WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

ISSUE FOR BID PACK 1 BIDS/PERMITS

11-17-23

Wayne State University Owner Furnished Materials Matrix

Version Feb-23

		W.S.U.		G.C.		REMARKS
		SUPPLY	INSTALL	SUPPLY	INSTALL	
1	Initial Balancing and Re-balancing	☑	☐	☐	☐	Support by GC
2	Corrections due to Balancing	☐	☐	☑	☑	
3	Comissioning	☑	☐	☐	☐	Support by GC
4	Corrections due to Comissioning	☐	☐	☑	☑	
5	BAS / Building Management System	☐	☐	☑	☑	
6	Coordination by BAS with Cx and TAB	☐	☐	☑	☑	
7	One Card conduit, boxes and wire	☐	☐	☑	☑	
8	One card equipment, devices	☐	☐	☑	☑	
9	One card equipment, programing	☑	☐	☐	☐	
10	Permitting	☐	☐	☑	☐	
11	Phone and computer software programming	☑	☐	☐	☐	
12	Phone and computer equipment	☑	☑	☐	☐	
13	Phone conduit, boxes and wire	☐	☐	☑	☑	
14	AV equipment including coverplates	☑	☑	☐	☐	
15	AV equipment blocking	☐	☐	☑	☑	
16	AV conduit, boxes and pull string	☐	☐	☑	☑	
17	AV wiring and terminations	☑	☑	☐	☐	
18	Camera(s), conduit & wire, software and programming	☐	☐	☑	☑	specified by C&IT
19	Camera License	☑	☐	☐	☐	
	Toilet Accessories	☐	☐	☑	☑	
20	Wall mounted soap disp	☑	☑	☐	☐	
21	Feminine napkin dispenser	☑	☑	☐	☐	
22	Toilet Paper Dispensers	☐	☐	☑	☑	
23	Feminine Napkin Disposal	☐	☐	☑	☑	
24	Electric Hand Dryers	☐	☐	☑	☑	
25	Trash receptacles: Classrooms, corridors & restrooms / Recycle (Sustainability) Compost	☑	☑	☐	☐	
26	Drinking fountain and water purity test	☐	☐	☑	☑	Reported to WSU/ OEHS
27	Brass Keys and permanent Cores	☐	☑	☑	☐	WSU to key GC provided cores and blanks
28	FFE final electrical connections	☐	☐	☑	☑	
29	FFE dumpster capacity	☐	☐	☑	☐	
30	Existing FFE / removal of all remaining building contents	☑	☐	☑	☐	WSU & GC to coordinate
31	New FFE installation	☑	☑	☐	☐	
32	Interior artwork	☑	☑	☐	☐	
33	Material testing	☑	☐	☐	☐	GC to coordinate
34	Defibrillator	☑	☐	☐	☑	
35	Directories	☑	☑	☐	☐	
36	Signage / room numbering	☐	☐	☑	☑	Coordinate room name and number with WSU
37	Roofing inspection with WSU, installer & mfr.	☑	☐	☑	☐	WSU supplies 3rd party inspector. GC to coordinate with WSU
38	Ground Penetrating Radar	☐	☐	☑	☐	If applicable
39	Soil borings	☑	☐	☐	☐	If required
40	Hydrant flow test	☑	☐	☐	☐	If required GC to observe
		☐	☐	☐	☐	

NOTE: All blocking to be provided and installed by GC

PROJECT PHASING DESCRIPTIONS:

GENERAL
ALL ELEMENTS OF THIS PROJECT WHICH ARE REQUIRED FOR THE OPERATION OF THE MRI, INCLUDING ALL SUPPORTING BUILDING SYSTEMS, MUST BE SUBSTANTIALLY COMPLETE BY APRIL 26TH, 2024 INCLUDING ALL WORK BY ALL TRADES IN THE FOLLOWING ROOM NUMBERS: MRI 0560, EQUIPMENT ROOM 0561, CONTROL ROOM 0560B, MRI ENTRY 0560C, TOILET ROOM 466A, CHANGING ROOM 0466B, CLEAN STORAGE 0466C, PATIENT WAITING ROOM A101, MOCK MRI A100, MRI OFFICE, A110, NMR 0250.

THE MRI EQUIPMENT IS SCHEDULED TO ARRIVE ON-SITE MONDAY, APRIL 1, 2024.

PHASE 1: NMR RELOCATION AND VENDING
PHASE 1 INCLUDES RELOCATING THE EXISTING NMR EQUIPMENT FROM ROOM 0560 TO ROOM 0250. THE EXISTING SLAB DEPRESSION IN 0250 WILL BE INFILLED, AND A LARGER DOOR ADDED TO THE ROOM TO ACCOMODATE THE NEW EQUIPMENT. EXISTING CASEWORK WILL REMAIN. THE CEILING HEIGHT WILL BE RAISED, WITH NEW LIGHTING AND HVAC. ROOM 0250 WILL RECEIVE NEW FLOORING AND PAINT FINISHES.

PHASE 2: MRI INSTALLATION AND ASSOCIATED SUPPORT SPACES
PHASE 2 INCLUDES RENOVATING THE EXISTING NMR ROOM INTO THE NEW MRI AREA INCLUDING THE MRI EQUIPMENT AREA WITH RF SHIELDING, CONTROL ROOM, EQUIPMENT ROOM, AND PATIENT CHANGING AND TOILET ROOM. ALL AREAS WILL HAVE NEW FLOORING, PAINT, CEILING SYSTEMS, LIGHTING AND HVAC. THE NEW MRI QUENCH VENT WILL BE ROUTED ABOVE THE LEVEL 0 CEILING SPACE TO THE FIRST FLOOR DLAR SHIPPING/RECEIVING AREA. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL SCOPE. WORK TO BE COORDINATED WITH CLASS SCHEDULES FOR LEVEL 0 CLASSROOMS ADJACENT TO THE MRI EQUIPMENT AND SUPPORT AREAS.

ADDITIONAL PATIENT SUPPORT AREAS INCLUDE THE MOCK MRI, PATIENT WAITING, THE MRI OFFICE AND A SMALL STORAGE SPACE BELOW THE EXISTING STAIR LANDING ADJACENT TO THE MRI OFFICE. ALL SPACES WILL RECEIVE NEW FLOORING, PAINT, CEILINGS, LIGHTING AND HVAC.

THE EXISTING WOMENS TOILET ROOM AND ASSOCIATED FIXTURES WILL BE DEMOLISHED TO ALLOW FOR FOUR NEW ALL GENDER RESTROOMS TO BE UTILIZED BY ALL BUILDING OCCUPANTS. FINISHES INCLUDE TILE FLOORING, WALL TILE ON WET WALLS ONLY, PAINT, AND GYPSUM BOARD CEILINGS WITH NEW LIGHTING AND HVAC. THE EXISTING HIGH/LOW WATER COOLER WILL BE RELOCATED TO THE NEW WORK.

PHASE 3: STUDENT LOUNGE (MAIN STREET) RENOVATION
PHASE 3 WILL BE THE STUDENT LOUNGE (MAIN STREET) RENOVATION OF LEVEL 0. THE EXISTING VENDING, KITCHENETTE AND SEATING AREAS WILL BE DEMOLISHED. A SMALL VENDING AREA WILL BE CREATED ON THE SOUTH END OF THE LOUNGE WITH TWO NEW VENDING MACHINES AND A SMALL KITCHENETTE.

NEW FLOORING WILL BE INSTALLED THROUGHOUT, WITH NEW PAINT AND LIGHTING THROUGHOUT. SEATING AREAS TO HAVE IN-FLOOR RECEPTACLES, WITH CONVENIENCE OUTLETS INSTALLED THROUGHOUT THE LOUNGE ATRIUM AT 12'-0" ON CENTER, 18" ABOVE FINISHED FLOOR.

DRAWING LIST - GENERAL

GENERAL	
GI-100	COVER SHEET
GI-300	OVERALL LEVEL 0 LIFE SAFETY PLAN

DRAWING LIST - STRUCTURAL

STRUCTURAL	
SE-100	STRUCTURAL DETAILS

DRAWING LIST - ARCHITECTURAL

ARCHITECTURAL	
AE-050	TYPICAL INTERIOR PARTITION DETAILS
AE-051	WALL / PARTITION TYPES
AS-100	ARCHITECTURAL SITE PLAN
AE-100	OVERALL LEVEL 0 FLOOR PLAN
AE-101	ENLARGED MRI SUITE PLANS
AE-102	ENLARGED NMR AND MRI OFFICE PLANS
AE-103	ENLARGED LEVEL 1 FLOOR PLAN - QUENCH VENT
AE-361	DOOR & WINDOW DETAILS & SCHEDULES
AE-400	TYPICAL MOUNTING HEIGHTS
AE-401	TOILET ROOM ELEVATIONS
AE-700	INTERIOR FINISH PLANS, SCHEDULES & DETAILS
AE-701	STUDENT LOUNGE - INTERIOR FINISH FLOOR PLAN
AE-800	INTERIOR ELEVATIONS & CASEWORK DETAILS
AE-870	INTERIOR DETAILS
AE-900	ARCHITECTURAL SPECIFICATIONS
AE-901	ARCHITECTURAL SPECIFICATIONS
AE-902	ARCHITECTURAL SPECIFICATIONS

DRAWING LIST - MECHANICAL

MH-001	HVAC NOTES, LEGEND, SCHEDULES AND ABBREVIATIONS
MH-101	ENLARGED MRI SUITE HVAC PLANS
MH-102	PARTIAL LEVEL 0 FLOOR QUENCH VENT PLANS
MH-103	ENLARGED NMR AND MRI OFFICE HVAC PLANS
MH-600	HVAC EQUIPMENT SCHEDULES AND DETAILS

DRAWING LIST - PLUMBING

PL-001	PLUMBING NOTES, LEGEND, SCHEDULES AND ABBREVIATIONS
PL-100	ENLARGED UNDERGROUND MRI SUITE PLUMBING PLANS
PL-101	ENLARGED NMR, PUMP ROOM AND MRI SUITE PLUMBING PLANS

DRAWING LIST - ELECTRICAL

ELECTRICAL	
E-000	ELECTRICAL LEGEND, SYMBOLS, & NOTES
E-001	ELECTRICAL SPECIFICATIONS
E-002	ELECTRICAL SPECIFICATIONS
E-100	OVERALL LEVEL 0 FLOOR PLAN
E-201	ENLARGED MRI SUITE PLANS - LIGHTING & POWER
E-202	ENLARGED NMR 0250 & MRI OFFICE A110 PLANS - LIGHTING & POWER
E-701	ELECTRICAL ONE LINE DIAGRAM
E-801	ELECTRICAL STANDARD CIRCUITING AND CONDUIT SIZING SCHEDULES
E-810	PANEL SCHEDULES
E-901	ELECTRICAL DETAILS

DRAWING LIST - TECHNOLOGY

TECHNOLOGY	
T-001	TECHNOLOGY GENERAL NOTES AND SYMBOLS
T-101	ENLARGED MRI SUITE PLANS PLANS - AUXILIARY
T-102	ENLARGED NMR 0250 & MRI OFFICE A110 PLANS - AUXILIARY

DRAWING LIST - FOR REFERENCE ONLY

FOR REFERENCE	
REFERENCE DRAWINGS	2312308R0 SIEMENS SITE SPECIFIC DRAWING PACKAGE (11 SHEETS TOTAL)

REFERENCE SYMBOLS

DETAIL IDENTIFICATION
DETAIL OR ENLARGED PLAN IDENTIFICATION NUMBER
SHEET IDENTIFICATION NUMBER (INDICATES SHEET NUMBER WHERE DETAIL IS DRAWN.)
XX / AXXX

SECTION IDENTIFICATION
SECTION OR ENLARGED PLAN IDENTIFICATION NUMBER
SHEET IDENTIFICATION NUMBER (INDICATES SHEET NUMBER WHERE SECTION IS DRAWN.)
X / AXXX

PLAN, SECTION AND DETAIL IDENTIFICATION
PLAN, SECTION AND DETAIL IDENTIFICATION NUMBER (SAME NUMBER ON SHEET WHERE DRAWN OR CUT)
H5 / A101 — FLOOR PLAN — SCALE: 1/8" = 1'-0"
ON SHEET WHERE DETAIL IS DRAWN, INDICATES SHEET NUMBER WHERE DETAIL IS CUT

ELEVATION LOCATION IDENTIFICATION
ELEVATION IDENTIFICATION NUMBER
SHEET IDENTIFICATION NUMBER
X / AXXX — AXXX / #
FILLED AREA INDICATES DIRECTION OF VIEW

MATERIAL OR WORK DIVISION INDICATION
EXISTING MATERIAL | NEW MATERIAL

WALL TYPE INDICATION
XX X — WALL TYPE IDENTIFICATION AS NOTED IN PARTITION SCHEDULE

NORTH INDICATION
N

BULLETIN / ADDENDUM IDENTIFICATION
BULLETIN (NUMBER)
ADDENDUM (LETTER)
WORK POINT

ROOM NAME AND NUMBER INDICATION
RM NAME
XXXX

NOTE LEADER INDICATION

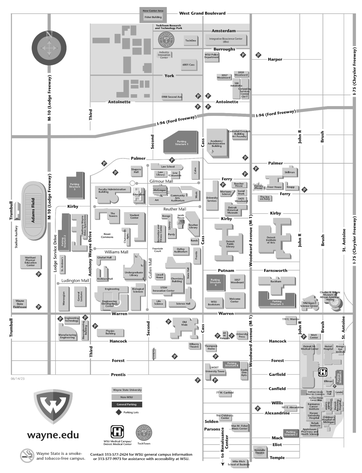
DOOR NUMBER INDICATION
DOOR SWING
1001 — DOOR NUMBER

COLUMN IDENTIFICATION
XX — EXISTING COLUMN IDENTIFICATION BUBBLE
XX — NEW COLUMN IDENTIFICATION BUBBLE

REFER TO MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR ADDITIONAL SYMBOLS

VICINITY MAP

SITE MAP



SSOE, Inc.
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

COVER SHEET

GI-100

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LIFE SAFETY PLAN LEGEND

WALL RATING GRAPHICS

- NEW NON RATED WALL
- 1P — 1 HOUR RATED FIRE PARTITION
- 1SB — 1 HOUR RATED SMOKE & FIRE BARRIER
- EXISTING NON RATED WALL
- 1P — EXISTING 1 HOUR RATED FIRE PARTITION
- 1SB — EXISTING 1 HOUR RATED SMOKE & FIRE BARRIER

ROOM REFERENCE

- Room name / 101 — ROOM NAME / ROOM NUMBER

DOOR IDENTIFICATION

- 60 — DOOR & FRAME RATING IN MINUTES
- EXIT — DENOTES DOOR IS EXTERIOR EXIT
- APPROACH TO DOOR
- ADA/ANSI DOOR CLEARANCE
- APPROACH TO DOOR

FIRE EXTINGUISHERS & CABINETS

- F01 — NOTE: EXISTING FIRE EXTINGUISHERS AND CABINETS TO REMAIN. FIRE EXTINGUISHER CABINETS WITHIN NEW WORK AREA TO BE REMOVED AND RELOCATED WITHIN 75'-0" OF EACH OTHER, TYPICAL.

LIFE SAFETY PLAN LEGEND

- COMMON PATH OF EGRESS TRAVEL
- EGRESS TRAVEL DISTANCE
- NOT IN SCOPE

LIFE SAFETY PLAN NOTES

1. THIS PROJECT REQUIRES THAT THE FOLLOWING LIFE SAFETY MEASURES ARE TO BE IMPLEMENTED AND ENFORCED AT ALL CONSTRUCTION AREAS. CONTRACTORS AND THEIR SUBCONTRACTORS ARE TO BE AWARE OF AND FOLLOW THESE REQUIREMENTS.
2. ASSURE THAT EXITS PROVIDE FREE AND UNOBSTRUCTED EGRESS, AND THAT PERSONNEL RECEIVE TRAINING IF ALTERNATIVE EXITS ARE DESIGNATED. BUILDINGS OR AREAS UNDER CONSTRUCTION SHALL MAINTAIN ESCAPE FACILITIES FOR CONSTRUCTION WORKERS AT ALL TIMES. MEANS OF EGRESS IN CONSTRUCTION AREAS ARE TO BE INSPECTED DAILY.
3. MAINTAIN MEANS OF EGRESS ROUTES THROUGHOUT THE PERIODS WHEN THE BUILDING IS OCCUPIED. EGRESS ROUTES ARE TO BE CLEARLY MARKED WITH SIGNS, LIGHTING, AND PROPER FLOOR SURFACES.
4. ASSURE FREE AND UNOBSTRUCTED ACCESS FOR EMERGENCY PERSONNEL AND EMERGENCY RESPONSE FORCES.
5. ASSURE THAT FIRE ALARM DETECTION AND SUPPRESSION SYSTEMS ARE NOT IMPAIRED WITHIN OCCUPIED AREAS OF THE BUILDING. PROVIDE TEMPORARY, EQUIVALENT SYSTEMS WHEN ANY SYSTEM NEEDS TO BE INOPERATIVE DURING CONSTRUCTION. INSPECT AND TEST TEMPORARY SYSTEMS MONTHLY.
6. PROVIDE 1 HOUR RATED TEMPORARY CONSTRUCTION PARTITIONS (UL # U309) THAT ARE AIR AND SMOKE TIGHT. WHERE PART OF EXTERIOR PARTITIONS, PROVIDE MINIMUM R-11 INSULATION.
7. PROHIBIT SMOKING IN, OR ADJACENT TO, ALL CONSTRUCTION AREAS.
8. DEVELOP AND ENFORCE STORAGE, HOUSEKEEPING, AND DEBRIS REMOVAL PRACTICES THAT REDUCE THE FLAMMABLE AND COMBUSTIBLE FIRE LOAD OF THE BUILDING TO THE LOWEST LEVEL REQUIRED FOR DAILY OPERATION.
9. PROVIDE INCREASED HAZARD SURVEILLANCE OF BUILDINGS, GROUNDS AND EQUIPMENT, WITH SPECIAL ATTENTION TO THE EXCAVATIONS, CONSTRUCTION AREAS, CONSTRUCTION STORAGE AND FIELD OFFICES. PROVIDE APPROVED BARRIERS AT ALL HAZARDOUS AREAS.
10. CONDUCT ORGANIZATION-WIDE SAFETY EDUCATION PROGRAMS TO ASSURE AWARENESS OF ANY LIFE SAFETY CODE DEFICIENCIES, CONSTRUCTION HAZARDS, AND THESE REQUIREMENTS.
11. PROVIDE EXHAUST AIR FLOW SUFFICIENT TO MAINTAIN NEGATIVE AIR PRESSURE IN THE CONSTRUCTION ZONES, RELATIVE TO ALL OCCUPIED ADJACENT AREAS.

CODE SUMMARY

PROJECT: WAYNE STATE UNIVERSITY APPLEBAUM MRI INSTALLATION
SSOE PROJECT NO.: 023-03727-00

SUMMARY OF WORK:
THIS PROJECT CONSISTS OF THE FOLLOWING:

- THE RELOCATION OF THE EXISTING NMR EQUIPMENT ROOM.
- THE RENOVATION OF THE EXISTING NMR ROOM INTO THE NEW MRI AREA INCLUDING THE MRI EQUIPMENT AREA WITH RF SHIELDING, CONTROL ROOM, EQUIPMENT ROOM, AND PATIENT CHANGING AND TOILET ROOM.
- THE RENOVATION OF ADDITIONAL PATIENT SUPPORT AREAS INCLUDING THE MOCK MRI, PATIENT WAITING, THE MRI OFFICE AND A SMALL STORAGE SPACE BELOW THE EXISTING STAIR LANDING ADJACENT TO THE MRI OFFICE. ALL SPACES WILL RECEIVE NEW FLOORING, PAINT, CEILINGS, LIGHTING AND HVAC.
- THE REMOVAL OF THE EXISTING WOMENS TOILET ROOM AND ASSOCIATED FIXTURES AND NEW WORK OF FOUR NEW ALL GENDER RESTROOMS
- THE RENOVATION OF THE STUDENT LOUNGE, THE EXISTING VENDING KITCHENETTE AND SEATING AREAS.
- ALL ASSOCIATED STRUCTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING WORK.

EXISTING BUILDING INFORMATION:

EXISTING BUILDING OCCUPANCY: BUSINESS (B) - EXISTING TO REMAIN
NO. OF STORIES: EXISTING TO REMAIN
CONSTRUCTION TYPE: EXISTING TO REMAIN

SECTION 1: APPLICABLE CODES
2015 MICHIGAN BUILDING CODE
2018 MICHIGAN PLUMBING CODE
2017 NATIONAL ELECTRICAL CODE
2015 MICHIGAN MECHANICAL CODE
2015 MICHIGAN REHABILITATION CODE
2015 MICHIGAN ENERGY CODE

SECTION 2: BUILDING INFORMATION *** ALL BUILDING INFORMATION EXISTING TO REMAIN ***

EXISTING TO REMAIN USE GROUP:	B - BUSINESS AND A-3 - ASSEMBLY
ACCESSORY OCCUPANCY:	N/A
INCIDENTAL USE:	N/A
CONSTRUCTION TYPE:	I-B
FIRE PROTECTION:	SPRINKLERED
HEIGHT/AREA LIMITATIONS:	EXISTING TO REMAIN

SECTION 3: OCCUPANT LOAD

USE GROUP	EXISTING AREA	NEW AREA	LOAD FACTOR	OCCUPANT LOAD
B-BUSINESS	EXISTING TO REMAIN	N/A	100 GROSS	EXISTING TO REMAIN
A-3 ASSEMBLY	EXISTING TO REMAIN	N/A	15 NET	EXISTING TO REMAIN
TOTAL OCCUPANT LOAD EXISTING TO REMAIN				956 PER EXISTING DRAWINGS

SECTION 4: MEANS OF EGRESS

(PER 2015 MICHIGAN BUILDING CODE SECTION 1006.2.1 / TABLE 1006.2.1, EGRESS BASED ON OCCUPANT LOAD AND COMMON PATH OF EGRESS TRAVEL DISTANCE.)

OCCUPANCY/SPACE	MAX OCCUPANT LOAD OF SPACE	CALCULATED OCCUPANT LOAD	MAX COMMON PATH OF TRAVEL OL<30
B-BUSINESS	49	EXISTING TO REMAIN	100
A-3 ASSEMBLY	49	EXISTING TO REMAIN	75

TOTAL EXITS REQUIRED: 1 PER TABLE 1006.2.1
TOTAL EXITS PROVIDED: EXISTING TO REMAIN

EXIT ACCESS AND TRAVEL DISTANCE:

TRAVEL DISTANCE TO EXITS: 250 FT MAX (TABLE 1017.2 SPRINKLED)
COMMON PATH OF TRAVEL: 75 FT MAX (TABLE 1006.2.1 EGRESS BASED ON OCCUPANT LOAD - MOST RESTRICTIVE)
DEAD END CORRIDOR: 50 FT MAX (SECTION 1020.4)

EXIT CAPACITY: (PER 2015 MICHIGAN BUILDING CODE SECTION 1005)

DOORS: .15 INCHES PER OCCUPANT
CORRIDORS: .15 INCHES PER OCCUPANT
STAIRS: .2 INCHES PER OCCUPANT

ACTUAL PROVIDED FOR DOOR COMPONENT= 34 INCHES CLEAR
ACTUAL PROVIDED FOR CORRIDOR= 72 INCHES CLEAR

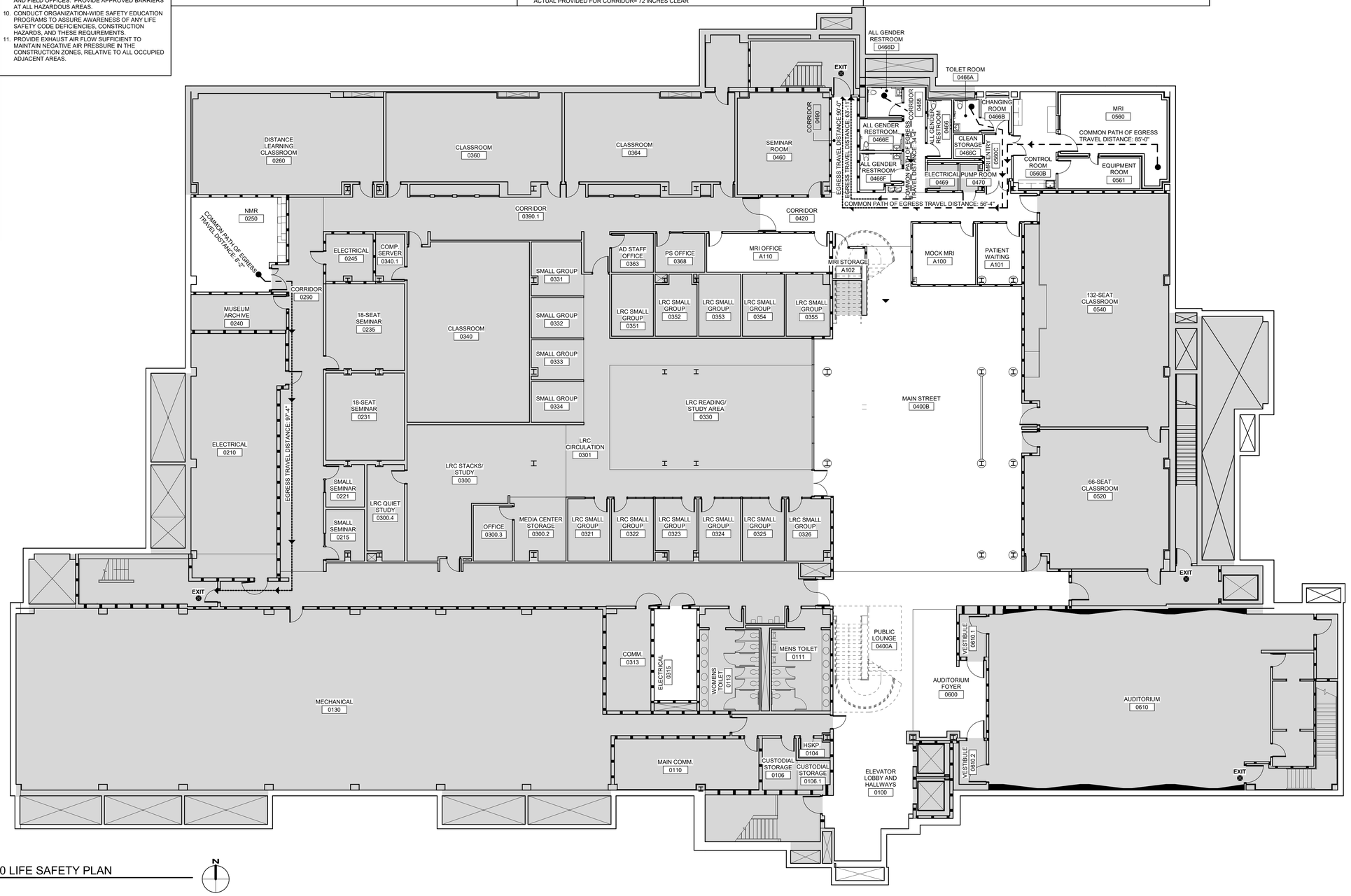
SECTION 5: MISCELLANEOUS PROVISIONS

OCCUPANCY SEPARATION: PER 2015 MICHIGAN BUILDING CODE TABLE 508.4

REQUIRED SEPARATION OF OCCUPANCY (HOURS) = A, E, I-1, I-3, I-4:1 HR, I-2:2 HR, R:1 HR, F-2, S-2, U: 1HR.

FIRE RATED ASSEMBLIES:

EXIT STAIR	1 HR - EXISTING TO REMAIN
ELEVATOR	1 HR - EXISTING TO REMAIN
SHAFTS	0 HR - EXISTING TO REMAIN
FIRE/SMOKE BARRIERS	1 HR - EXISTING TO REMAIN
HAZARDOUS SPACES	N/A (1 HR WHERE INCIDENTAL STORAGE > 100 SF)
CORRIDORS	0 HR REQUIRED (PER 2015 MICHIGAN BUILDING CODE TABLE 1020.1)



A7 / GI-300 OVERALL LEVEL 0 LIFE SAFETY PLAN
SCALE: 1" = 10'-0"

N

ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

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1	11-17-23	BID PACK 1 BIDS/PERMITS

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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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OVERALL LEVEL 0 LIFE SAFETY PLAN

GI-300

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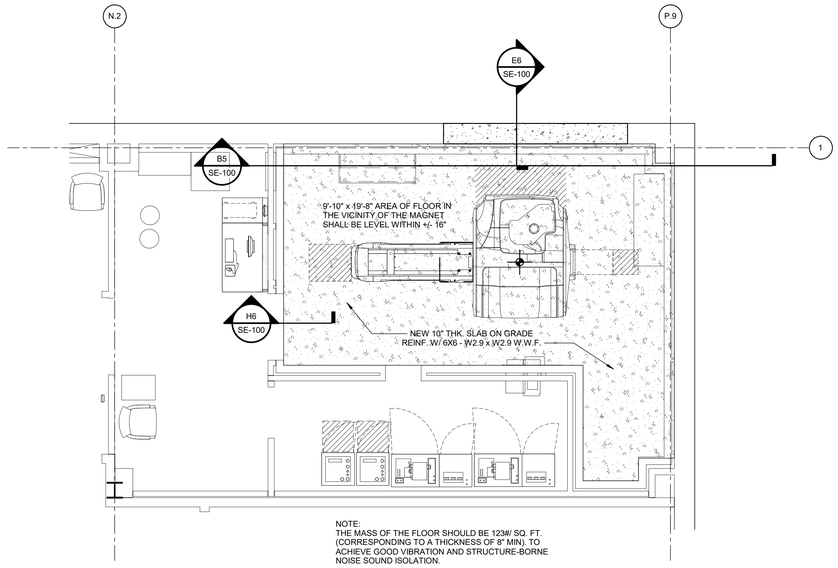
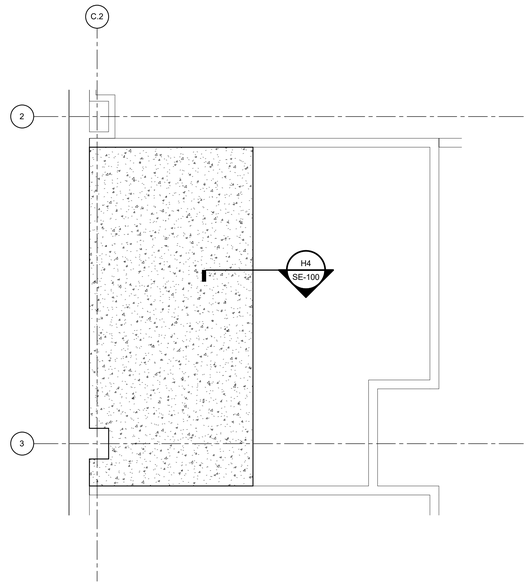


B3 SE-100 PARTIAL SLAB ON GRADE PLAN AT MRI SUITE

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



E3 SE-100 PARTIAL SLAB ON GRADE PLAN AT NMR 0250

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

GENERAL NOTES:

A. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND SITE CONDITIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH WORK.

B. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. UNLESS NOTED OTHERWISE, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE, WORKMEN, AND ALL OTHER PERSONS DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR JOB SITE SECURITY.

C. STRENGTH OF CAST-IN-PLACE CONCRETE SHALL BE 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS REGULAR WEIGHT CONCRETE, 145 P.C.F..

D. TEST CYLINDERS SHALL BE TAKEN AS A REPRESENTATIVE SAMPLE OF THE CONCRETE PLACED. TEST RESULTS SHALL BE FORWARDED TO THE ARCHITECT AND ENGINEER. TEST REPORTS SHALL ALSO BE KEPT ON SITE FOR REVIEW BY INSPECTORS.

E. NORMAL WEIGHT CONCRETE (145 PCF) SHALL BE USED AND 1" MINIMUM COARSE AGGREGATE CONFORMING TO ASTM C33, UNLESS NOTED OTHERWISE. THE MAXIMUM WATER/CEMENT RATIO SHALL BE 0.48 FOR AIR ENTRAINED CONCRETE AND 0.50 FOR ALL OTHER CONCRETE AND THE MAXIMUM SLUMP AT POINT OF PLACEMENT SHALL BE 5 INCHES, UNLESS SUPERPLASTICIZERS ARE USED.

F. ALL ADDITIVES FOR AIR ENTRAINMENT, WATER REDUCTION AND SET CONTROL SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS. THE USE OF CALCIUM CHLORIDE IS PROHIBITED.

G. CONCRETE SHALL REACH 75% OF THE TOTAL COMPRESSIVE STRENGTH BEFORE CONSTRUCTION LOADS ARE APPLIED. CONCRETE STRENGTH SHALL BE VERIFIED WITH A 7 DAY CYLINDER BREAK.

H. NO WATER SHALL BE ADDED TO THE CONCRETE AT THE JOB SITE.

I. THE DESIGN OF CONCRETE STRUCTURAL ELEMENTS, INCLUDING SLABS AND FOOTINGS, IS IN ACCORDANCE WITH ACI 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.

J. ALL REINFORCING BARS ARE ASTM A615, GRADE 60.

K. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.

L. CONTRACTOR SHALL PROVIDE FOR DEWATERING OF EXCAVATIONS FROM EITHER GROUND WATER OR SEEPAGE.

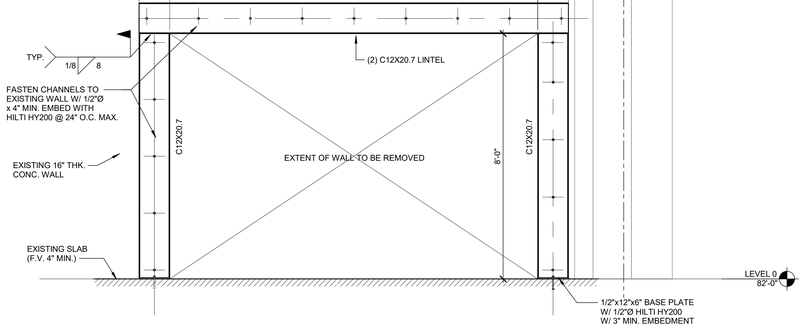
M. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITY LINES, ETC. THAT ARE ENCOUNTERED DURING EXCAVATION AND BACKFILLING.

N. ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED WITH MINIMUM COMPACTION OF 95% STANDARD PROCTOR. EXISTING SUBGRADE TO BE CHECKED BY THE GEOTECHNICAL ENGINEER PRIOR TO POURING THE MAT FOUNDATIONS.

O. ALL NEW MAT FOUNDATIONS SHALL BEAR ON A SOIL WITH A MINIMUM BEARING CAPACITY OF 1500 PSF.

P. THE INSTALLATION OF ANCHOR BOLTS AND ANCHOR BOLT SLEEVES TO BE COORDINATED WITH EQUIPMENT VENDOR SO THAT RF SHIELD IS NOT DAMAGED OR COMPROMISED.

Q. CONCRETE MAT FOUNDATIONS TO BE FLAT AND LEVEL WITHIN 1/16" FOR THE AREA UPON WHICH PHILLIPS EQUIPMENT IS TO BE PLACED/ANCHORED. SEE MANUFACTURER'S LITERATURE FOR ADDITIONAL INFORMATION.

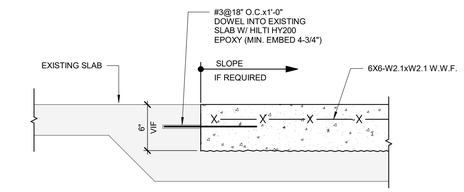


B5 SE-100 CONCRETE WALL DEMOLITION ELEVATION

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

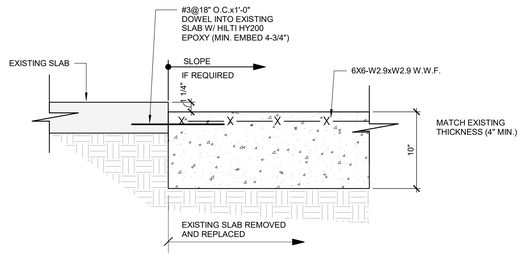
E6 SE-100 CONCRETE WALL OPENING INFILL DETAIL

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



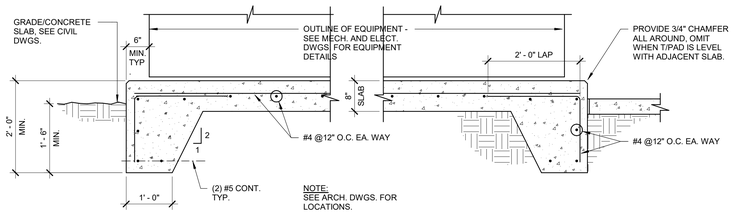
H4 SE-100 EXISTING SLAB ON GRADE INFILL DETAIL

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



H6 SE-100 NEW SLAB ON GRADE DETAIL

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



B7 SE-100 TYPICAL EXTERIOR EQUIPMENT PAD

SCALE: 3/4" = 1'-0"

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-8222

STRUCTURAL DETAILS

SE-100

GENERAL NOTES:
STUD CONSTRUCTION

1. BASIS OF DESIGN: *STEEL FRAMED PARTITIONS*
DESIGN IS BASED ON GUIDELINES INCLUDED IN PRODUCT TECHNICAL INFORMATION OF THE STEEL MANUFACTURE'S ASSOCIATION LATEST EDITION OF THE SSMA PUBLICATION AND THE FOLLOWING PERFORMANCE CRITERIA:

A. LIMITING HEIGHT CRITERIA:
DEFLECTION OF L/240 AT 7.5 LBS. PER SQ. FT CONSTANT AIR-PRESSURE LOADS

B. THICKNESS-STEEL COMPONENTS:

GAUGE	DESIGN THICKNESS
25	0.0188
22	0.0283
20	0.0346
18	0.0451

*LIGHT GAUGE METAL FRAMING MANUFACTURED TO "EQUIVALENT THICKNESS" PARAMETERS ARE ACCEPTABLE PROVIDED THE DESIGN CRITERIA NOTED ABOVE IS ACCOMODATED .

2. BASIS OF DESIGN: *SHAFT WALL PARTITIONS*
DESIGN IS BASED ON UNITED STATES GYPSUM COMPANY PRODUCT LITERATURE SA 926 DATED 2000 AND THE FOLLOWING PERFORMANCE CRITERIA:
A. LIMITING HEIGHT CRITERIA:
DEFLECTION OF L/240 5 LBS. PER SQ. FT. INTERMITTENT AIR-PRESSURE LOADS

B. THICKNESS-STEEL COMPONENTS:

GAUGE	DESIGN THICKNESS
25	0.0188
22	0.0310
20	0.0356

*LIGHT GUAGE METAL FRAMING MANUFACTURED TO "EQUIVALENT THICKNESS" PARAMETERS ARE ACCEPTABLE PROVIDED THEY DESIGN CIRTERIA NOTED ABOVE IS ACCOMDOATED .

3. MINIMUM GAUGE:
IF LIMITING HEIGHT AS SCHEDULED IN PARTITION DETAILS EXCEEDS PROJECT CONDITIONS OR IF THE SELECTED STEEL STUD MANUFACTURE'S THICKNESS OF STEEL COMPONENTS VARIES FROM THE BASIS OF DESIGN AS SET FORTH ABOVE, PROVIDE MANUFACTURE'S STANDARD THICKNESS (GAUGE) THAT MEETS OR EXCEEDS LIMITING HEIGHT PERFORMANCE CRITERIA FOR STUD DEPTH AND SPACING INDICATED.

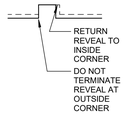
4. DOOR JAMBS
PROVIDE DOUBLE 20 GA. STUDS AT ALL DOOR OPENINGS, EXTEND FROM FLOOR TO STRUCTURE ABOVE. TYPICAL FOR ALL DOORS IN METAL STUD WALLS.

GENERAL NOTES:
GYPSUM WALLBOARD

1. DO NOT INSTALL GYPSUM WALLBOARD (GWB) IN DIRECT CONTACT WITH THE FLOOR. ALL GWB SHALL BE SHIMMED 1/2" ABOVE FLOOR SLAB WITH NON-POROUS SHIM. PLASTIC NON-POROUS HORSESHOE SHIMS ARE RECOMMENDED. GYPSUM WALLBOARD SHIMS ARE NOT ACCEPTABLE. PROVIDE BACKER ROD & CONTINUOUS ACOUSTICAL OR FIRE RATED SEALANT TOOLED FOR HOURGLASS SHAPE PER MFR'S RECOMMENDATIONS.
2. WHERE GYPSUM WALL BOARD EXTENDS TO THE UNDERSIDE OF STRUCTURE, STOP GYPSUM WALL BOARD 1/2" BELOW LINE OF STRUCTURE AND SEAL AS REQUIRED.
3. TYPICAL AT ALL INTERIOR PARTITIONS, GYPSUM WALLBOARD TO BE 5/8" TYPE "X" UNLESS NOTED OTHERWISE AT PARTITION TYPE MODIFIER OR AS SCHEDULED IN SPECIFICATION.
4. TYPICAL AT ALL EXTERIOR PERIMETER WALLS, INSTALL 5/8" TYPE "X" MOLD AND MOISTURE RESISTANT GYPSUM WALLBOARD.
5. STAGGER JOINTS AT INSTALLATIONS OF MULTIPLE LAYERS OF GYPSUM WALLBOARD.
6. TO GREATEST EXTENT POSSIBLE, ALL HORIZONTAL JOINTS BETWEEN PANELS SHALL BE ABOVE CEILING.

GENERAL NOTES:
GYPSUM WALLBOARD REVEALS

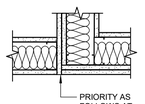
1. STANDARD, WHERE INDICATED IN THESE DOCUMENTS, PROVIDE REVEALS OF TYPE AND SIZE INDICATED AS SPECIFIED.
2. ELEVATIONS MAY NOT SHOW ALL FACES OF COLUMNS OR FACES OF EVERY WALL - G.C. SHALL ASSUME THAT ALL REVEALS WILL RETURN TO INSIDE CORNER UNLESS OTHERWISE NOTED.
3. AT ALL INTERSECTIONS OF VERTICAL AND HORIZONTAL REVEALS, PROVIDE FACTORY FABRICATED INTERSECTIONS AND CORNERS.



GENERAL NOTES:
FIRE RATED ASSEMBLIES

1. ALL FIRE-RATED ASSEMBLIES TO EXTEND FROM TOP OF SLAB TO UNDERSIDE OF STRUCTURE. SEAL TOP OF ASSEMBLY TO THE UNDERSIDE OF METAL DECK OR STEEL BEAM AS REQUIRED TO ACHIEVE FIRE PROTECTION RATING.
2. AT GWB/STUD FIRE RATED ASSEMBLIES, INSTALL FRAMING AND GYPSUM WALL BOARD TO OFFSET AROUND STRUCTURAL MEMBERS OR OTHER OBSTRUCTIONS TO MAINTAIN ACOUSTICAL OR FIRE RATINGS (IF ACOUSTICAL PARTITION IS ALSO FIRE-RATED). SEE DETAILS AT SHEET AE-051.
3. SEAL BOTTOM OF WALL TO CONCRETE SLAB TO ACHIEVE FIRE PROTECTION RATING. SEE DETAILS AT SHEET AE-051.
4. REFER TO PARTITION TYPES FOR FIRE-RATED JOINT SYSTEMS FOR FIRE-RATED SEALANTS AND FIRESTOP CAULKING.
5. INSTALL FRAMING AND GWB TO OFFSET AROUND STRUCTURAL MEMBERS OR OTHER PENETRATIONS OF FIRE-RATED ASSEMBLIES TO MAINTAIN FIRE RESISTIVE RATINGS PER UL APPROVED DETAIL.

ASSEMBLY PRIORITY LEGEND



PROVIDE RATED ASSEMBLIES IN ACCORDANCE WITH UL LISTING, MFR. INSTRUCTIONS & APPROVED DETAILS INDICATING HOURS OF FIRE RESISTANCE. REFER TO LIFE SAFETY PLANS, PLANS & ENLARGED PLANS FOR PARTITION TYPES, LOCATIONS & EXTENT OF RATED WALLS.

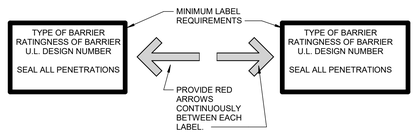
PRIORITY OF RATED ASSEMBLIES:

• TWO HOUR FIRE & SMOKE WALL	PRIORITY 1 - HIGHEST
• TWO HOUR FIRE WALL	PRIORITY 2
• TWO HOUR SHAFT WALL	PRIORITY 3
• ONE HOUR FIRE & SMOKE WALL	PRIORITY 4
• ONE HOUR FIRE WALL	PRIORITY 5
• ONE HOUR SHAFT WALL	PRIORITY 6
• NON-RATED	PRIORITY 7 - LOWEST

GENERAL NOTES - FIRE RATED STENCIL

1. APPLY PARTITION LABELS ABOVE THE CEILING ON ALL RATED AND SMOKE TIGHT ASSEMBLIES. LABEL AS PER ASSEMBLY RATING.
2. COLOR TO BE BRIGHT RED. MINIMUM TEXT SIZE AS REQUIRED BY LOCAL AUTHORITIES HAVING JURISDICTION.
3. APPLY LABEL AT BEGINNING AND END OF EACH LENGTH OF ASSEMBLY AND APPLY LABEL INTERMITTENTLY BETWEEN END/BEGINNING AT MINIMUM SPACING OF 12'-0" O.C.
4. ARROWS TO BE CONTINUOUS AROUND ASSEMBLY.
5. FIRE/SMOKE DAMPER ACCESS AND OTHER MECHANICAL ELEMENTS SHALL BE IDENTIFIED AS PER ***IBC 2018 SECTION 717.4***. ALL OTHER IDENTIFIERS SHALL BE IN COMPLIANCE WITH THE IBC AND ALL OTHER APPLICABLE CODES AND MUNICIPALITY REQUIREMENTS.
6. REPAIR/PATCH EXISTING FIRE RATED PARTITION LABELS AS NECESSARY
7. PAINT OVER EXISTING FIRE RATED PARTITION LABELS AND ARROWS SO AS TO COMPLETELY COVER ALL INDICATION OF A FIRE RATING FOR ASSEMBLIES THAT WILL NOT RETAIN A FIRE RATING IN THE PROPOSED NEW DESIGN.

FIRE RATED STENCIL DETAIL



GENERAL NOTES:
NON-RATED & ACOUSTICAL PARTITIONS/ASSEMBLIES

1. ALL INTERIOR PARTITIONS TO EXTEND TO DECK UNLESS NOTED OTHERWISE BY PARTITION TYPE HEAD CONDITION SCHEDULE. SEE PLAN FOR PARTITION IDENTIFICATION.
2. ALL ACOUSTIC PARTITIONS TO EXTEND FROM TOP OF SLAB TO UNDERSIDE OF STRUCTURE. SEAL TOP AND BOTTOM TYPICAL TO THE UNDERSIDE OF METAL DECK OR STEEL BEAM AS REQUIRED TO ACHIEVE ACOUSTIC OR FIRE PROTECTION RATING. SEE DETAILS AT SHEET AE.051. INSTALL FRAMING AND GYPSUM WALL BOARD TO OFFSET AROUND STRUCTURAL MEMBERS OR OTHER OBSTRUCTIONS TO MAINTAIN ACOUSTICAL OR FIRE RATINGS (IF ACOUSTICAL PARTITION IS ALSO FIRE-RATED).
3. ALL INTERIOR METAL STUD PARTITIONS TO HAVE SOUND BATTS INSULATION UNLESS NOTED OTHERWISE BY PARTITION MODIFIER. AT 3 5/8" STUD CAVITIES, PROVIDE 3 1/2" SOUND BATTS. AT 6" OR 8" STUD CAVITIES PROVIDE 5 1/2" SOUND BATTS.
4. ALL INTERIOR ROOF DRAINS AND OVERFLOW DRAINS TO BE WRAPPED CONTINUOUSLY WITH SOUND ATTENUATION INSULATION.
5. ALL PARTITIONS CONTAINING PLUMBING PIPING SHALL BE THERMALLY INSULATED WITH MINERAL WOOL.
6. THE FOLLOWING LIST OF ROOMS (IF USED) SHALL HAVE THEIR PERIMETER PARTITIONS INSULATED USING MINERAL WOOL: ELECTRICAL ROOMS, MECHANICAL ROOMS, AV EQUIPMENT ROOMS, DATA OR TELECOM ROOMS, SPRINKLER RISER ROOMS AND FIRE PUMP ROOMS.
7. WHERE NOTED, PROVIDE RESILIENT CHANNELS AT CORRIDOR SIDE OF WALL. SEE PARTITION TYPE DETAILS AND SPECIFICATIONS FOR INSTALLATION GUIDELINES.

GENERAL NOTES:
CONCRETE MASONRY UNIT ASSEMBLIES

1. ALL CMU PARTITIONS ARE TO BE INSTALLED TO UNDERSIDE OF DECK AND ANCHORED TO STRUCTURE UNLESS NOTED OTHERWISE BY PARTITION TYPE HEAD CONDITION AS SCHEDULED AT FLOOR PLAN PARTITION TYPE TAG. FOR WALLS NOT DIRECTLY ANCHORED TO STRUCTURE, WALL SHALL BE BRACED TO STRUCTURE. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
2. ALL CMU PARTITIONS SHALL BE BRACED TO STRUCTURE IF NOT DIRECTLY ADJACENT TO OTHER CMU PARTITIONS, SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
3. ALL CMU PARTITIONS SHALL BE REINFORCED. REFER TO STRUCTURAL DRAWINGS FOR MORE INFORMATION.
4. SEE STRUCTURAL DRAWINGS FOR CORE GROUTING LOCATIONS.
5. AT TOILET ROOM CHASES, BOTH WYTHES OF THE CHASE SHALL BE MADE OF CMU OF THE SAME WIDTH UNLESS NOTED OTHERWISE BY PARTITION TYPE TAG ON THE FLOOR PLAN.

GENERAL NOTES:
CAST IN PLACE CONCRETE

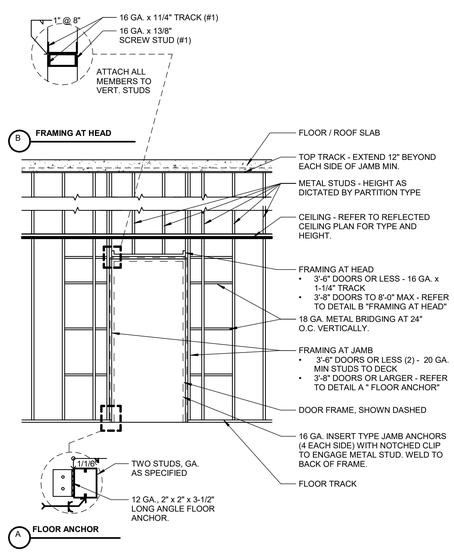
1. ALL CAST-IN-PLACE CONCRETE TO BE REINFORCED. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.

GENERAL NOTES:
WOOD STUD FRAMING & FURRING

1. TYPICAL, ALL WOOD STUD FRAMED PARTITIONS SHALL BE TO UNDERSIDE OF DESK UNO.
2. REFER TO DRAWINGS FOR ALL STRUCTURAL HEIGHTS, CEILING HEIGHTS AND HEIGHTS OF PARTIAL HEIGHT PARTITIONS.
3. WOOD STUDS SHALL BE INSTALLED AT 16" O.C. UNLESS OTHERWISE INDICATED BY "SPECIAL CONDITION"

GENERAL NOTES:
DOOR FRAMING

1. ALL DOOR JAMB STUDS ARE TO EXTEND TO DECK, REGARDLESS OF PARTITION TYPE STUD HEIGHTS AS NOTED BY PARTITION TYPE OR SPECIAL CONDITION.
2. REFER TO DETAIL BELOW FOR STUD GA. AT JAMB AND HEADER STUDS



- AS AN OPTION TO THE NESTED 16 GA. x 1-1/4" TRACK AND 16 GA. x 1-3/8" SCREW STUD 16 GA. x 1-1/4" TRACK SHOWN FOR "FRAMING AT HEAD" DETAIL, A 16 GA. RECTANGULAR TUBE OF SAME SIZE AS THE NESTED STUD / TRACK MAY BE USED + 16 GA. x 1-1/4" TRACK.
- BRIDGING TO BE AT 24" O.C. VERTICALLY AT DOORS OVER 36" WIDE AND AT LEAD LINED DOORS; DOORS 36" WIDE AND NARROWER, CAN HAVE BRIDGING AT MID-POINT OF VERTICAL DOOR HEIGHT.

PARTITION TYPE TAG LEGEND - CALLED OUT ON FLOOR PLANS & ENLARGED PLANS

ABBREVIATIONS

I I	=	"CORE"
(#)	=	NUMBER OF LAYERS OF GWB
CIP	=	CAST-IN-PLACE CONCRETE
CMU	=	CONCRETE MASONRY UNIT
FC	=	STUD FURRING (TYPE AS SCHEDULED)
GSL	=	GYPSUM SHAFT LINER
GWB	=	GYPSUM WALLBOARD, TYPE AS SCHEDULED
HF	=	HAT-SHAPED METAL FURRING
MS	=	METAL STUD FRAMING
MF	=	METAL STUD FURRING
MSS	=	METAL SHAFTWALL STUD FRAMING
RC	=	RESILIENT CHANNEL
WS	=	WOOD STUD FRAMING
WF	=	WOOD FURRING
ZF	=	METAL Z-FURRING

PARTITION TYPE SCHEDULE

METAL STUD PARTITION TYPES

F1	GWB(1) + FC
F2	GWB(2) + FC
F3	GWB(3) + FC
M1	GWB (1) + MS + GWB(1)
M2	GWB (2) + MS + GWB(2)
M3	GWB (3) + MS + GWB(3)
M4	GWB (1) + MS + GWB(2)
M5	GWB (1) + MS + GWB(3)
M6	GWB (2) + MS + GWB(3)

SHAFTWALL PARTITION TYPES

S1	GSB(1) + MSS + GSL(1)
S2	GSB(2) + MSS + GSL(1)
S3	GSB(3) + MSS + GSL(1)
T1	GWB(1) + MSS + GSL(1) + GWB(1)
T2	GWB(2) + MSS + GSL(1) + GWB(2)
T4	GWB(1) + MSS + GSL(1) + GWB(2)
T7	GWB(2) + MSS + GSL(1) + GWB(1)

SPECIAL CONDITION SCHEDULE

A. NONE.

LIGHT GAUGE METAL STUD SCHEDULE

NOMINAL	ACTUAL
1	1 5/8"
2	2 1/2"
3	3 5/8"
4	4"
6	6"
8	8"

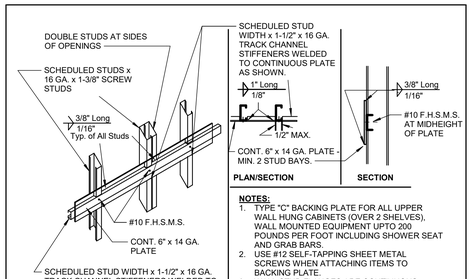
SHAFTWALL STUD SCHEDULE

NOMINAL	ACTUAL
2	2 1/2"
4	4"
6	6"

FURRING SCHEDULE

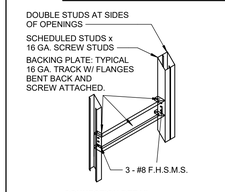
NOMINAL	TYPE	ACTUAL
A	HF	7/8"
B	HF	1 1/2"
C	RC	1/2"
D	ZF	1"
E	ZF	1 1/2"
F	ZF	2"
G	ZF	2 1/2"
H	MSF	3/4"
J	MSF	1"
K	MSF	1 1/2"
L	MSF	2"
M	1X2	3/4" x 1 1/2" WOOD
N	1X3	3/4 x 2 1/2"
P	1X4	3/4" x 3 1/2"
R	1X6	3/4" x 5 1/2"
S	1X8	3/4" x 7 1/4"
T	1X10	3/4" x 9 1/4"
U	1X12	3/4" x 11 1/4"
V		5/16" PLYWOOD SHEATHING
W		3/8" PLYWOOD SHEATHING
X		1/2" PLYWOOD SHEATHING

1. CAST-IN-PLACE CONCRETE "STRUCTURAL MEMBER SIZE IS DIMENSIONED AT PLANS, SEE STRUCTURAL DWGS FOR MORE INFORMATION.
2. RESILIENT CHANNEL IS 1/2" DEEP. SEE SPECIFICATIONS FOR LENGTH AND TYPE
3. FOR ALL METAL STUD FURRING, ONLY DEPTH IS NOTED. SEE SPECIFICATION FOR ALL OTHER SIZE AND GAUGE REQUIREMENTS. FURRING LEGS SHALL BE OF DIMENSION ADEQUATE TO MEET PERFORMANCE AND FASTENING REQUIREMENTS.



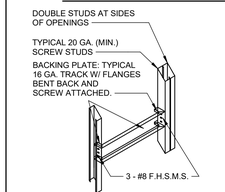
NOTES:
1. TYPE "C" BACKING PLATE FOR ALL UPPER WALL HUNG CABINETS (OVER 2 SHELVES), WALL MOUNTED EQUIPMENT UPTO 200 POUNDS PER FOOT INCLUDING SHOWER SEAT AND GRAB BARS.
2. USE #12 SELF-TAPPING SHEET METAL SCREWS WHEN ATTACHING ITEMS TO BACKING PLATE.
3. WALL STUD FLANGES ARE CONTINUOUS.

TYPE "C" BACKING PLATE



NOTES:
1. TYPE "B" BACKING PLATE FOR UPPER WALL HUNG CABINETS (UP TO 2 SHELVES), BASE CABINETS, FULL HEIGHT CABINETS, FILM VIEWING COUNTERS, WALL HUNG BENCHES, HANDRAILS, GUARDRAILS, AND WALL HUNG EQUIPMENT - MAXIMUM WEIGHT 100 POUNDS
2. VERIFY LENGTH, HEIGHT, LOCATION OF BACKING PLATE AND NUMBER REQUIRED WITH MANUFACTURER OF ITEMS IN NOTE 1.
3. USE #12 SELF-TAPPING SHEET METAL SCREWS WHEN ATTACHING ITEMS TO BACKING PLATE.
4. WALL STUD FLANGES ARE CONTINUOUS.

TYPE "B" BACKING PLATE



NOTES:
1. TYPE "A" BACKING PLATE FOR MISC. ITEMS; I.E. SURFACE MOUNTED MIRRORS, WASTE RECEPTACLES, TOWEL DISPENSERS, CHAIR RAILS, ETC. MAXIMUM WEIGHT 50 POUNDS
2. VERIFY LENGTH, HEIGHT, LOCATION OF BACKING PLATE AND NUMBER REQUIRED WITH ACCESSORY MANUFACTURER.
3. USE #12 SELF-TAPPING SHEET METAL SCREWS WHEN ATTACHING ITEMS TO BACKING PLATE.
4. WALL STUD FLANGES ARE CONTINUOUS.

TYPE "A" BACKING PLATE

SSOE

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

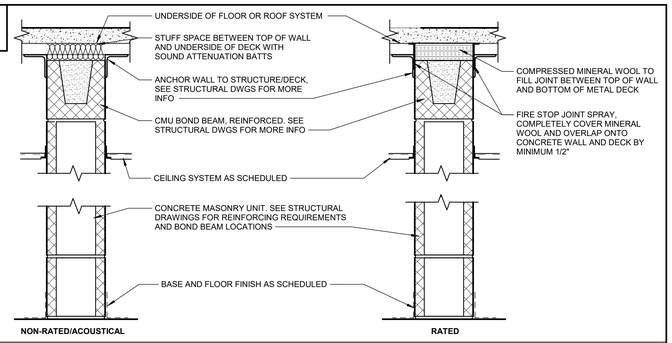
SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

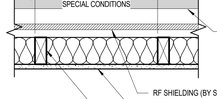
TYPICAL INTERIOR PARTITION DETAILS

AE-050

C



SECTION DETAIL



PLAN DETAIL

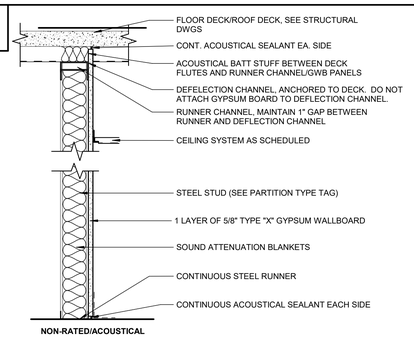
1. SPECIAL CONDITIONS AS TAGGED AT FLOOR PLAN ARE NOT SHOWN IN THE ABOVE DIAGRAM OR SCHEDULE BELOW, SEE SPECIAL CONDITIONS SCHEDULE FOR MORE INFO.

PARTITION NOTES

PARTITION TAG	FINISHED WIDTH	CMU SIZE	STC RATING	UL	
C 6 2B	5 5/8"	5 5/8"	45	U906	

PARTITON SCHEDULE

G1



SECTION DETAIL

PLAN DETAIL

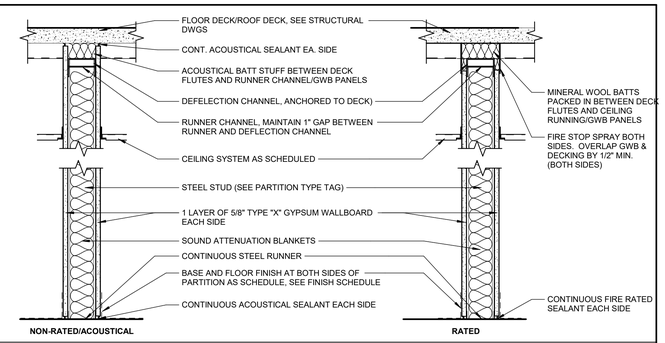
1. THE "a" ON PARTITION TAG INDICATES QUIETROCK 530 5/8" GYPSUM BOARD TO BE USED IN LIEU OF STANDARD GYPSUM BOARD.

PARTITON TYPE NOTES

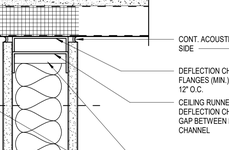
PARTITION TAG	FINISHED WIDTH	STUD SIZE	STC RATING	UL
G1 3 NR	4 1/4"	3 5/8"	45	N/A
G1 3 NRa	4 1/4"	3 5/8"	49	N/A

PARTITION SCHEDULE

M1



SECTION DETAIL



PLAN DETAIL

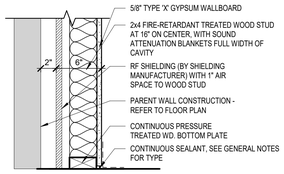
1. UL DESIGN NUMBER IS IN REFERENCE TO WALLS NOTED TO BE RATED AS INDICATED AT FLOOR PLANS AND LIFE SAFETY PLANS. REFER TO UL DETAILS ON THIS SHEET FOR MORE INFO.
2. REFER TO DETAILS THIS SHEET FOR MORE INFO ON RATED PARTITION HEAD OF PARTITION DETAIL.
3. SPECIAL CONDITIONS - THE "a" ON PARTITION TAG INDICATES QUIETROCK 530 5/8" GYPSUM BOARD TYPE 'X' TO BE USED IN LIEU OF STANDARD GYPSUM BOARD.

PARTITON TYPE NOTES

PARTITION TAG	FINISHED WIDTH	STUD SIZE	STC RATING	UL
M1 3 NR	4 7/8"	3 5/8"	49	N/A
M1 3 1P	4 7/8"	3 5/8"	49	U419
M1 3 1Pa	4 7/8"	3 5/8"	53	U419

PARTITION SCHEDULE

Z1



SECTION DETAIL

PLAN DETAIL

1. TYPICAL HEAD CONDITION 20/A0.04 AT NON-RATED WALL UNO.
2. USE ACOUSTIC SEALANT / CAULK AT NON-RATED PARTITIONS.

PARTITON TYPE NOTES

PARTITION TAG	FINISHED WIDTH	STUD SIZE	STC RATING	UL
Z1 3 NR	6"	3 1/2"	-	-

PARTITION SCHEDULE

HEAD - TOP OF TYPICAL FIRE RATED WALL

SCALE: 3" = 1'-0"

SSOE

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

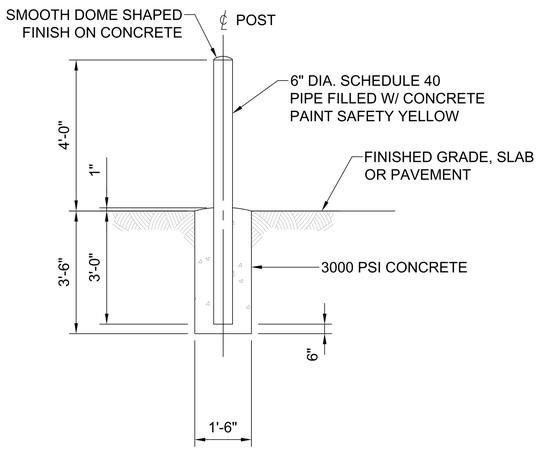
259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-8222

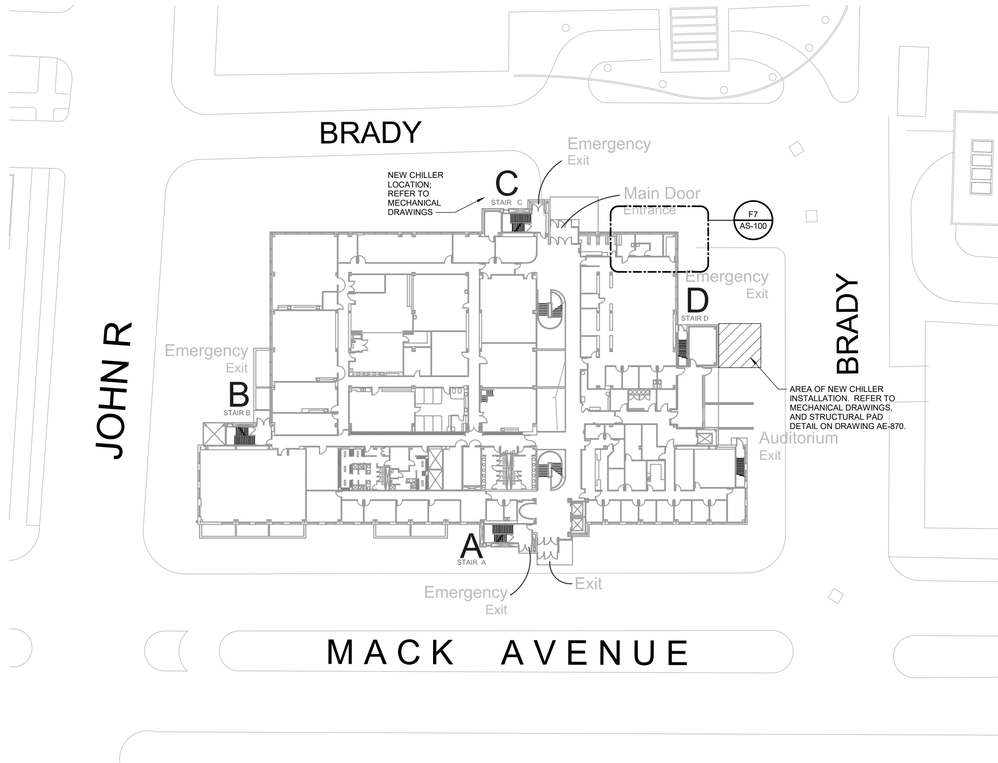
WALL / PARTITION TYPES

AE-051



A3 / AS-100 BOLLARD DETAIL

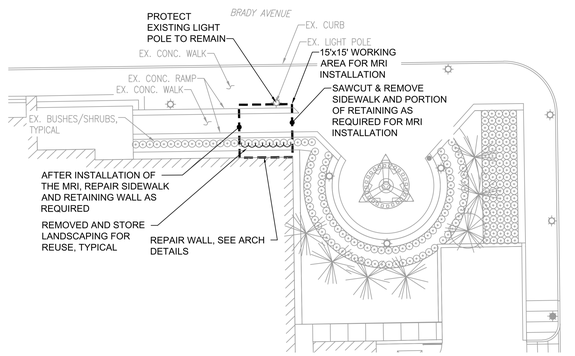
SCALE: 1 1/2" = 1'-0"



A7 / AS-100 ARCHITECTURAL SITE PLAN

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

NOTE:
1. CONTRACTOR SHALL MAINTAIN TRAFFIC AT ALL TIME DURING CONSTRUCTION
2. ANY DAMAGE CAUSE BY CONTRACTORS CONSTRUCTION SHALL BE REPAIRED AS DIRECTED BY ARCHITECT/ENGINEER PRIOR TO ACCEPTANCE



F7 / AS-100 ENLARGED PARTIAL SITE PLAN

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

ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

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48202

CLIENT PROJECT #:	PROJECT NUMBER
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DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

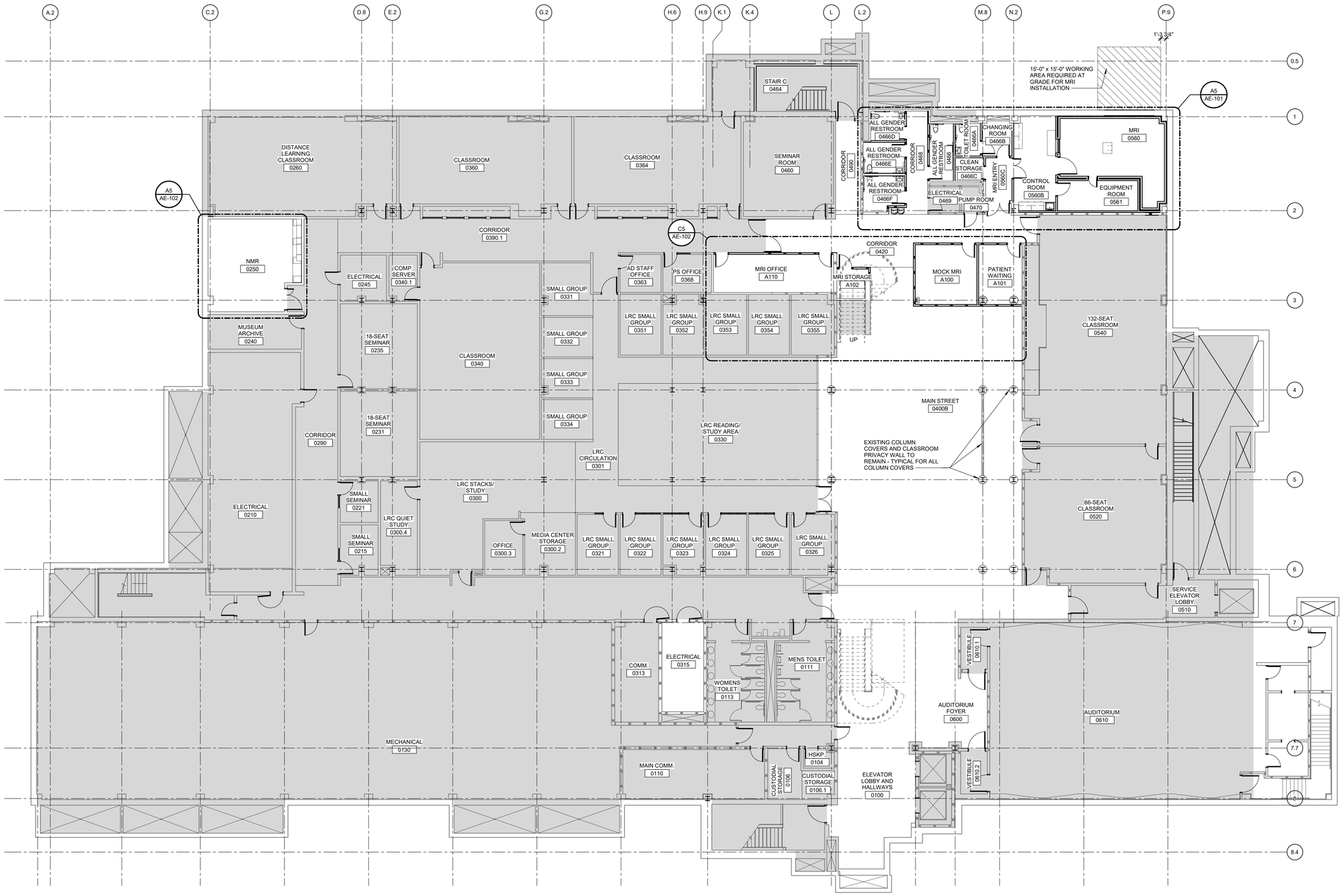
ssoe
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

ARCHITECTURAL SITE PLAN

AS-100

GENERAL FLOOR PLAN LEGEND

NOT IN SCOPE



A7 / AE-100 OVERALL LEVEL 0 FLOOR PLAN

SCALE: 1" = 10'-0"

N TRUE N

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
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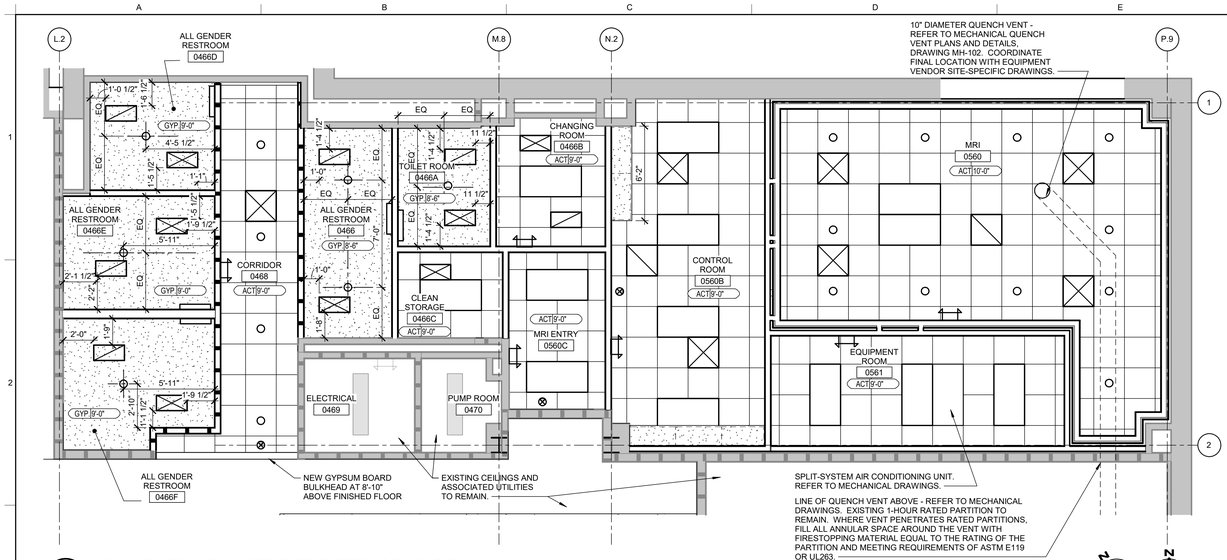
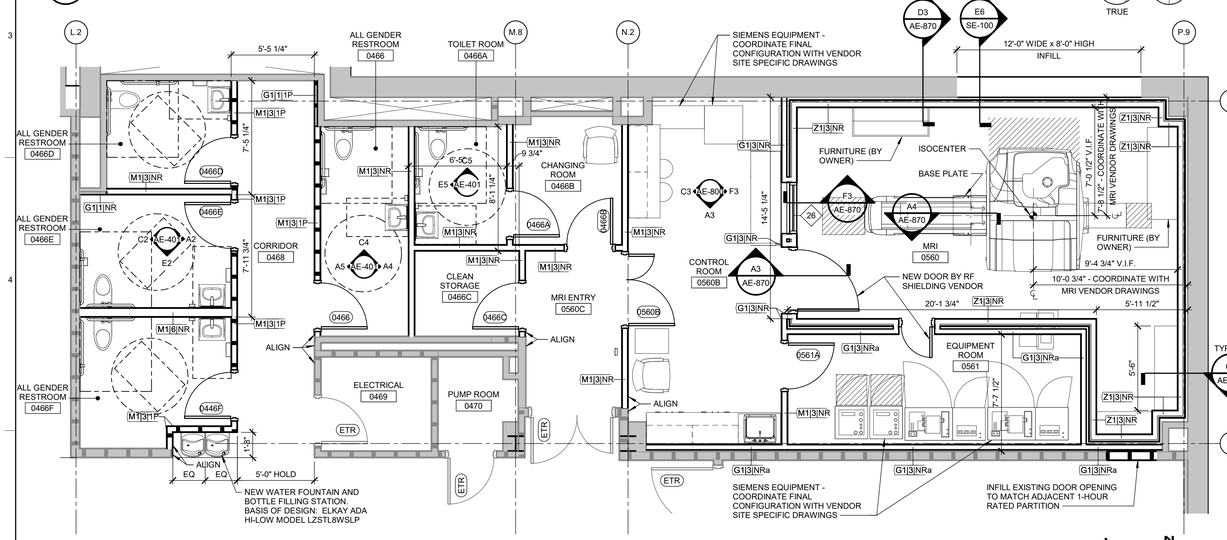
OVERALL LEVEL 0 FLOOR PLAN

AE-100



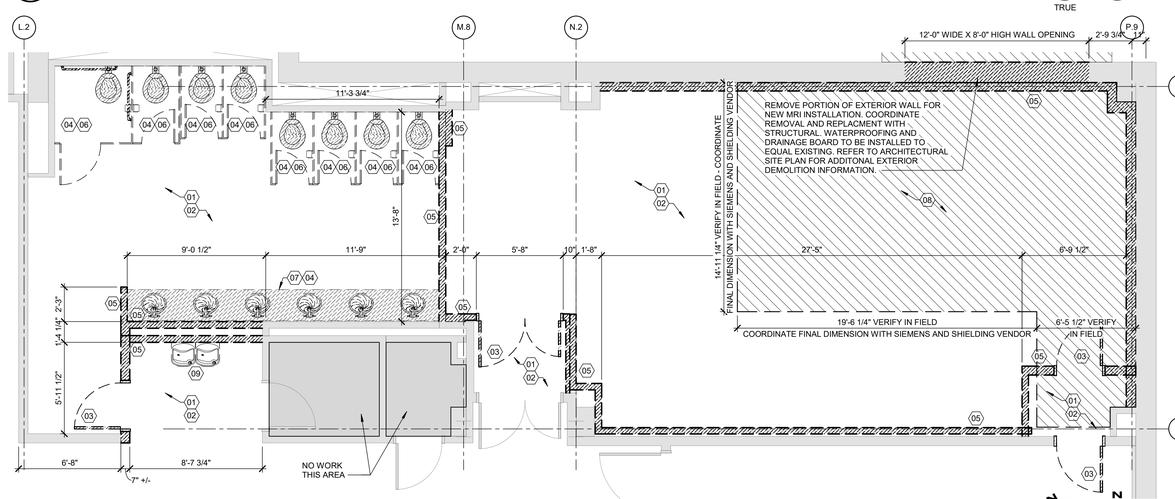
A7 / AE-101 — ENLARGED MRI SUITE REFLECTED CEILING PLAN

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



A5 / AE-101 — ENLARGED MRI SUITE NEW WORK PLAN

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



A3 / AE-101 — ENLARGED NMR SUITE DEMOLITION PLAN

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

GENERAL DEMOLITION NOTES

A. FIELD VERIFY EXISTING CONDITIONS, PRIOR TO THE START OF DEMOLITION OPERATIONS. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES WITHIN THE CONSTRUCTION DOCUMENTS OR ANY FIELD CONDITIONS WHICH DIFFER FROM THOSE DESCRIBED WITHIN THE DOCUMENTS.
B. ALL REQUIRED DEMOLITION IS INCLUDED IN THE GENERAL CONTRACT. DEMOLITION CONSISTS OF THE REMOVAL OF ANY EXISTING ELEMENT WHICH INTERFERES WITH THE COMPLETION OF NEW CONSTRUCTION OR TEMPORARY EGRESS MEASURES.
C. DEBRIS RESULTING FROM DEMOLITION SHALL BE REMOVED FROM THE CONSTRUCTION SITE ON A DAILY BASIS AND DISPOSED OF LEGALLY OFF-SITE.
D. ALL SURFACES DISTURBED BY DEMOLITION, CUTTING OR PATCHING SHALL BE LEFT WITH A "CLEAN CUT" TO FACILITATE THE MATCHING OF EXISTING SURFACES WITH ADJACENT NEW CONSTRUCTION.
E. PROTECT EXISTING CONSTRUCTION TO REMAIN FROM DAMAGE DURING DEMOLITION AND/OR NEW CONSTRUCTION OPERATIONS. CONDUCT DEMOLITION OPERATIONS SO AS TO MINIMIZE THE DEVELOPMENT AND SPREAD OF DUST.
F. ANY DAMAGE TO EXISTING CONDITIONS CAUSED BY DEMOLITION AND/OR NEW WORK SHALL BE REPAIRED AS DETAILED, BY THE CONTRACTOR RESPONSIBLE FOR THE DAMAGE.
G. THE CONTRACTOR SHALL INSTALL TEMPORARY BARRIERS AS REQUIRED TO PREVENT THE SPREAD OF DUST AND FUMES TO AREAS NOT INCLUDED IN THE WORK. PROVIDE TEMPORARY FILTERS AS REQUIRED TO PREVENT THE SPREAD OF DUST THROUGH THE BUILDING VIA THE RETURN AIR SYSTEM. UPON COMPLETION OF DEMOLITION OPERATIONS, REMOVE BARRIERS AND REPAIR DAMAGE CAUSED BY THEIR INSTALLATION OR PRESENCE TO "LIKE NEW" CONDITION.
H. THE CONTRACTOR SHALL MAINTAIN EMERGENCY EGRESS OF OCCUPANTS OF ADJACENT BUILDINGS AND TENANTS AT ALL TIMES.
I. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER AND OBTAIN APPROVALS FOR ANY ACTIVITIES WHICH INVOLVE ANY UTILITY INTERRUPTIONS OR EXCESSIVE NOISE. PARTICULARLY WHEN CONDUCTED DURING REGULAR OPERATING HOURS.
J. THE CONTRACTOR SHALL PROTECT ADJACENT EXISTING ROOF SURFACES FROM DAMAGE BY DEMOLITION AND CONSTRUCTION ACTIVITIES, ANY REPAIR ANY DAMAGE THAT OCCURS.
K. DO NOT STORE ANY MATERIALS ON ADJACENT ROOFS, AND LIMIT FOOT TRAFFIC TO THE EXTENT POSSIBLE.
L. DIMENSIONS SHOWN ON EXISTING PLANS ARE SHOWN AS A REFERENCE AND SHALL BE CONSIDERED +/- IF EXACT DIMENSIONS ARE REQUIRED, FIELD MEASUREMENTS SHALL BE TAKEN BY THE CONTRACTOR.
M. ANY DUCT WORK SHOWN PASSING THROUGH A NEW OR EXISTING WALL CARRYING A FIRE RATING SHALL BE EQUIPPED WITH APPROPRIATE FIRE RATED DAMPERS AT THE POINT OF INTERSECTION WITH THE WALL.
N. ANY NEW OR EXISTING PIPING CONDUIT OR WIRING PASSING THROUGH A NEW OR EXISTING WALL CARRYING A FIRE RATING SHALL BE SEALED TIGHT EQUAL TO OR EXCEEDING THE WALL RATING WITH A UL APPROVED METHOD.
O. WHERE NEW DOORS ARE SHOWN TO BE INSTALLED IN EXISTING MASONRY WALLS, NEW MASONRY SHALL BE INSTALLED AT EXISTING HEAD AND JAMBS AS REQUIRED FOR NEW DOOR INSTALLATION.
P. ALL PEELING PAINT SHALL BE SCRAPED FROM EXISTING WALLS AND WALLS SHALL BE CLEANED PRIOR TO REPAINTING.
Q. WHEN EXISTING PAINTED SURFACES ARE PATCHED IN VISIBLE AREAS, THE ENTIRE SURFACE OR WALL SHALL BE PAINTED TO ACHIEVE A UNIFORM APPEARANCE.
R. ALL HOLES IN MASONRY WALLS, EXISTING OR MADE BY THE REMOVAL OF ANY FIXTURES OR EQUIPMENT, SHALL BE PATCHED WITH MASONRY TO MATCH EXISTING. INSTALL NEW MASONRY FLUSH WITH EXISTING ON BOTH SIDES.
S. REMOVE ALL WALL BRACKETS, PLASTIC SHIELDS, HOOKS, CLIPS, NAILS, TAPE AND SCREWS ON EXISTING WALLS IN PREPAND FOR SMOOTH CLEAN SURFACE (TYPICAL AT SPACES WHERE NEW FINISH IS SCHEDULED).
T. ALL DEMOLITION SHALL BE PERFORMED TO PREVENT THE ARBITRARY DESTRUCTION OR INTERRUPTION OF CONCEALED UTILITIES WHICH ARE INTENDED TO REMAIN IN USE AND THE ROUTING OF WHICH CAN NOT BE PRE-DETERMINED UNTIL DEMOLITION IS STARTED. ALL SUCH DISCOVERIES OF UTILITIES WHICH ARE IN A DIFFERENT LOCATION FROM THAT INDICATED, CHANGE DIRECTION FROM FLOOR-TO-FLOOR, ETC. OR ARE UNIDENTIFIED SHALL BE REPORTED TO THE ARCHITECT BEFORE REMOVAL OR DISTURBANCE.
U. REMOVE ALL WALL MOUNTED ACCESSORIES IN AREAS OF DEMOLITION AND RENOVATION. PATCH/REPAIR WALLS TO MAKE SMOOTH AND PREPARE FOR NEW WALL FINISH. REINSTALL ANY REUSED/RELOCATED WALL ACCESSORIES PER MANUFACTURER'S INSTRUCTIONS.
V. SEE CIVIL, STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR MORE INFORMATION ON DEMOLITION AND CONSTRUCTION TO REMAIN.
W. AT AREAS WHERE NEW SYSTEMS ARE INSTALLED ABOVE EXISTING ACOUSTICAL LAY-IN CEILINGS, REMOVE THE CEILING TILES AND STORE IN A LOCATION AS DIRECTED BY THE OWNER. REINSTALL THE TILE UPON COMPLETION OF THE SYSTEMS WORK. PROTECT TILES FROM DAMAGE, DIRT OR STAINING. REPLACE ANY TILE WHICH DOES GET DAMAGED, DIRTY OR STAINED WITH NEW TILES MATCHING THE TYPE OF THE ADJACENT EXISTING TILES.
X. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. WHERE GENERAL DEMOLITION NOTES DO NOT AGREE WITH SPECIFICATIONS, REFER DISCREPANCY TO ARCHITECT FOR RESOLUTION.
Y. EXISTING ELEVATIONS AND LOCATIONS TO BE JOINED SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION. SHOULD THEY DIFFER FROM THOSE SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT SO THAT MODIFICATIONS CAN BE MADE BEFORE PROCEEDING WITH THE WORK.
Z. AT UNEVEN AREAS AND DEPRESSIONS IN EXISTING CONCRETE FLOOR CONSTRUCTION, PROVIDE CEMENTITIOUS UNDERLAYMENT AS REQUIRED TO PROVIDE SUITABLE BASE CONDITION FOR NEW FINISH(ES) AND NEW CONSTRUCTION.
AA. SAW/CUT SLABS ON GRADE WHERE REQUIRED TO INSTALL NEW CONDUIT, PIPING, ETC. REFER ALSO TO MECHANICAL AND ELECTRICAL DRAWINGS. PATCH AND REPAIR SLABS TO MATCH EXISTING.
BB. CORE EXISTING FLOOR SLAB CONSTRUCTION WHERE REQUIRED FOR INSTALLATION OF REQUIRED CONDUIT, PIPING, ETC. REFER ALSO TO MECHANICAL AND ELECTRICAL DRAWINGS. PROVIDE UL RATED FIRE SAFING ASSEMBLIES AT ALL SUCH CONDITIONS.
CC. REFER TO PHASING NARRATIVE FOR ADDITIONAL GENERAL INFORMATION ON THE SEQUENCE OF DEMOLITION WORK TO BE COMPLETED.
DD. EXISTING CONSTRUCTION MAY CONTAIN ASBESTOS CONTAMINATED PRODUCTS. MATERIALS THOUGHT TO CONTAIN ASBESTOS MUST BE INSPECTED BY AN EPA CERTIFIED INSPECTOR CAPABLE OF SAMPLING FOR THE EXISTENCE OF ASBESTOS. WORK SHALL BE DONE IN ACCORDANCE WITH THE MOST CURRENT OSHA REGULATIONS AND DISPOSED OF IN ACCORDANCE WITH CURRENT EPA REGULATIONS.
EE. EXISTING CONSTRUCTION MAY CONTAIN LEAD CONTAMINATED PRODUCTS. MATERIALS THOUGHT TO CONTAIN LEAD MUST BE INSPECTED BY AN EPA CERTIFIED INSPECTOR CAPABLE OF SAMPLING FOR THE EXISTENCE OF LEAD. WORK SHALL BE DONE IN ACCORDANCE WITH THE MOST CURRENT OSHA/EPA REGULATIONS AND DISPOSED OF IN ACCORDANCE WITH CURRENT EPA REGULATIONS.
FF. CONDUCT DEMOLITION OPERATIONS TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDING AREAS. ENSURE SAFE PASSAGE OF PEOPLE AROUND SELECTIVE DEMOLITION AREA.
A. PROTECT WALLS, CEILINGS, FLOORS AND OTHER FINISH WORK THAT ARE TO REMAIN AND ARE EXPOSED DURING SELECTIVE DEMOLITION OPERATIONS.
B. COVER AND PROTECT FURNISHINGS AND EQUIPMENT THAT HAVE NOT BEEN REMOVED.
C. DO NOT BLOCK ANY EXITS DURING CONSTRUCTION OPERATIONS.

DEMOLITION PLAN KEYNOTES

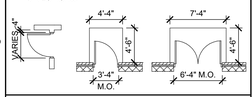
01 REMOVE CEILING SYSTEM. COORDINATE MECHANICAL AND ELECTRICAL. REFER TO CEILING PLAN AND ROOM FINISH SCHEDULE.
02 REMOVE FLOORING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL. REFER TO ROOM FINISH SCHEDULE.
03 EXISTING DOOR, FRAME, AND HARDWARE TO BE REMOVED. SALVAGE CARD READER FOR REINSTALLATION IN NEW WORK.
04 REMOVE EXISTING PLUMBING FIXTURES AND ACCESSORIES. CUT & CAP PLUMBING LINES. REFER TO PLUMBING DRAWINGS FOR EXTENT OF DEMOLITION.
05 REMOVE PORTION OF WALL INCLUDING ALL WALL-MOUNTED ACCESSORIES AND UTILITIES CONCEALED WITHIN THE WALL CAVITY.
06 REMOVE EXISTING TOILET ROOM PARTITIONS.
07 REMOVE EXISTING MILLWORK, INCLUDING ASSOCIATED PLUMBING FIXTURES WHERE APPLICABLE. CUT AND CAP PLUMBING LINES. REFER TO PLUMBING DRAWINGS FOR EXTENT OF DEMOLITION.
08 REMOVE PORTION OF EXISTING SLAB. CUT AND CAP EXISTING UTILITIES AS NEEDED FOR NEW SLAB INFILL. REFER TO STRUCTURAL DRAWINGS FOR EXTENT OF DEMOLITION AND INFILL.
09 REMOVE EXISTING DRINKING FOUNTAIN.
10 REMOVE AND SALVAGE EXISTING LOCKERS.

DEMOLITION LEGEND

- B01 — KEYNOTE - SEE KEYNOTE LEGEND
- AREA OF "NO WORK"
- AREA OF DEMOLITION AS DESCRIBED
- CONSTRUCTION TO BE DEMOLISHED (N.A.) [SEE KEYNOTES FOR MORE DETAIL]
- EXISTING EXTERIOR CONSTRUCTION (PLAN)
- EXISTING INTERIOR NON-RATED CONSTRUCTION
- EXISTING INTERIOR 1 HOUR CONSTRUCTION

GENERAL FLOOR PLAN NOTES

1. THESE DRAWINGS SHOULD BE USED TO DETERMINE THE DESIGN INTENT. THE CONTRACTOR SHALL FIELD VERIFY ALL WORK AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES IN THE DOCUMENTS BEFORE PROCEEDING. FAILURE TO DO SO WILL RESULT IN THE CONTRACTOR TAKING FULL RESPONSIBILITY AND LIABILITY FOR SAID DISCREPANCIES.
2. ALL WALLS SHALL EXTEND TO UNDERSIDE OF FLOOR/ROOF DECK ABOVE UNLESS NOTED OTHERWISE. (WALLS SHALL EXTEND TO BOTTOM OF TRUSS AT LIGHT GAUGE METAL TRUSSES).
3. ALLOW FOR 1/2" DEFLECTION WHERE WALL MEETS STRUCTURE ABOVE. PROVIDE COMPRESSIBLE FILLER BETWEEN TOP OF WALL AND STRUCTURE AT STANDARD WALL CONSTRUCTION AND FIRESAFING AT RATED WALL CONSTRUCTION.
4. FILL FLUTES OF DECK WITH ACOUSTICAL INSULATION AT STANDARD WALL CONSTRUCTION AND FIRE SAFING AT RATED WALL CONSTRUCTION.
5. BRACE INTERIOR PARTITIONS PER ANSI CRITERIA.
6. COORDINATE OPENINGS IN WALLS w/ OTHER TRADES AND SEAL.
7. SEAL ALL PENETRATIONS THROUGH WALL TYP.
8. FEC - FIRE EXTINGUISHER CABINET & EXTINGUISHER.
9. ALL DOORS AND EXTERIOR DOORS/STOOPS ARE DIMENSIONED AS SHOWN BELOW UNLESS NOTED OR DIMENSIONED OTHERWISE.
10. ALL EXTERIOR DIMENSIONS ARE TO FACE OF BRICK OR METAL PANEL UNLESS OTHERWISE NOTED.
11. ANY EXISTING FLOORS TO RECEIVE RESILIENT OR VINYL FLOORING SHALL BE GROUND OR LEVELED TO ACHIEVE FLATNESS THAT IS REQUIRED BY MANUFACTURER TO MAINTAIN WARRANTY.
12. ALL EXPOSED STRUCTURAL STEEL TO HAVE 2 HOUR SPRAY-ON FIRE PROOFING UNLESS NOTED OTHERWISE.
13. PROVIDE BULLNOSE CORNER BLOCKS AT ALL EXPOSED OUTSIDE CORNERS OF CMU WALLS AND PARTITIONS UNLESS NOTED OTHERWISE - TYPICAL.
14. PROVIDE DRYWALL CONTROL JOINTS AT LOCATIONS INDICATED ON DRAWINGS OR AT A MAXIMUM SPACING OF 30'-0" IN ANY DIRECTION AND AT ALL JAMB STUDS AT ALL OPENINGS. - TYPICAL. INSTALL IN ACCORDANCE WITH ASTM C-840. INSTALL CONTROL JOINTS ALIGNED WITH DOOR JAMBS AND/OR EDGE OF SOFFITS WHEREVER POSSIBLE. ALL GWB CONTROL JOINT LOCATIONS FOR WALLS AND SOFFITS SHALL BE MARKED UP ON SHOP DRAWINGS AND SUBMITTED TO THE ARCHITECT PRIOR TO INSTALLATION.
15. WHERE ADJACENT WALLS HAVE DISSIMILAR NUMBER OF LAYERS OF GWB, INSTALL FINAL LAYERS OF GWB FLUSH.
16. CONTRACTOR TO PROVIDE ALL BLOCKING IN WALLS FOR ALL BUILT-IN CABINETS, COUNTERTOP SUPPORTS, GRAB BARS, ETC
17. IN LOCATIONS WHERE DOORS ARE IN WALL ASSEMBLIES, HAVE FURRED OUT DRYWALL WRAP BACK TO DOOR FRAME
18. PROVIDE ALL FIRE BLOCKING AS REQUIRED PER OBC.
19. ACCESS DOORS SHALL BE INSTALLED IN WALLS AT ALL EQUIPMENT, VALVE OR OTHER LOCATIONS REQUIRING ACCESS FOR MAINTENANCE WHICH ARE LOCATED BEHIND FINISHED SURFACES. SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS AND DIRECTIONS.



EQUIPMENT ABBREVIATIONS

FEC - FIRE EXTINGUISHER CABINET & EXTINGUISHER
FF - SURFACE MTD FIRE EXTINGUISHER
PTD - PAPER TOWEL DISPENSER
UC - UTILITY CABINET
PORT - PORTFOLIO STORAGE CABINET
PB - PAPER STORAGE CABINET

GENERAL NOTES

1. DIMENSIONS ARE TO FINISH FACE OF WALL OR CASEWORK UNLESS NOTED OTHERWISE (UNO).
2. FIELD VERIFY PROJECT CONDITIONS PRIOR TO THE START OF, AND AS NEEDED DURING THE COURSE OF CONSTRUCTION, INCLUDING EXISTING SITEWORK CONDITIONS WITH ALL CIVIL DOCUMENTS, IF APPLICABLE. IF DISCREPANCIES OR INCONSISTENCIES IN THE DOCUMENTS ARE DISCOVERED, NOTIFY THE ARCHITECT IMMEDIATELY USING THE DESIGNATED "REQUEST FOR INFORMATION" PROCEDURE. INDICATION(S) FOR RATED WALL CONSTRUCTION AS SHOWN ON REFLECTED CEILING PLAN(S) TAKE PRECEDENCE OVER WALL CONSTRUCTION TYPES NOTED ON FLOOR PLAN DRAWINGS, IN CASE OF CONFLICT BETWEEN THE TWO.
3. KEEP MEANS OF EGRESS OPEN, PROPERLY ILLUMINATED, AND FREE OF OBSTRUCTIONS IN ALL AREAS IMPACTED BY PROJECT CONSTRUCTION.
4. WHERE NEW CONSTRUCTION ABUTS EXISTING CONSTRUCTION DIRECTLY, ALIGN NEW FINISH SURFACES(S) WITH EXISTING.
5. KEEP CONSTRUCTION NOISE TO A MINIMUM, PARTICULARLY DURING DAYTIME OPERATIONAL HOURS.
6. SMOKING AND SMOKELESS USE OF TOBACCO PRODUCTS ARE PROHIBITED ON PROJECT SITE.
7. PATCH AND REPAIR DENTS, CRACKS, HOLES, AND/OR OTHER UNEVEN SURFACE IMPERFECTIONS WHERE EXISTING CONSTRUCTION IS TO REMAIN AND/OR WHERE NEW FINISHES ARE TO BE INSTALLED.
8. VERIFY THE DIMENSIONS, LOCATIONS, ELEVATION AND ARRANGEMENT OF INFRASTRUCTURE ASSOCIATED WITH INSTALL OF EQUIPMENT AND RELATED MECHANICAL AND ELECTRICAL WORK.
9. WHERE DEMOLISHED OPENINGS ARE INFILLED PROVIDE WALL CONSTRUCTION SIMILAR TO ADJACENT PARTITION TYPE. ADJUST ASSEMBLY TO MATCH EXISTING WALL THICKNESS.
10. COORDINATE SCHEDULE OF OVERALL CONSTRUCTION AND DAY-TO-DAY CONSTRUCTION OPERATIONS WITH OWNER'S SCHEDULE REQUIREMENTS.
11. FLOOR PLAN DRAWINGS ARE COMPOSITES OF EXISTING CONSTRUCTION TO REMAIN AND NEW CONSTRUCTION. EXISTING CONSTRUCTION IS SHOWN IN LIGHTER, OUTLINE FORM. NEW CONSTRUCTION IS INDICATED WITH HEAVIER LINEWORK, AND ADDITIONALLY MAY BE IDENTIFIED BY SHADING, NOTE, KEYNOTE, LARGER SCALE DETAIL REFERENCE, OR MATERIAL PATTERN (REFER ALSO TO LEGEND).
12. THESE DRAWINGS ARE COMPLEMENTARY AND INTERRELATED. WORK OF ANY INDIVIDUAL TRADE IS NOT NECESSARILY CONFINED TO SPECIFIC DOCUMENTS, CHAPTERS OR LOCATIONS.
13. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
14. APPROVED PLANS SHALL NOT BE USED BY WORKMEN. ALL CONSTRUCTION SETS SHALL REFLECT THE SAME INFORMATION. THE CONTRACTOR SHALL ALSO MAINTAIN, IN GOOD CONDITION, ONE COMPLETE SET OF DRAWINGS WITH ALL REVISIONS, ADDENDA AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES. THERE ARE TO BE UNDER THE CARE OF THE JOB SUPERINTENDENT.
15. DO NOT SCALE THE DRAWINGS; USE DIMENSIONS ONLY.
16. IT IS THE INTENT OF THE CONTRACT DOCUMENT TO COMPLY WITH ALL GOVERNING CODES AND REGULATIONS IN EFFECT AT THE TIME THE PERMIT IS ISSUED. NOTIFY ARCHITECT IMMEDIATELY UPON DISCOVERY OF SUSPECTED DEVIATION.
17. ALL UL AND ASTM STANDARDS NOTED ON THESE DRAWINGS SHALL BE OF THE LATEST REVISION UNLESS NOTED OTHERWISE.
18. EQUIVALENT MATERIALS SUBSTITUTED AS PER "APPROVED EQUAL" NOTE SHALL BE APPROVED BY THE ARCHITECT/ENGINEER OF RECORD BEFORE ACCEPTANCE OF BID BY GENERAL CONTRACTOR. ANY MATERIAL DESIGNATED WITH A BRAND NAME MAY BE SUBSTITUTED WITH ITS EQUAL IF THE SO CALLED EQUIVALENT IS FIRST APPROVED BY THE ARCHITECT/ENGINEER . THE CONTRACTOR SHALL SUPPLY INFORMATION AS REQUESTED TO VERIFY MATERIAL IS EQUAL TO SPECIFIED MATERIAL. SEE SPECIFICATIONS FOR APPROPRIATE PROTOCOLS FOR REVIEW OF SUBSTITUTION REQUESTS.
19. THE DESIGN OF PRE-ENGINEERED SYSTEMS SPECIFIED IN THE CONTRACT DOCUMENTS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, SUPPLIER AND ITS DESIGN ENGINEER LICENSED IN THE PROJECT STATE. SUBMITTAL OF SUCH SYSTEMS TO THE ARCHITECT/ENGINEER OF RECORD SHALL BE REVIEWED FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS WITH REGARD TO THE ARRANGEMENT AND OR SIZES OF MEMBERS SHOWN ON THE CONTRACT DOCUMENTS, AND THE SUPPLIERS INTERPRETATION OF THE DESIGN INFORMATION INCLUDED IN THE CONTRACT DOCUMENTS. SUCH REVIEW BY THE ARCHITECT/ENGINEER OF RECORD SHALL NOT IMPLY ANY RESPONSIBILITY FOR THE ACTUAL DESIGN OF SUCH SYSTEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DIMENSIONAL ACCURACY AND CONFORMANCE WITH THE INFORMATION CONTAINED WITHIN THE CONTRACT DOCUMENTS. SEE SPECIFIC SECTIONS OF GENERAL NOTES ABOVE AND THE SPECIFICATIONS FOR APPROPRIATE DESIGN RESPONSIBILITIES OF THE SUPPLIER AND IT'S LICENSED ENGINEER.
20. FIRE ALARM AND SPRINKLER SYSTEMS SHALL BE SUBMITTED AND APPROVED BY THE FIRE MARSHAL'S OFFICE HAVING JURISDICTION PRIOR TO INSTALLATION. FIRE ALARM CONTRACTOR SHALL OBTAIN A FIRE ALARM SYSTEM PERMIT PRIOR TO INSTALLATION. ANY FIRE ALARM PLANS INCLUDED IN THIS SET OF PLANS ARE FOR REFERENCE ONLY, NOT FOR PERMIT. FIRE SPRINKLER CONTRACTOR SHALL OBTAIN A FIRE SPRINKLER PERMIT PRIOR TO INSTALLATION. ANY FIRE SPRINKLER PLANS INCLUDED IN THIS SET OF PLANS ARE FOR REFERENCE ONLY, NOT FOR PERMIT.
21. MECHANICAL, PLUMBING AND ELECTRICAL SUBCONTRACTORS SHALL SUBMIT AFFIDAVITS FOR EACH BUILDING PERMIT TO THE BUILDING PERMITS SECTION BEFORE REQUESTING INSPECTIONS. OBTAIN AFFIDAVITS FROM THE BUILDING PERMITS SECTION.
22. IT IS THE INTENT OF THESE DOCUMENTS THAT ALL ITEMS, EQUIPMENT, HARDWARE, CLEARANCES, MOUNTING HEIGHTS, SIGNAGE, SYSTEMS, ETC BE IN COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT. THE GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL REPORT TO THE ARCHITECT ANY DISCREPANCIES NOTED BETWEEN THE REQUIREMENTS OF THE ACT AND THE DOCUMENTS AND WAIT FOR DIRECTIONS ON THE RESOLUTION OF THE DISCREPANCIES.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE SECURITY OF THE PROJECT SITE, WHILE CONSTRUCTION IS IN PROGRESS AND UNTIL JOB IS COMPLETE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THE SAFETY OF THE OCCUPANTS AND WORKERS AT ALL TIMES.

NEW WORK PLAN NOTES

1. INSTALL NEW CEILING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL. REFER TO REFLECTED CEILING PLAN AND ROOM FINISH SCHEDULE.
2. INSTALL NEW FLOOR FINISHES PER SHEET AE-700 AND MATERIAL FINISH AND ROOM FINISH SCHEDULES.
3. INSTALL NEW DOOR AND FRAME AS SHOWN PER PLANS. REFER TO DOOR SCHEDULE.
4. INFILL EXISTING SLAB DEPRESSION. COORDINATE WITH STRUCTURAL.
5. INFILL EXTERIOR WALL OPENING PER STRUCTURAL DRAWINGS.

DRAWING CONVENTIONS LEGEND

- EXISTING CONSTRUCTION
- NEW EXTERIOR CONSTRUCTION
- NEW NON RATED CONSTRUCTION
- NEW 1-HOUR RATED CONSTRUCTION
- CENTERLINE
- BUILDING ELEMENTS ABOVE
- 23.4 — COLUMN GRID REFERENCE
- ALIGN — ALIGNMENT REFERENCE
- Masonry Opening — OPENING REFERENCE

TOILET ROOM NOTES

1. REFER TO DRAWING AE-400 FOR TYPICAL TOILET ELEVATIONS, MOUNTING HEIGHTS, ETC.
2. PROVIDE WOOD BLOCKING IN GYPSUM BOARD PARTITIONS AT WALL MOUNTED EQUIPMENT - TYPICAL.
3. REFER TO COVER SHEET FOR LIST OF OWNER FURNISHED/OWNER INSTALLED ITEMS.

REFLECTED CEILING PLAN LEGEND

SYMBOL	DESCRIPTION
GWB[12'-4"]	CEILING TYPE / CEILING HEIGHT
	DOWNLIGHT - REFER TO ELECTRICAL DRAWINGS
	LIGHTING FIXTURE - REFER TO ELECTRICAL DRAWINGS
	EXIT LIGHT - REFER ELECTRICAL DRAWINGS
	EMERGENCY LIGHT - REFER TO ELECTRICAL DRAWINGS
(F)	FIRE ALARM SMOKE DETECTOR, CEILING MOUNTED - REFER TO TECHNOLOGY DRAWINGS
	2'x2' SUPPLY DIFFUSER - REFER TO MECHANICAL DRAWINGS
	RETURN GRILL - REFER TO MECHANICAL DRAWINGS
	2'x2' SUSPENDED ACOUSTICAL TILE CEILING SYSTEM
	2'x4' SUSPENDED ACOUSTICAL TILE CEILING SYSTEM
	5/8" GYPSUM BOARD CEILING ON 3 5/8" METAL STUDS
CJ	CONTROL JOINT IN GYPSUM BOARD CEILING
	PATCH AND REPAIR PORTION OF CEILING
OS	OCCUPANCY SENSOR - REFER TO ELECTRICAL
VS	VISUAL SENSOR - REFER TO ELECTRICAL

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

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□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

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CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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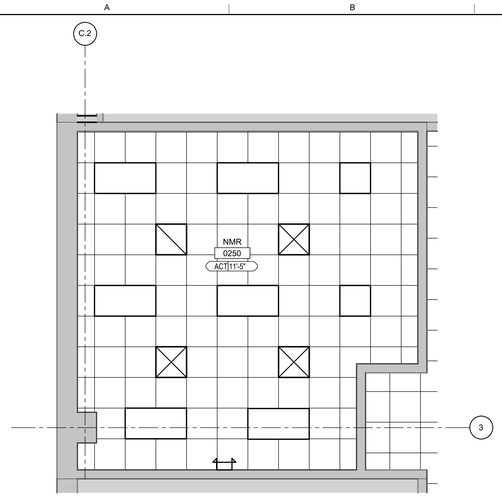
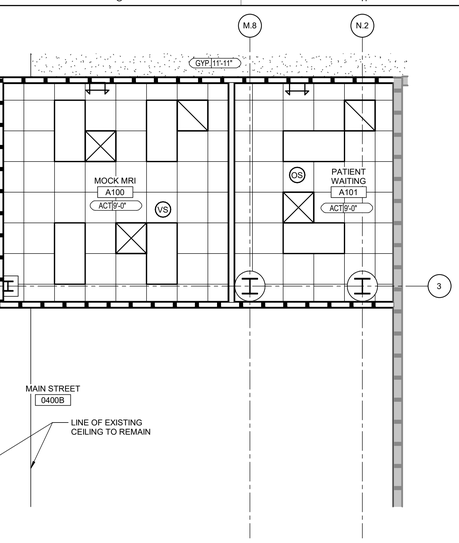
ENLARGED MRI SUITE PLANS

AE-101



A3 SE-100 ENLARGED NMR 0250 REFLECTED CEILING PLAN

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



C3 SE-100 ENLARGED MRI OFFICE A110 REFLECTED CEILING PLAN

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

NOTE:

REFER TO SHEET AE-101 FOR:

GENERAL DEMOLITION NOTES
DEMOLITION LEGEND
GENERAL FLOOR PLAN NOTES
EQUIPMENT ABRIVEATIONS
GENERAL NOTES
NEW WORK PLAN NOTES
DRAWING CONVENTIONS LEGEND
REFLECTED CEILING PLAN LEGEND

DEMOLITION PLAN KEYNOTES

01 REMOVE CEILING SYSTEM. COORDINATE MECHANICAL AND ELECTRICAL. REFER TO CEILING PLAN AND ROOM FINISH SCHEDULE.

02 REMOVE FLOORING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL. REFER TO ROOM FINISH SCHEDULE.

03 EXISTING DOOR, FRAME, AND HARDWARE TO BE REMOVED. SALVAGE CARD READER FOR REINSTALLATION IN NEW WORK.

04 REMOVE EXISTING PLUMBING FIXTURES AND ACCESSORIES. CUT & CAP PLUMBING LINES. REFER TO PLUMBING DRAWINGS FOR EXTENT OF DEMOLITION.

05 REMOVE PORTION OF WALL INCLUDING ALL WALL-MOUNTED ACCESSORIES AND UTILITIES CONCEALED WITHIN THE WALL CAVITY.

06 REMOVE EXISTING TOILET ROOM PARTITIONS.

07 REMOVE EXISTING MILLWORK, INCLUDING ASSOCIATED PLUMBING FIXTURES WHERE APPLICABLE. CUT AND CAP PLUMBING LINES. REFER TO PLUMBING DRAWINGS FOR EXTENT OF DEMOLITION.

08 REMOVE PORTION OF EXISTING SLAB. CUT AND CAP EXISTING UTILITIES AS NEEDED FOR NEW SLAB INFILL. REFER TO STRUCTURAL DRAWINGS FOR EXTENT OF DEMOLITION AND INFILL.

09 REMOVE EXISTING DRINKING FOUNTAIN.

10 REMOVE AND SALVAGE EXISTING LOCKERS. RETURN TO OWNER.

A5 AE-100 ENLARGED NMR 0250 NEW WORK PLAN

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

C5 AE-100 ENLARGED MRI OFFICE A110 NEW WORK PLAN

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

A7 AE-100 ENLARGED NMR 0250 DEMOLITION PLAN

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

C7 AE-100 ENLARGED MRI OFFICE A110 DEMOLITION PLAN

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

H7 AE-102 ENLARGED VENDING DEMOLITION PLAN

SCALE: 1/16" = 1'-0"

ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

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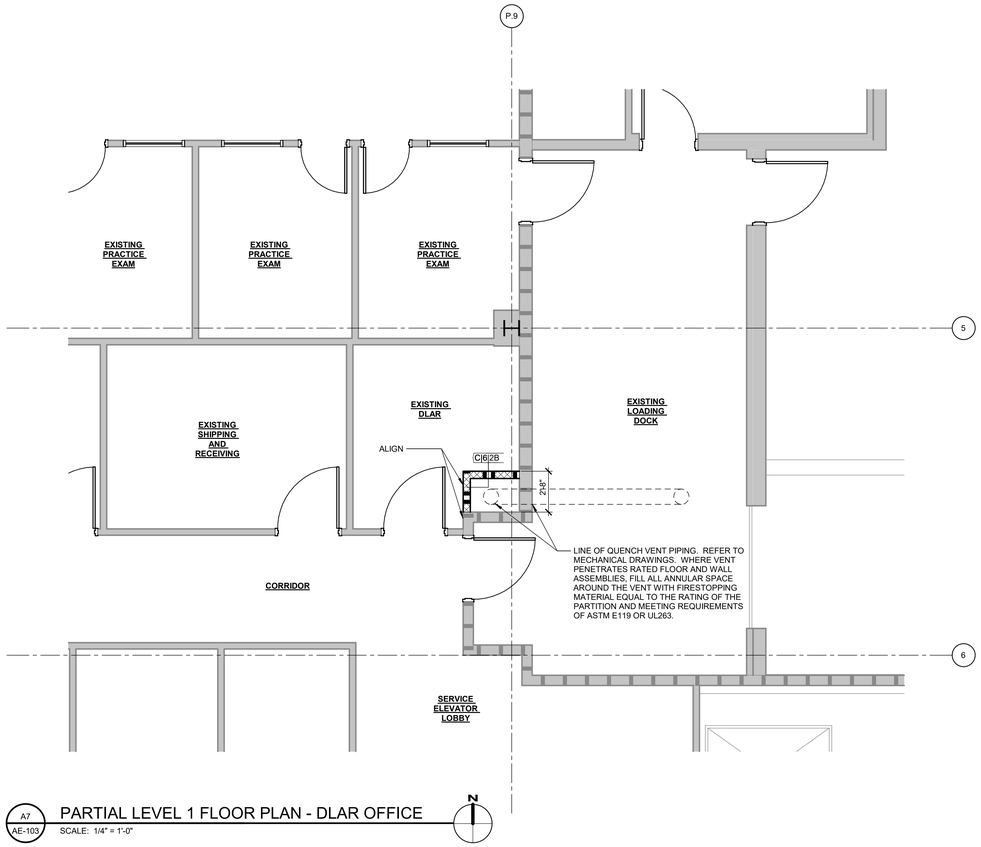
ENLARGED NMR AND MRI OFFICE PLANS

AE-102



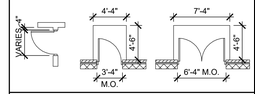
A7
AE-103

PARTIAL LEVEL 1 FLOOR PLAN - DLAR OFFICE

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

GENERAL FLOOR PLAN NOTES

1. THESE DRAWINGS SHOULD BE USED TO DETERMINE THE DESIGN INTENT. THE CONTRACTOR SHALL FIELD VERIFY ALL WORK AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES IN THE DOCUMENTS BEFORE PROCEEDING. FAILURE TO DO SO WILL RESULT IN THE CONTRACTOR TAKING FULL RESPONSIBILITY AND LIABILITY FOR SAID DISCREPANCIES.
2. ALL WALLS SHALL EXTEND TO UNDERSIDE OF FLOOR/ROOF DECK ABOVE UNLESS NOTED OTHERWISE. (WALLS SHALL EXTEND TO BOTTOM OF TRUSS AT LIGHT GAUGE METAL TRUSSES).
3. ALLOW FOR 1/2" DEFLECTION WHERE WALL MEETS STRUCTURE ABOVE. PROVIDE COMPRESSIBLE FILLER BETWEEN TOP OF WALL AND STRUCTURE AT STANDARD WALL CONSTRUCTION AND FIRESAFING AT RATED WALL CONSTRUCTION.
4. FILL FLUTES OF DECK WITH ACOUSTICAL INSULATION AT STANDARD WALL CONSTRUCTION AND FIRE SAFING AT RATED WALL CONSTRUCTION.
5. BRACE INTERIOR PARTITIONS PER ANSI CRITERIA.
6. COORDINATE OPENINGS IN WALLS w/ OTHER TRADES AND SEAL.
7. SEAL ALL PENETRATIONS THROUGH WALL TYP.
8. FEC - FIRE EXTINGUISHER CABINET & EXTINGUISHER.
9. ALL DOORS AND EXTERIOR DOORS/STOOPS ARE DIMENSIONED AS SHOWN BELOW UNLESS NOTED OR DIMENSIONED OTHERWISE.
10. ALL EXTERIOR DIMENSIONS ARE TO FACE OF BRICK OR METAL PANEL UNLESS OTHERWISE NOTED.
11. ANY EXISTING FLOORS TO RECEIVE RESILIENT OR VINYL FLOORING SHALL BE GROUND OR LEVELED TO ACHIEVE FLATNESS THAT IS REQUIRED BY MANUFACTURER TO MAINTAIN WARRANTY.
12. ALL EXPOSED STRUCTURAL STEEL TO HAVE 2 HOUR SPRAY-ON FIRE PROOFING UNLESS NOTED OTHERWISE.
13. PROVIDE BULLNOSE CORNER BLOCKS AT ALL EXPOSED OUTSIDE CORNERS OF CMU WALLS AND PARTITIONS UNLESS NOTED OTHERWISE - TYPICAL.
14. PROVIDE DRYWALL CONTROL JOINTS AT LOCATIONS INDICATED ON DRAWINGS OR AT A MAXIMUM SPACING OF 30'-0" IN ANY DIRECTION AND AT ALL JAMB STUDS AT ALL OPENINGS. - TYPICAL. INSTALL IN ACCORDANCE WITH ASTM C-840. INSTALL CONTROL JOINTS ALIGNED WITH DOOR JAMBS AND/OR EDGE OF SOFFITS WHEREVER POSSIBLE. ALL GWB CONTROL JOINT LOCATIONS FOR WALLS AND SOFFITS SHALL BE MARKED UP ON SHOP DRAWINGS AND SUBMITTED TO THE ARCHITECT PRIOR TO INSTALLATION.
15. WHERE ADJACENT WALLS HAVE DISSIMILAR NUMBER OF LAYERS OF GWB, INSTALL FINAL LAYERS OF GWB FLUSH.
16. CONTRACTOR TO PROVIDE ALL BLOCKING IN WALLS FOR ALL BUILT-IN CABINETS, COUNTERTOP SUPPORTS, GRAB BARS, ETC
17. IN LOCATIONS WHERE DOORS ARE IN WALL ASSEMBLIES, HAVE FURRED OUT DRYWALL WRAP BACK TO DOOR FRAME.
18. PROVIDE ALL FIRE BLOCKING AS REQUIRED PER OBC.
19. ACCESS DOORS SHALL BE INSTALLED IN WALLS AT ALL EQUIPMENT, VALVE OR OTHER LOCATIONS REQUIRING ACCESS FOR MAINTENANCE WHICH ARE LOCATED BEHIND FINISHED SURFACES. SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS AND DIRECTIONS.



EQUIPMENT ABBREVIATIONS

FEC - FIRE EXTINGUISHER CABINET & EXTINGUISHER
FF - SURFACE MTD FIRE EXTINGUISHER
PTD - PAPER TOWEL DISPENSER
UC - UTILITY CABINET
PORT - PORTFOLIO STORAGE CABINET
PB - PAPER STORAGE CABINET

SSOE

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

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PROJECT INFORMATION:

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ENLARGED LEVEL 1 FLOOR PLAN - QUENCH VENT

AE-103

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DOOR SCHEDULE

DOOR NUMBER	ROOM INFORMATION: ROOM NUMBER	ROOM INFORMATION: NAME	DOOR & FRAME RATING (IN MINUTES)	NUM OF PANELS	DOOR PANEL(S): PANEL 1 - TYPE	PANEL 1 WIDTH	PANEL 2 - TYPE	PANEL 2 WIDTH	PANEL HEIGHT	PANEL MATERIAL #1	PANEL MATERIAL #2 (IF APPLICABLE)	DOOR FRAME: FRAME TYPE	FRAME MATERIAL	DETAILS: HEAD	DETAILS: JAMB	DOOR HARDWARE: SET	DOOR HARDWARE: POWER / ACCESS	COMMENTS
LEVEL 0																		
0250	0250	NMR	-	2	F	1'-6"	F	3'-6"	7'-0"	SCW	SCW	00-HM01	HM	H1	J1	1	YES	REUSE EXISTING CARD READER AT DOOR LOCATION
0446F	0466F	ALL GENDER RESTROOM	45 min	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	2		
0466	0466	ALL GENDER RESTROOM	45 min	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	2		
0466A	0466B	CHANGING ROOM	-	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	2		
0466B	0466B	CHANGING ROOM	-	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	2		
0466C	0466C	CLEAN STORAGE	-	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	3		
0466D	0466D	ALL GENDER RESTROOM	45 min	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	2		
0466E	0466E	ALL GENDER RESTROOM	45 min	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	2		
0560B	0560B	CONTROL ROOM	-	2	F	1'-8"	F	3'-0"	7'-0"	SCW	SCW	00-HM01	HM	H1	J1	4		
0561A	0561	EQUIPMENT ROOM	-	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	3		
A100	A100	MOCK MRI	45 min	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	5		
A101	A101	PATIENT WAITING	45 min	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	5		
A102	A102	MRI STORAGE	45 min.	1	F	3'-0"	-		6'-8"	SCW		00-HM01	HM	H1	J1	3		
A110A	A110	MRI OFFICE	-	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	5		
A110B	A110	MRI OFFICE	45 min	1	F	3'-0"	-		7'-0"	SCW		00-HM01	HM	H1	J1	5		

NOTE: DOOR HARDWARE MANUFACTURERS TO MATCH EXISTING FACILITY STANDARDS.

HARDWARE SET 01:

2	EA	CONTINUOUS HINGE	651
1	EA	ELECTRIC POWER TRANSFER	628
1	EA	SFIC FINAL CORE BY OWNER	626
2	EA	CLOSER	689
1	EA	COORDINATOR	689
1	EA	ELECTRIC STRIKE	630
1	EA	AUTOMATIC FLUSH BOLT	626
2	EA	KICKPLATE 10" x 2" LDW	629
1	EA	RELOCATED CARD READER BY OWNER	

HARDWARE SET 02:

3	EA	BUTT HINGE	651
1	EA	PRIVACY SET WITH INDICATOR (LOCK/UNLOCK)	626
1	EA	SFIC FINAL CORE BY OWNER	626
1	EA	CLOSER	689
1	EA	KICKPLATE 10" x 2" LDW	629
1	EA	WALL STOP	630
1	SET	SEALS (AT RATED DOORS)	BLK

HARDWARE SET 03:

3	EA	BUTT HINGE	651
1	EA	STOREROOM LOCK	626
1	EA	SFIC FINAL CORE BY OWNER	626
1	EA	CLOSER	689
1	EA	WALL STOP	630
1	EA	KICKPLATE 10" x 2" LDW	629
1	EA	SEALS (AT RATED DOORS)	BLK

HARDWARE SET 04:

6	EA	BUTT HINGE	651
1	EA	CLASSROOM LOCK	626
1	EA	SFIC FINAL CORE BY OWNER	626
2	EA	CLOSER	689
1	EA	COORDINATOR	689
1	EA	MANUAL FLUSH BOLT	626
2	EA	KICKPLATE 10" x 2" LDW	629

HARDWARE SET 05:

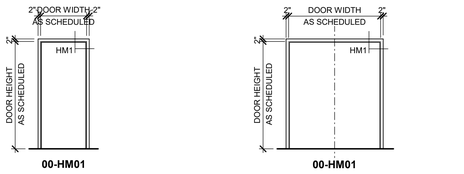
3	EA	BUTT HINGE	651
1	EA	OFFICE LOCK	626
1	EA	SFIC FINAL CORE BY OWNER	626
1	EA	WALL STOP	630
1	EA	SEALS (AT RATED DOORS)	BLK

DOOR SCHEDULE ABBREVIATIONS

ALUM	ALUMINUM
CR	CARD READER
CR-X	CARD READER A, B, C ETC
CW	CURTAINWALL
DMS	DOOR MONITORING SWITCH
EL	ELECTRIC LATCH RETRACTION
EXST	EXISTING
EXT STF	EXTERIOR STOREFRONT
FF	FACTORY FINISH
HGT	HEIGHT
HM	HOLLOW METAL
	• HM1 = STANDARD DOUBLE-RABBET FRAME
	• HM2 = CASED OPENING FRAME
	• HM3 = SINGLE RABBET FRAME
	• HM4 = DOUBLE EGRESS FRAME
	• HM5 - not used
	• HM6 = POCKET DOOR FRAME
	• HM7 = DOUBLE ACTING / NO RABBET FRAME
IN	INCH
INT STF	INTERIOR STOREFRONT
MAX	MAXIMUM
MHO	MAGNETIC HOLD OPEN DEVICE
MIN	MINIMUM
ML	MAGNETIC LOCK
THK	THICK/THICKNESS
P1	ACTIVE LEAF DOOR PANEL
P2	INACTIVE LEAF DOOR PANEL
PDO	POWER DOOR OPERATOR
PNT	PAINT
PR	PAIR
PT	POWER TRANSFER PREP
REV	REVISION (SEE SUBMITTAL/REVISION SCHEDULE AT RIGHT SHEET MARGIN)
RO	ROUGH OPENING
RX	REQUEST TO EXIT SWITCH
SCW	SOLID CORE WOOD
SIM	SIMILAR
STN	STAINED
WD	WOOD
	• WD1 = STANDARD DOUBLE-RABBET FRAME
	• WD2 = CASED OPENING FRAME
	• WD3 = SINGLE RABBET FRAME
	• WD4 = DOUBLE EGRESS FRAME
	• WD5 - not used
	• WD6 = POCKET DOOR FRAME
	• WD7 = DOUBLE ACTING / NO RABBET FRAME

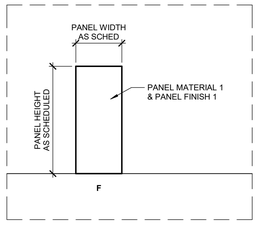
DOORS & GLAZED OPENINGS NOTES

1. ALL DOOR FRAMES SHALL BE HOLLOW METAL WITH A 2" FACE DIMENSION, EXCEPT AS NOTED AT DOOR SCHEDULE.
2. SEE WINDOW AND DOOR DETAILS ON **AE-361** FOR ADDITIONAL EXTERIOR HOLLOW METAL ELEVATIONS.
3. ALL DETAILS ARE ON **AE-361** EXCEPT AS NOTED. REFER TO WALL SECTIONS AND EXTERIOR ELEVATIONS FOR NON-TYPICAL HEAD, JAMB AND SILL INFORMATION.
4. ALL FLOORING TRANSITIONS UNDER DOORS SHALL BE IN ACCORDANCE WITH TRANSITION DETAILS ON **AE-361.**
5. THE FLOOR ON BOTH SIDES OF A DOOR SHALL BE LEVEL AND SHALL HAVE THE SAME ELEVATION ON BOTH SIDES OF THE DOOR FOR A DISTANCE ON EACH SIDE AT LEAST EQUAL TO THE WIDTH OF THE WIDEST SINGLE DOOR PANEL **(NFPA 101 2012 EDITION 7.2.1.3.1 & 7.2.1.3.2).**
6. ALL DOORS WITH SELF-CLOSERS SHALL CONFORM TO ALL APPLICABLE CODES OR HAVE A MAXIMUM FORCE ALLOWABLE OF 5 LBF AND HAVE A MINIMUM SWEEP PERIOD OF 3 SECONDS FROM 70 DEGREES OPEN TO 3" LATCH FROM LATCH TO LEADING DOOR EDGE, WHICHEVER IS MORE STRICT SHALL APPLY. SELF CLOSING DEVICES SHALL MEET THE REQUIREMENTS OF THE **LATEST EDITION OF THE LIFE SAFETY CODE AND NFPA 80.**
7. SWING AND FORCE TO OPEN DOORS SHALL MEET THE REQUIREMENTS OF THE **LATEST EDITION LIFE SAFETY CODE, CHAPTER 7.2.1.4.5.**
8. DOORS/HARDWARE HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATING DEVICES ON ACCESSIBLE DOORS SHALL HAVE A SHAPE THAT IS EASY TO GRASP WITH ONE HAND AND DOES NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING OR TWISTING OF THE WRIST TO OPERATE. LEVER-OPERATED MECHANISMS, PUSH-TYPE MECHANISMS AND U-SHAPED HANDLES ARE ACCEPTABLE DESIGNS.
9. OPENING HEIGHTS AND WIDTHS NOTED ARE NOMINAL ROUGH OPENING WIDTHS. VERIFY IN FIELD ALL DIMENSIONS.
10. AT ALL HOLLOW METAL FRAMES INSTALLED IN STUD WALLS THAT HAVE SOUND BATTS, FILL HOLLOW METAL FRAMES WITH SOUND BATTS.



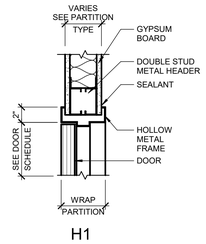
HOLLOW METAL FRAME TYPE ELEVATIONS

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



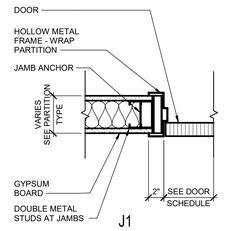
DOOR PANEL TYPE ELEVATIONS

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



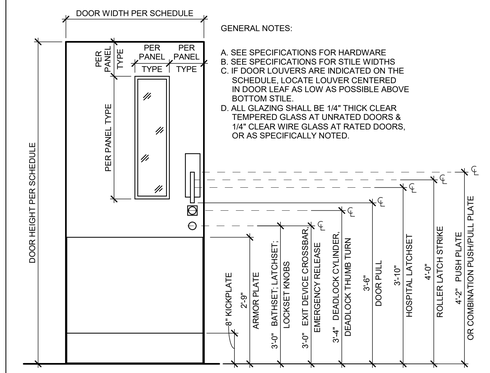
HEAD DETAILS

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



JAMB DETAILS

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



TYPICAL DOOR HARDWARE MOUNTING HEIGHTS

SCALE: 3/4" = 1'-0"

SSOE

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

DOOR & WINDOW DETAILS & SCHEDULES

AE-361

GENERAL NOTES

NOTE 1:
MOUNTING HEIGHTS SHOWN ARE FOR ACCESSORIES AND FIXTURES REQUIRED UNLESS OTHERWISE NOTED OR DIMENSIONED ON DRAWINGS FOR SPECIFIC CONDITIONS.

NOTE 2:
THE REFERENCE STANDARDS FOR THESE DETAILS IS THE 2009 INTERNATIONAL CODE COUNCIL A117.1-2009, ACCESSIBLE AND USABLE BUILDING AND FACILITIES, AS REFERENCED BY CHAPTER 11 OF THE INTERNATIONAL CODE COUNCIL MODEL CODES AND THE DEPARTMENT OF JUSTICE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

NOTE 3:
THE BASIS OF DESIGN FOR THESE DETAILS IS BOBRICK. REFER TO THE SPECIFICATION MANUAL FOR OTHER MANUFACTURERS. ADJUST MOUNTING TO MATCH CRITICAL DIMENSIONS AND OPERATION REQUIREMENTS AND REACH RANGES

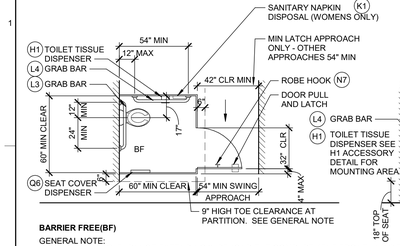
NOTE 4:
DIMENSIONS NOTED AS MINIMUM / MAXIMUM OR CLEAR INDICATE FINISHED DIMENSION AND MUST BE MAINTAINED. ADJUST WALL DIMENSIONS IF NECESSARY TO MAINTAIN REQUIRED CLEARANCES BETWEEN FIXTURES AND FINISHES.

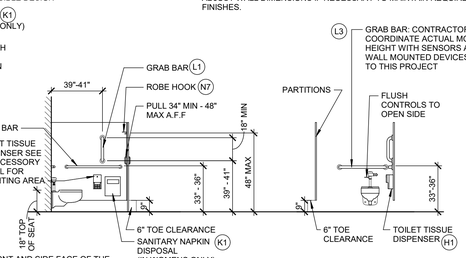
NOTE 5:
OPERABLE PARTS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 POUND (22.2N) MAXIMUM.

NOTE 6:
PROVIDE BARRIER FREE (BF), AMBULATORY (AM) OR STANDARD (ST) DETAILS AS INDICATED ON FLOOR PLANS. MOUNT ALL ACCESSORIES AS INDICATED BELOW IN EACH TOILET STALL TYPE. PROVIDE MINIMUM (1) SET OF BARRIER FREE (BF) ACCESSORIES FOR EACH BARRIER FREE (BF) FIXTURE.

TOILET ACCESSORY SCHEDULE

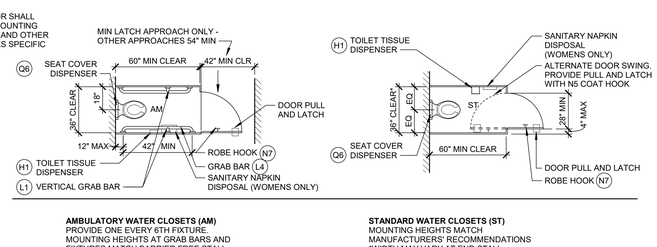
Toilet Key Name	Toilet Item Name





BARRIER FREE(BF)

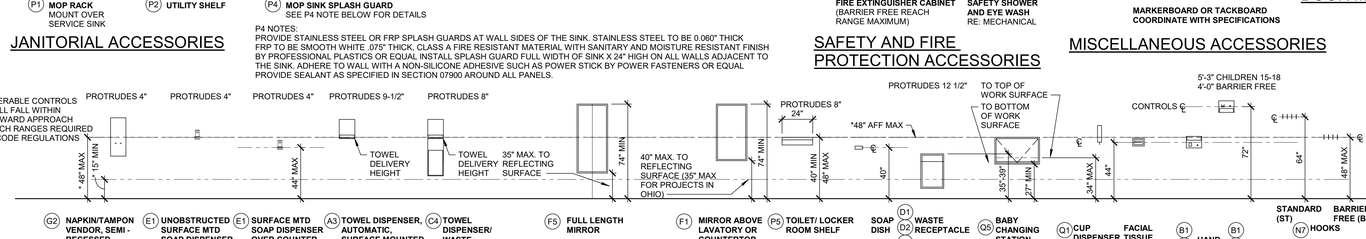
GENERAL NOTE:
PROVIDE 9" TOE CLEARANCE EXTENDING 6" BEYOND THE COMPARTMENT FRONT AND SIDE FACE OF THE PARTITION, EXCLUSIVE OF PARTITION SUPPORT MEMBERS TYPICAL. IF 9" TOE CLEARANCE IS NOT PROVIDED AT PARTITIONS, EXTEND COMPARTMENT DEPTH TO 62" AT WALL HUNG TOILETS AND 65" AT FLOOR MOUNTED TOILETS MINIMUM. MAINTAIN ALL OTHER CLEARANCES



AMBULATORY WATER CLOSETS (AM)
PROVIDE ONE EVERY 6TH FIXTURE.
MOUNTING HEIGHTS AT GRAB BARS AND FIXTURES MATCH BARRIER FREE STALL

STANDARD WATER CLOSETS (ST)
MOUNTING HEIGHTS MATCH MANUFACTURERS' RECOMMENDATIONS
*WIDTH MAY VARY AT END STALL

WATER CLOSET



STANDARD (ST) | **BARRIER FREE (BF)** | **STANDARD (ST)** | **BARRIER FREE (BF)**

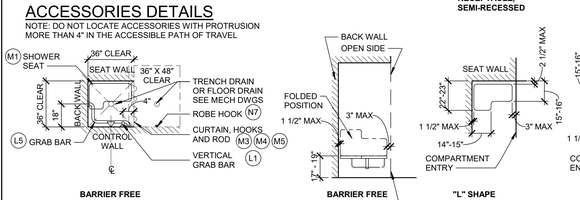
BARRIER FREE HEIGHT (BF) | STANDARD HEIGHT (ST) | L1 TO L5 **GRAB BAR AND REQ'D CLEARANCE** *MAY BE 1-1/2" AT SHOWER CONTROLS AND ADJACENT GRAB BARS. | Q6 **SEAT COVER DISPENSER, SURFACE MTD**

K1 K2 K3 **SANITARY NAPKIN RECEPTACLE** | E1 SOAP DISPENSER

BARRIER FREE (BF) | STANDARD (ST) | BARRIER FREE (BF) | STANDARD (ST)

H4 **SURFACE MOUNT TOILET PAPER HOLDER** | H5 **RECESSED TOILET PAPER DISPENSER** | H6 **SURFACE MOUNT JUMBO ROLL TOILET PAPER HOLDER**

URINALS



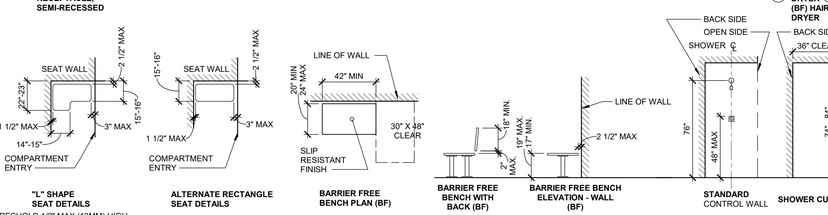
BARRIER FREE (BF) FRONT APPROACH | MAX. TOE CLEARANCE | MIN KNEE CLEARANCE

LAVATORY

SEE DETAIL FOR DIMENSIONS REQUIRED AT RECESSED FIXTURES

BARRIER FREE (BF) FRONT APPROACH | **HIGH - LOW BARRIER FREE FRONT APPROACH** | **HIGH - LOW BARRIER FREE ELEVATION**

WATER CLOSET ACCESSORIES



SC1 **BARRIER FREE 54" SEMICIRCULAR** | SC2 **BARRIER FREE 36" SEMICIRCULAR**

BARRIER FREE 54" SEMICIRCULAR | **BARRIER FREE 36" SEMICIRCULAR**

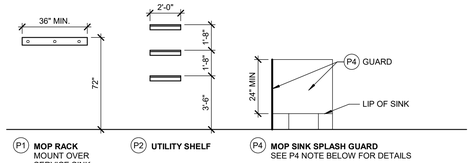
WASH FOUNTAINS

MINIMUM REQUIRED WIDTH AT RECESSED FIXTURES:
36" MIN CLR @ SIDE OBSTRUCTIONS OF 24" TO 60"
30" MIN CLR @ SIDE OBSTRUCTIONS OF 23" OR LESS

DRINKING FOUNTAINS AND BOTTLE FILLING STATIONS

ELECTRIC WATER COOLER (EWC) SHOWN
SEE DETAIL FOR DIMENSIONS REQUIRED AT RECESSED FIXTURES

BOTTLE FILL GENERAL NOTE:
IF BOTTLE FILL STATIONS ARE PROVIDED AT DRINKING FOUNTAINS, ACCESSIBLE BOTTLE FILL CONTROL HEIGHT MAY NOT EXCEED 46" ABOVE FLOOR

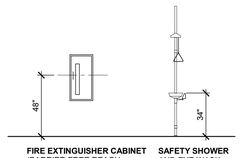


P1 **MOP RACK** MOUNT OVER SERVICE SINK | P2 **UTILITY SHELF** | P4 **MOP SINK SPLASH GUARD** SEE P4 NOTE BELOW FOR DETAILS

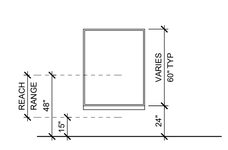
JANITORIAL ACCESSORIES

P4 NOTES:
PROVIDE STAINLESS STEEL OR FRP SPLASH GUARDS AT WALL SIDES OF THE SINK. STAINLESS STEEL TO BE 0.060" THICK FRP TO BE SMOOTH WHITE .075" THICK, CLASS A FIRE RESISTANT MATERIAL WITH SANITARY AND MOISTURE RESISTANT FINISH BY PROFESSIONAL PLASTICS OR EQUAL INSTALL SPLASH GUARD FULL WIDTH OF SINK X 24" HIGH ON ALL WALLS ADJACENT TO THE SINK. ADHERE TO WALL WITH A NON-SILICONE ADHESIVE SUCH AS POWER STICK BY POWER FASTENERS OR EQUAL PROVIDE SEALANT AS SPECIFIED IN SECTION 07900 AROUND ALL PANELS.

RECESSED FIXTURE REQUIRED DIMENSIONS



FIRE EXTINGUISHER CABINET (BARRIER FREE REACH RANGE MAXIMUM)



SAFETY SHOWER AND EYE WASH RE: MECHANICAL

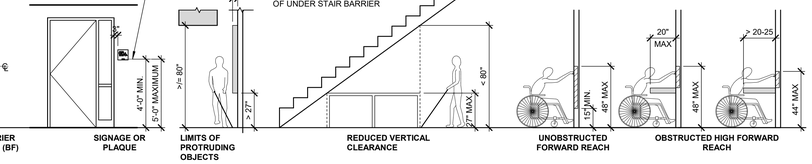
MARKERBOARD OR TACKBOARD COORDINATE WITH SPECIFICATIONS

SAFETY AND FIRE PROTECTION ACCESSORIES

MISCELLANEOUS ACCESSORIES

G2 **NAPKIN/TAMPON VENDOR, SEMI - RECESSED** | E1 **UNOBSTRUCTED SURFACE MTD SOAP DISPENSER** | E1 **SURFACE MTD SOAP DISPENSER OVER COUNTER** | A3 **TOWEL DISPENSER, AUTOMATIC, SURFACE MOUNTED** | C4 **TOWEL DISPENSER/ WASTE RECEPTACLE, SEMI-RECESSED**

F5 **FULL LENGTH MIRROR** | F1 **MIRROR ABOVE LAVATORY OR COUNTERTOP** | P5 **TOILET/ LOCKER ROOM SHELF** | **SOAP DISH** D1 D2 D3 | D1 D2 **WASTE RECEPTACLE** | Q5 **BABY CHANGING STATION** | Q7 **CUP DISPENSER** | **FACIAL TISSUE DISPENSER** | B1 B2 **HAND DRYER (BF) HAIR DRYER** | B1 B2 **HAIR DRYER (ST)** | **STANDARD (ST)** N7 **HOOKS** | **BARRIER FREE (BF)**



SIGNAGE OR PLAQUE | **LIMITS OF PROTRUDING OBJECTS** | **REDUCED VERTICAL CLEARANCE** | **UNOBSTRUCTED FORWARD REACH** | **OBSTRUCTED HIGH FORWARD REACH**

MISCELLANEOUS BARRIER FREE REQUIREMENTS

ACCESSORIES DETAILS

NOTE: DO NOT LOCATE ACCESSORIES WITH PROTRUSION MORE THAN 4" IN THE ACCESSIBLE PATH OF TRAVEL

BARRIER FREE TRANSFER TYPE

BARRIER FREE SEAT WALL

"L" SHAPE SEAT DETAILS

ALTERNATE RECTANGLE SEAT DETAILS

THRESHOLD 1/2" MAX (13MM) HIGH WITH BEVELED, ROUNDED OR VERTICAL EDGE.

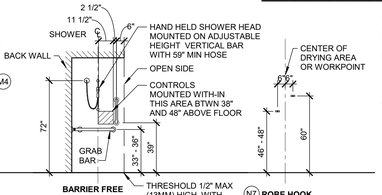
SHOWER STALL AND ACCESSORIES

BARRIER FREE BENCH

BARRIER FREE BENCH PLAN (BF)

BARRIER FREE BENCH WITH BACK (BF) | **BARRIER FREE BENCH ELEVATION - WALL (BF)**

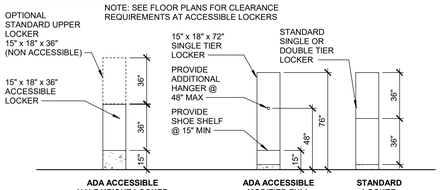
STANDARD CONTROL WALL | **SHOWER CURTAIN**



BARRIER FREE CONTROL WALL

N7 **ROBE HOOK (2 REQUIRED)**

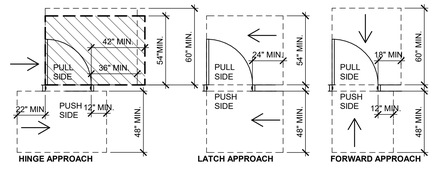
NOTE: SEE FLOOR PLANS FOR CLEARANCE REQUIREMENTS AT ACCESSIBLE LOCKERS



ADA ACCESSIBLE HALF HEIGHT LOCKER | **ADA ACCESSIBLE MODIFIED FULL HEIGHT LOCKER** | **STANDARD LOCKER BASE**

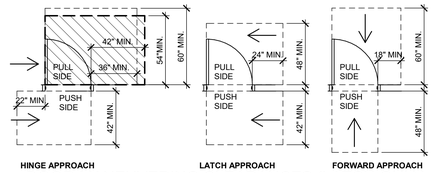
LOCKER DETAILS

DOOR IN SERIES CLEARANCES



HINGE APPROACH | **LATCH APPROACH** | **FORWARD APPROACH**

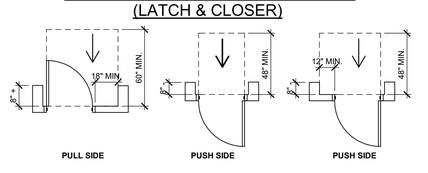
DOOR MANEUVERING CLEARANCES (LATCH & CLOSER)



HINGE APPROACH | **LATCH APPROACH**

FORWARD APPROACH

DOOR MANEUVERING CLEARANCES (LATCH ONLY - NO CLOSER)



PULL SIDE | **PUSH SIDE** | **PUSH SIDE**

MANEUVERING CLEARANCES AT RECESSED DOORS - ALL FORWARD APPROACH

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

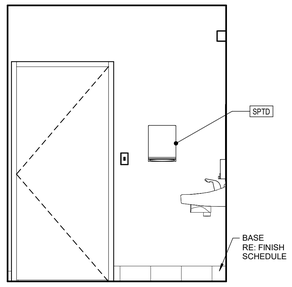
259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-8222

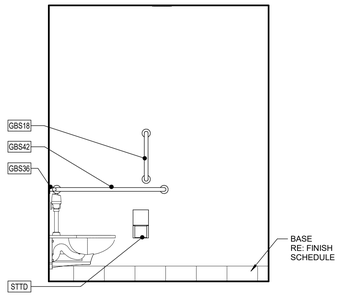
TYPICAL MOUNTING HEIGHTS

AE-400



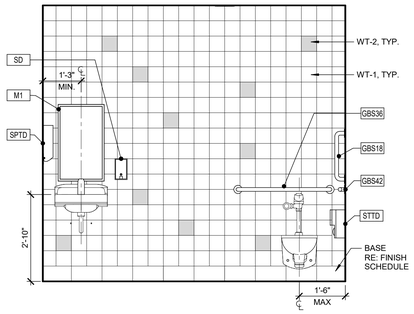
A2 / AE-101 TYPICAL ALL GENDER RESTROOMS

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



C2 / AE-101 TYPICAL ALL GENDER RESTROOMS

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



E2 / AE-101 TYPICAL ALL GENDER RESTROOMS

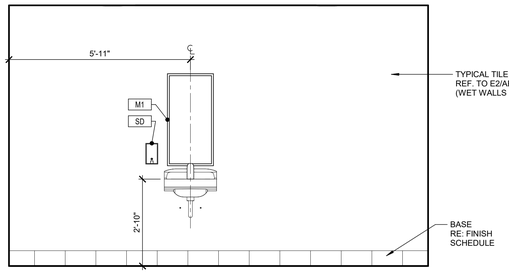
SCALE: 1/2" = 1'-0"

TOILET ACCESSORIES SCHEDULE

ITEM #	DESCRIPTION	MFR.	MODEL #	PROVIDED BY	REV
GBS18	GRAB BAR - 18" VERTICAL	BOBRICK	B-6806 Vertical		
GBS36	GRAB BAR – 36" HORIZONTAL	BOBRICK	B-6806 Series		
GBS42	GRAB BAR – 42" HORIZONTAL	BOBRICK	B-6806 Series		
M1	MIRROR	BOBRICK	B-165 2436		
SD	SOAP DISPENSER	BY OWNER	BY OWNER		
SND	SANITARY NAPKIN DISPOSAL	BY OWNER	BY OWNER		
SPTD	PAPER TOWEL (FOLDED) DISPENSER – SURFACE MOUNTED	BOBRICK	B-262 ClassicSeries		
STTD	TOILET TISSUE DISPENSER – SURFACE MOUNTED	BOBRICK	B-4288		

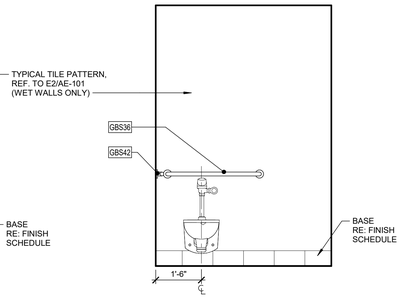
TOILET ROOM NOTES

1. REFER TO DRAWING AE-400 FOR TYPICAL TOILET ELEVATIONS, MOUNTING HEIGHTS, ETC.
2. PROVIDE WOOD BLOCKING IN GYPSUM BOARD PARTITIONS AT WALL MOUNTED EQUIPMENT - TYPICAL.
3. REFER TO COVER SHEET FOR LIST OF OWNER FURNISHED/OWNER INSTALLED ITEMS.



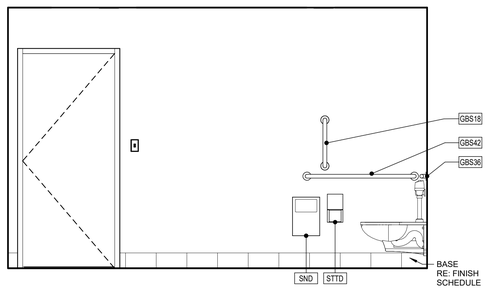
A4 / AE-101 TOILET ROOM 0466 - EAST ELEVATION

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



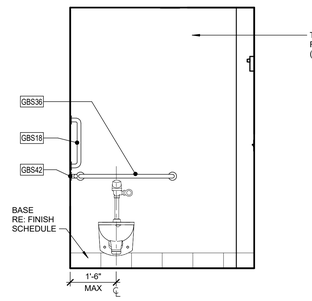
C4 / AE-101 TOILET ROOM 0466 - NORTH ELEVATION

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



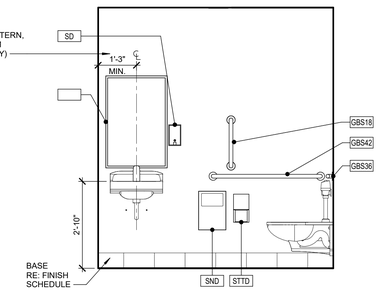
A5 / AE-101 TOILET ROOM 0466 - WEST ELEVATION

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



C5 / AE-101 TOILET ROOM 0466A - NORTH ELEVATION

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



E5 / AE-101 TOILET ROOM 0466A - WEST ELEVATION

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

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM
MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

TOILET ROOM
ELEVATIONS

AE-401

MATERIAL FINISH SCHEDULE

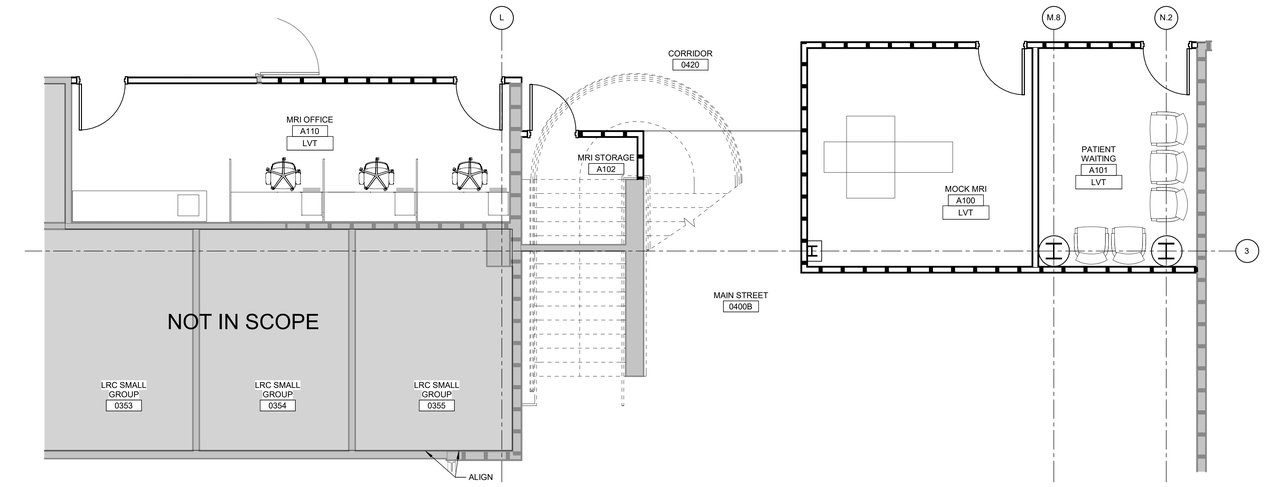
CODE	BASIS OF DESIGN MANUFACTURER	STYLE NAME #	COLOR NAME #	DESCRIPTION	LOCATION
ACOUSTICAL CEILING TILE					
ACT-1	ARMSTRONG CEILING SOLUTIONS	OPTIMA	WHITE (WH)	2'x2', SQUARE TEGULAR IN 15/16" PRELUDE GRID WITH STABILIZER CLIPS	MRI OFFICE, CORRIDORS, SUPPORT AREAS
ACT-2	ARMSTRONG CEILING SOLUTIONS	CLEAN ROOM FL	WHITE WITH GRAY SPATTER	2'x2', 5/8" THICK SQUARE LAY-IN 15/16" PRELUDE GRID WITH STABILIZER CLIPS	NMR AND MRI ROOMS
CERAMIC FLOOR TILE					
FT-1	AMERICAN OLEAN	COLOR STORY FLOOR	TBD	12"x24" FIELD TILE	TOILET ROOM FLOORS
FT-2	AMERICAN OLEAN	COLOR STORY FLOOR	TBD	12"x24" ACCENT TILE	TOILET ROOM FLOORS
CERAMIC FLOOR TILE BASE					
FTB-1	AMERICAN OLEAN	COLOR STORY FLOOR	TBD	6"x12" COVE BASE TO COORDINATE WITH FT-1	TOILET ROOMS
CERAMIC WALL TILE					
WT-1	AMERICAN OLEAN	COLOR STORY	TBD	6"x6" MATTE SQUARE WALL TILE - FIELD	TOILET ROOM WALLS
WT-2	AMERICAN OLEAN	COLOR STORY	TBD	6"x6" GLOSSY SQUARE WALL TILE - ACCENT	TOILET ROOM WALLS
LUXURY VINYL TILE					
LVT-1	MANNINGTON COMMERCIAL	TBD	TBD	FIELD TILE WITH STAIN SHIELD AND SILENT SOLUTION UNDERLAYMENT	MRI OFFICE; MAIN STREET STUDENT LOUNGE
LVT-2	MANNINGTON COMMERCIAL	TBD	TBD	ACCENT TILE WITH STAIN SHIELD AND SILENT SOLUTION UNDERLAYMENT	MAIN STREET STUDENT LOUNGE
PAINT AND COATINGS					
PT-1	SHERWIN WILLIAMS	TBD	TBD	FIELD; EGGSHELL FINISH	TYPICAL WALLS, U.N.O.
PT-2	SHERWIN WILLIAMS	TBD	TBD	ACCENT; EGGSHELL FINISH	TBD
PT-3	SHERWIN WILLIAMS	TBD	TBD	ACCENT; EGGSHELL FINISH	TBD
PT-4	SHERWIN WILLIAMS	SW 7757	HIGH REFLECTIVE WHITE	FLAT	TYPICAL PAINTED GWB CEILINGS IN NON WET LOCATIONS
PLASTIC LAMINATE					
PL-1	WILSONART	TBD	TBD	STANDARD HPL	MILLWORK VERTICAL SURFACES
PL-2	WILSONART	TBD	TBD	STANDARD HPL	MILLWORK HORIZONTAL SURFACES
RESILIENT BASE / ACCESSORIES / STAIR ACCESSORIES					
RB-1	JOHNSONITE	TRADITIONAL VINYL 1/8"	TBD	4" H CONTINUOUS ROLL, COLORMATCH	TYPICAL THROUGHOUT, UNO
SOLID SURFACE COUNTERTOPS					
SS-1	WILSONART	SOLID SURFACE	TBD	THROUGH-BODY COLOR, 1/2" THICKNESS, NOMINAL	SOLID SURFACE COUNTERTOPS
STATIC DISSIPATIVE TILE					
SDT-1	INTERFACE	TBD	TBD	FIELD	NMR AND MRI ROOMS

ROOM FINISH SCHEDULE

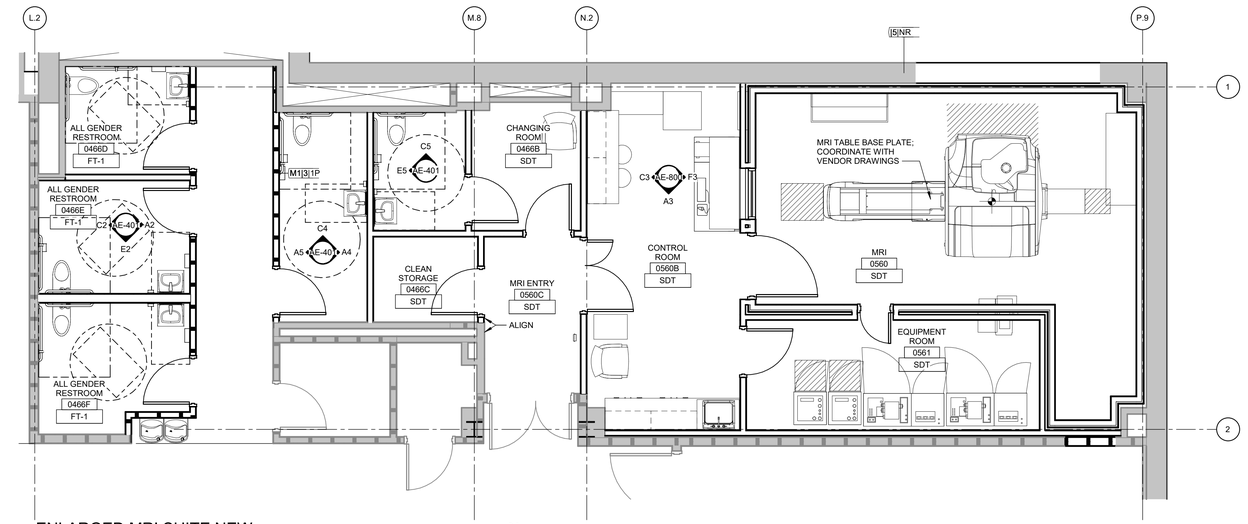
NO	ROOM NAME	FLOOR FINISH	BASE FINISH	WALL FINISH				CASEWORK		CEILING			REMARKS
				NORTH	EAST	SOUTH	WEST	VERTICAL	HORIZONTAL	HEIGHT	MATL	FINISH	
LEVEL 0													
0250	NMR	SDT	RB	PT	PT	PT	PT	ETR	ETR		ACT	-	
0466	ALL GENDER RESTROOM	FT-1	CTB-1	WT-1	WT-1	PT	PT	-	-		GYP BD	PT	
0466A	TOILET ROOM	FT-1	CTB-1	WT-1	PT	PT	WT-1	-	-		GYP BD	PT	
0466B	CHANGING ROOM	SDT	RB	PT	PT	PT	PT	-	-		ACT	-	
0466C	CLEAN STORAGE	SDT	RB	PT	PT	PT	PT	-	-		ACT	-	
0466D	ALL GENDER RESTROOM	FT-1	CTB-1	PT	PT	PT	WT-1	-	-		GYP BD	PT	
0466E	ALL GENDER RESTROOM	FT-1	CTB-1	PT	PT	WT-1	PT	-	-		GYP BD	PT	
0466F	ALL GENDER RESTROOM	FT-1	CTB-1	WT-1	PT	PT	PT	-	-		GYP BD	PT	
0560	MRI	SDT	RB	PT	PT	PT	PT	-	-		ACT	-	
0560B	CONTROL ROOM	SDT	RB	PT	PT	PT	PT	PL	SS-1		ACT	-	
0560C	MRI ENTRY	SDT	RB	PT	PT	PT	PT	-	-		ACT	-	
0561	EQUIPMENT ROOM	SDT	RB	PT	PT	PT	PT	PL	SS-1		ACT	-	
A100	MOCK MRI	LVT	RB	PT	PT	PT	PT	-	-		ACT	-	
A101	PATIENT WAITING	LVT	RB	PT	PT	PT	PT	-	-		ACT	-	
A110	MRI OFFICE	LVT	RB	PT	PT	PT	PT	-	-		ACT	-	

FINISH NOTES

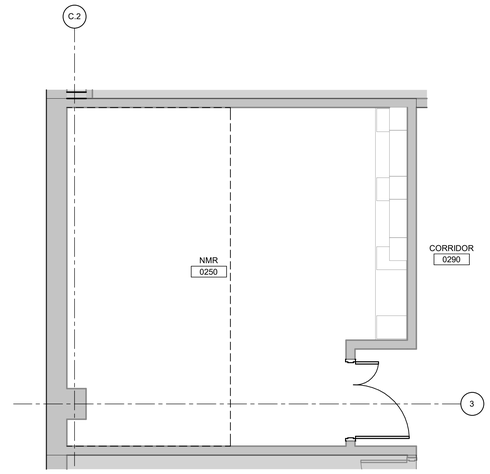
1. TILE TRIM: SCHLUTER RONDEC R0 100AE (10MM); FINISH TBD (EDGES & CORNERS).
2. TILE GROUT: TEC UNSANDED; COLOR TBD.



3 ENLARGED MRI OFFICE A110 NEW WORK FINISH PLAN
SCALE: 1/4" = 1'-0"



2 ENLARGED MRI SUITE NEW WORK FINISH PLAN
SCALE: 1/4" = 1'-0"



1 ENLARGED NMR 0250 NEW WORK FINISH PLAN
SCALE: 1/4" = 1'-0"

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

INTERIOR FINISH PLANS, SCHEDULES & DETAILS

AE-700

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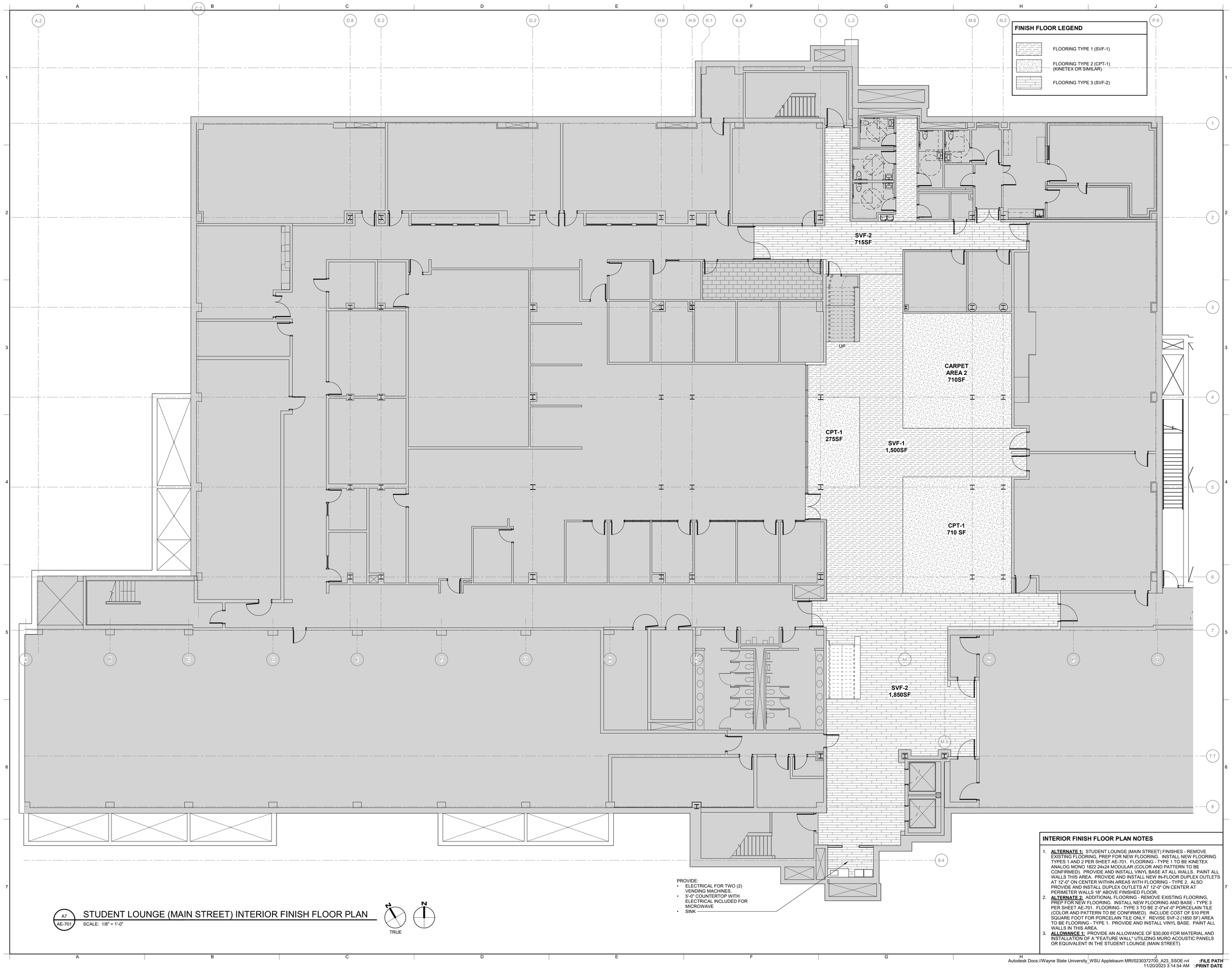

A7 / AE-701 STUDENT LOUNGE (MAIN STREET) INTERIOR FINISH FLOOR PLAN

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

TRUE

INTERIOR FINISH FLOOR PLAN NOTES

1. **ALTERNATE 1:** STUDENT LOUNGE (MAIN STREET) FINISHES - REMOVE EXISTING FLOORING, PREP FOR NEW FLOORING. INSTALL NEW FLOORING TYPES 1 AND 2 PER SHEET AE-701. FLOORING - TYPE 1 TO BE KINETEX ANALOG MONO 18Z2 24x24 MODULAR (COLOR AND PATTERN TO BE CONFIRMED). PROVIDE AND INSTALL VINYL BASE AT ALL WALLS. PAINT ALL WALLS THIS AREA. PROVIDE AND INSTALL NEW IN-FLOOR DUPLEX OUTLETS AT 12'-0" ON CENTER WITHIN AREAS WITH FLOORING - TYPE 2. ALSO PROVIDE AND INSTALL DUPLEX OUTLETS AT 12'-0" ON CENTER AT PERIMETER WALLS 18" ABOVE FINISHED FLOOR.
2. **ALTERNATE 2:** ADDITIONAL FLOORING - REMOVE EXISTING FLOORING, PREP FOR NEW FLOORING. INSTALL NEW FLOORING AND BASE - TYPE 3 PER SHEET AE-701. FLOORING - TYPE 3 TO BE 2'-0"x4'-0" PORCELAIN TILE (COLOR AND PATTERN TO BE CONFIRMED). INCLUDE COST OF $10 PER SQUARE FOOT FOR PORCELAIN TILE ONLY. REVISE SVF-2 (1850 SF) AREA TO BE FLOORING - TYPE 1. PROVIDE AND INSTALL VINYL BASE. PAINT ALL WALLS IN THIS AREA.
3. **ALLOWANCE 1:** PROVIDE AN ALLOWANCE OF $30,000 FOR MATERIAL AND INSTALLATION OF A "FEATURE WALL" UTILIZING MURO ACOUSTIC PANELS OR EQUIVALENT IN THE STUDENT LOUNGE (MAIN STREET).

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0.5

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

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SSOE MANAGER:	JEFF FALZON

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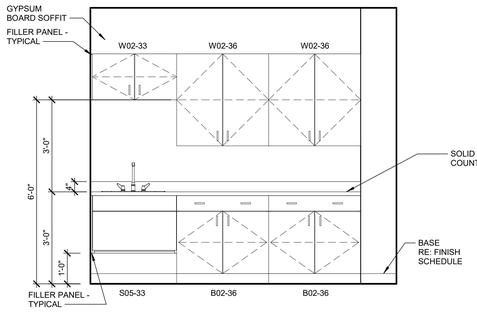
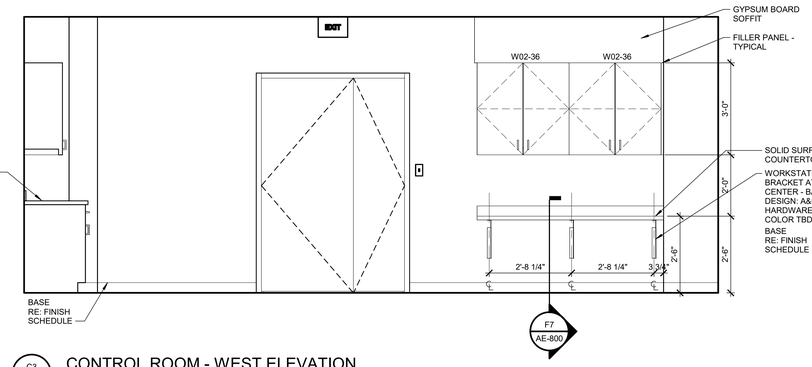
STUDENT LOUNGE - INTERIOR FINISH FLOOR PLAN

AE-701



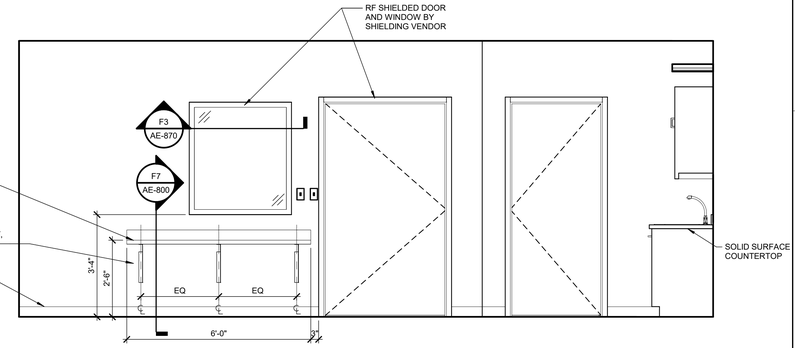
A3 / AE-101 CONTROL ROOM - SOUTH ELEVATION

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



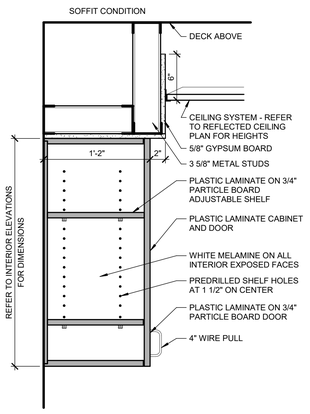
C3 / AE-101 CONTROL ROOM - WEST ELEVATION

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



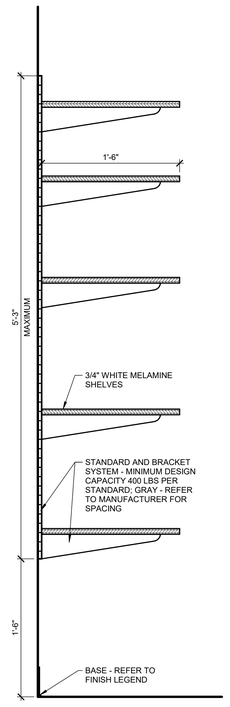
F3 / AE-101 CONTROL ROOM - EAST ELEVATION

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



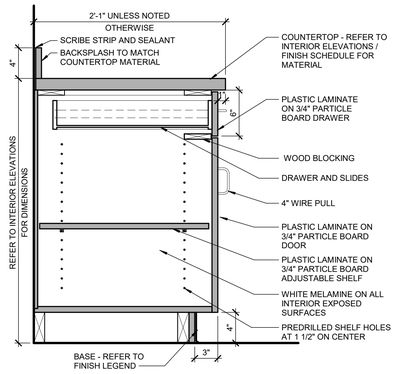
A7 CASEWORK SECTION (W06)

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



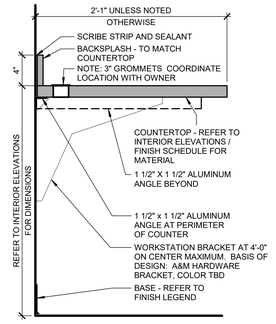
C7 / AE-101 CASEWORK SECTION

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



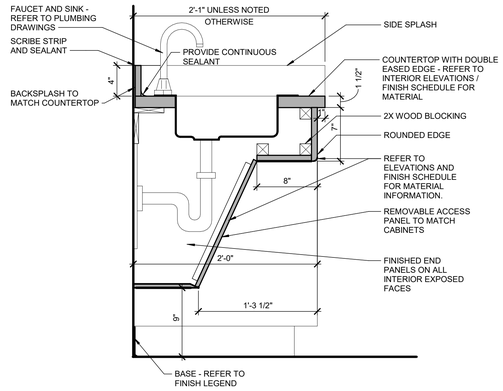
D7 CASEWORK SECTION (B02)

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



F7 / AE-800 CASEWORK SECTION (TYPICAL)

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



H7 ADA OPEN CABINET WITH SINK

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

PROFESSIONAL SEALS:

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INTERIOR ELEVATIONS & CASEWORK DETAILS

AE-800

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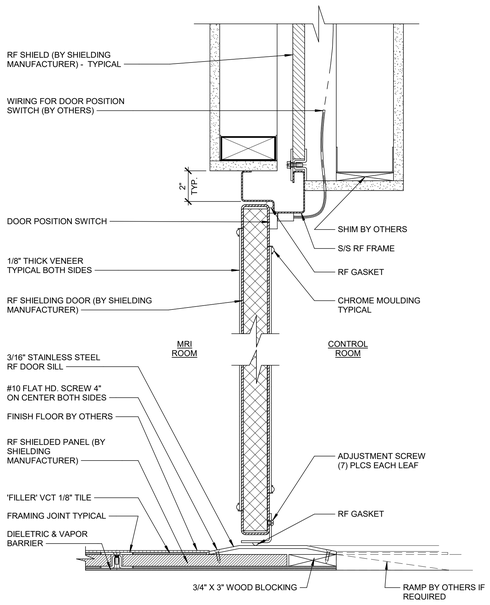
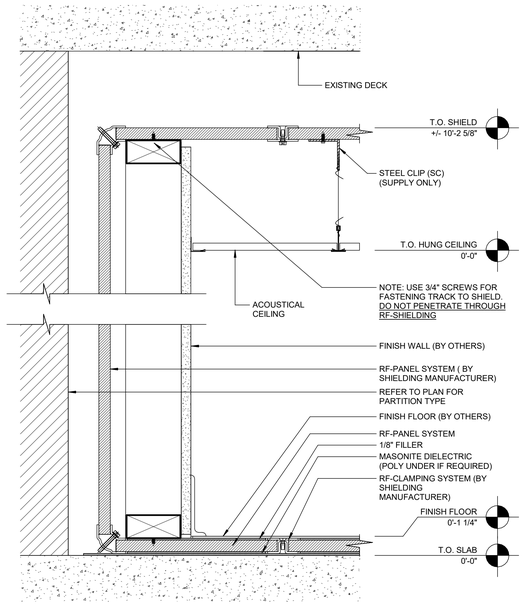


A3 / AE-870

DOOR SECTION

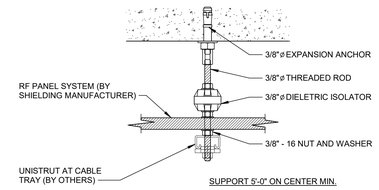
SCALE: 3" = 1'-0"



D3 / AE-870

RF WALL SECTION (TYPE 1)

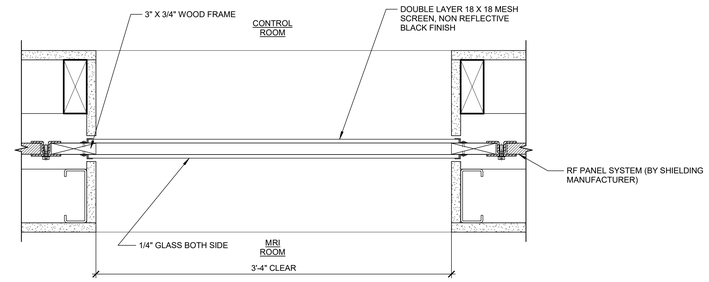
SCALE: 3" = 1'-0"



F2 / AE-870

PANEL SUPPORT DETAIL

SCALE: 3" = 1'-0"



F3 / AE-870

RF SHIELDED WINDOW DETAIL

SCALE: 3" = 1'-0"

A4 / AE-101

BASE PLATE FOR FIXED PATIENT TABLE SECTION

SCALE: 6" = 1'-0"

PROFESSIONAL SEALS:

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SSOE MANAGER:	JEFF FALZON

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T. (248) 643-6222

INTERIOR DETAILS

AE-870

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. Demolition and removal of selected site elements.
  3. 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 INFORMATIONAL SUBMITTALS (FOR OWNER REVIEW)
- 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. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.4 CLOSEOUT SUBMITTALS (FOR OWNER REVIEW)
- A. Inventory of items that have been removed and salvaged.

1.5 QUALITY ASSURANCE
- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

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 through the Construction Manager 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. If suspected hazardous materials are encountered, do not disturb; immediately notify Owner through the Construction Manager. 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/Tenant'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.
- C. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

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 PREPARATION
- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 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. Arrange to shut off utilities with utility companies.
  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.

3.4 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.

3.5 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 48 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. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. 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.
- C. 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.
- D. 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.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 CLEANING
- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
  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.
  4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- 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 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY
- A. Section Includes:
  1. Wood blocking and nailers.
  2. Plywood backing panels.

1.2 ACTION SUBMITTALS (FOR OWNER REVIEW)
- A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS (FOR OWNER REVIEW)
- A. Evaluation Reports: For the following, from ICC-ES:
  1. Fire-retardant-treated wood.
  2. Power-driven fasteners.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
- A. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

2.2 WOOD PRODUCTS, GENERAL
- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.3 FIRE-RETARDANT-TREATED MATERIALS
- A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
  1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
  2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
  3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- D. Application: Treat all miscellaneous carpentry unless otherwise indicated.

2.4 MISCELLANEOUS LUMBER
- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  1. Blocking.
  2. Nailers.
  3. Rooftop equipment bases and support curbs.
  4. Cants.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.

2.5 PLYWOOD BACKING PANELS
- A. Equipment Backing Panels: Plywood, DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.6 FASTENERS
- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M of Type 304 stainless steel.
- B. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL
- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  2. ICC-ES evaluation report for fastener.

3.2 PROTECTION
- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 064000 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY
- A. Provide interior architectural woodwork complete; as indicated on drawings, as specified, and as required for proper completion of work.

1.2 DEFINITIONS
- A. In addition to cabinetry, countertops, miscellaneous trim, and items indicated on drawings, interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.3 SUBMITTALS
- A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
  1. Show details full size.
  2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
  3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in architectural woodwork.
- B. Samples for verification:
  1. Plastic and metal laminates.
  2. Solid surface.

1.4 QUALITY ASSURANCE
- A. Fabricator Qualifications: AWI/QCP certified fabricator/installer. Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performace.
- B. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork.
- C. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1.5 DELIVERY, STORAGE, AND HANDLING
- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored n other than installed areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.6 PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg. F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurments: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MATERIALS
- A. General: Provide materials that comply with requirements of AWI's quality standard (Custom-Grade) for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Products: Comply with the following:
  1. Hardboard: AHA A135.4
  2. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
  3. Particleboard: ANSI A208.1, Grade M-2
  4. Particleboard: Straw-based particleboard complying with requriements in ANSI A208.1, Grade M-2, except for density.
  5. Plywood: Marine grade ply.
  6. Melamine: white
- C. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, malamine-impregnated decorative paper complying with LMA SAT-1.
  1. Provide 0.5mm PVC edge banding in case edge, shelf edges, and drawer box edge.
  2. Provide 3mm PVC edge banding at drawer front edge and door front edge.
- D. High- Pressure Decorative Laminate: NEMA LD 3, HDPL standard grade as indicated on the Finish Legend.
  1. Provide at exposed cabinet exteriors, door/drawer interior materal, exposed surfaces, and finished ends.
  2. Any exposed cabinet edge to be clad with laminate. Field verify casework in conjunction with windows, doors, sills, etc. prior to manufacturing.
- E. Laminates and solid surface materials as indicated on the Finish Legend.

2.2 CABINET HARDWARE AND ACCESSORIES
- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Door Hardware."
- B. Hinges: Blum 120-degree hinge system, press in without plate 73T5580/175H9100; nickel plated.
  1. 120° Opening Capacity.
  2. Provide one pair per door to 48" in height, one and one-half pair per door over 48" unless noted otherwise.
- C. Wire Pulls: Back mounted, Epco 4-inch wire pull, satin finish, model # MC402-4-SS.
- D. Catches: Magnetic catches, BHMA A156.9, B03141.
- E. Drawer Slides: Accuride Zinc plated, side mount, full extension, soft close, LD model #3832EC; nickel plate.
- F. Door Locks:

CABINET LOCK DOUBLE DOOR	COMPX TIMBERLINE	CB-250 C700LP-15 C700BZ-15 C257SP-19 C101SP-19	250 SERIES DOOR LOCK BODY LOCK PLUG BEZEL STRIKE PLATE (DOOR) STRIKE PLATE (CASE)	SATIN NICKEL
CABINET LOCK SINGLE DOOR	COMPX TIMBERLINE	CB-240 C700LP-15 C700BZ-15 C101SP-19	240 SERIES DOOR LOCK BODY LOCK PLUG BEZEL STRIKE PLATE	SATIN NICKEL
CABINET LOCK DRAWER	COMPX TIMBERLINE	CB-230 C700LP-15 C700BZ-15 C101SP-19	230 SERIES DRAWER LOCK BODY LOCK PLUG BEZEL STRIKE PLATE	SATIN NICKEL

- G. Shelf rest: Hafele shelf pin spoon 5mm x 19mm nickel plated model #282.04.711.
- H. Metal File Supports: Wurth File Holder System KT432ZC-T/EA1058A. Zinc plated aluminum finish.
- I. Grommets for Cable Passage through Countertops: 3-inch OD, molded-plastic grommets and matching plastic caps, color: charcoal.
- J. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with product class requirements in BHMA A156.9.
- K. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.
- I. Exposed Countertop Brackets: Steel brackets L-shaped.
  1. Product A & M Hardware, Inc. workstation wall bracket, flush mounted 15" x 21", white.
- M. Countertop cleat: 1.25" x 1.25" x 18" PVC, white.
- N. Shelf brackets:
  1. Knape & Vogt: Standard and bracket 182 and 82, black, model #82BP BLK 63 and 182BP BLK 10.5.

2.3 MICELLANEOUS MATERIALS
- A. Furring, Blocking, Shims, and Hanging Strips:
- B. Anchors: Select material, type, size, and finish requried for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as requried for corrosion resistance. Proved toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- C. Adhesives, General: Do not use adhesives that contain urea formaldehyde.
- D. Adhesives and Glues: Type 1 (waterproof).
- E. Adhesive for Bonding Plastic Laminate and Bonding Edges: As recommended by manufacturer of plastic laminate.

2.4 FABRICATION, GENERAL
- A. Interior Woodwork Grade: Unless otherwise indicated, provide Custom-grade interior woodwork complying with referenced quality standars.
- B. Install laminated plastic in single pieces up to the limits of the sheet sizes; small patches will not be accepted.
- C. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in realtion to ambient relative humidity during fabrication and in installation areas.
- D. Fabricate woodwork to dimensions, profiles, and detials indicated.
- E. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
  1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
  2. Trail fit assemlies at fabrication shop that cannot be shipped completely assembled. Install dowes, screw, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- F. Shop-cut openings to maxium extent possible to receive hardware, appliances, plumbing fixtures, electical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
  1. Seal edges of openings in countertops with a coat of varnish.

2.5 PLASTIC-LAMINATE CABINETS
- A. Grade: Custom.
- B. AWI Type of Cabinet Construction: Frameless/Flush Overlay.
- C. AWI Construction Type: Type 1, multiple self-supporting units rigidly jointed together.
- D. AWI Door and Drawer Front Style: Flush overlay.
- E. Reveal: per the drawings.
- F. Adhesive type: Type 1 (waterproof).
- G. Backing: 0.020 minimum material thickness.
- H. Spreader at base: 1/2" from wall.
- I. Door and Drawer Silencers: BHMA A156.16, L03011.
- J. Materials:
  1. Door/Drawer Thicknesses
     - a. Back and sides: 1/2"
     - b. Fronts: 3/4"
  2. Cabinet Thicknesses
     - a. Bottom: 3/4"
     - b. Sides: 3/4"
     - c. Wall Cabinet Tops: 3/4"
     - d. Sub-Tops: 1/2"
     - e. Backs: 3/8"
  3. Shelves: 3/4"
- K. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.
- L. Integral Bases of cabinets to be individual bases and doweled into cabinet sides.
- M. Filler and scribes to be covered with vertical grade laminate.
- N. Drawer Construction: Fabricate with exposed fronts fastened to sub-front with mounting screws from interior of body.
  1. Join sub-fronts, back , and sides, with glued dovetail joints.
  2. Drawer box: 5-piece box of 5/8" IPB core melamine.

2.6 SOLID-SURFACING -MATERIAL COUNTERTIOPS
- A. Countertop and back end splashes: Solid-Surfacing-Material Thickness: 3 cm slab thickness.
- B. Edge: Eased edge. Provide 1/2 inch radius at all outside edges.
- C. Colors, Patterns, and Finishes as indicated on Finish Legend.
- D. Fabricate tops and component in one piece, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

2.7 PLASTIC-LAMINATE COUNTERTOPS
- A. Grade: Custom
- B. High-Pressure Decorative Laminate Grade: HGP.
- C. Grain Direction: Vertical on doors and drawers.
- D. Edge Treatment: 3mm t-edge PVC to match face material. Provide 1/2 inch radius atall outside counter edges.
- E. Core Material: Exterior-grade plywood.
- F. Core Material at Sinks: Exterior-grade plywood.
- G. Backer Sheet: Provide plastic-laminate backer sheet, Grade BKL, on underside of countertop substrate.
- H. Paper Backing: Provide paper backing on underside of countertop substrate.
- I. Back and side splashes to be attached to countertop.

PART 3 - EXECUTION

3.1 PREPARATION
- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as requried, including removal of packing and backpriming.

3.2 INSTALLATION
- A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 of fabrication of type of woodwork involved.
- B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
  1. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
  2. Scribe and cut interior finish carpentry to fit adjoining work.
  3. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
  4. Install to tolerance of 1/8 inch in 96 inches (3mm in 2438mm) for level and plum. Install adjoining interior finish carpentry with 1/32 inch (0.8-mm) maximum offset.
- C. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- D. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installations of hardware and accessory items as indicated.
  1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
  2. Maintain veneer sequence matched of cabinets with transparent finish.
  3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c.
- E. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
  1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
  2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
  3. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c.
  4. Caulk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."
- G. Touch up finishing work specified in this Section after installation of woodwork. Fill Nail holes with matching filler where exposed.

3.3 ADJUSTING AND CLEANING
- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces.
- D. Protect countertop surfaces during construction with 30-mil protection paper or greater. Tape underside of countertop at a minimum of 48 inches (1200 mm) o.c.

END OF SECTION 064000

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY
- A. Section Includes:
  1. Glass-fiber blanket.
  2. Mineral-wool blanket.

1.2 ACTION SUBMITTALS (FOR OWNER REVIEW)
- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS (FOR OWNER REVIEW)
- A. Product test reports.
- B. Research reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
- A. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

2.2 GLASS-FIBER BLANKET
- A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.3 MINERAL-WOOL BLANKETS
- A. Mineral-Wool Blanket, Unfaced:ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.4 ACCESSORIES
- A. Insulation for Miscellaneous Voids:
  1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
- B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL
- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.2 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION
- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
  1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
  4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
  1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

END OF SECTION 072100

SECTION 081113 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY
- A. Section includes:
  1. Interior standard steel frames.

1.2 ACTION SUBMITTALS (FOR OWNER REVIEW)
- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS (FOR OWNER REVIEW)
- A. Product test reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
  1. Smoke-Control Assemblies: Provide assemblies with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
- B. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

2.2 INTERIOR STANDARD STEEL FRAMES
- A. Construct hollow-metal frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Frames: SDI A250.8, Level 2; SDI A250.4, Level B.
  1. Frames:
     - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
     - b. Construction: Knocked down or Face welded (where indicated)
  2. Doors:
     - a. Type: As indicated in the Door and Frame Schedule.
     - b. Thickness: 1-3/4 inches (44.5 mm).
     - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.053 inch (1.3 mm).
     - d. Edge Construction: Model 1, Full Flush.
     - e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.

2.3 FRAME ANCHORS
- A. Jamb Anchors:
  1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
  2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).
  3. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at top of underlayment.
- D. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
  1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M; hot-dip galvanized according to ASTM A 153/A 153M, Class B.

2.4 MATERIALS
- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- E. Glazing: Comply with requirements in Section 088000 "Glazing."

2.5 FABRICATION
- A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
  1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
     - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
- B. Hardware Preparation: Factory prepare hollow-metal frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
  1. Reinforce frames to receive nontemplated, mortised, and surface-mounted door hardware.
  2. Comply with BHMA A156.115 for preparing hollow-metal frames for hardware.

2.6 STEEL FINISHES
- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
  1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION
- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION
- A. Hollow-Metal Frames: Comply with SDI A250.11
  1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
     - a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
     - b. Install frames with removable stops located on secure side of opening.
  2. Fire-Rated Openings: Install frames according to NFPA 80.
  3. Floor Anchors: Secure with postinstalled expansion anchors.
     - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved.
  4. Solidly pack mineral-fiber insulation inside frames.
  5. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
     - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
     - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
     - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
     - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

3.3 CLEANING AND TOUCHUP
- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections

END OF SECTION 081113

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #: PROJECT NUMBER
JHA PROJECT #: PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #: 023-03727-00
SSOE MANAGER: JEFF FALZON

ssoe
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

ARCHITECTURAL SPECIFICATIONS

AE-900

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY
- A. Section Includes:
  - 1. Solid-core doors with wood-veneer faces.
  - 2. Factory finishing flush wood doors.
  - 3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 ACTION SUBMITTALS (FOR OWNER REVIEW)
- A. Product Data: For each type of door. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
  - 1. Dimensions and locations of blocking.
  - 2. Dimensions and locations of mortises and holes for hardware.
  - 3. Dimensions and locations of cutouts.
  - 4. Undercuts.
  - 5. Requirements for veneer matching.
  - 6. Doors to be factory finished and finish requirements.
  - 7. Fire-protection ratings for fire-rated doors.
- C. Samples: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS (FOR OWNER REVIEW)
- A. Quality Standard Compliance Certificates: AWI Quality Certification or WI Certified Compliance Program certificates.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
- A. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

2.2 FLUSH WOOD DOORS, GENERAL
- A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
  - 1. Provide AWI Quality Certification or WI Certified Compliance Labels indicating that doors comply with requirements of grades specified.
- B. WDMA I.S.1-A Performance Grade:
  - 1. Heavy Duty unless otherwise indicated.
- C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
  - 1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
  - 2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
- D. Smoke-Control Door Assemblies: Listed and labeled for smoke-control, based on testing according to UL 1784.
- E. Structural-Composite-Lumber-Core Doors:
  - 1. Structural Composite Lumber: WDMA I.S.10.
    - a. Screw Withdrawal, Face: 700 lbf (3100 N).
    - b. Screw Withdrawal, Edge: 400 lbf (1780 N).
- F. Mineral-Core Doors:
  - 1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
  - 2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
  - 3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH
- A. Interior Solid-Core Doors
  - 1. Grade: Custom (Grade A faces)
  - 2. Species: To match existing facility.
  - 3. Cut: To match existing facility.
  - 4. Match between Veneer Leaves: To match existing facility.
  - 5. Assembly of Veneer Leaves on Door Faces: To match existing facility.
  - 6. Core: Structural composite lumber or mineral core as required for fire rating.
  - 7. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.

2.5 FABRICATION
- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
  - 1. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.

2.6 FACTORY FINISHING
- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
  - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors that are indicated to receive transparent finish.
- C. Transparent Finish:
  - 1. Grade: Custom.
  - 2. Finish: To match existing facility.
  - 3. Sheen: To match existing facility.

PART 3 - EXECUTION

3.1 INSTALLATION
- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Manufacturer's written instructions and referenced quality standard, and as indicated.
  - 1. Install fire-rated doors according to NFPA 80.
  - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY
- A. Section Includes:
  - 1. Mechanical door hardware for the following:
    - a. Swinging doors.

1.2 ACTION SUBMITTALS (FOR OWNER REVIEW)
- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS (FOR OWNER REVIEW)
- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS (FOR OWNER REVIEW)
- A. Maintenance data.

1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers who is available during the course of the Work to consult Construction Manager about door hardware and keying.

1.6 WARRANTY
- A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
- A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
- B. Smoke-Control Door Assemblies: Where smoke-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
- C. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- D. Accessibility Requirements: For door hardware on doors in an accessible route, comply with agency having jurisdiction and as indicated on Drawings.
- E. Provide products for each door that comply with requirements indicated in Part 2 and door hardware schedule.
  - 1. Door hardware is scheduled on Drawings.
  - 2. Manufacturers for each component to match existing facility standards.

2.2 LOCK CYLINDERS
- A. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
- B. Permanent Cores: Final SFIC to be provide and installed by Owner.

2.3 KEYING
- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide as indicated on Drawings.
- B. Keys: Nickel silver or Brass.
  - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
    - a. Notation: "DO NOT DUPLICATE."

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

PART 3 - EXECUTION

3.1 INSTALLATION
- A. Mounting Heights: Mount door hardware units at heights required to comply with governing regulations.
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
- C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
  - 1. Replace construction cores with permanent cores as directed by Construction Manager.

3.2 ADJUSTING
- A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

END OF SECTION 087100

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 (FOR OWNER REVIEW)
- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS (FOR OWNER REVIEW)
- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation reports for firestop tracks, post-installed anchors, and power-actuated fasteners.

1.4 QUALITY ASSURANCE
- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, or the Steel Stud Manufacturers Association.

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.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- C. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

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.
  - 2. Protective Coating: Coating with equivalent corrosion resistance of ASTM A 653/ A 653M, G40 (Z120), hot-dip galvanized unless otherwise indicated.
- B. Studs and Tracks: ASTM C 645.
  - 1. Steel Studs and Tracks:
    - a. Minimum Base-Metal Thickness: 0.0296 inch (0.752 mm).
    - b. Depth: As indicated on Drawings.
- C. Slip-Type Head Joints: Where indicated, provide one of the following:
  - 1. Single Long-Leg Track System: ASTM C 645 top track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
  - 2. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
  - 3. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- D. Firestop Tracks: Top track 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.
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
  - 1. Minimum Base-Metal Thickness: 0.0296 inch (0.752 mm).
- F. Cold-Rolled Channel Bridging: Steel, 0.0538-inch (1.367-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
  - 1. Depth: 1-1/2 inches (38 mm)
  - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.
- G. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
  - 1. Minimum Base-Metal Thickness: 0.0296 inch (0.752 mm)
  - 2. Depth: As indicated on Drawings.
- H. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
  - 1. Configuration: Asymmetrical or hat shaped.
- I. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
  - 1. Depth: As indicated on Drawings.
  - 2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch (0.8 mm).
  - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- J. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.0179 inch (0.455 mm), and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS
- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- B. Hanger Attachments to Concrete:
  - 1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or AC308 as appropriate for the substrate.
    - a. Uses: Securing hangers to structure.
    - b. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch (25 by 5 mm) by length indicated.
- E. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch (1.367 mm) and minimum 1/2-inch- (13-mm-) wide flanges.
  - 1. Depth: As indicated on Drawings.
- F. Furring Channels (Furring Members):
  - 1. Cold-Rolled Channels: 0.0538-inch (1.367-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
  - 2. Steel Studs and Tracks: ASTM C 645.
    - a. Minimum Base-Metal Thickness: 0.0296 inch (0.752 mm)
    - b. Depth: As indicated on Drawings
  - 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22 mm) deep.
    - a. Minimum Base-Metal Thickness: 0.0296 inch (0.752 mm)
  - 4. Resilient Furring Channels: 1/2-inch- (13-mm-) deep members designed to reduce sound transmission.
    - a. Configuration: Asymmetrical or hat shaped.

2.4 AUXILIARY MATERIALS
- A. General: Provide auxiliary materials that comply with referenced installation standards.
  - 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
  - 1. Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), nonperforated.
  - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL
- A. Installation Standard: ASTM C 754.
  - 1. 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 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. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
  - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
    - a. Install two studs at each jamb unless otherwise indicated.
    - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
    - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
  - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
  - 4. 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.
  - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Z-Shaped Furring Members:
  - 1. Erect insulation where indicated, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches (610 mm) o.c.
  - 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
  - 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

SECTION 092216 - NON-STRUCTURAL METAL FRAMING - CONTINUED

3.3 INSTALLING CEILING 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.
  - 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 steel roof deck.
  - 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
  - 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
  - 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY
- A. Section Includes:
  - 1. Interior gypsum board.
  - 2. Tile backing panels.

1.2 ACTION SUBMITTALS (FOR OWNER REVIEW)
- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
- A. 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.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- C. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

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 Wallboard: ASTM C 1396/C 1396M.
  - 1. Thickness: 5/8 inch (15.9 mm).
  - 2. Long Edges: Tapered
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
  - 1. Thickness: 5/8 inch (15.9 mm).
  - 2. Long Edges: Tapered.
- C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
  - 1. Thickness: 1/2 inch (12.7 mm).
  - 2. Long Edges: Tapered.
- D. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
  - 1. Core: 1/2 inch (12.7 mm), regular type and 5/8 inch (15.9 mm), Type X.
  - 2. Long Edges: Tapered.
  - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TILE BACKING PANELS
- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
  - 1. Core: 1/2 inch (12.7 mm), regular type and 5/8 inch (15.9 mm), Type X.
  - 2. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- B. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
  - 1. Thickness: 5/8 inch (15.9 mm)
  - 2. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.6 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.
    - b. Bullnose bead.
    - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
    - d. L-Bead: L-shaped; exposed long flange receives joint compound.
    - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    - f. Expansion (control) joint.

2.7 JOINT TREATMENT MATERIALS
- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  - 1. Interior Gypsum Board: Paper.
  - 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
  - 3. Tile Backing Panels: As recommended by panel manufacturer.
- 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 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 drying-type, all-purpose compound.
  - 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound
- D. Joint Compound for Tile Backing Panels:
  - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
  - 2. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.8 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 (0.84 to 2.84 mm) thick.
  - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- E. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
- F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

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- (6.4- to 12.7-mm-) 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 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 1: Ceiling plenum areas, concealed areas, and where required for fire-resistance rated assemblies land sound rated assemblies.
  - 2. Level 2: Panels that are substrate for tile.
  - 3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
  - 4. Level 5: Where indicated on Drawings.
- H. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- I. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.
- J. Cementitious Backer Units: Finish according to manufacturer's written instructions.

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 093013 - TILING

PART 1 - GENERAL

1.1 SUMMARY
- A. Section Includes:
  - 1. Installation of tile.
  - 2. Waterproof membrane or thin-set applications.
  - 3. Metal edge strips.

1.2 SUBMITTALS (FOR OWNER REVIEW)
- A. Product Data: For each type of product being provided.
- B. Virtual sample showing corresponding paint code number of each type of product being provided with corresponding Finish Legend code.

1.3 QUALITY ASSURANCE
- A. Installer Qualifications:
  - 1. Installer is a five-star member of the National Tile Contractors Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
- A. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

2.2 PRODUCTS, GENERAL
- A. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSIA108.02, ANSI standards referenced in other Part2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- B. Meets ASTM E84, Class A. Meets NFPA 255 Class I.

2.3 TILE PRODUCTS
- A. Materials:
  - 1. Size and material as indicated on drawings on the Finish Schedule.

2.4 THRESHOLDS
- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
  - 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch (1.5 mm) above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch (12.7 mm) or less above adjacent floor surface.

2.5 TILE BACKING PANELS
- A. Cementitious Backer Units: See Gypsum Board specification.

2.6 WATERPROOF MEMBRANE
- A. General: Manufacturer's standard product, that complies with ANSIA118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch (0.2-mm) nominal thickness.
  - 1. Products:Subject to compliance with requirements, provide the following:
    - a. Schluter Systems L.P; KERDI.
- C. Latex-Portland Cement Waterproof Mortar: Flexible, waterproof mortar consisting of cement-based mix and latex additive.
  - 1. Product:Subject to compliance with requirements, provide one of the following:
    - a. ARDEX Americas; ARDEX 8+9™ Rapid Waterproofing and Crack Isolation Compound.
    - b. Or products equal and listed in manufacturer's written instructions.

2.7 CRACK ISOLATION MEMBRANE
- A. General: Manufacturer's standard product that complies with ANSIA118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch (0.2-mm) nominal thickness.
  - 1. Products:Subject to compliance with requirements, provide the following:
    - a. Schluter Systems L.P; KERDI.
- C. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
  - 1. Products:Subject to compliance with requirements, provide one of the following:
    - a. LATICRETE SUPERCAP, LLC; Laticrete Hydro Barrier.
- D. Latex-Portland Cement Crack-Resistant Mortar: Flexible mortar consisting of cement-based mix and latex additive.
  - 1. Products:Subject to compliance with requirements, provide one of the following:
    - a. ARDEX Americas; ARDEX 8+9™ Rapid Waterproofing and Crack Isolation Compound.

2.8 SETTING MATERIALS
- A. Portland Cement Mortar (Thickset) Installation Materials: ANSIA108.02.
- B. Standard Dry-Set Mortar (Thinset): ANSIA118.1.
  - 1. Products:(Owner Provided Material, For Reference and Coordination with GC Installation).
    - a. AFC PORCELAIN ADHESIVE 261DE / COLOR 500.
  - 2. Provide prepackaged, dry-mortar mix to which only water must be added at Project site.
  - 3. Provide prepackaged, dry-mortar mix combined with liquid-latex additive at Project site.
  - 4. For wall applications, provide non-sagging mortar.

2.9 GROUT MATERIALS
- A. Unsanded-Portland Cement Grout: ANSIA108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.
- B. High-Performance Tile Grout: ANSIA118.7.
  - 1. Products:
    - a. Grout color as selected by Architect from manufacturer's full range of colors.
    - b. Grout line thickness: 1/8 inch.
  - 2. Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.
  - 3. Polymer Type: Liquid-latex form for addition to prepackaged dry-grout mix.

2.10 MISCELLANEOUS MATERIALS
- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metal and designed specifically for flooring and wall applications.
  - 1. Schluter Systems L.PReno-U transition (TS2) and jolly edge if option is selected.
  - 2. Provide Schulter System DILEX-AHKA cove base where floor tile meets base and Schluter Systems Schiene at top to tile and all exposed edges.
  - 3. Finish Satin anodized aluminum
- C. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

PART 3 - EXECUTION

3.1 EXAMINATION
- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSIA108.01 for installations indicated.
  - 2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSIA108.01 for installations indicated.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSIA108.1A and is sloped 1/4 inch per foot (1:50) toward drains.

3.3 CERAMIC TILE INSTALLATION
- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSIA108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
  - 1. For the following installations, follow procedures in the ANSIA108 series of tile installation standards for providing 95 percent mortar coverage:
    - a. Tile floors in wet areas.
    - b. Tile floors consisting of tiles 8 by 8 inches (200 by 200 mm) or larger.
    - c. Tile floors consisting of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.
- F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
- G. Joint Widths:
  - 1. Per the manufacturer's written installation guidelines.
- H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- I. Metal Edge Strips: Install at locations indicated.
- J. Floor Sealer: Apply floor sealer to grout joints in tile floors according to flooring manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- K. Install tile backing panels and treat joints according to ANSIA108.11 and manufacturer's written instructions for type of application indicated. Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.
- L. Install waterproofing to comply with ANSIA108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
- M. Install crack isolation membrane to comply with ANSIA108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

END OF SECTION 093013

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #: PROJECT NUMBER

JHA PROJECT #: PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI INSTALLATION

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #: 023-03727-00

SSOE MANAGER: JEFF FALZON

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ARCHITECTURAL SPECIFICATIONS

AE-901

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.2 ACTION SUBMITTALS (FOR OWNER REVIEW)

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

C. For close-out booklet provide Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A according to ASTM E 1264.
2. Smoke-Developed Index: 50 or less.

B. Sustainable Design Requirements: Comply with Authorities Having Jurisdiction.

2.2 ACOUSTICAL PANELS

A. Product:

1. As indicated in Finish Schedule on drawings.

2.3 METAL SUSPENSION SYSTEM

A. Products:

1. As indicated in Finish Schedule on drawings.

B. Metal Suspension-System Standard: Manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M.

C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 (Z90) coating designation; with prefinished metal caps on flanges.

1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Cold-rolled steel or aluminum.
5. Cap Finish: Painted white.

2.4 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

B. Hold-Down Clips: Manufacturer's standard hold-down at vestibules.

2.5 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

PART 3 - EXECUTION

3.1 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated.

B. Layout openings for penetrations centered on the penetrating items.

3.2 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C 635/C 636M and manufacturer's written instructions.

B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
3. Arrange directionally patterned acoustical panels as follows:
    a. As indicated on reflected ceiling plans.
4. Install hold-down clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.

END OF SECTION 095113

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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ARCHITECTURAL
SPECIFICATIONS

AE-902

GENERAL LEGEND
(NOT ALL S□MBOLS □SED)

S□MBOL	DESCRIPTION
	E□ISTING S□PPL□ D□CT OR PIPE
	E□ISTING RET□RN D□CT OR □ENT
	E□ISTING S□PPL□ D□CT OR PIPE TO BE DEMOLISHED
	E□ISTING RET□RN D□CT OR □ENT TO BE DEMOLISHED
	NEW D□CT OR PIPE
	POINT OF NEW CONNECTION
T	THERMOSTAT - WALL MO□NTED
	AIR FLOW□S□PPL□□O□TSIDE AIR
	AIR FLOW□E□HA□ST□RET□RN
	□NDERC□T DOOR
	FINNED T□BE
— COND —	CONDENSATE RET□RN PIPING
— CW —	DOMESTIC COLD WATER PIPING
— CWR —	CONDENSER WATER RET□RN PIPING
— CWS —	CONDENSER WATER S□PPL□ PIPING
— DT —	DRAIN TILE PIPING
— F —	FIRE PROTECTION PIPING
— HWHR —	HOT WATER HEATING RET□RN PIPING
— HWHS —	HOT WATER HEATING S□PPL□ PIPING
— HP COND —	HIGH PRESS□RE CONDENSATE PIPING
— HPCW —	HIGH PRESS□RE COLD WATER PIPING
— HPHW —	HIGH PRESS□RE HOT WATER PIPING
— MA —	MEDICAL AIR PIPING
— M□ —	MEDICAL □AC□□M PIPING
— N2O —	NITRO□S O□IDE PIPING
— N —	NITROGEN PIPING
— O2 —	O□□GEN PIPING
— PC —	P□MPED CONDENSATE PIPING
— SAN —	SANITAR□ SEWER PIPING
— SAN(□) —	□NDERGRO□ND SANITAR□ SEWER PIPING
— ST —	STORM SEWER PIPING
— STM —	STEAM PIPING
— □ —	□ENT PIPING
	PIPE CAP (SCREWED)
	PIPE CAP (WELDED)
	BLIND FLANGE
	90° ELBOW DOWN
	90° ELBOW □P
	PIPE FLANGES
	ECCENTRIC RED□CER OR INCREASER
	CONCENTRIC RED□CER OR INCREASER
CO	CLEANO□T
FCO	CLEANO□T (FLOOR)
WCO	CLEANO□T (WALL)
	FLOW ARROW
	□NION
	STRAINER (W□E T□PE)
	STRAINER (W□E T□PE) W/BLOW OFF
	ANGLE □AL□E
	GATE □AL□E
	O□S□□ □□GATE □AL□E
	GLOBE □AL□E
	CHEC□ □AL□E
	B□TTERFL□ □AL□E
	BALL □AL□E
	MAN□AL BALANCING □AL□E
	CALIBRATED BALANCING □AL□E
S	SOLENOID □AL□E 2-WA□
S	SOLENOID □AL□E 3-WA□
	A□TO□CONTROL □AL□E 2-WA□ PNE□MATIC OPERATOR
	A□TO□CONTROL □AL□E 3-WA□ PNE□MATIC OPERATOR
	MOTORI□ED B□TTERFL□ □AL□E
T	STEAM TRAP
	FLE□IBLE HOSE
	FLE□IBLE CONNECTOR
OR	FLOOR DRAIN (FLOOR SIN□)
	BAC□FLOW PRE□ENTER/
	□NIT HEATER
	DRAIN □AL□E □/HOSE END
	THERMOWELL
T	THERMOSTATIC AIR □ENT
	DRAIN □AL□E
	ACCESS DOOR
	FINNED T□BE

D□CTWOR□ LEGEND
(NOT ALL S□MBOLS □SED)

RO□ND D□CT

DO□BLE LINE	DESCRIPTION	SINGLE LINE
12"	D□CT SI□E (DIAMETER)	12"
	FLE□IBLE D□CT (CONNECTION)	
	D□CT INDICATION FOR STAC□ING	
	D□CT T□RNING TOWARD □IEWER	
	D□CT T□RNING AWA□ FROM □IEWER	
	RO□ND ELBOW	
	MITERED ELBOW	
20°MA	TRANSITION	
	RECTANG□LAR TO RO□ND TRANSITION	

S□□ARE D□CT

DO□BLE LINE	DESCRIPTION	SINGLE LINE
12□6	D□CT SI□E (INSIDE DIMENSIONS/INCHES) FIRST FIG□RE IS SIDE SHOWN	12□6
	S□PPL□ D□CT□GRILLE (REGISTER) OR DIFF□SER	
	RET□RN D□CT□GRILLE OR REGISTER	
	E□HA□ST D□CT□GRILLE OR REGISTER	
	S□PPL□ DIFF□SER□GRILLE OR REGISTER ▼ INDICATES BLAN□ED-OFF SECTION	
	D□CT T□RNING □P	
	D□CT T□RNING DOWN	

D□CT ELBOWS

DO□BLE LINE	DESCRIPTION	SINGLE LINE
	ELBOW WITH T□RNING □ANES	
	RADI□S ELBOW W/□ANES	
20°MA / 30°MA	TRANSITION IN DIRECTION OF AIR FLOW	

DAMPERS

DO□BLE LINE	DESCRIPTION	SINGLE LINE
	□OL□ME DAMPER	
AIR FLOW 45° L W	BOOT T□PE CONNECTION L=1/4W□6"MIN□	
	CEILING DIFF□SER	

ABBRE□IATIONS
(NOT ALL ABBRE□IATIONS □SED)

ABBRE□IATION	DESCRIPTION
AA□	A□TOMAITC AIR □ENT
ACH	AIR CHANGES PER HO□R
AD	ACCESS DOOR OR AREA DRAIN
AFF	ABO□E FINISHED FLOOR
AH□	AIR HANDLING □NIT
AI□	ALARM INTERFACE □AL□E
ARCH	ARCHITECT□RAL
ARR	ARRANGEMENT
BF	BLIND FLANGE
BFF	BELOW FINISHED FLOOR
BFP	BAC□FLOW PRE□ENTER
BHP	BRA□E HORSEPOWER
BLDG	B□ILDING
BMS	B□ILDING MANAGEMENT S□STEM
BOD	BOTTOM OF D□CT
BOP	BOTTOM OF PIPE
BOT	BOTTOM
BT□H	BRITISH THERMAL □NIT PER HO□R
CD	CEILING DIFF□SER
CENTRIF□	CENTRIF□GAL
CFH	C□BIC FEET PER HO□R
CFM	C□BIC FEET PER MIN□TE
CLG	CEILING
CO	CLEANO□T
COND	CONDENSATE
CONN□	CONNECTION
CONT□	CONTIN□ATION
CONTR□	CONTRACTOR
CP	CONDENSATE P□MP
CSS	CLINICAL SER□ICE SIN□
C□H	CABINET □NIT HEATER
CW	COLD WATER
DD	DEC□ DRAIN
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DET	DETAIL
DI	DE-IONI□ED WATER
DIA	DIAMETER
DMPR	DAMPER
DN	DOWN
DWG	DRAWING
E	E□ISTING
EA	E□HA□ST AIR OR EACH
EG	E□HA□ST GRILLE
EF	E□HA□ST FAN
EFF	EFFICIENC□
ELECT	ELECTRICAL
ELE□	ELE□ATION
ER	E□HA□ST REGISTER
ESP	E□TERNAL STATIC PRESS□RE
EW	E□E WASH
E□H	E□HA□ST
E□IST□	E□ISTING
FCO	FLOOR CLEANO□T
FD	FLOOR DRAIN
FLE□□	FLE□IBLE
FLR	FLOOR
FM	FLOW METER
FP	FIRE PROTECTION
FPM	FEET PER MIN□TE
F□	FI□T□RE □NITS
GA	GA□GE
GAL	GALLON
GPM	GALLONS PER MIN□TE
HB	HOSE BIBB
HO	H□B O□TLET
HORI□	HORI□ONTAL
HP	HORSEPOWER OR HIGH PRESS□RE
HW	HOT WATER
HWR	HOT WATER RET□RN
ID	INSIDE DIAMETER
IE	IN□ERT ELE□ATION
IN	INCHES
INS□L□	INS□LATION
IW	INDIRECT WASTE
□W	□ILOWATT
□WH	□ILOWATT HO□R
LA□	LA□ATOR□
LB	PO□ND
MA	MEDICAL AIR
MA□	MA□IM□M
MBH	1000 BT□/HR
MIN	MINIM□M
M□	MEDICAL □AC□□M
N	NITROGEN OR NEW
N/A	NOT APPLICABLE
NG	NAT□RAL GAS
N□	NEC□
N2O	NITRO□S O□IDE
NTS	NOT TO SCALE
OA	O□TSIDE AIR
O2 OR O□□	O□□GEN
P	P□MP
PH	PHASE
PR□	PRESS□RE RED□CING □AL□E
PSI(G)	PO□NDS PER S□□ARE INCH (GA□GE)
RA	RET□RN AIR
RG	RET□RN GRILLE
RPM	RE□OL□TIONS PER MIN□TE
SA	S□PPL□ AIR
SAN	SANITAR□
SD	S□PPL□ DIFF□SER
S□	SIN□
SG	S□PPL□ GRILLE
SH	SHOWER
SP	STATIC PRESS□RE OR S□MP P□MP
SPEC	SPECIFICATIONS
S□	S□□ARE
SS	SER□ICE SIN□ OR STAINLESS STEEL
TM□	THERMOSTAIC MI□ING □AL□E
TSP	TOTAL STATIC PRESS□RE
TSTAT	THERMOSTAT
T□P	T□PICAL
□H	□NIT HEATER
□NO	□NLESS NOTED OTHERWISE
□	□ENT
□AC	□AC□□M
□EL	□ELOCIT□
□ERT	□ERTICAL
W	WASTE OR WATT
WC	WATER CLOSET OR WATER COL□MN
WCO	WALL CLEANO□T
WTR	WATER

GENERAL NOTES

1□ THE CONTRACTOR SHALL E□AMINE THE SITE AND BE FAMILIAR WITH THE CONDITIONS □NDER WHICH THIS CONTRACT M□ST BE E□EC□TED□NO AD□□STMENT TO THIS CONTRACT PRICE WILL BE PERMITTED BECA□SE OF LAC□ OF □NOWLEDGE OF THE E□ISTING FIELD CONDITIONS□

2□ THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL S□STEMS WITH OTHER TRADES AND OWNER TO A□OID INTERFERENCES□

3□ THE CONTRACTOR SHALL □ERIF□ ALL SPACE CONDITIONS AND DIMENSIONS PRIOR TO THE FABRICATION AND THE INSTALLATION OF THE PIPING S□STEM AND D□CTWOR□□

4□ ALL WOR□ SHALL BE DONE IN A MANNER COND□CI□E TO A PROFESSIONAL EN□IRONMENT□ALL AREAS M□ST BE □EPT AS NEAT AS POSSIBLE□AND AREAS SHALL BE CLEANED BEFORE LEA□ING SAID AREAS ON A DAIL□ BASIS□

5□ PRO□IDE COMPLETE OPERATING S□STEMS WITH MATERIALS OF CONSTR□CTION AND METHODS OF FABRICATION□ ASSEMBL□□ERECTION□TESTING□AND INTERIM OPERATIONS IN COMPLIANCE WITH THE RE□□IREMENTS SPECIFIED HEREIN AND THE RE□□IREMENTS OF APPLICABLE CODES AND A□THORITIES HA□ING □□RISDICTION□

6□ LOCATE CONTROLS□RELA□S□INSTR□MENTS□□AL□E BO□ES□ SWITCHES□ALARM PANELS□AND ACCESSORIES SO THE□ ARE READIL□ ACCESSIBLE FOR AD□□STMENT□SER□ICE□AND REPLACEMENT OR AS INDICATED□

7□ COORDINATE S□PPORT HANGERS□PIPE AND RO□TING AND E□□IPMENT INSTALLATION WITH E□ISTING CONDITIONS TO A□OID INTERFERENCES□

8□ INSTALL TEMPERAT□RE SENSORS 4□0" ABO□E FINISHED FLOOR□

9□ DEMOLITION WOR□ SHALL BE COMPLETED TO THE E□TENT INDICATED OR SPECIFIED□

10□ THE OWNER□S NORMAL OPERATION IN S□RRO□NDING AREAS WILL BE CONTIN□ED D□RING DEMOLITION□THE DEMOLITION SHALL NOT INTERFERE WITH THESE OPERATIONS IN AN□ WA□ WITHO□T THE OWNER□S E□PRESSED CONSENT□CONTRACTOR SHALL COORDINATE AND SCHED□LE E□TENT OF DEMOLITION WOR□ WITH OWNER IN FIELD□

11□ COMPL□ WITH OWNER□S STANDARDS AND ALL APPLICABLE LOCAL CODES□STANDARDS□AND REG□LATIONS□

12□ CONFIRM THAT E□ISTING S□STEMS ARE INACTI□E AND P□RGED BEFORE TAPPING INTO THEM□□NLESS OTHERWISE DIRECTED□

13□ SOME STANDARD S□MBOLS□ABBRE□IATIONS□AND DETAILS MA□ NOT BE APPLICABLE TO THE SPECIFIC CONTRACT ISS□E□

14□ CONTRACTOR SHALL RE□IEW THE DOC□MENTS OF ALL INTERFACING TRADES□CONTRACTS□AND DRAWINGS PRIOR TO BIDDING AND COMMENCEMENT OF WOR□ TO ENS□RE S□CCESS OF FINISHED WOR□□

15□ THE CONTRACTOR SHALL NOTIF□ THE ARCHITECT/ENGINEER OF AN□ PROBLEMS THAT MIGHT OCC□R D□RING DEMOLITION WOR□□

16□ THE DEMOLITION WOR□ RE□□IRED MA□ NOT BE LIMITED TO WHAT IS SHOWN ON PLAN□CONTRACTOR TO REMO□E ALL RELATED ITEMS AS RE□□IRED TO FACILITATE THE WOR□□

17□ □PON COMPLETION OF THE MECHANICAL TRADES WOR□□ALL S□STEMS SHALL BE TESTED□BALANCED AND AD□□STED□THE CONTRACTOR SHALL MA□E AN□ CHANGES IN THE SHEA□ES□ BELT OR MOTOR SI□E RE□□IREMENT FOR CORRECT BALANCE AS RE□□IRED AT NO ADDITIONAL COST TO THE OWNER□ THEREAFTER□THE CONTRACTOR SHALL S□BMIT A BALANCE REPORT OF THE H□AC S□STEM□ALL S□STEMS SHALL BE LEFT IN WOR□ING ORDER□BALANCING M□ST BE DONE BEFORE FINISHED CEILING IS INSTALLED□CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMO□AL OF ALL DEBRIS LEFT B□ THE MECHANICAL TRADES□

18□ FOR THE E□ACT LOCATION OF ALL THE CEILING MO□NTED AIR DE□ICES REFER TO THE ARCHITECT□RAL DRAWINGS□

19□ ALL E□□IPMENT AND MATERIAL BRO□GHT TO THE SITE IS THE PROPERT□ OF THE CONTRACTOR □NTIL THE OWNER HAS OFFICIALL□ ACCEPTED THE FINAL INSPECTION□IT IS THE CONTRACTOR□S RESPONSIBILIT□ TO PRO□IDE PROTECTION FOR E□□IPMENT AND MATERIAL □NTIL COMPLETION OF THE PRO□ECT□

20□ ALL SHEETMETAL D□CTWOR□ AND FITTINGS SHALL BE SEC□REL□ INSTALLED AND STEEL ANGLE REINFORCED AND PROPERL□ S□PPORTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS□ALL CONNECTIONS AND □OINTS IN THE E□ITING AND NEW D□CTWOR□ SHALL BE SEALED AND CA□L□ED AIR TIGHT IN AN APPRO□ED MANNER FOR THE □ARIO□S PRESS□RE APPLICATIONS□

21□ WHEN A DESIGN BASE IS INDICATED AND OTHER THAN THE DESIGN BASE E□□IPMENT IS APPRO□ED□DESIGN ALL NECESSAR□ MODIFICATIONS AT NO ADDITIONAL COST TO THE OWNER AND S□BMIT A SHOP DRAWING OF THE PROPOSED INSTALLATION□

22□ □ERIF□ ALL E□ISTING WOR□□PRO□IDE ALL NECESSAR□ MATERIAL□LABOR□AND E□□IPMENT RE□□IRED TO MODIF□ E□ISTING WOR□ AS NECESSAR□□IN ADDITION□MAINTAIN INTEGRIT□ OF THE E□ISTING S□STEM□

23□ CONTRACTOR SHALL G□ARANTEE INSTALLATION AGAINST DEFECTS IN MATERIALS□E□□IPMENT□AND WOR□MANSHIP FOR A PERIOD OF 12 MONTHS FROM THE DATE OF FINAL ACCEPTANCE□IF□D□RING G□ARANTEE PERIOD□AN□ DEFECTS APPEAR□CONTRACTOR SHALL REMED□ THEM INCL□DING AN□ NECESSAR□ MATERIALS AND LABOR WITHO□T COST TO THE OWNER□

24□ REPAIR AND PA□ FOR ALL DAMAGE DONE TO THE E□ISTING AND NEW WOR□□

25□ PROTECT ALL MECHANICAL E□□IPMENT□PL□MBING FI□T□RES AND TRIM FROM MORTAR□PAINT□ETC□□D□RING CONSTR□CTION□ALL PROD□CTS □SED IN MECHANICAL S□STEMS SHALL BE ASBESTOS-FREE□

26□ COORDINATE E□ACT LOCATION OF CONSTR□CTION TO PRECL□DE AN□ INTERFERENCE BETWEEN NEW AND E□ISTING PIPING□WIRING□LIGHTING FI□T□RES□CABLE TRA□S□ D□CTWOR□□B□ILDING E□□IPMENT□PNE□MATIC T□BING□ WOR□ B□ OTHER CONTRACTORS□AND OTHER CONSTR□CTION□

27□ COORDINATE E□ACT LOCATION OF E□□IPMENT RE□□IRING SER□ICE TO PRECL□DE AN□ INTERFERENCE WITH E□□IPMENT ACCESS DOORS OR PANELS OR WITH SER□ICE TO E□□IPMENT□INSTALLATION SHALL BE MADE SO THAT E□□IPMENT SER□ICE CAN BE ACCOMPLISHED WITHO□T HA□ING TO REMO□E E□□IPMENT□

28□ CONTRACTOR SHALL CONFIRM ALL A□AILABLE □TILIT□ SER□ICES□STORAGE AREAS AND TRANSPORTATION MEANS□

29□ ALL E□□IPMENT SHALL BE NEW □NLESS NOTED OTHERWISE AND SHALL CONFORM IN ALL RESPECTS TO THE LATEST STANDARDS OF ANSI□ASME□ASTM□FM□MIOSHA AND PDI□

30□ DO NOT PRO□IDE FLE□IBLE D□CTWOR□ TO AIR DE□ICES LOCATED ABO□E G□P BOARD CEILING□D□CTWOR□ ABO□E G□P BOARD CEILING SHALL BE SHEET METAL□

31□ PIPING LA□O□T IS SCHEMATIC ONL□□FINAL LA□O□T AND PIPING SI□ES SHALL BE COORDINATED WITH E□□IPMENT S□PPLIER□PREPARE COORDINATION DRAWINGS□

32□ MA□IM□M LENGTH OF FLE□IBLE D□CTWOR□ INSTALLATION SHALL BE 5 FEET□

33□ INSTALL LOC□ING □□ADRANT BALANCING DAMPER ON EACH DIFF□SER AND GRILLE R□NO□T□

MECHANICAL SPECIFICATIONS

1□ DESCRIPTION OF WOR□

A□Co□tractor □□all pro□de all □ater□al□e□□p□e□t a□d la□or to pro□de a co□plete a□d operat□□ □□tallat□o□□

B□Wor□ □□cl□de□la□or a□d □ater□al□ □ece□□ar□ for de□ol□t□o□ a□d □□tallat□o□ of □e□ e□□p□e□t p□p□□□d□ct□or□a□d ot□er □ec□a□□cal □te□□ a□ de□cr□□ed □ere□□ a□d □□o□□ o□ dra□□□□□ O□□□□o□ of d□rect refere□ce □ere□□ to a□□ e□□e□t□al □te□ □□all □ot e□c□□e co□tractor fro□ co□pl□□□□ □□t□ de□□□□ □□te□t□ Dra□□□□□ are d□a□ra□□at□c □□le□□ d□□e□□□o□ed□T□e dra□□□□□ d□a□ra□□at□call□ □□o□ □□□□e□ted e□a□ple□ for po□□□□le ro□t□□□ of □ec□a□□cal □□□te□□□T□e dra□□□□□ are □a□ed o□ a□a□la□le □□for□at□o□ a□d do □ot □□o□ t□e o□l□ po□□□□le arra□□e□e□t□ or do t□e□ rel□e□e t□e co□tractor□ of t□e re□po□□□□□l□t□ of f□eld □er□f□cat□o□ a□d preparat□o□ of coord□□at□o□ dra□□□□□

C□Pro□de □ □□cella□eo□□ □teel a□d □ard□are a□ re□□□red to □□pport□ a□dle□a□d □ec□re e□□p□e□t f□r□□□ed a□ part of t□□□ □or□□

D□Perfor□ c□tt□□□ a□d core dr□ll□□□ a□ re□□□red for □or□ de□cr□□ed□

E□Pro□de □lee□e□ for p□pe□ pa□□□□□ t□ro□□□ □la□□□ □all□ □or floor□ (3" □□□□ at floor pe□etrat□o□□)□

F□T□e O□□er□□ repre□e□tat□□e □□ to □e □ot□f□ed of all te□t□□□ a□d fl□□□□□□□ □ clea□□□□ a□d e□□p□e□t □tart-□p□□ Cop□e□ of □tart-□p report□ are to □e pro□□ded to O□□er□□ repre□e□tat□□e□

G□T□e □□tall□□□ co□tractor □□all pro□de a □al□t□ro□□□ a□d tra□□□□□ for t□e O□□er□□ □□ld□□□ e□□□□eer□ at or □ear co□plet□o□ of t□e pro□ect□

H□Operat□o□ a□d □a□□te□a□ce □a□□al□ are to □e pro□□ded for all co□po□e□t□ a□d/or □□□te□□ re□□□r□□□ a □a□□al□

I□ S□□□□□t for appro□al □□op dra□□□□□ for all □ec□a□□cal □□□te□□ or e□□□p□e□t □□t □ot l□□□ted to t□e □te□□ l□□ted □elo□□

D□ct Acce□□or□e□ — Gr□lle□□Re□□□ter□□ D□ff□□er□
Co□trol□ — I□□□lat□o□

2□ CODES□PERMITS□AND INSPECTIONS

A□Wor□ □□all □e □□talled □□ accorda□ce □□t□ local□□tate□a□d federal re□□lat□o□□ a□d ord□□a□ce□□

B□Sec□re a□d pa□ for all per□□t□ a□d □□□pect□o□□□

3□ STANDARDS

A□All e□□□p□e□t □□all □e □e□ □□le□□ □oted ot□er□□□e a□d □□all co□for□ □□ all re□pect□ to t□e late□t appro□ed □ta□dard□ of ANSI□ASME□ASTM□FM□IRI□ MIOSHA a□d PDI□

4□ PRO□ECT/SITE CONDITIONS

A□Co□tractor □□all □□□t□o□ □te a□d e□a□□□e pre□□□e□ at a□d ad□ace□t to propo□ed □or□□a□d □□all f□ll□ □for□ □□□elf of t□e co□d□t□o□ of pre□□□e□ □□t□ re□pect to co□□tr□ct□o□□□act□al le□el□ e□ca□at□o□□ f□ll a□d ot□er re□□□re□e□t□ □ece□□ar□ for carr□□□□ o□t t□□□ □or□□

B□Co□tractor □□all co□f□r□ all a□a□la□le □t□l□t□ □er□ce□□tora□e area□□a□d tra□□portat□o□ □ea□□□

5□ REMODELING

A□Co□tractor □□all co□pl□ □□t□ all re□□□re□e□t□ for co□f□□ed □pace e□tr□ to t□e □at□□fact□o□ of t□e O□□er□□ □afet□ depart□e□t□Co□tractor □□all pre□e□t a pla□ for □afe e□tr□ a□d co□□tr□ct□o□ □et□od□ a□d □□all f□r□□□□ all re□□□red te□t□□□ a□d □afet□ e□□□p□e□t□

B□Locate e□□□t□□□ p□p□□□ a□d □a□e co□□ect□o□□ □□ere re□□□red or □□ere □□o□□ o□ t□e dra□□□□□□Do □ot c□t □□to e□□□t□□□ □er□ce□ □□t□o□t □er□f□□□□ □□t□ t□e O□□er t□at t□e p□pe □□□ol□ed □□t□e de□□red □er□ce□ I□ a□□ area□ □□ere □ec□a□□cal □or□ □□ □□□ol□ed□re□tore t□e area to □t□ or□□□□al co□d□t□o□ □po□ co□plet□o□ of □or□□

C□Perfor□ □or□ t□at □□terr□pt□ a□□ □er□ce or □□□te□ □□□cl□d□□□ c□tt□□□ e□□□t□□□ l□□e□ for □e□ co□□ect□o□□□ at t□□e□ (□□□all□ at □□□□t□ after O□□er□□ □or□al operat□□□ □o□r□□or d□r□□□ □lo□e□t per□od□ of act□□□t□) to ca□□e □o □□terfere□ce to t□e □or□al operat□o□ of t□e □□□ld□□□□

D□I□for□ t□e O□□er □□ ad□a□ce of a□□ □□□□t-off t□at □□ll occ□r a□d □□□e e□t□□ate of d□rat□o□□O□ta□□ O□□er□□ per□□□□□o□ for □□□te□ □□□t-do□□□ 24 □o□r□ □□ ad□a□ce□ O□l□ after t□e O□□er□□ fac□l□t□e□ □a□a□e□e□t □taff □□ f□ll□ □□for□ed□ a□d □a□ appro□ed t□e □c□ed□le of □□□t-off□ ca□ t□e □or□ t□e□ proceed accord□□□l□□

E□All d□ff□□er□□co□l□□□al□e□□t□er□o□tat□□ f□t□re□□□p□p□□□ a□d ot□er □al□a□le e□□□p□e□t to re□a□□ propert□ of t□e O□□er□ e□cept □□ere □oted ot□er□□□e□ □□all □e □tored o□ t□e □te □□ere d□rected□

F□Protect all □ec□a□□cal e□□□p□e□t□pl□□□□□ f□t□re□ a□d tr□□ fro□ □ortar□ pa□□t□etc□d□r□□□ co□□tr□ct□o□□ All prod□ct□ □□ed □□ □ec□a□□cal □□□te□□ □□all □e a□□e□to□-free□

6□ CLEANING AND PAINTING

A□Clear a□a□ all de□r□□□□rpl□□ □ater□al□re□□lt□□□ fro□ □ec□a□□cal □or□or operat□o□□ lea□□□□ t□e □o□ a□d e□□□p□e□t □□ a clea□□ f□r□t-cla□□ co□d□t□o□□ W□ere □e□ □or□ occ□r□ □□ e□□□t□□□ area□□ clea□ a□d re□tore to or□□□□al co□d□t□o□□

B□Clea□ □pec□alt□e□ □□c□ a□ trap□□ □tra□□er□□etc□a□d all □ec□a□□cal e□□□p□e□t □□rface□□

7□ SELECTI□E DEMOLITION

A□Re□o□e d□ct□or□□co□trol□a□d e□□□t□□□ e□□□p□e□t a□ □□d□cated□

B□Re□o□e d□ct□or□ (□□cl□d□□□ □a□□er□□□□□lat□o□□da□per□□etc□) d□ff□□er□□ □rlle□a□d re□□□ter□a□ □□d□cated□ Cap d□ct ope□□□□□ a□ re□□□red to □a□ta□□ a□rt□□□t co□d□t□o□ a□d a□ re□□□red to clo□e off a□a□do□ed □ra□c□□or □a□□ d□ct□ to re□a□□ co□□ected to act□□e □□□te□ □a□rt□□□t□

C□All e□□□p□e□t□pl□□□□ f□t□re□□tr□□ □□rlle□/re□□□ter□/d□ff□□er□□a□d co□trol□ □ot re□□ed □□all re□a□□ t□e propert□ of t□e O□□er□□□le□□ ot□er□□□e d□rected□ a□d □□all □e del□□ered □□t□□□ co□tractor to a □tora□e area at t□e pro□ect □te a□ d□rected □□ t□e O□□er□□ pro□ect repre□e□tat□□e□

D□□□cla□□ed de□ol□□ed □ater□al□ □□all □e le□all□ d□po□ed of□off-□te□□□□ t□e co□tractor a□ part of t□□□ □cope of □or□ a□d at □o add□t□o□al co□t to t□e O□□er□

8□ CONNECTIONS TO E□ISTING S□STEMS

A□Ma□e all co□□ect□o□□ to e□□□t□□□ □□□te□ □p□p□□□ a□d e□□□p□e□t d□r□□□ de□□□□ated per□od□ □po□ appro□al of t□e O□□er a□d at □o □□crea□e □□ t□e co□tract □□□□

B□□er□f□ all e□□□t□□□ □or□□Pro□de all □ece□□ar□ □ater□al□la□or a□d e□□□p□e□t re□□□red to □od□f□ e□□□t□□□ □or□ a□ □ece□□ar□□ I□ add□t□o□□□ a□ta□□ □□te□r□t□ of t□e e□□□t□□□ □□□te□□□

9□ G□ARANTEE

A□Co□tractor □□all □□ara□tee □□□tallat□o□ a□a□□□t defect□ □□ □ater□al□□e□□□p□e□t□ a□d □or□□a□□□□p for a per□od of 12 □o□t□□ fro□ t□e date of f□□al accepta□ce□If□ d□r□□□ □□ara□tee per□od□a□□ defect□ appear□ Co□tractor □□all re□ed□ t□e□□ □□cl□d□□□ a□□ □ece□□ar□ □ater□al□a□d la□or □□t□o□t co□t to t□e O□□er□

10□ DAMAGE TO OTHER WOR□

A□Repa□r□a□d pa□ for□all da□a□e do□e to t□e e□□□t□□□ a□d □e□ □or□□

11□ COORDINATION OF THE WOR□

A□Coord□□ate □or□□□t□ ot□er trade□ to a□o□d □□terfere□ce□a□d to pre□e□t a □eat appeara□ce□ I□terfere□ce□□ □□□c□ re□□lt d□e to a lac□ of coord□□at□o□ are t□e co□tractor□□ re□po□□□□l□t□ to correct□

B□□er□f□ locat□o□□ of e□□□t□□□ p□p□□□ for co□□ect□o□□ to □a□e a□d □□ld□□□ □tr□ct□ral □ea□□□ to a□o□d po□□□□le □□terfere□ce□

C□Coord□□ate e□act locat□o□ of co□□tr□ct□o□ to precl□de a□□ □□terfere□ce □et□ee□ □e□ a□d e□□□t□□□ p□p□□□□□□r□□□□l□□□t□□□ f□t□re□□ca□le tra□□□d□ct□or□□□□ld□□□ e□□□p□e□t□□or□ □□ ot□er co□tractor□□a□d ot□er co□□tr□ct□o□□

D□Coord□□ate e□act locat□o□ of e□□□p□e□t re□□□r□□□ □er□□ce to precl□de a□□ □□terfere□ce □□t□ e□□□p□e□t acce□□ door□ or pa□el□ or □□t□ □er□□ce to e□□□p□e□t□I□□tallat□o□ □□all □e □ade □o t□at e□□□p□e□t □er□□ce ca□ □e acco□pl□□□ed □□t□o□t □a□□□□ to re□o□e e□□□p□e□t□

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13□ ESC□TCHEON PLATES

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14□ MECHANICAL IDENTIFICATION AND PAINTING

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4□P□p□□□ □de□t□f□cat□o□ □ater□al□ □□all □e lar□er□□□le la□el□□3-1/2" □□□□ a□ □a□□fact□red □□ Brad□ or Seto□□o□ p□p□□□ 10" a□d lar□er□ 2-1/2" □□□o□ p p aller t a 10" a d "letter o p p " a d aller

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15□ MECHANICAL INS□LATION

A□Ge□eral

1□Co□tractor □□all pro□de t□er□al □□□□lat□o□ all □□ppl□ d□ct□or□□ o□t□de a□r □□ta□e d□ct□or□ a□d ret□r□ a□r d□ct□or□□I□□□lat□o□ □□all □ot □e □□□talled □□t□l □□□te□ □ a□e □ee□ te□ted a□d □□□pected□

2□All □□□□lat□o□ o□ p□p□□□ a□d d□ct□or□ t□at □a□ □ee□ da□a□ed or □a□ □ee□ da□a□ed d□r□□□ co□□tr□ct□o□ □□all □e repa□red to l□□e-□e□□co□d□t□o□□

3□Appro□ed □a□□fact□rer□ for f□□er□la□□ □□□□lat□o□□ Certa□□teed□ O□e□□-Cor□□□□ F□□er□la□□ Corp□□Ma□□□lle Prod□ct□ Corp□a□d □□a□f F□□er Gla□□□

4□All □□□□lat□o□□□□cl□d□□□ fac□□□□ce□e□t□a□d ad□e□□□e□ □□□ □e te□ted per ASTM E84 □□□ □L □□all □a□e a fla□e □pread rat□□□ of le□□ t□a□ 25□a□d a □□o□e de□eloped rat□□□ of le□□ t□a□ 50□

5□For ad□e□□□e□ □□a□t□c□coat□□□□ a□d □eala□t□ appro□ed □a□□fact□rer□ are□ Fo□ter Prod□ct□□D□□□HB F□ller Co□□I-C Ad□e□□□e□ Co□□C□□ca□o Ma□t□c Co□□ C□□lder□ Prod□ct□ Co□□a□d St□Clar□ R□□□er Co□

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Co□cealed d□ct□or□ □□all □e co□ered □□t□ 1-1/2 □□c□ □la□□ f□□er fle□□□le □la□□et □□□□lat□o□ □□t□ a de□□□t□ of 1□5 l□□/c□□ft□ Bla□□et □□all □a□e a □apor retarda□t □ac□et of al□□□□□□□ fo□l re□□forced □□t□ f□□er□la□□ □ar□ a□d la□□□ated to a f□re re□□□ta□t □raft paper□□ec□red □□t□ □L l□□ted pre□□□re □e□□□t□□e tape□

16□ METAL D□CTWOR□

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F□Clear Acce□□

Clear acce□□ fro□ t□e occ□p□ed □pace □□all □e □a□□ta□□ed to de□□ce□ □□t□□□ d□ct□ (da□per□□e□□or□□TAB □o□e□etc□)□□t□o□t re□□□r□□□ per□o□□el to □tep o□ d□ct□or□ re□o□e e□□□p□e□t□ re□o□e p□p□□□□ or re□o□e e□□□p□e□t or p□p□□□ □□pport□□

17□ D□CTWOR□ ACCESSORIES

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18□ C□TTING AND PATCHING

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19□ TESTING AND BALANCING

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21□ RECORD DRAWINGS

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ssoe

PROFESSIONAL SEALS□

PRO□ECT PARTNERS□

□E□PLAN

S□BMITTAL/RE□ISION SCHED□LE□

NO.	DATE	DESCRIPTION
	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
■ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION□

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #: PRO□ECT N□MBER
JHA PROJECT #: PRO□ECT N□MBER

PRO□ECT INFORMATION□

WS□ APPLEBA□M MRI

□E□ PLAN
NO SCALE

259 MAC□ A□E
DETROIT□MICHIGAN
48201

SSOE PROJECT #: 023-03727-00
SSOE MANAGER: □EFF FAL□ON

ssoe
1050 W□l□□re Dr□e□S□te 260
Tro□□MI 48084-1526
T□(248) 643-6222

H□AC NOTES□ LEGEND□SPECS□ □ ABBRE□IATIONS

MH-001

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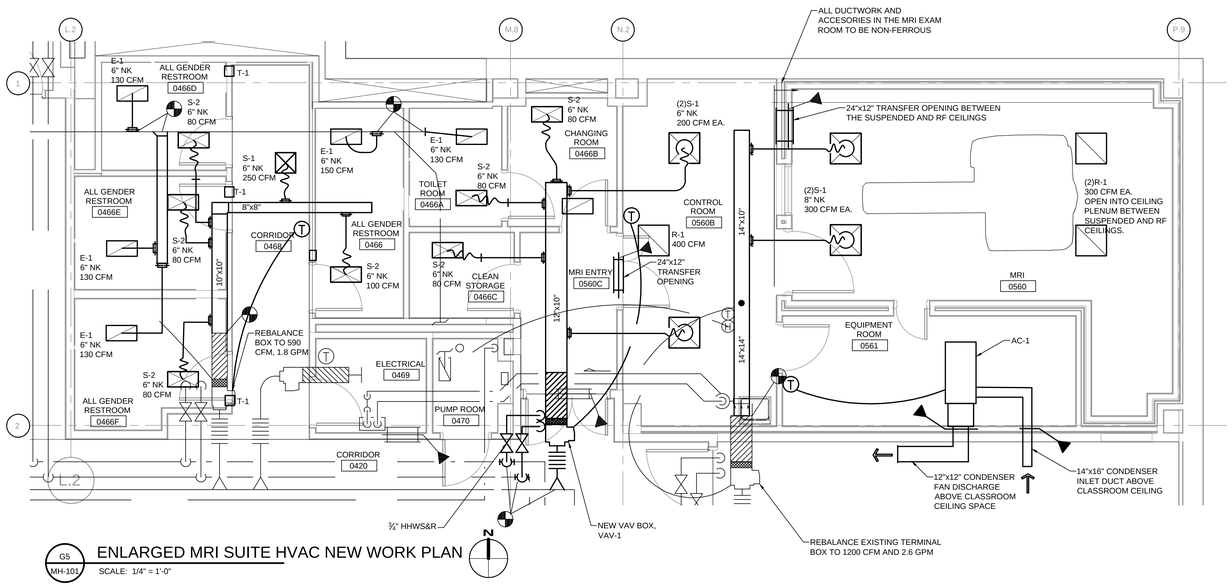


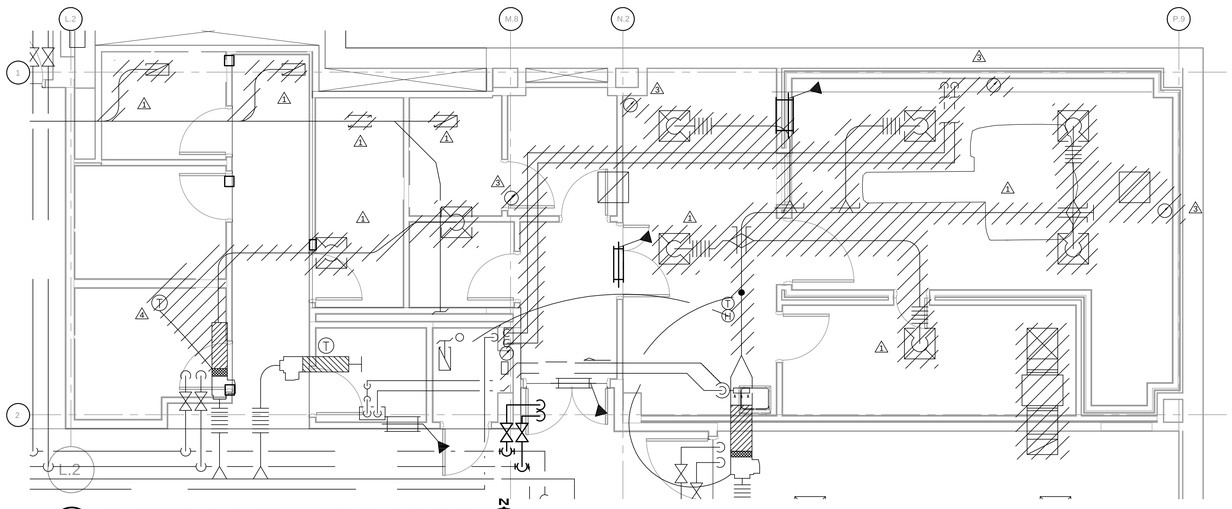
G5
MH-101

ENLARGED MRI SUITE HVAC NEW WORK PLAN

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

HVAC NEW WORK KEYNOTES

1. REBALANCE EXISTING BOX AND DIFFUSER TO 170 CFM AND RELOCATE THERMOSTAT.
2. REBALANCE EXISTING BOX TO 180 CFM AND RELOCATE THERMOSTAT.
3. REBALANCE EXISTING BOX TO 400 CFM AND RELOCATE THERMOSTAT.
4.



G7
MH-101

ENLARGED MRI SUITE HVAC DEMOLITION PLAN

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

HVAC DEMOLITION KEYNOTES

1. REMOVE ALL DIFFUSERS, GRILLES, CEILING EXHAUST FANS AND ASSOCIATED DUCTWORK IN THE PROJECT WORK AREA AS SHOWN. REMOVE DUCTS AS SHOWN AND CAP AIRTIGHT.
2. REMOVE EXISTING THERMOSTATS FOR FUTURE INSTALLATION LOCATION.
3. REMOVE EXISTING OXYGEN SENSORS FOR FUTURE INSTALLATION LOCATION.
4. RELOCATE EXISTING THERMOSTAT.

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PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
■ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

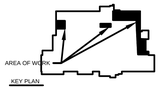
WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI



259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
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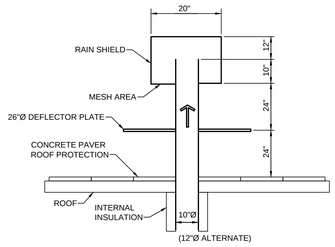
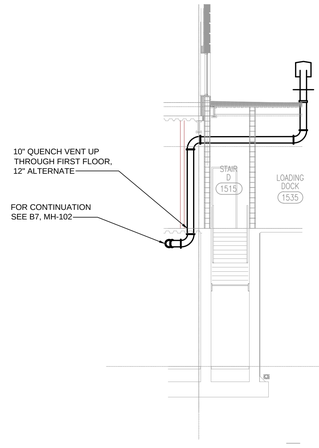
ENLARGED MRI SUITE
HVAC PLANS

MH-101



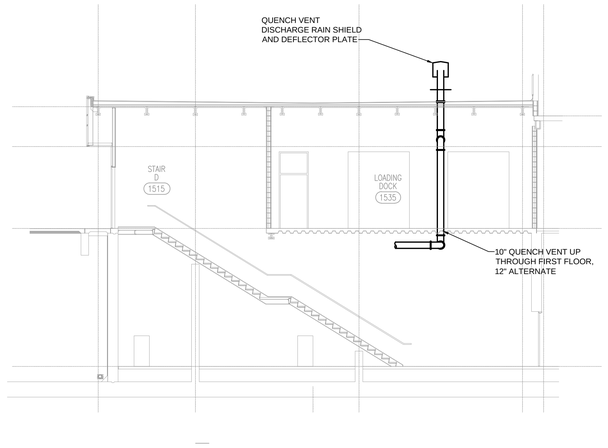
D7 / MH-102 — QUENCH VENT RAIN SHIELD DETAIL

NO SCALE



D3 / MH-102 — SECTION

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



E3 / MH-102 — SECTION

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

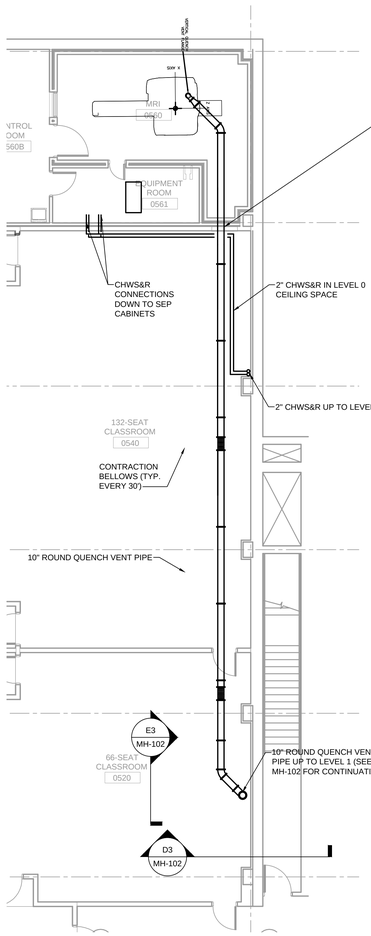
Quench Line Calculator Report

WSU APPLEBAUM MRI 45 elbows

Magnet Type:	3T	Total pressure drop:	81.91
Mass flow rate:	2	Total length:	39.72
Max pressure:	100	Inlet flange force:	149.4
		Outlet thrust:	116.9
		Gas temperature:	72
		Gas velocity:	58.2

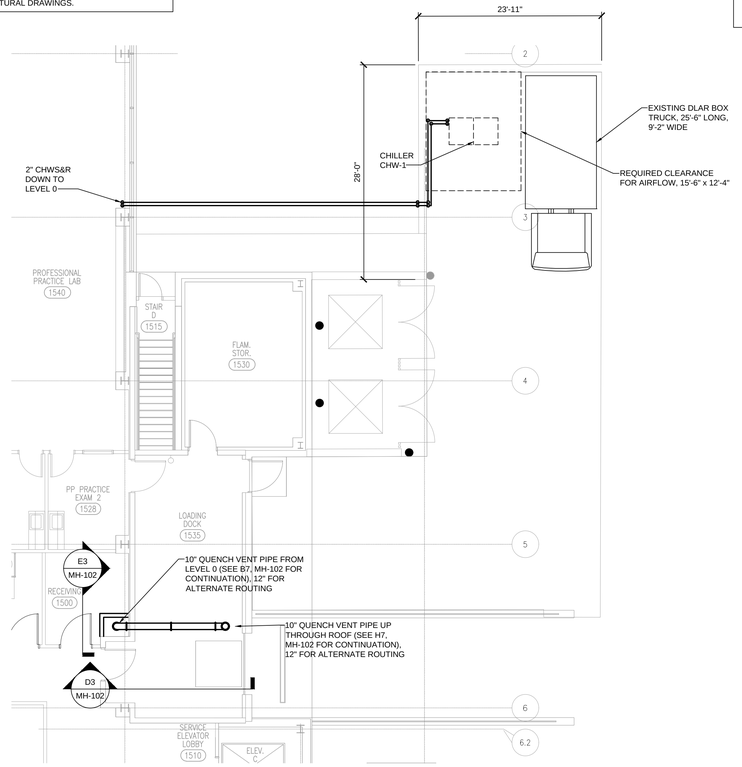
PASS

Type	Diameter (in)	Diameter (mm)	Length (m)	Length (ft)	Pressure Drop (mbar)	Total Pressure (mbar)
Vibration decoupler	6	152	0.37	1.21	4.84	4.84
Straight smooth	6	152	1.00	3.28	6.51	11.35
90° smooth	10	254	0.60	1.96	1.88	13.23
Straight smooth	10	254	1.50	4.92	1.10	14.32
45° smooth	10	254	0.30	0.98	1.61	15.94
Straight smooth	10	254	25.50	83.66	32.07	48.00
45° smooth	10	254	0.30	0.98	3.24	51.25
Straight smooth	10	254	2.00	6.56	3.31	54.56
90° smooth	10	254	0.60	1.96	5.09	59.65
Straight smooth	10	254	3.65	12.01	6.39	66.04
90° smooth	10	254	0.60	1.96	5.37	71.41
Straight smooth	10	254	2.70	8.86	4.93	76.34
90° smooth	10	254	0.60	1.96	5.57	81.91



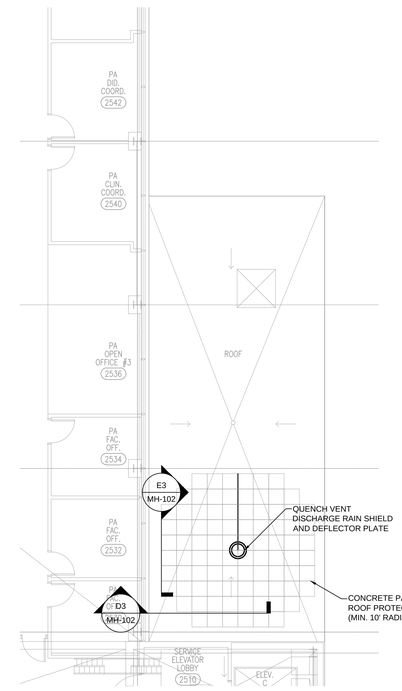
B7 / MH-102 — PARTIAL LEVEL 0 QUENCH VENT AND CHILLER PIPING NEW WORK PLAN

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



D7 / MH-102 — PARTIAL LEVEL 1 QUENCH VENT AND CHILLER PIPING NEW WORK PLAN

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



H7 / MH-102 — PARTIAL QUENCH VENT AND CHILLER PIPING ROOF NEW WORK PLAN

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

QUENCH VENT NOTES

1. QUENCH VENT TO BE WELDED OR FLANGED WITH FIBER GASKETS AND STAINLESS STEEL (>22 GA) GRADES 304, 309, 316 OR 321 OR ALUMINUM 6063 OR 6082 (MIN. 14 GA).
2. QUENCH VENT EXIT SHALL BE VERTICAL THROUGH THE ROOF WITH RAIN SHIELD AND DEFLECTOR PLATE. PROTECTION OF THE OUTLET SHALL BE ½" WIRE MESH OF ½" WIRES. PROTECT EXISTING ROOF WITH CONCRETE PAVERS FOR A DISTANCE OF 10'.
3. ALL ELBOWS SHALL BE SMOOTH WALLED WITH A BEND RADIUS TO DIAMETER OF A MINIMUM OF 1.5.
4. ENTIRE VENT LENGTH SHALL BE INSULATED WITH A MINIMUM OF 1" OF MINERAL FIBER INSULATION OR 1" OF ARMAFLEX.

PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

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Wayne State University

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DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
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PROJECT INFORMATION:

WSU APPLEBAUM MRI

KEY PLAN
NO SCALE

259 MACK AVE
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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
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Troy, MI 48084-1526
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QUENCH VENT PLANS AND DETAILS

MH-102

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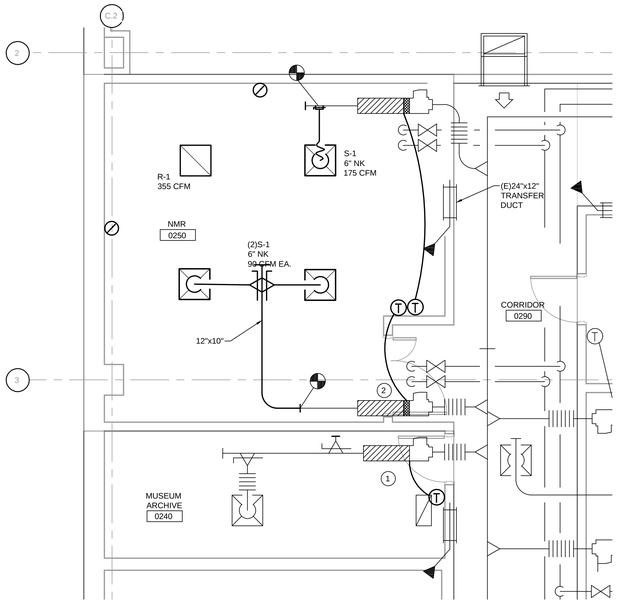
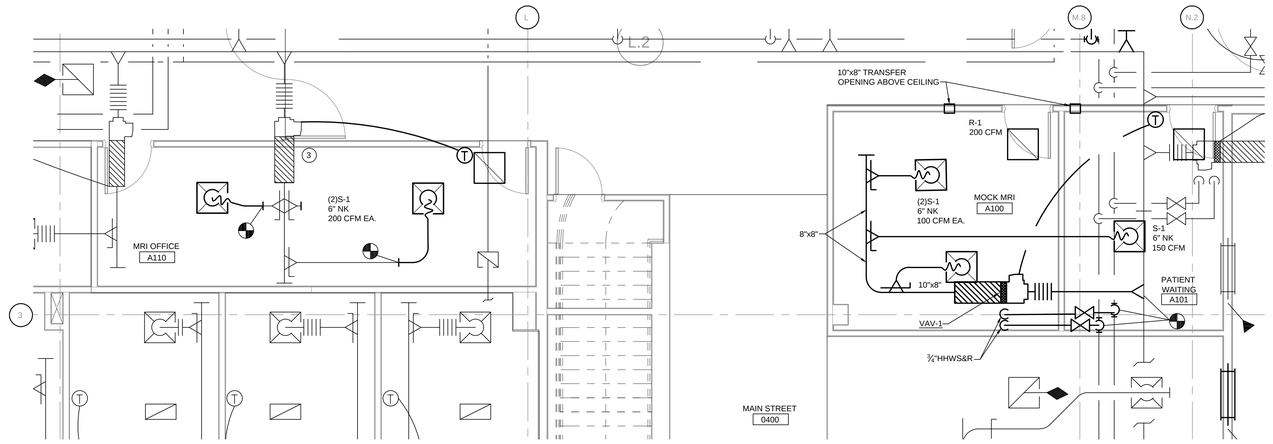


A5 / MH-101 ENLARGED NMR 0250 HVAC NEW WORK PLAN

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



D5 / MH-101 ENLARGED MRI OFFICE A110 HVAC NEW WORK PLAN

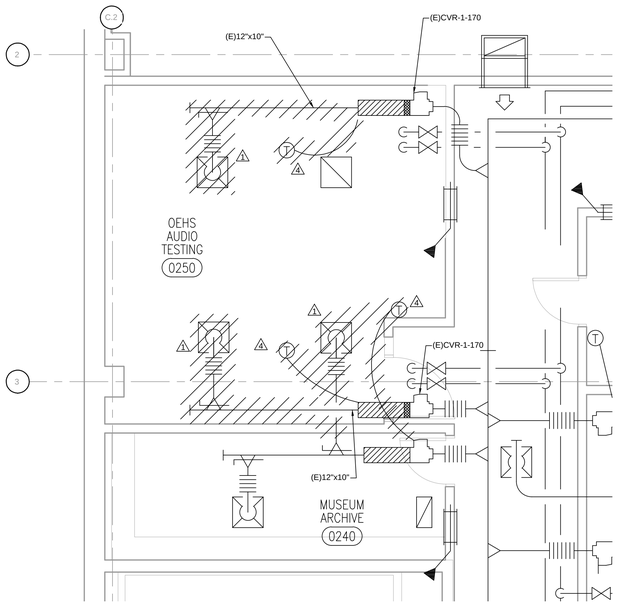
SCALE: 1/4" = 1'-0"

HVAC DEMOLITION KEYNOTES

1. REMOVE ALL DIFFUSERS, GRILLES, CEILING EXHAUST FANS AND ASSOCIATED DUCTWORK IN THE PROJECT WORK AREA AS SHOWN. REMOVE DUCTS AS SHOWN AND CAP AIRTIGHT.
2. REMOVE EXISTING THERMOSTATS FOR FUTURE INSTALLATION LOCATION.
3. REMOVE EXISTING OXYGEN SENSORS FOR FUTURE INSTALLATION LOCATION.
4. RELOCATE EXISTING THERMOSTAT.

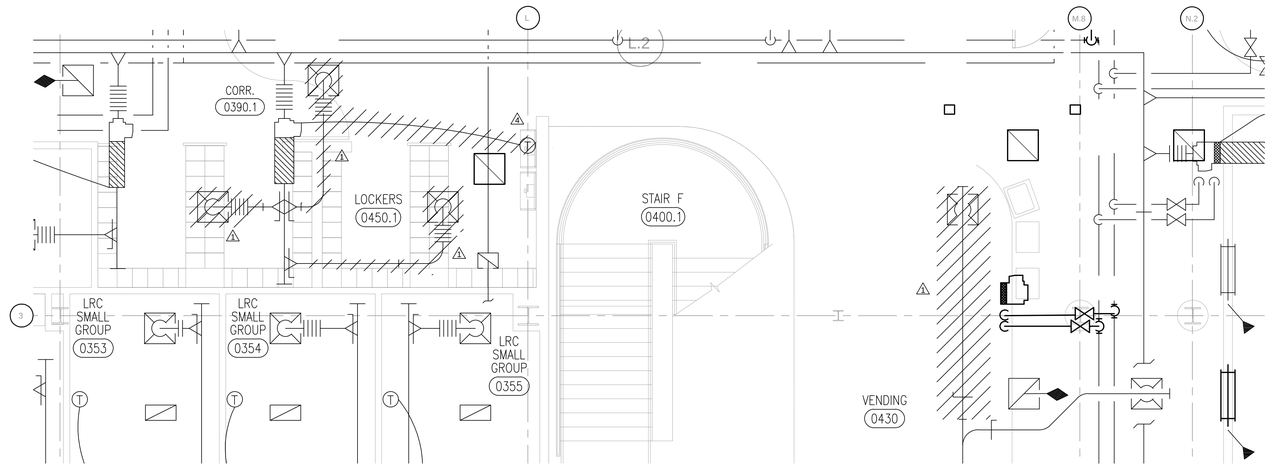
HVAC NEW WORK KEYNOTES

1. REBALANCE EXISTING BOX AND DIFFUSER TO 170 CFM AND RELOCATE THERMOSTAT.
2. REBALANCE EXISTING BOX TO 180 CFM AND RELOCATE THERMOSTAT.
3. REBALANCE EXISTING BOX TO 400 CFM AND RELOCATE THERMOSTAT.
4. S-1, 6" NK, 80 CFM. E-1, 6" NK, 130 CFM.



A7 / MH-101 ENLARGED NMR 0250 HVAC DEMOLITION PLAN

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



D7 / MH-101 ENLARGED MRI OFFICE A110 HVAC DEMOLITION PLAN

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

PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
■ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

AREA OF WORK

KEY PLAN
NO SCALE

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1050 Wilshire Drive, Suite 260
Troy, MI 48084-1526
T: (248) 643-6222

ENLARGED NMR 0250 & MRI OFFICE A110 PLANS

MH-103

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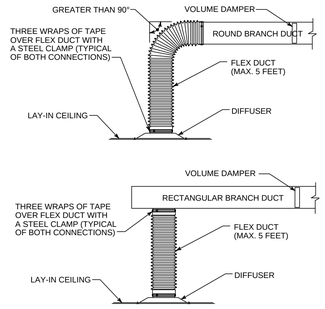
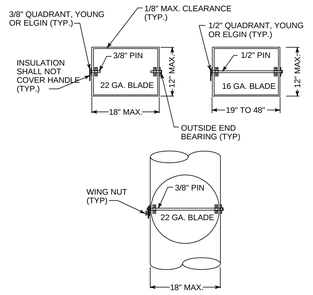


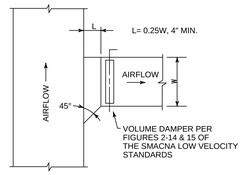
A2 / M600 FLEX DUCT DROP DETAIL

SCALE: NONE



C2 / M600 VOLUME DAMPER DETAIL

SCALE: NONE



D2 / M600 BRANCH DUCT DETAIL (SUPPLY)

SCALE: NONE

AIR TERMINAL BOXES

MARK	MANUFACTURER	MODEL	INLET DUCT VELOCITY (FPM)	INLET SIZE (IN)	DISCHARGE W"xH"	CFM	BOX SP DROP (IN)	HEATING COIL			REMARKS
								MBH	GPM	WATER HD LOSS (FT)	
VAV-1	PRICE	SDV	2300	7	12x10	600	0.01	13.8	2.0	2.59	

GRILLES, REGISTERS AND DIFFUSERS

MARK	FACE SIZE	NECK SIZE	FACE FLOW PATTERN	MANUFACTURER & MODEL	REMARKS
S-1	24"x24"	SEE PLANS	SQUARE	TITUS OMNI-AA	WHITE POWDER COAT FINISH, ALL ALUMINUM
S-2	24"x12"	SEE PLANS	RECT	TITUS PAS-AA	WHITE POWDER COAT FINISH, GYP BD CEILING BORDER
R-1	24"x24"	SEE PLANS	RECT	TITUS PXP-AA	WHITE, ALL ALUMINUM PERFORATED
R-2	24"x12"	SEE PLANS	RECT	TITUS 50F	WHITE, EGG CRATE, ALUMINUM, CLG MOUNTED
E-1	24"x12"	SEE PLANS	RECT	TITUS 50F	WHITE, EGG CRATE, ALUMINUM, GYP BD CEILING BORDER

SPLIT SYSTEM AIR CONDITIONER SCHEDULE

MARK	LOCATION	TYPE	CFM	COOLING DATA		ELECTRICAL DATA			WEIGHT	MANUFACTURER	MODEL	REMARKS
				TOTAL MBH	SENSIBLE MBH	FLA	VOLT	PHASE				
AC-1	EQUIPMENT ROOM	INDOOR	750	17.7	17.1	19	208	1	295	LIEBERT	MMD18A-PJ07N	WITH CONDENSER FAN MODULE, STEAM HUMIDIFIER, DISCHARGE GRILLE, CONDENSATE DRAIN

PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
■ NOT APPROVED FOR CONSTRUCTION

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5454 CASS AVE
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CLIENT PROJECT #:	PROJECT NUMBER
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PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

1050 Willshire Drive, Suite 260
Troy, MI 48084-1526
T. (248) 643-6222

HVAC EQUIPMENT SCHEDULES AND DETAILS

MH-600

PLUMBING / PIPING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
	ANC	ANCHOR
	AV	ANGLE VALVE
	AAV	AUTOMATIC AIR VENT W/HOSE END
	CV-3	AUTO.CONTROL VALVE 3-WAY W/ELECTRIC OPERATOR
	CV-3	AUTO.CONTROL VALVE 3-WAY W/PNEUMATIC OPERATOR
	CV-2	AUTO.CONTROL VALVE 2-WAY W/ELECTRIC OPERATOR
	CV-2	AUTO.CONTROL VALVE 2-WAY W/PNEUMATIC OPERATOR
	BALNCV	BALANCE VALVE
	BCKVA	BALL CHECK VALVE
	BV	BALL VALVE
	BKSTR	BASKET STRAINER
	BF	BLIND FLANGE
	BFV	BUTTERFLY VALVE
	BFV N.C.	BUTTERFLY VALVE NORMALLY CLOSED
	CBV	CALIBRATED BALANCING VALVE
	CKV	CHECK VALVE
	CS	CIRCUIT SETTER
	CON RED	CONCENTRIC REDUCER OR INCREASER
	CSTR	CONSTRUCTION OR SAFETY STRAINER
	DP	DIFFERENTIAL PRESSURE GAUGE
	DPOC	DIRT POCKET
	DV	DRAIN VALVE W/HOSE END
	DRPAN	DRIP PAN ELBOW
	2BKSTR	DUPLEX BASKET STRAINER
	EC RED	ECCENTRIC REDUCER OR INCREASER
		90° ELBOW DOWN
		90° ELBOW UP
	GUIDE	EXPANSION GUIDE
	EXP.JT.	EXPANSION JOINT W/GUIDES
	FT	FINTUBE
	FC	FLEXIBLE CONNECTOR
	FH	FLEXIBLE HOSE
	FD	FLOOR DRAIN
	FL ARR	FLOW ARROW
	FMO	FLOW MEASURING ORIFICE
	FTV	FOOT VALVE
	GCK	GAGE COCK
		VALVE (SEE SPECIFICATIONS FOR TYPE)
	GA	GAUGE
		PIPING OR EQUIPMENT TO BE REMOVED
TT		TEMPERATURE TRANSMITTER
PT		PRESSURE TRANSMITTER
DPT		DIFFERENTIAL PRESSURE TRANSMITTER
FPS		FLOW PROVING SWITCH
		GAUGE GLASS
	GLV	GLOBE VALVE
	MAV	MANUAL AIR VENT W/HOSE END
		METER
	MBUTT	MOTORIZED BUTTERFLY VALVE
	ORI	ORIFICE
		OUTLET
		OUTLET (TEE) DOWN
		OUTLET (TEE) UP
	CAP	PIPE CAP
	FLS	PIPE FLANGES
		PIPE OFFSETTING UP IN RESPECT TO ARROW
	PV	PLUG VALVE
	P	PRESSURE GAUGE W/GAUGE COCK
	P	PRESSURE GAUGE W/SIPHON & GAUGE COCK
	PRV	PRESSURE REDUCING VALVE PILOT OPERATED
	PRV	PRESSURE REDUCING VALVE SELF CONTAINED
	PRVV	PRESSURE REGULATING VALVE W/VENT
	RPBFP	REDUCED PRESSURE BACKFLOW PREVENTER
	SV	RELIEF OR SAFETY VALVE
	SOL-3	SOLENOID VALVE 3-WAY
	SOL-2	SOLENOID VALVE 2-WAY
		STEAM TRAP
	STR	STRAINER (WYE TYPE)
	STR	STRAINER (WYE TYPE) W/BALL VALVE BLOW DOWN & HOSE END
	STR	STRAINER (WYE TYPE) W/GATE VALVE BLOW DOWN & HOSE END
		SUCTION DIFFUSER
		TEE BRANCH
	T	TEMPERATURE INDICATOR
	TC	TEST CONNECTION
	THERM	THERMOMETER
	TAV	THERMOSTATIC AIR VENT W/HOSE END
	TW	THERMOWELL
	UN	UNION
	VB	VACUUM BREAKER
	VABX	VALVE BOX
		VALVE IN PIPING RISE
	WCKVA	WAFER CHECK VALVE
	WHA	WATER HAMMER ARRESTOR
	DCW	DOMESTIC COLD WATER
	DHW	DOMESTIC HOT WATER
	DHWR	DOMESTIC HOT WATER RETURN
	SAN	SANITARY WASTE
	SANV	SANITARY VENT

ABBREVIATIONS

(NOT ALL ABBREVIATIONS USED)

ABBREVIATION	DESCRIPTION
AAV	AUTOMAITC AIR VENT
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR OR AREA DRAIN
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AIV	ALARM INTERFACE VALVE
ARCH	ARCHITECTURAL
ARR	ARRANGEMENT
BF	BLIND FLANGE
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BMS	BULIDING MANAGEMENT SYSTEM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOT	BOTTOM
BTUH	BRITISH THERMAL UNIT PER HOUR
CD	CEILING DIFFUSER
CENTRIF.	CENTRIFUGAL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CO	CLEANOUT
COND	CONDENSATE
CONN.	CONNECTION
CONT.	CONTINUATION
CONTR.	CONTRACTOR
CP	CONDENSATE PUMP
CSS	CLINICAL SERVICE SINK
CUH	CABINET UNIT HEATER
CW	COLD WATER
DD	DECK DRAIN
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DET	DETAIL
DI	DE-IONIZED WATER
DIA	DIAMETER
DMPR	DAMPER
DN	DOWN
DWG	DRAWING
E	EXISTING
EA	EXHAUST AIR OR EACH
EG	EXHAUST GRILLE
EF	EXHAUST FAN
EFF	EFFICIENCY
ELECT	ELECTRICAL
ELEV	ELEVATION
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
EW	EYE WASH
EXH	EXHAUST
EXIST.	EXISTING
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FLEX.	FLEXIBLE
FLR	FLOOR
FM	FLOW METER
FP	FIRE PROTECTION
FPM	FEET PER MINUTE
FU	FIXTURE UNITS
GA	GAUGE
GAL	GALLON
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HO	HUB OUTLET
HORIZ	HORIZONTAL
HP	HORSEPOWER OR HIGH PRESSURE
HW	HOT WATER
HWR	HOT WATER RETURN
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INSUL.	INSULATION
IW	INDIRECT WASTE
KW	KILOWATT
KWH	KILOWATT HOUR
LAV	LAVATORY
LB	POUND
MA	MEDICAL AIR
MAX	MAXIMUM
MBH	1000 BTU/HR
MIN	MINIMUM
MV	MEDICAL VACUUM
N	NITROGEN OR NEW
N/A	NOT APPLICABLE
NG	NATURAL GAS
NK	NECK
N2O	NITROUS OXIDE
NTS	NOT TO SCALE
OA	OUTSIDE AIR
O2 OR OXY	OXYGEN
P	PUMP
PH	PHASE
PRV	PRESSURE REDUCING VALVE
PSI(G)	POUNDS PER SQUARE INCH (GAUGE)
RA	RETURN AIR
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SAN	SANITARY
SD	SUPPLY DIFFUSER
SK	SINK
SG	SUPPLY GRILLE
SH	SHOWER
SP	STATIC PRESSURE OR SUMP PUMP
SPEC	SPECIFICATIONS
SQ	SQUARE
SS	SERVICE SINK OR STAINLESS STEEL
TMV	THERMOSTAIC MIXIING VALVE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VENT
VAC	VACUUM
VEL	VELOCITY
VERT	VERTICAL
W	WASTE OR WATT
WC	WATER CLOSET OR WATER COLUMN
WCO	WALL CLEANOUT
WTR	WATER

GENERAL NOTES

1. THE CONTRACTOR SHALL EXAMINE THE SITE AND BE FAMILIAR WITH THE CONDITIONS UNDER WHICH THIS CONTRACT MUST BE EXECUTED. NO ADJUSTMENT TO THIS CONTRACT PRICE WILL BE PERMITTED BECAUSE OF LACK OF KNOWLEDGE OF THE EXISTING FIELD CONDITIONS.
2. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL SYSTEMS WITH OTHER TRADES AND OWNER TO AVOID INTERFERENCES.
3. THE CONTRACTOR SHALL VERIFY ALL SPACE CONDITIONS AND DIMENSIONS PRIOR TO THE FABRICATION AND THE INSTALLATION OF THE PIPING SYSTEM AND DUCTWORK.
4. ALL WORK SHALL BE DONE IN A MANNER CONDUCIVE TO A PROFESSIONAL ENVIRONMENT. ALL AREAS MUST BE KEPT AS NEAT AS POSSIBLE, AND AREAS SHALL BE CLEANED BEFORE LEAVING SAID AREAS ON A DAILY BASIS.
5. PROVIDE COMPLETE OPERATING SYSTEMS WITH MATERIALS OF CONSTRUCTION AND METHODS OF FABRICATION, ASSEMBLY, ERECTION, TESTING, AND INTERIM OPERATIONS IN COMPLIANCE WITH THE REQUIREMENTS SPECIFIED HEREIN AND THE REQUIREMENTS OF APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION.
6. LOCATE CONTROLS, RELAYS, INSTRUMENTS, VALVE BOXES, SWITCHES, ALARM PANELS, AND ACCESSORIES SO THEY ARE READILY ACCESSIBLE FOR ADJUSTMENT, SERVICE, AND REPLACEMENT OR AS INDICATED.
7. COORDINATE SUPPORT HANGERS, PIPE AND ROUTING AND EQUIPMENT INSTALLATION WITH EXISTING CONDITIONS TO AVOID INTERFERENCES.
8. INSTALL TEMPERATURE SENSORS 4'-0" ABOVE FINISHED FLOOR.
9. DEMOLITION WORK SHALL BE COMPLETED TO THE EXTENT INDICATED OR SPECIFIED.
10. THE OWNER'S NORMAL OPERATION IN SURROUNDING AREAS WILL BE CONTINUED DURING DEMOLITION. THE DEMOLITION SHALL NOT INTERFERE WITH THESE OPERATIONS IN ANY WAY WITHOUT THE OWNER'S EXPRESSED CONSENT. CONTRACTOR SHALL COORDINATE AND SCHEDULE EXTENT OF DEMOLITION WORK WITH OWNER IN FIELD.
11. COMPLY WITH OWNER'S STANDARDS AND ALL APPLICABLE LOCAL CODES, STANDARDS, AND REGULATIONS.
12. CONFIRM THAT EXISTING SYSTEMS ARE INACTIVE AND PURGED BEFORE TAPPING INTO THEM, UNLESS OTHERWISE DIRECTED.
13. SOME STANDARD SYMBOLS, ABBREVIATIONS, AND DETAILS MAY NOT BE APPLICABLE TO THE SPECIFIC CONTRACT ISSUE.
14. CONTRACTOR SHALL REVIEW THE DOCUMENTS OF ALL INTERFACING TRADES, CONTRACTS, AND DRAWINGS PRIOR TO BIDDING AND COMMENCEMENT OF WORK TO ENSURE SUCCESS OF FINISHED WORK.
15. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY PROBLEMS THAT MIGHT OCCUR DURING DEMOLITION WORK.
16. THE DEMOLITION WORK REQUIRED MAY NOT BE LIMITED TO WHAT IS SHOWN ON PLAN. CONTRACTOR TO REMOVE ALL RELATED ITEMS AS REQUIRED TO FACILITATE THE WORK.
17. UPON COMPLETION OF THE MECHANICAL TRADES WORK, ALL SYSTEMS SHALL BE TESTED, BALANCED AND ADJUSTED. THE CONTRACTOR SHALL MAKE ANY CHANGES IN THE SHEAVES, BELT OR MOTOR SIZE REQUIREMENT FOR CORRECT BALANCE AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER. THEREAFTER, THE CONTRACTOR SHALL SUBMIT A BALANCE REPORT OF THE HVAC SYSTEM. ALL SYSTEMS SHALL BE LEFT IN WORKING ORDER. BALANCING MUST BE DONE BEFORE FINISHED CEILING IS INSTALLED. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL DEBRIS LEFT BY THE MECHANICAL TRADES.
18. FOR THE EXACT LOCATION OF ALL THE CEILING MOUNTED AIR DEVICES REFER TO THE ARCHITECTURAL DRAWINGS.
19. ALL EQUIPMENT AND MATERIAL BROUGHT TO THE SITE IS THE PROPERTY OF THE CONTRACTOR UNTIL THE OWNER HAS OFFICIALLY ACCEPTED THE FINAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE PROTECTION FOR EQUIPMENT AND MATERIAL UNTIL COMPLETION OF THE PROJECT.
20. ALL SHEETMETAL DUCTWORK AND FITTINGS SHALL BE SECURELY INSTALLED AND STEEL ANGLE REINFORCED AND PROPERLY SUPPORTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL CONNECTIONS AND JOINTS IN THE EXITING AND NEW DUCTWORK SHALL BE SEALED AND CAULKED AIR TIGHT IN AN APPROVED MANNER FOR THE VARIOUS PRESSURE APPLICATIONS.
21. WHEN A DESIGN BASE IS INDICATED AND OTHER THAN THE DESIGN BASE EQUIPMENT IS APPROVED, DESIGN ALL NECESSARY MODIFICATIONS AT NO ADDITIONAL COST TO THE OWNER AND SUBMIT A SHOP DRAWING OF THE PROPOSED INSTALLATION.
22. VERIFY ALL EXISTING WORK, PROVIDE ALL NECESSARY MATERIAL, LABOR, AND EQUIPMENT REQUIRED TO MODIFY EXISTING WORK AS NECESSARY. IN ADDITION, MAINTAIN INTEGRITY OF THE EXISTING SYSTEM.
23. CONTRACTOR SHALL GUARANTEE INSTALLATION AGAINST DEFECTS IN MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF 12 MONTHS FROM THE DATE OF FINAL ACCEPTANCE. IF, DURING GUARANTEE PERIOD, ANY DEFECTS APPEAR, CONTRACTOR SHALL REMEDY THEM INCLUDING ANY NECESSARY MATERIALS AND LABOR WITHOUT COST TO THE OWNER.
24. REPAIR AND PAY FOR ALL DAMAGE DONE TO THE EXISTING AND NEW WORK.
25. PROTECT ALL MECHANICAL EQUIPMENT, PLUMBING FIXTURES AND TRIM FROM MORTAR, PAINT, ETC., DURING CONSTRUCTION. ALL PRODUCTS USED IN MECHANICAL SYSTEMS SHALL BE ASBESTOS-FREE.
26. COORDINATE EXACT LOCATION OF CONSTRUCTION TO PRECLUDE ANY INTERFERENCE BETWEEN NEW AND EXISTING PIPING, WIRING, LIGHTING FIXTURES, CABLE TRAYS, DUCTWORK, BUILDING EQUIPMENT, PNEUMATIC TUBING, WORK BY OTHER CONTRACTORS, AND OTHER CONSTRUCTION.
27. COORDINATE EXACT LOCATION OF EQUIPMENT REQUIRING SERVICE TO PRECLUDE ANY INTERFERENCE WITH EQUIPMENT ACCESS DOORS OR PANELS OR WITH SERVICE TO EQUIPMENT. INSTALLATION SHALL BE MADE SO THAT EQUIPMENT SERVICE CAN BE ACCOMPLISHED WITHOUT HAVING TO REMOVE EQUIPMENT.
28. CONTRACTOR SHALL CONFIRM ALL AVAILABLE UTILITY SERVICES, STORAGE AREAS AND TRANSPORTATION MEANS.
29. ALL EQUIPMENT SHALL BE NEW UNLESS NOTED OTHERWISE AND SHALL CONFORM IN ALL RESPECTS TO THE LATEST STANDARDS OF ANSI, ASME, ASTM, FM, MIOSHA AND PDI.
30. DO NOT PROVIDE FLEXIBLE DUCTWORK TO AIR DEVICES LOCATED ABOVE GYP BOARD CEILING. DUCTWORK ABOVE GYP BOARD CEILING SHALL BE SHEET METAL.
31. PIPING LAYOUT IS SCHEMATIC ONLY, FINAL LAYOUT AND PIPING SIZES SHALL BE COORDINATED WITH EQUIPMENT SUPPLIER. PREPARE COORDINATION DRAWINGS.
32. MAXIMUM LENGTH OF FLEXIBLE DUCTWORK INSTALLATION SHALL BE 5 FEET.
33. INSTALL LOCKING QUADRANT BALANCING DAMPER ON EACH DIFFUSER AND GRILLE RUNOUT.

PLUMBING SPECIFICATIONS

1. DESCRIPTION OF WORK
   - A. Contractor shall provide all materials, equipment, and labor to provide a complete and operating installation.
   - B. Work includes labor and materials necessary for demolition and installation of new equipment, piping, and other mechanical items as described herein and shown on drawings. Omission of direct reference herein to any essential item shall not excuse contractor from complying with design intent. Drawings are diagrammatic unless dimensioned. The drawings diagrammatically show suggested examples for possible routing of mechanical systems. The drawings are based on available information and do not show the only possible arrangement, nor do they relieve the contractors of the responsibility of field verification and preparation of coordination drawings.
   - C. Provide miscellaneous steel and hardware as required to support, handle, and secure equipment furnished as part of this work.
   - D. Perform cutting and core drilling as required for work described.
   - E. Provide sleeves for pipes passing through slabs, walls, or floors (3" high at floor penetrations).
   - F. The Owner's representative is to be notified of all testing and flushing & cleaning and equipment start-ups. Copies of start-up reports are to be provided to Owner's representative.
   - G. The installing contractor shall provide a walkthrough and training for the Owner's building engineers at or near completion of the project.
   - H. Operation and maintenance manuals are to be provided for all components and/or systems requiring a manual.
   - I. Submit for approval shop drawings for all mechanical systems or equipment but not limited to the items listed below:

     Plumbing Fixtures — Plumbing Accessories
     Piping Materials — Insulation

2. CODES, PERMITS, AND INSPECTIONS
   - A. Work shall be installed in accordance with local, state, and federal regulations and ordinances.
   - B. Secure and pay for all permits and inspections.
3. STANDARDS
   - A. All equipment shall be new unless noted otherwise and shall conform in all respects to the latest approved standards of ANSI, ASME, ASTM, FM, IRI, MIOSHA and PDI.
4. PROJECT/SITE CONDITIONS
   - A. Contractor shall visit job site and examine premises at and adjacent to proposed work, and shall fully inform himself of the condition of premises with respect to obstructions, actual levels, excavation, fill and other requirements necessary for carrying out this work.
   - B. Contractor shall confirm all available utility services, storage areas, and transportation means.
5. REMODELING
   - A. Contractor shall comply with all requirements for confined space entry to the satisfaction of the Owner's safety department. Contractor shall present a plan for safe entry and construction methods and shall furnish all required testing and safety equipment.
   - B. Locate existing piping and make connections where required or where shown on the drawings. Do not cut into existing services without verifying with the Owner that the pipe involved is the desired service. In any areas where mechanical work is involved, restore the area to its original condition upon completion of work.
   - C. Perform work that interrupts any service or system, including cutting existing lines for new connections, at times (usually at night, after Owner's normal operating hours, or during slowest periods of activity) to cause no interference to the normal operation of the building.
   - D. Inform the Owner in advance of any shut-off that will occur and give estimate of duration. Obtain Owner's permission for system shut-down 24 hours in advance. Only after the Owner's facilities management staff is fully informed, and has approved the schedule of shut-offs, can the work then proceed accordingly.
   - E. All diffusers, coils, valves, thermostats, fixtures, piping and other valuable equipment to remain property of the Owner, except where noted otherwise, shall be stored on the site where directed.
   - F. Protect all mechanical equipment, plumbing fixtures and trim, from mortar, paint, etc. during construction. All products used in mechanical systems shall be asbestos-free.
6. CLEANING AND PAINTING
   - A. Clear away all debris, surplus materials resulting from mechanical work or operations, leaving the job and equipment in a clean, first-class condition. Where new work occurs in existing areas, clean and restore to original condition.
   - B. Thoroughly clean floor drains, cleanouts, and plumbing fixtures. Remove all plaster, stickers, rust, discoloration and foreign matter.
   - C. Clean specialties such as traps, strainers, etc. and all mechanical equipment surfaces.
7. SELECTIVE DEMOLITION
   - A. Remove piping and existing equipment as indicated.
   - B. In general, piping shall be removed back to the main branch piping shutoff valves in the ceiling space, or to below floor, and capped or plugged. Patch openings to match existing adjacent materials and finish. Where piping is within walls that remain, remove pipes to within wall, cap or plug, and patch wall to match existing adjacent wall materials and finish.
   - C. All equipment, plumbing fixtures and trim not reused shall remain the property of the Owner, unless otherwise directed, and shall be delivered by this contractor to a storage area at the project site as directed by the Owner's project representative.
   - D. Unclaimed demolished materials shall be legally disposed of, off-site, by the contractor as part of this scope of work and at no additional cost to the Owner.
8. CONNECTIONS TO EXISTING SYSTEMS
   - A. Make all connections to existing systems piping and equipment during designated periods upon approval of the Owner and at no increase in the contract sum.
   - B. Verify all existing work. Provide all necessary material, labor and equipment required to modify existing work as necessary. In addition, maintain integrity of the existing systems.
9. GUARANTEE
   - A. Contractor shall guarantee installation against defects in materials, equipment, and workmanship for a period of 12 months from the date of final acceptance. If, during guarantee period, any defects appear, Contractor shall remedy them, including any necessary materials and labor, without cost to the Owner.
10. DAMAGE TO OTHER WORK
   - A. Repair, and pay for, all damage done to the existing and new work.
11. COORDINATION OF THE WORK
   - A. Coordinate work with other trades to avoid interferences and to present a neat appearance. Interferences which result due to a lack of coordination are the contractor's responsibility to correct.
   - B. Verify locations of existing piping for connections to same and building structural beams, to avoid possible interference.
   - C. Coordinate exact location of construction to preclude any interference between new and existing piping, wiring, lighting fixtures, cable trays, ductwork, building equipment, work by other contractors, and other construction.
   - D. Coordinate exact location of equipment requiring service to preclude any interference with equipment access doors or panels, or with service to equipment. Installation shall be made so that equipment service can be accomplished without having to remove equipment.
12. SANITARY DRAIN AND PLUMBING VENT
   - A. No-Hub cast iron soil pipe and cast iron fittings per ASTM A888. Construct couplings of 24 gauge Type 304 stainless steel in conformance with FM 1680, and incorporating a neoprene gasket in accordance with ASTM C564. Provide two tightening bands on pipe up to 4 inch. Install system in accordance with manufacturer's recommendations.
   - B. Supports shall be 5'-0" on center, maximum.
13. PIPE AND FITTINGS
   - A. All piping and fittings to be manufactured in the United States of America and bear markings to ascertain the same.
   - B. Domestic Hot and Cold Water piping shall be Type L hard drawn copper tubing (ASTM B88) with solder type fittings, Type L wrought copper (ASTM B16.22). Unions shall be solder type, brass (ASTM B62). Solder shall be lead-free 95-5.
14. VALVES
   - A. All valves shall be manufactured in the United States of America and bear markings to ascertain the same.
   - B. All valves shall be selected and suitable for use with ethylene glycol, even if project does not currently incorporate the use of ethylene glycol.
   - C. Domestic Hot and Cold Water - Isolation and Throttling Valves, 2" and smaller, unless otherwise shown or specified, shall be Class 150 PSI S.W.P., two-piece, 80 percent of port, bronze body, PTFE (15% glass filled) seat and seal, stainless steel ball and stem, oval handle with locking feature, suitable for threaded or soldered ends.
   - D. Provide stem extension of proper length on insulated pipes. Approved manufacturers: Apollo 77-240-01, Nibco S-585-70-66 or Watts B-6081-SS.
   - E. Domestic Hot and Cold Water - Check valves, 2" and smaller, shall be Class 200 PSI S.W.P., 400 PSI W.O.G., bronze body, resilient disk, stainless steel spring and seat, regrinding, suitable for threaded or soldered ends.
   - F. Approved Manufacturers shall be Apollo 300, Centerline CLC, Nibco W-910-W, Milwaukee, or Watts.
15. ESCUTCHEON PLATES
   - A. Finished Areas: Chrome-plated.
16. FIRESAFING
   - A. At all cored, irregular, angular, and any other openings for pipe penetrations of fire rated walls, ceilings and floors, provide a permanent fire stop system that consists of a water based fire-stop compound as the fill, void or cavity material along with appropriate damming material as per manufacturer's instruction. Provide a system that is UL classified for all pipe sizes.
17. PIPE HANGERS AND SUPPORTS
   - A. Furnish and install miscellaneous iron supports and appurtenances as required to securely and properly hang or support piping systems. Hangers and supports shall be designed and manufactured in conformance with MSS-SP-58 and the selection and application shall be in conformance with MSS-SP-69.
   - B. Approved manufacturers: Anvil (Grinnell), B-line Systems, Inc., Carpenter and Paterson, and Michigan Hanger.
   - C. Dissimilar metal-to-metal contact between pipe and hanger shall be avoided.
   - D. "C" type beam clamp hangers are unacceptable.
   - E. Insulated piping smaller than 3" shall be hung with clevis hangers larger than O.D. of insulation, and with steel shields to avoid crushing insulation. Insulated piping 4" and larger shall be installed on steel saddles and iron rollers.
   - F. On insulated piping, locate hangers or supports outside the insulation and provide insulated supports as manufactured by Pipe Shields, Inc., Value Engineering Products, Inc., or B-line Systems, Inc.
18. MECHANICAL IDENTIFICATION AND PAINTING
   - A. All pipes and ducts shall be identified with factory fabricated, pre-curled labels securely attached to the pipe or duct at 20'-0" O.C., approximately (At least at each mechanical equipment room penetration, on each side of a wall penetration, each story traversed by the piping system, exit and centerpoint). Film markers are not acceptable. Secure pre-curled or recoiled labels to pipes with 1" wide color tape, matching piping color, and wrapped completely around pipe.
   - B. All pipes shall be color-coded intermittently at 20'-0" intervals to identify the characteristic properties of the contents.
   - C. Color code lines by painting a 1" wide band around pipe or by using 1" wide color-coded tape wrapped completely around pipe.
   - D. Where more than 1 band is used, a 1" space shall be allowed between bands.
   - E. Color coding shall be provided for all mechanical systems in accordance with the Owner's existing system.
   - F. Content of Legend
     1. Identify contents of piping systems 20'-0" O.C. above ceilings by both fluid contained and unique temperature and/or pressure (if necessary to distinguish between other systems with same fluid at different conditions); i.e., Domestic Hot Water - 110°F vs. Domestic hot Water - 140°F, low pressure steam - 5 psig vs. low pressure steam - 2 psig.
     2. Clearly identify direction of flow in pipe with flow arrows 1" wide x 6" long with arrow head, 2" wide at base in shafts, above ceiling, pipe spaces, etc.
   - G. Location of Markers
     1. Pipe labels shall be installed at all access panels or doors, adjacent to valves and branch connections, both sides of floors, ceilings and walls, all major changes in direction, on straight lengths of pipe every 20 feet, and at points of entry termination.
     2. Similarly for duct labels flow arrows on ducts, 20'-0" O.C.
     3. Arrows and markers shall be mounted to provide unobstructed visibility from floor level.
     4. Piping identification materials shall be larger, legible labels, 3-1/2" high as manufactured by Brady or Seton on piping 10" and larger, 2-1/2" high on piping smaller than 10", and ¾" lettering on piping ¾" and smaller.
     5. Locations for pipe markers above ceilings in finished areas shall be adjacent to each valve, and on all horizontal pipe runs-marked every 20'-0", and on each side of a wall penetration.
   - H. Valve Identification
     1. Mechanical contractor shall tag all valves with brass tags having incised painted black numbers and attached securely to valve by brass chain. Include valve tag charts bound in operating manuals and submit one set of charts, under glass, in metal frame(s) for Owner's representative to turn over to the Maintenance Department.
     2. All main and branch line valves are to be tagged in accordance with the Owner's existing system.
19. PRESSURE TESTING AND CLEANING OF THE PIPING SYSTEMS
   - A. The following pressure test shall be performed on new or revised piping systems.
   - B. Chemically clean piping system of all welding slag. Operate the system for one week, then drain and flush out. Replace all start-up strainers with permanent strainers and leave the system in proper working order.
   - C. Perform the following prior to start of the Test and Balance (T&B).
     1. In scheduling completion of all work required by the Contract Documents, include allowance for time required to complete Testing and Balancing (verify required time needed with T&B contractor).
     2. Cooperate with test and balance contractor and make all necessary preparation for testing and balancing.
     3. Complete the following:
        - a. Check the temperature control sequence and calibration of all controls.
        - b. Make preliminary settings on all control devices and have all systems operational. The above two items should be jointly done with cooperation of the temperature control contractor.
        - c. Clean and flush all piping systems.
        - d. Leak test, pressure test and make tight all piping systems.
        - e. Fill all piping systems with clean water.
        - f. Remove all air from the water piping systems (make sure that control valves are circulating water through coils, etc. during air removal).
        - g. Tag and identify all equipment.
        - h. Patch insulation and housing using materials identical to those removed.
        - i. Seal insulation to re-establish integrity of the vapor barrier.
        - j. Operate system(s) successfully for twenty-four (24) hours, minimum.
        - k. Provide the required access to flow meter ports.
        - l. Provide a complete set of updated as-built drawings.
        - m. Attend a coordination meeting with the T&B Contractor.
   - D. Attend a coordination meeting with the T&B contractor following balancing of the system(s).
   - E. Provide craftsmen of the proper trade to work with T&B Contractor to make adjustments and installation changes as required.
   - F. Change out pump impellers when and if required by the T&B Contractor, at no added cost to the Owner.
   - G. Dedicate the resources to accommodate all changes identified by the T&B Contractor required by the contract documents in a timely manner.
   - H. Contact Owner's representative if balancing problems are discovered. Do not just identify problems in the report. Seek least expensive remedy to problems prior to leaving job site.
20. MECHANICAL INSULATION
   - A. General
     1. Contractor shall provide thermal insulation on all domestic hot water, domestic cold water piping, first ten feet of plumbing vents through roof, horizontal sanitary and storm piping above occupied spaces. Insulation shall not be installed until systems have been tested and inspected.
     2. All insulation on piping and ductwork that has been damaged or has been damaged during construction shall be repaired to 'like-new' condition.
     3. Approved manufacturers for fiberglass insulation: Certainteed, Owens-Corning Fiberglass Corp., Manville Products Corp., and Knauf Fiber Glass.
     4. All insulation, including facings, cements, and adhesives when tested per ASTM E84 by UL shall have a flame spread rating of less than 25, and a smoke developed rating of less than 50.
     5. For adhesives, mastics, coatings and sealants, approved manufacturers are: Foster Products Div., HB Fuller Co., I-C Adhesives Co., Chicago Mastic Co., Childers Products Co., and St. Clair Rubber Co.
   - B. Piping Insulation
     1. Fiberglass piping insulation shall be pre-formed, rigid, molded insulation with vapor retardant jacket consisting of white kraft paper reinforced with glass fiber yarn and bonded to aluminum foil, with self-sealing longitudinal laps and butt strips. Provide insulation with a thermal conductivity "k" of 0.23 Btu/hr/sq.ft./degree F/in at 75 degree F mean temperature.
     2. Pipe insulation glass fiber minimum thickness:

Pipe Service	Pipe Size	Thickness	Vapor Barrier	Jacket
Dom. CW, HW, HWR	½" to 4"	1"	No/ (yes for CW)	None
Horiz San / Storm	All sizes	1"	No	None
HW Heating S&R	½" to 1-1/2"	1-1/2"	No	None
HW Heating S&R	2" to 8"	2"	No	None
Refrigerant	All sizes	1"	Yes	None
Chilled Water	<3"	1"	Yes	Aluminum

21. PLUMBING EQUIPMENT AND SPECIALTIES
   - A. Water hammer arrestor
     Non-ferrous elasticals subje5 chamber contained in heavy steel casing with approved recoil dampeners. Locate the arrestor where required to eliminate water hammer in the domestic water system. Size the arrestor in accordance with Plumbing and Drainage Institute Standard PDI-WH 201 and submit selection criteria with shop drawings. Install arrestor per manufacturer's instructions. Approved manufacturers: Amtrol, Josam, Watts, Zurn, Jay R. Smith, and Wade.
   - B. Cleanout
     Cast iron body with straight threads and gasket seal or taper threads for plug, flashing flange and clamping ring, and a brass closure plug (ASME A112.36.2M). Cleanouts for installation in floors not having membrane waterproofing may be furnished without clamping ring (Jay R. Smith Series 4000 as required for varied installation conditions at finished and non-finished walls or floors). Floor Cleanouts: Jay R. Smith model 4020 with polished bronze cleanout covers in finished areas and nickel bronze cleanout covers in non-finished areas. Provide round stainless steel access cover at wall cleanout in finished areas. Approved manufacturers: Josam (58740-3), Jay R. Smith (4434-NB), Zurn (ZANB-1462). I
   - C. Floor Sink
     Cast-iron body, with acid resistant coated interior, nickel bronze rim, aluminum anti- splash interior bottom dome strainer, and grate with center opening (ASME A112.21.1M). 12"x12" top, no-hub outlet, seepage flange, and options as required to accommodate construction of floor assembly with no leakage. Zurn Z1901-4 or equal by Josam, Jay R. Smith, or Wade.
   - D. Floor Drain
     Cast-iron body, with seepage flange and clamping device, and options as required to accommodate construction of floor assembly with no leakage (ASME A112.21.1M). Jay R. Smith Model 2005-A or equal by Zurn, Josam or Wade.
22. CUTTING AND PATCHING
   - A. Cut walls and floor slabs for new work. Patch and paint to match new work.
23. CLEAN UP
   - A. Contractor shall keep site clean and free of debris at all times. Remove unused piping and materials from premises. Owner shall be given the option of retaining any removed items.
24. RECORD DRAWINGS
   - A. At the close of the project and prior to receipt of final payment, submit to the Owner one set of documents clearly indicating all deviations from the original

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ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
■ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #: PROJECT NUMBER
JHA PROJECT #: PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

KEY PLAN
NO SCALE

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #: 023-03727-00
SSOE MANAGER: JEFF FALZON

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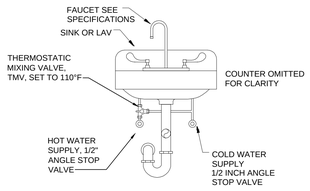
Troy, MI 48084-1526
T. (248) 643-6222

PLUMBING NOTES, LEGEND, SPECS. & ABBREVIATIONS

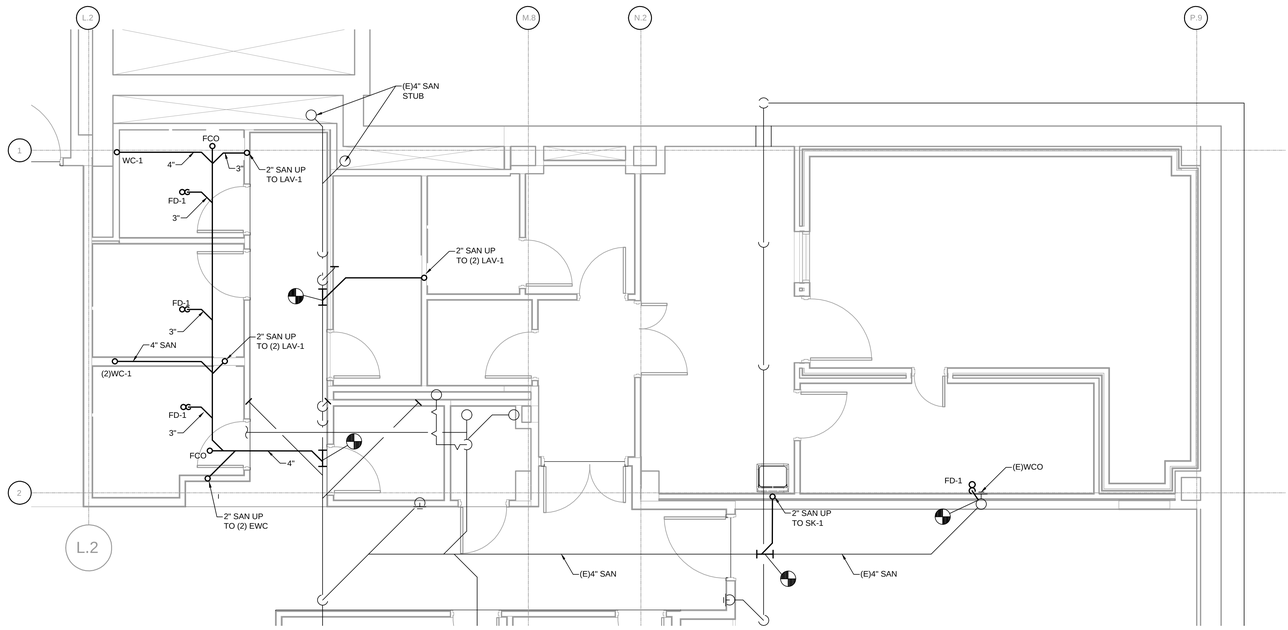
PL-001



B2 / PL-100

LAV / SINK PIPING DETAIL

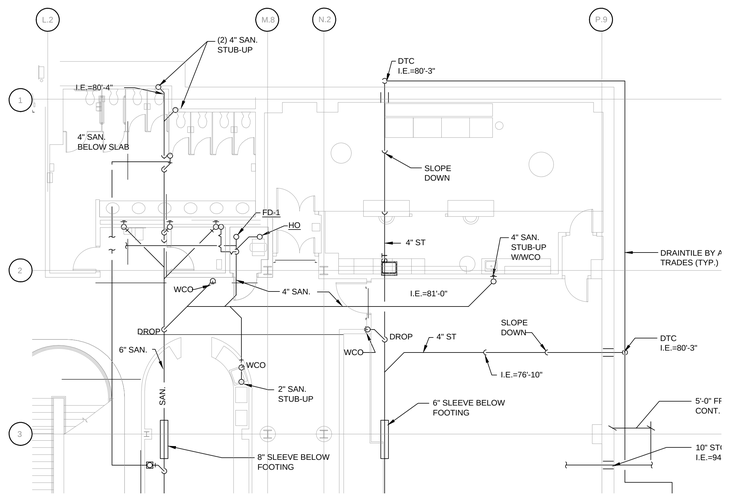
NO SCALE



D4 / PL-100

ENLARGED MRI SUITE UNDERGROUND PLUMBING NEW WORK PLAN

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



F7 / PL-100

ENLARGED MRI SUITE UNDERGROUND PLUMBING DEMOLITION PLAN

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

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PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
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CLIENT INFORMATION:

Wayne State University

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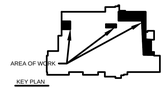
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI



259 MACK AVE
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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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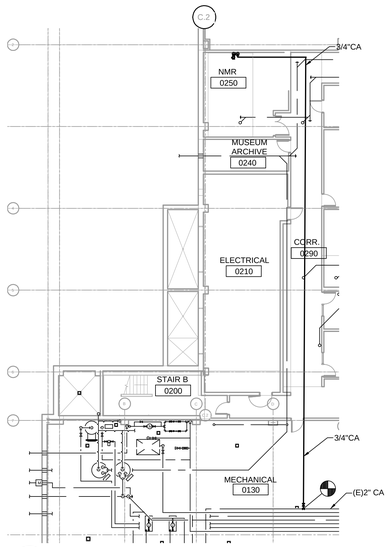
ENLARGED UNDERGROUND MRI SUITE PLUMBING PLANS

PL-100



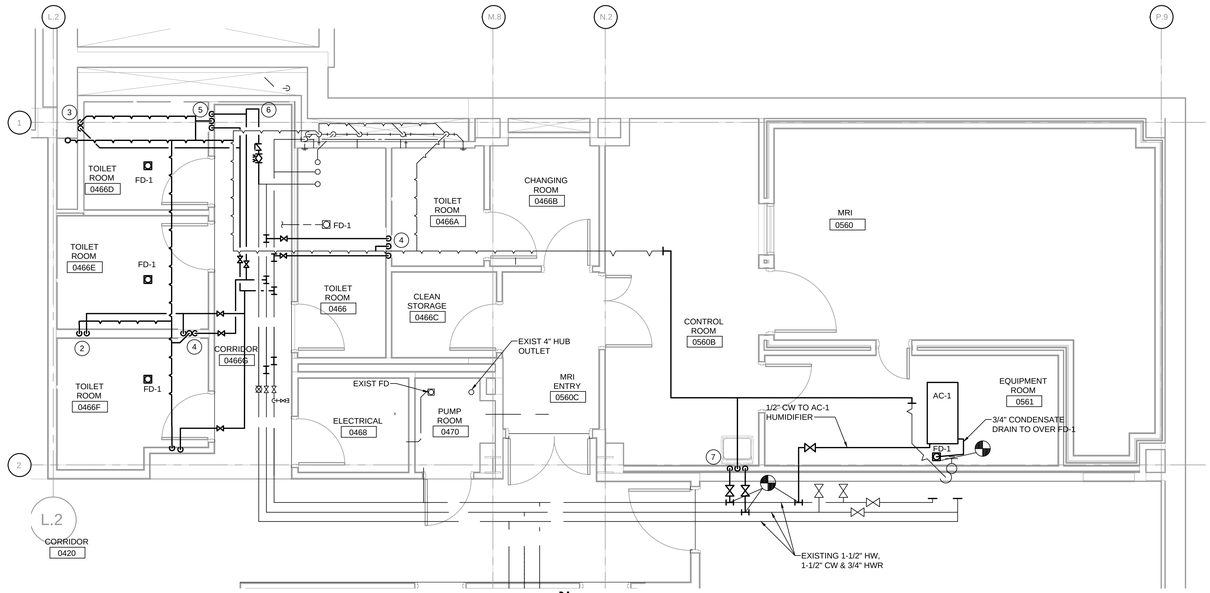
A3 / PL-101

PARTIAL LEVEL 0 PLUMBING NEW WORK PLAN

SCALE: 1/16" = 1'-0"

PLUMBING NEW WORK KEYNOTES

1. 1/2" CA DOWN TO VALVE AND QUICK DISCONNECT WITH FILTER AND REGULATOR, 36" AFF
2. 2" CW & 2" V DN TO (2) WC-1
3. 1-1/4" CW & 2" V DN TO WC-1
4. 3/4" CW, 1/2" HW & 1-1/2" V DN TO (2) LAV-1
5. 1/2" CW, 1/2" HW & 1-1/2" V DN TO LAV-1
6. 3/4" HWR WITH CHECK VALVE AND BALANCING VALVE
7. 1/2" CW, 1/2" HW & 1-1/2" V DN TO SK-1



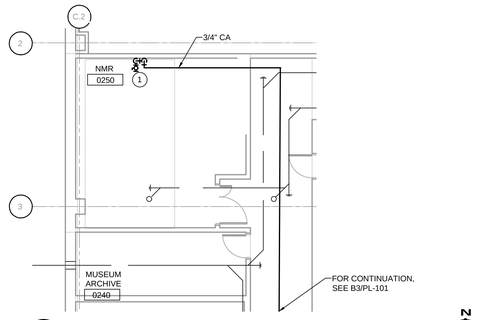
E3 / PL-101

ENLARGED MRI SUITE PLUMBING NEW WORK PLAN

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

PLUMBING FIXTURE SCHEDULE

MARK		CW	HW	WASTE	VENT	REMARKS
WC-1	WATER CLOSET	1-1/2"	---	4"	2"	SLOAN ST-2459, WHITE VITREOUS CHINA, FLUSH VALVE: SOLIS 8111 FLUSHOMETER EXPOSED 1.28 GPF, WALL MOUNTED AT HEIGHT CONFORMING TO A.D.A. STANDARDS. SEAT BEMIS 1655 SSCT WITH STATITE COMMERCIAL FASTENING SYSTEM, WHITE MOLDED OPEN FRONT.
LAV-1	WALL HUNG LAVATORY	1/2"	1/2"	1-1/2"	1-1/2"	AMERICAN STANDARD, DECORUM 9024.001EC, WHITE WALL HUNG, VITREOUS CHINA, FAUCET: SLOAN SF-2450-4-BAT-TEE-CP-0.35GPM WITH CHROME FINISH. MOUNT TO A.D.A.STANDARDS WITH P-TRAP, ANGLE STOPS, STRAINER AND MIXING VALVE, WATTS MMV-M1.
SK-1	COUNTERTOP SINK	1/2"	1/2"	1-1/2"	1-1/2"	ELKAY MODEL LRAD2222-3, STAINLESS STEEL, SELF RIMMING, COUNTERTOP LAY-IN, 19"x16", 5 1/2" DEEP. FAUCET: DECK MOUNTED, 8" CENTERS, 5 3/8" RIGID GOOSENECK SPOUT W/ GRID DRAIN, 4" WRIST BLADE HANDLES, LAMINAR FLOW OUTLET, FLAT STRAINER, SUPPLIES AND STOPS, ECONO-FLO OUTLET TRAP,CHICAGO FAUCETS 785-LESSSPT, GN2AH8JKCP, E2805-5JKCP, AMERICAN STANDARD 4331.013, 0.5 GPM.
CO	CLEANOUT	---	---	SEE PLAN	---	MIFAB C1230, LACQUERED CAST IRON LINE OR FLOOR CLEANOUT WITH 1/2" THICK GASKETED COMBINED DUCTILE IRON COVER & PLUG.
FCO	FLOOR CLEANOUT	---	---	SEE PLAN	---	MIFAB C1300-MF, LACQUERED CAST IRON,HEAVY DUTY ACCESS HOUSING WITH ANCHOR FLANGES. WITH VANDAL RESISTANT STAINLESS STEEL SCREWS.
FD-1	FLOOR DRAIN	---	---	SEE PLAN	---	MIFAB F1000, LACQUERED CAST IRON, 5" DIAMETER LIGHT DUTY FLOOD DRAIN WITH ROUND TOP, MEMBRAN FLASHING CLAMP AND SURESEAL INLINE FLOOR DRAIN TRAP SEALER.
EWC-1	ELECTRIC WATER COOLER, BOTTLE FILLER	1/2"	---	1-1/2"	1-1/2"	ELKAY LVRCGRNTL8WSK STAINLESS STEEL BOTTLE FILLING STATION AND BI LEVEL ADA WATER COOLER, FILTERED, LAMINAR FLOW, REAL DRAIN, VISUAL FILTER MONITOR. FURNISHED WITH FLEXI-GUARD SAFETY BUBBLER, ELECTRONIC BOTTLE FILLER SENSOR AND ELECTRONIC FRONT AND SIDE BUBBLER PUSHBAR ACTIVATION.
FS-3	FLOOR SINK	---	---	4"	---	ZURN MODEL Z1910-8P, 8"x8"X6" DEEP, W/ 8-7/8"x3-5/8"x3-3/4" HIGH OVAL FUNNEL, 4" OUTLET AND 1/2" TRAP PRIMER CONNECTION. TRAP PRIMER MIFAB M-500 ON ADJACENT SK-1
TMV	THERMOSTATIC MIXING VALVE	1/2"	1/2"	---	---	WATTS MMV-M1, BRONZE, ASSE 1070 LISTED, POINT OF USE APPLICATION WITH ADJUSTABLE THERMOSTAT AND SOLDERED CONNECTIONS.



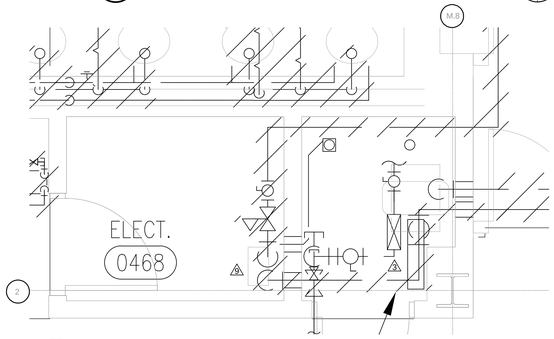
A5 / PL-101

PARTIAL LEVEL 0 PLUMBING NEW WORK PLAN

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

PLUMBING DEMOLITION KEYNOTES

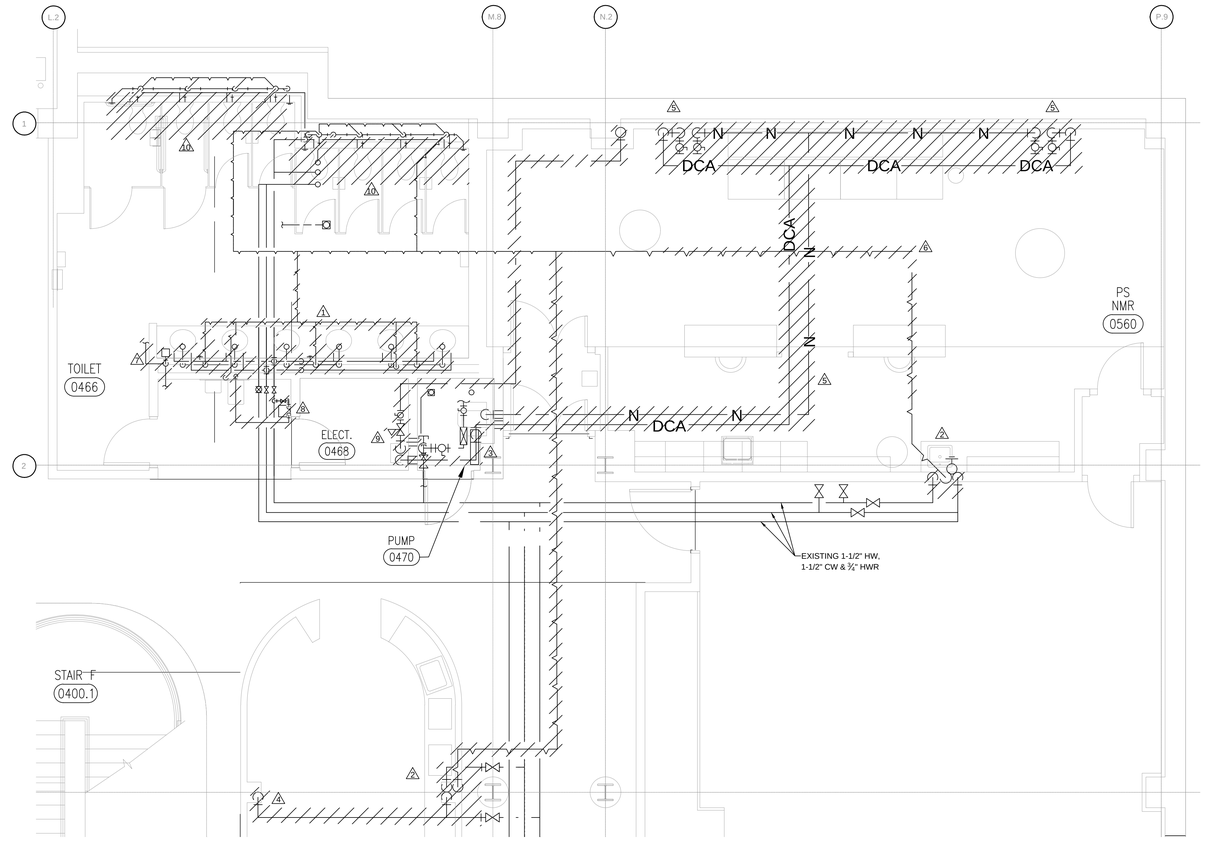
1. REMOVE BANK OF (6)LAVS, CAP ASSOCIATED PIPING AT MAINS AND REMOVE ALL ACCESSORIES AS SHOWN. CAP EXIST. W & V.
2. REMOVE SINK, ASSOCIATED PIPING AND ACCESSORIES AS SHOWN. CAP SERVICES AT MAINS.
3. REMOVE NITROGEN GENERATOR AND ALL ASSOCIATED PIPING AS SHOWN.
4. REMOVE CW, BACKFLOW PREVENTER AND VALVE SERVING VENDING.
5. REMOVE NITROGEN AND COMPRESSED AIR DROPS AND PIPING BACK TO PUMP ROOM.
6. REMOVE VENT FROM ABOVE FUTURE MRI ROOM. OFFSET.
7. REMOVE TRAP PRIMER AND PIPING TO BELOW FLOOR.
8. REMOVE REMOTE WATER CHILLER AND ALL ASSOCIATED PIPING.
9. REMOVE COMPRESSED AIR DRYER AND ALL ASSOCIATED PIPING. RELOCATE TO NMR ROOM.
10. REMOVE BANK OF (4)WC. CAP ASSOCIATED PIPING AT MAINS AND REMOVE ALL ACCESSORIES AS SHOWN. CAP EXIST. W & V AT WALL.



A7 / PL-101

PARTIAL LEVEL 0 PUMP ROOM PLUMBING DEMOLITION PLAN

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



E7 / PL-101

ENLARGED MRI SUITE PLUMBING DEMOLITION PLAN

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

PROFESSIONAL SEALS:

PROJECT PARTNERS:

KEYPLAN

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
	11-17-23	BID PACK 1 BIDS/PERMITS

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Wayne State University

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DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
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PROJECT INFORMATION:

WSU APPLEBAUM MRI

AREA OF WORK

KEY PLAN
NO SCALE

259 MACK AVE
DETROIT, MICHIGAN
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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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ENLARGED NMR, PUMP ROOM AND MRI SUITE PLUMBING PLANS

PL-101

LIGHTING SYMBOL LEGEND

(NOT ALL SYMBOLS USED)

XXX	LIGHT FIXTURE TYPE, REFER TO LIGHT FIXTURE SCHEDULE
	SURFACE OR PENDANT LIGHT FIXTURE, CHEVRON INDICATED WALL WASH AIMING, SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	RECESSED LIGHT FIXTURE, CHEVRON INDICATED WALL WASH AIMING, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	SURFACE OR PENDANT LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	RECESSED LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	RECESSED ARCHITECTURAL LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	SURFACE OR CHAIN HUNG STRIP LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	TRACK MOUNTED LIGHT FIXTURE
	EXIT SIGN, PROVIDE ARROWS/CHEVRONS AS INDICATED ON PLANS, SHADED AREA INDICATES FACE, FOOT ON SYMBOL INDICATES WALL MOUNTED, LIGHT HEADS INDICATE COMBINATION EXIT/BATTERY POWERED EMERGENCY LIGHTING UNIT
	BATTERY POWERED EMERGENCY LIGHTING UNIT, LIGHT HEADS ON SIDES OF UNIT INDICATES CEILING MOUNTED
$Xa	SINGLE POLE SWITCH - 20A, 125/277V UON, -'a' INDICATES WHICH FIXTURES/DEVICES ARE CONTROLLED VIA SWITCH -'X' DENOTES TYPE: BLANK - SINGLE POLE 2 - DOUBLE POLE 3 - THREE WAY 4 - FOUR WAY D - DIMMER K - KEY OPERATED I - ILLUMINATED (ILLUMINATED IN 'OFF' POSITION) P - WITH PILOT LIGHT (LIGHT ON IN 'ON' POSITION) T - TIME SWITCH L - LOW VOLTAGE C - MOMENTARY CONTACT O - WALL BOX OCCUPANCY SENSOR - PASSIVE INFRARED V - WALL BOX VACANCY SENSOR - PASSIVE INFRARED
OS Xa VS Xa OS Xa VS Xa	OCCUPANCY/VACANCY SENSOR, FOOT ON SYMBOL INDICATES WALL MOUNTED, -'a' INDICATES WHICH FIXTURES ARE CONTROLLED VIA SENSOR -'X' DENOTES TYPE: A - 180° DUAL TECHNOLOGY OCCUPANCY SENSOR B - 360° DUAL TECHNOLOGY OCCUPANCY SENSOR C - 180° PASSIVE INFRARED OCCUPANCY SENSOR D - 360° ULTRASONIC OCCUPANCY SENSOR
DS a DS a	DAYLIGHT SENSOR, FOOT ON SYMBOL INDICATES WALL MOUNTED, -'a' INDICATES WHICH FIXTURES ARE CONTROLLED VIA SENSOR
C	LIGHTING CONTACTOR, SIZE AS INDICATED ON DRAWINGS/DETAIL
ELTD, GTD	EMERGENCY LOAD/GENERATOR TRANSFER DEVICE
TC	TIME CLOCK

ONE-LINE DIAGRAM SYMBOL LEGEND

(NOT ALL SYMBOLS USED)

○	TERMINAL	△	DELTA
●	TERMINATOR		WYE - SOLIDLY GROUNDED
	STRESS CONE CABLE TERMINATION		GROUND
	STAB	G	ENGINE GENERATOR
	STATIONARY CIRCUIT BREAKER	ST	SHUNT TRIP
	DRAWOUT CIRCUIT BREAKER	A	AMMETER
	STATIONARY SWITCH	M	UTILITY METER
	FUSE	V	VOLT METER
	MOTOR STARTER WITH OVERLOAD	EMU	ELECTRONIC MONITORING UNIT
	THERMAL OVERLOAD RELAY	PM	POWER MONITORING UNIT
	NORMALLY OPEN CONTACTS	K	KEYED INTERLOCK
	NORMALLY CLOSED CONTACTS	SPD	SURGE PROTECTION DEVICE
	GROUND	MH	MANHOLE
	LIGHTNING ARRESTOR	HH	HANDHOLE
	CURRENT TRANSFORMER		TRANSFORMER
	POTENTIAL TRANSFORMER	XX-XX	PANELBOARD, 'XX-XX' INDICATES PANELBOARD DESIGNATION
	TRANSFER SWITCH		

NOTE:
1. REFER TO POWER SYMBOLS SCHEDULE FOR MORE SYMBOL DESCRIPTIONS THAT MAY BE SHOWN ON THE ONE LINE DIAGRAM.

GROUNDING AND LIGHTNING PROTECTION LEGEND

(NOT ALL SYMBOLS USED)

■	CADWELD CONNECTION BETWEEN GROUND CABLE AND BUILDING COLUMN
✚	CADWELD CABLE TO CABLE 'X' CONNECTION
┳	CADWELD CABLE TO CABLE 'T' CONNECTION
TW	COPPERWELD TYPE GROUND ELECTRODE WITH CADWELD CONNECTION. 'TW' INDICATES TEST WELL.
— — — —	BARE COPPER GROUND CABLE. INSTALL MINIMUM 30" BELOW FINISHED FLOOR OR GRADE
▲	LUG CONNECTION BETWEEN BUS BAR AND CABLE OR BONDING CONNECTION TO EQUIPMENT
●	CADWELD CONNECTION BETWEEN REBAR OR ROD AND CABLE
┬┴┬	WALL MOUNTED GROUND BAR
----------	COPPER LIGHTNING PROTECTION CONDUCTOR
	AIR TERMINAL
■	THRU ROOF PENETRATION
■▲	THRU ROOF PENETRATION WITH CONNECTION TO BUILDING STEEL
●	BOND OR DOWN LEAD TO GROUND ROD BOND TO GROUND RING BELOW GRADE AT EACH DOWN LEAD
⊣ı	DOWN LEAD TO COPPER CLAD GROUND ROD

POWER SYMBOL LEGEND

(NOT ALL SYMBOLS USED)

	SIMPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	DUPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	DUPLEX RECEPTACLE - NEMA 5-20R, GROUND FAULT INTERRUPTING, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	DUPLEX RECEPTACLE - NEMA 5-20R, TAMPER RESISTANT, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	SPLIT-WIRED DUPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	COMBINATION DUPLEX RECEPTACLE (NEMA 5-20R)/USB (TYPE A, 2.0), TWO CHARGING USB PORTS, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	QUADPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER (ALL OTHER NEMA 5-20R QUAD RECEPTACLE SYMBOLS FOLLOW SAME STACKED DUPLEX PATTERN)
	SPECIAL RECEPTACLE -'X' DENOTES TYPE: A - (NEMA L5-30R) 125V, 30A, SINGLE PHASE, TWIST-LOCK RECEPTACLE 2 POLE, 3 WIRE B - (NEMA L6-20R) 250V, 20A, SINGLE PHASE, TWIST-LOCK RECEPTACLE 2 POLE, 3 WIRE C - (NEMA L6-30R) 250V, 30A, SINGLE PHASE, TWIST-LOCK RECEPTACLE, 2 POLE, 3 WIRE D - (NEMA L15-20R) 250V, 20A, THREE PHASE, TWIST-LOCK RECEPTACLE 3 POLE, 4 WIRE E - (NEMA L15-30R) 250V, 30A, THREE PHASE, TWIST-LOCK RECEPTACLE, 3 POLE, 4 WIRE F - (NEMA L21-30R) 208Y/120V, 30A, THREE PHASE, TWIST-LOCK RECEPTACLE 4 POLE, 5 WIRE G - (NEMA 14-30R) 125/ 250V SINGLE PHASE RECEPTACLE 3 POLE, 4 WIRE H - (NEMA 14-50R) 125/ 250V SINGLE PHASE RECEPTACLE 3 POLE, 4 WIRE
	CEILING MOUNTED SIMPLEX RECEPTACLE - NEMA 5-20R, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	CEILING MOUNTED DUPLEX RECEPTACLE - NEMA 5-20R, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	CEILING MOUNTED SPECIAL RECEPTACLE -'X' DENOTES TYPE: REFER TO WALL MOUNTED SPECIAL RECEPTACLE TYPES ABOVE
	MULTI-OUTLET SURFACE RACEWAY
	SINGLE POINT ELECTRICAL CONNECTION OR AS INDICATED IN CIRCUITING/EQUIPMENT SCHEDULE
J	JUNCTION BOX, LEG INDICATES WALL/EQUIPMENT MOUNTING IS REQUIRED, SQUARE INDICATES FLOOR MOUNTED
SM	MANUAL MOTOR STARTER/DISCONNECT SWITCH WITH THERMAL OVERLOAD PROTECTION
	ENCLOSED DISCONNECT SWITCH, SHADING INDICATES SWITCH IS FUSIBLE
	ENCLOSED CIRCUIT BREAKER
	COMBINATION MAGNETIC MOTOR CONTROLLER/STARTER, SHADING INDICATES STARTER IS FUSIBLE
	MAGNETIC MOTOR CONTROLLER
VFD	VARIABLE FREQUENCY DRIVE (FURNISHED BY OTHERS)
	PUSHBUTTON STATION
	MOTOR
	AUTOMATIC OR MANUAL TRANSFER SWITCH.
	UTILITY METER
T	TRANSFORMER, DASHED LINE INDICATES NEC WORKING SPACE.
	DISTRIBUTION PANELBOARD. SOLID FILL INDICATES 480V LINE TO LINE, NO FILL INDICATES 208V OR 240V LINE TO LINE. DASHED LINE INDICATES NEC WORKING SPACE.
	SURFACE MOUNTED PANELBOARD. SOLID FILL INDICATES 480V LINE TO LINE, NO FILL INDICATES 208V OR 240V LINE TO LINE. INSTALL DOOR HINGE ON THE SIDE SHOWN ON SYMBOL. DASHED LINE INDICATES NEC WORKING SPACE. HALF-TONE LINE INDICATES WALL.
	FLUSH/RECESSED MOUNTED PANELBOARD. SOLID FILL INDICATES 480V LINE TO LINE, NO FILL INDICATES 208V OR 240V LINE TO LINE. INSTALL DOOR HINGE ON THE SIDE SHOWN ON SYMBOL. DASHED LINE INDICATES NEC WORKING SPACE. HALF-TONE LINE INDICATES WALL.
	MULTI-SECTION SWITCHBOARD OR MOTOR CONTROL CENTER. DASHED LINE INDICATES NEC WORKING SPACE.
CP	CONTROL PANEL/CONTROL POWER PANEL (FURNISHED BY OTHERS)
PS	POWER SUPPLY
GA	GENERATOR ANNUNCIATOR
BMS	BUILDING MANAGEMENT SYSTEM PANEL (FURNISHED BY OTHERS)
FACP	FIRE ALARM CONTROL PANEL (FURNISHED BY OTHERS)
FAA	FIRE ALARM ANNUNCIATOR (FURNISHED BY OTHERS)
FNAC	FIRE ALARM NOTIFICATION APPLIANCE CIRCUIT PANEL (FURNISHED BY OTHERS) EDIT ITEMS IN () TO SUIT PROJECT
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
RP1-1,3,5	INDICATES CIRCUITS TO PANEL, 'RP1' INDICATES PANEL DESIGNATION AND '1,3,5' INDICATED POLE POSITION(S)
X#Y, X#YG ,Z"C	'X' INDICATES QUANTITY AND 'Y' INDICATES SIZE OF CONDUCTORS, Z INDICATES CONDUIT SIZE
RP1	PANEL TAG, i.e. CIRCUITS WITHIN AREA WHERE TAG IS LOCATED ON PLAN ARE CIRCUITED TO PANEL 'RP1' UON
WSHP-2 MECH	MECHANICAL EQUIPMENT CONNECTION TAG. DESIGNATION ON TOP INDICATES EQUIPMENT IDENTIFIER AND DESIGNATION ON BOTTOM INDICATES ASSOCIATED EQUIPMENT CONNECTION SCHEDULE AS FOLLOWS: MECH = MECHANICAL, KTCH = KITCHEN, PUMP = PUMP, HEAT = HEATER, FAN = FAN. REFER TO ELECTRICAL SCHEDULES SHEETS FOR ADDITIONAL INFORMATION.

ELECTRICAL GENERAL NOTES

1. PRIOR TO BID, THE CONTRACTOR SHALL VISIT SITE TO SURVEY EXISTING CONDITIONS AFFECTING WORK. INCLUDE NECESSARY MATERIALS AND LABOR TO ACCOMPLISH THE ELECTRICAL WORK, INCLUDING RELOCATION OF EXISTING EQUIPMENT TO ALLOW FOR NEW CONSTRUCTION. ANY CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER AND RESOLVED PRIOR TO BID. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES.
2. THESE DRAWINGS ARE A PART OF A COMPLETE SET OF ARCHITECTURAL/ENGINEERING DRAWINGS. DRAWINGS SHOWING ELECTRICAL WORK ARE DIAGRAMATIC. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR GUIDANCE AND COORDINATION WITH DIMENSIONS, CEILINGS, DOOR SWINGS, ELEVATIONS, CASEWORK, FINISHES, STRUCTURAL CONCRETE, FRAMING, DUCTWORK, AND PIPING.
3. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE NEC AND LOCAL ORDINANCES INCLUDING ALL REQUIREMENTS OF APPLICABLE CODES. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS.
4. ALL SYMBOLS SHOWN ON THESE LEGENDS MAY NOT BE USED.
5. PROVIDE EXPANSION JOINT FITTINGS ON ALL CONDUITS THAT CROSS EXPANSION JOINTS OR CONDUITS THAT PENETRATE WALLS WITH SEISMIC BRACING. SEE ARCHITECTURAL DRAWINGS.
6. ALL FLUSH MOUNTED PANELS SHALL HAVE (4) 1" EMPTY CONDUITS STUBBED OUT ABOVE ACCESSIBLE CEILING FOR FUTURE CIRCUITS.
7. VERIFY LOCATION OF ALL FLOOR OUTLETS WITH ARCHITECT PRIOR TO ROUGH-IN.
8. ALL WALL OUTLETS NOT PROVIDED WITH A DEVICE BY THIS CONTRACTOR SHALL BE PROVIDED WITH BLANK WALL PLATES.
9. MULTI-WIRE BRANCH CIRCUITS ARE PROHIBITED UNLESS SPECIFICALLY NOTED OTHERWISE.
10. FINAL EQUIPMENT CONNECTIONS - THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL LABOR AND MATERIALS REQUIRED TO MAKE FINAL CONNECTIONS TO ALL EQUIPMENT FURNISHED BY THIS CONTRACTOR AND/OR EQUIPMENT FURNISHED BY OTHERS. VERIFY ALL REQUIREMENTS, CONDUCTOR SIZE, OVERCURRENT PROTECTION, PHASE, VOLTAGE, ETC., INDICATED ON DRAWINGS WILL SATISFY EQUIPMENT SUPPLIER REQUIREMENTS PRIOR TO ROUGH-IN. PROVIDE FUSED DISCONNECT IF REQUIRED BY MANUFACTURER.
11. REFER TO "TYPICAL MOUNTING AND ALIGNMENT CRITERIA" DETAIL FOR OUTLET DEVICE MOUNTING HEIGHT AND LOCATIONS.
12. TYPE "ENT" ELECTRICAL NON-METALLIC TUBING SHALL NOT USED.
13. PROVIDE ACCESS PANELS IN GYPBOARD CEILINGS WHERE ACCESS TO JUNCTION BOXES IS REQUIRED.
14. PROVIDE A MINIMUM OF (1) 3/4"C. WITH PULLSTRING AND NYLON END BUSHING STUBBED TO ABOVE ACCESSIBLE CEILING FOR ALL WALL MOUNTED AUXILIARY DEVICE, JUNCTION BOXES INCLUDING, BUT NOT LIMITED TO CARD READERS, PUSH PLATES, ETC, UON.
15. ALL 120V RECEPTACLE OUTLETS WITHIN 6FT OF A WATER SOURCE SHALL BE GFCI PROTECTED.
16. VERIFY ALL DOOR SWINGS W/ ARCHITECT PRIOR TO ROUGH-IN OF WALL MOUNTED LIGHTING CONTROLS, ACCESS CONTROLS, DOOR OPERATORS, ETC.
17. PROVIDE ADDITIONAL STEEL SUPPORTS FOR MOTOR CONTROLLERS, FIXTURES, RACEWAYS, CABINETS, BOXES, AND THE LIKE WHRE THE BUILDING, EQUIPMENT, OR STRUCTURE IS NOT SUITABLE FOR MOUNTING DIRECTLY THEREON.
18. "PROVIDE" USED IN SPECIFICATIONS AND DRAWINGS SHALL MEAN "TO FURNISH, INSTALL, CONNECT, AND PLACE IN SERVICE COMPLETELY IN SPECIFIED OR APPROVED MANNER THE ITEM DESCRIBED."
19. ELECTRICAL WORK EMBEDDED IN CONCRETE OR OTHERWISE PERMANENTLY CONCEALED SHALL NOT BE COVERED UNTIL INSPECTED BY THE OWNER'S REPRESENATIVE.
20. ALL PENETRATIONS THROUGH FIRE RESISTANT WALLS AND OTHER SUCH RATED ASSEMBLIES SHALL BE FIRESTOPPED TO MAINTAIN ITS RATING.
21. DIVISION 22 AND 23 EQUIPMENT CIRCUITING, DISCONNECT, AND OVERCURRENT PROTECTION CHARACTERISTICS ARE BASED ON THE BASIS OF DESIGN EQUIPMENT SPECIFICATION. CONTRACTOR SHALL BEAR ALL COSTS OF ELECTRICAL CHANGES RESULTING FROM PROVIDING EQUIPMENT FROM AN ALTERNATE MANUFACTURER.

ELECTRICAL DEMOLITION LEGEND

TAG	SYMBOLOGY	DESCRIPTION
(EX)		EXISTING DEVICE TO REMAIN.
(ED)		EXISTING DEVICE TO BE DEMOLISHED.
(ER)		EXISTING DEVICE TO BE RELOCATED.
(EL)		EXISTING DEVICE SHOWN IN NEW LOCATION TO BE REINSTALLED.
(EN)		EXISTING DEVICE TO BE REPLACED WITH NEW DEVICE IN SAME LOCATION.

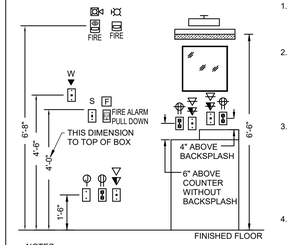
ELECTRICAL DEMOLITION NOTES

1. THE CONTRACTOR SHALL REMOVE THE EXISTING ELECTRICAL WORK NECESSARY TO PROVIDE THE INTENDED ARRANGEMENT OF WALLS AND CELINGS, AND SHALL RECONNECT ALL CIRCUITS INTERRUPTED BY THIS DEMOLITION WHERE THOSE CIRCUITS ARE UTILIZED BEYOND THE DEMOLITION, WHETHER SUCH CIRCUITS ARE INDICATED OR NOT.
2. WHERE AN ELECTRICAL DEVICE THAT IS TO BE REMOVED IS AN "END OF LINE" OR A SINGLE DEVICE, THE CONDUCTORS SHALL BE DISCONNECTED AT THE NEXT UPSTREAM DEVICE TO REMAIN OR AT ITS RELATED PANELBOARD. ALL NON-FUNCTIONAL CONDUCTORS INCLUDING POWER AND TELECOMMUNICATION CABLES SHALL BE REMOVED.
3. DEMOLITION: ACCURACY OF ORIGINAL PLANS HAS NOT BEEN VERIFIED. THE CONTRACTORS SHALL MAINTAIN CIRCUIT CONTINUITY OF ALL EXISTING FIXTURES AND DEVICES THAT ARE TO REMAIN.
4. EXISTING CIRCUITS, IF INDICATED, ARE DIAGRAMMATIC ONLY. VERIFY EXACT CONDUIT LOCATION AND ROUTING OF EXISTING CONDUIT RUNS AND NUMBER OF CONDUCTORS. AND PROVIDE ADDITIONAL CONDUITS / CONDUCTORS AS NECESSARY TO ACCOMPLISH THE DESIGN INTENT.
5. CIRCUIT BREAKERS ADDED TO THE EXISTING PANELBOARDS SHALL MATCH THE EXISTING BREAKER TYPE, MANUFACTURER, AND AIC RATING. PROVIDE NEW TYPE WRITTEN, UPDATED DIRECTORIES IN THE EXISTING PANELBOARDS TO REFLECT CHANGES MADE BY THIS RENOVATION.
6. ALL ADDITIONS TO SYSTEMS SHALL MATCH THE MANUFACTURER'S EXISTING SYSTEMS PRESENTLY INSTALLED IN THE FACILITY UNLESS OTHERWISE NOTED.
7. EXISTING SYSTEMS SHALL REMAIN UNLESS NOTED FOR REMOVAL OR RELOCATION. ALL SYSTEMS SHALL BE CHECKED TO ENSURE THEY ARE IN PROPER WORKING ORDER BEFORE ANY DEMOLITION IS STARTED. SYSTEMS NOT FOUND TO BE IN SATISFACTORY WORKING CONDITION SHALL BE REPORTED TO THE OWNER IN WRITING PRIOR TO THE START OF ANY DEMOLITION WORK. ALL SYSTEMS SHALL BE CHECKED TO ENSURE THAT THEY ARE WORKING PROPERLY AFTER THE DEMOLITION WORK IS FINISHED AND AFTER THE NEW ELECTRICAL INSTALLATION IS COMPLETE.
8. DEMOLITION, WHERE INDICATED ON PLAN, IS BASED ON EXISTING DRAWINGS AND LIMITED FIELD INVESTIGATION OF EXISTING CONDITIONS. SELECT DEMOLITION MAY BE REQUIRED FOR NEW CONSTRUCTION AND MAY NOT BE DELINEATED ON THIS DRAWING. CAREFULLY COORDINATE DEMOLITION WITH NEW CONSTRUCTION PLANS OF ALL DISCIPLINES TO VERIFY ACTUAL EXTENT OF DEMOLITION. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND FULLY UNDERSTAND THE EXTENT OF DEMOLITION WORK.
9. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
10. QUANTITY AND LOCATION OF EXISTING DEVICES SHOWN ON PLANS ARE APPROXIMATE. FIELD VERIFY DEVICES AND LOCATIONS.
11. ITEMS SHOWN HEAVY LINE WEIGHT DASHED LINES, HATCHED AND/OR NOTED SHALL BE DEMOLISHED AND ALL ASSOCIATED DEVICES, CONDUIT, AND WIRING SHALL BE REMOVED BACK TO THE NEAREST ACITVE JUNCTION BOX OR SOURCE UNLESS NOTED OTHERWISE. SEE DEMOLITION LEGEND FOR ADDITIONAL INFORMATION.
12. ALL EXISTING EQUIPMENT MAY NOT BE INDICATED. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO BIDDING. EXISTING ITEMS NOT SHOWN HATCHED SHALL REMAIN IN OPERATION. REVISE THE EXISTING CIRCUITRY TO MAINTAIN OPERATION OF ITEMS TO REMAIN.
13. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES, AND EQUIPMENT THAT ARE OUTSIDE AREA OF RENOVATION. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
14. RECYCLE OR DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL ASSOCIATED COSTS IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING LEED REQUIREMENTS, TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
15. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS 'SPARE' AND PLACE IN THE "OFF" POSITION.
16. VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
17. OFFER OWNERS REPRESENTATIVE FIRST RIGHT OF REFUSAL OF ALL EQUIPMENT REMOVED FROM SPACE.
18. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO-REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE CEILINGS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.

ELECTRICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
(ED)	EXISTING TO BE DEMOLISHED
(EL)	EXISTING DEVICE SHOWN IN NEW LOCATION TO BE REINSTALLED
(EN)	EXISTING TO BE REPLACED WITH NEW.
(ER)	EXISTING TO BE RELOCATED
(EX)	EXISTING TO REMAIN
A, AMP	AMPERES
AF	AMP FRAME - CIRCUIT BREAKER; AMP FUSE - FUSED SWITCH
AFC, AC	ABOVE FINISHED CABINET/COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT INTERRUPTER
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
ALSI	ARC FLASH ENERGY REDUCTION, LONG TIME, SHORT TIME, INSTANTANEOUS
ALSIG	ARC FLASH ENERGY REDUCTION, LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND FAULT
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
BKR, CB	CIRCUIT BREAKER
C	CONDUIT
CM	COFFEE MAKER
CPT	CONTROL POWER TRANSFORMER
CR	CRITICAL / CRITICAL BRANCH EMERGENCY
CT	CURRENT TRANSFORMER
CU	COPPER
DISC	DISCONNECT
DIV	DIVISION
DW	DISHWASHER
EC	ELECTRICAL CONTRACTOR
ECB	ENCLOSED CIRCUIT BREAKER
EG	EQUIPMENT GROUND
EM	EMERGENCY
EO	ELECTRICALLY OPERATED
EPO	EMERGENCY POWER OFF
EQ	EQUIPMEN BRANCH EMERGENCY
EWC	ELECTRIC WATER COOLER
FLA	FULL LOAD AMPS
FWE	FURNISHED WITH EQUIPMENT
G, GND	GROUND
GD	GARBAGE DISPOSAL
GDS	GENERATOR DOCKING STATION
GFI, GFCI	GROUND FAULT INTERRUPTER
GFPE	GROUND FAULT PROTECTION OF EQUIPMENT
H	HORIZONTAL, HORIZONTALLY MOUNTED
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
IAW	IN ACCORDANCE WITH
IG	ISOLATED GROUND
IM	ICE MACHINE
KV	KILOVOLT
KVA	KILOVOLT-AMPERES
KWH	KILOWATT-HOURS
LS	LIFE SAFETY BRANCH EMERGENCY
LSI	LONG TIME, SHORT TIME, INSTANTANEOUS
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND FAULT
LTS	LIGHTS
MCA	MAXIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MECHANICAL CONTROL PANEL
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MRS	MOTOR RATED SWITCH
MW	MEGAWATT
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT - FIXTURE CONTROLLED AT BRANCH CIRCUIT BREAKER ONLY
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
P	POLE
PH	PHASE
PNL	PANEL
PT	POTENTIAL TRANSFORMER
RECEPT, RCPT	RECEPTACLE
REF	REFRIGERATOR
SPD	SURGE PROTECTION DEVICE
SWBD	SWITCHBOARD
TR	TAMPER-RESISTANT
TYP	TYPICAL
UNO,UON	UNLESS NOTED OTHERWISE
UPS	UNINTERUPTABLE POWER SUPPLY
V	VOLTS
VA	VOLT-AMPERES
VB	VIEWBOX
W	WATTS, WIRE
WP	WEATHERPROOF WHILE IN USE COVER
XFMR	TRANSFORMER
XP, EP	EXPLOSION PROOF

STANDARD MOUNTING HEIGHTS



NOTES:
1. MOUNTING HEIGHTS SHOWN ARE FROM FINISHED FLOOR TO CENTERLINE OF DEVICE/OUTLET/FIXTURE, UNLESS OTHERWISE NOTED.
2. MOUNTING HEIGHTS, WHERE INDICATED, ON FLOOR PLANS, SHALL TAKE PRECEDENCE OVER THESE MOUNTING HEIGHTS. LOCATIONS OF OUTLETS SHOWN ON ARCHITECTURAL ELEVATIONS SHALL TAKE PRECEDENCE OVER THESE MOUNTING HEIGHTS. FIELD LOCATE OUTLETS WITH ARCHITECT DURING ROUGH-IN.
3. INSTALL OUTLETS THAT ARE IN CLOSE PROXIMITY ON THE SAME CENTERLINE. OUTLETS THAT ARE WITHIN 2'-0" HORIZONTALLY AND WITHIN 1'-0" VERTICALLY SHALL BE INSTALLED ON THE SAME HORIZONTAL CENTERLINE LOCATED HALF WAY BETWEEN THE HEIGHTS SHOWN. OUTLETS THAT ARE MORE THAN 1'-0" APART VERTICALLY SHALL BE INSTALLED ON THE SAME VERTICAL CENTERLINE.
4. MAXIMUM MOUNTING HEIGHT FOR SWITCHES ABOVE A COUNTER TOP 20" DEEP OR LESS IS 48" AFF TO TOP OF BOX. SWITCHES MOUNTED ABOVE COUNTER TOPS DEEPER THAN 20" SHALL BE INSTALLED AT NO MORE THAN 44" ABOVE FINISHED FLOOR TO TOP OF BOX. NOTIFY ARCHITECT WHERE COUNTERTOP PROHIBITS SWITCH INSTALLTION.

ELECTRICAL INDEX OF DRAWINGS

SHEET NUMBER	SHEET NAME
E-000	ELECTRICAL LEGEND, SYMBOLS, & NOTES
E-001	ELECTRICAL SPECIFICATIONS
E-002	ELECTRICAL SPECIFICATIONS
E-100	OVERALL LEVEL 0 FLOOR PLAN
E-201	ENLARGED MRI SUITE PLANS - LIGHTING & POWER
E-202	ENLARGED NMR 0250 & MRI OFFICE A110 PLANS - LIGHTING & POWER
E-701	ELECTRICAL ONE LINE DIAGRAM
E-801	ELECTRICAL STANDARD CIRCUITING AND CONDUIT SIZING SCHEDULES
E-810	PANEL SCHEDULES
E-901	ELECTRICAL DETAILS
TOTAL COUNT: 10	

ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

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CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

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ELECTRICAL LEGEND, SYMBOLS, & NOTES

E-000

ELECTRICAL GENERAL REQUIREMENT:

A. SCOPE OF WORK: ALL MATERIAL SHALL BE NEW UNLESS OTHERWISE INDICATED. FURNISH ALL LABOR, EQUIPMENT, TECHNICAL SUPERVISION, AND INCIDENTAL SERVICES REQUIRED TO COMPLETE, TEST AND LEAVE READY FOR OPERATION THE ELECTRICAL SYSTEMS AS SPECIFIED AND AS INDICATED ON DRAWINGS.

B. ORDINANCES AND CODES: PERFORM ALL WORK IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL ORDINANCES AND REGULATIONS, THE RULES AND REGULATIONS OF NFPA, NECA, AND UL UNLESS OTHERWISE INDICATED.

C. UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES FOR ELECTRICAL WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR. ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, RULES AND REGULATIONS.

D. THE DRAWINGS SHOW THE LOCATION AND GENERAL ARRANGEMENT OF EQUIPMENT, ELECTRICAL SYSTEMS AND RELATED ITEMS. THEY SHALL BE FOLLOWED AS CLOSELY AS ELEMENTS OF NEW CONSTRUCTION WILL PERMIT.

E. EXAMINE THE DRAWINGS OF OTHER TRADES AND VERIFY THE CONDITIONS GOVERNING THE WORK ON THE JOB SITE. ARRANGE WORK ACCORDINGLY, PROVIDING LABOR AND MATERIALS AS MAY BE REQUIRED TO MEET SUCH CONDITIONS.

F. COORDINATE ARRANGEMENT, MOUNTING AND SUPPORT OF ELECTRICAL EQUIPMENT WITH OTHER TRADES.

G. VISIT THE SITE, EXAMINE AND VERIFY THE CONDITIONS UNDER WHICH THE WORK MUST BE CONDUCTED BEFORE SUBMITTING PROPOSAL THE SUBMISSION OF A PROPOSAL IMPLIES THAT THE CONTRACTOR HAS VISITED THE SITE AND UNDERSTANDS THE CONDITIONS UNDER WHICH THE WORK MUST BE CONDUCTED. NO ADDITIONAL CHARGES WILL BE ALLOWED BECAUSE OF FAILURE TO MAKE THIS EXAMINATION OR TO INCLUDE ALL MATERIALS AND LABOR TO COMPLETE THE WORK.

H. BIDS SHALL BE BASED UPON MANUFACTURED EQUIPMENT SPECIFIED. VOLUNTARY ALTERNATES MAY BE SUBMITTED FOR CONSIDERATION, WITH LISTED ADDITION OR DEDUCTION TO THE BID.

I. WARRANTY: CONTRACTOR SHALL WARRANTY THAT THE ELECTRICAL INSTALLATION IS FREE FROM DEFECTS AND AGREES TO REPLACE OR REPAIR, TO THE OWNER'S SATISFACTION, ANY PART OF THIS ELECTRICAL INSTALLATION WHICH BECOMES DEFECTIVE WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION FOLLOWING FINAL ACCEPTANCE, PROVIDED THAT SUCH FAILURE IS DUE TO DEFECTS IN THE EQUIPMENT, MATERIAL WORKMANSHIP OR FAILURE TO FOLLOW THE CONTRACT DOCUMENTS.

J. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TEMPORARY SERVICES INCLUDING EQUIPMENT AND INSTALLATION REQUIRED TO MAINTAIN OPERATION AS A RESULT OF ANY EQUIPMENT FAILURE OR DEFECT DURING WARRANTY PERIOD.

K. FILE WITH THE OWNER ANY AND ALL WARRANTIES FROM THE EQUIPMENT MANUFACTURERS INCLUDING THE OPERATING CONDITIONS AND PERFORMANCE CAPACITIES THEY ARE BASED ON.

L. IN GENERAL DEMOLITION WORK IS INDICATED ON THE DRAWINGS. HOWEVER, THE CONTRACTOR SHALL VISIT THE JOB SITE TO DETERMINE THE FULL EXTENT AND CHARACTER OF THIS WORK.

M. UNLESS SPECIFICALLY NOTED TO THE CONTRARY, REMOVED MATERIALS SHALL NOT BE REUSED IN THE WORK. SALVAGED MATERIALS THAT ARE TO BE REUSED SHALL BE STORED SAFE AGAINST DAMAGE AND TURNED OVER TO THE APPROPRIATE TRADE FOR REUSE. SALVAGED MATERIALS OF VALUE THAT ARE NOT TO BE REUSED SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS SUCH OWNERSHIP IS WAIVED. ITEMS ON WHICH THE OWNER WAIVES OWNERSHIP SHALL BECOME THE PROPERTY OF THE CONTRACTOR, WHO SHALL REMOVE AND LEGALLY DISPOSE OF SAME, AWAY FROM THE PREMISES.

N. CONSULT WITH THE OWNER'S REPRESENTATIVE AS TO THE METHODS OF CARRYING ON THE WORK SO AS NOT TO INTERFERE WITH THE OWNER'S OPERATION ANY MORE THAN ABSOLUTELY NECESSARY. ACCORDINGLY, ALL SERVICE LINES SHALL BE KEPT IN OPERATION AS LONG AS POSSIBLE AND THE SERVICES SHALL ONLY BE INTERRUPTED AT SUCH TIME AS WILL BE DESIGNATED BY THE OWNER'S REPRESENTATIVE.

O. ALL CUTTING, PATCHING AND REPAIR WORK SHALL BE PERFORMED BY THE CONTRACTOR THROUGH APPROVED, QUALIFIED SUBCONTRACTORS. CONTRACTOR SHALL INCLUDE FULL COST OF SAME IN BID.

P. PROVIDE ALL EXCAVATION, TRENCHING, TUNNELING, DEWATERING AND BACKFILLING REQUIRED FOR THE ELECTRICAL WORK. COORDINATE THE WORK WITH OTHER EXCAVATING AND BACKFILLING IN THE SAME AREA.

Q. INSPECT THE INSTALLATION OF ALL EQUIPMENT PER THE MANUFACTURER'S RECOMMENDATION AND APPLICABLE CODES.

R. PROVIDE UL APPROVED FIRE-STOPPING SYSTEM FOR ALL PENETRATIONS PASSING THROUGH FIRE RATED ASSEMBLES.

S. COMPLY WITH NECA 1.

T. PROVIDE COMPLETE OPERATION AND MAINTENANCE INSTRUCTIONAL MANUALS COVERING ALL ELECTRICAL EQUIPMENT HEREIN SPECIFIED, TOGETHER WITH PARTS LISTS.

U. CONTRACTOR SHALL SUBMIT TO THE ARCHITECT/ENGINEER, RECORD DRAWINGS ON ELECTRONIC MEDIA OR BLACK LINE REPRODUCTIONS WHICH HAVE BEEN NEATLY MARKED TO REPRESENT AS-BUILT CONDITIONS FOR ALL NEW ELECTRICAL WORK.

V. SUBMIT FOR APPROVAL SHOP DRAWINGS FOR ALL ELECTRICAL SYSTEMS OR EQUIPMENT LIMITED TO THE ITEMS LISTED BELOW:
1. PANEL BOARDS
2. TRANSFORMERS
3. DISCONNECT SWITCHES
4. WIRING DEVICES
5. LIGHTING FIXTURES
6. LIGHTING CONTROL SYSTEMS AND DEVICES

W. PROVIDE AND INSTALL ARC-FLASH HAZARD LABELS ON ELECTRICAL EQUIPMENT AND ENCLOSURES DEFINED BY NFPA 70E. LABELS SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 70E AND CONTAIN AS A MINIMUM:
1. VOLTAGE (PHASE-PHASE)
2. FLASH PROTECTION BOUNDARY (INCHES)
3. INCIDENT ENERGY LEVEL AT THE WORKING DISTANCE (CA/CM2)
4. PERSONNEL PROTECTIVE EQUIPMENT (PPE) CLASS AND DESCRIPTION
5. RESTRICTED APPROACH BOUNDARY (INCHES)
6. LIMITED SHOCK APPROACH BOUNDARY (INCHES)
7. PROHIBITED SHOCK APPROACH BOUNDARY (INCHES)

LIGHTING CONTROL DEVICES

A. COORDINATE OCCUPANCY/VACANCY SENSOR LOCATIONS, COVERAGE AND REQUIRED QUANTITIES WITH MANUFACTURER'S RECOMMENDATIONS. COVERAGE AREAS INDICATED ON THE DRAWINGS ARE FOR MINOR MOTION (6 TO 8 INCHES OF HAND MOVEMENT). PROVIDE ADDITIONAL OCCUPANCY SENSORS AND CONTROL UNITS AS REQUIRED TO ACHIEVE COMPLETE MINOR MOTION COVERAGE OF THE SPACE INDICATED.

B. OCCUPANCY/VACANCY SENSOR ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, PROVIDE ON-SITE ASSISTANCE IN ADJUSTING SENSORS TO SUIT ACTUAL OCCUPIED CONDITIONS PROVIDE UP TO TWO VISITS TO SITE OUTSIDE NORMAL OCCUPANCY HOURS FOR THIS PURPOSE.

C. OCCUPANCY/VACANCY SENSOR:
1. WALL SWITCH DUAL TECHNOLGY SENSOR 120/177V: WATTSTOPPER DSW-100 OR EQUAL
2. WALL SWITCH DUAL RELAY, DUAL TECHNOLOGY SENSOR 120/277V: WATTSTOPPER DSW-200 OR EQUAL
3. MULTI-WAY DUAL REALY, DUAL TECHNOLOGY SENSOR: WATTSTOPPER DSW-203 OR EQUAL
4. 360° CEILING MOUNTED DUAL TECHNOLOGY SENSOR 24VDC/VAC: WATTSTOPPER DT-300 OR EQUAL
5. 360° CEILING MOUNTED PASSIVE INFRARED SENSOR. WATTSTOPPER CI-200 OR EQUAL

D. OCCUPANCY/VACANCY SENSOR CONTROL UNITS:
1. DESCRIPTION: TRANSFORMER AND RELAY COMBINED IN SINGLE UNIT TO PROVIDE 24DC POWER TO SENSORS AND PROVIDE 20A CONTACT(S) FOR CONTROL OF LIGHTING LOADS AT 120 OR 277V. CONTROL UNIT INPUT POWER SHALL BE FROM UNSWITCHED LEG OF LIGHTING CIRCUIT IT IS CONTROLLING.
   a. CONTROL UNITS SHALL BE PROVIDED AS REQUIRED TO POWER CEILING MOUNTED OCCUPANCY SENSORS, CONTROL LIGHTING LOADS AND PROVIDE A MINIMUM OF ONE AUXILIARY CONTACT.
   b. OCCUPANCY SENSOR CONTROL UNITS SHALL MOUNT EXTERNAL TO 4-INCH SQ JUNCTION BOX IN THE CEILING SPACE. ALL WIRING BETWEEN CONTROL UNIT AND OCCUPANCY SENSOR SHALL BE PLENUM RATED.
   c. LOCATE CONTROL UNIT IN ACCESSIBLE LOCATION IN GYP-BOARD CEILINGS, ADJACENT TO RETURN AIR GRILLES, OR PROVIDE ACCESS PANEL
   d. ADDITIONAL AUXILIARY RELAY MODULES SHALL BE PROVIDED AS REQUIRED TO PROVIDE CONTROL OF ALL LIGHTING CIRCUITS AND ADDITIONAL AUXILIARY CONTACTS AS REQUIRED.
   e. IT IS ACCEPTABLE TO PROVIDE CONTROLS AND AUXILIARY CONTACTS AS REQUIRED INTEGRAL TO NEW CEILING SENSOR, PROVIDED ALL REQUIRED CONTACTS ARE PROVIDED.
   f. MAXIMUM OF 3 SENSORS PER POWER PACK. VERIFY EXACT QUANTITIES REQUIRED WITH MANUFACTURER.

RACEWAYS AND BOXES

A. SURFACE METAL RACEWAYS: GALVANIZED STEEL WITH SNAP-ON COVERS. FINISH WITH MANUFACTURER'S STANDARD PRIME COATING. WIREMOLD OR EQUAL SIZE/TYPE AS SHOWN ON DRAWINGS.

B. MINIMUM RACEWAY SIZE 3/4-INCH TRADE SIZE

C. INSTALL CONDUIT IN ACCORDANCE WITH NECA "NATIONAL ELECTRICAL INSTALLATION STANDARDS".

D. ROUTE CONDUITS IN FINISHED AREAS WITH EXPOSED CEILINGS AT UNDERSIDE OF STRUCTURAL DECK OR AS HIGH AS POSSIBLE. WHERE STEEL METAL DECK ON STEEL JOIST CONSTRUCTION, ROUTE CONDUITS ABOVE JOISTS. DO NOT SECURE CONDUIT TO BOTTOM OF JOISTS.

E. RACEWAY APPLICATIONS REFER TO RACEWAY APPLICATIONS SCHEDULE ON SHEET E-801.

F. FITTINGS FOR EMT: STEEL COMPRESSION TYPE.

IDENTIFICATION

A. COMPLY WITH ANSI A13.1, ANSI C2, NFPA 70, AND 29 CFR 1910.145.

B. COORDINATE IDENTIFICATION NAMES, ABBREVIATIONS, COLORS, AND OTHER FEATURES WITH REQUIREMENTS IN THE CONTRACT DOCUMENTS, SHOP DRAWINGS, MANUFACTURER'S WIRING DIAGRAMS, AND THE OPERATION AND MAINTENANCE MANUAL AND WITH THOSE REQUIRED BY CODES, STANDARDS, AND 29 CFR 1910.145. USE CONSISTENT DESIGNATIONS THROUGHOUT PROJECT.

C. COORDINATE INSTALLATION OF IDENTIFYING DEVICES WITH COMPLETION OF COVERING AND PAINTING OF SURFACES WHERE DEVICES ARE TO BE APPLIED, WITH LOCATION OF ACCESS PANELS AND DOORS.

D. INSTALL IDENTIFYING DEVICES BEFORE INSTALLING ACOUSTICAL CEILINGS AND SIMILAR CONCEALMENT.

E. INSTALL ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABELS THAT ARE PUNCHED OR DRILLED FOR SCREW MOUNTING WITH SELF TAPPING STAINLESS STEEL SCREW. LABELS SHALL HAVE BLACK LETTERS ON A WHITE BACKGROUND AND WHITE LETTERS ON RED BACKGROUND FOR EMERGENCY. MINIMUM LETTER HEIGHT SHALL BE 3/8 INCH (10 MM). LABELS SHALL BE INSTALLED ON ALL ELECTRICAL EQUIPMENT AFFECTED BY PROJECT.
1. PANELBOARD AND TRANSFORMER NAMEPLATES IDENTIFY SOURCE FED FROM, VOLTAGE, SIZE, NAME.
2. ENCLOSED CONTROLLERS, CIRCUIT BREAKERS, DISCONNECT SWITCHES IDENTIFY SOURCE AND LOAD SERVED.

F. WIRING DEVICES: USE ADHESIVE LABEL WITH BLACK, RED FOR EMERGENCY, FILM LETTERING ON FACE OF WALL PLATE AND DURABLE WIRE MARKERS OR TAGS INSIDE OUTLET BOXES. LABELS SHALL BE CLEAR POLYESTER WITH BLACK LETTER, RED LETTER FOR EMERGENCY, FONT SIZE OF 7. IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH SERVED.

G. USE THE COLORS USED BELOW FOR UNGROUNDED SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS.
1. COLOR SHALL BE FACTORY APPLIED OR, FOR SIZES LARGER THAN NO. 10 AWG IF AUTHORITIES HAVING JURISDICTION PERMIT, FIELD APPLIED.
2. COLORS FOR 240/120-V CIRCUITS
   a. PHASE A BLACK
   b. PHASE B: RED
   c. PHASE C: BLUE
   d. NEUTRAL: WHITE
3. COLORS FOR 480/277-V CIRCUITS:
   a. PHASE A: BROWN
   b. PHASE B: ORANGE
   c. PHASE C: YELLOW
   d. NEUTRAL: GRAY
4. FIELD-APPLIED, COLOR-CODING CONDUCTOR TAPE APPLY IN HALF-LAPPED TURNS FOR A MINIMUM DISTANCE OF 6 INCHES FROM TERMINAL POINTS AND IN BOXES WHERE SPLICES OR TAPS ARE MADE. APPLY LAST TWO TURNS OF TAPE WITH NO TENSION TO PREVENT POSSIBLE UNWINDING. LOCATE BANDS TO AVOID OBSCURING FACTORY CABLE MARKINGS.

H. WARNING LABELS FOR INDOOR CABINETS, BOXES, AND ENCLOSURES FOR POWER AND LIGHTING: COMPLY WITH 29 CFR 1910.145 AND APPLY SELF-ADHESIVE WARNING LABELS. IDENTIFY SYSTEM VOLTAGE WITH BLACK LETTERS ON AN ORANGE BACKGROUND. APPLY TO EXTERIOR OF DOOR, COVER, OR OTHER ACCESS.
1. EQUIPMENT REQUIRING WORKSPACE CLEARANCE ACCORDING TO NFPA 70: UNLESS OTHERWISE INDICATED, APPLY TO DOOR OR COVER OF EQUIPMENT BUT NOT ON FLUSH PANELBOARDS AND SIMILAR EQUIPMENT IN FINISHED SPACES.

I. UNLESS OWNER STANDARDS DICATE OTHERWISE - ACCESSIBLE RACEWAYS AND CABLES OF AUXILIARY SYSTEMS IDENTIFY THE FOLLOWING SYSTEMS WITH COLOR-CODED, SELF-ADHESIVE VINYL TAPE APPLIED IN BANDS OR PAINTED RACEWAY
1. FIRE ALARM SYSTEM: RED.
2. SECURITY SYSTEM: BLUE AND YELLOW.
3. TELECOMMUNICATION SYSTEM: GREEN AND YELLOW.
4. CONTROL WIRING: GREEN AND RED.

WIRING DEVICES

A. HOSPITAL GRADE STRAIGHT BLADE RECEPTACLES: COMPLY WITH NEMA WD1, NEMA WD6, DSCC W-C-596G AND UL498. CONFIGURATION 5-20R DUPLEX RECEPTACLE. HUBBELL HBL8300X OR EQUAL BY PASS & SEYMOUR OR COOPER.

B. HOSPITAL GRADE GFI RECEPTACLES: STRAIGHT BLADE FEED-THROUGH TYPE, GENERAL DUTY GRADE, WITH INTEGRAL NEMA WD 6, CONFIGURATION 5-20R DUPLEX RECEPTACLE; COMPLYING WITH UL 498 AND UL 943. DESIGN UNITS FOR INSTALLATION IN A 2-3/4-INCH- (70-MM-) DEEP OUTLET BOX WITHOUT AN ADAPTER. HUBBELL GFR8300HXL OR EQUAL BY PASS & SEYMOUR OR COOPER.

C. HOSPITAL GRADE TAMPER-RESISTANT RECEPTACLES: STRAIGHT BLADE WITH SAFETY MECHANISM TO ENERGIZE CONTACTS ONLY WHEN BOTH OPENINGS ARE SIMULTANEOUSLY ENGAGED. COMPLY WITH NEMA WD1, NEMA WD6, UL498, AND UL544. PROVIDE IN ALL AREAS WHERE CHILDREN MAY BE PRESENT (I.E. WAITING AREAS, LOBBIES, EXAM ROOMS, ETC.). CONFIGURATION 5-20R DUPLEX RECEPTACLE. HUBBELL HBL8300SG OR EQUAL BY PASS & SEYMOUR OR COOPER.
REQUIRED IN WAITING AREAS AND OFFICES.

D. HOSPITAL GRADE MRI RECEPTACLES: STRAIGHT BLADE NON-FERROUS CONTACTS. COMPLY WITH NEMA WD1, NEMA WD6, UL498, AND UL544. PROVIDE IN MRI PROCEDURE ROOM. CONFIGURATION 5-20R DUPLEX RECEPTACLE. HUBBELL HBL8300XMRI OR EQUAL BY PASS & SEYMOUR OR COOPER.

E. HOSPITAL GRADE USB CHARGER TYPE A RECEPTACLES: COMPLY WITH NEMA WD1, NEMA WD6, UL498, AND UL544. CONFIGURATION 5-20R DUPLEX RECEPTACLE. AND TWO TYPE A 2.0 PORTS. HUBBELL USB8300A5X OR EQUAL BY PASS & SEYMOUR OR COOPER.

F. WALL SWITCHES: SINGLE AND DOUBLE-POLE SWITCHES COMPLY WITH DSCC W-C-896F AND UL 20. HUBBELL WIRING DEVICE, KELLEMS 1220 SERIES OR EQUAL BY PASS & SEYMOUR, COOPER OR LEVITON.

G. LED LAMP DIMMER SWITCHES: LEGRAND OR EQUAL, COMPATIBLE WITH LED DIMMING DRIVER SPECIFIED.

H. DIMMERS:
1. CONTROL: CONTINUOUSLY ADJUSTABLE SLIDER WITH PRE-SET; SINGLE-POLE OR THREE-WAY SWITCHING TO SUIT CONNECTIONS.
2. INSTALL WALL DIMMERS TO ACHIEVE FULL RATING SPECIFIED AND INDICATED AFTER DERATNG FOR GANGING ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS
3. INSTALL UNSHARED NEUTRAL CONDUCTORS ON LINE AND LOAD SIDE OF DIMMERS ACCORDING TO MANUFACTURERS' WRITTEN INSTRUCTIONS.

I. WALL PLATES:
1. PROVIDE BRUSHED STAINLESS STEEL WALL PLATES IN FINISHED AREAS.
2. PROVIDE BRUSHED GALVANIZED STEEL WALL PLATES IN UNFINISHED AREAS.
3. PROVIDE WEATHERPROOF WHILE-IN-USE COVERPLATES FOR WET LOCATIONS.

J. WIRING DEVICE/WALL PLATE COLOR AS SELECTED BY ARCHITECT UNLESS OTHERWISE INDICATED OR REQUIRED BY NFPA 70.

K. CONNECT WIRING DEVICE GROUNDING TERMINAL TO OUTLET BOX WITH BONDING JUMPER. USE OF QUICK GROUND STRAP OR SCREW IS NOT ACCEPTABLE.

L. CORD AND PLUG SETS: MATCH VOLTAGE, AND CURRENT RATINGS AND NUMBER OF CONDUCTORS TO REQUIREMENTS OF EQUIPMENT BEING CONNECTED.
1. CORD: RUBBER-INSULATED, STRANDED-COPPER CONDUCTORS, WITH TYPE SOW-A JACKET; WITH GREEN-INSULATED GROUNDING CONDUCTOR AND EQUIPMENT-RATING AMPACITY PLUS A MINIMUM OF 30 PERCENT.
2. PLUG: NYLON BODY AND INTEGRAL CABLE-CLAMPING JAWS. MATCH CORD AND RECEPTACLE TYPE FOR CONNECTION.
3. PROVIDE STRAIN RELIEF FOR CORD DROP INSTALLATIONS.

GROUNDING AND BONDING

A. EQUIPMENT GROUNDING: COMPLY WITH NFPA 70, ARTICLE 250, FOR TYPES, SIZES, AND QUANTITIES OF EQUIPMENT GROUNDING CONDUCTORS, UNLESS SPECIFIC TYPES, LARGER SIZES, OR MORE CONDUCTORS THAN REQUIRED BY NFPA 70 ARE INDICATED.

B. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN EACH RACEWAY.

C. PROVIDE PANELBOARD BONDING FOR PATIENT CARE AREAS PER NEC 517 WHERE REQUIRED.

CONDUCTORS AND CABLES

A. CONDUCTOR MATERIAL: COPPER COMPLYING WITH NEMA WC: 70; STRANDED CONDUCTOR.

B. CONDUCTOR INSULATION TYPES: TYPE THHN-THWN, SO, COMPLYING WITH NEMA WC 70.

C. CONCEAL CABLES IN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.

D. USE CONDUCTOR NOT SMALLER THAN 12 AWG FOR POWER AND LIGHTING CIRCUITS. UNLESS INDICATED OTHERWISE, ALL 20A BRANCH CIRCUITS SHALL BE 2#12, 1#12G, 3/4"C.

E. USE CONDUCTOR NOT SMALLER THAN #14 AWG FOR CONTROL CIRCUITS PROVIDED BY ELECTRICAL CONTRACTOR.

F. USE "STA-KON" CONNECTORS TO TERMINATE STRANDED CONDUCTORS #10 AWG AND SMALLER TO SCREW TERMINALS.

G. CONDUCTOR AND INSULATION APPLICATIONS:
1. FEEDERS: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY
2. BRANCH CIRCUITS, INCLUDING IN CRAWLSPACES: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY OR ARMORED CABLE TYPE AC (HFC) PROVIDE A DEDICATED NEUTRAL FOR EACH CIRCUIT.
3. CORD DROPS AND PORTABLE APPLIANCE CONNECTIONS: TYPE SO, HARD SERVICE CORD
4. CLASS I CONTROL CIRCUITS TYPE THHN -THWN IN RACEWAY
5. CLASS II CONTROL CIRCUITS: POWER LIMITED CABLE

I. REFER TO RACEWAY APPLICATION SCHEDULE ON SHEET E-801. FOR ADDITIONAL REQUIREMENTS.

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY SQUARE D, EATON, GENERAL ELECTRIC, OR SIEMENS.

B. FUSIBLE AND NON-FUSIBLE SWITCHES: NEMA KS 1, QUICK MAKE QUICK-BREAK LOAD INTERRUPTER ENCLOSED KNIFE SWITCH TYPE HD, WITH CLIPS OR BOLT PADS TO ACCOMMODATE SPECIFIED FUSES (IF REQUIRED), EXTERNALLY OPERABLE LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION. SQUARE D OR EQUAL

C. TOGGLE DISCONNECT SWITCH: HEAVY DUTY, 30A, 600 VOLT, DOUBLE OR THREE POLE AS REQUIRED, SINGLE THROW, MOTOR RATED SWITCH WITHOUT OVERLOAD PROTECTION. PROVIDE NEMA 1 ENCLOSURE AND PADLOCK ATTACHMENT.

D. COMPLY WITH APPLICABLE PORTIONS OF NECA 1, NEMA PB 1.1, AND NEMA PB 2.1 FOR INSTALLATION OF ENCLOSED SWITCHES AND CIRCUIT BREAKERS.

PANELBOARDS

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY SQUARE D, EATON, ABB, OR SIEMENS.

B. COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, AND ENCUMBRANCES TO NFPA 70 DEDICATED AND WORKSPACE CLEARANCE REQUIREMENTS.

C. PHASE AND GROUND BUSES SHALL BE HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.

D. SERVICE EQUIPMENT LABEL: UL LABELED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS WITH MAIN SERVICE DISCONNECT SWITCHES.

E. SHORT-CIRCUIT RATING: FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS.

F. INSTALL PANELBOARDS AND ACCESSORIES ACCORDING TO NEMA PB 1.1.

G. MOUNT TOP OF TRIM 74 INCHES (18130 MM) ABOVE FINISHED FLOOR, UNLESS OTHERWISE INDICATED.

H. STUB FOUR 1-INCH (27-GRC) EMPTY CONDUITS FROM RECESSED PANELBOARD INTO ACCESSIBLE CEILING SPACE OR SPACE DESIGNATED TO BE CEILING SPACE IN THE FUTURE. STUB FOUR 1-INCH (27-GRC) EMPTY CONDUITS INTO RAISED FLOOR SPACE OR BELOW SLAB NOT ON GRADE.

I. CREATE A DIRECTORY TO INDICATE INSTALLED CIRCUIT LOADS AFTER BALANCING PANELBOARD LOADS OR CREATED BY RETROFITTING. OBTAIN APPROVAL BEFORE INSTALLING. CREATE A TYPED DIRECTORY; HANDWRITTEN DIRECTORIES ARE NOT ACCEPTABLE. COORDINATE FINAL DIRECTORY ROOM NAMES AND NUMBERS WITH (OWNER) (FACILITY ENGINEER).

J. LOAD BALANCING: AFTER SUBSTANTIAL COMPLETION, BUT NOT MORE THAN 60 DAYS AFTER FINAL ACCEPTANCE, MEASURE LOAD BALANCING AND MAKE CIRCUIT CHANGES.

K. ON COMPLETION OF INSTALLATION, INSPECT INTERIOR AND EXTERIOR OF PANELBOARDS. REMOVE PAINT SPLATTERS AND OTHER SPOTS. VACUUM DIRT AND DEBRIS; DO NOT USE COMPRESSED AIR TO ASSIST IN CLEANING. REPAIR EXPOSED SURFACES TO MATCH ORIGINAL FINISH.

L. DISTRIBUTION PANELBOARDS
1. DOORS: SECURED WITH VAULT-TYPE LATCH WITH TUMBLER LOCK; KEYED ALIKE OMIT FOR FUSED-SWITCH PANELBOARDS.
2. MAIN OVERCURRENT PROTECTIVE DEVICES: AS INDICATED ON DRAWING.
3. BRANCH OVERCURRENT PROTECTIVE DEVICES
   a. FOR CIRCUIT-BREAKER FRAME SIZES 125A AND SMALLER: BOLT-ON CIRCUIT BREAKERS.
   b. FOR CIRCUIT-BREAKER FRAME SIZES LARGER THAN 125A BOLT-ON CIRCUIT BREAKERS; PLUG-IN CIRCUIT BREAKERS WHERE INDIVIDUAL POSITIVE-LOCKING DEVICE REQUIRES MECHANICAL RELEASE FOR REMOVAL
   c. FUSED SWITCHES.

M. LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS
1. BRANCH OVERCURRENT PROTECTIVE DEVICES: BOLT-ON CIRCUIT BREAKERS, REPLACEABLE WITHOUT DISTURBING ADJACENT UNITS.

N. SURGE SUPPRESSION PANELBOARDS
1. BUS COPPER PHASE AND NEUTRAL BUSES; 200 PERCENT CAPACITY NEUTRAL BUS AND LUGS.
2. SURGE SUPPRESSION DEVICE: IEEE C62.41, INTEGRALLY MOUNTED, DIRECT BUS CONNECTED, SOLID-STATE, PARALLEL-CONNECTED, SINE-WAVE TRACKING SUPPRESSION AND FILTERING MODULES.

O. MOLDED-CASE CIRCUIT BREAKERS UL 489, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.
1. THERMAL-MAGNETIC CIRCUIT BREAKERS INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER WITH RESTRICTED ACCESS COVER.

P. MOLDED-CASE CIRCUIT-BREAKER FEATURES AND ACCESSORIES:
1. LUGS MECHANICAL STYLE, SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIALS.
2. APPLICATION USING: APPROPRIATE FOR APPLICATION; TYPE SW) FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HACR FOR HEATING, AIR-CONDITIONING, AND REFRIGERATING EQUIPMENT.
3. GROUND-FAULT PROTECTION: INTEGRALLY MOUNTED RELAY AND TRIP UNIT WITH ADJUSTABLE PICKUP AND TIME-DELAY SETTINGS, PUSH-TO-TEST FEATURE, AND GROUND-FAULT INDICATOR.
4. SHUNT TRIP: 120-V TRIP COIL ENERGIZED FROM SEPARATE CIRCUIT, SET TO TRIP AT 75 PERCENT OF RATED VOLTAGE.
5. TANDEM CIRCUIT BREAKERS ARE NOT PERMITTED.
6. PROVIDE CIRCUIT BREAKERS U.L LISTED AS TYPE GFEPCI FOR ALL SELF REGULATING HEATING (SNOW MELTING AND HEAT TRACE) CABLES BRANCH CIRCUITS.
7. PROVIDE LOCK ON DEVICES FOR CIRCUIT BREAKERS WHEN CALLED OUT ON PANEL SCHEDULES WITH “LOD" DESIGNATION AND WHERE REQUIRED FOR FIRE ALARM BRANCH CIRCUITS.
8. PROVIDE GROUND FAULT INTERRUPT 5MA CIRCUIT BREAKER WHEN CALLED OUT ON PANEL SCHEDULES.
9. PROVIDE SHUNT TRIP BREAKERS WHEN CALLED OUT ON PANEL SCHEDULES.

Q. FUSED SWITCH: NEMA KS 1, TYPE HD; CLIPS TO ACCOMMODATE SPECIFIED FUSES; LOCKABLE HANDLE.

R. ENCLOSURES: MOUNTING AS NOTED ON PANEL SCHEDULES.
1. NEMA PB 1, RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION.
   a. INDOOR DRY LOCATIONS NEMA 250, TYPE 1.
   b. OUTDOOR LOCATIONS NEMA 250, TYPE 3R.
   c. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4.
2. CABINET FRONT: FLUSH OR SURFACE CABINET AS NOTED ON THE DRAWINGS, WITH FRONT WITH CONCEALED TRIM CLAMPS, PIANO TYPE HINGED DEAD FRONT COVER, HINGED DOOR, AND FLUSH LOCK ALL KEYED ALIKE
3. DIRECTORY CARD WITH TRANSPARENT PROTECTIVE COVER, MOUNTED IN METAL FRAME INSIDE PANELBOARD DOOR.

DRY-TYPE TRANSFORMERS (600 V AND LESS)

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY SQUARE D, EATON, ABB, OR SIEMENS.

B. DESCRIPTION: FACTORY-ASSEMBLED AND TESTED, AIR COOLED, DRY-TYPE TRANSFORMER RATED FOR 60 HZ OPERATION. COMPLY WITH NEMA ST 20, AND LIST AND LABEL AS COMPLYING WITH UL 1561.

C. INDOOR ENCLOSURE: VENTILATED, NEMA 250, TYPE 2. PROVIDE LIFTING EYES OR BRACKETS.

D. OUTDOOR ENCLOSURE: VENTILATED, RAINTIGHT, NEMA 250, TYPE 3R. PROVIDE LIFTING EYES OR BRACKETS.

E. INSULATION CLASS (15 KVA AND LARGER): 220 DEG C, UL-COMPONENT-RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 115 DEG C RISE ABOVE 40 DEG C AMBIENT TEMPERATURE.

F. BASIC IMPULSE LEVEL 10 KV.

G. TAPS FOR TRANSFORMERS 7.5 TO 24 KVA: ONE 5 PERCENT TAP ABOVE AND ONE 5 PERCENT TAP BELOW NORMAL FULL CAPACITY.

H. TAPS FOR TRANSFORMERS 25 KVA AND LARGER: TWO 2.5 PERCENT TAPS ABOVE AND TWO 2.5 PERCENT TAPS BELOW NORMAL FULL CAPACITY.

I. CASE TEMPERATURE DO NOT EXCEED 35 DEGREES C RISE ABOVE AMBIENT AT WARMEST POINT.

J. CORES GRAIN-ORIENTED, NON-AGING SILICON STEEL.

K. COILS: CONTINUOUS WINDINGS WITHOUT SPLICES, EXCEPT FOR TAPS; INTERNAL COIL CONNECTIONS BRAZED OR PRESSURE TYPE; COIL MATERIAL ALUMINUM.

L. VIBRATION ISOLATION: ISOLATE CORE AND COIL FROM ENCLOSURE USING VIBRATION-ABSORBING MOUNTS.

M. GROUNDING: GROUND CORE AND COIL ASSEMBLY TO ENCLOSURE BY MEANS OF A VISIBLE FLEXIBLE COPPER GROUNDING STRAP.

N. TEST AND INSPECT TRANSFORMERS ACCORDING TO IEEE C57.12.91.

O. VERIFY THAT FIELD MEASUREMENTS ARE AS NEEDED TO MAINTAIN WORKING CLEARANCES REQUIRED BY NFPA 70 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

P. RECORD TRANSFORMER SECONDARY VOLTAGE AT EACH UNIT FOR AT LEAST 48 HOURS OF TYPICAL OCCUPANCY PERIOD. ADJUST TRANSFORMER TAPS TO PROVIDE OPTIMUM VOLTAGE CONDITIONS AT SECONDARY TERMINALS.

FUSES

A. OBTAIN FUSES FROM A SINGLE MANUFACTURER.

B. COORDINATE FUSE RATINGS WITH UTILIZATION EQUIPMENT NAMEPLATE LIMITATIONS OF MAXIMUM FUSE SIZE.

C. EXAMINE UTILIZATION EQUIPMENT NAMEPLATES AND INSTALLATION INSTRUCTIONS. INSTALL FUSES OF SIZES AND WITH CHARACTERISTICS APPROPRIATE FOR EACH PIECE OF EQUIPMENT.

D. INSTALL LABELS INDICATING FUSE REPLACEMENT INFORMATION ON INSIDE DOOR OF EACH FUSED SWITCH.

E. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY COOPER BUSMAN, INC. OR EQUAL

F. CARTRIDGE FUSES: NEMA FU 1, NONRENEWABLE CARTRIDGE FUSE; CLASS AND CURRENT RATING INDICATED; VOLTAGE RATING CONSISTENT WITH CIRCUIT VOLTAGE
1. SERVICE ENTRANCE: CLASS L TIME DELAY.
2. FEEDERS: CLASS RK5 TIME DELAY.
3. MOTOR BRANCH CIRCUITS: CLASS RK1, TIME DELAY.
4. OTHER BRANCH CIRCUITS: CLASS RK1, TIME DELAY.

G. COMPLY WITH:
1. NEMA FU 1 - LOW VOLTAGE CARTRIDGE FUSES.
2. NFPA 70 - NATIONAL ELECTRICAL CODE.
3. UL 198C - HIGH-INTERRUPTING-CAPACITY FUSES, CURRENT-LIMITING TYPES.
4. UL 198E - CLASS R FUSES.
5. UL 512 - FUSEHOLDERS.

LIGHTING

A. PROVIDE LIGHTING FIXTURES AS INDICATED ON DRAWINGS.

B. INSTALL DRIVERS/BALLASTS, AND SPECIFIED ACCESSORIES AT FACTORY. FOR FIXTURES CONTAINING LAMPS, INSTALL ON PROJECT SITE AFTER FIXTURE INSTALLATION.

C. FIXTURES SET LEVEL, PLUMB, AND SQUARE WITH CEILINGS AND WALLS. INSTALL LAMPS IN EACH FIXTURE WHERE REQUIRED.

D. SUPPORT LUMINARIES INDEPENDENT OF CEILING FRAMING. SUPPORT RECESSED GRID LUMINARIES FROM TWO OPPOSITE CORNERS DIRECTLY TO STRUCTURE. WIRE OR ROD SHALL HAVE BREAKING STRENGTH OF THE WEIGHT OF FIXTURE AT A SAFETY FACTOR OF 3.

E. INSTALL RECESSED LUMINARIES TO PERMIT REMOVAL FROM BELOW.

F. INSTALL RECESSED LUMINARIES USING ACCESSORIES AND FIRE STOPPING MATERIALS TO MEET REGULATORY REQUIREMENTS FOR FIRE RATING.

G. INSTALL SURFACE MOUNTED LUMINARIES AND EXIT SIGNS PLUMB AND ADJUST TO ALIGN WITH BUILDING LINES AND WITH EACH OTHER. SECURE TO PROHIBIT MOVEMENT.

H. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 4868.

I. MAKE WIRING CONNECTIONS TO BRANCH CIRCUIT USING BUILDING WIRE WITH INSULATION SUITABLE FOR TEMPERATURE CONDITIONS WITHIN LUMINAIRE

J. BOND PRODUCTS AND METAL ACCESSORIES TO BRANCH CIRCUIT EQUIPMENT GROUNDING CONDUCTOR.

K. CONNECT LUMINARIES TO BRANCH CIRCUIT OUTLET BOXES PROVIDED UNDER RACEWAYS AND BOXES SECTION USING 1/2" FLEXIBLE CONDUIT OF NO MORE THAN 6'-0" IN LENGTH.

L. CLEAN ELECTRICAL PARTS TO REMOVE CONDUCTIVE AND DELETERIOUS MATERIALS.

M. REMOVE DIRT AND DEBRIS FROM ENCLOSURES AND LENSES.

N. CLEAN PHOTOMETRIC CONTROL SURFACES AS RECOMMENDED BY MANUFACTURER.

O. CLEAN FINISHES AND TOUCH UP DAMAGE.

P. EACH LED LUMINAIRE TYPE SHALL BE BINNED WITHIN A THREE-STEP MACADAM ELLIPSE TO ENSURE COLOR CONSISTENCY AMONG LUMINAIRES AND CONTAIN INTERNAL DRIVER UNLESS NOTED OTHERWISE.

Q. EMERGENCY LOAD TRANSFER DEVICE LOCALIZED LOAD TRANSFER SWITCH TO SENSE NORMAL PRESENCE OF NORMAL POWER FOR SWITCHED CIRCUITS AND SWITCH LUMINAIRE OVER TO EMERGENCY SOURCE UPON LOSS OF NORMAL SOURCE. DEVICE SHALL BE INSTALLED INTEGRAL TO LUMINAIRE OR MOUNTED REMOTELY AS APPLICATION REQUIRED. U.L 924 LISTED, INTEGRAL TEST SWITCH AND INDICATING LAMPS TO INDICATE STATUS: BODINE BLCD SERIES OR EQUAL BY LVS OR CHLORIDE.

R. EXIT SIGNS: COMPLY WITH UL 924; FOR SIGN COLORS AND LETTERING SIZE, COMPLY WITH AUTHORITIES HAVING JURISDICTION.
1. PROVIDE EXIT SIGNS WIN LIGHT-EMITTING DIODES, 70,000 HOURS MINIMUM OF RATED LAMP LIFE
2. SELF-POWERED EXIT SIGNS (BATTERY TYPE): INTEGRAL AUTOMATIC CHARGER IN A SELF-CONTAINED POWER PACK.
3. BATTERY: SEALED, MAINTENANCE-FREE NICKEL-CADMIUM TYPE WITH SPECIAL WARRANTY.
4. CHARGER: FULLY AUTOMATIC, SOLID-STATE TYPE WITH SEALED TRANSFER RELAY.
5. OPERATION: RELAY AUTOMATICALLY ENERGIZES LAMP FROM BATTERY WHEN CIRCUIT VOLTAGE DROPS TO 80 PERCENT OF NOMINAL VOLTAGE OR BELOW. WHEN NORMAL VOLTAGE IS RESTORED, RELAY DISCONNECTS LAMPS FROM BATTERY, AND BATTERY IS AUTOMATICALLY RECHARGED AND FLOATED ON CHARGER.

S. EMERGENCY LIGHTING UNITS SELF-CONTAINED UNITS COMPLYING WITH UL 924.
1. BATTERY: SEALED, MAINTENANCE-FREE LEAD-ACID TYPE WITH MINIMUM 10-YEAR NOMINAL LIFE AND SPECIAL WARRANTY.
2. CHARGER: FULLY AUTOMATIC, SOLID-STATE TYPE WITH SEALED TRANSFER RELAY.
3. OPERATION: RELAY AUTOMATICALLY TURNS LAMP ON WHEN POWER SUPPLY CIRCUIT VOLTAGE DROPS TO 80 PERCENT OF NOMINAL VOLTAGE OR BELOW. LAMP AUTOMATICALLY DISCONNECTS FROM BATTERY WHEN VOLTAGE APPROACHES DEEP-DISCHARGE LEVEL WHEN NORMAL VOLTAGE IS RESTORED.
4. WIRE GUARD: WHERE INDICATED, HEAVY-CHROME-PLATED WIRE GUARD PROTECTS LAMP HEADS OR FIXTURES.
5. INTEGRAL TIME-DELAY RELAY: HOLDS UNIT ON FOR FIXED INTERVAL WHEN POWER IS RESTORED AFTER AN OUTAGE TIME DELAY PERMITS HIGH-INTENSITY-DISCHARGE LAMPS TO RE-STRIKE AND DEVELOP ADEQUATE OUTPUT.

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

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48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

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SSOE PROJECT #:	023-03727-00
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ELECTRICAL SPECIFICATIONS

E-001

FIRE ALARM

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE COMPONENTS TO MATCH EXISTING.

B. PERFORMANCE REQUIREMENTS:
   1. DESIGN AND INSTALLATION OF NEW DEVICES ONTO AN EXISTING FIRE ALARM SYSTEM. THE COMPLETE FUNCTIONAL SYSTEM SHALL MEET THE REQUIREMENTS OF THIS SPECIFICATION, APPLICABLE CODES, AND AUTHORITIES HAVING JURISDICTION (AHJ) REQUIREMENTS.
   2. COMPLY WITH NFPA 72.
   3. PROVIDE DEVICE LOCATIONS AND RATINGS AS REQUIRED TO MEET THE REQUIREMENTS OF THE AHJ AND ALL APPLICABLE CODES.
   4. FIRE ALARM SYSTEM VENDOR SHALL PROVIDE SOUND PRESSURE LEVEL CALCULATIONS DEMONSTRATING COMPLIANCE WITH NFPA 72 AND ESTABLISH QUANTITIES AND TAP SETTINGS OF AUDIBLE DEVICES.
   5. NO ADDITIONAL CHARGE FOR FIRE ALARM DEVICES WILL BE ALLOWED UNLESS SPACE DEFINITION, USE OR CONSTRUCTION IS SUBSTANTIALLY REVISED.

C. MANUAL FIRE ALARM BOXES: UL 38 LISTED; FINISHED IN RED WITH MOLDED, RAISED-LETTER OPERATING INSTRUCTIONS IN CONTRASTING COLOR. STATION SHALL SHOW VISIBLE INDICATION OF OPERATION. MOUNTED ON RECESSED OUTLET BOX IF INDICATED AS SURFACE MOUNTED, PROVIDE MANUFACTURER'S SURFACE BACK BOX.
   1. DOUBLE-ACTON MECHANISM REQUIRING TWO ACTIONS TO INITIATE AN ALARM, PULL-LEVER TYPE WITH INTEGRAL ADDRESSABLE MODULE, ARRANGED TO COMMUNICATE MANUAL-STATION STATUS (NORMAL, ALARM, OR TROUBLE) TO THE FACP.
   2. STATION RESET: KEY- OR WRENCH-OPERATED SWITCH.

D. DUCT SMOKE DETECTORS: PHOTOELECTRIC TYPE; UL 268A USED, OPERATING AT 24-V DC, NOMINAL INTEGRAL ADDRESSABLE MODULE: ARRANGED TO COMMUNICATE DETECTOR STATUS (NORMAL, ALARM, OR TROUBLE) TO THE FACP; PLUG-IN ARRANGEMENT: DETECTOR AND ASSOCIATED ELECTRONIC COMPONENTS SHALL BE MOUNTED IN A PLUG-IN MODULE THAT CONNECTS TO A FIXED BASE. THE FIXED BASE SHALL BE DESIGNED FOR MOUNTING DIRECTLY TO THE AIR DUCT. PROVIDE TERMINALS IN THE FIXED BASE FOR CONNECTION TO BUILDING WIRING.
   1. SELF-RESTORING: DETECTORS SHALL NOT REQUIRE RESETTING OR READJUSTMENT AFTER ACTUATION TO RESTORE THEM TO NORMAL OPERATION.
   2. EACH SENSOR SHALL HAVE MULTIPLE LEVELS OF DETECTION SENSITIVITY.
   3. SAMPLING TUBES: DESIGN AND DIMENSIONS AS RECOMMENDED BY MANUFACTURER FOR THE SPECIFIC DUCT SIZE, AIR VELOCITY, AND INSTALLATION CONDITIONS WHERE APPLIED. INSTALL SAMPLING TUBES SO THEY EXTEND THE FULL WIDTH OF THE DUCT.
   4. RELAY FAN SHUTDOWN: PROVIDE TWO (2) SETS OF CONTACTS RATED TO INTERRUPT FAN MOTOR-CONTROL CIRCUIT.
   5. COMPLY WITH NFPA 72 AND NFPA 90A

E. SINGLE-STATION DUCT DETECTORS:
   1. UL 268A USED, OPERATING AT 120-V AC.
   2. SENSOR: LED OR INFRARED LIGHT SOURCE WITH MATCHING SILICON-CELL RECEIVER
      a. DETECTOR SENSITIVITY: BETWEEN 2.5 AND 3.5 PERCENT/FOOT (0.008 AND 0.011 PERCENT/1MM) SMOKE OBSCURATION WHEN TESTED ACCORDING TO UL 268A
   3. PLUG-IN ARRANGEMENT: DEFECTOR AND ASSOCIATED ELECTRONIC COMPONENTS SHALL BE MOUNTED IN A PLUG-IN MODULE THAT CONNECTS TO A FIXED BASE. THE FIXED BASE SHALL BE DESIGNED FOR MOUNTING DIRECTLY TO THE AIR DUCT. PROVIDE TERMINALS IN THE FIXED BASE FOR CONNECTION TO BUILDING WIRING.
      a. WEATHERPROOF DUCT HOUSING ENCLOSURE UL LISTED FOR USE WITH THE SUPPLIED DETECTOR. THE ENCLOSURE SHALL COMPLY WITH NEMA 250 REQUIREMENTS FOR TYPE 4X.
   4. SELF-RESTORING: DETECTORS SHALL NOT REQUIRE RESETTING OR READJUSTMENT AFTER ACTUATION TO RESTORE THEM TO NORMAL OPERATION.
   5. INTEGRAL VISUAL-INDICATING LIGHT: LED TYPE. INDICATING DETECTOR HAS OPERATED AND POWER-ON STATUS. PROVIDE REMOTE STATUS AND ALARM INDICATOR AND TEST STATION WHERE INDICATED AND/OR REQUIRED.
   6. TUBES DESIGN AND DIMENSIONS AS RECOMMENDED BY MANUFACTURER FOR THE SPECIFIC DUCT SIZE, AIR VELOCITY, AND INSTALLATION CONDITIONS WHERE APPLIED.
   7. RELAY FAN SHUTDOWN: PROVIDE TWO (2) SETS OF CONTACTS RATED TO INTERRUPT FAN MOTOR-CONTROL CIRCUIT.

F. SYSTEM SMOKE DETECTORS
   1. PHOTOELECTRIC: UL 268 LISTED, OPERATING AT 24-V DC, NOMINAL WITH INTEGRAL ADDRESSABLE MODULE: ARRANGED TO COMMUNICATE DETECTOR STATUS (NORMAL, ALARM, OR TROUBLE) TO THE FACP.

G. SINGLE-STATION SMOKE DETECTORS: (CHANGE REQUIREMENTS IF THEY NEED TO TALK TO THE FACP)
   1. UL 217 LISTED, SUITABLE FOR NFPA 101, SECTION 9.6.2.9 OCCUPANCIES, OPERATING AT 120-V AC
   2. AUXILIARY RELAYS: ONE FORM C RATED AT 0.5 A
   3. AUDIBLE NOTIFICATION APPLIANCE PIEZOELECTRIC SOUNDER RATED AT 90 DBA AT 10 FEET (3 M) ACCORDING TO UL 464.
   4. VISIBLE NOTIFICATION APPLIANCE 177 CANDELA STROBE
   5. TEST SWITCH: PUSH-TO-TEST, SIMULATES SMOKE AT RATED OBSCURATION.
   6. TANDEM CONNECTION: ALLOW TANDEM CONNECTION OF NUMBER OF INDICATED DETECTORS; ALARM ON ONE DETECTOR SHALL ACTUATE NOTIFICATION ON ALL CONNECTED DETECTORS.
   7. PLUG-IN ARRANGEMENT: DEFECTOR AND ASSOCIATED ELECTRONIC COMPONENTS SHALL BE MOUNTED IN A PLUG-IN MODULE THAT CONNECTS TO A FIXED BASE. PROVIDE TERMINALS IN THE FIXED BASE FOR CONNECTION TO BUILDING WIRING.
   8. SELF-RESTORING: DETECTORS SHALL NOT REQUIRE RESETTING OR READJUSTMENT AFTER ACTUATION TO RESTORE THEM TO NORMAL OPERATION.
   9. INTEGRAL VISUAL-INDICATING LIGHT: LED TYPE INDICATING [DETECTOR HAS OPERATED] [AND POWER-ON] STATUS.
   10. WHERE MORE THAN ONE SMOKE ALARM IS INSTALLED WITHIN A DWELLING OR SUITE, THEY SHALL BE CONNECTED SO THAT THE OPERATION OF ANY SMOKE ALARM CAUSES THE ALARM IN ALL SMOKE ALARMS TO SOUND.

H. HEAT DETECTORS: UL 521 LISTED. FIXED-TEMPERATURE TYPE ACTUATED BY TEMPERATURE THAT EXCEEDS A FIXED TEMPERATURE OF 190 DEG F (88 DEG C).

I. NOTIFICATION APPLIANCES: EQUIPPED FOR MOUNTING AS INDICATED AND WITH SCREW TERMINALS FOR SYSTEM CONNECTIONS
   1. COMBINATION DEVICES FACTORY-INTEGRATED AUDIBLE AND VISIBLE DEVICES IN A SINGLE-MOUNTING ASSEMBLY.
   2. BELLS: ELECTRIC-VIBRATING, 24-V DC, UNDER-DOME TYPE; WITH PROVISION FOR HOUSING THE OPERATING MECHANISM BEHIND THE BELL. BELLS SHALL PRODUCE A SOUND-PRESSURE LEVEL OF 94 DBA, MEASURED 10 FEET (3 M) FROM THE BELL 10-INCH (254-MM) SIZE, UNLESS OTHERWISE INDICATED. BELLS ARE WEATHERPROOF WHERE INDICATED.
   3. CHIMES, LOW-LEVEL OUTPUT: VIBRATING TYPE, 75-DBA MINIMUM RATED OUTPUT.
   4. CHIMES, HIGH-LEVEL OUTPUT: VIBRATING TYPE, 81-DBA MINIMUM RATED OUTPUT. HORNS: ELECTRIC-VIBRATING-POLARIZED TYPE, 24-V DC; WITH PROVISION FOR HOUSING THE OPERATING MECHANISM BEHIND A GRILLE.
   5. HORNS SHALL PRODUCE A SOUND-PRESSURE LEVEL OF 90 DBA, MEASURED 10 FEET (3 M) FROM THE HORN.
   6. VISIBLE ALARM DEVICES XENON STROBE LIGHTS USED UNDER UL 1971, WITH CLEAR OR NOMINAL WHITE POLYCARBONATE LENS MOUNTED ON AN ALUMINUM FACEPLATE. THE WORD "FIRE" IS ENGRAVED IN MINIMUM 1-INCH- (25-MM-) HIGH LETTERS ON THE LENS.
      a. RATED LIGHT OUTPUT: 15, 30, 60, 75, 110, 135, 185 CANDELA AS REQUIRED TO MEET NFPA 72 REQUIREMENTS.
      a.a. STROBE LEADS: FACTORY CONNECTED TO SCREW TERMINALS.
   7. VOICE/TONE SPEAKERS:
      a. UL 1480 LISTED.
      b. HIGH-RANGE UNITS: RATED 2 TO 15 W.
      c. LOW-RANGE UNITS: RATED 1 TO 2 W.
      d. MOUNTING: FLUSH, SEMIRECESSED, OR SURFACE MOUNTED; BIDIRECTIONAL AS INDICATED.
      e. MATCHING TRANSFORMERS TAP RANGE MATCHED TO THE ACOUSTICAL ENVIRONMENT OF THE SPEAKER LOCATION.
   8. AUDIBLE ALARM-INDICATING DEVICES INSTALL AT 96" AFF OR 6 INCHES (150 MM) BELOW THE CEILING, WHICHEVER IS LESS. INSTALL BELLS AND HORNS ON FLUSH-MOUNTED BACK BOXES WITH THE DEVICE-OPERATING MECHANISM CONCEALED BEHIND A GRILLE.
   9. VISIBLE ALARM-INDICATING DEVICES: INSTALL AT 96" AFF OR 6 INCHES (150 MM) BELOW THE CEILING, WHICHEVER IS LESS.

J. MAGNETIC DOOR HOLDERS: UNITS ARE EQUIPPED FOR WALL OR FLOOR MOUNTING AS INDICATED AND ARE COMPLETE WITH MATCHING DOOR PLATE.
   1. ELECTROMAGNET: REQUIRES NO MORE THAN 3 W TO DEVELOP 25-LBF (111-N) HOLDING FORCE.
   2. WALL-MOUNTED UNITS: FLUSH MOUNTED, UNLESS OTHERWISE INDICATED.
   3. RATING: 24-V AC OR DC OR 120V AC AS REQUIRED.
   4. MATERIAL AND FINISH: MATCH DOOR HARDWARE.

K. DIGITAL ALARM COMMUNICATOR TRANSMITTER: LISTED AND LABELED ACCORDING TO UL 632.
   1. FUNCTIONAL PERFORMANCE: UNIT RECEIVES AN ALARM, SUPERVISORY, OR TROUBLE SIGNAL FROM THE FACP, AND AUTOMATICALLY CAPTURES ONE OR TWO TELEPHONE LINES AND DIALS A PRESET NUMBER FOR A REMOTE CENTRAL STATION. WHEN CONTACT IS MADE WITH THE CENTRAL STATION(S), THE SIGNAL IS TRANSMITTED. THE UNIT SUPERVISES UP TO TWO TELEPHONE LINES. WHERE SUPERVISING 2 LINES, IF SERVICE ON OTHER LINE IS INTERRUPTED FOR LONGER THAN 45 SECONDS, THE UNIT INITIATES A LOCAL TROUBLE SIGNAL AND TRANSMITS A SIGNAL INDICATING LOSS OF TELEPHONE LINE TO THE REMOTE ALARM RECEIVING STATION OVER THE REMAINING LINE. WHEN TELEPHONE SERVICE IS RESTORED, UNIT AUTOMATICALLY REPORTS THAT EVENT TO THE CENTRAL STATION. IF SERVICE IS LOST ON BOTH TELEPHONE ONES, THE LOCAL TROUBLE SIGNAL IS INITIATED.
   2. SECONDARY POWER: INTEGRAL RECHARGEABLE BATTERY AND AUTOMATIC CHARGER. BATTERY CAPACITY IS ADEQUATE TO COMPLY WITH NFPA 72 REQUIREMENTS.
   3. SELF-TEST: CONDUCTED AUTOMATICALLY EVERY 24 HOURS WITH REPORT TRANSMITTED TO CENTRAL STATION.

L. REMOTE STATUS AND ALARM INDICATORS:
   1. INSTALL NEAR EACH SMOKE DETECTOR AND EACH SPRINKLER WATER-FLOW SWITCH AND VALVE-TAMPER SWITCH THAT IS NOT READILY VISIBLE FROM NORMAL VIEWING POSITION.
   2. LOCATE INDICATING LIGHTS IN PUBLIC SPACE NEAR THE DEVICE THEY MONITOR.

M. ADDRESSABLE INTERFACE DEVICE MICROELECTRONIC MONITOR MODULE LISTED FOR USE IN PROVIDING A SYSTEM ADDRESS FOR LISTED ALARM-INITIATING DEVICES FOR WIRED APPLICATIONS WITH NORMALLY OPEN CONTACTS.

CONTINUATION OF FIRE ALARM SECTION AT THE BOTTOM OF THIS SHEET

OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY

A. SCOPE: STUDY SHALL ENCOMPASS ALL NEW AND EXISTING EQUIPMENT DOWN TO THE PANELBOARD LEVEL. CONTRACTOR SHALL COLLECT EXISTING INFORMATION IN FIELD AS NEEDED TO COMPLETE THE STUDY. NO NEW EQUIPMENT SHALL BE ORDERED UNTIL THE STUDY IS REVIEWED BY THE ENGINEER OF RECORD.
B. STUDIES SHALL USE COMPUTER PROGRAMS THAT ARE DISTRIBUTED NATIONALLY AND ARE IN WIDE USE. SOFTWARE ALGORITHMS SHALL COMPLY WITH REQUIREMENTS OF STANDARDS AND GUIDES SPECIFIED IN THIS SECTION. MANUAL CALCULATIONS ARE UNACCEPTABLE.
C. SHORT-CIRCUIT STUDY SOFTWARE DEVELOPER QUALIFICATIONS: AN ENTITY THAT OWNS AND MARKETS COMPUTER SOFTWARE USED FOR STUDIES, HAVING PERFORMED SUCCESSFUL STUDIES OF SIMILAR MAGNITUDE ON ELECTRICAL DISTRIBUTION SYSTEMS USING SIMILAR DEVICES.
   1. THE COMPUTER PROGRAM SHALL BE DEVELOPED UNDER THE CHARGE OF A LICENSED PROFESSIONAL ENGINEER WHO HOLDS IEEE COMPUTER SOCIETY'S CERTIFIED SOFTWARE DEVELOPMENT PROFESSIONAL CERTIFICATION.
D. SHORT-CIRCUIT STUDY SPECIALIST QUALIFICATIONS: PROFESSIONAL ENGINEER IN CHARGE OPROJECT IS LOCATED. ALL ELEMENTS OF THE STUDY SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION AND CONTROL OF THIS PROFESSIONAL ENGINEER.
E. FIELD ADJUSTING AGENCY QUALIFICATIONS: AN INDEPENDENT AGENCY, WITH THE EXPERIENCE AND CAPABILITY TO ADJUST OVERCURRENT DEVICES AND TO CONDUCT THE TESTING INDICATED, THAT IS A MEMBER COMPANY OF THE INTERNATIONAL ELECTRICAL TESTING ASSOCIATION OR IS A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) AS DEFINED BY OSHA IN 29 CFR 1910.7, AND THAT IS ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

- COMPUTER SOFTWARE
A. COMPLY WITH IEEE 399 AND IEEE 551.
B. ANALYTICAL FEATURES OF FAULT-CURRENT-STUDY COMPUTER SOFTWARE PROGRAM SHALL HAVE THE CAPABILITY TO CALCULATE "MANDATORY," "VERY DESIRABLE," AND "DESIRABLE" FEATURES AS LISTED IN IEEE 399.
C. COMPUTER SOFTWARE PROGRAM SHALL BE CAPABLE OF PLOTTING AND DIAGRAMMING TIME-CURRENT-CHARACTERISTIC CURVES AS PART OF ITS OUTPUT.

- SHORT-CIRCUIT STUDY REPORT CONTENTS
A. STUDY DESCRIPTIONS, PURPOSE, BASIS, AND SCOPE. INCLUDE CASE DESCRIPTIONS, DEFINITION OF TERMS, AND GUIDE FOR INTERPRETATION OF THE COMPUTER PRINTOUT.
B. ONE-LINE DIAGRAM, SHOWING THE FOLLOWING:
   1. PROTECTIVE DEVICE DESIGNATIONS AND AMPERE RATINGS.
   2. CABLE SIZE AND LENGTHS.
   3. TRANSFORMER KILOVOLT AMPERE (KVA) AND VOLTAGE RATINGS.
   4. MOTOR AND GENERATOR DESIGNATIONS AND KVA RATINGS.
   5. SWITCHGEAR, SWITCHBOARD, MOTOR-CONTROL CENTER, AND PANELBOARD DESIGNATIONS.
   6. COMMENTS AND RECOMMENDATIONS FOR SYSTEM IMPROVEMENTS, WHERE NEEDED.
C. PROTECTIVE DEVICE EVALUATION:
   1. EVALUATE EQUIPMENT AND PROTECTIVE DEVICES AND COMPARE TO SHORT-CIRCUIT RATINGS.
   2. TABULATIONS OF CIRCUIT BREAKER, FUSE, AND OTHER PROTECTIVE DEVICE RATINGS VERSUS CALCULATED SHORT-CIRCUIT DUTIES.
   3. FOR 600-V OVERCURRENT PROTECTIVE DEVICES, ENSURE THAT INTERRUPTING RATINGS ARE EQUAL TO OR HIGHER THAN CALCULATED 1/2-CYCLE SYMMETRICAL FAULT CURRENT.
   4. FOR DEVICES AND EQUIPMENT RATED FOR ASYMMETRICAL FAULT CURRENT, APPLY MULTIPLICATION FACTORS LISTED IN THE STANDARDS TO 1/2-CYCLE SYMMETRICAL FAULT CURRENT.
   5. VERIFY ADEQUACY OF PHASE CONDUCTORS AT MAXIMUM THREE-PHASE BOLTED FAULT CURRENTS; VERIFY ADEQUACY OF EQUIPMENT GROUNDING CONDUCTORS AND GROUNDING ELECTRODE CONDUCTORS AT MAXIMUM GROUND-FAULT CURRENTS. ENSURE THAT SHORT-CIRCUIT WITHSTAND RATINGS ARE EQUAL TO OR HIGHER THAN CALCULATED 1/2-CYCLE SYMMETRICAL FAULT CURRENT.
D. SHORT-CIRCUIT STUDY INPUT DATA: AS DESCRIBED IN "POWER SYSTEM DATA" ARTICLE IN THE EVALUATIONS.
F. SHORT-CIRCUIT STUDY OUTPUT:
   1. LOW-VOLTAGE FAULT REPORT: THREE-PHASE AND UNBALANCED FAULT CALCULATIONS, SHOWING THE FOLLOWING FOR EACH OVERCURRENT DEVICE LOCATION:
      a. VOLTAGE.
      b. CALCULATED FAULT-CURRENT MAGNITUDE AND ANGLE.
      c. FAULT-POINT X/R RATIO.
      d. EQUIVALENT IMPEDANCE.
   2. MOMENTARY DUTY REPORT: THREE-PHASE AND UNBALANCED FAULT CALCULATIONS, SHOWING THE FOLLOWING FOR EACH OVERCURRENT DEVICE LOCATION:
      a. VOLTAGE.
      b. CALCULATED SYMMETRICAL FAULT-CURRENT MAGNITUDE AND ANGLE.
      c. FAULT-POINT X/R RATIO.
      d. CALCULATED ASYMMETRICAL FAULT CURRENTS:
         1. BASED ON FAULT-POINT X/R RATIO,
         2. BASED ON CALCULATED SYMMETRICAL VALUE MULTIPLIED BY 1.6.
         3. BASED ON CALCULATED SYMMETRICAL VALUE MULTIPLIED BY 2.7.
   3. INTERRUPTING DUTY REPORT: THREE-PHASE AND UNBALANCED FAULT CALCULATIONS, SHOWING THE FOLLOWING FOR EACH OVERCURRENT DEVICE LOCATION:
      a. VOLTAGE.
      b. CALCULATED SYMMETRICAL FAULT-CURRENT MAGNITUDE AND ANGLE.
      c. FAULT-POINT X/R RATIO.
      d. NO AC DECREMENT (NACD) RATIO.
      e. EQUIVALENT IMPEDANCE.
      f. MULTIPLYING FACTORS FOR 2-, 3-, 5-, AND 8-CYCLE CIRCUIT BREAKERS RATED ON A SYMMETRICAL BASIS.
      g. MULTIPLYING FACTORS FOR 2-, 3-, 5-, AND 8-CYCLE CIRCUIT BREAKERS RATED ON A TOTAL BASIS.
G. OBTAIN ALL DATA NECESSARY FOR THE CONDUCT OF THE STUDY.
   1. VERIFY COMPLETENESS OF DATA SUPPLIED ON THE ONE-LINE DIAGRAM. CALL ANY DISCREPANCIES TO THE ATTENTION OF ARCHITECT.
   2. FOR EQUIPMENT PROVIDED THAT IS WORK OF THIS PROJECT, USE CHARACTERISTICS SUBMITTED UNDER THE PROVISIONS OF ACTION SUBMITTALS AND INFORMATION SUBMITTALS FOR THIS PROJECT.
H. GATHER AND TABULATE THE FOLLOWING INPUT DATA TO SUPPORT THE SHORT-CIRCUIT STUDY. COMPLY WITH RECOMMENDATIONS IN IEEE 551 AS TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE ACQUIRED IN THE FIELD. FIELD DATA GATHERING SHALL BE UNDER THE DIRECT SUPERVISION AND CONTROL OF THE ENGINEER IN CHARGE OF PERFORMING THE STUDY, AND SHALL BE BY THE ENGINEER OR ITS REPRESENTATIVE WHO HOLDS NETA ETT LEVEL III CERTIFICATION OR NICET ELECTRICAL POWER TESTING LEVEL III CERTIFICATION.
   1. PRODUCT DATA FOR PROJECT'S OVERCURRENT PROTECTIVE DEVICES INVOLVED IN OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDIES. USE EQUIPMENT DESIGNATION TAGS THAT ARE CONSISTENT WITH ELECTRICAL DISTRIBUTION SYSTEM DIAGRAMS, OVERCURRENT PROTECTIVE DEVICE SUBMITTALS, INPUT AND OUTPUT DATA, AND RECOMMENDED DEVICE SETTINGS.
   2. OBTAIN ELECTRICAL POWER UTILITY IMPEDANCE AT THE SERVICE.
   3. POWER SOURCES AND TIES.
   4. FOR TRANSFORMERS, INCLUDE KVA, PRIMARY AND SECONDARY VOLTAGES, CONNECTION TYPE, IMPEDANCE, X/R RATIO, TAPS MEASURED IN PERCENT, AND PHASE SHIFT.
   5. FOR REACTORS, PROVIDE MANUFACTURER AND MODEL DESIGNATION, VOLTAGE RATING, AND IMPEDANCE.
   6. FOR CIRCUIT BREAKERS AND FUSES, PROVIDE MANUFACTURER AND MODEL DESIGNATION. LIST TYPE OF BREAKER, TYPE OF TRIP, SCCR, CURRENT RATING, AND BREAKER SETTINGS.
   7. GENERATOR SHORT-CIRCUIT CURRENT CONTRIBUTION DATA, INCLUDING SHORT-CIRCUIT REACTANCE, RATED KVA, RATED VOLTAGE, AND X/R RATIO.
   8. BUSWAY MANUFACTURER AND MODEL DESIGNATION, CURRENT RATING, IMPEDANCE, LENGTHS, AND CONDUCTOR MATERIAL.
   9. MOTOR HORSEPOWER AND NEMA MG 1 CODE LETTER DESIGNATION.
   10. CABLE SIZES, LENGTHS, NUMBER, CONDUCTOR MATERIAL AND CONDUIT MATERIAL (MAGNETIC OR NONMAGNETIC).

- SHORT-CIRCUIT STUDY
A. PERFORM STUDY FOLLOWING THE GENERAL STUDY PROCEDURES CONTAINED IN IEEE 399.
B. CALCULATE SHORT-CIRCUIT CURRENTS ACCORDING TO IEEE 551.
C. BASE STUDY ON THE DEVICE CHARACTERISTICS SUPPLIED BY DEVICE MANUFACTURER.
D. THE EXTENT OF THE ELECTRICAL POWER SYSTEM TO BE STUDIED IS INDICATED ON DRAWINGS.
E. BEGIN SHORT-CIRCUIT CURRENT ANALYSIS AT THE SERVICE, EXTENDING DOWN TO THE SYSTEM OVERCURRENT PROTECTIVE DEVICES AS FOLLOWS:
   1. TO NORMAL SYSTEM LOW-VOLTAGE LOAD BUSES WHERE FAULT CURRENT IS 10 KA OR LESS.
F. STUDY ELECTRICAL DISTRIBUTION SYSTEM FROM NORMAL AND ALTERNATE POWER SOURCES THROUGHOUT ELECTRICAL DISTRIBUTION SYSTEM FOR PROJECT. STUDY ALL CASES OF SYSTEM- SWITCHING CONFIGURATIONS AND ALTERNATE OPERATIONS THAT COULD RESULT IN MAXIMUM FAULT CONDITIONS.
G. THE CALCULATIONS SHALL INCLUDE THE AC FAULT-CURRENT DECAY FROM INDUCTION MOTORS, SYNCHRONOUS MOTORS, AND ASYNCHRONOUS GENERATORS AND SHALL APPLY TO LOW- AND MEDIUM-VOLTAGE, THREE-PHASE AC SYSTEMS. THE CALCULATIONS SHALL ALSO ACCOUNT FOR THE FAULT-CURRENT DC DECREMENT, TO ADDRESS THE ASYMMETRICAL REQUIREMENTS OF THE INTERRUPTING EQUIPMENT.
   1. FOR GROUNDED SYSTEMS, PROVIDE A BOLTED LINE-TO-GROUND FAULT-CURRENT STUDY FOR AREAS AS DEFINED FOR THE THREE-PHASE BOLTED FAULT SHORT-CIRCUIT STUDY.
H. CALCULATE SHORT-CIRCUIT MOMENTARY AND INTERRUPTING DUTIES FOR A THREE-PHASE BOLTED FAULT AT EACH OF THE FOLLOWING:
   1. ELECTRIC UTILITY'S SUPPLY TERMINATION POINT.
   2. INCOMING SWITCHGEAR.
   3. LOW-VOLTAGE SWITCHGEAR.
   4. CONTROL PANELS.
   5. STANDBY GENERATORS AND AUTOMATIC TRANSFER SWITCHES.
   6. BRANCH CIRCUIT PANELBOARDS.

- ADJUSTING
A. MAKE MINOR MODIFICATIONS TO EQUIPMENT AS REQUIRED TO ACCOMPLISH COMPLIANCE WITH SHORT-CIRCUIT STUDY.

END OF SECTION

OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY

PART 1 - GENERAL
1.1 RELATED DOCUMENTS
   A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 01 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUMMARY
   A. SECTION INCLUDES A COMPUTER-BASED, ARC-FLASH STUDY TO DETERMINE THE ARC-FLASH HAZARD DISTANCE AND THE INCIDENT ENERGY TO WHICH PERSONNEL COULD BE EXPOSED DURING WORK ON OR NEAR ELECTRICAL EQUIPMENT.

1.3 DEFINITIONS
   A. EXISTING TO REMAIN: EXISTING ITEMS OF CONSTRUCTION THAT ARE NOT TO BE REMOVED AND THAT ARE NOT OTHERWISE INDICATED TO BE REMOVED, REMOVED AND SALVAGED, OR REMOVED AND REINSTALLED.
   B. ONE-LINE DIAGRAM: A DIAGRAM WHICH SHOWS, BY MEANS OF SINGLE LINES AND GRAPHIC SYMBOLS, THE COURSE OF AN ELECTRIC CIRCUIT OR SYSTEM OF CIRCUITS AND THE COMPONENT DEVICES OR PARTS USED THEREIN.
   C. PROTECTIVE DEVICE: A DEVICE THAT SENSES WHEN AN ABNORMAL CURRENT FLOW EXISTS AND THEN REMOVES THE AFFECTED PORTION FROM THE SYSTEM.
   D. SCCR: SHORT-CIRCUIT CURRENT RATING.
   E. SERVICE: THE CONDUCTORS AND EQUIPMENT FOR DELIVERING ELECTRIC ENERGY FROM THE SERVING UTILITY TO THE WIRING SYSTEM OF THE PREMISES SERVED.

1.4 ACTION SUBMITTALS
   A. PRODUCT DATA: FOR COMPUTER SOFTWARE PROGRAM TO BE USED FOR STUDIES.
   B. OTHER ACTION SUBMITTALS: SUBMIT THE FOLLOWING SUBMITTALS AFTER THE APPROVAL OF SYSTEM PROTECTIVE DEVICES SUBMITTALS. SUBMITTALS SHALL BE IN DIGITAL FORM.
      1. ARC-FLASH STUDY INPUT DATA, INCLUDING COMPLETED COMPUTER PROGRAM INPUT DATA SHEETS.
      2. ARC-FLASH STUDY REPORT; SIGNED, DATED, AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER.
         a. SUBMIT STUDY REPORT FOR ACTION PRIOR TO RECEIVING FINAL APPROVAL OF THE DISTRIBUTION EQUIPMENT SUBMITTALS. IF FORMAL COMPLETION OF STUDIES WILL CAUSE DELAY IN EQUIPMENT MANUFACTURING, OBTAIN APPROVAL FROM ARCHITECT FOR PRELIMINARY SUBMITTAL OF SUFFICIENT STUDY DATA TO ENSURE THAT THE SELECTION OF DEVICES AND ASSOCIATED CHARACTERISTICS IS SATISFACTORY.

1.5 CLOSEOUT SUBMITTALS
   A. MAINTENANCE PROCEDURES ACCORDING TO REQUIREMENTS IN NFPA 70E SHALL BE PROVIDED IN THE EQUIPMENT MANUALS.
   B. OPERATION AND MAINTENANCE PROCEDURES: IN ADDITION TO ITEMS SPECIFIED IN FRONT END SPECIFICATIONS, PROVIDE MAINTENANCE PROCEDURES FOR USE BY OWNER'S PERSONNEL THAT COMPLY WITH REQUIREMENTS IN NFPA 70E.

1.6 QUALITY ASSURANCE
   A. STUDIES SHALL USE COMPUTER PROGRAMS THAT ARE DISTRIBUTED NATIONALLY AND ARE IN WIDE USE. SOFTWARE ALGORITHMS SHALL COMPLY WITH REQUIREMENTS OF STANDARDS AND GUIDES SPECIFIED IN THIS SECTION. MANUAL CALCULATIONS ARE UNACCEPTABLE.
   B. ARC-FLASH STUDY SOFTWARE DEVELOPER QUALIFICATIONS: AN ENTITY THAT OWNS AND MARKETS COMPUTER SOFTWARE USED FOR STUDIES, HAVING PERFORMED SUCCESSFUL STUDIES OF SIMILAR MAGNITUDE ON ELECTRICAL DISTRIBUTION SYSTEMS USING SIMILAR DEVICES.
      1. THE COMPUTER PROGRAM SHALL BE DEVELOPED UNDER THE CHARGE OF A LICENSED PROFESSIONAL ENGINEER WHO HOLDS IEEE COMPUTER SOCIETY'S CERTIFIED SOFTWARE DEVELOPMENT PROFESSIONAL CERTIFICATION.
   C. ARC-FLASH STUDY SPECIALIST QUALIFICATIONS: PROFESSIONAL ENGINEER IN CHARGE OF PERFORMING THE STUDY, ANALYZING THE ARC FLASH, AND DOCUMENTING RECOMMENDATIONS, LICENSED IN THE STATE WHERE PROJECT IS LOCATED. ALL ELEMENTS OF THE STUDY SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION AND CONTROL OF THIS PROFESSIONAL ENGINEER.

PART 2 - PRODUCTS
2.1 COMPUTER SOFTWARE DEVELOPERS
   A. COMPLY WITH IEEE 1584-2018 AND NFPA 70E.
   B. ANALYTICAL FEATURES OF DEVICE COORDINATION STUDY COMPUTER SOFTWARE PROGRAM SHALL HAVE THE CAPABILITY TO CALCULATE "MANDATORY," "VERY DESIRABLE," AND "DESIRABLE" FEATURES AS LISTED IN IEEE 399.

2.2 ARC-FLASH STUDY REPORT CONTENT
   A. EXECUTIVE SUMMARY.
   B. STUDY DESCRIPTIONS, PURPOSE, BASIS AND SCOPE.
   C. ONE-LINE DIAGRAM, SHOWING THE FOLLOWING:
      1. PROTECTIVE DEVICE DESIGNATIONS AND AMPERE RATINGS.
      2. CABLE SIZE AND LENGTHS.
      3. TRANSFORMER KILOVOLT AMPERE (KVA) AND VOLTAGE RATINGS.
      4. MOTOR AND GENERATOR DESIGNATIONS AND KVA RATINGS.
      5. SWITCHGEAR, SWITCHBOARD, MOTOR-CONTROL CENTER AND PANELBOARD DESIGNATIONS.
   D. STUDY INPUT DATA: AS DESCRIBED IN "POWER SYSTEM DATA" ARTICLE.
   E. SHORT-CIRCUIT STUDY OUTPUT: AS SPECIFIED IN "SHORT CIRCUIT STUDY OUTPUT" PARAGRAPH IN "SHORT-CIRCUIT STUDY REPORT CONTENTS" ARTICLE IN SECTION "OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY."
   F. PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS: AS SPECIFIED IN "PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS" ARTICLE IN SECTION "OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY."
   G. ARC-FLASH STUDY OUTPUT:
      1. INTERRUPTING DUTY REPORT: THREE-PHASE AND UNBALANCED FAULT CALCULATIONS, SHOWING THE FOLLOWING FOR EACH OVERCURRENT DEVICE LOCATION:
         a. VOLTAGE.
         b. CALCULATED SYMMETRICAL FAULT-CURRENT MAGNITUDE AND ANGLE.
         c. FAULT-POINT X/R RATIO.
         d. NO AC DECREMENT (NACD) RATIO.
         e. EQUIVALENT IMPEDANCE.
         f. MULTIPLYING FACTORS FOR 2-, 3-, 5-, AND 8-CYCLE CIRCUIT BREAKERS RATED ON A SYMMETRICAL BASIS.
         g. MULTIPLYING FACTORS FOR 2-, 3-, 5-, AND 8-CYCLE CIRCUIT BREAKERS RATED ON A TOTAL BASIS.
   H. INCIDENT ENERGY AND FLASH PROTECTION BOUNDARY CALCULATIONS:
      1. ARCING FAULT MAGNITUDE.
      2. PROTECTIVE DEVICE CLEARING TIME.
      3. DURATION OF ARC.
      4. ARC-FLASH BOUNDARY.
      5. WORKING DISTANCE.
      6. INCIDENT ENERGY.
      7. SITE SPECIFIC PPE
      8. RECOMMENDATIONS FOR ARC-FLASH ENERGY REDUCTION.
   I. FAULT STUDY INPUT DATA, CASE DESCRIPTIONS, AND FAULT-CURRENT CALCULATIONS INCLUDING A DEFINITION OF TERMS AND GUIDE FOR INTERPRETATION OF THE COMPUTER PRINTOUT.

2.3 ARC-FLASH WARNING LABELS
A. COMPLY WITH REQUIREMENTS IN SECTION 260553 "IDENTIFICATION FOR ELECTRICAL SYSTEMS." PRODUCE A 3.5-BY-5-INCH (76-BY-127-MM) THERMAL TRANSFER LABEL OF HIGH-ADHESION POLYESTER FOR EACH WORK LOCATION INCLUDED IN THE ANALYSIS.
B. THE LABEL SHALL HAVE AN ORANGE HEADER WITH THE WORDING, "WARNING, ARC-FLASH HAZARD," AND SHALL INCLUDE THE FOLLOWING INFORMATION TAKEN DIRECTLY FROM THE ARC-FLASH HAZARD ANALYSIS:
   1. LOCATION DESIGNATION.
   2. NOMINAL VOLTAGE.
   3. FLASH PROTECTION BOUNDARY.
   4. INCIDENT ENERGY
   5. WORKING DISTANCE.
   6. SITE SPECIFIC PPE
   7. ENGINEERING REPORT NUMBER, REVISION NUMBER, AND ISSUE DATE.
C. LABELS SHALL BE MACHINE PRINTED, WITH NO FIELD-APPLIED MARKINGS.

PART 3 - EXECUTION
3.1 EXAMINATION
   A. EXAMINE PROJECT OVERCURRENT PROTECTIVE DEVICE SUBMITTALS. PROCEED WITH ARC-FLASH STUDY ONLY AFTER RELEVANT EQUIPMENT SUBMITTALS HAVE BEEN ASSEMBLED. OVERCURRENT PROTECTIVE DEVICES THAT HAVE NOT BEEN SUBMITTED AND APPROVED PRIOR TO ARC-FLASH STUDY MAY NOT BE USED IN STUDY.

3.2 ARC-FLASH HAZARD ANALYSIS
   A. COMPLY WITH NFPA 70E AND ITS ANNEX D FOR HAZARD ANALYSIS STUDY.
      1. PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS: AS SPECIFIED IN "PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS" ARTICLE IN SECTION 16053 "OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY."
   B. CALCULATE MAXIMUM AND MINIMUM CONTRIBUTIONS OF FAULT-CURRENT SIZE.
      1. THE MINIMUM CALCULATION SHALL ASSUME THAT THE UTILITY CONTRIBUTION IS AT A MINIMUM AND SHALL ASSUME NO MOTOR LOAD.
      2. THE MAXIMUM CALCULATION SHALL ASSUME A MAXIMUM CONTRIBUTION FROM THE UTILITY AND SHALL ASSUME MOTORS TO BE OPERATING UNDER FULL-LOAD CONDITIONS.
   C. CALCULATE THE ARC-FLASH PROTECTION BOUNDARY AND INCIDENT ENERGY AT LOCATIONS IN THE ELECTRICAL DISTRIBUTION SYSTEM WHERE PERSONNEL COULD PERFORM WORK ON ENERGIZED PARTS.
   D. INCLUDE MEDIUM- AND LOW-VOLTAGE EQUIPMENT LOCATIONS, EXCEPT EQUIPMENT RATED 240-V AC OR LESS FED FROM TRANSFORMERS WITH A SECONDARY SHORT CIRCUIT CURRENT OF 2,000A OR LESS.
   E. SAFE WORKING DISTANCES SHALL BE SPECIFIED FOR CALCULATED FAULT LOCATIONS BASED ON THE CALCULATED ARC-FLASH BOUNDARY, CONSIDERING INCIDENT ENERGY OF 1.2 CAL/SQ.CM.
   F. INCIDENT ENERGY CALCULATIONS SHALL CONSIDER THE ACCUMULATION OF ENERGY OVER TIME WHEN PERFORMING ARC-FLASH CALCULATIONS ON BUSES WITH MULTIPLE SOURCES. ITERATIVE CALCULATIONS SHALL TAKE INTO ACCOUNT THE CHANGING CURRENT CONTRIBUTIONS, AS THE SOURCES ARE INTERRUPTED OR DECREMENTED WITH TIME. FAULT CONTRIBUTION FROM MOTORS AND GENERATORS SHALL BE DECREMENTED AS FOLLOWS:
      1. FAULT CONTRIBUTION FROM INDUCTION MOTORS SHOULD NOT BE CONSIDERED BEYOND THREE TO FIVE CYCLES.
      2. FAULT CONTRIBUTION FROM SYNCHRONOUS MOTORS AND GENERATORS SHOULD BE DECAYED TO MATCH THE ACTUAL DECREMENT OF EACH AS CLOSELY AS POSSIBLE (E.G., CONTRIBUTIONS FROM PERMANENT MAGNET GENERATORS WILL TYPICALLY DECAY FROM 10 PER UNIT TO THREE PER UNIT AFTER 10 CYCLES).
   G. ARC-FLASH COMPUTATION SHALL INCLUDE BOTH LINE AND LOAD SIDE OF A CIRCUIT BREAKER AS FOLLOWS:
      1. WHEN THE CIRCUIT BREAKER IS IN A SEPARATE ENCLOSURE.
      2. WHEN THE LINE TERMINALS OF THE CIRCUIT BREAKER ARE SEPARATE FROM THE WORK LOCATION.
   H. BASE ARC-FLASH CALCULATIONS ON ACTUAL OVERCURRENT PROTECTIVE DEVICE CLEARING TIME. CAP MAXIMUM CLEARING TIME AT TWO SECONDS BASED ON IEEE 1584-2018, SECTION B.1.2.

3.3 POWER SYSTEM DATA
   A. OBTAIN ALL DATA NECESSARY FOR THE CONDUCT OF THE ARC-FLASH HAZARD ANALYSIS.
      1. VERIFY COMPLETENESS OF DATA SUPPLIED ON THE ONE-LINE DIAGRAM ON DRAWINGS. CALL DISCREPANCIES TO THE ATTENTION OF ARCHITECT.
      2. FOR NEW EQUIPMENT, USE CHARACTERISTICS SUBMITTED UNDER THE PROVISIONS OF ACTION SUBMITTALS AND INFORMATION SUBMITTALS FOR THIS PROJECT.
   B. ELECTRICAL SURVEY DATA: GATHER AND TABULATE THE FOLLOWING INPUT DATA TO SUPPORT STUDY. COMPLY WITH RECOMMENDATIONS IN IEEE 1584-2018 AND NFPA 70E AS TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE ACQUIRED IN THE FIELD. FIELD DATA GATHERING SHALL BE UNDER THE DIRECT SUPERVISION AND CONTROL OF THE ENGINEER IN CHARGE OF PERFORMING THE STUDY, AND SHALL BE BY THE ENGINEER.
      1. PRODUCT DATA FOR OVERCURRENT PROTECTIVE DEVICES SPECIFIED IN OTHER SECTIONS AND INVOLVED IN OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDIES. USE EQUIPMENT DESIGNATION TAGS THAT ARE CONSISTENT WITH ELECTRICAL DISTRIBUTION SYSTEM DIAGRAMS, OVERCURRENT PROTECTIVE DEVICE SUBMITTALS, INPUT AND OUTPUT DATA, AND RECOMMENDED DEVICE SETTINGS.
      2. OBTAIN ELECTRICAL POWER UTILITY IMPEDANCE AT THE SERVICE.
      3. POWER SOURCES AND TIES.
      4. SHORT-CIRCUIT CURRENT AT EACH SYSTEM BUS, THREE PHASE AND LINE-TO-GROUND.
      5. FULL-LOAD CURRENT OF ALL LOADS.
      6. VOLTAGE LEVEL AT EACH BUS.
      7. FOR TRANSFORMERS, INCLUDE KVA, PRIMARY AND SECONDARY VOLTAGES, CONNECTION TYPE, IMPEDANCE, X/R RATIO, TAPS MEASURED IN PER CENT, AND PHASE SHIFT.
      8. FOR CIRCUIT BREAKERS AND FUSES, PROVIDE MANUFACTURER AND MODEL DESIGNATION. LIST TYPE OF BREAKER, TYPE OF TRIP AND AVAILABLE RANGE OF SETTINGS, SCCR, CURRENT RATING, AND BREAKER SETTINGS.
      9. GENERATOR SHORT-CIRCUIT CURRENT CONTRIBUTION DATA, INCLUDING SHORT-CIRCUIT REACTANCE, RATED KVA, RATED VOLTAGE, AND X/R RATIO.
      10. FOR RELAYS, PROVIDE MANUFACTURER AND MODEL DESIGNATION, CURRENT TRANSFORMER RATIOS, POTENTIAL TRANSFORMER RATIOS, AND RELAY SETTINGS.
      11. MOTOR HORSEPOWER.
      12. LOW-VOLTAGE CABLE SIZES, LENGTHS, NUMBER, CONDUCTOR MATERIAL AND CONDUIT MATERIAL (MAGNETIC OR NONMAGNETIC).
      13. MEDIUM-VOLTAGE CABLE SIZES, LENGTHS, CONDUCTOR MATERIAL, AND CABLE CONSTRUCTION AND METALLIC SHIELD PERFORMANCE PARAMETERS.

3.4 LABELING
   A. APPLY ONE ARC-FLASH LABEL FOR 600-V AC, 480-V AC, AND APPLICABLE 208-V AC PANELBOARDS AND DISCONNECTS AND FOR EACH OF THE FOLLOWING LOCATIONS:
      1. LOW-VOLTAGE SWITCHBOARD.
      2. DISTRIBUTION PANELS.
      3. BRANCH CIRCUIT PANELBOARDS.
      4. CONTROL PANEL.

3.5 APPLICATION OF WARNING LABELS
   A. INSTALL THE ARC-FAULT WARNING LABELS UNDER THE DIRECT SUPERVISION AND CONTROL OF THE ARC-FLASH STUDY SPECIALIST.

END OF SECTION

N. ADDRESSABLE CONTROL MODULE PROVIDE FOR INTEGRATION OF AUXILIARY CONTROL FUNCTIONS INTO THE ANALOG SIGNALING CIRCUIT. INTELLIGENT ANALOG SIGNALING CIRCUIT CONTROL WITH COMMUNICATION INTERACTION WITH THE ANALOG SIGNALING CIRCUIT HAVING THE CAPABILITY OF INITIATING A CONTROL FUNCTION TO AN AUXILIARY DEVICE BASED ON A SPECIFIED EVENT AND NO/NC CONTACT PAIRS RATED AT 2 AMPS 120 VAC OR 24 VDC.

O. WIRE AND CABLE WIRE AND CABLE FOR FIRE ALARM SYSTEMS SHALL BE UL LISTED AND LABELED AS COMPLYING WITH NFPA 70, ARTICLE 760.
   1. SIGNALING LINE CIRCUITS: TWISTED, SHIELDED PAIR, SIZE AS RECOMMENDED BY SYSTEM MANUFACTURER.
   2. NON-POWER-LIMITED CIRCUITS: SOLID-COPPER CONDUCTORS WITH 600-V RATED, 75 DEG C, COLOR- CODED INSULATION. LOW-VOLTAGE CIRCUITS: NO. 16 AWG, MINIMUM. LINE-VOLTAGE CIRCUITS: NO. 12 AWG MINIMUM.
   3. INSTALL WIRING ACCORDING TO NECA 1 AND TIA/EIA 568-A
   4. FIRE ALARM CIRCUITS AND EQUIPMENT CONTROL WIRING ASSOCIATED WITH THE FIRE ALARM SYSTEM SHALL BE INSTALLED IN A DEDICATED RACEWAY SYSTEM IN AREAS OF EXPOSED CONSTRUCTION.
   5. [PLENUM RATED CABLE IS ALLOWED ABOVE CONCEALED, ACCESSIBLE CEILINGS.] (Not allowed in Phx)

P. SUBMIT FIRE ALARM DRAWINGS AND DOCUMENTATION TO THE AUTHORITIES HAVING JURISDICTION AND THE ARCHITECT/ENGINEER.

Q. INSTALLER QUALIFICATIONS: PERSONNEL CERTIFIED BY NICET AS FIRE ALARM LEVEL II

R. INTERRUPTION OF EXISTING FIRE ALARM SERVICE: DO NOT INTERRUPT FIRE ALARM SERVICE TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY GUARD SERVICE ACCORDING TO REQUIREMENTS INDICATED. NOTIFY ARCHITECT, OWNER OR CONSTRUCTION MANAGER NO FEWER THAN SEVEN DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF FIRE ALARM SERVICE DO NOT PROCEED WITH INTERRUPTION OF FIRE ALARM SERVICE WITHOUT OWNER'S WRITTEN PERMISSION.

R. EXISTING FIRE ALARM EQUIPMENT: MAINTAIN FULLY OPERATIONAL UNTIL NEW EQUIPMENT HAS BEEN TESTED AND ACCEPTED. AS NEW EQUIPMENT IS INSTALLED, LABEL IT "NOT IN SERVICE" UNTIL IT IS ACCEPTED. REMOVE LABELS FROM NEW EQUIPMENT WHEN PUT INTO SERVICE AND LABEL EXISTING FIRE ALARM EQUIPMENT "NOT IN SERVICE" UNTIL REMOVED FROM THE BUILDING.

S. EQUIPMENT REMOVAL AFTER ACCEPTANCE OF THE NEW FIRE ALARM SYSTEM, REMOVE EXISTING DISCONNECTED FIRE ALARM EQUIPMENT.

T. FIRE ALARM SYSTEM AND COMPONENTS SHALL OPERATE AS AN EXTENSION OF AN EXISTING SYSTEM. ALL NEW DEVICES SHALL BE SUITABLE AND LISTED WITH EXISTING FIRE ALARM CONTROL PANEL.

U. CONNECTING TO EXISTING EQUIPMENT: VERIFY THAT EXISTING FIRE ALARM SYSTEM IS OPERATIONAL BEFORE MAKING CHANGES OR CONNECTIONS.

V. PERFORM BATTERY CALCULATIONS AND PROVIDE NECESSARY EQUIPMENT WHERE EXISTING BATTERIES WILL NOT SUPPORT ADDITION OF NEW DEVICES INDICATED ON DRAWINGS.

W. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT EST, AND ADJUST FIELD- ASSEMBLED COMPONENTS AND EQUIPMENT INSTALLATION, INCLUDING CONNECTIONS, AND TO ASSIST IN FIELD TESTING. REPORT RESULTS IN WRITING.

X. TEST AND INSPECTION RECORDS: PREPARE ACCORDING TO NFPA 72, INCLUDING DEMONSTRATION OF SEQUENCES OF OPERATION BY USING THE MATRIX-STYLE FORM IN APPENDIX A IN NFPA 7.

Y. CERTIFY FIRE ALARM SYSTEM UPON COMPLETION OF INSTALLATION AND TESTING.

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

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48202

CLIENT PROJECT #: PROJECT NUMBER
JHA PROJECT #: PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #: 023-03727-00
SSOE MANAGER: JEFF FALZON

ssoe
1001 Madison Avenue
Toledo, OH 43604
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ELECTRICAL SPECIFICATIONS

E-002

PLAN NOTES

ES01 REFER TO MRI VENDOR'S DRAWINGS FOR FLOOR DUCT REQUIREMENTS IN THE MRI/EQUIPMENT ROOM/CONTROL ROOM. SAWCUT, PATCH, AND REPAIR FLOOR IN COORDINATION WITH THE NEW FLOORING INSTALLATION. COORDINATE WITH ARCHTECTURAL DRAWINGS.

ES02 REFER TO MRI VENDOR'S DRAWINGS FOR CABLE TRAY, JUNCTION BOX AND INTERCONNECTING CONDUIT AND WIRING REQUIREMENTS IN THE MRI/EQUIPMENT ROOM/CONTROL ROOM. COORDINATE WITH CEILING INSTALLATION/ARCHITECTURAL DRAWINGS.

ES03 REFER TO MRI VENDOR'S DRAWINGS INCLUDED AS PART OF BID DOCUMENTS. ELECTRICAL CONTRACTOR SHALL INCLUDE IN BID PRICE MATERIALS AND LABOR FOR EQUIPMENT IDENTIFIED ON THE EQUIPMENT MANUFACTURERS DRAWINGS TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL REVIEW MRI VENDOR'S DRAWINGS FOR AN ASSEMENT OF ALL WORK NECESSARY FOR A COMPLETE INSTALLATION OF THE MRI SYSTEM AND INCLUDE IN BID PRICE OF MATERIAL AND LABOR DIRECTLY AND INDIRECTLY AFFECTING THE ELECTRICAL INSTALLATION OF THE MRI MACHINE. IN THE EVENT OF A DISCREPANCY BETWEEN THE ELECTRICAL CONTRACT DRAWINGS AND THE MRI VENDOR'S DRAWINGS, THE ELECTRICAL CONTRACTOR SHALL FOLLOW THE MRI VENDOR'S DRAWINGS.

ES04 REFER TO MRI VENDOR'S DRAWING ON E-102 FOR MRI GROUNDING AND GENERAL GROUNDING REQUIREMENTS OF DEVICES CONTAINED WITHIN THE MRI/EQUIPMENT ROOM/CONTROL ROOM. INTERCONNECTING GROUNDING AND BONDING BETWEEN MRI COMPONENTS AS NOTED.

ES05 CONTRACTOR SHALL FIELD LOCATE GROUND ROD FOR ISOLATION TRANSFORMER ADHERING TO NEC 250.

NOT IN SCOPE

NOT IN SCOPE

NOT IN SCOPE

NOT IN SCOPE

NOT IN SCOPE

APPROXIMATE LOCATION OF OUTDOOR MRI CHILLER ON GRADE ON LEVEL 1. COORDINATE WITH MECHANICAL DRAWINGS FOR FINAL LOCATION.

(EL) RP-NMR

RP-MRI

DS-RP-NMR

DS-RP-MRI

XFRM-MRI

1 E-100 OVERALL LEVEL 0 FLOOR PLAN
SCALE: 1/8" = 1'-0"

N

Autodesk Docs://Wayne State University_WSU Applebaum MRI/0230372700_MEP23_SSOE.rvt :FILE PATH
11/17/2023 3:08:26 PM :PRINT DATE

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
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CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

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SSOE MANAGER:	JEFF FALZON

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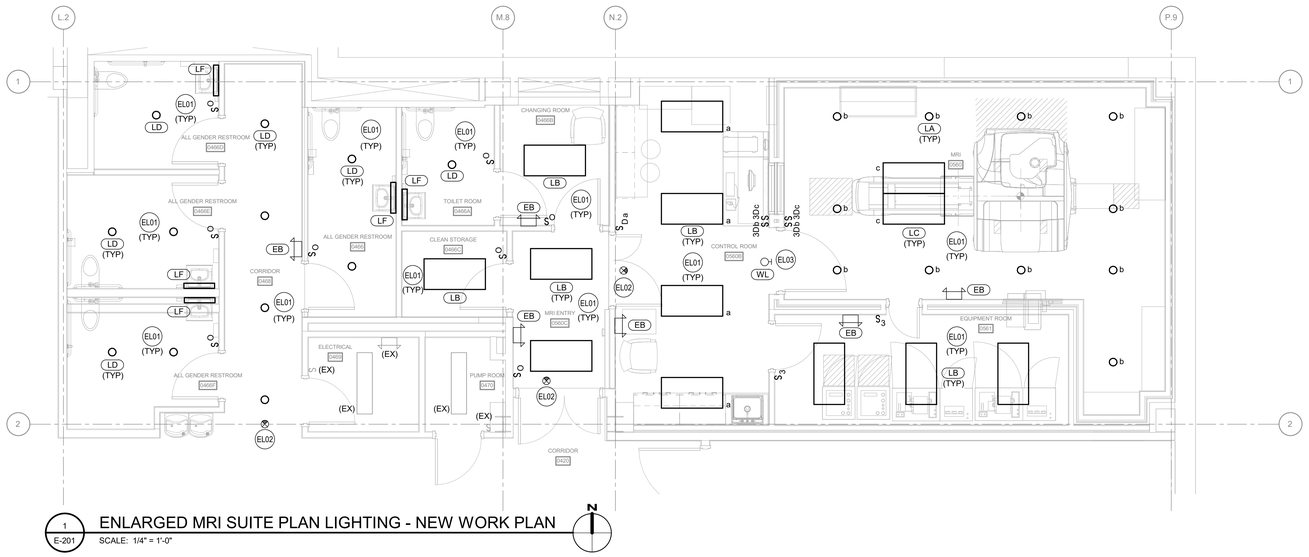
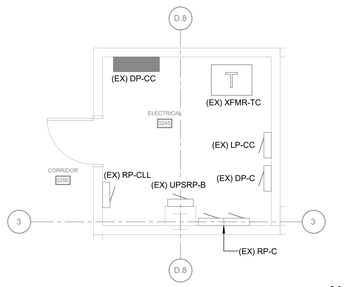
OVERALL LEVEL 0 FLOOR PLAN

E-100



1 E-201 — ENLARGED MRI SUITE PLAN LIGHTING - NEW WORK PLAN
SCALE: 1/4" = 1'-0"



4 E-201 — ELECTRICAL ROOM 0245
SCALE: 1/4" = 1'-0"

2 E-201 — ENLARGED MRI SUITE PLAN POWER AND AUXILIARY - NEW WORK PLAN
SCALE: 1/4" = 1'-0"

5 E-201 — ELECTRICAL ROOM 0315
SCALE: 1/4" = 1'-0"

3 E-201 — ENLARGED MRI SUITE PLAN LIGHTING - DEMOLITION PLAN
SCALE: 1/4" = 1'-0"

GENERAL NOTES - LIGHTING

A. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHTING FIXTURES UNLESS NOTED OTHERWISE.

B. REFER TO THE LUMINAIRE SCHEDULE LOCATED ON THE ELECTRICAL GENERAL INFORMATION DRAWING.

C. ELECTRICAL DEVICES INDICATED ON THIS PLAN SHALL BE NEW UNLESS NOTED OTHERWISE.

D. LIGHT SWITCHES SHALL BE GROUPED UNDER ONE COMMON FACEPLATE WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION.

E. LIGHTING BRANCH CIRCUIT WIRING ASSOCIATED WITH NEW LIGHTING SHALL BE 2#12, 1#12GND IN 3/4"C UNLESS NOTED OTHERWISE.

F. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

G. REUSE OF THE LEFT-IN-PLACE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING ASSOCIATED WITH THE LIGHTING FIXTURES REMOVED DURING DEMOLITION TO REFEED NEW LIGHTING FIXTURES IS ACCEPATBLE. REWORK THE EXISTING CIRCUIT TO PROVIDE LIGHTING CONTROL AS INDICATED ON THIS DRAWING, UNLESS NOTED OTHERWISE.

H. EXISTING LIGHTING INDICATED AS TO REMAIN AND LOCATED IN AREAS WHERE THE CEILING IS BEING MODIFIED SHALL BE TEMPORARILY SUPPORTED AND REINSTALLED UPON COMPLETION OF CEILING REVISIONS. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLANS AND ARCHITECTURAL TRADE.

I. NIGHT LIGHT AND EXIT SIGNS SHALL BE UNCONTROLLED AND CONNECTED AHEAD OF THE LOCAL LIGHTING CONTROLS.

J. CONDUITS INSTALLED IN FINISHED AREAS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

K. EXIT SIGN FIXTURES ARE TYPE 'X1' UNLESS NOTED OTHERWISE.

GENERAL NOTES - POWER

A. REFER TO ARCHITECTURAL FLOOR PLAN AND ELEVATIONS FOR EXACT LOCATION OF DEVICES WHERE INDICATED.

B. RECEPTACLE OUTLETS SHALL BE RATED 20A U.O.N..

C. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE U.O.N..

D. PROVIDE GFCI PROTECTION WHERE REQUIRED BY THE NEC WHETHER INDICATED OR NOT.

E. BRANCH CIRCUIT JUNCTION BOXES SHALL BE LABELED WITH THE CIRCUITS ENCLOSED.

F. SINGLE PHASE 20A BRANCH CIRCUIT WIRING SHALL BE 2#12, 1#12GND IN 3/4"C UNLESS NOTED OTHERWISE.

G. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

H. CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

I. ELECTRICAL EQUIPMENT MOUNTED ON THE FLOOR SHALL BE MOUNTED ON A 4" CONCRETE HOUSEKEEPING PAD.

J. PROVIDE HOSPITAL GRADE RECEPTACLE OUTLETS.

K. PROVIDE A METAL RACEWAY SYSTEM, METALLIC CABLE ARMOR, OR SHEATH ASSEMBLY THAT QUALIFIES AS AN EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH SECTION 250.118 OF THE NEC IN PATIENT CARE AREAS AS REQUIRED BY SECTION 517.13 OF THE NEC. AN INSULATED EQUIPMENT GROUND CONDUCTOR SHALL BE PROVIDED IN ADDITION AS INDICATED IN SECTION 517.13 OF THE NEC.

PLAN NOTES

ED01 RELOCATE PANEL 'RP-NMR' TO NEW NRM ROOM. INTERCEPT AND EXTEND EXISTING PANELBOARD FEEDER FROM 45KVA 480D-240D W/ 120V CENTER TAP TRANSFORMER ON MAIN STREET LEVEL ELECTRICAL ROOM 0468.

ED02 RELOCATE EXISTING 30A NON-FUSED DISCONNECT SWITCH AND ASSOCIATED L6-20 RECEPTACLE FOR RELOCATED NMR.

ED03 DEMOLISH UPS AND ASSOCIATED FEEDERS, CONDUIT, DEVICES, AND SUPPORTS BACK TO SOURCE. RETURN ALL BREAKERS ASSOCIATED WITH DEMOLISHED UPS TO SPARE AND UPDATE PANEL SCHEDULES ACCORDINGLY.

ED04 DEMOLISH NITROGEN GENERATOR AND ASSOCIATED FEEDERS, CONDUIT, DEVICES, AND SUPPORTS BACK TO SOURCE. RETURN ALL BREAKERS ASSOCIATED WITH DEMOLISHED NITROGEN GENERATOR TO SPARE AND UPDATE PANEL SCHEDULES ACCORDINGLY.

EL01 CONNECT NEW LED LIGHTING TO EXISTING 277V LIGHTING CIRCUIT CURRENTLY SERVING THE AREA VIA NEW CONTROLS INDICATED. REVISE EXISTING CIRCUITING TO PROVIDE CONTROLS AS INDICATED ON PLANS. REUSE EXISTING LIGHTING CONTROLS RECESSED WALL MOUNTED JUNCTION BOXES FOR NEW LIGHTING CONTROLS WHERE PRACTICAL, OTHERWIRE PROVIDE NEW.

EL02 NEW EXIT LIGHTS WITH 90-MINUTE EMERGENCY BATTERY TO MATCH EXISTING EXIT LIGHTS IN ADJACENT EXISTING AREA.

EL03 CIRCUIT WARNING LIGHT TO 120V GENERAL USE RECEPTACLE CIRCUIT SERVING THE CONTROL ROOM. COORDINATE WITH MRI MANUFACTURER TO TIE WARNING LIGHT INTO MRI SYSTEM SUCH THAT LIGHT FIXTURE IS CONTROLLED VIA MRI ACTIVATION.

EP03 REFER TO MRI VENDOR'S DRAWINGS - SHEET NUMBERS A-101, A-501, A-502, A-503, E-101, E-102, E-501 FOR ALL FINAL LOCATIONS, MOUNTING HEIGHTS, CONTRACTOR SUPPLIED DEVICES, CONTRACTOR SUPPLIED WIRING, CONTRATOR MADE CONNECTIONS, CONTROLS, SUPPORTS, PULL BOXES, CONTRACTOR SUPPLIED ELECTRICAL EQUIPMENT, DUCTS, CONTRACTOR MADE CABLE PULLS AND RACEWAY ROUTING AND SIZES.

EP04 EMERGENCY POWER OFF BUTTON. REFER TO DETAIL 6 ON E-901.

EP05 NEW 225KVA ISLOATION TRANSFORMER FOR MRI PANEL. STACK ON TOP OF EXISTING TRANSFORMER 'TA' LOCATED IN THIS ROOM. REFER TO DETAIL 3 AND 5 ON E-901.

EP06 ALL DEVICES IN THE MRI ROOM SHALL BE NON-FERROUS AND RATED FOR USE IN MRI SPACES AS PER THE MRI MANUFACTURER'S DRAWINGS, THE SPECIFICATIONS, AND LIGHT FIXTURE SCHEDULE.

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

MARK	FLA	MCA	MOCP	VOLTAGE	PHASE	CIRCUIT	WIRE & CONDUIT	DISCONNECT SIZE/TYPE	NOTES
AC-1	19.0 A	23.8 A	30 A	208 V	1	(EX) RP-F-75,77	2#10, #10 G, IN 3/4" C	NEMA 1 NON-FUSIBLE 30A/3P	
CHW-1	48.3 A	53.0 A	70 A	480 V	3	(EX) DP-BB-1	3#4, #8 G, IN 1-1/4" C	NEMA 3R FUSIBLE 100A/70AF/3P	1,2

MECHANICAL EQUIPMENT CONNECTION SCHEDULES NOTES

1. PROVIDE MOUNTING HARDWARE FOR DISCONNECT. COORDINATE EXACT MOUNTING LOCATION IN FIELD. REFER TO CHILLER VENDOR DRAWINGS FOR MORE INFORMATION.
2. PROVIDE DEDICATED 120V 20A CIRCUIT (2#12, #12 G, IN 3/4" C, 20A BREAKER) FROM NEAREST 208/120V POWER PANEL ON LEVEL 1 FOR SERVICE GFCI WEATHERPROOF RECEPTACLE. RECEPTACLE SHALL BE ADJACENT TO UNIT - NOT FARTHER THAN 25'-0" AS PER NEC 210.63.

ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
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CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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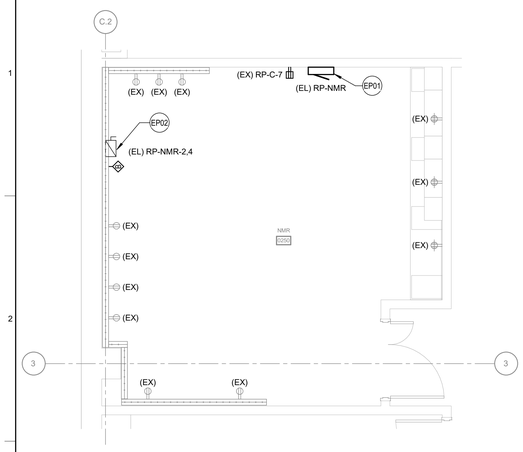
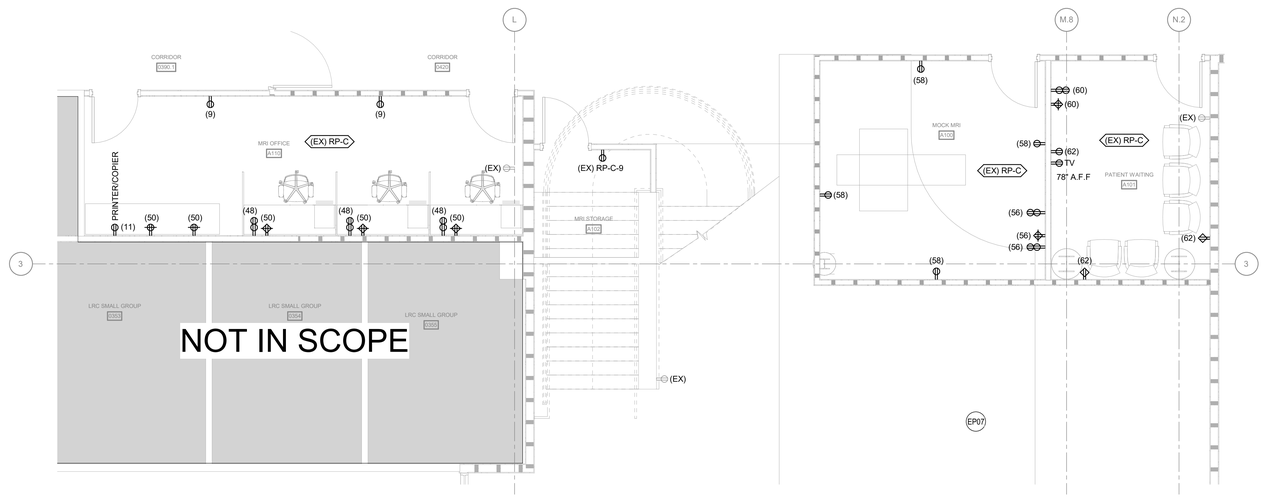
ENLARGED MRI SUITE PLANS - LIGHTING & POWER

E-201



1 E-202 ENLARGED NMR 0250 POWER - NEW WORK PLAN

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



4 E-202 ENLARGED MRI OFFICE A110 POWER - NEW WORK PLAN

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

2 E-202 ENLARGED NMR 0250 LIGHTING - NEW WORK PLAN

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

5 E-202 ENLARGED MRI OFFICE A110 LIGHTING - NEW WORK PLAN

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

3 E-202 ENLARGED NMR 0250 POWER AND LIGHTING DEMOLITION PLAN

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

6 E-202 ENLARGED MRI OFFICE A110 POWER & LIGHTING - DEMOLITION PLAN

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

GENERAL NOTES - LIGHTING.

A. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHTING FIXTURES UNLESS NOTED OTHERWISE.

B. REFER TO THE LUMINAIRE SCHEDULE LOCATED ON THE ELECTRICAL GENERAL INFORMATION DRAWING.

C. ELECTRICAL DEVICES INDICATED ON THIS PLAN SHALL BE NEW UNLESS NOTED OTHERWISE.

D. LIGHT SWITCHES SHALL BE GROUPED UNDER ONE COMMON FACEPLATE WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION.

E. LIGHTING BRANCH CIRCUIT WIRING ASSOCIATED WITH NEW LIGHTING SHALL BE 2#12, 1#12GND IN 3/4"C UNLESS NOTED OTHERWISE.

F. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

G. REUSE OF THE LEFT-IN-PLACE EXISTING BRANCH CIRCUIT CONDUIT AND WIRING ASSOCIATED WITH THE LIGHTING FIXTURES REMOVED DURING DEMOLITION TO REFEED NEW LIGHTING FIXTURES IS ACCEPATBLE. REWORK THE EXISTING CIRCUIT TO PROVIDE LIGHTING CONTROL AS INDICATED ON THIS DRAWING, UNLESS NOTED OTHERWISE.

H. EXISTING LIGHTING INDICATED AS TO REMAIN AND LOCATED IN AREAS WHERE THE CEILING IS BEING MODIFIED SHALL BE TEMPORARILY SUPPORTED AND REINSTALLED UPON COMPLETION OF CEILING REVISIONS. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLANS AND ARCHITECTURAL TRADE.

I. NIGHT LIGHT AND EXIT SIGNS SHALL BE UNCONTROLLED AND CONNECTED AHEAD OF THE LOCAL LIGHTING CONTROLS.

J. CONDUITS INSTALLED IN FINISHED AREAS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

K. EXIT SIGN FIXTURES ARE TYPE 'X1' UNLESS NOTED OTHERWISE.

GENERAL NOTES - POWER.

A. REFER TO ARCHITECTURAL FLOOR PLAN AND ELEVATIONS FOR EXACT LOCATION OF DEVICES WHERE INDICATED.

B. RECEPTACLE OUTLETS SHALL BE RATED 20A U.O.N..

C. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE U.O.N..

D. PROVIDE GFCI PROTECTION WHERE REQUIRED BY THE NEC WHETHER INDICATED OR NOT.

E. BRANCH CIRCUIT JUNCTION BOXES SHALL BE LABELED WITH THE CIRCUITS ENCLOSED.

F. SINGLE PHASE 20A BRANCH CIRCUIT WIRING SHALL BE 2#12, 1#12GND IN 3/4"C UNLESS NOTED OTHERWISE.

G. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

H. CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

I. ELECTRICAL EQUIPMENT MOUNTED ON THE FLOOR SHALL BE MOUNTED ON A 4" CONCRETE HOUSEKEEPING PAD.

J. PROVIDE HOSPITAL GRADE RECEPTACLE OUTLETS.

K. PROVIDE A METAL RACEWAY SYSTEM, METALLIC CABLE ARMOR, OR SHEATH ASSEMBLY THAT QUALIFIES AS AN EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH SECTION 250.118 OF THE NEC IN PATIENT CARE AREAS AS REQUIRED BY SECTION 517.13 OF THE NEC. AN INSULATED EQUIPMENT GROUND CONDUCTOR SHALL BE PROVIDED IN ADDITION AS INDICATED IN SECTION 517.13 OF THE NEC.

PLAN NOTES

ED05 DEMOLISH DISCONNECT SWITCH AND ASSOCIATED FEEDERS, CONDUIT, DEVICES, AND SUPPORTS BACK TO SOURCE.

ED06 DEMOLISH RECEPTACLES AND ASSOCIATED BRANCH CIRCUITS IN AREA WHERE NEW MOCK MRI AND WAITING ROOM WILL BE CONSTRUCTED BACK TO SOURCE. KEEP CIRCUIT CONTINUITY OF EXISTING DEVICES IN THE EVENT THEY SHARE A CIRCUIT WITH A TO BE DEMOLISHED RECEPTACLE.

ED07 DEMOLISH LIGHT FIXTURES, LIGHTING DEVICES, LIGHTING CONTROLS AND ASSOCIATED BRANCH CIRCUITS IN AREA WHERE NEW MOCK MRI AND WAITING ROOM WILL BE CONSTRUCTED BACK TO SOURCE. KEEP CIRCUIT CONTINUITY OF EXISTING LIGHT FIXTURES, LIGHTING DEVICES, LIGHTING CONTROLS IN THE EVENT THEY SHARE A CIRCUIT WITH A TO BE DEMOLISHED LIGHT FIXTURE OR LIGHTING DEVICE.

ED09 DEMOLISH POWER RECEPTACLES AND DATA RECEPTACLES FOR EXISTING VENDING MACHINE IN STUDENT LOUNGE THAT ARE TO BE MOVED TO A NEW LOCATION. KEEP EXISTING POWER AND DATA CIRCUITS INTACT FOR RE-USE. COORDINATE WITH ARCHTECTURAL DRAWINGS FOR EXACT LOCATION OF VENDING MACHINES.

EL01 CONNECT NEW LED LIGHTING TO EXISTING 277V LIGHTING CIRCUIT CURRENTLY SERVING THE AREA VIA NEW CONTROLS INDICATED. REVISE EXISTING CIRCUITING TO PROVIDE CONTROLS AS INDICATED ON PLANS. REUSE EXISTING LIGHTING CONTROLS RECESSED WALL MOUNTED JUNCTION BOXES FOR NEW LIGHTING CONTROLS WHERE PRACTICAL, OTHERWIRE PROVIDE NEW.

EP01 RELOCATED EXISTING PANEL "RP-NMR'. PROVIDE NEW BRANCH CIRCUITS FROM RELOCATED 'RP-NMR' TO RELOCATED NMR MACHINE AND ASSOCIATED ACCESSORIES. REFER TO PARTIAL ONE-LINE DIAGRAM AND PANEL SCHEDULES FOR ADDITIONAL INFORMATION.

EP02 RELOCATED EXISTING 30A NON-FUSED DISCONNECT SWITCH AND ASSOCIATED L6-20R FOR RELOCATED NMR MACHINE. REFER TO E-801 FOR CIRCUIT REQUIREMENTS.

EP07 PROVIDE ONE POWER RECEPTACLE AND ONE DATA RECEPTACLE PER RELOCATED VENDING MACHINE IN STUDENT LOUNGE. MATCH PREVIOUS POWER AND DATA RECEPTACLE TYPES. REUSE EXISTING POWER AND DATA CIRCUITS KEPT IN DEMOLITION OF PREVIOUS RECEPTACLES SERVING THE VENDING MACHINES. COORDINATE WITH ARCHTECTURAL DRAWINGS FOR EXACT LOCATION OF VENDING MACHINES.

ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
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CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
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48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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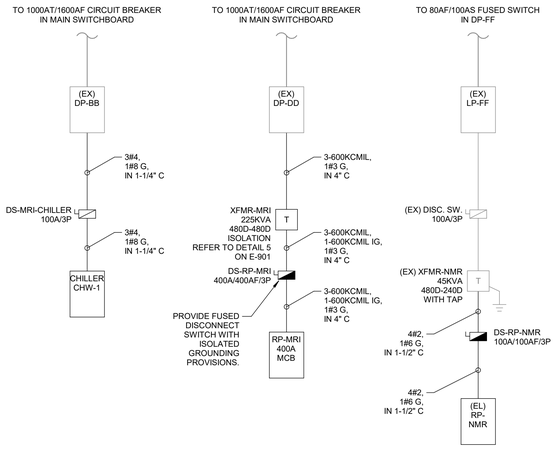
ENLARGED NMR 0250 & MRI OFFICE A110 PLANS - LIGHTING & POWER

E-202



1 / E-701 PARTIAL ELECTRICAL ONE-LINE DIAGRAM

SCALE: NOT TO SCALE

EXISTING SERVICE SWITCHBOARD ("MAIN SWITCHBOARD")		
4000A, 480Y/277V, 3Φ, 4W		
LOAD CALCULATION SUMMARY PER NEC 2020 SECTION 220.87		
*PEAK DEMAND (September 2023):	1351KW	
X1.25	(125%)	
0.9 POWER FACTOR ASSUMED	1689KW	
INITIAL TOTAL KW:	1689KW	2032AMPS
FINAL TOTAL KW:	1945KW	2340AMPS
ADDED LOAD		
DP-DD	203KW	
DP-BB	36KW	
RP-F	10KW	
RP-C	7KW	
TOTAL LOAD ADDED:	256KW	
NET LOAD ADDED:	256KW	308AMPS

*ELECTRICAL UTILITY COMPANY PROVIDED 12 MONTHS OF DEMAND DATA

GENERAL NOTES - ONE LINE

A. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE U.O.N..

B. JUNCTION AND PULL BOXES SHALL BE LABELED WITH THE CIRCUITS ENCLOSED.

C. PROVIDE CIRCUIT DIRECTORIES IN ALL ELECTRICAL PANELS AND NAMEPLATES ON SWITCHBOARDS PER THE SPECIFICATIONS.

D. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

E. CONDUITS IN FINISHED AREAS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

F. PROVIDE ARC FLASH CALCULATIONS AND LABELS FOR ALL SWITCHBOARDS, PANELBOARDS, MOTOR CONTROLLERS, AND CONTROL PANELS PER SECTION 110.16 OF THE NEC AND NFPA 70E. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

G. ELECTRICAL EQUIPMENT MOUNTED ON THE FLOOR SHALL BE MOUNTED ON A 4" CONCRETE HOUSEKEEPING PAD.

H. FAULT CURRENT VALUES, WHERE INDICATED, ARE ESTIMATES BASED ON AVAILABLE INFORMATION AND ESTIMATED FEEDER LENGTHS AT THE TIME OF DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR COLLECTING UPDATED AVAILABLE FAULT CURRENT FROM THE LOCAL UTILITY, MOTOR SIZES FOR NEW MECHANICAL AND PLUMBING EQUIPMENT, AND FIELD MEASUREMENTS TO PERFORM THE SHORT CIRCUIT CALCULATIONS REQUIRED PER THE ELECTRICAL SPECIFICATIONS. ELECTRICAL EQUIPMENT SHALL HAVE RATINGS GREATER THAN THE AVAILABLE FAULT CURRENT DETERMINED BY THE CONTRACTORS STUDY.

LIGHTING FIXTURE SCHEDULE

TYPE	MFR	MODEL	CCT	LAMP	LUMENS	VOLTAGE	WATTS	DESCRIPTION	MFR ALT	NOTES
EB	LITHONIA	ELM4L		LED		MVOLT	7 W	EMERGENCY EGRESS LUMINAIRE, WALL OR CEILING MOUNT, WITH BATTERY. WALL MOUNTED AT 7'-6" UNLESS OTHERWISE NOTED.	METALUX, PHILIPS, GE OR APPROVED EQUAL.	
LA	KENALL	MRIDL6-NF-DCFW-31L-40K9-W-FW-T-RIMRI6-24V-DIM1	4000 K	LED	2008 lm	MVOLT	31 W	6" LED DOWNLIGHT WITH DIE-CAST ALUMINUM FRAME. FLUSH LENS FRAME WITH DRIVER TO BE 0-10V DIMMABLE DOWN TO 1%. SEMI-DIFFUSE REFLECTOR WITH WHITE TRIM RIGN.	KIRLIN OR APPROVED EQUAL	PROVIDE REMOTE LOCATED HIGH POWER FACTOR POWER SUPPLY FROM MANUFACTURER
LB	LITHONIA	EPANL-2X4-4000LM-80CRI-40K-MIN10-ZT-MVOLT	4000 K	LED	4240 lm	MVOLT	38 W	2'X4' FLAT PANEL LED SUITABLE FOR INSTALLATION IN A LAY-IN CEILING SYSTEM. SEAMLESS ALUMINUM FRAME WITH A SATIN WHITE LENS. DRIVER SHALL BE 0-10V DIMMABLE DOWN TO 10%	METALUX, PHILIPS, GE OR APPROVED EQUAL.	
LC	HEALTHCARE LIGHTING	HCV324-G-MVOLT-SP0-J2-DMTR4-GW	4000 K	LED	654 lm	MVOLT	79 W	2'X4' LED PANEL SUITABLE FOR LAY-IN CEILINGS. 18 GUAGE STEEL HOUSING WITH HIGH-IMPACT POLYMER TRANSLUCENT PHOTOGRAPHIC LENS, IMAGE NUMBER TA3137. POLYESTER POWDERCOAT FINISH. DRIVER SHALL BE 0-10V DIMMABLE DOWN TO 1%.	KIRLIN OR APPROVED EQUAL	
LD	LITHONIA	LDN6-35/15-LO6-WH-LSS-TRW-MVOLT-GZ10	3500 K	LED	1788 lm	MVOLT	19 W	6" LED DOWNLIGHT, POWDER COATED C.R.S. FRAME, MATTE WHITE REFLECTOR AND FLANGE, CLEAR REGRESSED LENS, SEMI-SPECULAR FINISH, 0 - 10V DIMMING DOWN TO 10%.	METALUX, PHILIPS, GE OR APPROVED EQUAL.	
LE	LITHONIA	EPANL-2X2-3400LM-80CRI-40K-MIN10-ZT-MVOLT	4000 K	LED	3566 lm	MVOLT	30 W	2'X2' FLAT PANEL LED SUITABLE FOR INSTALLATION IN A LAY-IN CEILING SYSTEM. SEAMLESS ALUMINUM FRAME WITH A SATIN WHITE LENS. DRIVER SHALL BE 0-10V DIMMABLE DOWN TO 10%.	METALUX, PHILIPS, GE OR APPROVED EQUAL.	
LF	LITHONIA	FMVCCLS-24IN-MVOLT-30K3 5K40K-90CRI-BN	3500 K	LED	1800 lm	MVOLT	27 W	LED DECORATIVE VANITY LUMINAIRE, 24 INCH LENGTH, MIN. 90 CRI, BRUSHED NICKEL FINISH.	METALUX, PHILIPS, GE OR APPROVED EQUAL.	
WL	LITHONIA	LE SERIES	4000 K	RED LED	1500 lm	MVOLT	5 W	UNIVERSAL MOUNT, SINGLE FACE SIGNATURE DIE CAST ALUMINUM 'MRI IN USE' WARNING WITH RED LETTERING	METALUX, PHILIPS, GE OR APPROVED EQUAL.	MOUNT JUST ABOVE ENTRANCE TO MRI MACHINE ROOM.

PROFESSIONAL SEALS:

PROJECT PARTNERS:

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PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1001 Madison Avenue
Toledo, OH 43604
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ELECTRICAL ONE LINE DIAGRAM

E-701

COPPER CIRCUIT LENGTH TABLE. 480V 3PH
(NOTES 7,8, 9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	MINIMUM AMPERAGE RATING OF WIRE REQUIRED FOR LENGTH INDICATED																								
		20A	30A	40A	50A	70A	80A	90A	100A	150A	175A	200A	225A	250A	300A	350A	400A	450A	500A	600A	700A	800A	1000A	1200A	1600A	2000A
20A	16	250'	415'	645'	1025'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30A	24	-	275'	425'	680'	1060'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40A	32	-	-	320'	510'	800'	1000'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50A	40	-	-	-	410'	640'	780'	960'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70A	56	-	-	-	-	455'	560'	690'	840'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80A	64	-	-	-	-	-	490'	600'	735'	950'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90A	72	-	-	-	-	-	-	535'	655'	850'	990'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100A	80	-	-	-	-	-	-	-	590'	755'	880'	1070'	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150A	120	-	-	-	-	-	-	-	-	505'	588'	710'	840'	-	-	-	-	-	-	-	-	-	-	-	-	-
175A	140	-	-	-	-	-	-	-	-	-	500'	600'	710'	780'	-	-	-	-	-	-	-	-	-	-	-	-
200A	160	-	-	-	-	-	-	-	-	-	-	525'	620'	685'	830'	-	-	-	-	-	-	-	-	-	-	-
225A	180	-	-	-	-	-	-	-	-	-	-	-	550'	605'	750'	885'	-	-	-	-	-	-	-	-	-	-
250A	200	-	-	-	-	-	-	-	-	-	-	-	-	530'	650'	770'	820'	-	-	-	-	-	-	-	-	-
300A	240	-	-	-	-	-	-	-	-	-	-	-	-	-	540'	635'	685'	820'	-	-	-	-	-	-	-	-
350A	280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	545'	585'	705'	765'	-	-	-	-	-	-	-
400A	320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510'	615'	670'	815'	-	-	-	-	-	-
450A	360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	550'	600'	725'	850'	-	-	-	-	-
500A	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	535'	650'	765'	820'	-	-	-	-
600A	480	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	545'	640'	680'	820'	-	-	-
700A	560	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	550'	580'	750'	875'	-	-
800A	640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510'	650'	760'	1020'	-
1000A	800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	525'	610'	815'	1010'
1200A	960	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510'	680'	850'
1600A	1280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510'	680'
2000A	1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510'

ONE WAY MAXIMUM CIRCUIT LENGTH

COPPER FEEDER & BRANCH CIRCUIT SIZING SCHEDULE
(NOTES 1,2,10,11,12)

OVERCURRENT DEVICE RATING	SETS PER PHASE	AWG OR KCMIL		CONDUIT SIZE	
		PHASE & NEUTRAL	EG	3 WIRE (3W) (3PH)	4 WIRE (4W) (3PH & 1N)
20A	1	12	12	3/4"	3/4"
30A	1	10	10	3/4"	3/4"
40A	1	8	10	3/4"	3/4"
50A	1	6	10	3/4"	1"
60A	1	4	10	1"	1-1/4"
70A	1	4	8	1"	1-1/4"
100A	1	2	8	1-1/4"	1-1/4"
110A	1	2	6	1-1/4"	1-1/4"
125A	1	1	6	1-1/4"	1-1/2"
150A	1	1/0	6	1-1/2"	1-1/2"
175A	1	2/0	6	1-1/2"	2"
200A	1	3/0	6	2"	2"
225A	1	4/0	4	2"	3"
250A	1	250	4	2"	3"
300A	1	350	4	3"	3"
400A	1	500	2	3"	3"
450A	2	4/0	2	2"	3"
500A	2	250	2	2"	3"
600A	2	350	1	3"	3"
800A	2	500	1/0	3"	3"
1000A	3	500	2/0	3"	3"
1200A	3	600	3/0	3"	4"
1600A	4	600	4/0	3"	4"
2000A	5	600	250	3"	4"

SHEET NOTES

1. AMPACITIES BASED ON THHN/THWN, 90°., 600V., INSULATED, COPPER WIRE APPLIED AT 60° TERMINATIONS FOR CIRCUITS RATED 110A AND DOWN AND APPLIED AT 75° TERMINTATIONS FOR CIRCUITS RATED ABOVE 110A PER NEC 110.14(C)(1).
2. BASED ON WIRE OUTSIDE DIAMETERS AND NON-RIGID METALLIC CONDUIT INSIDE DIAMETERS AS PROVIDED IN THE NEC. REFER TO NEC FOR CONDUIT TYPES MORE RESTRICTIVE THAN NON-RIGID METALLIC. CONDUCTOR AND CONDUIT SIZES INDICATED ARE MINIMUM REQUIREMENTS. FOLLOW NEC REQUIRMENTS FOR DERATING AND PROVIDE LARGER CONDUCTORS AND CONDUIT WHERE APPLICABLE.
3. BASED ON MOTOR FULL LOAD AMPERES AS PROVIDED BY THE NEC.
4. BASED ON MOTOR RUNNING OVERLOAD PROTECTION PROVIDED BY THERMAL OVERLOAD RELAYS.
5. MOTOR STARTING TYPE BASED ON 3 PHASE, FULL VOLTAGE NON-REVERSING EXCEPT FOR MOTORS SIZED 75HP OR GREATER WHICH ARE BASED ON 3 PHASE, PART WINDING REDUCED VOLTAGE STARTING.
6. TRANSFORMER CIRCUITS BASED ON 480V-208Y/120V, 3 PHASE, 4 WIRE, DRY TYPE. REFER TO CIRCUIT SIZING SCHEDULES ON THIS SHEET FOR PRIMARY/SECONDARY PHASE/NEUTRAL/SUPPLY SIDE BONDING JUMPER CONDUCTOR REQUIREMENTS ASSOCIATED WITH CIRCUIT SIZES NOTED IN THIS TABLE UON.
7. CIRCUIT MAXIMUM DISTANCE IS BASED ON NEC CHAPTER 9, TABLE 8 CONDUCTOR PROPERTIES FOR COATED COPPER AT 75 DEGREES CELSIUS. REFER TO NEXT LARGER OVERCURRENT DEVICE RATING IN THIS TABLE FOR OVERCURRENT DEVICES WITH RATINGS NOT INDICATED.
8. MAXIMUM CIRCUIT LOAD FOR DISTANCE IS BASED ON NEC 220-10.
9. REFER TO CIRCUIT SIZING SCHEDULE ON THIS SHEET FOR UPSIZING CONDUIT AND WIRING. E.G. SHALL BE INCREASED IN SIZE PROPORTIONATELY PER THE NEC. ONLY CONDUCTORS AND CONDUIT SHALL BE INCREASED IN SIZE. OVERCURRENT PROTECTION DEVICE SHALL REMAIN AS SPECIFIED.
10. CONDUCTORS SHALL BE STRANDED. COPPER CONDUCTORS ARE REQUIRED.
11. WHERE OVERCURRENT DEVICE REQUIRED IS NOT LISTED IN TABLE, USE CONDUIT AND WIRE REQUIREMENTS LISTED FOR NEXT LARGER LISTED OVERCURRENT DEVICE.
12. TABLE IS NOT APPLICABLE FOR SERVICE ENTRANCE FEEDERS. REFER TO ELECTRICAL PLANS AND DIAGRAMS FOR SERVICE ENTRANCE FEEDER REQUIREMENTS.
13. REFER TO CIRCUIT SIZING SCHEDULE ON THIS SHEET FOR CONDUIT AND WIRING REQUIREMENTS ASSOCIATED WITH CIRCUIT SIZES NOTED IN THIS TABLE.
14. NON-FUSED LOCAL DISCONNECT SWITCH SIZE SHALL HAVE AN AMPERE RATING NO LESS THAN THE CIRCUIT SIZE INDICATED IN THIS TABLE. WHERE THE CIRCUIT SIZE IS NOT INDICATED, THE AMPERE RATING SHALL BE NO LESS THAN THE RATING OF THE PHASE CONDUCTORS PER THE NEC.

CIRCUIT LENGTH TABLE. 120V 1PH
(NOTES 7,8,9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	CIRCUIT SIZE				
		20A	30A	40A	50A	70A
20A	4	215'	360'	555'	880'	-
	8	105'	180'	275'	440'	700'
	12	70'	120'	185'	295'	465'
	16	50'	90'	140'	220'	350'
30A	24	-	60'	90'	145'	230'
40A	32	-	-	70'	110'	175'
50A	40	-	-	-	85'	140'
60A	48	-	-	-	-	115'

ONE WAY CIRCUIT LENGTH

CIRCUIT LENGTH TABLE. 208V 1PH
(NOTES 7,8,9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	CIRCUIT SIZE				
		20A	30A	40A	50A	70A
20A	4	375'	625'	965'	-	-
	8	185'	310'	480'	765'	-
	12	125'	205'	320'	510'	810'
	16	90'	155'	240'	380'	605'
30A	24	-	100'	160'	255'	405'
40A	32	-	-	120'	190'	300'
50A	40	-	-	-	150'	240'
60A	48	-	-	-	-	200'

ONE WAY CIRCUIT LENGTH

CIRCUIT LENGTH TABLE. 208V 3PH
(NOTES 7,8,9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	CIRCUIT SIZE				
		20A	30A	40A	50A	70A
20A	4	435'	720'	1115'	-	-
	8	215'	360'	555'	880'	-
	12	145'	240'	370'	590'	935'
	16	105'	180'	275'	440'	700'
30A	24	-	120'	185'	295'	465'
40A	32	-	-	135'	220'	350'
50A	40	-	-	-	175'	275'
60A	48	-	-	-	-	230'

ONE WAY CIRCUIT LENGTH

CIRCUIT LENGTH TABLE. 277V 1PH
(NOTES 7,8,9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	CIRCUIT SIZE				
		20A	30A	40A	50A	70A
20A	4	500'	830'	1290'	-	-
	8	250'	415'	645'	1010'	-
	12	165'	275'	430'	675'	1065'
	16	125'	205'	320'	510'	805'
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

ONE WAY CIRCUIT LENGTH

TRANSFORMER CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE TYPE
(NOTE 6)

KVA	PRIMARY CIRCUIT (480V)			SECONDARY CIRCUIT (208Y/120V)			
	FLA	SWITCH/FUSE OR CIRCUIT BREAKER SIZE	PRIMARY FEEDER	FLA	SWITCH/FUSE OR CIRCUIT BREAKER SIZE	GROUNDING ELECTRODE CONDUCTOR/ SUPPLY SIDE BONDING JUMPER	SECONDARY FEEDER [PROVIDE SUPPLY SIDE BONDING JUMPER FOR SECONDARY FEEDER PER LOW VOLTAGE DISTRIBUTION TRANSFORMER WIRING DETAIL IN LIEU OF EQUIPMENT GROUND]
9	10.8	30/20A	20A, 3W	25.0	30/30A	#8	30A, 4W
15	18.1	30/30A	30A, 3W	41.7	60/60A	#8	70A, 4W
30	36.1	60/60A	60A, 3W	83.3	100/100A	#6	125A, 4W
45	54.2	100/90A	100A, 3W	125.0	200/150A	#6	150A, 4W
75	90.3	200/150A	150A, 3W	208.3	400/250A	#2	250A, 4W
112.5	135.4	400/225A	225A, 3W	312.5	400/400A	#1/0	4#600, 4"C.
150	180.5	400/300A	300A, 3W	416.7	600/500A	#1/0	500A, 4W
225	270.8	400/400A	400A, 3W	625.0	800/800A	#3/0	2 SETS 4#600, 4"C
300	361.0	600/600A	600A, 3W	833.3	1200/1000A	#3/0	1000A, 4W

MOTOR CIRCUIT SCHEDULE. 208V 3PH
(NOTES 3,4,5,13,14)

MOTOR HP	SWITCH/FUSE	CIRCUIT BREAKER	NEMA STARTER SIZE/TYPE	CIRCUIT SIZE
1/2	30/4A	15A	00	20A
3/4	30/6.25A	15A	00	20A
1	30/8A	15A	00	20A
1 1/2	30/15A	20A	00	20A
2	30/15A	20A	0	20A
3	30/20A	30A	0	3#12, 1#10G, 3/4"C
5	30/30A	45A	1	30A
7 1/2	60/45A	60A	1	40A
10	60/60A	80A	2	3#8, 1#8G, 1"C
15	100/90A	125A	3	3#4, 1#6G, 1-1/4"C
20	100/100A	150A	3	110A
25	200/150A	200A	3	110A
30	200/150A	225A	4	3#1, 1#4G, 1-1/2"C
40	200/200A	300A	4	3#1/0, 1#4G, 2"C
50	400/250A	400A	5	3#3/0, 1#2G, 2"C
60	400/300A	450A	5	3#4/0, 1#2G, 2"C
75	400/400A	600A	5	3#350, 1#1G, 3"C
100	600/500A	700A	6	3#500, 1#1/0G, 3"C
125	600/600A	900A	6	2 SETS 3#2/0,1#1/0G, 3"C
150	800/700A	1000A	6	2 SETS 3#250,1#2/0G, 3"C
200	-	1600A	6	2 SETS 3#500,1#4/0G, 3"C

MOTOR CIRCUIT SCHEDULE. 480V 3PH
(NOTES 3,4,5,13,14)

MOTOR HP	SWITCH/FUSE	CIRCUIT BREAKER	NEMA STARTER SIZE/TYPE	CIRCUIT SIZE
1/2	30/2A	15A	00	20A
3/4	30/3.2A	15A	00	20A
1	30/4A	15A	00	20A
1 1/2	30/5.6A	15A	00	20A
2	30/6.25A	15A	00	20A
3	30/8A	15A	0	20A
5	30/15A	20A	0	20A
7 1/2	30/20A	30A	1	3#12, 1#10G, 3/4"C
10	30/25A	35A	1	3#12, 1#10G, 3/4"C
15	60/40A	60A	2	30A
20	60/50A	70A	2	3#8, 1#8G, 1"C
25	60/60A	90A	2	3#6, 1#8G, 1"C
30	100/70A	100A	3	3#6, 1#8G, 1"C
40	100/90A	150A	3	3#4, 1#6G, 1-1/4"C
50	200/125A	175A	3	110A
60	200/150A	200A	4	125A
75	200/175A	250A	4	3#1, 1#4G, 1 1/2"C
100	400/225A	350A	4	3#2/0, 1#2G, 2"C
125	400/300A	400A	5	3#3/0, 1#2G, 2"C
150	400/350A	450A	5	3#4/0, 1#2G, 3"C
200	600/450A	600A	5	3#350, 1#1G, 3"C

RACEWAY APPLICATION SCHEDULE

	RACEWAY	AC / MC CABLE	ALUMINUM RIGID CONDUIT	ELECTRICAL METALLIC TUBING (EMT)	SURFACE RACEWAY	ELECTRICAL NONMETALLIC TUBING (ENT)	FLEXIBLE METAL CONDUIT (FMC)	GENERAL-USE OPTICAL FIBER / COMMUNICATION CABLE RACEWAY	INTERMEDIATE METAL CONDUIT (IMC)	LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)	LIQUIDTIGHT FLEXIBLE NON METALLIC CONDUIT (LFNC)	PLENUM-TYPE OPTICAL FIBER / COMMUNICATIONS CABLE RACEWAY	RIGID STEEL CONDUIT	RISER-TYPE OPTICAL FIBER / COMMUNICATIONS CABLE RACEWAY	RIGID NONMETALLIC CONDUIT (RNC) TYPE EPC-40	RIGID NONMETALLIC CONDUIT (RNC) TYPE EPC-80	RIGID NONMETALLIC POLYTHYLENE (HDPE) SCHEDULE-40	RIGID NONMETALLIC POLYTHYLENE (HDPE) SCHEDULE-80	KEYED NOTES
OUTDOOR	EXPOSED								X				X						
OUTDOOR	CONCEALED (ABOVE GROUND)								X				X						
OUTDOOR	UNDERGROUND												X		X	X	X	X	EQUIPMENT INCLUDING: TRANSFORMERS, HYDRAULIC, PNEUMATIC, ELECTRIC, SOLENOID, MOTOR DRIVEN EQUIPMENT
OUTDOOR	CONNECTED TO VIBRATING EQUIPMENT									X									PNEUMATIC, ELECTRIC SOLENOID, MOTOR DRIVEN EQUIPMENT
INDOOR	EXPOSED NOT SUBJECT TO PHYSICAL DAMAGE - UNFINISHED SPACES			X															
INDOOR	EXPOSED NOT SUBJECT TO PHYSICAL DAMAGE - UNFINISHED SPACES				X														
INDOOR	EXPOSED NOT SUBJECT TO PHYSICAL DAMAGE - UNFINISHED SPACES								X				X						(RIGID STEEL CONDUIT UP TO 10'-0" AFF.) LOCATIONS INCLUDE: LOADING DOCKS, CORRIDORS USED FOR TRAFFIC OF MECHANIZED CARTS AND PALLET HANDLING UNITS MEHANICAL ROOMS
INDOOR	CONCEALED IN CEILINGS, INTERIOR WALL AND PARTITIONS	X		X															NOT TO EXCEED 6'-0" IN ACCESSIBLE CEILING SPACE
INDOOR	CONNECTED TO VIBRATING EQUIPMENT						X			X									EQUIPMENT INCLUDING: TRANSFORMERS, HUYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, MOTOR DRIVEN EQUIPMENT USE LFMC IN DAMP/WET AREAS
INDOOR	DAMP AND WET LOCATIONS								X				X						
INDOOR	BELOW SLAB ON GRADE														X	X			PROVIDE RIGID STEEL ELBOWS WHERE CONDUIT PENETRATES SLAB. CONDUIT INSTALLED 6" BELOW BOTTOM OF SLAB
INDOOR	EMBEDDED IN CONCRETE ABOVE GRADE												X		X	X			
INDOOR	OPTICAL FIBER OR COMMUNICATIONS CABLE IN SPACES USED FOR ENVIRONMENTAL AIR			X								X							
INDOOR	CONCEALED GENERAL PURPOSE DISTRIBUTION OF OPTICAL FIBER OR COMMUNICATION CABLE			X				X				X		X					
SPECIAL APPLICATIONS	MRI		X																
SPECIAL APPLICATIONS																			
SPECIAL APPLICATIONS																			
SPECIAL APPLICATIONS																			

GENERAL NOTES

1. "X" INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS
2. REFER TO "CONDUCTORS AND CABLES" SPECIFICATION FOR APPLICATION LIMITATIONS OF AC/MC CABLE.

ssoe®

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

ssoe
1001 Madison Avenue
Toledo, OH 43604
T. (419) 255-3830

ELECTRICAL STANDARD CIRCUITING AND CONDUIT SIZING SCHEDULES

E-801

EX. PANELBOARD: (EL) RP-NMR

MAINS: 100 A MCB
LOCATION: NMR 0250
FED FROM: (EX) XFMR-NMR
VOLTAGE: 240D/120 3Ø 4W.
ENCLOSURE: NEMA 1
MOUNTING: SURFACE
AIC RATING: EXISTING

LOAD DESCRIPTION	BKR	P	CKT	A	B	C	CKT	P	BKR	LOAD DESCRIPTION
			1	0.0 **1.9**			**2**	**2**	**20**	**NMR-01 - A110**
SPARE	30	3	3		0.0 **1.9**		**4**			
			5			0.0 **0.5**	**6**	**1**	**20**	**SOLENOID - A110**
SPARE	20	1	7	0.0 --			8	1	--	SPACE
SPACE	--	1	9		-- 0.0		10	2	20	SPARE
SPARE	20	1	11			0.0 0.0	12			
SPACE	--	1	13	-- --			14	1	--	SPACE
SPACE	--	1	15		-- --		16	1	--	SPACE
SPACE	--	1	17			-- --	18	1	--	SPACE
SPACE	--	1	19	-- --			20	1	--	SPACE
SPACE	--	1	21		-- --		22	1	--	SPACE
SPACE	--	1	23			-- --	24	1	--	SPACE
SPACE	--	1	25	-- --			26	1	--	SPACE
SPACE	--	1	27		-- --		28	1	--	SPACE
SPACE	--	1	29			-- --	30	1	--	SPACE
TOTAL CONNECTED kVA:				1.9	1.9	0.5				
TOTAL CONNECTED AMPS:				16.0 A	16.0 A	4.2 A				

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
Miscellaneous	4.3 kVA	100.00%	4.3 kVA		
				CONNECTED LOAD:	4.3 kVA
				DEMAND LOAD:	4.3 kVA
				CONNECTED CURRENT:	10.4 A
				DEMAND CURRENT:	10.4 A

NOTES:
REPLACE FLUSH MOUNT FRONT COVER WITH NEW SURFACE MOUNT STYLE COVER. COORDINATE LOCK AND KEY REQUIREMENTS WITH OWNER.
PROVIDE HIGH LEG WARNING DECALS PER NEC 408.3(F)(1).

PANELBOARD: RP-MRI

MAINS: 400 A
LOCATION: EQUIPMENT ROOM 0561
FED FROM: XFRM-MRI
LUG TYPE: MCB
VOLTAGE: 480Y/277V 3Ø 4W.
ENCLOSURE: NEMA 1
MOUNTING: SURFACE
AVAIL. FAULT: 5,275 AMPS SYMM.
AIC RATING: 42,000 AMPS SYMM.
ISOL GRND: YES - SEE DETAIL 5 ON E-901

LOAD DESCRIPTION	BKR	P	CKT	A	B	C	CKT	P	BKR	LOAD DESCRIPTION
			1	33.3 33.3			2			
GP1	150	3	3		33.3 33.3		4	3	150	GP2
			5			33.3 33.3	6			
			7	27.7 --			8	1	--	SPACE
EPC	125	3	9		27.7 --		10	1	--	SPACE
			11			27.7 --	12	1	--	SPACE
TOTAL CONNECTED kVA:				94.2	94.2	94.2				
TOTAL CONNECTED AMPS:				340.2 A	340.2 A	340.2 A				

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
MRI	282.7 kVA	78.00%	220.5 kVA		
				CONNECTED LOAD:	282.7 kVA
				DEMAND LOAD:	220.5 kVA
				CONNECTED CURRENT:	340.0 A
				DEMAND CURRENT:	265.2 A

NOTES:

EX. PANELBOARD: (EX) RP-C

MAINS: 225 A MCB
LOCATION: ELECTRICAL 0245
FED FROM: (EX) DP-C
VOLTAGE: 208Y/120V 3Ø 4W.
ENCLOSURE: NEMA 1
MOUNTING: SURFACE
AIC RATING: EXISTING

LOAD DESCRIPTION	BKR	P	CKT	A	B	C	CKT	P	BKR	LOAD DESCRIPTION
			1	6.7 0.2			2	1	20	RECEPTACLE 0250
RP-CLL	70	3	3		6.7 0.2		4	1	20	RECEPTACLE 0250
			5			6.7 0.2	6	1	20	RECEPTACLE 0250
REC - RP-NMR - 0250	**20**	**1**	**7**	**0.2** 1.0			8	1	20	1 PROJECTOR - 0364
REC - MRI OFFICE AND STORAGE - A110, A102	**20**	**1**	**9**		**0.5** 1.0		10	1	20	1 PROJECTOR - 0360
REC - MRI OFFICE PRINTER/COPIER - A110	**20**	**1**	**11**			**1.0** 0.7	12	1	20	4 RECEPTACLE
1 JB - 8 SEATS	20	1	13	0.7 1.1			14	1	20	6 RECEPTACLE
1 JB - 8 SEATS	20	1	15		0.7 1.1		16	1	20	6 RECEPTACLE
1 JB - 8 SEATS	20	1	17			0.7 0.7	18	1	20	4 RECEPTACLE
1 JB - 8 SEATS	20	1	19	0.7 0.9			20	1	20	5 RECEPTACLE
1 JB - 7 SEATS	20	1	21		0.7 0.0		22	1	20	SPARE
1 JB - 7 SEATS	20	1	23			0.7 0.2	24	1	20	RECEPTACLE 0250
1 JB - 7 SEATS	20	1	25	0.7 0.7			26	1	20	1 JB - 6 SEATS
1 JB - 8 SEATS	20	1	27		0.7 0.7		28	1	20	1 JB - 6 SEATS
1 JB - 8 SEATS	20	1	29			0.7 0.7	30	1	20	1 JB - 6 SEATS
1 JB - 8 SEATS	20	1	31	0.7 1.4			32	1	20	8 RECEPTACLE
1 JB - 8 SEATS	20	1	33		0.7 0.2		34	1	20	RECEPTACLE 0250
1 JB - 8 SEATS	20	1	35			0.7 0.2	36	1	20	RECEPTACLE 0250
1 JB - 6 SEATS	20	1	37	0.7 0.2			38	1	20	RECEPTACLE 0250
1 JB - 6 SEATS	20	1	39		0.7 0.4		40	1	20	2 RECEPTACLE - A/V
1 JB - 6 SEATS	20	1	41			0.7 0.4	42	1	20	2 RECEPTACLE - A/V
1 JB - 6 SEATS	20	1	43	0.7 1.1			44	1	20	RECEPTACLES SOUTH AUDIO BOOTH
1 JB - 6 SEATS	20	1	45		0.7 1.1		46	1	20	RECEPTACLES NORTH AUDIO BOOTH
120V FOR SIEMENS PANELS	20	1	47			0.5 **1.1**	**48**	**1**	**20**	**REC - MRI OFFICE COMPUTERS - A110**
6 RECEPTACLE	20	1	49	1.1 **0.9**			**50**	**1**	**20**	**REC - MRI OFFICE - A110**
5 RECEPTACLE	20	1	51		0.9 0.4		52	1	20	2 RECEPTACLES - A/V 0235
3 RECEPTACLE	20	1	53			0.5 0.4	54	1	20	2 RECEPTACLES - A/V 0231
N. SIGNAL GEN. CLOCK	20	1	55	0.5 **0.9**			**56**	**1**	**20**	**REC - MOCK MRI COMPUTERS - A110**
S. SIGNAL GEN. CLOCK	20	1	57		0.5 **0.7**		**58**	**1**	**20**	**REC - MOCK MRI - A110**
SPACE	--	1	59			-- **0.8**	**60**	**1**	**20**	**REC - PATIENT WAITING COMPUTER & TV - A101**
COMPUTER TABLE 0340	20	1	61	0.7 **0.5**			**62**	**1**	**20**	**REC - PATIENT WAITING - A101**
COMPUTER TABLE 0340	20	1	63		0.7 0.0		64	1	20	SPARE
COMPUTER TABLE 0340	20	1	65			0.7 0.0	66	1	20	SPARE
COMPUTER TABLE 0340	20	1	67	0.7 0.5			68	1	20	3 RECEPTACLES - 0250
COMPUTER TABLE 0340	20	1	69		0.7 0.5		70	1	20	3 RECEPTACLES - 0240 0235 0245
COMPUTER TABLE 0340	20	1	71			0.7 0.7	72	1	20	4 RECEPTACLES - 0231 0210
SPACE	--	1	73	-- 0.0			74			
SPACE	--	1	75		-- 0.0		76	3	50	SPARE
SPACE	--	1	77			-- 0.0	78			
SPACE	--	1	79	-- --			80	1	--	SPACE
SPACE	--	1	81		-- --		82	1	--	SPACE
SPACE	--	1	83			-- --	84	1	--	SPACE
TOTAL CONNECTED kVA:				23.7	20.6	19.8				
TOTAL CONNECTED AMPS:				198.5 A	173.0 A	164.6 A				

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
Equipment	1.0 kVA	100.00%	1.0 kVA		
Receptacle	63.1 kVA	57.93%	36.5 kVA		
				CONNECTED LOAD:	64.1 kVA
				DEMAND LOAD:	37.5 kVA
				CONNECTED CURRENT:	177.8 A
				DEMAND CURRENT:	104.2 A

NOTES:
EXISTING PANELBOARD IS TWO 42 POLE TUBS

EX. PANELBOARD: (EX) RP-F

MAINS: 225 A MLO
LOCATION: ELECTRICAL 0469
FED FROM: DP-F
VOLTAGE: 208Y/120V 3Ø 4W.
ENCLOSURE: NEMA 1
MOUNTING: SURFACE
AIC RATING: EXISTING

LOAD DESCRIPTION	BKR	P	CKT	A	B	C	CKT	P	BKR	LOAD DESCRIPTION
1 JB - 11 SEATS	20	1	1	1.0 1.0			2	1	20	1 JB - 11 SEATS
1 JB - 11 SEATS	20	1	3		1.0 1.0		4	1	20	1 JB - 11 SEATS
1 JB - 11 SEATS	20	1	5			1.0 1.0	6	1	20	1 JB - 11 SEATS
1 JB - 11 SEATS	20	1	7	1.0 1.0			8	1	20	1 JB - 11 SEATS
1 JB - 11 SEATS	20	1	9		1.0 1.0		10	1	20	1 JB - 11 SEATS
1 JB - 11 SEATS	20	1	11			1.0 1.0	12	1	20	1 JB - 11 SEATS
4 RECEPTACLE	20	1	13	0.7 1.0			14	1	20	1 PROJECTOR
4 RECEPTACLE	20	1	15		0.7 1.0		16	1	20	1 PROJECTOR
4 RECEPTACLE	20	1	17			0.7 0.9	18	1	20	5 RECEPTACLE
RM 0520 - ROW 1	20	1	19	0.7 0.7			20	1	20	RM 0520 - ROW 2
RM 0520 - ROW 1	20	1	21		0.7 0.7		22	1	20	RM 0520 - ROW 2
RM 0520 - ROW 2	20	1	23			0.7 0.7	24	1	20	RM 0520 - ROW 3
RM 0520 - ROW 3	20	1	25	0.7 0.7			26	1	20	RM 0520 - ROW 4
RM 0520 - ROW 3	20	1	27		0.7 0.7		28	1	20	RM 0520 - ROW 4
RM 0520 - ROW 4	20	1	29			0.7 0.7	30	1	20	RM 0520 - ROW 5
RM 0520 - ROW 5	20	1	31	0.7 **0.5**			**32**	**1**	**20**	**REC - MRI 0560**
1 PROJECTOR	20	1	33		1.0 1.0		34	1	20	1 DISPOSAL UNIT
6 RECEPTACLE	20	1	35			1.1 0.7	36	1	20	1 JB - 8 SEATS
6 RECEPTACLE	20	1	37	1.1 0.7			38	1	20	1 JB - 8 SEATS
RM 0520 - ROW 5	20	1	39		0.7 0.7		40	1	20	1 JB - 7 SEATS
1 RECEPTACLE	20	1	41			0.2 1.0	42	1	20	C.U.H
1 RECEPTACLE	20	1	43	0.2 0.7			44	1	20	RM 0520 - ROW 6
1 RECEPTACLE	20	1	45		0.2 **0.9**		**46**	**1**	**20**	**E.W.C. - GFCI BREAKER - CORRIDOR 0420**
1 RECEPTACLE	20	1	47			0.2 0.4	48	1	20	1ST. FL. GUARD DESK
1 RECEPTACLE	20	1	49	0.2 0.4			50	1	20	1 GFI PLUG STRIP
1 RECEPTACLE	20	1	51		0.2 0.4		52	1	20	1 GFI PLUG STRIP
4 RECEPTACLE	20	1	53			0.7 0.7	54	1	20	4 RECEPTACLE
1 GFI RECEPTACLE	20	1	55	0.2 **0.7**			**56**	**1**	**20**	**REC - MRI 0560**
1 GFI RECEPTACLE - MICROWAVE	20	1	57		1.3 **0.4**		**58**	**1**	**20**	**REC - EQUIPMENT ROOM 0561**
1 GFI RECEPTACLE - MICROWAVE	20	1	59			1.3 0.2	60	1	20	1 RECEPTACLE
SF-1 EX-FAN (0560)	20	1	61	1.3 1.2			62	1	20	IRRIGATION PUMP
REC - CONTROL ROOM 0560B	**20**	**1**	**63**		**0.5** 0.5		64	1	20	3 GFI RECEPTACLES - 0466
REC - 0468, 0420, 0560C, 0466C	**20**	**1**	**65**			**0.9** 0.2	**66**	**1**	**20**	**REC - EQUIPMENT ROOM 0561**
MAG. DOOR HOLDER 0450	20	1	67	0.5 **0.7**			**68**	**1**	**20**	**REC - CONTROL ROOM COMPUTER 0560B**
COMPRESSED AIR DRYER	20	1	69		1.3 0.2		70	1	20	1 FLR. RECEPTACLE - A/V
REC - 0466, 0466A, 66D, 66E, 66F	**20**	**1**	**71**			**0.9** 1.0	72	1	20	JB WIRELESS SYSTEM
EM. BLUE LIGHT (NORTH)	20	1	73	1.0 0.2			74	1	20	1 RECEPTACLE - A/V 0540
AC-1 - EQUIPMENT ROOM 0561	**30**	**2**	**75**		**2.0** 0.5		76	1	20	1 RECEPTACLE - A/V 0540
			77			**2.0 0.7**	**78**	**1**	**20**	**REC - CONTROL ROOM 0560B**
			79	2.8 0.7			80	1	20	RM 0520 - ROW 6
PUMP ROOM (0470) STEAM HEATER SH-1	30	3	81		2.8 0.7		82	1	20	RM 0520 - ROW 6
			83			2.8 0.7	84	1	20	RM 0520 - FRONT ROW RECEPTACLES
TOTAL CONNECTED kVA:				22.5	23.9	24.2				
TOTAL CONNECTED AMPS:				187.1 A	201.5 A	203.3 A				

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
Receptacle	52.4 kVA	59.54%	31.2 kVA		
Lighting	1.0 kVA	100.00%	1.0 kVA	**CONNECTED LOAD:**	70.6 kVA
Mechanical	16.3 kVA	100.00%	16.3 kVA	**DEMAND LOAD:**	49.4 kVA
Appliance	0.9 kVA	100.00%	0.9 kVA	**CONNECTED CURRENT:**	195.9 A
				DEMAND CURRENT:	137.0 A

NOTES:
EXISTING PANELBOARD IS TWO 42 POLE TUBS
PROVIDE NEW GROUND-FAULT CIRCUIT INTERRUPTER STYLE CIRCUIT BREAKER FOR E.W.C.

EX. DIST. PANEL: (EX) DP-DD

MAINS: 1200 A
LOCATION: ELECTRICAL 0315
FED FROM: MAIN SWITCHBOARD
VOLTAGE: 480Y/277V 3Ø 4W.
ENCLOSURE: NEMA 1
AIC RATING: 100,000 AMPS SYMM.

CKT	CIRCUIT DESCRIPTION	# OF POLES	FRAME SIZE	TRIP RATING	LOAD	
1	**225 KVA ISOLATION XFMR**	**3**	**400 A**	**400 A**	**282.7 kVA**	
2	BUSS #6	3	400 A	350 A	232.8 kVA	
3	SPACE	3	--	--	--	
4	PHASE MONITORING	3	100 A	30 A	0.0 kVA	
5	BUSS #4	3	400 A	350 A	232.8 kVA	
6	BUSS #5	3	400 A	350 A	232.8 kVA	
	TOTAL CONNECTED kVA:				981.1 kVA	
	TOTAL CONNECTED AMPS:				1180 A	

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
Miscellaneous	698.4 kVA	100.00%	698.4 kVA		
MRI	282.7 kVA	78.00%	220.5 kVA	**CONNECTED LOAD:**	981.1 kVA
				DEMAND LOAD:	918.9 kVA
				CONNECTED AMPS:	1180.1 A
				DEMAND AMPS:	1105 A

NOTES:

EX. DIST. PANEL: (EX) DP-BB

MAINS: 1200 A
LOCATION: ELECTRICAL 0315
FED FROM: MAIN SWITCHBOARD
VOLTAGE: 480Y/277V 3Ø 4W.
ENCLOSURE: NEMA 1
AIC RATING: 100,000 AMPS SYMM.

CKT	CIRCUIT DESCRIPTION	# OF POLES	FRAME SIZE	TRIP RATING	LOAD	
1	**CHW-1**	**3**	**125 A**	**70 A**	**40.2 kVA**	
2	BUSS #3	3	400 A	350 A	232.8 kVA	
3	SPACE	1	--	--	--	
4	PHASE MONITORING	1	125 A	30 A	0.0 kVA	
5	BUSS #1	3	400 A	350 A	232.8 kVA	
6	BUSS #2	3	400 A	350 A	232.8 kVA	
	TOTAL CONNECTED kVA:				738.6 kVA	
	TOTAL CONNECTED AMPS:				888 A	

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
Mechanical	40.2 kVA	100.00%	40.2 kVA		
Miscellaneous	698.4 kVA	100.00%	698.4 kVA	**CONNECTED LOAD:**	738.6 kVA
				DEMAND LOAD:	738.6 kVA
				CONNECTED AMPS:	888.3 A
				DEMAND AMPS:	888 A

NOTES:

GENERAL NOTES - PANEL SCHEDULES

A. PROVIDE CIRCUIT DIRECTORIES IN ALL ELECTRICAL PANELS AND NAMEPLATES ON SWITCHBOARDS PER THE SPECIFICATIONS.

B. PROVIDE ARC FLASH CALCULATIONS AND LABELS FOR ALL SWITCHBOARDS, PANELBOARDS, MOTOR CONTROLLERS, AND CONTROL PANELS PER SECTION 110.16 OF THE NEC AND NFPA 70E. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

C. NEW WORK IN EXISTING PANELS IS NOTED IN BOLD TEXT.

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY
5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
DETROIT, MICHIGAN
48201

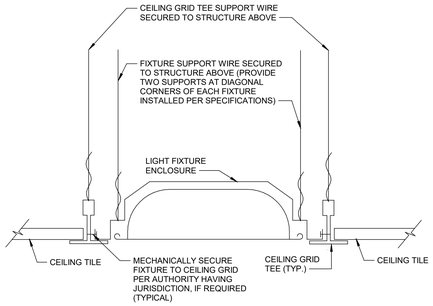
SSOE PROJECT #: 023-03727-00
SSOE MANAGER: JEFF FALZON

SSOE
1001 Madison Avenue
Toledo, OH 43604
T. (419) 255-3830

PANEL SCHEDULES

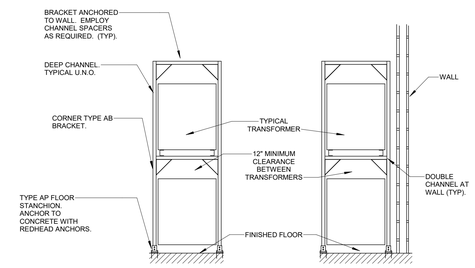
E-810

Autodesk Docs://Wayne State University_WSU Applebaum MRI/0230372700_MEP23_SSOE.rvt :**FILE PATH**
11/17/2023 3:08:36 PM :**PRINT DATE**



4 E-901 RECESSED GRID TROFFER LIGHT FIXTURE INSTALLATION

SCALE: NOT TO SCALE



NOTES:

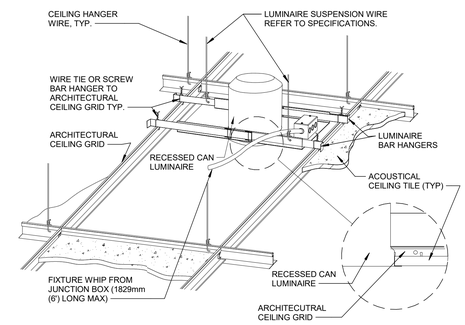
1. STACK THE NEW TRANSFORMER ABOVE THE EXISTING. THIS DETAIL SHOW THE DESIGN INTENT. COORDINATE IN THE FIELD.
2. PROVIDE THOMAS & BETTS SUPERSTRUT OR EQUIVALENT.
3. ALL PART NUMBERS SHOWN ARE THOMAS & BETTS SUPERSTRUT.

3 E-901 STACKED TRANSFORMER

SCALE: NOT TO SCALE

7 E-901 ISOLATED GROUND SYSTEM WIRING

SCALE: NOT TO SCALE

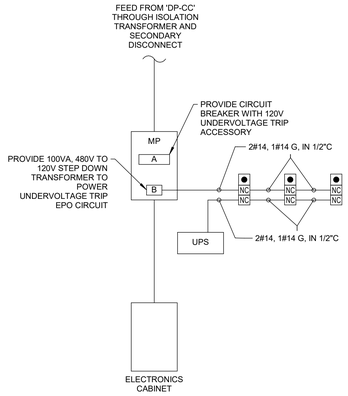


NOTE:

1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S MOUNTING INSTRUCTIONS AND USING RECOMMENDED MOUNTING HARDWARE

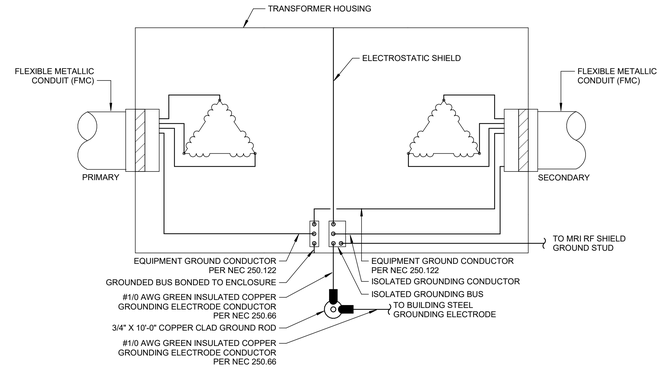
2 E-901 LAY-IN CEILING DOWNLIGHT INSTALLATION

SCALE: NOT TO SCALE



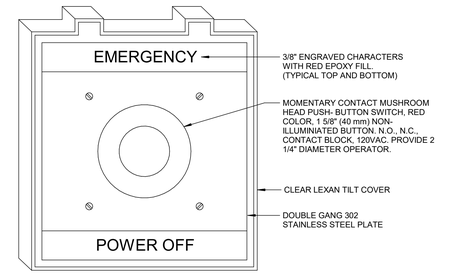
6 E-901 EPO WIRING

SCALE: NOT TO SCALE



5 E-901 TYPICAL LOW VOLTAGE ISOLATION TRANSFORMER WIRING

SCALE: NOT TO SCALE



1 E-901 EPO SWITCH

SCALE: NOT TO SCALE

PROFESSIONAL SEALS:

PROJECT PARTNERS:

SUBMITTAL/REVISION SCHEDULE:

NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

■ APPROVED FOR CONSTRUCTION
□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

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5454 CASS AVE
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CLIENT PROJECT #:	PROJECT NUMBER
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PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1001 Madison Avenue
Toledo, OH 43604
T: (419) 255-3830

ELECTRICAL DETAILS

E-901

FIRE ALARM SYMBOL SCHEDULE

(NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL, MH=6'-0" AFF TO TOP OF PANEL UNO
FAP	FIRE ALARM PANEL, MH=6'-0" AFF TO TOP OF PANEL UNO
FAPS	FIRE ALARM POWER SUPPLY, MH=6'-0" AFF TO TOP OF PANEL UNO
FAA	FIRE ALARM ANNUNCIATOR, MH=5'-0" AFF TO TOP OF PANEL UNO
FSCP	FIRE SUPPRESSION CONTROL PANEL, INSTALLED BY FSC WIRED BY FAC
MNS	MASS NOTIFICATION SYSTEM PANEL, MH=6'-0" AFF TO TOP OF PANEL UNO
TMB	MASS NOTIFICATION TEXT MESSAGE BOARD, MH= 7'-6" AFF UNO
ASD	AIR ASPIRATING TYPE SMOKE DETECTOR WITH POWER SUPPLY AND BATTERIES, MH=5'-0" AFF UNO
F	FIRE ALARM MANUAL STATION, MH=4'-0" AFF UNO
	FIRE ALARM SMOKE DETECTOR, CEILING MOUNTED
	FIRE ALARM ADDRESSABLE DUCT TYPE SMOKE DETECTOR, MOUNTED ON DUCT
	FIRE ALARM HEAT DETECTOR, CEILING MOUNTED
	FLAME DETECTOR, MH=9'-0" AFF UNO
AIM	FIRE ALARM ADDRESSABLE INPUT MODULE
AOM	FIRE ALARM ADDRESSABLE OUTPUT MODULE
	NON-ADDRESSABLE IMPOSING RELAY, MOUNTED WITHIN 3'-0" OF DEVICE UNO
	FIRE ALARM SPEAKER WITH STROBE, MH=6'-8" AFF UNO
	FIRE ALARM SPEAKER WITH STROBE, CEILING MOUNTED
	FIRE ALARM SPEAKER, MH=10'-0" AFF UNO
C	FIRE ALARM SPEAKER, CEILING MOUNTED
	FIRE ALARM STROBE, MH=6'-8" AFF UNO
	FIRE ALARM STROBE, CEILING MOUNTED
A	MASS NOTIFICATION AMBER STROBE, MH=6'-8" AFF UNO
A	MASS NOTIFICATION AMBER STROBE, CEILING MOUNTED
WP	FIRE ALARM BELL WITH PROTECTIVE CAGE, MH=7'-6" AFG UNO
	WALKTEST SWITCH, MH=4'-6" AFF UNO
	MUSTER BUTTON, MH=4'-6" AFF UNO
RT	REMOTE TEST STATION, MH=4'-0" AFF UNO
WT	WATCH TOUR STATION, MH=4'-0" AFF UNO
	PANEL TAMPER SWITCH, MOUNTED IN PANEL
	SAFETY SHOWER EYEWASH STATION, INSTALLED BY MC WIRED BY FAC
	EYEWASH STATION, INSTALLED BY MC WIRED BY FAC
	MAGNETIC DOOR HOLDER, MH=6'-6" AFF UNO
	GAS DETECTOR SENSOR CO=CARBON MONOXIDE CO2=CARBON DIOXIDE HCL=HYDROGEN CHLORIDE CH4=METHANE
LT	LOW TEMPERATURE SENSOR (SET TO ALARM AT 40°F), MH=5'-6" AFF UNO
FS	FIRE SUPPRESSION WATER FLOW/PRESSURE SWITCH, INSTALLED BY FSC WIRED BY FAC
TS	FIRE SUPPRESSION TAMPER/TROUBLE/SUPERVISORY SWITCH, INSTALLED BY FSC WIRED BY FAC
LS	FIRE SUPPRESSION LOW-AIR PRESSURE SWITCH, INSTALLED BY FSC WIRED BY FAC
HS	FIRE SUPPRESSION HIGH-AIR PRESSURE SWITCH, INSTALLED BY FSC WIRED BY FAC
S	SOLENOID VALVE
EOL	FIRE ALARM END OF LINE RESISTOR
EOLR	FIRE ALARM END OF LINE RELAY

SECURITY & ACCESS CONTROL SYMBOL SCHEDULE

(NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
ACP	ACCESS CONTROL PANEL, MH=6'-0" AFF TO TOP OF PANEL UNO
SCP	SECURITY CONTROL PANEL, MH=6'-0" AFF TO TOP OF PANEL UNO
CCTV	CLOSED CIRCUIT TELEVISION HEAD END
F P IP WP MP	CCTV CAMERA, CEILING MOUNTED F=FIXED P=PAN/TILT/ZOOM IP= INTERNET PROTOCOL WP=WEATHER PROOF MP=MEGA PIXEL
P.F IP WP	CCTV CAMERA, MH=8'-6" AFF UNO F=FIXED P=PAN/TILT/ZOOM IP= INTERNET PROTOCOL WP= WEATHER PROOF
CR	CARD READER, MH=4'-0" AFF UNO
KP	KEY PAD, MH=4'-0" AFF UNO
BR	BIOMETRIC READER, MH=4'-0" AFF UNO
DC	DOOR CONTACT/DOOR STATUS SWITCH, MOUNTED IN DOOR FRAME
ML	MAGNETIC LOCK, MOUNTED ON DOOR FRAME
DML	DOUBLE MAGNETIC LOCK, MOUNTED ON DOOR FRAME
CB	CRASH BAR WITH REQUEST TO EXIT CONTACT
EK	ELECTRONIC LOCK
ES	ELECTRIC STRIKE
PL	PNEUMATIC LATCH RETRACTOR
BD	BEAM MOTION DETECTOR
DO	ADA DOOR OPENER CONTROLLER
PP	ADA DOOR OPENER PUSH PAD, MH=4'-0" AFF UNO
RTE	REQUEST TO EXIT BUTTON, MH=4'-0" AFF UNO
RTM	REQUEST TO EXIT MOTION, CEILING MOUNTED
PO	PNEUMATIC DOOR OPENER
DA	AUDIBLE DOOR ALARM, MOUNTED 4" ABOVE DOOR FRAME UNO
PB	PANIC BUTTON
GO	GATE OPERATOR
IC	INTERCOM STATION WITH DOOR/TURNSTILE/GATE RELEASE, MH=4'-0" AFF UNO
DB	DOORBELL, MH=4'-0" AFF UNO
MD	MOTION DETECTOR, MH=8'-6" AFF UNO
MD	MOTION DETECTOR, CEILING MOUNTED
MD	360 DEGREE MOTION DETECTOR, CEILING MOUNTED

DATA SYMBOL SCHEDULE

(NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
W	TELEPHONE OUTLET, FLUSH MOUNTED, MH=5'-0" AFF UNO
#	DATA OUTLET, FLUSH MOUNTED, # = QUANTITY OF CABLES, MH=1'-4" AFF UNO
#	TELEPHONE OUTLET, WIREWAY MOUNTED, # = QUANTITY OF CABLES, MH=3'-6" AFF UNO
#	TELEPHONE AND DATA OUTLET, WIREWAY MOUNTED, # = QUANTITY OF CABLES, MH=3'-6" AFF UNO
#	DATA OUTLET(S), WIREWAY MOUNTED, # = QUANTITY OF CABLES, MH=3'-6" AFF UNO
#	TELEPHONE OUTLET, FLOOR BOX, # = QUANTITY OF CABLES
#	TELEPHONE AND DATA OUTLET, FLOOR BOX, # = QUANTITY OF CABLES
#	DATA OUTLET, FLOOR BOX, # = QUANTITY OF CABLES
#	TELEPHONE OUTLET, SURFACE MOUNTED, # = QUANTITY OF CABLES, MH=1'-4" AFF UNO
#	TELEPHONE AND DATA OUTLET, SURFACE MOUNTED, # = QUANTITY OF CABLES, MH=1'-4" AFF UNO
#	DATA OUTLET, SURFACE MOUNTED, # = QUANTITY OF CABLES, MH=1'-4" AFF UNO
TV	CABLE TELEVISION OUTLET, FLUSH MOUNTED, MH=7'-0" AFF UNO
TV A/V	TELEVISION OUTLET, FLUSH MOUNTED, WITH CONDUIT TO FLOOR BOX, MH=7'-0" AFF UNO
CM	MICROPHONE, CEILING MOUNTED
S A/V	AUDIO/VISUAL SPEAKER, MH=8'-0" AFF UNO
S A/V	AUDIO/VISUAL SPEAKER, CEILING MOUNTED
SB	SMART BOARD
H	TV / PILLOW SPEAKER CONNECTION, REFER TO ARCHITECTURAL DRAWINGS - SINGLE DIALYSIS STATION ELEVATION
P	PROJECTOR, CEILING MOUNTED
P	SHORT THROW PROJECTOR, MH=8'-6" AFF UNO
DAS	DISTRIBUTED ANTENNA SYSTEM ANTENNA, CEILING MOUNTED
WAP	WIRELESS ACCESS POINT, CEILING MOUNTED
T	TELECOMMUNICATIONS POWER POLE
J	MODULAR FURNITURE SYSTEM JUNCTION BOX, MH=1'-0" AFF UNO
	COMMUNICATION CABLE TRAY
W	WIREWAY
	TELECOMMUNICATIONS BACKBOARD
TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
TGB	TELECOMMUNICATIONS GROUNDING BUSBAR

AUXILIARY SYMBOL SCHEDULE

(NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
AMP	PUBLIC ADDRESS OR PAGING SYSTEM HEAD END, MH=6'-0" AFF TO TOP OF PANEL UNO
S	PUBLIC ADDRESS SPEAKER, MH=8'-0" AFF UNO
S	PUBLIC ADDRESS SPEAKER, CEILING MOUNTED
V	VOLUME CONTROL, MH=4'-0" AFF UNO
	SINGLE FACE CLOCK, MH=8'-0" AFF UNO
	DOUBLE FACE CLOCK, MH=8'-0" AFF UNO
	DOUBLE FACE CLOCK, CEILING MOUNTED
DCLK	DIGITAL CLOCK, MH=8'-0" AFF UNO
	POWER SOURCE, CROSS MARKS WHEN SHOWN INDICATE QUANTITY OF CONDUCTORS. WHEN OMITTED, QUANTITY SHALL BE DETERMINED BY CONTRACTOR. LONG MARKS INDICATE PHASE CONDUCTORS. SHORT MARK INDICATES NEUTRAL CONDUCTOR AND SLANTED MARK INDICATES GROUND CONDUCTOR WHERE REQUIRED.

NURSE CALL SYMBOL SCHEDULE

(NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
DS	NURSE CALL DUTY STATION, MH=4'-0" AFF UNO
NC	NURSE CALL MASTER CONSOLE STATION
NA	NURSE ASSIST STATION, MH=4'-0" AFF UNO
EP	EMERGENCY PULL CORD STATION, MH=4'-0" AFF UNO
DA	PATIENT DEPARTURE ALERT CONTROLLER, MOUNTED ABOVE CEILING
SP	SINGLE PATIENT ROOM NURSE CALL STATION, MH=4'-8" AFF UNO
DP	DUAL PATIENT ROOM NURSE CALL STATION, MH=4'-8" AFF UNO
CL	CORRIDOR LIGHT, MOUNTED 4" ABOVE DOOR UNO
ZL	ZONE LIGHT, MOUNTED ON CEILING

ABBREVIATIONS SCHEDULE

(NOT ALL SYMBOLS USED)

ABBREVIATION	DESCRIPTION
ACP	ACCESS CONTROL PANEL
ACEG	ALTERNATING CURRENT EQUIPMENT GROUND
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AMP	AMPLIFIER
ASD	ASPIRATING SMOKE DETECTOR
A/V	AUDIO/VISUAL
BC	BONDING CONDUCTOR
BOCT	BOTTOM OF CABLE TRAY ELEVATION
C	CEILING
CATV	CABLE TELEVISION
CCTV	CLOSED CIRCUIT TELEVISION
CD	CANDELA SETTING
DE	DELAYED EGRESS
DVR	DIGITAL VIDEO RECORDER
E	EXISTING DEVICE OR EQUIPMENT
EC	ELECTRICAL CONTRACTOR
ES	EQUIPMENT SUPPLIER
FAC	FIRE ALARM CONTRACTOR
FSC	FIRE SUPPRESSION CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
IDF	INTERMEDIATE DISTRIBUTION FRAME
IP	INTERNET PROTOCOL
LAN	LOCAL AREA NETWORK
MAC	MOUNTED ABOVE COUNTER
MAN	METROPOLITAN AREA NETWORK
MC	MECHANICAL CONTRACTOR
MDF	MAIN DISTRIBUTION FRAME
MH	MOUNTING HEIGHT - FROM FINISHED FLOOR TO BOTTOM OF EQUIPMENT
MIC	MOUNTED IN CEILING
MM	MULLION MOUNTED
MNS	MASS NOTIFICATION SYSTEM
MP	MEGA PIXEL
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NVR	NETWORK VIDEO RECORDER
POE	POWER OVER ETHERNET
PTZ	PAN/TILT/ZOOM CAMERA
R	RECESSED
SCP	SECURITY CONTROL PANEL
SMS	SECURITY MANAGEMENT SYSTEM
TBB	TELECOMMUNICATIONS BONDING BACKBONE
TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERUPTED POWER SUPPLY
VOIP	VOICE OVER INTERNET PROTOCOL
W	WATTAGE
WAN	WIDE AREA NETWORK
WAP	WIRELESS ACCESS POINT
WP	WEATHERPROOF
XP	EXPLOSION PROOF

GENERAL NOTES

1. THE CONTRACTOR SHALL INSTALL ALL CABLE IN A PROFESSIONAL MANNER. CARE MUST BE GIVEN IN THE ROUTING OF THE CABLE SO AS TO PROVIDE CLEARANCE TO ALLOW THE SERVICING OF OTHER ELECTRICAL CONDUITS, EQUIPMENT, LIGHTS, ETC.
2. THE CONTRACTOR SHALL FURNISH ALL LABOR, SERVICES, AND MATERIALS NECESSARY TO INSTALL A COMPLETE, FUNCTIONAL, AND OWNER APPROVED SYSTEM.
3. MINIMUM CONDUIT SIZE ALLOWABLE SHALL BE 3/4" UNLESS NOTED OTHERWISE. WIRE SIZE SHALL BE INCREASED AS REQUIRED TO PREVENT A VOLTAGE DROP EXCEEDING 18% CONDUIT SIZE SHALL BE INCREASED AS REQUIRED TO MEET NEC REQUIREMENTS.
4. CONTRACTOR SHALL COORDINATE AND VERIFY ACTUAL EQUIPMENT SIZES WITH SIZES SHOWN ON PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SPACE ALLOCATION WITH OTHER EQUIPMENT. EQUIPMENT ORIENTATION AND FLOOR AND WALL OPENINGS.
5. CONTRACTOR SHALL SEAL ALL OPENINGS IN FIRE RATED WALLS AND FLOORS. THE RATING OF THE SEALANT SHALL MATCH THE WALL OR FLOOR RATING.
6. CONTRACTOR SHALL PROVIDE MISCELLANEOUS STEEL SUPPORTS AS REQUIRED FOR MOUNTING HARDWARE AND EQUIPMENT.
7. VERTICALLY ALIGN DEVICES INSTALLED ON WALL WITH OTHER EQUIPMENT (THERMOSTATS, LIGHT SWITCHES, CARD READERS, MANUAL PULL STATIONS, ETC.) WHERE APPLICABLE. MAINTAIN PROPER MOUNTING HEIGHT AND LOCATION OF DEVICES TO MEET CODE.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES, PERMITS, AND LICENSES FOR THE COMPLETE INSTALLATION OF HIS/HER WORK.
9. COORDINATE EXACT PHASING AND SEQUENCING OF ALL WORK WITH PROJECT TECHNICAL LEADER AND THE OWNER.

TELECOMMUNICATIONS SPECIFICATION

A. ALL INSTALLATIONS, EQUIPMENT AND MATERIALS SHALL BE PROVIDED IN COMPLIANCE WITH THE CURRENT LAWS AND REGULATIONS OF STATE COUNTY AND CITY FIRE MARSHALLS, BUILDING INDUSTRY CONSULTING SERVICES INTERNATIONAL (BICSI), NEC, THE INTERNATIONAL BUILDING CODE (IBC), COMMUNICATIONS STANDARDS PUBLISHED BY TIA/EIA, AND ALL OTHER APPLICABLE CODES.

B. THE CONTRACTOR SHALL INSURE THAT THE MANUFACTURER PULL TENSIONS AND MINIMUM BENDING RADIUS OF THE CABLES BEING INSTALLED ARE NOT EXCEEDED AT ANY TIME DURING INSTALLATION.

C. 3/4" CONDUIT SHALL BE RUN TO THE CLOSEST CABLE TRAY IN THE DIRECTION OF THE IDF ROOM, FOR DEVICES WITH MORE THAN 3 CABLES, UTILIZE (1) 1" CONDUIT.

D. ALL BENDS WILL BE LONG, SWEEPING BENDS WITH A RADIUS NOT LESS THAN:
   1. SIX TIMES THE INTERNAL DIAMETER OF CONDUITS 2 INCHES OR SMALLER.
   2. TEN TIES THE INTERNAL DIAMETER OF CONDUITS LARGER THAN 2 INCHES.

E. ENSURE THAT THE HORIZONTAL CABLE BEND RADIUS IS NO LESS THAN FOUR (4) TIMES THE CABLE DIAMETER.

F. THE AMOUNT OF UNTWISTING MUST NOT EXCEED 13mm (0.5 INCHES) FOR ALL CAT6E CABLES.

G. ENSURE THAT THERE IS A MINIMUM OF 15' OF SLACK AT THE IDF.

H. ENSURE THAT THERE IS A MINIMUM OF 12' OF SLACK AT THE WORK AREA OUTLET.

I. IDENTIFY CABLES AT EACH END WITH PERMANENT ALPHANUMERIC LABELS PER OWNER STANDARDS.

J. WHERE CABLE TRAY IS NOT ACCESSIBLE, SUPPORT NEW CABLING SYSTEM USING J-HOOKS.

K. TELECOMMUNICATIONS JACKS SHALL COME FROM THE SAME MANUFACTURER AS THE HORIZONTAL TELECOMMUNICATIONS CABLING.

L. COLOR CODING OF ALL CABLES SHALL MEET OWNER'S STANDARDS.

M. ALL ELECTRONICS HARDWARE WILL BE DESIGNED AND PROVIDED BY THE OWNER.

N. INTRA-BUILDING BACKBONE CABLING SHALL SUPPORT A MINIMUM OF 10GBPS ETHERNET ON OM3 50-MICRON 12 STRAND MULTI-MODE AND 12 STRAND SINGLE-MODE FIBER RISER CABLING BETWEEN TELECOMMUNICATIONS ROOMS.

O. ALL TELECOM CABLING FROM MDF/IDF ROOM TO DEVICES AND DATA RECEPTACLES (VOICE, DATA, WIRELESS ACCESS POINTS, AND SECURITY CAMERA HORIZONTAL WIRING) SHALL BE CAT6E COPPER CABLING. HUBBELL NEXTSPEED CAT 6 ENCHANCED OR ENGINEER APPROVED EQUAL.

P. CABLE LENGTH FROM TELECOMMUNICATION ROOM TO ANY DEVICE SHALL NOT EXCEED 295'.

Q. THE INSTALLING CONTRACTOR MUST BE CERTIFIED BY THE CABLING AND CONNECTOR MANUFACTURERS AS AN APPROVED AND TRAINED INSTALLER OF THEIR EQUIPMENT AND PRODUCT.

R. PROVIDE A CHANNEL WARRANTY FOR ALL DATA DROPS. WARRANTY SHALL COVER REPAIR OR REPLACEMENT OF ALL DEFECTIVE COMPONENTS FREE OF CHARGE, INCLUDING ALL LABOR PERFORMED BY A MANUFACTURER-CERTIFIED INSTALLER. ALL NEW OR REPLACEMENT COMPONENTS SHALL BE FURNISHED NEW.

S. TELECOMMUNICATIONS PATCH CORD SHALL COME FROM THE SAME MANUFACTURER AS THE HORIZONTAL TELECOMMUNICATIONS CABLING, JACKS, AND PATHC PANELS INSTALLED IN THE BUILDING.

T. TELECOMMUNICATIONS FACEPLATES SHALL COME FROM THE SAME MANUFACTURER AS THE HORIZONTAL TELECOMMUNICATIONS CABLING, JACKS, AND PATHC PANELS INSTALLED IN THE BUILDING. PROVIDE STAINLESS STEEL FACEPLATES IN LIEU OF PLASTIC IN ALL LABS.

U. TELECOMMUNICATIONS FACEPLATES FOR WALL MOUNTED WORKSTATION OUTLETS SHALL ALLOW A MINIMUM OF 2 AND A MAXIMUM OF 6 POSITIONS AND ACCEPT SNAP-IN JACKS.

V. UPON COMPLETION OF THE CABLE INSTALLATION, THE CONTRACTOR SHALL PERFORM A COMPLETE COPPER CABLE CERTIFICATION TEST, ACCORDING TO ALL MANUFACTURER'S REQUIREMENTS FOR APPLICATION WARRANTY, TESTING REQUIRED BY THE TIA/EIA, INCLUDING BUT NOT LIMITED TO:
   1. CONTINUITY CHECKS ON EACH CABLE, CHECKING FOR OPENS AND SHORTS.
   2. CABLE LENGTH (CHANNEL AND PERMANENT LINK).
   3. CORRECT PAIR POLARITY.
   4. CORRECT CABLE LABELING AT BOTH ENDS.

W. PROVIDE A 20'-0" COIL OF EXTRA CAT 6E CABLE FOR EVERY WAP LOCATION.

TECHNOLOGY INDEX OF DRAWINGS

SSOE®

PROFESSIONAL SEALS:

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NO.	DATE	DESCRIPTION
1	11-17-23	BID PACK 1 BIDS/PERMITS

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□ NOT APPROVED FOR CONSTRUCTION

CLIENT INFORMATION:

Wayne State University

WAYNE STATE UNIVERSITY

5454 CASS AVE
DETROIT, MICHIGAN
48202

CLIENT PROJECT #:	PROJECT NUMBER
JHA PROJECT #:	PROJECT NUMBER

PROJECT INFORMATION:

WSU APPLEBAUM MRI

259 MACK AVE
DETROIT, MICHIGAN
48201

SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

SSOE
1001 Madison Avenue
Toledo, OH 43604
T. (419) 255-3830

TECHNOLOGY GENERAL NOTES AND SYMBOLS

T-001

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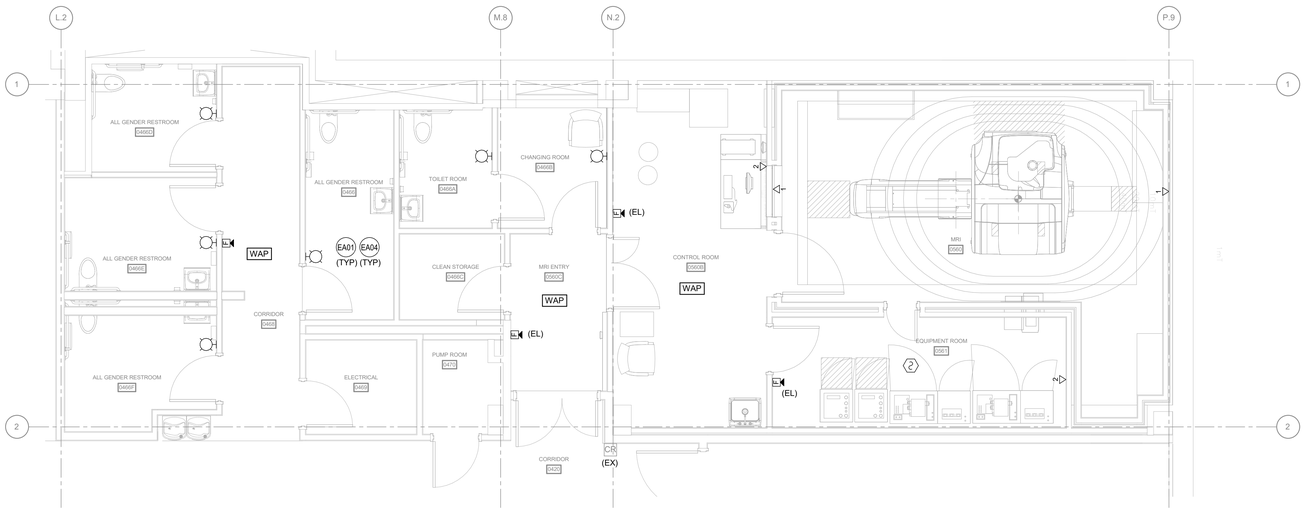
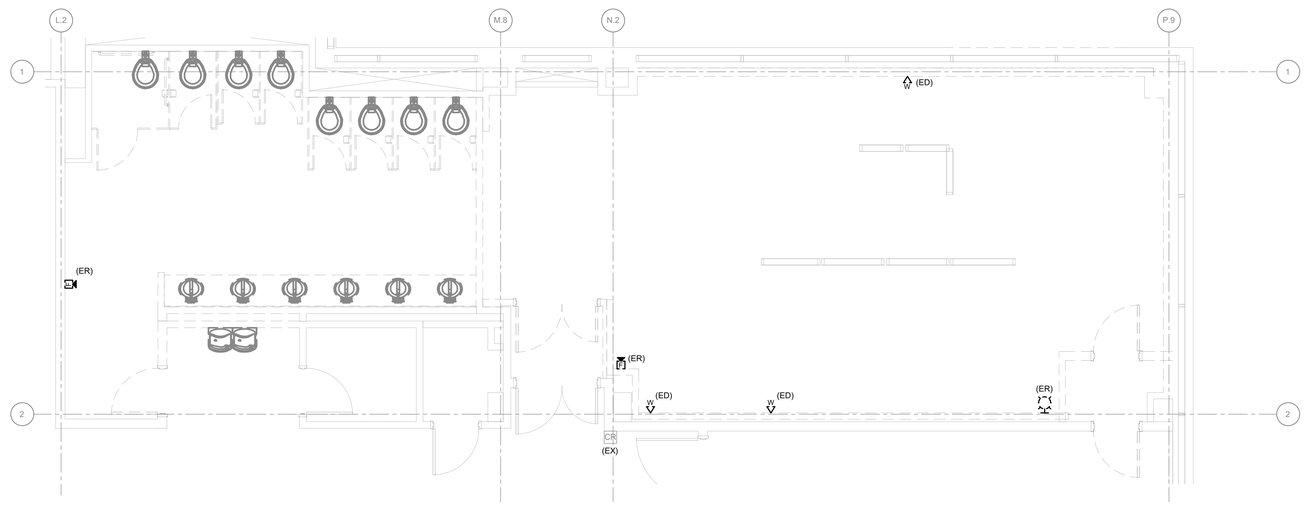


1 T-101 ENLARGED MRI SUITE PLAN AUXILIARY - NEW WORK PLAN

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



2 T-101 ENLARGED MRI SUITE PLAN AUXILIARY - DEMOLITION PLAN

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

GENERAL NOTES - AUXILIARY

A. ALL SECURITY CABLING INCLUDING CARD READERS IS LOW VOLTAGE AND SHALL BE PLENUM RATED. CABLING REQUIREMENTS AND LAYOUT TO BE PROVIDED BY SECURITY CONTRACTOR. ALL CABLING TO BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. HOMERUN CABLING TO NEAREST TELE/DATA ROOM. VERIFY WITH ENCOMPASS HEALTH ITG

B. CONTRACTOR SHALL OBTAIN TV AND NURSE CALL SYSTEM SINGLE LINE DIAGRAMGS FROM VENDORS. PROVIDE CABLING PER THEIR REQUIREMENTS.

C. CONTRACTOR SHALL VERIFYWITH EACH LOW VOLTAGE VENDOR THE HOMERUN LOCATIONS FOR THEIR SYSTEM CABLES BEFORE RUNNING CABLING.

D. LOW VOLTAGE INSTALLER SHALL HAVE RCDD CERTIFIED STAFF ON SITE FOR INSTALLATION, TESTING, AND PROJECT MANAGEMENT PER ENCOMPASS HEALTH ITG.

E. COORDINATE LOCATION OF SMOKE DAMPERS WITH MECHANICAL PRIORTO ROUGH-IN.

F. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT FOR TV AND TV DATA OUTLETS WITH OWNER PRIOR TO ROUGH-IN.

G. ALL LOW VOLTAGE SYSTEMS (VOICE, DATA, TV, PAGING, AND NURSE CALL) SHALL BE PROVIDED IN SEPARATE HOOKS/SUPPORTS FOR EACH SYSTEM. NO HOOK/SUPPORT SHALL EXCEED 40 CABLES.

H. CABLE SYSTEM TYPES (VOICE, DATA, TV, PAGING, AND NURSE CALL) SHALL BE SEPARATED IN SLEEVES/FIRE BARRIERS THROUGH RATED WALLS.

I. ALL ELECTRIC LOCKS SHALL BE INTEGRATED WITH FIRE ALARM FOR DOOR RELEASE UPON FIRE ALARM ACTIVATION

J. COORDINATE SECURITY DEVICES CONNECTION TO POWERED DOORS WITH VENDOR.

PLAN NOTES

EA01 CONNECT NEW FIRE ALARM NOTIFICATION APPLIANCES TO EXISTING FIRE ALARM SYSTEM.

EA04 EXISTING COMM ROOM TO SERVE ALL NEW AND EXISTING DEVICES IS LOCATED ADJACENT TO ELECTRICAL ROOM 0315.

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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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1001 Madison Avenue
Toledo, OH 43604
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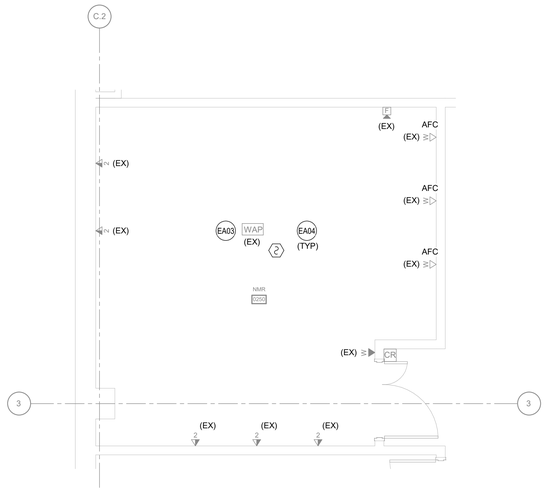
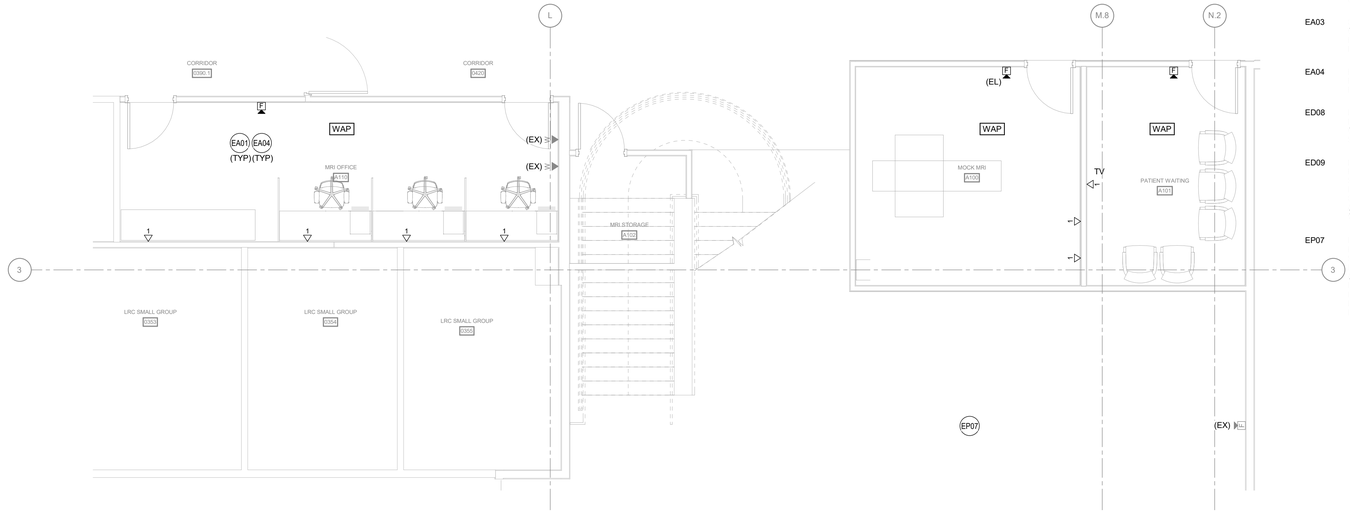
ENLARGED MRI SUITE PLANS PLANS - AUXILIARY

T-101



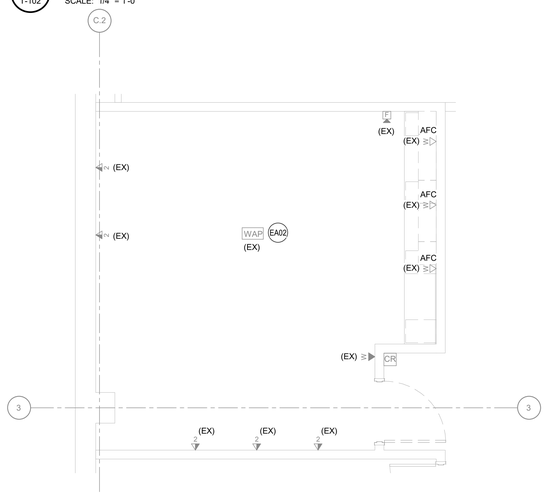
2 T-102 ENLARGED NMR 0250 AUXILIARY - NEW WORK PLAN

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



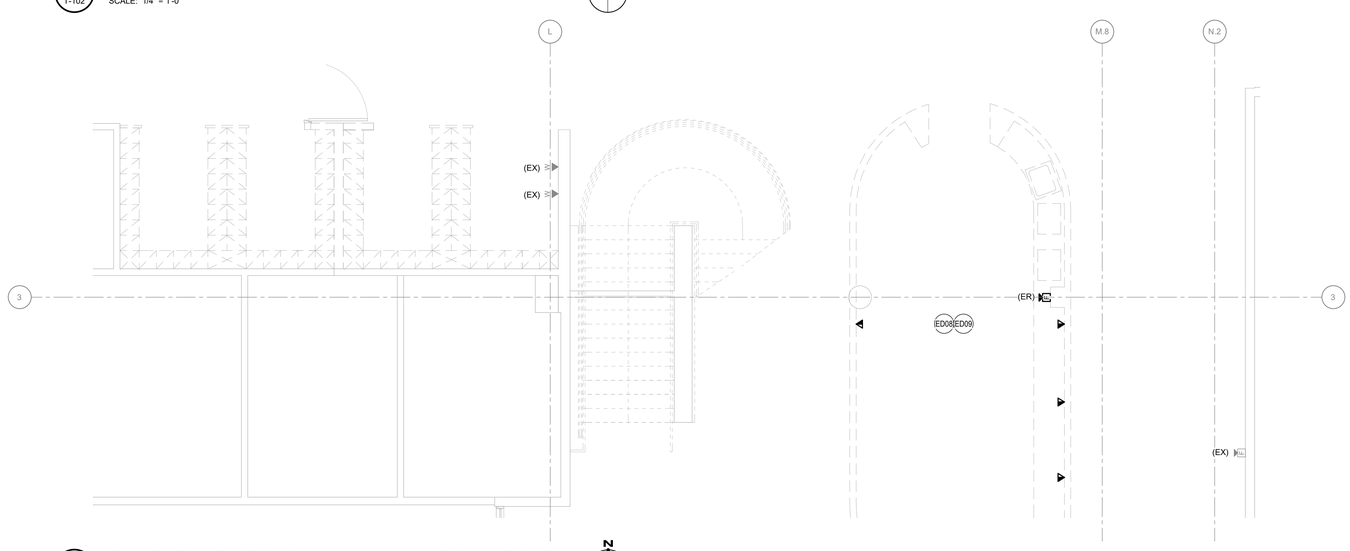
1 T-102 ENLARGED MRI OFFICE A110 AUXILIARY - NEW WORK PLAN

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



4 T-102 ENLARGED NMR 0250 AUXILIARY - DEMOLITION PLAN

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



3 T-102 ENLARGED MRI OFFICE A110 AUXILIARY - DEMOLITION PLAN

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

GENERAL NOTES - AUXILIARY

A. ALL SECURITY CABLING INCLUDING CARD READERS IS LOW VOLTAGE AND SHALL BE PLENUM RATED. CABLING REQUIREMENTS AND LAYOUT TO BE PROVIDED BY SECURITY CONTRACTOR. ALL CABLING TO BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. HOMERUN CABLING TO NEAREST TELE/DATA ROOM. VERIFY WITH ENCOMPASS HEALTH ITG

B. CONTRACTOR SHALL OBTAIN TV AND NURSE CALL SYSTEM SINGLE LINE DIAGRAMGS FROM VENDORS. PROVIDE CABLING PER THEIR REQUIREMENTS.

C. CONTRACTOR SHALL VERIFYWITH EACH LOW VOLTAGE VENDOR THE HOMERUN LOCATIONS FOR THEIR SYSTEM CABLES BEFORE RUNNING CABLING.

D. LOW VOLTAGE INSTALLER SHALL HAVE RCDD CERTIFIED STAFF ON SITE FOR INSTALLATION, TESTING, AND PROJECT MANAGEMENT PER ENCOMPASS HEALTH ITG.

E. COORDINATE LOCATION OF SMOKE DAMPERS WITH MECHANICAL PRIORTO ROUGH-IN.

F. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT FOR TV AND TV DATA OUTLETS WITH OWNER PRIOR TO ROUGH-IN.

G. ALL LOW VOLTAGE SYSTEMS (VOICE, DATA, TV, PAGING, AND NURSE CALL) SHALL BE PROVIDED IN SEPARATE HOOKS/SUPPORTS FOR EACH SYSTEM. NO HOOK/SUPPORT SHALL EXCEED 40 CABLES.

H. CABLE SYSTEM TYPES (VOICE, DATA, TV, PAGING, AND NURSE CALL) SHALL BE SEPARATED IN SLEEVES/FIRE BARRIERS THROUGH RATED WALLS.

I. ALL ELECTRIC LOCKS SHALL BE INTEGRATED WITH FIRE ALARM FOR DOOR RELEASE UPON FIRE ALARM ACTIVATION

J. COORDINATE SECURITY DEVICES CONNECTION TO POWERED DOORS WITH VENDOR.

PLAN NOTES

EA01 CONNECT NEW FIRE ALARM NOTIFICATION APPLIANCES TO EXISTING FIRE ALARM SYSTEM.

EA02 REMOVE EXISTING WIRELESS ACCESS POINT AND SAVE TO BE REINSTALLED IN SAME LOCATION ON NEW CEILING.

EA03 CONNECT EXISTING WIRELESS ACCESS POINT THAT WAS SAVED IN DEMOLITION AND RECONNECT TO EXISTING DATA WIRING TO RESTORE PREVIOUS FUNCTIONALITY.

EA04 EXISTING COMM ROOM TO SERVE ALL NEW AND EXISTING DEVICES IS LOCATED ADJACENT TO ELECTRICAL ROOM 0315.

ED08 DEMOLISH DATA RECEPTACLES AND ASSOCIATED DATA WIRING IN AREA WHERE NEW MOCK MRI AND WAITING ROOM WILL BE CONSTRUCTED BACK TO SOURCE.

ED09 DEMOLISH POWER RECEPTACLES AND DATA RECEPTACLES FOR EXISTING VENDING MACHINE IN STUDENT LOUNGE THAT ARE TO BE MOVED TO A NEW LOCATION. KEEP EXISTING POWER AND DATA CIRCUITS INTACT FOR RE-USE. COORDINATE WITH ARCHTECTURAL DRAWINGS FOR EXACT LOCATION OF VENDING MACHINES.

EP07 PROVIDE ONE POWER RECEPTACLE AND ONE DATA RECEPTACLE PER RELOCATED VENDING MACHINE IN STUDENT LOUNGE. MATCH PREVIOUS POWER AND DATA RECEPTACLE TYPES. REUSE EXISTING POWER AND DATA CIRCUITS KEPT IN DEMOLITION OF PREVIOUS RECEPTACLES SERVING THE VENDING MACHINES. COORDINATE WITH ARCHTECTURAL DRAWINGS FOR EXACT LOCATION OF VENDING MACHINES.

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SSOE PROJECT #:	023-03727-00
SSOE MANAGER:	JEFF FALZON

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ENLARGED NMR 0250 & MRI OFFICE A110 PLANS - AUXILIARY

T-102

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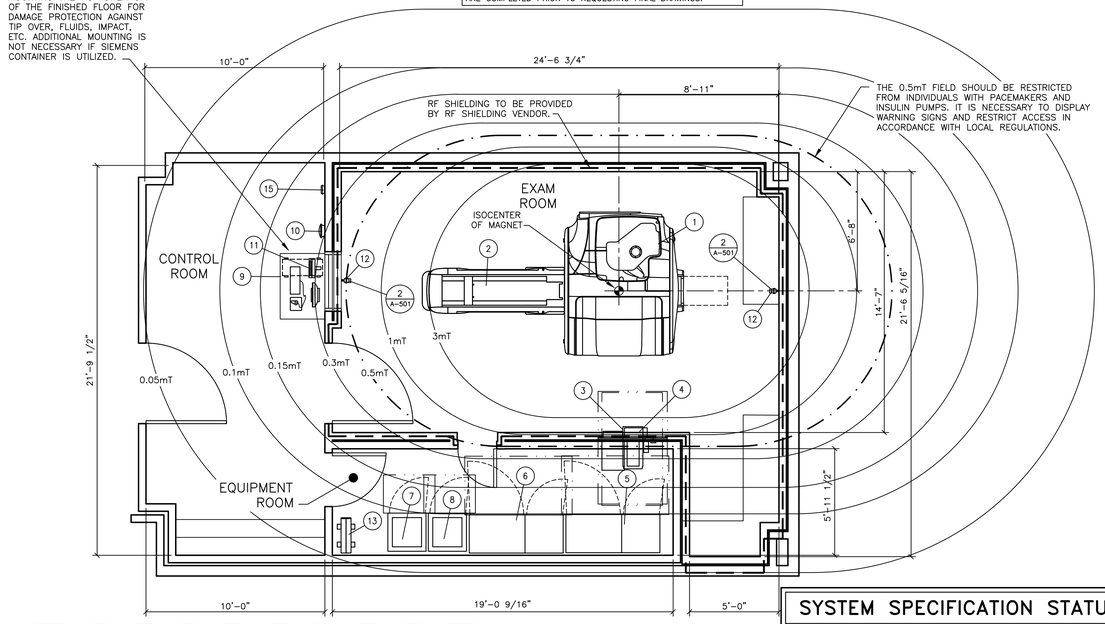
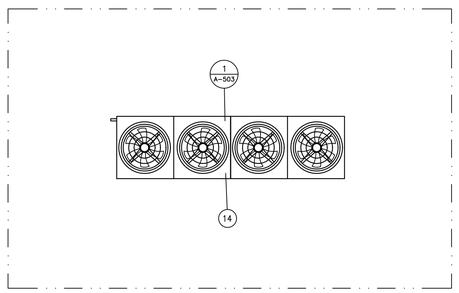
IT IS THE RESPONSIBILITY OF THE CUSTOMER/CONTRACTOR TO PROVIDE A MEANS OF MOUNTING THE PC TOWER OFF OF THE FINISHED FLOOR FOR DAMAGE PROTECTION AGAINST TIP OVER, FLUIDS, IMPACT, ETC. ADDITIONAL MOUNTING IS NOT NECESSARY IF SIEMENS CONTAINER IS UTILIZED.

THIS LAYOUT IS NOT REFLECTIVE OF THE LATEST SALES QUOTE AVAILABLE AT THE TIME OF DRAWING. IT HAS BEEN MODIFIED TO REFLECT ANTICIPATED CHANGES TO YOUR CONFIGURATION. IF REQUESTED CHANGES ARE NOT IMPLEMENTED A REVISION WILL BE REQUIRED. PLEASE ENSURE THAT ANY CONFIGURATION CHANGES ARE COMPLETED PRIOR TO REQUESTING FINAL DRAWINGS.





IF A CLOSET IS DESIRED TO CONCEAL THE FILTER PLATE AND CABLE CONNECTIONS, IT IS TO BE DESIGNED AND SPECIFIED AND PROVIDED BY THE CUSTOMER OR THEIR REPRESENTATIVE. A 30 1/4" CLEARANCE IS REQUIRED FOR SERVICE AND CABLING. DOORS THAT OPEN TO PROVIDE THIS ACCESS ARE ACCEPTABLE.

SYSTEM SPECIFICATION STATUS

PLEASE NOTE: CURRENT STATUS IS DRAFT

SIEMENS RESERVES THE RIGHT TO MAKE CHANGES AND OTHER MODIFICATIONS BASED UPON, BUT NOT LIMITED TO, NEW TECHNICAL DEVELOPMENTS, UNTIL RELEASE OF THE PLANNING GUIDELINE, CONTENT OF PRELIMINARY AND FINAL PLANNING IS SUBJECT TO CHANGE AND MODIFICATION.

FUTURE PRODUCTS STILL IN DEVELOPMENT

- THIS PRODUCT IS UNDER DEVELOPMENT AND NOT COMMERCIALLY AVAILABLE. ITS FUTURE AVAILABILITY CANNOT BE ENSURED.
- THIS DOCUMENT PROVIDES INFORMATION REGARDING TECHNICAL SPECIFICATIONS, AND STANDARD AND OPTIONAL FEATURES. THIS LIST SPECIFICATIONS AND FEATURES DO NOT APPLY TO ALL PRODUCTS/OR SITES.
- THIS INFORMATION IS DRAFT STAGES AND SUBJECT TO CHANGE, FOR REFERENCE ONLY.

EQUIPMENT LEGEND

NO	DESCRIPTION	SMS SYM	WEIGHT (LBS)	BTU/HR TO AIR	DIMENSIONS (INCHES) W	D	H	REMARKS
1	NEXT GEN MAGNET IN OPERATION	(S)	16,755	10,246	99 1/4	88 1/4	99 1/4	HEAT DISSIPATION DEPENDS ON SEQUENCE
2	PATIENT TABLE (MOBILE)	(—)	529	---	29 1/2	97 1/4	21-41	
3	RF-FILTER PLATE	(F1)	287	853	46 1/2	35 1/8	21 5/8	
4	ADDITIONAL RF-FILTER PLATE	(F2)	287	853	46 1/2	35 1/8	21 5/8	
5	ELECTRONICS CABINET	(EC)	3,638	---	61 1/2	26	77 1/2	
6	ADDITIONAL ELECTRONICS CABINET	(EC2)	2,425	---	38	26	77 1/2	
7	SEP CABINET	(SEP)	701	<3,412	25 5/8	25 5/8	73 5/8	
8	ADDITIONAL SEP CABINET	(SEP)	419	<3,412	25 5/8	25 5/8	73 5/8	
9	CONTROL ROOM COMPONENTS	(MC)	---	---	---	---	---	
10	ALARM BOX	(AB)	2	---	9	4	9	
11	PATIENT MONITOR	(PM)	9	---	13	8	12 1/2	
12	PATIENT SUPERVISION CAMERA	(PC)	3	---	3 1/8	6 3/4	6 3/4	WALL MOUNTED
13	LIEBERT GXT5 UPS WITH BATTERY	(UPS)	164	1,121	17	23 5/8	6 3/4	
14	HASKRIS OPC 48 CHILLER	(WC)	3,550	---	153	41 7/8	74	CUST. TO LOCATE/INSTALL
15	HASKRIS REMOTE CONTROL PANEL	(RC)	2	---	6 1/8	1 1/2	3 1/4	WALL MOUNTED IN CONTROL ROOM

PROTECTING THE MAGNETIC FIELD

THE SIEMENS MR SYSTEM UTILIZES A SUPERCONDUCTIVE MAGNET WITH AN EXTREMELY HOMOGENOUS FIELD WITHIN THE MAGNET TO PROVIDE DISTORTION FREE IMAGING. THE PRESENCE OF FERROMAGNETIC MATERIAL WITHIN THE VICINITY OF THE MAGNET CAN ADVERSELY AFFECT THE UNIFORMITY OF THE USEFUL MAGNETIC FIELD. THIS APPLIES TO STATIONARY FERROUS MATERIAL (STRUCTURAL STEEL) WHICH IS TO BE MINIMIZED. STATIONARY STEEL COMPENSATION MAY BE ACHIEVED BY MAGNET POSITIONING AND SELECTIVE USE OF SHIMS. DISTORTION CAUSED BY MOVING FERROMAGNETIC OBJECTS (MOTOR VEHICLES, ELEVATORS) IS MORE DIFFICULT TO COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

REV 0

MAGNET SITING REQUIREMENTS

IT MUST BE ENSURED THAT THE MAGNET IS LOCATED SO THAT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD ARE NOT ADVERSELY AFFECTED BY EXTRANEOUS FIELDS AND STATIC OR DYNAMIC FERROMAGNETIC OBJECTS.

X & Y AXES	Z AXIS	SOURCE OF INTERFERENCE
4'-4"		FLOOR STEEL REINFORCEMENT<20 LBS./ FT²
4'-4"		IRON BEAMS < 67 LBS./FT.
18'-1"	21'-4"	MOVING METAL UP TO 110 LBS.
13'-1"		WATER COOLING UNIT (CHILLER)
19'-9"	23'-0"	MOVING METAL UP TO 440 LBS.
21'-4"	26'-3"	MOVING METAL UP TO 2,000 LBS.
23'-0"	31'-2"	ELEVATORS, TRUCKS UP TO 10,000 LBS.
13'-2"		AC TRANSFORMERS UP TO 650 KVA
16'-5"		AC TRANSFORMERS UP TO 1600 KVA
5'-0"	5'-0"	AC CABLES, MOTORS LESS THAN 100 AMPS
5'-0"	5'-0"	AC CABLES, MOTORS LESS THAN 250 AMPS
8'-3"	8'-3"	AC CABLES, MOTORS LESS THAN 1000 AMPS

FOR IRON OBJECTS LOCATED UP TO 45° FROM THE Z AXIS, THE DISTANCES FOR THE Z AXIS MUST BE USED. REDUCTION IS POSSIBLE WITH STEEL SHIELDING.

PROTECTING THE ENVIRONMENT

PROTECTING THE IMMEDIATE ENVIRONMENT FROM THE EFFECT OF THE MAGNETIC FIELD REQUIRES CONSIDERATION. INFORMATION STORED ON MAGNETIC DATA CARRIERS SUCH AS DISCS, TAPES AND CARDS MAY BE ERASED IF NEAR THE MAGNET. CAUTION WITH REGARD TO HEART PACEMAKERS MUST BE EXERCISED. MOST PACEMAKER UNITS EMPLOY A REED RELAY WHICH MAY CHANGE OPERATING MODE WHEN EXPOSED TO AN EXTERNAL MAGNETIC FIELD. PACEMAKER USERS MUST BE KEPT AT A SPECIFIED DISTANCE FROM THE MAGNET WHICH IS DETERMINED BY THE MAGNET FIELD STRENGTH.

REV 0

MAGNETIC FRINGE FIELDS

MAGNETIC FIELDS MAY AFFECT THE FUNCTION OF DEVICES IN THE VICINITY OF THE MAGNET. THESE DEVICES MUST BE OUTSIDE CERTAIN MAGNETIC FIELDS. THE DISTANCES LISTED ARE FROM THE MAGNET ISOCENTER AND DO NOT CONSIDER ANY MAGNETIC ROOM SHIELDING.

FIELD	X & Y	Z AXIS	DEVICES
3.0mT	7'-2"	10'-8"	SMALL MOTORS, WATCHES, CAMERAS, CREDIT CARDS, MAGNETIC DATA CARRIERS.
1.0mT	8'-1"	13'-4"	COMPUTERS, MAGNETIC DISK DRIVES, OSCILLOSCOPES, PROCESSORS
0.5mT	8'-7"	15'-2"	CARDIAC PACEMAKERS, X-RAY TUBES, INSULIN PUMPS, B/W MONITORS, MAGNETIC DATA CARRIERS (LONG-TERM STORAGE)
0.2mT	10'-3"	18'-9"	SIEMENS CT SCANNERS
0.15mT	11'-0"	20'-1"	CRT MONITORS, SIEMENS LINEAR ACCELERATORS
0.05mT	15'-9"	26'-7"	X-RAY IMAGE INTENSIFIERS, GAMMA CAMERAS, PET/CYCLOTRON, ELECTRON MICROSCOPES, LINEAR ACCELERATORS

THE OWNER/USER IS TO VERIFY THE LOCATION OF THE 0.5mT FIELD AND ENSURE THAT IT IS MAINTAINED AS A RESTRICTED AREA.

OEM ACCESSORY ITEMS

FOR OEM (OUTSIDE EQUIPMENT MANUFACTURER) ITEMS THAT ARE SOLD AS ACCESSORIES TO THE SIEMENS MR SYSTEM (INJECTORS, LASER LIGHTS, ELASTOGRAPHY, CHILLERS, UPS, ETC.), PLEASE REFER TO THE SIEMENS PROJECT MANAGER AND THE ACTUAL EQUIPMENT VENDOR FOR TECHNICAL INFORMATION AND INSTALLATION REQUIREMENTS.

REV 1

EXAM ROOM LIGHTING

THE MAGNETIC FIELD ADVERSELY AFFECTS THE OPERATING LIFE OF LIGHT BULBS LOCATED IN THE IMMEDIATE VICINITY OF THE MAGNET. THE FILAMENT IN THE BULBS OSCILLATES WITH THE FREQUENCY OF THE POWER SUPPLY. LIGHTS IN THE VICINITY OF THE MAGNET CONNECTED TO A DC POWER SUPPLY CAN REDUCE THIS EFFECT. RESIDUAL DC RIPPLE SHOULD BE LESS THAN 5%.

REV 2

PROJECT MILESTONES

	PROJECT MILESTONES TO BE COMPLETED BEFORE EQUIPMENT DELIVERY	REFERENCE SHEET
☐	DELIVERY PATH VERIFIED, COORDINATED DELIVERY PATH CLOSE UP PRIOR TO CALIBRATION	A-102
☐	COORDINATE RF ROOM CONSTRUCTION/ROOM FINISH PRIOR TO CALIBRATION	A-102
☐	FLOOR LEVEL MEETS SIEMENS SPECIFICATIONS AND ALL BASEPLATES INSTALLED	S-101
☐	RF ROOM TEST COMPLETED AND MEETS SIEMENS SPECIFICATIONS	A-502
☐	ALL RACEWAY, CONDUITS AND JUNCTION BOXES INSTALLED	E-101
☐	ALL PLUMBING INSTALLED AND TESTED	M-101
☐	POWER DISTRIBUTION COMPLETED PER SYSTEM REQUIREMENTS	E-102
☐	ALL EPO BUTTONS INSTALLED AND TESTED	E-101
☐	MR COMPATIBLE LIGHTING AND CEILING GRIDS INSTALLED IN MAGNET ROOM	A-101
☐	CONTROL ROOM COMPLETED ENOUGH TO FACILITATE THE INSTALLATION	A-101
☐	CHILLED WATER SUPPLY AVAILABLE AND MEETS SIEMENS SPECIFICATIONS	M-101
☐	HVAC SYSTEM COMPLETE, TESTED AND WORKING PER SIEMENS SPECIFICATIONS	M-101
☐	QUENCH PIPE CONSTRUCTED AND INSTALLED PER SIEMENS SPECIFICATIONS	M-501
☐	ETHERNET CONNECTION INSTALLED AND IN OPERATION AT THE SHOWN LOCATIONS	E-101
☐	ALL ROOMS CONTAINING SIEMENS EQUIPMENT ARE CLEAN AND DUST FREE	A-101

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM
CONTROL ROOM 6'-11 MINIMUM
EQUIPMENT ROOM 7'-3" MINIMUM

ARCHITECTURAL NOTES

1) ALL PRELIMINARY EQUIPMENT LAYOUTS SUBMITTED BY SIEMENS HEALTHCARE ARE BASED ON THE RECOMMENDED SPACE NECESSARY FOR THE OPERATION AND SERVICEABILITY OF THE EQUIPMENT BEING PROPOSED. SIEMENS WILL NOT SUBMIT AN EQUIPMENT LAYOUT THAT IS NOT IN THE BEST INTEREST OF BOTH THE CUSTOMER AND SIEMENS. ALL EQUIPMENT LAYOUTS ARE BASED EITHER ON AN ACTUAL SITE SURVEY OR ARCHITECTURAL DRAWINGS SUPPLIED TO SIEMENS. SIEMENS WILL NOT BE RESPONSIBLE FOR ANY ALTERATIONS THAT ENCROACH WITHIN DESIGNATED SAFETY AND SERVICE CLEARANCE ZONES AS INDICATED ON DRAWINGS (I.E., PIPE CHASES, VENTILATION DUCTS, CASEWORK, AND SOFFITS, ETC.) MADE BY THE CUSTOMER OR REQUIRED BY A CUSTOMER'S ARCHITECTURAL FIRM ONCE PRELIMINARY DRAWINGS HAVE BEEN SUBMITTED AND APPROVED. DO NOT ALTER ANY SPECIFICATIONS AND/OR DIMENSIONS WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SIEMENS PROJECT MANAGER.
2) SIEMENS HEALTHCARE IS NOT AN ARCHITECTURAL OR ENGINEERING FIRM. DRAWINGS SUPPLIED BY SIEMENS ARE NOT CONSTRUCTION DRAWINGS. THEREFORE, THESE DRAWINGS ARE TO BE USED ONLY FOR INFORMATION TO COMPLEMENT ACTUAL CONSTRUCTION DRAWINGS AVAILABLE FROM A CUSTOMER APPOINTED ARCHITECTURAL REPRESENTATIVE OR A CUSTOMER'S ENGINEERING DESIGN GROUP. THE CUSTOMER'S ARCHITECT AND GENERAL CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE CODES AND PROFESSIONAL DESIGN REQUIREMENTS INCLUDING OSHA/NEC SAFETY CLEARANCE REQUIREMENTS IN ADDITION TO SIEMENS-REQUIRED SAFETY/SERVICE CLEARANCES SHOWN.
3) THE CUSTOMER IS RESPONSIBLE FOR ALL ROOM AND AREA PREPARATION COSTS, PROFESSIONAL FEES, PERMITS, REPORTS, AND INSPECTION FEES.
4) EQUIPMENT WARRANTIES, EXPRESSED OR IMPLIED ON THE PART OF SIEMENS SHALL BE CONTINGENT UPON STRICT COMPLIANCE WITH THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL AND RECOMMENDATIONS AND REQUIREMENTS CONTAINED IN THESE DRAWINGS, UNLESS SPECIFIED OTHERWISE.
5) ALL DIMENSIONS SHOWN ARE FROM FINISHED SURFACES UNLESS SPECIFIED OTHERWISE.
6) SIEMENS HEALTHCARE SHALL BE RESPONSIBLE FOR SIEMENS EQUIPMENT INSTALLATION, CALIBRATION, CONNECTION AND INSTALLATION OF SIEMENS PROVIDED CABLES. THE CUSTOMER/ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR TERMINATIONS OF CUSTOMER/ELECTRICAL CONTRACTOR-SUPPLIED CABLES TO SIEMENS EQUIPMENT. IN THE EVENT THAT SPECIFIC TRADE RULES OR LICENSE REQUIREMENTS PROHIBIT THIS, THE CUSTOMER SHALL INITIATE THE SERVICES OF APPROVED OTHER CONTRACTORS AND PAY FOR SELECTED, APPROVED PARTIES TO PERFORM THIS WORK WITH SUPERVISION PROVIDED BY SIEMENS. CALIBRATION WHEN ACCOMPLISHED OUTSIDE OF NORMAL INSTALLATION SEQUENCES DUE TO CONTRACTOR OR TRADE RULE ACTIONS OR REQUIREMENTS SHALL BE SUPPORTED BY, CHARGED TO, AND ACCEPTED BY THE CUSTOMER AS AN ADDITIONAL INSTALLATION EXPENSE.
7) THE CUSTOMER SHALL COORDINATE WITH SIEMENS PROJECT MANAGER THE LOCATIONS AND TRAVEL OF ALL ANCILLARY EQUIPMENT TO BE CEILING OR WALL MOUNTED (I.E.: O.R. LIGHTS, MEDICAL GAS COLUMNS, PHYSIOLOGICAL MONITORING INJECTORS, CRT PLATFORMS, SPRINKLER HEADS, SMOKE DETECTORS, ELECTRICAL OUTLETS, HVAC GRILLES, SPEAKERS, AND GENERAL ROOM LIGHTING, ETC.).
8) THE GENERAL CONTRACTOR/CUSTOMER SHALL BE RESPONSIBLE FOR ALL FINAL PAINT, TOUCH-UP AND ANY COSMETIC OR TRIM WORK WHICH NEEDS TO BE OR IS REQUIRED TO BE COMPLETED AFTER THE INSTALLATION OF THE SIEMENS EQUIPMENT AND ANY ASSOCIATED SUPPORT APPARATUS.
9) CUSTOMER/CONTRACTOR MUST ASSIST SIEMENS INSTALLERS WITH INSTALLATION OF EQUIPMENT ABOVE 14'-0". REFER TO THE ELECTRICAL NOTES ON SIEMENS SHEET E-101 FOR MORE DETAILS.

REV 0

CONSTRUCTION REQUIREMENTS

THE CUSTOMER/CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL CONSTRUCTION MATERIALS INCLUDING ELECTRICAL AND MECHANICAL DEVICES REQUIRED BY SIEMENS SPECIFICATIONS AND TO ENSURE THAT THE MATERIAL USED INSIDE THE RF-SHIELDING IS AS FREE OF FERROMAGNETIC PROPERTIES AS POSSIBLE. STEEL WALL STUDS ARE PERMITTED BUT MUST BE SECURED PROPERLY. ANY FERROUS MATERIAL INSIDE THE EXAM ROOM MAY BECOME A PROJECTILE AND CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT. FERROUS ITEMS INSIDE THE EXAM ROOM ARE THE LIABILITY OF THE CONTRACTOR AND/OR INSTALLER.

REV 3

CASEWORK & ACCESSORY NOTES

1) ALL CASEWORK IS EITHER EXISTING OR IS TO BE DESIGNED, DETAILED, FURNISHED AND INSTALLED BY THE CUSTOMER AND/OR CONTRACTOR. FOLLOW DESIGN RECOMMENDATIONS INCLUDED HEREWITH, AS THEY ARE ESSENTIAL FOR THE SUCCESSFUL INSTALLATION & OPERATION OF THE SIEMENS EQUIPMENT.

2) ALL FURNITURE (CHAIRS, ETC.) FOR THE CONTROL ROOM ARE TO BE PROVIDED BY THE CUSTOMER.

REV 0

RESOURCE LIST (SMS USE ONLY)

DESIGNATION	PG NUMBER	DATE
PLANNING GUIDE	M7-044.891.01.01.02	07.23
BASIC PLANNING INFORMATION	V2.0	12.07.2022

NEXT GEN DRAFT

ARCHITECTURAL EQUIPMENT PLAN

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

MAGNETIC FIELD WARNING

PLEASE BE AWARE THAT DURING THE CALIBRATION PHASE OF THE MRI INSTALLATION, THE MAGNET WILL BE AT FULL FIELD STRENGTH AND ALL NECESSARY PRECAUTIONS WHEN WORKING IN THE VICINITY OF STRONG MAGNETIC FIELDS MUST BE TAKEN. WHEN THE CALIBRATION OF THE MAGNET OVERLAPS WITH FINAL CONSTRUCTION ACTIVITIES, THERE IS THE POSSIBILITY OF THE INTRODUCTION OF FERROUS MAGNETIC OBJECTS BY WORKERS INTO THE MR ROOM. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THAT ALL PRECAUTIONS ARE TAKEN TO ENSURE THAT THIS DOES NOT HAPPEN, AS EQUIPMENT DAMAGE AND SERIOUS BODILY INJURY COULD OCCUR.

REV 0

STATE AGENCY REVIEW

PRIOR TO SIEMENS EQUIPMENT INSTALLATION, APPROVAL OF CONSTRUCTION OR STRUCTURAL MODIFICATIONS FOR DIAGNOSTIC OR THERAPEUTIC PURPOSES, MUST BE OBTAINED BY THE CUSTOMER FROM THE APPROPRIATE STATE AGENCY, IF APPLICABLE.

NOISE LEVELS

SYSTEM ROOM	NOISE LEVEL / dB(A)
CONTROL ROOM	<55
EXAMINATION ROOM	TBD WITHOUT CUSTOMER HEAD COIL WITH RF COIL COULD BE SIGNIFICANTLY HIGHER
EQUIPMENT ROOM	<65 MAY BE HIGHER – TBD

NOISE LEVELS ARE BASED ON AN AVERAGE MEASUREMENT OVER 8 HOURS OF CLINICAL SCANNING. PEAK LEVELS MAY BE HIGHER FOR CERTAIN SEQUENCES.

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL/ STATE/OSHA NOISE REGULATIONS ARE ADHERED TO. ADDITIONAL NOISE DATA MAY BE PROVIDED BY SIEMENS PROJECT MANAGER UPON REQUEST.

MAGNET CO-SITING

MINIMUM MAGNET TO MAGNET DISTANCE (SIEMENS)

	7.0T	3.0T	1.5T	1.0T	0.35T	0.2T
DISTANCE	32'-9"	19'-9"	19'-9"	19'-9"	32'-9"	32'-9"

TWO MAGNETS WITH THE SAME FREQUENCY ALIGNED IN THE Z AXES WILL REQUIRE MORE SEPARATION DUE TO INCREASED RF COUPLING BETWEEN THE TWO SYSTEMS. THIS IS EVALUATED INDIVIDUALLY.

DO NOT RAMP ONE MAGNET WHILE THE OTHER IS RUNNING APPLICATIONS. SHIM IS ONLY OPTIMIZED WHEN BOTH MAGNETS ARE RAMPED UP DURING THE SHIMMING PROCEDURE.

WHEN CO-SITING AN MR SYSTEM WITH A MAGNETIC NAVIGATION SYSTEM THE MINIMUM DISTANCE FOR CLINICAL IMAGING IS 98'-6", FOR SPECTROSCOPY THE MINIMUM SEPARATION IS 121'-5".

REV 0

ATTENTION:

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- THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.
- THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

SYM	DATE	DESCRIPTION
0	09/28/23	

-ISSUE BLOCK-

PROJECT MANAGER: NICHOLAS FOLK
TEL: (248)873-9912 EXT:
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SIEMENS

WAYNE STATE UNIVERSITY

540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

PROJECT #: 2312308

SHEET: A-101

SHEET 1 OF 10

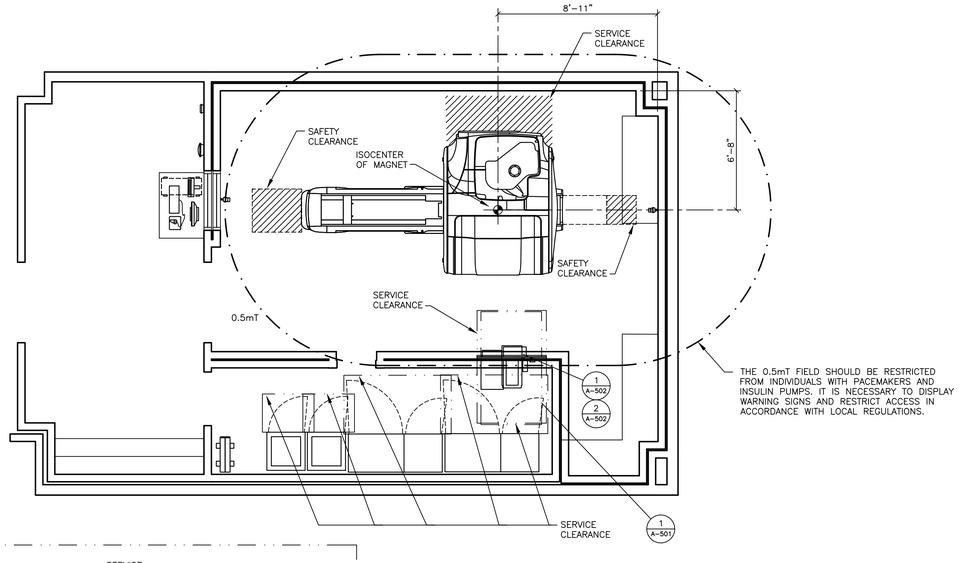
DRAWN BY: B. HERRMANN

SCALE: AS NOTED

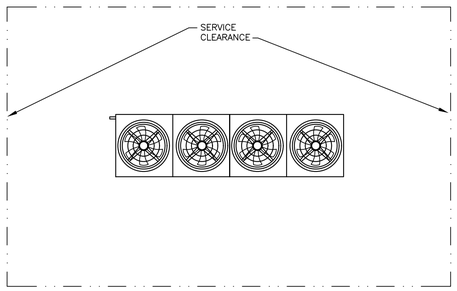
REF. #: 30273767

DATE: 09/28/23

REFERENCE DOCUMENT - NOT FOR CONSTRUCTION

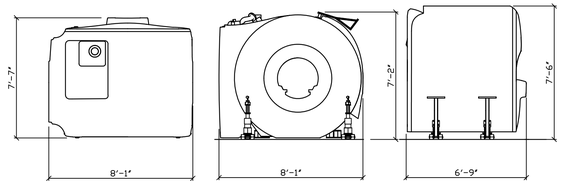


THE 0.5mT FIELD SHOULD BE RESTRICTED FROM INDIVIDUALS WITH PACEMAKERS AND INSULIN PUMPS. IT IS NECESSARY TO DISPLAY WARNING SIGNS AND RESTRICT ACCESS IN ACCORDANCE WITH LOCAL REGULATIONS.



SAFETY/SERVICE CLEARANCE PLAN

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



MAGNET DIMENSIONS

LARGEST ITEM – MAGNET – 13,603 LBS.
MINIMUM TRANSPORT OPENING IN THE WALL: 7'-11" WIDE X 7'-8 1/2" HIGH.
MINIMUM TRANSPORT OPENING IN THE CEILING: 7'-11" X 8'-4 3/8"

TO TRANSPORT THE GPA/EPC CABINET (3,638 POUNDS)
A MINIMUM ROOM HEIGHT OF 6'-9" IS REQUIRED,
6'-3" WITH WHEELS REMOVED, 6'-1" WITH WHEELS
AND MAINS CONNECTION REMOVED.

THE MAXIMUM LOAD AND WIDTH OF DOORS AND OPENINGS MUST BE CONSIDERED FOR DELIVERY OF THE SYSTEM PARTS AND DELIVERY OF CRYOGENS. THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR THE FLOOR LOADING OF THE TRANSPORTATION ROUTES.
THE TRANSPORT ROUTE FOR THE MAGNET MUST NOT EXCEED AN ANGLE OF 15° (FOR EXAMPLE, ON A RAMP).
THE RF DOOR AND COMPLETE PATH FROM EXAM ROOM TO THE EXTERIOR OF THE BUILDING MUST HAVE A MINIMUM CLEARANCE OF 40". THIS IS REQUIRED FOR REPLACEMENT PARTS AND HELIUM FILLS.

– NEXT GEN TRANSPORT REQUIREMENTS — SCALE: 1/4"=1'-0"

FUTURE PRODUCTS STILL IN DEVELOPMENT

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- THIS INFORMATION IS DRAFT STAGES AND SUBJECT TO CHANGE, FOR REFERENCE ONLY.

SYSTEM SPECIFICATION STATUS

PLEASE NOTE: CURRENT STATUS IS DRAFT

SIEMENS RESERVES THE RIGHT TO MAKE CHANGES AND OTHER MODIFICATIONS BASED UPON, BUT NOT LIMITED TO, NEW TECHNICAL DEVELOPMENTS. UNTIL RELEASE OF THE PLANNING GUIDELINE, CONTENT OF PRELIMINARY AND FINAL PLANNING IS SUBJECT TO CHANGE AND MODIFICATION.

SURFACE COIL STORAGE

SURFACE COILS ARE COMPONENTS OF THE MRI SYSTEM THAT ARE ATTACHED TO THE PATIENT TABLE DURING EXAMS. WHEN NOT IN USE COILS SHOULD BE STORED SO THAT THEY ARE FREE FROM DAMAGE. THE DESIGN OF THE MR EXAM ROOM MUST HAVE AMPLE STORAGE SPACE TO ACCOMMODATE ANY COILS THAT THE OWNER WILL HAVE. COILS MAY BE SELECTED FROM THE LIST BELOW. STORAGE PROVIDED BY CUSTOMER/CONTRACTOR.

COIL NAME	POUND WEIGHT	INCHES LENGTH	INCHES WIDTH	INCHES HEIGHT
HEAD/NECK 16	11	17 3/8	13	14 5/8
BIOMATRIX SPINE 24	23	47 1/4	19 1/4	3
BIOMATRIX BODY 12	4	15 1/8	23 1/4	3
FLEX LARGE 4	1.2	20 3/8	8 7/8	–
FLEX SMALL 4	1	14 3/8	8 7/8	–
ULTRA FLEX LARGE 18	4	23 1/4	11 1/2	–
ULTRA FLEX SMALL 18	3	16 1/8	7 1/2	–
CONTOUR 24 OR 48	5	15 7/8	27 7/8	1 5/8
PERIPHERAL ANGIO 16	14	32 1/4	25 5/8	10 1/4
PERIPHERAL ANGIO 36	18	33 7/8	11–25	11
HAND/WRIST 16	6	8 1/2	8 1/2	4 1/2
HAND COIL BASE PLATE	3.5	20 5/8	12 3/8	11
FOOT/ANKLE 16	7	16 1/8	13	15 3/8
FOOT COIL BASE PLATE	16	16 3/4	13 1/8	15
SHOULDER SHAPE 16	3	8 1/2	8 1/2	10 1/4
TX/RX KNEE 18	14	11 1/8	20 7/8	10 3/8
BREAST BI 7	16	22 3/8	19 5/8	8 3/4
SENTINELLE BREAST COIL	35 49 W/ RISER	43 1/4	23	11
BREAST 18	12	22 5/8	18 5/8	8
HEAD COIL	12	12 3/8	19 5/8	14 1/4
PEDIATRIC 16	3	12 3/8	18 5/8	14 1/4
PEDIATRIC COIL CRADLE	7	27	12 5/8	4 7/8

CEILING HEIGHTS

EXAM ROOM 7'–11" MINIMUM
CONTROL ROOM 6'–11 MINIMUM
EQUIPMENT ROOM 7'–3" MINIMUM

NEXT GEN DRAFT

SYM	DATE	DESCRIPTION
1	09/28/23	

–ISSUE BLOCK–

PROJECT MANAGER: NICHOLAS FOLK
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SIEMENS

WAYNE STATE UNIVERSITY
540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

PROJECT #: 2312308
SHEET: A-102
SHEET OF 2 10
DRAWN BY: B. HERRMANN
SCALE: AS NOTED
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ATTENTION:

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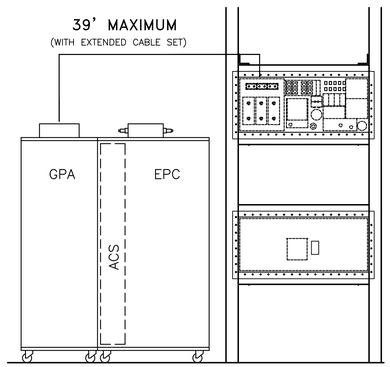
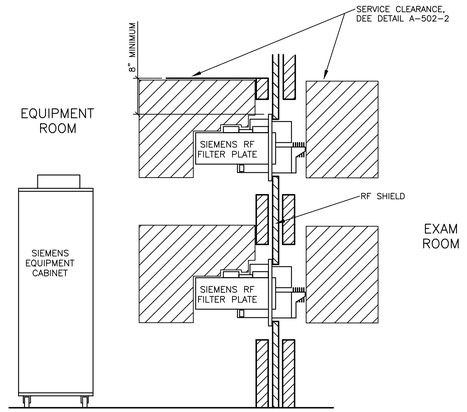


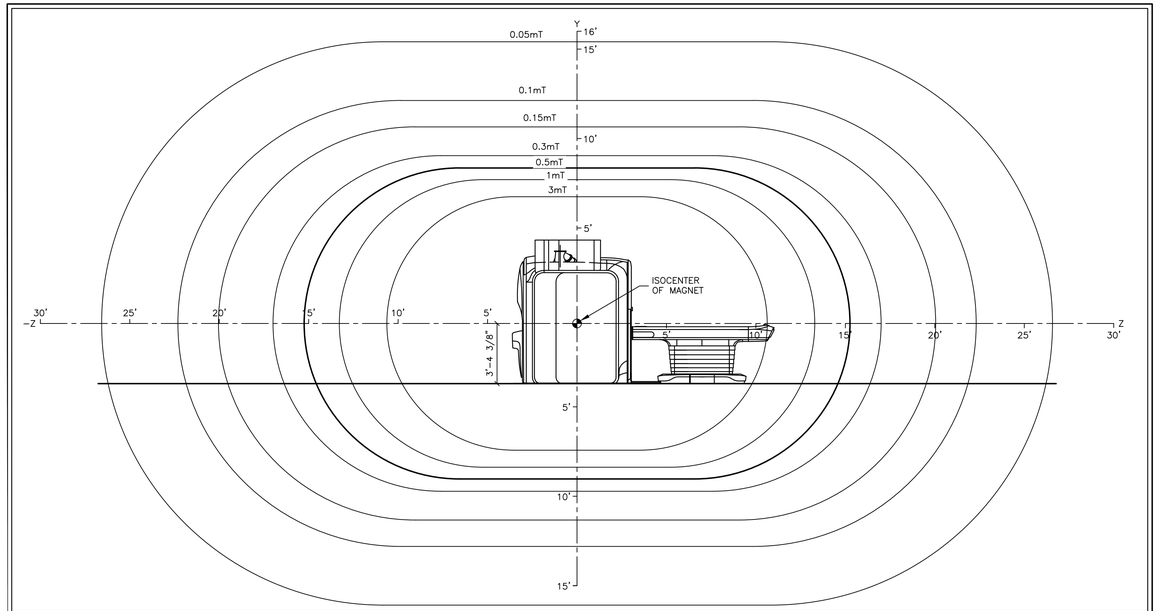
REMOTE INSTALLATION



SECTION VIEW

FOR A REMOTE INSTALLATION THE SIEMENS FILTER PANEL AND ELECTRONICS CABINET ARE LOCATED SEPARATELY FROM EACH OTHER. THE MAXIMUM CABLE LENGTH BETWEEN THE TWO IS 39 FEET. TWO CABLE TRAYS WILL BE REQUIRED TO MAINTAIN THE REQUIRED SEPARATION OF THE SIEMENS CABLES.

1 | FILTER PANEL AND ELECTRONICS CABINET INSTALLATION | SCALE: 1/2"=1'-0"



– | NEXT GEN MAGNETIC FIELDS – SIDE ELEVATION | SCALE: 1/4"=1'-0"

FUTURE PRODUCTS STILL IN DEVELOPMENT

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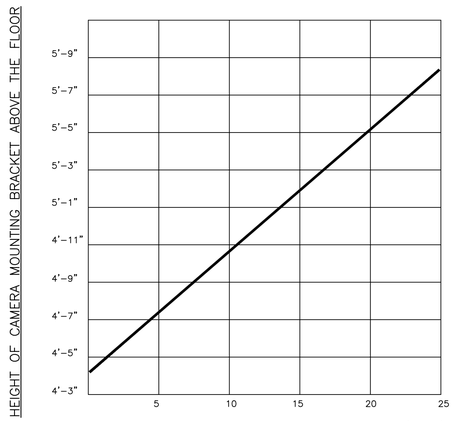
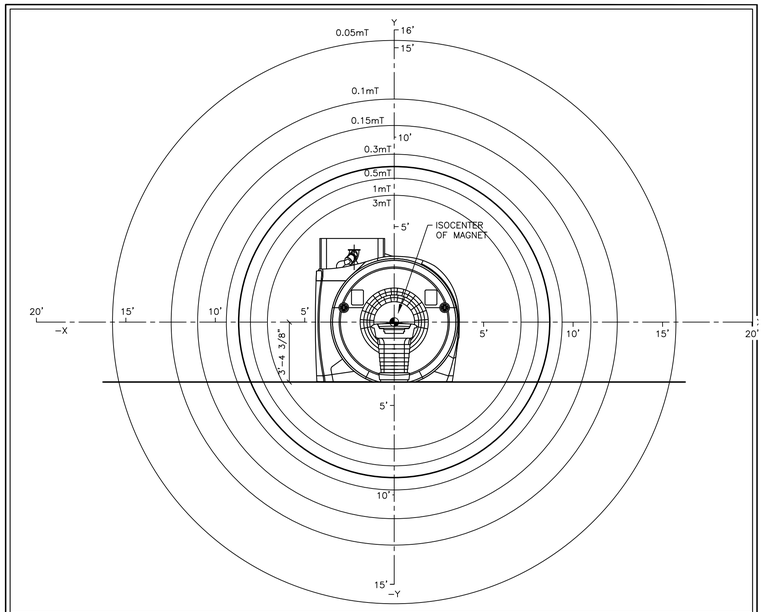
PATIENT VIDEO MONITORING

IT IS IMPORTANT TO VISUALLY MONITOR THE PATIENT DURING AN MR EXAM, IF OPERATING PERSONNEL CANNOT VISUALLY OBSERVE THE PATIENT THROUGH AN RF ROOM WINDOW VIDEO CAMERAS ARE OPTIONALLY AVAILABLE FROM SIEMENS. THE CAMERA INSIDE THE EXAM ROOM WILL HAVE TO BE INSTALLED ON THE FINISHED WALL. THE CAMERA WALL BRACKET IS PART OF THE DELIVERY, MOUNTING SCREWS AND DOWELS SHOULD BE PROVIDED LOCALLY. THE CHART BELOW SHOWS SUGGESTED MOUNTING HEIGHTS RELATED TO THE WALL DISTANCE FROM THE MAGNET COVER.



REV 0

2 | PATIENT SUPERVISION CAMERA | SCALE: NONE



– | NEXT GEN MAGNETIC FIELDS – FRONT ELEVATION | SCALE: 1/4"=1'-0"

NEXT GEN
DRAFT

SYM	DATE	DESCRIPTION
0	09/28/23	

–ISSUE BLOCK–

PROJECT MANAGER: NICHOLAS FOLK
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SIEMENS

WAYNE STATE UNIVERSITY

540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

PROJECT #: 2312308

SHEET: A-501

SHEET 3 OF 10

DRAWN BY: B. HERRMANN

SCALE: AS NOTED

REF. #: 30273767

DATE: 09/28/23

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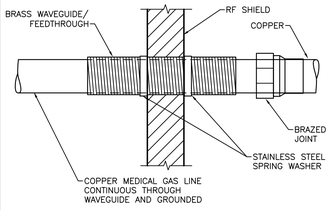
REFERENCE DOCUMENT - NOT FOR CONSTRUCTION



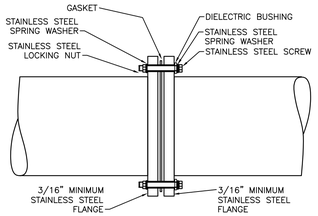
THE MEDICAL GAS FEED THROUGH SHOULD BE AS CLOSE TO THE SIEMENS FILTER PANEL AS POSSIBLE. WITHIN 3 FEET IS STRONGLY RECOMMENDED.

THE FINAL MEDICAL GAS CONNECTION TO THE WAVEGUIDE CANNOT BE MADE UNTIL GROUND ISOLATION MONITORING IS COMPLETE.

THE MEDICAL GAS MUST BE GROUNDED TO THE WAVEGUIDE AND RF SHIELD.

REV 0

–	MEDICAL GAS EXAMPLE	NO SCALE



DIELECTRIC ISOLATION HAS TO BE INSTALLED TO AVOID ELECTRICAL NOISE BEING PICKED UP BY LOOPS BETWEEN THE MAGNET, THE QUENCH TUBE, THE RF ROOM, AND THE BUILDING.

IT IS NECESSARY TO HAVE ONE DIELECTRIC ISOLATION OF THE QUENCH TUBE INSIDE THE RF ROOM (PROVIDED BY SIEMENS AT THE MAGNET) AND ONE OUTSIDE THE RF ROOM (PROVIDED BY THE QUENCH TUBE MANUFACTURER).

REV 0

–	DIELECTRIC ISOLATION	NO SCALE

IMAGE QUALITY CONCERNS

BROADBAND RF NOISE IS A SINGLE TRANSIENT OR CONTINUOUS SERIES OF TRANSIENT DISTURBANCES CAUSED BY AN ELECTRICAL DISCHARGE. LOW HUMIDITY ENVIRONMENTAL CONDITIONS WILL HAVE HIGHER PROBABILITY OF ELECTRICAL DISCHARGE. THE ELECTRICAL DISCHARGE CAN OCCUR DUE TO ELECTRICAL ARCING OR MERELY STATIC DISCHARGE. SOME POTENTIAL SOURCES CAPABLE OF PRODUCING ELECTRICAL DISCHARGE INCLUDE:

- LOOSE HARDWARE/FASTENERS–VIBRATION OR MOVEMENT (ELECTRICAL CONTINUITY MUST ALWAYS BE MAINTAINED).
- FLOORING MATERIAL INCLUDING RAISED ACCESS FLOORING (PANELS AND SUPPORT HARDWARE) AND CARPETING.
- ELECTRICAL FIXTURES (LIGHTING FIXTURES, TRACK LIGHTING, EMERGENCY LIGHTING, BATTERY CHARGERS, OUTLETS).
- DUCTING FOR HVAC AND CABLE ROUTING.
- RF SHIELD SEALS (WALLS, DOORS, WINDOWS, ETC.).

REV 0

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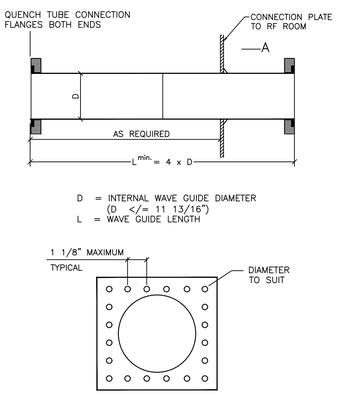


D = INTERNAL WAVE GUIDE DIAMETER
(D </= 11 13/16")
L = WAVE GUIDE LENGTH

VIEW A

THE RF CABIN FEED THROUGH NEEDS TO CONFORM TO CERTAIN GEOMETRIC CONSTRAINTS IN ORDER TO GUARANTEE THE RF INTEGRITY OF THE RF CABIN.

AS A FUNCTION OF INTERNAL PIPE DIAMETER, THE FOLLOWING APPLIES TO MINIMUM PIPE LENGTH FOR FREQUENCIES UP TO 128 MHz AND 110 dB ATTENUATION.

DEPENDING ON RF CABIN DESIGNS, RF SEALS CAN BE REQUIRED BETWEEN THE MOUNTING FLANGE AND THE RF CABIN.

QUENCH TUBE RF CABIN FEED THROUGH

REV 0

–	WAVE GUIDE	NO SCALE

RF DOOR OPENING

IN THE EVENT OF A CATASTROPHIC FAILURE OF THE QUENCH VENT DURING A QUENCH, PRESSURE BUILT UP MAY PREVENT OPENING A DOOR THAT OPENS INTO THE RF ROOM, PREVENTING EVACUATION FROM LIFE THREATENING CONDITIONS.

FOR THIS REASON THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. IF THE DOOR CANNOT OPEN OUT FROM THE RF ROOM, OTHER APPROPRIATE MEANS HAVE TO BE PROVIDED SO THAT THE RF ROOM DOOR IS NOT PREVENTED FROM OPENING DUE TO PRESSURE.

IF THE DOOR OPENS INTO THE RF ROOM, A 24"x24" OPENING FOR PRESSURE EQUALIZATION INTO THE RF ROOM MUST BE INSTALLED. THIS IS MANDATORY. THIS IS NOT AN ESCAPE HATCH. THE PURPOSE OF THE OPENING IS TO RELIEVE PRESSURE AND ALLOW THE MAIN DOOR TO BE OPENED SO THAT OCCUPANTS CAN BE EVACUATED.

THE OPENINGS WILL HAVE PANELS INSTALLED IN THE RF ROOM OR THE DOOR THAT CAN BE UNLOCKED AND OPENED TO THE OUTSIDE IN CASE OF EMERGENCY. THESE PANELS REQUIRE AN RF SEALED INSTALLATION. AFTER OPENING THE PANEL, THE OUTLET SHOULD MEASURE AT LEAST 24"x24". WHEN USING RECTANGULAR PANELS, THE SHORTER SIDE SHOULD MEASURE OF MINIMUM OF 24".

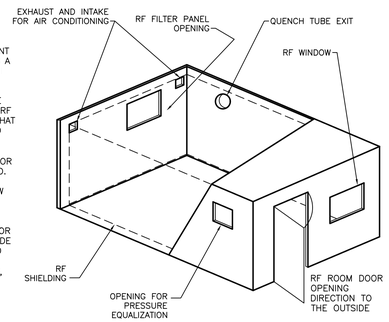
TO ENSURE UNOBSTRUCTED VENTING, THIS OPENING CANNOT BE SUBDIVIDED. THIS MEANS THAT, FOR EXAMPLE, RF SEALED HONEYCOMB GRIDS ARE NOT PERMITTED.

EASY REMOVAL OF THE PANEL BY A PERSON HAS TO BE ENSURED AND A MINIMUM DISTANCE OF 40" TO A FIXED OBJECT MUST BE MAINTAINED. THE PANEL SHOULD BE INSTALLED IN AN ACCESSIBLE LOCATION AND ALLOW ESCAPE OF THE LOW DENSITY HELIUM.

AS AN ALTERNATIVE TO AN OUT SWING DOOR, THE STATIONARY OBSERVATION WINDOW IS REPLACED BY A WINDOW OPENING INTO THE CONTROL AREA OR THE DOOR IS REPLACED WITH AN RF SEALED SLIDING DOOR. IT SHOULD BE ENSURED THAT THE DOOR CLOSES IN A WAY THAT ALLOWS IT TO MOVE AWAY FROM THE FRAME IN CASE OF OVERPRESSURE.

IF THE DOOR OPENS TO THE OUTSIDE, THE OPENING IN THE RF ROOM IS STILL RECOMMENDED.

THE RF ROOM MANUFACTURER CAN PROVIDE YOU WITH ADDITIONAL RF SEALED ROOM OPENINGS THAT LEAD DIRECTLY TO THE OUTSIDE. HOWEVER, THESE OPENINGS ARE ALSO CONDUITS FOR NOISE GENERATED OUTSIDE THE RF ROOM. UNOBSTRUCTED FLOW THROUGH THIS PIPE MUST BE GUARANTEED.



SAFETY ASPECTS FOR THE RF ROOM:

IT MUST BE POSSIBLE TO LOCK THE RF ROOM (EXAMINATION ROOM) DOOR FROM THE OUTSIDE. IT MUST ALSO BE POSSIBLE TO OPEN THE DOOR FROM THE INSIDE WITHOUT A KEY OR ADDITIONAL DEVICE.

THE RF DOOR IS AN IMPORTANT COMPONENT FOR GOOD IMAGE QUALITY AS WELL AS SAFETY. THE OWNER/OPERATOR OF THE MR SYSTEM MUST MAINTAIN THE RF ROOM AS INSTRUCTED BY THE RF ROOM MANUFACTURER IN ORDER TO GUARANTEE CORRECT FUNCTION OF THE RF DOOR.

NO FERROMAGNETIC ITEMS CAN BE BROUGHT INTO THE RF ROOM AFTER THE MAGNET HAS BEEN RAMPED UP TO FIELD. MAGNETIC ITEMS WILL BECOME ATTRACTED TO THE MAGNET WITH NO WARNING AND DUE TO THE HIGH MAGNETIC FIELD, WILL BECOME MISSILES.

NOTE: FOR DOORS MOVED BY AN AUXILIARY DRIVES (ELECTRICAL OR PNEUMATIC), MANUAL OPERATION HAS TO BE ENSURED. AN OUTSIDE WINDOW SHOULD BE IN THE VICINITY TO ALLOW VENTING EXHAUSTED GAS TO THE OUTSIDE. THE INTEGRITY OF THE RF SHIELD MUST BE TESTED AFTER REMODELING.

REV 0

–	SAFETY INFORMATION – PRESSURE EQUALIZATION	SCALE: NONE

RF SHIELDING

1) THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15–128 MHz. IF CO–SITING TWO SYSTEMS EACH ROOM SHOULD BE 100 dB.

2) THE RF SHIELD MUST BE TESTED BEFORE AND AFTER MAGNET PLACEMENT IN THE RF ROOM AND AFTER THE SIEMENS RF FILTER PANEL IS INSTALLED. THE RF–SHIELDING MUST BE INSULATED FROM ALL GROUNDS SUCH THAT THE ONLY GROUND IS THE SINGLE POINT GROUND ON THE OUTSIDE OF THE RF–ROOM WALL. RESISTANCE $\geq$ 100 OHMS.

3) ALL ELECTRICAL LINES INTO THE RF ROOM MUST BE ROUTED THROUGH RF FILTERS (PROVIDED BY RF SHIELDING SUPPLIER). ALL ELECTRICALLY NON–CONDUCTIVE SUPPLY LINES (E.G. FIBER OPTIC CABLES, OR HOSES) INTO THE RF ROOM MUST BE ROUTED THROUGH RF SEALED WAVE GUIDES (PROVIDED BY RF SHIELDING SUPPLIER).

4) FOR PRESSURE EQUALIZATION PURPOSES THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. AS AN ALTERNATIVE A 24"X24" OPENING IN THE RF ROOM FOR PRESSURE EQUALIZATION IS REQUIRED.

REV 1

EXAM ROOM INTERIOR NOTES

1) ONLY NON–MAGNETIC MATERIALS ARE TO BE USED AND INSTALLED IN THE RF ROOM. SEE CONSTRUCTION REQUIREMENTS.

2) A SUSPENDED CEILING MUST BE STATICALLY SUSPENDED, NOT SUSPENDED WITH MOVABLE CLAMPS, SPRINGS, ETC.

3) RODS IN SUSPENDED CEILINGS MUST BE INSTALLED SECURELY. GALVANIC CONTENT BETWEEN THE RODS MUST BE GUARANTEED, THEY MUST NOT JUST LIE ON TOP OF ONE ANOTHER. A WIRE JUMPER BETWEEN RODS MAY BE USEFUL.

4) ELECTRICAL WIRING, FOR AMBIENT LIGHTS FOR EXAMPLE, MUST NOT SIMPLY REST ON THE SUSPENDED CEILING, THEY MUST BE FASTENED OR INSIDE A CONDUIT TO PREVENT MOTION.

REV 1

SHIELDING GENERAL NOTES

1) SIEMENS REQUESTS THAT THE SHIELDING MANUFACTURER(S) SUBMIT FINAL SHOP DRAWINGS TO SIEMENS FOR REVIEW PRIOR TO THEIR INCLUSION IN CONSTRUCTION DOCUMENTS. SIEMENS SHALL BE COPIED ON ALL FIELD ORDER CHANGES CONCERNING CHANGES IN RF AND MAGNETIC SHIELDING CONDITIONS, CONFIGURATION AND SPECIFICATION. THE RF AND MAGNETIC SHIELDING CONTRACTOR(S) SHALL FURNISH "AS BUILT" SCALED AND DIMENSIONED PLANS REFLECTING ANY AND ALL FIELD ORDER CHANGES PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.

2) ALL CHANGES TO SIEMENS RECOMMENDED OPENINGS AND PENETRATIONS SHALL BE APPROVED BY THE SIEMENS PROJECT MANAGER PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.

3) THE SIZE, LOCATION, AND DIMENSIONS OF ANY MAGNETIC SHIELDING REQUIRED HAS BEEN DETERMINED BY SIEMENS. THIS INFORMATION HAS BEEN SUPPLIED TO THE MAGNETIC SHIELDING FABRICATOR TO DESIGN THE STRUCTURAL SUPPORT SYSTEM REQUIRED FOR THE MAGNETIC SHIELDING MATERIAL.

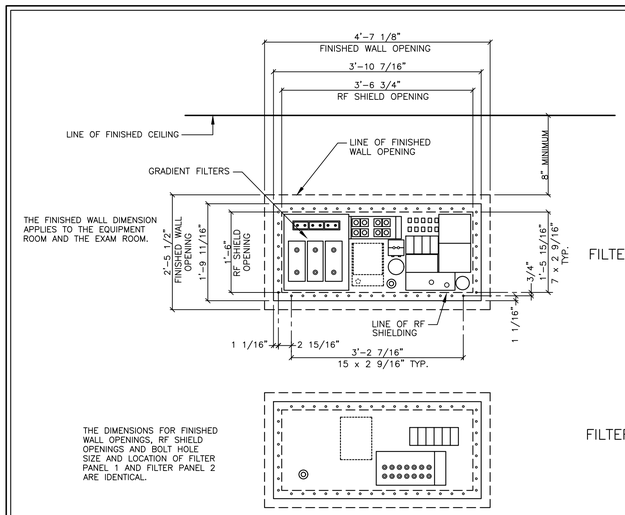
REV 0

FILTER PLATE GENERAL NOTES

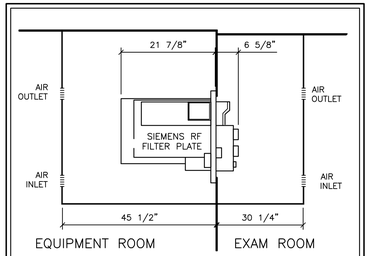
1) STRUCTURAL SUPPORT AND INTEGRATION OF THE SIEMENS SUPPLIED AND INSTALLED FILTER PLATE WITH MAGNETIC AND RF SHIELDING SHALL BE SPECIFIED, DETAILED AND NOTED BY THE RF AND MAGNETIC SHIELDING MANUFACTURER(S) WITH OVERALL COORDINATION WITH SIEMENS SITE SPECIFIC RECOMMENDATIONS TO BE THE RESPONSIBILITY OF THE ARCHITECT OF RECORD.

2) THE FILTER PLATE FRAME, RF FILTER PLATE BLANK, RF GASKET AND MOUNTING HARDWARE FOR THE PURPOSES OF TESTING THE INTEGRITY OF THE RF ENCLOSURE PRIOR TO THE INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED RF FILTER PLATE SHALL BE PROVIDED AND INSTALLED BY THE SHIELDING CONTRACTOR(S) UNLESS SPECIFIED OTHERWISE.

REV 0



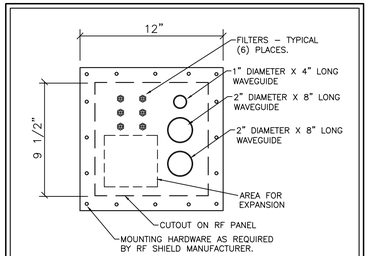
1	EQUIPMENT ROOM SIDE RF FILTER PANEL DETAILS	SCALE: 3/4"=1'–0"



IF A COVER IS DESIRED TO CONCEAL THE FILTER PANEL INSIDE THE EXAM ROOM (NOT INCLUDED IN DELIVERY), IT IS NECESSARY TO HAVE VENTILATION AND PROPER CLEARANCE FOR CABLING AND SERVICE. RECOMMENDED SIZE IS 4'–4" WIDE. THERE SHOULD BE A MINIMUM 8" CLEAR FROM THE TOP OF THE FILTER TO THE CEILING ABOVE.

18/18/09

2	FILTER PANEL COVERS	NO SCALE



NON–SIEMENS EQUIPMENT REQUIRING RF ROOM PENETRATION REQUIRES A SEPARATE PENETRATION PANEL BE PROVIDED BY THE CUSTOMER AND INSTALLED BY THE RF ROOM MANUFACTURER. SIEMENS FILTER PANEL IS RESERVED FOR SIEMENS PRODUCTS AND FUTURE UPGRADES ONLY.

TYPICAL OEM (ORIGINAL EQUIPMENT MANUFACTURER) EQUIPMENT MAY INCLUDE, BUT NOT BE LIMITED TO, INJECTORS, fMRI, AND SAFETY RELATED ITEMS. SPECIFIC EQUIPMENT MANUFACTURERS WILL HAVE DETAILED INFORMATION REGARDING REQUIRED PENETRATIONS. ABOVE IS AN EXAMPLE OF A PENETRATION PANEL THAT WILL MEET MANY REQUIREMENTS. THE PENETRATION PANEL SHALL BE LOCATED IN CLOSE PROXIMITY TO THE SIEMENS FILTER PANEL AND BE COMPLIANT WITH ALL SIEMENS RF ROOM REQUIREMENTS.

REV 0

–	OEM FILTER PANEL	NO SCALE

NEXT GEN
DRAFT

SYM	DATE	DESCRIPTION
1	09/28/23	

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SIEMENS

WAYNE STATE UNIVERSITY

540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

PROJECT #: 2312308

SHEET: A-502

SHEET 4 OF 10

DRAWN BY: B. HERRMANN

SCALE: AS NOTED

REF. #: 30273767

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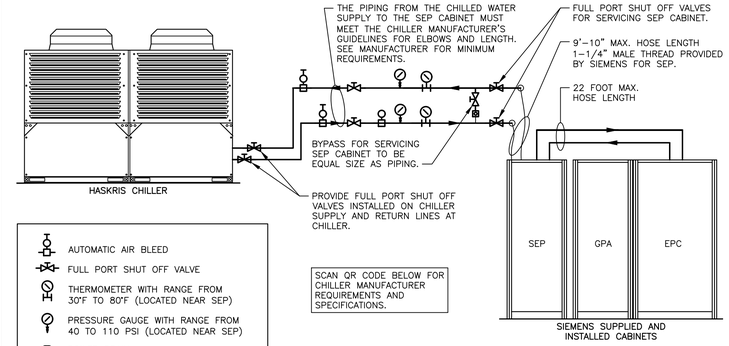
CHILLER MECHANICAL



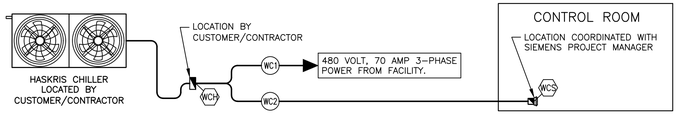
- AUTOMATIC AIR BLEED
- FULL PORT SHUT OFF VALVE
- THERMOMETER WITH RANGE FROM 30°F TO 80°F (LOCATED NEAR SEP)
- PRESSURE GAUGE WITH RANGE FROM 40 TO 110 PSI (LOCATED NEAR SEP)
- BOILER DRAIN
- VISUAL FLOW METER WITH GAUGE

SCAN QR CODE BELOW FOR CHILLER MANUFACTURER REQUIREMENTS AND SPECIFICATIONS.

CHILLED WATER PIPING NOTES:

1. ALL PIPING AND PLUMBING FIXTURES SHALL BE FURNISHED, INSTALLED, CLEANED, PRESSURE TESTED AND CHARGED BY THE MECHANICAL CONTRACTOR PRIOR TO THE DELIVERY AND INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED EQUIPMENT UNLESS SPECIFIED OTHERWISE.
2. THE MECHANICAL CONTRACTOR MUST INSTALL AUTOMATIC DE-AERATION DEVICE (AIR VENT) AT THE HIGHEST POINT OF THE WATER SUPPLY PIPE FROM THE CHILLER TO SEP.
3. SYSTEM MUST BE PROVEN TO BE LEAK FREE.
4. THE SUPPLY AND RETURN PIPES FROM THE CHILLED WATER SUPPLY TO THE SEP MUST BE LABELED TO SHOW FLOW DIRECTION AND CONTENT (WATER/GLYCOL).
5. THE MECHANICAL ENGINEER OF RECORD SHALL BE ULTIMATELY RESPONSIBLE FOR THE SITE SPECIFIC DESIGN AND SPECIFICATION OF THE MECHANICAL AND PIPING SYSTEMS AS SHOWN AND SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES. ALL WORK SHALL MEET CHILLER MANUFACTURERS REQUIREMENTS AND SPECIFICATIONS.
6. MANUFACTURER APPROVED GLYCOL AND MIXTURE TO BE SUPPLIED AND FILLED BY MECHANICAL CONTRACTOR FOR COMPLETE CHILLER LOOP. 25 GALLONS ARE NEEDED IN ADDITION TO THE SUPPLY AND RETURN LINES. AN ADDITIONAL 5 GALLONS OF THE MIXED GLYCOL TO REMAIN ON SITE FOR START UP.

CHILLER ELECTRICAL



ELECTRICAL LEGEND

SYM	SIZE	DESCRIPTION	REMARKS
		SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR	
WCH	AS REQUIRED	PULL BOX MOUNTED ADJACENT TO WATER CHILLER PROVIDED WITH FLEX-TITE CONDUIT FROM PULL BOX TO KNOCK OUT PANEL ON CHILLER. COORDINATE WITH SIEMENS PROJECT MANAGER.	WATER CHILLER
WCS	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL IN CONTROL ROOM IN LOCATION COORDINATED WITH SIEMENS PROJECT MANAGER, WIRES ENTER CONTROL PANEL FROM THE BOTTOM.	CHILLER REMOTE CONTROL/ STATUS PANEL
WC1	(1) 2"ø	CONDUIT FROM FACILITY POWER TO "WCH".	
WC2	(1) 1"ø	CONDUIT FROM "WCH" TO "WCS".	NOT TO EXCEED 150 FEET

CONTRACTOR SUPPLIED CABLES

FROM	VIA	TO	DESCRIPTION	REMARKS
SOURCE	WC1	WCH	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.	
WCH	WC2	WCS	CABLE PROVIDED BY CHILLER MANUFACTURER, PULLED BY ELECTRICIAN	

FOR ADDITIONAL INFORMATION FROM HASKRIS MANUFACTURER, SCAN THE QR CODE OR VISIT THE FOLLOWING WEB SITE.

WWW.HASKRIS.COM/SIEMENS
PASSWORD: 1944

1	HASKRIS CHILLER	SCALE: NONE

NEXT GEN DRAFT

SYM	DATE	DESCRIPTION
0	09/28/23	

-ISSUE BLOCK-

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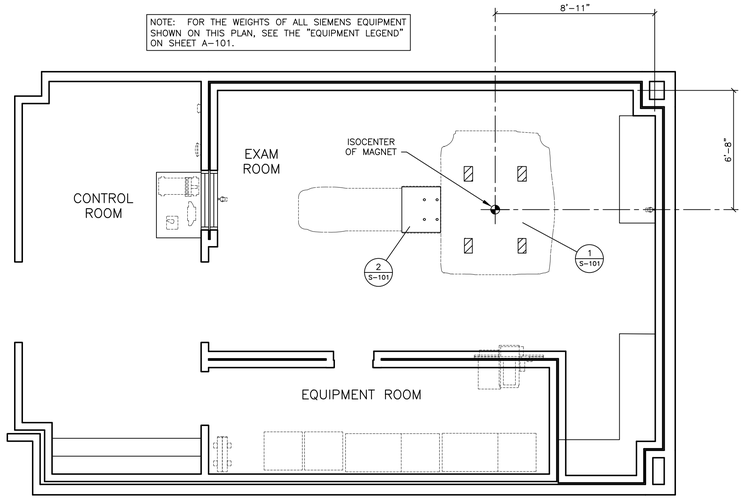
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.
- THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

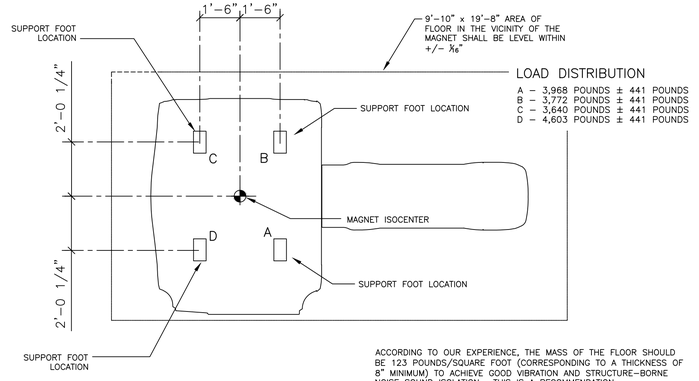
REFERENCE DOCUMENT - NOT FOR CONSTRUCTION

NOTE: FOR THE WEIGHTS OF ALL SIEMENS EQUIPMENT SHOWN ON THIS PLAN, SEE THE "EQUIPMENT LEGEND" ON SHEET A-101.



STRUCTURAL FLOOR PLAN

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



LOAD DISTRIBUTION

A – 3,968 POUNDS ± 441 POUNDS
B – 3,772 POUNDS ± 441 POUNDS
C – 3,640 POUNDS ± 441 POUNDS
D – 4,603 POUNDS ± 441 POUNDS

ACCORDING TO OUR EXPERIENCE, THE MASS OF THE FLOOR SHOULD BE 123 POUNDS/SQUARE FOOT (CORRESPONDING TO A THICKNESS OF 8" MINIMUM) TO ACHIEVE GOOD VIBRATION AND STRUCTURE-BORNE NOISE SOUND ISOLATION. THIS IS A RECOMMENDATION.

VIBRATION OF THE SITE HAS THE ABILITY TO AFFECT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD. THEREFORE EXTERNAL VIBRATIONS OR SHOCKS AFFECTING THE MAGNET MAY DEGRADE IMAGE QUALITY. IN THE THREE SPATIAL ORIENTATIONS THE BUILDING MUST NOT EXCEED ACCELERATION OF 0.001 m/s^2 OR ~80 dB(G) G=9.81 m/s^2

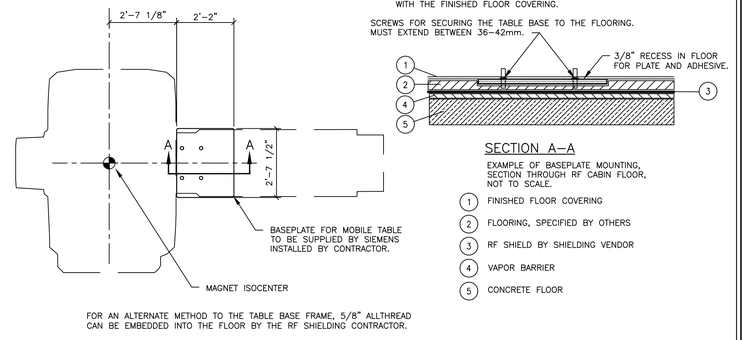
THE REQUIREMENT FOR G_{max} IS MEASURED AS MAXIMUM RMS VALUE PER FREQUENCY COMPONENT <0.5Hz IN THE FOURIER TRANSFORMATION OF THE RECORDED SIGNAL (SPECTRUM).

THE VIBRATION LEVEL OF CONTINUOUS VIBRATIONS (CAUSED BY AIR CONDITIONER, COMPRESSOR, ETC.) AT THE LOCATION OF THE MAGNET MUST NOT EXCEED THE SPECIFIED VALUES. FOR ALL NON-CONTINUOUS TRANSIENT VIBRATIONS THE FIGURES SHOULD BE MULTIPLIED BY 4 (OR 12 dB).

CONTACT SIEMENS PROJECT MANAGER FOR MORE DETAILS.

ANTI STATIC FLOOR COVERING IS NECESSARY TO REDUCE THE RISK OF STATIC ELECTRIC DISCHARGES THAT MAY DAMAGE SENSITIVE EQUIPMENT AND COMPONENTS.

1 **BASE DETAIL** SCALE: 3/8"=1'-0"



SECTION A-A

EXAMPLE OF BASEPLATE MOUNTING, SECTION THROUGH RF CABIN FLOOR, NOT TO SCALE.

1. FINISHED FLOOR COVERING
2. FLOORING, SPECIFIED BY OTHERS
3. RF SHIELD BY SHIELDING VENDOR
4. VAPOR BARRIER
5. CONCRETE FLOOR

FOR AN ALTERNATE METHOD TO THE TABLE BASE FRAME, 5/8" ALLTHREAD CAN BE EMBEDDED INTO THE FLOOR BY THE RF SHIELDING CONTRACTOR.

2 **BASEPLATE FOR MOBILE PATIENT TABLE** SCALE: 3/8"=1'-0"

STRUCTURAL NOTES

1) THE CUSTOMER/CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL SUPPORT MEMBERS AND NEEDED HARDWARE FOR THE INSTALLATION OF THE SIEMENS EQUIPMENT.

2) THE OVERHEAD STRUCTURAL SUPPORT SYSTEM SHALL BE FIXED, RIGID AND BRACED FOR SWAY.

3) ALL STRUCTURAL SUPPORT MEMBERS SHALL BE TRUE, SQUARE, LEVEL, PARALLEL AND COPLANAR WITH RESPECT TO EACH OTHER, WITH A HORIZONTAL STRUCTURAL SUPPORT MEMBER TO BE LOCATED AND SET WITH A TRANSIT.

4) ALL STRUCTURAL SUPPORT DETAILS SHOWN ARE SAMPLE DETAILS BASED UPON TYPICAL AND STANDARD BUILDING PRACTICES AND ARE NOT INTENDED AS ACTUAL CONSTRUCTION DETAILS. ALL CONSTRUCTION DETAILS AND SUPPORT CALCULATIONS SHALL BE PREPARED BY A PROFESSIONAL STRUCTURAL ENGINEER AT THE CUSTOMER'S EXPENSE. IN THE EVENT AN EXISTING SUPPORT SYSTEM IS TO BE USED, IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO VERIFY THE INTEGRITY OF THAT SYSTEM.

5) MOUNTING PLATES, FRAMES, AND HARDWARE SUPPLIED BY SIEMENS AS DETAILED IN THIS DRAWING SET ARE INSTALLED BY SIEMENS UNLESS OTHERWISE REQUIRED. ANY DEVIATION FROM THE PROVIDED MATERIALS OR MOUNTING METHODS MUST BE DESIGNED AND DOCUMENTED BY THE STRUCTURAL ENGINEER OF RECORD. ALTERNATE MOUNTING MATERIALS (I.E. ANCHORS, THREADED ROD, BACKING PLATES, ETC.) MUST BE SUPPLIED BY THE CUSTOMER/CONTRACTOR. SIEMENS MAY REQUIRE ASSISTANCE FROM THE CUSTOMER/CONTRACTOR WITH INSTALLATION WHEN UTILIZING ALTERNATE MOUNTING MATERIALS.

6) ALL CEILING FIXTURES (I.E. AIR SUPPLY GRILLES, AIR RETURN GRILLES, EXHAUST GRILLES, SPRINKLER HEADS, INCANDESCENT AND FLUORESCENT LIGHT FIXTURES, INTERCOM SPEAKERS, MEDICAL GAS COLUMNS, ETC.) SHALL BE INSTALLED FLUSH MOUNTED WITH THE FINISHED CEILING TO PROVIDE FREE AND UNRESTRICTED TRAVEL OF THE SMS CEILING MOUNTED EQUIPMENT.

7) THE STRUCTURAL PLANNING AS SHOWN ON THE 1/4" STRUCTURAL PLAN HAS BEEN COORDINATED WITH THE EQUIPMENT LOCATION AS SHOWN ON THE 1/4" EQUIPMENT LAYOUT PLAN. FOR THIS REASON, ANY DEVIATIONS FROM THE STRUCTURAL PLANNING AS SHOWN MUST BE APPROVED BY SMS PLANNING DEPARTMENT.

8) THE STRUCTURAL ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR THE DESIGN AND DETAIL OF FLOOR, WALL AND CEILING STRUCTURES IN ACCORDANCE WITH THE WEIGHTS, MOMENTS AND FORCES AS SHOWN ON OUR STRUCTURAL CALCULATIONS, OR INFORMATION IN CONSIDERATION OF FORCES AS DETERMINED PER LOCAL GOVERNING BUILDING CODES.

FUTURE PRODUCTS STILL IN DEVELOPMENT

- THIS PRODUCT IS UNDER DEVELOPMENT AND NOT COMMERCIALLY AVAILABLE. ITS FUTURE AVAILABILITY CANNOT BE ENSURED.
- THIS DOCUMENT PROVIDES INFORMATION REGARDING TECHNICAL SPECIFICATIONS, AND STANDARD AND OPTIONAL FEATURES. THIS LIST SPECIFICATIONS AND FEATURES DO NOT APPLY TO ALL PRODUCTS/OR SITES.
- THIS INFORMATION IS DRAFT STAGES AND SUBJECT TO CHANGE, FOR REFERENCE ONLY.

SYSTEM SPECIFICATION STATUS

PLEASE NOTE: CURRENT STATUS IS DRAFT

SIEMENS RESERVES THE RIGHT TO MAKE CHANGES AND OTHER MODIFICATIONS BASED UPON, BUT NOT LIMITED TO, NEW TECHNICAL DEVELOPMENTS. UNTIL RELEASE OF THE PLANNING GUIDELINE, CONTENT OF PRELIMINARY AND FINAL PLANNING IS SUBJECT TO CHANGE AND MODIFICATION.

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM
CONTROL ROOM 6'-11 MINIMUM
EQUIPMENT ROOM 7'-3" MINIMUM

NEXT GEN DRAFT

SYM	DATE	DESCRIPTION
0	09/28/23	

-ISSUE BLOCK-

PROJECT MANAGER: NICHOLAS FOLK
TEL: (248)873-9912 EXT:
VMAIL:
FAX:
EMAIL: NICK.FOLK@SIEMENS-HEALTHINEERS.COM

SIEMENS

WAYNE STATE UNIVERSITY

540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

SCALE: AS NOTED
REF. #: 30273767

PROJECT #: 2312308
SHEET 5 OF 10
DRAWN BY: B. HERRMANN
DATE: 09/28/23

SHEET: S-101

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.
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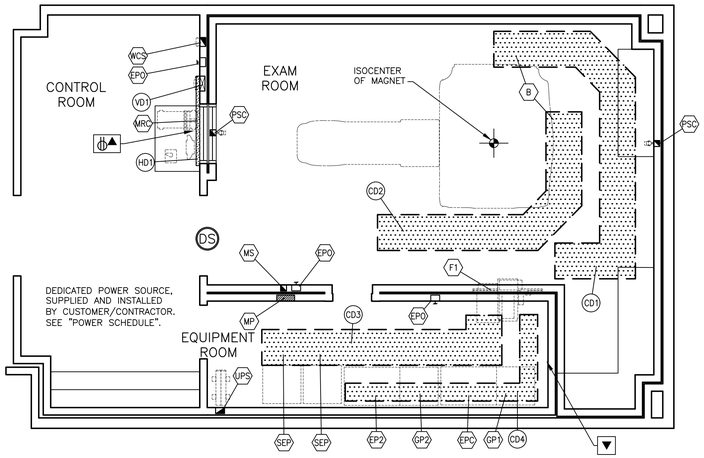
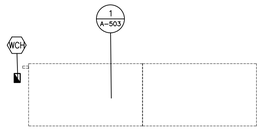
NOT FOR CONSTRUCTION - REFERENCE DOCUMENT



TWO DUPLEX OUTLETS MUST BE PROVIDED IN THE EQUIPMENT ROOM FOR SERVICE PURPOSES



ELECTRICAL RACEWAY PLAN

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

ELECTRICAL LEGEND

SYM	SIZE	DESCRIPTION SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR	REMARKS
AB	3"ø	OPENING IN FACE OF VERTICAL DUCT 5'-0" ABOVE FINISHED FLOOR IN LOCATION TO BE COORDINATED WITH THE ARCHITECT.	ALARM BOX
EPA EPB EPC	18" x 18"	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	ELECTRONICS CABINETS
B	AS REQUIRED	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	MAGNET CABLE ACCESS
EPO	----	EMERGENCY POWER OFF BUTTONS, MOUNTED WITH CENTERLINE AT 5'-0" ABOVE FINISHED FLOOR. ALL PARTS ARE TO BE NONFERROUS INSIDE THE RF ROOM. EXACT LOCATIONS ARE TO BE VERIFIED WITH THE ARCHITECT OF RECORD.	SEE POWER SCHEDULE, SHEET E-102
F1	----	SIEMENS RF FILTER PANEL TO BE MOUNTED ON RF SHIELDED WALL	FILTER PANEL
MP	----	MAIN PANEL WITH MAIN BREAKER. EXACT LOCATION DETERMINED BY CUSTOMER/CONTRACTOR	SEE POWER SCHEDULE
HCA	4" x 4"	OPENING IN FACE OF RACEWAY IN SHOWN LOCATION.	HOST COMPUTER
MS	AS REQUIRED	NON-FERROUS SINGLE GANG BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 6'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	MAGNET STOP
PSA	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL REFER TO HEIGHT CHART A-501-3. THE PULL BOX CAN BE MOUNTED AT APPROXIMATELY 5'-0" ABOVE THE FINISHED FLOOR IN MOST CASES, DEPENDING ON THE DISTANCE FROM THE MAGNET TO THE WALL.	PATIENT SUPERVISION CAMERA
UPS	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT FLOOR LINE IN SHOWN LOCATION PROVIDED WITH 2"ø OPENING IN FINISHED COVER.	LIEBERT GXT5 UPS
CD1	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER, IN THE EXAM ROOM, MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE FILTER PANEL AND THE MAGNET. A 15" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE RF FILTER PANEL (F1). WHEN ROUTING ALL RACEWAYS REFER TO DETAIL E-501/2 TAKING CARE SO THAT MAXIMUM CABLE LENGTHS ARE NOT EXCEEDED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/1
CD2	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EXAM ROOM. A 12" SEPARATION BETWEEN CD1 AND CD2 MUST BE MAINTAINED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/1
CD3	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EQUIPMENT ROOM MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE EQUIPMENT ROOM AND THE RF FILTER PANEL (F1). AN 18" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE FILTER PANEL.	CABLE TRAY SEE DETAIL E-501/1
HD1	4" x 2"	HORIZONTAL DUCT SURFACE MOUNTED ON WALL IN CONTROL AREA AT FLOOR LINE AS SHOWN, FINISHED TO MATCH WALLS.	
VD1	10" x 3-1/2"	VERTICAL DUCT MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA FROM ABOVE FINISHED CEILING TO FLOOR LINE PROVIDED WITH REMOVABLE FINISHED COVERS.	
1	AS PER NEC	CONDUIT FROM FACILITY POWER TO MAIN PANEL "MP".	SEE POWER SCHEDULE, SHEET E-102
2	AS PER NEC	CONDUIT FROM "MP" TO "EPO".	SEE POWER SCHEDULE, SHEET E-102
3	AS PER NEC	CONDUIT FROM "EPO" TO "EPO" TO BE NON-FERROUS WHEN INSIDE THE RF ROOM. CUSTOMER/CONTRACTOR IS TO PROVIDE RF FILTERS FOR ALL NON-SIEMENS WIRING.	SEE POWER SCHEDULE, SHEET E-102
4	(1) 2"ø	CONDUIT FROM "MP" TO END AT "CD3" (EPC) VIA FLEX CONDUIT. THERE MUST BE A DIELECTRIC SEPARATION BETWEEN THE CONDUIT AND THE CONNECTION AT THE SIEMENS EPC CABINET.	SEE POWER SCHEDULE, SHEET E-102
5	(1) 2"ø	CONDUIT FROM "MP" TO END AT "CD3" (GPA) VIA FLEX CONDUIT. THERE MUST BE A DIELECTRIC SEPARATION BETWEEN THE CONDUIT AND THE CONNECTION AT THE SIEMENS GPA CABINET.	SEE POWER SCHEDULE, SHEET E-102
6	(1) 2"ø	CONDUIT FROM "MP" TO END AT "CD3" (GPA) VIA FLEX CONDUIT. THERE MUST BE A DIELECTRIC SEPARATION BETWEEN THE CONDUIT AND THE CONNECTION AT THE SIEMENS GPA CABINET.	
7	(1) 3/4"ø	CONDUIT FROM "EPO" TO "UPS".	
8	(1) 2"ø	CONDUIT FROM "UPS" TO "CD3" (EPC)	MAXIMUM LENGTH 29 FEET
9	(2) 2 1/2"ø	CONDUIT FROM "VD1" (MRC) TO "CD3" (EPC).	NOT TO EXCEED 54 FT.
10	(1) 1 1/2"ø	CONDUIT FROM "VD1" (AB) TO "CD3" (EPC).	NOT TO EXCEED 60 FT.
11	(1) 1/2"ø	CONDUIT FROM "DS" TO "CD3" (EPC).	NOT TO EXCEED 60 FT.
12	(1) 3/4"ø	CONDUIT FROM "MS" TO "CD1" (WIRES TO MAGNET) TO BE NON-FERROUS WHEN INSIDE THE RF ROOM.	NOT TO EXCEED 25 FT.
13	(1) 1"ø	NON-FERROUS CONDUIT FROM "PSC" TO "CD1".	

ELECTRICAL NOTES

1) COMPLIANCE: ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA-70), O.S.H.A. REGULATIONS, AS WELL AS APPLICABLE REGULATIONS OF CITY, COUNTY, STATE AND FEDERAL AGENCIES. PROVIDE MATERIALS AND EQUIPMENT THAT COMPLY TO ANSI, IEEE AND NEMA STANDARDS AND ARE U.L. LISTED AND LABELED. THE CUSTOMER'S/CONTRACTOR'S WORK AND ALL EQUIPMENT INSTALLED SHALL COMPLY WITH THE CURRENT EDITION OF NATIONAL ELECTRICAL CODE ADOPTED/ENFORCED BY THE AUTHORITY HAVING JURISDICTION.
2) QUALITY ASSURANCE: THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN THE FIELD TO INSURE THAT THE NEW WORK WILL FIT INTO THE EXISTING STRUCTURE AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST OR BE DISCOVERED THAT PREVENT THE INSTALLATION OF WORK AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO FABRICATION OF EQUIPMENT, OR THE PERFORMANCE OF ANY WORK THAT MAY BE AFFECTED. DO NOT ALTER DRAWINGS, DIMENSIONS, OR SPECIFICATIONS IN ANY WAY WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SIEMENS PROJECT MANAGER. ALL DIMENSIONS ARE FROM FINISHED SURFACES. CONDUIT AND PULL BOXES TO BE INSTALLED BY THE CUSTOMER/CONTRACTOR WITH LOCATIONS BEING FIELD VERIFIED BY SIEMENS PROJECT MANAGER.
3) POWER SUPPLY SOURCE: POWER SUPPLIES FOR SIEMENS HEALTHCARE EQUIPMENT SHALL BE FROM A MEDICAL IMAGING PANEL OR BUILDING SERVICE EQUIPMENT THAT IS A GROUNDED 3 OR 4-WIRE 'WYE' SOURCE PER THE SPECIFIC EQUIPMENT OPERATION REQUIREMENTS. A DEDICATED CIRCUIT SHALL BE PROVIDED THAT IS KEPT ENTIRELY FREE AND INDEPENDENT OF ALL OTHER BUILDING WIRING. NO ELEVATORS, GENERATORS, PUMPS, HVAC OR SIMILAR EQUIPMENT SHALL BE CONNECTED TO THE SAME CIRCUIT OR MEDICAL IMAGING PANEL THAT SERVES THE SIEMENS HEALTHCARE EQUIPMENT. IF THE POWER SUPPLY SOURCE DOES NOT MEET THE SPECIFIC SIEMENS EQUIPMENT POWER REQUIREMENTS, THE CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT REQUIRED TO ESTABLISH THE POWER SUPPLY IN ACCORDANCE WITH THE REQUIRED POWER SUPPLY PARAMETERS OF THE SIEMENS EQUIPMENT. THE CONTRACTOR SHALL COORDINATE THIS WORK WITH THE CUSTOMER AND/OR UTILITY COMPANY FIELD REPRESENTATIVE.
4) WORK FURNISHED BY CUSTOMER/CONTRACTOR: WORK NOT PROVIDED BY SIEMENS HEALTHCARE BUT SHOWN ON DRAWINGS TO BE FURNISHED AND INSTALLED BY CUSTOMER/CONTRACTOR INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING, UNLESS NOTED OTHERWISE: ELECTRICAL RACEWAYS AND DUCTS, WIRING TROUGHS, PULL BOXES, CONDUITS, CIRCUIT BREAKERS, ACCESS PANELS, EMERGENCY OFF BUTTONS, DOOR SWITCHES, WARNING LIGHTS, WIRING, WIRING DEVICES, CONNECTORS, LIGHTING EQUIPMENT AND GROUNDING.
5) RACEWAY AND CONDUIT NOTES: ALL ITEMS IN THE MAGNET ROOM SHALL BE NON-FERROUS. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT ENFORCED EDITION OF THE NATIONAL ELECTRICAL CODE.
CONDUIT BODIES SHALL NOT BE USED. WHERE A CONDUIT ENTERS A BOX, FITTING, OR OTHER ENCLOSURE, AN INSULATED THROAT CONNECTOR SHALL BE PROVIDED TO PROTECT THE WIRE FROM ABRASION. ALL CONNECTORS FOR EMT SHALL BE COMPRESSION OR DOUBLE SET SCREW TYPE.
KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES OR STEAM AND HOT WATER PIPES. INSTALL RACEWAY RUNS ABOVE WATER AND STEAM PIPES PROVIDED THAT CABLE RUN DISTANCES ARE MAINTAINED. USE TEMPORARY CLOSURES TO PREVENT FOREIGN MATTER FROM ENTERING RACEWAY.
CONDUIT RUNS ARE SHOWN SCHEMATICALLY. INSTALL CONDUIT WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE BUILDING CONSTRUCTION AND OBSTRUCTIONS, EXCEPT AS OTHERWISE INDICATED. THE CONTRACTOR SHALL MAKE CERTAIN THAT ANY CONDUIT/RACEWAY RUNS CONTAINING SIEMENS HEALTHCARE CABLES DO NOT EXCEED THE SPECIFIED MAXIMUM DISTANCES AS SHOWN ON THE ELECTRICAL DETAILS. LISTED CONDUIT SIZES FOR SIEMENS-SUPPLIED CABLES MUST BE MAINTAINED IN ORDER TO ENABLE THE TOTAL CABLE BUNDLE INCLUDING CONNECTORS TO BE PULLED THROUGH WITHOUT DAMAGE.
PROVIDE ENCLOSED METAL WIRE DUCT RACEWAY SYSTEM WHERE SHOWN ON DRAWINGS WITH DIVIDERS TO SEPARATE THE DUCT INTO TWO OR THREE SEPARATE COMPARTMENTS AS SHOWN ON THE SIEMENS PLANS (FOR POWER AND SIEMENS HEALTHCARE CABLING). DIVIDERS AND CROSSOVER PIECES TO BE PROVIDED AS NECESSARY. THE CABLE TO CABLE AS WELL AS THE CIRCUIT TO CIRCUIT SEPARATION REQUIREMENT WAS EVALUATED DURING THE UL SYSTEM CERTIFICATION OF THE EQUIPMENT. ADDITIONAL SEPARATION OF THE SYSTEM CABLE ASSEMBLIES INTO SEPARATE OR PARTITIONED RACEWAYS, UNLESS OTHERWISE NOTED, IS NOT NECESSARY TO INSURE SEPARATION OF CIRCUITS.
PROVIDE WIRE DUCT/RACEWAY WITH ACCESSIBLE REMOVABLE COVERS. LOCATIONS OF BUILDING MATERIAL OPENINGS (I.E. ACCESS PANELS) TO BE CUT IN FIELD ARE TO BE COORDINATED WITH THE DRAWING REQUIREMENTS AND BUILDING STRUCTURE. THOSE THAT ARE NOT INDICATED OR INTERFERE WITH BUILDING ELEMENTS SHALL BE COORDINATED WITH SIEMENS PROJECT MANAGER. ELECTRICAL PULL BOXES AND RACEWAY COVERS SHALL BE INSTALLED IN A MANNER TO ALLOW ACCESSIBILITY FOR INSTALLATION AND MAINTENANCE. CONTRACTORS MUST PROVIDE PULL STRINGS FOR ALL CONDUIT AND WIRE DUCT/RACEWAY. IN-FLOOR TRENCH DUCT AND FLUSH FLOOR BOXES SHALL BE PROVIDED WITH FULLY GASKETED REMOVABLE COVERS.
WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED HIGHER THAN 14 FEET ABOVE FINISHED FLOOR, THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP THE SIEMENS INSTALL TEAM PULL SIEMENS SUPPLIED CABLES AT CUSTOMER EXPENSE.
WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED ABOVE A HARD CEILING (I.E. SHEET ROCK), A 24" x 24" ACCESS PANEL IS REQUIRED AT EACH JUNCTION BOX AND WITHIN 2 FEET OF EACH RACEWAY TRANSITION (SUCH AS A 90 DEGREE ELBOW OR TEE) IN DUCT/RACEWAY. THERE MUST BE FREE AND CLEAR ACCESS TO JUNCTION BOXES AND WIRE DUCT/RACEWAY. WHEN ACCESS PANELS ARE LOCATED MORE THAN 3 FEET FROM JUNCTION BOXES AND WIRE DUCT/RACEWAY THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP SIEMENS INSTALL TEAM PULL SIEMENS SUPPLIED CABLES AT CUSTOMER EXPENSE.
6) WIRING: ALL WIRING INSTALLED SHALL BE 600 VOLT CLASS, STRANDED TYPE THHN/THWN-2, SINGLE CONDUCTOR ANNEALED COPPER FOR A MAXIMUM OPERATING TEMPERATURE OF 90° C (194° F). SIZED AS INDICATED INSTALLED IN METAL RACEWAYS. THE CUSTOMER/CONTRACTOR SHALL LEAVE MINIMUM 10 FT. OF WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY THE CUSTOMER/ELECTRICAL CONTRACTOR.
7) SHORT CIRCUIT REQUIREMENTS: ALL CIRCUIT BREAKERS SUPPLIED FOR THE SIEMENS EQUIPMENT REQUIREMENTS SHALL BE RATED HIGHER THAN THE SHORT CIRCUIT AVAILABLE AT THE TERMINALS OF THE ELECTRICAL EQUIPMENT AS DETERMINED BY THE ENGINEER OF RECORD, BUT NOT LESS THAN 35,000A RMS SYMMETRICAL AT 480V, 3-PHASE, 60 HERTZ. THE CONTRACTOR SHALL OBTAIN THE CORRECT SHORT CIRCUIT CURRENT RATING OF ALL THE NEW EQUIPMENT FOR INSTALLATION FROM THE ENGINEER OF RECORD.

FUTURE PRODUCTS STILL IN DEVELOPMENT

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SYMBOLS

ALL MAY NOT APPLY

	CAUTION OR WARNING
	CRITICAL NOTE(S)
	PANEL OR ENCLOSURE BY CUSTOMER/CONTRACTOR
	OPENING IN RACEWAY OR TRENCHDUCT
	PULLBOX IN (FLOOR/WALL/CEILING)
	OPENING IN ACCESS FLOORING
DS	RF DOOR SWITCH - MCMASTER-CARR SUPPLY ROLLER LIMIT SWITCH 7076k14 PROVIDED BY CONTRACTOR, AND MOUNTED AT TOP OF DOOR. COORDINATE WITH SIEMENS PROJECT MANAGER.
EPO	(EPO) EMERGENCY POWER OFF BUTTON
	CEILING DUCT
	SURFACE MOUNTED DUCT
	VERTICAL DUCT
	ETHERNET CONNECTION TO CUSTOMER'S INFORMATION SYSTEMS NETWORK IN AN ACCESSIBLE LOCATION (VERIFY WITH SIEMENS PROJECT MANAGER).
	110 VOLT, 20 AMP, HOSPITAL GRADE DUPLEX OUTLET LOCATED NEAR THE ETHERNET CONNECTION.

REV 2

CONTRACTOR SUPPLIED CABLES

FROM	VIA	TO	DESCRIPTION	REMARKS
SOURCE	1	MP	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.	
MP	2	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.	
EPO	3	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.	
MP	4,CD3	EPC	(3) 2/0 AND (1) 2/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED. THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.	LANDED BY ELECTRICAL CONTRACTOR
MP	4,CD3	EPC	(3) 1/0 AND (1) 1/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED. THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.	LANDED BY ELECTRICAL CONTRACTOR
MP	5,CD3	GP1	(3) 2/0 AND (1) 2/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED. THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.	LANDED BY ELECTRICAL CONTRACTOR
MP	6,CD3	GP2	(3) 2/0 AND (1) 2/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED. THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.	LANDED BY ELECTRICAL CONTRACTOR

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM
CONTROL ROOM 6'-11 MINIMUM
EQUIPMENT ROOM 7'-3" MINIMUM

SYM	DATE	DESCRIPTION
0	09/28/23	

-ISSUE BLOCK-

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540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE - 0560 (GROUND FLOOR) - MAGNETOM PRISMA

SCALE: AS NOTED
REF. #: 30273767
PROJECT #: 2312308
SHEET OF 6 10
DRAWN BY: B. HERRMANN
DATE: 09/28/23
SHEET: E-101

NEXT GEN DRAFT

ATTENTION:

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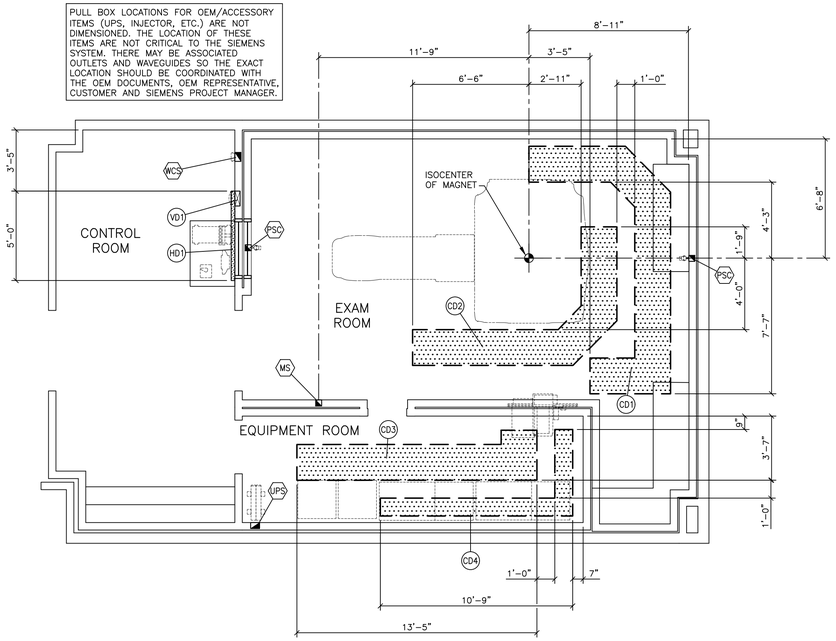
PULL BOX LOCATIONS FOR OEM/ACCESSORY ITEMS (UPS, INJECTOR, ETC.) ARE NOT DIMENSIONED. THE LOCATION OF THESE ITEMS ARE NOT CRITICAL TO THE SIEMENS SYSTEM. THERE MAY BE ASSOCIATED OUTLETS AND WAVEGUIDES SO THE EXACT LOCATION SHOULD BE COORDINATED WITH THE OEM DOCUMENTS, OEM REPRESENTATIVE, CUSTOMER AND SIEMENS PROJECT MANAGER.



ELECTRICAL DIMENSION PLAN

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

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- THIS DOCUMENT PROVIDES INFORMATION REGARDING TECHNICAL SPECIFICATIONS, AND STANDARD AND OPTIONAL FEATURES. THIS LIST SPECIFICATIONS AND FEATURES DO NOT APPLY TO ALL PRODUCTS/OR SITES.
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SYSTEM SPECIFICATION STATUS

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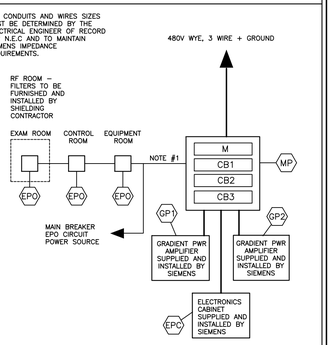
POWER QUALITY NOTES

1) IT IS THE CUSTOMER'S RESPONSIBILITY TO COMPLY WITH THE POWER QUALITY REQUIREMENTS FOR SIEMENS MEDICAL SYSTEMS EQUIPMENT.
2) THE ELECTRICAL FEEDER TO THE SIEMENS MEDICAL SYSTEMS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS, AND OTHER POTENTIAL SOURCES OF ELECTRICAL INTERFERENCE.
3) THE ELECTRICAL FEEDER TO THE IMAGING SYSTEM MUST BE RUN DIRECTLY TO A MAIN FACILITY DISTRIBUTION PANEL OR TO THE FACILITY SERVICE ENTRANCE, WITH NO OTHER LOADS POWERED FROM THIS FEEDER.
4) IN ORDER TO COMPLY WITH IMAGING SYSTEM POWER QUALITY REQUIREMENTS, ADDITIONAL POWER CONDITIONING DEVICES MAY BE REQUIRED. EXAMPLES INCLUDE VOLTAGE REGULATORS, TRANSFORMERS, SURGE PROTECTIVE DEVICES, FILTERS, AND/OR UNINTERRUPTIBLE POWER SUPPLIES (UPS). RECOMMENDED FOR THE INSTALLATION OF ELECTRONIC EQUIPMENT CAN BE FOUND IN IEEE STANDARD 1100-1999 "POWERING AND GROUNDING ELECTRONIC EQUIPMENT:
5) POWER CONDITIONING DEVICES NOT APPROVED BY SIEMENS MEDICAL SYSTEMS MAY NOT BE COMPATIBLE WITH THE MAGNETOM SYSTEM. "FERRORESONANT" POWER CONDITIONING EQUIPMENT RE-APPLIED FROM PREVIOUS GENERATION SYSTEMS IS ALSO GENERALLY EXCLUDED DUE TO HIGHER POWER REQUIREMENTS OF THE NEWER SYSTEMS.
6) INCOMING SOURCE POWER WIRES MUST BE SEPARATED FROM ANY SIEMENS CABLING BY A MINIMUM OF 12".

REV 0

POWER SCHEDULE

ALL CONDUITS AND WIRES SIZES MUST BE DETERMINED BY THE ELECTRICAL ENGINEER OF RECORD PER N.E.C AND TO MAINTAIN SIEMENS IMPEDANCE REQUIREMENTS.



ITEM	QTY	DESCRIPTION				
MP	1	MAIN PANEL WITH MAIN BREAKER FLUSH OR SURFACE MOUNTED.				
M	1	MAIN CIRCUIT BREAKER MUST HAVE TRIPPING DEVICE SO WHEN ANY EPO IS PRESSED THE MAIN BREAKER TRIPS.				
		MAIN BREAKER AMPS: SEE POWER REQUIREMENTS				
		VOLTS	PHASES	NEUTRAL	GROUND	TOTAL WIRES
		480	3	0	1	4 (NOTE 1)
CB1	1	BREAKER AMPS: SEE POWER REQUIREMENTS				
		VOLTS	PHASES	NEUTRAL	GROUND	TOTAL WIRES
		480	3	0	1	4 (NOTE 1)
CB2	1	BREAKER AMPS: SEE POWER REQUIREMENTS				
		VOLTS	PHASES	NEUTRAL	GROUND	TOTAL WIRES
		480	3	0	1	4 (NOTE 1)
CB3	1	BREAKER AMPS: 125				
		VOLTS	PHASES	NEUTRAL	GROUND	TOTAL WIRES
		480	3	0	1	4 (NOTE 1)
1) ALL WIRES MUST BE SAME SIZE. NOTE: UNLESS OTHERWISE NOTED ALL BREAKERS WILL BE 80% RATED.						
EPO	VARIES	NOTE 1 – EPO CIRCUIT #1 MAIN CIRCUIT BREAKER EMERGENCY POWER OFF BUTTON WITH PROTECTIVE COVER THAT PREVENTS ACCIDENTAL ACTIVATION. THE EPO MUST BE OF FAIL-SAFE DESIGN, ALL EPO'S TO HAVE MECHANICAL LATCHING MECHANISM. EPO MUST BE RESET BEFORE MAIN BREAKER CAN RESUME OPERATION. CONTACTS AND WIRING CONFIGURATION TO BE DESIGNED BY ELECTRICAL ENGINEER OF RECORD. NOTE 2 – EPO CIRCUIT #2 EPO CONTACTS TO BE NORMALLY CLOSED, WIRED IN SERIES, CONNECTED TO 93PM UPS ONLY. THE EPO'S MUST BE INSTALLED BY A QUALIFIED ELECTRICAL CONTRACTOR ACCORDING TO NATIONAL ELECTRICAL CODE, STATE AND LOCAL REGULATIONS. THE CUSTOMER IS SOLELY RESPONSIBLE FOR THE IMPLEMENTATION OF THE EPOs AND THEIR ASSOCIATED CIRCUITS AND MUST MAKE THE FINAL DETERMINATION CONSIDERING ALL SITE CONDITIONS AND REGULATORY FACTORS.				
UNLESS OTHERWISE NOTED, ALL ITEMS LISTED IN THIS SCHEDULE SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR. REV 2						

CLINICAL POWER REQUIREMENTS

VOLTAGE VARIATION:480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS
VOLTAGE UNBALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES

FREQUENCY:	60 Hz ± 1.0 Hz
LINE IMPEDENCE:	<95 mOHMS
CONNECTION VALUE 1	91 kVA
CONNECTION VALUE 2	91 kVA
SHORT TIME (<3 SECONDS) EACH	105 kVA
CONNECTION VALUE 3	55 kVA
SHORT TIME (<3 SECONDS)	25 kVA
TOTAL CONNECTION VALUE	220 kVA
TOTAL SYSTEM <5 SECONDS	230 kVA
CIRCUIT BREAKER 1 (GP1)	150 A
CIRCUIT BREAKER 2 (GP2)	150 A
CIRCUIT BREAKER 3 (EPC)	80 A
ALL BREAKERS ARE RATED AT 80%	

POWER QUALITY

POOR POWER WILL ALTER EQUIPMENT PERFORMANCE

IT IS IN THE CUSTOMER'S INTEREST THAT THE ELECTRICAL CONTRACTOR BE RESPONSIBLE FOR TESTING AND VERIFYING THAT THE EQUIPMENT POWER SUPPLY COMPLIES WITH THE SIEMENS SPECIFICATIONS.

DEMAND AND CAPACITY

1) IF EQUIPMENT UPGRADE IS ANTICIPATED, INSTALLING ELECTRICAL POWER TO MEET THE REQUIREMENTS OF THE HIGHER POWER GRADIENT PACKAGE AT THE TIME OF INITIAL INSTALLATION WILL REDUCE THE COST TO UPGRADE THE ELECTRICAL SYSTEM LATER.

2) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS, AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET.

3) OVER CURRENT PROTECTION IS SPECIFIED FOR SYSTEMS WITHOUT AN UNINTERRUPTIBLE POWER SUPPLY (UPS). ADDITION OF A UPS REQUIRES A HIGHER CAPACITY MAINS CONNECTION (DEPENDENT UPON UPS MODEL AND SIZE). MAXIMUM FAULT CURRENT IS DEPENDENT UPON THE IMPEDANCE OF THE FACILITY ELECTRICAL SYSTEM. THE CUSTOMER'S ARCHITECT OR ELECTRICAL CONTRACTOR TO SPECIFY AIC RATING OF OVER CURRENT PROTECTION BASED ON FACILITY IMPEDANCE CHARACTERISTICS.

4) MOMENTARY POWER IS BASED ON A MAXIMUM RMS VALUE FOR A PERIOD NOT TO EXCEED FIVE (5) SECONDS, AS DEFINED IN NEC. 517.2. STAND-BY AND AVERAGE CURRENT ARE SUBSTANTIALLY LOWER.

5) THE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VOLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS USED TO OBTAIN THE PROPER EQUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.

6) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.

7) A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (>8x RATED CURRENT) IS REQUIRED TO PERMIT SWITCH-ON OF THE UPS SYSTEM WITHOUT SPURIOUS TRIPPING. CIRCUIT BREAKERS WITH AN ADJUSTABLE MAGNETIC TRIP (SIEMENS FD6 SERIES OR SIMILAR) ARE HIGHLY RECOMMENDED.

REV 1

ELECTRICAL INSTALLATION NOTES

1) INSTALL THE MR SYSTEM CIRCUIT BREAKER IN OR NEAR THE EQUIPMENT ROOM. THE PERMITTED FRINGE FIELD FOR THE PANEL IS UP TO 3mT. IF THE FRINGE FIELDS HAVE HIGHER VALUES, MAGNETIC SHIELDING MUST BE PROVIDED OR THE DISTANCE FROM THE MAGNET MUST BE INCREASED.

2) AN ACCEPTABLE MEANS FOR SWITCHING MAIN POWER ON AND OFF SHOULD BE INSTALLED IN THE MAIN BREAKER PANEL. INSTALL EMERGENCY SHUTDOWN BUTTONS IN EACH ROOM WHERE THERE IS SIEMENS EQUIPMENT.

3) THE ELECTRICAL FEEDER TO THE SIEMENS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS AND OTHER POTENTIAL SOURCES OF ELECTRICAL INTERFERENCE.

4) THE EMERGENCY POWER OFF (EPO) BUTTONS ARE TO BE MUSHROOM TYPE WITH PUSH LOCK AND PULL TO RELEASE.

5) WALL RECEPTACLES MADE OF FERROMAGNETIC MATERIALS ARE NOT PERMITTED IN THE EXAM ROOM. PERIPHERAL UNITS (SUCH AS VENTILATORS) NOT APPROVED FOR USE IN A HIGH MAGNETIC FIELD ENVIRONMENT CAN INFLUENCE THE MAGNETIC FIELD, COMPROMISING IMAGE QUALITY. THE CUSTOMER IS RESPONSIBLE FOR INSTALLATION AND USE OF RECEPTACLES IN THE EXAM ROOM. INSTALLATION OF RECEPTACLES AND THE FILTERS REQUIRED ARE TO BE COORDINATED WITH THE RF SHIELDING SUPPLIER.

6) THE RF SHIELD MUST BE FITTED WITH A GROUND STUD OR BUS BAR, LOCATED WITHIN 24" OF THE AUXILIARY FILTERS FOR ROOM LIGHTS AND OUTLETS, SUPPLIED AND INSTALLED BY THE RF SHIELD SUPPLIER.

7) IN ORDER TO PREVENT GROUND LOOPS, ALL CUSTOMER OR CUSTOMER/CONTRACTOR SUPPLIED AC POWER ENTERING THE EXAMINATION ROOM (I.E. OUTLETS, EPO, ETC.) SHOULD BE SUPPLIED VIA AN ISOLATION TRANSFORMER. THE ISOLATION TRANSFORMER SECONDARY WINDING GROUND CONDUCTOR SHOULD BE CONNECTED TO THE RF SHIELD GROUND STUD OR BUS BAR.

REV 1

GROUNDING NOTES

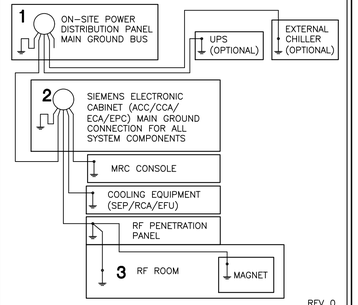
EQUIPMENT GROUNDING CONDUCTOR TO COMPLY WITH THE FOLLOWING:

1) SIZE GROUNDING WIRE TO SIEMENS EQUIPMENT PER POWER SCHEDULE REQUIREMENTS.
2) DERIVED FROM THE ELECTRICAL SERVICE, TRANSFORMER OR MAIN DISTRIBUTION PANEL FEEDING THE SIEMENS EQUIPMENT.
3) RUN IN THE SAME CONDUIT, TROUGH OR RACEWAY AS THE PHASE CONDUCTORS.
4) CONTINUOUS, WITH NO BREAKS OR USE OF CONDUIT, CHASSIS OR EARTH AS THE SOLE GROUNDING PATH.
5) BONDED TO CHASSIS AND/OR CONDUIT IN ACCORDANCE WITH THE NEC REQUIREMENTS.
6) MINIMIZE CONNECTIONS OR TERMINALS TO ENSURE CONTINUITY OVER THE LIFE OF THE INSTALLATION.
7) AS A NORM, THERE SHOULD NOT BE ANY CURRENT PRESENCE ON THE GROUND CONDUCTOR, BUT IT IS ACCEPTABLE TO HAVE <u>≤500mA</u> DURING OPERATION OF THE IMAGING EQUIPMENT.

MR GROUNDING NOTES

THE INTERNAL GROUND WIRING OF THE MR SYSTEM MUST BE INSTALLED WITH MINIMUM GROUND LOOPS. THIS IS TO PREVENT NOISE CURRENTS AND GENERAL DISTURBANCES FROM FLOWING THROUGH THE GROUNDING PATH.

TO ACHIEVE SUCH GROUNDING, THREE MAJOR GROUND POINTS SHOULD BE USED.



REV 0

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM
CONTROL ROOM 6'-11 MINIMUM
EQUIPMENT ROOM 7'-3" MINIMUM

NEXT GEN DRAFT

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SYM	DATE	DESCRIPTION
1	09/28/23	

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SIEMENS

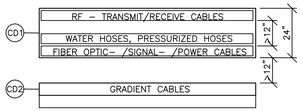
WAYNE STATE UNIVERSITY

540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

PROJECT #: 2312308
SHEET: E-102
SHEET OF 7 10
DRAWN BY: B. HERRMANN
SCALE: AS NOTED
REF. #: 30273767
DATE: 09/28/23

REFERENCE DOCUMENT - NOT FOR CONSTRUCTION

THE PROPER ROUTING OF CABLES IS ESSENTIAL TO ACHIEVE GOOD IMAGE QUALITY. RF CABLES MUST BE SEPARATED FROM FIBER OPTIC BY AT LEAST 12" AND FROM THE GRADIENT CABLES BY AT LEAST 12".FIBER OPTIC CABLES MUST ALSO BE SEPARATED FROM THE GRADIENT CABLES BY AT LEAST 12". THIS SHOWS RACEWAY/CABLE ROUTING.



THIS CABLE TRAY MAY BE 6" OR 12" WIDE, SEE ELECTRICAL LEGEND.

CABLE DESIGNATIONS ARE SHOWN AS AN EXAMPLE, ANY CATEGORY CABLE CAN BE LOCATED IN ANY OF THE COMPARTMENTS OF THE RACEWAY AS LONG AS CORRECT SEPARATIONS ARE MAINTAINED.

WHEN ROUTING RACEWAYS, DO NOT EXCEED THE MAXIMUM LENGTHS LISTED IN DETAIL E-501/2. EXCESS CABLE SHOULD BE ROUTED IN THE RACEWAY IN A MEANDERING METHOD, NEVER ROLLED IN LOOPS.

THE BENDING RADIUS FOR THE CABLES MUST BE MAINTAINED.
TRANSMITTER CABLE – 5" WHEN BENT ONCE.
TRANSMITTER CABLE – 14.25 WHEN BENT SEVERAL TIMES.
FIBER OPTIC CABLE – 6"
GRADIENT CABLE – 5.5" (ONLY WITH EXTENDED CABLE SET)
FIBER OPTIC CABLE FOR PATIENT OBSERVATION – 2"

REV 0

2 **CABLE SEPARATION** SCALE: NONE

CABLE PROTECTION

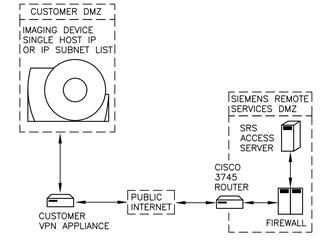
CABLES ARE NOT PLENUM RATED. ALL CABLES MUST BE ROUTED IN CABLE DUCTS OR CABLE CONDUITS.

SIEMENS SMART REMOTE SERVICE

TO ENSURE THE UPTIME OF YOUR SYSTEM DURING THE WARRANTY PERIOD (AND BEYOND WITH A SERVICE AGREEMENT), SIEMENS REMOTE SERVICES (SRS) REQUIRES REMOTE LOCAL AREA NETWORK ACCESS TO SIEMENS SYSTEMS.

THE PREFERRED CONNECTION METHOD IS (VPN) VIRTUAL PRIVATE NETWORK (WHERE THE CUSTOMER HAS AVAILABLE A VPN CAPABLE FIREWALL OR OTHER VPN APPLIANCE). THIS METHOD PROVIDES THE POSSIBILITY FOR REMOTE SYSTEM DIAGNOSTICS WITHOUT ADDITIONAL HARDWARE. PLEASE CONTACT SIEMENS SMART REMOTE SERVICES TO DETERMINE BEST IMPLEMENTATION FOR YOUR SITE. CONTACT:

IMCPTSCSRS.DL@SIEMENS-HEALTHINEERS.COM.



CONDUITS AND RACEWAYS

1) ALL POWER CONDUCTORS SUPPLIED BY THE CUSTOMER/ CONTRACTOR SHALL BE INSTALLED IN METAL RACEWAY, 600 VOLT CLASS, STRANDED TYPE THHN-THWN, RATED FOR 75°C (165°F) OPERATION. RECOMMEND MINIMUM 5 FEET WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY SIEMENS MEDICAL SYSTEMS.

2) THE CABLE GROUPS INCLUDED WITH THE MAGNETOM SYSTEM MAY BE ROUTED IN THE SAME CABLE TRAY IF PROVIDED WITH AN 8" SEPARATION BETWEEN SMALL SIGNAL LINES, GRADIENT CABLES, AND THE RF TRANSMIT CABLE. A 24" WIDE LADDER TYPE CABLE TRAY IS RECOMMENDED. CABLES SHOULD NOT BE BUNDLED TOGETHER.

3) NOTE THE CABLE CONNECTOR SIZES (LARGEST CONNECTOR SIZE IS 2 1/2" x 2 1/2") FOR CABLE FEED-THROUGHS AND CABLE DUCTS.

4) THE CABLE LENGTHS SPECIFIED ARE THE STANDARD LENGTHS.

5) THE SIEMENS SYSTEM CABLES ARE NOT PLENUM RATED AND SHOULD NOT BE RUN UNPROTECTED IN AN AIR PLENUM UNLESS ENCLOSED IN A SEALED CABLE TRAY OR CONDUIT.

REV 0

CABLE LENGTH RESTRICTIONS

1) THE CABLE SET LENGTH IDENTIFIES THE "FREE CABLE LENGTH". THIS IS THE LENGTH FROM CONNECTION POINT TO CONNECTION POINT. THE CABLE LENGTH IS NOT THE DISTANCE BETWEEN COMPONENTS.

2) THE GRADIENT CABLES INSIDE THE RF SHIELDED ROOM ARE 6'-0" SHORTER THAN THE OTHER SYSTEM CABLES. THIS MEANS THAT IF THE 22' CABLE SET IS SELECTED, THE GRADIENT CABLES WILL BE 16' IN LENGTH. THE GRADIENT CABLES NEED TO GO UP INTO THE CABLE TRAY IN THE CEILING AT THE FILTER PLATE AND DOWN AT THE MAGNET. THESE VERTICAL RUNS MUST BE DEDUCTED FROM THE TOTAL CABLE LENGTH OF 16'.

REV 0

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MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

PROJECT #: 2312308

SHEET: E-501

SHEET 8 OF 10

DRAWN BY: B. HERRMANN

SCALE: AS NOTED

REF. #: 30273767

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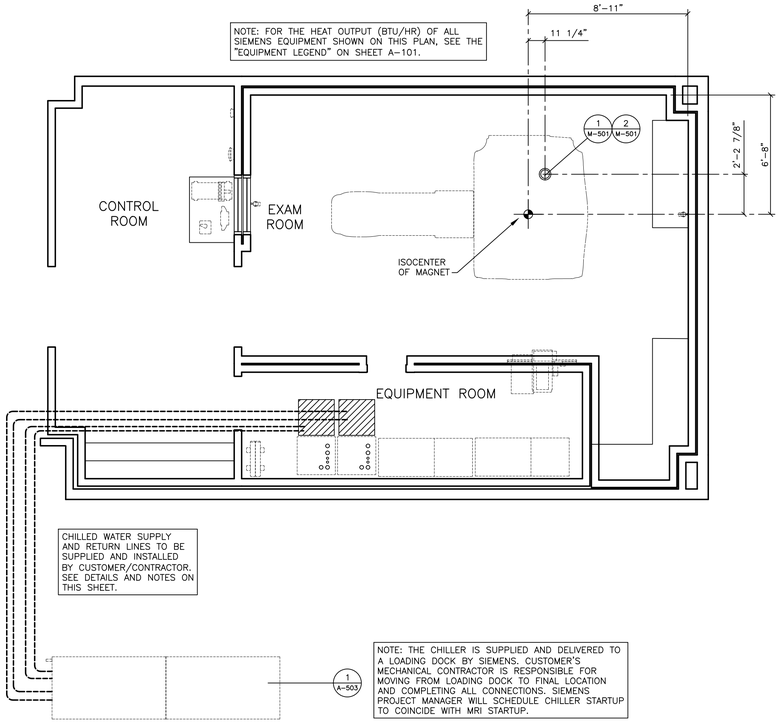
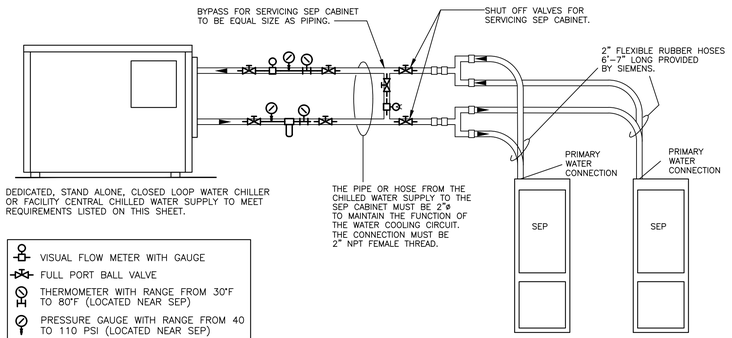


MECHANICAL PLAN

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

WATER SUPPLY



- VISUAL FLOW METER WITH GAUGE
- FULL PORT BALL VALVE
- THERMOMETER WITH RANGE FROM 30°F TO 80°F (LOCATED NEAR SEP)
- PRESSURE GAUGE WITH RANGE FROM 40 TO 110 PSI (LOCATED NEAR SEP)
- BOILER DRAIN
- 700 uM FILTER

COOLING WATER (SEP CABINET)

WATER QUALITY	pH-VALUE : 6 TO 8 HARDNESS : < 250 ppm $CaCO_3$ INITIAL FILLING OF THE SECONDARY CHILLED WATER LOOP REQUIRES AN INDUSTRIAL OR PROCESS WATER CONNECTION WITHIN 49 FEET OF THE SEP CABINET. DO NOT USE ANY CONNECTION TO A DRINKING WATER SYSTEM. CHORINE GAS CONCENTRATION : < 200 ppm SULFATE GAS CONCENTRATION : < 200 ppm FILTRATION : 700 µm -THE INSTALLED STRAINER DOES APPLY TO THIS VALUE.
SEP CABINET 1	HEAT DISSIPATION TO WATER : 153,684 BTU/hr (45 kW) WATER FLOW RATE : 21.1 GPM ± 2.5 GPM; FROM ON SITE CHILLER TO SEP. WATER SUPPLY TEMPERATURE : 42.8°F – 53.6°F. PRIMARY WATER PRESSURE : MAXIMUM 87 PSI PRESSURE LOSS ACROSS SEP : MAXIMUM 8.7 PSI (AT 26 GPM/MINUTE).
SEP CABINET 2	HEAT DISSIPATION TO WATER : 187,835 BTU/hr (55 kW) WATER FLOW RATE : 23.8 GPM ±2.5 GPM FROM ON SITE CHILLER TO SEP. WATER SUPPLY TEMPERATURE : 42.8°F – 53.6°F. PRIMARY WATER PRESSURE : MAXIMUM 87 PSI PRESSURE LOSS ACROSS SEP : MAXIMUM 8.7 PSI (AT 26 GPM/MINUTE).

PIPING MATERIAL

TO BE USED	NOT TO BE USED
STAINLESS STEEL (V2A, V4A)	ALUMINUM
NON-FERROUS METAL (COPPER, BRASS)	IRON, CARBON STEEL
SYNTHETIC MATERIALS, PLASTIC	ZINC PLATED STEEL
BRAZING SOLDER, HARD SOLDER	ZINC
FITTING SOLDER TYPES 3 AND 4	STANDARD STEEL PIPES

THE CUSTOMER/CONTRACTOR IS TO PROVIDE 31 GALLONS OF DISTILLED WATER FOR FILLING THE SYSTEM.

THE PIPE/HOSE DIAMETER BETWEEN THE MR CHILLER AND AND SEP MUST BE 2 INCHES. IF OTHER DIAMETERS ARE USED, THE FUNCTION OF THE COOLING CIRCUIT WILL BE AFFECTED. THE WATER CIRCUIT BETWEEN CENTRAL WATER SUPPLY AND SEP HAS TO BE FLUSHED BEFORE CONNECTING. THE COOLING WATER USED HAS TO MEET OUR SPECIFICATIONS.

MECHANICAL NOTES

1) THE AIR H.V.A.C. SYSTEM MUST OPERATE FOR A MINIMUM OF 48 CONSECUTIVE HOURS PRIOR TO THE DELIVERY OF THE EQUIPMENT.

2) THE FILTERS MUST BE CHANGED IMMEDIATELY PRIOR TO THE DELIVERY OF THE EQUIPMENT.

3) SIEMENS REQUIRES THE USE OF A DEDICATED H.V.A.C. SYSTEM FOR THE EQUIPMENT ROOM TO BE LOCATED, SIZED AND SPECIFIED BY THE MECHANICAL ENGINEER OF RECORD AND TO BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

4) SIEMENS RECOMMENDS THAT THE CUSTOMER PROVIDE AND INSTALL AN OXYGEN MONITORING SYSTEM WITH VISUAL AND AUDIBLE ALARMS TO INDICATE WHEN THE OXYGEN CONTAINED IN AMBIENT AIR FALLS BELOW PRE-PROGRAMMED SAFETY LEVELS WITH THE SENSOR TO BE LOCATED IN THE SCAN ROOM IN THE AREA DESIGNATED FOR CRYOGEN FILLING.

5) THE SIEMENS ACTIVE SHIELDED MAGNET RECIRCULATES LIQUID HELIUM, ELIMINATING THE NEED FOR A DEDICATED CRYOGEN STORAGE AREA. THE RECIRCULATING SYSTEM SIGNIFICANTLY REDUCES THE HELIUM "BOIL OFF". THE MAGNET WILL REQUIRE OCCASIONAL FILLING, A DELIVERY ROUTE FOR CRYOGEN DEWARS MUST BE ESTABLISHED. A MINIMUM 36" CLEARANCE IS REQUIRED.

REV 0

FIRE CONTROL NOTES

1) SIEMENS HAS NO SPECIFIC REQUIREMENT FOR FIRE PROTECTION. FIRE PROTECTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH LOCAL CODES AND CUSTOMER'S INSURANCE REQUIREMENTS. ALL FIRE PROTECTION SYSTEMS SHALL BE DEFINED BY THE ARCHITECT OF RECORD WITH DESIGN, SPECIFICATION AND DETAILING OF THE FIRE PROTECTION SYSTEM BY THE MECHANICAL ENGINEER OF RECORD IN ACCORDANCE WITH SIEMENS GUIDELINES AS STATED HEREIN. THE ELECTRONIC EQUIPMENT OF THE MR SYSTEMS WILL BE DAMAGED BY WATER, REDUCTION OR ELIMINATION OF WATER USED FOR FIRE SUPPRESSION WILL REDUCE POTENTIAL WATER DAMAGE. PRE-ACTION INERT GAS, OR HALOCARBONS OR OTHER METHODS CAN REDUCE OR ELIMINATE WATER. REFER TO YOUR FIRE PROTECTION PROFESSIONAL.

2) THE USE OF SMOKE DETECTORS INSIDE OF THE MR EXAMINATION ROOM IS NOT RECOMMENDED. SMOKE DETECTORS, BY DESIGN, CAN GENERATE NOISE THAT MAY INTERFERE WITH THE MRI EXAMINATION AND CAUSE IMAGE ARTIFACTS. IF THE USE OF A SMOKE DETECTOR IN THE EXAMINATION ROOM IS MANDATED BY LOCAL REQUIREMENTS, SPECIAL NOISE TESTS MUST BE PERFORMED BY SIEMENS SERVICE AFTER THE MRI IS OPERATIONAL. MRI EQUIPMENT PERFORMANCE PROBLEMS DUE TO SMOKE DETECTORS ARE THE RESPONSIBILITY OF THE CUSTOMER AND ARE NOT COVERED UNDER WARRANTY OR SERVICE AGREEMENT.

3) ALL MATERIAL USED INSIDE THE MAGNET ROOM SHALL BE NON-MAGNETIC. SEE CONSTRUCTION REQUIREMENTS.

4) ALL PENETRATIONS IN THE RF CABIN/SHIELD SHALL BE THROUGH A WAVE GUIDE TO BE EQUIPPED WITH A DIELECTRIC COUPLER ON BOTH ENDS OF THE WAVE GUIDE. ALL WAVE GUIDES SHALL BE DESIGNED, DETAILED AND SPECIFIED BY THE RF CABIN/SHIELD CONTRACTOR WITH ALL LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND MECHANICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION, AND FABRICATION OF THE RF CABIN/SHIELD.

5) EACH ELECTRICAL PENETRATION OF THE RF CABIN/SHIELD FOR ELECTRICAL SERVICING OF THE FIRE PROTECTION SYSTEM SHALL BE THROUGH AN RF FILTER TO BE SUPPLIED BY THE RF SHIELD CONTRACTOR WITH FILTER LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND THE ELECTRICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION AND FABRICATION OF THE RF CABIN/SHIELD.

6) IT IS PERMISSIBLE TO RUN "BLACK PIPE" UP TO THE DIELECTRIC COUPLER ON THE OUTSIDE OF THE RF SHIELD.

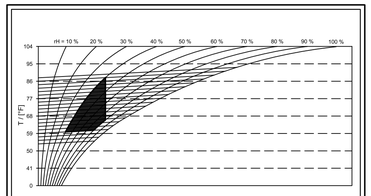
7) THERE MUST BE NO GROUND CONNECTIONS MADE DURING THE THE INSTALLATION OF EITHER THE PIPING OR ELECTRICAL FOR THE FIRE PROTECTION SYSTEM.

8) THE USE OF HALON IS NOT ACCEPTABLE.

9) THE LOCATION OF FIRE CONTROL SYSTEM COMPONENTS SHALL BE COORDINATED THROUGH THE ARCHITECT OF RECORD WITH ALL LOCATIONS TO BE COORDINATED WITH SIEMENS EQUIPMENT LOCATIONS AS SHOWN ON THE 1/4" SCALE EQUIPMENT LOCATION PLAN.

10) THE FIRE CONTROL CONTRACTOR SHALL VERIFY EQUIPMENT MOUNTING PROCEDURES AND LOCATIONS ON ANY WALLS CONTAINING RF SHIELDING WITH THE SIEMENS PROJECT MANAGER PRIOR TO THE COMMENCEMENT OF WORK.

REV 1



REV 0

–	TEMPERATURE/HUMIDITY	SCALE: NONE

ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F-71°F IN THE EXAM ROOM, 59°F-85°F IN THE EQUIPMENT & CONTROL AREAS, RELATIVE HUMIDITY OF 40-60% (NON-CONDENSING) IS REQUIRED EXAMINATION ROOM AND 40-80% (NON-CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK.

2) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS RECOMMENDED FOR THE EXAM ROOM. A MINIMUM AIR EXCHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED. IT IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-50% FRESH AIR INTAKE. AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED CONTROL AND SENSOR TO MONITOR AND ADJUST THE AIR.

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,246 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 3,412 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY, AUXILIARY SUPPORT EQUIPMENT (ie. UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.

4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST AIR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST AIR SHOULD BE INSTALLED AT LEAST 6'-6" ABOVE FINISHED FLOOR.

5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.

6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING, IT IS RECOMMENDED TO INSTALL AN ON-SITE FILTER TO REMOVE DUST PARTICLES GREATER THAN 10 MICRONS.

7) DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET. THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET.

CHILLED WATER SUPPLY

A CHILLED WATER SUPPLY IS REQUIRED TO THE MRI SYSTEM 24 HOURS A DAY, YEAR ROUND FOR THE COLD HEAD AND GRADIENT SYSTEMS. THIS CAN BE PROVIDED BY A CENTRAL CHILLED WATER SUPPLY OR A SEPARATE STAND ALONE CHILLER THAT MEETS THE STATED REQUIREMENTS. CHILLED WATER CAN ALSO BE SUPPLIED BY A CHILLER PROVIDED BY SIEMENS.

TWO SEPARATOR CABINETS (SEP) ARE INCLUDED WITH THE SIEMENS ORDER TO INTERFACE WITH THE CHILLER. THE PIPE SIZE BETWEEN THE WATER SUPPLY AND SEP MUST MEET MANUFACTURER AND SIEMENS REQUIREMENTS; LARGER DIAMETER PIPE MAY BE REQUIRED DUE TO LENGTH OF RUN. FLOW AND PRESSURE REQUIREMENTS MUST BE MET.

PERMISSIBLE MATERIALS THAT CAN BE USED FOR THE PIPING ARE: STAINLESS STEEL (V2A, V4A), NON-FERROUS METAL (COPPER, BRASS), SYNTHETIC MATERIAL, PLASTICS, BRAZING SOLDER, HARD SOLDER, OR FITTING SOLDER TYPE 3 AND 4. THERE ARE MATERIALS THAT MAY CAUSE DAMAGE TO THE COOLING SYSTEM AND CANNOT BE USED, THESE MATERIALS ARE ALUMINUM, IRON, CARBON STEEL, ZINC, ZINC PLATED STEEL, OR STANDARD STEEL PIPES.

27 GALLONS OF DISTILLED/DE-IONIZED WATER MUST BE PROVIDED AND INSTALLED BY CUSTOMER/CONTRACTOR FOR FILLING THE SECONDARY CHILLED WATER CIRCUIT.

SEE MANUFACTURER'S REQUIREMENTS FOR GLYCOL AND WATER QUALITY TO BE PROVIDED AND FILLED BY CUSTOMER/CONTRACTOR.

THE SUPPLY AND RETURN CHILLED WATER PIPES MUST BE LABELED. THE LOCATION OF THE LABELS MUST BE AT ALL CONNECTION AND REFILLING POINTS AND MUST CONTAIN FLOW DIRECTION AND CONTENTS.

FUTURE PRODUCTS STILL IN DEVELOPMENT

- THIS PRODUCT IS UNDER DEVELOPMENT AND NOT COMMERCIALLY AVAILABLE. ITS FUTURE AVAILABILITY CANNOT BE ENSURED.
- THIS DOCUMENT PROVIDES INFORMATION REGARDING TECHNICAL SPECIFICATIONS, AND STANDARD AND OPTIONAL FEATURES. THIS LIST SPECIFICATIONS AND FEATURES DO NOT APPLY TO ALL PRODUCTS/OR SITES.
- THIS INFORMATION IS DRAFT STAGES AND SUBJECT TO CHANGE, FOR REFERENCE ONLY.

SYSTEM SPECIFICATION STATUS

PLEASE NOTE: CURRENT STATUS IS DRAFT

SIEMENS RESERVES THE RIGHT TO MAKE CHANGES AND OTHER MODIFICATIONS BASED UPON, BUT NOT LIMITED TO, NEW TECHNICAL DEVELOPMENTS. UNTIL RELEASE OF THE PLANNING GUIDELINE, CONTENT OF PRELIMINARY AND FINAL PLANNING IS SUBJECT TO CHANGE AND MODIFICATION.

COMPRESSOR LINE INSULATION

COMPRESSOR LINES RUNNING FROM THE COMPRESSOR (OR SEP CABINET) TO THE MAGNET ARE INSULATED BY SIEMENS. ADDITIONAL INSULATION (ARMAFLEX OR EQUIVALENT) FOR NOISE REDUCTION (CHIRPING) MAY BE REQUIRED. ADDITIONAL INSULATION NOT PROVIDED BY SIEMENS.

REV 0

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM
CONTROL ROOM 6'-11 MINIMUM
EQUIPMENT ROOM 7'-3" MINIMUM

NEXT GEN DRAFT

SYM	DATE	DESCRIPTION
0	09/28/23	

-ISSUE BLOCK-

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SIEMENS

WAYNE STATE UNIVERSITY
540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

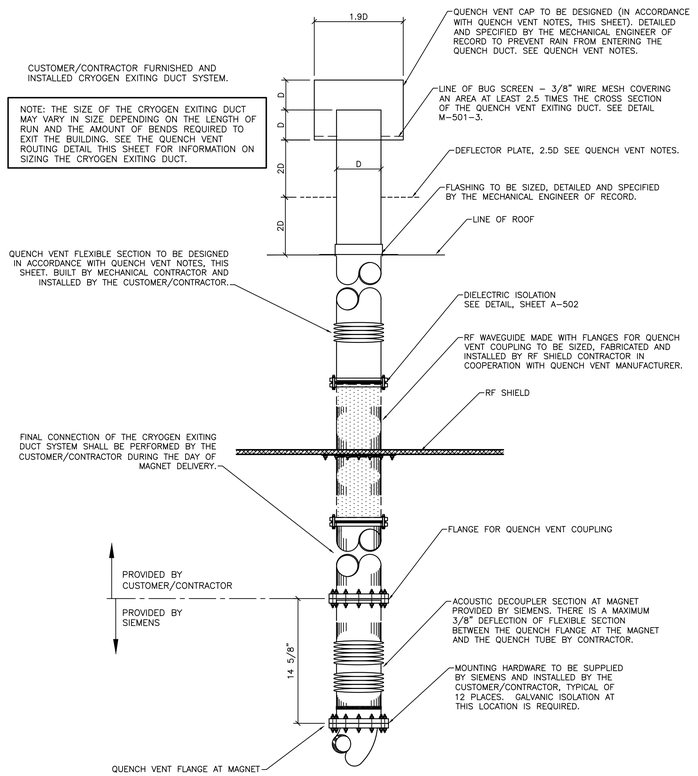
PROJECT #: 2312308
SHEET OF 9 10
DRAWN BY: B. HERRMANN
SCALE: AS NOTED
REF. #: 30273767
DATE: 09/28/23

SHEET: M-101

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.
- THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.
- THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

NOT FOR CONSTRUCTION - REFERENCE DOCUMENT



CRYOGEN EXITING DUCT SYSTEM NOTES:

1) THE MECHANICAL ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR THE DESIGN, DETAIL AND SPECIFICATION OF THE CRYOGEN EXITING DUCT SYSTEM WITH ALL WORK TO PERFORMED BY THE CUSTOMER/CONTRACTOR UNLESS SPECIFIED OTHERWISE.

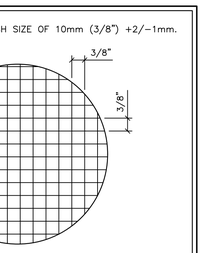
2) TAKE PROPER PRECAUTIONS WHEN FIELD WELDING IN THE VICINITY OF LIQUEFIED/FROZEN OXYGEN.

3) UNLESS SPECIFIED OTHERWISE ALL MATERIAL AND WORK SHALL BE PERFORMED BY THE CUSTOMER/CONTRACTOR WITH FINAL CONNECTION OF THE CRYOGEN EXITING DUCT SYSTEM TO THE SIEMENS MAGNET TO BE PERFORMED BY THE CUSTOMER/CONTRACTOR UNDER SIEMENS' SUPERVISION.

4) THE DIAMETER OF THE CRYOGEN EXITING DUCT MAY VARY WITH ACTUAL ROUTING.

REV 0

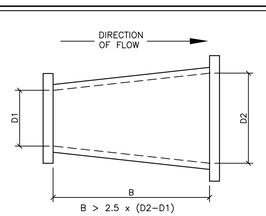
–	QUENCH VENT DUCT SYSTEM DETAIL	SCALE: NO SCALE



A SQUARE, STAINLESS STEEL WIRE MESH MUST BE FITTED TO ALL OUTLETS. THE AREA OF THE MESH MUST BE >2.5 TIMES THE AREA OF THE QUENCH VENT OUTLET.

REV 1

3	QUENCH VENT MESH	NO SCALE



EXPANSION TO A GREATER DIAMETER TUBE CAN BE ACCOMPLISHED BY USE OF A DIFFUSER. THE DIFFUSER MUST MEET QUENCH VENT REQUIREMENTS AND THE GEOMETRIC PARAMETERS SHOWN HERE. THE DIAMETER OF THE PIPE SHOULD NEVER DECREASE IN THE DIRECTION OF FLOW.

REV 0

–	QUENCH VENT DIFFUSER	NO SCALE

CRYOGEN NOTES

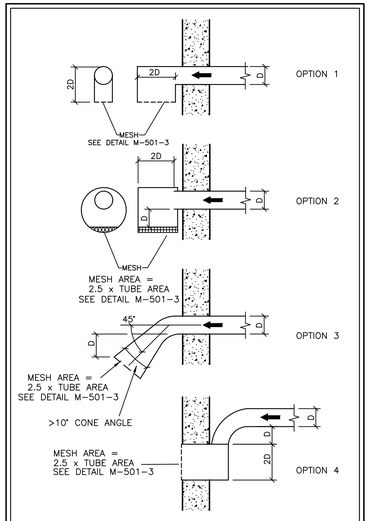
1) "CRYOGENS" IS A TERM USED TO IDENTIFY THE REFRIGERANT USED TO MAKE THE MAGNET "SUPER-CONDUCTING", IN THIS APPLICATION, LIQUID AND GASEOUS HELIUM. SPECIAL CARE MUST BE TAKEN DURING THE TRANSFILLING OF THE MAGNET WITH CRYOGENS AND NORMAL EXHAUST OF CRYOGENS FROM THE SYSTEM. ASIDE FROM THE OBVIOUS DANGER OF FREEZING, HELIUM GAS WILL ALSO DISPLACE THE OXYGEN IN THE ROOM. THE INSTALLATION OF AN APPROVED TOXGARD MONITORING SYSTEM IS RECOMMENDED.

2) THERE SHALL BE A TRANSPORT ROUTE FOR DELIVERY OF CRYOGENS TO THE EXAM ROOM. SPECIAL VESSELS CALLED DEWARS ARE USED TO TRANSPORT HELIUM. A 250 LITER DEWAR WEIGHS 335 POUNDS AND HAS A 32" DIAMETER, A 500 LITER IS 540 POUNDS, AND IS 42" IN DIAMETER.

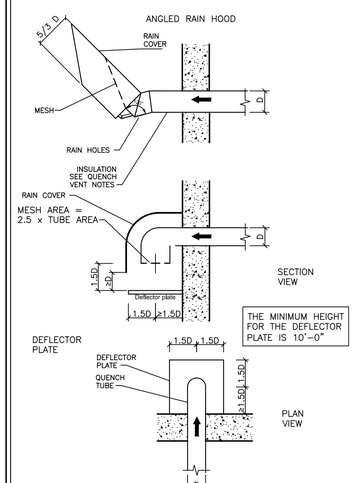
3) HELIUM GAS CYLINDERS MAY BE USED DURING THE INITIAL FILLING OF HELIUM INTO THE MAGNET. THE FACILITY IN WHICH THESE MAY BE USED NEEDS TO HAVE THE ABILITY TO TEMPORARILY STORE AND SECURE THESE CYLINDERS THAT WILL PREVENT THEM FROM INADVERTENTLY FALLING OVER.

4) OUTSIDE VENTING OF THE HELIUM IS TO BE PROVIDED BY MEANS OF A VENT PIPE OF NON-MAGNETIC MATERIAL CALLED A QUENCH VENT.

REV 0



OPTIONS FOR QUENCH TUBE EXITING THROUGH A WALL



SEE QUENCH VENT NOTES

REV 1

–	HORIZONTAL OUTLET	SCALE: NONE

QUENCH VENT NOTES

QUENCH VENT DESIGN INSTRUCTIONS

1) IN THE EVENT OF A QUENCH, THE THERMAL ENERGY DISSIPATED CAUSES AN EXTREMELY RAPID BOIL OFF OF THE LIQUID HELIUM. THE SYSTEM MUST BE CAPABLE OF VENTING THE LARGE VOLUME OF GAS GENERATED AT THE APPROXIMATE EXPANSION RATIO OF 1:700 FROM LIQUID AT 4.2°K TO ROOM TEMPERATURE GAS. THE EXHAUST SYSTEM IS CRITICAL FOR THE SAFE OPERATION OF THE MAGNET, THE DATA IN THIS DOCUMENT MUST BE FOLLOWED. SINCE HELIUM VENTED IN A QUENCH IS AN ASPHYXIANT & AN EXTREMELY COLD GAS, THE QUENCH TUBE MUST ALWAYS END AT A POINT WHERE ACCESS BY PEOPLE IS NOT POSSIBLE. QUENCH TUBE PLANNING MUST ONLY BE DONE BY QUALIFIED PERSONNEL. IT IS THE OWNER'S RESPONSIBILITY TO ENSURE THAT THE QUENCH TUBE IS MAINTAINED IN AN OPERABLE STATE.

2) IF THE QUENCH VENT IS NOT CONFIGURED CORRECTLY THERE IS A RISK OF DANGER THAT MAY LEAD TO DEATH OR SERIOUS INJURY AND CAN RESULT IN STRUCTURAL DAMAGE. THE EXHAUST MUST NOT BE VENTED IN AN ENCLOSED SPACE. THE OPERATOR OF THE SYSTEM MUST PREPARE AN EMERGENCY PLAN IN THE EVENT OF A QUENCH.

3) THE QUENCH TUBE CONSISTS OF STRAIGHT, HYDRAULICALLY SMOOTH SECTIONS, BENDS UP TO 90° AND A DIFFUSER, IF REQUIRED. THE END OF THE TUBE MUST BE PROTECTED FROM RAIN, SNOW, AND FOREIGN OBJECTS. ROUND SECTIONS ONLY. NO SQUARE SECTIONS.

4) THE SIEMENS MAGNET HAS A QUENCH VALVE ASSEMBLY FOR CONNECTION TO THE TUBE LOCATED AT THE TOP LEFT SIDE OF THE MAGNET (SEE MAGNET ELEVATION). THE MECHANICAL CONTRACTOR WILL SUPPLY AND INSTALL A QUENCH VENT TUBE WITH CAP, TO BE NON-MAGNETIC STAINLESS STEEL (≥22 GAUGE RECOMMENDED). GRADES AISI304, 309, 316, OR 321 ONLY. THERMAL CONDITIONS MAY CAUSE THE TUBE TO CONTRACT UP TO 3mm/METER SO A STAINLESS STEEL BELLOWS OR FLEXIBLE SECTION MUST BE INSTALLED A MINIMUM OF EVERY 32'–9" NOT TO EXCEED 2% OF THE OVERALL LENGTH. THE QUENCH TUBE MAY ALSO BE MADE OF ALUMINUM, EXTRUDED TUBE ALUMINUM GRADES 6063 AND 6082 ONLY MUST BE USED. ROLLED AND WELDED TUBE FROM SHEET ALUMINUM GRADE 5083 ONLY MUST BE USED. THE WALL SECTIONS OF ALUMINUM TUBE MUST BE A MINIMUM 14 GAUGE. THERMAL CONTRACTION OF 4.5 MM/METER MUST BE CONSIDERED FOR ALUMINUM QUENCH TUBES. THE MOVEMENT OF THE BELLOWS MUST BE RESTRICTED TO PREVENT EXCESSIVE EXPANSION DUE TO PRESSURE. THE WEIGHT OF THE TUBE MUST BE SUPPORTED BY THE BUILDING AND BE FLEXIBLE ENOUGH TO ALLOW MOVEMENT FROM THERMAL CONTRACTION. THE WALL EXIT SHOULD ALSO BE FLEXIBLE.

PRESSURE CALCULATION

5) THE MAXIMUM INTERNAL PRESSURE IS CALCULATED AT 1.45 PSI. THE MAXIMUM PRESSURE SHOULD BE ENGINEERED FOR 6.5 PSI.

6) USE THE QUENCH VENT CALCULATOR PROVIDED BY SIEMENS TO DESIGN A QUENCH VENT THAT MEETS DESIGN REQUIREMENTS FOR DIAMETER, LENGTH, NUMBER OF ELBOWS AND PRESSURE DROP. ALL BENDS MUST BE SMOOTH WALLED AND HAVE A CENTERLINE TO INTERNAL PIPE DIAMETER RATIO OF 1.5 TO 5.0. EXPANSIONS TO PIPE DIAMETER CAN BE DONE WITH A DIFFUSER, ONLY ROUND TUBE SECTIONS MAY BE USED, RECTANGULAR SECTIONS ARE NOT ALLOWED.

7) THERE MUST BE A 12–19 INCH FLEXIBLE SECTION OF PIPE FOR CONNECTION TO THE QUENCH VALVE AT THE MAGNET WITH AN INSIDE DIAMETER GREATER THAN 4" (1.5T) OR 6" (3.0T) AND ABLE TO WITHSTAND 6.5 PSI.

CONNECTING SECTIONS

8) SECTIONS OF THE PIPE CAN ONLY BE JOINED BY WELDING OR BOLTED FLANGES WITH FIBER GASKETS. ROTARY FLANGES ARE PERMITTED, VEE CLAMPED FLANGES MAY NOT BE USED.

QUENCH VENT EXIT

9) THE PROTECTION AT THE END OF THE TUBE SHALL BE 3/8" WIRE MESH WITH 1/16 INCH WIRES, COVERING AN AREA AT LEAST 2.5 TIMES THE CROSS SECTION AREA OF THE QUENCH PIPE.

10) WHERE THE QUENCH TUBE EXITS THROUGH A FLAT ROOF, THE THE OUTLET MUST BE ABOVE A LEVEL WHERE WATER COULD ENTER IN THE EVENT THAT THE ROOF DRAINS BECOME BLOCKED. IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET SHALL BE ANGLED DOWNWARD NOT LESS THAN 1 PIPE DIAMETER TO PREVENT RAIN INGRESS. THE EXIT SHALL BE LOCATED ABOVE THE LEVEL OF DRIFTING SNOW.

11) WHERE THE QUENCH TUBE EXITS VERTICALLY, A RAIN COVER MUST ALSO BE FITTED WITH THE DIAMETER TO BE TWO TIMES THE DIAMETER OF THE QUENCH TUBE. THE CLEARANCE BETWEEN THE RAIN GUARD AND THE MESH SHALL 2 TIMES THE DIAMETER OF THE TUBE. A DEFLECTOR PLATE SHALL BE WELDED TO THE TUBE WHERE IT EXITS THE ROOF TO PREVENT HELIUM FROM RE-ENTERING THE BUILDING. THE DEFLECTOR SHALL BE AT LEAST 3 TIMES THE DIAMETER OF THE QUENCH TUBE AND LOCATED TWO PIPE DIAMETERS ABOVE THE ROOF AND TWO PIPE DIAMETERS BELOW THE RAIN GUARD.

DURING A QUENCH THE HELIUM GAS EXITING THE QUENCH PIPE MAY BE AT TEMPERATURES OF LESS THAN –400°F. DUE TO THIS TEMPERATURE ROOFING MATERIALS OR ITEMS AROUND THE VENT EXIT MAY BE ADVERSELY AFFECTED. CONSIDERATION OF MATERIALS AND ITEMS PLACED NEAR THE VENT EXIT SHOULD BE TAKEN INTO ACCOUNT SO DAMAGE DOES NOT OCCUR.

12) WHERE THE QUENCH TUBE EXITS HORIZONTALLY, THE OUTLET MUST CONFORM TO OPTIONS 1–4 OR THE ANGLED RAIN HOOD. THE OUTLET SHOULD NOT BE LOCATED WHERE HELIUM GAS CAN BE DRAWN INTO AN AIR INLET, ENTER AN OPEN WINDOW, OR BLOW DIRECTLY ONTO STRUCTURE OR EQUIPMENT. RESTRICT ACCESS TO WINDOWS AND DOORS TO AVOID INJURY FROM COLD BURNS AND ASPHYXIATION BY 9'–11" ON EACH SIDE, BELOW AND 19'–9" ABOVE, IF THE OUTLET IS POSITIONED TOO LOW A DEFLECTOR PLATE CAN BE USED WITH OPTION 1 AND 3.

WARNING SIGNS AND OUTLET RESTRICTIONS

A WARNING SIGN MUST BE FIXED AND VISIBLE NEAR THE QUENCH VENT OUTLET. THE TUBE MUST HAVE A WARNING POSTED ALONG IT'S ENTIRE LENGTH FOR EXTREMELY COLD HELIUM GAS – AUTHORIZED PERSONNEL ONLY.

13) AREAS WITH ACCESS IN THE AREA OF THE OUTLET MUST BE CLEARLY IDENTIFIED AND FENCED, FOR EXAMPLE, A ROOF OUTLET WITH MAINTENANCE ACCESS.

INSULATION AND GALVANIC SEPARATION

14) THE QUENCH TUBE MUST HAVE MINIMUM 1" INSULATION FOR THE FULL LENGTH. WITHIN THE RF ROOM THERE SHOULD BE A 1" LAYER OF MINERAL FIBER INSULATION WITH A VAPOR BARRIER AND 1" CLASS O OR CLASS AP ARMAFLEX. OUTDOOR PIPES MUST BE WEATHERPROOF. THE INSULATION MUST NOT TOUCH THE MAGNET COVERS. TO AVOID RF DISTURBANCES THE INSULATION MUST NOT MAKE ELECTRICAL CONTACT WITH THE WAVEGUIDE.

15) GALVANIC SEPARATION MUST BE PROVIDED BETWEEN THE MAGNET, THE QUENCH VENT, THE RF ROOM, AND THE BUILDING, TWO SEPARATIONS ARE REQUIRED USING STAINLESS STEEL BOLTS, INSULATING BUSHES AND LOCKING NUTS. NO OTHER DESIGNS ARE PERMITTED FOR SAFETY.

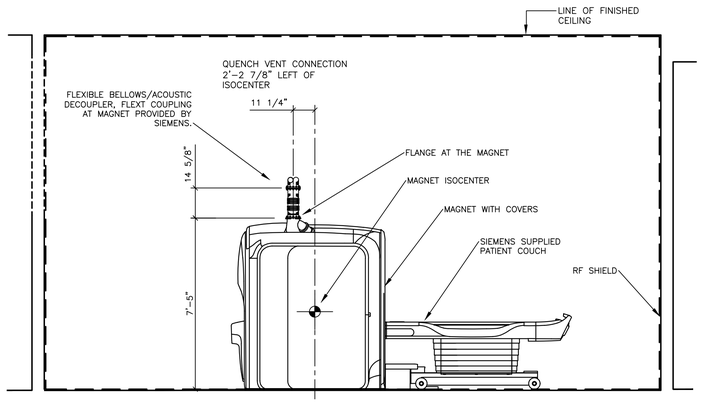
DOCUMENTATION

16) THE DESIGN AND CONSTRUCTION OF THE QUENCH PIPE MUST BE DOCUMENTED WITH DRAWINGS AND CALCULATIONS THAT ARE KEPT WITH INSTALLATION DOCUMENTS. IT MUST COMPLY WITH THE REQUIREMENTS IN THIS DOCUMENT BEFORE BEING CONNECTED TO THE MAGNET.

REV 6

THE EQUIPMENT CONFIGURATION SHOWN ON THESE ELEVATIONS REPRESENT "TYPICAL" INSTALLATION CONDITIONS.

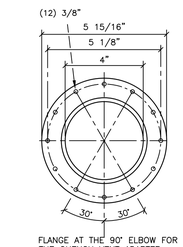
THE QUENCH VENT IS TO BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR. IT MAY BE CONNECTED TO THE FLANGE AT THE MAGNET HORIZONTALLY OR VERTICALLY AND SHOULD BE DESIGNED, CONSTRUCTED AND INSTALLED AS PER THE INSTRUCTIONS ON THIS SHEET.



THE LOCATION, PITCH, AND MOUNTING HEIGHT ABOVE FINISHED FLOOR FOR THE MECHANICAL SYSTEMS SHALL BE SPECIFIED, DETAILED AND NOTED BY THE MECHANICAL ENGINEER OF RECORD. ALL MECHANICAL SYSTEM LOCATIONS SHALL BE COORDINATED WITH THE LOCATION OF THE CABLE TRAYS AS SHOWN ON THE 1/4" SCALE ELECTRICAL PLAN.

FOR HORIZONTAL CONNECTION, A 90° ELBOW MUST BE PROVIDED BY CUSTOMER/CONTRACTOR TO MATCH DIAMETER OF THE FLEXIBLE SECTION.

1	MAGNET SIDE ELEVATION	NO SCALE

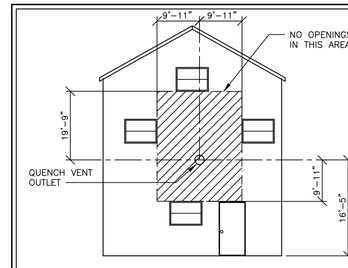


CONNECTION OF THE QUENCH VENT PIPE TO FLANGE TO BE DESIGNED, DETAILED, AND SPECIFIED BY THE MECHANICAL ENGINEER OF RECORD TO BE FABRICATED AND INSTALLED BY THE MECHANICAL CONTRACTOR UNDER SIEMENS SUPERVISION. THE 90° ELBOW IS PART OF THE DELIVERY VOLUME, THE TWO FLANGES ARE IDENTICAL.

CONNECTING FLANGE

REV 0

2	QUENCH VENT	NO SCALE



IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET MUST BE TURNED DOWN BY NOT LESS THAN THE LINE OF THE DIAMETER TO PREVENT RAIN INGRESS. THE EXIT MUST BE SITUATED WHERE IT CANNOT BE BLOCKED BY DRIFTING SNOW.
TO AVOID RISK OF INJURY FROM COLD BURNS AND ASPHYXIATION, ACCESS TO THE QUENCH VENT OUTLET MUST BE RESTRICTED AS SHOWN. THE OUTLET MUST NOT BE SITUATED WHERE, IN THE EVENT OF A QUENCH, HELIUM GAS COULD BE DRAWN INTO AN AIR INLET OR OPEN WINDOW. WHERE WINDOWS ARE WITHIN THE RESTRICTED AREA, THEY MUST BE PERMANENTLY CLOSED.

OUTLET SAFETY CLEARANCES

REV 1

–	QUENCH VENT	NO SCALE

HELIUM CONTENT

MAXIMUM LIQUID FILL	1,356 LITERS	
TYPICAL BOIL OFF RATE	0.0 L/HR	FOR TYPICAL CLINICAL USE, DEPENDING ON SEQUENCES AND OPERATING TIME.
TYPICAL REFILL INTERVAL	NA	

WITHOUT THE COLD HEAD RUNNING THE LIQUID HELIUM WILL BOIL OFF FROM 97% TO 0% IN APPROXIMATELY 30 DAYS.
THE LOSS DURING SHIPPING IS APPROXIMATELY 65 LITERS PER DAY.

NEXT GEN DRAFT

SYM	DATE	DESCRIPTION
0	09/28/23	

–ISSUE BLOCK–

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WAYNE STATE UNIVERSITY

540 EAST CANFIELD STREET, DETROIT, MI 48201
MRI SUITE – 0560 (GROUND FLOOR) – MAGNETOM PRISMA

PROJECT #: 2312308

SHEET: M-501

SHEET 10 OF 10

DRAWN BY: B. HERRMANN

SCALE: AS NOTED

REF. #: 30273767

DATE: 09/28/23

ATTENTION:

– THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.
– THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

– IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

– ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.
– THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

REFERENCE DOCUMENT - NOT FOR CONSTRUCTION