

WAYNE STATE UNIVERSITY

DESIGN AND CONSTRUCTION SERVICES

PROJECT # 064-340774

BEECHER HOUSE

HVAC IMPROVEMENTS

5475 WOODWARD AVE.,

DETROIT, MI 48202

BIDS - 08/27/2021

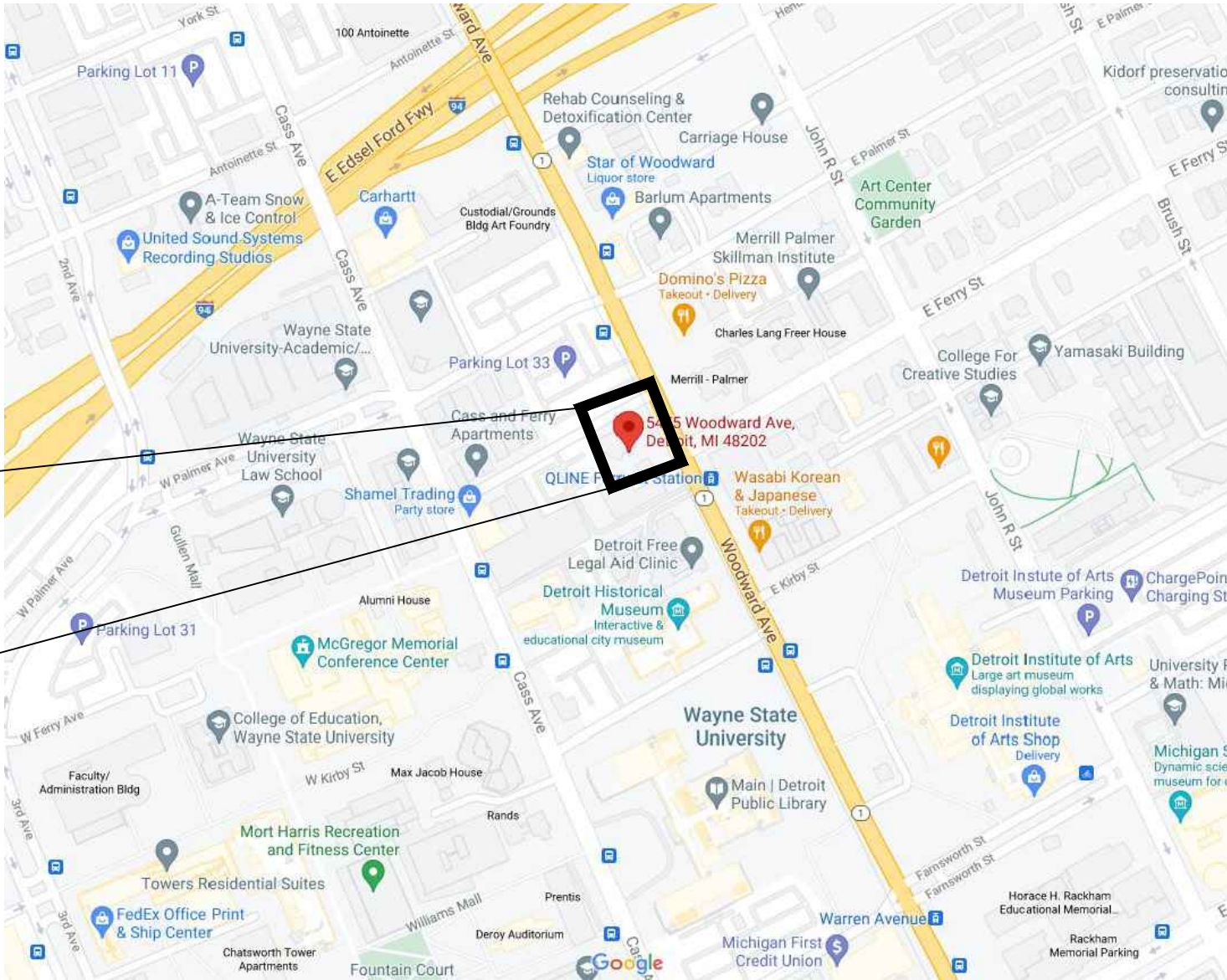
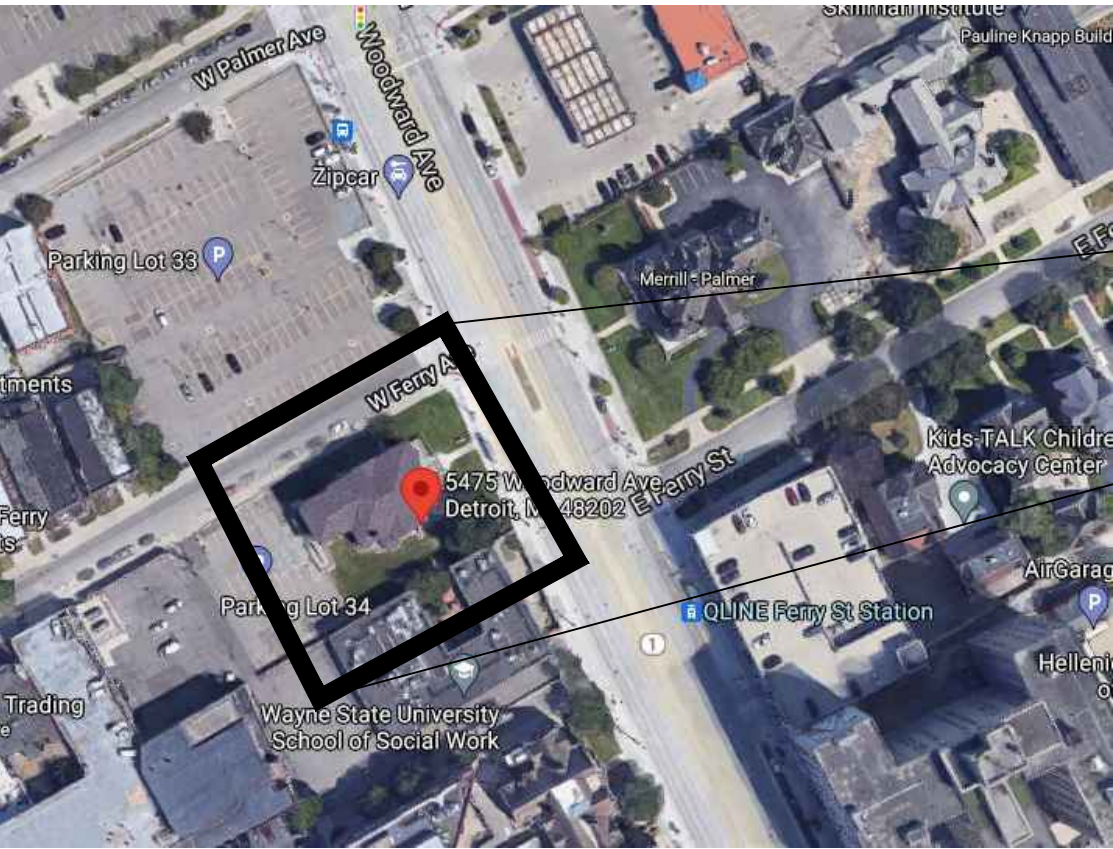


Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

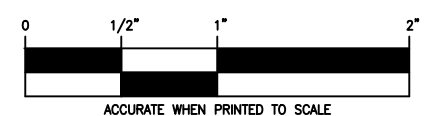


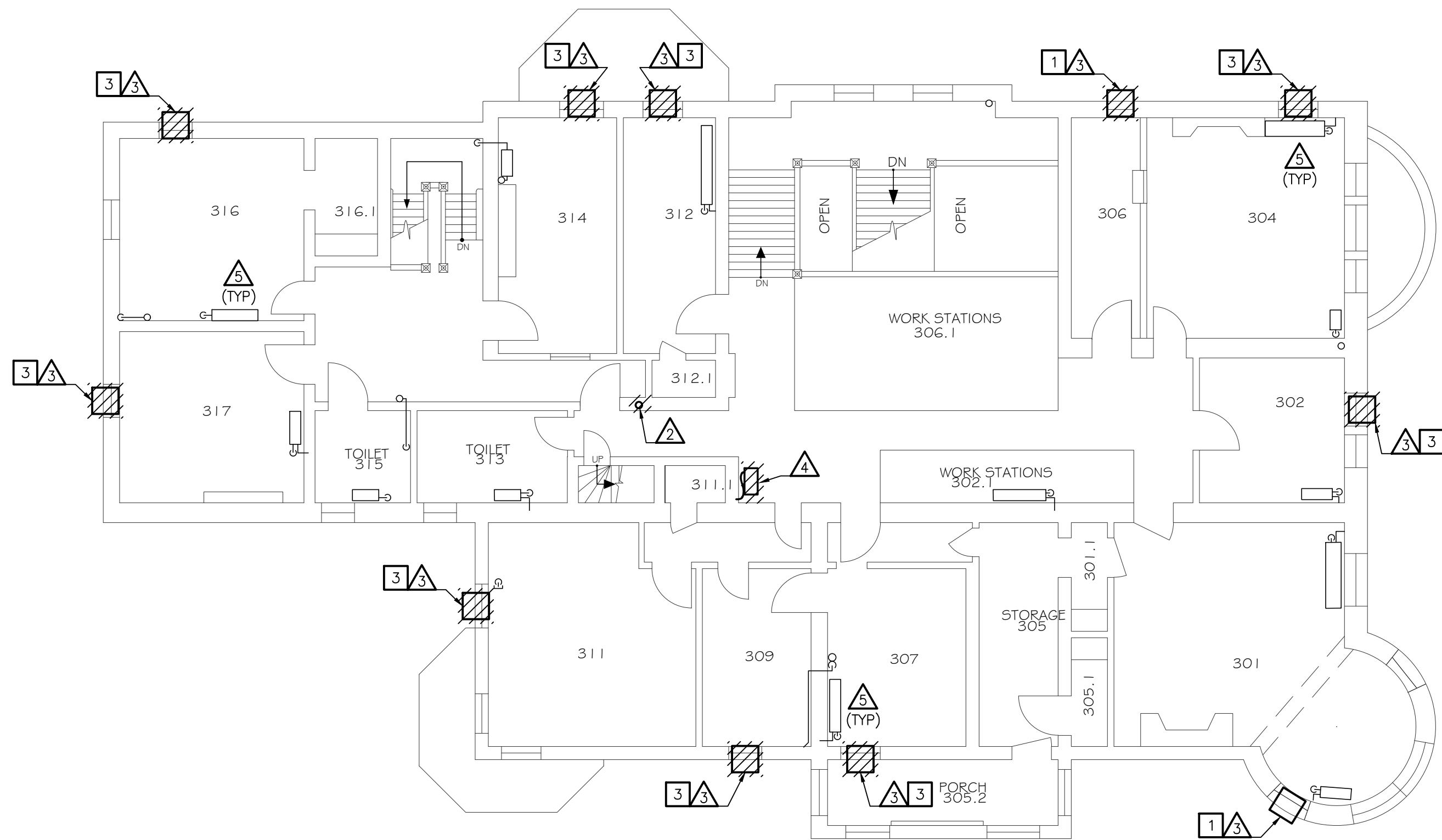
WAYNE STATE
UNIVERSITY

DRAWING INDEX	
SHT NO	DESCRIPTION
--	COVER SHEET
M0.0	MECHANICAL GENERAL INFORMATION
MD1.1	BASEMENT AND FIRST FLOOR MECHANICAL DEMOLITION PLANS
MD1.2	SECOND AND THIRD FLOOR MECHANICAL DEMOLITION PLANS
MP1.1	BASEMENT AND FIRST FLOOR HVAC PIPING PLAN
MP1.2	SECOND, THIRD AND ATTIC HVAC PIPING PLAN
MH1.1	BASEMENT AND FIRST FLOOR ARCHITACTURAL AND SHEET METAL PLAN
MH1.2	SECOND, THIRD, AND ATTIC ARCHITECTURAL AND SHEET METAL PLAN
M4.0	ENLARGED BASEMENT MECHANICAL ROOM DEMOLITION AND NEW WORK PLANS
M6.0	MECHANICAL SCHEDULES
M7.0	MECHANICAL PIPING DIAGRAMS AND CONTROLS
M9.0	ARCHITECTURAL SPECIFICATIONS
M9.1	MECHANICAL SPECIFICATIONS
M9.2	MECHANICAL SPECIFICATIONS
E0.0	ELECTRICAL GENERAL INFORMATION
ED1.1	BASEMENT AND FIRST FLOOR ELECTRICAL DEMOLITION PLAN
ED1.2	SECOND AND THIRD FLOOR ELECTRICAL DEMOLITION PLAN
EP1.1	BASEMENT AND FIRST FLOOR ELECTRICAL POWER PLAN
EP1.2	SECOND, THIRD AND ATTIC FLOOR ELECTRICAL POWER PLAN
E5.0	ELECTRICAL ONE--LINE DIAGRAM AND DETAILS
E9.0	ELECTRICAL SPECIFICATIONS
E9.1	ELECTRICAL SPECIFICATIONS

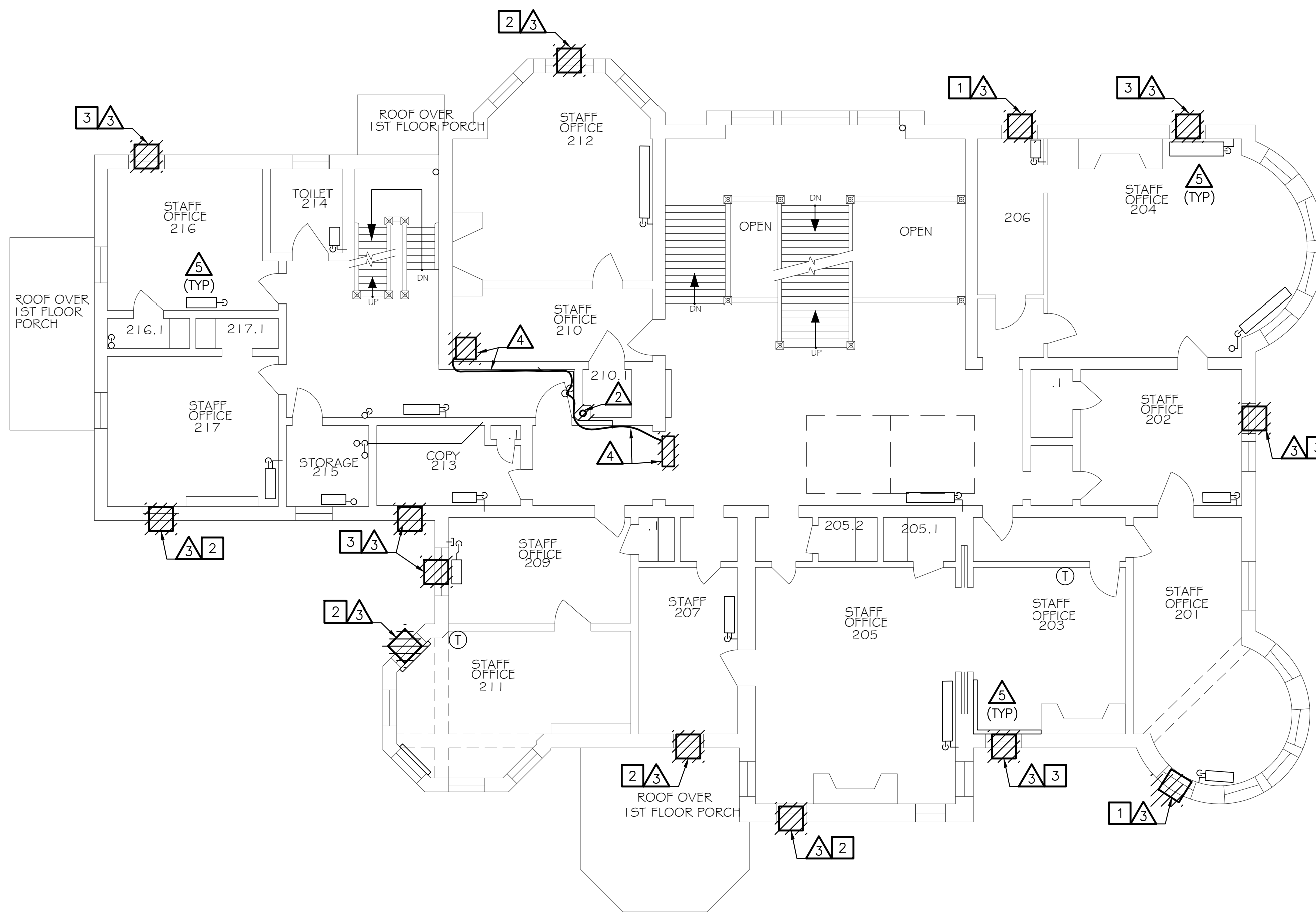


 **LOCATION MAP**
SCALE: NONE





THIRD FLOOR MECHANICAL DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



SECOND FLOOR MECHANICAL DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

MECHANICAL DEMOLITION NOTES

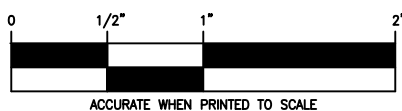
1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
2. PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY ARCHITECT OF ANY INTERFERENCES OR DISCREPANCIES.
3. VERIFY DEPTH, SIZE, LOCATIONS AND CONDITION OF EXISTING UTILITIES IN THE FIELD, INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
4. ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
5. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
6. ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETE, WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTS.
7. ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT OR PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
8. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER PROVIDED EQUIPMENT.

DEMOLITION KEYED NOTES

1. DISCONNECT AND COMPLETELY REMOVE HEATING HOT WATER, STEAM AND CONDENSATE PIPING AND ALL ASSOCIATED EQUIPMENT I.E. HEAT EXCHANGER, PUMPS, VALVES, HANGERS, CONTROLS AND ACCESSORIES FROM BASEMENT LEVEL. CAP ALL PIPING RISERS UP TO FIRST FLOOR AT CEILING LEVEL OF BASEMENT.
2. REMOVE HEATING HOT WATER/STEAM MAIN RISER PIPING FROM BASEMENT TO ATTIC LEVEL FIELD VERIFY RISER LOCATION. COORDINATE WITH NEW CONSTRUCTION. RESTORE/PATCH AREAS TO MATCH EXISTING CONDITIONS.
3. REMOVE EXISTING WINDOW AIR CONDITIONING UNIT. COORDINATE WINDOW REPAIR OR IN-FILL WITH NEW CONSTRUCTION.
4. DISCONNECT AND REMOVE PORTABLE WATER COOLED AIR CONDITIONING UNIT AND ASSOCIATED DRAIN PIPING, WATER SUPPLY PIPING BACK TO MAINS AND CAP.
5. EXISTING RADIATOR/BASEBOARD TO REMAIN.

WINDOW SASH REPAIRS

1. LOWER EXISTING BOTTOM SASH TO WINDOW SILL AFTER REMOVAL OF AC UNIT.
2. REMOVE INTERMEDIATE MUNTIN, GLASS, AND AC PANEL IN BOTTOM SASH AND REGLAZE WITH GLASS.
3. REMOVE A/C PANEL IN BOTTOM SASH AND REGLAZE WITH GLASS.



SES
Strategic Energy Solutions
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:
Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:
Beecher House
5475 Woodward Ave.,
Detroit, MI 48202

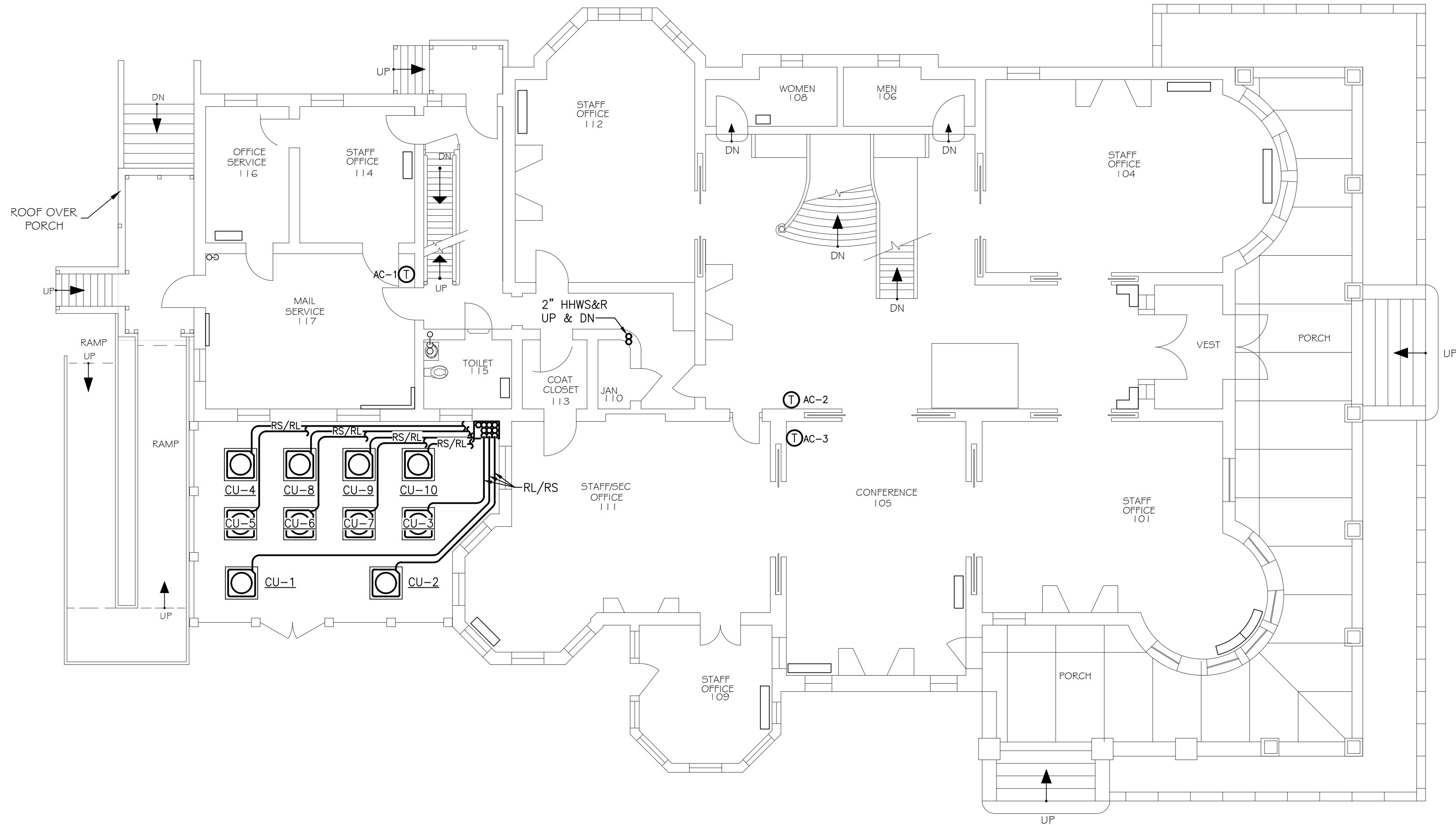


Seal:

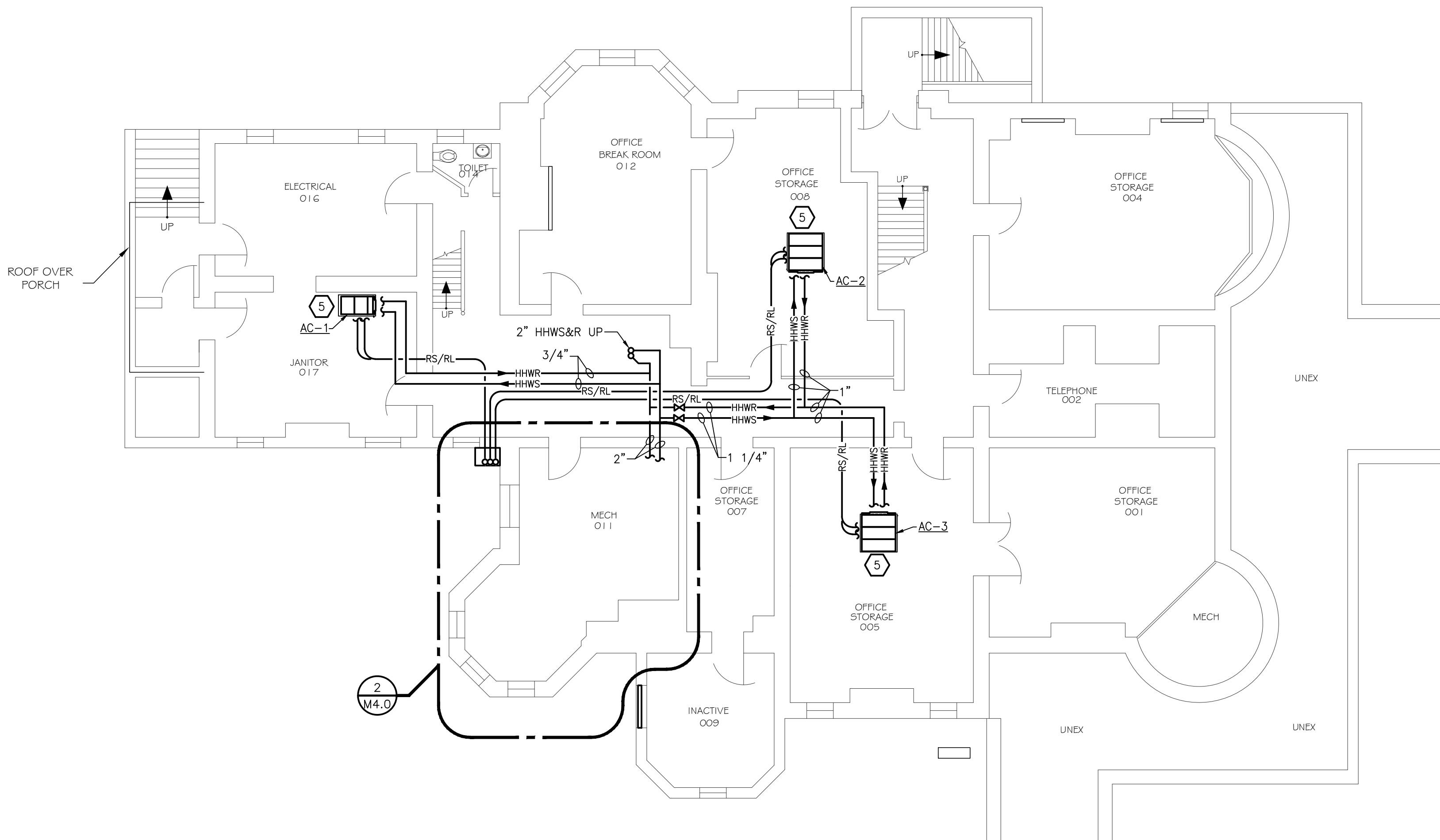
ISSUED FOR:	
BIDS	08/27/21
ISSUED	DATE
DESIGNER:	RRS
ENGINEER:	RRS

SHEET TITLE:
**SECOND AND THIRD FLOOR
MECHANICAL DEMOLITION
PLANS**

SHEET NUMBER:
MD1.2



FIRST FLOOR HVAC PIPING PLAN
SCALE: 1/8" = 1'-0"



BASEMENT HVAC PIPING PLAN
SCALE: 1/8" = 1'-0"

HVAC PIPING GENERAL NOTES

1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE HVAC SYSTEMS COMPLETE PER SPECIFICATION, SMACNA STANDARDS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, FITTINGS, SPECIAL RADIUS OR MITERED ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR STRUCTURAL CONDITIONS OR OTHER CONDITIONS.
2. CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE WORK OF ALL OTHER TRADES. ALL DUCTWORK IS TO BE ROUTED AS HIGH AS POSSIBLE. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.
3. PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL NOT BE LOCATED OVER ELECTRICAL EQUIPMENT/PANELS. PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT. PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
4. PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
5. THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL, ETC. FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
6. COORDINATE FLOOR, WALL, ROOF PENETRATIONS, LOUVER SIZES, PAD LOCATIONS ETC. WITH ARCHITECTURAL TRADES. SEAL ALL PIPING AND DUCT PENETRATIONS.
7. COORDINATE AND PROVIDE ACCESS DOORS IN HARD CEILING AREAS FOR ACCESS TO BALANCING DAMPERS, ETC.
8. FOR EQUIPMENT VALVING, COMPONENT, AND PIPING ARRANGEMENT, REFER TO PIPING DIAGRAMS AND DETAILS.
9. PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR DAMPERS, VALVES, AND CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS. COORDINATE LOCATIONS WITH ARCHITECT.
10. CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.



KEYED NOTES

1. ROUTE PIPING IN NEW 12" DEEP DRYWALL SOFFIT. COORDINATE PIPING INSTALLATION WITH DUCTWORK.
2. CONDENSATE DRAIN TO BE SAME SIZE AS A/C UNIT DRAIN CONNECTION WITH MINIMUM PIPE SIZE TO BE 3/4"
3. 1" CONDENSATE DRAIN DOWN.
4. EXTEND CONDENSATE DRAIN TO EXISTING HUB OUTLET.
5. EXTEND CONDENSATE DRAIN TO DISCHARGE ABOVE NEAREST FLOOR DRAIN.



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



**WAYNE STATE
UNIVERSITY**

Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED

DATE

DESIGNER:

RRS

ENGINEER:

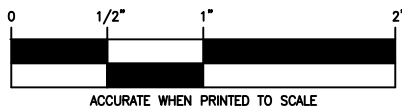
RRS

SHEET TITLE:

**BASEMENT AND FIRST
FLOOR HVAC PIPING PLAN**

SHEET NUMBER:

MP1.1





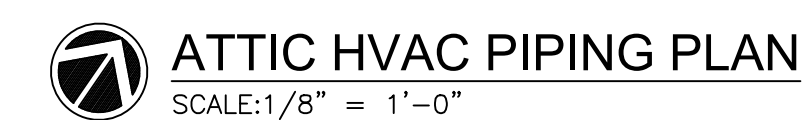
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

5475 Woodward Ave.,
Detroit, MI 48202



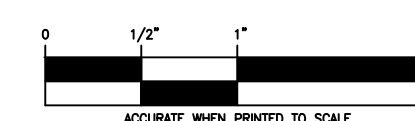
SECOND, THIRD AND ATTIC HVAC PIPING PLAN

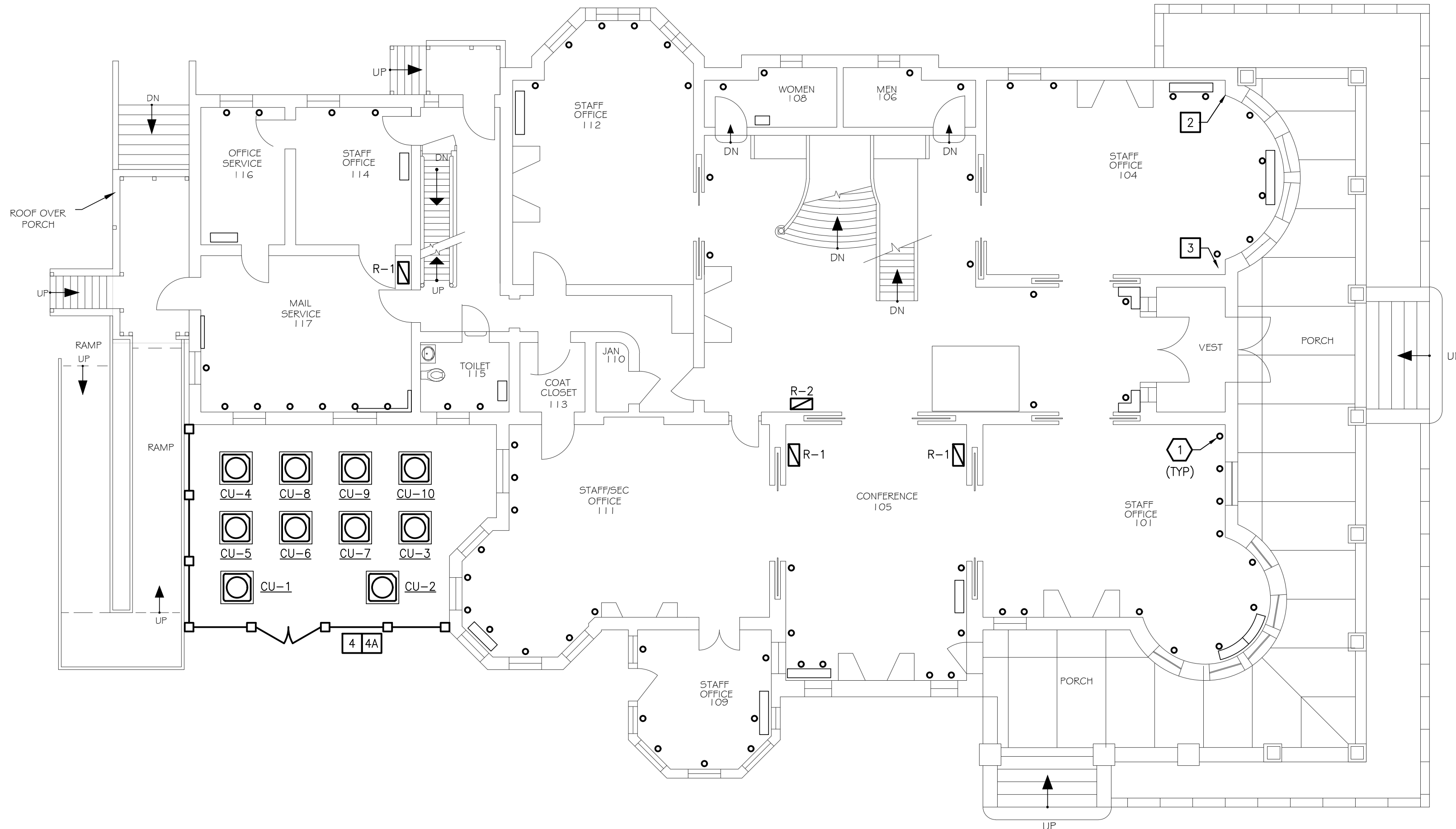
MP1.2



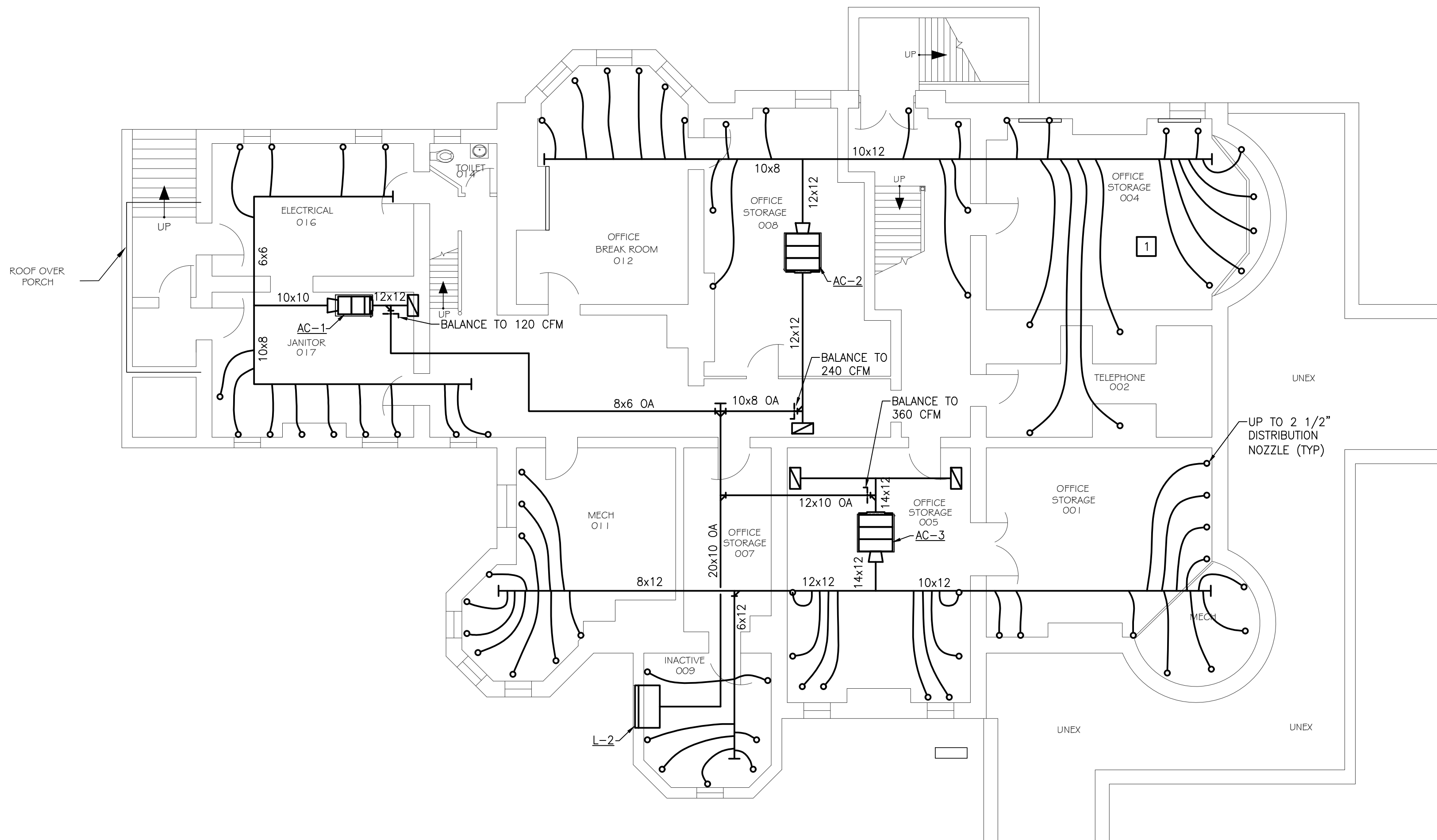
1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE HVAC SYSTEMS COMPLETE PER SPECIFICATION, SMACNA STANDARDS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, FITTINGS, SPECIAL RADIUS OR MITERED ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR STRUCTURAL CONDITIONS OR OTHER CONDITIONS.
2. CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE WORK OF ALL OTHER TRADES. ALL DUCTWORK IS TO BE ROUTED AS HIGH AS POSSIBLE. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.
3. PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL NOT BE LOCATED OVER ELECTRICAL EQUIPMENT/PANELS. PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT. PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
4. PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
5. THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL, ETC. FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
6. COORDINATE FLOOR, WALL, ROOF PENETRATIONS, LOUVER SIZES, PAD LOCATIONS ETC. WITH ARCHITECTURAL TRADES. SEAL ALL PIPING AND DUCT PENETRATIONS.
7. COORDINATE AND PROVIDE ACCESS DOORS IN HARD CEILING AREAS FOR ACCESS TO BALANCING DAMPERS, ETC.
8. FOR EQUIPMENT VALVING, COMPONENT, AND PIPING ARRANGEMENT, REFER TO PIPING DIAGRAMS AND DETAILS.
9. PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR DAMPERS, VALVES, AND CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS. COORDINATE LOCATIONS WITH ARCHITECT.
10. CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.

1. ROUTE PIPING IN NEW 12" DEEP DRYWALL SOFFIT. COORDINATE PIPING INSTALLATION WITH DUCTWORK.
2. CONDENSATE DRAIN TO BE SAME SIZE AS A/C UNIT DRAIN CONNECTION WITH MINIMUM PIPE SIZE TO BE 3/4"
3. 1" CONDENSATE DRAIN DOWN.
4. EXTEND CONDENSATE DRAIN TO EXISTING HUB OUTLET.
5. EXTEND CONDENSATE DRAIN TO DISCHARGE ABOVE NEAREST FLOOR DRAIN.





FIRST FLOOR ARCHITECTURAL AND SHEET METAL PLAN
SCALE: 1/8" = 1'-0"



BASEMENT ARCHITECTURAL AND SHEET METAL PLAN
SCALE: 1/8" = 1'-0"

ARCHITECTURAL GENERAL NOTES

- DO NOT CUT INTO ANY DECORATIVE CEILING CORNICES, MEDALLIONS (INDICATED BY DASHED CIRCLES), ETC.
- INSTALL NEW AIR DIFFUSERS A MINIMUM OF 4" FROM EDGE OF DIFFUSER TO ANY ADJACENT CEILING CORNICE, MEDALLION, ETC.
- AIR DIFFUSER SHOULD BE CUT WITH A HOLE SAW TO AVOID PLASTER PATCHING, AND ALL PLASTER SLOTS OPENED FOR DUCTWORK/PIPING INSTALLATION SHOULD BE SAWCUT, NOT BROKEN OUT.

ARCHITECTURAL KEYED NOTES

- INSTALL DUCTWORK/PIPING ABOVE EXISTING SUSPENDED ACOUSTICAL CEILING.
- REMOVE DAMAGED PLASTER IN FLAT WALL AREAS (APPROXIMATELY 50 SQUARE FEET) TO SOLID SUBSTRATE AND INSTALL NEW PLASTER (GROUND/ROUGH/FINISH COATS). CLEAN LOOSE MATERIAL FROM EDGES OF DECORATIVE CEILING CORNICE ELEMENTS (DENTILS, EGGS/DARTS, ETC) TO SOLID MATERIAL. PAINT ENTIRE NORTH WALL AFTER PLASTER WORK IS COMPLETE.
- AFTER REMOVAL OF HEATING WATER PIPING, PATCH PLASTER HOLE IN CEILING CORNICE AND HOLE IN WOOD FLOORING WITH MATCHING MATERIAL. PAINT CEILING CORNICE TO NEAREST CORNERS.
- INSTALL 8FT HIGH STEEL FENCING (SATIN BLACK FINISH) WITH VERTICAL SPINDLES 4" O.C. AND DECORATIVE ARROW TIP CAPS. FENCE POSTS TO BE SET IN 8" DIAMETER BY 3'-6" DEEP CONCRETE FOUNDATIONS. DOUBLE GATES TO HAVE CYLINDER LOCK INSTALLED FOR MASTER KEYING TO WSU SYSTEM.
- EXTERIOR CONDENSER FARM AREA TO HAVE GRASS REMOVED, NON WOVEN GEOTEXTILE WEED BARRIER PLACED OVER ENTIRE AREA WITH SEAMS OVERLAPPED MINIMUM ONE FOOT IN ALL DIRECTIONS, AND INSTALL 4" PEA GRAVEL ON TOP OF PLASTIC OVER ENTIRE AREA.
- INSTALL 1/4" DRYWALL OVER ENTIRE CEILING AFTER REMOVAL OF PLASTER SLOTS FOR DUCTWORK/PIPING INSTALLATION. PAINT CEILING.
- CUT PLASTER SLOTS ANGLED AWAY FROM OPENING (BACKCUT) IN MINIMAL SIZE NECESSARY FOR INSTALLATION/THREADING OF DUCTWORK/PIPING IN JOIST SPACES (SEE DOTTED BOXES INDICATING RELATIVE SIZE OF SLOTS.) PROVIDE PLASTER PATCH AFTER INSTALLATION. REPAINT ENTIRE CEILING.
- ALIGN NEW 12" DEEP DRYWALL SOFFIT WITH WEST LEADING EDGE OF ADJACENT CEILING CORNICE CORNER. SOFFIT TO ENCLOSE EAST/WEST DUCTWORK/PIPING AND CONNECTIONS. PAINT SOFFIT AND CEILING.
- 12" DEEP DRYWALL SOFFIT IN WIDTHS REQUIRED TO ENCLOSE ALL INSTALLED DUCTWORK/PIPING, ETC. PAINT SOFFIT, CEILING AND CORNICE.
- REMOVE BASE AND DAMAGED PLASTER (APPROXIMATELY 4 SQUARE FEET). PATCH PLASTER, REINSTALL BASE AND PAINT WALLS FULL HEIGHT TO NEAREST VERTICAL CORNER.
- REMOVE ANY WALL TRIM, REMOVE 3" DEEP NICHE IN BRICK WALL FULL HEIGHT FOR INSTALLATION OF DUCTWORK/PIPING. INSTALL 5/8" DRYWALL OVER ENTIRE WALL AND THEN REINSTALL WOOD TRIM. PAINT WALL.
- CONSTRUCT A/C UNIT PLATFORMS ABOVE EXISTING CEILING JOISTS, SPANNING BETWEEN BEARING WALLS AS SHOWN. PLATFORM FRAMING TO BE 2X10'S 16" O.C. WITH 2X4 BLOCKING BETWEEN JOISTS 4'-0" O.C. AND ABOVE BEARING WALL SUPPORTS. PROVIDE 3/4" PLYWOOD PLATFORM SURFACE BENEATH A/C UNITS EXTENDING MINIMUM 2'-0" FROM ALL SIDES OF UNITS.
- ELEVATED PLATFORM FOR A/C UNIT #8 (ABOVE #4) TO BE CONSTRUCTED OF SIMILAR FRAMING AND SIZE OF BASE PLATFORM AND BE SUPPORTED AT EACH END, ABOVE THE RESPECTIVE BEARING WALL, WITH A 2X4 STUD PARTITION IN HEIGHT AS REQUIRED FOR A/C UNIT CLEARANCES. PROVIDE DIAGONAL BRACING BETWEEN 2X4 STUD WALLS AND PLATFORM FOR RIGIDITY.
- INSTALL AN ADDITIONAL 4" OF CELLULOSE INSULATION OVER THE EXISTING MATERIAL THROUGHOUT THE ENTIRE ATTIC SURFACE, AND REMOVE/REPLACE WOOD WALKWAY BOARDS AS NECESSARY TO PROVIDE CONTINUOUS COVERAGE OF ALL ATTIC FLOOR SURFACE AREAS.
- INSTALL REPRODUCTION WOOD PANEL DOOR TO MATCH EDISTING HISTORIC DOORS IN SPECIES, FINISH, PROFILES, DETAILS, CONSTRUCTION, DIMENSIONS AND WITH HARDWARE TO ALSO MATCH.
- INSTALL SUSPENDED "INELINE" 2'X2' ACOUSTICAL CEILING GRID WITH MINIMUM GRID LINES CENTERED IN SPACE AND WITH NON-FISSURED CEILING PADS INSTALLED.

SHEET METAL GENERAL NOTES

- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE HVAC SYSTEMS COMPLETE PER SPECIFICATION, SMACNA STANDARDS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, FITTINGS, SPECIAL RADIUS OR MITERED ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR STRUCTURAL CONDITIONS OR OTHER CONDITIONS.
- CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE WORK OF ALL OTHER TRADES. ALL DUCTWORK IS TO BE ROUTED AS HIGH AS POSSIBLE. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.
- DUCTWORK/PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL NOT BE LOCATED OVER ELECTRICAL EQUIPMENT/PANELS. PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT. DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
- DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
- THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL, ETC. FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
- COORDINATE FLOOR, WALL, ROOF PENETRATIONS, LOUVER SIZES, PAD LOCATIONS ETC. WITH ARCHITECTURAL TRADES. SEAL ALL PIPING AND DUCT PENETRATIONS.
- COORDINATE AND PROVIDE ACCESS DOORS IN HARD CEILING AREAS FOR ACCESS TO BALANCING DAMPERS, ETC.
- FOR EQUIPMENT VALVING, COMPONENT, AND PIPING ARRANGEMENT, REFER TO PIPING DIAGRAMS AND DETAILS.
- PAINT ALL VISIBLE INTERIOR SURFACES OF EXHAUST/RETURN GRILLES, REGISTERS AND VISIBLE ASSOCIATED DUCTWORK FLAT BLACK.
- PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR DAMPERS, VALVES, AND CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS.
- CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.

SHEET METAL KEYED NOTES

- 2 1/2" FLOOR MOUNTED AIR DISTRIBUTION NOZZLE. COORDINATE NOZZLE FINISH WITH OWNER.
- RETURN AIR IS LOCATED ON THE BOTTOM OF THE VERTICAL A/C UNIT. MOUNT EQUIPMENT STAND TO ALLOW ACCESS TO FILTER AND NOT OBSTRUCT AIRFLOW INTO THE UNIT.
- 2 1/2" CEILING MOUNTED AIR DISTRIBUTION NOZZLE. COORDINATE NOZZLE FINISH WITH OWNER.
- INSTALL RETURN GRILLE ABOVE WOOD BASE TRIM. ROUTE 12X10 RETURN DUCT UP TO CEILING SPACE FOR CONNECTION OF OUTSIDE AIR DUCT.

ARCHITECTURAL GENERAL NOTES

- DO NOT CUT INTO ANY DECORATIVE CEILING CORNICES, MEDALLIONS (INDICATED BY DASHED CIRCLES), ETC.
- INSTALL NEW AIR DIFFUSERS A MINIMUM OF 4" FROM EDGE OF DIFFUSER TO ANY ADJACENT CEILING CORNICE, MEDALLION, ETC.
- AIR DIFFUSER SHOULD BE CUT WITH A HOLE SAW TO AVOID PLASTER PATCHING, AND ALL PLASTER SLOTS OPENED FOR DUCTWORK/PIPING INSTALLATION SHOULD BE SAWCUT, NOT BROKEN OUT.



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED

DATE

DESIGNER:

RRS

ENGINEER:

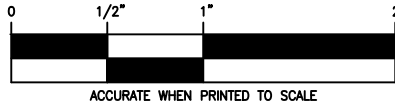
RRS

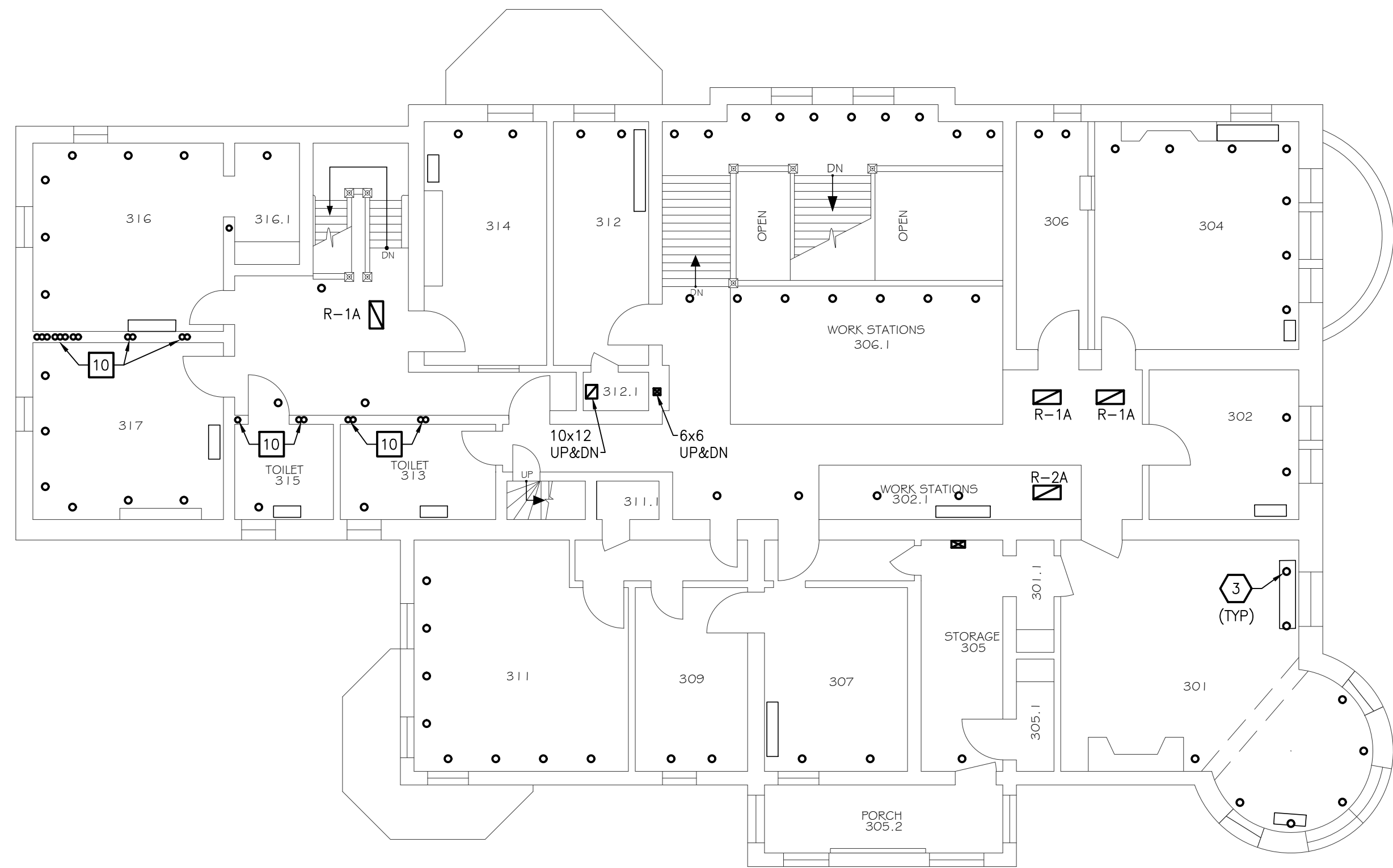
SHEET TITLE:

**BASEMENT AND FIRST
FLOOR ARCHITACTURAL
AND SHEET METAL PLAN**

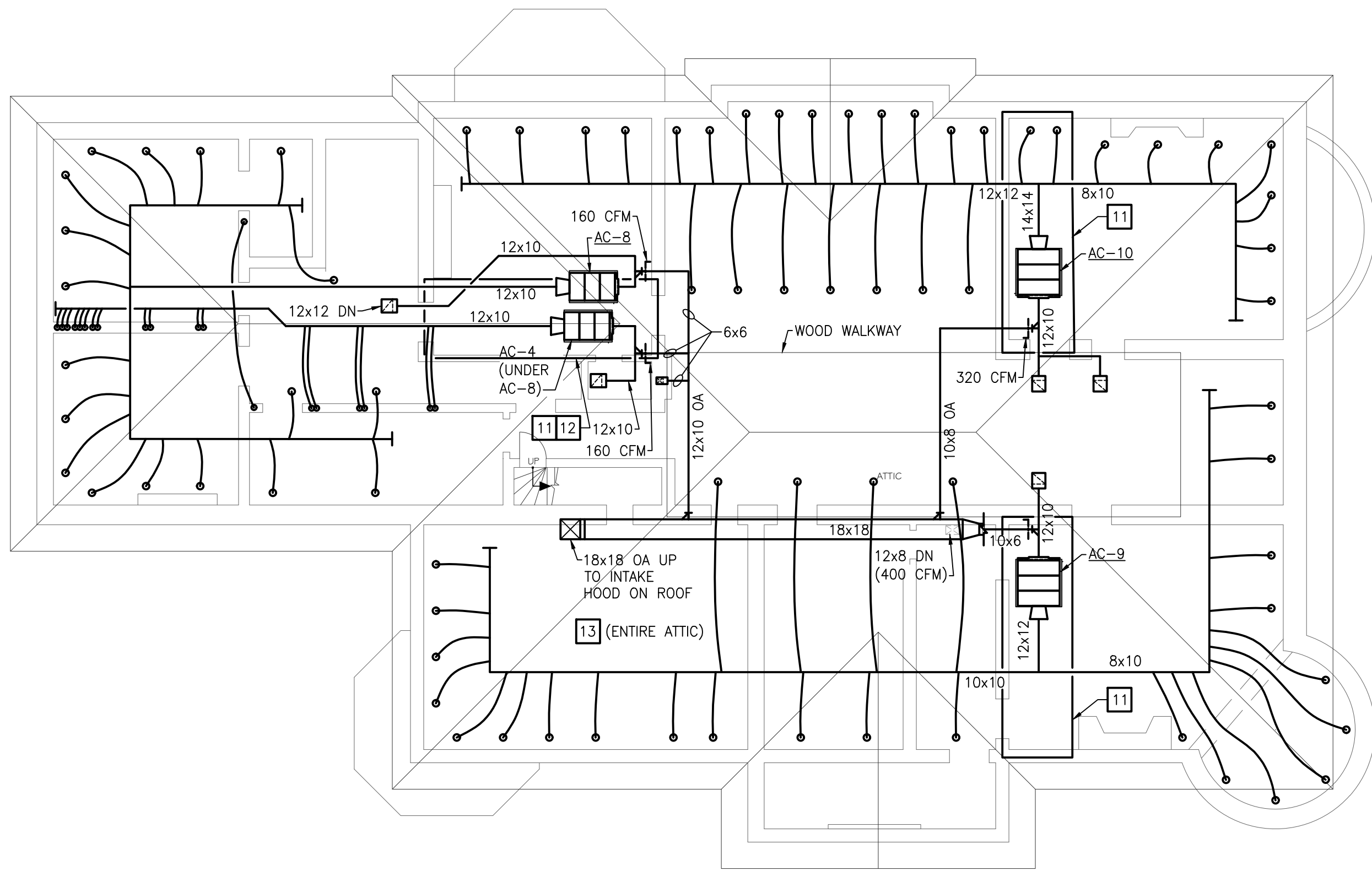
SHEET NUMBER:

MH1.1

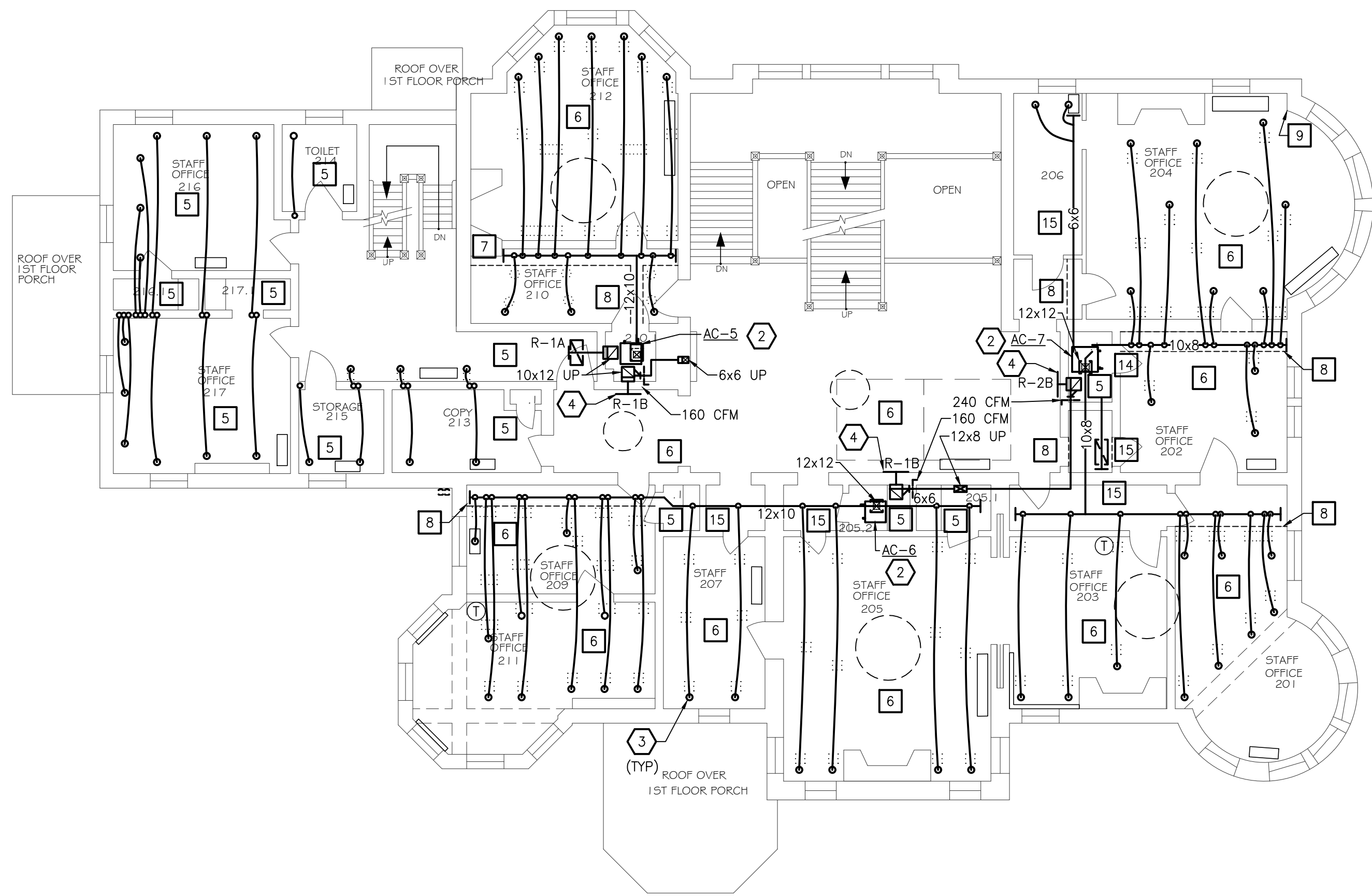




THIRD FLOOR ARCHITECTURAL AND SHEET METAL PLAN
SCALE:1/8" = 1'-0"



ATTIC ARCHITECTURAL AND SHEET METAL PLAN
SCALE:1/8" = 1'-0"



SECOND FLOOR ARCHITECTURAL AND SHEET METAL PLAN
SCALE:1/8" = 1'-0"

ARCHITECTURAL KEYED NOTES

1. INSTALL DUCTWORK/PIPING ABOVE EXISTING SUSPENDED ACOUSTICAL CEILING.
2. REMOVE DAMAGED PLASTER IN FLAT WALL AREAS (APPROXIMATELY 50 SQUARE FEET) TO SOLID SUBSTRATE AND INSTALL NEW PLASTER (GROUND/ROUGH/FINISH COATS). CLEAN LOOSE MATERIAL FROM EDGES OF DECORATIVE CEILING CORNICE ELEMENTS (DENTILS, EGGS/DARTS, ETC) TO SOLID MATERIAL. PAINT ENTIRE NORTH WALL AFTER PLASTER WORK IS COMPLETE.
3. AFTER REMOVAL OF HEATING WATER PIPING, PATCH PLASTER HOLE IN CEILING CORNICE AND HOLE IN WOOD FLOORING WITH MATCHING MATERIAL. PAINT CEILING CORNICE TO NEAREST CORNERS.
4. INSTALL 8FT HIGH STEEL FENCING (SATIN BLACK FINISH) WITH VERTICAL SPINDLES 4" O.C. AND DECORATIVE ARROW TIP CAPS. FENCE POSTS TO BE SET IN 8" DIAMETER BY 3'-6" DEEP CONCRETE FOUNDATIONS. DOUBLE GATES TO HAVE CYLINDER LOCK INSTALLED FOR MASTER KEYING TO WSU SYSTEM.
- 4A. EXTERIOR CONDENSER FARM AREA TO HAVE GRASS REMOVED, NON WOVEN GEOTEXTILE WEED BARRIER PLACED OVER ENTIRE AREA WITH SEAMS OVERLAPPED MINIMUM ONE FOOT IN ALL DIRECTIONS, AND INSTALL 4" PEA GRAVEL ON TOP OF PLASTIC OVER ENTIRE AREA.
5. INSTALL 1/4" DRYWALL OVER ENTIRE CEILING AFTER REMOVAL OF PLASTER SLOTS FOR DUCTWORK/PIPING INSTALLATION. PAINT CEILING.
6. CUT PLASTER SLOTS ANGLED AWAY FROM OPENING (BACKCUT) IN MINIMAL SIZE NECESSARY FOR INSTALLATION/THREADING OF DUCTWORK/PIPING IN JOIST SPACES (SEE DOTTED BOXES INDICATING RELATIVE SIZE OF SLOTS.) PROVIDE PLASTER PATCH AFTER INSTALLATION. REPAINT ENTIRE CEILING.
7. ALIGN NEW 12" DEEP DRYWALL SOFFIT WITH WEST LEADING EDGE OF ADJACENT CEILING CORNICE CORNER. SOFFIT TO ENCLOSE EAST/WEST DUCTWORK/PIPING AND CONNECTIONS. PAINT SOFFIT AND CEILING.
8. 12" DEEP DRYWALL SOFFIT IN WIDTHS REQUIRED TO ENCLOSE ALL INSTALLED DUCTWORK/PIPING, ETC. PAINT SOFFIT, CEILING AND CORNICE.
9. REMOVE BASE AND DAMAGED PLASTER (APPROXIMATELY 4 SQUARE FEET). PATCH PLASTER, REINSTALL BASE AND PAINT WALLS FULL HEIGHT TO NEAREST VERTICAL CORNER.
10. REMOVE ANY WALL TRIM, REMOVE 3" DEEP NICHE IN BRICK WALL FULL HEIGHT FOR INSTALLATION OF DUCTWORK/PIPING. INSTALL 5/8" DRYWALL OVER ENTIRE WALL AND THEN REINSTALL WOOD TRIM. PAINT WALL.
11. CONSTRUCT A/C UNIT PLATFORMS ABOVE EXISTING CEILING JOISTS, SPANNING BETWEEN BEARING WALLS AS SHOWN. PLATFORM FRAMING TO BE 2X10'S 16" O.C. WITH 2X4 BLOCKING BETWEEN JOISTS 4'-0" O.C. AND ABOVE BEARING WALL SUPPORTS. PROVIDE 3/4" PLYWOOD PLATFORM SURFACE BENEATH A/C UNITS EXTENDING MINIMUM 2'-0" FROM ALL SIDES OF UNITS.
12. ELEVATED PLATFORM FOR A/C UNIT #8 (ABOVE #4) TO BE CONSTRUCTED OF SIMILAR FRAMING AND SIZE OF BASE PLATFORM AND BE SUPPORTED AT EACH END, ABOVE THE RESPECTIVE BEARING WALL, WITH A 2x4 STUD PARTITION IN HEIGHT AS REQUIRED FOR A/C UNIT CLEARANCES. PROVIDE DIAGONAL BRACING BETWEEN 2x4 STUD WALLS AND PLATFORM FOR RIGIDITY.
13. INSTALL AN ADDITIONAL 4" OF CELLULOSE INSULATION OVER THE EXISTING MATERIAL THROUGHOUT THE ENTIRE ATTIC SURFACE, AND REMOVE/REPLACE WOOD WALKWAY BOARDS AS NECESSARY TO PROVIDE CONTINUOUS COVERAGE OF ALL ATTIC FLOOR SURFACE AREAS.
14. INSTALL REPRODUCTION WOOD PANEL DOOR TO MATCH EXISTING HISTORIC DOORS IN SPECIES, FINISH, PROFILES, DETAILS, CONSTRUCTION, DIMENSIONS AND WITH HARDWARE TO ALSO MATCH.
15. INSTALL SUSPENDED "FINELINE" 2'X2' ACOUSTICAL CEILING GRID WITH MINIMUM GRID LINES CENTERED IN SPACE AND WITH NON-FISSURED CEILING PADS INSTALLED.

SHEET METAL GENERAL NOTES

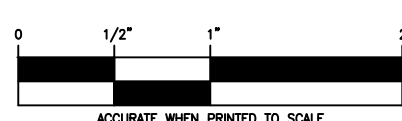
1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE HVAC SYSTEMS COMPLETE PER SPECIFICATION, SMACNA STANDARDS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, FITTINGS, SPECIAL RADIUS OR MITERED ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR STRUCTURAL CONDITIONS OR OTHER CONDITIONS.
2. CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE WORK OF ALL OTHER TRADES. ALL DUCTWORK IS TO BE ROUTED AS HIGH AS POSSIBLE. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.
3. DUCTWORK/PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL NOT BE LOCATED OVER ELECTRICAL EQUIPMENT/PANELS. PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT. DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
4. DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
5. THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL, ETC. FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
6. COORDINATE FLOOR, WALL, ROOF PENETRATIONS, LOUVER SIZES, PAD LOCATIONS ETC. WITH ARCHITECTURAL TRADES. SEAL ALL PIPING AND DUCT PENETRATIONS.
7. COORDINATE AND PROVIDE ACCESS DOORS IN HARD CEILING AREAS FOR ACCESS TO BALANCING DAMPERS, ETC.
8. FOR EQUIPMENT VALVING, COMPONENT, AND PIPING ARRANGEMENT, REFER TO PIPING DIAGRAMS AND DETAILS.
9. PAINT ALL VISIBLE INTERIOR SURFACES OF EXHAUST/RETURN GRILLES, REGISTERS AND VISIBLE ASSOCIATED DUCTWORK FLAT BLACK.
10. PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR DAMPERS, VALVES, AND CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS.
11. CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.

SHEET METAL KEYED NOTES

1. 2 1/2" FLOOR MOUNTED AIR DISTRIBUTION NOZZLE. COORDINATE NOZZLE FINISH WITH OWNER.
2. RETURN AIR IS LOCATED ON THE BOTTOM OF THE VERTICAL A/C UNIT. MOUNT EQUIPMENT STAND TO ALLOW ACCESS TO FILTER AND NOT OBSTRUCT AIRFLOW INTO THE UNIT.
3. 2 1/2" CEILING MOUNTED AIR DISTRIBUTION NOZZLE. COORDINATE NOZZLE FINISH WITH OWNER.
4. INSTALL RETURN GRILLE ABOVE WOOD BASE TRIM. ROUTE 12X10 RETURN DUCT UP TO CEILING SPACE FOR CONNECTION OF OUTSIDE AIR DUCT.

ARCHITECTURAL GENERAL NOTES

1. DO NOT CUT INTO ANY DECORATIVE CEILING CORNICES, MEDALLIONS (INDICATED BY DASHED CIRCLES), ETC.
2. INSTALL NEW AIR DIFFUSERS A MINIMUM OF 4" FROM EDGE OF DIFFUSER TO ANY ADJACENT CEILING CORNICE, MEDALLION, ETC.
3. AIR DIFFUSER SHOULD BE CUT WITH A HOLE SAW TO AVOID PLASTER PATCHING, AND ALL PLASTER SLOTS OPENED FOR DUCTWORK/PIPING INSTALLATION SHOULD BE SAWCUT, NOT BROKEN OUT.



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



**WAYNE STATE
UNIVERSITY**

Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED DATE

DESIGNER:

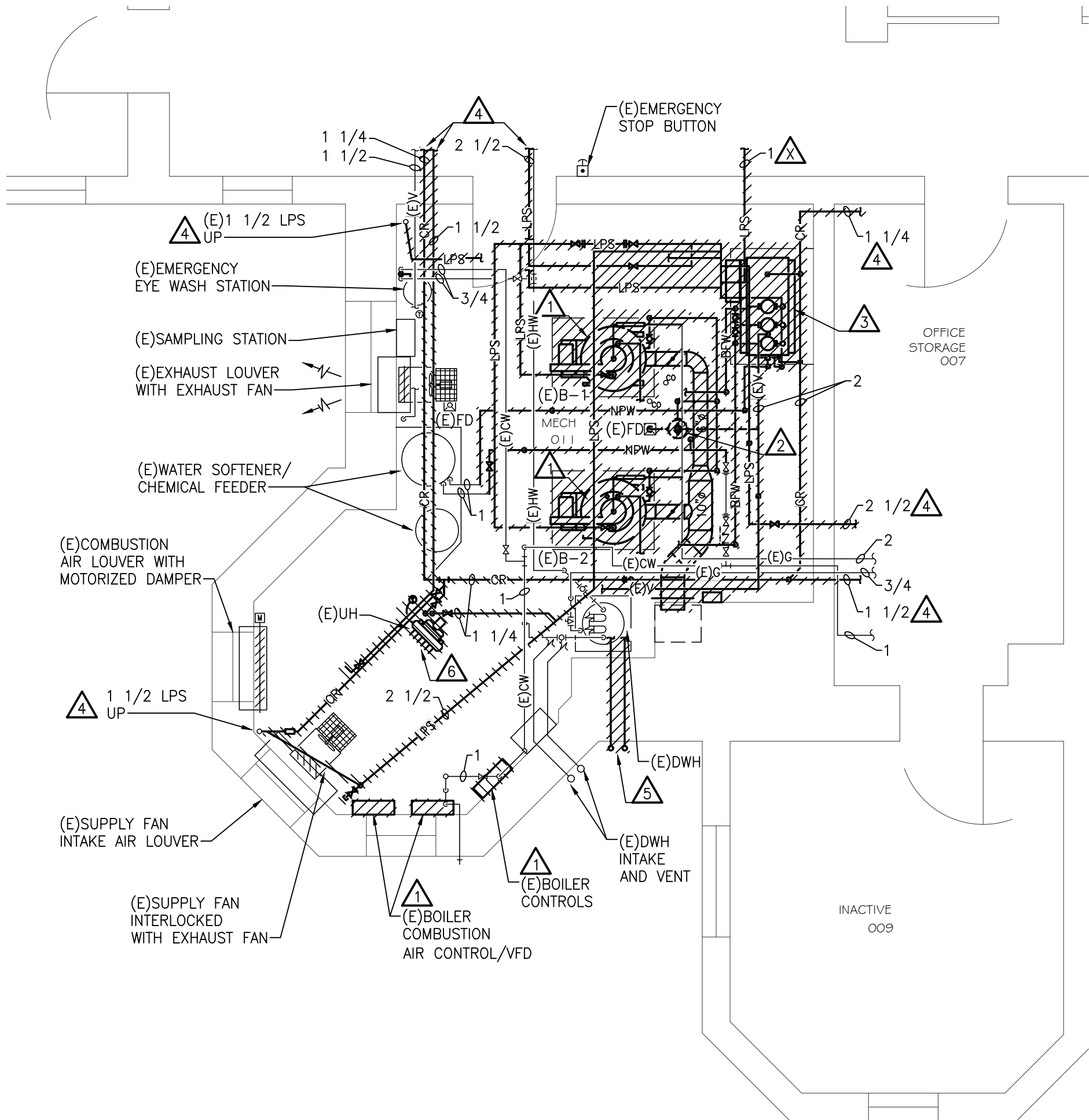
ENGINEER:

SHEET TITLE:

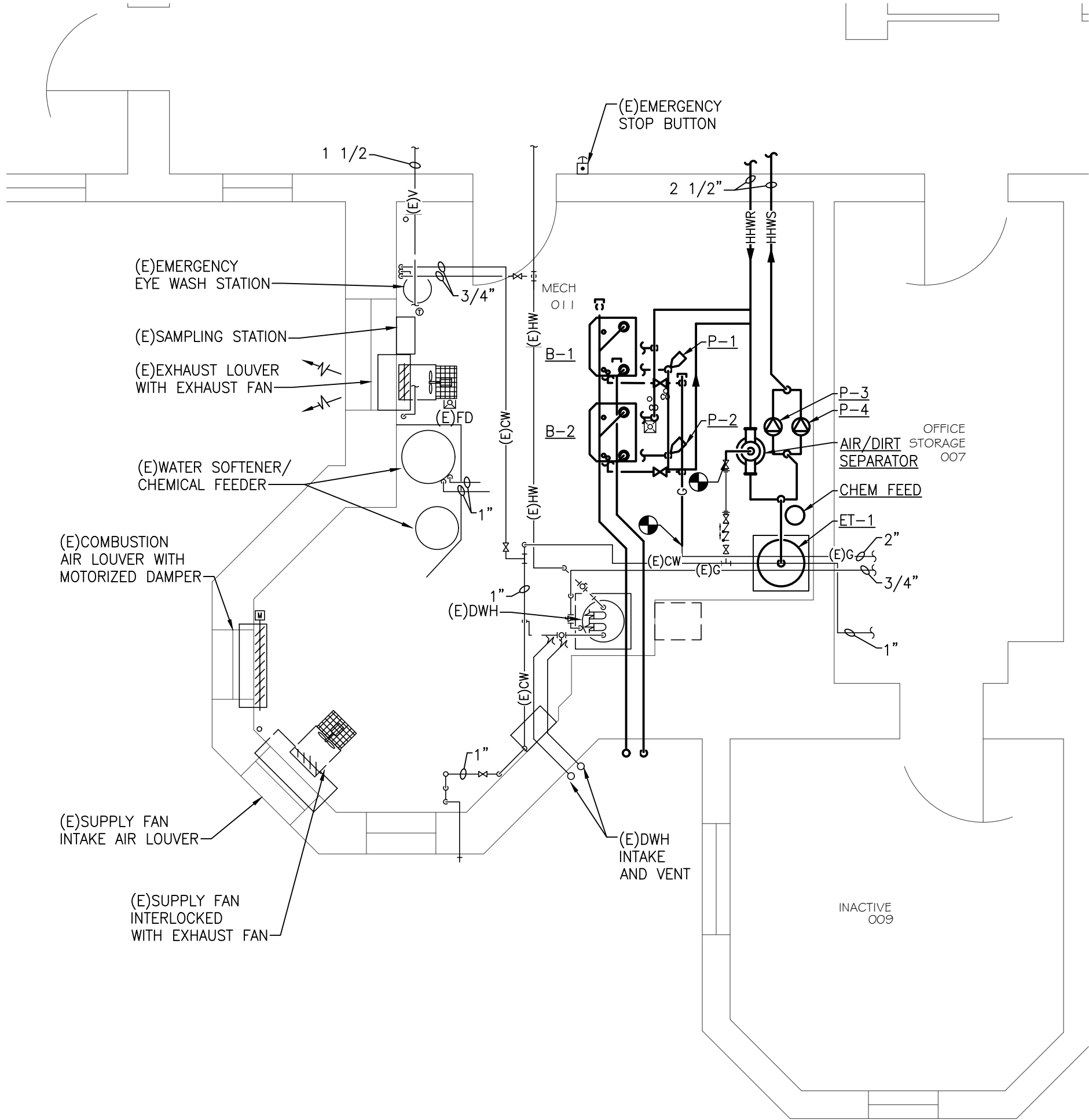
**SECOND, THIRD, AND ATTIC
ARCHITECTURAL AND
SHEET METAL PLAN**

SHEET NUMBER:

MH1.2



ENLARGED BASEMENT MECHANICAL ROOM DEMOLITION PLAN
SCALE:1/4" = 1'-0"



ENLARGED BASEMENT MECHANICAL ROOM NEW WORK PLAN
SCALE:1/4" = 1'-0"

MECHANICAL DEMOLITION NOTES

1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
2. PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY ARCHITECT OF ANY INTERFERENCES OR DISCREPANCIES.
3. VERIFY DEPTH, SIZE, LOCATIONS AND CONDITION OF EXISTING UTILITIES IN THE FIELD, INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
4. ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
5. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
6. ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETE, WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTS.
7. ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT OR PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
8. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER PROVIDED EQUIPMENT.

DEMOLITION KEYED NOTES

1. REMOVE STEAM BOILERS COMPLETE, INCLUDING ALL ASSOCIATED STEAM AND CONDENSATE PIPING, VENTING, FLUE DUCTWORK, CONTROLS, ACCESSORIES AND CONCRETE HOUSEKEEPING PAD.
2. REMOVE BLOW-DOWN SEPARATOR COMPLETE, INCLUDING ALL ASSOCIATED PIPING, VENTING, CONTROLS AND ACCESSORIES.
3. REMOVE CONDENSATE RECEIVER AND PUMP SKID COMPLETE, INCLUDING ALL ASSOCIATE PIPING, VENTING CONTROLS, ACCESSORIES AND CONCRETE HOUSEKEEPING PAD.
4. REMOVE ALL CONDENSATE RETURN, STEAM OR HEATING HOT WATER PIPING IN AND LEAVING MECHANICAL ROOM. IF LINES RUN UP THROUGH FLOOR, DISCONNECT PIPING BELOW FLOOR/CEILING LINE AND CAP. REMOVE ALL ASSOCIATED HANGERS AND SUPPORTS FROM PIPING TO BE REMOVED.
5. REMOVE BOILER SYSTEM VENT PIPING THROUGH WALL AND FROM EXTERIOR OF BUILDING.
6. REMOVE UNIT HEATER COMPLETE, INCLUDING ALL ASSOCIATED PIPING, CONTROLS AND ACCESSORIES.

HVAC GENERAL NOTES

1. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE HVAC SYSTEMS COMPLETE PER SPECIFICATION, SMACNA STANDARDS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, FITTINGS, SPECIAL RADIUS OR MITERED ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR STRUCTURAL CONDITIONS OR OTHER CONDITIONS.
2. CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE WORK OF ALL OTHER TRADES. ALL DUCTWORK IS TO BE ROUTED AS HIGH A POSSIBLE. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.
3. DUCTWORK/PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL NOT BE LOCATED OVER ELECTRICAL EQUIPMENT/PANELS. PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT. DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
4. DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
5. THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL, ETC. FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
6. COORDINATE FLOOR, WALL, ROOF PENETRATIONS, LOUVER SIZES, PAD LOCATIONS ETC. WITH ARCHITECTURAL TRADES. SEAL ALL PIPING AND DUCT PENETRATIONS.
7. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.
8. COORDINATE AND PROVIDE ACCESS DOORS IN HARD CEILING AREAS FOR ACCESS TO BALANCING DAMPERS, ETC. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
9. FOR EQUIPMENT VALVING, COMPONENT, AND PIPING ARRANGEMENT, REFER TO PIPING DIAGRAMS AND DETAILS.
10. PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR DAMPERS, VALVES, AND CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS. COORDINATE LOCATIONS WITH ARCHITECT. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES.
11. CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



**WAYNE STATE
UNIVERSITY**

Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED

DATE

DESIGNER:

RRS

ENGINEER:

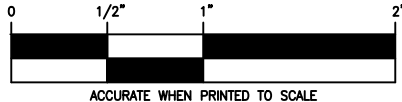
RRS

SHEET TITLE:

**ENLARGED BASEMENT
MECHANICAL ROOM
DEMOLITION AND NEW
WORK PLANS**

SHEET NUMBER:

M4.0



CONDENSING UNIT SCHEDULE														
UNIT ID	UNIT SERVED	NOMINAL TONNAGE	MINIMUM SEER	DESIGN AMBIENT (°F)	NO. OF FANS	ELECTRICAL				DISCONNECT			MANUFACTURER/ MODEL NO.	REMARKS
						MOCPP	MCA	VOLTS	PHASE	FURN. BY	INST. BY	TYPE		
CU-1	AC-1	1.5	14	95	1	25	17	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-2	AC-2	3	14	95	1	40	23.4	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-3	AC-3	4.5	14	95	1	40	24.2	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-4	AC-4	2	14	95	1	25	17	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-5	AC-5	2	14	95	1	25	17	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-6	AC-6	2	14	95	1	25	17	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-7	AC-7	3	14	95	1	40	23.4	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-8	AC-8	2	14	95	1	25	17	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-9	AC-9	3	14	95	1	40	23.4	208	1	E	E	SWITCH	LENNOX ML14XC1	
CU-10	AC-10	4	14	95	1	40	24.2	208	1	E	E	SWITCH	LENNOX ML14XC1	

- NOTES:
1. PROVIDE OUTDOOR UNITS WITH EQUIPMENT PADS.
 2. PROVIDE UNITS ON BALCONY WITH ELEVATED EQUIPMENT SUPPORTS AND VIBRATION ISOLATION.

GRILLE, REGISTER AND DIFFUSER SCHEDULE								
UNIT ID	FACE SIZE	DAYLIGHT OPENING	MOUNTING	ACCESSORY	FINISH	MATERIAL	PRICE/ MODEL NO.	REMARKS
R-1	24x12	22.25x10.25	FLOOR	-	WHITE	STEEL	LG250	
R-1A	24x12	22.25x10.25	CEILING	-	WHITE	STEEL	LG250	
R-1B	24x12	22.25x10.25	WALL	-	WHITE	STEEL	LG250	
R-2	29x14	26.75x12.5	FLOOR	-	WHITE	STEEL	LG250	
R-2A	29x14	26.75x12.5	CEILING	-	WHITE	STEEL	LG250	

BOILER SCHEDULE																			
UNIT ID	FUEL TYPE	GAS PRESS MIN - MAX (IN WG)	INPUT (MBH)	OUTPUT (MBH)	TURNDOWN RATIO	PRESSURE RELIEF VALVE RATING (PSIG)	FLUID (WATER OR GLYCOL)				ELECTRICAL				DISCONNECT			MANUFACTURER/ MODEL NO.	REMARKS
							FLOW (GPM)	EWT (°F)	LWT (°F)	WPD (FT HD)	MOCP	MCA	FLA	VOLTS	PHASE	FURN. BY	INST. BY		
B-1	NAT GAS	4-10.5	399	380	10:1	55	29	125	150	5.7	15	7	12	120	1	E	E	SWITCH	NTI TRINITY TR399
B-2	NAT GAS	4-10.5	399	380	10:1	55	29	125	150	5.7	15	7	12	120	1	E	E	SWITCH	NTI TRINITY TR399

- NOTES:
1. PROVIDE FLOOR STAND FOR EACH BOILER AND ATTACHMENT TWINING KIT.
 2. PROVIDE EACH BOILER WITH CONDENSATE NEUTRALIZATION KIT.

ABOVEGROUND HVAC PIPING INSULATION SCHEDULE																								
		MATERIAL & THICKNESS (IN)										JACKET												
		FIBERGLASS	CELLULAR GLASS	MINERAL WOOL	PHENOLIC	POLYISOCYANURATE CELLULAR PLASTIC	CALCIUM SILICATE	FLEXIBLE ELASTOMERIC CELLULAR INSULATION (FECI)	PVC	ALUMINUM	TYPE 304 STAINLESS STEEL	SELF-ADHESIV (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES									
INDOOR PIPE SYSTEM AND SIZE (INCHES)																								
HEATING HOT WATER (UP TO 200°F)																								
2 AND SMALLER		1							X	X														A
2 1/2 AND LARGER		1.5							X	X														A
REFRIGERANT SUCTION AND HOT GAS (RIGID COPPER)																								
ALL SIZES		1							1	X	X													
REFRIGERANT SUCTION AND HOT GAS (SOFT COPPER)																								
ALL SIZES									1	X	X													
OUTDOOR, ABOVEGROUND PIPE SYSTEM AND SIZE (INCHES)																								
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)																								
ALL SIZES		1							1		X		X											B
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)																								
ALL SIZES									1															B

- GENERAL NOTES:
1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
 2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.

- KEYED NOTES
- A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.
- B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.

MODULAR HIGH STATIC AIR HANDLING UNIT SCHEDULE																															
UNIT ID	ASSOCIATED OUTDOOR UNIT	AIR FLOW (CFM)	SUPPLY FAN			DX COOLING COIL						HEATING COIL								ELECTRICAL					DISCONNECT			MANUFACTURER/ MODEL	REMARKS		
			MAX ESP (IN WG)	DRIVE TYPE	HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	AIR				REFRIGERANT TYPE	MIN. TOTAL CAPACITY (MBH)	AIR			WATER					MOCP	MCA	FLA	VOLTS	PHASE	FURN. BY			INST. BY	TYPE
								EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)			EAT (°F)	LAT (°F)	APD (IN WG)	FLOW (GPM)	EWT (°F)	LWT (°F)	MAX WPD (FT HD)	CONTROL VALVE										
AC-1	CU-1	450	1.3	ECM	1/3	18	15	80	67	55	54.8	R-410A	19.5	50	90	0.10	1.7	150	127	2.0	3-WAY	15	7.0	5.6	120	1	E	E	SWITCH	M1218	
AC-2	CU-2	900	1.3	ECM	1/3	42	34	80	67	55	54.8	R-410A	39.1	50	90	0.11	3.4	150	127	2.0	2-WAY	20	12.8	10.2	120	1	E	E	SWITCH	M3642	
AC-3	CU-3	1350	1.3	ECM	1/3	48	38	80	67	55	54.8	R-410A	58.6	50	90	0.20	5.1	150	127	2.0	3-WAY	20	12.8	10.2	120	1	E	E	SWITCH	M4860	
AC-4	CU-4	600	1.3	ECM	1/3	30	24	80	67	55	54.8	R-410A	26.0	50	90	0.12	2.3	150	127	2.0	2-WAY	15	7.0	5.6	120	1	E	E	SWITCH	M2430	
AC-5	CU-5	600	1.3	ECM	1/3	30	24	80	67	55	54.8	R-410A	26.0	50	90	0.12	2.3	150	127	2.0	2-WAY	15	7.0	5.6	120	1	E	E	SWITCH	V2430	VERTICAL CONFIGURATION
AC-6	CU-6	600	1.3	ECM	1/3	30	24	80	67	55	54.8	R-410A	26.0	50	90	0.12	2.3	150	127	2.0	2-WAY	15	7.0	5.6	120	1	E	E	SWITCH	V2430	VERTICAL CONFIGURATION PROVIDE CONDENSATE DRAIN PUMP
AC-7	CU-7	900	1.3	ECM	1/3	42	34	80	67	55	54.8	R-410A	39.1	50	90	0.11	3.4	150	127	2.0	3-WAY	20	12.8	10.5	120	1	E	E	SWITCH	V3642	VERTICAL CONFIGURATION PROVIDE CONDENSATE DRAIN PUMP
AC-8	CU-8	600	1.3	ECM	1/3	30	24	80	67	55	54.8	R-410A	26.0	50	90	0.12	2.3	150	127	2.0	2-WAY	15	7.0	5.6	120	1	E	E	SWITCH	M2430	
AC-9	CU-9	900	1.3	ECM	1/3	42	34	80	67	55	54.8	R-410A	39.1	50	90	0.11	3.4	150	127	2.0	2-WAY	20	12.8	10.2	120	1	E	E	SWITCH	M3642	
AC-10	CU-10	1200	1.3	ECM	1/3	48	38	80	67	55	54.8	R-410A	52.1	50	90	0.18	4.5	150	127	2.0	3-WAY	20	12.8	10.2	120	1	E	E	SWITCH	M4860	

- NOTES:
1. COORDINATE EXACT MODEL NUMBERS FOR EACH UNICO MODULE WITH EQUIPMENT SUPPLIER.
 2. PROVIDE EACH UNIT WITH SUPPLY AND RETURN TRANSITIONS/ADAPTERS.
 3. PROVIDE EACH UNIT WITH PROPERLY SIZED DRAIN PAN TO MEET UNIT CONFIGURATIONS.

INTAKE/RELIEF HOOD SCHEDULE												
UNIT ID	SYSTEM SERVED	AIRFLOW (CFM)	THROAT SIZE (IN)	THROAT VELOCITY (FPM)	STATIC PRESSURE DROP (IN WG)	HOOD SIZE			CURB HEIGHT (IN)	HOOD CONSTRUCTION	MANUFACTURER/ MODEL NO.	REMARKS
						WIDTH (IN)	LENGTH (IN)	HEIGHT (IN)				
IH-1	OUTSIDE AIR	1440	18x18	640	0.96	28	36	16	8	GALVANIZED	GREENHECK FGI	PROVIDE WITH INSECT AND BIRD SCREEN TYPICAL

- NOTES:
1. PROVIDE ROOF CURB FOR PITCHED ROOF. FIELD VERIFY PITCH ANGLE.

PUMP SCHEDULE																
UNIT ID	SYSTEM SERVED	TYPE	FLOW (GPM)	HEAD (FT)	ELECTRICAL				DISCONNECT			STARTER		MANUFACTURER/ MODEL NO.	REMARKS	
					BHP	HP	VOLTS	PHASE	FURN. BY	INST. BY	TYPE	TYPE	FURN. BY			INST. BY
P-1	BOILER (B-1)	IN-LINE	29	15	-	2/5	120	1	M	E		H-O-A	M	E	BELL & GOSSETT PL-100	
P-2	BOILER (B-2)	IN-LINE	29	15	-	2/5	120	1	M	E		H-O-A	M	E	BELL & GOSSETT PL-100	
P-3	HEATING HOT WATER (SYSTEM)	IN-LINE	31	25	-	1.0	120	1	M	E		H-O-A	M	E	BELL & GOSSETT E-90 1.5 AAB	PROVIDE WITH ECM MOTOR
P-4	HEATING HOT WATER (SYSTEM)	IN-LINE	31	25	-	1.0	120	1	M	E		H-O-A	M	E	BELL & GOSSETT E-90 1.5 AAB	PROVIDE WITH ECM MOTOR



Wayne State University

Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

Beecher House

5475 Woodward Ave.,
Detroit, MI 48202



BIDS 08/27/21

ISSUED	DATE
--------	------

ISSUED	DATE
--------	------

DESIGNER: _____ RRS

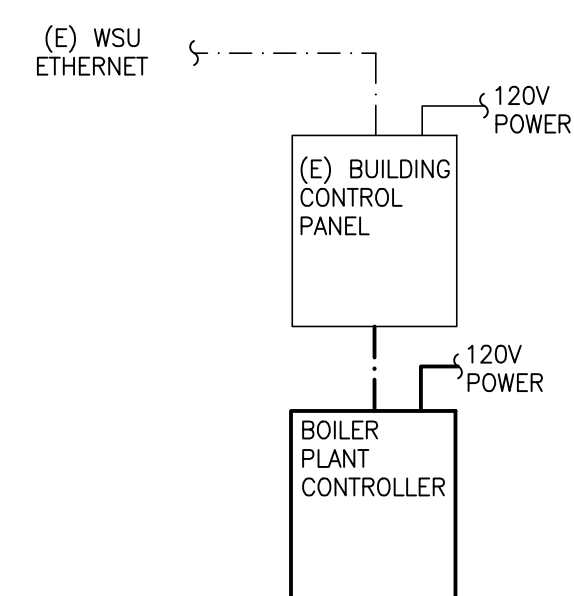
ENGINEER: _____ RRS

MECHANICAL PIPING DIAGRAMS AND CONTROLS

M7.0



NO SCALE

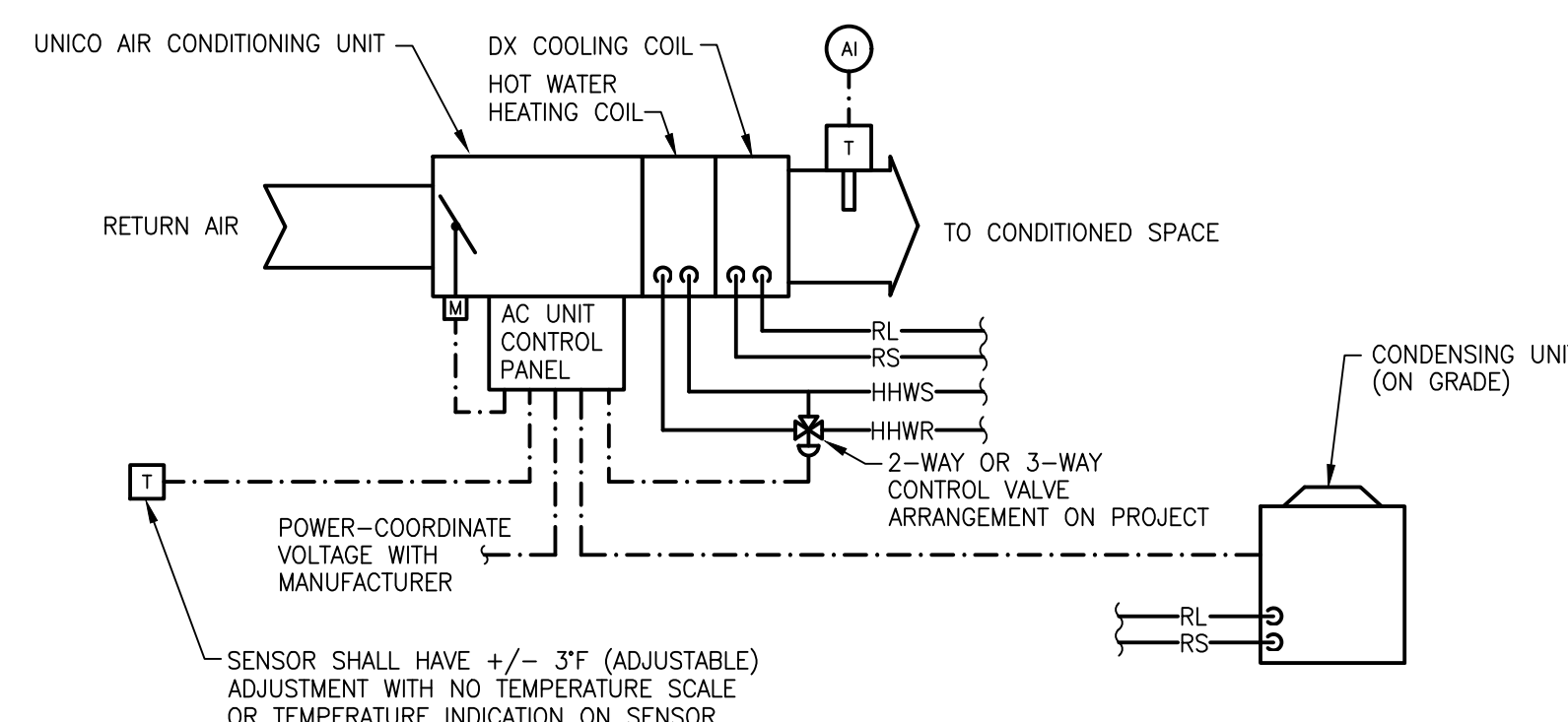


DDC SYSTEM ARCHITECTURE

NO SCALE

BUILDING AUTOMATION SYSTEM NOTES:

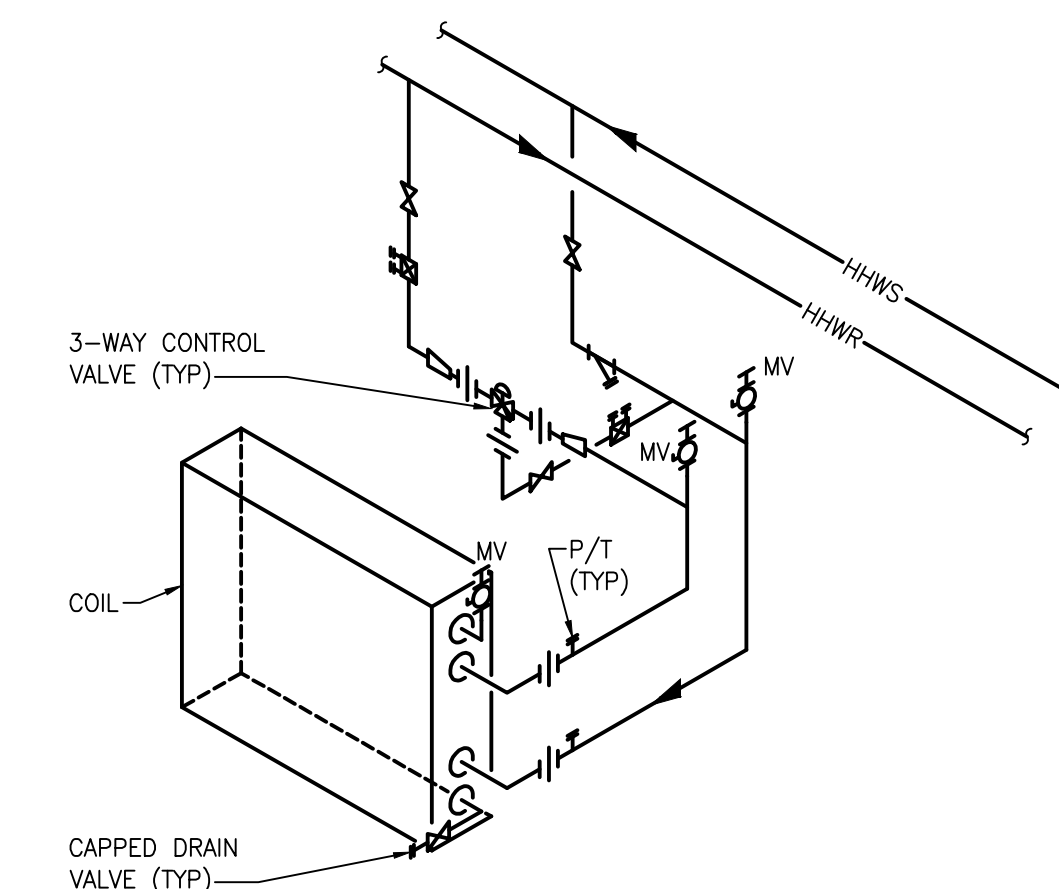
1. CONNECT NEW BOILERS TO EXISTING BUILDING CONTROL PANEL
COORDINATE WITH WSU REQUIREMENTS.



TYPICAL UNICO AIR CONDITIONING UNIT CONTROL DIAGRAM

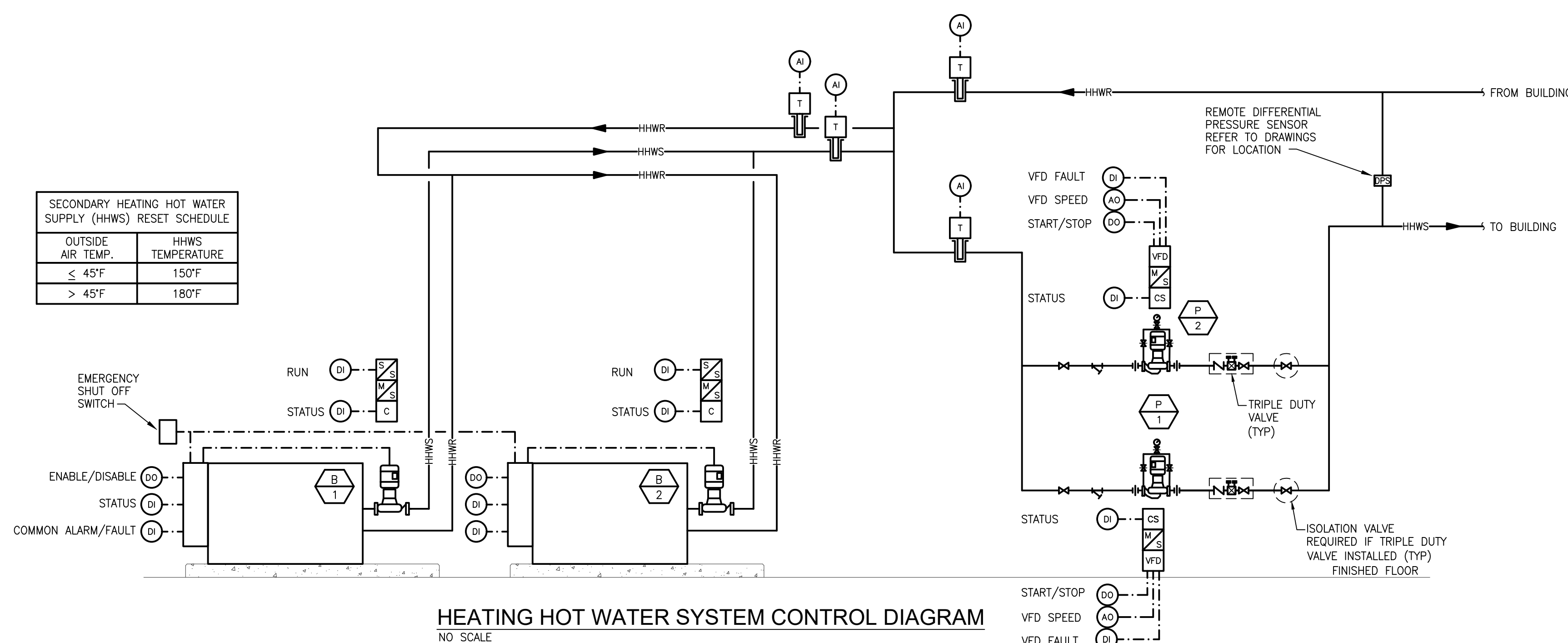
NO SCALE

NOTE:
1. REFER TO SCHEDULE TO DETERMINE EACH COIL'S CONTROL VALVE ARRANGEMENT.



HEATING COIL PIPING DIAGRAM (3-WAY VALVE)

NO SCALE



HEATING HOT WATER SYSTEM CONTROL DIAGRAM

NO SCALE

HEATING HOT WATER SYSTEM SEQUENCE OF OPERATIONS:

NOTE: ALL SETPOINTS AND TIME INTERVALS SHALL BE ADJUSTABLE BY THE SYSTEM OPERATOR.

1. WITH THE HYDRONIC HEATING SECONDARY PUMPS' HAND/AUTO/OFF SWITCH IN THE "AUTO" POSITION, THE DDC SYSTEM SHALL ENERGIZE THE LEAD PUMP. ONE OF THE TWO PUMPS SHALL BE DESIGNATED "LEAD PUMP" AND SHALL OPERATE CONTINUOUSLY. THE OTHER PUMPS SHALL SERVE AS THE "STANDBY PUMP".
2. THE DDC SYSTEM SHALL ALTERNATE PUMP OPERATION BASED ON RUN TIME HOURS OR AT THE BEGINNING OF EACH MONTH.
3. EACH PUMP WILL PROVE OPERATION TO THE DDC SYSTEM WITH ITS CURRENT SWITCH. IF A PUMP FAILS, AN ALARM WILL BE SENT TO THE DDC SYSTEM AND THE STANDBY PUMP WILL BE ACTIVATED.
4. THE BOILER CONTROL PANEL SHALL ALTERNATE BOILER OPERATION BASED ON RUN TIME HOURS. IF A BOILER FAILS, AN ALARM WILL BE SENT TO THE DDC SYSTEM AND THE STANDBY BOILER WILL BE ACTIVATED.
5. UPON A CALL FOR HEATING, THE BOILER PRIMARY PUMP SHALL BE ENERGIZED AND RUN WHENEVER THE BOILER IS FIRING. AFTER FLOW IS PROVEN BY THE PUMPS CURRENT SWITCH, THE BOILER SHALL MODULATE FIRING RATE TO MAINTAIN THE SYSTEM SUPPLY WATER TEMPERATURE.
6. IF THE PRIMARY BOILER CANNOT MAINTAIN SYSTEM SETPOINT, THE SECOND BOILER SHALL BE ENERGIZED.
7. WHEN THE EMERGENCY SHUT OFF SWITCH IS ACTIVATED, THE BOILERS AND PUMPS SHALL IMMEDIATELY BE DE-ENERGIZED.
8. THE BUILDING DDC SYSTEM SHALL MONITOR AND GRAPHICALLY SHOW THE FOLLOWING POINTS: ALL TEMPERATURE POINTS INDICATED, BOILER STATUS, BOILER ALARM, PUMP ALARM, AND OUTSIDE AIR TEMPERATURE.

SECTION 02_4119 – SELECTIVE STRUCTURE DEMOLITION

- PART 1 GENERAL**
- 1.01 SECTION INCLUDES
- A. Selective structure demolition work includes, but is not limited to, the following:
1. Demolition and removal of selected portions of the existing building.
 2. Patching and repairs.

- 1.02 REFERENCES
- A. NFPA 241 – Standard for Safeguarding Construction, Alteration, and Demolition Operations 2019.

- 1.03 SUBMITTALS
- A. Submit schedule indicating proposed methods and sequence of operations for selective structure demolition work to Owner's Representative for review prior to commencement of work.
- B. Proposed dust-control and noise-control measures.
- C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction that might be misconstrued as damage caused by selective structure demolition, operations.

- 1.04 QUALITY ASSURANCE
- A. Contractor Qualifications: Engage only subcontractors who can demonstrate not less than five years successful experience in work of similar character.
- B. Standards: Comply with NFPA 241.

- 1.05 PROJECT CONDITIONS
- A. Occupancy: The Owner will be continuously occupying spaces immediately adjacent to areas of selective structure demolition. Conduct selective structure demolition work in such manner that will minimize need for disruption of normal operations.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items to be demolished.
- C. Asbestos is NOT expected to be encountered in the course of this Contract. If any materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Architect and the Owner.

1. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
2. Protect floors with dustable coverings when necessary.
3. Construct temporary dust barriers and partitions where needed to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors.

- E. Damages: Promptly repair damages caused to adjacent facilities by structure demolition work at no cost to Owner.

- 1.06 SCHEDULING
- A. Arrange selective structure demolition operations so as not to interfere with Owner's existing on-site operations.

- 2.01 MATERIALS
- A. General: Except as otherwise indicated or approved by Architect, provide materials for selective structure demolition which will result in equal-or-better work than the work being cut-out-and-patched in terms of performance characteristics, including visual effect where applicable. Comply with the requirements and use materials identical to or superior to materials where feasible and where recognized that satisfactory results can be produced thereby.

- PART 3 EXECUTION**
- 1.01 EXAMINATION
- A. Prior to commencement of selective structure demolition work, inspect areas in which work will be performed.
- B. When unanticipated mechanical, electrical, and structural elements are encountered, and conflict with intended design, investigate and measure the nature and extent of conflict. Promptly submit a report in writing to the Architect and the Owner.
- C. Survey condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective structure demolition operations.

- 1.02 UTILITY SERVICES
- A. Maintain existing utilities indicated to remain in service and protect against damage during selective structure demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Owner or authorities having jurisdiction.

- 1.03 PREPARATION
- A. Conduct selective structure demolition operations to prevent injury to people and damage to existing buildings and facilities to remain. Ensure safe passage of people around selective structure demolition area.
- B. Erect and maintain dustproof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

- 1.04 DEMOLITION
- A. Demolish and remove existing construction only to extent required by new construction and indicated.
- B. Perform selective structure demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
- C. Employ only skilled tradesmen to perform selective structure demolition.

- D. Cut by work by methods least likely to damage work to be retained and work adjoining.
- E. Maintain positive air-pressure devices during flame-cutting operations.
- F. In general, where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools.
- G. Maintain positive air-pressure devices during flame-cutting operations.
- H. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and G. Demolish concrete and masonry in small sections. Cut concrete and masonry at joints with construction to remain, using power driven masonry saw or hand tools; do not use power driven impact tools.

- 1.05 PATCHING AND REPAIRS
- A. Promptly patch and repair damaged surfaces caused to adjacent construction by selective structure demolition operations.
- B. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
- C. Restore exposed finishes of patched area; and where necessary, extend finish restoration onto retained work adjoining, in manner to eliminate evidence of patching.
- D. Closely match finish and texture of existing adjacent surfaces.

- E. Where selective structure demolition terminates at a surface, finish, or substrate to remain, completely remove all traces of material selectively demolished, including mortar beds. Provide smooth, even substrate transition.
- F. Where patching smooth painted surfaces, extend final coat of paint over entire unbroken surfaces, after patched and repaired area has received primer and second coat.

- 1.06 DISPOSAL OF DEMOLISHED MATERIALS
- A. Remove debris, rubbish and other materials resulting from demolition operations from building site. Do not allow demolished materials to accumulate on-site. Transport and dispose of materials off-site in legal manner in an EPA-approved landfill.
1. If hazardous materials are encountered during demolition operations, immediately stop work in the area affected and the condition to the Owner and Architect for further action. If the Owner determines the hazardous materials are asbestos or PCB's, do no further work in the area until the materials are either removed or rendered harmless, and the area has been certified safe by appropriate authorities.

- 1.07 CLEAN-UP AND REPAIR
- A. Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protection and interior area ready for construction.
- B. Repair demolition work in excess of that required. Return surfaces to remain to condition existing prior to commencement of selective structure demolition work. Repair adjacent construction or surfaces soiled or damaged by selective structure demolition work.

- 1.08 FINISHES
- A. Clean adjacent portion of the structure and improvements of dust, dirt and debris caused by demolition operations, including dust, dirt and debris caused by demolition operations. Return adjacent areas to conditions existing prior to start of work.

- 1.09 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- 2.01 FRAMING INSTALLATION
- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed member.
- B. Install structural members full length without splices unless otherwise specifically detailed.
- C. Install with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFO) Wood Frame Construction Manual.

- 1.03 BLOCKING, NAILERS, AND SUPPORTS
- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim. Form shapes shown and cut as required for true line and level of attached work.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

- 1.04 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- 2.01 FRAMING INSTALLATION
- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed member.
- B. Install structural members full length without splices unless otherwise specifically detailed.
- C. Install with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFO) Wood Frame Construction Manual.

- 1.03 BLOCKING, NAILERS, AND SUPPORTS
- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim. Form shapes shown and cut as required for true line and level of attached work.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

- 1.04 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- 2.01 FRAMING INSTALLATION
- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed member.
- B. Install structural members full length without splices unless otherwise specifically detailed.
- C. Install with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFO) Wood Frame Construction Manual.

SECTION 06_2013 – HISTORIC STILE & RAIL DOOR RECONSTRUCTION

- PART 1 GENERAL**
- 1.01 SECTION INCLUDES
- A. Reconstruction of historic stile & rail paneled closet door in room #202.

- 1.02 SUBMITTALS
- A. Product Data: Submit manufacturer's wood door product data.
- B. Shop Drawings: Submit shop drawings showing door elevation, all dimensions of panels, stiles, rails, door construction details, etc. Also, submit manufacturer's cuts on proposed matching historic wood species including finishes, posts, nail, stile, etc.
- C. Samples: Submit two corner samples of mockup panel/stile/rail section of historic door design with finish/species/pinfinery to match existing doors, 12" square samples.

- 1.03 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in fabricating the products specified in this section with minimum 10 years of documented experience, with sufficient production capacity to produce required units without causing delay in the Work.
- B. Quality Standards: Unless otherwise indicated, comply with Architectural Woodwork Standards for grades of woodwork, construction, finishes and other requirements.
- C. Assume undivided responsibility for architectural woodwork including fabrication, finishing and installation.
- D. Single Source responsibility: Obtain primary repair materials from a single manufacturer. Provide secondary materials as recommended by the manufacturer of the primary materials.

- 1.04 DELIVERY, STORAGE, AND HANDLING
- A. Protect materials from weather and contact with damp or wet surfaces.
- B. Discard materials and remove from job site materials damaged in handling or storage and materials that have been subjected to conditions contrary to the manufacturer's recommendations or product which has exceeded it's shelf life.
- C. Perform work only when existing and forecasted weather conditions permit work to be performed and of least one coat of specified finish can be applied in accordance with finish manufacturer's recommendations.
- D. Do not install carpentry materials that are wet, moisture or mold damaged.

- 1.05 PROJECT CONDITIONS
- A. Field Measurements: Check actual dimensions of existing historic door frame by accurate field measurements before manufacturing door; show recorded measurements on final shop drawings. Coordinate manufacturer's schedule with construction progress to avoid delay in Work.

- 2.01 MANUFACTURERS
- A. Blackberry Window and Door Systems, Inc.; Kalamazoo, MI (800) 732-9400
- B. Century Restorations; South Haven, MI (616) 443-0169
- C. Depe Enterprises, LLC; Marshall, MI (269) 781-8128
- D. Full Spectrum Stained Glass; Colon, MI (269) 432-2610
- E. H & R Window Repair Company; Hazel Park, MI (248) 544-8282
- F. Looking Glass Works; Lansing, MI (517) 628-0006
- G. Kelly Windows; Detroit, MI (313) 861-6910
- H. Midway Craftsmen, LLC; Grand Rapids, MI (616) 245-5970
- I. R & A Raven Company; Grand Rapids, MI (616) 245-5684
- J. Seaverty Restorations; Detroit, MI (313) 622-5582
- K. Wood Window Repair; Ann Arbor, MI (734) 604-4778

- 2.02 HISTORIC STILE AND RAIL DOOR RECONSTRUCTION
- A. Quality Standard: Custom Grade, Heavy Duty Construction, in accordance with AW/ANMA/CW (AWS) or ANMA/CW (NAAMS), unless noted otherwise.
- B. Construction, General: Comply with the following requirements:
1. Grade of Doors for Transparent Finish: Premium.
 2. Material Species and Cut for Transparent Finish: Match existing historic species, plain sanded/sliced.
 3. Stile and Rail Construction for Transparent Finish: Clear lumber; may be edge glued for width. Select stock for similarity of grain and color, and arrange for optimum match between adjacent pieces.
 4. Raised Panel Construction for Transparent Finish: Shaped, edge-glued, clear-lumber panel faces glued to both sides of a wood-based panel product. Select face stock for similarity of grain and color, and arrange for optimum match between adjacent pieces.

- C. Interior Doors: Comply with the following requirements:
1. Stile and Rail Widths/Molding Profiles/Raised Panel Thickness/Panel Design: Match existing historic doors.

- 2.03 FABRICATION
- A. Fabricate stile and rail wood doors in sizes indicated for Project site fitting.
- B. Factory fit doors to meet existing door frame dimensions, with the following uniform clearances and bevels, unless otherwise indicated:
1. Clearances: Provide 1/8 inch at heads, jambs. Provide 1/2 inch from bottom of door to top of decorative finish rail or coving.
 2. Factory machine doors or hardware that is not surface applied. Locate hardware to comply with DHI WDHS-3. Comply with, existing door frame dimensions, Shop Drawings, BHMA A156.15 standards, and hardware templates.

- 2.04 SHOP FINISH
- A. Transparent Finish: Shop seal faces and edges of doors for transparent finish with stain to match existing historic doors.
- B. Factory Finishes: Finish doors with the following requirements:
1. Apply with AW/ANMA/CW (AWS) Section 5, unless otherwise indicated.
 2. Preparations for Finishing: Comply with referenced quality standard for sanding, filling, and other similar preparations required for finishing.
 3. Transparent Finish: Comply with requirements indicated below for grade, finish, system, staining, and sheen, with sheen measured on 60-degree gloss meter per ASTM D523.

1. Grade: Premium
2. AWS Finish System: Catalyzed polyurethane.
3. Staining: As approved by Architect to match existing historic door finish.
4. Sheen: Satin 30 gloss units.

- PART 3 EXECUTION**
- 1.01 INSTALLATION
- A. Hardware: Match existing historic door hardware.
- B. Manufacturer's Written Instructions: Install wood doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated in 2.03. Do not trim stile and rails in excess of limits set by manufacturer. Machine doors for hardware. Seal cut surfaces after fitting and machining.
- D. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at Project site.

- 1.02 ADJUSTING
- A. Operation: Do not allow door to swing or replace doors that do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
- C. Protect doors as recommended by door manufacturer to ensure wood doors are without damage or deterioration at time of Substantial Completion.

- 1.03 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- 2.01 FRAMING INSTALLATION
- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed member.
- B. Install structural members full length without splices unless otherwise specifically detailed.
- C. Install with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFO) Wood Frame Construction Manual.

- 1.03 BLOCKING, NAILERS, AND SUPPORTS
- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim. Form shapes shown and cut as required for true line and level of attached work.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

- 1.04 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- 2.01 FRAMING INSTALLATION
- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed member.
- B. Install structural members full length without splices unless otherwise specifically detailed.
- C. Install with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFO) Wood Frame Construction Manual.

- 1.03 BLOCKING, NAILERS, AND SUPPORTS
- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim. Form shapes shown and cut as required for true line and level of attached work.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

- 1.04 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- 2.01 FRAMING INSTALLATION
- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed member.
- B. Install structural members full length without splices unless otherwise specifically detailed.
- C. Install with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFO) Wood Frame Construction Manual.

- 1.03 BLOCKING, NAILERS, AND SUPPORTS
- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim. Form shapes shown and cut as required for true line and level of attached work.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

- 1.04 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- 2.01 FRAMING INSTALLATION
- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed member.
- B. Install structural members full length without splices unless otherwise specifically detailed.
- C. Install with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFO) Wood Frame Construction Manual.

- 1.03 BLOCKING, NAILERS, AND SUPPORTS
- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim. Form shapes shown and cut as required for true line and level of attached work.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

- 1.04 SUBMITTALS
- A. Product Data: Provide data on product characteristics, performance criteria, limitations, sizes, nominal sizes as indicated on drawings, S&S.
- B. Moisture Content: MC19.
- C. Miscellaneous Finishing, Blocking, Nailers, Grounds, and Furring:
1. Lumber: S&S No. 2 or Standard Grade per WCLB or NFPA G-5 rules.
 2. Boards: Southern Pine No.2 Boards per SPB rules, or any other graded construction board per WCLB or NFPA rules.
 3. Plywood: PS-2 type, rated Structural I Plywood Sheathing, a. Bond Classification for exterior applications: Exterior b. Bond Classification for interior applications: Exposure I

- 1.03 ACCESSORIES
- A. Fasteners and Anchors: Provide fasteners of size and type indicated to comply with requirements specified.
1. Where rough carpentry is provided to weather, in ground contact or in areas of high relative humidity, provide fasteners made of Hot-dipped galvanized steel per ASTM A 153/A 153M or type 304 stainless steel.
2. Anchor bolts: Provide bolt type for anchorage to hollow masonry.

SECTION 08_8000 – GLAZING

- PART 1 GENERAL**
- 1.01 PERFORMANCE REQUIREMENTS
- A. Provide glass and glazing product, fabricated and installed to withstand normal thermal movement, wind loading, impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and drip-free, deterioration of glass and glazing materials, and other defects in the work.
- B. Glass Selection: Provide glass lites to match the thickness of existing glass lites in view of the existing door frame double hung windows. Glass thickness should be sufficient for rigid installation that has no visual distortions to reflections on the glass.

- 1.02 DEFINITIONS
- A. Manufacturer: Perfect alignment.
- 1.03 SUBMITTALS
- A. Samples: Submit 12" square sample of window glass

- 1.04 QUALITY ASSURANCE
- A. Manufacturer Qualifications: For Fabrication and Installation: Engage a fabricator/installer who shall assume undivided responsibility for all components of structural glazing work, including structural design and waterproofing integrity of the system in place.
- B. Perform Work in accordance with GANA (GMA), GANA (GMA), and IGMA TM-3000 for glazing installation methods.

- 1.05 WARRANTY
1. Warranty Period: Five (5) years after date of Substantial Completion.

- 2.01 SINGLE LITE FLOAT GLASS
- A. Manufacturing Process: Provide single lite float glass for installation in existing double hung aluminum windows.
- B. Discard materials and remove from job site materials damaged in handling or storage and materials that have been subjected to conditions contrary to the manufacturer's recommendations or product which has exceeded it's shelf life.
- C. Perform work only when existing and forecasted weather conditions permit work to be performed and of least one coat of specified finish can be applied in accordance with finish manufacturer's recommendations.
- D. Do not install carpentry materials that are wet, moisture or mold damaged.

- 1.05 PROJECT CONDITIONS
- A. Field Measurements: Check actual dimensions of existing historic door frame by accurate field measurements before manufacturing door; show recorded measurements on final shop drawings. Coordinate manufacturer's schedule with construction progress to avoid delay in Work.

- 2.01 MANUFACTURERS
- A. Blackberry Window and Door Systems, Inc.; Kalamazoo, MI (800) 732-9400
- B. Century Restorations; South Haven, MI (616) 443-0169
- C. Depe Enterprises, LLC; Marshall, MI (269) 781-8128
- D. Full Spectrum Stained Glass; Colon, MI (269) 432-2610
- E. H & R Window Repair Company; Hazel Park, MI (248) 544-8282
- F. Looking Glass Works; Lansing, MI (517) 628-0006
- G. Kelly Windows; Detroit, MI (313) 861-6910
- H. Midway Craftsmen, LLC; Grand Rapids, MI (616) 245-5970
- I. R & A Raven Company; Grand Rapids, MI (616) 245-5684
- J. Seaverty Restorations; Detroit, MI (313) 622-5582
- K. Wood Window Repair; Ann Arbor, MI (734) 604-4778

- 2.02 HISTORIC STILE AND RAIL DOOR RECONSTRUCTION
- A. Quality Standard: Custom Grade, Heavy Duty Construction, in accordance with AW/ANMA/CW (AWS) or ANMA/CW (NAAMS), unless noted otherwise.
- B. Construction, General: Comply with the following requirements:
1. Grade of Doors for Transparent Finish: Premium.
 2. Material Species and Cut for Transparent Finish: Match existing historic species, plain sanded/sliced.
 3. Stile and Rail Construction for Transparent Finish: Clear lumber; may be edge glued for width. Select stock for similarity of grain and color, and arrange for optimum match between adjacent pieces.
 4. Raised Panel Construction for Transparent Finish: Shaped, edge-glued, clear-lumber panel faces glued to both sides of a wood-based panel product. Select face stock for similarity of grain and color, and arrange for optimum match between adjacent pieces.

- C. Interior Doors: Comply with the following requirements:
1. Stile and Rail Widths/Molding Profiles/Raised Panel Thickness/Panel Design: Match existing historic doors.

- 2.03 FABRICATION
- A. Fabricate stile and rail wood doors in sizes indicated for Project site fitting.
- B. Factory fit doors to meet existing door frame dimensions, with the following uniform clearances and bevels, unless otherwise indicated:
1. Clearances: Provide 1/8 inch at heads, jambs. Provide 1/2 inch from bottom of door to top of decorative finish rail or coving.
 2. Factory machine doors or hardware that is not surface applied. Locate hardware to comply with DHI WDHS-3. Comply with, existing door frame dimensions, Shop Drawings, BHMA A156.15 standards, and hardware templates.

- 2.04 SHOP FINISH
- A. Transparent Finish: Shop seal faces and edges of doors for transparent finish with stain to match existing historic doors.
- B. Factory Finishes: Finish doors with the following requirements:
1. Apply with AW/ANMA/CW (AWS) Section 5, unless otherwise indicated.
 2. Preparations for Finishing: Comply with referenced quality standard for sanding, filling, and other similar preparations required for finishing.
 3. Transparent Finish: Comply with requirements indicated below for grade, finish, system, staining, and sheen, with sheen measured on 60-degree gloss meter per ASTM D523.

1. Grade: Premium
2. AWS Finish System: Catalyzed polyurethane.
3. Staining: As approved by Architect to match existing historic door finish.
4. Sheen: Satin 30 gloss units.

- PART 3 EXECUTION**
- 1.01 INSTALLATION
- A. Hardware: Match existing historic door hardware.
- B. Manufacturer's Written Instructions: Install wood doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated in 2.03. Do not trim stile and rails in excess of limits set by manufacturer. Machine doors for hardware. Seal cut surfaces after fitting and machining.
- D. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at Project site.

- 1.02 ADJUSTING
- A. Operation: Do not allow door to swing or replace doors that do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
- C. Protect doors as recommended by door manufacturer to ensure wood doors are without damage or deterioration at time of Substantial Completion.

- 1.03 SUBMITTALS
- A. Product Data: Provide manufacturer's product technical data and installation instructions for each acoustical ceiling panel, suspension system and trim products required.
- B. Samples for Verification Purposes: Submit samples of each type of exposed finish required, of size indicated below and of same thickness and material indicated for final installation. Provide samples of each type of finish, color and texture variations, include sample sets showing full range of variations expected.
1. 6 inch by 8 inch samples of each acoustical panel and color required.
 2. Set of 12 inch long samples of exposed suspension system members, including moldings for each color and each type of finish.

- C. Ceiling Layouts – Submit reflected ceiling plan layouts of grid pattern for each area shown on plans.
- 1.04 QUALITY ASSURANCE
- A. Installer Qualifications: Not less than 3 years of successful experience in installation of acoustical ceilings similar to this project and is acceptable to the manufacturer of acoustical units.
- B. Single-Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties and to provide products of consistent quality in appearance and physical properties and to provide products of consistent quality in appearance and physical properties.
- C. Single-Source Responsibility for Suspension System: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties and to provide products of consistent quality in appearance and physical properties.
- D. Fire Performance Characteristics: Provide acoustical ceilings identical to those tested for the following fire performance characteristics, per ASTM test method indicated, by U.L. ORP or other listing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.

1. Surface Burning Characteristics: As follows, tested per ASTM E84, and complying with Class A product requirements.
2. Smoke Developed: 25 or less.
3. Flame Spread: 0 or less.
4. Thermal Conductivity: 0.27 BTU in/hr-sq ft (ft deg F).
5. Installed Thickness: As indicated on Drawings.

- PART 3 EXECUTION**
- 1.01 INSTALLATION – GENERAL
- A. Use common wire nails, unless otherwise indicated. Make tight connections between members. Install fasteners without splitting wood; predr

COPPER FEEDER SCHEDULE											
FEEDER (AMPS)	COND. SIZE	2 WIRE WITH GROUND	FEEDER (AMPS)	COND. SIZE	3 WIRE WITH GROUND	FEEDER (AMPS)	COND. SIZE	4 WIRE WITH GROUND			
<15S>	12	2#12, 1#12 GND IN 3/4°C	<15>	12	3#12, 1#12 GND IN 3/4°C	<15N>	12	4#12, 1#12 GND IN 3/4°C			
<20S>	12	2#12, 1#12 GND IN 3/4°C	<20>	12	3#12, 1#12 GND IN 3/4°C	<20N>	12	4#12, 1#12 GND IN 3/4°C			
<25S>	10	2#10, 1#10 GND IN 3/4°C	<25>	10	3#10, 1#10 GND IN 3/4°C	<25N>	10	4#10, 1#10 GND IN 3/4°C			
<30S>	10	2#10, 1#10 GND IN 3/4°C	<30>	10	3#10, 1#10 GND IN 3/4°C	<30N>	10	4#10, 1#10 GND IN 3/4°C			
<35S>	8	2#8, 1#10 GND IN 3/4°C	<35>	8	3#8, 1#10 GND IN 3/4°C	<35N>	8	4#8, 1#10 GND IN 3/4°C			
<40S>	8	2#8, 1#10 GND IN 3/4°C	<40>	8	3#8, 1#10 GND IN 3/4°C	<40N>	8	4#8, 1#10 GND IN 3/4°C			
<45S>	6	2#6, 1#10 GND IN 3/4°C	<45>	6	3#6, 1#10 GND IN 3/4°C	<45N>	6	4#6, 1#10 GND IN 1°C			
<50S>	6	2#6, 1#10 GND IN 3/4°C	<50>	6	3#6, 1#10 GND IN 3/4°C	<50N>	6	4#6, 1#10 GND IN 1°C			
<60S>	4	2#4, 1#10 GND IN 1°C	<60>	4	3#4, 1#10 GND IN 1°C	<60N>	4	4#4, 1#10 GND IN 1 1/4°C			
<70S>	4	2#4, 1#8 GND IN 1°C	<70>	4	3#4, 1#8 GND IN 1°C	<70N>	4	4#4, 1#8 GND IN 1 1/4°C			
<80S>	3	2#3, 1#8 GND IN 1°C	<80>	3	3#3, 1#8 GND IN 1°C	<80N>	3	4#3, 1#8 GND IN 1 1/4°C			
<90S>	2	2#2, 1#8 GND IN 1°C	<90>	2	3#2, 1#8 GND IN 1 1/4°C	<90N>	2	4#2, 1#8 GND IN 1 1/2°C			
<100S>	1	2#1, 1#8 GND IN 1 1/4°C	<100>	1	3#1, 1#8 GND IN 1 1/4°C	<100N>	1	4#1, 1#8 GND IN 1 1/2°C			
			<110>	2	3#2, 1#6 IN 1 1/4°C	<110N>	2	4#2, 1#6 GND IN 1 1/4°C			
			<125>	1	3#1, 1#6 GND IN 1 1/4°C	<125N>	1	4#1, 1#6 GND IN 1 1/2°C			
			<150>	1/0	3#1/0, 1#6 GND IN 1 1/2°C	<150N>	1/0	4#1/0, 1#6 GND IN 2°C			
			<175>	2/0	3#2/0, 1#6 GND IN 1 1/2°C	<175N>	2/0	4#2/0, 1#6 GND IN 2°C			
			<200>	3/0	3#3/0, 1#6 GND IN 2°C	<200N>	3/0	4#3/0, 1#6 GND IN 2°C			
			<225>	4/0	3#4/0, 1#4 GND IN 2°C	<225N>	4/0	4#4/0, 1#4 GND IN 2 1/2°C			
			<250>	250	3–250 KCMIL, 1#4 GND IN 2°C	<250N>	250	4–250 KCMIL, 1#4 GND IN 2 1/2°C			
			<300>	350	3–350 KCMIL, 1#4 GND IN 2°C	<300N>	350	4–350 KCMIL, 1#4 GND IN 3°C			
			<350>	500	3–500 KCMIL, 1#3 GND IN 3°C	<350N>	500	4–500 KCMIL, 1#3 GND IN 3 1/2°C			
			<400>	600	3–600 KCMIL, 1#3 GND IN 3 1/2°C	<400N>	600	4–600 KCMIL, 1#3 GND IN 4°C			
			<450>	2–4/0	(2) 3#4/0, 1#2 GND IN 2°C	<450N>	2–4/0	(2) 4#4/0, 1#2 GND IN 2 1/2°C			
			<500>	2–250	(2) 3–250 KCMIL, 1#2 GND IN 2 1/2°C	<500N>	2–250	(2) 4–250 KCMIL, 1#1 GND IN 3°C			
			<600>	2–350	(2) 3–350 KCMIL, 1#1 GND IN 2 1/2°C	<600N>	2–350	(2) 4–350 KCMIL, 1#1 GND IN 3°C			
			<700>	2–500	(2) 3–500 KCMIL, 1#1/0 GND IN 3°C	<700N>	2–500	(2) 4–500 KCMIL, 1#1/0 GND IN 3 1/2°C			
			<800>	2–600	(2) 3–600 KCMIL, 1#1/0 GND IN 3 1/2°C	<800N>	2–600	(2) 4–600 KCMIL, 1#1/0 GND IN 4°C			
			<1000>	3–500	(3) 3–500 KCMIL, 1#2/0 GND IN 3°C	<1000N>	3–500	(3) 4–500 KCMIL, 1#2/0 GND IN 3 1/2°C			
			<1200>	3–600	(3) 3–600 KCMIL, 1#3/0 GND IN 4°C	<1200N>	3–600	(3) 4–600 KCMIL, 1#3/0 GND IN 4°C			
			<1600>	4–600	(4) 3–600 KCMIL, 1#4/0 GND IN 4°C	<1600N>	4–600	(4) 4–600 KCMIL, 1#4/0 GND IN 4°C			
			<2000>	5–600	(5) 3–600 KCMIL, 1–250 KCMIL GND IN 4°C	<2000N>	5–600	(5) 4–600 KCMIL, 1–250 KCMIL GND IN 4°C			
			<2500>	7–500	(7) 3–500 KCMIL, 1–350 KCMIL GND IN 3 1/2°C	<2500N>	7–500	(7) 4–500 KCMIL, 1–350 KCMIL GND IN 3 1/2°C			
			<3000>	8–500	(8) 3–500 KCMIL, 1–400 KCMIL GND IN 3 1/2°C	<3000N>	8–500	(8) 4–500 KCMIL, 1–400 KCMIL GND IN 3 1/2°C			
			<4000>	10–600	(10) 3–600 KCMIL, 1–500 KCMIL GND IN 4°C	<4000N>	10–600	(10) 4–600 KCMIL, 1–500 KCMIL GND IN 4°C			
			<5000>	12–600	(12) 3–600 KCMIL, 1–700 KCMIL GND IN 4°C	<5000N>	12–600	(12) 4–600 KCMIL, 1–700 KCMIL GND IN 4°C			
			<6000>	15–600	(15) 3–600 KCMIL, 1–500 KCMIL GND IN 4°C	<6000N>	15–600	(15) 4–600 KCMIL, 1–800 KCMIL GND IN 4°C			

NOTES:

1. AMPACITIES FOR FEEDER SIZES ARE BASED ON N.E.C. CODE 110–14. (TERMINATION PROVISIONS FOR EQUIPMENT RATED 100A OR LESS ARE RATED FOR USE WITH CONDUCTORS RATED 60°C. TERMINATION PROVISIONS FOR EQUIPMENT RATED GREATER THAN 100A ARE RATED FOR USE WITH CONDUCTORS RATED 75°C.)

2. CONTRACTOR MAY OPTIONALLY USE 1/2" CONDUIT IN LIEU OF 3/4" CONDUIT FOR #10 AND #12 CONDUCTORS.

3. CONDUIT FILL IS BASED ON 40% FILL USING SINGLE CONDUCTOR BUILDING WIRE OF INSULATION TYPES THHN, THWN, THWN–2, XHH, XHHW, AND XHHW–2 IN RMC. FOR OTHER RACEWAY TYPES REFER TO APPROPRIATE N.E.C. APPENDIX C TABLES.

4. EQUIPMENT GROUND SIZING BASED ON N.E.C. TABLE 250.122.

TECHNOLOGY SYMBOL LIST	
SYMBOL	DESCRIPTION
	CAMERA
	CARD READER
	TECHNOLOGY OUTLET – 6" ABOVE COUNTER
	TECHNOLOGY OUTLET – FLOOR
	TECHNOLOGY OUTLET – WALL
	MAGNETIC DOOR HOLDER
	PUSH BUTTON
	SPEAKER
	WALL CLOCK – SINGLE FACE
	WALL CLOCK – DOUBLE FACE
	WALL CLOCK AND SPEAKER UNIT
	WIRELESS ACCESS POINT

NOTES:

1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR BOX AND CONDUIT FOR ALL DEVICES INDICATED.

2. LOW VOLTAGE CONTRACTOR SHALL PROVIDE EXACT SPECIFICATIONS AND LOCATIONS OF ALL DEVICES.

LIGHTING CONTROLS LEGEND	
SYMBOL	DESCRIPTION
	SINGLE POLE SWITCH
	THREE WAY SWITCH
	FOUR WAY SWITCH
	LIGHT CONTROL LOCATION
	GENERATOR TRANSFER DEVICE

POWER SYMBOL LIST	
SYMBOL	DESCRIPTION
	CONDUIT DOWN
	CONDUIT UP
	DISCONNECT SWITCH – NON FUSED
	DISCONNECT SWITCH – FUSED
	DISCONNECT SWITCH – COMB. MOTOR STARTER
	ELECTRICAL PANEL
	GROUNDING ROD
	GROUND
	GROUNDING BAR
	JUNCTION BOX
	METER
	MOTOR – SINGLE PHASE
	MOTOR – THREE PHASE
	MOTOR RATED SWITCH
	POWER RECEPTACLE – SIMPLEX TYPE
	POWER RECEPTACLE – DUPLEX TYPE
	POWER RECEPTACLE – DUPLEX 6" ABOVE COUNTER
	POWER RECEPTACLE – USB/DUPLEX COMBO. DEVICE
	POWER RECEPTACLE – QUADRUPLEX TYPE
	POWER RECEPTACLE – RECESSED FLOOR TYPE
	POWER RECEPTACLE – SPECIALTY TYPE
	TIME CLOCK
	TRANSFORMER

NOTES:

1. ALL DEVICE RATINGS/SIZES SHALL BE COORDINATED WITH PLANS AND SCHEDULES.

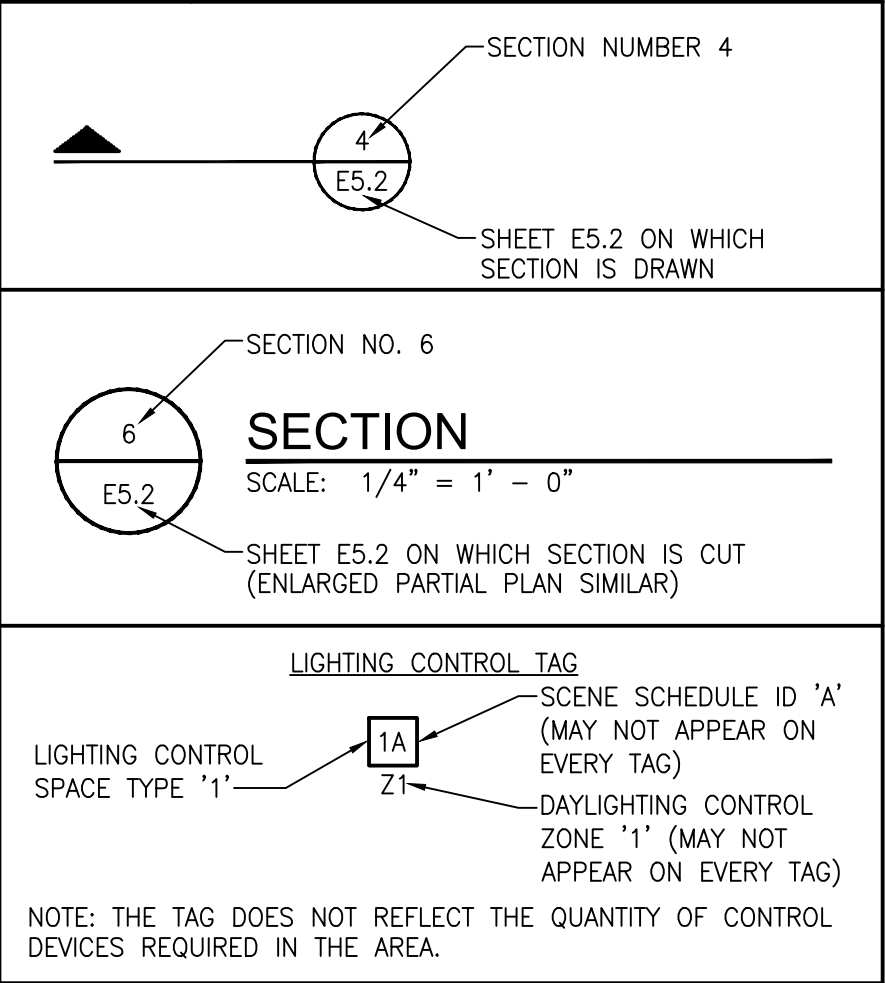
FIRE ALARM SYMBOL LIST	
SYMBOL	DESCRIPTION
	AUDIBLE DEVICE/WALL MOUNTED
	VISUAL DEVICE/WALL MOUNTED
	COMBO AUDIBLE/VISUAL DEVICE/WALL MOUNTED
	AUDIBLE DEVICE/CEILING MOUNTED
	VISUAL DEVICE/CEILING MOUNTED
	COMBO AUDIBLE/VISUAL DEVICE/CEILING MOUNTED
	CO ALARM/SMOKE DETECTOR
	SMOKE DETECTOR
	CO ALARM
	DUCT MOUNTED SMOKE DETECTOR
	HEAT DETECTOR
	FIRE DEPARTMENT COMMUNICATION OUTLET
	EXISTING COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	EXISTING COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	MANUAL PULL STATION
	FLOW SWITCH
	TAMPER SWITCH
	FIRE ALARM ANNUNCIATOR PANEL
	FIRE ALARM CONTROL PANEL
	INPUT/OUTPUT CONTROL MODULE

NOTES:

1. DRAWINGS INDICATE DESIGN INTENT ONLY, FINAL LOCATIONS AND DEVICE SPECIFICATIONS SHALL BE PROVIDED BY FIRE ALARM MANUFACTURER. REFER TO PROJECT SPECIFICATIONS FOR APPROVED MANUFACTURERS.

ELECTRICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
A	AMPERE
AF	AMPERE FUSE/AMPERE FRAME
AWG	AMERICAN WIRE GAUGE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AIC	AVAILABLE INTERRUPTING CURRENT (AMPS)
C	CONDUIT OR CEILING MOUNTED
CB	CIRCUIT BREAKER
CU	COPPER
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
EMT	ELECTRICAL METALLIC TUBING
EWG	ELECTRIC WATER COOLER
EPO	EMERGENCY POWER OFF
(E)	EXISTING ELECTRICAL EQUIPMENT OR WORK
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
F	FUSE
G/GRD	GROUND
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
HOA	HAND–OFF–AUTO
HP	HORSEPOWER
IG	ISOLATED GROUND
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LP	LIGHTING PANEL
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
MAX	MAXIMUM
MIN	MINIMUM
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
N/NEU	NEUTRAL
NF	NON–FUSIBLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NIC	NOT IN CONTRACT
PH. OR Ø	PHASE
P	POLE
PF	POWER FACTOR
PVC	POLYVINYL CHLORIDE (PLASTIC)
(R)	RELOCATED EXISTING ELECTRICAL EQUIPMENT
(RR)	REMOVE AND REINSTALL
RMC	RIGID METALLIC CONDUIT
RP	RECEPTACLE PANEL
TBB	TELEPHONE BACKBOARD
TYP.	TYPICAL
UC	UNDER COUNTER
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
USB	UNIVERSAL SERIAL BUS
V	VOLT
VA	VOLT AMPERE
W	WATT
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER

DRAWING NOTATION	
SYMBOL	DESCRIPTION
L1	LIGHTING FIXTURE TAG
	CONSTRUCTION KEY NOTE NUMBER 1
	DEMOLITION KEY NOTE NUMBER 1
	COPPER FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE)
	ALUMINUM FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE)
EQUIPMENT	EQUIPMENT TAG
	EXISTING DEVICES OR EQUIPMENT
	NEW OR MODIFIED DEVICES OR EQUIPMENT
	NEW OR MODIFIED UNDERGROUND WIRING
	EXISTING SYSTEM COMPONENT TO BE REMOVED
	POINT OF NEW CONNECTION



APPLICABLE CODES AND REGULATIONS	
YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN ENERGY CODE
2015	MICHIGAN RESIDENTIAL CODE
2015	MICHIGAN REHABILITATION CODE
2017	MICHIGAN ELECTRICAL CODE RULES, PART 8
2017	NATIONAL ELECTRICAL CODE (NFPA 70)
2013	NFPA 20
2013	NFPA 72
2013	NFPA 101
2013	NFPA 110
2009	ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS & FACILITIES
1985	DETROIT ELEVATOR CODE



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



WAYNE STATE UNIVERSITY

Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED _____ DATE _____

DESIGNER: _____ DAD

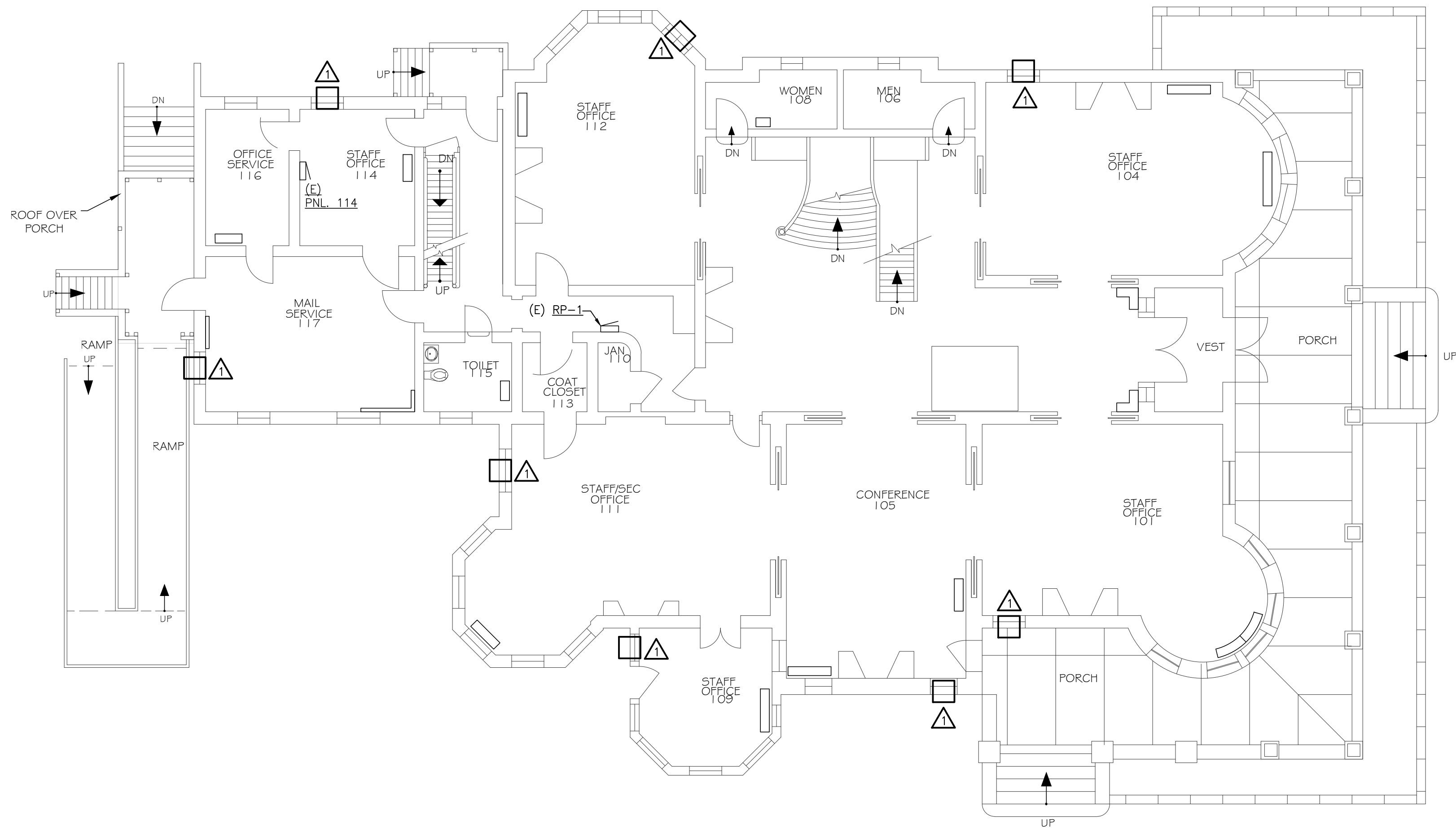
ENGINEER: _____ SET

SHEET TITLE:

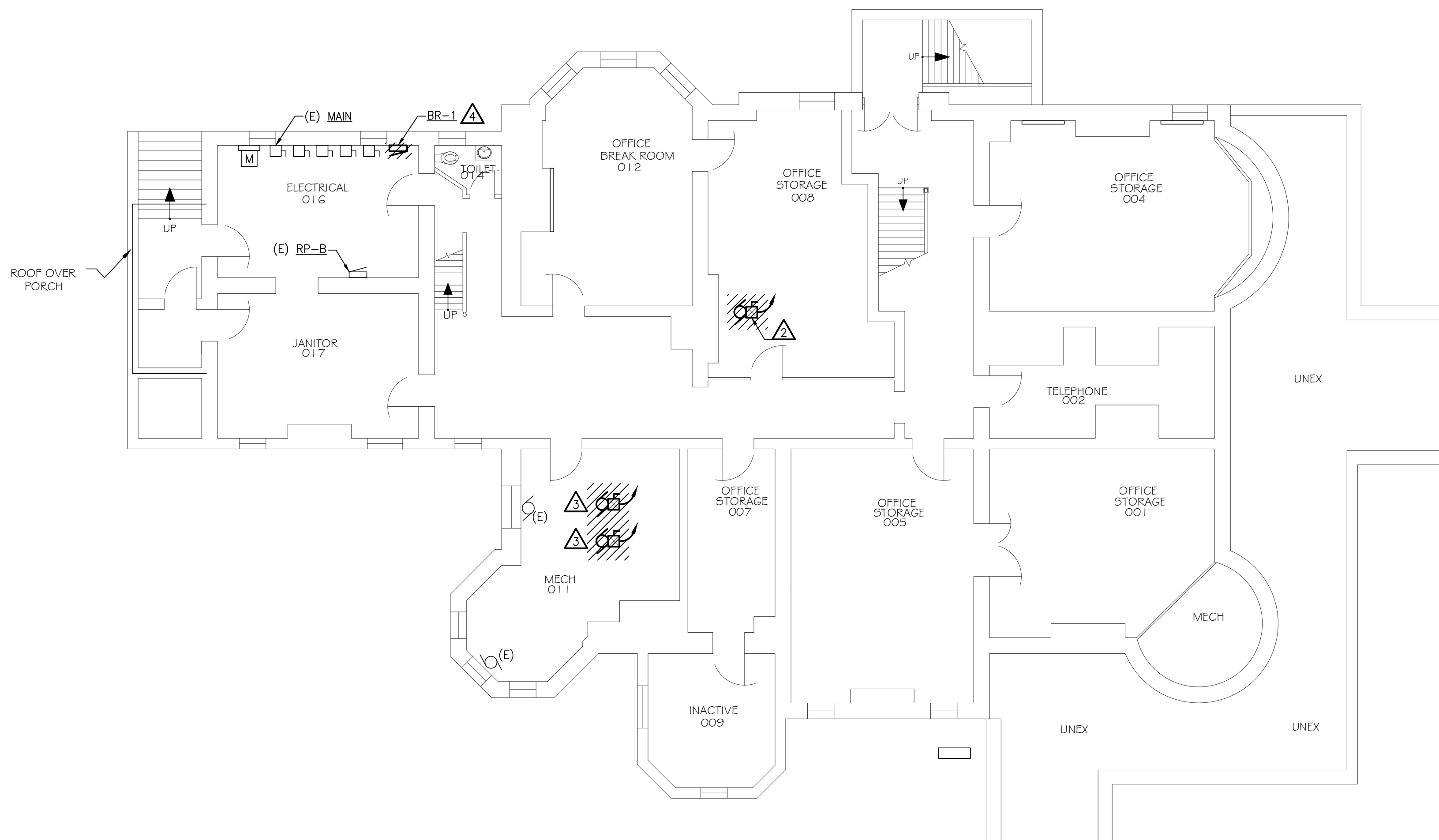
ELECTRICAL GENERAL INFORMATION

SHEET NUMBER:

E0.0



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



BASEMENT ELECTRICAL DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

ELECTRICAL DEMOLITION NOTES

1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES, BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES.
3. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION OF DEVICES AND EQUIPMENT REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES.
4. COORDINATE WITH NEW WORK PLANS, ONE LINE, AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
5. COORDINATE ANY SHUTDOWN OF EXISTING SERVICES AND EQUIPMENT REMAINING IN USE WITH OWNERS' REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COST TO PERFORM THIS WORK DURING EVENING AND WEEKENDS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER.
6. REMOVE ALL CONDUIT AND WIRE BACK TO NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
7. WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM DEVICES TO REMAIN; EXTEND CONDUIT AND WIRE AS REQUIRED TO MAINTAIN ELECTRICAL SERVICE.
8. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED, AND WALL REMAINS INTACT. MARK ALL UNUSED CIRCUIT BREAKERS AS "SPARE".
9. CONTRACTOR TO TAG ALL CIRCUITS AT BOTH ENDS AFFECTED BY THIS SCOPE OF WORK.
10. CONTRACTOR SHALL PROVIDE UPDATED, TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS SCOPE OF WORK.
11. CONTRACTOR SHALL VERIFY ALL UNDERGROUND AND IN-SLAB UTILITIES LOCATIONS PRIOR TO SAW CUTTING OR PENETRATING ANY FLOOR SLABS. CONTRACTOR SHALL REPAIR ALL UTILITIES DAMAGED BY SAW CUTTING.
12. REMOVE AND RE-INSTALL LIGHT FIXTURES AS REQUIRED BY PLASTER DEMOLITION CONTRACTOR.

DEMOLITION KEYED NOTES

1. EXISTING WINDOW A/C UNIT TO BE REMOVED. ELECTRICAL OUTLET PREVIOUSLY USED FOR THIS UNIT SHALL REMAIN IN PLACE AND UNDISTURBED.
2. REMOVE EXISTING MECHANICAL PUMP COMPLETE AND BACK TO SOURCE.
3. REMOVE MECHANICAL BOILER AND ASSOCIATED ELECTRICAL COMPONENTS COMPLETE AND BACK TO SOURCE.
4. REPLACE PANELBOARD IN PLACE WITH NEW AS INDICATED IN ELECTRICAL SCHEDULES AND ONE-LINE DIAGRAM.



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



Seal:

ISSUED FOR:
BIDS 08/27/21

ISSUED DATE

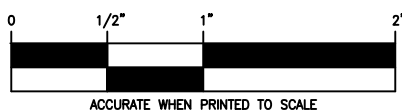
DESIGNER: DAD
ENGINEER: SET

SHEET TITLE:

**BASEMENT AND FIRST
FLOOR ELECTRICAL
DEMOLITION PLAN**

SHEET NUMBER:

ED1.1



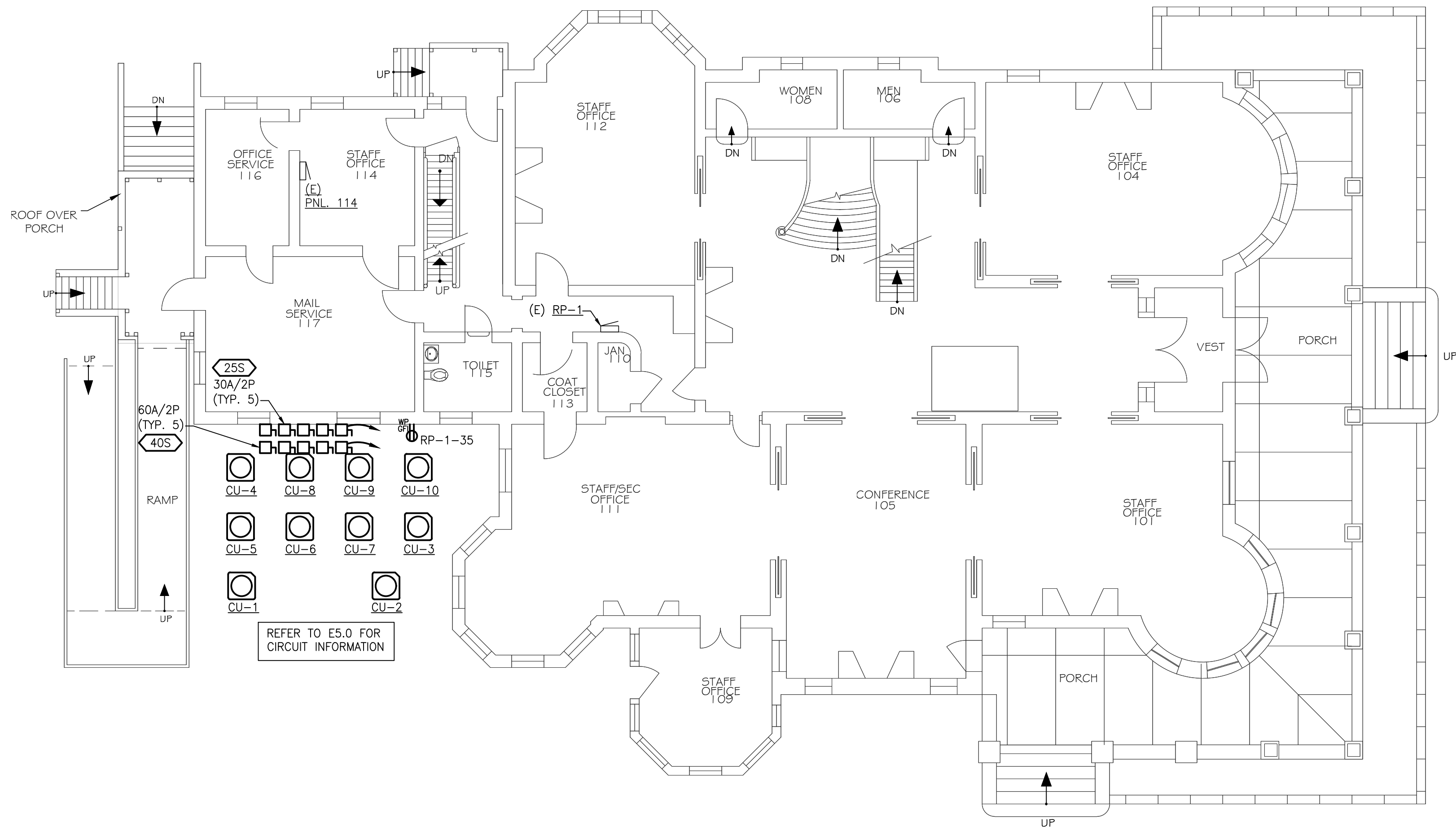


SCALE: 1/8" = 1'-0"

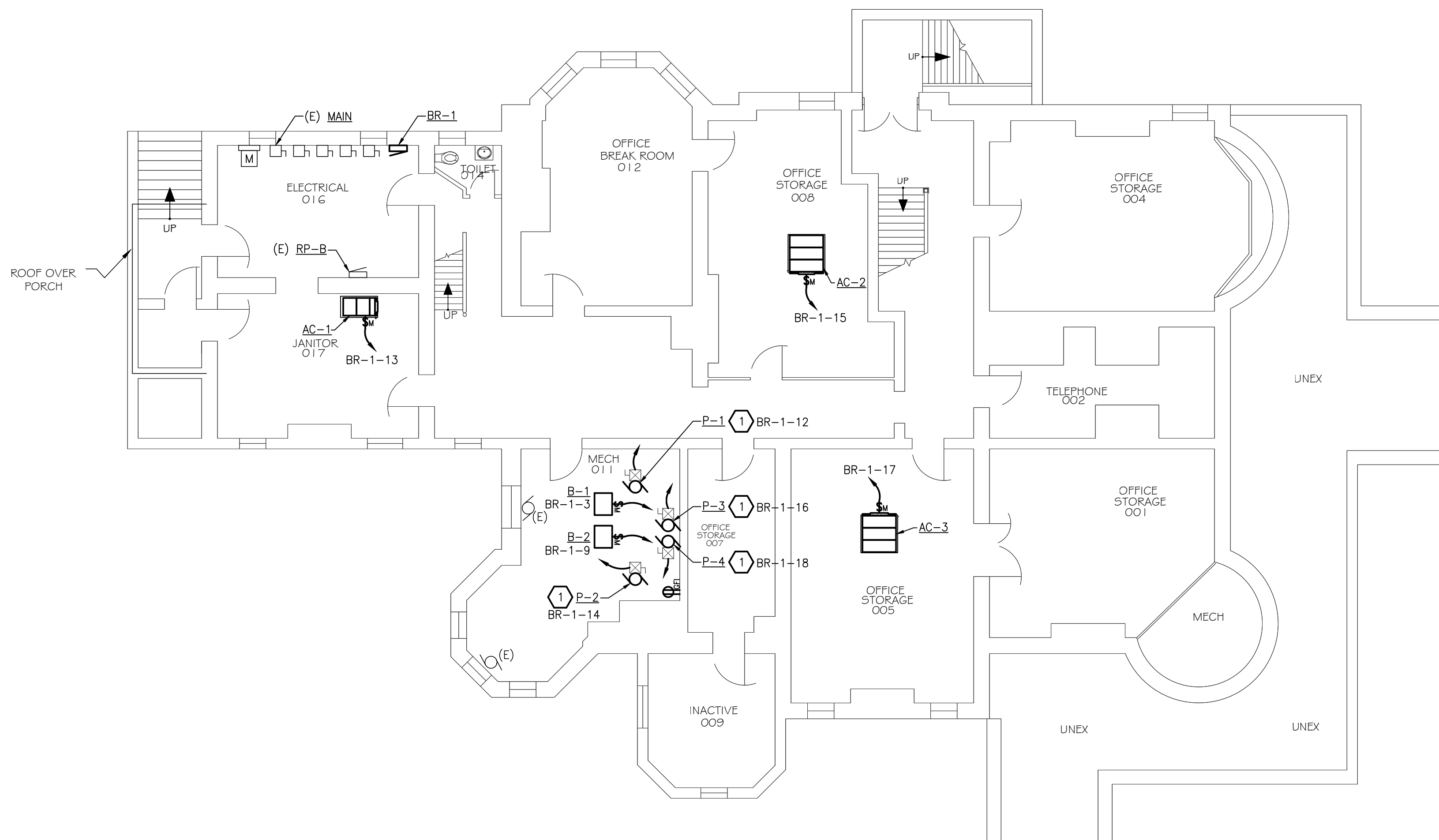


SCALE: 1/8" = 1'-0"





FIRST FLOOR ELECTRICAL POWER PLAN
SCALE: 1/8" = 1'-0"



BASEMENT ELECTRICAL POWER PLAN
SCALE: 1/8" = 1'-0"

POWER GENERAL NOTES

- 1. ALL RECEPTACLES ON EXTERIOR, IN KITCHEN, IN CONCESSION, IN LABORATORY, AND WITHIN 6'-0" OF SINK OR OTHER WATER SUPPLY SHALL BE READILY ACCESSIBLE GFCI TYPE RECEPTACLE.
- 2. ALL CONDUITS SERVING 120 VOLTS OR GREATER SHALL INCLUDE A GROUND WIRE.
- 3. ALL CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.
- 4. ALL 120 VOLT CIRCUITS SHALL UTILIZE A SEPARATE NEUTRAL.
- 5. ALL BRANCH CIRCUITS THAT SUPPLY 125-V SINGLE PHASE, 15 AND 20 AMP OUTLETS TO BE INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, RECREATION ROOMS, CLOSETS, HALLWAYS OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER; COMBINATION-TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT.
- 6. REMOVE AND RE-INSTALL LIGHT FIXTURES AS REQUIRED BY PLASTER DEMOLITION CONTRACTOR.



KEYED NOTES

- 1. H/O/A DISCONNECT COMBINATION UNITS SHALL BE PROVIDED BY UNIT MANUFACTURER, INSTALLED BY ELECTRICAL CONTRACTOR.
- 2. 120V CIRCUIT FEEDS BOTH AC UNIT AND CONDENSATE PUMP LOCATED ADJACENT TO UNIT. PROVIDE DISCONNECTING MEANS FOR BOTH UNIT AND PUMP.



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



WAYNE STATE UNIVERSITY

Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED DATE

DESIGNER: DAD

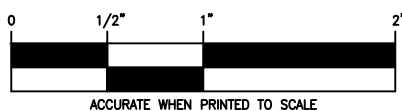
ENGINEER: SET

SHEET TITLE:

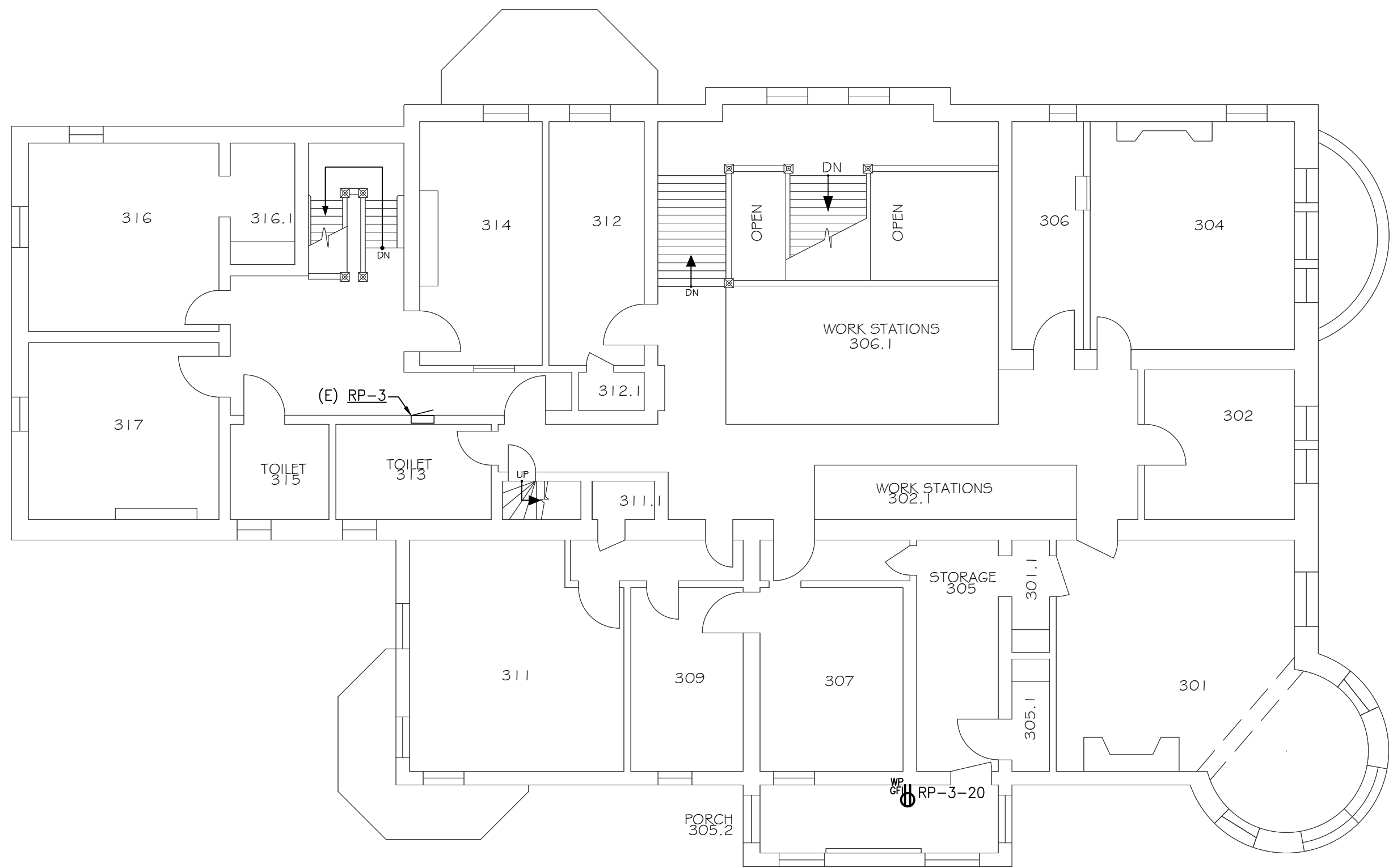
BASEMENT AND FIRST FLOOR ELECTRICAL POWER PLAN

SHEET NUMBER:

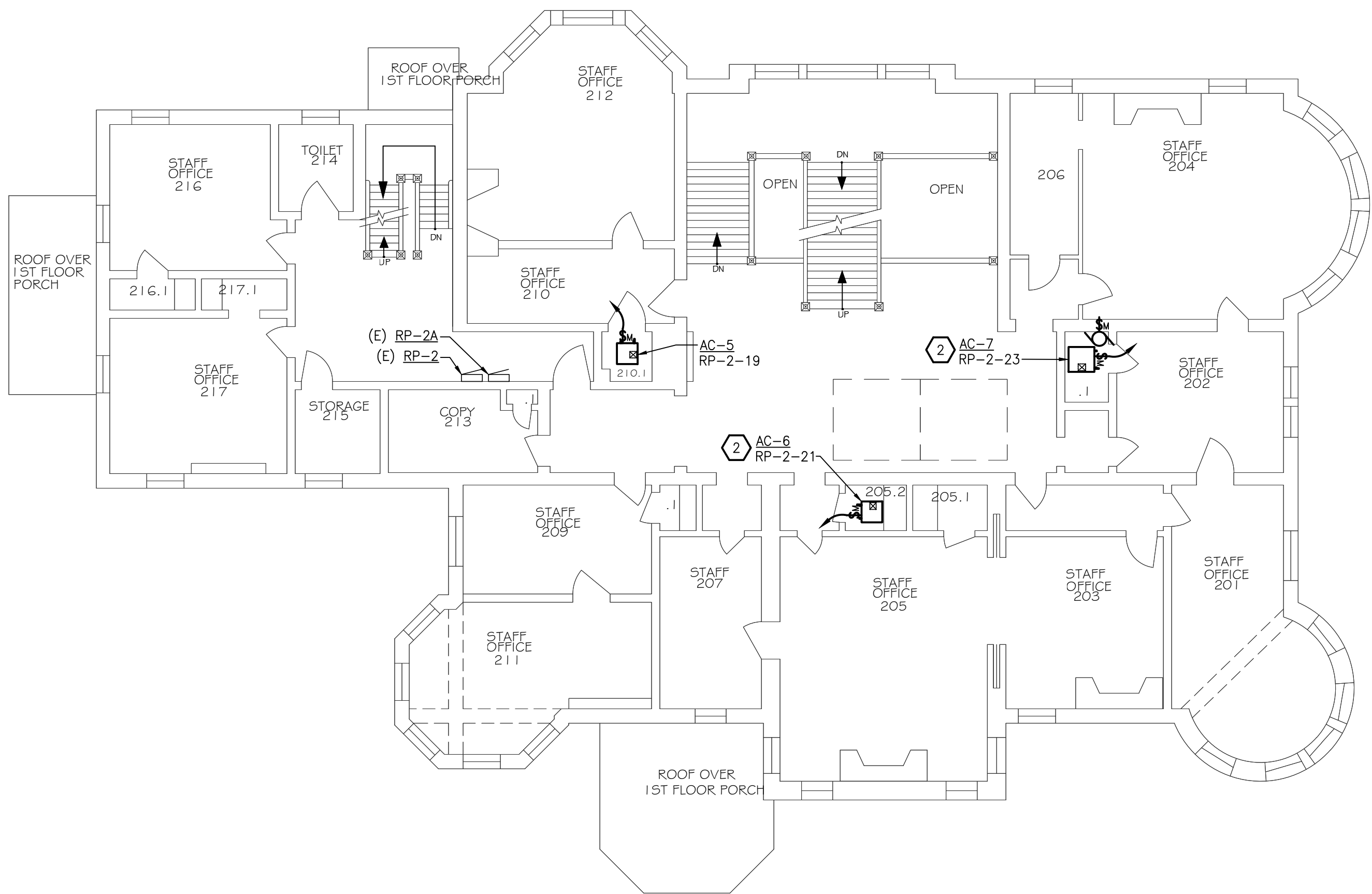
EP1.1



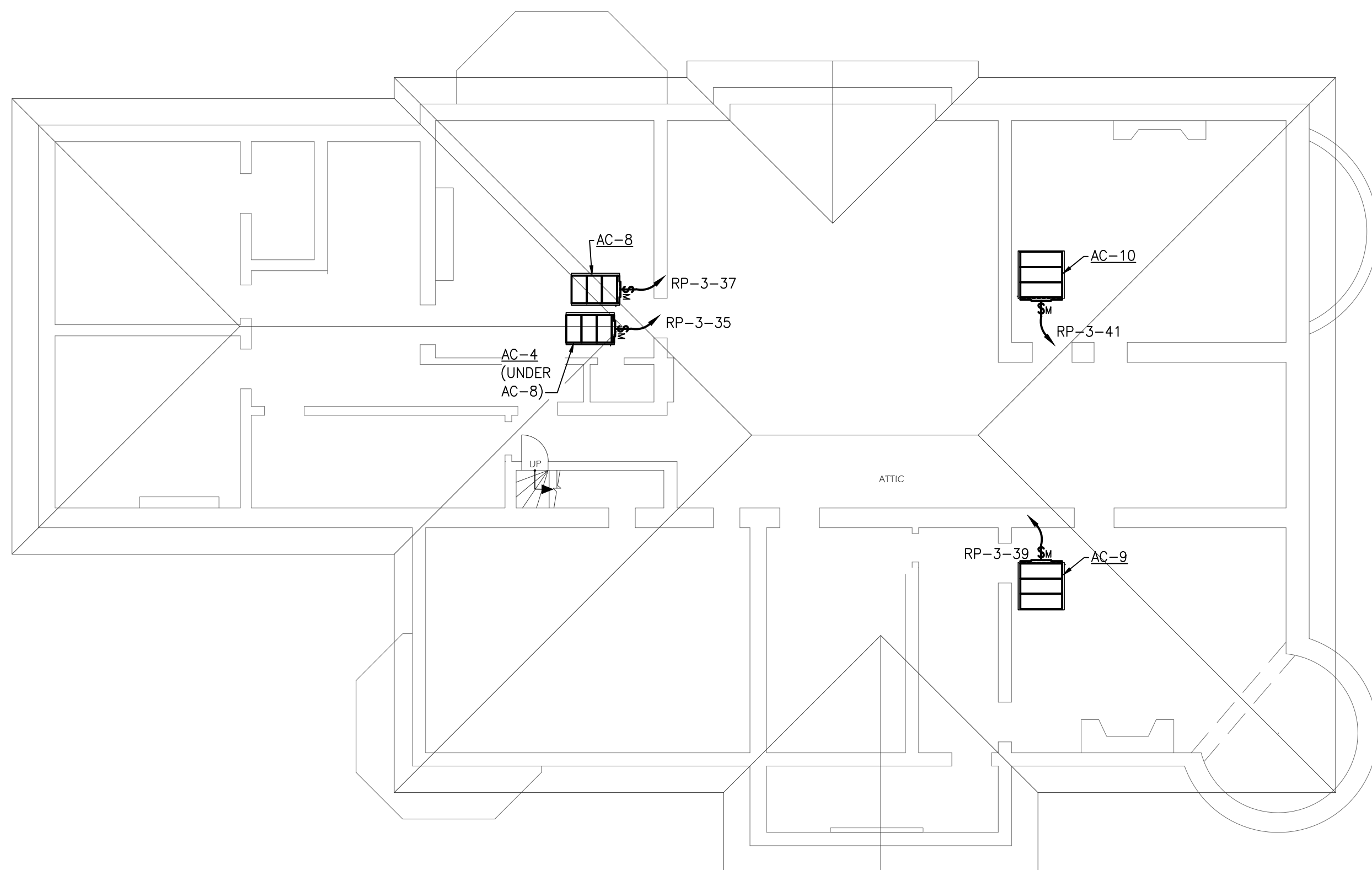
ACCURATE WHEN PRINTED TO SCALE



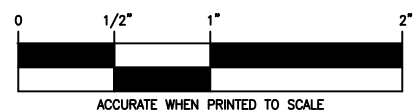
 **THIRD FLOOR ELECTRICAL POWER PLAN**
SCALE: 1/8" = 1'-0"



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



 **ATTIC ELECTRICAL POWER PLAN**
SCALE: 1/8" = 1'-0"



POWER GENERAL NOTES

1. ALL RECEPTACLES ON EXTERIOR, IN KITCHEN, IN CONCESSION, IN LABORATORY, AND WITHIN 6'-0" OF SINK OR OTHER WATER SUPPLY SHALL BE READILY ACCESSIBLE GFCI TYPE RECEPTACLE.
2. ALL CONDUITS SERVING 120 VOLTS OR GREATER SHALL INCLUDE A GROUND WIRE.
3. ALL CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.
4. ALL 120 VOLT CIRCUITS SHALL UTILIZE A SEPARATE NEUTRAL.
5. ALL BRANCH CIRCUITS THAT SUPPLY 125-V SINGLE PHASE, 15 AND 20 AMP OUTLETS TO BE INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, RECREATION ROOMS, CLOSETS, HALLWAYS OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER; COMBINATION-TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT.
6. REMOVE AND RE-INSTALL LIGHT FIXTURES AS REQUIRED BY PLASTER DEMOLITION CONTRACTOR.



KEYED NOTES

1. H/O/A DISCONNECT COMBINATION UNITS SHALL BE PROVIDED BY UNIT MANUFACTURER, INSTALLED BY ELECTRICAL CONTRACTOR.
2. 120V CIRCUIT FEEDS BOTH AC UNIT AND CONDENSATE PUMP LOCATED ADJACENT TO UNIT. PROVIDE DISCONNECTING MEANS FOR BOTH UNIT AND PUMP.



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED DATE

DESIGNER: DAD

ENGINEER: SET

SHEET TITLE:

**SECOND, THIRD AND ATTIC
FLOOR ELECTRICAL POWER
PLAN**

SHEET NUMBER:

EP1.2



Strategic Energy Solutions®
4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com
SES Project # 21 0407 01

CLIENT:

Wayne State University
Design and Construction Services
5454 Cass Avenue
Detroit, MI 48202

PROJECT:

Beecher House
5475 Woodward Ave.,
Detroit, MI 48202



Seal:

ISSUED FOR:

BIDS 08/27/21

ISSUED

DATE

DESIGNER:

DAD

ENGINEER:

SET

SHEET TITLE:

**ELECTRICAL
SPECIFICATIONS**

SHEET NUMBER:

E9.0

BASIC ELECTRICAL REQUIREMENTS

- PART 1 GENERAL
- 1.01 RELATED DOCUMENTS
- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS, SPECIAL CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION.
- 1.02 DRAWINGS
- A. THE DRAWINGS SHOW THE LOCATION AND GENERAL ARRANGEMENT OF EQUIPMENT, ELECTRICAL SYSTEMS AND RELATED ITEMS. THEY SHALL BE FOLLOWED AS CLOSELY AS ELEMENTS OF THE CONSTRUCTION WILL PERMIT.
- B. EXAMINE THE DRAWINGS OF OTHER TRADES AND VERIFY THE CONDITIONS GOVERNING THE WORK ON THE JOB SITE. ARRANGE WORK ACCORDINGLY, PROVIDING SUCH FITTINGS, CONDUIT, JUNCTION BOXES AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS.
- C. DEVIATIONS FROM THE DRAWINGS, WITH THE EXCEPTION OF MINOR CHANGES IN ROUTING AND OTHER SUCH INCIDENTAL CHANGES THAT DO NOT AFFECT THE FUNCTIONING OR SERVICEABILITY OF THE SYSTEMS, SHALL NOT BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
- D. THE ARCHITECTURAL AND STRUCTURAL DRAWINGS TAKE PRECEDENCE IN ALL MATTERS PERTAINING TO THE BUILDING STRUCTURE, MECHANICAL DRAWINGS IN ALL MATTERS PERTAINING TO MECHANICAL TRACES AND ELECTRICAL DRAWINGS IN ALL MATTERS PERTAINING TO ELECTRICAL TRACES, WHERE THERE ARE CONFLICTS OR DIFFERENCES BETWEEN THE DRAWINGS FOR THE VARIOUS TRADES, REPORT SUCH CONFLICTS OR DIFFERENCES TO THE ARCHITECT/ENGINEER FOR RESOLUTION.
- 1.03 CODES, PERMITS AND FEES
- A. UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES FOR ELECTRICAL WORK SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR. ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, RULES AND REGULATIONS.
- B. RULES OF LOCAL UTILITY COMPANIES SHALL BE COMPLIED WITH. CHECK WITH THE UTILITY COMPANY SUPPLYING POWER TO THE INSTALLATION AND DETERMINE ALL SUCH ITEMS IN PROPOSAL.
- C. ALL WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE RULES AND REGULATIONS SET FORTH IN LOCAL AND STATE CODES. PREPARE ANY DETAILED DRAWINGS OR DIAGRAMS WHICH MAY BE REQUIRED BY THE GOVERNING AUTHORITIES. WHERE THE DRAWINGS AND/OR SPECIFICATIONS INDICATE MATERIALS OR CONSTRUCTION IN EXCESS OF CODE REQUIREMENTS, THE DRAWINGS AND/OR SPECIFICATIONS SHALL GOVERN.
- 1.04 STANDARDS OF MATERIAL AND WORKMANSHIP
- A. ALL MATERIALS SHALL BE NEW. THE ELECTRICAL AND PHYSICAL PROPERTIES OF ALL MATERIALS, AND THE DESIGN, PERFORMANCE CHARACTERISTICS, AND METHODS OF CONSTRUCTION OF ALL ITEMS OF EQUIPMENT, SHALL BE IN ACCORDANCE WITH THE LATEST ISSUE OF THE VARIOUS, APPLICABLE STANDARD SPECIFICATIONS OF THE FOLLOWING RECOGNIZED AUTHORITIES:
1. A.N.S.I.AMERICAN NATIONAL STANDARDS INSTITUTE
2. A.S.T.AMERICAN SOCIETY FOR TESTING MATERIALS
3. I.E.E.E.AMERICAN CABLE ENGINEERS ASSOCIATION
4. I.E.E.E.INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
5. N.E.C.NATIONAL ELECTRICAL CODE
6. N.E.A.NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
7. U.L.UNDERWRITERS LABORATORIES, INC.
- B. ALL EQUIPMENT OF THE SAME OR SIMILAR SYSTEMS SHALL BE BY THE SAME MANUFACTURER.
- 1.05 RECORD DRAWINGS
- A. PROVIDE COMPLETE OPERATING AND MAINTENANCE INSTRUCTION MANUALS COVERING ALL ELECTRICAL EQUIPMENT HEREIN SPECIFIED, TOGETHER WITH PRICE LISTS. ALL LITERATURE SHALL BE SUBMITTED TO THE ARCHITECT IN AN ELECTRONIC FORMAT.
- B. THE OPERATING AND MAINTENANCE INSTRUCTIONS SHALL INCLUDE A BRIEF, GENERAL DESCRIPTION FOR ALL ELECTRICAL SYSTEMS INCLUDING, BUT NOT LIMITED TO, ROUTINE MAINTENANCE, TROUBLESHOOTING PROCEDURES AND SHOP DRAWINGS.
- C. ANY EQUIPMENT OFFERED AS A SUBSTITUTION SHALL BE EQUAL IN QUALITY, DURABILITY, APPEARANCE, IMPACT, AND EFFICIENCY THROUGHOUT ALL RANGES OF OPERATION, SHALL CONFORM WITH ARRANGEMENTS AND SPACE LIMITATIONS OF THE EQUIPMENT SHOWN ON THE PLANS AND/OR SPECIFIED, SHALL BE COMPATIBLE WITH THE OTHER COMPONENTS OF THE SYSTEM, ALL COSTS TO MAKE THESE ITEMS OF EQUIPMENT COMPLY WITH THESE REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, CONDUIT, WIRING, BUS WORK, ENCLOSURES AND BUILDING ALTERATIONS SHALL BE INCLUDED IN THE ORIGINAL BID. SIMILAR EQUIPMENT SHALL BE BY ONE MANUFACTURER.
- 1.06 SHOP DRAWINGS/SUBMITTALS
- A. ALL SHOP DRAWINGS SHALL BE SUBMITTED IN GROUPINGS OF SIMILAR AND/OR RELATED ITEMS (LIGHTING FIXTURES, SWITCHGEAR, ETC.). INCOMPLETE SUBMITTAL GROUPINGS WILL BE RETURNED UNCHECKED.
- B. SUBMIT FOR APPROVAL SHOP DRAWINGS FOR ALL ELECTRICAL SYSTEMS OR EQUIPMENT BUT NOT LIMITED TO THE SECTIONS OF SPECIFICATIONS. WHERE ITEMS ARE REFERRED TO BY SYMBOLIC DESIGNATION ON THE DRAWINGS AND SPECIFICATIONS, ALL SUBMITTALS SHALL BEAR THE SAME DESIGNATION (LIGHT FIXTURES). REFER TO OTHER SECTIONS OF THE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 1.07 MANUFACTURERS LISTED
- A. THE LISTING OF SPECIFIC MANUFACTURERS DOES NOT IMPLY ACCEPTANCE OF THEIR PRODUCTS THAT DO NOT MEET THE SPECIFIED RATINGS, FEATURES AND FUNCTIONS. MANUFACTURERS LISTED ARE NOT RELIEVED FROM MEETING THESE SPECIFICATIONS IN THEIR ENTIRETY.
- B. PRODUCTS IN COMPLIANCE WITH THE SPECIFICATION AND MANUFACTURED BY OTHERS NOT NAMED WILL BE CONSIDERED ONLY IF PRE-APPROVED BY THE ENGINEER TEN (10) DAYS PRIOR TO BID DATE.
- 1.08 USE OF EQUIPMENT
- A. THE USE OF ANY EQUIPMENT, OR ANY PART THEREOF FOR PURPOSES OTHER THAN TESTING EVEN WITH THE OWNER'S CONSENT, SHALL NOT BE CONSIDERED TO BE AN ACCEPTANCE OF THE WORK ON THE PART OF THE OWNER, NOR BE CONSIDERED TO OBLIGATE THE OWNER IN ANY WAY TO ACCEPT IMPROPER WORK OR DEFECTIVE MATERIALS.
- B. DO NOT USE OWNER'S LAMPS FOR TEMPORARY LIGHTING EXCEPT AS ALLOWED AND DIRECTED BY THE OWNER. EQUIP LIGHTING FIXTURES WITH NEW LAMPS WHEN THE PROJECT IS TURNED OVER TO THE OWNER.
- PART 2 EXECUTION
- 2.01 INSTALLATION OF EQUIPMENT
- A. INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH ALL DIRECTIONS AND RECOMMENDATIONS FURNISHED BY THE MANUFACTURER. WHERE SUCH DIRECTIONS ARE IN CONFLICT WITH THE DRAWINGS AND SPECIFICATIONS, REPORT SUCH CONFLICTS TO THE ARCHITECT/ENGINEER FOR RESOLUTION.
- B. DO NOT PENETRATE OR OTHERWISE NOTCH OR CUT STRUCTURAL MEMBERS, INCLUDING FOOTINGS AND GRADE BEAMS, WITHOUT APPROVAL OF STRUCTURAL ENGINEER.
- C. MAKE PENETRATIONS PERPENDICULAR TO SURFACES UNLESS OTHERWISE INDICATED.
- D. PROVIDE SLEEVES FOR PENETRATIONS AS INDICATED OR AS REQUIRED TO FACILITATE INSTALLATION. SET SLEEVES FLUSH WITH EXPOSED SURFACES UNLESS OTHERWISE INDICATED OR REQUIRED.
- E. CONICAL BENDS FOR CONDUIT RISERS EMERGING ABOVE GROUND.
- F. SEAL INTERIOR OF CONDUITS ENTERING THE BUILDING FROM UNDERGROUND AT FIRST ACCESSIBLE POINT TO PREVENT ENTRY OF MOISTURE AND GASES.
- G. WHERE CONDUITS PENETRATE WATERPROOF MEMBRANE, SEAL AS REQUIRED TO MAINTAIN INTEGRITY OF MEMBRANE.
- H. MAKE PENETRATIONS FOR ROOF-MOUNTED EQUIPMENT WITH ASSOCIATED EQUIPMENT OPENINGS AND CURBS WHERE POSSIBLE TO MINIMIZE ROOF SYSTEM PENETRATIONS; WHERE PENETRATIONS ARE NECESSARY, SEAL AS INDICATED OR AS REQUIRED TO PRESERVE INTEGRITY OF ROOFING AND MAINTAIN ROOF WARRANTY. INCLUDE PROPOSED LOCATIONS OF PENETRATIONS AND METHODS FOR SEALING WITH SUBMITTALS.
- 2.02 COORDINATION
- A. INSTALL WORK TO AVOID INTERFERENCE WITH WORK OF OTHER TRADES, REMOVE AND RELOCATE ANY WORK THAT CAUSES AN INTERFERENCE AT CONTRACTOR'S EXPENSE. DISPUTES REGARDING THE CAUSE OF AN INTERFERENCE WILL BE RESOLVED BY THE CONSTRUCTION MANAGER OR ARCHITECT/ENGINEER.
- 2.03 CHASES AND RECESSES
- A. PROVIDED BY THE ARCHITECTURAL TRADES, BUT THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR ACCURATE LOCATION AND SIZE.
- 2.04 CUTTING, PATCHING AND DAMAGE TO OTHER WORK
- A. REFER TO GENERAL CONDITIONS FOR REQUIREMENTS.
- B. ALL CUTTING, PATCHING AND REPAIR WORK SHALL BE PERFORMED BY THE CONTRACTOR THROUGH APPROVED, QUALIFIED SUBCONTRACTORS. CONTRACTOR SHALL INCLUDE FULL COST OF SAME IN BID.
- 2.05 EXCAVATION AND BACKFILLING
- A. PROVIDE ALL EXCAVATION, TRENCHING, TUNNELING, DETOURING AND BACKFILLING REQUIRED FOR THE ELECTRICAL WORK. COORDINATE THE WORK WITH OTHER EXCAVATING AND BACKFILLING IN THE SAME AREA.
- B. WHERE CONDUIT IS INSTALLED LESS THAN 2"6" BELOW THE SURFACE OF PAVEMENT, PROVIDE CONCRETE ENCASMENT, 4" MINIMUM COVERAGE, ALL AROUND OR AS SHOWN ON THE ELECTRICAL DRAWINGS.
- C. BACKFILL ALL EXCAVATIONS INSIDE BUILDING, UNDER DRIVES AND PARKING AREAS WITH WELL-TAMPED GRANULAR MATERIAL. BACKFILL ALL EXCAVATIONS UNDER WALL FOOTINGS WITH LEAN MIX CONCRETE UP TO UNIFORMITY OF FOOTINGS AND EXTEND CONCRETE WITHIN EXCAVATION A MINIMUM OF FOUR (4) FEET EACH SIDE OF FOOTING. GRANULAR BACKFILL SHALL BE PLACED IN LAYERS NOT MORE THAN 8 INCHES IN THICKNESS, 95 PERCENT COMPACTION THROUGHOUT WITH APPROVED COMPACTION EQUIPMENT. TAMP ROLL AS REQUIRED. EXCAVATED MATERIAL SHALL NOT BE USED.
- D. BACKFILL OUTSIDE BUILDING WITH GRANULAR MATERIAL TO A HEIGHT 12 INCHES OVER TOP OF PIPE. COMPACTED TO 95 PERCENT COMPACTION AS SPECIFIED ABOVE. BACKFILL REMAINING OF EXCAVATION WITH UNBLENDED, EXCAVATED MATERIAL IN SUCH A WAY TO PREVENT SETTLING. TAMP, ROLL AS REQUIRED.
- 2.06 EQUIPMENT FOUNDATION AND SUPPORTS
- A. SHALL BE AS REQUIRED OR AS SHOWN ON PLANS OR SPECIFIED.
- B. PROVIDE CONCRETE BASES AND SUPPORTS FOR FLOOR MOUNTED ELECTRICAL EQUIPMENT.
- C. PROVIDE CONCRETE HOUSE KEEPING BASES 4" ABOVE FINISHED FLOOR, WITH LEVELING CHANNELS, WHERE NOTED, FOR FLOOR-MOUNTED EQUIPMENTS.
- D. FOR EQUIPMENT SUSPENDED FROM CEILINGS OR WALLS, FURNISH AND INSTALL ALL INSERTS, ROOLS, STRUCTURAL STEEL, FRAMES, BRACKETS AND PLATFORMS REQUIRED.
- 2.07 EQUIPMENT CONNECTIONS
- A. MAKE CONNECTIONS TO EQUIPMENT, MOTORS, LIGHTING FIXTURES, AND OTHER ITEMS INCLUDED IN THE WORK IN ACCORDANCE WITH THE APPROVED SHOP DRAWINGS AND ROUGH-IN MEASUREMENTS FURNISHED BY THE MANUFACTURERS OF THE PANELBOARD EQUIPMENT FURNISHED. ALL ADDITIONAL CONNECTIONS NOT SHOWN ON THE DRAWINGS, BUT CALLED OUT BY THE EQUIPMENT MANUFACTURER'S SHOP DRAWINGS SHALL BE PROVIDED.
- 2.08 ACCESS DOORS
- A. COORDINATE REQUIREMENTS FOR ACCESS DOORS WITH ARCHITECT.
- 2.09 CLEANING
- A. ALL DEBRIS SHALL BE REMOVED DAILY AS REQUIRED TO MAINTAIN THE WORK AREA IN A NEAT, ORDERLY CONDITION.
- B. FINAL CLEANUP SHALL INCLUDE, BUT NOT BE LIMITED TO, WASHING OF FIXTURE LENSES OR LOUVERS, SWITCHBOARDS, SUBSTITUTIONS, MOTOR CONTROL CENTERS, PANELS, ETC.. FUTURE REFLECTORS AND LENSES OR LOUVERS SHALL BE LEFT WITH NO WATER MARKS OR CLEANING STREAKS.
- 2.10 PROTECTION AND HANDLING OF EQUIPMENT AND MATERIALS
- A. EQUIPMENT AND MATERIALS SHALL BE PROTECTED FROM THEFT, INJURY OR DAMAGE.
- B. PROTECT CONDUIT OPENINGS WITH TEMPORARY PLUGS OR CAPS.
- C. PROVIDE ADEQUATE STORAGE FOR ALL EQUIPMENT AND MATERIALS DELIVERED TO THE JOB SITE. LOCATION OF THE SPACE WILL BE DESIGNATED BY THE CONSTRUCTION MANAGER OR ARCHITECT/ENGINEER. EQUIPMENT SET IN PLACE IN UNPROTECTED AREAS MUST BE PROVIDED WITH TEMPORARY PROTECTION.
- 2.11 EXTRA WORK
- A. FOR ANY EXTRA ELECTRICAL WORK WHICH MAY BE PROPOSED, THIS CONTRACTOR SHALL FURNISH TO THE CONSTRUCTION MANAGER, AN ITEMIZED BREAKDOWN OF THE ESTIMATED COST OF THE MATERIALS AND LABOR REQUIRED TO COMPLETE THIS WORK. THE CONTRACTOR SHALL PROCEED ONLY AFTER RECEIVING A WRITTEN ORDER FROM THE CONSTRUCTION MANAGER ESTABLISHING THE AGREED PRICE AND DESCRIBING THE WORK TO BE DONE.
- 2.12 DRAWINGS AND MEASUREMENTS
- A. THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS ARE INTENDED TO DESCRIBE AND PROVIDE FOR FINISHED WORK. THEY ARE INTENDED TO BE COOPERATIVE, AND WHAT IS CALLED FOR BY EITHER SHALL BE AS BIDDING AS IF CALL FOR BY BOTH. THE CONTRACTOR WILL UNDERSTAND THAT THE WORK HEREIN DESCRIBED SHALL BE COMPLETE IN EVERY DETAIL.
- B. THE DRAWINGS ARE NOT INTENDED TO BE SCALED FOR ROUGH-IN MEASUREMENTS NOR TO SERVE AS SHOP DRAWINGS. FIELD MEASUREMENTS NECESSARY FOR ORDERING MATERIALS AND FITTING THE INSTALLATION TO THE BUILDING CONSTRUCTION AND ARRANGEMENT SHALL BE TAKEN BY THE CONTRACTOR. THE CONTRACTOR SHALL CHECK LATEST ARCHITECTURAL DRAWINGS AND LOCATE LIGHT SWITCHES FROM SAME WHERE DOOR SWINGS ARE DIFFERENT FROM ELECTRICAL DRAWINGS.

MINOR ELECTRICAL DEMOLITION

- PART 1 GENERAL
- 1.01 SUMMARY
- A. THE WORK COVERED UNDER THIS SECTION CONSISTS OF THE FURNISHING OF ALL NECESSARY LABOR, SUPERVISION, MATERIALS, EQUIPMENT, AND SERVICES TO COMPLETELY EXECUTE THE SYSTEM OF MINOR ELECTRICAL DEMOLITION AS DESCRIBED IN THIS SPECIFICATION.
- B. IT IS THE CONTRACTOR'S OBLIGATION TO BECOME FAMILIAR WITH THE EXTENT OF DEMOLITION AND THE EXISTING CONDITION BEFORE SUBMITTING THEIR BID.
- C. DURING DEMOLITION IF THE CONTRACTOR DISCOVERS UNFORESEEN SIGNIFICANT NON CODE COMPLIANCE CONDITIONS OF THE EXISTING INSTALLATION THEY SHALL NOTIFY THE ARCHITECT AND ENGINEER IMMEDIATELY IN WRITING.
- D. DURING DEMOLITION THE CONTRACTOR SHALL RECORD ON THE AS-BUILTS ALL DEMOLISHED CIRCUITS UNLESS OTHERWISE INDICATED. THIS NOTE CAN BE USED FOR NEW CIRCUITING.
- PART 2 EXECUTION
- 2.01 EXAMINATION
- A. VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES.
- B. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION AND EXISTING RECORD DOCUMENTS. REPORT DISCREPANCIES TO OWNER BEFORE DISTURBING EXISTING INSTALLATION.
- C. BEGINNING OF DEMOLITION MEANS INSTALLER ACCEPTS EXISTING CONDITIONS.
- 2.02 PREPARATION
- A. DISCONNECT ELECTRICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS TO BE REMOVED.
- B. COORDINATE UTILITY SERVICE OUTAGES WITH UTILITY COMPANY.
- C. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.
- D. EXISTING ELECTRICAL SERVICES: CONTRACTOR EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR USE. REMOVE EXISTING SYSTEM AFTER NEW SYSTEM IS COMPLETE AND READY FOR USE.
- 2.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK
- A. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION.
- B. REMOVE ABANDONED WIRING TO SOURCE OF SUPPLY.
- C. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES.
- D. DISCONNECT ABANDONED OUTLETS AND REMOVE DEVICES. REMOVE ABANDONED OUTLETS IF CONDUIT SERVING THEM IS ABANDONED AND REMOVE. PROVIDE BLANK COVER FOR ABANDONED OUTLETS.
- E. DISCONNECT AND REMOVE ABANDONED PANELBOARDS AND DISTRIBUTION EQUIPMENT.
- F. DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES.
- G. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.
- H. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS THAT REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANEL AS APPROPRIATE.
- I. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS, OR AS SPECIFIED.
- 2.04 CLEANING AND REPAIR
- A. REMOVE AND REPAIR DAMAGE TO EXISTING MATERIALS AND EQUIPMENT THAT REMAIN OR THAT ARE TO BE REUSED.
- B. PANELBOARDS: CLEAN EXPOSED SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AND REMOVE COUSIDE PLATES FOR VACANT POSITIONS. PROVIDE TYPED CIRCUIT DIRECTORY SHOWING REWIRING CONNECTIONS.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

- PART 1 PRODUCTS
- 1.01 CONDUCTOR AND CABLE APPLICATIONS
- A. DO NOT USE CONDUCTORS AND CABLES FOR APPLICATIONS OTHER THAN AS PERMITTED BY NFPA 70
- B. PROVIDE PRODUCT LISTINGS AND SPECIFICATIONS FOR THE APPLICATIONS AND METHODS OF CONSTRUCTION TO BE USED.
- C. PROVIDE SINGLE CONDUCTOR BUILDING WIRE INSTALLED IN SUITABLE RACEWAY UNLESS OTHERWISE INDICATED, PERMITTED, OR REQUIRED.
- D. NONMETALLIC-SHEATHED CONDUCTORS ARE NOT PERMITTED.
- E. UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE IS NOT PERMITTED.
- F. SERVICE ENTRANCE CABLE IS NOT PERMITTED.
- F. ARMORED CABLE IS NOT PERMITTED.
- G. METAL-CLAD CABLE IS PERMITTED ONLY AS FOLLOWS:
1. WHERE NOT OTHERWISE RESTRICTED, MAY BE USED:
- a. WHERE CONCEALED ABOVE ACCESSIBLE CEILINGS FOR FINAL CONNECTIONS FROM JUNCTION BOXES TO LUMINAIRES.
- 1) MAXIMUM LENGTH: 6 FEET.
2. IN ADDITION TO OTHER APPLICABLE RESTRICTIONS, MAY NOT BE USED:
- a. WHERE EXPOSED TO DAMAGE.
- b. FOR DAMP, WET, OR CORROSIVE LOCATIONS, UNLESS PROVIDED WITH A PVC JACKET LISTED AS SUITABLE FOR THOSE LOCATIONS.
- H. MANUFACTURED WIRING SYSTEMS ARE NOT PERMITTED.
- 1.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS
- A. PROVIDE PRODUCTS THAT COMPLY WITH REQUIREMENTS OF NFPA 70.
- B. PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED.
- C. UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED CONDUIT, BOXES, WIRING, CONNECTORS, ETC. AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.
- D. COMPLY WITH NFPA 70.
- E. THERMOPLASTIC-INSULATED CONDUCTORS AND CABLES: LISTED AND LABELED AS COMPLYING WITH UL 83.
- F. CONDUCTOR MATERIALS
1. PROVIDE CONDUCTOR CONDUCTORS EXCEPT WHERE ALUMINUM CONDUCTORS ARE SPECIFICALLY INDICATED. SUBSTITUTION OF ALUMINUM CONDUCTORS FOR COPPER IS NOT PERMITTED. CONDUCTOR SIZES INDICATED ARE BASED ON COPPER UNLESS OTHERWISE INDICATED. INSTALL ALUMINUM AT 45 DEGREE ANGLE OR BURRY HORIZONTALLY IN TRENCH AT LEAST 30 INCHES (750 MM) DEEP IN ACCORDANCE WITH NFPA 70 OR PERMITTED GROUND PLATES.
2. COPPER CONDUCTORS: SOFT DRAW ANNEALED, 98 PERCENT CONDUCTIVITY, UNCOATED COPPER CONDUCTORS COMPLYING WITH ASTM B3, ASTM B8, OR ASTM B787/B787M UNLESS OTHERWISE SPECIFIED.
3. TINNED COPPER CONDUCTORS: COMPLY WITH ASTM B33.
4. ALUMINUM CONDUCTORS ONLY WHERE SPECIFICALLY INDICATED OR PERMITTED FOR SUBSTITUTION: 44-B000 SERIES ALUMINUM ALLOY CONDUCTORS RECORDED BY ASTM B800 AND CONTACT STRANDED IN ACCORDANCE WITH ASTM B801 UNLESS OTHERWISE INDICATED.
- H. CONDUCTOR COLOR CODING:
1. COLOR CODE CONDUCTORS AS INDICATED UNLESS OTHERWISE REQUIRED BY THE AUTHORITY HAVING JURISDICTION, MAINTAIN CONSISTENT COLOR CODING THROUGHOUT PROJECT.
2. COLOR CODE METHOD: INTEGRALLY COLORED INSULATION.
3. COLOR CODE:
- a. 480Y/277 V, 3 PHASE, 4 WIRE SYSTEM:
- 1) PHASE A: BROWN.
- 2) PHASE B: ORANGE.
- 3) PHASE C: YELLOW.
- 4) NEUTRAL/GROUND: GRAY.
- b. 208Y/120 V, 3 PHASE, 4 WIRE SYSTEM:
- 1) PHASE A: RED.
- 2) PHASE B: BLACK.
- 3) PHASE C: BLUE.
- 4) NEUTRAL/GROUND: WHITE.
- c. EQUIPMENT GROUND, ALL SYSTEMS: GREEN.
- 1.03 SINGLE CONDUCTOR BUILDING WIRE
- A. DESCRIPTION: SINGLE CONDUCTOR INSULATED WIRE.
- B. CONDUCTOR STRANDING:
1. FEEDERS AND BRANCH CIRCUITS:
- a. SIZE 12 AWG AND SMALLER: STRANDED.
- b. SIZE 10 AWG AND LARGER: STRANDED.
2. INSULATION VOLTAGE RATING: 600 V.
- C. INSULATION:
1. COPPER BUILDING WIRE: TYPE THHN/THHN OR THHN/THHN-2, EXCEPT AS INDICATED BELOW.
- 1.04 METAL-CLAD CABLE
- A. DESCRIPTION: NFPA 70, TYPE MC CABLE LISTED AND LABELED AS COMPLYING WITH UL 1569, AND LISTED FOR USE IN CLASSIFIED FIRESTOP SYSTEMS TO BE USED.
- B. CONDUCTOR STRANDING:
1. SIZE 12 AWG AND SMALLER: STRANDED.
2. COORDINATE REQUIREMENTS FOR ACCESS DOORS WITH ARCHITECT.
- 2.09 CLEANING
- A. ALL DEBRIS SHALL BE REMOVED DAILY AS REQUIRED TO MAINTAIN THE WORK AREA IN A NEAT, ORDERLY CONDITION.
- B. FINAL CLEANUP SHALL INCLUDE, BUT NOT BE LIMITED TO, WASHING OF FIXTURE LENSES OR LOUVERS, SWITCHBOARDS, SUBSTITUTIONS, MOTOR CONTROL CENTERS, PANELS, ETC.. FUTURE REFLECTORS AND LENSES OR LOUVERS SHALL BE LEFT WITH NO WATER MARKS OR CLEANING STREAKS.
- 2.10 PROTECTION AND HANDLING OF EQUIPMENT AND MATERIALS
- A. EQUIPMENT AND MATERIALS SHALL BE PROTECTED FROM THEFT, INJURY OR DAMAGE.
- B. PROTECT CONDUIT OPENINGS WITH TEMPORARY PLUGS OR CAPS.
- C. PROVIDE ADEQUATE STORAGE FOR ALL EQUIPMENT AND MATERIALS DELIVERED TO THE JOB SITE. LOCATION OF THE SPACE WILL BE DESIGNATED BY THE CONSTRUCTION MANAGER OR ARCHITECT/ENGINEER. EQUIPMENT SET IN PLACE IN UNPROTECTED AREAS MUST BE PROVIDED WITH TEMPORARY PROTECTION.

- A. CRUISING REQUIREMENTS:
1. UNLESS DIMENSIONED, CIRCUIT ROUTING INDICATED IS DIAGRAMMATIC.
2. WHEN CIRCUIT DESTINATION IS INDICATED WITHOUT SPECIFIC ROUTING, DETERMINE EXACT ROUTING AND LABOR REQUIRED TO COMPLETE THIS WORK. THE CONTRACTOR SHALL PROCEED ONLY AFTER RECEIVING A WRITTEN ORDER FROM THE CONSTRUCTION MANAGER ESTABLISHING THE AGREED PRICE AND DESCRIBING THE WORK TO BE DONE.
4. INCLUDE CIRCUIT LENGTHS REQUIRED TO INSTALL CONNECTED DEVICES WITHIN 10 FT OF LOCATION INDICATED.
5. MAINTAIN SEPARATION OF CLASS 1, CLASS 2, AND CLASS 3 REMOTE-CONTROL, SIGNALING, AND POWER-LIMITED CIRCUITS IN ACCORDANCE WITH NFPA 70.
6. MAINTAIN SEPARATION OF WIRING FOR EMERGENCY SYSTEMS IN ACCORDANCE WITH NFPA 70.
- B. PERFORM WORK IN ACCORDANCE WITH NFPA 70 (GENERAL WORKMANSHIP).
- C. INSTALL ALUMINUM CONDUCTORS IN ACCORDANCE WITH NFPA 104.
- D. INSTALL METAL-CLAD CABLE (TYPE MC) IN ACCORDANCE WITH NFPA 120.
- E. INSTALLATION IN RACEWAY:
1. MAKE ENDS OF CONDUCTORS AND CABLES TO PREVENT INFILTRATION OF MOISTURE AND OTHER CONTAMINANTS.
2. PULL ALL CONDUCTORS AND CABLES TOGETHER INTO RACEWAY AT SAME TIME.
3. DO NOT DAMAGE CONDUCTORS AND CABLES OR EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING TENSION AND SKEWAL PRESSURE.
4. USE SUITABLE WIRE PULLING LUBRICANT WHEN NECESSARY, EXCEPT WHEN LUBRICANT IS NOT RECOMMENDED BY THE MANUFACTURER.
- F. PARALLELLED CONDUCTORS: INSTALL CONDUCTORS OF THE SAME LENGTH AND TERMINATE IN THE SAME MANNER.
- G. SECURE AND SUPPORT CONDUCTORS AND CABLES IN ACCORDANCE WITH NFPA 70 USING SUITABLE SUPPORTS AND METHODS APPROVED BY THE AUTHORITY HAVING JURISDICTION. PROVIDE INDEPENDENT SUPPORT FROM BUILDING STRUCTURE. DO NOT PROVIDE SUPPORT FROM RACEWAYS, PIPING, DUCTWORK, OR OTHER SYSTEMS.
- H. TERMINATE CABLES USING SUITABLE FITTINGS.
- I. METAL-CLAD CABLE (TYPE MC):
- a. USE LISTED FITTINGS.
- b. CUT CABLE ARMOR ONLY USING SPECIALIZED TOOLS TO PREVENT DAMAGING CONDUCTORS OR INSULATION. DO NOT USE HACKSAW OR WIRE CUTTERS TO CUT ARMOR.
- J. INSTALL CONDUCTORS WITH A MINIMUM OF 12 INCHES OF SLACK AT EACH OUTLET.
- K. NEATLY TRIM AND BUNDLE CONDUCTORS INSIDE BOXES, MINIRUNS, PANELBOARDS AND OTHER EQUIPMENT ENCLOSURES.
- L. GROUP OR OTHERWISE IDENTIFY NEUTRAL/GROUNDED CONDUCTORS WITH ASSOCIATED UNGROUNDED CONDUCTORS INSIDE ENCLOSURES IN ACCORDANCE WITH NFPA 70.
- M. MAKE WIRING CONNECTIONS USING SPECIFIED WIRING CONNECTIONS.
1. MAKE SPLICES AND TAPS ONLY IN ACCESSIBLE BOXES. DO NOT PULL SPLICES INTO RACEWAYS OR EQUIPMENT ENCLOSURES.
2. REMOVE APPROPRIATE AMOUNT OF CONDUCTOR INSULATION FOR MAKING CONNECTIONS WITHOUT CUTTING, NICKING OR DAMAGING CONDUCTORS.
3. DO NOT REMOVE CONDUCTOR STRANDS TO FACILITATE INSERTION INTO CONNECTOR.
4. CLEAN CONTACT SURFACES ON CONDUCTORS AND CONNECTORS TO SUITABLE REMOVE CORROSION, OXIDES, AND OTHER CONTAMINANTS. DO NOT USE WIRE BRUSH ON PLATED CONTACT SURFACES.
5. CONNECTIONS FOR ALUMINUM CONDUCTORS: FILL CONNECTIONS WITH OXIDE INHIBITING COMPOUND WHERE NOT PRE-FILLED BY MANUFACTURER.
- N. INSULATE SPLICES AND TAPS THAT ARE MADE WITH UNINSULATED CONNECTORS USING METHODS OF GROUNDING SYSTEM RESISTANCE.
- O. INSULATE ENDS OF SPARE CONDUCTORS USING VINYL INSULATING ELECTRICAL TAPE.
- P. INSTALL FIRESTOPPING TO PRESERVE FIRE RESISTANCE RATING OF PARTITIONS AND OTHER ELEMENTS.
- Q. PATCH AND REPAIR DAMAGE TO EXISTING MATERIALS AND FINISHES CAUSED BY CONDUIT INSTALLATION AND DEVICES, INCLUDING THOSE FURNISHED BY OTHERS, AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- PART 1 PRODUCTS
- 1.01 GROUNDING AND BONDING REQUIREMENTS
- A. EXISTING WORK: WHERE EXISTING GROUNDING AND BONDING SYSTEM COMPONENTS ARE INDICATED TO BE REUSED, THEY MAY BE REUSED ONLY WHEN THEY ARE FREE FROM CORROSION, INJURY AND CONTINUITY ARE VERIFIED, AND WHERE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
- B. DO NOT USE PRODUCTS FOR APPLICATIONS OTHER THAN AS PERMITTED BY NFPA 70 AND PRODUCT LISTING.
- C. UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED COMPONENTS: CONDUCTORS, CONNECTORS, CONDUIT, BOXES, FITTINGS, SUPPORTS, ACCESSORIES, ETC. AS NECESSARY FOR A COMPLETE GROUNDING AND BONDING SYSTEM.
- D. WHERE CONDUCTOR SIZE IS NOT INDICATED, SIZE TO COMPLY WITH NFPA 70 BUT NOT LESS THAN APPLICABLE MINIMUM SIZE REQUIREMENTS SPECIFIED.
- E. GROUNDING SYSTEM RESISTANCE:
1. GROUNDING ELECTRICAL SYSTEM: NOT GREATER THAN 5 OHMS TO GROUND, WHEN TESTED BY ACCORDING TO IEEE 81 USING "FALL-OR-POTENTIAL" METHOD.
- F. GROUNDING ELECTRICAL SYSTEM:
1. PROVIDE CONNECTION TO REQUIRED AND SUPPLEMENTAL GROUNDING ELECTRODES INDICATED TO FORM GROUNDING ELECTRICAL SYSTEM.
- a. PROVIDE CONTINUOUS GROUNDING ELECTRICAL CONDUCTORS WITHOUT SPLICES OR JOINT.
- b. INSTALL GROUNDING-ELECTRIC CONDUCTORS IN RACEWAY WHERE EXPOSED TO PHYSICAL DAMAGE. BOND GROUNDING ELECTRICAL CONDUCTOR TO METALLIC RACEWAYS AT EACH END WITH BONDING JUMPER.
2. PROVIDE ADDITIONAL GROUND (ELECTRODE) AS REQUIRED TO ACHIEVE SPECIFIED GROUNDING ELECTRICAL SYSTEM RESISTANCE.
- 1.02 GROUNDING AND BONDING COMPONENTS
- A. GENERAL REQUIREMENTS:
1. PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED.
2. PROVIDE PRODUCTS LISTED AND LABELED AS COMPLYING WITH UL 467 WHERE APPLICABLE.
- B. CONDUCTORS FOR GROUNDING AND BONDING, IN ADDITION TO REQUIREMENTS OF SECTION 26 0526:
1. USE INSULATED COPPER CONDUCTORS UNLESS OTHERWISE INDICATED.
- a. EXCEPTIONS:
- 1) USE BARE COPPER CONDUCTORS WHERE INSTALLED UNDERGROUND IN DIRECT CONTACT WITH EARTH.
- 2) USE BARE COPPER CONDUCTORS WHERE DIRECTLY ENCASED IN CONCRETE (NOT IN RACEWAY), IN WHERE EXPOSED TO DAMAGE.
- C. CONNECTORS FOR GROUNDING AND BONDING:
1. DESCRIPTION: CONNECTORS APPROPRIATE FOR THE APPLICATION AND SUITABLE FOR THE CONDUITS AND ITEMS TO BE CONNECTED, LISTED AND LABELED AS COMPLYING WITH UL 467.
2. UNLESS OTHERWISE INDICATED, USE EXOTHERMIC WELDED CONNECTIONS FOR UNDERGROUND, CONCEALED AND OTHER ACCESSIBLE LOCATIONS.
3. UNLESS OTHERWISE INDICATED, USE MECHANICAL CONNECTORS, COMPRESSION CONNECTORS, OR EXOTHERMIC WELDED CONNECTIONS FOR ACCESSIBLE CONNECTIONS.
- PART 2 EXECUTION
- 2.01 EXAMINATION
- A. VERIFY THAT WORK LIKELY TO DAMAGE GROUNDING AND BONDING SYSTEM COMPONENTS HAS BEEN COMPLETED.
- B. VERIFY THAT CONDITIONS ARE SATISFACTORY FOR INSTALLATION PRIOR TO STARTING WORK.
- 2.02 INSTALLATION
- A. PERFORM WORK IN ACCORDANCE WITH NFPA 70 (GENERAL WORKMANSHIP).
- B. GROUND ROD ELECTRODES: UNLESS OTHERWISE INDICATED, INSTALL GROUND ROD ELECTRODES VERTICALLY, WHERE UNCONFINED, OR VERTICALLY, WHERE UNCONFINED, INSTEAD OF AT 45 DEGREE ANGLE OR BURRY HORIZONTALLY IN TRENCH AT LEAST 30 INCHES (750 MM) DEEP IN ACCORDANCE WITH NFPA 70 OR PERMITTED GROUND PLATES.
- C. CHASES AND BONDING CONNECTIONS USING SPECIFIED CONNECTIONS.
1. REMOVE APPROPRIATE AMOUNT OF CONDUCTOR INSULATION FOR MAKING CONNECTIONS WITHOUT CUTTING, NICKING OR DAMAGING CONDUCTORS. DO NOT REMOVE CONDUCTOR STRANDS TO FACILITATE INSERTION INTO CONNECTOR.
2. REMOVE NONCONDUCTIVE PAINT, ENAMEL, OR SIMILAR COATING AT THREADS, CONTACT POINTS, AND CONTACT SURFACES.
3. EXOTHERMIC WELDS: MAKE CONNECTIONS USING MOLDS AND WELD MATERIAL SUITABLE FOR THE ITEMS TO BE CONNECTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. MECHANICAL CONNECTORS: SECURE CONNECTIONS ACCORDING TO MANUFACTURER'S RECOMMENDED TORQUE SETTINGS.
5. COMPRESSION CONNECTORS: SECURE CONNECTIONS USING MANUFACTURER'S RECOMMENDED TOOLS AND DES.
- 2.03 FIELD QUALITY CONTROL
- A. INSPECT AND TEST IN ACCORDANCE WITH NFPA 70 EXCEPT SECTION 4.
- B. PERFORM INSPECTIONS AND TESTS LISTED IN NFPA 70, SECTION 7.1.3.
- C. PERFORM GROUND ELECTRICAL RESISTANCE TESTS UNDER NORMALLY DRY CONDITIONS. PRECIPITATION WITHIN THE PREVIOUS 48 HOURS DOES NOT CONSTITUTE NORMALLY DRY CONDITIONS.
- D. INVESTIGATE AND CORRECT DEFICIENCIES WHERE MEASURED GROUND RESISTANCES DO NOT COMPLY WITH SPECIFIED REQUIREMENTS.

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

- PART 1 GENERAL
- 1.01 SUMMARY
- A. THE WORK COVERED UNDER THIS SECTION CONSISTS OF THE FURNISHING OF ALL NECESSARY LABOR, SUPERVISION, MATERIALS, EQUIPMENT, AND SERVICES TO COMPLETELY EXECUTE THE SYSTEM OF HANGERS AND SUPPORTS AS DESCRIBED IN THIS SPECIFICATION.
- B. RATED STRENGTH: ADEQUATE IN TENSION, SHEAR, AND PULLOUT FORCE TO RESIST MAXIMUM LOADS.
- C. PROVIDE ADEQUATE STORAGE FOR ALL EQUIPMENT AND MATERIALS DELIVERED TO THE JOB SITE. LOCATION OF THE SPACE WILL BE DESIGNATED BY THE CONSTRUCTION MANAGER OR ARCHITECT/ENGINEER. EQUIPMENT SET IN PLACE IN UNPROTECTED AREAS MUST BE PROVIDED WITH TEMPORARY PROTECTION.
- 1.02 COORDINATION
- A. COORDINATE INSTALLATION OF ROOF CURBS, EQUIPMENT SUPPORTS, AND ROOF PENETRATIONS.
- PART 2 PRODUCTS
- 2.01 SUPPORT AND ATTACHMENT COMPONENTS
- A. GENERAL REQUIREMENTS:
1. PROVIDE ALL REQUIRED HANGERS, SUPPORTS, ANCHORS, FASTENERS, FITTINGS, ACCESSORIES, AND HARDWARE AS NECESSARY FOR THE COMPLETE INSTALLATION OF ELECTRICAL WORK.
2. PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED.
3. WHERE SUPPORT AND ATTACHMENT COMPONENT TYPES AND SIZES ARE NOT INDICATED, SELECT IN ACCORDANCE WITH MANUFACTURER'S APPLICATION CRITERIA AS REQUIRED FOR THE LOAD TO BE SUPPORTED. INCLUDE CONSIDERATION FOR VIBRATION, EQUIPMENT OPERATION, AND SHOCK LOADS WHERE APPLICABLE.
4. DO NOT USE PRODUCTS FOR APPLICATIONS OTHER THAN AS PERMITTED BY NFPA 70 AND PRODUCT LISTING.
5. STEEL COMPONENTS: USE CORROSION RESISTANT MATERIALS SUITABLE FOR THE ENVIRONMENT WHERE INSTALLED.
- a. ZINC-PLATED STEEL: ELECTROPLATED IN ACCORDANCE WITH ASTM B633.
- b. GALVANIZED STEEL: HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123/A123M OR ASTM A153/A153M.
- B. CONDUIT AND CABLE SUPPORTS: STRIPS, CLAMPS, ETC. SUITABLE FOR THE CONDUIT OR CABLE TO BE SUPPORTED.

1. CONDUIT STRAPS: ONE-HOLE OR TWO-HOLE TYPE, STEEL OR MALLEABLE IRON.
2. CONDUIT CLAMPS: BOLTED TYPE UNLESS OTHERWISE INDICATED.
3. CULLET BOX SUPPORTS: HANGERS, BRACKETS, ETC. SUITABLE FOR THE BOXES TO BE SUPPORTED.
- D. METAL CHANNEL (STRUT) FRAMING SYSTEMS: FACTORY-FABRICATED CONTINUOUS-SOLID METAL CHANNEL (STRUT) AND ASSOCIATED FITTINGS, ACCESSORIES, AND HARDWARE REQUIRED FOR FIELD-ASSEMBLY OF SUPPORTS.
1. COMPLY WITH NFPA-4.
2. CHANNEL (STRUT) USED AS RACEWAY (ONLY WHERE SPECIFICALLY INDICATED): LISTED AND LABELED AS COMPLYING WITH UL 58.
- E. HANGER RODS: THREADED ZINC-PLATED STEEL UNLESS OTHERWISE INDICATED.
1. MINIMUM SIZE UNLESS OTHERWISE INDICATED OR REQUIRED:
- a. EQUIPMENT SUPPORTS: 1/2 INCH DIAMETER.
- b. SINGLE CONDUIT UP TO 1 INCH (25 MM) TRADE SIZE: 1/4 INCH DIAMETER.
- F. ANCHORS AND FASTENERS:
1. UNLESS OTHERWISE INDICATED AND WHERE NOT OTHERWISE RESTRICTED, USE THE ANCHOR AND FASTENER TYPES INDICATED FOR THE SPECIFIED APPLICATIONS.
- G. HANGERS, SUPPORTS, ANCHORS, AND FASTENERS - GENERAL:
1. PROTECTIVE ZINC COATING OTHER ELECTRO-PLATED (ASTM B633, SD OR SD3), PRE-GALVANIZED (ASTM A593 COATING DESIGNATION C80) OR HOT-DIP GALVANIZED AFTER FABRICATION (ASTM A123).
2. THE MINIMUM THICKNESS OF ZINC COATING SHALL BE 0.2 MIL (5 MICROMETERS).
- H. PROVIDE MATERIALS OF SIZE AND TYPE ADEQUATE TO CARRY THE LOADS OF EQUIPMENT AND CONDUIT, APPROXIMATE WEIGHT OF WIRE IN CONDUIT.
- I. CONDUIT HANGERS:
1. SHALL HAVE A VERTICAL LOAD LIMIT OF 100 LBS, AND A HORIZONTAL LOAD LIMIT OF 25 LBS.
2. SHALL BE AVAILABLE WITH EITHER A PLAN HOLE FOR 1/4" BOLT OR A 1/4"-TO-25 THREAD IMPRESSION.
3. SHALL BE AVAILABLE FOR 3/8" THROUGH 2" ENT, ROD, AND ALUMINUM CONDUIT.
4. SHALL BE AVAILABLE PRE-ASSEMBLED WITH MANUFACTURER'S SPECIALTY FASTENERS FOR USE IN BUILDING STRUCTURES LIKE BEAM, FLANGE, DROP WIRE/ROD, WOOD STRUCTURE, CONCRETE AND ACUSTICAL TIE GRID.
- J. WIRE ROPE HANGERS:
1. WIRE ROPE HANGER ASSEMBLIES SHALL BE MADE OF GALVANIZED STEEL.
2. HANGER SHALL MEET THE FIRE RATING REQUIREMENTS FOR DIN 4102-2 FOR 30 MINUTES AT 30 PERCENT OF RATED LOAD.
3. ROPE HANGERS SHALL HAVE A MINIMUM SAFETY FACTOR OF 5:1.
4. ROPE HANGERS ARE NOT PERMITTED TO SUPPORT CONDUITS.
5. ROPE HANGERS ARE PERMITTED TO HANG LIGHT FIXTURES, WERE APPLICABLE.
6. HANGERS SHALL BE FULLY ADJUSTABLE.

CONDUIT

- PART 1 GENERAL
- 1.01 DELIVERY, STORAGE, AND HANDLING
- A. RECEVE, INSPECT, HANDLE, AND STORE CONDUIT AND FITTINGS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. PROTECT CONDUIT FROM CORROSION AND ENTRANCE OF DEBRIS BY STORING ABOVE GRADE. PROVIDE APPROPRIATE GROUNDING AND BONDING SYSTEM.
- C. PROTECT PVC CONDUIT FROM SUNLIGHT.
- PART 2 PRODUCTS
- 2.01 CONDUIT APPLICATIONS
- A. DO NOT USE CONDUIT AND ASSOCIATED FITTINGS FOR APPLICATIONS OTHER THAN AS PERMITTED BY NFPA 70 AND PRODUCT LISTING.
- B. UNLESS OTHERWISE INDICATED AND WHERE NOT OTHERWISE RESTRICTED, USE THE CONDUIT TYPES INDICATED FOR THE SPECIFIED APPLICATIONS. WHERE MORE THAN ONE LISTED APPLICATION APPLIES, COMPLY WITH THE MOST RESTRICTIVE REQUIREMENTS. WHERE CONDUIT TYPE FOR A PARTICULAR APPLICATION IS NOT LISTED, USE GALVANIZED STEEL RIGID METAL CONDUIT.
- 2.02 CONDUIT REQUIREMENTS
- A. PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED.
- B. WHERE CONDUIT SIZE IS NOT INDICATED, SIZE TO COMPLY WITH NFPA 70 BUT NOT LESS THAN APPLICABLE MINIMUM SIZE REQUIREMENTS SPECIFIED.
- 2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)
- A. DESCRIPTION: NFPA 70, TYPE RMC GALVANIZED STEEL RIGID METAL CONDUIT COMPLYING WITH ANSI C200.1 AND LISTED AND LABELED AS COMPLYING WITH UL 6.
- B. FITTINGS:
1. NON-HAZARDOUS LOCATIONS: USE FITTINGS COMPLYING WITH NFPA 70 1 AND LISTED AND LABELED AS COMPLYING WITH UL 5148.
2. MATERIAL: USE STEEL OR MALLEABLE IRON.
3. CONNECTORS AND COUPLINGS: USE THREADED TYPE FITTINGS ONLY. THREADLESS SET SCREW AND COMPRESSION (SLAND) TYPE FITTINGS ARE NOT PERMITTED.
- 2.04 FLEXIBLE METAL CONDUIT (FMC)
- A. DESCRIPTION: NFPA 70, TYPE FMC STANDARD WALL STEEL FLEXIBLE METAL CONDUIT LISTED AND LABELED AS COMPLYING WITH UL 1, AND LISTED FOR USE IN CLASSIFIED FIRESTOP SYSTEMS TO BE USED.
- B. FITTINGS:
1. DESCRIPTION: FITTINGS COMPLYING WITH NFPA 70 1 AND LISTED AND LABELED AS COMPLYING WITH UL 5148.
2. MATERIAL: USE STEEL OR MALLEABLE IRON.
3. CONNECTORS AND COUPLINGS: USE COMPRESSION (LAND) OR SET-SCREW TYPE.
- c. DO NOT USE INDUSTRY TYPE CONNECTORS AND COUPLINGS.
- C. DESCRIPTION: ANSI C200.3; GALVANIZED TUBING.
- D. CHASES AND BONDING CONNECTIONS USING SPECIFIED CONNECTIONS.
- 2.06 ELECTRICAL NONMETALLIC TUBING (ENT)
- A. DESCRIPTION: NFPA 70, TYPE ENT ELECTRICAL NONMETALLIC TUBING COMPLYING WITH NFPA 70 13 AND LISTED AND LABELED AS COMPLYING WITH UL 1653.
- B. FITTINGS:
1. MANUFACTURER: SAME AS MANUFACTURER OF ENT TO BE CONNECTED.
2. USE SOLVENT-WELDED TYPE FITTINGS.
3. SOLVENT-WELDED FITTINGS: RIGID PVC FITTINGS COMPLYING WITH NFPA 70 3 AND LISTED AND LABELED AS COMPLYING WITH UL 851. SUITABLE FOR USE WITH ENT.
- PART 3 EXECUTION
- 3.01 EXAMINATION
- A. VERIFY THAT MOUNTING SURFACES ARE READY TO RECEIVE CONDUITS.</

