WAYNE STATE UNIVERSITY

FREER OCCUPANT THERMAL COMFORT

FREER BUILDING **FERRY STREET, DETROIT, MICHIGAN** **BUILDING NO. 511**

DiCLEMENTE SIEGEL DESIGN INC.

28105 GREENFIELD ROAD
SOUTHFIELD, MICHIGAN 48076-3046
DSD PROJECT No. 13–4806

ENGINEERS • ARCHITECTS • PLANNERS

G–1 COVER SHEET

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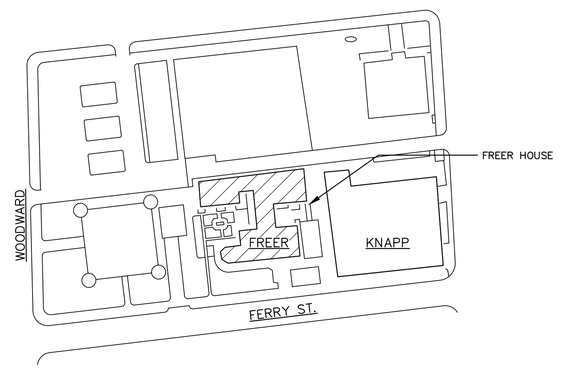

N LOCATION MAP
NOT TO SCALE

SHEET: G–01
ACADFILE: 13–4806G01
ISSUED FOR: BIDS
DATE: 07/29/15

ABBREVIATIONS

A.F.F.	ABOVE FINISHED FLOOR	F.D.	FLOOR DRAIN	QT.	QUARRY TILE
ALUM.	ALUMINUM	FIN.	FINISH	R.	RADIUS
ARCH.	ARCHITECTURAL	FL. OR FLR.	FLOOR	R.A.	RETURN AIR
ASSY.	ASSEMBLY	FRP	FLUSH FIBER REINF. POLYESTER	R.B.	RUBBER BASE
BD.	BOARD	GALV.	GALVANIZED	REFIN.	REFINISH
B.P.	BID PACKAGE	GA.	GAUGE	REINF.	REINFORCED/REINFORCING
B.F.	BARRIER FREE	GL.	GLASS OR GLAZING	REQ'D.	REQUIRED
B.O.S.	BOTTOM OF STEEL	GYP.	GYPSUM	RF.	RESILIENT FLOORING
BOT.	BOTTOM	HDWR.	HARDWARE	RM.	ROOM
BRG.	BEARING	H.M.	HOLLOW METAL	R.O.	ROUGH OPENING
C.J.	CONTROL JOINT	HORIZ.	HORIZONTAL	S.A.	SUPPLY AIR
CLG.	CEILING	H.P.	HIGH POINT	S.C.	SOLID CORE
CLR.	CLEAR	HT.	HEIGHT	S.F.	SQUARE FEET
CLOS.	CLOSET	INSUL.	INSULATION	SHT.	SHEET
CMU	CONCRETE MASONRY UNIT	INT.	INTERIOR	SIM.	SIMILAR
C.O.	CLEAN OUT	JAN.	JANITOR	SPECS.	SPECIFICATIONS
COMP.	COMPACTED	JST.	JOIST	S.S.	STAINLESS STEEL
CONC.	CONCRETE	LAM.	LAMINATE	ST.	STONE
CONSTR.	CONSTRUCTION	LAV.	LAVATORY	STL.	STEEL
CONT.	CONTINUOUS	L.P.	LOW POINT	STRUCT.	STRUCTURAL
CONTR.	CONTRACTOR	MANUF.	MANUFACTURER	SUSP.	SUSPENDED
CPT.	CARPET	MAS.	MASONRY	THK.	THICK
DET.	DETAIL	MAX.	MAXIMUM	THRU	THROUGH
DIA.	DIAMETER	MECH.	MECHANICAL	T.O.	TOP OF
DN.	DOWN	MET. OR MTL.	METAL	T.O.C.	TOP OF CURB
D.O.	DOOR OPENING	MIN.	MINIMUM	T.O. CONC.	TOP OF CONCRETE
DR.	DOOR	MTD.	MOUNTED	T&G	TONGUE AND GROOVE
DWG.	DRAWING	M.O.	MASONRY OPENING	T.S.	TUBE STEEL
E.J.	EXPANSION JOINT	N.I.C.	NOT IN CONTRACT	T.O.S.	TOP OF STEEL
ELECT.	ELECTRICAL	NON. COMB.	NON COMBUSTIBLE	TYP.	TYPICAL
EL. OR ELEV.	ELEVATION	N.T.S.	NOT TO SCALE	UNEXCAV.	UNEXCAVATED
ENG.	ENGINEER	O.C.	ON CENTER	U.O.N.	UNLESS OTHERWISE NOTED
EQ.	EQUAL	O.H.	OVERHEAD	V.C.T.	VINYL COMPOSITION TILE
EQUIP.	EQUIPMENT	OPN'G.	OPENING	VERT.	VERTICAL
E.W.C.	ELECTRIC WATER COOLER	OPP.	OPPOSITE	VEST.	VESTIBULE
EX.	EXISTING	PL.	PLATE	V.I.F.	VERIFY IN FIELD
EXP.	EXPANSION	P.LAM.	PLASTIC LAMINATE	W/	WITH
EXPD.	EXPOSED	PT.	PAINT	WD.	WOOD
EXT.	EXTERIOR	PTD.	PAINTED	W.P.	WORK POINT
		PA.	PAIR	W.W.F.	WELDED WIRE FABRIC

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
	COLUMN NUMBER IDENTIFICATION AND GRID
	SECTION IDENTIFIER
	WORK POINT / ELEVATION ABOVE FINISHED FLOOR OR GRADE
	BREAK LINE

PLAN LEGEND

SYMBOL	DESCRIPTION
	ITEM TO BE REMOVED
	GYP. BD. WALL
	EXISTING WALL TO REMAIN
	NEW DOOR
	EXISTING DOOR TO REMAIN
	DOOR TO BE REMOVED

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OVERVIEW OF ARCHITECTURAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ARCHITECTURAL:

1. DEMOLITION OF WALLS, DOORS, AND FINISH MATERIALS AND OTHER MISCELLANEOUS ARCHITECTURAL ITEMS AS INDICATED.
2. REMOVE PORTIONS OF WALLS AND FLOORS TO ACCOMMODATE MECHANICAL WORK.
3. REMOVE AND REPLACE CEILINGS AS REQUIRED FOR INSTALLATION OF MECHANICAL EQUIPMENT.
4. PROVIDE EQUIPMENT PADS AS INDICATED.
5. PROVIDE INTERIOR WALL SYSTEMS AS INDICATED.
6. PROVIDE DOORS AND HARDWARE AS INDICATED.
7. PROVIDE INTERIOR FINISHES AS INDICATED.
8. PROVIDE STEEL SUPPORTS FOR EQUIPMENT AS INDICATED.
9. PROVIDE LOUVERS AS INDICATED.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2012 MICHIGAN MECHANICAL CODE

2012 MICHIGAN PLUMBING CODE

2009 INTERNATIONAL FIRE CODE (AS REFERENCED)

2009 INTERNATIONAL FUEL GAS CODE

NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)

MICHIGAN ENERGY CODE–ASHRAE 90.1–2007

2011 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2011 MICHIGAN ELECTRICAL CODE RULES, PART 8.

2012 MICHIGAN BUILDING CODE

2012 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE CONTRACTOR SHALL BEAR ALL ADDITIONAL COSTS ASSOCIATED WITH USING EQUIPMENT AND/OR SYSTEMS BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT AND/OR SYSTEMS INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ARCHITECT THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

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These documents are two dimensional, traditional plan and specification documents that are not intended to be used by the contractor as shop drawings. Final dimensions, equipment access, routing, miscellaneous fittings, final installation and coordination is the contractor's responsibility.

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MARK	ISSUE	DATE
	BIDS	07/29/15
	BIDS	06/04/15
	FINAL REVIEW	05/28/15
	OWNER REVIEW	04/28/15

DESIGNER	DWL
DRAWN	DWL
CHECKED	JSR
DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: **FREER OCCUPANT THERMAL COMFORT**

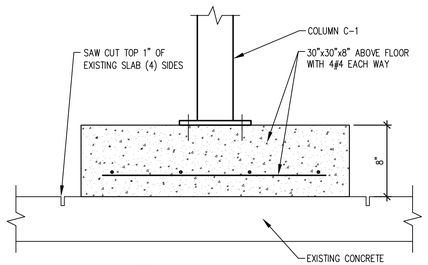
SHEET INDEX, GENERAL SYMBOLS, & ARCHITECTURAL OVERVIEW OF SCOPE

WSU PROJECT #: 511–254496–2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

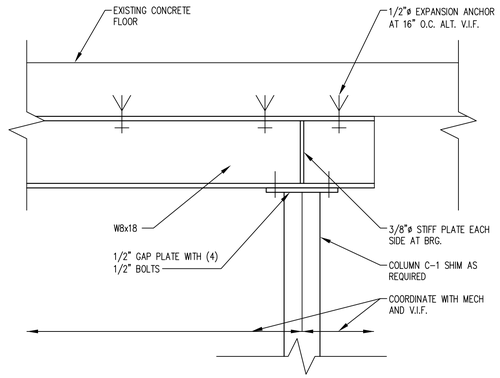
A/E PROJECT NO.
13-4806

SHEET NO.
A - 1

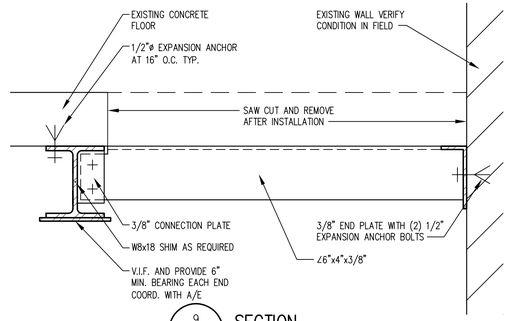
DSD FILE NAME
13–4806–A1



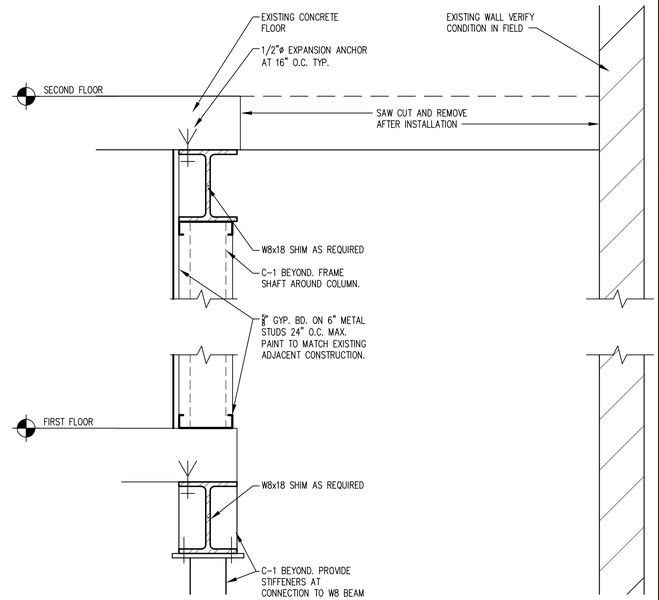
11 / A-10 **F-1**
SCALE: 1-1/2" = 1'-0"



10 / A-10 **SECTION**
SCALE: 1-1/2" = 1'-0"



9 / A-10 **SECTION**
SCALE: 1-1/2" = 1'-0"

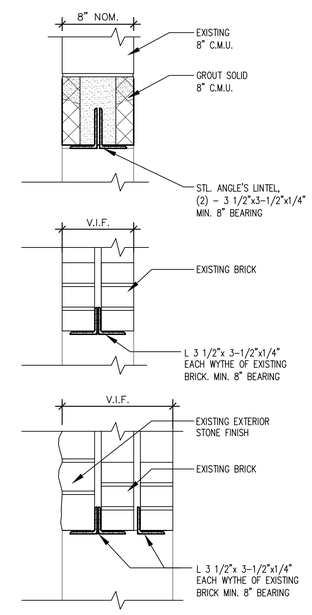


8 / A-10 **MECHANICAL OPENING**
SCALE: 1-1/2" = 1'-0"

7 / A-10 **NOT USED**
SCALE: 1" = 1'-0"

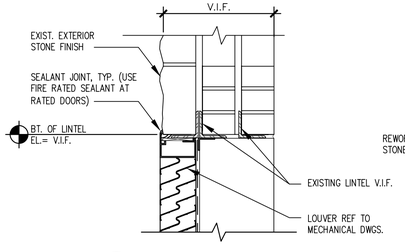
6 / A-10 **MECHANICAL SUPPORT DETAIL**
SCALE: 1/2" = 1'-0"

5 / A-10 **MECHANICAL SUPPORT DETAIL**
SCALE: 1/2" = 1'-0"

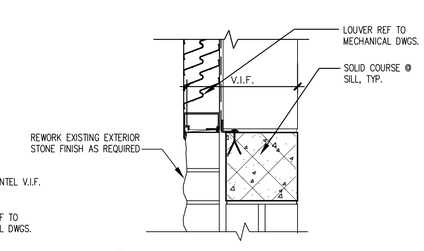


TYPICAL LINTEL DETAILS (4'-0" MAX OPENINGS)

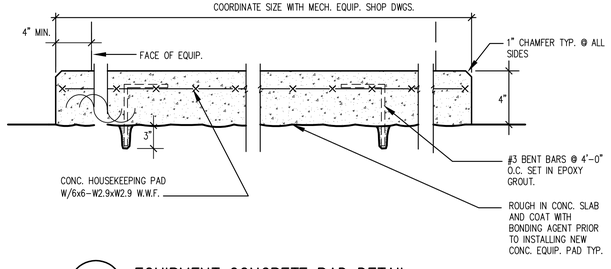
1 / A-10
SCALE: 1 1/2" = 1'-0"



4 / A-10 **LOUVER HEAD DETAIL**
SCALE: 1-1/2" = 1'-0"



3 / A-10 **LOUVER SILL DETAIL**
SCALE: 1-1/2" = 1'-0"



2 / A-10 **EQUIPMENT CONCRETE PAD DETAIL**
SCALE: 1 1/2" - 1'-0"
NOTES:
1. COORDINATE LOCATION OF PADS WITH MECHANICAL CONTRACTOR.
2. APPLY EPOXY COATING TO ALL EXPOSED CONC. SURFACES OF CONCRETE PAD.

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DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

SECTIONS AND DETAILS

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
A - 10

DSD FILE NAME
13-4806-A10

GENERAL

ALL ARCHITECTURAL WORK SHALL COMPLY WITH FOLLOWING LOCAL & STATE CODES, ORDINANCES & REGULATIONS, INCLUDING THE OCCUPATIONAL SAFETY & HEALTH ACT. (OSHA).

2012 MICHIGAN BUILDING CODE

2012 MICHIGAN MECHANICAL CODE

2003 MICHIGAN PLUMBING CODE

2009 INTERNATIONAL FIRE CODE

NFPA 101 LIFE SAFETY CODE 1997 AND 2006

ALL OTHER ORDINANCES & REGULATIONS, INCLUDING THE OCCUPATIONAL SAFETY & HEALTH ACT. (OSHA) THAT MAY APPLY

SECTION 024119 – SELECTIVE DEMOLITION

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES:
1. DEMOLITION AND REMOVAL OF SELECTED PORTIONS OF BUILDING OR STRUCTURE.
2. SALVAGE OF EXISTING ITEMS TO BE REUSED OR RECYCLED.
1.2 MATERIALS OWNERSHIP
A. UNLESS OTHERWISE INDICATED, DEMOLITION WASTE BECOMES PROPERTY OF CONTRACTOR.
B. HISTORIC ITEMS, RELICS, ANTIQUES, AND SIMILAR OBJECTS INCLUDING, BUT NOT LIMITED TO, CORNERSTONES AND THEIR CONTENTS, COMMEMORATIVE PLAQUES AND TABLETS, AND OTHER ITEMS OF INTEREST OR VALUE TO OWNER THAT MAY BE UNCOVERED DURING DEMOLITION REMAIN THE PROPERTY OF OWNER.
1. CAREFULLY SALVAGE IN A MANNER TO PREVENT DAMAGE AND PROMPTLY RETURN TO OWNER.
1.3 PREINSTALLATION MEETINGS
A. PREDEMOLITION CONFERENCE: CONDUCT CONFERENCE AT PROJECT SITE.
1.4 INFORMATIONAL SUBMITTALS
A. ENGINEERING SURVEY: SUBMIT ENGINEERING SURVEY OF CONDITION OF BUILDING.
B. PROPOSED PROTECTION MEASURES: SUBMIT REPORT, INCLUDING DRAWINGS, THAT INDICATES THE MEASURES PROPOSED FOR PROTECTING INDIVIDUALS AND PROPERTY, FOR ENVIRONMENTAL PROTECTION, FOR DUST CONTROL AND, FOR NOISE CONTROL. INDICATE PROPOSED LOCATIONS AND CONSTRUCTION OF BARRIERS.
C. SCHEDULE OF SELECTIVE DEMOLITION ACTIVITIES WITH STARTING AND ENDING DATES FOR EACH ACTIVITY.
D. PREDEMOLITION PHOTOGRAPHS OR VIDEO.
1.5 CLOSEOUT SUBMITTALS
A. INVENTORY OF ITEMS THAT HAVE BEEN REMOVED AND SALVAGED.
1.6 FIELD CONDITIONS
A. OWNER WILL OCCUPY PORTIONS OF BUILDING IMMEDIATELY ADJACENT TO SELECTIVE DEMOLITION AREA. CONDUCT SELECTIVE DEMOLITION SO OWNER'S OPERATIONS WILL NOT BE DISRUPTED.
B. CONDITIONS EXISTING AT TIME OF INSPECTION FOR BIDDING PURPOSE WILL BE MAINTAINED BY OWNER AS FAR AS PRACTICAL.
C. NOTIFY ARCHITECT OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DRAWINGS BEFORE PROCEEDING WITH SELECTIVE DEMOLITION.
D. HAZARDOUS MATERIALS: IT IS NOT EXPECTED THAT HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK.
1. HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER BEFORE START OF THE WORK.
2. IF SUSPECTED HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; IMMEDIATELY NOTIFY ARCHITECT AND OWNER. HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER UNDER A SEPARATE CONTRACT.
E. STORAGE OR SALE OF REMOVED ITEMS OR MATERIALS ON-SITE IS NOT PERMITTED.
F. UTILITY SERVICE: MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS.
1. MAINTAIN FIRE-PROTECTION FACILITIES IN SERVICE DURING SELECTIVE DEMOLITION OPERATIONS.
G. ARRANGE SELECTIVE DEMOLITION SCHEDULE SO AS NOT TO INTERFERE WITH OWNER'S OPERATIONS.
1.7 WARRANTY
A. EXISTING WARRANTIES: REMOVE, REPLACE, PATCH, AND REPAIR MATERIALS AND SURFACES CUT OR DAMAGED DURING SELECTIVE DEMOLITION, BY METHODS AND WITH MATERIALS AND USING APPROVED CONTRACTORS SO AS NOT TO VOID EXISTING WARRANTIES.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. REGULATORY REQUIREMENTS: COMPLY WITH GOVERNING EPA NOTIFICATION REGULATIONS BEFORE BEGINNING SELECTIVE DEMOLITION. COMPLY WITH HAULING AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
B. STANDARDS: COMPLY WITH ASSE A10.6 AND NFPA 241.

PART 3 – EXECUTION

3.1 EXAMINATION
A. VERIFY THAT UTILITIES HAVE BEEN DISCONNECTED AND CAPPED BEFORE STARTING SELECTIVE DEMOLITION OPERATIONS.
B. PERFORM AN ENGINEERING SURVEY OF CONDITION OF BUILDING TO DETERMINE WHETHER REMOVING ANY ELEMENT MIGHT RESULT IN STRUCTURAL DEFICIENCY OR UNPLANNED COLLAPSE OF ANY PORTION OF STRUCTURE OR ADJACENT STRUCTURES DURING SELECTIVE BUILDING DEMOLITION OPERATIONS.
C. INVENTORY AND RECORD THE CONDITION OF ITEMS TO BE REMOVED AND SALVAGED.
3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS
A. EXISTING SERVICES/SYSTEMS TO REMAIN: MAINTAIN SERVICES/SYSTEMS INDICATED TO REMAIN AND PROTECT THEM AGAINST DAMAGE.
B. EXISTING SERVICES/SYSTEMS TO BE REMOVED, RELOCATED, OR ABANDONED: LOCATE, IDENTIFY, DISCONNECT, AND SEAL OR CAP OFF UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS SERVING AREAS TO BE SELECTIVELY DEMOLISHED.
1. OWNER WILL ARRANGE TO SHUT OFF INDICATED SERVICES/SYSTEMS WHEN REQUESTED BY CONTRACTOR.
2. IF SERVICES/SYSTEMS ARE REQUIRED TO BE REMOVED, RELOCATED, OR ABANDONED, PROVIDE TEMPORARY SERVICES/SYSTEMS THAT BYPASS AREA OF SELECTIVE DEMOLITION AND THAT MAINTAIN CONTINUITY OF SERVICES/SYSTEMS TO OTHER PARTS OF BUILDING.
3. DISCONNECT, DEMOLISH, AND REMOVE FIRE-SUPPRESSION SYSTEMS, PLUMBING, AND HVAC SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED ON DRAWINGS TO BE REMOVED.
a. PIPING TO BE REMOVED: REMOVE PORTION OF PIPING INDICATED TO BE REMOVED AND CAP OR PLUG REMAINING PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
b. PIPING TO BE ABANDONED IN PLACE: DRAIN PIPING AND CAP OR PLUG PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL AND LEAVE IN PLACE.
c. EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT.
d. EQUIPMENT TO BE REMOVED AND REINSTALLED: DISCONNECT AND CAP SERVICES AND REMOVE, CLEAN, AND STORE EQUIPMENT; WHEN APPROPRIATE, REINSTALL, RECONNECT, AND MAKE EQUIPMENT OPERATIONAL.
e. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT AND DELIVER TO OWNER.
f. DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED AND PLUG REMAINING DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL.
g. DUCTS TO BE ABANDONED IN PLACE: CAP OR PLUG DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL AND LEAVE IN PLACE.
3.3 PROTECTION
A. TEMPORARY PROTECTION: PROVIDE TEMPORARY BARRICADES AND OTHER PROTECTION REQUIRED TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDINGS AND FACILITIES TO REMAIN.
B. TEMPORARY SHORING: DESIGN, PROVIDE, AND MAINTAIN SHORING, BRACING, AND STRUCTURAL SUPPORTS AS REQUIRED TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF CONSTRUCTION AND FINISHES TO REMAIN, AND TO PREVENT UNEXPECTED OR UNCONTROLLED MOVEMENT OR COLLAPSE OF CONSTRUCTION BEING DEMOLISHED.
C. REMOVE TEMPORARY BARRICADES AND PROTECTIONS WHERE HAZARDS NO LONGER EXIST.
3.4 SELECTIVE DEMOLITION
A. GENERAL: DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE THE WORK WITHIN LIMITATIONS OF GOVERNING REGULATIONS AND AS FOLLOWS:
1. NEATLY CUT OPENINGS AND HOLES PLUMB, SQUARE, AND TRUE TO DIMENSIONS REQUIRED. USE CUTTING METHODS LEAST LIKELY TO DAMAGE CONSTRUCTION TO REMAIN OR ADJOINING CONSTRUCTION. USE HAND TOOLS OR SMALL POWER TOOLS DESIGNED FOR SAWING OR GRINDING, NOT HAMMERING AND CHOPPING. TEMPORARILY COVER OPENINGS TO REMAIN.
2. CUT OR DRILL FROM THE EXPOSED OR FINISHED SIDE INTO CONCEALED SURFACES TO AVOID MARRING EXISTING FINISHED SURFACES.
3. DO NOT USE CUTTING TORCHES UNTIL WORK AREA IS CLEARED OF FLAMMABLE MATERIALS. AT CONCEALED SPACES, SUCH AS DUCT AND PIPE INTERIORS, VERIFY CONDITION AND CONTENTS OF HIDDEN SPACE BEFORE STARTING FLAME-CUTTING OPERATIONS. MAINTAIN PORTABLE FIRE-SUPPRESSION DEVICES DURING FLAME-CUTTING OPERATIONS.
4. MAINTAIN FIRE WATCH DURING AND FOR AT LEAST 2 HOURS AFTER FLAME-CUTTING OPERATIONS.
5. LOCATE SELECTIVE DEMOLITION EQUIPMENT AND REMOVE DEBRIS AND MATERIALS SO AS NOT TO IMPOSE EXCESSIVE LOADS ON SUPPORTING WALLS, FLOORS, OR FRAMING.
6. DISPOSE OF DEMOLISHED ITEMS AND MATERIALS PROMPTLY.
7. SITE ACCESS AND TEMPORARY CONTROLS: CONDUCT SELECTIVE DEMOLITION AND DEBRIS-REMOVAL OPERATIONS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS, WALKWAYS, AND OTHER ADJACENT OCCUPIED AND USED FACILITIES.
B. REMOVED AND SALVAGED ITEMS:
1. CLEAN SALVAGED ITEMS.
2. PACK OR CRATE ITEMS AFTER CLEANING. IDENTIFY CONTENTS OF CONTAINERS.
3. STORE ITEMS IN A SECURE AREA UNTIL DELIVERY TO OWNER.
4. TRANSPORT ITEMS TO OWNER'S STORAGE AREA DESIGNATED BY OWNER.
5. PROTECT ITEMS FROM DAMAGE DURING TRANSPORT AND STORAGE.
C. REMOVED AND REINSTALLED ITEMS:
1. CLEAN AND REPAIR ITEMS TO FUNCTIONAL CONDITION ADEQUATE FOR INTENDED REUSE.
2. PACK OR CRATE ITEMS AFTER CLEANING AND REPAIRING. IDENTIFY CONTENTS OF CONTAINERS.
3. PROTECT ITEMS FROM DAMAGE DURING TRANSPORT AND STORAGE.
4. REINSTALL ITEMS IN LOCATIONS INDICATED. COMPLY WITH INSTALLATION REQUIREMENTS FOR NEW MATERIALS AND EQUIPMENT. PROVIDE CONNECTIONS, SUPPORTS, AND MISCELLANEOUS MATERIALS NECESSARY TO MAKE ITEM FUNCTIONAL FOR USE INDICATED.
D. EXISTING ITEMS TO REMAIN: PROTECT CONSTRUCTION INDICATED TO REMAIN AGAINST DAMAGE AND SOILING DURING SELECTIVE DEMOLITION. WHEN PERMITTED BY OWNER, ITEMS MAY BE REMOVED TO A SUITABLE, PROTECTED STORAGE LOCATION DURING SELECTIVE DEMOLITIONAND REINSTALLED IN THEIR ORIGINAL LOCATIONS AFTER SELECTIVE DEMOLITION OPERATIONS ARE COMPLETE.
3.5 CLEANING
A. REMOVE DEMOLITION WASTE MATERIALS FROM PROJECT SITE AND DISPOSE OF THEM IN AN EPA-APPROVED CONSTRUCTION AND DEMOLITION WASTE LANDFILL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
1. DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON-SITE.
2. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.
3. REMOVE DEBRIS FROM ELEVATED PORTIONS OF BUILDING BY CHUTE, HOIST, OR OTHER DEVICE THAT WILL CONVEY DEBRIS TO GRADE LEVEL IN A CONTROLLED DESCENT.
B. BURNING: DO NOT BURN DEMOLISHED MATERIALS.
C. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE SELECTIVE DEMOLITION OPERATIONS BEGAN.

END OF SECTION 024119

SECTION 033053 – MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES CAST-IN-PLACE CONCRETE, INCLUDING REINFORCEMENT, CONCRETE MATERIALS, MIXTURE DESIGN, PLACEMENT PROCEDURES, AND FINISHES.
1.2 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.
B. DESIGN MIXTURES: FOR EACH CONCRETE MIXTURE.
1.3 QUALITY ASSURANCE
A. READY-MIX-CONCRETE MANUFACTURER QUALIFICATIONS: A FIRM EXPERIENCED IN MANUFACTURING READY-MIXED CONCRETE PRODUCTS AND THAT COMPLIES WITH ASTM C 94/C 94M REQUIREMENTS FOR PRODUCTION FACILITIES AND EQUIPMENT.

PART 2 – PRODUCTS

2.1 CONCRETE, GENERAL
A. COMPLY WITH ACI 301.
B. COMPLY WITH ACI 117.
2.2 STEEL REINFORCEMENT
A. REINFORCING BARS: ASTM A 615/A 615M, GRADE 60, DEFORMED.
B. PLAIN-STEEL WELDED-WIRE REINFORCEMENT: ASTM A 1064/A 1064M, PLAIN, FABRICATED FROM AS-DRAWN STEEL WIRE INTO FLAT SHEETS.
2.3 CONCRETE MATERIALS
A. CEMENTITIOUS MATERIALS:
1. PORTLAND CEMENT: ASTM C 150/C 150M, TYPE I.
B. NORMAL-WEIGHT AGGREGATE: ASTM C 33/C 33M, 1-1/2-INCH NOMINAL MAXIMUM AGGREGATE SIZE.
C. AIR-ENTRAINING ADMIXTURE: ASTM C 260/C 260M.
D. WATER: ASTM C 94/C 94M.
2.4 CURING MATERIALS
A. ABSORPTIVE COVER: AASHTO M 182, CLASS 3, BURLAP CLOTH OR COTTON MATS.
B. WATER: POTABLE.
2.5 CONCRETE MIXTURES
A. NORMAL-WEIGHT CONCRETE:
1. MINIMUM COMPRESSIVE STRENGTH: 3500 PSI AT 28 DAYS.
2. SLUMP LIMIT: 4 INCHES, PLUS OR MINUS 1 INCH.
3. AIR CONTENT: MAINTAIN WITHIN RANGE PERMITTED BY ACI 301.
2.6 CONCRETE MIXING
A. READY-MIXED CONCRETE: MEASURE, BATCH, MIX, AND DELIVER CONCRETE ACCORDING TO ASTM C 94/C 94M, AND FURNISH BATCH TICKET INFORMATION.
1. WHEN AIR TEMPERATURE IS ABOVE 90 DEG F, REDUCE MIXING AND DELIVERY TIME TO 60 MINUTES.

PART 3 – EXECUTION

3.1 FORMWORK INSTALLATION
A. DESIGN, CONSTRUCT, ERECT, BRACE, AND MAINTAIN FORMWORK ACCORDING TO ACI 301.
3.2 EMBEDDED ITEM INSTALLATION
A. PLACE AND SECURE ANCHORAGE DEVICES AND OTHER EMBEDDED ITEMS REQUIRED FOR ADJOINING WORK THAT IS ATTACHED TO OR SUPPORTED BY CAST-IN-PLACE CONCRETE. USE SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.
3.3 STEEL REINFORCEMENT INSTALLATION
A. COMPLY WITH CRSI'S "MANUAL OF STANDARD PRACTICE" FOR FABRICATING, PLACING, AND SUPPORTING REINFORCEMENT.
3.4 CONCRETE PLACEMENT
A. BEFORE TEST SAMPLING AND PLACING CONCRETE, WATER MAY BE ADDED AT PROJECT SITE, SUBJECT TO LIMITATIONS OF ACI 301.
B. CONSOLIDATE CONCRETE WITH MECHANICAL VIBRATING EQUIPMENT ACCORDING TO ACI 301.
3.5 FINISHING FORMED SURFACES
A. ROUGH-FORMED FINISH: AS-CAST CONCRETE TEXTURE IMPARTED BY FORM-FACING MATERIAL WITH TIE HOLES AND DEFECTS REPAIRED AND PATCHED. REMOVE FINS AND OTHER PROJECTIONS EXCEEDING 1/2 INCH.
B. RELATED UNFORMED SURFACES: AT TOPS OF WALLS, HORIZONTAL OFFSETS, AND SIMILAR UNFORMED SURFACES ADJACENT TO FORMED SURFACES, STRIKE OFF SMOOTH AND FINISH WITH A TEXTURE MATCHING ADJACENT FORMED SURFACES. CONTINUE FINAL SURFACE TREATMENT OF FORMED SURFACES UNIFORMLY ACROSS ADJACENT UNFORMED SURFACES UNLESS OTHERWISE INDICATED.
3.6 FINISHING UNFORMED SURFACES
A. GENERAL: COMPLY WITH ACI 302.1R FOR SCREEDING, RESTRAIGHTENING, AND FINISHING OPERATIONS FOR CONCRETE SURFACES. DO NOT WET CONCRETE SURFACES.
B. TROWEL FINISH: APPLY A HARD TROWEL FINISH TO SURFACES INDICATED AND TO FLOOR AND SLAB SURFACES EXPOSED TO VIEW OR TO BE COVERED WITH RESILIENT FLOORING, CARPET, CERAMIC OR QUARRY TILE SET OVER A CLEAVAGE MEMBRANE, PAINT, OR ANOTHER THIN FILM-FINISH COATING SYSTEM.
3.7 CONCRETE PROTECTING AND CURING
A. GENERAL: PROTECT FRESHLY PLACED CONCRETE FROM PREMATURE DRYING AND EXCESSIVE COLD OR HOT TEMPERATURES. COMPLY WITH ACI 306.1 FOR COLD-WEATHER PROTECTION AND WITH ACI 301 FOR HOT-WEATHER PROTECTION DURING CURING.
B. BEGIN CURING AFTER FINISHING CONCRETE BUT NOT BEFORE FREE WATER HAS DISAPPEARED FROM CONCRETE SURFACE.
C. CURING METHODS: CURE FORMED AND UNFORMED CONCRETE FOR AT LEAST SEVEN DAYS BY ONE OR A COMBINATION OF THE FOLLOWING METHODS:
1. MOISTURE CURING: KEEP SURFACES CONTINUOUSLY MOIST FOR NOT LESS THAN SEVEN DAYS WITH THE FOLLOWING MATERIALS:
a. WATER.
b. CONTINUOUS WATER-FOG SPRAY.
c. ABSORPTIVE COVER, WATER SATURATED, AND KEPT CONTINUOUSLY WET. COVER CONCRETE SURFACES AND EDGES WITH 12-INCH LAP OVER ADJACENT ABSORPTIVE COVERS.
2. MOISTURE-RETAINING-COVER CURING: COVER CONCRETE SURFACES WITH MOISTURE-RETAINING COVER FOR CURING CONCRETE, PLACED IN WIDEST PRACTICABLE WIDTH, WITH SIDES AND ENDS LAPPED AT LEAST 12 INCHES, AND SEALED BY WATERPROOF TAPE OR ADHESIVE. CURE FOR NOT LESS THAN SEVEN DAYS. IMMEDIATELY REPAIR ANY HOLES OR TEARS DURING CURING PERIOD, USING COVER MATERIAL AND WATERPROOF TAPE.

END OF SECTION 033053

SECTION 055000 – METAL FABRICATIONS

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES:
1. MISCELLANEOUS STEEL FRAMING AND SUPPORTS.
2. SHELF ANGLES.
3. LOOSE BEARING AND LEVELING PLATES.
B. PRODUCTS FURNISHED, BUT NOT INSTALLED, UNDER THIS SECTION INCLUDE THE FOLLOWING:
1. LOOSE STEEL LINTELS.
1.2 ACTION SUBMITTALS
A. SHOP DRAWINGS: SHOW FABRICATION AND INSTALLATION DETAILS.

PART 2 – PRODUCTS

2.1 METALS
A. METAL SURFACES, GENERAL: PROVIDE MATERIALS WITH SMOOTH, FLAT SURFACES UNLESS OTHERWISE INDICATED. FOR METAL FABRICATIONS EXPOSED TO VIEW IN THE COMPLETED WORK, PROVIDE MATERIALS WITHOUT SEAM MARKS, ROLLER MARKS, ROLLED TRADE NAMES, OR BLEMISHES.
B. STEEL PLATES, SHAPES, AND BARS: ASTM A 36/A 36M.
C. ROLLED-STEEL FLOOR PLATE: ASTM A 786/A 786M, ROLLED FROM PLATE COMPLYING WITH ASTM A 36/A 36M OR ASTM A 283/A 283M, GRADE C OR D.
D. STEEL TUBING: ASTM A 500/A 500M, COLD-FORMED STEEL TUBING.
E. STEEL PIPE: ASTM A 53/A 53M, STANDARD WEIGHT (SCHEDULE 40) UNLESS OTHERWISE INDICATED.
F. SLOTTED CHANNEL FRAMING: COLD-FORMED METAL BOX CHANNELS (STRUTS) COMPLYING WITH MFMA-4.
1. SIZE OF CHANNELS: AS INDICATED.
2. MATERIAL: COLD-ROLLED STEEL, ASTM A 1008/A 1008M, COMMERCIAL STEEL TYPE B MINIMUM THICKNESS; COATED WITH RUST-INHIBITIVE, BAKED-ON, ACRYLIC ENAMEL.
2.2 FASTENERS
A. CAST-IN-PLACE ANCHORS IN CONCRETE: EITHER THREADED TYPE OR WEDGE TYPE UNLESS OTHERWISE INDICATED; GALVANIZED FERROUS CASTINGS, EITHER ASTM A 47/A 47M MALLEABLE IRON OR ASTM A 27/A 27M CAST STEEL. PROVIDE BOLTS, WASHERS, AND SHIMS AS NEEDED, ALL HOT-DIP GALVANIZED PER ASTM F 2329.
B. POST-INSTALLED ANCHORS: TORQUE-CONTROLLED EXPANSION ANCHORS.
1. MATERIAL FOR INTERIOR LOCATIONS: CARBON-STEEL COMPONENTS ZINC PLATED TO COMPLY WITH ASTM B 633 OR ASTM F 1941, CLASS FE/ZN 5, UNLESS OTHERWISE INDICATED.
C. SLOTTED-CHANNEL INSERTS: COLD-FORMED, HOT-DIP GALVANIZED-STEEL BOX CHANNELS (STRUTS) COMPLYING WITH MFMA-4, 1-5/8 BY 7/8 INCHES BY LENGTH INDICATED WITH ANCHOR STRAPS OR STUDS NOT LESS THAN 3 INCHES LONG AT NOT MORE THAN 8 INCHES O.C. PROVIDE WITH TEMPORARY FILLER AND TEE-HEAD BOLTS, COMPLETE WITH WASHERS AND NUTS, ALL ZINC-PLATED TO COMPLY WITH ASTM B 633, CLASS FE/ZN 5, AS NEEDED FOR FASTENING TO INSERTS.
2.3 MISCELLANEOUS MATERIALS
A. UNIVERSAL SHOP PRIMER: FAST-CURING, LEAD- AND CHROMATE-FREE, UNIVERSAL MODIFIED-ALKYD PRIMER COMPLYING WITH MPI#79 AND COMPATIBLE WITH TOPCOAT.
1. USE PRIMER CONTAINING PIGMENTS THAT MAKE IT EASILY DISTINGUISHABLE FROM ZINC-RICH PRIMER.
B. NONSHRINK, NONMETALLIC GROUT: FACTORY-PACKAGED, NONSTAINING, NONCORROSIVE, NONGASEOUS GROUT COMPLYING WITH ASTM C 1107/C 1107M. PROVIDE GROUT SPECIFICALLY RECOMMENDED BY MANUFACTURER FOR INTERIOR AND EXTERIOR APPLICATIONS.
2.4 FABRICATION, GENERAL
A. SHOP ASSEMBLY: PREASSEMBLE ITEMS IN THE SHOP TO GREATEST EXTENT POSSIBLE. USE CONNECTIONS THAT MAINTAIN STRUCTURAL VALUE OF JOINED PIECES.
B. CUT, DRILL, AND PUNCH METALS CLEANLY AND ACCURATELY. REMOVE BURRS AND EASE EDGES. REMOVE SHARP OR ROUGH AREAS ON EXPOSED SURFACES.
C. WELD CORNERS AND SEAMS CONTINUOUSLY TO COMPLY WITH THE FOLLOWING:
1. USE MATERIALS AND METHODS THAT MINIMIZE DISTORTION AND DEVELOP STRENGTH AND CORROSION RESISTANCE OF BASE METALS.
2. OBTAIN FUSION WITHOUT UNDERCUT OR OVERLAP.
3. REMOVE WELDING FLUX IMMEDIATELY.
4. AT EXPOSED CONNECTIONS, FINISH EXPOSED WELDS AND SURFACES SMOOTH AND BLENDED.
D. FORM EXPOSED CONNECTIONS WITH HAIRLINE JOINTS, FLUSH AND SMOOTH, USING CONCEALED FASTENERS OR WELDS WHERE POSSIBLE. LOCATE JOINTS WHERE LEAST CONSPICUOUS.
E. FABRICATE SEAMS AND OTHER CONNECTIONS THAT ARE EXPOSED TO WEATHER IN A MANNER TO EXCLUDE WATER. PROVIDE WEEP HOLES WHERE WATER MAY ACCUMULATE.
F. WHERE UNITS ARE INDICATED TO BE CAST INTO CONCRETE OR BUILT INTO MASONRY, EQUIP WITH INTEGRALLY WELDED STEEL STRAP ANCHORS NOT LESS THAN 8 INCHES FROM ENDS AND CORNERS OF UNITS AND 24 INCHES O.C.
2.5 MISCELLANEOUS FRAMING AND SUPPORTS
A. GENERAL: PROVIDE STEEL FRAMING AND SUPPORTS NOT SPECIFIED IN OTHER SECTIONS AS NEEDED TO COMPLETE THE WORK.
B. FABRICATE UNITS FROM STEEL SHAPES, PLATES, AND BARS OF WELDED CONSTRUCTION UNLESS OTHERWISE INDICATED. FABRICATE TO SIZES, SHAPES, AND PROFILES INDICATED AND AS NECESSARY TO RECEIVE ADJACENT CONSTRUCTION.
2.6 SHELF ANGLES
A. FABRICATE SHELF ANGLES FROM STEEL ANGLES OF SIZES INDICATED AND FOR ATTACHMENT TO CONCRETE FRAMING. PROVIDE HORIZONTALLY SLOTTED HOLES TO RECEIVE 3/4-INCH BOLTS, SPACED NOT MORE THAN 6 INCHES FROM ENDS AND 24 INCHES O.C., UNLESS OTHERWISE INDICATED.
2.7 LOOSE BEARING AND LEVELING PLATES
A. PROVIDE LOOSE BEARING AND LEVELING PLATES FOR STEEL ITEMS BEARING ON MASONRY OR CONCRETE CONSTRUCTION. DRILL PLATES TO RECEIVE ANCHOR BOLTS AND FOR GROUTING.
2.8 LOOSE STEEL LINTELS
A. FABRICATE LOOSE STEEL LINTELS FROM STEEL ANGLES AND SHAPES OF SIZE INDICATED FOR OPENINGS AND RECESSES IN MASONRY WALLS AND PARTITIONS AT LOCATIONS INDICATED.
B. GALVANIZE LOOSE STEEL LINTELS LOCATED IN EXTERIOR WALLS.
C. PRIME LOOSE STEEL LINTELS LOCATED IN EXTERIOR WALLS WITH ZINC-RICH PRIMER.
2.9 STEEL WELD PLATES AND ANGLES
A. PROVIDE STEEL WELD PLATES AND ANGLES NOT SPECIFIED IN OTHER SECTIONS, FOR ITEMS SUPPORTED FROM CONCRETE CONSTRUCTION AS NEEDED TO COMPLETE THE WORK. PROVIDE EACH UNIT WITH NO FEWER THAN TWO INTEGRALLY WELDED STEEL STRAP ANCHORS FOR EMBEDDING IN CONCRETE.
2.10 FINISHES, GENERAL
A. FINISH METAL FABRICATIONS AFTER ASSEMBLY.
2.11 STEEL AND IRON FINISHES
A. SHOP PRIMING: APPLY SHOP PRIMER TO COMPLY WITH SSPC-PA 1, "PAINT APPLICATION SPECIFICATION NO. 1: SHOP, FIELD, AND MAINTENANCE PAINTING OF STEEL," FOR SHOP PAINTING.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL
A. CUTTING, FITTING, AND PLACEMENT: PERFORM CUTTING, DRILLING, AND FITTING REQUIRED FOR INSTALLING METAL FABRICATIONS. SET METAL FABRICATIONS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION; WITH EDGES AND SURFACES LEVEL, PLUMB, TRUE, AND FREE OF RACK; AND MEASURED FROM ESTABLISHED LINES AND LEVELS.
B. FIT EXPOSED CONNECTIONS ACCURATELY TOGETHER TO FORM HAIRLINE JOINTS. WELD CONNECTIONS THAT ARE NOT TO BE LEFT AS EXPOSED JOINTS BUT CANNOT BE SHOP WELDED BECAUSE OF SHIPPING SIZE LIMITATIONS. DO NOT WELD, CUT, OR ABRADE SURFACES OF EXTERIOR UNITS THAT HAVE BEEN HOT-DIP GALVANIZED AFTER FABRICATION AND ARE FOR BOLTED OR SCREWED FIELD CONNECTIONS.
C. FIELD WELDING: COMPLY WITH THE FOLLOWING REQUIREMENTS:
1. USE MATERIALS AND METHODS THAT MINIMIZE DISTORTION AND DEVELOP STRENGTH AND CORROSION RESISTANCE OF BASE METALS.
2. OBTAIN FUSION WITHOUT UNDERCUT OR OVERLAP.
3. REMOVE WELDING FLUX IMMEDIATELY.
4. AT EXPOSED CONNECTIONS, FINISH EXPOSED WELDS AND SURFACES SMOOTH AND BLENDED SO NO ROUGHNESS SHOWS AFTER FINISHING AND CONTOUR OF WELDED SURFACE MATCHES THAT OF ADJACENT SURFACE.
D. FASTENING TO IN-PLACE CONSTRUCTION: PROVIDE ANCHORAGE DEVICES AND FASTENERS WHERE METAL FABRICATIONS ARE REQUIRED TO BE FASTENED TO IN-PLACE CONSTRUCTION.
E. PROVIDE TEMPORARY BRACING OR ANCHORS IN FORMWORK FOR ITEMS THAT ARE TO BE BUILT INTO CONCRETE, MASONRY, OR SIMILAR CONSTRUCTION.
3.2 INSTALLING BEARING AND LEVELING PLATES
A. CLEAN CONCRETE AND MASONRY BEARING SURFACES OF BOND-REDUCING MATERIALS, AND ROUGHEN TO IMPROVE BOND TO SURFACES. CLEAN BOTTOM SURFACE OF PLATES.
B. SET BEARING AND LEVELING PLATES ON WEDGES, SHIMS, OR LEVELING NUTS. AFTER BEARING MEMBERS HAVE BEEN POSITIONED AND PLUMBED, TIGHTEN ANCHOR BOLTS. DO NOT REMOVE WEDGES OR SHIMS BUT, IF PROTRUDING, CUT OFF FLUSH WITH EDGE OF BEARING PLATE BEFORE PACKING WITH NONSHRINK GROUT. PACK GROUT SOLIDLY BETWEEN BEARING SURFACES AND PLATES TO ENSURE THAT NO VOIDS REMAIN.
3.3 ADJUSTING AND CLEANING
A. TOUCHUP PAINTING: IMMEDIATELY AFTER ERECTION, CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRADED AREAS. PAINT UNCOATED AND ABRADED AREAS WITH THE SAME MATERIAL AS USED FOR SHOP PAINTING TO COMPLY WITH SSPC-PA 1 FOR TOUCHING UP SHOP-PAINTED SURFACES.

END OF SECTION 055000

SECTION 055313 – BAR GRATINGS

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES METAL BAR GRATINGS.
1.2 ACTION SUBMITTALS
A. SHOP DRAWINGS: INCLUDE PLANS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. STRUCTURAL PERFORMANCE: GRATINGS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND THE FOLLOWING LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED:
1. WALKWAYS AND ELEVATED PLATFORMS OTHER THAN EXITS: UNIFORM LOAD OF 60 LBF/SQ. FT..
2. LIMIT DEFLECTION TO L/360 OR 1/4 INCH, WHICHEVER IS LESS.
2.2 METAL BAR GRATINGS
A. METAL BAR GRATING STANDARDS: COMPLY WITH NAAMM MBG 531, "METAL BAR GRATING MANUAL.
2.3 ALUMINUM
A. GENERAL: PROVIDE ALLOY AND TEMPER RECOMMENDED BY ALUMINUM PRODUCER FOR TYPE OF USE INDICATED, WITH NOT LESS THAN THE STRENGTH AND DURABILITY PROPERTIES OF ALLOY, AND TEMPER DESIGNATED BELOW FOR EACH ALUMINUM FORM REQUIRED.
B. EXTRUDED BARS AND SHAPES: ASTM B 221, ALLOYS AS FOLLOWS:
1. 6061-T6 OR 6063-T6, FOR BEARING BARS OF GRATINGS AND SHAPES.
2. 6061-T1, FOR GRATING CROSSBARS.
2.4 FASTENERS
A. GENERAL: UNLESS OTHERWISE INDICATED, PROVIDE TYPE 304 STAINLESS-STEEL FASTENERS FOR EXTERIOR USE AND ZINC-PLATED FASTENERS WITH COATING COMPLYING WITH ASTM B 633 OR ASTM F 1941, CLASS FE/ZN 5, AT EXTERIOR WALLS. SELECT FASTENERS FOR TYPE, GRADE, AND CLASS REQUIRED.
1. PROVIDE STAINLESS-STEEL FASTENERS FOR FASTENING ALUMINUM.
2.5 FABRICATION
A. CUT, DRILL, AND PUNCH MATERIAL CLEANLY AND ACCURATELY. REMOVE BURRS AND EASE EDGES TO A RADIUS OF APPROXIMATELY 1/32 INCH UNLESS OTHERWISE INDICATED. REMOVE SHARP OR ROUGH AREAS ON EXPOSED SURFACES.
B. FIT EXPOSED CONNECTIONS ACCURATELY TOGETHER TO FORM HAIRLINE JOINTS.
2.6 ALUMINUM FINISHES
A. CLEAR ANODIC FINISH: AAMA 611, AA-M12C22A41, CLASS I.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL
A. CUTTING, FITTING, AND PLACEMENT: PERFORM CUTTING, DRILLING, AND FITTING REQUIRED FOR INSTALLING GRATINGS. SET UNITS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION; MEASURED FROM ESTABLISHED LINES AND LEVELS AND FREE OF RACK.
B. FIT EXPOSED CONNECTIONS ACCURATELY TOGETHER TO FORM HAIRLINE JOINTS.
C. CORROSION PROTECTION: COAT CONCEALED SURFACES OF ALUMINUM THAT WILL COME INTO CONTACT WITH GROUT, CONCRETE, MASONRY, WOOD, OR DISSIMILAR METALS, WITH A HEAVY COAT OF BITUMINOUS PAINT.
3.2 INSTALLING METAL BAR GRATINGS
A. GENERAL: INSTALL GRATINGS TO COMPLY WITH RECOMMENDATIONS OF REFERENCED METAL BAR GRATING STANDARDS THAT APPLY TO GRATING TYPES AND BAR SIZES INDICATED, INCLUDING INSTALLATION CLEARANCES AND STANDARD ANCHORING DETAILS.
B. ATTACH REMOVABLE UNITS TO SUPPORTING MEMBERS WITH TYPE AND SIZE OF CLIPS AND FASTENERS INDICATED OR, IF NOT INDICATED, AS RECOMMENDED BY GRATING MANUFACTURER FOR TYPE OF INSTALLATION CONDITIONS SHOWN.
C. ATTACH NONREMOVABLE UNITS TO SUPPORTING MEMBERS BY WELDING WHERE BOTH MATERIALS ARE SAME; OTHERWISE, FASTEN BY BOLTING AS INDICATED ABOVE.
3.3 ADJUSTING AND CLEANING
A. TOUCHUP PAINTING: IMMEDIATELY AFTER ERECTION, CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRADED AREAS OF SHOP PAINT AND PAINT EXPOSED AREAS WITH SAME MATERIAL AS USED FOR SHOP PAINTING TO COMPLY WITH SSPC-PA 1 REQUIREMENTS FOR TOUCHING UP SHOP-PAINTED SURFACES.

END OF SECTION 055313

SECTION 092216 – NON-STRUCTURAL METAL FRAMING

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES:
1. NON-LOAD-BEARING STEEL FRAMING SYSTEMS FOR INTERIOR PARTITIONS.
2. SUSPENSION SYSTEMS FOR INTERIOR CEILINGS AND SOFFITS.
1.2 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.
1.3 INFORMATIONAL SUBMITTALS
A. EVALUATION REPORTS FOR FIRESTOP TRACKS.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. FIRE-TEST-RESPONSE CHARACTERISTICS: FOR FIRE-RESISTANCE-RATED ASSEMBLIES THAT INCORPORATE NON-LOAD-BEARING STEEL FRAMING, PROVIDE MATERIALS AND CONSTRUCTION IDENTICAL TO THOSE TESTED IN ASSEMBLY INDICATED, ACCORDING TO ASTM E 119 BY AN INDEPENDENT TESTING AGENCY.
2.2 FRAMING SYSTEMS
A. FRAMING MEMBERS, GENERAL: COMPLY WITH ASTM C 754 FOR CONDITIONS INDICATED.
1. STEEL SHEET COMPONENTS: COMPLY WITH ASTM C 645 REQUIREMENTS FOR METAL UNLESS OTHERWISE INDICATED.
B. STUDS AND RUNNERS: ASTM C 645.
1. STEEL STUDS AND RUNNERS:
a. MINIMUM BASE-METAL THICKNESS: AS INDICATED ON DRAWINGS
b. DEPTH: AS INDICATED ON DRAWINGS.
C. FIRESTOP TRACKS: TOP RUNNER MANUFACTURED TO ALLOW PARTITION HEADS TO EXPAND AND CONTRACT WITH MOVEMENT OF STRUCTURE WHILE MAINTAINING CONTINUITY OF FIRE-RESISTANCE-RATED ASSEMBLY INDICATED; IN THICKNESS NOT LESS THAN INDICATED FOR STUDS AND IN WIDTH TO ACCOMMODATE DEPTH OF STUDS.
D. HAT-SHAPED, RIGID FURRING CHANNELS: ASTM C 645.
1. MINIMUM BASE-METAL THICKNESS: AS INDICATED ON DRAWINGS.
2. DEPTH: AS INDICATED ON DRAWINGS.
2.3 SUSPENSION SYSTEMS
A. TIE WIRE: ASTM A 641/A 641M, CLASS 1 ZINC COATING, SOFT TEMPER, 0.062-INCH-DIAMETER WIRE, OR DOUBLE STRAND OF 0.048-INCH- DIAMETER WIRE.
B. HANGER ATTACHMENTS TO CONCRETE:
1. EXPANSION ANCHORS: FABRICATED FROM CORROSION-RESISTANT MATERIALS, WITH ALLOWABLE LOAD OR STRENGTH DESIGN CAPACITIES CALCULATED ACCORDING TO ICC-ES AC193 AND ACI 318 GREATER THAN OR EQUAL TO THE DESIGN LOAD, AS DETERMINED BY TESTING PER ASTM E 488/E 488M CONDUCTED BY A QUALIFIED TESTING AGENCY.
C. WIRE HANGERS: ASTM A 641/A 641M, CLASS 1 ZINC COATING, SOFT TEMPER, 0.16 INCH IN DIAMETER.
D. FLAT HANGERS: STEEL SHEET, IN SIZE INDICATED ON DRAWINGS.
E. CARRYING CHANNELS: COLD-ROLLED, COMMERCIAL-STEEL SHEET WITH A BASE-METAL THICKNESS OF 0.0538 INCH AND MINIMUM 1/2-INCH- WIDE FLANGES.
1. DEPTH: AS INDICATED ON DRAWINGS
F. FURRING CHANNELS (FURRING MEMBERS):
1. STEEL STUDS AND RUNNERS: ASTM C 645.
2.4 AUXILIARY MATERIALS
A. GENERAL: PROVIDE AUXILIARY MATERIALS THAT COMPLY WITH REFERENCED INSTALLATION STANDARDS.
1. FASTENERS FOR METAL FRAMING: OF TYPE, MATERIAL, SIZE, CORROSION RESISTANCE, HOLDING POWER, AND OTHER PROPERTIES REQUIRED TO FASTEN STEEL MEMBERS TO SUBSTRATES.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL
A. INSTALLATION STANDARD: ASTM C 754.
1. GYPSUM PLASTER ASSEMBLIES: ALSO COMPLY WITH REQUIREMENTS IN ASTM C 841 THAT APPLY TO FRAMING INSTALLATION.
2. GYPSUM BOARD ASSEMBLIES: ALSO COMPLY WITH REQUIREMENTS IN ASTM C 840 THAT APPLY TO FRAMING INSTALLATION.
B. INSTALL FRAMING AND ACCESSORIES PLUMB, SQUARE, AND TRUE TO LINE, WITH CONNECTIONS SECURELY FASTENED.
C. INSTALL SUPPLEMENTARY FRAMING, AND BLOCKING TO SUPPORT FIXTURES, EQUIPMENT SERVICES, HEAVY TRIM, GRAB BARS, TOILET ACCESSORIES, FURNISHINGS, OR SIMILAR CONSTRUCTION.
D. INSTALL BRACING AT TERMINATIONS IN ASSEMBLIES.
E. DO NOT BRIDGE BUILDING CONTROL AND EXPANSION JOINTS WITH NON-LOAD-BEARING STEEL FRAMING MEMBERS. FRAME BOTH SIDES OF JOINTS INDEPENDENTLY.
3.2 INSTALLING FRAMED ASSEMBLIES
A. INSTALL FRAMING SYSTEM COMPONENTS ACCORDING TO SPACINGS INDICATED, BUT NOT GREATER THAN SPACINGS REQUIRED BY REFERENCED INSTALLATION STANDARDS FOR ASSEMBLY TYPES.
B. WHERE STUDS ARE INSTALLED DIRECTLY AGAINST EXTERIOR MASONRY WALLS OR DISSIMILAR METALS AT EXTERIOR WALLS, INSTALL ISOLATION STRIP BETWEEN STUDS AND EXTERIOR WALL.
C. INSTALL STUDS SO FLANGES WITHIN FRAMING SYSTEM POINT IN SAME DIRECTION.
D. INSTALL TRACKS (RUNNERS) AT FLOORS AND OVERHEAD SUPPORTS. EXTEND FRAMING FULL HEIGHT TO STRUCTURAL SUPPORTS OR SUBSTRATES ABOVE SUSPENDED CEILINGS EXCEPT WHERE PARTITIONS ARE INDICATED TO TERMINATE AT SUSPENDED CEILINGS. CONTINUE FRAMING AROUND DUCTS THAT PENETRATE PARTITIONS ABOVE CEILING.
1. FIRE-RESISTANCE-RATED PARTITIONS: INSTALL FRAMING TO COMPLY WITH FIRE-RESISTANCE-RATED ASSEMBLY INDICATED AND SUPPORT CLOSURES AND TO MAKE PARTITIONS CONTINUOUS FROM FLOOR TO UNDERSIDE OF SOLID STRUCTURE.
a. FIRESTOP TRACK: WHERE INDICATED, INSTALL TO MAINTAIN CONTINUITY OF FIRE-RESISTANCE-RATED ASSEMBLY INDICATED.
E. DIRECT FURRING:
1. SCREW TO WOOD FRAMING.
2. ATTACH TO CONCRETE OR MASONRY WITH STUB NAILS, SCREWS DESIGNED FOR MASONRY ATTACHMENT, OR POWDER-DRIVEN FASTENERS SPACED 24 INCHES O.C.
F. INSTALLATION TOLERANCE: INSTALL EACH FRAMING MEMBER SO FASTENING SURFACES VARY NOT MORE THAN 1/8 INCH FROM THE PLANE FORMED BY FACES OF ADJACENT FRAMING.
3.3 INSTALLING SUSPENSION SYSTEMS
A. INSTALL SUSPENSION SYSTEM COMPONENTS ACCORDING TO SPACINGS INDICATED, BUT NOT GREATER THAN SPACINGS REQUIRED BY REFERENCED INSTALLATION STANDARDS FOR ASSEMBLY TYPES.
B. ISOLATE SUSPENSION SYSTEMS FROM BUILDING STRUCTURE WHERE THEY ABUT OR ARE PENETRATED BY BUILDING STRUCTURE TO PREVENT TRANSFER OF LOADING IMPOSED BY STRUCTURAL MOVEMENT.
C. SUSPEND HANGERS FROM BUILDING STRUCTURE AS FOLLOWS:
1. INSTALL HANGERS PLUMB AND FREE FROM CONTACT WITH INSULATION OR OTHER OBJECTS WITHIN CEILING PLENUM THAT ARE NOT PART OF SUPPORTING STRUCTURAL OR SUSPENSION SYSTEM.
a. SPLAY HANGERS ONLY WHERE REQUIRED TO MISS OBSTRUCTIONS AND OFFSET RESULTING HORIZONTAL FORCES BY BRACING, COUNTERSPLAYING, OR OTHER EQUALLY EFFECTIVE MEANS.
2. WHERE WIDTH OF DUCTS AND OTHER CONSTRUCTION WITHIN CEILING PLENUM PRODUCES HANGER SPACINGS THAT INTERFERE WITH LOCATIONS OF HANGERS REQUIRED TO SUPPORT STANDARD SUSPENSION SYSTEM MEMBERS, INSTALL SUPPLEMENTAL SUSPENSION MEMBERS AND HANGERS IN THE FORM OF TRAPEZES OR EQUIVALENT DEVICES.
a. SIZE SUPPLEMENTAL SUSPENSION MEMBERS AND HANGERS TO SUPPORT CEILING LOADS WITHIN PERFORMANCE LIMITS ESTABLISHED BY REFERENCED INSTALLATION STANDARDS] <INSERT DEFLECTION LIMIT.
3. WIRE HANGERS: SECURE BY LOOPING AND WIRE TYING, EITHER DIRECTLY TO STRUCTURES OR TO INSERTS, EYE SCREWS, OR OTHER DEVICES AND FASTENERS THAT ARE SECURE AND APPROPRIATE FOR SUBSTRATE, AND IN A MANNER THAT WILL NOT CAUSE HANGERS TO DETERIORATE OR OTHERWISE FAIL.
4. FLAT HANGERS: SECURE TO STRUCTURE, INCLUDING INTERMEDIATE FRAMING MEMBERS, BY ATTACHING TO INSERTS, EYE SCREWS, OR OTHER DEVICES AND FASTENERS THAT ARE SECURE AND APPROPRIATE FOR STRUCTURE AND HANGER, AND IN A MANNER THAT WILL NOT CAUSE HANGERS TO DETERIORATE OR OTHERWISE FAIL.
5. DO NOT ATTACH HANGERS TO PERMANENT METAL FORMS. FURNISH CAST-IN-PLACE HANGER INSERTS THAT EXTEND THROUGH FORMS.
6. DO NOT ATTACH HANGERS TO ROLLED-IN HANGER TABS OF COMPOSITE STEEL FLOOR DECK.
7. DO NOT CONNECT OR SUSPEND STEEL FRAMING FROM DUCTS, PIPES, OR CONDUIT.
D. FIRE-RESISTANCE-RATED ASSEMBLIES: WIRE TIE FURRING CHANNELS TO SUPPORTS.
E. INSTALLATION TOLERANCES: INSTALL SUSPENSION SYSTEMS THAT ARE LEVEL TO WITHIN 1/8 INCH IN 12 FEET MEASURED LENGTHWISE ON EACH MEMBER THAT WILL RECEIVE FINISHES AND TRANSVERSELY BETWEEN PARALLEL MEMBERS THAT WILL RECEIVE FINISHES.

END OF SECTION 092216

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SPECIFICATIONS

WSU PROJECT #: 511-254496-2
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A/E PROJECT NO. 13-4806

SHEET NO. A - 11

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SECTION 092300 – GYPSUM PLASTERING

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES:
1. GYPSUM PLASTERING ON EXPANDED–METAL LATH.
1.2 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.

PART 2 – PRODUCTS

2.1 EXPANDED–METAL LATH
A. EXPANDED–METAL LATH: ASTM C 847, COLD–ROLLED CARBON–STEEL SHEET WITH ASTM A 653/A 653M, G60, HOT–DIP GALVANIZED–ZINC COATING.
1. FLAT–RIB LATH: RIB DEPTH OF NOT MORE THAN 1/8 INCH, 2.75 LB/SQ. YD..
2.2 ACCESSORIES
A. GENERAL: COMPLY WITH ASTM C 841, AND COORDINATE DEPTH OF TRIM AND ACCESSORIES WITH THICKNESSES AND NUMBER OF PLASTER COATS REQUIRED.
B. PLASTIC ACCESSORIES: MANUFACTURED FROM HIGH–IMPACT PVC.
1. CORNERBEADS: WITH PERFORATED FLANGES.
a. SMALLNOSE CORNERBEAD; USE UNLESS OTHERWISE INDICATED.
2. CASING BEADS: WITH PERFORATED FLANGES IN DEPTH REQUIRED TO SUIT PLASTER BASES INDICATED AND FLANGE LENGTH REQUIRED TO SUIT APPLICATIONS INDICATED.
a. SQUARE–EDGE STYLE; USE UNLESS OTHERWISE INDICATED.
b. BULLNOSE STYLE, RADIUS 3/4–INCH MINIMUM; USE AT LOCATIONS INDICATED ON DRAWINGS.
2.3 MISCELLANEOUS MATERIALS
A. WATER FOR MIXING AND FINISHING PLASTER: POTABLE AND FREE OF SUBSTANCES CAPABLE OF AFFECTING PLASTER SET OR OF DAMAGING PLASTER, LATH, OR ACCESSORIES.
B. BONDING COMPOUND: ASTM C 631.
C. FASTENERS FOR ATTACHING METAL LATH TO SUBSTRATES: ASTM C 841.
D. WIRE: ASTM A 641/A 641M, CLASS 1 ZINC COATING, SOFT TEMPER, NOT LESS THAN 0.0475–INCH DIAMETER UNLESS OTHERWISE INDICATED.
2.4 BASE–COAT PLASTER MATERIALS
A. LIGHTWEIGHT–GYPSUM READY–MIXED PLASTER: ASTM C 28/C 28M, WITH MILL–MIXED PERLITE AGGREGATE.
B. GYPSUM NEAT PLASTER: ASTM C 28/C 28M, FOR USE WITH JOB–MIXED AGGREGATES.
2.5 FINISH–COAT PLASTER MATERIALS
A. GYPSUM GAGING PLASTER: ASTM C 28/C 28M.
B. GYPSUM READY–MIXED FINISH PLASTER: MANUFACTURER'S STANDARD, MILL–MIXED, GAGED, INTERIOR FINISH.
2.6 PLASTER MIXES
A. MIXING: COMPLY WITH ASTM C 842 AND MANUFACTURER'S WRITTEN INSTRUCTIONS FOR APPLICATIONS INDICATED.

PART 3 – EXECUTION

3.1 INSTALLING EXPANDED–METAL LATH
A. EXPANDED–METAL LATH: INSTALL ACCORDING TO ASTM C 841.
3.2 INSTALLING ACCESSORIES
A. GENERAL: INSTALL ACCORDING TO ASTM C 841.
B. CORNERBEADS: INSTALL AT EXTERNAL CORNERS.
C. CASING BEADS: INSTALL AT TERMINATIONS OF PLASTERWORK, EXCEPT WHERE PLASTER PASSES BEHIND AND IS CONCEALED BY OTHER WORK AND WHERE METAL SCREEDS, BASES, OR FRAMES ACT AS CASING BEADS.
3.3 PLASTER APPLICATION
A. GENERAL: COMPLY WITH ASTM C 842.
B. BASE–COAT PLASTER:
1. OVER EXPANDED–METAL LATH:
a. SCRATCH COAT: GYPSUM NEAT PLASTER WITH JOB–MIXED SAND
b. BROWN COAT: LIGHTWEIGHT–GYPSUM READY–MIXED PLASTER
C. FINISH COATS:
2. FLOAT FINISHES: GYPSUM GAGING PLASTER AND LIME PUTTY
D. CONCEALED PLASTER:
1. WHERE PLASTER APPLICATION IS CONCEALED BEHIND BUILT–IN CABINETS, SIMILAR FURNISHINGS, AND EQUIPMENT, APPLY FINISH COAT.
2. WHERE PLASTER APPLICATION IS CONCEALED ABOVE SUSPENDED CEILINGS AND IN SIMILAR LOCATIONS, OMIT FINISH COAT.
3. WHERE PLASTER APPLICATION IS USED AS A BASE FOR ADHESIVE APPLICATION OF TILE AND SIMILAR FINISHES, OMIT FINISH COAT.
3.4 PLASTER REPAIRS
A. REPAIR OR REPLACE WORK TO ELIMINATE CRACKS, DENTS, BLISTERS, BUCKLES, CRAZING AND CHECK CRACKING, DRY OUTS, EFFLORESCENCE, SWEAT OUTS, AND SIMILAR DEFECTS AND WHERE BOND TO SUBSTRATE HAS FAILED.

END OF SECTION 092300

SECTION 092900 – GYPSUM BOARD

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES:
1. INTERIOR GYPSUM BOARD.
1.2 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
B. FIRE–RESISTANCE–RATED ASSEMBLIES: FOR FIRE–RESISTANCE–RATED ASSEMBLIES, PROVIDE MATERIALS AND CONSTRUCTION IDENTICAL TO THOSE TESTED IN ASSEMBLY INDICATED ACCORDING TO ASTM E 119 BY AN INDEPENDENT TESTING AGENCY.
2.2 GYPSUM BOARD, GENERAL
A. SIZE: PROVIDE MAXIMUM LENGTHS AND WIDTHS AVAILABLE THAT WILL MINIMIZE JOINTS IN EACH AREA AND THAT CORRESPOND WITH SUPPORT SYSTEM INDICATED.
2.3 INTERIOR GYPSUM BOARD
A. GYPSUM BOARD, TYPE X: ASTM C 1396/C 1396M.
1. THICKNESS: 5/8 INCH.
2. LONG EDGES: TAPERED.
B. GYPSUM CEILING BOARD: ASTM C 1396/C 1396M.
1. THICKNESS: 1/2 INCH.
2. LONG EDGES: TAPERED.
2.4 TRIM ACCESSORIES
A. INTERIOR TRIM: ASTM C 1047.
1. MATERIAL: GALVANIZED OR ALUMINUM–COATED STEEL SHEET, ROLLED ZINC, PLASTIC, OR PAPER–FACED GALVANIZED–STEEL SHEET
2. SHAPES:
a. CORNERBEAD.
2.5 JOINT TREATMENT MATERIALS
A. GENERAL: COMPLY WITH ASTM C 475/C 475M.
B. JOINT TAPE:
1. INTERIOR GYPSUM BOARD: PAPER.
C. JOINT COMPOUND FOR INTERIOR GYPSUM BOARD: FOR EACH COAT, USE FORMULATION THAT IS COMPATIBLE WITH OTHER COMPOUNDS APPLIED ON PREVIOUS OR FOR SUCCESSIVE COATS.
1. PREFILLING: AT OPEN JOINTS[, ROUNDED OR BEVELED PANEL EDGES,] AND DAMAGED SURFACE AREAS, USE SETTING–TYPE TAPING COMPOUND.
2. EMBEDDING AND FIRST COAT: FOR EMBEDDING TAPE AND FIRST COAT ON JOINTS, FASTENERS, AND TRIM FLANGES, USE SETTING–TYPE TAPING COMPOUND.
a. USE SETTING–TYPE COMPOUND FOR INSTALLING PAPER–FACED METAL TRIM ACCESSORIES.
3. FILL COAT: FOR SECOND COAT, USE SETTING–TYPE, SANDABLE TOPPING COMPOUND.
4. FINISH COAT: FOR THIRD COAT, USE SETTING–TYPE, SANDABLE TOPPING COMPOUND.
5. SKIM COAT: FOR FINAL COAT OF LEVEL 5 FINISH, USE SETTING–TYPE, SANDABLE TOPPING COMPOUND
2.6 AUXILIARY MATERIALS
A. GENERAL: PROVIDE AUXILIARY MATERIALS THAT COMPLY WITH REFERENCED INSTALLATION STANDARDS AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
B. LAMINATING ADHESIVE: ADHESIVE OR JOINT COMPOUND RECOMMENDED FOR DIRECTLY ADHERING GYPSUM PANELS TO CONTINUOUS SUBSTRATE.
C. STEEL DRILL SCREWS: ASTM C 1002 UNLESS OTHERWISE INDICATED.
1. USE SCREWS COMPLYING WITH ASTM C 954 FOR FASTENING PANELS TO STEEL MEMBERS FROM 0.033 TO 0.112 INCH THICK.

PART 3 – EXECUTION

3.1 APPLYING AND FINISHING PANELS
A. EXAMINE PANELS BEFORE INSTALLATION. REJECT PANELS THAT ARE WET, MOISTURE DAMAGED, AND MOLD DAMAGED.
B. COMPLY WITH ASTM C 840.
C. ISOLATE PERIMETER OF GYPSUM BOARD APPLIED TO NON–LOAD–BEARING PARTITIONS AT STRUCTURAL ABUTMENTS. PROVIDE 1/4– TO 1/2–INCH– WIDE SPACES AT THESE LOCATIONS AND TRIM EDGES WITH EDGE TRIM WHERE EDGES OF PANELS ARE EXPOSED. SEAL JOINTS BETWEEN EDGES AND ABUTTING STRUCTURAL SURFACES WITH ACOUSTICAL SEALANT.
D. FOR TRIM WITH BACK FLANGES INTENDED FOR FASTENERS, ATTACH TO FRAMING WITH SAME FASTENERS USED FOR PANELS. OTHERWISE, ATTACH TRIM ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
E. PREFILL OPEN JOINTS[, ROUNDED OR BEVELED EDGES,] AND DAMAGED SURFACE AREAS.
F. APPLY JOINT TAPE OVER GYPSUM BOARD JOINTS, EXCEPT FOR TRIM PRODUCTS SPECIFICALLY INDICATED AS NOT INTENDED TO RECEIVE TAPE.
G. GYPSUM BOARD FINISH LEVELS: FINISH PANELS TO LEVELS INDICATED BELOW AND ACCORDING TO ASTM C 840:
1. LEVEL 4: AT PANEL SURFACES THAT WILL BE EXPOSED TO VIEW UNLESS OTHERWISE INDICATED.
a. PRIMER AND ITS APPLICATION TO SURFACES ARE SPECIFIED IN SECTION 099123 "INTERIOR PAINTING."
3.2 PROTECTION
A. PROTECT INSTALLED PRODUCTS FROM DAMAGE FROM WEATHER, CONDENSATION, DIRECT SUNLIGHT, CONSTRUCTION, AND OTHER CAUSES DURING REMAINDER OF THE CONSTRUCTION PERIOD.
B. REMOVE AND REPLACE PANELS THAT ARE WET, MOISTURE DAMAGED, AND MOLD DAMAGED.

END OF SECTION 092900

SECTION 096513 – RESILIENT BASE AND ACCESSORIES

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES:
1. RESILIENT BASE.
1.2 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.
B. SAMPLES: FOR EACH EXPOSED PRODUCT AND FOR EACH COLOR AND TEXTURE SPECIFIED, NOT LESS THAN 12 INCHES LONG.

PART 2 – PRODUCTS

2.1 THERMOSET–RUBBER BASE
A. PRODUCT STANDARD: ASTM F 1861, TYPE TS (RUBBER, VULCANIZED THERMOSET), GROUP I (SOLID, HOMOGENEOUS).
1. STYLE AND LOCATION:
a. STYLE A, STRAIGHT: PROVIDE IN AREAS WITH CARPET.
b. STYLE B, COVE: PROVIDE IN AREAS WITH RESILIENT FLOORING.
B. THICKNESS: 0.125 INCH.
C. HEIGHT: AS INDICATED ON DRAWINGS.
D. LENGTHS: CUT LENGTHS 48 INCHES LONG OR COILS IN MANUFACTURER'S STANDARD LENGTH.
E. OUTSIDE CORNERS: JOB FORMED OR PREFORMED.
F. INSIDE CORNERS: JOB FORMED OR PREFORMED.
G. COLORS: AS SELECTED BY ARCHITECT FROM FULL RANGE OF INDUSTRY COLORS.
2.2 INSTALLATION MATERIALS
A. TROWELABLE LEVELING AND PATCHING COMPOUNDS: LATEX–MODIFIED, PORTLAND CEMENT BASED OR BLENDED HYDRAULIC–CEMENT–BASED FORMULATION PROVIDED OR APPROVED BY RESILIENT–PRODUCT MANUFACTURER FOR APPLICATIONS INDICATED.
B. ADHESIVES: WATER–RESISTANT TYPE RECOMMENDED BY RESILIENT–PRODUCT MANUFACTURER FOR RESILIENT PRODUCTS AND SUBSTRATE CONDITIONS INDICATED.

PART 3 – EXECUTION

3.1 PREPARATION
A. PREPARE SUBSTRATES ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS TO ENSURE ADHESION OF RESILIENT PRODUCTS.
B. FILL CRACKS, HOLES, AND DEPRESSIONS IN SUBSTRATES WITH TROWELABLE LEVELING AND PATCHING COMPOUND; REMOVE BUMPS AND RIDGES TO PRODUCE A UNIFORM AND SMOOTH SUBSTRATE.
C. DO NOT INSTALL RESILIENT PRODUCTS UNTIL THEY ARE THE SAME TEMPERATURE AS THE SPACE WHERE THEY ARE TO BE INSTALLED.
D. IMMEDIATELY BEFORE INSTALLATION, SWEEP AND VACUUM CLEAN SUBSTRATES TO BE COVERED BY RESILIENT PRODUCTS.
3.2 RESILIENT BASE INSTALLATION
A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR INSTALLING RESILIENT BASE.
B. APPLY RESILIENT BASE TO WALLS, COLUMNS, PILASTERS, CASEWORK AND CABINETS IN TOE SPACES, AND OTHER PERMANENT FIXTURES IN ROOMS AND AREAS WHERE BASE IS REQUIRED.
C. INSTALL RESILIENT BASE IN LENGTHS AS LONG AS PRACTICAL WITHOUT GAPS AT SEAMS AND WITH TOPS OF ADJACENT PIECES ALIGNED.
D. TIGHTLY ADHERE RESILIENT BASE TO SUBSTRATE THROUGHOUT LENGTH OF EACH PIECE, WITH BASE IN CONTINUOUS CONTACT WITH HORIZONTAL AND VERTICAL SUBSTRATES.
E. DO NOT STRETCH RESILIENT BASE DURING INSTALLATION.
F. ON MASONRY SURFACES OR OTHER SIMILAR IRREGULAR SUBSTRATES, FILL VOIDS ALONG TOP EDGE OF RESILIENT BASE WITH MANUFACTURER'S RECOMMENDED ADHESIVE FILLER MATERIAL.
G. PREFORMED CORNERS: INSTALL PREFORMED CORNERS BEFORE INSTALLING STRAIGHT PIECES.
H. JOB–FORMED CORNERS:
1. OUTSIDE CORNERS: USE STRAIGHT PIECES OF MAXIMUM LENGTHS POSSIBLE AND FORM WITH RETURNS NOT LESS THAN 3 INCHES IN LENGTH.
a. FORM WITHOUT PRODUCING DISCOLORATION (WHITENING) AT BENDS.
2. INSIDE CORNERS: USE STRAIGHT PIECES OF MAXIMUM LENGTHS POSSIBLE AND FORM WITH RETURNS NOT LESS THAN 3 INCHES IN LENGTH.
a. MITER OR COPE CORNERS TO MINIMIZE OPEN JOINTS.
3.3 CLEANING AND PROTECTION
A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR CLEANING AND PROTECTING RESILIENT PRODUCTS.
B. COVER RESILIENT PRODUCTS SUBJECT TO WEAR AND FOOT TRAFFIC UNTIL SUBSTANTIAL COMPLETION.

END OF SECTION 096513

SECTION 096519 – RESILIENT TILE FLOORING

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES:
1. VINYL COMPOSITION FLOOR TILE.
1.2 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT.
1.3 CLOSEOUT SUBMITTALS
A. MAINTENANCE DATA.

PART 2 – PRODUCTS

2.1 VINYL COMPOSITION FLOOR TILE
A. TILE STANDARD: ASTM F 1066, CLASS 1, SOLID–COLOR TILE.
B. WEARING SURFACE: SMOOTH.
C. THICKNESS: 0.125 INCH.
D. SIZE: 12 BY 12 INCHES.
E. COLORS AND PATTERNS: AS SELECTED BY ARCHITECT FROM FULL RANGE OF INDUSTRY COLORS.
2.2 INSTALLATION MATERIALS
A. TROWELABLE LEVELING AND PATCHING COMPOUNDS: LATEX–MODIFIED, PORTLAND CEMENT BASED OR BLENDED HYDRAULIC–CEMENT–BASED FORMULATION PROVIDED OR APPROVED BY FLOOR TILE MANUFACTURER FOR APPLICATIONS INDICATED.
B. ADHESIVES: WATER–RESISTANT TYPE RECOMMENDED BY FLOOR TILE AND ADHESIVE MANUFACTURERS TO SUIT FLOOR TILE AND SUBSTRATE CONDITIONS INDICATED.
C. FLOOR POLISH: PROVIDE PROTECTIVE, LIQUID FLOOR–POLISH PRODUCTS RECOMMENDED BY FLOOR TILE MANUFACTURER.

PART 3 – EXECUTION

3.1 PREPARATION
A. PREPARE SUBSTRATES ACCORDING TO FLOOR TILE MANUFACTURER'S WRITTEN INSTRUCTIONS TO ENSURE ADHESION OF RESILIENT PRODUCTS.
B. CONCRETE SUBSTRATES: PREPARE ACCORDING TO ASTM F 710.
1. VERIFY THAT SUBSTRATES ARE DRY AND FREE OF CURING COMPOUNDS, SEALERS, AND HARDENERS.
2. REMOVE SUBSTRATE COATINGS AND OTHER SUBSTANCES THAT ARE INCOMPATIBLE WITH ADHESIVES AND THAT CONTAIN SOAP, WAX, OIL, OR SILICONE, USING MECHANICAL METHODS RECOMMENDED BY FLOOR TILE MANUFACTURER. DO NOT USE SOLVENTS.
3. ALKALINITY AND ADHESION TESTING: PERFORM TESTS RECOMMENDED BY FLOOR TILE MANUFACTURER. PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATE ALKALINITY FALLS WITHIN RANGE ON PH SCALE RECOMMENDED BY MANUFACTURER IN WRITING, BUT NOT LESS THAN 5 OR MORE THAN 9 PH.
4. MOISTURE TESTING: PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATES PASS TESTING ACCORDING TO FLOOR TILE MANUFACTURER'S WRITTEN RECOMMENDATIONS, BUT NOT LESS STRINGENT THAN THE FOLLOWING:
a. PERFORM ANHYDROUS CALCIUM CHLORIDE TEST ACCORDING TO ASTM F 1869. PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATES HAVE MAXIMUM MOISTURE–VAPOR–EMISSION RATE OF 3 LB OF WATER/1000 SQ. FT. IN 24 HOURS.
b. PERFORM RELATIVE HUMIDITY TEST USING IN SITU PROBES ACCORDING TO ASTM F 2170. PROCEED WITH INSTALLATION ONLY AFTER SUBSTRATES HAVE A MAXIMUM 75 PERCENT RELATIVE HUMIDITY LEVEL.
C. FILL CRACKS, HOLES, AND DEPRESSIONS IN SUBSTRATES WITH TROWELABLE LEVELING AND PATCHING COMPOUND; REMOVE BUMPS AND RIDGES TO PRODUCE A UNIFORM AND SMOOTH SUBSTRATE.
D. DO NOT INSTALL FLOOR TILES UNTIL THEY ARE THE SAME TEMPERATURE AS THE SPACE WHERE THEY ARE TO BE INSTALLED.
E. IMMEDIATELY BEFORE INSTALLATION, SWEEP AND VACUUM CLEAN SUBSTRATES TO BE COVERED BY RESILIENT FLOOR TILE.
3.2 FLOOR TILE INSTALLATION
A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR INSTALLING FLOOR TILE.
B. MATCH FLOOR TILES FOR COLOR AND PATTERN BY SELECTING TILES FROM CARTONS IN THE SAME SEQUENCE AS MANUFACTURED AND PACKAGED, IF SO NUMBERED. DISCARD BROKEN, CRACKED, CHIPPED, OR DEFORMED TILES.
1. LAY TILES WITH GRAIN RUNNING IN ONE DIRECTION.
C. SCRIBE, CUT, AND FIT FLOOR TILES TO BUTT NEATLY AND TIGHTLY TO VERTICAL SURFACES AND PERMANENT FIXTURES INCLUDING BUILT–IN FURNITURE, CABINETS, PIPES, OUTLETS, AND DOOR FRAMES.
D. MAINTAIN REFERENCE MARKERS, HOLES, AND OPENINGS THAT ARE IN PLACE OR MARKED FOR FUTURE CUTTING BY REPEATING ON FLOOR TILES AS MARKED ON SUBSTRATES. USE CHALK OR OTHER NONPERMANENT MARKING DEVICE.
E. ADHERE FLOOR TILES TO FLOORING SUBSTRATES USING A FULL SPREAD OF ADHESIVE APPLIED TO SUBSTRATE TO PRODUCE A COMPLETED INSTALLATION WITHOUT OPEN CRACKS, VOIDS, RAISING AND PUCKERING AT JOINTS, TELEGRAPHING OF ADHESIVE SPREADER MARKS, AND OTHER SURFACE IMPERFECTIONS.
3.3 CLEANING AND PROTECTION
A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR CLEANING AND PROTECTING FLOOR TILE.
B. FLOOR POLISH: REMOVE SOIL, ADHESIVE, AND BLEMISHES FROM FLOOR TILE SURFACES BEFORE APPLYING LIQUID FLOOR POLISH.
2. APPLY TWO COAT(S).
C. COVER FLOOR TILE UNTIL SUBSTANTIAL COMPLETION.

END OF SECTION 096519

SECTION 099123 – INTERIOR PAINTING

PART 1 – GENERAL

1.1 SUMMARY
A. SECTION INCLUDES SURFACE PREPARATION AND THE APPLICATION OF PAINT SYSTEMS ON [INTERIOR SUBSTRATES.
1.2 ACTION SUBMITTALS
A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT. INCLUDE PREPARATION REQUIREMENTS AND APPLICATION INSTRUCTIONS.
1. INCLUDE PRINTOUT OF CURRENT "MPI APPROVED PRODUCTS LIST" FOR EACH PRODUCT CATEGORY SPECIFIED, WITH THE PROPOSED PRODUCT HIGHLIGHTED.
B. SAMPLES: FOR EACH TYPE OF PAINT SYSTEM AND IN EACH COLOR AND GLOSS OF TOPCOAT.
1.3 QUALITY ASSURANCE
A. MOCKUPS: APPLY MOCKUPS OF EACH PAINT SYSTEM INDICATED AND EACH COLOR AND FINISH SELECTED TO VERIFY PRELIMINARY SELECTIONS MADE UNDER SAMPLE SUBMITTALS AND TO DEMONSTRATE AESTHETIC EFFECTS AND SET QUALITY STANDARDS FOR MATERIALS AND EXECUTION.
1. FINAL APPROVAL OF COLOR SELECTIONS WILL BE BASED ON MOCKUPS.
a. IF PRELIMINARY COLOR SELECTIONS ARE NOT APPROVED, APPLY ADDITIONAL MOCKUPS OF ADDITIONAL COLORS SELECTED BY ARCHITECT AT NO ADDED COST TO OWNER.

PART 2 – PRODUCTS

2.1 PAINT, GENERAL
A. MPI STANDARDS: PRODUCTS SHALL COMPLY WITH MPI STANDARDS INDICATED AND SHALL BE LISTED IN ITS "MPI APPROVED PRODUCTS LISTS."
B. MATERIAL COMPATIBILITY:
1. MATERIALS FOR USE WITHIN EACH PAINT SYSTEM SHALL BE COMPATIBLE WITH ONE ANOTHER AND SUBSTRATES INDICATED, UNDER CONDITIONS OF SERVICE AND APPLICATION AS DEMONSTRATED BY MANUFACTURER, BASED ON TESTING AND FIELD EXPERIENCE.
2. FOR EACH COAT IN A PAINT SYSTEM, PRODUCTS SHALL BE RECOMMENDED IN WRITING BY TOPCOAT MANUFACTURERS FOR USE IN PAINT SYSTEM AND ON SUBSTRATE INDICATED.
C. COLORS: TO MATCH EXISTING ADJACENT COLORS.

PART 3 – EXECUTION

3.1 EXAMINATION
A. EXAMINE SUBSTRATES AND CONDITIONS, WITH APPLICATOR PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR MAXIMUM MOISTURE CONTENT AND OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK.
B. MAXIMUM MOISTURE CONTENT OF SUBSTRATES: WHEN MEASURED WITH AN ELECTRONIC MOISTURE METER AS FOLLOWS:
1. GYPSUM BOARD: 12 PERCENT.
2. PLASTER: 12 PERCENT.
C. VERIFY SUITABILITY OF SUBSTRATES, INCLUDING SURFACE CONDITIONS AND COMPATIBILITY WITH EXISTING FINISHES AND PRIMERS.
D. PROCEED WITH COATING APPLICATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
1. APPLICATION OF COATING INDICATES ACCEPTANCE OF SURFACES AND CONDITIONS.
3.2 PREPARATION
A. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS IN "MPI ARCHITECTURAL PAINTING SPECIFICATION MANUAL" APPLICABLE TO SUBSTRATES AND PAINT SYSTEMS INDICATED.
B. REMOVE HARDWARE, COVERS, PLATES, AND SIMILAR ITEMS ALREADY IN PLACE THAT ARE REMOVABLE AND ARE NOT TO BE PAINTED. IF REMOVAL IS IMPRACTICAL OR IMPOSSIBLE BECAUSE OF SIZE OR WEIGHT OF ITEM, PROVIDE SURFACE–APPLIED PROTECTION BEFORE SURFACE PREPARATION AND PAINTING.
1. AFTER COMPLETING PAINTING OPERATIONS, USE WORKERS SKILLED IN THE TRADES INVOLVED TO REINSTALL ITEMS THAT WERE REMOVED. REMOVE SURFACE–APPLIED PROTECTION IF ANY.
3.3 APPLICATION
A. APPLY PAINTS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS IN "MPI ARCHITECTURAL PAINTING SPECIFICATION MANUAL."
B. APPLY PAINTS TO PRODUCE SURFACE FILMS WITHOUT CLOUDINESS, SPOTTING, HOLIDAYS, LAPS, BRUSH MARKS, ROLLER TRACKING, RUNS, SAGS, ROPINESS, OR OTHER SURFACE IMPERFECTIONS. CUT IN SHARP LINES AND COLOR BREAKS.
3.4 INTERIOR PAINTING SCHEDULE
A. STEEL SUBSTRATES:
1. ALKYD SYSTEM MPI INT 5.1E:
a. PRIME COAT: SHOP PRIMER SPECIFIED IN SECTION WHERE SUBSTRATE IS SPECIFIED.
b. TOPCOAT: ALKYD, INTERIOR, FLAT (MPI GLOSS LEVEL 1).
B. GYPSUM BOARD AND PLASTER SUBSTRATES:
1. HIGH–PERFORMANCE ARCHITECTURAL LATEX SYSTEM:
a. PRIME COAT: PRIMER SEALER, LATEX, INTERIOR.
b. INTERMEDIATE COAT: LATEX, INTERIOR, HIGH PERFORMANCE ARCHITECTURAL, MATCHING TOPCOAT.
c. TOPCOAT: LATEX, INTERIOR, HIGH PERFORMANCE ARCHITECTURAL, SEMI–GLOSS (MPI GLOSS LEVEL 5).

END OF SECTION 099123

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DESIGNER	DWL
DRAWN	DWL
CHECKED	JSR
DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

SPECIFICATIONS

WSU PROJECT #: 511–254496–2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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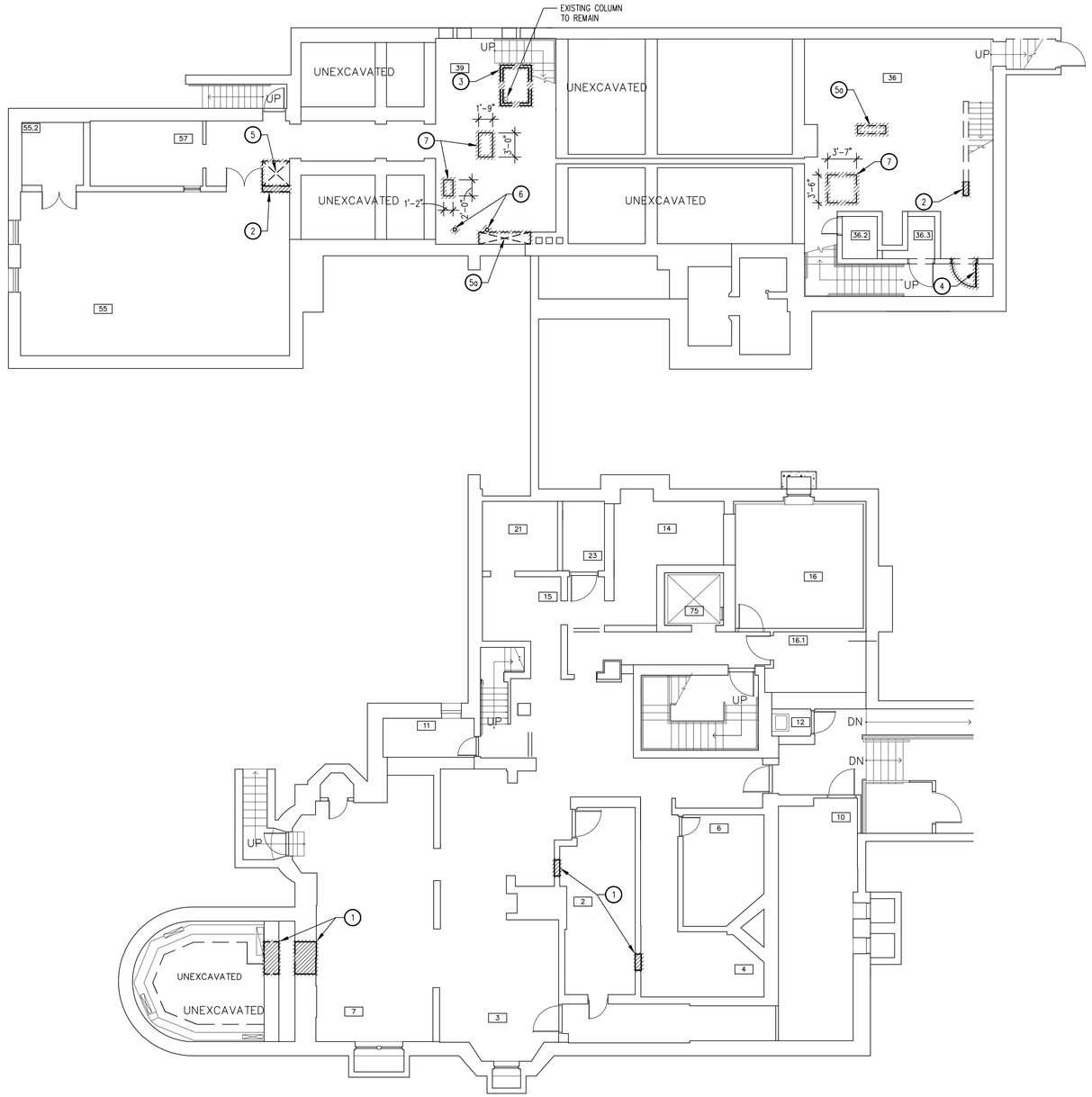
A/E PROJECT NO.
13-4806

SHEET NO.
A - 12

DSD FILE NAME
13–4806–A12



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FREER HOUSE BASEMENT FLOOR PLAN – ARCHITECTURAL DEMOLITION

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

0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.
2. VERIFY ALL EXISTING DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION. CONTRACTORS TO NOTIFY ENGINEER AND PROJECT MANAGER OR ARCHITECT IMMEDIATELY IF ANY CONFLICTS ARISE.
3. PROTECT ALL FINISH WORK FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION. REPAIR OF DAMAGED EXISTING FINISHES WILL BE AT THE CONTRACTORS EXPENSE.
4. REFER TO OTHER SHEETS OF THIS DOCUMENT SET WITH SPECS. FOR COMPLETE CONTRACT REQUIREMENTS.
5. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL WORK REQUIRED.
6. WORK TO BE COORDINATED WITH MECHANICAL AND ELECTRICAL. PATCH AND REPAIR, AS REQUIRED TO ACCOMMODATE MECHANICAL AND ELECTRICAL WORK.
7. CONTRACTOR TO COORDINATE DELIVERY TIME, STAGING AREA AND ACCESS WITH OWNER.
8. CONTRACTOR TO PROVIDE BARRIER/ PROTECTION FOR OWNER'S PERSONNEL AND GENERAL PUBLIC AS REQ'D TO KEEP EGRESS PATH OPEN THROUGHOUT CONSTR.
9. CORE DRILL HOLES THROUGH WALLS FOR MECH.PIPING,ELEC. CONDUIT PENETRATIONS. REFER TO MECH. & ELECTRICAL DWG'S. FOR LOCATION, NUMBER AND SIZE OF HOLES REQ'D. PATCH AND REPAIR EXISTING WALLS AFTER DUCT, PIPING AND CONDUIT INSTALLATION IS COMPLETE, TYP. OTHER WORK REQ'D FOR CLOSING/FINISHING WALL PENETRATIONS TO BE BY MECH. OR ELECTRICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO SEALING OPENINGS OR FIRE RATED SEALS AS REQ'D.
10. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT/SHORING AS REQUIRED DURING MECHANICAL EQUIPMENT INSTALLATION.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

(1) REMOVE MASONRY WALL CONSTRUCTION AS REQUIRED FOR DUCT/PIPING INSTALLATION. SEE DETAIL 1/A-10 FOR TYPICAL DETAILS.

(2) REMOVE CMU WALL AS REQUIRED FOR MECH. EQUIPMENT INSTALLATION. PATCH REMAINING MASONRY.

(3) REMOVE EXISTING GYP. BD. WALL CONSTRUCTION.

(4) REMOVE H.M. DOOR AND FRAME TO ACCOMMODATE MECH. EQUIPMENT. REINSTALL AFTER MECH. EQUIPMENT HAS BEEN INSTALLED.

(5) REMOVE FLOOR SLAB ABOVE AS REQUIRED FOR DUCT INSTALLATION. REFER TO DETAILS 9/A-10 FOR OPENING FRAMING.

(5a) REMOVE FLOOR SLAB ABOVE AS REQUIRED FOR DUCT INSTALLATION. PROVIDE W8x18 BEAM AND POSTS BELOW OPENING SIMILAR TO DETAIL 10/A-10.

(6) REMOVE STEEL BEAM & COLUMNS AFTER NEW BEAM AND COLUMNS ARE INSTALLED. SEE DETAIL 10/A-10.

(7) REMOVE EXISTING CONCRETE PAD, PATCH FLOOR TO MATCH ADJACENT AS REQUIRED. VERIFY ACTUAL DIMENSIONS IN FIELD.

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CHECKED	JSR
DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE BASEMENT FLOOR PLAN - ARCHITECTURAL DEMOLITION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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DSD FILE NAME
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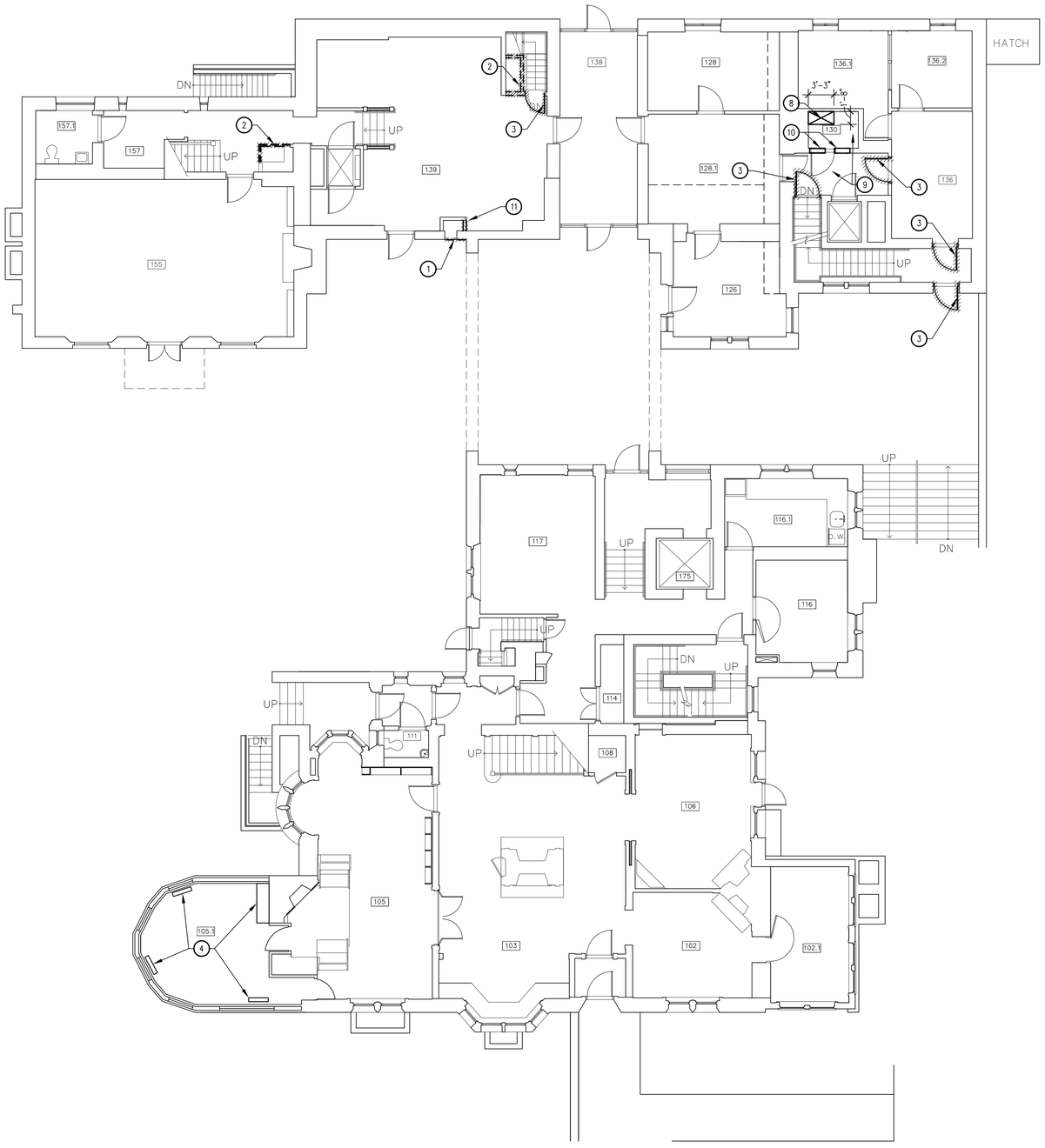

FREER HOUSE FIRST FLOOR PLAN – ARCHITECTURAL DEMOLITION

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

0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.
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4. REFER TO OTHER SHEETS OF THIS DOCUMENT SET WITH SPECS. FOR COMPLETE CONTRACT REQUIREMENTS.
5. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL WORK REQUIRED.
6. WORK TO BE COORDINATED WITH MECHANICAL AND ELECTRICAL. PATCH AND REPAIR, AS REQUIRED TO ACCOMMODATE MECHANICAL AND ELECTRICAL WORK.
7. CONTRACTOR TO COORDINATE DELIVERY TIME, STAGING AREA AND ACCESS WITH OWNER.
8. CONTRACTOR TO PROVIDE BARRIER/ PROTECTION FOR OWNER'S PERSONNEL AND GENERAL PUBLIC AS REQ'D TO KEEP EGRESS PATH OPEN THROUGHOUT CONSTR.
9. CORE DRILL HOLES THROUGH WALLS FOR MECH.PIPING,ELEC. CONDUIT PENETRATIONS. REFER TO MECH. & ELECTRICAL DWG'S. FOR LOCATION, NUMBER AND SIZE OF HOLES REQ'D. PATCH AND REPAIR EXISTING WALLS AFTER DUCT, PIPING AND CONDUIT INSTALLATION IS COMPLETE, TYP. OTHER WORK REQ'D FOR CLOSING/FINISHING WALL PENETRATIONS TO BE BY MECH. OR ELECTRICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO SEALING OPENINGS OR FIRE RATED SEALS AS REQ'D.
10. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT/SHORING AS REQUIRED DURING MECHANICAL EQUIPMENT INSTALLATION.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. REMOVE EXISTING LOUVER AND EXISTING MASONRY AS REQUIRED FOR NEW 16X24 MIN. LOUVER. REPAIR MASONRY TO MATCH EXISTING ADJACENT OPENING CONSTRUCTION.
2. REMOVE EXISTING GYP. BD. WALL CONSTRUCTION.
3. REMOVE DOOR AND FRAME AS NECESSARY TO ACCOMMODATE MECH. EQUIPMENT. REINSTALL AFTER MECH. EQUIPMENT HAS BEEN INSTALLED.
4. REMOVE FLOOR TO ACCOMMODATE MECHANICAL DIFFUSERS. REWORK FLOOR JOISTS AS REQUIRED. DOUBLE JOISTS EACH SIDE OF OPENINGS WITH DOUBLE HEADERS IN BETWEEN. JOIST DIRECTION VERIFY IN FIELD COORDINATE WITH A/E TYP.
5. NOT USED.
6. NOT USED.
7. NOT USED.
8. REMOVE PORTION OF FLOOR TO ACCOMMODATE NEW DUCTWORK. VERIFY SIZE AND LOCATION OF OPENING WITH MECHANICAL CONTRACTOR. OPENING FRAMING SIMILAR TO DETAIL 10/A10.
9. REMOVE CEILING IN AREA INDICATED AS REQUIRED TO FACILITATE MECHANICAL WORK. REPLACE CEILING AFTER MECHANICAL WORK IS COMPLETE.
10. REMOVE PORTION OF WALL ABOVE CEILING AS REQUIRED FOR NEW MECHANICAL DUCT OPENING. VERIFY SIZE AND LOCATION WITH MECHANICAL CONTRACTOR PRIOR DEMOLITION.
11. REMOVE PORTION OF GYP. BD. SHAFT WALL INDICATED.

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DRAWN	DWL
CHECKED	JSR
DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE FIRST FLOOR PLAN - ARCHITECTURAL DEMOLITION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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DSD FILE NAME
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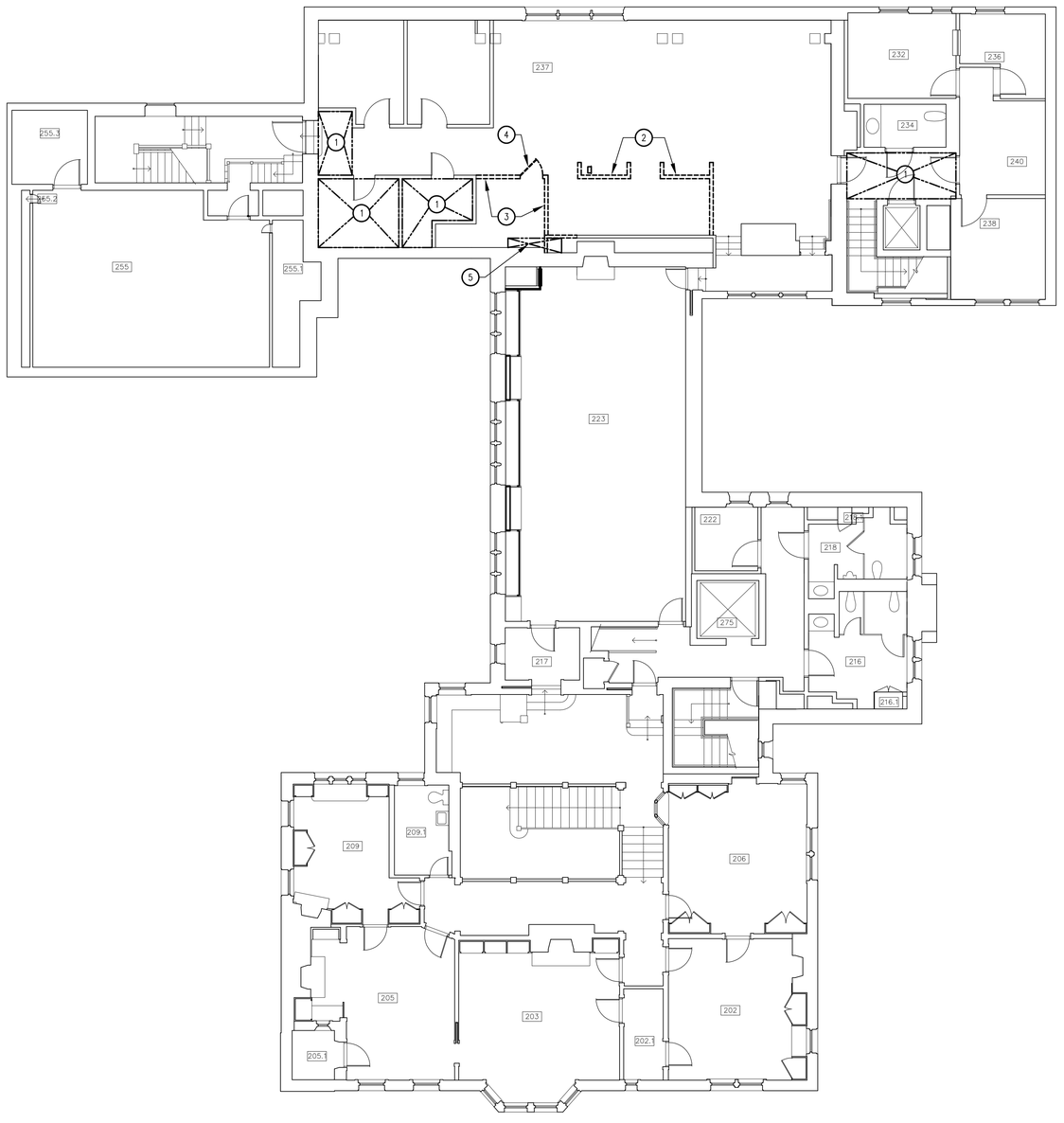

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FREER HOUSE SECOND FLOOR PLAN – ARCHITECTURAL DEMOLITION

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

0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.
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3. PROTECT ALL FINISH WORK FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION. REPAIR OF DAMAGED EXISTING FINISHES WILL BE AT THE CONTRACTORS EXPENSE.
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8. CONTRACTOR TO PROVIDE BARRIER/ PROTECTION FOR OWNER'S PERSONNEL AND GENERAL PUBLIC AS REQ'D TO KEEP EGRESS PATH OPEN THROUGHOUT CONSTR.
9. CORE DRILL HOLES THROUGH WALLS FOR MECH.PIPING,ELEC. CONDUIT PENETRATIONS. REFER TO MECH. & ELECTRICAL DWG'S. FOR LOCATION, NUMBER AND SIZE OF HOLES REQ'D. PATCH AND REPAIR EXISTING WALLS AFTER DUCT, PIPING AND CONDUIT INSTALLATION IS COMPLETE, TYP.. OTHER WORK REQ'D FOR CLOSING/FINISHING WALL PENETRATIONS TO BE BY MECH. OR ELECTRICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO SEALING OPENINGS OR FIRE RATED SEALS AS REQ'D.
10. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT/SHORING AS REQUIRED DURING MECHANICAL EQUIPMENT INSTALLATION.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. REMOVE EXISTING PLASTER CEILING AS REQUIRED FOR INSTALLATION OF NEW MECHANICAL EQUIPMENT.
2. COMPLETELY REMOVE PARTIAL HEIGHT WALLS. PATCH FLOOR CARPET AND WALLS TO MATCH EXISTING.
3. COMPLETELY REMOVE FULL HEIGHT PARTITION WALLS. PATCH FLOOR CARPET AND WALLS TO MATCH EXISTING CONSTRUCTION.
4. COMPLETELY REMOVE EXISTING DOOR AND JAMB.
5. REMOVE PORTION OF FLOOR TO ACCOMMODATE NEW MECHANICAL DUCTWORK. COORDINATE EXACT SIZE AND LOCATION WITH MECHANICAL CONTRACTOR. REFER TO DETAIL 8/A10 FOR OPENING FRAMING.

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DRAWN	DWL
CHECKED	JSR
DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: **FREER OCCUPANT THERMAL COMFORT**

FREER HOUSE SECOND FLOOR PLAN - ARCHITECTURAL DEMOLITION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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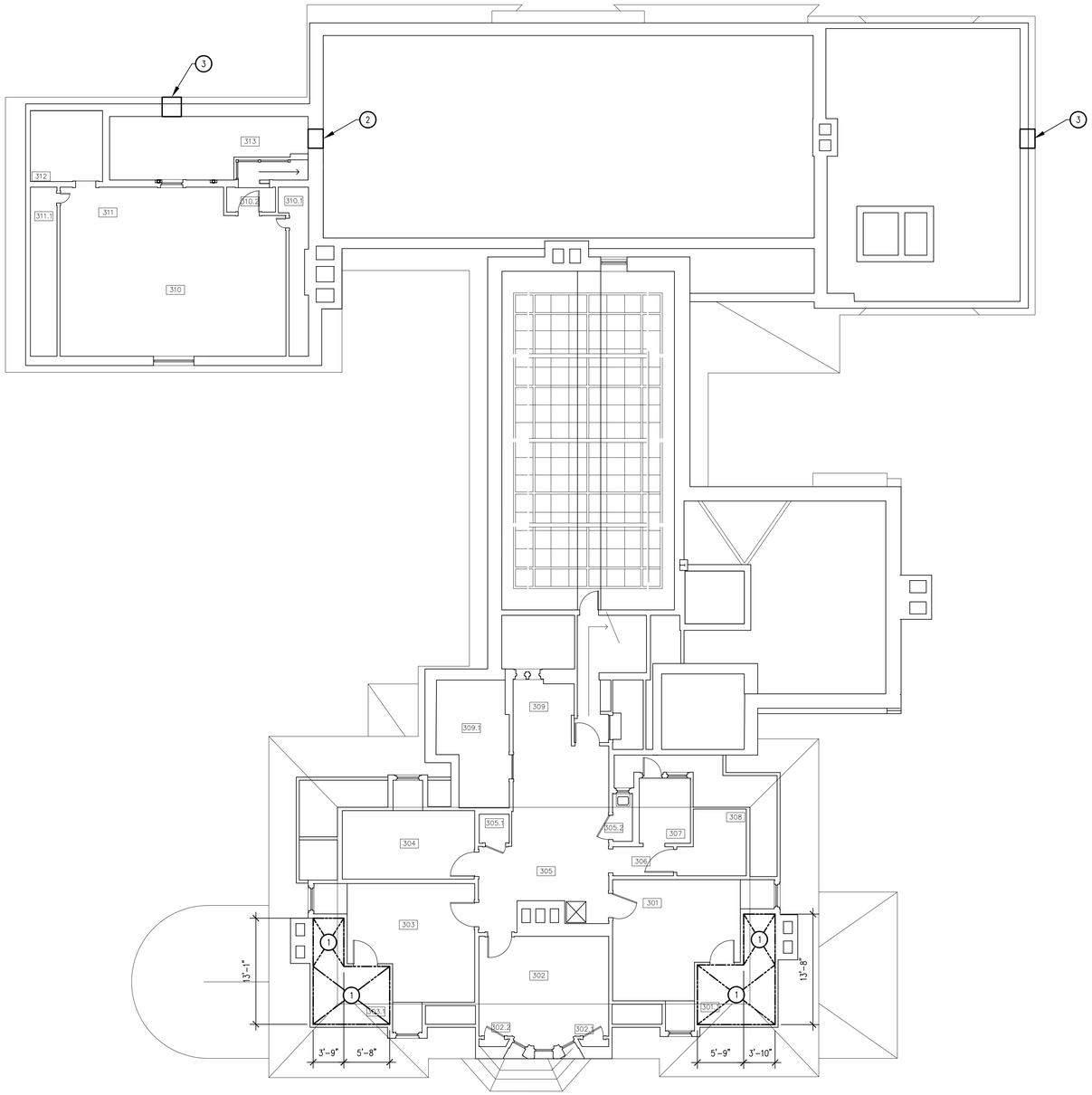
DSD FILE NAME
13-4806-A4



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FREER HOUSE ATTIC FLOOR PLAN – ARCHITECTURAL DEMOLITION

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

0 4 8 16 32

GENERAL NOTES:

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2. VERIFY ALL EXISTING DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION. CONTRACTORS TO NOTIFY ENGINEER AND PROJECT MANAGER OR ARCHITECT IMMEDIATELY IF ANY CONFLICTS ARISE.
3. PROTECT ALL FINISH WORK FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION. REPAIR OF DAMAGED EXISTING FINISHES WILL BE AT THE CONTRACTORS EXPENSE.
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8. CONTRACTOR TO PROVIDE BARRIER/ PROTECTION FOR OWNER'S PERSONNEL AND GENERAL PUBLIC AS REQ'D TO KEEP EGRESS PATH OPEN THROUGHOUT CONSTR.
9. CORE DRILL HOLES THROUGH WALLS FOR MECH.PIPING,ELEC. CONDUIT PENETRATIONS. REFER TO MECH. & ELECTRICAL DWG'S. FOR LOCATION, NUMBER AND SIZE OF HOLES REQ'D. PATCH AND REPAIR EXISTING WALLS AFTER DUCT, PIPING AND CONDUIT INSTALLATION IS COMPLETE, TYP. OTHER WORK REQ'D FOR CLOSING/FINISHING WALL PENETRATIONS TO BE BY MECH. OR ELECTRICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO SEALING OPENINGS OR FIRE RATED SEALS AS REQ'D.
10. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT/SHORING AS REQUIRED DURING MECHANICAL EQUIPMENT INSTALLATION.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

(1) REMOVE EXISTING BASE, CERAMIC TILE FLOORING, AND SUB FLOOR.

(2) REMOVE PORTION OF MASONRY WALL TO ACCOMMODATE NEW MECHANICAL DUCTWORK. COORDINATE EXACT SIZE AND LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION. PROVIDE STEEL ANGLE LINTEL, REFER TO DETAIL 1/A10.

(3) REMOVE EXISTING LOUVER CAP CONSTRUCTION AND WALL INFILL. LOUVER TO REMAIN.

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MARK	ISSUE	DATE
	BIDS	07/29/15
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	FINAL REVIEW	05/28/15
	OWNER REVIEW	04/28/15

DESIGNER	DWL
DRAWN	DWL
CHECKED	JSR
DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE
ATTIC FLOOR PLAN - ARCHITECTURAL DEMOLITION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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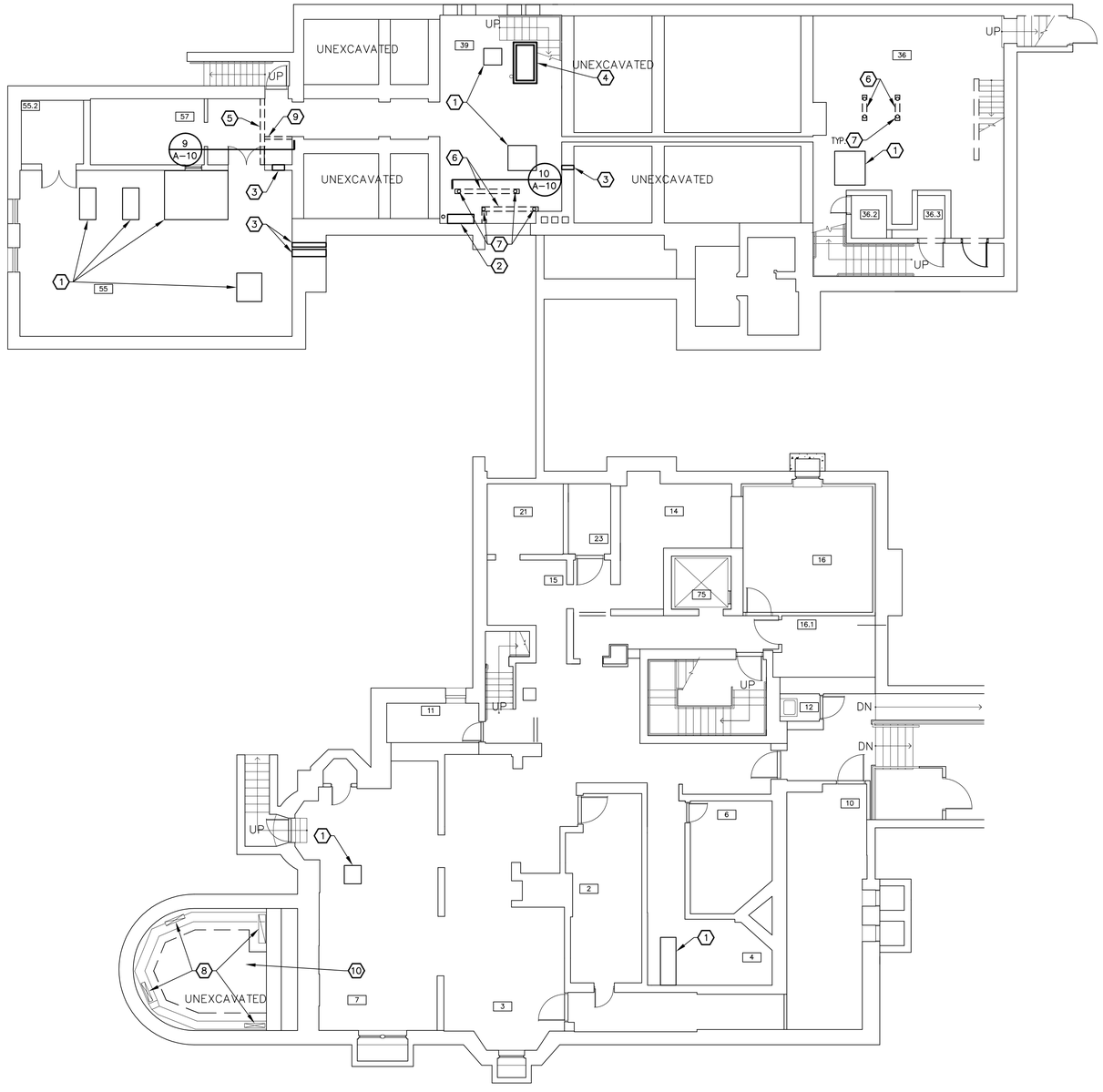
A/E PROJECT NO.
13-4806

SHEET NO.
A - 5

DSD FILE NAME
13-4806-A5



N

FREER HOUSE BASEMENT FLOOR PLAN – NEW WORK

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

0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.
2. VERIFY ALL EXISTING DIMENSIONS IN FIELD PRIOR TO CONSTRUCTION. CONTRACTORS TO NOTIFY ENGINEER AND PROJECT MANAGER OR ARCHITECT IMMEDIATELY IF ANY CONFLICTS ARISE.
3. PROTECT ALL FINISH WORK FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION. REPAIR OF DAMAGED EXISTING FINISHES WILL BE AT THE CONTRACTORS EXPENSE.
4. REFER TO OTHER SHEETS OF THIS DOCUMENT SET WITH SPECS. FOR COMPLETE CONTRACT REQUIREMENTS.
5. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL WORK REQUIRED.
6. WORK TO BE COORDINATED WITH MECHANICAL AND ELECTRICAL. PATCH AND REPAIR, AS REQUIRED TO ACCOMMODATE MECHANICAL AND ELECTRICAL WORK.
7. CONTRACTOR TO COORDINATE DELIVERY TIME, STAGING AREA AND ACCESS WITH OWNER.
8. CONTRACTOR TO PROVIDE BARRIER/ PROTECTION FOR OWNER'S PERSONNEL AND GENERAL PUBLIC AS REQ'D TO KEEP EGRESS PATH OPEN THROUGHOUT CONSTR.
9. CORE DRILL HOLES THROUGH WALLS FOR MECH.PIPING,ELEC. CONDUIT PENETRATIONS. REFER TO MECH. & ELECTRICAL DWG'S. FOR LOCATION, NUMBER AND SIZE OF HOLES REQ'D. PATCH AND REPAIR EXISTING WALLS AFTER DUCT, PIPING AND CONDUIT INSTALLATION IS COMPLETE, TYP. OTHER WORK REQ'D FOR CLOSING/FINISHING WALL PENETRATIONS TO BE BY MECH. OR ELECTRICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO SEALING OPENINGS OR FIRE RATED SEALS AS REQ'D.
10. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT/SHORING AS REQUIRED DURING MECHANICAL EQUIPMENT INSTALLATION.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

(1) 4" CONCRETE EQUIPMENT PADS COORDINATE SIZE AND LOCATION W/MECH. SEE DETAIL 2/A-10.

(2) PATCH FLOOR AT PIPE OPENING.

(3) PATCH MASONRY WALL AT PIPE OPENING.

(4) UL U415 1 HOUR RATED GYP. BD. SHAFT WALL CONSTRUCTION. PROVIDE ACCESS PANELS AT DAMPER LOCATIONS. SEAL ALL PENETRATIONS. COORDINATE LOCATION WITH MECHANICAL. PAINT TO MATCH ADJACENT CONSTRUCTION.

(5) W8x18 WITH 6" MIN. BRG. EACH END, SHIM AS REQUIRED. REFER TO DETAIL 9/A10

(6) W8x18 WITH 1/2"ø EXPANSION ANCHOR BOLT TO FLOOR DECK ABOVE 16" O.C.± WITH (2) C-1 COLUMN SUPPORTS DIMENSIONS AND LOCATIONS TO BE V.I.F.

(7) C-1:
4" STANDARD PIPE COLUMN WITH 12x12x3/4 BASE PLATE +(4) 3/4"ø EXPANSION ANCHOR BOLTS. THICKNESS OF EXISTING SLAB TO BE V.I.F. PROVIDE F-1 IF SLAB IS LESS THAN 6" THICK. REFER TO DETAIL 11/A-10.

(8) REWORK FRAMING AT NEW 1ST FLOOR OPENINGS; DOUBLE JOISTS EACH SIDE OF OPENING WITH DOUBLE HEADERS IN BETWEEN. JOIST DIRECTION TO BE V.I.F. COORDINATE WITH A/E TYP.

(9) ∠6"x4"x3/8" REFER TO DETAIL 9/A10.

(10) INSTALL REINFORCED POLYETHYLENE VAPOR RETARDER BELOW PORCH FLOOR.

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DEPT MGR	JSR
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TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE BASEMENT FLOOR PLAN - NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
A - 6

DSD FILE NAME
13-4806-A6

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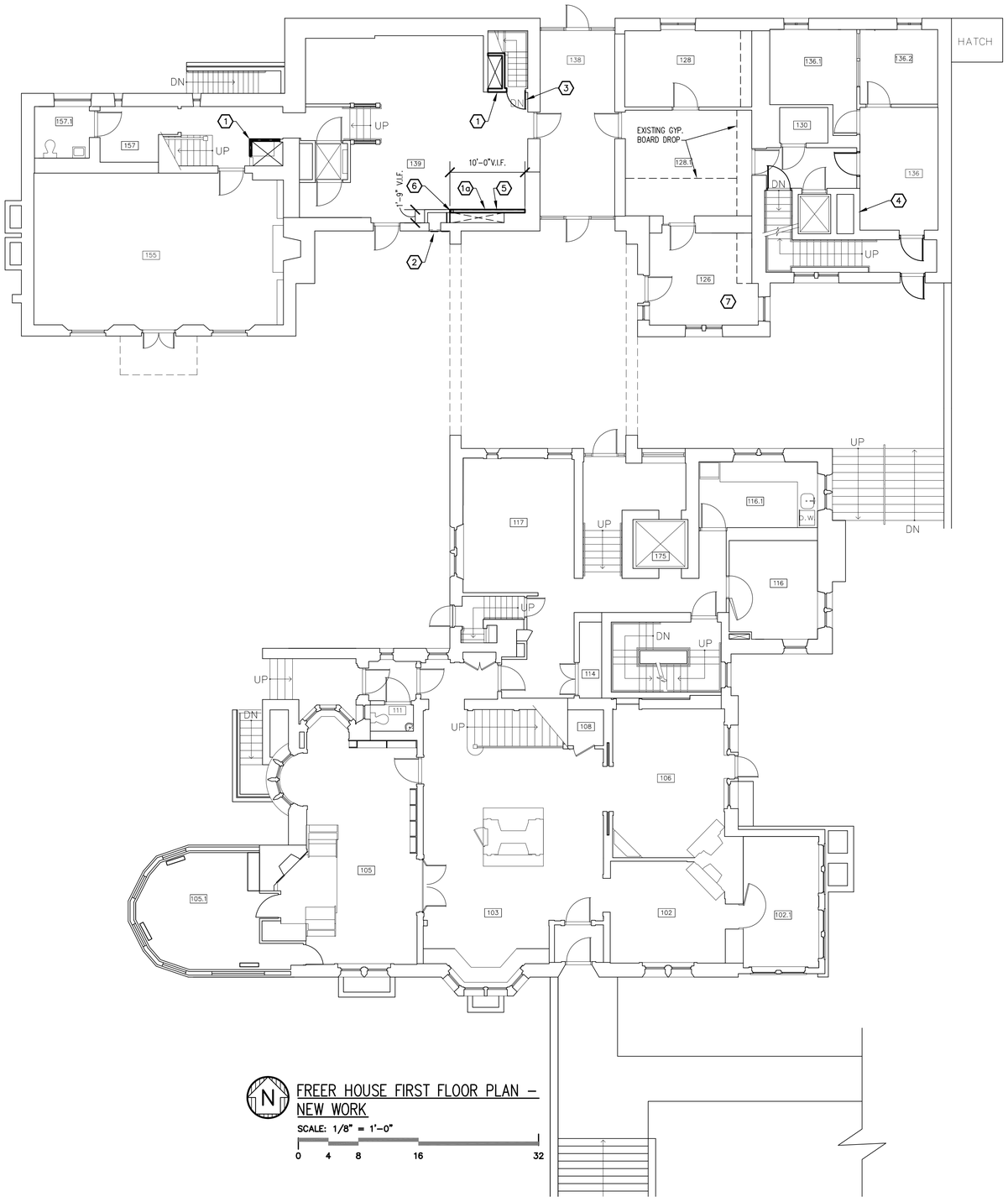

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FREER HOUSE FIRST FLOOR PLAN - NEW WORK

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

0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.
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9. CORE DRILL HOLES THROUGH WALLS FOR MECH.PIPING,ELEC. CONDUIT PENETRATIONS. REFER TO MECH. & ELECTRICAL DWG'S. FOR LOCATION, NUMBER AND SIZE OF HOLES REQ'D. PATCH AND REPAIR EXISTING WALLS AFTER DUCT, PIPING AND CONDUIT INSTALLATION IS COMPLETE, TYP. OTHER WORK REQ'D FOR CLOSING/FINISHING WALL PENETRATIONS TO BE BY MECH. OR ELECTRICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO SEALING OPENINGS OR FIRE RATED SEALS AS REQ'D.
10. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT/SHORING AS REQUIRED DURING MECHANICAL EQUIPMENT INSTALLATION.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

(1) UL U415 GYP. BD. SHAFT WALL CONSTRUCTION PROVIDE ACCESS PANELS AT DAMPER LOCATIONS. SEAL PENETRATIONS. COORDINATE LOCATION WITH MECHANICAL. REFER TO DETAIL 8 FOR OPENING FRAMING. PAINT TO MATCH ADJACENT CONSTRUCTION.

(1a) GYP. BD. SHAFT WALL CONSTRUCTION PROVIDE ACCESS PANELS AT DAMPER LOCATIONS. 3-5/8"x18 GAUGE FRAMING STUDS @ 24" O.C. MAX SPACING. COORDINATE LOCATION WITH MECHANICAL. REFER TO DETAIL 8 FOR OPENING FRAMING. SHAFT WALL TO BE CONSTRUCTED AROUND STEEL PIPE COLUMNS. PAINT TO MATCH ADJACENT CONSTRUCTION.

(2) 16" x 24" MIN. LOUVER. REPAIR MASONRY WALL CONSTRUCTION TO MATCH ADJACENT CONSTRUCTION. PROVIDE 3-1/2"x3-1/2"x1/4" FOR EVERY 4" OF MASONRY WALL WIDTH V.I.F. SEE DETAILS 3/A-10 AND 4/A-10. (IF REQUIRED - VERIFY CONDITION OF EXISTING LINTEL).

(3) REINSTALL DOOR, FRAME AND HARDWARE AFTER INSTALLATION OF MECHANICAL EQUIPMENT.

(4) PATCH WALL AT REMOVED RETURN GRILL. CONSTRUCTION AND FINISH TO MATCH EXISTING ADJACENT CONSTRUCTION.

(5) W8x18 WITH 1/2"ø EXPANSION ANCHOR BOLT TO FLOOR DECK ABOVE 16" O.C.± WITH (2) C-1 COLUMN SUPPORTS DIMENSIONS AND LOCATIONS TO BE V.I.F.

(6) C-1:
4" STANDARD PIPE COLUMN WITH 12x6x3/4 BASE PLATE +(4) 3/4"ø EXPANSION ANCHOR BOLTS.

(7) PATCH WALL AS REQUIRED AT REMOVED RADIATOR. WALL FINISH TO MATCH EXISTING ADJACENT CONSTRUCTION.

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DRAWN	DWL
CHECKED	JSR
DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

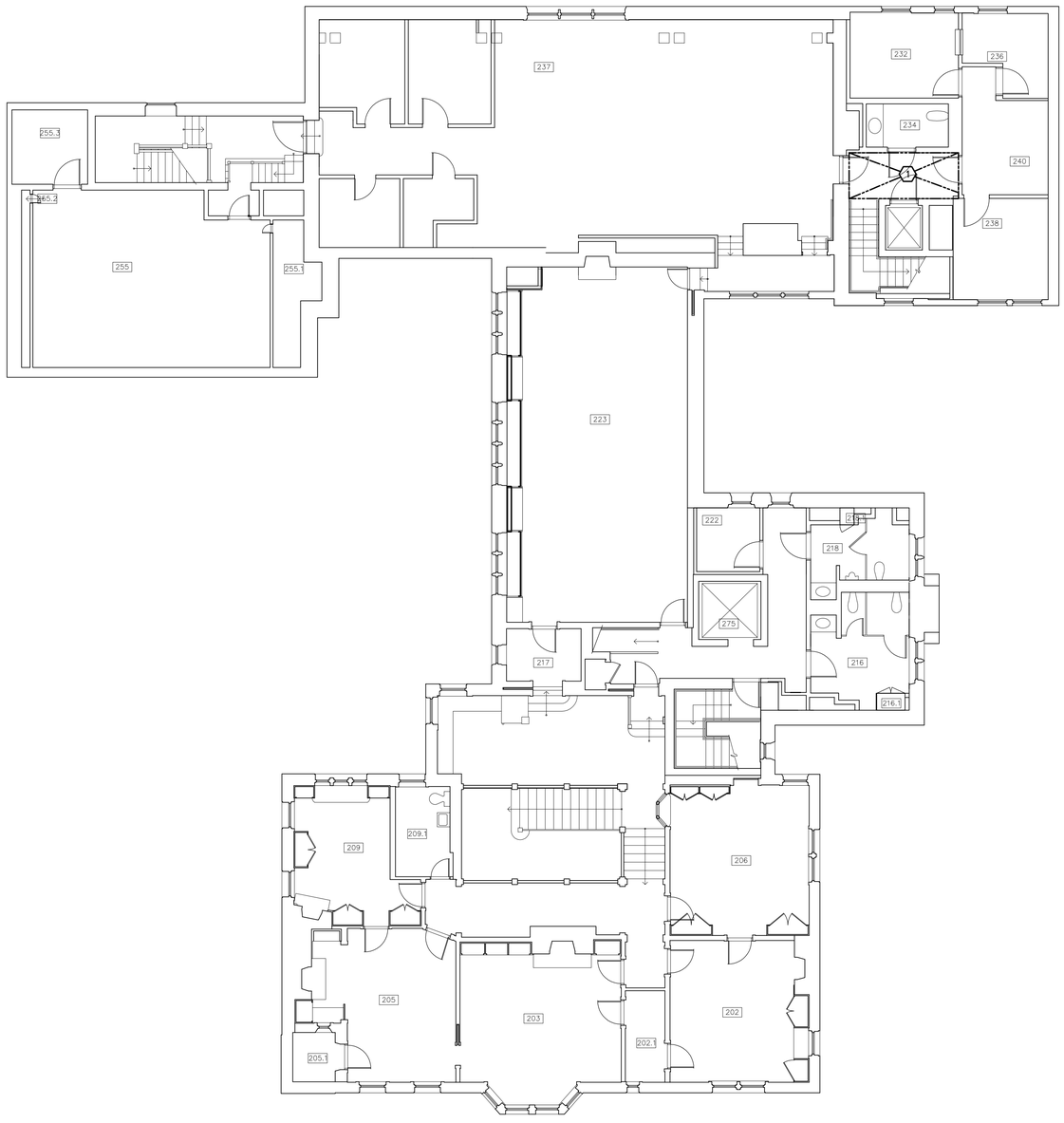
FREER HOUSE FIRST FLOOR PLAN - NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
A - 7

DSD FILE NAME
13-4806-A7



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FREER HOUSE SECOND FLOOR PLAN - NEW WORK

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

0 4 8 16 32

GENERAL NOTES:

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10. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT/SHORING AS REQUIRED DURING MECHANICAL EQUIPMENT INSTALLATION.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

(1) NEW GYP. BD. CEILING AFTER INSTALLATION OF MECHANICAL UNIT IS COMPLETE. MATCH EXISTING ADJACENT FINISHES.

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DEPT MGR	JSR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

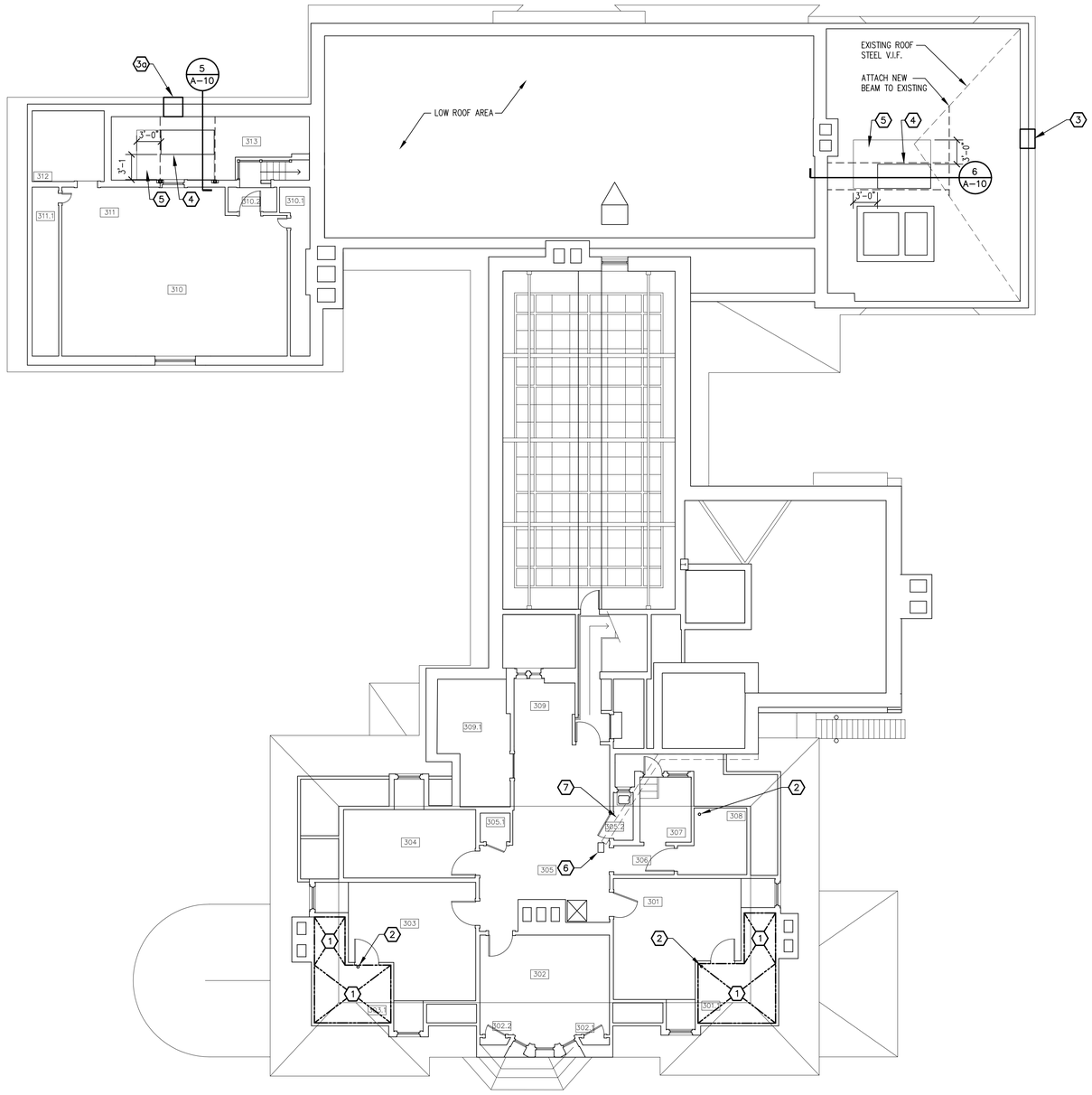
FREER HOUSE
SECOND FLOOR PLAN - NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
A - 8

DSD FILE NAME
13-4806-A8



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FREER HOUSE ATTIC FLOOR PLAN – NEW WORK

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

0 4 8 16 32

GENERAL NOTES:

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   OTHER WORK REQ'D FOR CLOSING/FINISHING WALL PENETRATIONS TO BE BY MECH. OR ELECTRICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO SEALING OPENINGS OR FIRE RATED SEALS AS REQ'D.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. NEW RESILIENT FLOOR, SUB FLOOR, AND BASE.
2. PATCH CEILING AS REQUIRED AT REWORKED MECHANICAL PIPING. REFER TO MECHANICAL SHEETS FOR ADDITIONAL INFORMATION.
3. PROVIDE NEW WOODEN LOUVER FINISH AND CONSTRUCTION TO MATCH EXISTING.
3a. RESTORE EXISTING WOOD LOUVER TO MATCH EXISTING.
4. SUPPORT MECHANICAL EQUIPMENT FROM ROOF STRUCTURE ABOVE. REFER TO SECTION SHEET A10.
5. NEW ALUMINUM GRATING WALKWAY SUPPORTED BY CEILING STRUCTURE BELOW.
6. FLASH ROOF AROUND NEW CONDENSATE PIPING PENETRATION.
7. INSTALL COPPER FLASHING AT VALLEY TO PROTECT ROOF FROM CONDENSATE DISCHARGE. INSTALL PER MANUFACTURERS RECOMMENDATIONS, COPPER TO BE PRE-PATINA'D GREEN.

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TITLE: **FREER OCCUPANT THERMAL COMFORT**

FREER HOUSE ATTICFLOOR PLAN - NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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13-4806

SHEET NO.
A - 9

DSD FILE NAME
13-4806-A9

ELECTRICAL SPECIFICATIONS

1. **RELATED DOCUMENTS**

   WORK PROVIDED BY ELECTRICAL TRADES IS SUBJECT TO ALL APPLICABLE REQUIREMENTS OF THE GENERAL CONDITIONS AND SPECIAL CONDITIONS.

2. **WORK INCLUDED**

   ELECTRICAL WORK SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO:

   DEMOLITION AND DISPOSAL, AND / OR REMOVAL AND REINSTALLATION OF EXISTING ELECTRICAL EQUIPMENT IN REMODELED AND NEW CONSTRUCTION AREAS.

   REVISIONS AND ADDITIONS TO THE EXISTING BUILDING ELECTRICAL SYSTEMS AS NECESSARY TO ACCOMMODATE BUILDING REVISIONS, INCLUDING THE RELOCATION AND RECONNECTION OF EXISTING ELECTRICAL EQUIPMENT AND WIRING TO REMAIN INTERFERING WITH REMODELED AND NEW CONSTRUCTION AREAS.

   PROVISION OF NEW WIRING DEVICES, POWER OUTLETS AND ASSOCIATED BRANCH CIRCUIT FROM EXISTING PANELS.

   ADDITION AND / OR MODIFICATIONS TO EXISTING PANELS AS REQUIRED. ELECTRICAL TRADES SHALL UPDATE EXISTING PANELBOARD DIRECTORIES TO REFLECT REVISIONS / ADDITIONS TO BRANCH CIRCUIT WIRING WITHIN THE PROJECT AREA.

   MODIFICATIONS/ADDITIONS TO EXISTING BUILDING FIRE ALARM SYSTEM.

   GROUNDING PER CODE REQUIREMENTS.

   ALL CUTTING AND PATCHING REQUIRED FOR THE ELECTRICAL WORK.

   ALL STEEL SUPPORTS REQUIRED FOR THE ELECTRICAL INSTALLATION AND ALL ITEMS INCIDENTAL AND REQUIRED TO COMPLETE THE INSTALLATION.

3. **WORK NOT INCLUDED**

   THE FOLLOWING WORK WILL NOT BE PART OF THE ELECTRICAL WORK:
   FINISHED COATS OF PAINT OTHER THAN TOUCH-UP OF FACTORY FINISHES.

4. **ELECTRICAL SERVICES**

   LIGHTING SYSTEM: 208Y/120VAC – 3 PHASE, 4 WIRE, GROUNDED WYE.
   RECEPTACLES AND SMALL POWER SYSTEM: 208Y/120VAC – 3 PHASE, 4 WIRE, GROUNDED WYE.

5. **REGULATIONS**

   ALL WORKMANSHIP, MATERIALS AND METHODS OF INSTALLATION SHALL BE GOVERNED BY THE REQUIREMENTS OF THESE SPECIFICATIONS, THE NATIONAL ELECTRICAL CODE CURRENT EDITION, ADA, OSHA AND ALL STATE AND LOCAL REGULATIONS.

6. **INSPECTION OF SITE**

   BEFORE SUBMITTING THEIR PROPOSAL, THIS CONTRACTOR SHALL PERSONALLY INSPECT THE SITE TO ARRIVE AT A CLEAR UNDERSTANDING OF THE CONDITIONS UNDER WHICH WORK IS TO BE DONE.

   NO ALLOWANCES OR EXTRA CONSIDERATION ON BEHALF OF THE CONTRACTOR WILL SUBSEQUENTLY BE ALLOWED BECAUSE OF ERROR OR FAILURE ON THE ON THE PART OF THE CONTRACTOR IN MAKING SUCH INSPECTION.

7. **PAINTING**

   IN GENERAL, NO PAINTING IS REQUIRED BY ELECTRICAL TRADES OTHER THAN TOUCH-UP OF FACTORY FINISHED ELECTRICAL EQUIPMENT.

8. **STRUCTURAL DIFFICULTIES**

   SHOULD ANY CONSTRUCTION CONDITIONS PREVENT THE INSTALLATION OF EQUIPMENT AT LOCATIONS SHOWN ON DRAWINGS, MINOR DEVIATIONS SHALL BE MADE AS DIRECTED BY THE OWNER'S REPRESENTATIVE, WITHOUT ANY ADDITIONAL COST TO THE OWNER.

9. **SLEEVES, CHASES AND RECESSES**

   PROVIDE CONDUIT SLEEVES WHERE CONDUITS PASS THROUGH FIRE / SMOKE RATED FLOORS, WALLS AND CEILINGS. SLEEVES SHALL BE GALVANIZED RIGID STEEL CONDUIT. THE SPACE BETWEEN CONDUIT AND SLEEVES SHALL BE FILLED WITH U.L. APPROVED NON-COMBUSTIBLE MATERIAL, RATED AT LEAST EQUAL TO THE FIRE / SMOKE RESISTANCE OF THE CONSTRUCTION MATERIAL BEING PENETRATED. FLOOR SLEEVES SHALL BE GROUTED IN CONCRETE WITH NON-SHRINKING EPOXY GROUT. FLOOR SLEEVES SHALL EXTEND 2" (MIN.) ABOVE FINISH FLOOR.

10. **GRADE OF MATERIAL AND / OR EQUIPMENT**

    ALL ITEMS PURCHASED FOR THIS PROJECT SHALL BE NEW, UNUSED MATERIAL, AND SHALL BE MANUFACTURERS FIRST OR SPECIFICATION GRADE, SHALL BE U.L. LISTED, AND SHALL MATCH EXISTING WHERE APPLICABLE, IN EVERY RESPECT.

11. **PROTECTION, HANDLING AND CLEANING**

    RESPONSIBILITY FOR CARE AND PROTECTION OF ELECTRICAL WORK INCLUDING ASSIGNED EQUIPMENT RESTS WITH ELECTRICAL TRADES UNTIL THE INSTALLATION HAS BEEN ACCEPTED.

12. **INTERRUPTION OF SERVICES**

    OBTAIN APPROVAL FROM THE OWNER PRIOR TO INTERRUPTING EXISTING SERVICES (POWER AND SYSTEMS). ALL SERVICE INTERRUPTIONS SHALL BE AT A TIME SUITABLE TO THE OWNER.

13. **CONDUIT INSTALLATION**

    ALL WORK IN FINISHED AREAS SHALL BE CONCEALED IN WALLS AND ABOVE CEILINGS. EXPOSED WORK, IN UNFINISHED AREAS, SHALL BE INSTALLED PERPENDICULAR OR PARALLEL TO WALLS, CEILINGS AND STRUCTURAL MEMBERS.

14. **ACCESS DOORS**

    PROVIDE ALL ACCESS DOORS REQUIRED FOR THE ELECTRICAL INSTALLATION. DOORS SHALL BE AS MANUFACTURED BY MILCOR OR APPROVED EQUAL. LOCATION SHALL BE APPROVED BY THE ARCHITECT PRIOR TO INSTALLATION.

15. **DEMOLITION**

    AS SHOWN ON PLANS, CERTAIN AREAS IN THE EXISTING BUILDING SHALL BE MODIFIED TO SUIT THE NEW REQUIREMENTS.

    WORK IN THE AREAS SHALL INCLUDE THE DISCONNECTION, REMOVAL, DISPOSAL AND / OR RELOCATION AND COMPLETE RECONNECTION, OF ALL ITEMS WHETHER SHOWN ON PLANS OR NOT AS REQUIRED TO SUIT THE DESIGN INTENT.

    ALL ELECTRICAL WORK INTERFERING WITH THE MODIFICATION WORK FOR THE NEW REQUIREMENTS SHALL BE RECONNECTED, REMOVED, DISPOSED, AND / OR RELOCATED TO SUIT THE FINAL INSTALLATION.

    ALL EQUIPMENT AND WIRING NOT IN RENOVATION AREAS BUT AFFECTED BY WORK IN RENOVATION AREAS SHALL BE RECONNECTED AS NECESSARY FOR THE COMPLETE WORKING SYSTEM.

    EXISTING EQUIPMENT SUITABLE FOR REUSE, REMOVED DURING CONSTRUCTION, SHALL BE TURNED OVER TO OWNER AS DIRECTED.

    REMOVE SHALL MEAN COMPLETE DISCONNECTION AND REMOVAL OF ELECTRICAL WORK AND MATERIAL, NORMALLY PROVIDED BY ELECTRICAL TRADES, INCLUDING CONDUIT AND WIRE TO SOURCE. SOURCE SHALL MEAN PANEL OR EXISTING ITEM TO REMAIN.

    DISPOSE SHALL MEAN REMOVAL AND DELIVERY TO A PLACE DESIGNATED AND / OR APPROVED BY THE OWNER.

    ABANDONED AND INACTIVE CONDUITS, WIRE, EQUIPMENT, ETC. ABOVE ACCESSIBLE CEILINGS AND / OR EXPOSED, SHALL BE REMOVED IN THEIR ENTIRETY. CONDUIT AND BOXES ABOVE INACCESSIBLE CEILINGS AND / OR CONCEALED SHALL BE ABANDONED IN PLACE, WIRING FEEDING DEVICES, AND LIGHT FIXTURES TO BE REMOVED SHALL BE ALSO REMOVED UP TO THE NEXT ACTIVE PULLBOX, JUNCTION BOX OR PANEL.

16. **DAMAGE TO OTHER WORK**

    REPAIR AND PAY FOR ALL DAMAGE DONE TO EXISTING AND NEW WORK BY ELECTRICAL TRADES.

17. **COORDINATION WITH OTHER TRADES**

    INSTALL ALL WORK SO AS TO AVOID INTERFERENCE WITH THE WORK OF OTHER TRADES. BE RESPONSIBLE FOR REMOVING AND RELOCATING ANY WORK WHICH, IN THE OPINION OF THE OWNER'S REPRESENTATIVE, CAUSES AN INTERFERENCE.

18. **SHOP DRAWINGS**

    PREPARE LAYOUT SHOP DRAWINGS DRAWN TO SCALE AND SUBMIT ONE (1) TRANSPARENCY COPY AND THREE (3) PRINTS OF EACH TO THE ARCHITECT FOR REVIEW.
    SUBMIT MANUFACTURER'S SHOP DRAWINGS ON ALL MAJOR ELECTRICAL SYSTEMS AND / OR EQUIPMENT.

19. **AS-BUILT DRAWINGS**

    THE LAYOUT SHOP DRAWINGS AS HEREIN BEFORE DESCRIBED SHALL BE REVISED AS REQUIRED DURING CONSTRUCTION TO INDICATE THE AS-BUILT CONDITION.

    AT THE COMPLETION OF THE PROJECT, RESUBMIT TO THE ARCHITECT FOR TRANSMITTAL TO THE OWNER'S REPRESENTATIVE THE REVISED MYLARS AND TWO SETS OF PRINTS FOR OWNER'S RECORD.

20. **TESTING AND ACCEPTANCE**

    PERFORM ALL TESTS REQUIRED BY OWNER, STATE, CITY, COUNTY AND / OR OTHER AGENCIES HAVING JURISDICTION.

    WHEN THE SYSTEMS ARE COMPLETED, THE CONTRACTOR SHALL OPERATE EQUIPMENT AS DIRECTED BY THE OWNER'S REPRESENTATIVE. REPLACE FAULTY EQUIPMENT, AND MAKE NECESSARY ADJUSTMENTS BEFORE FINAL ACCEPTANCE.

    PROVIDE COMPLETE OPERATING INSTRUCTIONS, MANUALS AND REPAIR PARTS LISTS FOR THE OWNER'S PERSONNEL IN THE OPERATION OF ALL SYSTEMS / EQUIPMENT.

21. **PERMITS AND FEES**

    UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS AND APPROVALS SHALL BE SECURED BY, AND PAID FOR BY, THIS CONTRACTOR.

22. **CERTIFICATE OF APPROVAL**

    UPON COMPLETION OF THE ALTERATIONS, PROVIDE OWNER'S REPRESENTATIVE WITH CERTIFICATE OF APPROVAL FROM ELECTRICAL INSPECTION AUTHORITY.

23. **MOUNTING HEIGHTS**

    UNLESS OTHERWISE INDICATED, MOUNTING HEIGHTS SHALL MATCH SIMILAR EXISTING HEIGHTS.

24. **GUARANTEE**

    THE GUARANTEE FOR ALL WORK UNDER THIS CONTRACT SHALL COMPLY WITH THE REQUIREMENTS PRESCRIBED IN THE GENERAL CONDITION, EXCEPT THAT THE TIME COVERAGE SHALL BE FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK.

25. **CONDUIT**

    WIRING SHALL BE INSTALLED IN GALVANIZED STEEL CONDUITS UNLESS OTHERWISE NOTED.

    ALL CONDUITS SHALL BE THINWALL (EMT) TYPE WITH COMPRESSION TYPE OR SET SCREW TYPE FITTINGS.

    OUTLET BOXES SHALL BE GALVANIZED PRESSED STEEL OF CONFIGURATION TO ACCOMMODATE FIXTURE TAP OR CONNECTION REQUIRED.

    MANUFACTURER SHALL BE PITTSBURG, TRIANGLE OR WHEATLAND.

    MINIMUM SIZE CONDUIT SHALL BE 1/2" TRADE SIZE.

    UNDERGROUND CONDUIT INSTALLATIONS SHALL USE SCHEDULE 40 PVC, MINIMUM SIZE: 1 INCH.

26. **CONDUCTORS**

    WIRE AND CABLE SHALL BE COPPER WITH 98% CONDUCTIVITY.

    WIRE FOR GENERAL INTERIOR USE, SIZES No. 10 AWG AND SMALLER SHALL BE STRANDED EQUAL TO TYPE "THWN" 75° C, OR "THHN", 90° C, 600 VOLTS.

    WIRE FOR GENERAL INTERIOR USE, SIZES No. 8 AWG AND LARGER SHALL BE STRANDED EQUAL TO TYPE "THHN" OR "XHHW" 90° C, 600 VOLTS.

    NO WIRE SMALLER THAN No. 12 AWG SHALL BE USED, EXCEPT WHERE INDICATED.

    A GREEN GROUND CONDUCTOR SHALL BE PROVIDED WITH ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS.

    MANUFACTURER SHALL BE SOUTHWIRE, TRIANGLE, OR CAROL.

27. **WIRING DEVICES**

    LOCAL WALL SWITCHES SHALL BE SPECIFICATION GRADE, 20 AMPERE, "QUIETTE" TOGGLE SWITCHES. SWITCHES SHALL BE HUBBELL #1220 SERIES OR EQUAL BY BRYANT, AND PASS & SEYMOUR. FINISH SHALL MATCH EXISTING IN IMMEDIATE AREA.

    GENERAL USE RECEPTACLES SHALL BE DUPLEX, 3 WIRE, 2 POLE GROUNDING TYPE. RECEPTACLES SHALL BE 20 AMPERE, 125 VOLTS A.C. AND SHALL BE HUBBELL #5362, OR EQUAL BY BRYANT AND PASS & SEYMOUR.

    GROUND FAULT INTERRUPTER RECEPTACLES SHALL BE IVORY, NYLON PLASTIC FACED, EQUAL TO BRYANT #GFR83FT-I.

28. **HARDWARE**

    PLATES FOR ALL CONCEALED CONDUIT AREAS SHALL MATCH EXISTING IN IMMEDIATE AREA (FLAT FRONT SQUARE CHAMFER CORNERED BRUSHED SATIN STAINLESS STEEL EQUAL TO HUBBELL 93000 SERIES).

29. **DISTRIBUTION EQUIPMENT**

    NEW COMPONENTS FOR USE IN EXISTING DISTRIBUTION EQUIPMENT SHALL MATCH EXISTING IN ALL RESPECTS. VERIFY EXISTING AT SITE.

    FUSES SHALL BE DUAL-ELEMENT, TIME DELAY TYPE RK-5 "FUSETRONS" BY BUSSMAN, OR EQUAL BY GOULD-SHAWMUT OR LITTLFUSE.

30. **DISCONNECT SWITCHES**

    IN GENERAL, ALL DISCONNECT SWITCHES SHALL BE 250V., HEAVY DUTY TYPE; NEMA 1, FOR INDOOR USE, AND NEMA 3R FOR OUTDOOR USE.

31. **MOTOR STARTERS**

    STARTERS FOR 3 PHASE MOTORS SHALL BE COMBINATION TYPE, MINIMUM SIZE 1, WITH FUSIBLE FRONT OPERATED DISCONNECT SWITCH, 208V TO 120V CONTROL TRANSFORMER WITH FUSED SECONDARY, H-O-A SELECTOR SWITCH AND PUSH-TO-TEST PILOT LIGHT MOUNTED ON DOOR. CONTROL TRANSFORMER SHALL BE 50VA MINIMUM. EACH STARTER SHALL HAVE A MINIMUM OF TWO AUXILIARY CONTACTS.

    STARTERS FOR SINGLE PHASE MOTORS SHALL BE MANUAL TYPE WITH "ON-OFF" SINGLE POLE SWITCH AND THERMAL OVERLOAD PROTECTION.

    THERMAL OVERLOADS FOR ALL MOTOR STARTERS SHALL BE SELECTED AFTER FINAL INSTALLED HORSEPOWER OF MOTOR IS DETERMINED. STARTERS SHALL BE EQUAL TO SQUARE D CLASS 8538.

32. **GROUNDING**

    ELECTRICAL SYSTEM GROUNDING AND GROUNDING OF NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL IN ALL INSTANCES CONFORM TO THE MINIMUM REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

33. **ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE CONTROLS**

    ELECTRICAL INSTALLATION AND WIRING CONTRACTOR (EIWC) SHALL BE RESPONSIBLE FOR THE INSTALLATION AND WIRING OF ALL AUTOMATIC TEMPERATURE CONTROL DEVICES FURNISHED BY SIEMENS BUILDING TECHNOLOGIES AS MAY BE REQUIRED PER THE PROJECT PLANS AND SPECIFIC CONTROL SYSTEM REQUIREMENTS. (EIWC SHALL REFER TO SIEMENS COMPLETE DRAWING PACKAGE FOR ALL PERTINENT INFORMATION REGARDING EXTENT OF WORK AND INSTALLATION REQUIREMENTS PRIOR TO COMMENCING WITH WORK.)

OVERVIEW OF ELECTRICAL SCOPE:

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH YOUR CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THE FOLLOWING OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. DEMOLITION OF SELECTED ELECTRICAL EQUIPMENT WITHIN THE PROJECT AREA TO ACCOMMODATE SCOPE OF NEW WORK.
2. PROVISION AND INSTALLATION OF ALL REQUIRED ELECTRICAL DEVICES, SWITCHES, ETC. AS INDICATED ON THE DRAWINGS.
3. MODIFICATIONS/ADDITIONS TO EXISTING BUILDING ELECTRICAL POWER/DISTRIBUTION PANELS TO ACCOMMODATE ELECTRICAL SERVICES TO NEW MECHANICAL EQUIPMENT AS REQUIRED. (NEW ELECTRICAL EQUIPMENT TO MATCH EXISTING).
4. MODIFICATIONS/ADDITIONS TO EXISTING FIRE ALARM SYSTEM. (RECONNECTION OF EXISTING/RELOCATED AND PROVISION/INSTALLATION OF NEW DUCT MOUNTED SMOKE DETECTORS AT HEAT PUMP UNITS)
5. PROVISION OF WIRING AND TERMINATIONS FOR ALL REQUIRED MECHANICAL CONTROLS. THE ELECTRICAL INSTALLATION AND WIRING CONTRACTOR (EIWC) SHALL BE RESPONSIBLE FOR INSTALLATION OF ALL CONTROL EQUIPMENT PROVIDED BY SIEMENS BUILDING TECHNOLOGIES, INC.. THE EIWC SHALL FURNISH, INSTALL AND TERMINATE ALL NECESSARY WIRING, CONDUIT, HANGERS, ETC. TO PROVIDE A COMPLETE CONTROL SYSTEM INSTALLATION.

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING BUT NOT LIMITED TO THE 2012 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS, MMC, MPC, IFC, IFGC, 2012 NEC, MICHIGAN ENERGY CODE AND THEIR RELATED REFERENCES.

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE ELECTRICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COSTS ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2011 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2011 MICHIGAN ELECTRICAL CODE RULES, PART 8.
NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)
MICHIGAN ENERGY CODE–ASHRAE 90.1–2007
2009 INTERNATIONAL FIRE CODE (AS REFERENCED)
2012 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
2012 MICHIGAN MECHANICAL CODE
2012 MICHIGAN PLUMBING CODE
2012 INTERNATIONAL FUEL GAS CODE

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE ELECTRICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

ELECTRICAL SHEET INDEX

SHEET	DESCRIPTION
E–1	SHEET INDEX, SYMBOL LIST AND ELECTRICAL SPECIFICATIONS
E–2	FREER HOUSE BASEMENT FLOOR PLAN – ELECTRICAL DEMOLITION
E–3	FREER HOUSE PARTIAL FIRST & SECOND FLOOR PLANS – ELECTRICAL DEMOLITION
E–4	FREER HOUSE ATTIC FLOOR PLAN – ELECTRICAL DEMOLITION
E–5	FREER HOUSE BASEMENT FLOOR PLAN – ELECTRICAL NEW WORK
E–6	FREER HOUSE PARTIAL 1ST & 2ND FLOOR PLANS – ELECTRICAL NEW WORK
E–7	FREER HOUSE ATTIC PLAN – ELECTRICAL NEW WORK
E–8	PANELBOARD DETAILS & FIRE ALARM SYSTEM DIAGRAM

SYMBOL LIST

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE OUTLET – (48" A.F.F. OR AS DIRECTED)
M	SINGLE PHASE MOTOR
M	THREE PHASE MOTOR
	DISCONNECT SWITCH
$	SINGLE POLE SWITCH
$T	MANUAL MOTOR STARTER SWITCH WITH THERMAL PROTECTION
$TP	MANUAL MOTOR STARTER SWITCH WITH PILOT LIGHT
	LIGHTING / RECEPTACLE / EQUIPMENT PANEL
	COMBINATION MAGNETIC STARTER / DISCONNECT SWITCH (FUSED)
J	JUNCTION BOX
CP	CONTROL PANEL BY MECHANICAL TRADES
T	THERMOSTAT
F	FIRE ALARM MANUAL PULL STATION
AFH	FIRE ALARM AUDIBLE / STROBE FLASHER
S P	DUCT DETECTOR – PHOTOELECTRIC TYPE (S=SUPPLY)
AFF	ABOVE FINISHED FLOOR
GFI	GROUND FAULT INTERRUPTER
WP	WEATHERPROOF
E	EXISTING EQUIPMENT / DEVICE
R	RELOCATED EQUIPMENT/DEVICE
———	NEW
———	EXISTING TO REMAIN
⟋⟋⟋⟋⟋	EXISTING TO BE REMOVED

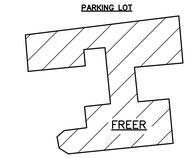
ARCHITECTURAL – MECHANICAL – ELECTRICAL COORDINATION SCHEDULE

DESIGNATION	LOCATION	HP	KW	FLA	ELECTRICAL		DISCONNECT		STARTER		REMARKS
					VOLTAGE	PHASE	FURN.	INST.	FURN.	INST.	
HP–1	B01 MECH./ELECT. ROOM	—	—	25.4	208	3	E	E	S	S	–
HP–2	B12 MECHANICAL ROOM	—	—	25.4	208	3	E	E	S	S	
HP–3	B06.1 MECHANICAL ROOM	—	—	25.4	208	3	E	E	S	S	
HP–4	B14 MECH./ELECT. ROOM	—	—	9.5	208	3	E	E	S	S	
HP–5	BASEMENT, UNDER ENTRANCE TO PORCH	—	—	13.7	208	3	E	E	S	S	
HP–6	B28 MECHANICAL ROOM	—	—	32.5	208	3	E	E	S	S	
HP–7	ATTIC NORTHEAST	—	—	9.5	208	3	E	E	S	S	
HP–8	B23 MECHANICAL ROOM	—	—	31.0	208	3	E	E	S	S	
HP–9	ATTIC 313 NORTHWEST	—	—	24.3	208	3	E	E	S	S	
HP–10	B23 MECHANICAL ROOM	—	—	13.7	208	3	E	E	S	S	
HP–11	NORTHWEST BASEMENT (CURRENTLY ON 2ND FLR.)	—	—	24.3	208	3	E	E	S	S	
HP–12	MECHANICAL CLOSET SOUTHWEST ATTIC OF SOUTH BUILDING	—	—	25.4	208	3	E	E	S	S	
HP–13	MECHANICAL CLOSET SOUTHEAST ATTIC OF SOUTH BUILDING	—	—	25.4	208	3	E	E	S	S	
HP–14	MECHANICAL ROOM NORTHEAST ATTIC OF SOUTH BUILDING	—	—	25.4	208	3	E	E	S	S	
HP–15	MECHANICAL ROOM NORTHWEST ATTIC OF NORTH BUILDING	—	—	9.5	208	3	E	E	S	S	
P–1	BASEMENT NORTHWEST	7.5	–	–	208	3	E	E	E	E	
P–2	BASEMENT NORTHWEST	7.5	–	–	208	3	E	E	E	E	STANDBY
CONTROLS	FREER HOUSE BASEMENT	—	—	1.2	120	1	E	E	–	–	CONTROL PANEL
GP–1	BASEMENT MECHANICAL ROOM – NORTHWEST	0.5	–	–	115	1	E	E	E	E	
CP–1 THRU CP–5	FREER HOUSE BASEMENT WEST END & ATTIC	1/8	–	–	120	1	E	E	S	S	PROVIDED WITH CORD AND PLUG

L E G E N D

S = SUPPLIER (MANUFACTURER)*
M = MECHANICAL
E = ELECTRICAL
CP = CONDENSATE PUMP
RF = RELIEF AIR FAN
AHU = AIR HANDLING UNIT
P = PUMP
HP = HEAT PUMP

PARKING LOT



N KEY PLAN
NO SCALE

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MARK	ISSUE	DATE
	BIDS	07/29/15
	FINAL REVIEW	05/28/15
	OWNER REVIEW	04/28/15

DESIGNER	PA
DRAWN	SKH
CHECKED	GDC
DEPT MGR	SM
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

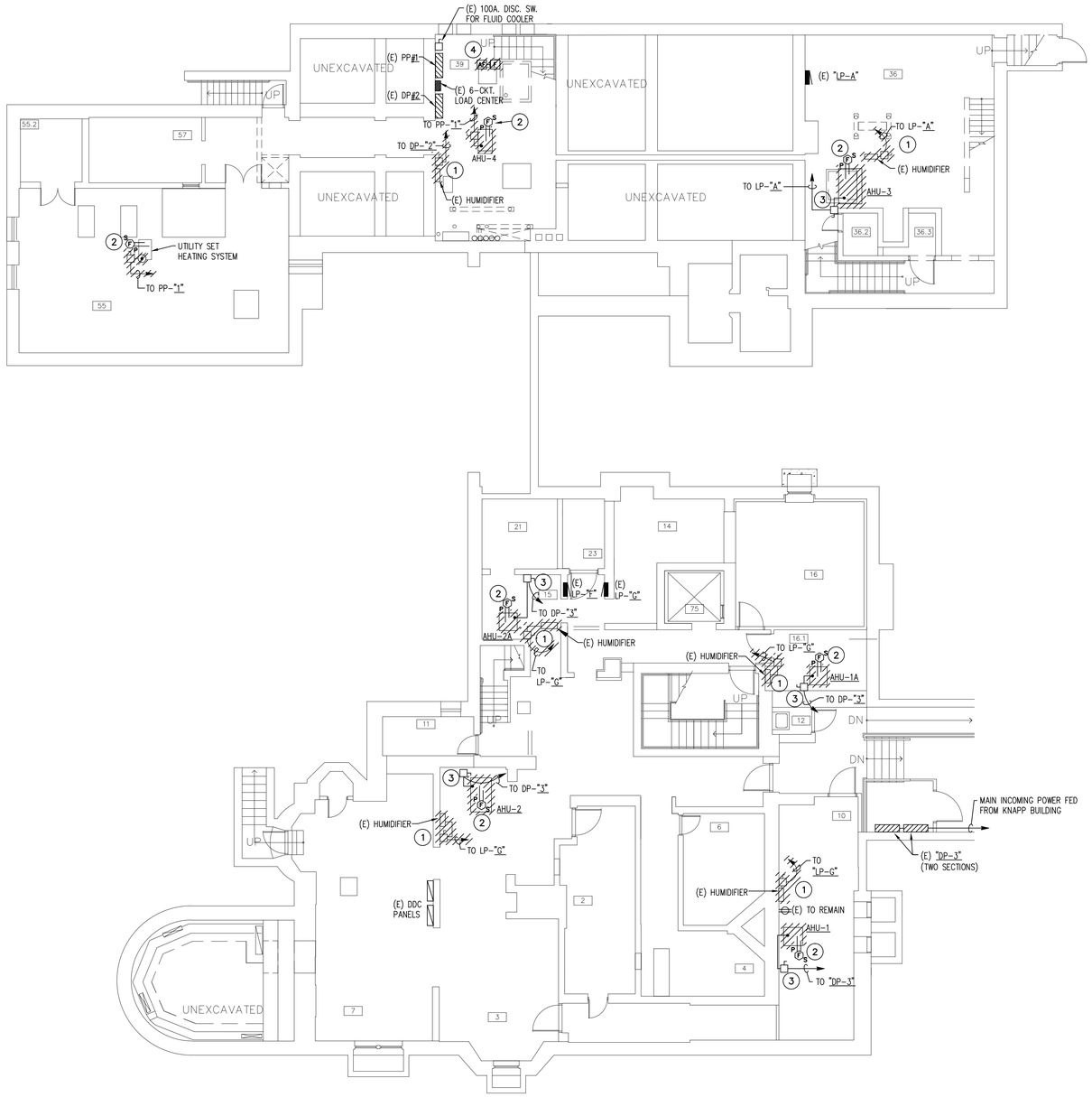
SHEET INDEX
SYMBOL LIST
& ELECTRICAL
SPECIFICATIONS

WSU PROJECT #: 511–254496–2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
E - 1

DSD FILE NAME
13–4806–E1



FREER HOUSE BASEMENT FLOOR PLAN – ELECTRICAL DEMOLITION

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

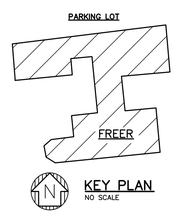
0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER BEFORE OCCURRING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.

DEMOLITION KEY NOTES:

1. EXISTING HUMIDIFIER TO BE REMOVED INCLUDING ALL EXPOSED CONDUIT AND WIRING BACK TO SOURCE.
2. EXISTING DUCT SMOKE DETECTOR SHALL BE REUSED TO SERVE NEW HEAT PUMP UNIT. DISCONNECT/RECONNECT DUCT DETECTOR TO ACCOMMODATE NEW DUCTWORK CONNECTION.
3. EXISTING NON-FUSED DISCONNECT SWITCH AND CONDUIT BACK TO SOURCE PANEL SHALL BE REUSED. EXISTING FEEDER CONDUCTORS SHALL BE REPLACED.
4. TEMPORARILY DISCONNECT, REMOVE & REINSTALL EXISTING FIRE ALARM DEVICES TO ACCOMMODATE WALL REMOVAL FOR NEW MECHANICAL DUCTWORK.



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DRAWN	MRK
CHECKED	GDC
DEPT MGR	SM
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE BASEMENT FLOOR PLAN - ELECTRICAL DEMOLITION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
E - 2

DSD FILE NAME
13-4806-E2

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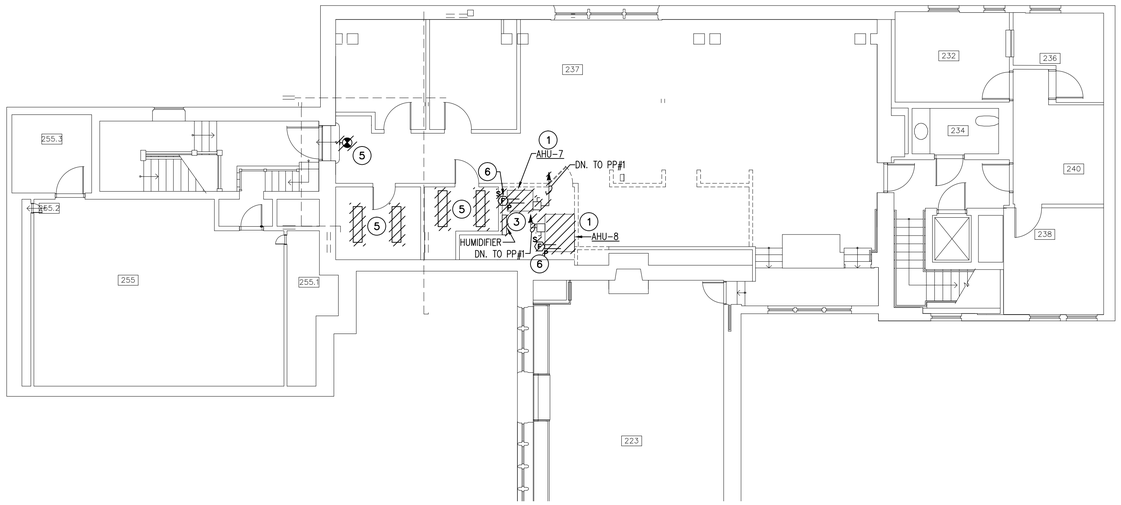

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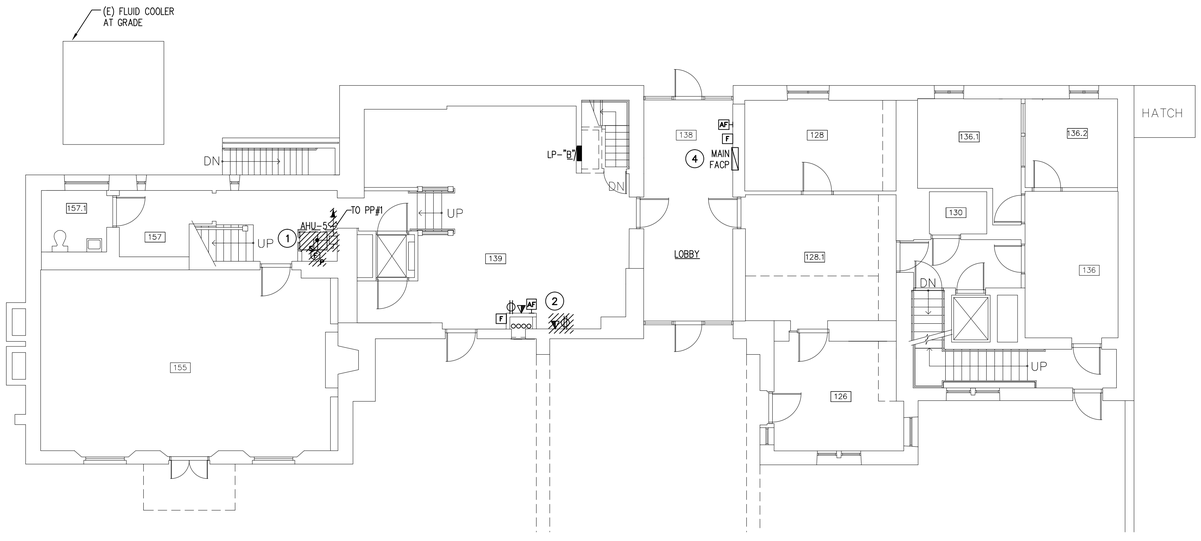
FREER HOUSE PARTIAL SECOND FLOOR PLAN – ELECTRICAL DEMOLITION

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

0 4 8 16 32



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FREER HOUSE PARTIAL FIRST FLOOR PLAN – ELECTRICAL DEMOLITION

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

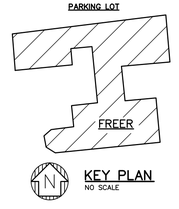
0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER BEFORE OCCURRING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.

DEMOLITION KEY NOTES:

1. EXISTING AHU TO BE REMOVED INCLUDING ALL EXPOSED CONDUIT AND WIRING BACK TO SOURCE.
2. DISCONNECT, MAKE SAFE AND REMOVE EXISTING OUTLETS BACK TO SOURCE TO ACCOMMODATE ARCHITECTURAL AND MECHANICAL WORK.
3. EXISTING HUMIDIFIERS TO BE REMOVED INCLUDING ALL EXPOSED CONDUIT AND WIRING BACK TO SOURCE.
4. SEE SHEET E-8 FOR F/A PANEL UPGRADE REQUIREMENTS.
5. TEMPORARILY DISCONNECT, REMOVE & REINSTALL EXISTING LIGHT FIXTURES TO FACILITATE CEILING REMOVAL & NEW DUCT WORK. COORDINATE WITH MECHANICAL TRADES.
6. DISCONNECT AND REMOVE EXISTING DUCT SMOKE DETECTORS COMPLETE WITH WIRING & CONDUIT BACK TO FIRE ALARM PANEL AND/OR NEXT ACTIVE F/A DEVICE.



N KEY PLAN
NO SCALE

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	BIDS	07/29/15
	FINAL REVIEW	05/28/15
	OWNER REVIEW	04/28/15

DESIGNER	PA
DRAWN	MRK
CHECKED	GDC
DEPT MGR	SM
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

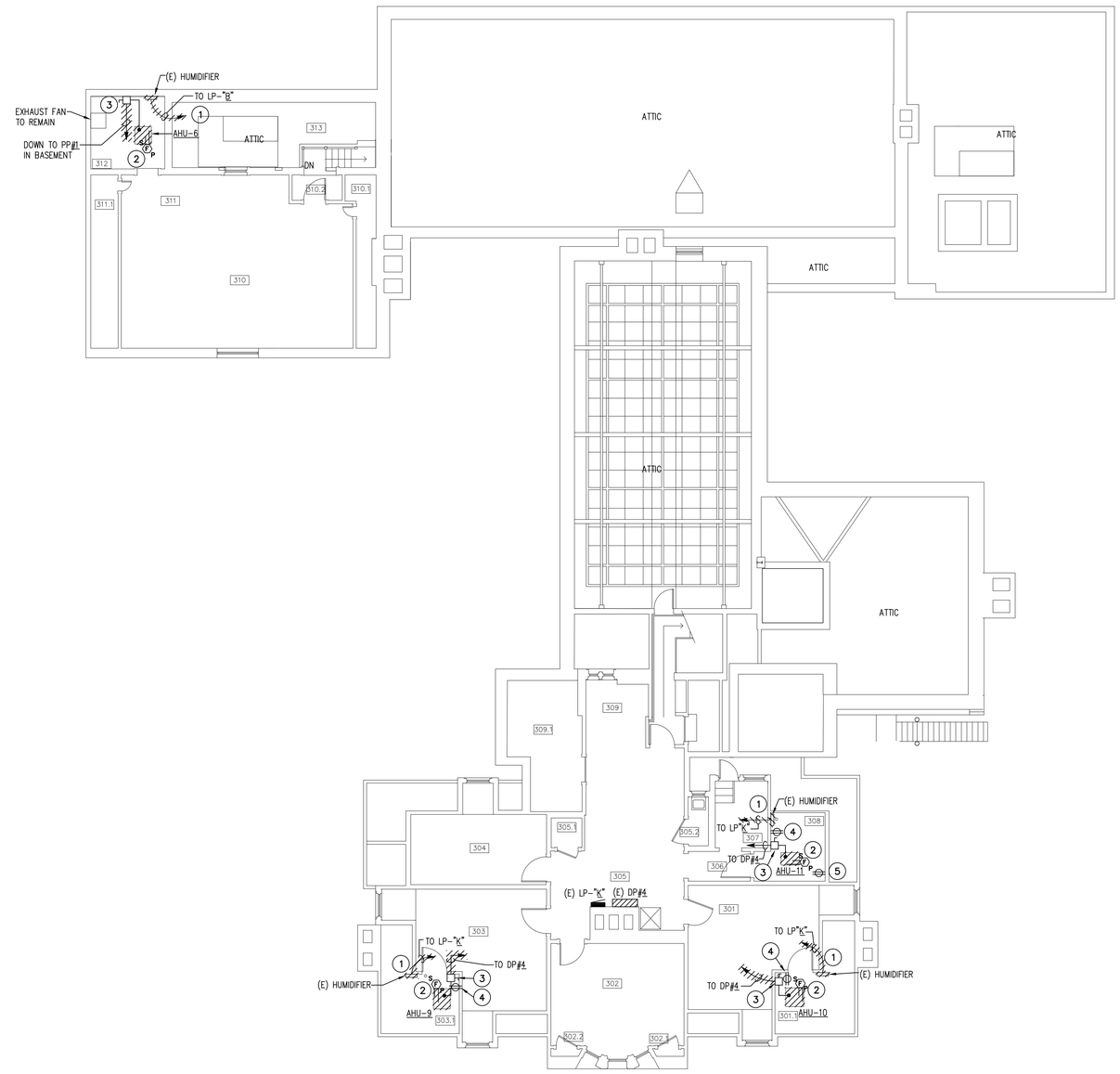
FREER HOUSE PARTIAL 1ST & 2ND FLOOR PLANS - ELECTRICAL DEMOLITION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
E - 3

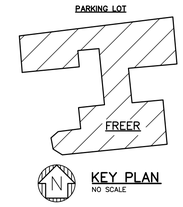
DSD FILE NAME
13-4806-E3



FREER HOUSE ATTIC FLOOR PLAN – ELECTRICAL DEMOLITION

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

0 4 8 16 32



KEY PLAN
NO SCALE

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER BEFORE OCCURRING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.

DEMOLITION KEY NOTES:

1. EXISTING HUMIDIFIER TO BE REMOVED INCLUDING ALL EXPOSED CONDUIT AND WIRING BACK TO SOURCE.
2. EXISTING DUCT SMOKE DETECTOR SHALL BE REUSED TO SERVE NEW HEAT PUMP UNIT. DISCONNECT/RECONNECT DUCT DETECTOR TO ACCOMMODATE NEW DUCTWORK CONNECTION.
3. EXISTING NON-FUSED DISCONNECT SWITCH AND CONDUIT BACK TO SOURCE PANEL SHALL BE REUSED. EXISTING FEEDER CONDUCTORS SHALL BE REPLACED.
4. EXISTING DUPLEX RECPTACLE SERVING CORD & PLUG CONNECTED CONDENSATE PUMP SHALL REMAIN.
5. EXISTING GENERAL-USE DUPLEX RECEPTACLE SHALL BE USED FOR NEW CONDENSATE PUMP.

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TITLE: **FREER OCCUPANT THERMAL COMFORT**

FREER HOUSE ATTIC FLOOR PLAN - ELECTRICAL DEMOLITION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
E - 4

DSD FILE NAME
13-4806-E4

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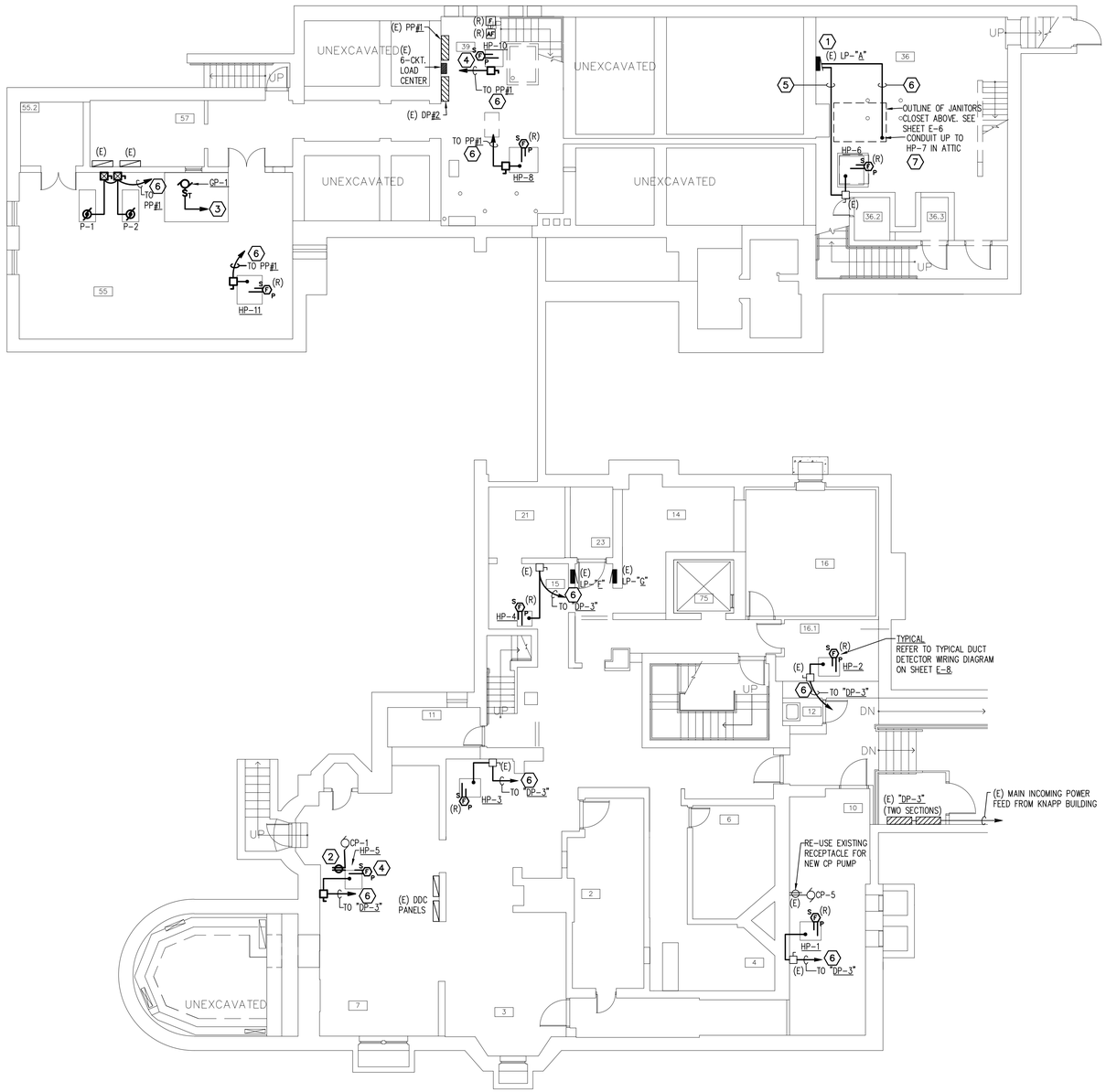


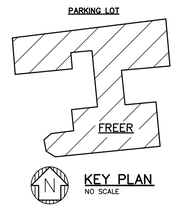
NEW WORK KEY NOTES:

1. FURNISH AND INSTALL NEW 50A,3P. "HACR" RATED CIRCUIT BREAKER IN EXISTING PANEL TO ACCOMMODATE ELECTRICAL CONNECTION TO HP-6.
2. NEW DUPLEX RECEPTACLE FOR CORD & PLUG CONNECTED CONDENSATE PUMP. CONNECT TO AVAILABLE "SPARE" CKT. BREAKER IN EXISTING LP-"G".
3. NEW 2#12 & 1#12GRD., 1/2"C. TO "SPARE" 20A.1P. CIRCUIT BREAKER IN EXISTING "DP-2" (CKT. #9) VERIFY BREAKER AVAILABILITY IN FIELD.
4. NEW DUCT SMOKE DETECTOR. CONNECT TO EXISTING FIRE ALARM SYSTEM. SEE SHEET E-8.
5. NEW 3#6+1#10GND IN EXISTING CONDUIT.
6. SEE SHEET E-8 FOR WIRE & BRANCH CIRCUIT RATING.
7. COORDINATE EXACT CONDUIT ROUTING IN FIELD WITH OWNER. SEAL ALL CONDUIT PENETRATIONS.

FREER HOUSE BASEMENT FLOOR PLAN – ELECTRICAL NEW WORK

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

0 4 8 16 32



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TITLE: FREER OCCUPANT THERMAL COMFORT

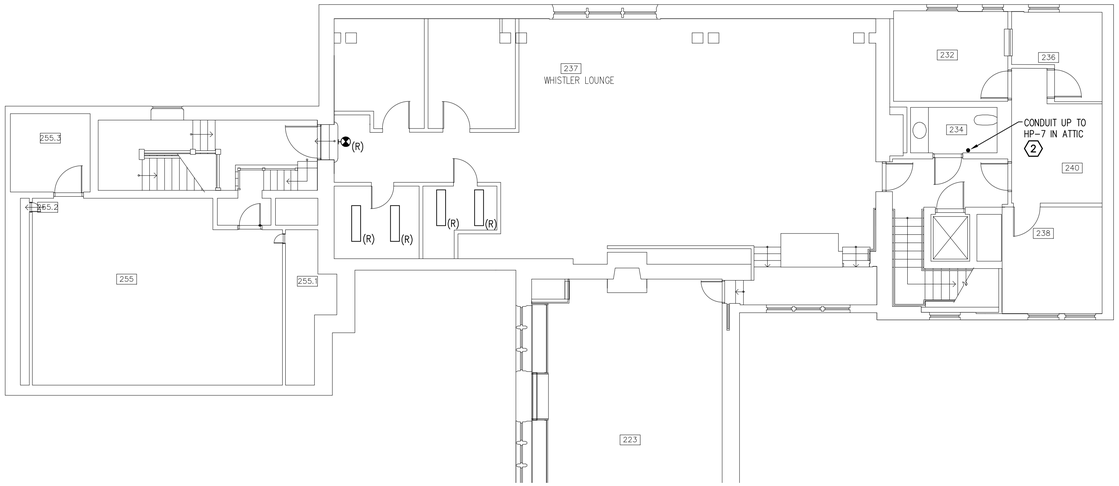
FREER HOUSE BASEMENT FLOOR PLAN - ELECTRICAL NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
E - 5

DSD FILE NAME
13-4806-E5



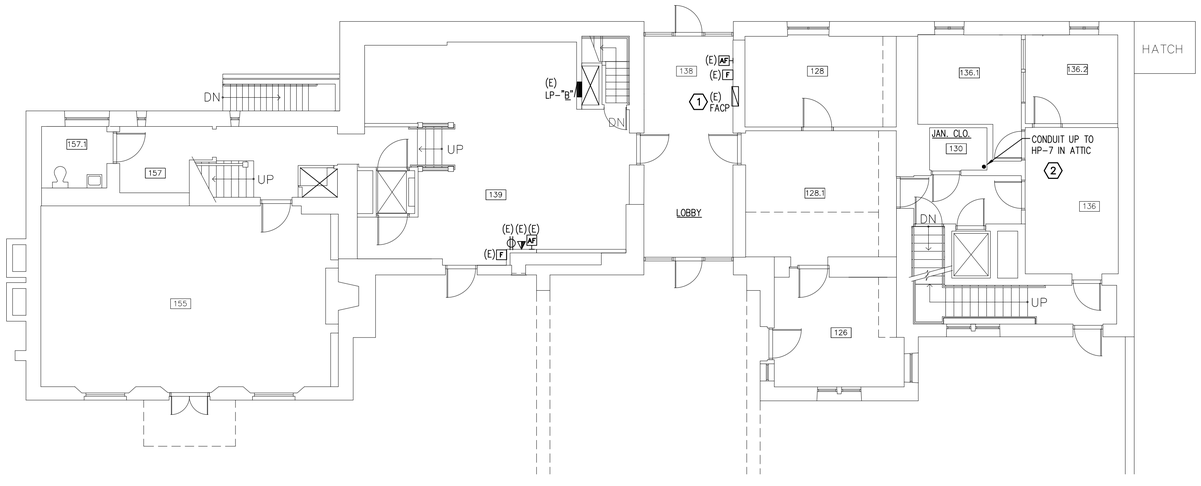
FREER HOUSE PARTIAL SECOND FLOOR PLAN – ELECTRICAL NEW WORK

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

0 4 8 16 32

NEW WORK KEY NOTES:

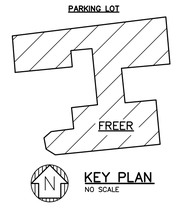
1. ELECTRICAL TRADES SHALL FURNISH AND INSTALL ONE(1) NEW EIGHT(8) ZONE ALARM MODULE AND DISPLAY DEVICE IN EXISTING "GAMEWELL" FIRE ALARM SYSTEM CONTROL PANEL TO ACCOMMODATE INSTALLATION OF ADDITIONAL/NEW HEAT PUMP DUCT MOUNTED SMOKE DETECTORS. (REFER TO TYPICAL DUCT DETECTOR WIRING DIAGRAM ON SHEET E-8)
2. COORDINATE EXACT CONDUIT ROUTING IN THE FIELD WITH OWNER. SEAL ALL CONDUIT PENETRATIONS.



FREER HOUSE PARTIAL FIRST FLOOR PLAN – ELECTRICAL NEW WORK

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

0 4 8 16 32



KEY PLAN
NO SCALE

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TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE PARTIAL 1ST & 2ND FLOOR PLANS - ELECTRICAL NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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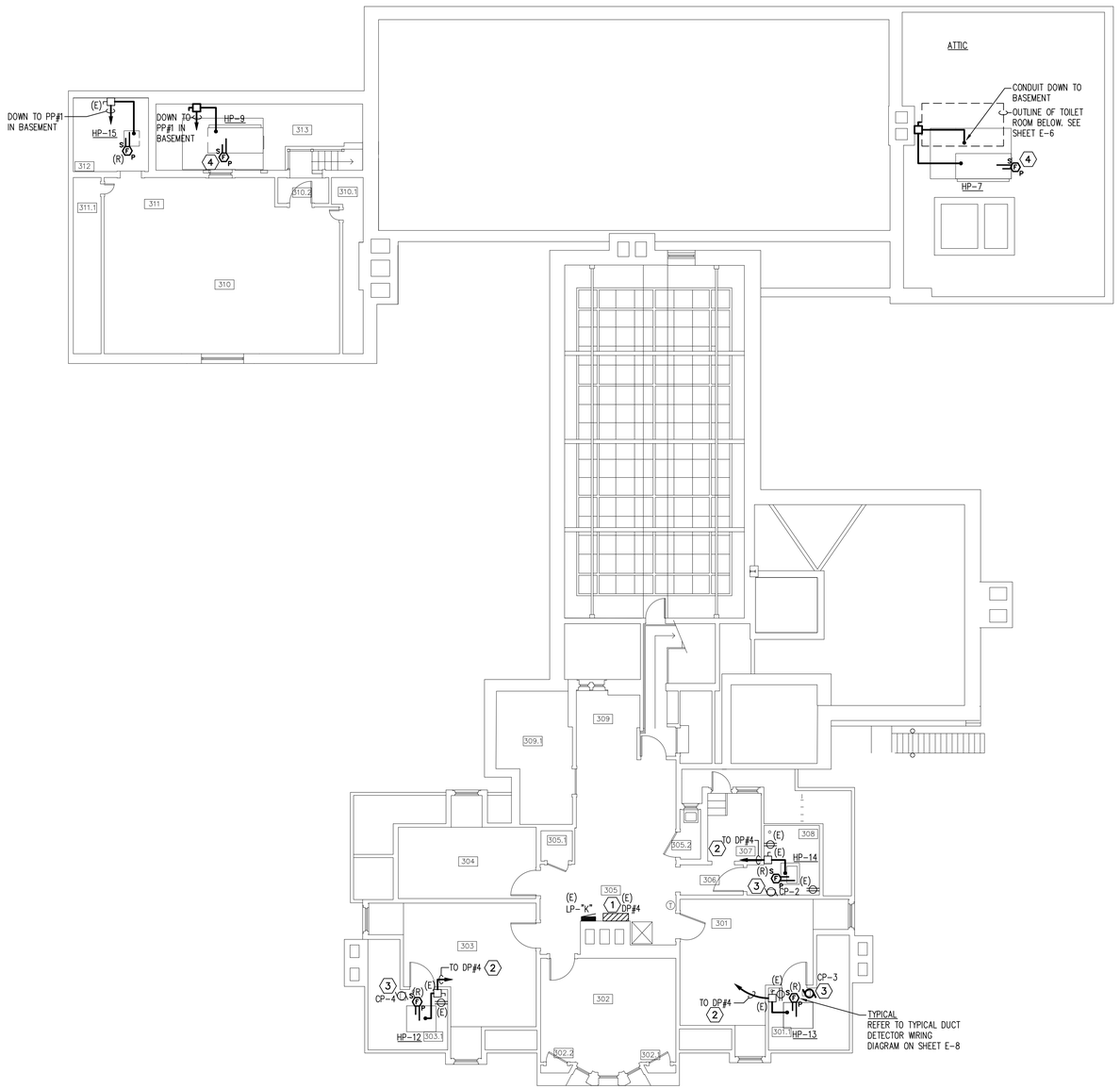
A/E PROJECT NO.
13-4806

SHEET NO.
E - 6

DSD FILE NAME
13-4806-E6

NEW WORK KEY NOTES:

1. REFER TO DETAIL OF EXISTING DP#4 ON SHEET E-8.
2. SEE SHEET E-8 FOR WIRE & BRANCH CIRCUIT RATING.
3. NEW CORD & PLUG CONDENSATE PUMP CONNECTED TO EXISTING DUPLEX RECEPTACLE IN ROOM.
4. CONNECT NEW DUCT SMOKE DETECTORS TO EXISTING FIRE ALARM PANEL. REFER TO F/A DIAGRAM ON SHEET E-8.

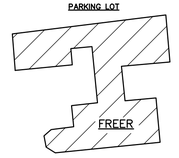


FREER HOUSE ATTIC FLOOR PLAN – ELECTRICAL NEW WORK

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

0 4 8 16 32

PARKING LOT



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TITLE: **FREER OCCUPANT THERMAL COMFORT**

FREER HOUSE ATTIC FLOOR PLAN - ELECTRICAL NEW WORK

WSU PROJECT #: 511-254496-2
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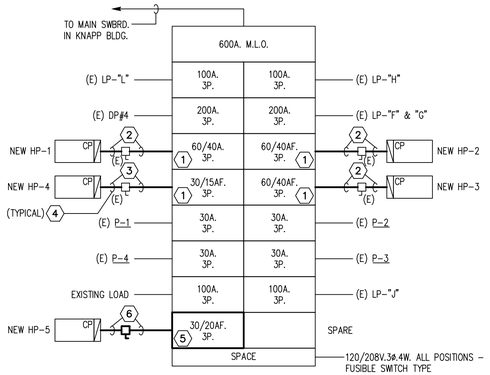
13-4806

SHEET NO.
E - 7

DSD FILE NAME
13-4806-E7

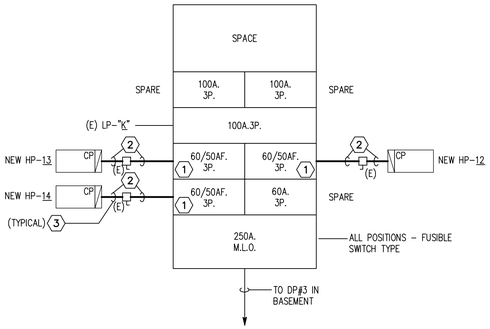


EXISTING DISTRIBUTION PANEL "DP#3" (NEW WORK)

NOT TO SCALE (SECTION 1)

KEY NOTES:

1. FURNISH AND INSTALL NEW FUSES IN EXISTING SWITCH.
2. NEW 3#8 & 1#10GRD., IN EXISTING 1"C.
3. NEW 3#12 & 1#12GRD., IN EXISTING 3/4"C.
4. REUSE/EXTEND EXISTING CONDUIT AS REQUIRED.
5. PROVIDE NEW FUSE/SWITCH IN EXISTING SPACE.
6. NEW 3#12 & 1#12GRD., IN NEW 3/4"C.

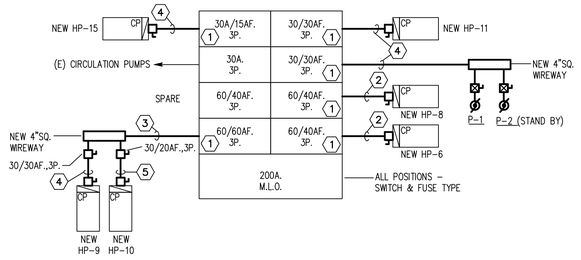


EXISTING DISTRIBUTION PANEL "DP#4" (NEW WORK)

NOT TO SCALE (120/208V.3ø.4W.)

KEY NOTES:

1. FURNISH AND INSTALL NEW FUSES IN EXISTING SWITCH.
2. NEW 3#8 & 1#10GRD., IN EXISTING 1"C.
3. REUSE/EXTEND EXISTING CONDUIT AS REQUIRED.

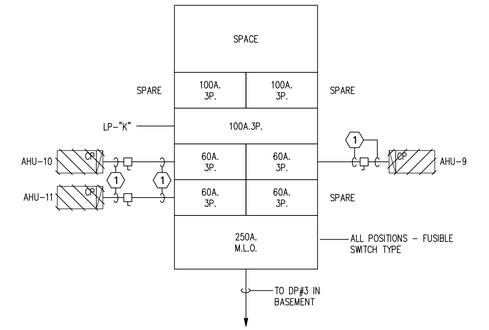


EXISTING DISTRIBUTION PANEL "PP#1" (NEW WORK)

NOT TO SCALE (208V.3ø.3W.)

KEY NOTES:

1. FURNISH AND INSTALL NEW FUSES IN EXISTING SWITCH.
2. NEW 3#8 & 1#10GRD., 3/4"C.
3. NEW 3#6 & 1#10GRD., 1"C.
4. NEW 3#10 & 1#10GRD., 3/4"C.
5. NEW 3#12 & 1#12GRD., 3/4"C.

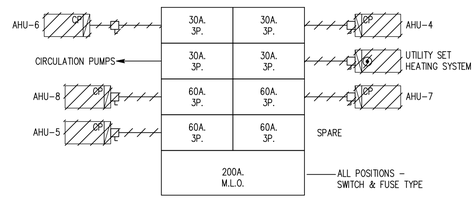


EXISTING DISTRIBUTION PANEL "DP#4" (DEMOLITION)

NOT TO SCALE (120/208V.3ø.4W.)

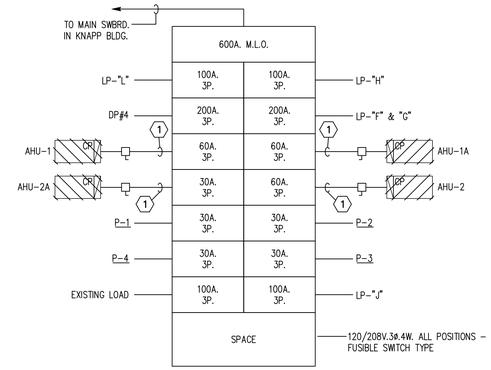
KEY NOTES:

1. EXISTING CONDUIT TO BE REUSED. REMOVE/REPLACE EXISTING FEEDER CONDUCTORS. SEE NEW WORK.



EXISTING DISTRIBUTION PANEL "PP#1" (DEMOLITION)

NOT TO SCALE (208V.3ø.3W.)

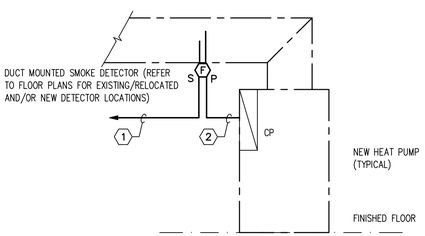


EXISTING DISTRIBUTION PANEL "DP#3" (DEMOLITION)

NOT TO SCALE (SECTION 1)

KEY NOTES:

1. EXISTING CONDUIT TO BE REUSED. REMOVE/REPLACE EXISTING FEEDER CONDUCTORS. SEE NEW WORK.

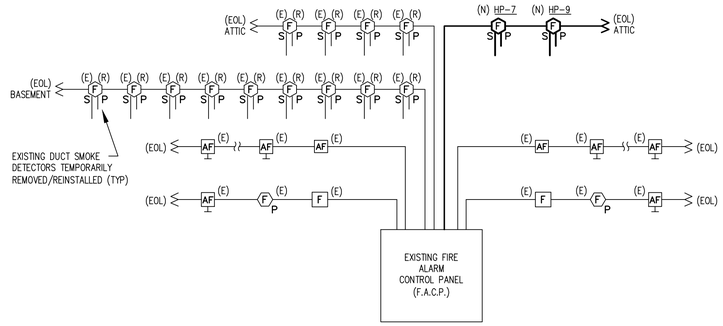


TYPICAL HEAT PUMP DUCT DETECTOR WIRING DIAGRAM

NO SCALE

DIAGRAM KEY NOTES:

1. CONDUIT AND WIRE CONNECTION TO EXISTING FIRE ALARM CONTROL PANEL PER MANUFACTURERS REQUIREMENTS. RECONNECTION OF EXISTING/RELOCATED AND CONNECTION OF NEW FIRE ALARM SYSTEM DETECTION AND SIGNALING DEVICES SHALL BE AS DIRECTED BY SERVICE/INSTALLATION REPRESENTATIVE: CONTACT MR. JEFF VOTH OF ELECTRONIC SAFETY SERVICES, INC. AT (586) 777-5578 REGARDING PRICING GUIDELINES FOR SYSTEM DEVICES AND INSTALLATION.
2. CONDUIT AND WIRING CONNECTION FROM DUCT DETECTOR TO HEAT PUMP CONTROL PANEL FOR UNIT SHUTDOWN UPON DETECTION OF PRODUCTS OF COMBUSTION IN SUPPLY AIR DUCTWORK.

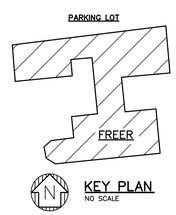


EXISTING FIRE ALARM SYSTEM DIAGRAM – MODIFIED FOR NEW WORK

NO SCALE

FIRE ALARM GENERAL NOTES:

1. PROVIDE EMPTY CONDUITS, JUNCTION BOXES AND WIRING AS NECESSARY ACCESSORIES TO FACILITATE THE INSTALLATION OF FIRE ALARM DEVICES AND WIRING.
2. SEE FLOOR PLANS FOR LOCATIONS AND QUANTITIES OF DEVICES.
3. ALL WORK REVISIONS AND ADDITIONS ASSOCIATED WITH THE EXISTING BUILDING FIRE ALARM SYSTEM SHALL BE COORDINATED WITH EXISTING SYSTEM SUPPLIER/INSTALLER PRIOR TO COMMENCING WITH WORK.
4. SEE TYPICAL HEAT PUMP DUCT DETECTOR WIRING DIAGRAM THIS SHEET.



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TITLE: FREER OCCUPANT THERMAL COMFORT

PANELBOARD DETAILS & FIRE ALARM SYSTEM DIAGRAMS

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
E - 8

DSD FILE NAME
13-4806-E8

SYMBOL LIST

SYMBOL	DESCRIPTION
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	NEW WORK
	NEW CONNECTION TO EXISTING
	PIPING ELBOW
	PIPING ELBOW UP
	PIPING ELBOW DOWN
	PIPING TEE
	PIPING TEE UP
	PIPING TEE DOWN
	UNION
	GATE VALVE
	CHECK VALVE
	BUTTERFLY VALVE
	CONTROL VALVE – ELECTRIC
	CONTROL VALVE – PNEUMATIC
	BALL VALVE
	BALANCE VALVE
	PRESSURE REGULATOR
	BLOW DOWN VALVE
	PLUG VALVE
	GLOBE VALVE
	STRAINER
	SAFETY RELIEF VALVE
	THERMOMETER
	PRESSURE GAUGE WITH BALL VALVE
	FLOW ARROW
	CONCENTRIC REDUCER
T	THERMOSTAT
E/P	ELECTRIC TO PNEUMATIC CONVERTOR
	FLEXIBLE PIPE CONNECTION

ABBREVIATIONS

SYMBOL	DESCRIPTION
ABV	ABOVE
A.F.F.	ABOVE FINISHED FLOOR
B.O.D.	BOTTOM OF DUCT
B.O.P.	BOTTOM OF PIPE
C.O.	CLEAN OUT
CONN.	CONNECTION
C.W.	COLD WATER
DN	DOWN
F.D.	FLOOR DRAIN
GC	GENERAL CONTRACTOR
M.B.H.	THOUSAND BTU/HR (BRITISH THERMAL UNITS PER HOUR)
NC	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
NO	NORMALLY OPEN
N.T.S.	NOT TO SCALE
OA	OUTDOOR AIR
RA	RETURN AIR
SA	SUPPLY AIR
TYP.	TYPICAL

PIPING LEGEND

SYMBOL	DESCRIPTION
CW	DOMESTIC COLD WATER
NPW	NON-POTABLE WATER
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
CR	CONDENSER RETURN (TO EXISTING FLUID COOLER AT FREER HOUSE)
CS	CONDENSER SUPPLY (FROM EXISTING FLUID COOLER AT FREER HOUSE)
LPS	LOW PRESSURE STEAM PIPING
AC COND.	AIR CONDITIONING CONDENSATE DRAIN PIPING
COND. DR.	HUMIDIFIER CONDENSATE DRAIN PIPING
LS	HEAT PUMP LOOP SUPPLY (TO NEW FLUID COOLER AT FREER HOUSE)
LR	HEAT PUMP LOOP RETURN (TO NEW FLUID COOLER AT FREER HOUSE)

ARCHITECTURAL – MECHANICAL – ELECTRICAL COORDINATION SCHEDULE

DESIGNATION	LOCATION	HP	KW	FLA	ELECTRICAL		DISCONNECT		STARTER		REMARKS
					VOLTAGE	PHASE	FURN.	INST.	FURN.	INST.	
HP-1	B01 MECH./ELECT. ROOM	—	—	25.4	208	3	E	E	S	S	–
HP-2	B12 MECHANICAL ROOM	—	—	25.4	208	3	E	E	S	S	
HP-3	B06.1 MECHANICAL ROOM	—	—	25.4	208	3	E	E	S	S	
HP-4	B14 MECH./ELECT. ROOM	—	—	9.5	208	3	E	E	S	S	
HP-5	BASEMENT, UNDER ENTRANCE TO PORCH	—	—	13.7	208	3	E	E	S	S	
HP-6	B28 MECHANICAL ROOM	—	—	32.5	208	3	E	E	S	S	
HP-7	ATTIC NORTHEAST	—	—	9.5	208	3	E	E	S	S	
HP-8	B23 MECHANICAL ROOM	—	—	31.0	208	3	E	E	S	S	
HP-9	ATTIC 313 NORTHWEST	—	—	24.3	208	3	E	E	S	S	
HP-10	B23 MECHANICAL ROOM	—	—	13.7	208	3	E	E	S	S	
HP-11	NORTHWEST BASEMENT (CURRENTLY ON 2ND FLR.)	—	—	24.3	208	3	E	E	S	S	
HP-12	MECHANICAL CLOSET SOUTHWEST ATTIC OF SOUTH BUILDING	—	—	25.4	208	3	E	E	S	S	
HP-13	MECHANICAL CLOSET SOUTHEAST ATTIC OF SOUTH BUILDING	—	—	25.4	208	3	E	E	S	S	
HP-14	MECHANICAL ROOM NORTHEAST ATTIC OF SOUTH BUILDING	—	—	25.4	208	3	E	E	S	S	
HP-15	MECHANICAL ROOM NORTHWEST ATTIC OF NORTH BUILDING	—	—	9.5	208	3	E	E	S	S	
P-1	BASEMENT NORTHWEST	7.5	–	–	208	3	E	E	E	E	
P-2	BASEMENT NORTHWEST	7.5	–	–	208	3	E	E	E	E	STANDBY
CONTROLS	FREER HOUSE BASEMENT	—	—	1.2	120	1	E	E	–	–	CONTROL PANEL
GP-1	BASEMENT MECHANICAL ROOM – NORTHWEST	0.5	–	–	115	1	E	E	E	E	
CP-1 THRU CP-5	FREER HOUSE BASEMENT WEST END & ATTIC	1/8	–	–	120	1	E	E	S	S	PROVIDED WITH CORD AND PLUG

LEGEND

S = SUPPLIER (MANUFACTURER)*
M = MECHANICAL
E = ELECTRICAL
CP = CONDENSATE PUMP
RF = RELIEF AIR FAN
AHU = AIR HANDLING UNIT
P = PUMP
HP = HEAT PUMP

PUMP SCHEDULE

MARK	AREA SERVED	LOCATION	GPM	TOTAL DISCHARGE HEAD (FT.)	MOTOR HP	MOTOR RPM	MANUFACTURER & MODEL NUMBER	REMARKS
CP-1	HP-5 DIRECTOR'S OFFICE UNIT	BASEMENT, UNDER ENTRANCE TO PORCH	9.2	10	1/8	3000	HARTELL MODEL A2-SA-115 BY DRI-STEEM	
CP-2	HP-14	MECHANICAL ROOM NORTHEAST ATTIC OF SOUTH BUILDING	9.2	10	1/8	3000	HARTELL MODEL A2-SA-115 BY DRI-STEEM	
CP-3	HP-13	MECHANICAL CLOSET SOUTHEAST ATTIC OF SOUTH BUILDING	9.2	10	1/8	3000	HARTELL MODEL A2-SA-115 BY DRI-STEEM	
CP-4	HP-12	MECHANICAL CLOSET SOUTHWEST ATTIC OF SOUTH BUILDING	9.2	10	1/8	3000	HARTELL MODEL A2-SA-115 BY DRI-STEEM	
P-1	HEAT PUMP LOOP	BASEMENT, NORTHWEST	173	190	7.5	1750	B&G 2BC	
P-2	HEAT PUMP LOOP	BASEMENT, NORTHWEST	173	190	7.5	1750	B&G 2BC	BACK-UP PUMP
GP-1	PROPYLENE GLYCOL INJECTION PUMP	BASEMENT, NORTHWEST	4	70	0.5	1750	TEEL ROTARY SCREW PUMP MODEL 3P569	GRAINGER PUMP 3P569

MECHANICAL SHEET INDEX

SHEET	DESCRIPTION
M-1	SHEET INDEX, LEGENDS, SYMBOLS, OVERVIEW OF MECH. SCOPE, SCHEDULES
M-2	FREER HOUSE BASEMENT FLOOR PLAN – MECHANICAL DEMOLITION
M-3	FREER HOUSE FIRST FLOOR PLAN – MECHANICAL DEMOLITION
M-4	FREER HOUSE SECOND FLOOR PLAN – MECHANICAL DEMOLITION
M-5	FREER HOUSE ATTIC PLAN – MECHANICAL DEMOLITION
M-6	FREER HOUSE BASEMENT PLAN – MECHANICAL NEW WORK
M-7	FREER HOUSE FIRST FLOOR PLAN – MECHANICAL NEW WORK
M-8	FREER HOUSE SECOND FLOOR PLAN – MECHANICAL NEW WORK
M-9	FREER HOUSE ATTIC PLAN – MECHANICAL NEW WORK
M-10	DETAILS & SCHEDULES
M-11	PIPING SCHEMATICS & SCHEDULES
M-12	SPECIFICATIONS

OVERVIEW OF MECHANICAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

MECHANICAL:

1. DEMOLITION AND REMOVAL OF EXISTING PLUMBING, HVAC AND OTHER MECHANICAL SYSTEMS/EQUIPMENT ITEMS AS INDICATED.
2. PROVIDE NEW/MODIFIED PLUMBING SYSTEMS AS INDICATED AND EXTEND/CONNECT TO EXISTING BUILDING SERVICES.
4. PROVIDE NEW/MODIFIED HVAC AND EXHAUST SYSTEMS TO THE BUILDING AREAS INCLUDING EXTENSION, MODIFICATIONS AND NEW SYSTEMS.
5. MODIFIED EXISTING CONDENSER WATER PIPING SYSTEM TO SERVE AS HEAT PUMP LOOP SYSTEM AS INDICATED.
6. PROVIDE NEW/MODIFIED TEMPERATURE CONTROL SYSTEM AND/OR COMPONENTS AS INDICATED.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2012 MICHIGAN MECHANICAL CODE

2012 MICHIGAN PLUMBING CODE

2012 INTERNATIONAL FIRE CODE (AS REFERENCED)

2012 INTERNATIONAL FUEL GAS CODE

NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)

MICHIGAN ENERGY CODE–ASHRAE 90.1–2007

2011 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2011 MICHIGAN ELECTRICAL CODE RULES, PART 8.

2012 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE MECHANICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

GENERAL START UP, CONTROL AND BALANCE NOTES

1. START UP – EACH NEW AND MODIFIED PIECE OF MECHANICAL EQUIPOMENT SHALL RECEIVE A START UP. PACKAGED EQUIPMENT WITH MOTORS SHALL INCLUDE A FACTORY REPRESENTATIVE START UP. OTHER EQUIPMENT SHALL RECEIVE A MECHANICAL CONTRACTOR OR PLUMBING CONTRACTOR START UP (BASED ON WHO PURCHASED THE EQUIPMENT OR WHO IT WAS ASSIGNED TO). START UP REPORTS SHALL INCLUDE A FUNCTIONAL TEST OF ALL MODES OF OPERATION AND A WITNESSED REPORT OF THE VALIDATION (BY THE CONTRACOTR, WHERE PERFORMED BY THE SUPPLIER OR THE OWNER'S REPRESENTATIVE WHERE PERFORMED BY THE CONTRACTOR).
2. TEMPERATURE CONTROL CONTRACTOR (TCC) OR TEMPERATURE CONTROL WIRING CONTRACTOR SHALL PERFORM A DOCUMENTED STARTUP ON THE MECHANICAL CONTROLS. THIS SHALL VALIDATE THE START UP REPORT.
3. EACH SYSTEM SHALL BE TESTED IN EACH MODE OF OPERATION.
4. DISCHARGE AIR TEMPERATURE, PRESSURE AND OTHER SYSTEM PARAMETERS ARE TO BE RECORDED DURING TESTING.
5. TEST IS TO SIMULATE VARYING SPACE DEMAND TO PROVE THE SYSTEM CONTROLS ARE AUTOMATICALLY FUNCTIONING.
6. SYSTEM SAFETY FEATURES (FREEZE THERMOSTATS, HIGH PRESSURE, ETC.) ARE TO BE TESTED TO PROVE OPERATION.
7. TCC SHALL PROVIDE A WRITTEN REPORT FOR EACH CONTROLLED COMPONENT SHOWING TESTING AND PROPER OPERATION.
8. TEST AND BALANCE – EACH NEW OR MODIFIED SYSTEM SHALL RECEIVE A HYDRONIC AND/OR AIR TEST AND BALANCE AT THE CONCLUSION OF THE INSTALLATION (AND AS DESIGNATED OTHERWISE). THE MINIMUM BALANCE SHALL INCLUDE THE SYSTEM TOTALS OF THE MAIN EQUIPMENT DELIVERING THE AIR OR WATER (INCLUDING THE HP, BHP, MOTOR AMPS, RPM AND FLOW RATES) AS WELL AS INDIVIDUAL BALANCES OF EACH ITEM MODIFIED AS A PART OF THE PROJECT, (EACH DIFFUSER, COIL, ETC.). WHERE NEW SYSTEMS ARE PROVIDED, A FULL TEST AND BALANCE SHALL BE PROVIDED IN ACCORDANCE WITH ASHRAE HVAC APPLICATIONS HANDBOOOK.

HEAT PUMP SCHEDULE

MARK	EXISTING AHU MARK (ON DRAWINGS)	EXISTING AHU MARK (IN FIELD)	NEW LOCATION OF HEAT PUMP	AREA SERVED	SUPPLY FAN				COMPRESSOR			WATER TO REFRIGERANT HEAT EXCHANGER – 30% PROPYLENE GLYCOL						FILTER		OUTSIDE AIR CFM	MARK	MANUFACTURER & MODEL NUMBER	REMARKS
					CFM	WHEEL DIA. IN.	EXTERNAL S.P. W.G.	MOTOR H.P.	COMPR. NO.	STEPS PER COMPR.	RLA PER COMPR.	COOLING		HEATING MBH	FLUID P.D. FT. H20	GPM	ENT. AIR 'F' SUMMER D.B./W.B.	ENT. AIR 'F' WINTER D.B.	SIZE (IN)	QUANTITY				
												TOTAL MBH	SENSIBLE MBH										
HP-1	AHU-1	AHU-1 AC511001	B01 BASEMENT, MECH./ELECT. ROOM	FIRST FLOOR, SE CORNER OF SOUTH BUILDING	2000	12 x 11	0.51	1.0	1	1	20	59.66	28.58	73.43	12.3	13	75/69	58	20 5/8 x 29 3/4	1	380	HP-1	TRANE GEV 060	"R" DESIGN SEQUENCE NEEDED – DRAIN CONNECTION MUST BE 18" ABOVE BOTTOM OF UNIT. LEFT RETURN/TOP SUPPLY
HP-2	AHU-1A	AHU-4 AC511004	B12 BASEMENT, MECHANICAL ROOM	FIRST FLOOR, NE CORNER OF SOUTH BUILDING	2000	12 x 11	0.51	1.0	1	1	20	59.66	18.59	70.03	12.3	13	72/66.2	72	20 5/8 x 29 3/4	1	0	HP-2	TRANE GEV 060	RIGHT RETURN/TOP SUPPLY
HP-3	AHU-2	AHU-3 AC511003	B06.1 BASEMENT, MECHANICAL ROOM	FIRST FLOOR, SW CORNER OF SOUTH BUILDING	2000	12 x 11	0.51	1.0	1	1	20	59.66	21.92	70.75	12.3	13	73/68.8	68	20 5/8 x 29 3/4	1	120	HP-3	TRANE GEV 060	LEFT RETURN/TOP SUPPLY
HP-4	AHU-2A	AHU-2 AC511002	B14 BASEMENT, MECH./ELECT. ROOM	114 OPEN OFFICE	900	10 x 6	0.46	0.33	1	1	7.7	27.26	13.23	30.81	7.51	4.5	72/66.2	72	16 3/8 x 23 5/8	1	0	HP-4	TRANE GEV 030	LEFT RETURN/TOP SUPPLY
HP-5	N/A NEW UNIT	N/A NEW UNIT	BASEMENT, UNDER ENTRANCE TO PORCH	DIRECTOR'S OFFICE ROOM 107	1200	12 x 8	0.8	0.5	1	1	10.4	35.22	17.13	42.09	9.71	8	74/67.9	65	18 5/8 x 25 3/8	1	120	HP-5	TRANE GEV 036	RIGHT RETURN/TOP SUPPLY
HP-6	AHU-3	AHU-206 A/C 512006	B28 BASEMENT MECHANICAL ROOM	1ST FLOOR – EAST END OF NORTH BUILDING	2360	12.62 x 12.62	1.25	1.0	2	1	14	69.36	28.41	66	15.5	22.5	74/68.5	66	19 5/8 x 24 5/8	3	140	HP-6	TRANE GEV 090	BACK RETURN/TOP SUPPLY
HP-7	N/A NEW UNIT	N/A NEW UNIT	MECHANICAL ROOM NORTHWEST ATTIC OF NORTH BUILDING	2ND FLOOR–EAST END OF NORTH BUILDING	910	10 x 6	0.46	0.33	1	1	7.7	27.26	13.23	30.81	7.51	4.5	72/66.2	72	16 3/8 x 23 5/8	1	120	HP-7	TRANE GEH 030	RIGHT RETURN/BACK SUPPLY
HP-8	AHU-8	AHU-204 A/C 512004	B23 BASEMENT MECHANICAL ROOM	HOOBLER'S LOUNGE ROOM 210 BACKUP	2000	12.62 x 12.62	1.25	1.0	2	1	14	87.82	36.57	105	15.5	22.5	74/68.5	40	19 5/8 x 24 5/8	3	880	HP-8	TRANE GEV 090	BACK RETURN/TOP SUPPLY
HP-9	AHU-7	AHU-203 A/C 512003	B13 ATTIC	WHISTLER'S LOUNGE (OFFICE AREA) ROOM 212	2000	12.62 x 12.62	1.25	1.0	2	1	14	71.45	38.05	80.44	8.65	13	78/69.5	48	19 5/8 x 24 5/8	3	660	HP-9	TRANE GEH 072	LEFT RETURN/BACK SUPPLY
HP-10	AHU-4	AHU-201 A/C 512001	B23 BASEMENT MECHANICAL ROOM	ROOM 133 & LOBBY	1200	12 x 8	0.8	0.5	1	1	10.4	35.87	15.25	42.09	9.71	8	74/67.9	65	18 5/8 x 25 3/8	1	120	HP-10	TRANE GEV 036	RIGHT RETURN/TOP SUPPLY
HP-11	AHU-5		NORTHWEST BASEMENT (CURRENTLY ON 2ND FLR.)	PEACOCK LOUNGE ROOM 137	2000	12.62 x 12.62	1.25	1.0	2	1	14	71.45	38.05	80.44	8.65	13	78/69.5	48	19 5/8 x 24 5/8	3	660	HP-11	TRANE GEV 072	BACK RETURN/TOP SUPPLY
HP-12	AHU-9	AHU-007	MECHANICAL CLOSET SOUTHWEST ATTIC OF SOUTH BUILDING	SECOND FLOOR, SW CORNER OF SOUTH BUILDING	2000	12 x 11	0.51	1.0	1	1	20	59.37	22.92	70.94	12.3	13	72/66.2	72	20 5/8 x 29 3/4	1	0	HP-12	TRANE GEV 060	RIGHT RETURN/TOP SUPPLY
HP-13	AHU-10	AHU-6 A/C 511006	MECHANICAL CLOSET SOUTHEAST ATTIC OF SOUTH BUILDING	SECOND FLOOR, SE CORNER OF SOUTH BUILDING	2000	12 x 11	0.51	1.0	1	1	20	59.37	22.92	70.94	12.3	13	72/66.2	72	20 5/8 x 29 3/4	1	0	HP-13	TRANE GEV 060	RIGHT RETURN/TOP SUPPLY
HP-14	AHU-11	AHU-005 AC511005	MECHANICAL ROOM NORTHEAST ATTIC OF SOUTH BUILDING	ATTIC CENTER AREA OF SOUTH BUILDING	1400	12 x 11	1.01	1.0	1	1	20	57.88	24.7	70.23	12.3	13	75/69.1	61	20 5/8 x 29 3/4	1	220	HP-14	TRANE GEV 060	LEFT RETURN/TOP SUPPLY
HP-15	AHU-6		MECHANICAL ROOM NORTHWEST ATTIC OF NORTH BUILDING	WEST SIDE OF NORTH BUILDING	1000	10 x 6	0.46	0.33	1	1	7.7	27.26	13.23	30.81	7.51	4.5	72/66.2	72	16 3/8 x 23 5/8	1	0	HP-15	TRANE GEV 030	LEFT RETURN/TOP SUPPLY

NOTE 1: THE FLUID COOLER FOR THE FREER HOUSE IS DESIGNED FOR 85°F SUPPLY WATER TEMPERATURE AND 95°F RETURN WATER TEMPERATURE.

WAYNE STATE UNIVERSITY

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MARK	ISSUE	DATE
	BIDS	07/29/15
	BIDS	06/04/15
	FINAL REVIEW	05/28/15
	OWNER REVIEW	04/28/15

DESIGNER	WAG
DRAWN	WAG
CHECKED	BJR
DEPT MGR	BJR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

SHEET INDEX, LEGENDS, SYMBOLS, OVERVIEW OF MECH. SCOPE, SCHEDULES

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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A/E PROJECT NO.
13-4806

SHEET NO.
M - 1

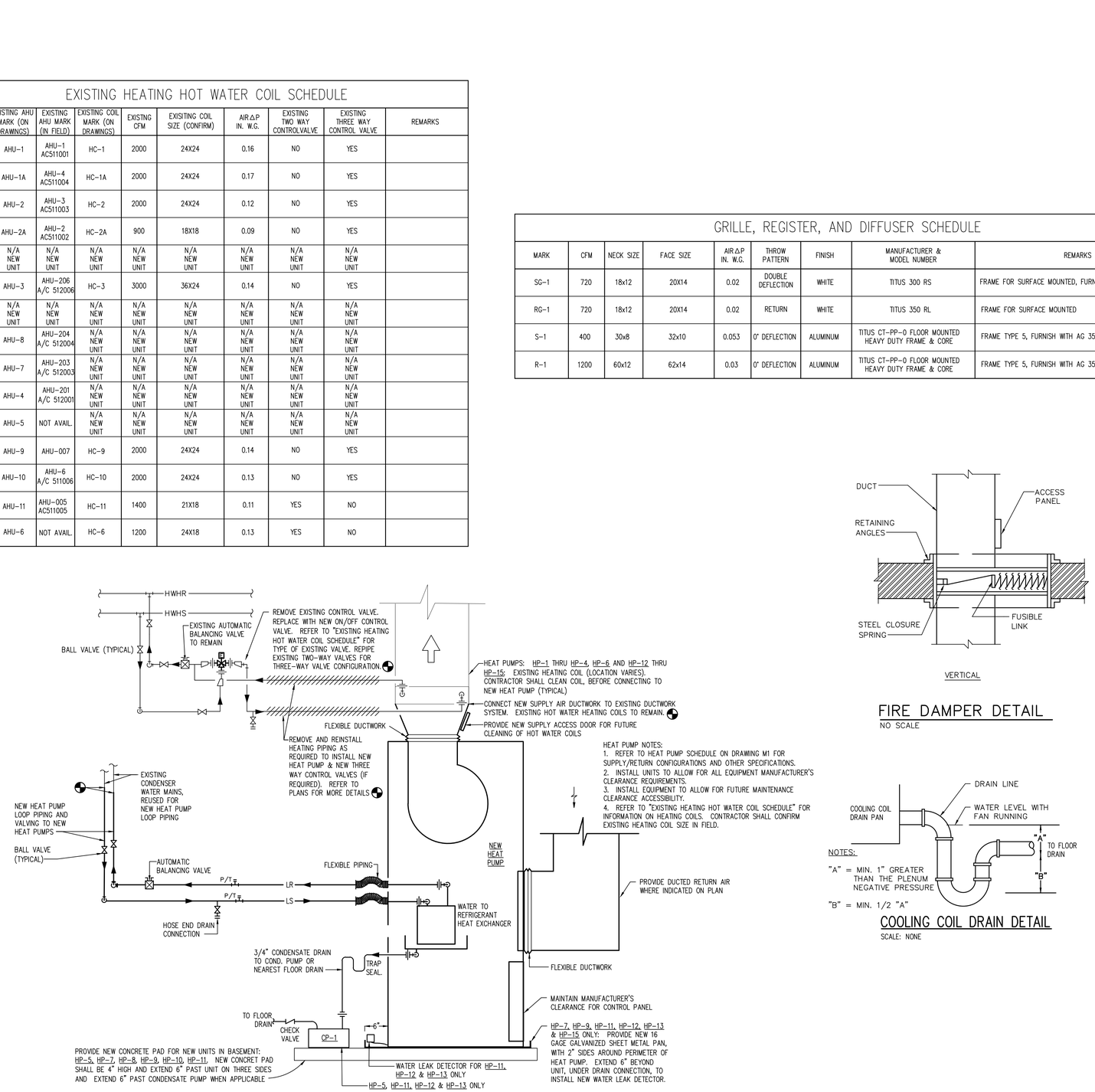
DSD FILE NAME
13-4806-M1

EXISTING HEATING HOT WATER COIL SCHEDULE

MARK	EXISTING AHU MARK (ON DRAWINGS)	EXISTING AHU MARK (IN FIELD)	EXISTING COIL MARK (ON DRAWINGS)	EXISTNG CFM	EXISITING COIL SIZE (CONFIRM)	AIR ΔP IN. W.G.	EXISTING TWO WAY CONTROLVALVE	EXISTING THREE WAY CONTROL VALVE	REMARKS
HP-1	AHU-1	AHU-1 AC511001	HC-1	2000	24X24	0.16	NO	YES	
HP-2	AHU-1A	AHU-4 AC511004	HC-1A	2000	24X24	0.17	NO	YES	
HP-3	AHU-2	AHU-3 AC511003	HC-2	2000	24X24	0.12	NO	YES	
HP-4	AHU-2A	AHU-2 AC511002	HC-2A	900	18X18	0.09	NO	YES	
HP-5	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	
HP-6	AHU-3	AHU-206 A/C 512006	HC-3	3000	36X24	0.14	NO	YES	
HP-7	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	
HP-8	AHU-8	AHU-204 A/C 512004	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	
HP-9	AHU-7	AHU-203 A/C 512003	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	
HP-10	AHU-4	AHU-201 A/C 512001	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	
HP-11	AHU-5	NOT AVAIL.	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	N/A NEW UNIT	
HP-12	AHU-9	AHU-007	HC-9	2000	24X24	0.14	NO	YES	
HP-13	AHU-10	AHU-6 A/C 511006	HC-10	2000	24X24	0.13	NO	YES	
HP-14	AHU-11	AHU-005 AC511005	HC-11	1400	21X18	0.11	YES	NO	
HP-15	AHU-6	NOT AVAIL.	HC-6	1200	24X18	0.13	YES	NO	

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

MARK	CFM	NECK SIZE	FACE SIZE	AIR ΔP IN. W.G.	THROW PATTERN	FINISH	MANUFACTURER & MODEL NUMBER	REMARKS
SG-1	720	18x12	20X14	0.02	DOUBLE DEFLECTION	WHITE	TITUS 300 RS	FRAME FOR SURFACE MOUNTED, FURNISH WITH DAMPER
RG-1	720	18x12	20X14	0.02	RETURN	WHITE	TITUS 350 RL	FRAME FOR SURFACE MOUNTED
S-1	400	30x8	32x10	0.053	0° DEFLECTION	ALUMINUM	TITUS CT-PP-0 FLOOR MOUNTED HEAVY DUTY FRAME & CORE	FRAME TYPE 5, FURNISH WITH AG 35 DAMPER
R-1	1200	60x12	62x14	0.03	0° DEFLECTION	ALUMINUM	TITUS CT-PP-0 FLOOR MOUNTED HEAVY DUTY FRAME & CORE	FRAME TYPE 5, FURNISH WITH AG 35 DAMPER



HEAT PUMP UNITS PIPING & INSTALLATION DIAGRAM – NEW WORK

SCALE: NONE

VERTICAL

FIRE DAMPER DETAIL

NO SCALE

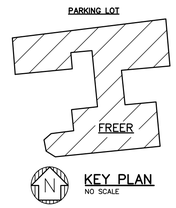
NOTES:

"A" = MIN. 1" GREATER THAN THE PLENUM NEGATIVE PRESSURE

"B" = MIN. 1/2 "A"

COOLING COIL DRAIN DETAIL

SCALE: NONE



KEY PLAN
NO SCALE

WAYNE STATE UNIVERSITY

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TITLE: FREER OCCUPANT THERMAL COMFORT

DETAILS AND SCHEDULES

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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A/E PROJECT NO.
13-4806

SHEET NO.
M - 10

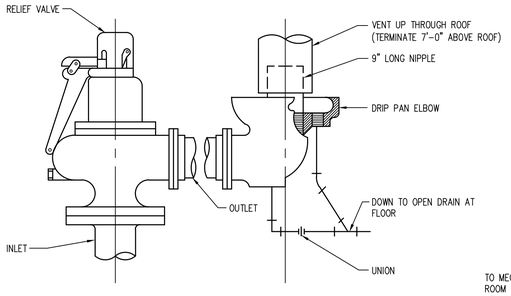
DSD FILE NAME
13-4806-M10

HEAT EXCHANGER SCHEDULE – (STEAM TO LIQUID)

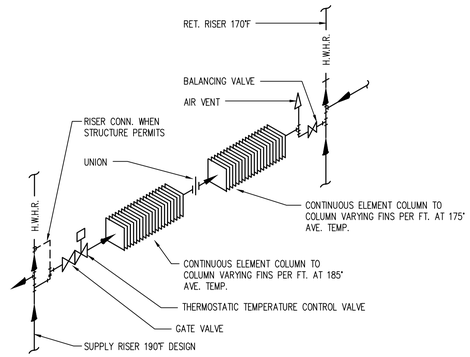
MARK	SYSTEM SERVED	CAPACITY MBH	TUBE SIDE						SHELL SIDE		APPROX. OVERALL SIZE L x DIA.	MANUFACTURER AND MODEL NUMBER	REMARKS
			LIQUID	GPM	INLET TEMP. °F	OUTLET TEMP. °F	MAX. ΔP FT. W.G.	No. OF PASSES	STEAM CAPACITY LBS/HR.	INLET PRESSURE PSIG			
HX–1	HEAT PUMP LOOP	878.9	30% PROPYLENE GLYCOL	173	70	80	2.37	2	827.3	10	3' TUBE LENGTH x 8" DIA.	B&G SU832	.
.	.	.	.	.	.	.	.	.	.	.		.	.

FINNED TUBE RADIATION SCHEDULE

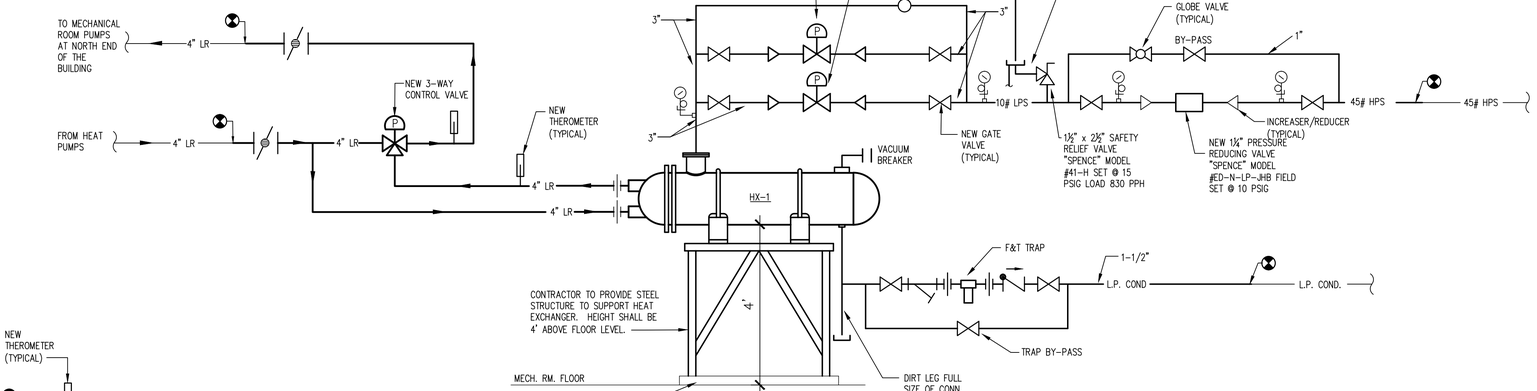
MARK	ELEMENT LENGTH	PIPE SIZE	FIN SIZE	FINS PER FOOT	BTUH PER LIN. FT.	E.W.T. °F	L.W.T. °F	FLOW (GPM)	ENCLOSURE STYLE	MOUNTING HEIGHT	ENCLOSURE HEIGHT	MANUFACTURER & MODEL NUMBER	REMARKS
FT–1	36"	1–1/4"	4–1/4 x 4–1/4	–	750	180	160	1.3	SLOPED	9.125"	7.25"	STERLING, MODEL #CLCU75 ENCLOSURE WALL TO WALL WITH CAPS, BOTH SIDES.	



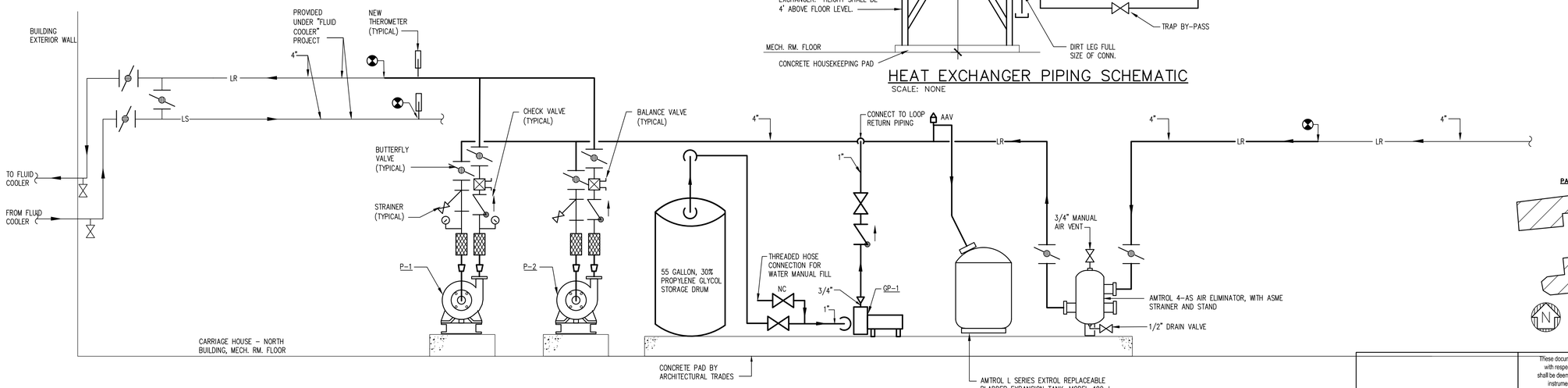
SAFETY RELIEF VALVE DETAIL
NO SCALE



TYPICAL FIN–TUBE RADIATION SCHEMATIC
NO SCALE



HEAT EXCHANGER PIPING SCHEMATIC
SCALE: NONE



PIPING SCHEMATIC
SCALE: NONE

WAYNE STATE UNIVERSITY

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MARK	ISSUE	DATE
	BIDS	07/29/15
	BIDS	06/04/15
	FINAL REVIEW	05/28/15
	OWNER REVIEW	04/28/15

DESIGNER	WAG
DRAWN	WAG
CHECKED	BJR
DEPT MGR	BJR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

PIPING SCHEMATICS AND SCHEDULES

WSU PROJECT #: 511–254496–2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
M - 11

DSD FILE NAME
13–4806–M11

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These documents are two dimensional, traditional plan and specification documents that are not intended to be used by the contractor as shop drawings. Final dimensions, equipment access, routing, miscellaneous fittings, final installation and coordination is the contractor's responsibility.

MECHANICAL SPECIFICATIONS

1. RELATED DOCUMENTS

A. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion. The drawings show the locations and general arrangement of all equipment and piping and shall be followed as closely as actual building construction and work of other trades will permit.

B. Refer to the architectural and electrical drawings in this project for coordination of equipment electrical devices, lights, wall and ceiling removal and installation, etc. Notify owner immediately of any coordination items not shown documents that will effect the authentic history of the Freer House.

2. STANDARDS & MISC. REQUIREMENTS

A. All equipment shall be new and shall conform in all respects to the latest approved standards of the ASME, ASTM, and ANSI.

B. All equipment shall be installed per manufacturer's recommendations and shall be installed to allow for future maintenance accessibility.

3. CUTTING AND PATCHING

A. All cutting and patching required for installation shall be by mechanical trades and included in expense to aforementioned.

4. EXAMINATION OF SITE

A. Visit the site and examine the conditions under which all work must be conducted including existing services and equipment, obstructions, and all conditions which will be encountered in the removal and/or relocation of present materials and equipment, installation of new materials and cutting, patching, etc., for a complete installation.

5. AS-BUILT RECORD DRAWINGS

A. Provide a record of drawings which present an accurate as-built condition for all new mechanical work. As-built drawings shall consist of (1) set of prints.

6. CONNECTIONS TO EXISTING SERVICES

A. Make all final connections to existing piping, shut-down of services shall be on premium time and shall be coordinated and scheduled so as not to interfere with the operation of the existing building.

B. Sanitary piping and other utilities are original to the building. Care shall be taken when connecting to existing piping. Notify owner before connections are made, if it is anticipated that connecting may disturb existing piping, causing leaks or other malfunctions.

7. DEMOLITION

A. Disconnect all existing piping etc., as indicated on the drawings and remove from the site.

B. Disconnect all remove existing air conditioning units and their associated piping and ductwork etc., as indicated on the drawings. Remove/reclaim refrigerant from air conditioning units before discarding.

8. CLEANING AND FINISHING

A. Clean the existing heating hot water coils in the ductwork before installing the new heat pumps. Existing coils shall be vacuumed and all debris removed from the surfaces on both side. Provide new access doors for future cleaning.

B. After all tests have been made and the systems pronounced tight and satisfactory, clean all equipment, piping, etc., and leave them in clean and completed working order at the final completion of the work. The premises shall be thoroughly cleaned upon completion of all work.

9. IDENTIFICATION

A. Provide pipe markers on each system. Include arrows showing normal direction of flow. Full-band pipe markers, extending 360 degrees around pipe at each location

B. Locate pipe markers and color bands as follows: wherever piping is exposed in finished spaces, Mechanical Rooms, accessible maintenance spaces and exterior non-concealed locations. Install every 25', near major equipment and in other logical locations.

C. Provide valve tag on valves and control devices in piping systems. Label by-pass valves as such, including service.

D. Provide engraved metal nameplates on or near each major item of mechanical equipment, including heat pumps and pumps.

10. INSULATION

A. Duct insulation in concealed areas shall be 1.5" thick exterior fiberglass wrap with aluminum vapor barrier, 1.5 # min. density. Approved manufacturers shall be Knauf, Mansville, Owens Corning.

B. Duct insulation in exposed areas (basement without ceilings, mechanical rooms, etc.) shall be rigid board insulation, 1" thick, 6 PCF density, high strength. insulation board shall be made from glass fibers bonded with thermosetting resin and covered on one side with a factory-applied vapor barrier facing, as supplied by the following manufacturers under these trade names: Manson – IB600 Industrial Insulation Board; Johns-Manville – Type 817 Ap Spin-Glas; Knauf – 6PCF-ASJ Insulation Board; Owens/Corning – Type 705 ASJ-25 Fiberglas Insulation.

C. Pipe insulation shall be fiberglass 1.5#/ft. density rigid one piece with all purpose vapor barrier jacket. Composite insulation (insulation, jacket and adhesive) shall have a flame spread classification (ASTM E84, NFPA 255) not greater than 50. Insulate all valves and fitting with pre-molded fittings with vapor barrier jacket. Approved manufacturers shall be Knauf, Mansville, Owens Corning.

D. Pipe insulation thickness shall be as follows:

STEAM PIPING EXPOSED AND CONCEALED			
PIPE SIZES (NPS)	MATERIAL	THICKNESS IN INCHES	VAPOR BARRIER REQUIRED
1/2" TO 1-1/2"	GLASS FIBER	1-1/2"	NO
2" & ABOVE	GLASS FIBER	3"	NO

STEAM CONDENSATE PIPING EXPOSED AND CONCEALED			
PIPE SIZES (NPS)	MATERIAL	THICKNESS IN INCHES	VAPOR BARRIER REQUIRED
1/2" TO 1"	GLASS FIBER	1"	NO
1-1/4" TO 2"	GLASS FIBER	1-1/2"	NO
2-1/2" & UP	GLASS FIBER	2"	NO

DOMESTIC COLD WATER INTERIOR INSTALLATION			
PIPE SIZES (NPS)	MATERIAL	THICKNESS IN INCHES	VAPOR BARRIER REQUIRED
1/2" & UP	GLASS FIBER	1"	YES

11. VALVES

A. Valves shall be suitable for temperature and pressure involved. Unless noted otherwise, valves shall be rated at not less than 125 psi water working pressure at 240 °F for water systems.

B. Ball valves, 2" in size and smaller, shall be manufactured in accordance with Federal Specification WW-V-35C, rated 150 psi WSP and 600 psi non-shock WOG Valve shall have 2-pc cast bronze body, threaded or solder ends, PTFE seats with stainless steel or brass/bronze trim, full port opening, blowout-proof stem, and lever handle. Stem extension shall be provided for valves installed in insulated piping. Equal to Apollo 77-100 Series or 77-200 Series, or equal by Jomar, Nibco or Watts.

C. Gate valves, 2" in size and smaller Class 150, shall be rising stem, union bonnet, solid wedge, threaded or solder ends, and conforms to MSS SP-80. Body, bonnet and wedge shall be of bronze ASTM B-62. Stems shall be of silicon bronze ASTM B-371, non-asbestos packing, and malleable iron handwheel. Valves shall be equal to Crane No. 438 UB, or or equal by Milwaukee or Stockham.

D. Gate valves, 2 1/2" in size and larger Class 125, shall be manufactured in accordance with MSS SP-70, OS&Y, bolted bonnet, flanged ends, iron body, solid wedge, bronze trimmed, and non-asbestos packing and gaskets. Body and bonnet shall conform to ASTM A126 Class B. Valves shall be equal to Crane No. 465 1/2.

E. Combination balancing valves and flow meters shall have a calibrated indicator, threaded ends for 3" and smaller, welded ends for 4" and larger, bronze body/brass ball construction, and carbon filled TFE seat rings. Valves shall have differential pressure read-out ports across valve seat area. Valve bodies to have 1/4" NPT tapped drain/purge port. Valves to have memory stop feature, and calibrated name plates. B&G, Armstrong (CBV-T), Tour and Anderson Inc. (STAD 787), or Wheatley.

11. VALVES (CONTINUED)

F. Butterfly valves, 3" in size and larger Butterfly Valves 2-1/2 Inch and Larger: MSS SP-67; rated at 200 psi; cast-body conforming to ASTM A 126, Class B. Provide valves with field replaceable EPDM sleeve, aluminum bronze disc, stainless steel stem, and EPDM O-ring stem seals. Provide lever operators with locks for sizes smaller than 6 inches and gear operators with position indicator for sizes 6 inches and larger. Valve body shall be full lug construction only. Drill and tap valves on dead-end service or requiring additional body strength. Valves shall be equal to Crane No. 44 series.

G. Check valves, 2-Inch and Smaller: MSS SP-80; Class 125, cast-bronze body and cap conforming to ASTM B 62; with horizontal swing, Y-pattern, and bronze disc; and having threaded ends. Provide valves capable of being reground while the valve remains in the line. Provide Class 150 valves meeting the above specifications, with threaded end connections, where system pressure requires or where Class 125 valves are not available.

H. Check Valves, 2-1/2-Inch and Larger: MSS SP-71; Class 125 (Class 175 FM approved for fire protection piping systems), cast iron body and bolted cap conforming to ASTM A 126, Class B; horizontal swing, and bronze disc or cast-iron disc with bronze disc ring; and flanged ends. Provide valves capable of being refitted while the valve remains in the line.

12. DOMESTIC COLD WATER SYSTEMS

A. Piping 2" and smaller shall be copper pipe, Type "L" hard drawn seamless copper tube, ASTM B88, with wrought copper fittings and brazed joints. Mueller "Streamline" or equal. Caps shall be same material as existing domestic cold water piping.

13. SANITARY WATER SYSTEMS

A. Sanitary drainage and vent piping above grade shall be service weight, hubless, cast iron soil pipe with gasketed stainless steel bands.

14. STEAM, STEAM CONDENSATE, HEATING HOT WATER & LOOP PIPING

A. Low pressure steam, heating hot water piping and heat pump "loop piping", 2 inch in size and smaller, shall be schedule 40 black steel with 125 lb. cast iron threaded fittings. Type S, grade B piping for low pressure steam.

B. Low pressure steam, heating hot water piping and heat pump "loop piping" piping 2-1/2" and larger shall be schedule 40 type E or S grade B, black steel piping with class 150 wrought-steel welded fittings and welded and flanged joints.

C. High pressure steam piping 2-1/2" and larger shall be schedule 40, type E, grade B, black steel piping with class 150 wrought-steel fittings, flanges, and flange fittings; and welded and flange joints.

D. Steam Condensate piping 2" NPS and smaller shall be schedule 80 black steel, type S, grade B, steel pipe, class 125 cast-iron fittings; and threaded joints.

E. Float and Thermostatic Traps shall be ASTM A 126, cast iron, threaded connections. Float shall be replaceable, stainless steel, head and seat shall be hardened stainless steel, balanced pressure trap type, maximum operating pressure of 125 psig. Acceptable manufacturers: Armstrong International, Inc; Barnes & Jones, Inc; Dunham-Bush, Inc; Hoffman Specialty, Division of ITT Industries; Spirax Sarco, Inc; Sterling.

F. Vacuum Breakers shall be rated for 125 psig operating pressure and constructed with a cast iron body, threaded end connections, stainless steel sealing ball, retainer, sprind and screen. o-ring seal shall be made of EPR. Acceptable manufacturers: Armstrong International, Inc; Dunham-Bush, Inc; Hoffman Specialty, Division of ITT Industries; Spirax Sarco, Inc; Johnson Corporation (The).

15. FLEXIBLE PIPING CONNECTIONS

A. Metal flexible connectors shall be constructed of corrugated phosphor bronze or Type 321 stainless steel, with braided metal jacket of matching material, either IPT screwed ends or fixed ASA 150 pound standard flanges. Acceptable manufacturers shall be Flexonics Series 401M, Metraflex, Anaconda PCM, PCF, or approved equal.

16. HEAT EXCHANGER

A. Shell and tube heat exchanger shall be constructed with a cast iron bonnet, steel baffles, shell, tie rods, spacers and tubesheet. The tubes shall be 20 gage, 3/4" O.D. copper. Heat exchanger shall comply with ASME code rule form no. U-1 for 150 psig design pressure at 375 °F for both the shell and tube sides. Heat exchanger shall meet design criteria on the drawings and as specified herein.

17. BASE MOUNTED PUMPS

A. The heat pump "loop piping" pumps shall be long coupled, base mounted, single stage, end suction, vertical split case design, in cast iron bronze fitted construction specifically designed for quiet operation. Suitable standard operations up to 100°F and 125 PSIG working pressure for water/propylene glycol mixture. The pump internals shall be capable of being services without disturbing piping connections, electrical motor connections or pump to motor alignment.

B. A bearing assembly shall support the shaft via two heavy-duty regreaseable ball bearings. Bearing assembly shall be replaceable without disturbing the system piping and shall have foot support at the coupling end. Pump bearings shall be regreaseable without removal of the bearings from the bearing assembly. Thermal expansion of the shaft toward the impeller shall be prevented via an inboard thrust bearing. The bearing assembly shall have a solid SAE1144 steel shaft. A non-ferrous shaft sleeve shall be employed to completely cover the wetted area under the seal.

C. Bearing assembly shaft shall connect to a bronze impeller. Impeller shall be both hydraulically and dynamically balanced and keyed to the shaft and secured by a stainless steel locking capscrew or nut.

D. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Pump and motors shall be factory aligned, and shall be realigned after installation by the manufacturer's representative. Motors shall be non-overloading at any point on the pump curve and shall meet NEMA specifications and conform to the standards outlined in EPACT 92.

E. Base plate shall be of structural steel or fabricated steel channel configuration fully enclosed at sides and ends, with securely welded cross members and fully open grouting area (for field grouting).

F. Each pump shall be factory tested and name-plated before shipment.

18. PIPING SPECIALTIES

A. Thermometers: Provide thermometers as indicated in equipment documentation, drawings, and specifications. All thermometers shall be located so as to be visible by the operator and easily accessible for maintenance. The range shall be 0-250(Deg F), Division 1(Deg F). Thermometers shall be industrial type, 9" aluminum case, adjustable angle, red appearing Mercury in clear acrylic plastic glass (up thru 300°F.) or double strength glass (above 300°F.), brass separable socket. Thermometers shall be Weiss Instruments, Ashcroft, Weksler, or Palmer Instruments (Model 5AE).

B. Strainers:

Strainers shall be "Y" type with easily removable brass, stainless steel strainer screens with semi-steel body for steel piping and brass body for copper piping. Strainers for piping 2" and smaller shall have screwed ends. Strainers for 2-1/2" and larger shall have flanged ends. All strainers shall be provided with blow-down valves. Strainers shall be as manufactured by Mueller Steam Specialty Company #352 (1/2" to 2") #761 (2 ½" and larger), or Wheatley.

Strainer minimum non-shock working pressure and screen perforation schedule:

Service Pipe Sizes	Minimum Non-Shock Working Pressure Rating	Perforations	Flanges ANSI
Water 1/4" to 2"	125 psi Steam	1/16"]	
Water 2-1/2" to 4"	125 psi Steam	1/16"]	150 lb.

Provide line size strainers ahead of control valves and/or as indicated on the drawings.

C. Pressure Reducing Valves: diaphragm operated, brass body valve, with low inlet pressure check valve, inlet strainer removable without system shut-down, and non-corrosive valve seat and stem. Select valve size, capacity, and operating pressure to suit system. Valve shall be factory-set at operating pressure and have the capability for field adjustment.

D. Bladder-Type Expansion Tanks:

Tank: Welded steel, rated for 125-psig (860-kPa) working pressure and 375 deg F (191 deg C) maximum operating temperature. Factory test with taps fabricated and supports installed and labeled according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

Bladder: Securely sealed into tank to separate air charge from system water to maintain required expansion capacity.

Air-Charge Fittings: Schrader valve, stainless steel with EPDM seats.

E. In-Line Air Separators: Tank shall be one-piece cast iron with an integral weir constructed to decelerate system flow to maximize air separation. Maximum Working Pressure: Up to 175 psig (1207 kPa). Maximum Operating Temperature: Up to 300 deg F (149 deg C).

F. Provide dielectric fittings where copper alloy and ferrous materials are connecting. Acceptable manufacturers for dielectric unions are Capital Manufacturing Company, Hart Industries, Watts Water Technologies, Zurn Plumbing.

19. RIGID DUCTWORK

All ductwork shall be galvanized sheet metal as indicated on the drawings. All sheet metal work shall be constructed and installed in accordance with latest editions of SMACNA hvac duct construction standards and SMACNA allowable leakage standards.

Low pressure ductwork: construct, install and seal in accordance with the requirements of the latest SMACNA issue of "Medium and Low Pressure Duct Construction Standards" for 4"w.g. pressure rectangular and round ductwork.

Sheet metal ductwork shall be smooth inside and true to size. all duct sizes indicated on the drawings are inside dimensions.

Sheet metal elbows shall have a radius of 1-1/2 times the duct width measured to duct centerline. Where conditions will not permit or where indicated on drawings, use miter turns with double thickness acoustic turning vanes.

All taps from low pressure supply ducts to round duct run-outs shall be made with conical "spin-in" fittings to the side of the ductwork, with insulation guard and damper. Dampers shall have dual pivots regardless of size. All square to round or oval to round connections shall be made with fabricated fittings. Compressing the duct in the field will not be acceptable.

20. DAMPERS

A. Provide volume dampers (in addition to diffuser neck damper) in the duct systems where shown on plans and where required to insure proper system balancing. Spin-in fittings with manual volume dampers may be used.

B. Provide factory fabricated motor operated volume dampers in all supply, return and exhaust branch ducts and others where indicated on drawings. Volume dampers shall be constructed in accordance with applicable SMACNA standards. standard of quality shall be Ruskin CD-35 or American Warming and Ventilating #V21 for sizes less than 4 square feet. Provide with blade seals for positive, air tight closure.

C. Manual volume dampers shall be made of galvanized steel 18 gauge or heavier. Dampers for ductwork up to 12 inches deep shall be one blade carried on a 3/8 inch square steel rod mounted in the side of duct without frame and fitted with a locking type quadrant. Single blade hand dampers up to 12 inches width may be used. Dampers for ducts of greater depth shall be multi-blade type, maximum blade width 12 inches up to 30 inches blade length, 8 inches maximum width over 30 inches length. Blades shall be mounted in frame and interconnected for operation from one locking type hand quadrant.

21. SEALING OF DUCWORK.

A. All supply air and return air ductwork shall be sealed in accordance with Seal Class "A" requirements regardless of the operating pressure specified.

B. All joints and all seams of all ductwork shall be sealed with UL labeled duct sealer as manufactured by United McGill, United Duct Sealer (water based). Provide three wraps minimum, per application. Duct tape is not allowed. All ductwork shall be suitable cleaned and prepared, and sealant applied in strict accordance with manufacturers instructions. Sealant shall be applied only after ductwork has been installed. Manufacturer's recommendations for cure time shall be followed before pressure testing is begun.

C. The seal classes correspond to the seal classes specified in table 1-2 of SMACNA HVAC Duct Construction Standards.

D. Seal procedures shall be repeated as often as necessary until field tests verify a "sealed" duct system, as approved by UHMS Mechanical Engineer.

22. AIR DISTRIBUTION PRODUCTS

A. Provide shop drawings which shall include performance data, components and accessories, dimensions, weights and loadings, field connections, and required clearances for ductwork accessories as noted in this section.

B. GRAVITY ROOF HOOD: Roof hood shall be constructed of 18 gauge aluminum, bolted to a 8 gauge aluminum support structure. Base shall have a continuously welded curb cap for leak protection. Provide with lifting lugs and birdscreen constructed of ½" galvanized mesh mounted in the hood. Unit shall be designed to exceed the 30 pounds per square foot snowload rating. Acceptable Manufacturers: Cook, Greenheck, Louvers and Dampers, Inc., Ruskin, or approved equal.

C. A schedule of all supply and return grilles shall be submitted for approval. The schedule shall list the location, make, model, type, size, finish, capacity, and throw rating of each unit. Air inlets and outlets shall be tested in accordance with ASHRAE 70. Acceptable Manufacturers: Titus, Anemostat, Barber-Colman, Carnes, Krueger, or approved equal

D. SOUND ATTENUATORS: Construction: Minimum 22 gauge galvanized steel outer casing and 26 gauge galvanized perforated inner casing. Media: Inorganic glass fiber tested in accordance with UL 723 procedures and meets NFPA 90A requirements.Acceptable Manufacturers: Industrial Acoustic, Aeroacoustic, Koppers, Vibro-Acoustics, United Sheet Metal, or approved equal.

E. FIRE DAMPERS: Fire dampers shall be falling curtain style equal to Ruskin DIBD2 fire dampers as indicated on drawings and specified herein. Damper shall bear the U.L. 1-1/2 hour-fire damper label. The curtain style fire damper shall be used in the duct(s) penetrating the floor or wall as indicated on the drawings. Damper blades and frames shall be constructed of galvanized steel and curtain style shall be arranged for blade storage outside of the air stream. Dampers shall be designed for duct pressures and sizes shown on drawings. Horizontal dampers designed for vertical airflow shall have closure springs and latching devices. Provide access dampers per drawing detail(s). Acceptable Manufacturers: Ruskin, Air Balance, Alcor, Louvers and Dampers, Philips-Air, or approved equal.

E. FLEXIBLE CONNECTIONS: Comply with NFPA 90A, possessing a flame spread rating of not over 25 and a smoke developed rating no higher than 50. Construction: UL listed, waterproof, fire-retardant, airtight neoprene coated glass fiber cloth.

F. RELIEF AIR FAN: Fan shall be inline, forward curved wheel duct blower. Fan shall be listed by UL 705 and bear the AMCA Certified ratings seal for sound and air performance. Fan housing shall be a minimum of 18 gauge galvanized steel with two access doors to access the motor effectively. Provide an ingraved aluminum nameplate with CFM, static pressure, RPM, etc. Fan wheel shall be balanced for vibration free operation. Motor shall be TEFC furnished at specified voltage and phase.

23. WATER SOURCE HEAT PUMP UNITS

A. Provide shop drawings which shall include performance data, components and accessories, wiring diagrams, dimensions, weights and loadings, field connections, and required clearances.

B. Heat pumps shall comply with the following codes and guidelines:
Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
Comply with ASHRAE 15 and with minimum COP/efficiency levels according to ASHRAE/IESNA 90.1.
Comply with NFPA 70.
Comply with safety requirements in UL 484 for assembly of free-delivery water-source heat pumps.
Comply with safety requirements in UL 1995 for duct-system connections

C. Heat pump unit shall be factory assembled and consist of a compressor(s), refrigerant circuit(s), air-to-refrigerant coil, water/propylene glycol-to-refrigerant heat exchanger, drain pan, filters, and internal supply fan. The unit shall be designed for floor mounted installation and serviceable from the front or side of the system.

D. The internal supply fan shall be a quiet, belt driven fan assembly. The fan shall be statically and dynamically balanced, forward curve centrifugal steel fan. The bearings shall be self-aligning and have lifetime lubrication. Fan motor shall be open drip proof, and have accessible variable pitch dreve sheaves.

E. The air filters shall be 1" fiberglass, throwaway filters. The filter rack shall be able to accommodate 1" or 2" filters. Filters shall have an average resistance of 76% and have dust holding capacity of 26 grams per square foot. Install new, clean filters after construction, before start-up.

F. The units shall have a single point power connection with a terminal block connection. The unit shall come with a control interface that will include the terminal strip and 24 volt transformer. The unit's terminal strip shall be internally wired to all the major components of the unit and shall include, but not be limitied to the following: the evaporator fan, compressor(s), refrigerant versing valve(s), signal to initate the control of heating or cooling mode, etc. The unit's terminal strip shall be accessible to receive signal from Siemens controller to system components. Refer to the temperature control drawings and specifications for more details.

G. Air-to-refrigerant coil – Construct of copper tubes and aluminum fins. Refrigerant flow shall be controlled by an externally equalized thermostatic expansion valve. The 6 and 7.5 ton units shall have two (2) independent refrigerant systems with separate compressors, refrigerant circuits including separate filter driers, sight glass, distributors, thermal expansion valves and ait-to refrigerant coils. The compressor(s) shall be a scroll compressor with vibration isolation. The refrigerant system shall be leak tested, dehydrated and charged with oil and refrigerant.

H. The air-to-refrigerant coil shall be provided with a galvanized steel or other corrosion resistant material drain pan. The bottom of the drain pan shall be sloped on two planes to pitch the condensate flow towards the drain connection. The drain pan shall be flame resistant per UL945V-B.

I. The refrigerant tubing shall be 99% pure copper and free from contaminants, drilling fragments, dirt and oil. All refrigerant piping shall be insulated with an elastomeric insulation that has a 3/8" thick wall in the air side section of the unitl.

J. ACCEPTABLE MANUFACTURERS: Trane, Mammoth, York or approved equal.

24. WATER TREATMENT

A. Provide the following water treatment systems as described herein and shown on the drawings:
1. Closed-Loop 30% Propylene Glycol/water solution with corrosion inhibitor.

B. Closed system: Inhibited propylene glycol-based heat transfer fluids shall be used for freeze and burst protection of pipes. Unless noted otherwise, minimum concentrations of glycol shall be 30% by volume for freeze protection, and 30% by volume for burst protection. Acceptable Manufacturers: Dow Dowtherm or Interstate Chemical "Intercool NFE".

C. Submittals: Include shop drawing on Chemical Controller, pumps and types of chemicals. Include wiring diagrams showing power and control wirings to be wired by contractor in the field. Include piping diagrams and all other drawings needed to install the system complete.

D. Piping Material:

Piping above grade, inside building shall be CPVC, Chlorinated Polyvinyl Chloride Piping, Schedule 80 CPVC piping and CPVC or compatible joining PVC valves.

25. TEST AND BALANCE

A. Employ the services of an independent test and balance company to balance the heat pump "loop water" piping system, including the new loop water pumps, located in the basement. Include new fluid cooler GPM, BHP, HP, and pressure drop, measured before and after the new fluid cooler (provided under separate project).

B. The air balance shall include the heat pumps supply air flow, outdoor air flow for the units and the relief air fan air balance. Also, air balance the existing supply air terminals to CFM quantities noted on the drawings. Provide additional air balancing dampers if needed to completely air balance the systems.

C. The test and balance contractor shall submit 4 copies of the test and balance report to the owner which will include all required measurements of GPM; BHP, pressure drop, CFM, etc. for all the new equipment installed in this project. Test and balance companies shall be approved by owner.

26. TEMPERATURE CONTROLS

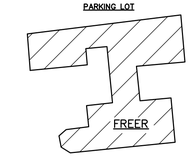
A. Controls shall be provided by Siemens Controls. Control components, except where listed below, shall be installed by the Electrical Installation and Wiring Contractor (EIWC) per the drawings, as specified on the project documents.

Mechanical Contractor shall install the following:
1. Install automatic control valves.
2. Install automatic control dampers.
3. Install immersion wells, pressure tapings, and any associated shut-off cocks.
4. Furnish automatic valve flanges and flange nuts as required.
5. Install flow switches as required.

B. All new control devices shall be waranteed for 1 year after operation has been accepted by the owner as as a complete installation.

C. The control system shall be fully operational and communicate to the campus control center before it is acceptable as a complete system.

PARKING LOT



KEY PLAN
NO SCALE

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DRAWN	WAG
CHECKED	BJR
DEPT MGR	BJR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

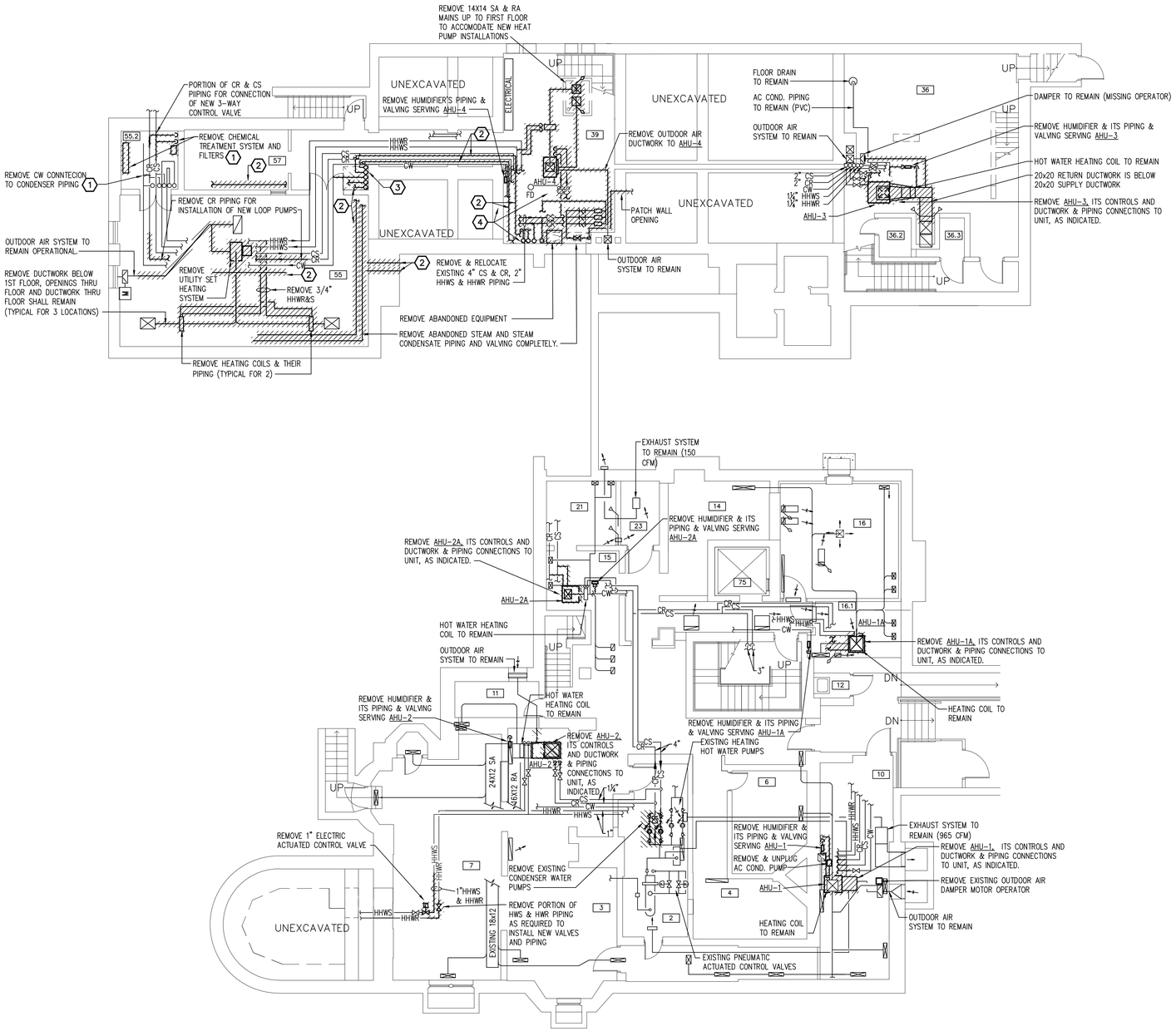
SPECIFICATIONS

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
M - 12

DSD FILE NAME
13-4806-M12



FREER HOUSE BASEMENT FLOOR PLAN – MECHANICAL DEMOLITION

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

0 4 8 16 32

GENERAL NOTES:

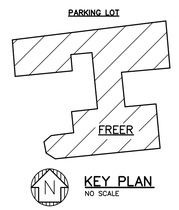
1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.

2. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING REFRIGERANT IN THE AC UNITS BEING REMOVED. CONTRACTOR SHALL RECOVER REFRIGERANT PER STATE AND LOCAL CODES AND REGULATIONS

3. CONTRACTOR SHALL REMOVE ALL ABANDONED STEAM AND STEAM CONDENSATE PIPING IN THE ROOMS IN WHICH THERE IS WORK. ALTHOUGH PARTIAL PIPING IS SHOWN, CONTRACTOR SHALL REMOVE TOTAL PIPING SYSTEM, INCLUDING VALVES, DRAIN PIPING, ETC.

KEYED NOTES:

1. DEMOLITION WORK IS SHOWN AS A REFERENCE. WORK IS PART OF THE FLUID COOLER INSTALLATION PROJECT.
2. REMOVE ALL ABANDONED STEAM, STEAM CONDENSATE ABD MISC. PIPING (TYPICAL)
3. REMOVE CS, CR, CW AND SANITARY PIPING & VALVING SERVING AHU-5 COMPLETLY, BACK TO MAINS AND CAP
4. REMOVE CS, CR, CW AND SANITARY PIPING & VALVING SERVING AHU-7 & AHU-8 & AHU-4 COMPLETLY, BACK TO MAINS AND CAP



KEY PLAN
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PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE BASEMENT FLOOR PLAN - MECHANICAL DEMOLTION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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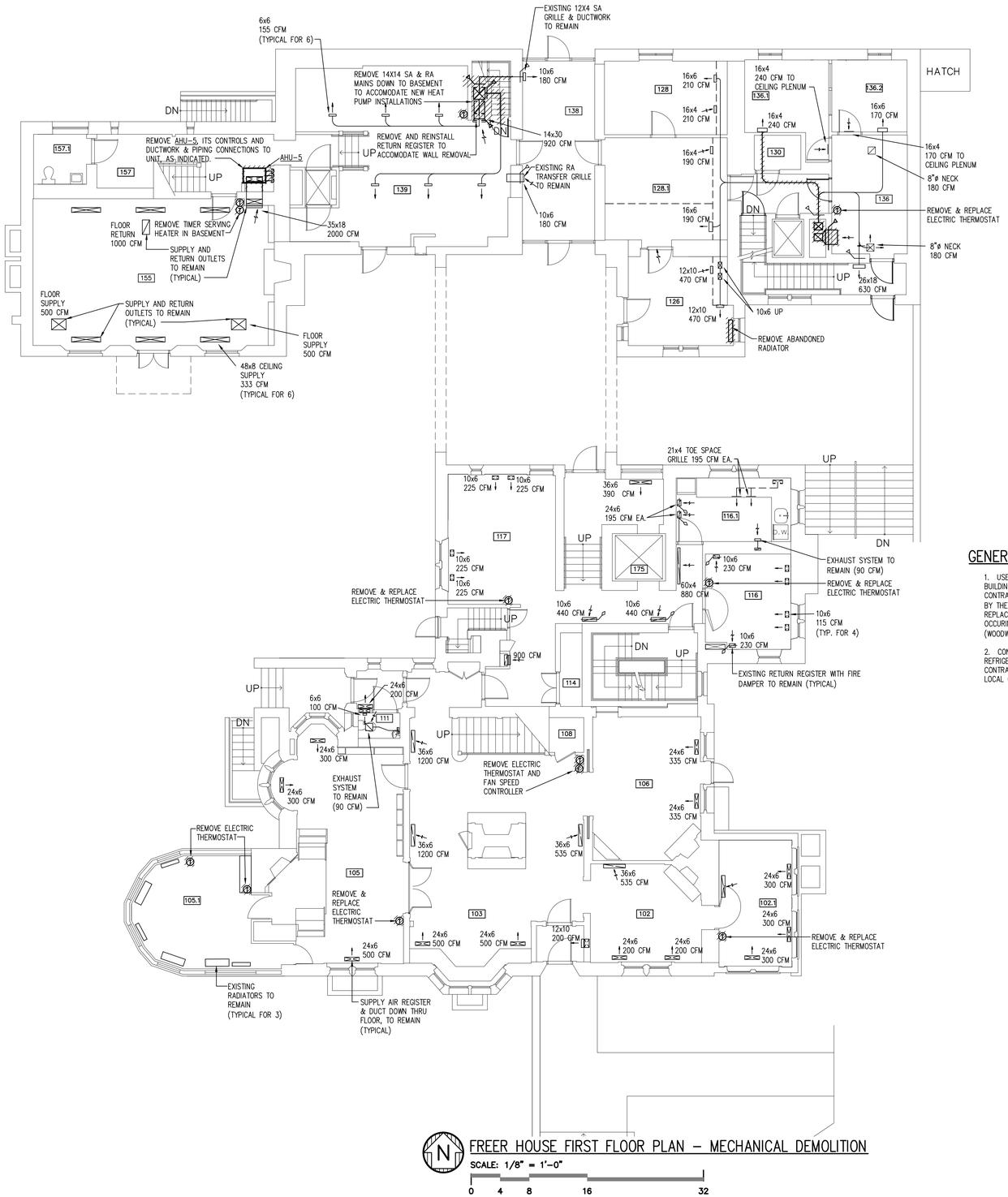
13-4806

SHEET NO.
M - 2

DSD FILE NAME
13-4806-M2



N

FREER HOUSE FIRST FLOOR PLAN – MECHANICAL DEMOLITION

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

0 4 8 16 32

GENERAL NOTES:

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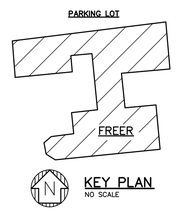

N KEY PLAN
NO SCALE

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TITLE: **FREER OCCUPANT THERMAL COMFORT**

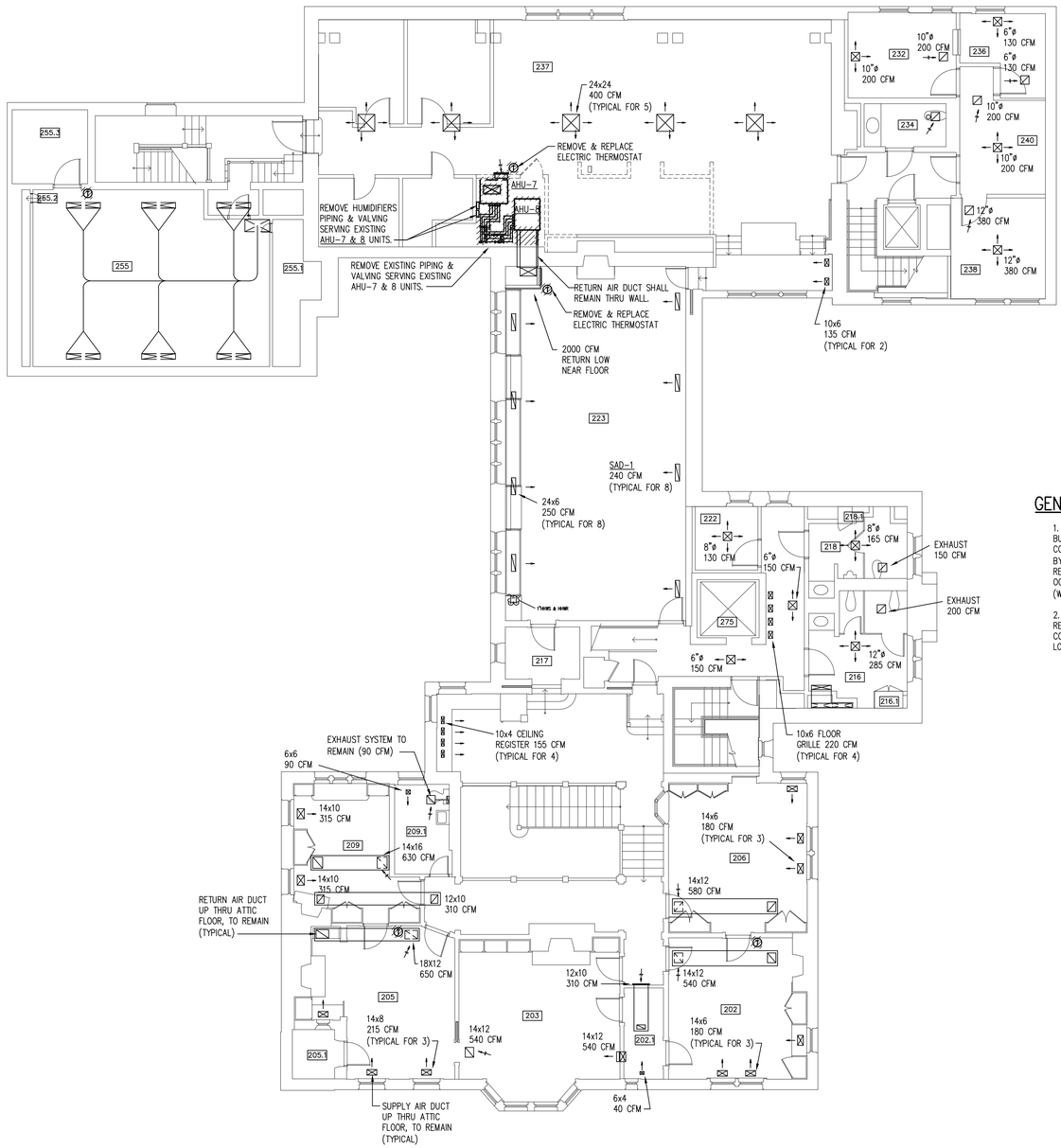
FREER HOUSE
FIRST FLOOR PLAN - MECHANICAL DEMOLTION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
M - 3

DSD FILE NAME
13-4806-M3



FREER HOUSE SECOND FLOOR PLAN – MECHANICAL DEMOLITION

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

0 4 8 16 32

GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.

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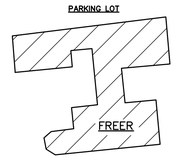
PARKING LOT



KEY PLAN
NO SCALE

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TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE SECOND FLOOR PLAN - MECHANICAL DEMOLTION

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
M - 4

DSD FILE NAME
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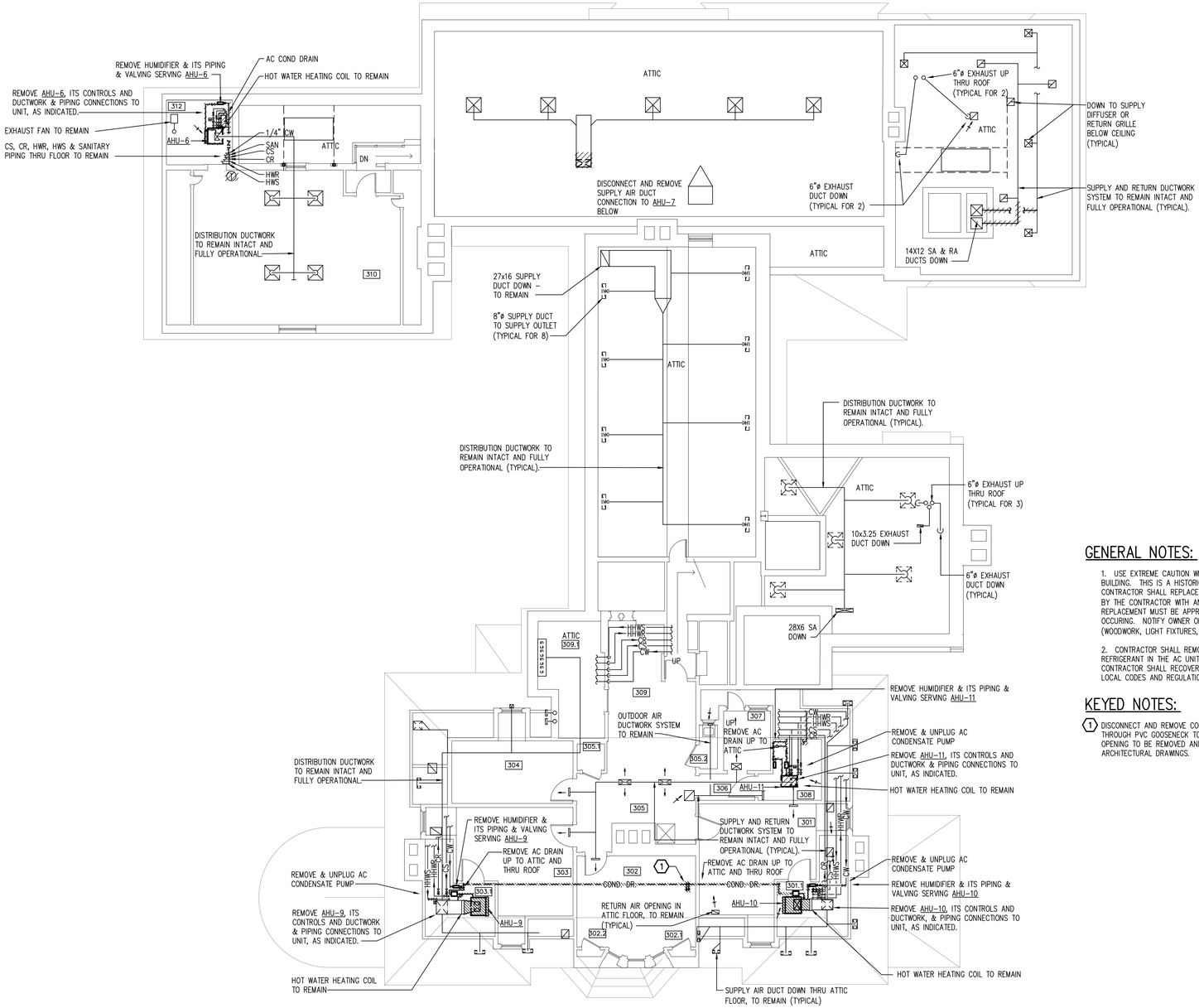


N

FREER HOUSE ATTIC FLOOR PLAN – MECHANICAL DEMOLITION

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

0 4 8 16 32

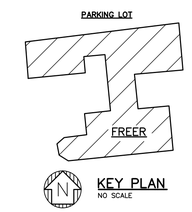
GENERAL NOTES:

1. USE EXTREME CAUTION WHEN REMOVING ITEMS FROM THIS BUILDING. THIS IS A HISTORICALLY REGISTERED BUILDING. CONTRACTOR SHALL REPLACE ANYTHING THAT IS DAMAGED BY THE CONTRACTOR WITH AN EQUAL ITEM(S). REPLACEMENT MUST BE APPROVED BY THE OWNER, BEFORE OCCURING. NOTIFY OWNER OF ANY DAMAGE TO THE BUILDING (WOODWORK, LIGHT FIXTURES, ETC.) AS SOON AS IT OCCURS.

2. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING REFRIGERANT IN THE AC UNITS BEING REMOVED. CONTRACTOR SHALL RECOVER REFRIGERANT PER STATE AND LOCAL CODES AND REGULATIONS.

KEYED NOTES:

1. DISCONNECT AND REMOVE CONDENSATE PIPING DISCHARGE THROUGH PVC GOOSENECK TO ROOF. PVC GOOSENECK OPENING TO BE REMOVED AND ROOF REPAIRED. REFER TO ARCHITECTURAL DRAWINGS.



N KEY PLAN
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TITLE: FREER OCCUPANT THERMAL COMFORT

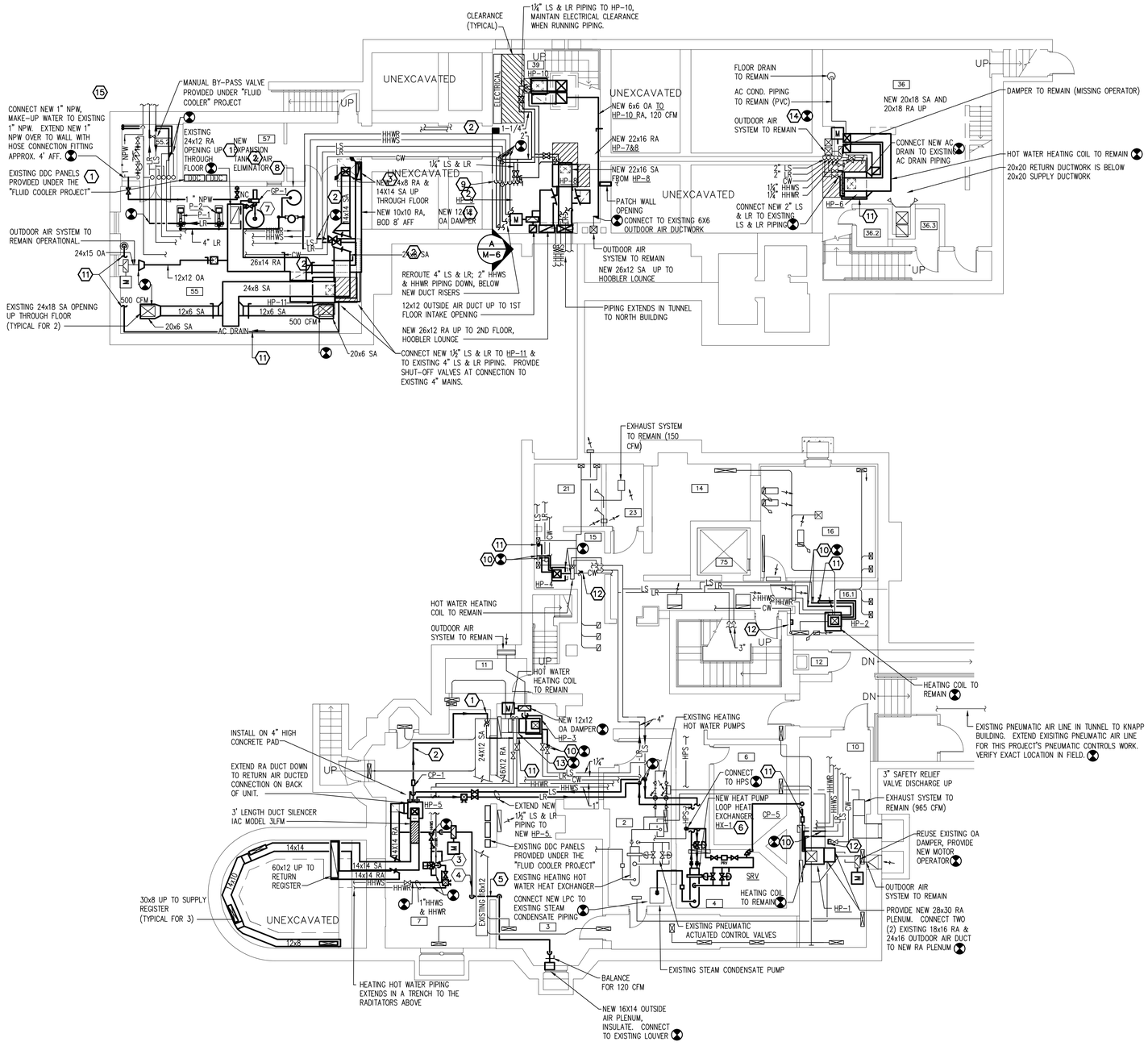
FREER HOUSE ATTIC FLOOR PLAN - MECHANICAL DEMOLTION

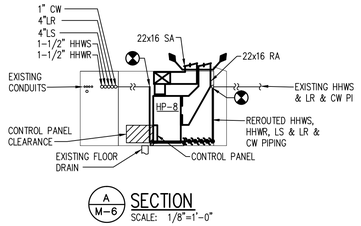
WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
M - 5

DSD FILE NAME
13-4806-M5



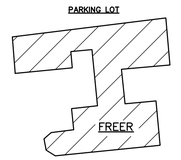


A/M-6 SECTION
SCALE: 1/8"=1'-0"

KEYED NOTES

1. EXTEND ¾" AC CONDENSATE PIPING DOWN, INTO EXISTING FLOOR DRAIN.
2. ¾" AC CONDENSATE PIPING, INSULATE. 8'-8" BOP
3. PROVIDE NEW 1" HEATING HOT WATER ELECTRIC ACTUATED 3-WAY CONTROL VALVE
4. INSTALL NEW OUTSIDE AIR DUCT AS HIGH AS POSSIBLE, BOTTOM APPROX. 8' AFF.
5. NEW 6"ø OUTSIDE AIR DUCTWORK, INSULATE.
7. CONNECT TO RETURN AIR DUCT SERVING NEW HP-5
6. REFER TO PIPING SCHEMATIC FOR VALVING FOR NEW HEAT EXCHANGER, HX-1, ON DRAWING M-11.
3. PROVIDE NEW GLYCOL FILL SYSTEM. REFER TO PIPING SCHEMATIC ON DRAWING M-11.
4. PROVIDE NEW EXPANSION TANK AND AIR ELIMINATOR. REFER TO PIPING SCHEMATIC ON DRAWING M-11.
8. RELOCATE HHWS, HHWR, LS, AND LR PIPING DOWN TO FLOOR LEVEL TO ACCOMODATE NEW DUCTWORK.
9. CONNECT NEW 1¼" LS & LR TO EXISTING LS & LR PIPING, RESPECTIVELY. REFER TO HEAT PUMP DETAIL ON DRAWING M-11.
10. RUN NEW ¾" AC DRAIN TO EXISTING FLOOR DRAIN.
11. CAP ½" COLD WATER PIPING.
12. CONNECT NEW SA DUCT TO EXISTING HEATING COIL. CONFIRM DUCT SIZES IN FIELD.
13. PROVIDE DAMPER ACTUATOR AND RECONNECT O.A. DUCT TO NEW RETURN AIR DUCTWORK.
14. ¾" HHWS AND HHWR PIPING FROM EXISTING MAINS IN BASEMENT UP TO FT-10 ABOVE

PARKING LOT



KEY PLAN
NO SCALE

FREER HOUSE BASEMENT FLOOR PLAN – MECHANICAL NEW WORK

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

0 4 8 16 32

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DEPT MGR	BJR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE BASEMENT FLOOR PLAN - MECHANICAL NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
M - 6

DSD FILE NAME
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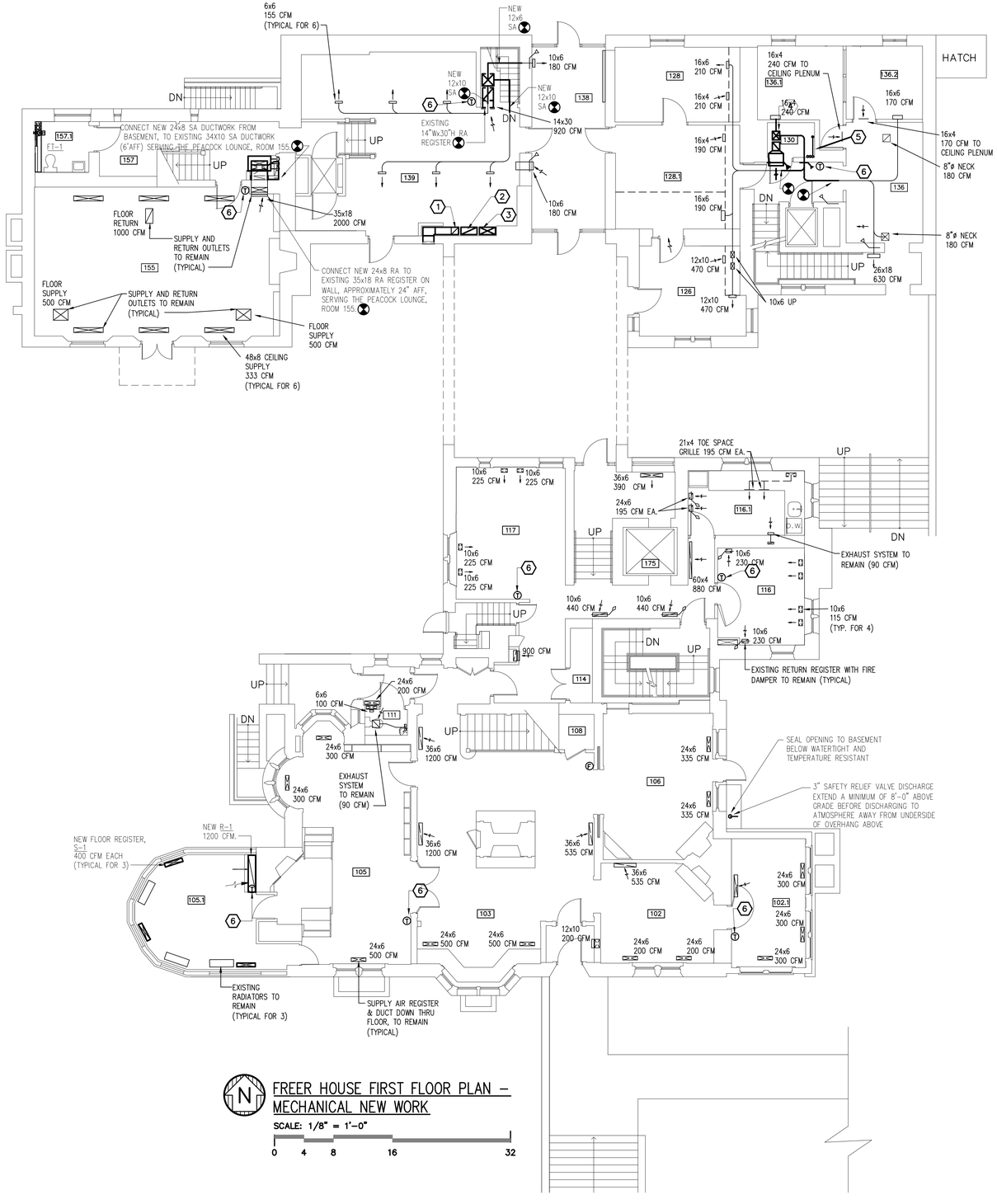


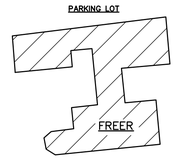
FREER HOUSE FIRST FLOOR PLAN – MECHANICAL NEW WORK

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

0 4 8 16 32

KEYED NOTES

1. EXTEND NEW 12x12 OUTDOOR AIR DUCTWORK FROM NEW LOUVER DOWN IN NEW CHASE TO BASEMENT.
2. NEW 26x12 SA UP AND DOWN TO HP-8
3. NEW 26x12 RA UP AND DOWN TO HP-8
4. NEW 20x18 SUPPLY AND REURN AIR DUCT DOWN TO BASEMENT
5. 1" LS, 1" LR DOWN TO BASEMENT AND ¾" COND SPILL TO SERVICE SINK
6. PROVIDE NEW ROOM TEMPERATURE SENSOR, AND PROVIDE "GOOF PLATE" IF NEEDED, INCLUDING OVER AREAS WHERE A CONTROL DEVICE WAS LOCATED, AND IS NOT BEING REPLACED.



KEY PLAN
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PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

FREER HOUSE FIRST FLOOR PLAN - MECHANICAL NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

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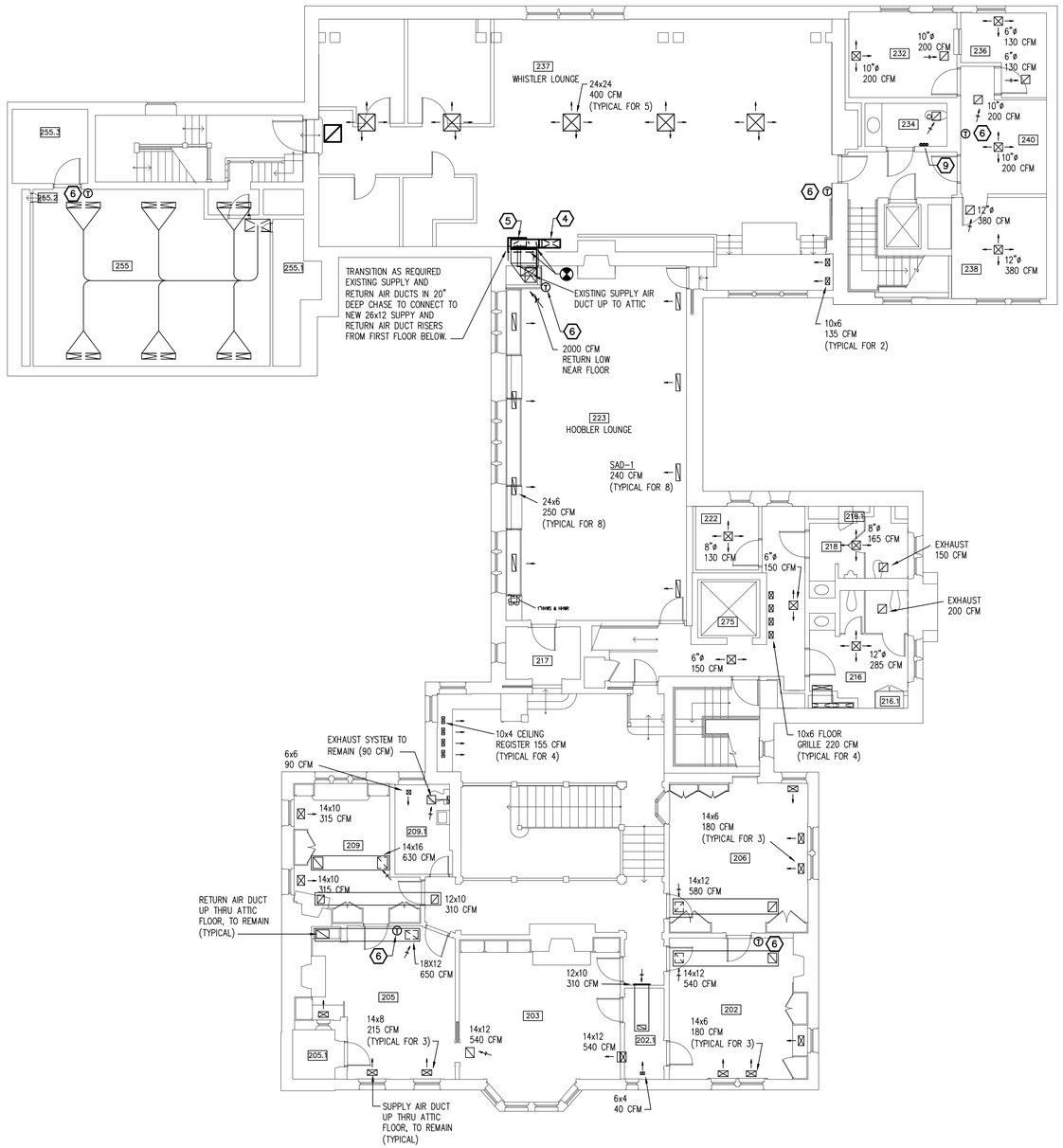
A/E PROJECT NO.
13-4806

SHEET NO.
M - 7

DSD FILE NAME
13-4806-M7



KEYED NOTES

1. 12X12 RELIEF AIR UP TO NEW GRAVITY RELIEF HOOD, GH-1.
2. NOT USED
3. NEW 12x12 RELIEF AIR DUCTWORK AND MOTOR OPERATED DAMPER. CONNECT 12x12 RELIEF AIR TO THE RETURN AIR CHASE IN THE HOOBLER LOUNGE.
4. NEW 26x12 SA DOWN TO HP-7&8
5. NEW 26x12 RA DOWN TO HP-7&8
6. PROVIDE NEW ROOM TEMPERATURE SENSOR, AND PROVIDE "GOOF PLATE" IF NEEDED.
7. PROVIDE 10x6 OUTDOOR AIR DUCT AND MANUAL BALANCING DAMPER FROM 22x10 OUTDOOR AIR DUCT, EXTENDED FROM FIRST FLOOR, TO RETURN AIR DUCT GOING TO HP-9 IN BASEMENT. BALANCE FOR 280 CFM.
8. PROVIDE 10x16 OUTDOOR AIR DUCT AND MOTOR OPERATED DAMPER FROM 22x10 OUTDOOR AIR DUCT, EXTENDED FROM FIRST FLOOR, TO RETURN AIR DUCT GOING TO HP-7 & HP-8 IN BASEMENT. BALANCE FOR 880 CFM.
9. 1" LS, 1"LR AND ¾" COND UP AND DOWN

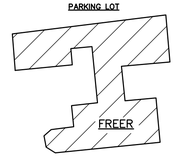
N

FREER HOUSE SECOND FLOOR PLAN - MECHANICAL NEW WORK

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

0 4 8 16 32

PARKING LOT



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KEY PLAN
NO SCALE

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MARK	ISSUE	DATE
	BIDS	07/29/15
	BIDS	06/04/15
	FINAL REVIEW	05/28/15
	OWNER REVIEW	04/28/15

DESIGNER	WAG
DRAWN	WAG
CHECKED	BJR
DEPT MGR	BJR
PROJECT MGR	JSR

TITLE: FREER OCCUPANT THERMAL COMFORT

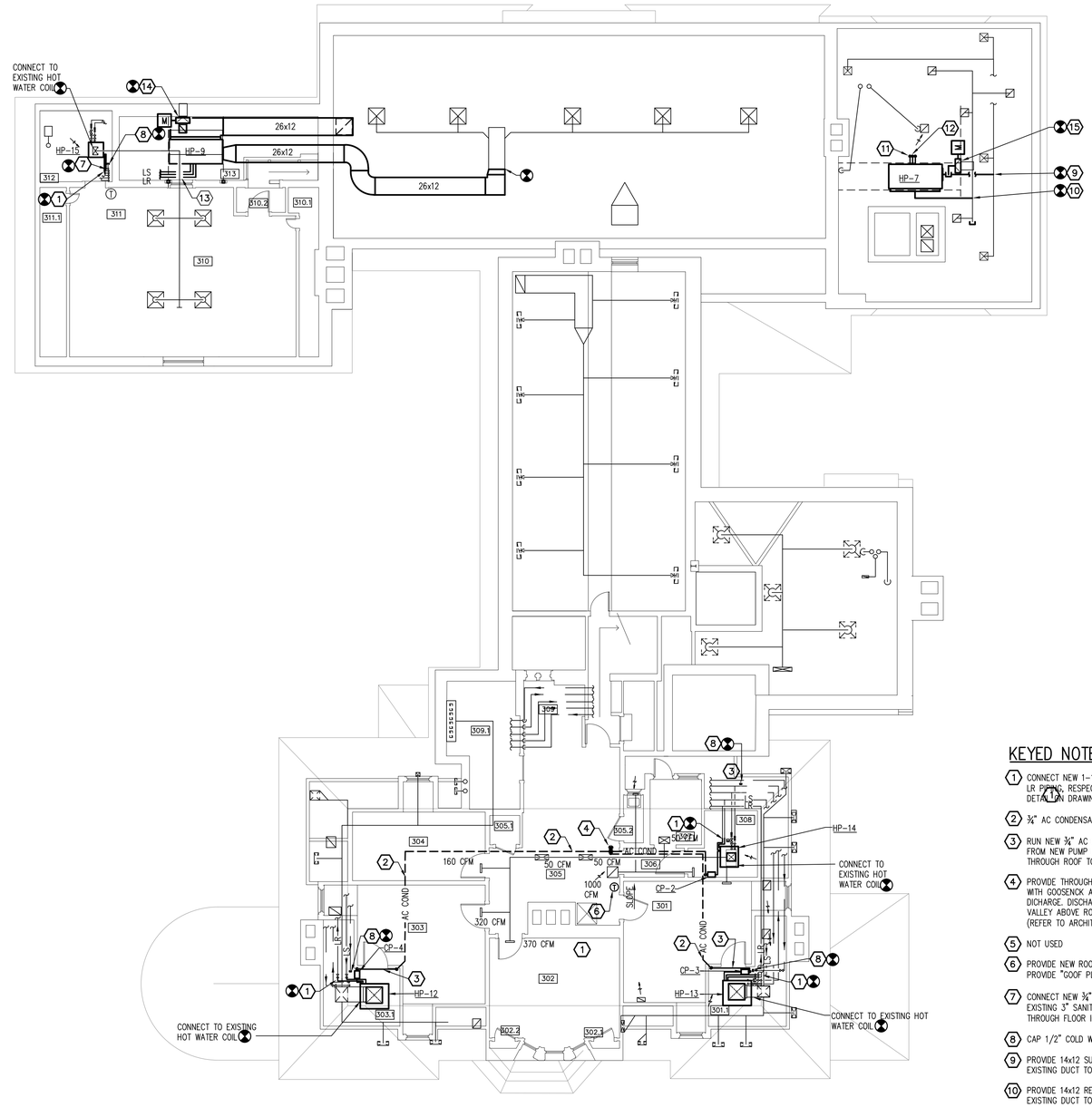
FREER HOUSE SECOND FLOOR PLAN - MECHANICAL NEW WORK

WSU PROJECT #: 511-254496-2
WSU BLDG NAME: FREER HOUSE
WSU BLDG #:

A/E PROJECT NO.
13-4806

SHEET NO.
M - 8

DSD FILE NAME
13-4806-M8



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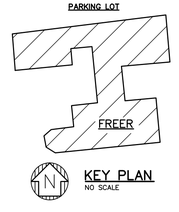
FREER HOUSE ATTIC FLOOR PLAN – MECHANICAL NEW WORK

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

0 4 8 16 32

KEYED NOTES

1. CONNECT NEW 1-1/2" LS & LR TO EXISTING LS & LR PIPING, RESPECTIVELY. REFER TO HEAT PUMP DETAIL ON DRAWING M-11.
2. ¾" AC CONDENSATE PIPING RUN IN ATTIC
3. RUN NEW ¾" AC CONDENSATE DISCHARGE PIPING FROM NEW PUMP UP HIGH NEAR CEILING AND THROUGH ROOF TO ATTIC ABOVE
4. PROVIDE THROUGH ROOH OPENING WITH PVC PIPING WITH GOOSENCK ABOVE ROOF FOR CONDENSATE DICHARGE. DISCHARGE TO SPILL NEAR COPPER VALLEY ABOVE ROOF TO AVOID DAMAGE TO SHINGLES (REFER TO ARCHITECTURAL DRAWINGS.
5. NOT USED
6. PROVIDE NEW ROOM TEMPERATURE SENSOR, AND PROVIDE "GOOF PLATE" IF NEEDED.
7. CONNECT NEW ¾" AC CONDENSATE PIPING TO EXISTING 3" SANITARY PIPING WHICH EXTENDS UP THROUGH FLOOR IN MECHANICAL ROOM.
8. CAP 1/2" COLD WATER PIPING.
9. PROVIDE 14x12 SUPPLY AIR CONNECTION FROM EXISTING DUCT TO HP-16.
10. PROVIDE 14x12 RETURN AIR DUCT CONNECTION FROM EXISTING DUCT TO HP-16
11. EXTEND ¾" AC CONDENSTAE DISCHARGE PIPING FROM NEW HEAT PUMP DOWN THROUGH FLOOR TO 1ST FLOOR AND DISCHARGE IN MOP SINK.
12. 1" LS AND 1" LR PIPING DOWN TO BASEMENT.
13. 1¼" LS, 1¼" LR AND ¾" COND TO EXISTING RISERS IN ATTIC 312
14. CONNECT NEW 12x12 OUTSIDE AIR INTAKE DUCT TO PEAK LOUVERED OPENING. REFER TO ARCHITECTURAL DRAWINGS FOR LOUVER MODIFICATIONS.
15. CONNECT NEW 12x12 OUTSIDE AIR INTAKE DUCT TO PEAK OPENING. REFER TO ARCHITECTURAL DRAWINGS FOR LOUVER AND OPENING MODIFICATIONS.



N KEY PLAN
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FREER HOUSE ATTIC FLOOR PLAN - MECHANICAL NEW WORK

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WSU BLDG NAME: FREER HOUSE
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M - 9

DSD FILE NAME
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