYPAD CONTROLLER OUTLET |
| CR | PROXIMITY CARD READER OUTLET |
| PB | PANIC BUTTON OUTLET |
| MD | MOTION DETECTOR OUTLET |
| GB | GLASS BREAK SENSOR OUTLET |
| S | SECURITY SIREN OUTLET |
| PA | DOOR PROP ALARM OUTLET |
| MC | DOOR MAGNETIC CONTACTS |
| DS | ELECTRIC DOOR STRIKE |
| DL | ELECTRIC DOOR LATCH |
| EH | ELECTRIC POWER TRANSFER HINGE |
| RE | REQUEST-TO-EXIT DEVICE OUTLET |

## GENERAL ELECTRICAL ABBREVIATIONS

| | | | |
|---|---|---|---|
| A, AMP | AMPERES | KW | KILOWATT |
| AC | ALTERNATING CURRENT | KWHR | KILOWATT-HOUR |
| ACP | ACOUSTICAL CEILING PANEL | LED | LIGHT-EMITTING DIODE |
| ADA | AMERICANS WITH DISABILITIES ACT | LS | LIGHT SWITCH OR LIMIT SWITCH |
| AFF | ABOVE FINISHED FLOOR | LT | LIGHT OR LEVEL TRANSDUCER |
| AHJ | AUTHORITY HAVING JURISDICTION | LTFMC | LIQUID-TIGHT FLEXIBLE METAL CONDUIT |
| AIC | AMPERE-INTERRUPTING CURRENT | LTG | LIGHTING |
| AL | ALUMINUM | LV | LOW VOLTAGE |
| ATM | AUTOMATIC TELLER MACHINE | M | METER |
| ATS | AUTOMATIC TRANSFER SWITCH | MANUF | MANUFACTURER |
| BMS | BUILDING MANAGEMENT SYSTEM | MCA | MINIMUM CIRCUIT AMPACITY |
| BRKR | BREAKER | MCB | MAIN CIRCUIT BREAKER |
| C | CONDUIT OR CELSIUS | MCC | MOTOR CONTROL CENTER |
| CB | CIRCUIT BREAKER | MCP | MOTOR CIRCUIT PROTECTOR |
| CATV | CABLE TELEVISION | MH | MANHOLE |
| CIP | CAST-IN-PLACE | MLO | MAIN LUGS ONLY |
| CJ | CONTROL JOINT | MT | MOUNT |
| CKT | CIRCUIT | MTD | MOUNTED |
| CLG | CEILING | MV | MEDIUM VOLTAGE |
| CM | CONSTRUCTION MANAGER | N, NEUT | NEUTRAL |
| CMU | CONCRETE MASONRY UNIT | NC | NORMALLY CLOSED |
| COAX | COAXIAL | NEC | NATIONAL ELECTRICAL CODE |
| CONC | CONCRETE | NEMA | NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION |
| CP | CONTROL PANEL | | |
| CT | CURRENT TRANSFORMER | NL | NIGHT LIGHT |
| CU | COPPER | NO | NORMALLY OPEN |
| Cx | COMMISSIONING | NOM | NOMINAL |
| CxA | COMMISSIONING AGENT | NTS | NOT TO SCALE |
| DB | DECIBEL | OD | OUTSIDE DIAMETER |
| DC | DIRECT CURRENT | OH | OVERHEAD |
| DEM | DEMOLISH | OHD | OVERHEAD DOOR |
| DEMO | DEMOLISH OR DEMOLITION | OL | OVERLOAD |
| DF | DRINKING FOUNTAIN | PA | PUBLIC ADDRESS |
| DISC | DISCONNECT | PB | PULL BOX OR PUSHBUTTON |
| DPDT | DOUBLE POLE DOUBLE THROW | PFC | POWER FACTOR CORRECTION |
| DPST | DOUBLE POLE SINGLE THROW | PH | PHASE |
| EC | ELECTRICAL CONTRACTOR | PNL | PANEL OR PANELBOARD |
| EJ | EXPANSION JOINT | PT | POTENTIAL TRANSFORMER |
| ELEC | ELECTRICAL | PTZ | PAN-TILT-ZOOM |
| ELEV | ELEVATOR OR ELEVATION | PWR | POWER |
| EM | EMERGENCY | RCP | REFLECTED CEILING PLAN |
| EMT | ELECTRICAL METALLIC TUBING | REBAR | REINFORCING BAR |
| ENCL | ENCLOSURE | RECEPT | RECEPTACLE |
| ETR | EXISTING TO REMAIN | RM | ROOM |
| EWC | ELECTRIC WATER COOLER | RNMC | RIGID NON-METALLIC CONDUIT |
| EWH | ELECTRIC WATER HEATER | ROW | RIGHT-OF-WAY |
| EXIST | EXISTING | RMC | RIGID METAL CONDUIT |
| F | FUSE OR FAHRENHEIT | SEC | SECONDARY |
| FA | FIRE ALARM | SPD | SURGE PROTECTIVE DEVICE |
| FAAP | FIRE ALARM ANNUNCIATOR PANEL | SPDT | SINGLE POLE DOUBLE THROW |
| FACP | FIRE ALARM CONTROL PANEL | SPECS | SPECIFICATIONS |
| FF&E | FIXTURES, FURNISHINGS & EQUIPMENT | SPST | SINGLE POLE SINGLE THROW |
| FIXT | FIXTURE | SQ | SQUARE |
| FLA | FULL LOAD AMPERES | SS | STAINLESS STEEL |
| FM | FACTORY MUTUAL | SV | SOLENOID VALVE |
| FMC | FLEXIBLE METAL CONDUIT | SWBD | SWITCHBOARD |
| FO | FIBER OPTIC | SWGR | SWITCHGEAR |
| FRT | FIRE RETARDANT | TCC | TEMPERATURE CONTROL CONTRACTOR |
| GC | GENERAL CONTRACTOR | TCP | TEMPERATURE CONTROL PANEL |
| GEN | GENERATOR | TRANS | TRANSFORMER |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER | TS | TIME SWITCH |
| GFI | GROUND FAULT INTERRUPTER | TYP | TYPICAL |
| GND | GROUND | UL | UNDERWRITERS LABORATORIES |
| GYP BD | GYPSUM BOARD | UNO | UNLESS NOTED OTHERWISE |
| HH | HANDHOLE | UPS | UNINTERRUPTIBLE POWER SUPPLY |
| HOA | HAND-OFF-AUTO | V | VOLTS |
| HP | HORSE POWER | VA | VOLT-AMPERE |
| HV | HIGH VOLTAGE | VAC | VOLTS-ALTERNATING CURRENT |
| ID | INSIDE DIAMETER | VDC | VOLTS-DIRECT CURRENT |
| JB | JUNCTION BOX | VFD | VARIABLE FREQUENCY DRIVE |
| KO | KNOCKOUT | W | WATTS |
| KVA | KILOVOLT AMPERE | WH | WATER HEATER |
| | | WP | WEATHERPROOF |

## GENERAL NOTES

1. SYMBOLS AND GENERAL DESCRIPTIONS IN SYMBOL LEGENDS ARE INDICATED FOR GENERAL REFERENCE ONLY. NOT ALL SYMBOLS ARE USED ON THIS PROJECT. SEE SCHEDULES, SPECIFICATIONS AND PLANS FOR ADDITIONAL INFORMATION INCLUDING MOUNTING HEIGHTS.
2. THESE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE ELECTRICAL DESIGN INTENT. PROVIDE ALL WORK AND MATERIALS THAT ARE REQUIRED FOR COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEMS THAT FULLY MEET THE ELECTRICAL DESIGN INTENT. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST VERSION OF THE NEC AS ADOPTED BY THE AUTHORITY HAVING JURISDICTION. SEE SPECIFICATIONS FOR ADDITIONAL INSTALLATION REQUIREMENTS AND ITEMS THAT MAY BE REQUIRED ABOVE AND BEYOND THE MINIMUM REQUIREMENTS THAT ARE OUTLINED IN THE NATIONAL ELECTRICAL CODE (NEC).
3. THOROUGHLY AND CAREFULLY REVIEW ALL DRAWINGS, SPECIFICATIONS AND WORK SCOPES IN CONTRACT DOCUMENTS PRIOR TO BIDS AND CONSTRUCTION. WHERE THERE ARE CONFLICTS AMONG THE DRAWINGS, SPECIFICATIONS AND WORK SCOPES, THE MORE STRINGENT OR GREATER QUANTITY REQUIREMENTS SHALL APPLY.
4. ALL ELECTRICAL EQUIPMENT SHALL BE UL LISTED.
5. SEE INDIVIDUAL SPECIFICATION SECTIONS FOR SPECIFIC REQUIREMENTS RELATED TO TESTING, MANUFACTURER STARTUP, TRAINING, ETC. ALL APPLICABLE TESTING AND MANUFACTURER STARTUP REPORTS SHALL BE SUBMITTED AND APPROVED PRIOR TO THE DEVELOPMENT OF ELECTRICAL PUNCH LISTS.
6. ALL CONDUCTORS, INCLUDING THE GROUNDED CONDUCTORS (NEUTRALS), SHALL BE LABELED AT ALL ENDS AND JOINTS, WITH THE CORRESPONDING PANELBOARD NAME AND CIRCUIT NUMBER OR OTHERWISE IDENTIFIED TO CORRESPOND WITH THE ASSOCIATED EQUIPMENT MANUFACTURER'S IDENTIFICATION SYSTEM.
7. AT A MINIMUM, PROVIDE 1#12, 1#12N, 1#12G FOR 20A BRANCH CIRCUITING, UNO. MINIMUM CONDUIT SIZE SHALL BE 3/4", UNO. NO MORE THAN NINE CURRENT CARRYING CONDUCTORS, SHALL BE ALLOWED IN A RACEWAY, UNO. EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE NEC AND MAY BE SHARED. ALL GROUNDED CONDUCTORS (NEUTRALS) SHALL BE TREATED AS CURRENT CARRYING CONDUCTORS.
8. PROVIDE A DEDICATED GROUNDED CONDUCTOR (NEUTRAL) FOR EACH BRANCH CIRCUIT. SHARED NEUTRALS ARE NOT ALLOWED.
9. INSTALL GREEN, INSULATED, COPPER EQUIPMENT GROUNDING CONDUCTORS IN ALL RACEWAYS INCLUDING ALL FLEXIBLE METAL CONDUITS AND NON-METALLIC RACEWAYS. GREEN INSULATED, EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSTALLED WITH ALL FEEDERS AND BRANCH CIRCUITS.
10. PROVIDE FIRE STOPPING FOR ALL CONDUIT AND OTHER ELECTRICAL EQUIPMENT PENETRATIONS THROUGH FLOORS, WALLS AND CEILINGS TO MAINTAIN FIRE RATINGS. SEE ARCHITECTURAL FOR THE SPECIFIED FIRE RATINGS OF FLOORS, WALLS, AND CEILINGS.
11. LIMIT VOLTAGE DROP IN CONDUCTORS TO 2% FOR FEEDERS AND 3% FOR BRANCH CIRCUITS, ASSUMING FULL LOAD CONDITIONS. VOLTAGE DROP SHALL NOT EXCEED 5% FROM THE ELECTRICAL SERVICE TO THE FURTHEST ELECTRICAL DEVICE.
12. CALCULATE AND APPLY THE APPROPRIATE NEC DERATING FACTOR FOR CONDUCTORS INSTALLED IN ROOF MOUNTED CONDUITS.
13. PROVIDE THERMAL SEALS IN ALL CONDUITS THAT RUN FROM CONDITIONED SPACES TO UNCONDITIONED SPACES.
14. ALL WIRING FOR INTERIOR LED LUMINAIRES THAT ARE REQUIRED TO BE DIMMED SHALL INCLUDE (2) #18 AWG WIRES FROM EACH LUMINAIRE TO THE ASSOCIATED LIGHTING CONTROLLER FOR 0-10V LIGHTING CONTROL. ALL CONTROL WIRES SHALL BE LABELED.
15. SEE ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATIONS FOR LOCATIONS OF CEILING AND WALL MOUNTED DEVICES.
16. ALL LUMINAIRES SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE.
17. UNLESS NOTED OTHERWISE, ALL CONDUIT AND WIRING SHALL BE CONCEALED. ELECTRICAL CONNECTIONS SHOWN ON DRAWINGS ARE DIAGRAMMATIC AND ARE USED TO ILLUSTRATE CIRCUITING AND WIRING REQUIREMENTS ONLY.
18. ALL JUNCTION BOXES SERVING BRANCH CIRCUIT WIRING SHALL BE LABELED TO IDENTIFY THE CIRCUIT(S) ROUTED THROUGH EACH RESPECTIVE JUNCTION BOX BY UTILIZING BRADY LABELS.
19. WHERE PLENUMS ARE UTILIZED FOR HVAC AIR DISTRIBUTION, PROVIDE PLENUM RATED CABLES AND CONDUCTORS IN THOSE PLENUMS. SEE MECHANICAL FOR LOCATIONS OF HVAC PLENUMS.
20. ELECTRICAL EQUIPMENT INSTALLED ABOVE CEILINGS SHALL BE INSTALLED IN READILY ACCESSIBLE LOCATIONS, SUCH AS, BUT NOT LIMITED TO, ABOVE DOORWAYS TO ROOMS. COORDINATE ALL LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS WITH OTHER EQUIPMENT AND THE NEED FOR EXCESSIVELY LONG LADDER REQUIREMENTS TO ACCESS EQUIPMENT AND DIFFICULT AND AWKWARD CLIMBING AND/OR UNNECESSARY BENDING DURING SERVICING OF EQUIPMENT.
21. CONDUCTORS INSTALLED IN WIREWAYS THAT CONTAIN MORE THAN 30 CURRENT CARRYING CONDUCTORS SHALL BE DERATED IN ACCORDANCE WITH THE NEC.
22. DO NOT USE LOAD CENTERS, PANELBOARDS, SWITCHBOARDS, MOTOR CONTROL CENTERS AND OTHER POWER DISTRIBUTION EQUIPMENT AS RACEWAYS.
23. SEE SPECIFICATION SECTION 26 05 34, RACEWAYS FOR ELECTRICAL SYSTEMS, FOR PROJECT SPECIFIC RACEWAY INSTALLATION REQUIREMENTS.
24. SEE SPECIFICATION SECTION 26 05 53, IDENTIFICATION FOR ELECTRICAL SYSTEMS, FOR PROJECT SPECIFIC IDENTIFICATION REQUIREMENTS.
25. EXISTING ELECTRICAL ITEMS INDICATED IN THE CONTRACT DRAWINGS ARE BASED ON THE OWNER'S LIMITED RECORD DRAWINGS AND THE ENGINEER'S LIMITED FIELD OBSERVATIONS. CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS SHALL VISIT THE SITE TO UNDERSTAND COMPLETELY THE CONDITIONS UNDER WHICH THE WORK SHALL BE PERFORMED. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION OF DEVICES AND EQUIPMENT REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES AT NO ADDITIONAL COST TO THE OWNER.
26. DRAWINGS DO NOT INDICATE ALL ELECTRICAL EQUIPMENT AND DEVICES INTENDED TO BE REMOVED. DRAWINGS INDICATE MAJOR ELECTRICAL EQUIPMENT, FIXTURES AND DEVICES THAT ARE REQUIRED TO BE REMOVED. CONTRACTOR SHALL REMOVE OR RELOCATE ELECTRICAL EQUIPMENT, FIXTURES AND DEVICES AS NECESSARY FOR A COMPLETE AND PROFESSIONAL INSTALLATION. SEE NEW LIGHTING, POWER, SYSTEMS, ARCHITECTURAL, PLUMBING AND MECHANICAL PLANS FOR ADDITIONAL DEMOLITION REQUIREMENTS.
27. UNLESS NOTED OTHERWISE, DISPOSE ALL REMOVED MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. THE DISPOSAL OF MATERIALS SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS INCLUDING TCLP TESTING.

## LUMINAIRE SCHEDULE

| MARK | DESCRIPTION | MANUFACTURER | CATALOG NO. | OR EQUAL BY | LAMPS | VOLTAGE | LOAD | REMARKS |
|---|---|---|---|---|---|---|---|---|
| B | 2'x2', RECESSED DIMMABLE LED TROFFER, 3.25" DEEP EXTRUDED ALUMINUM HOUSING, 3400 LUMEN OUTPUT | METALUX - - | 22EN LD1 34 UNV L840 CD1 | CREE LITHONIA | (LED LAMPS INCLUDED) | 120 V | 35 VA | 4000K CCT |
| BE | SIMILER TO TYPE B EXCEPT PROVIDED WITH INTEGRAL BATTERY PACK WITH TEST SWITCH AND INDICATOR LIGHT | METALUX - - | 22EN LD1 34 UNV EL14W L840 CD1 | CREE LITHONIA | (LED LAMPS INCLUDED) | 120 V | 35 VA | 4000K CCT |
| C | 2'x2', RECESSED LED TROFFER, 3.25" DEEP EXTRUDED ALUMINUM HOUSING, 2500 LUMEN OUTPUT, PROVIDE WITH 2'x2' DRYWALL FRAME KIT | METALUX - | 22 LD1 25 UNV L840 CD1-DF-22-W | CREE LITHONIA | (LED LAMPS INCLUDED) | 120 V | 26 VA | 4000K CCT A3 |
| CE | SIMILER TO TYPE C EXCEPT PROVIDED WITH INTEGRAL BATTERY PACK WITH TEST SWITCH AND INDICATOR LIGHT | METALUX - - | 22EN LD1 25 UNV EL14W L840 CD1 | CREE LITHONIA | (LED LAMPS INCLUDED) | 120 V | 26 VA | 4000K CCT |
| D | 4' LED CHAIN MOUNTED LENSED INDUSTRIAL LIGHT | LITHONIA | CLX-L48-5000LM-SEF-RDL-WD-120-GZ10-40 K-80CRI | COOPER ACUITY HUBBELL | (LED LAMPS PROVIDED) | 120 V | 32 VA | 4000K CCT |
| DE | SIMILER TO TYPE D EXCEPT PROVIDED WITH INTEGRAL BATTERY PACK WITH TEST SWITCH AND INDICATOR LIGHT | LITHONIA | CLX-L48-5000LM-SEF-RDL-WD-120-GZ10-40 K-80CRI-E10WLCP | COOPER ACUITY HUBBELL | (LED LAMPS PROVIDED) | 120 V | 32 VA | 4000K CCT |
| XA | SINGLE FACE LED EXIT SIGN, WHITE FACE, RED LETTERS, INTEGRAL BATTERY AND CHARGER | SURE-LITES | CX 7 SERIES | LITHONIA | LED INCLUDED | 120 V | 6 VA | UNIVERSAL MOUNTING KIT |

## ELECTRICAL SHEET LIST


| SHEET | SHEET NAME |
|---|---|
| E001 | LEGENDS AND GENERAL NOTES |
| E101 | FIRST FLOOR ELECTRICAL PLAN |
| E102 | SECOND FLOOR ELECTRICAL PLANS |
| E103 | THIRD FLOOR ELECTRICAL PLANS |
| E401 | ONE LINE DIAGRAMS |
| E501 | ELECTRICAL DETAILS |
| E601 | PANELBOARD SCHEDULES |
| ED101 | ELECTRICAL DEMOLITION PLANS |
| TC101 | COMMUNICATIONS LEGEND AND DETAILS |
| TC102 | CONNECTIVITY DETAILS |



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Prentis Building Computer Lab Relocation
**WSU Project: 022-313456**

REVISIONS

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|---|---|---|
| 8/23/2018 | A3 | ADDENDUM NO. 3 |

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|---|---|
| 8/13/2018 | BIDS |

Drawn By MRF
Designer LTI
Reviewer RMM
Manager MM5

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PROJECT NO.
180746

LEGENDS AND GENERAL NOTES

**E001**


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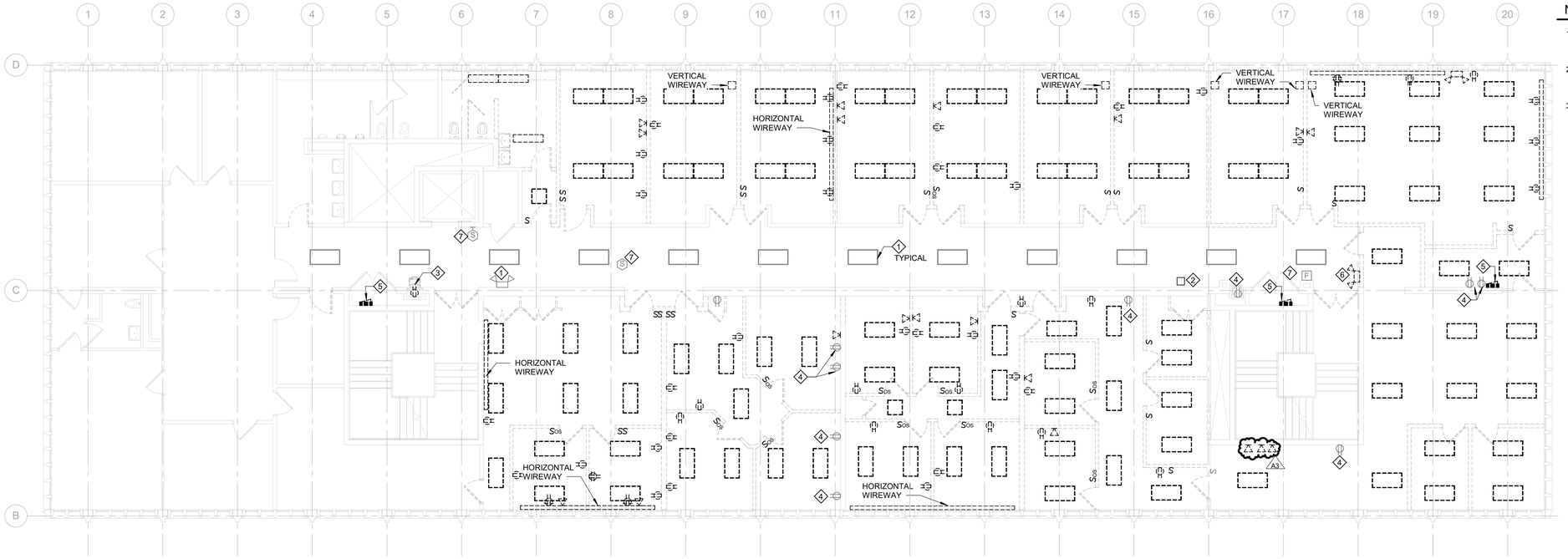



NORTH

## SECOND FLOOR ELECTRICAL DEMOLITION PLAN

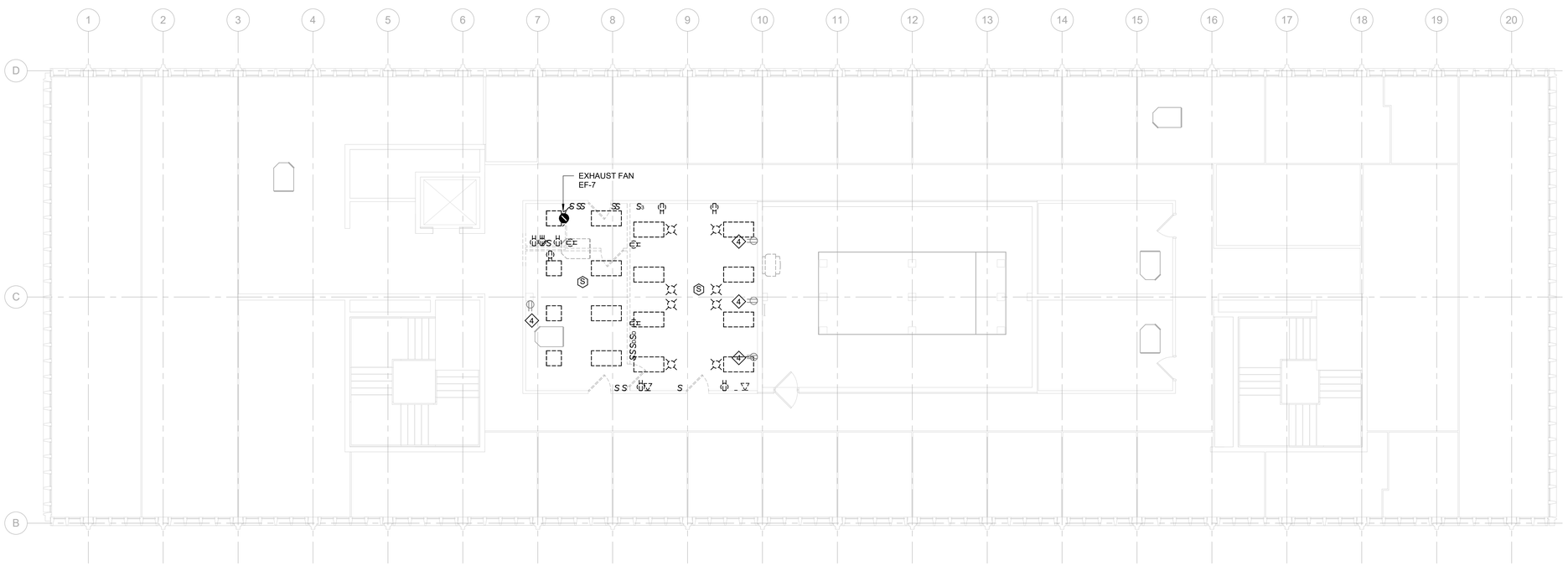
SCALE: 1/8" = 1'-0"

## NOTES

1. ITEMS SHOWN DASHED TO BE DEMOLISHED, SOLID ITEMS ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.
2. MAINTAIN LIGHTING, POWER AND DATA CONNECTION FOR AREAS NOT PART OF THE SCOPE OF DEMOLITION THROUGH THE DURATION OF DEMOLITION.
3. FIRE ALARM, SECURITY AND OTHERS SYSTEMS TO REMAIN ACTIVE AT ALL TIMES.

## KEY NOTES

1. EXISTING CORRIDOR LIGHT FIXTURES AND EXIT/EMERGENCY UNIT TO REMAIN, WITH LIGHTING CONTROL SYSTEM.
2. EXISTING DATA SERVICE TO REMAIN.
3. REMOVE RECEPTACLE FOR WATER COOLER. CIRCUIT TO BE EXTEND TO NEW WATER COOLER.
4. EXISTING POWER AND DATA OUTLETS TO REMAIN.
5. EXISTING ELECTRICAL PANEL TO BE REMOVED. FEEDER TO BE TERMINATED BACK AT THE SOURCE.
6. EXISTING EXIT/EMERGENCY UNIT TO BE RELOCATED. SEE SHEET E102 FOR NEW LOCATION.
7. EXISTING FIRE ALARM DEVICES TO BE TIED TO NEW FIRE ALARM CONTROL PANEL ON FIRST FLOOR.




NORTH

## THIRD FLOOR ELECTRICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

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# Wayne State University

5201 Cass Ave, Detroit, MI 48202

Prentis Building Computer Lab Relocation

**WSU Project: 022-313456**

REVISIONS

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| 8/23/2018 | A3 | ADDENDUM NO. 3 |

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| 8/13/2018 | BIDS |

Drawn By MRF
Designer LTI
Reviewer RMM
Manager MM5

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180746

ELECTRICAL DEMOLITION PLANS

# ED101

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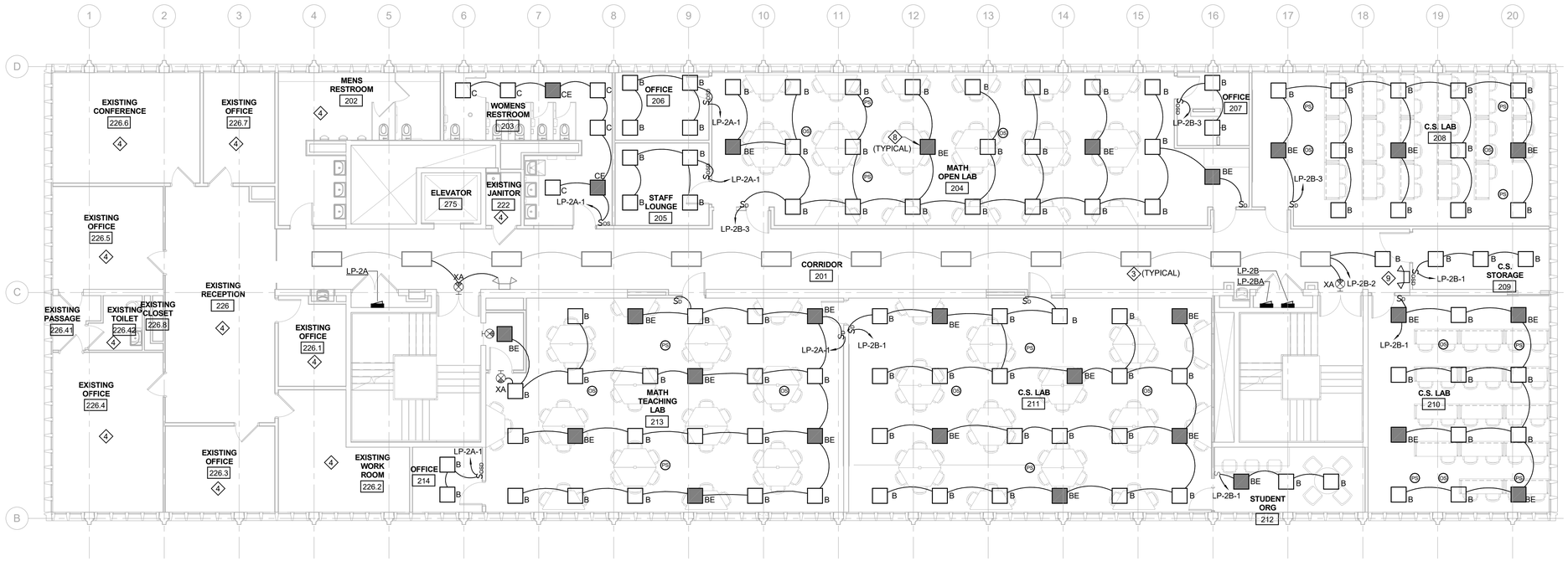



## SECOND FLOOR LIGHTING PLAN

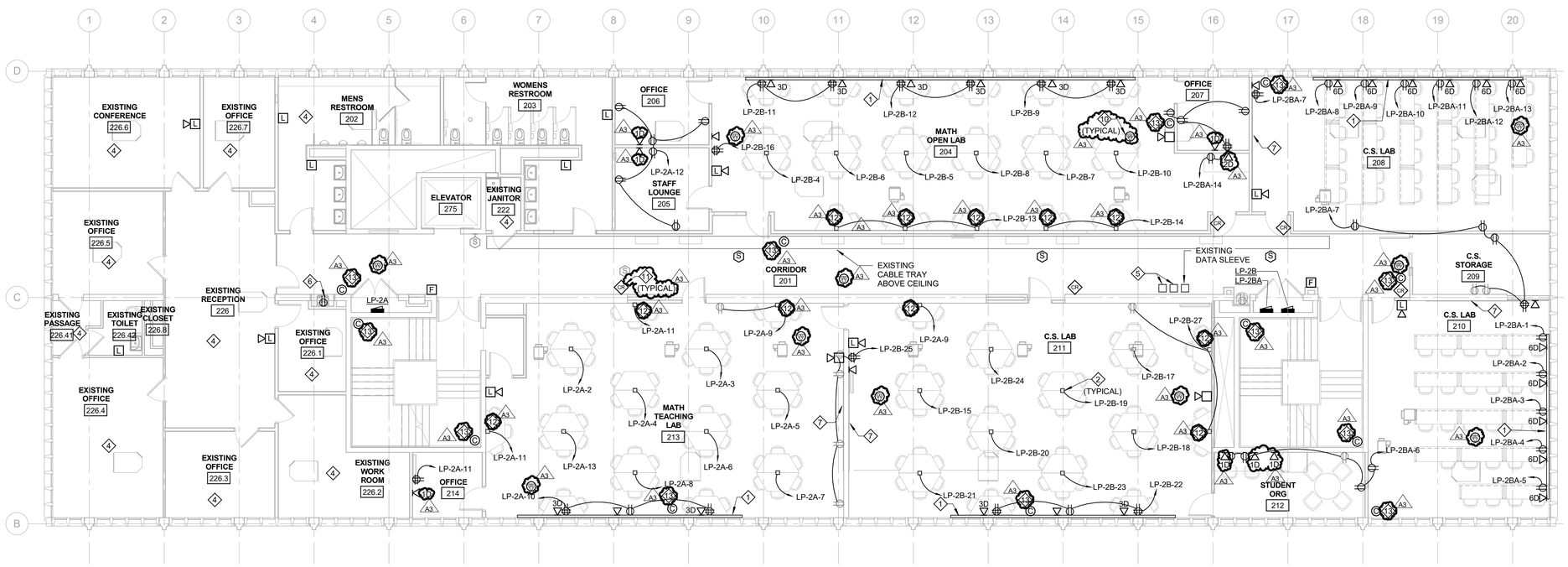
SCALE: 1/8" = 1'-0"

NORTH

## KEY NOTES

1. FURNISH AND INSTALL SURFACE MOUNTED RACEWAY. MOUNT AT 0'-6" AFF. TO THE TOP. FOR ELECTRICAL ROUGH-IN REQUIREMENTS SEE DETAIL ON E501. (18) DATA DROPS IN ROOM 204, (36) DATA DROPS IN ROOM 208. WSU REQUIRES AT LEAST (1) BOX FOR EVERY (3) DATA OUTLETS.
2. PROVIDE POWER POLE WITH (8) EIGHT POWER OUTLETS AND (8) DATA OUTLETS, LEGRAND 25DTP-4 WITH 25DTP-B ADD ON POWER COVER AND 25DTC-CVR DATA & A/V ADD ON POWER COVER WITH COVER AND DATA OUTLETS AS REQUIRED. RUN 3/4" CONDUIT ABOVE THE CEILING FOR POWER CONNECTION, AND 2" CONDUIT FOR DATA, CONDUITS TO RUN TO EXISTING CABLE TRAY IN THE CORRIDOR CEILING. PROVIDE (6) SIX - CAT 6 CABLE FOR DATA CONNECTION. AND ADDITIONAL (2) TWO CAT 6 CABLE FOR MONITORS. A3
3. EXISTING LIGHT FIXTURE TO REMAIN. CIRCUIT TO BE POWERED TO NEW PANEL LP-B CIRCUIT NO. 2.
4. EXISTING LIGHTING AND POWER CIRCUITS TO BE POWERED TO NEW PANEL LP-2A, PROVIDE CIRCUIT BREAKERS AS REQUIRED.
5. PROVIDE (2) TWO 4" CONDUIT DATA SLEEVES FROM IDF ROOM 305 ON THIRD FLOOR. A3
6. NEW WATER COOLER TO BE CONNECTED TO REMOVED WATER COOLER CIRCUIT.
7. COORDINATE DEVICES LOCATION AND MOUNTING HEIGHT WITH GLASS MARKERBOARD.
8. EMERGENCY LIGHT FIXTURES TO REMAIN ENERGIZED UPON LOSS OF POWER.
9. RELOCATED EXIT/EMERGENCY UNIT EXTEND FEEDER TO NEW LOCATION.
10. WIRELESS ACCESS POINT (WITH TWO CAT 5e DATA DROPS) COORDINATE EXACT LOCATION WITH CTI.
11. PROVIDE (1) ONE CAT6 CABLE FROM CARD READER TO THIRD FLOOR IDF ROOM 305.
12. PROVIDE POWER POLE WITH (3) POWER OUTLETS AND (3) DATA OUTLETS. LEGRAND 25DTP-4 WITH POWER AND DATA OUTLETS AS REQUIRED. RUN 3/4" CONDUIT FOR POWER CONNECTION TO EXISTING CABLE TRAY IN CORRIDOR CEILING . AND (3) THREE CAT 6 CABLE.
13. DATA CABLING FOR SECURITY CAMERAS IS BASE BID. FURNISHING AND INSTALLATION OF SECURITY CAMERAS IS AN ALTERNATE TO THE BASE BID.

A3




## SECOND FLOOR POWER AND SYSTEMS PLAN

SCALE: 1/8" = 1'-0"

NORTH

## LIGHTING CONTROL FUNCTIONAL INTENT

1. PRIVATE OFFICES, LOUNGE ROOM AND STORAGE: MANUAL-ON -OFF, AUTO OFF WITH DIMMER AND OCCUPANCY SENSOR.
2. RESTROOMS: MANUAL ON-OFF , AUTOMATIC OFF, PIR TECHNOLOGY, LINE VOLTAGE WALL SWITCH OCCUPANCY. EMERGENCY LIGHT FIXTURES TO BE ENERGIZED UPON LOSS OF NORMAL POWER.
3. LAB SPACES: MANUAL ON-OFF, AUTOMATIC OFF, DUAL ZONES DAYLIGHT HARVESTING , DIMMER SWITCH TO ADJUST LIGHTING LEVEL. EMERGENCY LIGHT FIXTURES TO BE ENERGIZED UPON LOSS OF NORMAL POWER.

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Drawn By MRF
Designer LTI
Reviewer RMM
Manager MM5

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SECOND FLOOR ELECTRICAL PLANS

**E102**

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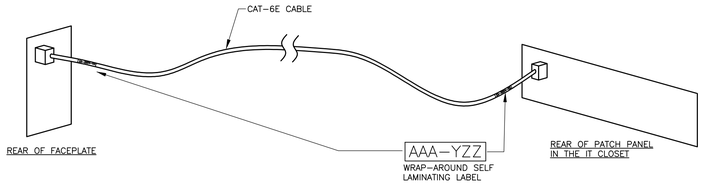


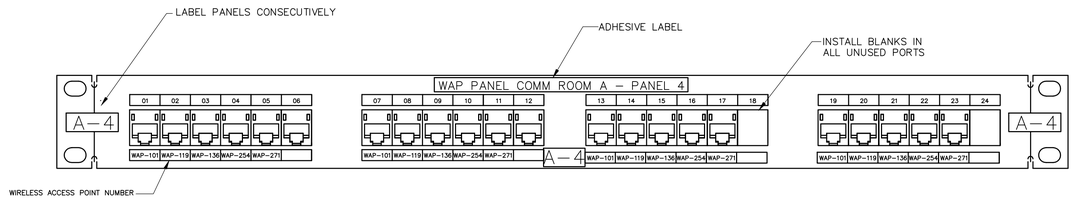

CABLE LABELING SCHEME
4AA = ROOM NUMBER
Y = FUNCTION (D=DATA)
ZZ = PORT NUMBER

TYPICAL HORIZONTAL CABLING DETAIL NOTES:

1. INSTALL A LABEL AT EACH END OF THE CAT 6E CABLE.
2. LABELS SHALL BE LASER PRINTED AND OF THE WRAP AROUND, SELF LAMINATING STYLE.

## TYPICAL HORIZONTAL CABLING DETAIL

NO SCALE




WIRELESS PANEL LABELING NOTES:

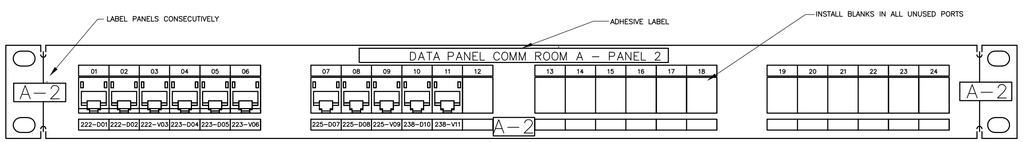
1. INSTALL A LABEL ON EACH PATCH PANEL DETAILING THE COMM ROOM NUMBER AND PANEL NUMBER.
2. ALL LABELS SHALL BE LASER PRINTED AND CUT TO FIT. ALL NUMBERS SHALL EXACTLY ALIGN WITH THE LOCATION ON THE PATCH PANEL.
3. EACH PORT SHALL BE LABELED WITH THE DEVICE NUMBER TO WHICH THE PORT IS CONNECTED.
4. CABLES SHALL BE TERMINATED ON PATCH PANELS IN NUMERICAL ORDER. NO EXCEPTIONS.

WAP–XXX

WIRELESS ACCESS POINT IDENTIFIER
WAP = DESTINATION DEVICE
XXX = ROOM NUMBER

## WIRELESS PANEL LABELING

NO SCALE




DATA PANEL LABELING NOTES:

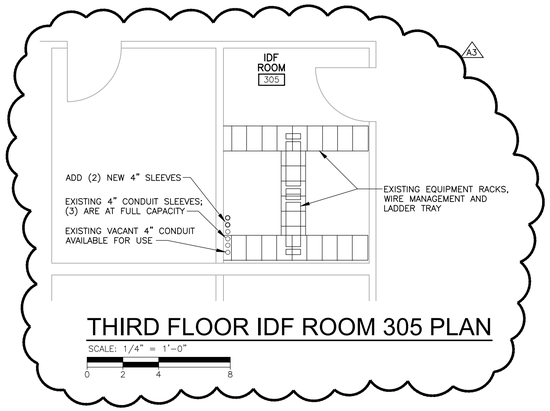
1. INSTALL A LABEL ON EACH PATCH PANEL DETAILING THE RACK NUMBER AND PATCH PANEL NUMBER.
2. ALL LABELS SHALL BE LASER PRINTED AND CUT TO FIT. ALL NUMBERS SHALL EXACTLY ALIGN WITH THE LOCATION ON THE PATCH PANEL.
3. IF THE PANEL IS NOT PRE–LABELED 01–24 THEN THE CONTRACTOR SHALL INSTALL A LABEL FOR EACH PORT.
4. INDIVIDUAL CABLES AT A SINGLE FACEPLATE SHALL BE LABELED IN SEQUENCE AS PER THE PATCH PANEL.
5. THE CABLES SHALL BE TERMINATED ON THE PATCH PANEL IN NUMERICAL ORDER. NO EXCEPTIONS.

RRR–YXX

DATA IDENTIFIER;
RRR = ROOM NUMBER
Y = FUNCTION (D=DATA)
XX = PORT NUMBER

## DATA PANEL LABELING

NO SCALE




## THIRD FLOOR IDF ROOM 305 PLAN

SCALE: 1/4" = 1'–0"

0 2 4 8

### COMMUNICATION EQUIPMENT SCHEDULE

| |
|---|
| ALL NEW CABLING MUST BE TERMINATED IN IDF ROOM 305 ON THIRD FLOOR. ANY RE–USED EXISTING CABLING FOR THIS PROJECT MUST BE RE–TERMINTED IN IDF THIRD FLOOR. ANY REMAINING CABLE NOT RELATED TO THIS PROJECT WILL CONTINUE TO BE LOCATED IN IDF THIRD FLOOR. A3 |
| PATCH PANEL –DATA & VOICE, UNLOADED PANEL, POPULATE ALL UN–USED PORTS WITH BLANKS. TERMINATE ALL CABLES WITH THE FOLLOWING JACKS. DATA = ORANGE, SYSTIMAX #MGS400–112. A3 |
| PATCH PANEL –WIRELESS, UNLOADED PANEL, POPULATE ALL UN–USED PORTS WITH BLANKS. TERMINATE ALL CABLES WITH ORANGE JACKS. |
| SINGLE RACK UNIT PATCH CORD ORGANIZER (PCO–1). |
| MANUFACTURED SLEEVES, 2" FIRE–STOP SLEEVE, HILTI SPEED SLEEVE #CP 653 2", CONTRACTOR SHALL UTILIZE FOR ANY ADDITIONAL PENETRATIONS INTO ROOMS IF NO EXISTING AVAILABLE. |
| RACK MOUNTED PERFORATED EQUIPMENT SHELF. |
| MANUFACTURED SLEEVES, 4" FIRE–STOP SLEEVE, HILTI SPEED SLEEVE #CP 653 4", CONTRACTOR SHALL UTILIZE FOR BACKBONE OR TELECOMM ROOM PENETRATIONS IF NO EXISTING AVAILABLE. |
| MANUFACTURED SLEEVES, 2" FIRE–STOP SLEEVE, HILTI SPEED SLEEVE #CP 653 2", CONTRACTOR SHALL UTILIZE FOR ANY ADDITIONAL PENETRATIONS INTO ROOMS IF NO EXISTING SLEEVES ARE AVAILABLE. |

### COMMUNICATION SYMBOL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| | DATA OUTLET IN WALL OR COMBINED POWER SURFACE RACEWAY |
| 1 | KEYNOTES. REFER TO NOTES ON THE SHEET FOR ADDITIONAL INFORMATION |
| WAP | WIRELESS ACCESS POINT. PROVIDED AND INSTALLED BY CONTRACTOR |
| X" | SPEED SLEEVE ABOVE DROP CEILING. SIZE AS NOTED. INSTALLED BY THIS CONTRACTOR. FIRESTOP ALL EXISTING SLEEVES USED UNDER THIS CONTRACT TO MEET CODES. |

THE FOLLOWING SUBSCRIPTS AND ABBREVIATIONS MAY BE USED THROUGHOUT THE DRAWINGS IN ONE OR MORE COMBINATIONS.

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|---|---|---|---|
| C–EMT | EMT TYPE CONDUIT | 2G | TWO–GANG BOX –PROVIDED BY EC |
| EC | ELECTRICAL CONTRACTOR | | |
| PET | PROTECTED ENTRANCE TERMINAL | NIC | NOT IN CONTRACT |
| QTY | QUANTITY | AC | ABOVE COUNTER –INSTALL BACKBOX SAME HEIGHT AS OTHER ELECTRICAL OUTLETS ABOVE THE COUNTER. |
| AWG | AMERICAN WIRE GAUGE | | |
| PBO | PROVIDED BY OTHERS | PCO–1 | PATCH CORD ORGANIZER –1 UNIT HIGH |
| EC | ELECTRICAL CONTRACTOR | | |
| AFG | ABOVE FINISHED GRADE | PCO–2 | PATCH CORD ORGANIZER –2 UNITS HIGH |
| AFF | ABOVE FINISHED FLOOR | | |

### COMMUNICATION CABLE SCHEDULE

| DESCRIPTION |
|---|
| CAT–6E PLENUM CABLE. GREEN FOR WIRELESS ACCESS POINTS. |
| CAT–6E PLENUM CABLE. GREEN FOR STANDARD DATA CONNECTIONS. |
| 12 STRAND MULTIMODE, 50 MICRON FIBER CABLE, CORNING FIBER #012T8P–31180–29 |
| 12 STRAND SINGLEMODE, OS2 FIBER CABLE, CORNING FIBER #012E88–33131–29 |
| |

CONTRACTOR SHALL UTILIZE EXISTING CAT 6E CABLING PRIOR TO UTILIZING NEW CAT 6E CABLING. FIELD CONFIRM WITH C&IT

NOT ALL ITEMS ON THIS SHEET ARE APPLICABLE TO THIS PROJECT THIS SHEET IS ISSUED TO CONVEY LOW VOLTAGE WIRING REQUIREMENTS. CONFIRM ALL WORK REQUIRED WITH WSU C&IT PERSONNEL AND STANDARDS. CONTRACTOR SHALL SUBMIT AND GAIN APPROVED SHOP DRAWINGS PRIOR TO ROUGH–IN OR INSTALLATION OF ANY EQUIPMENT, DEVICE OR CABLE. WSU C&IT LINK IS AS FOLLOWS:

https://computing.wayne.edu/docs/wsu–communications–standards.pdf

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| Manager | MM5 |

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COMMUNICATIONS LEGEND AND DETAILS

# TC101

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