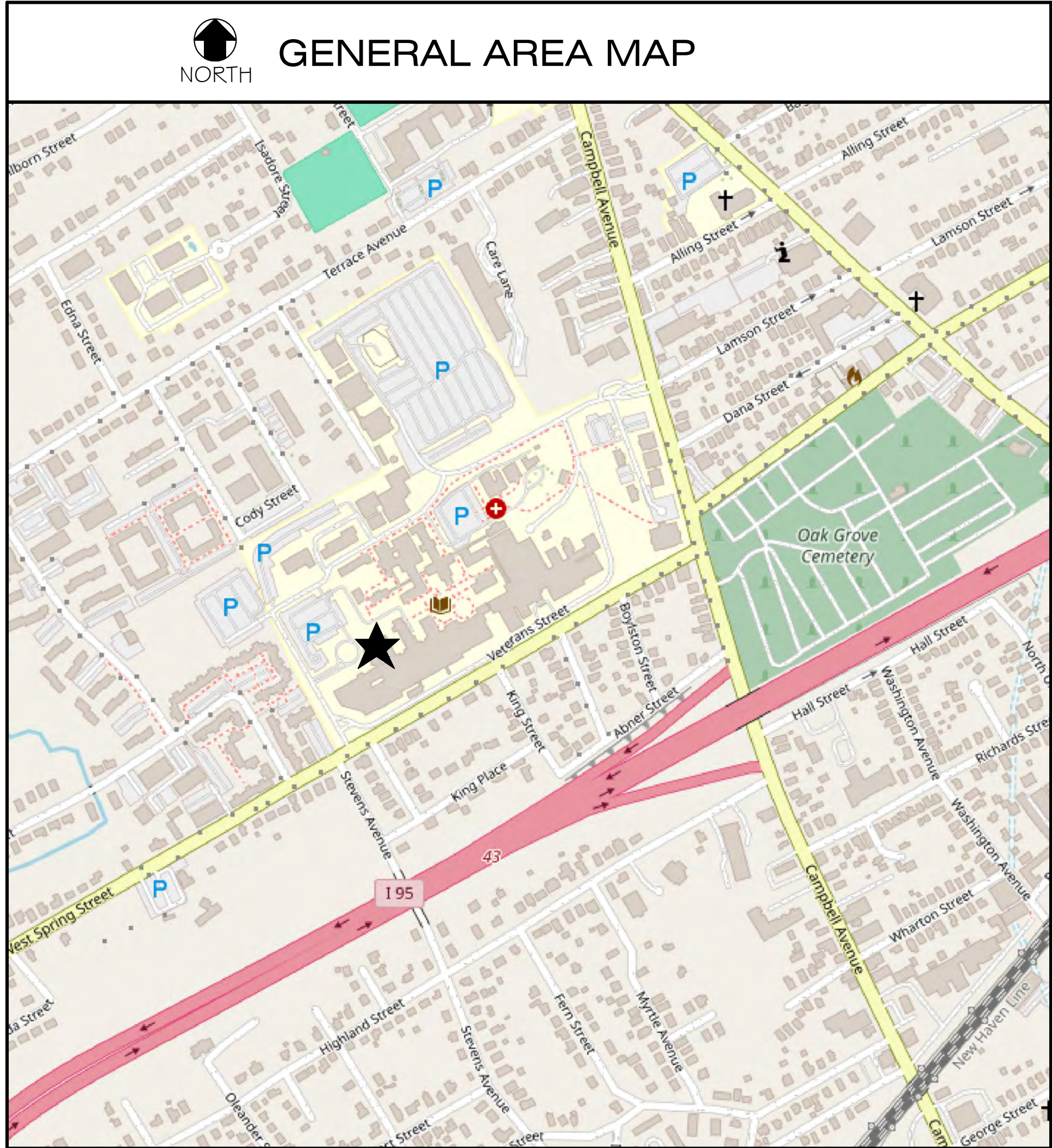
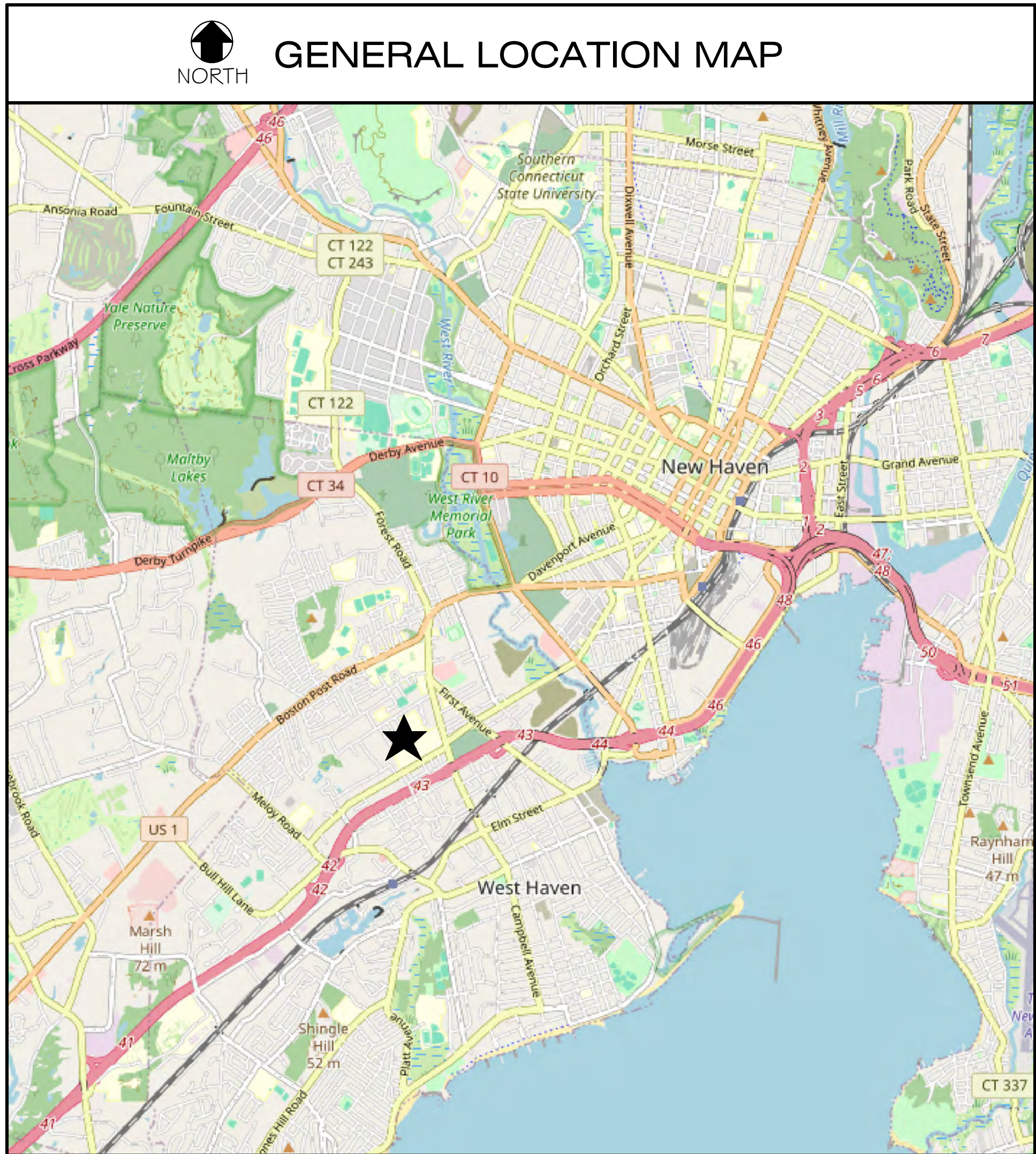




MRI EQUIPMENT UPGRADE BUILDING 1, SUB-GROUND FLOOR MRI SUITE

VA CONNECTICUT HEALTHCARE SYSTEM WEST HAVEN CAMPUS

950 CAMPBELL AVENUE
WEST HAVEN, CONNECTICUT 06516



PROJECT TEAM:

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Project Mgr: Taylor LaRosa
Phone: (516) 848-7433
taylor.larosa@philips.com

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MECHANICAL
ENGINEERING

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ENGINEERING

 **CONSTRUCTION**
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2605 N. AIRPORT ROAD
PLANT CITY, FLORIDA 33563
PHONE 813-752-2959
tom@ctg-inc.com

INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION
COVER	KEY PLAN, LOCATION MAP, ABBREVIATIONS, CODES, DESIGN CRITERIA
A-1	ORIENTATION / REFERENCE BUILDING 1 - SUB-GROUND FLOOR PLAN
A-1a	ILSM AND IGRA FLOOR PLANS, DUSTPROOF PARTITION DETAILS
A-2	DEMOLITION FLOOR PLANS
A-3	DEMOLITION CEILING PLAN
A-4	CONSTRUCTION PLAN
A-5	REFLECTED CEILING PLAN
A-6	MEDICAL EQUIPMENT PLAN
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A-8	INTERIOR ELEVATIONS
A-9	MONITOR SUPPORT DETAILS
A-10	DOOR, WINDOW, FINISH SCHEDULES, AND PENETRATION DETAILS
A-11	ARCHITECTURAL SPECIFICATIONS
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E-2	ELECTRICAL KEY PLAN AND DETAILS
E-3	POWER PLAN, NOTES
E-4	REFERENCED VENDOR'S DRAWINGS
E-5	POWER RISER DIAGRAM
E-6	PANEL SCHEDULES
E-7	ELECTRICAL SPECIFICATIONS

ATTACHED TO THESE DOCUMENTS ARE FIFTY-TWO (52) DRAWING SHEETS, PROJECT NUMBER N-EAS220310 B, REVISION B DATED 04-11-25 AS PREPARED BY PHILIPS. THESE DRAWINGS PROVIDE DETAILED INFORMATION CONCERNING SITE PREPARATION FOR THEIR MRI EQUIPMENT. USE OF THESE DRAWINGS IS REQUIRED FOR REFERENCE AND FOR ADDITIONAL INFORMATION.

ABBREVIATIONS

AFF. AL.	ABOVE FINISH FLOOR ALUMINUM	MECH. MIN.	MECHANICAL MANUFACTURER MINIMUM
B.O. BLDG. BLK.	BY OTHERS BOARD BUILDING BLOCK	MISC. M.O. MTL.	MISCELLANEOUS MASONRY OPENING METAL
C.G. C.J. C.G. CONT.	CORNER GUARD CONTROL JOINT CEILING CONTINUOUS	NEC. N.T.S.	N/A NOT APPLICABLE NATIONAL ELECTRIC CODE NOT TO SCALE
DIA. DR. D.S.	DIAMETER DOOR DOWNSPOUT	O.C. O.P.S.	ON CENTER OUTSIDE DIAMETER OPENING
ELEC. ELEV. EQ. ENG. EXH. EXT.	ELECTRIC ELEVATION EQUAL EXHAUST EXTERIOR	PL. PLAS. LAM. FLYWD.	PLATE PLASTIC LAMINATE FLYWOOD
F.D. F.F. FL.	FLOOR DRAIN FIRE EXTINGUISHER FLOOR	REINF. REQD. REV. RM. R.O.	REINFORCING REQUIRED REVISION ROOM ROUGH OPENING
G.A. G.C. GL. GYP. BD.	GAUGE GENERAL CONTRACTOR GLASS GYPSUM BOARD	S.F. SPEC. SS. STD. STL. SUSP.	SQUARE FEET SPECIFICATION STAINLESS STEEL STANDARD STEEL SUSPENDED
H.C. HDW. H.M. HORIZ.	HANDICAP HARDWARE HOLLOW METAL HORIZONTAL	TEL. T.O.S. TYP.	TELEPHONE TOP OF STEEL TYPICAL
I.D. INSUL. INT.	INSIDE DIAMETER INSULATION INTERIOR	VERT. V.T. V.W.C.	VERTICAL VINYL TILE VINYL WALL COVERING
MATL.	MATERIAL	W/ W.W.F. WD.	WITH WELDED WIRE FABRIC WOOD

CODES

[HTTPS://WWW.CFM.VA.GOV/TTL/SPEC.ASP](https://www.cfm.va.gov/ttl/spec.asp) - MASTER CONSTRUCTION SPECIFICATIONS (PG-18-1)
NFPA 13 - STANDARD for the INSTALLATION of SPRINKLER SYSTEMS, 2022 EDITION
NFPA 70 - NATIONAL ELECTRIC CODE, 2023 EDITION
NFPA 90A - STANDARD for the INSTALLATION of AIR-CONDITIONING and VENTILATING SYSTEMS, 2024 EDITION
NFPA 99 - STANDARDS FOR HEALTH CARE FACILITIES, 2021 EDITION
NFPA 101 - LIFE SAFETY CODE, 2021 EDITION
NFPA NATIONAL FIRE CODES (EXCEPT NFPA 5000 NFPA 900)
INTERNATIONAL BUILDING CODE, 2021 EDITION
INTERNATIONAL MECHANICAL CODE, 2021 EDITION
INTERNATIONAL PLUMBING CODE, 2021 EDITION
ARCHITECTURAL BARRIERS ACT ACCESSIBILITY STANDARDS (ABAAS) WITH VA SUPPLEMENT, BARRIER FREE DESIGN GUIDE PG-18-13
SEISMIC CATEGORY PER H-18-8 "LOW", JULY 2023

DESIGN CRITERIA

OCCUPANCY CLASSIFICATION - HEALTH CARE OCCUPANCY, INSTITUTIONAL GROUP 1-2
CONSTRUCTION TYPE - TYPE II (222) - PROTECTED, AUTOMATIC SPRINKLER SYSTEM, 4 OR MORE STORIES
MAXIMUM TRAVEL DISTANCE TO AN EXIT - 200 FEET
MAXIMUM DEAD END CORRIDOR LENGTH - 30 FEET
MINIMUM OCCUPANT LOAD:
NO CHANGES
MEANS OF EGRESS
NO CHANGES
EXIT WIDTH REQUIRED
NO CHANGES
NOTE:
NO ADDITIONAL SQUARE FOOTAGE IS BEING ADDED
NO ADDITIONAL BEDS ARE BEING ADDED
OCCUPANCY CLASSIFICATION IS NOT BEING CHANGED
HAZARD RATING IS NOT BEING CHANGED
SMOKE AND FIRE ZONES ARE NOT BEING CHANGED OR EFFECTED

PERMITTING

VA MEDICAL CENTER
VA CONNECTICUT HEALTHCARE SYSTEM, WEST HAVEN CAMPUS
FACILITIES MANAGEMENT SERVICE, ENGINEERING 130
950 CAMPBELL AVENUE
WEST HAVEN, CT 06516

SCOPE OF WORK

THE GENERAL SCOPE OF WORK INCLUDES ALL GENERAL TRADES, PLUMBING, MECHANICAL AND ELECTRICAL WORK TO RENOVATE AND ALTER AN EXISTING AREA ON THE SUB-GROUND FLOOR MRI SUITE OF BUILDING 1 AT THE VA MEDICAL CENTER, WEST HAVEN CAMPUS FOR AN MRI EQUIPMENT UPGRADE. THERE ARE NO CHANGES TO USE, OCCUPANCY CLASSIFICATION, BUILDING AREA, FIRE OR SMOKE COMPARTMENTS, OR MEANS OF EGRESS.

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MRI EQUIPMENT UPGRADE
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VA CONNECTICUT HEALTHCARE SYSTEM
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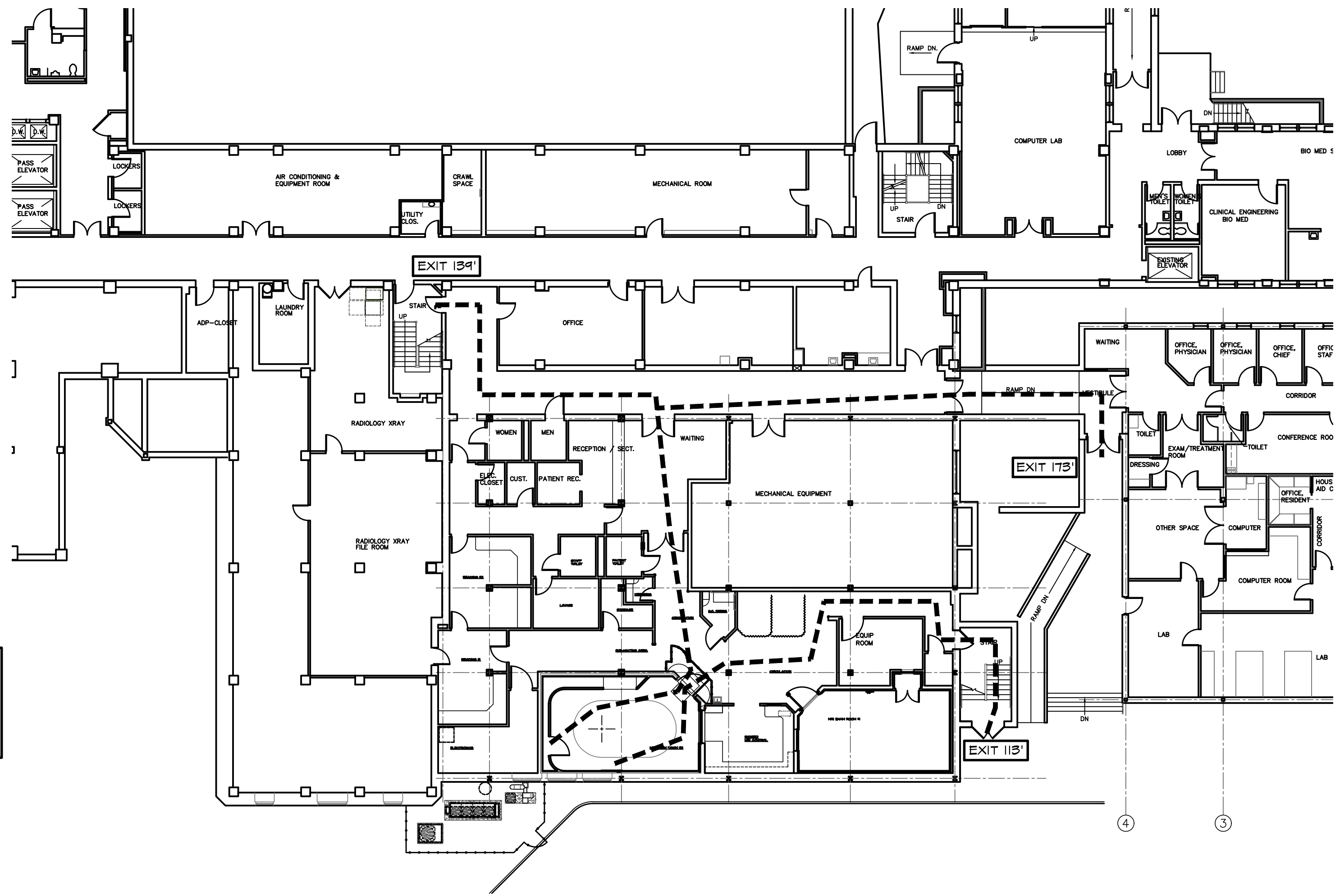
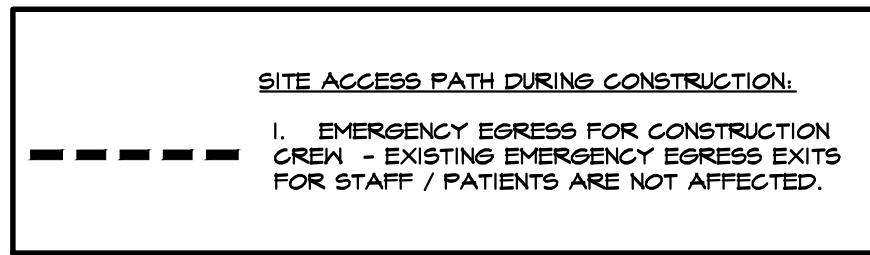
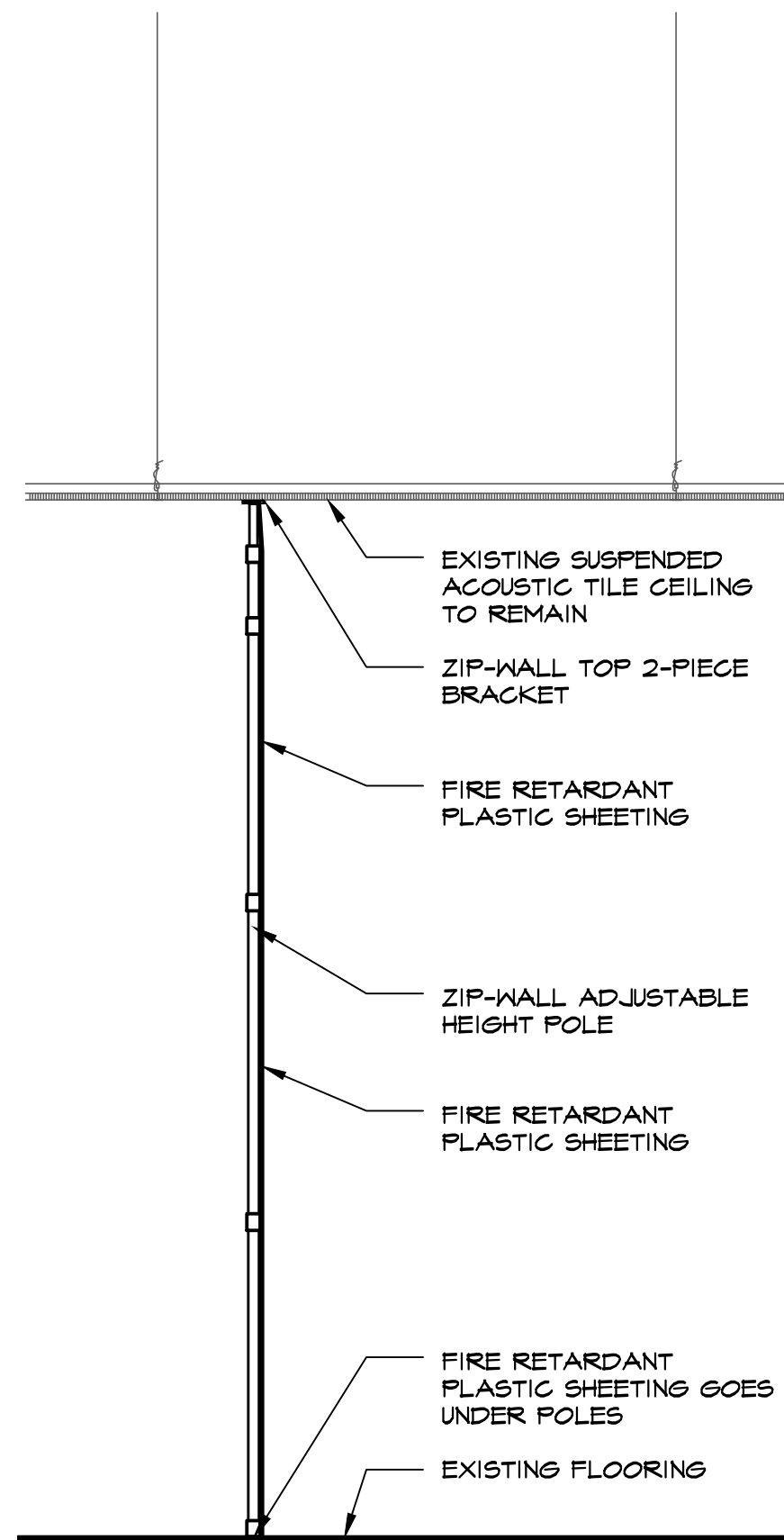
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ISSUED FOR:	DATE:
☐ PROJECT	
☐ REVIEW	06/16/25
☐ BIDDING	
☐ PERMIT	
☒ CONSTRUCTION	07/02/25

SHEET TITLE
COVER

DATE
MAY 2, 2025
PROJECT NO.
0225-02

SHEET NO.
COVER



ZIP-WALL DUST PARTITION

SCALE
3/4" = 1'-0"

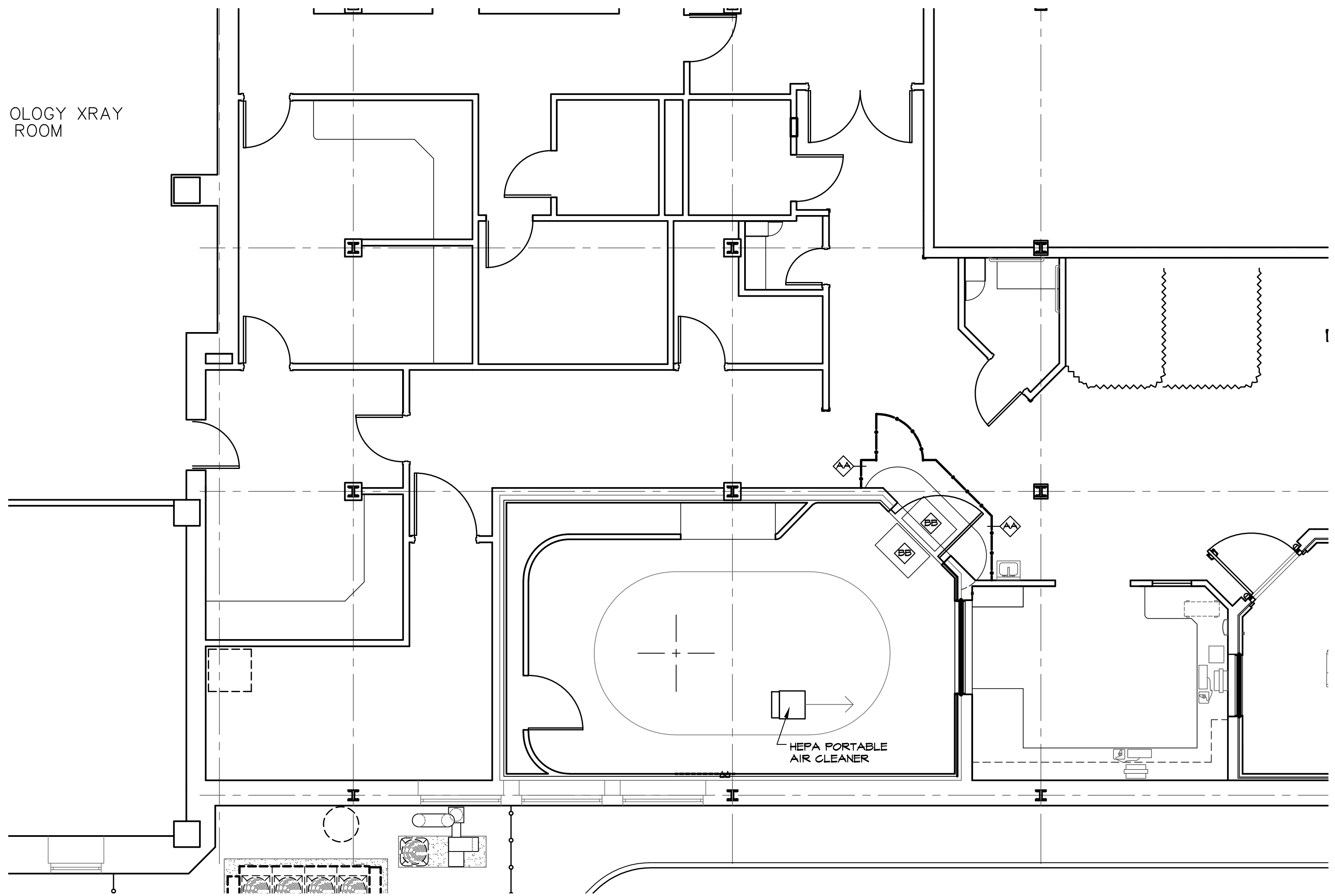
1

ILSM PLAN

SCALE
1/16" = 1'-0"

2

OLOGY XRAY ROOM



INSTRUCTIONS - INFECTION CONTROL RISK ASSESSMENT

BASED UPON THE TYPE OF CONSTRUCTION ACTIVITY, IT IS THE ARCHITECT'S OPINION THAT THE REQUIRED INFECTION CONTROL PRECAUTIONS WILL BE AS FOLLOWS:

REQUIREMENTS DURING CONSTRUCTION ARE:

1. COVER HVAC GRILLES IN AREAS WHERE WORK IS BEING DONE TO PREVENT CONTAMINATION OF DUCT SYSTEM.
2. COMPLETE CRITICAL BARRIERS, INCLUDING ZIP-WALL AND PLASTIC, TO SEAL CONSTRUCTION AREA FROM NON-WORK AREAS BEFORE CONSTRUCTION BEGINS.
3. CONTAIN CONSTRUCTION WASTE BEFORE TRANSPORT IN TIGHTLY COVERED CONTAINERS.
4. COVER TRANSPORT RECEPTACLES OR CARTS. TAPE COVERING UNLESS SOLID LID IS UTILIZED.

REQUIREMENTS UPON COMPLETION OF PROJECT ARE:

1. DO NOT REMOVE BARRIERS FROM WORK AREA UNTIL COMPLETED PROJECT IS INSPECTED BY THE SAFETY DEPARTMENT AND INFECTION CONTROL DEPARTMENT AND THOROUGHLY CLEANED BY THE ENVIRONMENTAL SERVICES DEPARTMENT.
2. REMOVE BARRIER MATERIALS CAREFULLY TO MINIMIZE SPREAD OF DIRT AND DEBRIS ASSOCIATED WITH CONSTRUCTION.
3. VACUUM WORK AREA WITH FILTERED VACUUMS.

SEQUENCE FOR ILSM / ICRA PLAN:

1. INSTALL DUSTPROOF BARRIER IN AREAS WHERE SHOWN.
2. INSTALL WALK-OFF MATS. CORRIDOR FLOORS WILL BE MOPPED CLEAN DAILY TO REMOVE ANY DUST GENERATED BY THE WORK. NOTE - WALK-OFF MATS AND HEPA AIR MACHINES WILL BE INSPECTED AND MAINTAINED BY THE FIELD SUPERVISOR ON A DAILY BASIS.
3. POST ALL SIGNAGE AND POSTERS IN A CLEAR VISIBLE AREA (I.E. DANGER DO NOT ENTER - CONSTRUCTION, EMERGENCY CALL NUMBERS, OSHA POSTERS, ETC.).
4. ITEMS 1 - 3 WILL BE INSPECTED AND ACCEPTED BY THE HOSPITAL SAFETY AND INFECTION CONTROL STAFF PRIOR TO DEMOLITION. DEMOLITION AND CONSTRUCTION CAN COMMENCE ONCE THE ABOVE ITEMS ARE COMPLETE AND ACCEPTED BY THE HOSPITAL. ITEMS 1 - 3 WILL BE INSPECTED ON A DAILY BASIS BY THE FIELD SUPERVISOR.

DUST CONTROL NOTES:

1. FILTRATION MACHINE SHALL BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETE AND MEET THE FOLLOWING:
 - PORTABLE FILTRATION AIR MACHINE WITH PRIMARY FILTER, SECONDARY FILTER AND HEPA FILTER; 2-SPEED AND 12"Ø INTAKE COLLAR.
 - FILTER AND RECIRCULATE AIR 6 TIMES PER HOUR.
 - COVER NEGATIVE AIR MACHINE INLET WITH CARBON FILTER.
 - FILTRATION AIR WILL EXHAUSTED WITHIN ROOM.
2. CLOSE OPEN DUCTS WITH 6-MIL POLYETHYLENE AND SEAL WITH DUCT TAPE (NOT SHOWN).

DUST PARTITION NOTES:

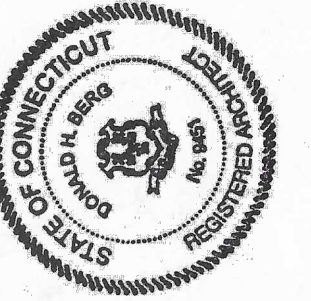
- AA - ZIP-WALL DUST PARTITION WITH ONE 36" WIDE HINGED DOOR - SEE DETAIL 1A-2 ABOVE.
- BB - WALK-OFF STICKY MATS (24" x 36") ON BOTH SIDES OF DOOR.

ICRA PLAN

SCALE
3/16" = 1'-0"

3

MRI EQUIPMENT UPGRADE
BUILDING 1, SUB-GROUND FLOOR
MRI SUITE
VA CONNECTICUT HEALTHCARE SYSTEM
WEST HAVEN CAMPUS
950 CAMPBELL AVENUE
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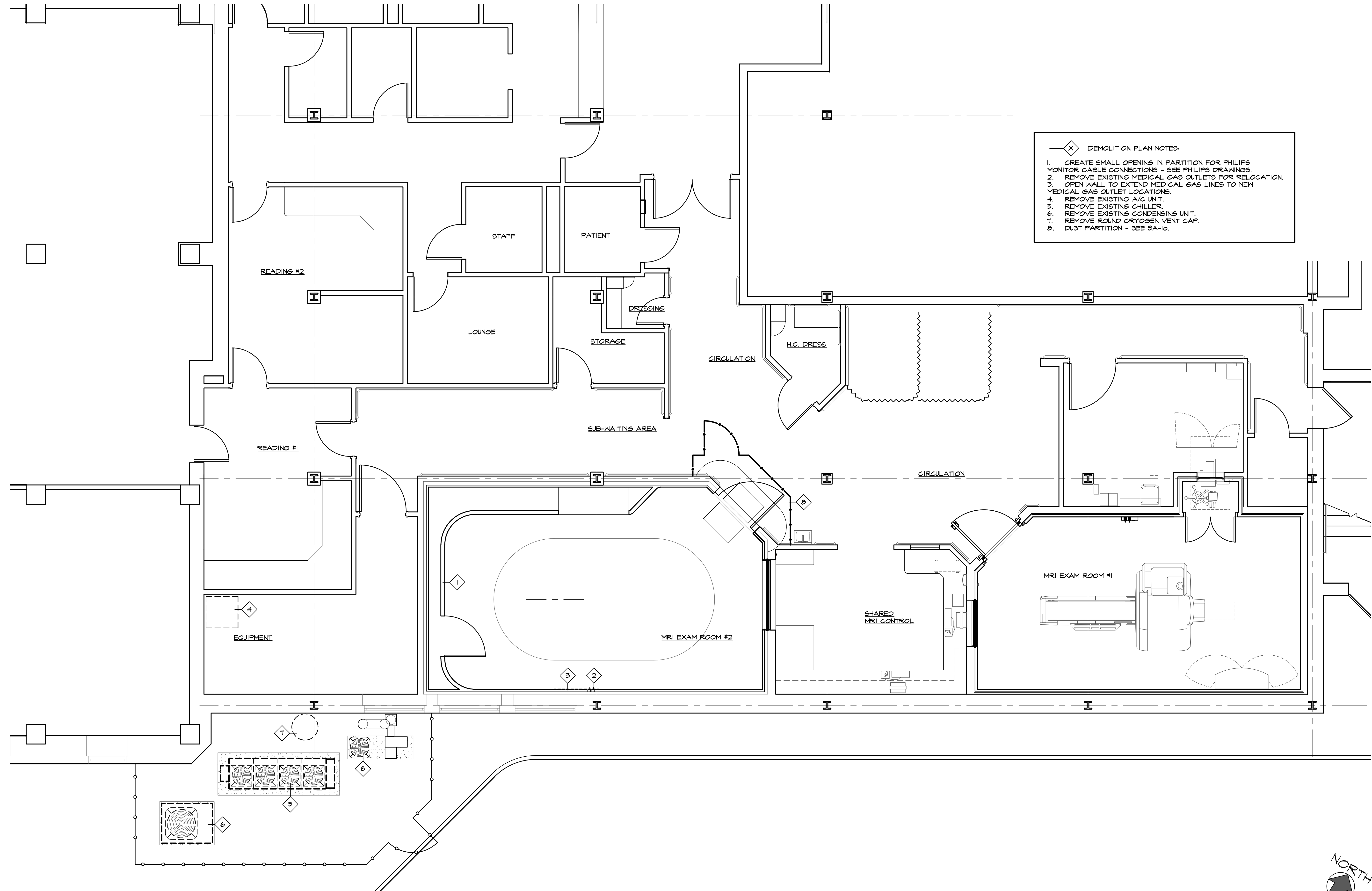
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☐ BIDDING	
☐ PERMIT	
☒ CONSTRUCTION	07/02/25

SHEET TITLE
ILSM & ICRA
PLANS

DATE
MAY 2, 2025
PROJECT NO.
0225-02

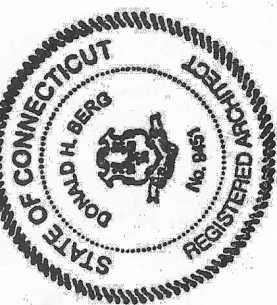
SHEET NO.

A-1a



- DEMOLITION PLAN NOTES:
1. CREATE SMALL OPENING IN PARTITION FOR PHILIPS MONITOR CABLE CONNECTIONS - SEE PHILIPS DRAWINGS.
 2. REMOVE EXISTING MEDICAL GAS OUTLETS FOR RELOCATION.
 3. OPEN WALL TO EXTEND MEDICAL GAS LINES TO NEW MEDICAL GAS OUTLET LOCATIONS.
 4. REMOVE EXISTING A/C UNIT.
 5. REMOVE EXISTING CHILLER.
 6. REMOVE EXISTING CONDENSING UNIT.
 7. REMOVE ROUND CRYOGEN VENT CAP.
 8. DUST PARTITION - SEE 3A-1a.

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SHEET TITLE
DEMOLITION
FLOOR PLAN

DATE
MAY 2, 2025
PROJECT NO.
0225-02

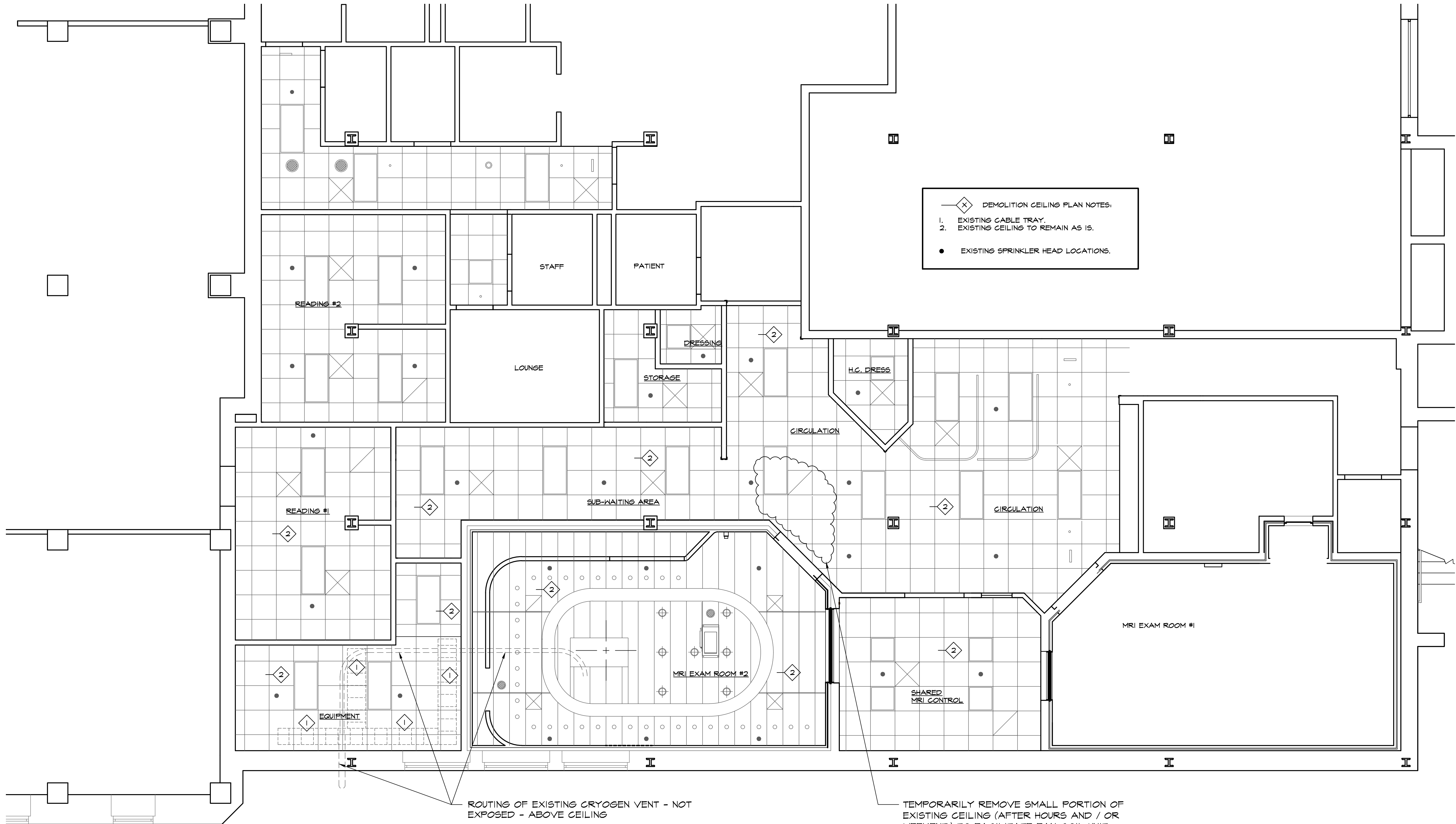
SHEET NO.

A-2

DEMOLITION FLOOR PLAN

SCALE
1/4" = 1'-0"

1



DEMOLITION CEILING PLAN NOTES:

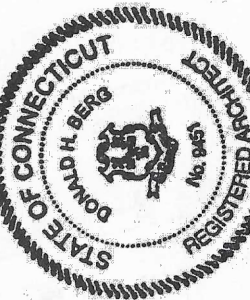
- EXISTING CABLE TRAY.
- EXISTING CEILING TO REMAIN AS IS.

EXISTING SPRINKLER HEAD LOCATIONS.

ROUTING OF EXISTING CRYOGEN VENT - NOT EXPOSED - ABOVE CEILING

TEMPORARILY REMOVE SMALL PORTION OF EXISTING CEILING (AFTER HOURS AND / OR WEEKEND) TO FACILITATE FAN COIL UNIT REPLACEMENT - SEE MECHANICAL DRAWINGS.

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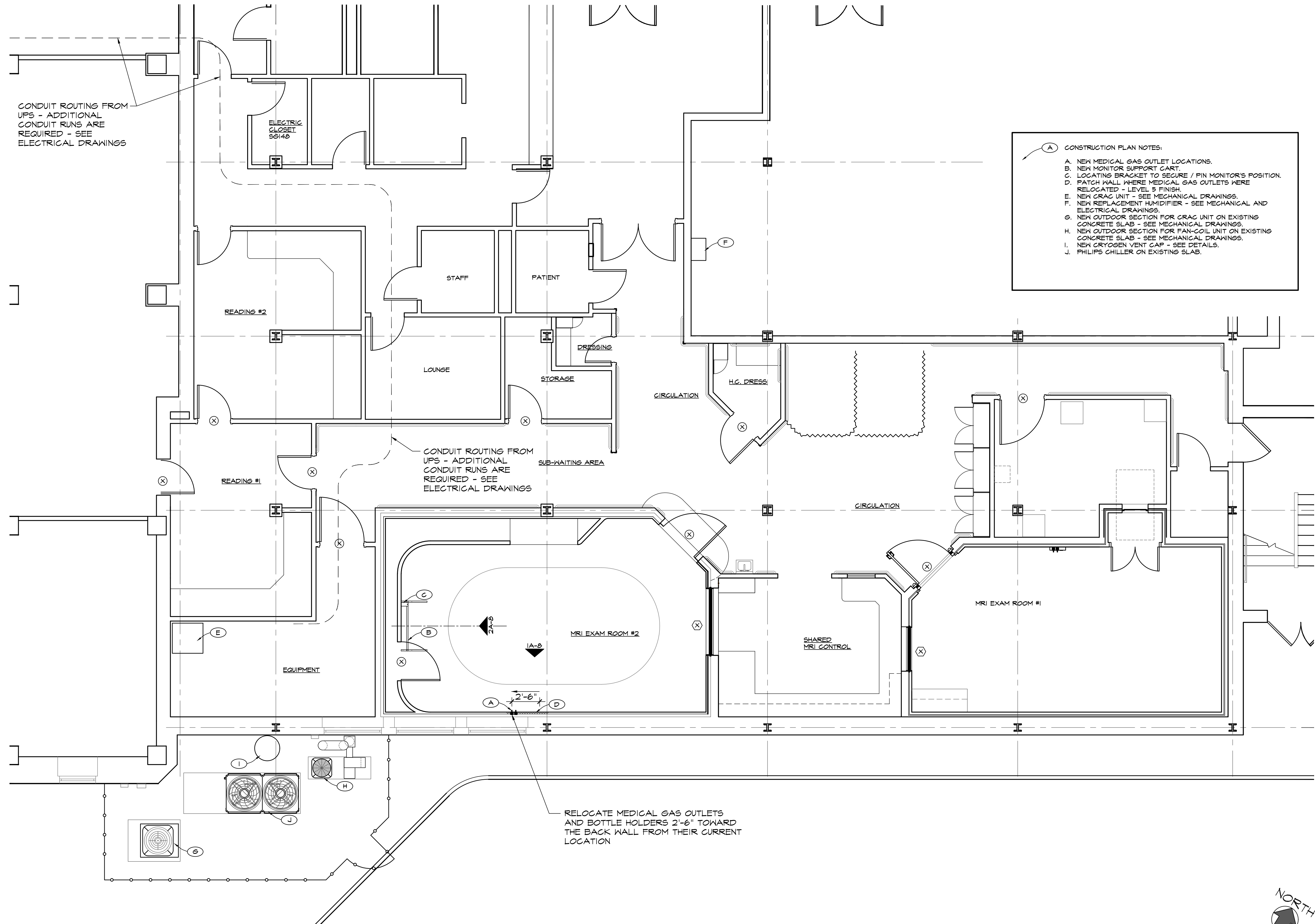
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☐ PERMIT	
☒ CONSTRUCTION	07/02/25

SHEET TITLE
DEMOLITION
CEILING
PLAN

DATE
MAY 2, 2025
PROJECT NO.
0225-02

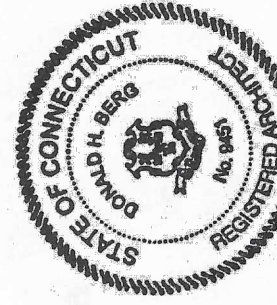
SHEET NO.

A-3



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MRI SUITE
VA CONNECTICUT HEALTHCARE SYSTEM
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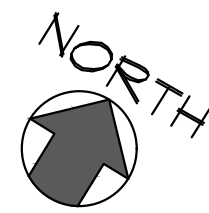
REVISIONS	

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SHEET TITLE
CONSTRUCTION FLOOR PLAN

DATE
MAY 2, 2025
PROJECT NO.
0225-02
SHEET NO.

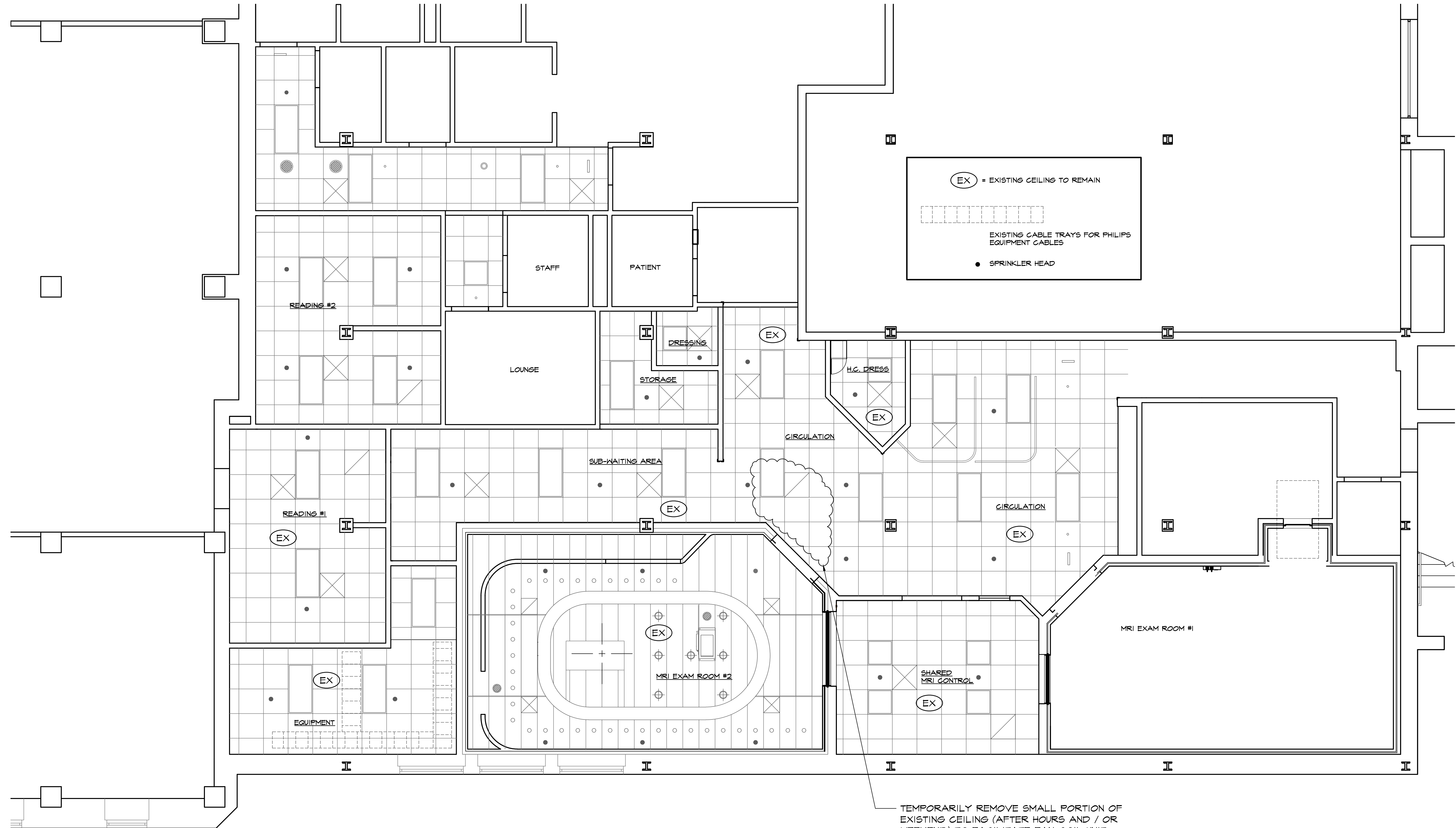
A-4



CONSTRUCTION FLOOR PLAN

SCALE
1/4" = 1'-0"

1



TEMPORARILY REMOVE SMALL PORTION OF EXISTING CEILING (AFTER HOURS AND / OR WEEKEND) TO FACILITATE FAN COIL UNIT REPLACEMENT - SEE MECHANICAL DRAWINGS.



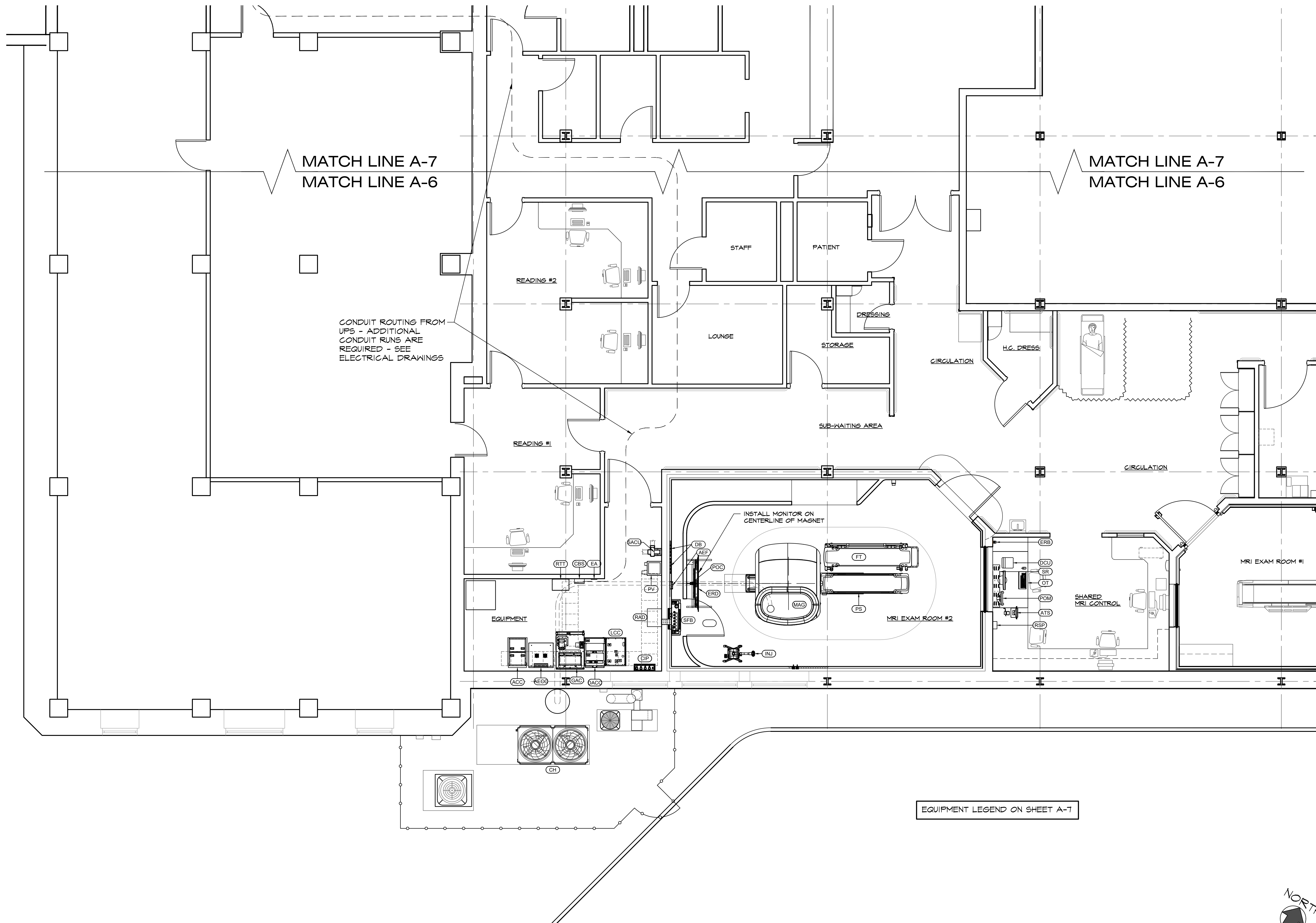
DONALD H. BERG, ARCHITECT
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MRI EQUIPMENT UPGRADE
BUILDING 1, SUB-GROUND FLOOR
MRI SUITE
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950 CAMPBELL AVENUE
WEST HAVEN, CONNECTICUT 06516

REVISIONS	

ISSUED FOR:	DATE:
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☐ PERMIT	
☒ CONSTRUCTION	07/02/25

SHEET TITLE	
REFLECTED CEILING PLAN	
DATE	MAY 2, 2025
PROJECT NO.	0225-02
SHEET NO.	A-5



MATCH LINE A-7
MATCH LINE A-6

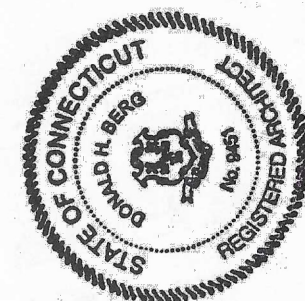
MATCH LINE A-7
MATCH LINE A-6

CONDUIT ROUTING FROM
UPS - ADDITIONAL
CONDUIT RUNS ARE
REQUIRED - SEE
ELECTRICAL DRAWINGS

EQUIPMENT LEGEND ON SHEET A-7

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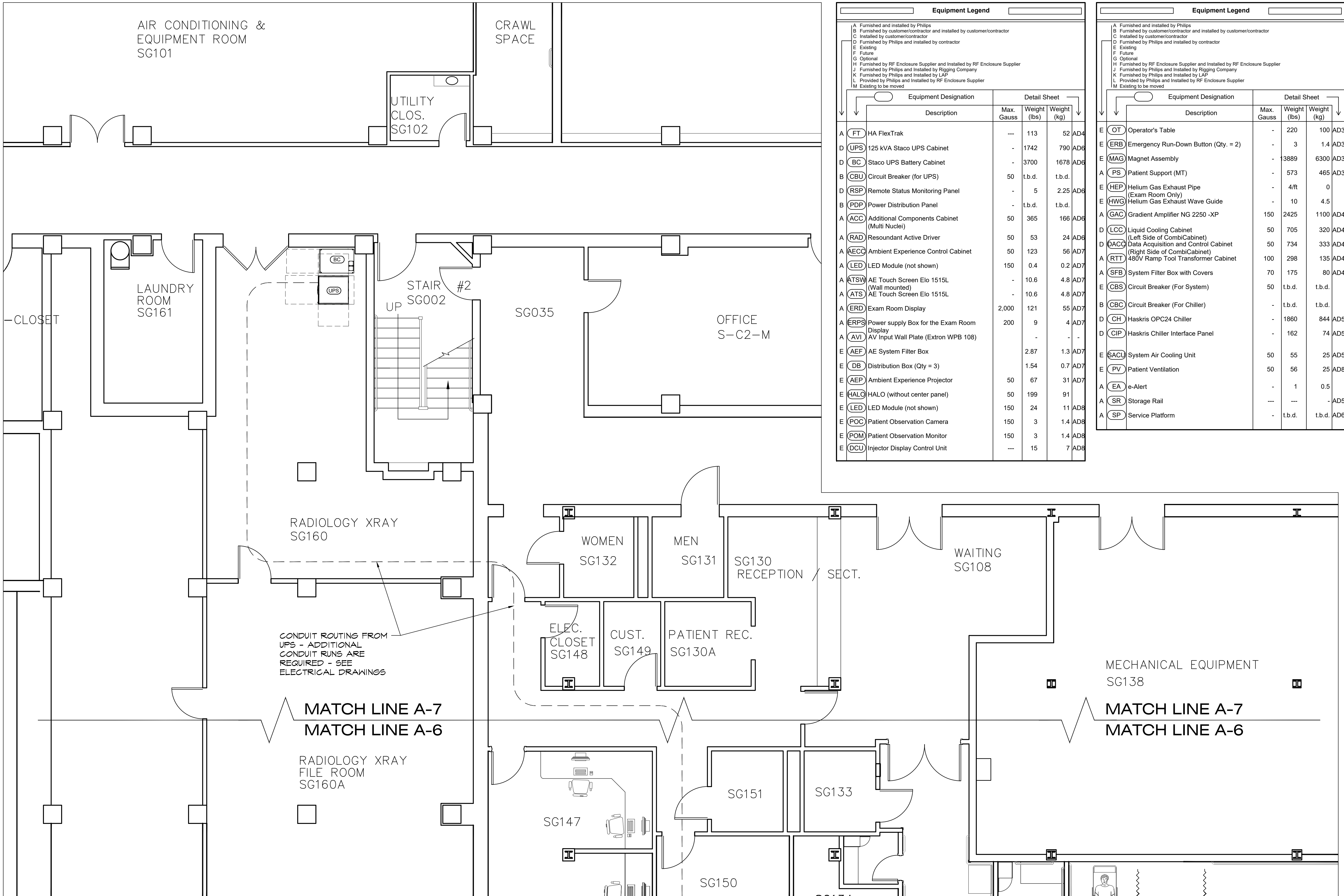
SHEET TITLE
MEDICAL
EQUIPMENT
PLAN
DATE
MAY 2, 2025
PROJECT NO.
0225-02
SHEET NO.

A-6

MEDICAL EQUIPMENT PLAN

SCALE
1/4" = 1'-0"

1



Equipment Legend					
A	Furnished and installed by Philips				
B	Furnished by customer/contractor and installed by customer/contractor				
C	Installed by customer/contractor				
D	Furnished by Philips and installed by contractor				
E	Existing				
F	Future				
G	Optional				
H	Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier				
J	Furnished by Philips and installed by Rigging Company				
K	Furnished by Philips and installed by LAP				
L	Provided by Philips and installed by RF Enclosure Supplier				
M	Existing to be moved				

Equipment Designation		Detail Sheet		
Description		Max. Gauss	Weight (lbs)	Weight (kg)
A	FT HA FlexTrak	---	113	52 AD4
D	UPS 125 kVA Stacco UPS Cabinet	-	1742	790 AD6
D	BC Stacco UPS Battery Cabinet	-	3700	1678 AD6
B	CBU Circuit Breaker (for UPS)	50	t.b.d.	t.b.d.
D	RSP Remote Status Monitoring Panel	-	5	2.25 AD6
B	PDP Power Distribution Panel	-	t.b.d.	t.b.d.
A	ACC Additional Components Cabinet (Multi Nuclei)	50	365	166 AD6
A	RAD Resoundant Active Driver	50	53	24 AD6
A	AEC Ambient Experience Control Cabinet	50	123	56 AD7
A	LED LED Module (not shown)	150	0.4	0.2 AD7
A	ATSW AE Touch Screen Elo 1515L (Wall mounted)	-	10.6	4.8 AD7
A	ATS AE Touch Screen Elo 1515L	-	10.6	4.8 AD7
A	ERD Exam Room Display	2,000	121	55 AD7
A	ERPS Power supply Box for the Exam Room Display	200	9	4 AD7
A	AVI AV Input Wall Plate (Extron WPB 108)	-	-	-
E	AEF AE System Filter Box	-	2.87	1.3 AD7
E	DB Distribution Box (Qty = 3)	-	1.54	0.7 AD7
E	AEP Ambient Experience Projector	50	67	31 AD7
E	HALO HALO (without center panel)	50	199	91
E	LED LED Module (not shown)	150	24	11 AD8
E	POC Patient Observation Camera	150	3	1.4 AD8
E	POM Patient Observation Monitor	150	3	1.4 AD8
E	DCU Injector Display Control Unit	---	15	7 AD8

Equipment Legend					
A	Furnished and installed by Philips				
B	Furnished by customer/contractor and installed by customer/contractor				
C	Installed by customer/contractor				
D	Furnished by Philips and installed by contractor				
E	Existing				
F	Future				
G	Optional				
H	Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier				
J	Furnished by Philips and installed by Rigging Company				
K	Furnished by Philips and installed by LAP				
L	Provided by Philips and installed by RF Enclosure Supplier				
M	Existing to be moved				

Equipment Designation		Detail Sheet		
Description		Max. Gauss	Weight (lbs)	Weight (kg)
E	OT Operator's Table	-	220	100 AD3
E	ERB Emergency Run-Down Button (Qty. = 2)	-	3	1.4 AD3
E	MAG Magnet Assembly	-	3889	6300 AD3
A	PS Patient Support (MT)	-	573	465 AD3
E	HEP Helium Gas Exhaust Pipe (Exam Room Only)	-	4/ft	0
E	HWO Helium Gas Exhaust Wave Guide	-	10	4.5
A	GAC Gradient Amplifier NG 2250 -XP	150	2425	1100 AD4
D	LCO Liquid Cooling Cabinet (Left Side of CombiCabinet)	50	705	320 AD4
D	DACC Data Acquisition and Control Cabinet (Right Side of CombiCabinet)	50	734	333 AD4
A	RTT 480V Ramp Tool Transformer Cabinet	100	298	135 AD4
A	SFB System Filter Box with Covers	70	175	80 AD4
E	CBS Circuit Breaker (For System)	50	t.b.d.	t.b.d.
B	CBC Circuit Breaker (For Chiller)	-	t.b.d.	t.b.d.
D	CH Haskris OPC24 Chiller	-	1860	844 AD5
D	CIP Haskris Chiller Interface Panel	-	162	74 AD5
E	SACU System Air Cooling Unit	50	55	25 AD5
E	PV Patient Ventilation	50	56	25 AD8
A	EA e-Alert	-	1	0.5
A	SR Storage Rail	---	---	- AD5
A	SP Service Platform	-	t.b.d.	t.b.d. AD6

DONALD H. BERG, ARCHITECT
3904 TURKEY OAK DRIVE
VALRICO, FLORIDA 33596
TEL: 813-681-7588

MRI EQUIPMENT UPGRADE
BUILDING 1, SUB-GROUND FLOOR
MRI SUITE
VA CONNECTICUT HEALTHCARE SYSTEM
WEST HAVEN CAMPUS
950 CAMPBELL AVENUE
WEST HAVEN, CONNECTICUT 06516

REVISIONS

ISSUED FOR: ☐ REVIEW ☐ BIDDING ☐ PERMIT ☒ CONSTRUCTION

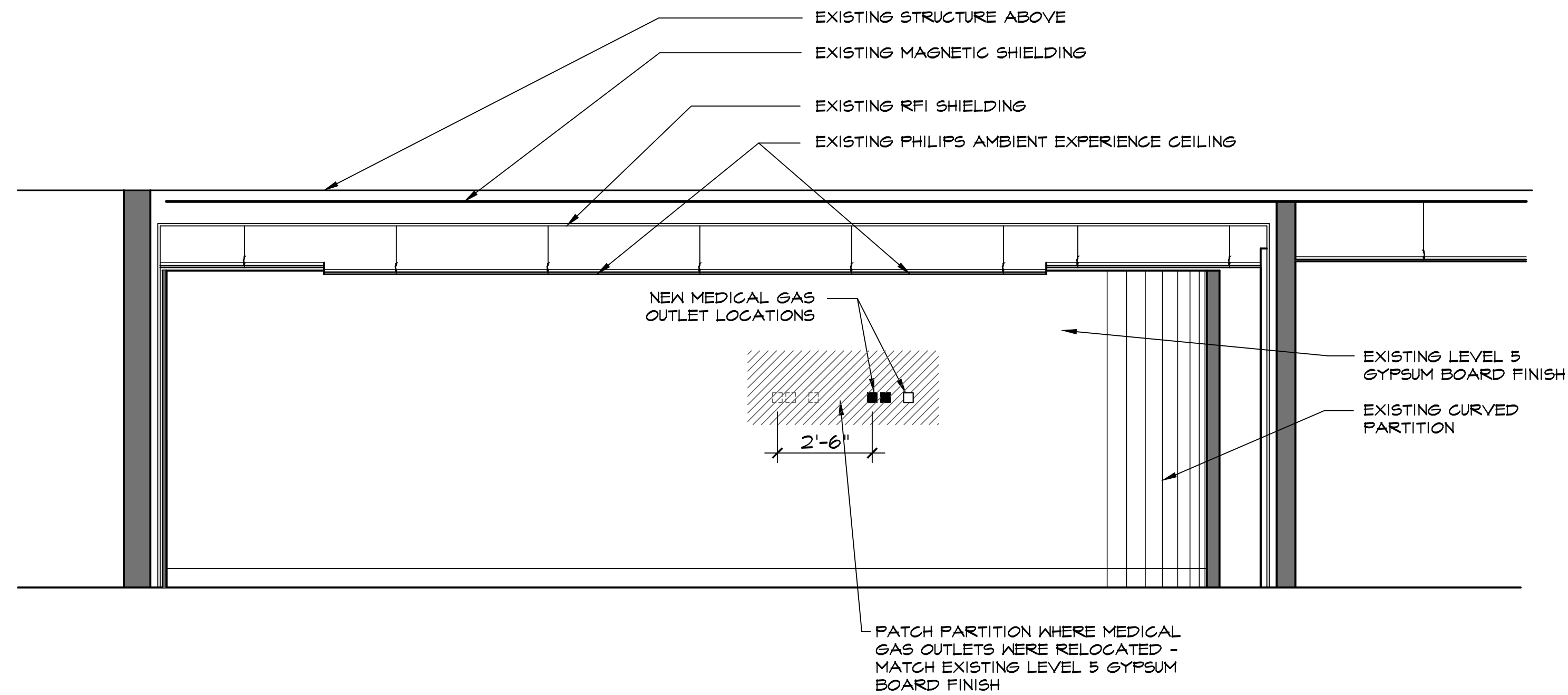
DATE: 06/16/25 07/02/25

SHEET TITLE
MEDICAL EQUIPMENT PLAN

DATE
MAY 2, 2025

PROJECT NO.
0225-02

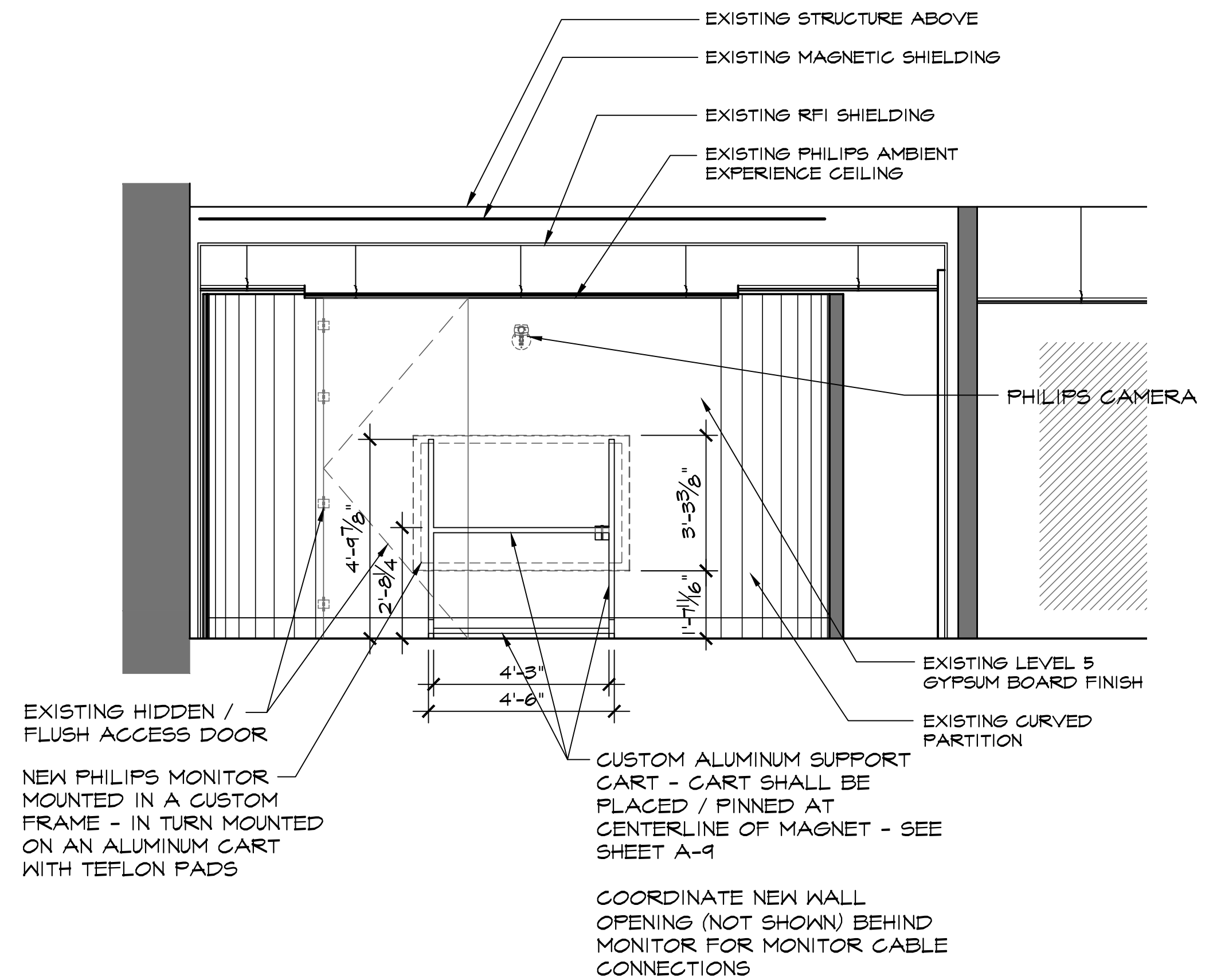
SHEET NO.
A-7



INTERIOR ELEVATION

SCALE
3/8" = 1'-0"

1

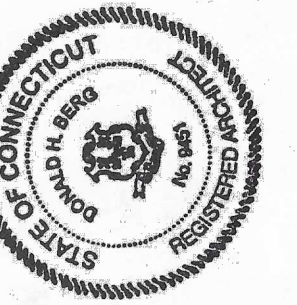


INTERIOR ELEVATION

SCALE
3/8" = 1'-0"

2

MRI EQUIPMENT UPGRADE
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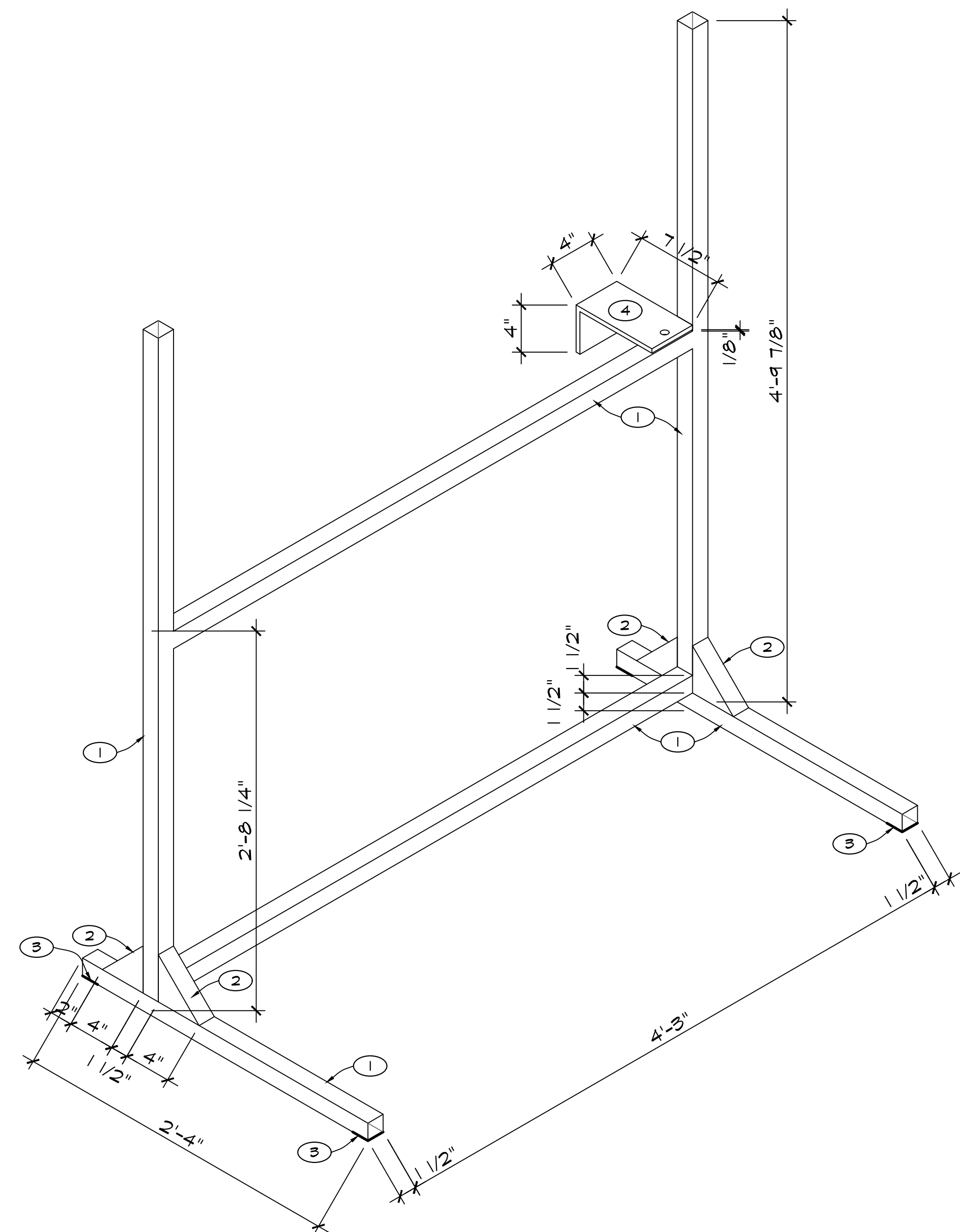
CT LICENSE NO. AR10009451

REVISIONS	

ISSUED FOR:	DATE:
☐ DESIGN	
☐ REVIEW	06/16/25
☐ BIDDING	
☐ PERMIT	
☒ CONSTRUCTION	07/02/25

SHEET TITLE	
INTERIOR ELEVATIONS	
DATE	MAY 2, 2025
PROJECT NO.	0225-02
SHEET NO.	

A-8



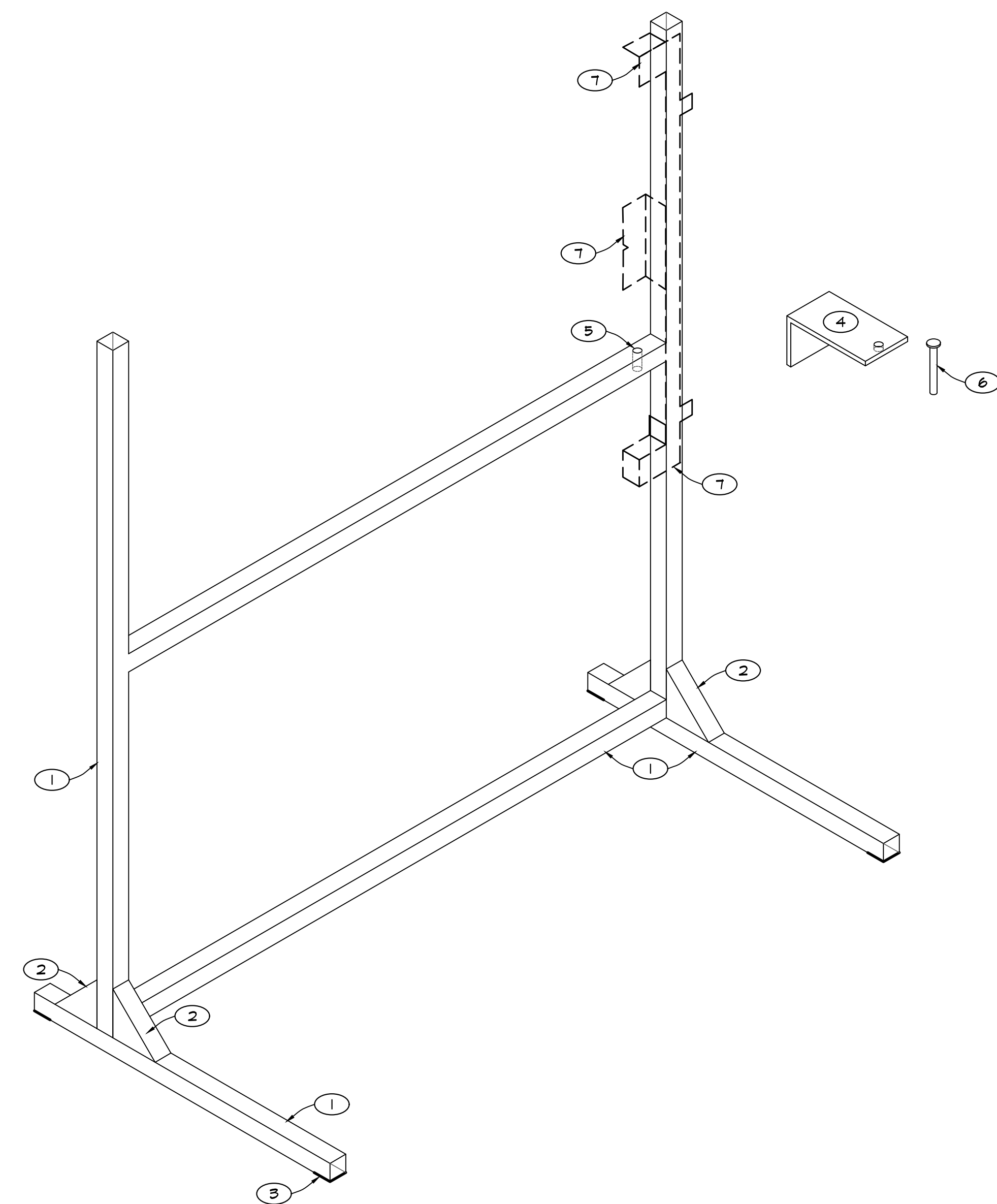
ISOMETRIC - MONITOR SUPPORT

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

1

- NOTES:

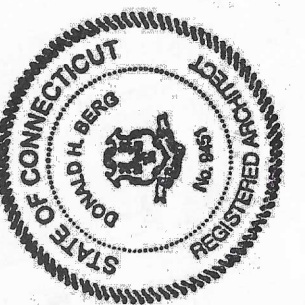
1. 1/2" x 1/2" x 1/8" 6061-T6 ALUMINUM SQUARE TUBE.
2. 4" ALUMINUM GUSSET WELDED IN PLACE.
3. INSTALL 1/2" SQUARE TEFLON PADS AT EACH END.
4. ALUMINUM BRACKET SECURED TO WALL (PROVIDE WALL BLOCKING AS NEEDED) TO PIN MONITOR SUPPORT ASSEMBLY IN PLACE AND LOCATE PARKED POSITION - PROVIDE 1/2" Ø FOR CLEVIS PIN.
5. 1/2" Ø THROUGH HOLE FOR CLEVIS PIN.
6. 4" L x 3/8" Ø STAINLESS STEEL CLEVIS PIN.
7. PHILIPS MONITOR BRACKET (SHOWING 1 OF 2) - INSTALLATION BY PHILIPS.



ISOMETRIC - MONITOR SUPPORT

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

2



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MRI EQUIPMENT UPGRADE
BUILDING 1, SUB-GROUND FLOOR
MRI SUITE

VA CONNECTICUT HEALTHCARE SYSTEM
WEST HAVEN CAMPUS
950 CAMPBELL AVENUE
WEST HAVEN, CONNECTICUT 06516

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WEST HAVEN, CONNECTICUT 06516

[illegible]

ISSUED FOR:	DATE:
☐ _____	_____
☐ _____	_____
☒ REVIEW	06/16/25
☐ BIDDING	_____
☐ PERMIT	_____
☒ CONSTRUCTION	07/02/25

SHEET TITLE

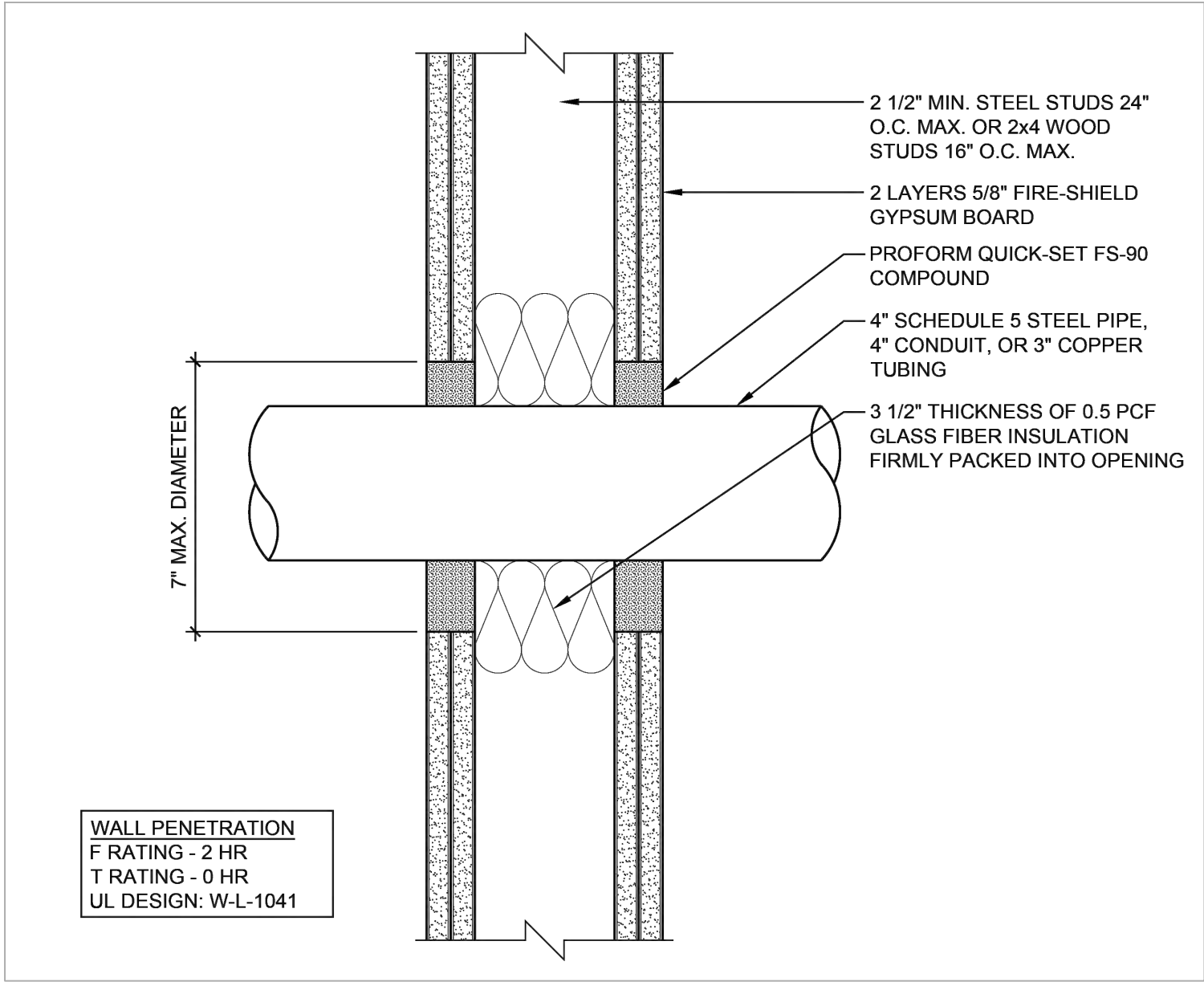
MONITOR
SUPPORT
DETAILS

DATE
MAY 2, 2025

PROJECT NO.
0225-02

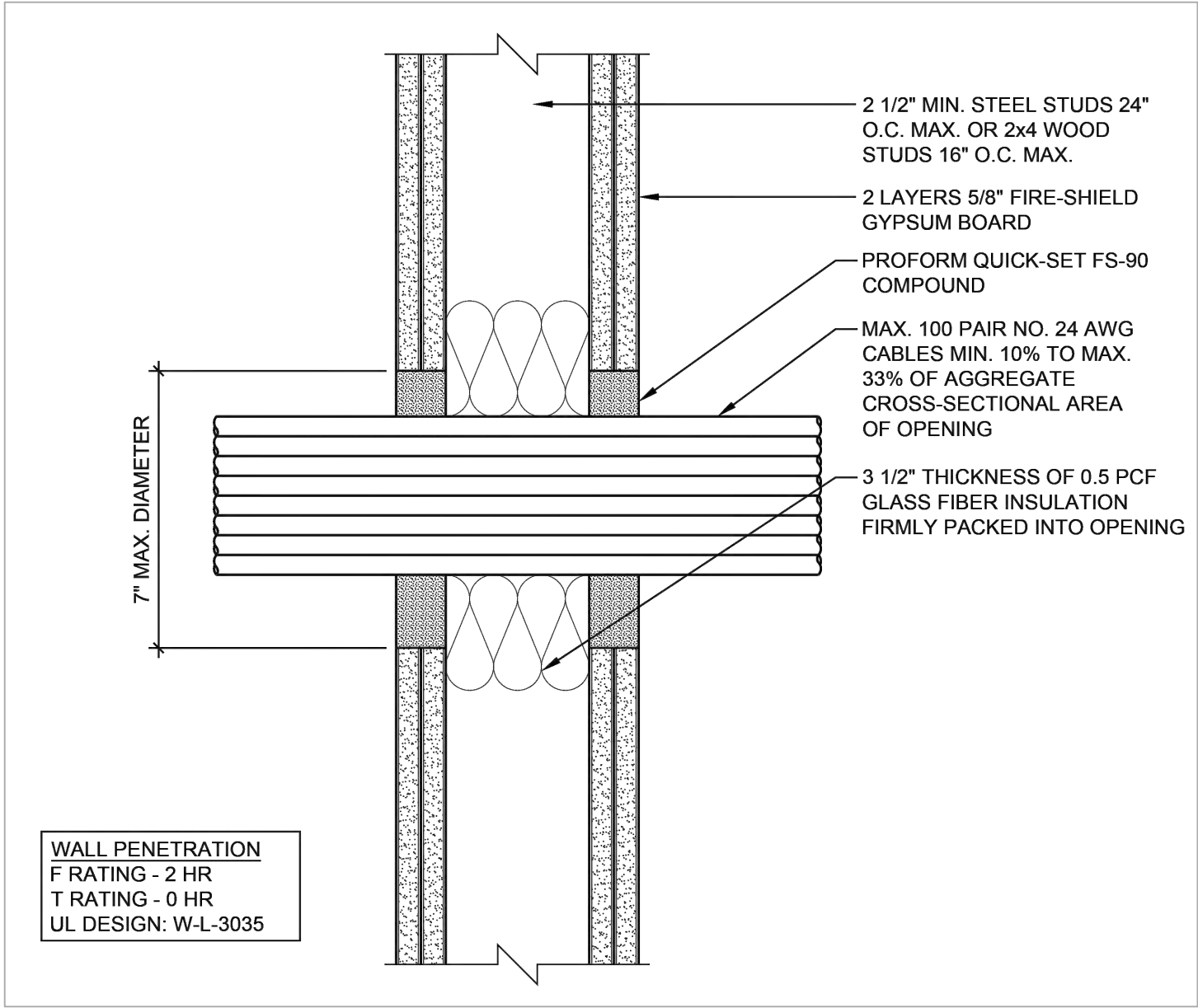
SHEET NO.

A-9



WALL PENETRATION
F RATING - 2 HR
T RATING - 0 HR
UL DESIGN: W-L-1041

PIPE PENETRATION THROUGH WALL



WALL PENETRATION
F RATING - 2 HR
T RATING - 0 HR
UL DESIGN: W-L-3035

CABLE PENETRATION THROUGH WALL

PENETRATION DETAIL

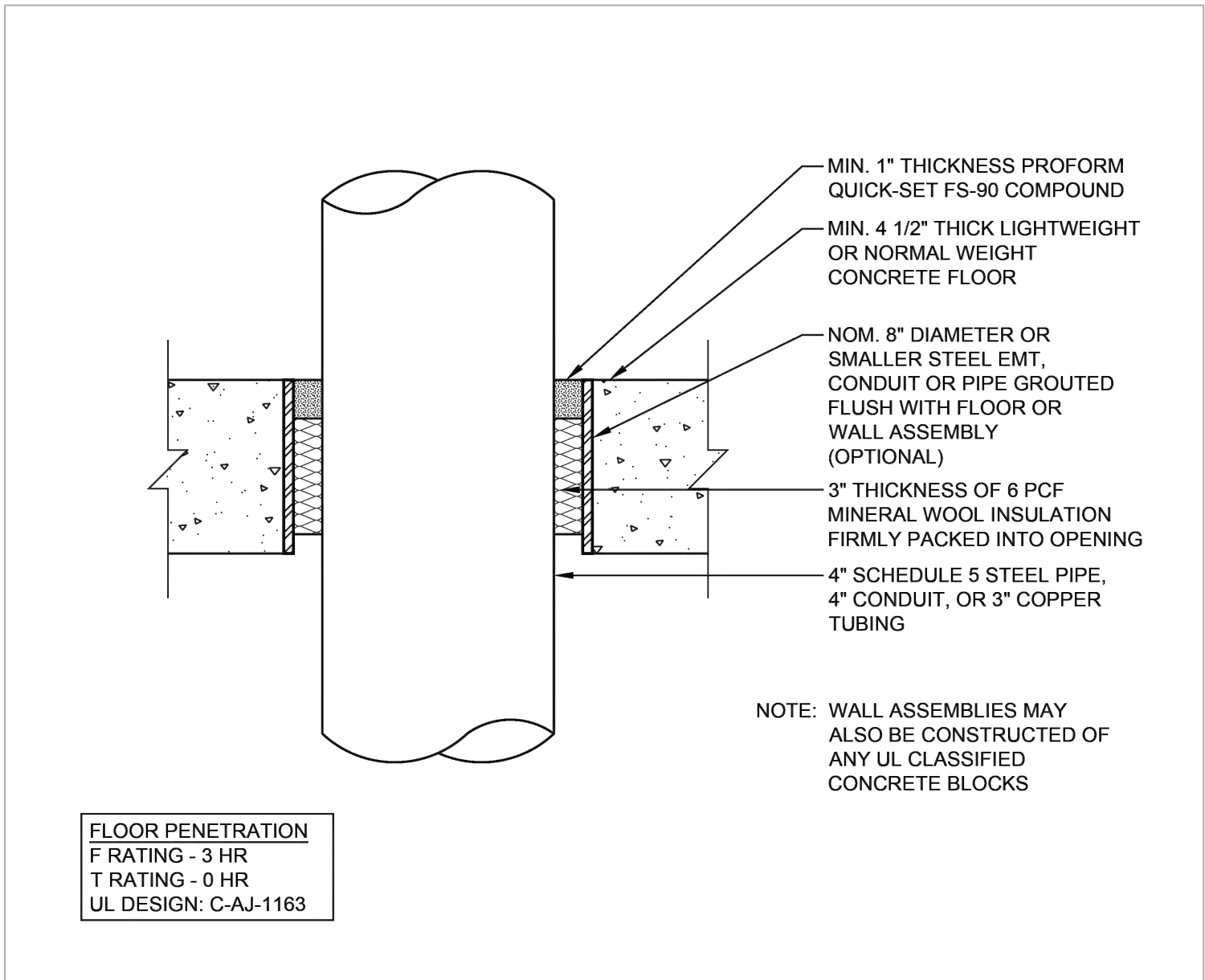
SCALE
N.T.S.

1

PENETRATION DETAIL

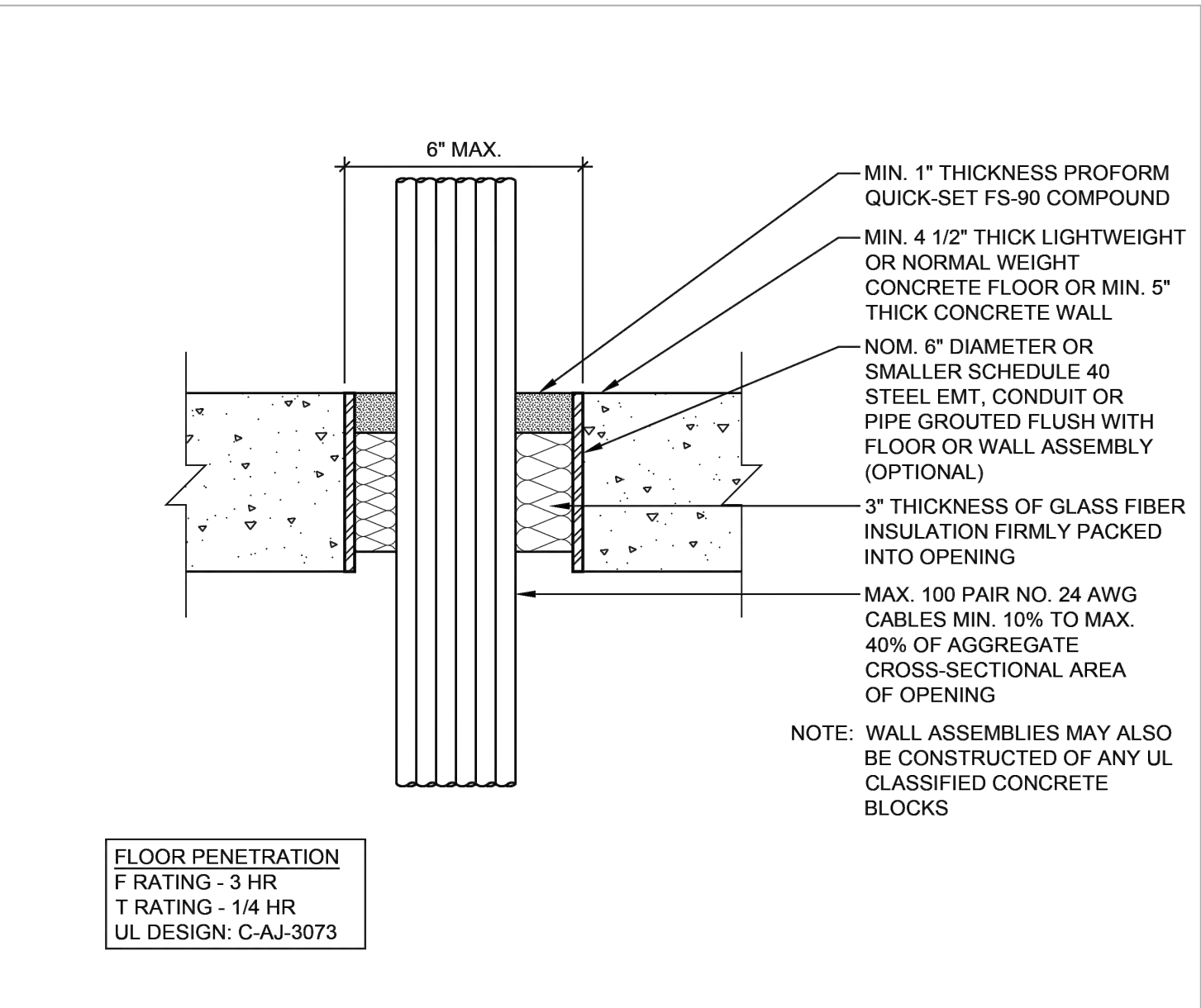
SCALE
N.T.S.

3



FLOOR PENETRATION
F RATING - 3 HR
T RATING - 0 HR
UL DESIGN: C-AJ-1163

PIPE PENETRATION THROUGH FLOOR



FLOOR PENETRATION
F RATING - 3 HR
T RATING - 1/4 HR
UL DESIGN: C-AJ-3073

CABLE PENETRATION THROUGH FLOOR

PENETRATION DETAIL

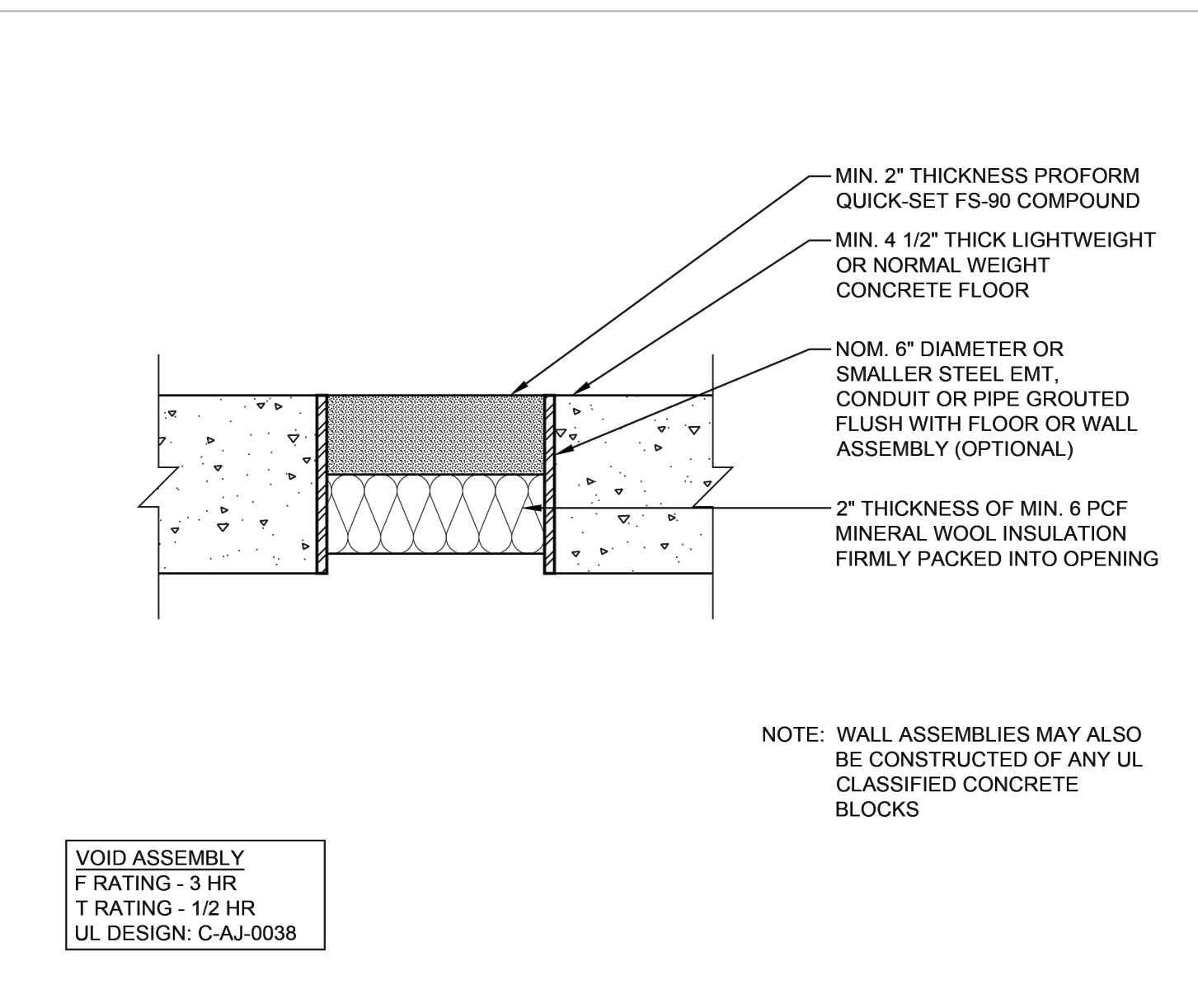
SCALE
N.T.S.

2

PENETRATION DETAIL

SCALE
N.T.S.

4



VOID ASSEMBLY
F RATING - 3 HR
T RATING - 1/2 HR
UL DESIGN: C-AJ-0038

VOID FILL ASSEMBLY

PENETRATION DETAIL

SCALE
N.T.S.

5

NAME	FLOOR	BASE	WALLS	CEILING	CEILING HT.	REMARKS
READING #2	-	-	-	-	-	
READING #1	-	-	-	-	-	
EQUIPMENT	-	-	-	-	-	
STAFF TOILET	-	-	-	-	-	
PATIENT TOILET	-	-	-	-	-	
LOUNGE	-	-	-	-	-	
SUB-WAITING AREA	-	-	-	-	-	
DRESSING	-	-	-	-	-	
STORAGE	-	-	-	-	-	
H.C. DRESS	-	-	-	-	-	
CIRCULATION	-	-	-	-	-	
MRI EXAM ROOM #2	-	PATCH TO MATCH	PAINT	-	-	NOTE 1 NOTE 2
SHARED MRI CONTROL	-	-	-	-	-	
MRI EXAM ROOM #1	-	-	-	-	-	

- NOTES:
- TEMPORARILY REMOVE SMALL PORTION OF EXISTING CEILING (AFTER HOURS AND / OR WEEKEND) TO FACILITATE FAN COIL UNIT REPLACEMENT - SEE MECHANICAL DRAWINGS.
 - PATCH WALLS WHERE NEW WORK OCCURRED - PATCHING WILL REQUIRE LEVEL 5 FINISH. REPAINT WALLS.

FINISH SCHEDULE

SCALE
N/A

6

NO.	SIZE	TYPE	FRAME	GLASS	DETAIL	REMARKS
X	EXISTING	-	EXISTING	EXISTING		

WINDOW SCHEDULE

SCALE
N/A

7

NO.	SIZE	DOOR	FRAME	LABEL	GLAZING	TYPE	HARDWARE	REMARKS
X	EXISTING TO REMAIN	EXISTING	EXISTING	EXISTING	EXISTING		EXISTING	

DOOR SCHEDULE

SCALE
N/A

8

REVISIONS

ISSUED FOR:	DATE:
☐ REVIEW	06/16/25
☐ BIDDING	
☐ PERMIT	
☒ CONSTRUCTION	07/02/25

SCHEDULES
& DETAILS

DATE
MAY 2, 2025

PROJECT NO.
0225-02

SHEET NO.

A-10

MRI EQUIPMENT UPGRADE
BUILDING 1, SUB-GROUND FLOOR
MRI SUITE
VA CONNECTICUT HEALTHCARE SYSTEM
WEST HAVEN CAMPUS
950 CAMPBELL AVENUE
WEST HAVEN, CONNECTICUT 06516

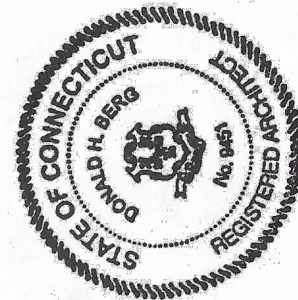


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GT LICENSE NO. ARI,0009451



MRI EQUIPMENT UPGRADE
BUILDING 1, SUB-GROUND FLOOR
MRI SUITE

V/A CONNECTICUT HEALTHCARE SYSTEM
WEST HAVEN CAMPUS
950 CAMPBELL AVENUE
WEST HAVEN, CONNECTICUT 06516

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REVISIONS

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☐ _____	_____
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☐ PERMIT	_____
☒ CONSTRUCTION	07/02/20

SHEET TITLE

ARCHITECTURAL SPECIFICATIONS

DATE
MAY 2, 2025

PROJECT NO.
0225-02

SHEET NO.

A-11

GENERAL PROJECT NOTES:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL DRAWINGS AND SPECIFICATIONS AS PART OF THIS DRAWING SET INCLUDING ARCHITECTURAL, MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, AND PHILIPS DRAWINGS PRIOR TO SUBMITTING A BID. REPORT ANY DISCREPANCIES TO ARCHITECT OR APPLICABLE ENGINEER PRIOR TO BID.

2. BIDDER'S ARE TO VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS AND SATISFY THEMSELVES AS TO THE NATURE AND SCOPE OF WORK. THE SUBMISSION OF A BID WILL BE EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED, OR FOR ANY DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD AN EXAMINATION BEEN MADE, WILL NOT BE ALLOWED.

3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ARCHITECT OR HOSPITAL OF ANY DISCREPANCIES ENCOUNTERED ON THE PLANS OR IN EXISTING SITE CONDITIONS PRIOR TO SUBMISSION OF BID.

DIVISION I - GENERAL REQUIREMENTS

CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR FROM THE DATE OF ACCEPTANCE AND SHALL ADVISE HOSPITAL IN WRITING OF ANY HOSPITAL REQUIRED MAINTENANCE TO MAINTAIN WARRANTY.

CORRECTION OF ANY DEFECTS TO BE COMPLETED WITHOUT ADDITIONAL CHARGE AND TO INCLUDE REPLACEMENT OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED THEREBY.

ALL REQUIRED INSURANCE TO BE PROVIDED FOR THE PROTECTION AGAINST PUBLIC LIABILITY OF PROPERTY DAMAGE FOR THE DURATION OF THE WORK.

CONTRACTOR SHALL MAINTAIN ON SITE A DEDICATED COMPLETE COPY OF THESE DRAWINGS TO BE MARKED UP WITH ALL CONSTRUCTION DEVIATIONS. A COPY OF THIS MARKED-UP SET OF DRAWINGS WILL BE GIVEN TO THE ARCHITECT AFTER WORK HAS BEEN COMPLETED AND ACCEPTED BY THE MEDICAL CENTER. TRANSMITTAL SHALL TAKE PLACE WITHIN 30 DAYS OF ACCEPTANCE.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL CONSTRUCTION MATERIALS AND MANUFACTURED ITEMS / PRODUCTS.

DIVISION 2 - SITE WORK (DEMOLITION)

OPEN PARTITIONS WHERE SHOWN.

REMOVE SUSPENDED CEILINGS AND GRID WHERE SHOWN.

DIVISION 3 - CONCRETE - N/A

DIVISION 4 - MASONRY - N/A

DIVISION 5 - METALS

MONITOR SUPPORT SHALL BE MADE FROM 6061 GRADE ALUMINUM ALLOY ANGLES AND PLATES. CONNECTIONS SHALL BE FULL PENETRATION WELDS. USE STAINLESS STEEL BOLTS FOR ANCHORAGE AND CONNECTIONS WHERE SHOWN. STAINLESS STEEL BOLTS SHALL BE COATED WITH EPOXY OR ANTI-CORROSION PRIMER.

DIVISION 6 - WOOD & PLASTICS

ALL LUMBER SHALL BE GRADE MARKED. MOISTURE CONTENT SHALL BE:

1. SOUTHERN PINE: 12% AVERAGE, 15% MAXIMUM
2. WEST COAST SOFT WOODS: 15% AVERAGE, 19% MAXIMUM

DIVISION 7 - THERMAL & MOISTURE PROTECTION

CAULK AND SEAL ALL PENETRATIONS THROUGH SLABS IN ACCORDANCE WITH NEC 300-21. SEE EXAMPLE DRAWINGS ON SHEET A-10 AND SHALL MEET VA MASTER SPECIFICATIONS SECTION 07 84 00.

DIVISION 8 - DOORS & WINDOWS - N/A

DIVISION 9 - FINISHES

PAINT ALL NEW GYPSUM WALL BOARD WITH ONE (1) COAT PRIMER AND TWO (2) FINISH COATS OF SHERWIN WILLIAMS SEMI GLOSS PAINT. COLOR IN MRI EXAM ROOM #2 SHALL BE SHERWIN WILLIAMS SW 7005 PURE WHITE, MATTE FINISH.

PAINT ALL EXPOSED DRYWALL IN MRI EXAM ROOM #2 WITH TWO (2) COATS OF SHERWIN WILLIAMS SW 7005 PURE WHITE, MATTE FINISH

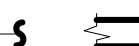
LEVEL 5 GYPSUM BOARD FINISH FOR MRI EXAM ROOM #2 ONLY:
ALL JOINTS AND INTERIOR ANGLES HAVE TAPE EMBEDDED IN JOINT COMPOUND AND TWO SEPARATE COATS OF JOINT COMPOUND APPLIED OVER ALL FLAT JOINTS AND ONE SEPARATE COAT OF JOINT COMPOUND APPLIED OVER INTERIOR ANGLES. FASTER HEADS AND ACCESSORIES SHALL BE COVERED WITH THREE SEPARATE COATS OF JOINT COMPOUND. ALL SURFACES SHALL BE SMOOTH AND FREE FROM TOOLS, MARKS AND RIDGES.
ADDITIONALLY, A THIN SKIN COAT OF JOINT COMPOUND, OR MATERIAL MANUFACTURED ESPECIALLY FOR THIS PURPOSE, SHALL BE APPLIED TO THE ENTIRE SURFACE DISTURBED BY THE NEW WORK.

DIVISION 10 - SPECIALTIES - N/A

DIVISION II - EQUIPMENT - N/A

DIVISION 12 - FURNISHINGS - N/A

DIVISION 13 - SPECIAL CONSTRUCTION - N/A

MECHANICAL LEGEND	
SYMBOL	DESCRIPTION
	NEW DUCTWORK, PIPING, OR EQUIPMENT
	EXISTING DUCTWORK, PIPING, OR EQUIPMENT TO REMAIN
	FLEXIBLE DUCT
	SUPPLY OR OUTSIDE AIR DUCT SECTION
	RETURN OR EXHAUST DUCT SECTION
	EXISTING DUCTWORK, PIPING, OR EQUIPMENT TO BE REMOVED
	DUCTWORK TRANSITION
	MANUAL AIR VOLUME CONTROL DAMPER
	MOTORIZED DAMPER (24 VOLTS)
	SUPPLY AIR DEVICE. CLEAR TRIANGLE SIDES INDICATE AIR FLOW PATTERN
	RETURN AIR DEVICE
	EXHAUST AIR DEVICE
	CONNECTION BETWEEN NEW AND EXISTING WORK
	UNDERCUT DOOR 1"
	WALL MOUNTED THERMOSTAT
	HUMIDIFIER DISTRIBUTION WAND
	TEMPERATURE/HUMIDITY SENSOR
CD	CEILING DIFFUSER
ERC	EXHAUST REGISTER AT CEILING
RRC	RETURN REGISTER AT CEILING
TGC	TRANSFER GRILLE AT CEILING
(E)	EXISTING
(N)	NEW
SA	SUPPLY AIR
RA	RETURN AIR
EA	EXHAUST AIR
OA	OUTSIDE AIR
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN

HVAC DESIGN CRITERIA DRY BULB TEMPERATURE		
	OUTDOOR (°F)	INDOOR (°F)
SUMMER	93	74
WINTER	3	70

MECHANICAL SHEET INDEX	
M-0	MECHANICAL LEGEND SCHEDULES AND NOTES
M-1	MECHANICAL DEMOLITION PLAN
M-2	MECHANICAL RENOVATION PLAN
M-3	MECHANICAL DETAILS

MECHANICAL GENERAL NOTES	
• IN GENERAL, PLANS AND DIAGRAMS ARE SCHEMATIC ONLY AND SHOULD NOT BE SCALED. • INTENT OF THESE NOTES AND MECHANICAL NOTES ON DRAWINGS IS TO CLARIFY THE SCOPE OF WORK AND ALERT CONTRACTOR OF EXISTING CONDITIONS. CONTRACTOR TO VISIT SITE AND VERIFY ALL CLEARANCES BEFORE FABRICATION OF DUCTWORK AND PROVIDE ADDITIONAL OFFSET AND/OR CHANGES IN DUCT SIZES TO MEET FIELD CONDITIONS AND COORDINATE WITH ELECTRICAL, PLUMBING AND FIRE PROTECTION SUBCONTRACTOR BEFORE ANY CONSTRUCTION WORK. • CONTRACTOR SHALL NOTIFY THE OWNER, ARCHITECT OR HIS AUTHORIZED REPRESENTATIVE OF ANY DAMAGE TO THE EXISTING INSTALLATION BEFORE PROCEEDING WITH THE WORK. • PROVIDE ADDITIONAL DUCTWORK AND PIPING SUPPORTS ON BOTH SIDES AND WITHIN 18" OF FIRE RATED WALL. DUCTWORK OR PIPING SHALL NOT BE SUPPORTED FROM ANY FIRE RATED WALL. • DUCT DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. • DUCTWORK, DIFFUSERS, REGISTERS, GRILLES, AND OTHER ITEMS OF THE AIR HANDLING SYSTEM SHALL NOT BE SUPPORTED BY THE CEILING OR CEILING SUSPENSION SYSTEM. • ALL SUPPLY AND RETURN DUCTWORK SHALL BE EXTERNALLY INSULATED SHEET METAL CONSTRUCTION IN ACCORDANCE WITH LATEST SMACNA STANDARDS. • ALL WALL MOUNTED THERMOSTATS AND/OR TEMPERATURE SENSORS SHALL BE INSTALLED AT AN ELEVATION OF 48" ABOVE FINISHED FLOOR TO THE TOP UNLESS OTHERWISE NOTED ON DRAWINGS. LOCATION OF THE WALL MOUNTED THERMOSTAT SHALL BE COORDINATED WITH OTHER TRADES FOR A NEAT APPEARANCE. FINAL LOCATION OF THERMOSTAT SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER OR HIS REPRESENTATIVE IN THE FIELD. • CONTRACTOR SHALL PROVIDE A COPY OF THE TEST AND BALANCE REPORT AT THE FINAL INSPECTION. TEST AND BALANCE REPORT SHALL BE PERFORMED BY AN INDEPENDENT NEBB OR AABC CERTIFIED AGENCY. THIS REPORT MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO THE FINAL ACCEPTANCE. • ALL DUCTWORK MUST BE INSTALLED 6" AWAY FROM ANY FIRE RATED WALL TO FACILITATE INSPECTION. • THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL TRADES INSTALLATION SCHEDULES. FIXED WORK SUCH AS DUCTWORK AND PLUMBING SHALL BE INSTALLED PRIOR TO ANY TRADE WORK THAT CAN BE EASILY RELOCATED OR OFFSET SUCH AS ELECTRICAL CONDUITS, SMALL WATER LINES ETC. • UNLESS OTHERWISE NOTED, INSTALL DUCTWORK AS HIGH AS POSSIBLE, TIGHT TO BOTTOM OF STRUCTURE. COORDINATE DUCT ELEVATION WITH RAIN LEADERS, WATER PIPING, SANITARY DRAINS AND MAJOR ELECTRICAL CONDUITS. • CONTRACTOR SHALL PROVIDE ALL SUPPLEMENTARY STEEL REQUIRED TO SUSPEND MECHANICAL EQUIPMENT AND MATERIALS. • ALL MECHANICAL WORK SHALL MEET ALL THE REQUIREMENTS OF THE 2018 INTERNATIONAL MECHANICAL CODE & ASHRAE 170 2013 (W/ ADDENDA) AS INCORPORATED IN 2018 FGI GUIDELINES. • IT IS THE RESPONSIBILITY OF THE MECHANICAL INSTALLER TO PATCH AND REPAIR ANY DUCT OPENINGS WHICH RESULT FROM THE RELOCATION OR ELIMINATION OF ANY EXISTING AIR DEVICES. THE PATCH IS TO BE OF A SIMILAR MATERIAL TO THE REPAIRED DUCT AND TO BE SEALED IN ACCORDANCE WITH SMACNA STANDARDS. • FLEXIBLE AND RIGID ROUND DUCT TAKE-OFFS FOR DIFFUSERS SHALL BE THE SAME SIZE AS DIFFUSER NECK. MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 8'-0". • PROVIDE A TRAP IN ALL CONDENSATE PIPING LOCATED AT THE AIR HANDLING UNIT. INSULATE ALL CONDENSATE LINES WITH 1/2" THICK CLOSED CELL FOAM INSULATION. CONDENSATE PIPING SHALL BE COPPER. • ALL EXHAUST DUCTS SHALL BE GALVANIZED SHEET METAL.	
• DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS. • THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER, OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT THE CONTRACTOR'S EXPENSE. • ALL CONCEALED SUPPLY, RETURN, OUTSIDE AIR, AND TRANSFER DUCTWORK SHALL BE EXTERNALLY INSULATED SHEET METAL CONSTRUCTION IN ACCORDANCE WITH LATEST SMACNA STANDARDS. INSULATION SHALL HAVE AN INSTALLED MINIMUM THERMAL RESISTANCE (R) VALUE OF 6.0. ALL JOINTS SHALL BE SECURELY TAPED WITH 3" WIDE GLASS FABRIC TAPE WITH FOSTER 30/35 MASTIC OR EQUAL.	

SPLIT SYSTEM A/C SCHEDULE				
AIR HANDLING UNIT DATA				
TAG	—	FCU-1		
TOTAL CAPACITY	BTUH	28,080		
SENSIBLE CAPACITY	BTUH	23,830		
SUPPLY AIR	CFM	800		
OUTSIDE AIR	CFM	—		
ENTERING AIR TEMP DB/WB	°F/°F	80/64		
LEAVING AIR TEMP DB/WB	°F/°F	52/51		
EXT. STATIC PRESSURE	IN. H ₂ O	0.4		
MOTOR	H.P.	1.0		
ELECTRICAL	VOLT/PH	460V/3ø		
MCA/MOCP	AMPS	3.13/15.00		
HOT WATER TEMP. (ENT/LVG)	°F/°F	180/160		
TOTAL CAPACITY	MBH	68.470		
HOT WATER FLOW	GPM	6.84		
FILTER TYPE	—	—		
MANUFACTURER	—	TRANE		
MODEL NO.	—	BCHE024		
NOTES	①	①2③⑤		
CONDENSING UNIT DATA				
TAG	—	CU-1		
OUTDOOR TEMP.	°F	95		
ELECTRICAL	V/ø	208V/1ø		
SEER	—	—		
MANUFACTURER	—	TRANE		
MODEL NO.	—	STTR4030		
NOTES	②	②③④		

- ① HORIZONTAL UNIT. DOUBLE WALL CONSTRUCTION WITH INJECTED FOAM INSULATION. STAINLESS STEEL COIL CASING. NO INSULATION SHALL BE ALLOWED IN AIRSTREAM. SECONDARY DRAIN PAN AND CODE REQUIRED FLOAT SWITCH. PROVIDE VIBRATION ISOLATION HANGER.
- ② SINGLE POINT ELECTRICAL CONNECTION-DISCONNECT SWITCH BY ELECTRICAL DIVISION.
- ③ VERIFY REFRIGERANT LINE SIZES WITH MANUFACTURER. PROVIDE FACTORY R-454 LEAK DETECTION/REFRIGERANT SAFETY ACCESSORIES.
- ④ PROVIDE SHORT CIRCUIT PROTECTION AND LOW AMBIENT CONTROL TO 30°F.
- ⑤ EXISTING T-STAT OUTSIDE OF SCAN ROOM SHALL REMAIN. UNIT TO BE CONTROLLED THROUGH EXISTING TEMPERATURE AND EXISTING HUMIDISTAT SENSORS IN RETURN DUCT. EXISTING CONTROL TO REMAIN. NEW UNIT SHALL BE TIED INTO EXISTING BMS/BACNET CONTROL. BMS SHALL HAVE THE ABILITY TO ADJUST SETPOINTS AS WELL AS MONITOR.

SEQUENCE OF OPERATION	
FCU-1/CU-1:	
UNIT SHALL BE TIED INTO THE BUILDINGS EXISTING B.A.S.	
COOLING AND HEATING: THE SEQUENCE OF OPERATION FOR THE NEW UNIT TO BE EXISTING TO REMAIN.	
HUMIDIFIER: SHALL BE CONTROLLED THROUGH EXISTING HUMIDISTAT LOCATED IN RETURN DUCT AND MANUFACTURER CONTROL SEQUENCE, TIE MONITORING POINTS INTO EXISTING B.A.S.	
DEHUMIDIFIER: SHALL BE CONTROLLED THROUGH EXISTING HUMIDISTAT LOCATED IN RETURN DUCT. IF THE HUMIDITY IS 60% R.H. OR ABOVE THE SET POINT, THE COMPRESSOR AND THE HEATER SHALL ENERGIZE TO REHEAT THE AIR TO 70 DEGREES OR ROOM SETPOINT. IF THE SPACE TEMPERATURE RISES ABOVE THE SET POINT, THE HEATER SHALL DE-ENERGIZE AND REMAIN IN COOLING-ONLY MODE UNTIL THE SPACE TEMPERATURE SET POINT IS SATISFIED.	
CRAC-1:	
UNIT SHALL BE TIED INTO THE BUILDINGS EXISTING B.A.S.	
THE COMPRESSOR(S) SHALL STAGE "ON" AS REQUIRED TO MAINTAIN COOLING SET POINT. UNIT OPERATES TO MAINTAIN SPACE COOLING AND HEATING REQUIREMENTS VIA ADJUSTABLE THERMOSTAT/HUMIDISTAT. THE UNIT SHALL HUMIDIFY AND DEHUMIDIFY AS NEEDED. UNITS TO SHUTDOWN UPON FIRE ALARM OR DUCT SMOKE DETECTOR ACTIVATION.	

COMPUTER ROOM A/C SCHEDULE			
AIR HANDLING UNIT DATA			
TAG	—	CRAC-1	
TOTAL CAPACITY	BTUH	55,970	
SENSIBLE CAPACITY	BTUH	50,170	
SUPPLY AIR	CFM	2,700	
OUTSIDE AIR	CFM	—	
ENTERING AIR TEMP DB/WB	°F/°F	72.0/60.0	
LEAVING AIR TEMP DB/WB	°F/°F	—	
EXT. STATIC PRESSURE	IN. H ₂ O	0.5	
MOTOR	H.P.	4.9	
ELECTRICAL	VOLT/PH	460/3	
MCA/MOCP	AMPS	31.1/35.0	
ELECTRIC HEAT	KW	9.0	
NO. OF STAGES	—	1	
HUMIDIFICATION INPUT	KW	3.4	
HUMIDIFICATION CAPACITY	LB/HR	4-10	
FILTER TYPE	—	2"-MERV11	
MANUFACTURER	—	STULZ	
MODEL NO.	—	SCS-060-AR-U-EO	
NOTES	①	①4⑤	
CONDENSER DATA			
TAG	—	CRAC-CU-1	
OUTDOOR TEMP.	°F	95	
ELECTRICAL	V/ø	460/3	
MCA/MOCP	AMPS	5.8/15.0	
EER	—	—	
MANUFACTURER	—	STULZ	
MODEL NO.	—	SCS-144-SEC	
NOTES	②	②③④	

- ① PROVIDE WITH ELECTRIC REHEAT, DEHUMIDIFICATION CONTROL MODE, STEAM GENERATING HUMIDIFIER, SMOKE DETECTOR, CONDENSATE PUMP, HIGH EFFICIENCY MOTOR, TWO WAY TOP DISCHARGE PLENUM, WATER DETECTOR FOR LEAK DETECTION, CONDENSATE PAN WATER SWITCH AND DISCONNECT BY ELECTRICAL.
- ② PROVIDE WITH PREMIUM EFFICIENCY MOTOR, LOW AMBIENT CONTROLS AND DISCONNECT BY ELECTRICAL.
- ③ VERIFY REFRIGERANT LINE SIZES WITH MANUFACTURER.
- ④ PROVIDE PROGRAMMABLE THERMOSTAT AND HUMIDISTAT. TIE CONTROL POINTS INTO EXISTING BMS/BACNET CONTROL. BMS SHALL HAVE THE ABILITY TO ADJUST SETPOINTS AS WELL AS MONITOR.
- ⑤ SHALL MEET VA MASTER SPECIFICATION, SECTION 23 81 23 AND 23 21 00.

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MRI EQUIPMENT UPGRADE
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MRI SUITE
VA CONNECTICUT HEALTHCARE SYSTEM
WEST HAVEN CAMPUS
950 CAMPBELL AVENUE
WEST HAVEN, CONNECTICUT 06516

REVISIONS

ISSUED FOR:	DATE:
☐ _____	_____
☐ _____	_____
☐ REVIEW	06/16/25
☐ BIDDING	_____
☐ PERMIT	_____
☒ CONSTRUCTION	07/02/25

SHEET TITLE

LEGEND,
SCHEDULES,
AND NOTES

DATE
MAY 2, 2025

PROJECT NO.
0225-02

SHEET NO.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ARCHITECT, LANDLORD OR TENANT OF ANY DISCREPANCIES ENCOUNTERED ON THE PLANS OR IN EXISTING SITE CONDITIONS PRIOR TO SUBMISSION OF BID.

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- ① EXISTING MRI CHILLER TO BE REMOVED AND REPLACED WITH NEW. ASSOCIATED PIPING SHALL REMAIN.
- ② EXISTING FCU-1/CU-1 TO BE REMOVED AND REPLACED WITH NEW. ASSOCIATED PIPING SHALL REMAIN.
- ③ EXISTING CRAC-1/CU-1 TO BE REMOVED AND REPLACED WITH NEW. ASSOCIATED PIPING SHALL REMAIN.
- ④ EXISTING HUMIDIFIER TO BE REMOVED AND REPLACED WITH NEW. ASSOCIATED PIPING AND DISTRIBUTION WAND SHALL REMAIN.

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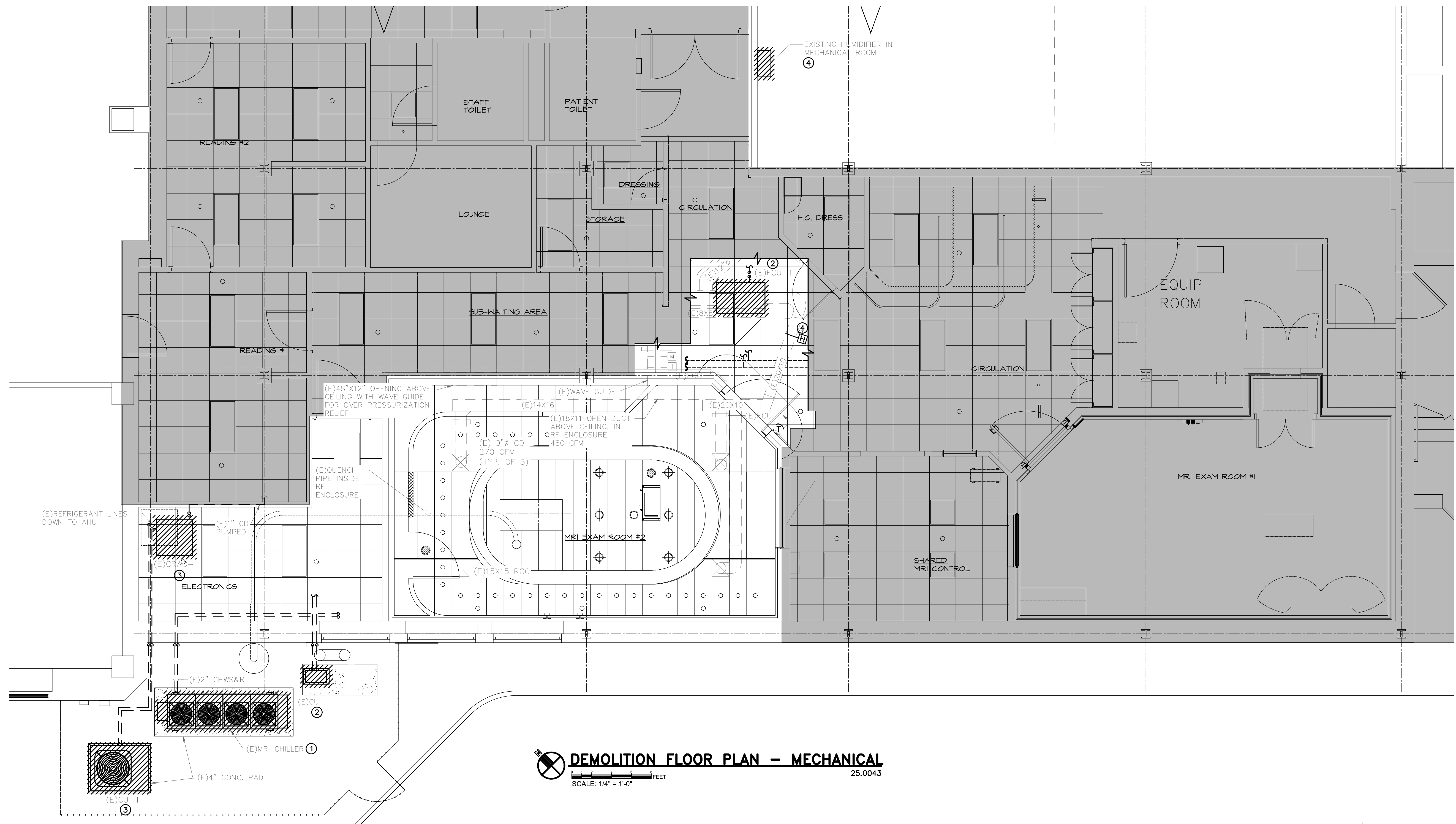
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_____	_____
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PERMIT	_____
CONSTRUCTION	07/02/25

SHEET NO.

**Shane R.
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Consulting Engineer

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- ① EXTEND AND CONNECT NEW HUMIDIFIER TO EXISTING 1-1/2" CW WITH EXISTING SHUT OFF VALVE AND EXISTING BFP. EXTEND AND CONNECT NEW DRAIN TO EXISTING DRAIN FOR THE EXISTING/REPLACED HUMIDIFIER. CONTRACTOR SHALL VERIFY EXACT LOCATION, SIZES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION. REPLACE AS/IF REQUIRED.
- ② INSTALL NEW FCU-1 ABOVE THE CEILING. CONNECT TO EXISTING DUCTWORK. PROVIDE DUCT TRANSITION AS/IF REQUIRED. REFER TO SPLIT SYSTEM A/C SCHEDULE ON SHEET M-0 FOR FURTHER INFORMATION.
- ③ EXTEND AND CONNECT TO EXISTING REFRIGERANT LINES. FIELD VERIFY EXISTING CONDITIONS AND SIZES PRIOR TO CONSTRUCTION. CLEAN/SERVICE EXISTING LINES PRIOR TO INSTALLATION.
- ④ PROVIDE NEW CONDENSATE DRAIN P-TRAP. CONNECT NEW PIPING/P-TRAP TO EXISTING PIPING ROUTED TO SINK SIDE OF P-TRAP IN STRETCHER HOLDING. FIELD VERIFY EXACT LOCATION. CLEAN AND FLUSH EXISTING PIPES TO REUSE.
- ⑤ FASTEN NEW CONDENSING UNIT TO EXISTING HOUSEKEEPING CONCRETE PAD PER CODE. MAINTAIN REQUIRED CLEARANCES FOR PROPER OPERATION. EXTEND EXISTING CONCRETE PAD AS/IF REQUIRED TO ACCOMMODATE NEW CONDENSING UNIT. SUPPORT REFRIGERANT PIPING FROM CONCRETE USING UNISTRUT STANDS.
- ⑥ EXISTING WALL MOUNTED THERMOSTAT TO REMAIN FOR (N) FCU-1.
- ⑦ EXTEND AND CONNECT TO EXISTING CHILLED WATER SUPPLY AND RETURN LINES. REFER TO PHILIPS MRI DOCUMENTS FOR FINAL INSTALLATION REQUIREMENTS.
- ⑧ NEW MRI CHILLER SUPPLIED BY PHILIPS. MOUNTED AND INSTALLED ON EXISTING CONCRETE PAD PER CODE. SEE PHILIPS MRI DOCUMENTS FOR INSTALLATION INSTRUCTIONS. MAINTAIN ALL MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND AIRFLOW. EXTEND EXISTING CONCRETE PAD AS/IF REQUIRED TO ACCOMMODATE NEW MRI CHILLER.
- ⑨ NEW CRAC-1 IN EQUIPMENT ROOM. REFER TO COMPUTER ROOM A/C SCHEDULE ON SHEET M-0 FOR FURTHER INFORMATION.
- ⑩ EXTEND AND CONNECT TO EXISTING HOT WATER SUPPLY & RETURN. HOT WATER CONTROL VALVE SHALL REMAIN. FIELD VERIFY EXISTING CONDITIONS AND SIZES PRIOR TO CONSTRUCTION.
- ⑪ EXTEND AND CONNECT NEW 3/4" CD PUMPED TO EXISTING CD PIPING ABOVE THE CEILING. CLEAN AND FLUSH EXISTING PIPES TO REUSE. DO NOT ROUTE PIPING OVER ELECTRICAL PANELS.

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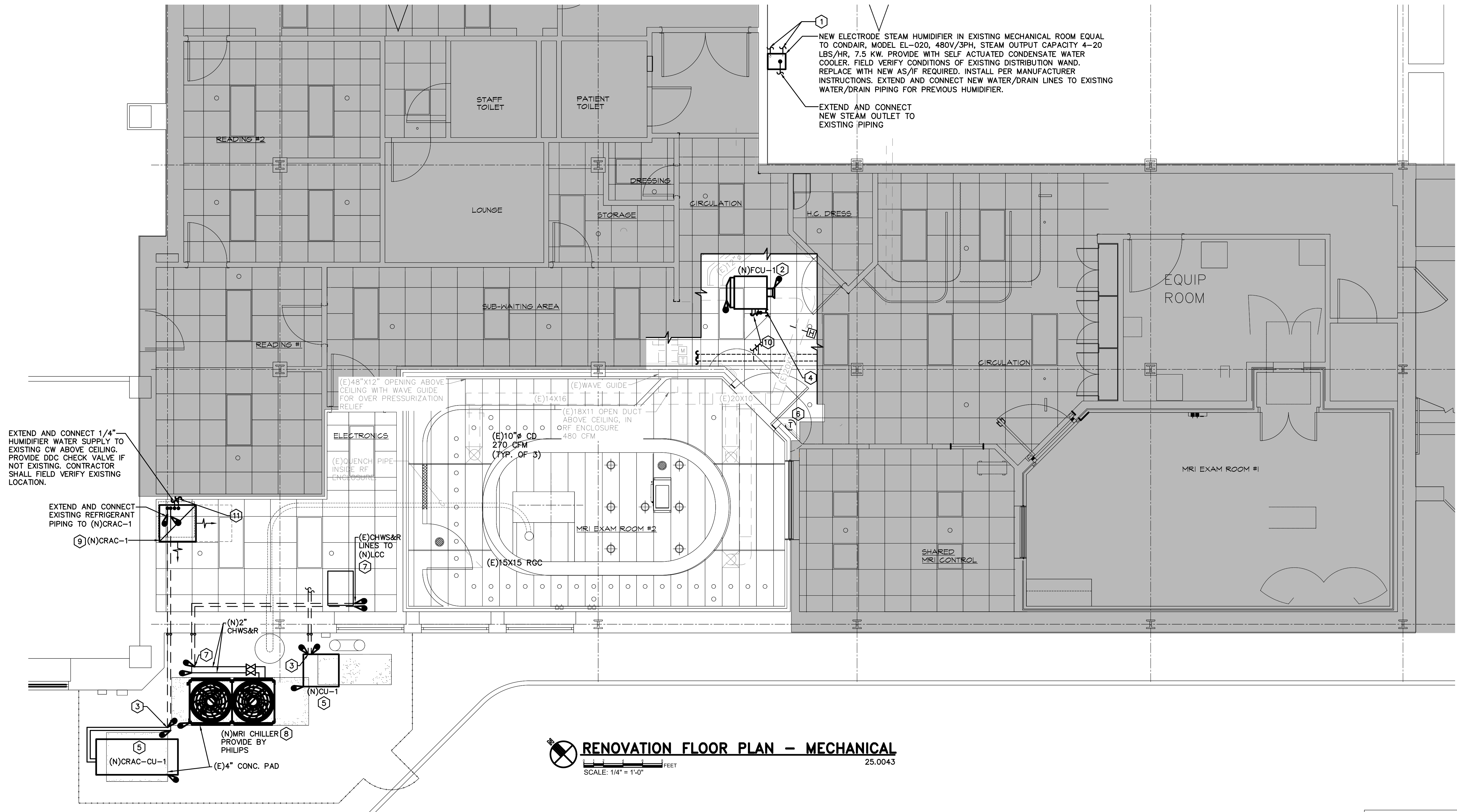
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CONSTRUCTION	07/02/25

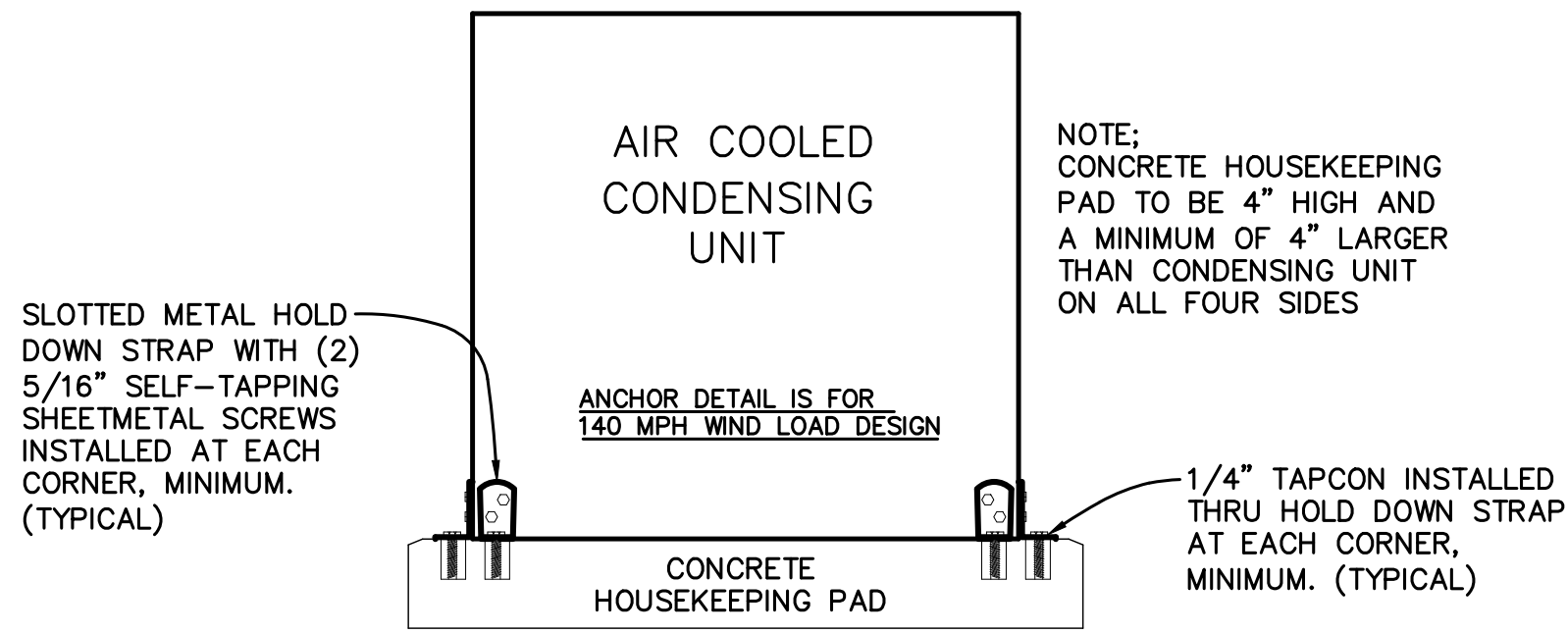
RENOVATION
PLANS

M-2

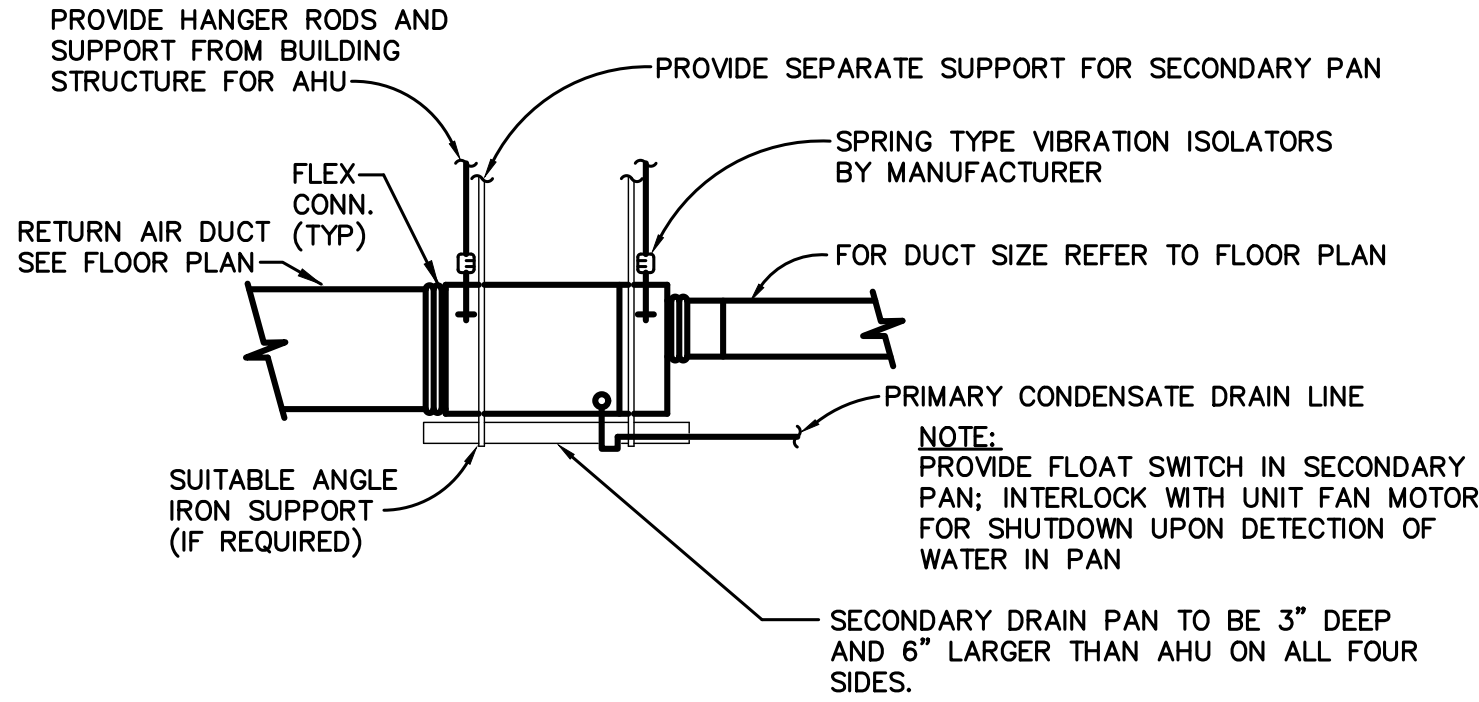
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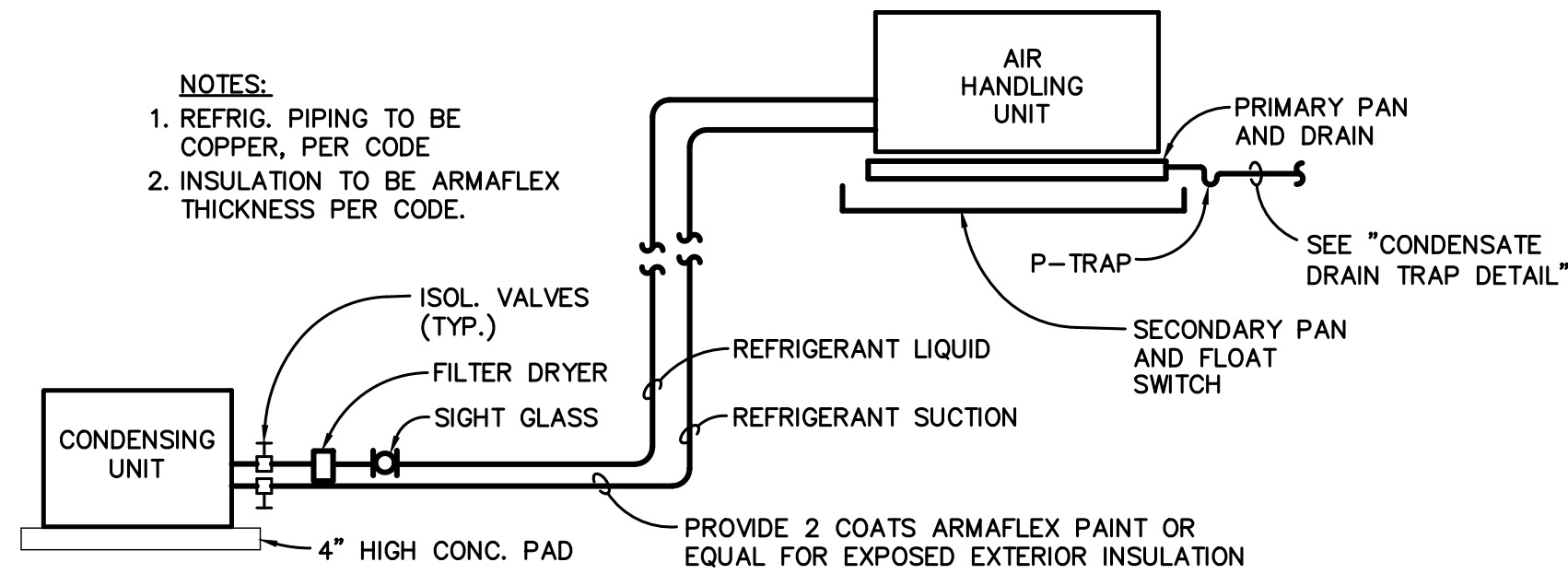




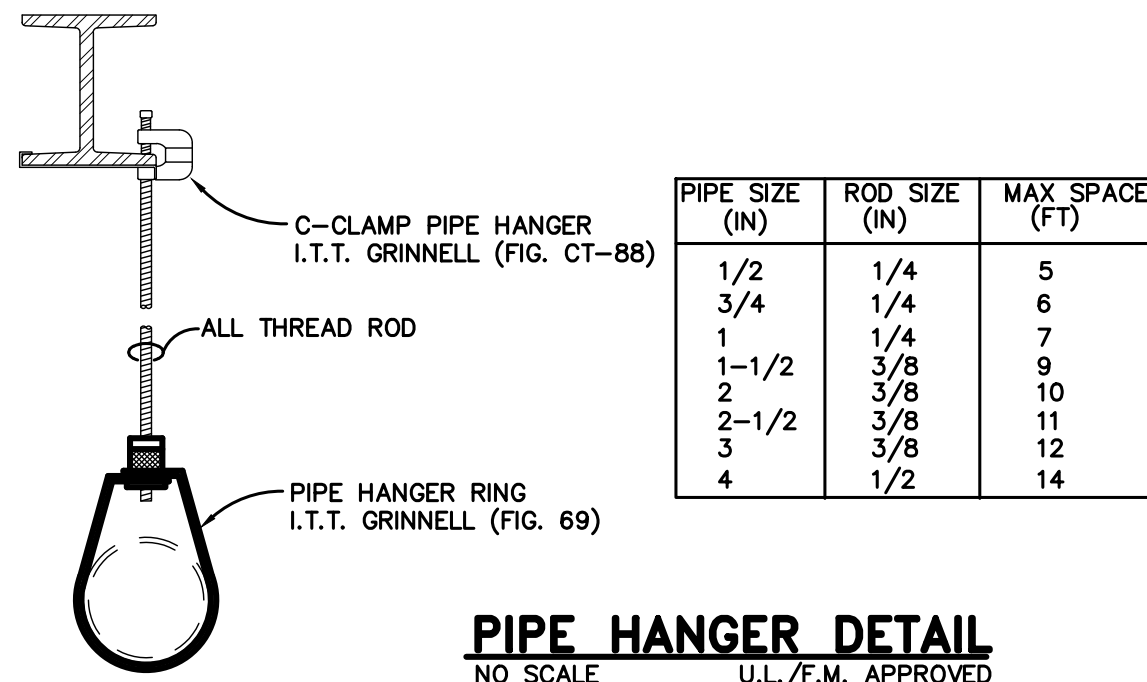
CONDENSING UNIT MOUNTING DETAIL
NOT TO SCALE



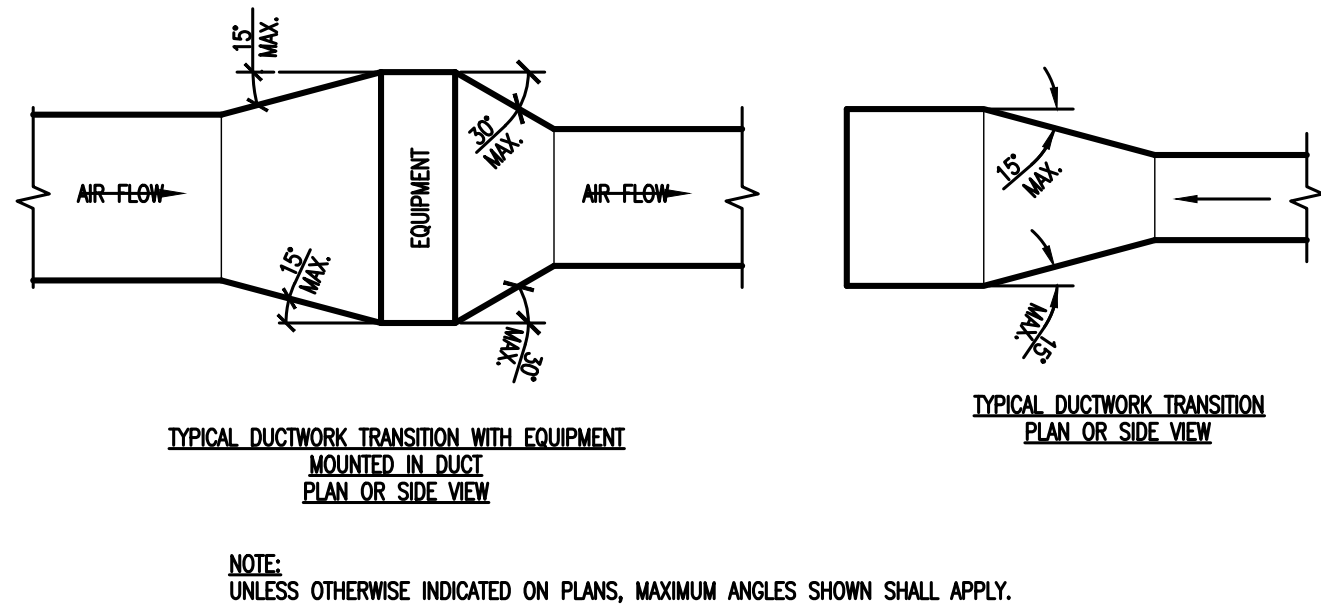
AIR HANDLING UNIT MOUNTING DETAIL
NO SCALE



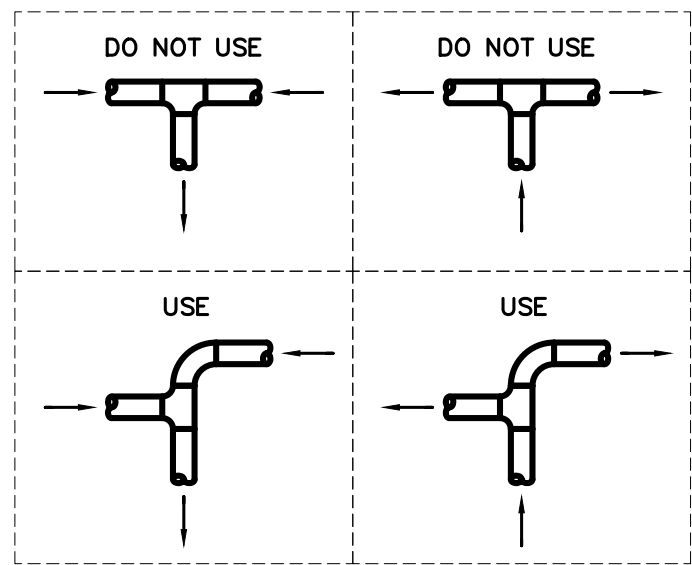
SPLIT 'DX' UNIT PIPING DIAGRAM
NO SCALE



PIPE HANGER DETAIL
NO SCALE U.L./F.M. APPROVED



DUCTWORK TRANSITIONS DETAIL
NO SCALE



PIPING CONNECTIONS
SCALE: NONE

NOTE:
OFFSET PIPING CONNECTIONS AT ALL THREE AND FOUR WAY JOINTS. "BULL-HEADING" IS NOT ALLOWED.

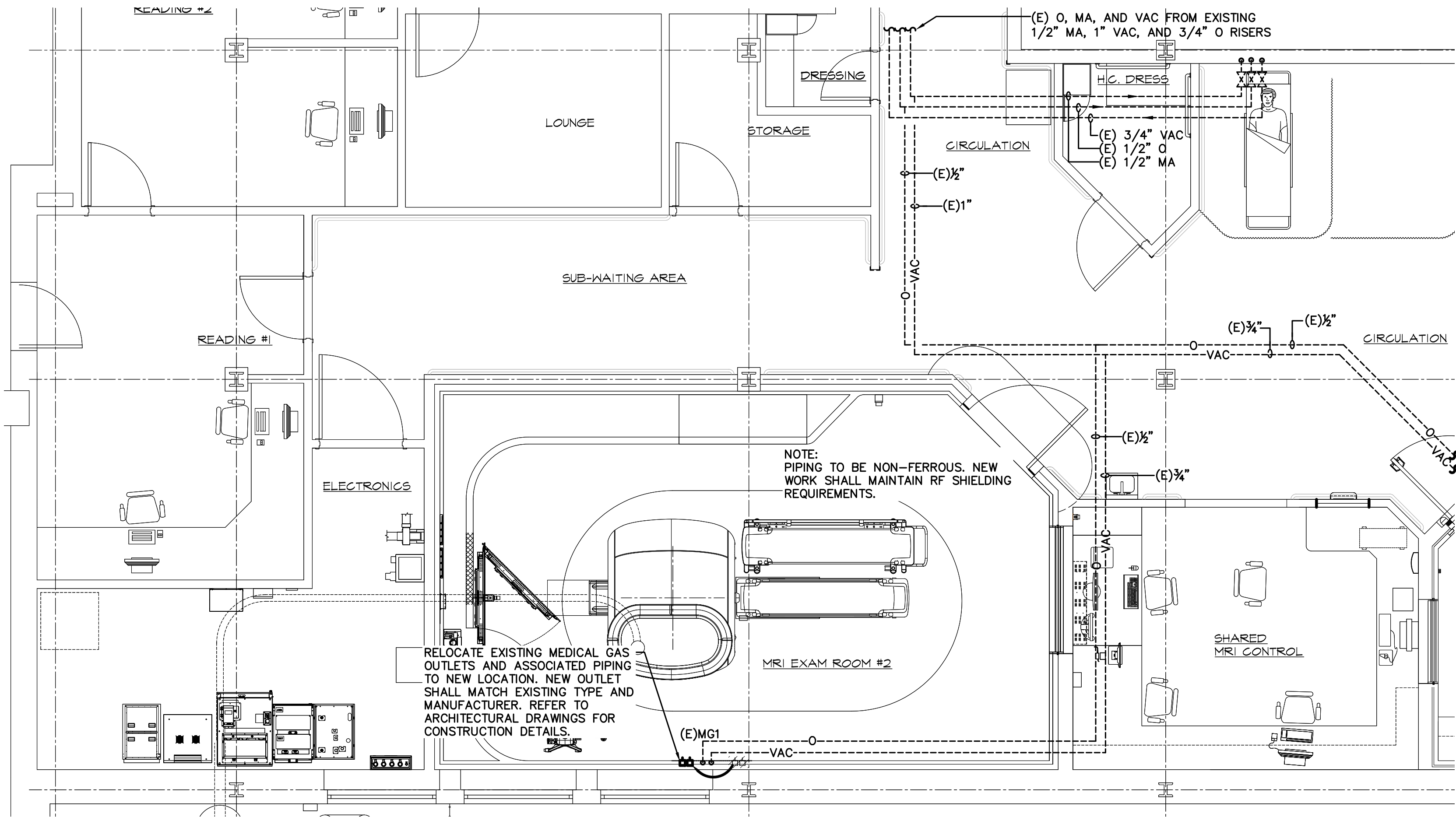
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SHEET TITLE	
MECHANICAL DETAILS	
DATE MAY 2, 2025	
PROJECT NO. 0225-02	
SHEET NO.	



NOTE:

EXISTING PIPING DEPICTED IS SCHEMATIC. FIELD VERIFY EXACT LOCATION AND ADJUST NEW CONNECTIONS TO SUIT FIELD CONDITIONS.

THE CONTRACTOR SHALL PROVIDE RUBBER MATS AND PLYWOOD COVERS TO ALL OWNER'S EQUIPMENT SUSCEPTIBLE TO DAMAGE DURING CONSTRUCTION. VERIFY SPECIFIC LOCATIONS WITH OWNER'S AUTHORIZED REPRESENTATIVE.

CONTRACTOR NOTES

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ARCHITECT, LANDLORD OR TENANT OF ANY DISCREPANCIES ENCOUNTERED ON THE PLANS OR IN EXISTING SITE CONDITIONS PRIOR TO SUBMISSION OF BID.

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MEDICAL GAS LEGEND	
MG1	(1) OXYGEN, (1) VACUUM

CONSTRUCTION FLOOR PLAN – MEDICAL GAS

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

25.0043

MEDICAL GAS SYSTEM

SYSTEM DESCRIPTION

A. SYSTEMS SHALL INCLUDE ALL PIPING, STATION OUTLETS, SERVICE CONNECTIONS TO EXISTING SYSTEM, AND ACCESSORIES SPECIFIED OR REQUIRED FOR A FULLY FUNCTIONAL INSTALLATION, READY FOR USE.

B. WHERE MEDICAL GAS SERVICES ARE REQUIRED FOR EQUIPMENT FURNISHED UNDER OTHER SECTIONS, OR PROVIDED BY OWNER, DETERMINE ACCURATE "ROUGH-IN" REQUIREMENTS IN ADVANCE OF WORK, SET EQUIPMENT IN PLACE, MAKE NECESSARY SERVICE CONNECTIONS, AND PROVIDE ACCESSORY EQUIPMENT AS SPECIFIED.

DESIGN AND INSTALLATION STANDARDS

A. VA CODE STANDARDS.

B. INTERNATIONAL FIRE CODE (2021 EDITION).

C. NATIONAL STANDARD PLUMBING CODE, LATEST EDITION.

D. ALL BRAZING SHALL BE DONE BY PERSONNEL HAVING BRAZING QUALIFICATION RECORDS AS PER NFPA-99.

TESTING

A. ALL MEDICAL GAS SYSTEMS SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION AND OTHER STANDARDS AS SPECIFIED IN THIS SECTION. SUBMIT TO ARCHITECT CERTIFICATION THAT ALL TESTS HAVE BEEN COMPLETED AND THAT EACH OUTLET IS CONNECTED TO THE PROPER SYSTEM. THESE TESTS SHALL INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING:

1. GAS AND VACUUM PRESSURE TESTS AND CROSS CONNECTION TESTING IN ACCORDANCE WITH NFPA PAMPHLET 99, SECTION 5.1.12, PERFORMANCE CRITERIA AND TESTING

B. MEDICAL GAS CERTIFICATION MUST BE REVIEWED AND ACCEPTED BY THE VA PROJECT ENGINEER PRIOR TO FINAL INSPECTION.

PIPING

A. ALL PIPING SHALL BE SEAMLESS COPPER TUBING, TYPE "K", ASTM B819, HARD DRAWN TEMPER, WITH WROUGHT COPPER FITTINGS CONFORMING TO ASME B16.22 OR BRAZING FITTINGS COMPLYING WITH ASME B16.50. SIZE DESIGNATED REFLECTING NOMINAL INSIDE DIAMETER. ALL TUBING AND FITTINGS SHALL BE LABELED "ACR/OXY", "OXY", "OXY/MED", "ACR/MED", OR "MED".

B. BRAZING ALLOY: AWS A5.8M/A5.8, CLASSIFICATION BCUP, GREATER THAN 538 DEGREES C (1,000 DEGREES F) MELTING TEMPERATURE. FLUX IS STRICTLY PROHIBITED FOR COPPER-TO-COPPER CONNECTIONS.

STATION OUTLETS

A. FOR ALL SERVICES: BRASS, STAINLESS STEEL OR CHROMED METAL NON-INTERCHANGEABLE DISS CONNECTIONS FOR APPROPRIATE SERVICE TO CONFORM WITH CGA V-A. EQUIP EACH STATION OUTLET WITH AN AUTOMATIC VALVE AND A SECONDARY CHECK VALVE TO CONFORM WITH NFPA 99. EQUIP EACH STATION INLET WITH AN AUTOMATIC VALVE TO CONFIRM WITH NFPA 99. PLACE VALVES IN THE ASSEMBLY TO PROVIDE EASY ACCESS AFTER INSTALLATION, FOR SERVICING AND REPLACEMENT, AND TO FACILITATE LINE BLOW-OUT, PURGING, AND TESTING. FASTEN EACH OUTLET SECURELY TO OUTLET ROUGH-IN TO PREVENT FLOATING, AND PROVIDE EACH OUTLET WITH A CAPPED STUB LENGTH OF 6 MM (1/4-INCH) (10 MM (3/8-INCH) OUTSIDE DIAMETER) TUBING FOR CONNECTION TO SUPPLY. LABEL STUB TUBING FOR APPROPRIATE SERVICE. ADJUSTABLE TO COMPENSATE FOR VARIATIONS IN PLASTER OR COVER THICKNESS. ROUGH-IN KITS AND TEST PLUGS FOR PBPU ARE FURNISHED UNDER THIS SPECIFICATION BUT INSTALLED BY MANUFACTURER OF PBPU BEFORE INITIAL TESTS SPECIFIED HEREIN. INSTALL OUTLET COMPLETION KITS (VALVE BODY AND FACE PLATE) FOR THE REMAINDER OF REQUIRED TESTS. OUTLETSS SHALL MATCH EXISTING VA BUILDING STANDARDS.

STATION OUTLETS ROUGH-IN

A. ANCHOR FLUSH MOUNTED ROUGH-IN SECURELY TO UNIT OR WALL CONSTRUCTION.

B. MODULAR COVER PLATE: DIE CAST BACK PLATE, TWO PIECE 0.85 MM (22 GAGE) STAINLESS STEEL OR 1.6 MM (16 GAGE) CHROMIUM PLATED METAL, WITH MOUNTING FLANGES ON ALL FOUR SIDES, SECURED TO ROUGH-IN WITH STAINLESS STEEL OR CHROMIUM PLATED COUNTERSUNK SCREWS.

C. COVER PLATE FOR PBPU: ONE-PIECE WITH CONSTRUCTION AND MATERIAL AS INDICATED FOR MODULAR COVER PLATE.

D. PROVIDE PERMANENT, METAL OR PLASTIC, IDENTIFICATION PLATES SECURELY FASTENED AT EACH OUTLET AND INLET OPENING, WITH INSCRIPTION FOR APPROPRIATE SERVICE USING COLOR CODED LETTER AND BACKGROUND. METAL PLATES SHALL HAVE LETTERS EMBOSSED ON BAKED-ON ENAMEL BACKGROUND. COLOR CODING FOR IDENTIFICATION PLATES IS AS FOLLOWS:

SERVICE LABEL – IDENTIFICATION PLATE COLORS

OXYGEN – WHITE LETTERS ON GREEN BACKGROUND AND VICE VERSA

NITROUS OXIDE – WHITE LETTERS ON BLUE BACKGROUND

NITROGEN – WHITE LETTER ON BLACK BACKGROUND

MEDICAL AIR – BLACK LETTERS ON YELLOW

CARBON DIOXIDE – WHITE LETTERS ON GRAY BACKGROUND

PIPE INSTALLATION

A. ALL PIPING USED FOR MEDICAL GAS SYSTEMS SHALL BE CLEANED AND PREPARED FOR ITS SPECIFIC TYPE SERVICE AND HAVE ENDS CAPPED AT FACTORY.

B. ALL CHANGES IN DIRECTION REQUIRING TURNS OR OFFSETS A RADIUM LESS THAN FIVE TIMES THE PIPE OR TUBING OUTSIDE DIAMETER SHALL BE MADE USING BRAZE-TYPE WROUGHT FITTINGS, OR BY PIPE OR TUBING SHAPED BY BENDING TOOLS. ALL BENDS SHALL BE FREE FROM APPRECIABLE FLATTENING, BUCKLING OR THINNING OF THE TUBE WALL AT ANY POINT. ALL PIPE AND TUBING SHALL BE CUT ACCURATELY TO MEASUREMENTS OBTAINED AT THE SITE OF THE SYSTEM AND SHALL BE INSTALLED WITHOUT SPRINGING OR FORCING. ALL PIPE AND TUBING SHALL BE PROTECTED AGAINST MECHANICAL INJURY IN A MANNER SATISFACTORY TO THE AUTHORITIES HAVING JURISDICTION.

C. PIPING SHALL NOT BE SUPPORTED BY OTHER PIPING BUT SHALL BE SUPPORTED WITH HANGERS DIRECTLY FROM THE BUILDING STRUCTURE.

D. ALL PIPE AND TUBING SHALL BE LABELED TO INDICATE ITS CONTENTS AND OPERATING PRESSURE. COLOR CODING FOR MEDICAL GAS PIPING IS: OXYGEN – GREEN, AIR – YELLOW, VACUUM – WHITE, NITROUS OXIDE – BLUE, NITROGEN – BLACK. METAL TAGS, STENCILING, OR ADHESIVE MARKERS MAY BE USED IF AFFIXED SO AS NOT TO BE READILY REMOVABLE. LABELING SHALL APPEAR ON THE PIPE AT INTERVALS OF NOT MORE THAN TWENTY FEET AND AT LEAST ONCE IN EVERY ROOM.

E. PIPE OR TUBING IN CORRIDORS OR OTHER EXPOSED LOCATIONS WHERE SUBJECT TO DAMAGE SHALL BE ADEQUATELY PROTECTED.

F. PROVIDE DIELECTRIC UNIONS FOR ALL MEDICAL GAS PIPING AT THE JUNCTION TO STATION OUTLETS.

G. COPPER LINES SHALL BE ISOLATED FROM CONTACT WITH CONCRETE AND OTHER DISSIMILAR METALS.

MEDICAL GAS GENERAL NOTES

- COORDINATE ALL WORK IN OCCUPIED CORRIDOR WITH OWNER. FOLLOW THE REQUIREMENTS OF THE OWNER'S ICRA FOR WORK IN THESE AREAS IN APPROVED CONTAINMENT WITH NEGATIVE AIR.
- CONTRACTOR TO FIELD VERIFY LOCATION AND CONDITION OF ALL EXISTING PIPING SYSTEMS WITHIN PROJECT LIMITS. CONTRACTOR TO PROVIDE NEW PIPING SUPPORTS AND PER HANGER DETAILS.
- CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF ALL EXISTING PIPING PENETRATIONS IN EXISTING FIRE RATED WALL WITHIN PROJECT LIMITS. CONTRACTOR TO PROVIDE NEW UL FIRE STOPPING SYSTEMS AS NECESSARY TO BRING ALL EXISTING PENETRATIONS IN SPACE INTO COMPLIANCE.
- DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.
- THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER, OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT THE CONTRACTOR'S EXPENSE.
- SPACE ABOVE CEILING IS LIMITED. CONTRACTOR SHALL FULLY INVESTIGATE SITE FOR THE NEW WORK PROPOSED PRIOR TO BIDDING OR FABRICATION AND FULLY COORDINATE WITH EXISTING CONDITIONS AND SERVICES PASSING THROUGH PROJECT AREA. NOTIFY OWNER & ENGINEER FOR ALL REQUIRED SHUTDOWNS TO EXISTING SERVICES REQUIRED TO INSTALL NEW EQUIPMENT DUCTWORK OR PIPING. COORDINATE SHUTDOWN SCHEDULE WITH OWNER PRIOR TO ONSET OF WORK. MODIFICATIONS TO EXISTING SYSTEMS REQUIRING SHUTDOWN SHALL BE ON PREMIUM TIME.
- WORK SHALL BE PERFORMED BY 6020/6030 CERTIFIED MEDICAL GAS FITTER.
- THE MEDICAL GAS SYSTEMS SHALL PASS THIRD PARTY CERTIFICATION.
- THE CONTRACTOR SHALL BE PRESENT DURING THE THIRD PARTY CERTIFICATION.
- THIS PROJECT INCLUDES ALL WORK REQUIRED TO PERFORM THE TASKS NOTED, INCLUDING SYSTEM SHUT DOWNS, PURGING, MAINTAINING SYSTEM CLEANLINESS, TAKING CARE OF ISSUES WITH THE ALARM PANELS, LABELING ALL EQUIPMENT/PIPING AND DISPOSAL OF WASTE.
- ALL WORK SHALL CONFORM TO NFPA-99. (2021)
- IN ACCORDANCE TO NFPA-99, INCLUDE CERTIFIED RESULTS IN REPORT FORM OF THE INITIAL PRESSURE TEST, STANDING PRESSURE TEST, SYSTEM INSPECTION AND SYSTEM VERIFICATION.

MEDICAL GAS CONSTRUCTION NOTES

- ALL DEMO AND NEW WORK TO BE COORDINATE WITH OWNER PRIOR TO START OF WORK. COORDINATE SHUTDOWNS, PROVIDE TEMPORARY SERVICES AND RECERTIFY ALL AFFECTED AREAS.
- DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.
- THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT THE CONTRACTOR'S EXPENSE.
- FIELD VERIFY EXISTING MEDICAL GAS SIZES IN VICINITY PRIOR TO START OF ANY WORK.
- WORK SHALL BE PERFORMED BY 6010 CERTIFIED MEDICAL GAS FITTER.
- THE MEDICAL GAS SYSTEMS SHALL PASS THIRD PARTY CERTIFICATION.
- THE MEDICAL GAS CERTIFIED INSTALLING CONTRACTOR WHOM HOLDS THE LICENSE SHALL BE PRESENT ONSITE WITH CREDENTIALS AVAILABLE FOR OWNER REVIEW.
- THIS PROJECT INCLUDES ALL WORK REQUIRED TO PERFORM THE TASKS NOTED, INCLUDING SYSTEM SHUT DOWNS, PURGING, MAINTAINING SYSTEM CLEANLINESS, TAKING CARE OF ISSUES WITH THE ALARM PANELS, AND DISPOSAL OF WASTE.
- ALL WORK SHALL CONFORM TO NFPA-99. (2021).
- PIPING CONSIDERED NOT CLEAN FOR OXYGEN SERVICE IF JOINTS HAVE NOT BEEN BRAZED WITHIN EIGHT (8) HOURS AFTER THE PLUG OR CAP FROM THE MANUFACTURER IS REMOVED. TAPING OF THE JOINTS IS NOT ACCEPTABLE TO SEAL THE PIPING FROM CONTAMINATION FOR LONGER THAN THE MAXIMUM 8 HOUR PERIOD. PIPING THAT HAS BECOME CONTAMINATED INTERNALLY AND NOT CLEAN FOR OXYGEN SERVICE SHALL NOT BE INSTALLED AND SHALL BE REMOVED AND REPLACED.
- COPPER-TO-COPPER JOINTS SHALL BE BRAZED USING A COPPER-PHOSPHORUS OR COPPER-PHOSPHORUS-SILVER BRAZING FILLER METAL WITHOUT FLUX.
- JOINTS SHALL BE MADE IN ACCORDANCE WITH 2021 NFPA99 5.1.10.3.1.

MEDICAL GAS CODE CRITERIA

- ALL MECHANICAL WORK SHALL MEET ALL THE REQUIREMENTS OF THE FOLLOWING LOCAL, STATE AND NATIONAL CODES:
- CONNECTICUT STATE BUILDING CODE 2022 – ALL SECTIONS
- CONNECTICUT STATE FIRE SAFETY CODE
- NFPA 99-2021, STANDARD FOR HEALTH CARE FACILITIES
- 2022 GUIDELINES FOR DESIGN AND CONSTRUCTION OF HOSPITALS

NFPA 99 RISK CATEGORY

- ALL DEMO AND NEW WORK TO BE PERFORMED TO MEET THE REQUIREMENTS OF A RISK CATEGORY 1 MEDICAL GAS SYSTEM.

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MRI EQUIPMENT UPGRADE
BUILDING 1, SUB-GROUND FLOOR
MRI SUITE
VA CONNECTICUT HEALTHCARE SYSTEM
WEST HAVEN CAMPUS
950 CAMPBELL AVENUE
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REVISIONS	
ISSUED FOR:	DATE:
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☐	
☐ REVIEW	06/16/25
☐ BIDDING	
☐ PERMIT	
☒ CONSTRUCTION	07/02/25
SHEET TITLE	
MEDICAL GAS PLAN	
DATE MAY 2, 2025	
PROJECT NO. 0225-02	
SHEET NO.	

MG-1

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DIVISION 26 ELECTRICAL REQUIREMENTS

- ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE N.E.C., ALL APPLICABLE VA STANDARDS, AND COMPLY WITH THE SPECIFICATIONS.
- ALL MATERIALS SHALL BE NEW AND OF DOMESTIC ORIGIN AND SHALL BEAR UNDERWRITERS' LABEL WHERE APPLICABLE.
- ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST-CLASS WORKMANLIKE MANNER. THE COMPLETED SYSTEM IS TO BE FULLY OPERABLE AND ACCEPTANCE OF THIS SYSTEM BY THE ENGINEER/ARCHITECT MUST BE A CONDITION OF THE SUB CONTRACT.
- ALL WORK TO BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
- CONTRACTOR TO GUARANTEE ALL MATERIALS AND WORKMANSHIP FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR FROM DATE OF ACCEPTANCE.
- CORRECTION OF ANY DEFECTS TO BE COMPLETED WITHOUT ADDITIONAL CHARGE AND TO INCLUDE REPLACEMENT OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED THEREBY.
- ALL REQUIRED INSURANCE TO BE PROVIDED FOR PROTECTION AGAINST PUBLIC LIABILITY OF PROPERTY DAMAGE FOR THE DURATION OF THE WORK.
- ELECTRICAL INSTALLATION TO MEET ALL STANDARD REQUIREMENTS OF LOCAL POWER AND TELEPHONE COMPANIES.
- MINIMUM WIRE SIZE SHALL BE #12 AWG, EXCLUDING CONTROL WIRING. UNLESS OTHERWISE NOTED, ALL CONDUCTORS SHALL BE COPPER WITH THIN/THIN INSULATION. CONDUCTORS #10 AND SMALLER SHALL BE SOLID; ALL THOSE #8 AND LARGER TO BE STRANDED, PER N.E.C. 310.3.
- ALL RECESSED OUTLET BOXES IN WALLS OR CEILING, SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET OR DAMP LOCATIONS, AND BE OF SPECIAL CONSTRUCTION FOR OTHER CLASSIFIED AREAS.
- ALL GENERAL PURPOSE SWITCHES AND RECEPTACLES SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER. COLOR OF DEVICES AND PLATES SHALL BE DICTATED BY ARCHITECT/OWNER TO MATCH BUILDING STANDARD. ALL NEW RECEPTACLES SHALL BE HOSPITAL GRADE, ALL NEW SWITCHES SHALL BE INDUSTRIAL GRADE. ALL DEVICES ON GENERATOR POWER SHALL BE RED WITH "EMERGENCY" ENGRAVED IN BLACK LETTERS. ALL RECEPTACLE AND LIGHT SWITCH COVER PLATES SHALL BE ENGRAVED WITH PAINT FILLED LETTERS (BLACK) TO INDICATE PANEL AND CIRCUIT NUMBER POWERING THE DEVICE.
- IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION. THE CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM, AND PROVIDE ALL NECESSARY DEVICES AND COMPONENTS FOR EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
- ALL ELECTRICAL RACEWAYS (METALLIC AND NONMETALLIC) SHALL HAVE AN EQUIPMENT GROUND CONDUCTOR SIZED IN ACCORDANCE WITH THE N.E.C.
- LOAD DATA IS BASED ON INFORMATION GIVEN ENGINEER AT THE TIME OF DESIGN. VERIFY ALL EQUIPMENT NAMEPLATE RATINGS BEFORE ORDERING.
- CIRCUITS SHOWN ON PLANS ARE TO DETERMINE LOAD DATA AND PANEL SIZES. THE CONTRACTOR IS TO PROVIDE CIRCUITS AND ROUTING OF CONDUITS TO SUIT JOB CONDITIONS.
- ALL ELECTRICAL CONDUCTORS SHALL BE INSTALLED IN AN APPROVED RACEWAY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING ALL CONDUIT PENETRATIONS. PENETRATION SEALS SHALL BE PER U.L. LISTED ASSEMBLY STANDARDS FOR EACH LOCATION.
- TANDEM AND HALF-SPACE CIRCUIT BREAKERS SHALL NOT BE USED.

DEMOLITION NOTES

- ELECTRICAL PLANS DO NOT INCLUDE A DEMOLITION PLAN FOR THE RENOVATED AREAS. THE RENOVATED AREAS, INCLUDING WALLS, CEILINGS, ETC., TO BE REMOVED, ARE SHOWN ON THE ARCHITECTURAL PLANS. MAJOR MECHANICAL EQUIPMENT TO BE REMOVED IS SHOWN ON THE MECHANICAL PLANS. CONTRACTOR SHALL REVIEW THESE PLANS AND COORDINATE WITH THE GENERAL CONTRACTOR ON SITE TO DETERMINE THE EXTENT OF THE DEMOLITION WORK AND PROJECT PHASING REQUIRED AND PROVIDE ACCORDINGLY. ALL ELECTRICAL DEMOLITION WORK SHOWN OR IMPLIED IN THE ELECTRICAL, MECHANICAL, PLUMBING, AND ARCHITECTURAL PLANS SHALL BE PART OF THE ELECTRICAL CONTRACTOR'S WORK.
- ELECTRICAL DEMOLITION WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, REMOVING, RECEPTACLES, WIRE, CONDUIT, ETC., AS REQUIRED FOR THE INSTALLATION OF NEW EQUIPMENT AND REMODELING OF THE EXISTING FACILITY AS INDICATED ON THE PLANS.
- CONTRACTOR SHALL REMOVE ANY EXPOSED WIRE, CONDUIT, HANGERS, CLAMPS, ETC., WHICH ARE NOT BEING UTILIZED FOR THE NEW INSTALLATION.
- EXISTING WIRE AND CONDUITS CONCEALED ABOVE CEILING OR IN WALLS AND NOT BEING REUSED SHALL BE REMOVED. EXISTING CONDUITS, WHERE APPLICABLE, MAY BE REUSED.
- REVISE ALL EXISTING PANEL DIRECTORIES TO REFLECT ALL REVISIONS.
- ALL LIGHTING FIXTURES BEING RELOCATED OR SHOWN ON PLANS DENOTED WITH (RE) SHALL BE CLEANED, RE-LAMPED, AND REPAIRED TO PROPER WORKING CONDITION IF REQUIRED.
- THE CONTRACTOR SHALL PROVIDE RUBBER MATS AND PLYWOOD COVERS TO ALL OWNER'S EQUIPMENT SUSCEPTIBLE TO DAMAGE DURING CONSTRUCTION. VERIFY SPECIFIC LOCATIONS WITH OWNER'S AUTHORIZED REPRESENTATIVE.
- ALL WORK SHALL BE PERFORMED DURING TIME PERIODS ACCEPTABLE TO THE OWNER. SCHEDULE ALL WORK WITH THE OWNER'S AUTHORIZED REPRESENTATIVE 48 HOURS BEFORE PROCEEDING.
- CONTRACTOR SHALL VISIT THE JOB SITE AND BE THOROUGHLY FAMILIAR WITH EXISTING CONDITIONS UNDER WHICH THE WORK MUST BE PERFORMED.
- ANY LIGHTING FIXTURES AND LAMPS BEING REMOVED SHALL BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER. COORDINATE DISPOSITION OF ALL FIXTURES WITH OWNER PRIOR TO REMOVAL.

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS.

NOTES

- THE INTERIOR ELECTRICAL SYSTEMS SHALL BE COMPLETELY AND EFFECTIVELY GROUNDED AS REQUIRED BY THE NEC. ALL METALLIC RACEWAYS SHALL BE MECHANICALLY AND ELECTRICALLY SECURE AT ALL JOINTS AND AT ALL BOXES, CABINETS, FITTINGS AND EQUIPMENT. METALLIC RACEWAYS SHALL BE CONNECTED TO A DIRECT GROUND AT THE POINT OF ELECTRICAL SERVICE ENTRANCE.
- CONTRACTOR SHALL FIELD VERIFY RECEPTACLE CONFIGURATION, VOLTAGE, PHASE AND AMPERAGE FOR ALL REQUIRED OUTLETS. PROVIDE DEDICATED CIRCUITS AS REQUIRED. ADVISE ENGINEER IF NECESSARY.
- CONTRACTOR SHALL SUPPLY AND INSTALL ALL JUNCTION BOXES, TROUGHS, WIRE, CIRCUIT BREAKERS, ETC., UNLESS OTHERWISE SPECIFIED.
- CONDUIT RUNS ARE SHOWN SCHEMATICALLY. BUILDING CONDITIONS TO DETERMINE THE ACTUAL RUNS.
- CONDUIT ELBOWS TO BE LARGE SNEEPS PER CODE.
- CONTRACTOR SHALL PROVIDE AND COIL A MINIMUM 10'-0" OF SLACK CONDUCTOR FOR CONNECTION TO EQUIPMENT BY OTHERS. IDENTIFY BOTH ENDS OF WIRE.
- CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE CANON SYSTEM INSTALLATION DRAWINGS PRIOR TO START OF CONSTRUCTION.
- ALL CONDUIT USED SHALL BE A MINIMUM 3/4" DIAMETER.
- CONDUITS AND DUCT, ABOVE CEILING, MUST BE INSTALLED AS NEAR TO CEILING AS POSSIBLE TO REDUCE RUN LENGTHS.
- THESE DRAWINGS ARE DIAGRAMMATIC AND INTENDED ONLY TO SHOW THE REQUIRED SCOPE OF WORK. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY ALL EXISTING CONDUIT RUNS AND THEIR CONDITIONS AS WELL AS THE SUITABILITY OF LOCATING ALL NEW CONDUIT SHOWN ON THE PLANS OR IDENTIFIED IN NOTES.

NOTES

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL DRAWINGS AND SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL PRIOR TO SUBMITTING A BID.
- REPORT ANY DISCREPANCIES TO ARCHITECT OR ENGINEER PRIOR TO BID.
- BIDDERS ARE TO VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS AND SATISFY THEMSELVES AS TO THE NATURE AND SCOPE OF THE WORK.
- IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING SITE CONDITIONS INCLUDING BUT NOT LIMITED TO, SERVICE LOCATION, SERVICE LAYOUTS, AND TELEPHONE LOCATION, ETC.
- THE SUBMISSION OF A BID WILL BE EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS FOR LABOR, EQUIPMENT, OR MATERIALS REQUIRED, OR FOR ANY DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD AN EXAMINATION BEEN MADE, WILL NOT BE ALLOWED.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ARCHITECT OF ANY DISCREPANCIES ENCOUNTERED ON THE PLANS OR IN EXISTING SITE CONDITIONS PRIOR TO SUBMISSION OF BID.
- COORDINATE WITH OTHER TRADES FOR ITEMS IN THEIR SCOPE OF WORK WHICH WOULD REQUIRE ELECTRICAL WORK (DISCONNECTION, RECONNECTION, ETC.) AND ARE NOT INDICATED ON ELECTRICAL DRAWINGS.

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS.

PROJECT SYMBOLS LEGEND

MOUNTING HEIGHTS SHOWN ARE MAXIMUM/MINIMUM HANDICAPPED ACCESSIBILITY STANDARDS - THEY SHALL NOT BE ALTERED WITHOUT WRITTEN AUTHORIZATION.

NOT ALL DEVICES SHOWN IN LEGEND ARE REQUIRED. REVIEW POWER & LIGHTING PLANS AND DETAILS FOR ITEMS WHICH APPLY TO THIS PROJECT.

- FLUORESCENT LIGHT FIXTURE, LETTER INDICATES TYPE
- INCANDESCENT OR HID LIGHT FIXTURE, LETTER INDICATES TYPE
- WALL BRACKET LIGHT FIXTURE, LETTER INDICATES TYPE
- EXIT LIGHT (ARROW INDICATES DIRECTION)
- BATTERY POWERED EMERGENCY LIGHT
- SINGLE POLE SWITCH, LOWER CASE LETTER INDICATES LIGHT CONTROLLED, MOUNT 48" AFF. U.O.N.
- DOUBLE POLE SWITCH, MOUNT 48" AFF. U.O.N.
- THREE-WAY SWITCH, MOUNT 48" AFF. U.O.N.
- FOUR-WAY SWITCH, MOUNT 48" AFF. U.O.N.
- SINGLE POLE SWITCH WITH PILOT LIGHT, MOUNT 48" AFF. U.O.N.
- KEY OPERATED SINGLE POLE SWITCH, MOUNT 48" AFF. U.O.N.
- DIMMER SWITCH, WATTS AS NOTED, MOUNT 48" AFF. U.O.N.
- DUPLEX RECEPTACLE HOSPITAL-GRADE, MOUNT 18" AFF. U.O.N.
- DUPLEX RECEPTACLE HOSPITAL-GRADE, MOUNT ABOVE COUNTER HEIGHT U.O.N.
- QUADRUPLEX RECEPTACLE HOSPITAL-GRADE, MOUNT 18" AFF. U.O.N.
- FLOOR MOUNTED DUPLEX RECEPTACLE HOSPITAL-GRADE.
- GROUND FAULT INTERRUPTER RECEPTACLE, HOSPITAL-GRADE, MOUNT ABOVE COUNTER HEIGHT U.O.N.
- DUPLEX RECEPTACLE, ISOLATED GROUND TYPE, HOSPITAL-GRADE, MOUNT AT 18" AFF. U.O.N.
- 27T/480V, 3-PH PANELBOARD
- LIGHTING OR POWER PANELBOARD
- QUAD TELEPHONE/DATA WALL OUTLET, PROVIDE SINGLE GANG BOX WITH 1" CONDUIT WITH FULL WIRE AND INSULATING BUSHING STUBBED INTO CEILING SPACE. MOUNT BOX 18" AFF. U.O.N.
- QUAD TELEPHONE/DATA WALL OUTLET, PROVIDE SINGLE GANG BOX WITH 1" CONDUIT WITH FULL WIRE AND INSULATING BUSHING STUBBED INTO CEILING SPACE. MOUNT BOX ABOVE COUNTER HEIGHT, U.O.N.
- DUCT MOUNTED PHOTOELECTRIC SMOKE DETECTOR
- FAN SHUTDOWN RELAY
- DUAL-ACTION MANUAL FIRE ALARM PULL STATION (48" AFF. U.O.N.)

- MAIN SWITCHBOARD
- MAIN DISTRIBUTION PANEL
- SPECIAL NOTES, SEE PLANS
- CONDUIT CONCEALED IN WALL OR ABOVE CEILING WITH CONDUCTORS AS SHOWN ON PANEL SCHEDULE U.O.N.
- CONDUIT CONCEALED BELOW FLOOR SLAB OR FINISHED GRADE WITH CONDUCTORS AS SHOWN ON PANEL SCHEDULE U.O.N.
- CONDUIT EXPOSED ON WALL OR CEILING WITH CONDUCTORS AS SHOWN ON PANEL SCHEDULE U.O.N.
- FLEXIBLE CONDUIT NOT TO EXCEED 6 FEET IN LENGTH
- T.V. CAMERA
- T.V. MONITOR
- TELEVISION OUTLET, PROVIDE SINGLE GANG BOX WITH 3/4" CONDUIT WITH FULL WIRE AND INSULATING BUSHING STUBBED INTO CEILING SPACE. MOUNT BOX 18" AFF. U.O.N.
- DISCONNECT SWITCH
- DISCONNECT DESIGNATION (SIZE/POLES/FUSE) "NF" INDICATES NON-FUSED; "DE" INDICATES DUAL ELEMENT FUSES.
- COMBINATION MAGNETIC MOTOR STARTER/DISCONNECT SWITCH
- DRY TYPE TRANSFORMER
- CONTACTOR (AS NOTED)
- TIME CLOCK
- PHOTO-CELL
- MOTOR PERMANENTLY CONNECTED WITH FLEXIBLE CONDUIT
- JUNCTION BOX (FLUSH MOUNT IN FINISHED AREAS U.O.N.)
- DEVICE AS NOTED
- TELEPHONE BACKBOARD WITH #6 CU. GROUND (SIZE AS NOTED)
- FIRE ALARM AUDIO/VISUAL APPLIANCE (ADA) MOUNTED AT 80" AFF. TO BOTTOM.
- FIRE ALARM STROBE (ADA) (80" AFF. TO BOTTOM).
- PHOTOELECTRIC SMOKE DETECTOR
- DUPLEX RECEPTACLE WITH USB CHARGING PORTS, HUBBELL #USB20X2, MOUNT AT 18" AFF. U.O.N.

ABBREVIATIONS

EG	EQUIPMENT GROUND	EW	ELECTRIC WATER COOLER	NL	NIGHT LIGHT	AFG	ABOVE FINISH GRADE
IG	ISOLATED GROUND	E/F-EF	EXHAUST FAN	C/T	CURRENT TRANSFORMER	U.O.N.	UNLESS OTHERWISE NOTED
WP	WEATHERPROOF	A/H-AHU	AIR HANDLING UNIT	EX	EXISTING DEVICE	N.T.S.	NOT TO SCALE
EW	ELECTRIC WATER HEATER	ACC-CU	CONDENSING UNIT	AF	ABOVE FINISH FLOOR	NIC	NOT IN CONTRACT

NOTE: MOUNTING HEIGHTS NOTED ARE TO CENTERLINE OF DEVICE SHOWN U.O.N.

EXISTING CONDITION NOTES

GENERAL:

THESE DRAWINGS ARE BASED ON EXISTING DOCUMENTS FOR THE SAID BUILDING AND ON A VISUAL FIELD OBSERVATION. THEREFORE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO, SERVICE LOCATION AND AVAILABLE BRANCH PANELBOARDS, AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO BID. FAILURE TO DO SO MAY CONSTITUTE THAT THE CONTRACTOR PROVIDE ANY AND ALL ADDITIONAL EQUIPMENT, LABOR, ETC. TO MEET THE INTENDED DESIGN PARAMETERS AT HIS/HER SOLE EXPENSE.

SPECIFIC ITEMS TO BE VERIFIED:

CONTRACTOR SHALL VERIFY LOCATION AND TYPE OF EXISTING SERVICE DISTRIBUTION PANELBOARDS SERVING THE PROJECT AREA.

CONTRACTOR SHALL VERIFY ALL EXISTING FIRE ALARM DEVICES SERVING THE PROJECT AREA. REMOVE ANY EXISTING DEVICES AFFECTED BY RENOVATION AND MAINTAIN CIRCUIT CONTINUITY TO REMAINING DEVICES.

CONTRACTOR SHALL REVISE ALL EXISTING PANEL DIRECTORIES, AS REQUIRED, TO REFLECT ALL REVISIONS. PROVIDE NEW DIRECTORIES FOR PANELS WITH CURRENT DIRECTORIES MISSING.

ELECTRICAL SHEET INDEX

SHEET NO.	SHEET TITLE
E-1	ELECTRICAL LEGEND AND NOTES
E-2	ELECTRICAL KEY PLAN AND DETAILS
E-3	POWER PLAN AND NOTES
E-4	REFERENCED VENDOR'S DRAWINGS
E-5	POWER RISER DIAGRAM
E-6	PANEL SCHEDULES
E-7	ELECTRICAL SPECIFICATIONS

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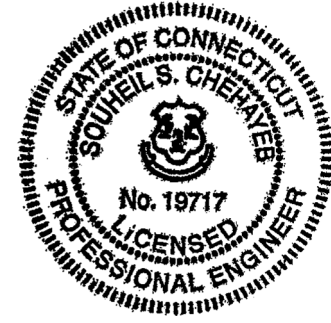
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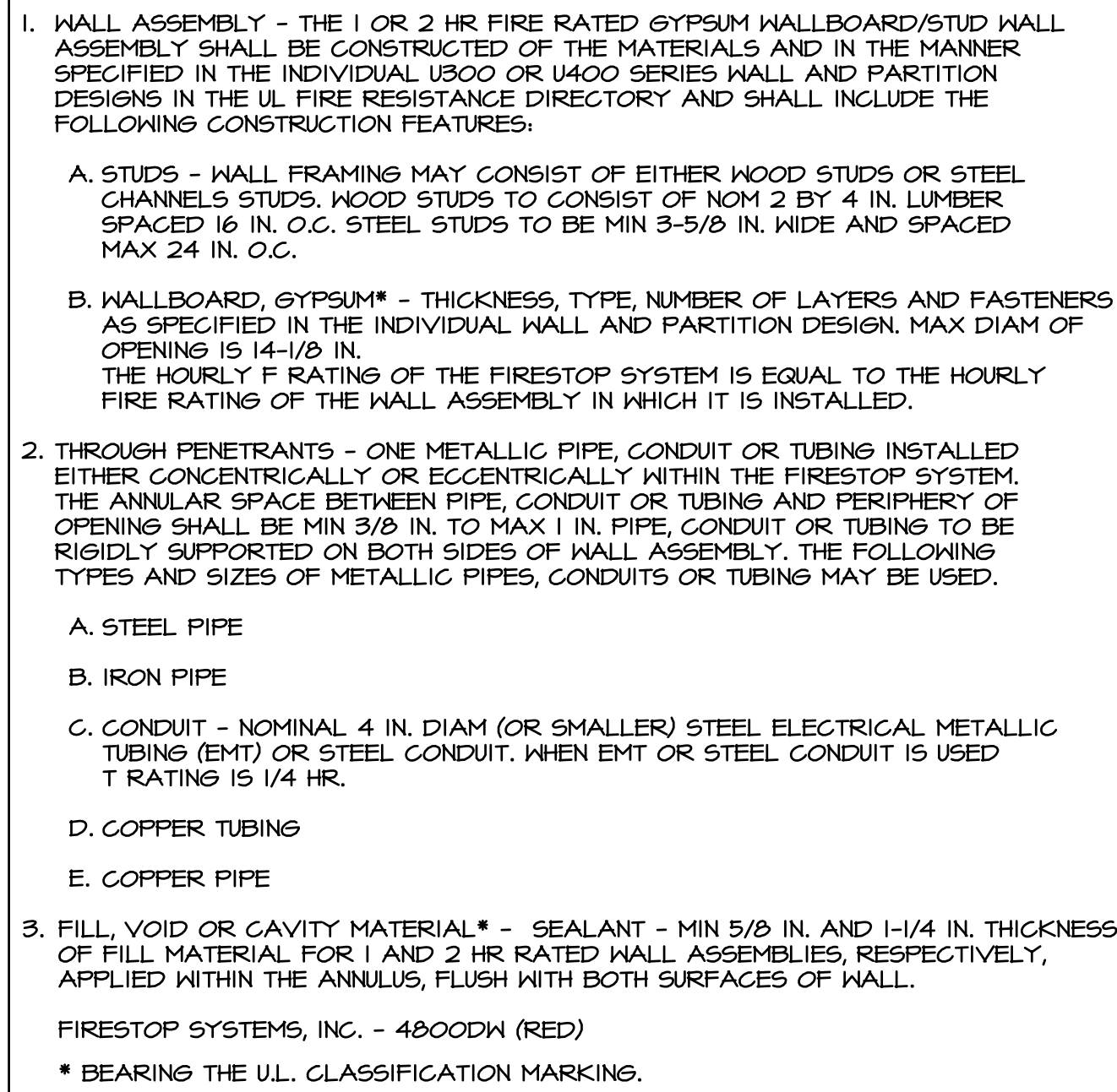
SHEET TITLE
ELECTRICAL
LEGEND
AND NOTES

DATE
MAY 7, 2025
PROJECT NO.
0225-02

SHEET NO.

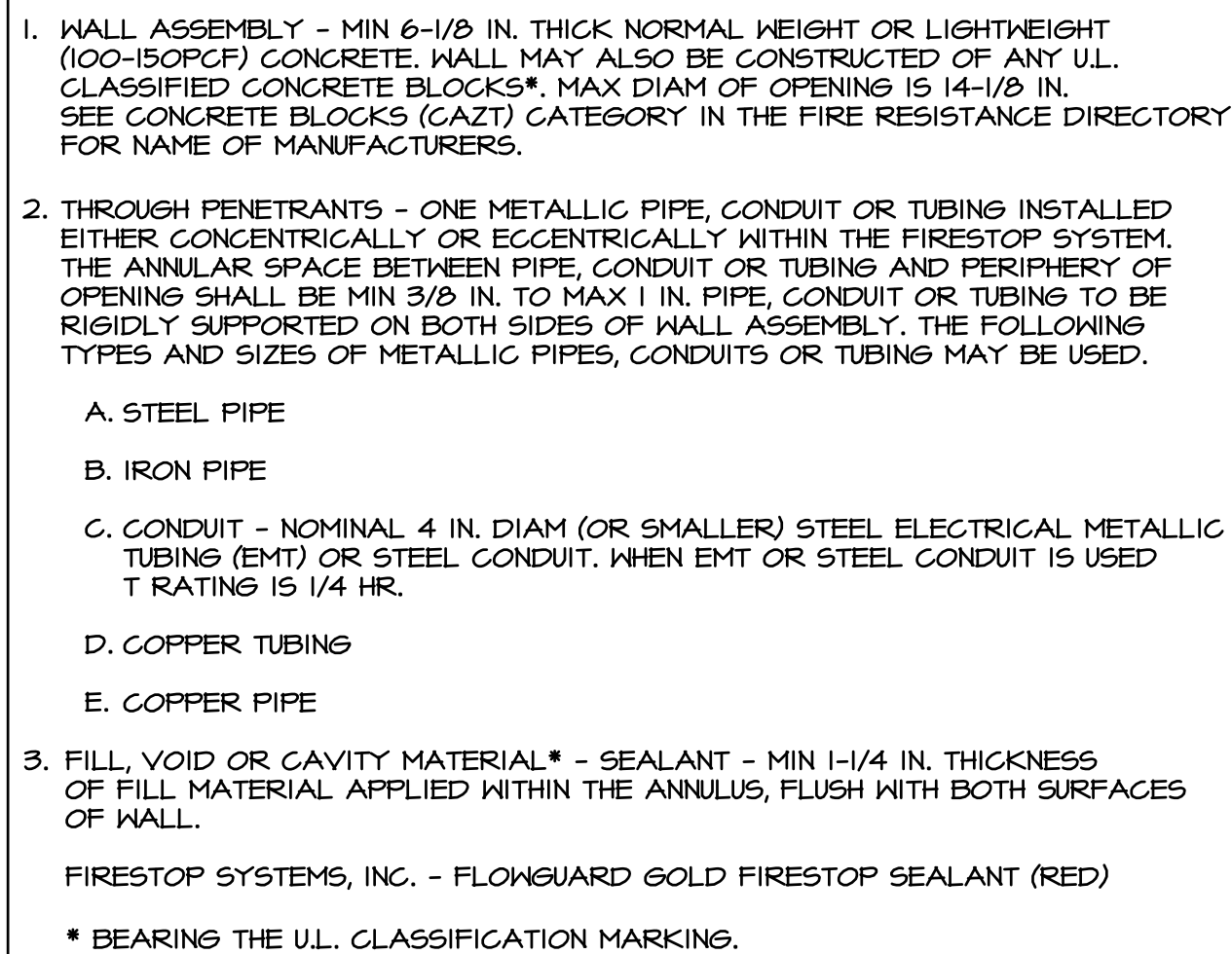
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FIRE STOP SYSTEM



PóA

FIRSTOP SYSTEM



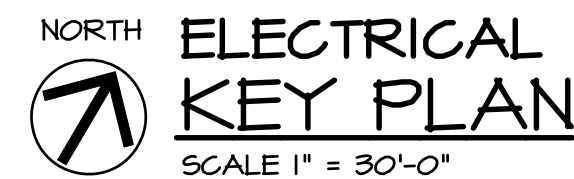
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MECHANICAL EQUIPMENT

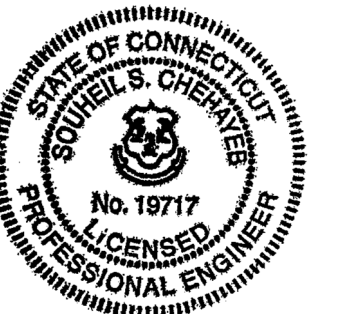


1. VERIFY NAMEPLATE RATINGS, LOCATIONS, AND POINT OF POWER CONNECTIONS PRIOR TO ROUGH-IN.
2. DO NOT LOCATE DISCONNECT SWITCHES OVER UNIT ACCESS PANELS.
3. PROVIDE A 3/4" EMPTY CONDUIT THROUGH INACCESSIBLE LOCATIONS (I.e., WALLS, UNDER SLAB) FOR CONTROL WIRING. COORDINATE WITH MECH. PLANS.
4. EQUIP. REQUIREMENTS ARE FOR MANUFACTURER AND MODEL NUMBER LISTED ON MECH. PLANS. THE MECH. CONTRACTOR SHALL BEAR ANY ADDITIONAL COSTS INCURRED IF ALTERNATE EQUIPMENT IS PROVIDED.
5. VERIFY ACTUAL EQUIPMENT NAMEPLATE MAXIMUM OVERCURRENT PROTECTION RATING AND ADJUST FUSE SIZES ACCORDINGLY. INSTALL "RK-5" TYPE FUSES AND CLASS "R" REJECTION CLIPS.

HIC



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ELECTRICAL KEY PLAN AND DETAILS

DATE
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0225-02

SHEET NO.

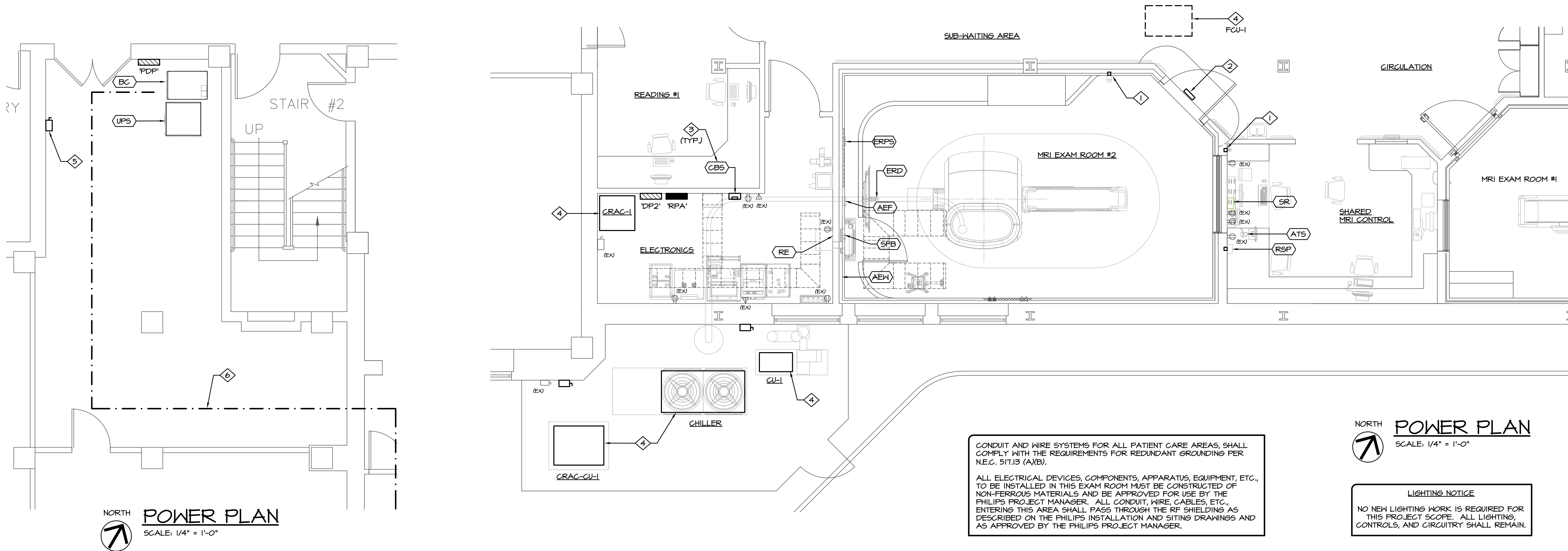
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NORTH
POWER PLAN
SCALE: 1/4" = 1'-0"

NORTH
POWER PLAN
SCALE: 1/4" = 1'-0"

CONDUIT AND WIRE SYSTEMS FOR ALL PATIENT CARE AREAS, SHALL COMPLY WITH THE REQUIREMENTS FOR REDUNDANT GROUNDING PER N.E.C. 517.13 (A)(B).

ALL ELECTRICAL DEVICES, COMPONENTS, APPARATUS, EQUIPMENT, ETC., TO BE INSTALLED IN THIS EXAM ROOM MUST BE CONSTRUCTED OF NON-FERROUS MATERIALS AND BE APPROVED FOR USE BY THE PHILIPS PROJECT MANAGER. ALL CONDUIT, WIRE, CABLES, ETC., ENTERING THIS AREA SHALL PASS THROUGH THE RF SHIELDING AS DESCRIBED ON THE PHILIPS INSTALLATION AND SITING DRAWINGS AND AS APPROVED BY THE PHILIPS PROJECT MANAGER.

LIGHTING NOTICE

NO NEW LIGHTING WORK IS REQUIRED FOR THIS PROJECT SCOPE. ALL LIGHTING, CONTROLS, AND CIRCUITRY SHALL REMAIN.

CRITICAL NOTE

THESE ELECTRICAL DRAWINGS WERE CREATED FOR USE WITH PHILIPS SHARTRIP T100 SYSTEM INSTALLATION DRAWINGS. REFER TO THE PLANS NOTED BELOW FOR ADDITIONAL ELECTRICAL DETAILS AND NOTES AND PROVIDE ACCORDINGLY. CONTRACTOR MUST COORDINATE THESE ELECTRICAL DRAWINGS WITH SYSTEM DRAWINGS TO PROVIDE A COMPLETE INSTALLATION. NOTIFY ARCHITECT/ENGINEER IF SYSTEM DRAWINGS ARE NOT AS INDICATED IN THIS NOTE.

PHILIPS DRAWING LIST:

GN	GENERAL NOTES
AI	EQUIPMENT LAYOUT
EN	ELECTRICAL NOTES
EL	ELECTRICAL LEGEND
EI	ELECTRICAL LAYOUT
E2	RACEWAY DIAGRAM
EDI	ELECTRICAL DETAILS

GENERAL NOTE:

EQUIPMENT LAYOUT, NOTES AND INTERCONNECTION WIRING ARE BASED UPON INFORMATION GIVEN TO THE ENGINEER AT TIME OF DESIGN. THE CONTRACTOR SHALL COORDINATE ALL CONDUIT REQUIREMENTS, ALL CABLING LENGTHS, AND EQUIPMENT LAYOUT OF ACTUAL EQUIPMENT FURNISHED WITH PHILIPS REPRESENTATIVE PRIOR TO START OF CONSTRUCTION.

NOTES

- EXISTING EMERGENCY STOP FOR ACTIVATION OF SHUNT-TRIP BREAKERS. MAINTAIN EXISTING 120V SHUNT-TRIP CIRCUIT.
- EXISTING X-RAY IN USE WARNING LIGHT. VERIFY WITH PHILIPS REP. FOR CONTROL OF SIGN AND SEE WARNING LIGHT DETAIL ON VENDOR SHOP DRAWINGS. MAINTAIN EXISTING CIRCUIT.
- PHILIPS EQUIPMENT IDENTIFICATION TAG. REFER TO VENDOR REFERENCE DRAWINGS FOR DESCRIPTION.
- REFER TO SHEET E-2 FOR MECHANICAL EQUIPMENT WIRING DETAILS.
- EXISTING 400A DISCONNECT SWITCH FED FROM BUSB 'F' TO REMAIN. REFER TO POWER RISER DIAGRAM.
- RECOMMENDED CONDUIT ROUTING PATH.

ELECTRICAL CONTRACTOR SHALL COORDINATE CLOSELY WITH PHILIPS REPRESENTATIVE FOR CLARIFICATION OF CABLES AND EQUIPMENT TO BE:

- SUPPLIED/INSTALLED BY PHILIPS
- SUPPLIED/INSTALLED BY CONTRACTOR
- SUPPLIED BY PHILIPS, INSTALLED BY CONTRACTOR
- AVAILABLE THROUGH PHILIPS, SUPPLIED/INSTALLED BY CONTRACTOR

COORDINATION NOTES:

- THIS SHEET SHALL BE USED IN CONJUNCTION WITH PHILIPS VENDOR REFERENCE DRAWINGS FOR CONNECTION REQUIREMENTS, CONDUITS, BOX SIZES, ETC.
- INFORMATION SHOWN IN THIS DOCUMENT IS AN EXCERPT OF THE INFORMATION SHOWN ON THOSE DRAWINGS.
- CONTRACTOR SHALL REFER TO ARCHITECTURAL INTERIOR ELEVATIONS FOR ALL WALL MOUNTED DEVICES AND EQUIPMENT.

SYSTEM GROUNDING NOTES

- DEDICATED EARTH CONDUCTOR (GROUND) SHALL BE SAME SIZE AS POWER WIRES AT ALL TIMES FOR ALL ROUTINGS FROM GROUNDED NEUTRAL SOURCE TO PHILIPS EQUIPMENT (REFER TO DETAILS ON DRAWINGS).
- GROUND THE NEWLY DERIVED NEUTRAL IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. HOWEVER, DO NOT USE ELECTRICAL CONDUITS OR ELECTRICAL RACEWAYS AS GROUNDING ELECTRODES.
- VERIFY WITH EQUIPMENT SUPPLIER/INSTALLER FOR ALL REQUIRED GROUNDING LOCATIONS AND PROVIDE ACCORDINGLY.
- ALL METAL DEVICES, INCLUDING METAL SURFACES OF FIXED MEDICAL EQUIPMENT, WITHIN THE PROCEDURE ROOM SHALL BE BONDED WITH MINIMUM #10 AWG CU. ITEMS SHALL INCLUDE, BUT NOT LIMITED TO:
 - MEDICAL GAS PIPES AND WATER PIPES
 - ALL INTERCOM, TELEPHONE AND NURSE CALL OUTLET BOXES
 - ALL EXPOSED CONDUCTIVE SURFACES
 - GROUNDING TERMINAL OF ROOM RECEPTACLES
- ELECTRICAL CONTRACTOR SHALL PERFORM EQUIPOTENTIAL GROUND TESTING IN THE PATIENT CARE AREAS WITH AN APPROVED METER AS STIPULATED IN NFPA 99 SECTION 4.3.3. TESTING REPORTS SHALL BE PROVIDED TO THE ARCHITECT, AND ONE COPY SHALL REMAIN AT THE JOB SITE FOR REFERENCE BY THE INSPECTING AUTHORITIES.

BUILDING SITE SPECIFIC NOTE

INFORMATION SHOWN ON THIS DRAWING IS BASED ON INFORMATION PROVIDED TO ENGINEER AT TIME OF DESIGN. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES BACK TO ARCHITECT AND/OR ENGINEER PRIOR TO BID.

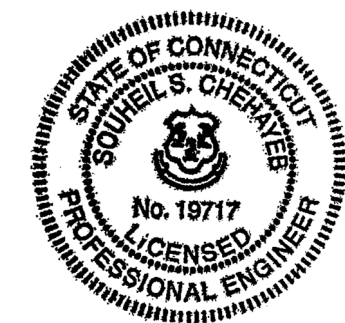
POWER PLAN NOTES

- THE CONTRACTOR SHALL REMOVE ALL EXISTING WIRING AND EQUIPMENT MADE UNNECESSARY BY THE RENOVATION. ALL MATERIALS REMOVED SHALL BE DISPOSED OF BY THE CONTRACTOR.
- CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR COORDINATION OF MOUNTING HEIGHTS AND/OR LOCATIONS OF ALL OUTLETS AND WIRING DEVICES.
- ALL TELEPHONE/DATA JACKS AND CABLING TO BE PROVIDED AND INSTALLED BY OWNER'S VENDOR.
- (EX) DENOTES EXISTING DEVICE TO REMAIN AS-IS. (R) DENOTES RELOCATED EXISTING DEVICE.
- GROUND CONDUCTOR SHALL BE INSTALLED IN ENTIRE RACEWAY SYSTEM.
- REUSE EXISTING JUNCTION BOXES, CONDUIT AND WIRING WHERE APPLICABLE. REMOVE AND DISPOSE OF ALL UNUSED CONDUIT AND WIRING BACK TO ITS SOURCE.
- ELECTRICAL CONTRACTOR SHALL VERIFY AND COORDINATE ALL DEVICE TYPES, LOCATIONS AND QUANTITIES WITH OWNER'S REPRESENTATIVE AND PROVIDE ACCORDINGLY.

NOTICE

- THESE ELECTRICAL DRAWINGS HAVE BEEN DESIGNED WITH AND SHALL BE BID IN CONJUNCTION WITH THE PHILIPS INSTALLATION AND SITING DRAWING SET. SUBMISSION OF AN ELECTRICAL BID WILL BE CONSIDERED AS EVIDENCE THAT THE PHILIPS DRAWINGS WERE REVIEWED AND THAT ALL INFORMATION SHOWN HAS BEEN INCLUDED IN THE BID. LATER CLAIMS FOR ADDITIONAL COMPENSATION FOR WORK DESCRIBED ON EITHER SET OF DRAWINGS SHALL NOT BE ACCEPTED.
- ELECTRICAL DRAWINGS INDICATE THE INSTALLATION CONCEPT FOR THE PHILIPS EQUIPMENT. HOWEVER, CONTRACTOR SHALL OBTAIN AND BID EQUIPMENT INSTALLATION WITH PHILIPS INSTALLATION DRAWINGS WHICH INDICATE ADDITIONAL REQUIREMENTS NECESSARY FOR PROPER INSTALLATION.
- CONTRACTOR SHALL REFER TO INTERIOR ARCHITECTURAL DRAWINGS FOR COORDINATION OF MOUNTING HEIGHTS AND/OR LOCATIONS OF ALL OUTLETS AND WIRING DEVICES.

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REVISIONS	

ISSUED FOR:	DATE:
☐ REVIEW	05/01/25
☐ BIDDING	
☐ PERMIT	
☒ CONSTRUCTION	01/02/25

SHEET TITLE
POWER PLAN AND NOTES
DATE
MAY 7, 2025
PROJECT NO.
0225-02
SHEET NO.

E-3

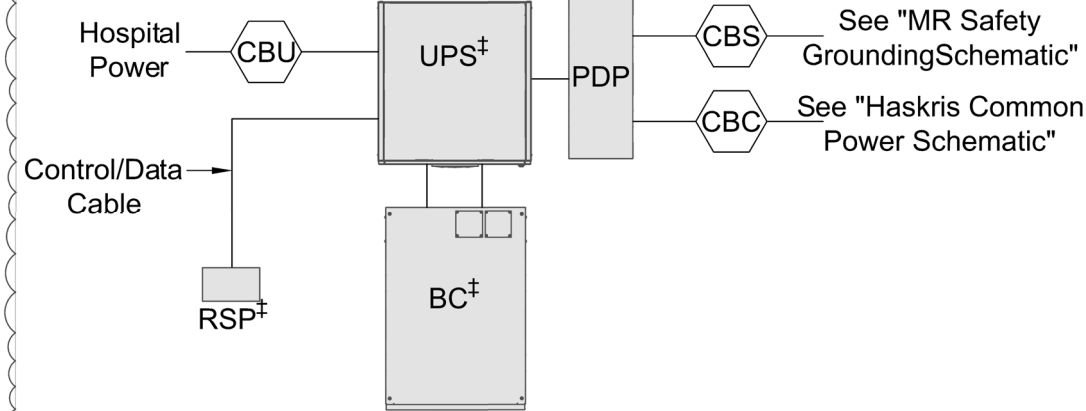
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25-33

Power Quality Requirements (Incoming power to UPS)

Supply Configuration	3 Phase + isolated ground + equipment grounding conductor
Phase wires	Refer to "Maximum Cable Length per Wire Size" chart
Isolated Ground	Same size as Phase wires
Equipment Grounding Conductor	Per NEC, #4 AWG minimum
Nominal Input Voltage	480 VAC
Input Circuit Breaker	200 Amps (CBU)
Power Distribution Panel Outputs	Refer to CBS and CBC
Power Factor	>0.99
Battery Feeder Wire Size (Min)	400 kcmil



For UPS purchased from PHILIPS, refer to Installation and Operation manual from the manufacturer for all detailed specification and installation requirements. Wiring and circuit sizes at supply and load side of UPS to meet UPS requirements and verified by contractor to meet building conditions and local codes.

Maximum Cable Length per Wire Size (Between Hospital Power and CBS)

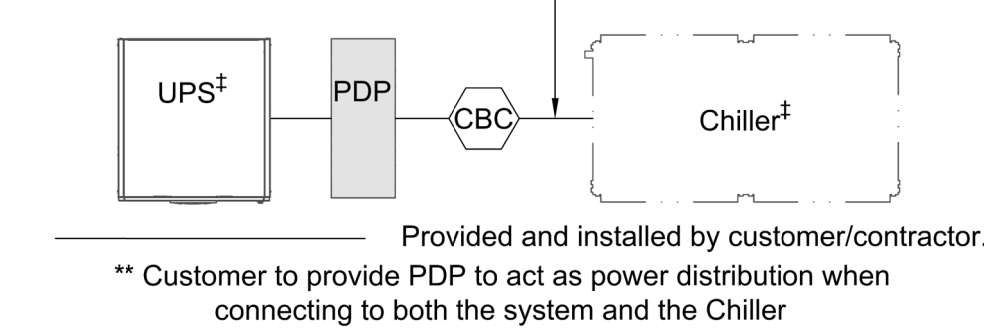
(Based on 20° C copper ambient temperature)

< 177'	#3/0 AWG
< 225'	#4/0 AWG
< 264'	250 MCM
< 316'	300 MCM
< 369'	350 MCM
< 426'	400 MCM

The ground conductor for the power feeder shall be the same size as the phase conductor wires. Ground conductor must be dedicated and totally separate from conduit, raceway, or structural ground. Wire sizes shown are factory recommendations: Adjustments may be acceptable as needed in the field per local electrical engineer. (24.0)

Diagram - Common Haskris Chiller Power Schematic

(Not to scale)



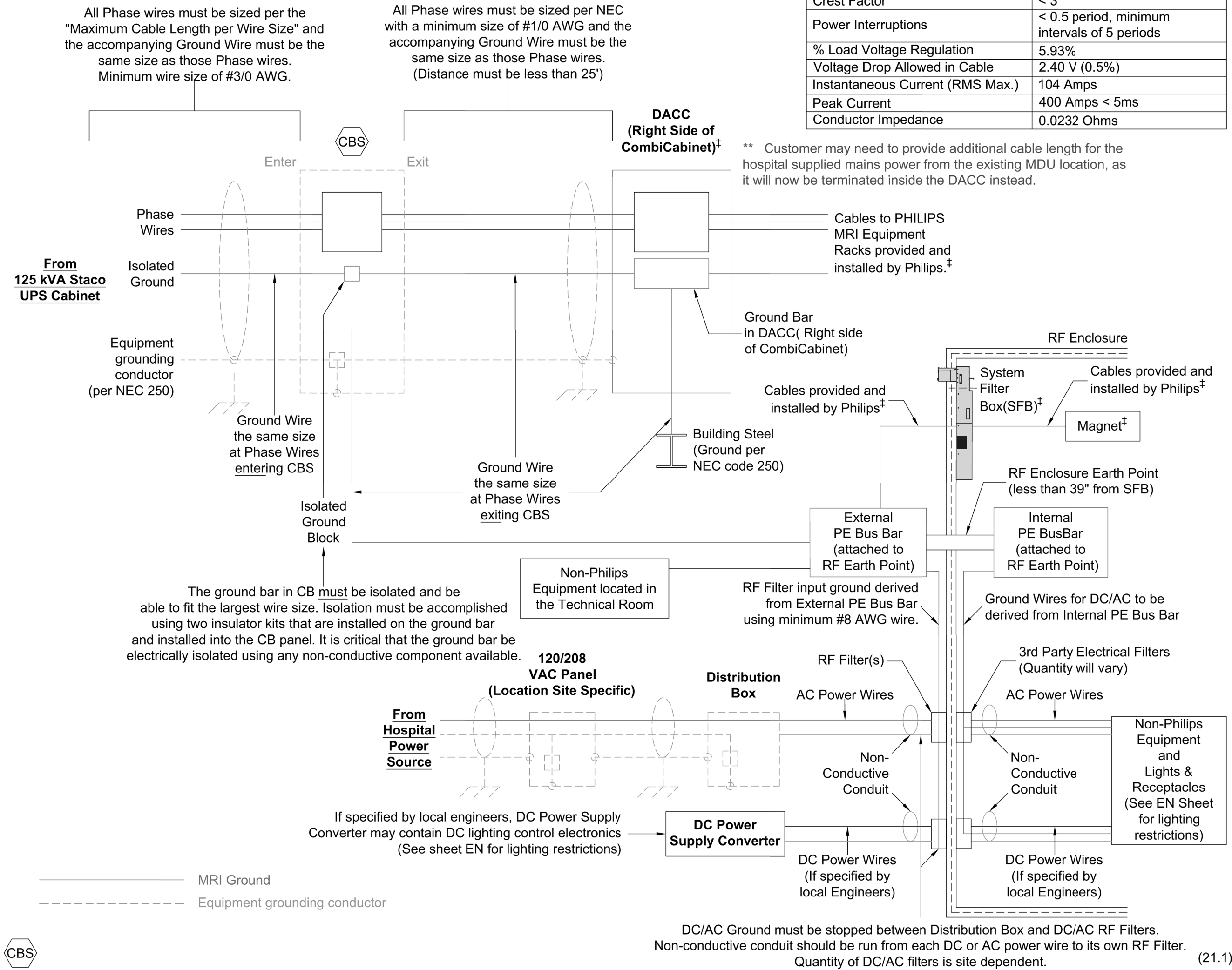
Circuit Breaker for Chiller	
Haskris OPC15 Chiller: 480V, 60 Hz, 3φ + ground, 70 Amps.	
Haskris OPC24 Chiller: 480V, 60 Hz, 3φ + ground, 70 Amps.	

THIS SHEET IS PART OF THE DOCUMENT SET LISTED ON SHEET C1 AND SHOULD NOT BE SEPARATED. (24.0)

Diagram - MR Safety Grounding Schematic

(Not to scale)

- Notes:
- All items shown are to be provided and installed by contractor unless otherwise specified.
 - Philips provided equipment designated with †.
 - All ground conductors for power feeders must be the same size as the phase conductor wires.
 - All non-power feeder ground wires must be sized per NEC without going below the minimum size shown.
 - All wires and conduits must be insulated per NEC.
 - For additional notes, see Sheet EN (section "RF Enclosure Electrical Notes").



Power Quality Requirements into DACC

Branch/Max. Power Required	115 kVA
Supply Configuration	3 Phase, 3 Wire Power + Unity Ground + Bonded Ground
Nominal Input Voltage	480 VAC
Circuit Breaker (3φ, 60 Hz, 3 pole)	150 Amps
Mains Impedance	< 0.110 Ohms
Distortion Power Factor	> 0.9
Cos phi	> 0.98
Total Harmonic Distortion (THD)	< 45% (current, not voltage)
K-factor	< 10
Crest Factor	< 3
Power Interruptions	< 0.5 period, minimum intervals of 5 periods
% Load Voltage Regulation	5.93%
Voltage Drop Allowed in Cable	2.40 V (0.5%)
Instantaneous Current (RMS Max.)	104 Amps
Peak Current	400 Amps < 5ms
Conductor Impedance	0.0232 Ohms

** Customer may need to provide additional cable length for the hospital supplied mains power from the existing MDU location, as it will now be terminated inside the DACC instead.

PHILIPS

Project Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

Philips Contacts
Project Manager: Taylor LaRosa
Contact Number: 516-648-7433
Email: taylor.larosa@philips.com

Project Details
Drawing Number: N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

ED1

6.30.2020

REVISIONS	

ISSUED FOR:	DATE:
☐ REVIEW	05/01/25
☐ BIDDING	
☐ PERMIT	
☒ CONSTRUCTION	07/02/25

SHEET TITLE	
REFERENCED VENDOR'S DRAWINGS	
DATE	MAY 7, 2025
PROJECT NO.	0225-02
SHEET NO.	

E-4

MRI EQUIPMENT UPGRADE
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MRI SUITE
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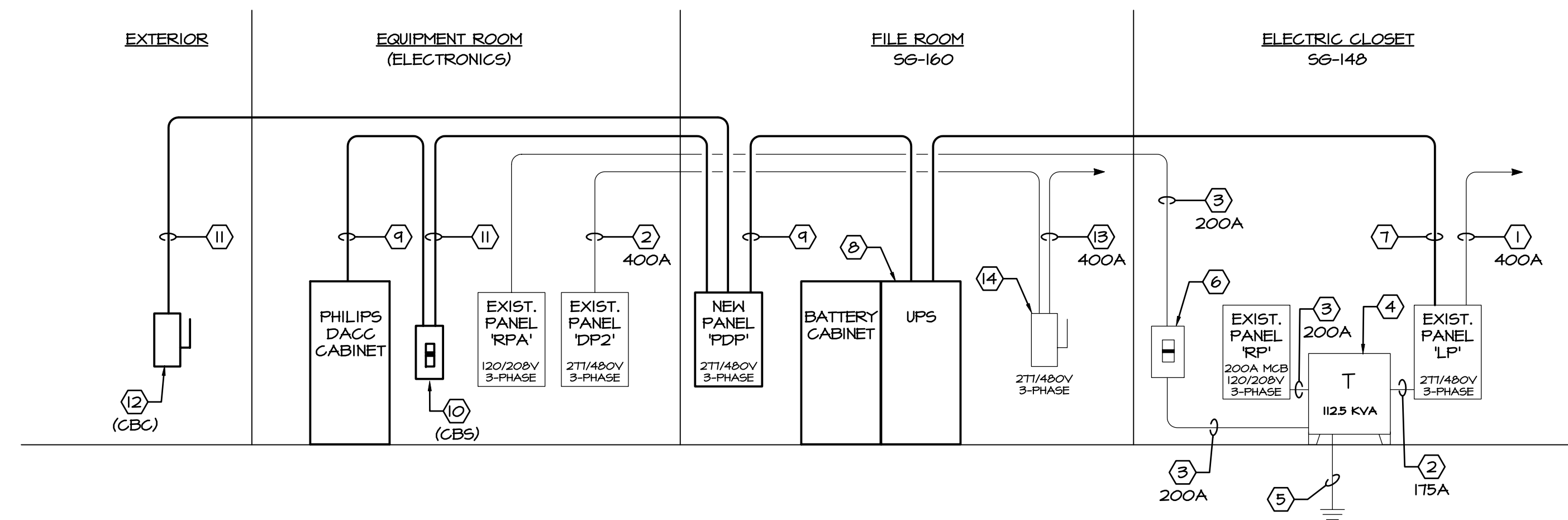
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25-33

NOTICE

INFORMATION SHOWN ON THIS SHEET IS COPIED FROM PHILIPS INSTALLATION DRAWINGS, DATED 04/11/25, AND IS SHOWN FOR REFERENCE ONLY.

COORDINATION NOTES:

- THIS SHEET SHALL BE USED IN CONJUNCTION WITH PHILIPS VENDOR DRAWINGS FOR CONNECTION REQUIREMENTS, CONDUITS, BOX SIZES, ETC.
- INFORMATION SHOWN IN THIS DOCUMENT IS AN EXCERPT OF THE INFORMATION SHOWN ON PHILIPS DRAWINGS.
- INFORMATION SHOWN ON THIS SHEET IS PROVIDED TO SHOW CONDUIT, WIRE, BOXES, ETC., BETWEEN PHILIPS EQUIPMENT AND DEVICES. THE ACTUAL PLACEMENT OF THIS EQUIPMENT IS SHOWN ON SHEET E-3 THEREFORE, A CLOSE COORDINATION IS REQUIRED BETWEEN THE DRAWINGS TO ASSURE PROPER EXECUTION OF THESE DOCUMENTS.



NOTES

- (1) EXISTING MAIN FEEDER TO REMAIN.
- (2) EXISTING 277/480V, 3-PHASE FEEDER TO REMAIN.
- (3) EXISTING 120/208V, 3-PHASE FEEDER TO REMAIN.
- (4) EXISTING 112.5 KVA DRY-TYPE TRANSFORMER TO REMAIN.
- (5) EXISTING TRANSFORMER GROUND TO REMAIN.
- (6) EXISTING 200 AMP, 120/208V, 3-POLE ENCLOSED CIRCUIT BREAKER TO REMAIN.
- (7) REFER TO PANEL 'LP' SCHEDULE FOR CONDUIT AND WIRE SIZES.
- (8) NEW UPS AND BATTERY CABINET FURNISHED BY PHILIPS, INSTALLED BY CONTRACTOR, INCLUDING INTERCONNECTION OF UPS TO BATTERY CABINET. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ALL REQUIREMENTS.
- (9) 2-1/2" CONDUIT WITH 3 #250 MCM CU, 1 #250 MCM CU 1.G., 1 #4 E.G.
- (10) 150A FRAME, 150A TRIP, 480V, 3-POLE ENCLOSED CIRCUIT BREAKER RATED FOR 35K A.I.C. MINIMUM, EQUAL TO SQUARE 'D' HG SERIES. MOUNT IN NEMA 1 ENCLOSURE.
- (11) REFER TO PANEL 'PDP' SCHEDULE FOR CONDUIT AND WIRE SIZES.
- (12) DISCONNECT SWITCH FOR CHILLER. REFER TO MECHANICAL EQUIPMENT WIRING DETAILS ON SHEET E-2 FOR ADDITIONAL INFORMATION.
- (13) EXISTING MAIN FEEDER FROM BUSS 'F' TO REMAIN.
- (14) EXISTING 400 AMP DISCONNECT SWITCH FUSED AT 400 AMPS TO REMAIN.

ELECTRICAL POWER RISER DIAGRAM

NO SCALE

LINE LEGEND:

EXISTING TO REMAIN _____

EXISTING TO BE REMOVED - - - -

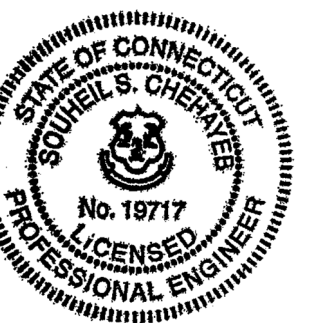
NEW WORK THIS SCOPE _____

MTA

PRE-CONSTRUCTION VERIFICATION NOTE:

POWER SOURCE SELECTED FOR NEW EQUIPMENT ON THIS PROJECT HAS BEEN DIRECTED BY V.A. STAFF. CONTRACTOR SHALL VERIFY AVAILABLE CAPACITY, WITH V.A. STAFF, TO ENSURE THAT SOURCE CAN ACCOMMODATE THE LOADS SHOWN ON THE PANEL SCHEDULES.

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ISSUED FOR:

REVIEW

BIDDING

PERMIT

CONSTRUCT

CONSTRUCT

SHEET TITLE

POWE

DIA

DATE 11/17/77

PROJECT NO.

PROJECT NO.
0225-C

SHEET NO.

10. *Journal of the American Medical Association*, 2000; 284: 1039-1044.

F

E

E-5

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25-33

SPECIFICATIONS - ELECTRICAL

DIVISION 26 - ELECTRICAL
SECTION 260500 COMMON WORK

I. GENERAL

1.01 The following are minimum requirements and shall govern, except that VA Standards and/or drawings shall govern when their requirements are in excess thereof.

2. DRAWINGS AND SPECIFICATIONS

2.01 The architectural, mechanical, electrical and equipment drawings and specifications are hereby incorporated into and become a part of this Division. This Contractor shall examine all such drawings and specifications and become thoroughly familiar with provisions contained herein and the submission of his bid shall be construed as indicating such knowledge.

2.02 Electrical drawings are diagrammatic and are intended to show the approximate locations of equipment and piping. Dimensions given on the plans shall be verified in the field. Drawings may not be scaled to obtain exact dimensions.

2.03 The exact locations of apparatus, fixtures, equipment and conduits shall be ascertained from the Owner's representative in the field and the work shall be laid out accordingly. Should the Contractor fail to ascertain such locations, the work shall be changed at his own expense when so ordered by the Owner. The Owner reserves the right to make minor changes in the location of conduit and equipment up to the time of installation, without additional cost.

2.04 The electrical drawings and specifications are intended to supplement each other and any material or labor called for in one shall be furnished and supplied even though not specifically mentioned in both. Labor and/or materials neither shown nor specified, but necessary for the completion and proper functioning of the system, shall be provided by this Contractor.

2.05 The work required under these specifications includes all labor, materials, equipment and services necessary to provide lighting and power systems, service entrances, motor controls and connections, branch circuiting, feeders, panels, fixtures, wiring devices, and other items shown on the plans or specified.

2.06 When the specification of an item is not identified with a particular area, the item shall pertain to all areas.

2.07 This Contractor shall furnish such labor and materials as hereinafter specified and as required to complete all electrical connections in accordance with the manufacturer's requirements for all mechanical equipment and Owner's equipment as shown and/or specified.

3. EXAMINATION OF SITE

3.01 Contractor shall visit the site and familiarize himself with existing conditions and satisfy himself as to the nature and scope of work.

4. DEFINITIONS

4.01 "Install" shall mean to place, fix in position, secure, anchor, wire, etc., including necessary appurtenances and labor so that equipment or installation will function as specified and intended.

4.02 "Furnish" shall mean to purchase and supply equipment or components.

4.03 "Provide" shall mean to "furnish and install".

4.04 "Or approved equal" shall mean equal in type, design, quality, style, color, etc., as determined by the Engineer/Architect.

5. INTERFERENCES

5.01 It shall be the duty of this Contractor to report any interferences between his work and that of any other Contractor to the Owner or Architect as soon as they are discovered. The Owner or Architect will determine which equipment shall be relocated regardless of which was first installed, and his decision shall be final.

6. MATERIALS AND WORKMANSHIP

6.01 All work shall be installed in a practical and workmanlike manner by competent workmen, skilled in their branch of the trade.

6.02 Unless otherwise specified or indicated on the drawings, all materials shall be new and free from defects.

6.03 All material and equipment shall meet or exceed standards specified by UL, NEMA, ANSI and IEEE wherever such standards have been established.

6.04 From time-to-time during the operation and at the completion thereof, this Contractor shall remove all debris and excess materials caused by his work and he shall leave the area of the operation broom clean.

6.05 All electrical equipment and material shall bear the Underwriter's Laboratories label.

7. SUPPORTS

7.01 This Contractor shall furnish and install all angle iron, channel iron, rods, supports or hangers required to install or mount panelboards, switchboards, or any electrical equipment called for on the plans, in these specifications, or as necessary to mount any piece of electrical equipment, material, or device. Conduit, fixtures, or any electrical devices shall not be supported from steel deck, bridging, ceiling, or ceiling support wires.

8. TEMPORARY CONSTRUCTION POWER AND LIGHTING

8.01 Sufficient temporary power, during construction, for tools and portable equipment shall be provided by the Electrical Contractor. Contractor shall coordinate with Owner.

9. CODES, LAWS, PERMITS AND INSPECTIONS

9.01 Install all work in full accordance with codes, rules and regulations of the VA Design Standards, public utility, and all other authorities having jurisdiction over the premises. This shall include all requirements of the local Building Code, regulations of the State Department of Industrial Relations, OSHA, ADA (Americans with Disabilities Act), and the requirements of the National Electric Code, as interpreted by the Local Inspection Division. All these codes, rules, and regulations are hereby incorporated into this specification.

9.02 Comply with specification requirements which are in excess of code requirements and not in conflict with same.

9.03 The Contractor shall secure all permits and certificates of inspection incidental to the work, required by foregoing authorities. All such certificates shall be delivered to the Owner in duplicate, before final payment on contract will be allowed. The Contractor shall pay all fees, charges and other expenses in connection therewith.

10. FIELD CHANGES (AS BUILT DRAWINGS)

10.01 Keep one (1) set of working drawings and shop drawings at the job site for sole purpose of recording all changes made during construction. After completion of the work and before requesting final payment, the above mentioned drawings shall be delivered to the Owner.

11. LABELING AND NAMEPLATES

11.01 Permanently label switchboards, panelboards, time switches and safety switches indicating equipment or panels and areas which they serve.

11.02 Lighting and appliance panels shall be labeled as shown on drawings.

11.03 Electrical Contractor shall furnish and install identification for pull or junction boxes furnished by him.

11.04 Identify as to use on face of equipment by means of laminated black and white phenolic label with 3/8" letters engraved through black to white.

11.05 Materials

A. Nameplates: Engraved three-layer laminated plastic, white letters on a black background.

11.06 Installation

A. Degrease and clean surfaces to receive nameplates and tape labels.

B. Install nameplates and tape labels parallel to equipment lines.

C. Secure nameplates to equipment fronts using screws, rivets or adhesive. Secure nameplates to inside face of recessed panelboard doors in finished locations.

D. Mark every junction or pull box cover plates with the circuit number(s) of all wires contained therein.

11.07 Wire Identification:

A. Provide wire markers on each conductor at terminal strips and at final line and load connections. Identify with branch circuit or feeder number of power and lighting circuits, and with control wire number as indicated on equipment manufacturer's shop drawings for control wiring or as drawings indicate.

B. All wires shall be color coded. Color code branch circuit wiring as follows:

1. Three Phase System:	120/208V	277/480V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

2. Switched Wires: Other than colors listed above

3. Travelers Between 3-Way Switches: Purple

4. Isolated Ground: Green with Yellow Stripes

12. GUARANTEE

12.01 In addition to guarantees of equipment by manufacturer of same, this Contractor shall also guarantee equipment provided by him and shall be held for a period of one (1) year to make good any defects in material and and workmanship occurring during this period, at his sole expense. This one year period shall start from the date of final occupancy by Owner.

13. SCOPE OF WORK

13.01 Furnish all labor and material necessary to complete the electrical work shown on the drawings, specified herein or required to complete the construction of the building as shown.

13.02 The listing herein of article or material, operation or method, required that the Contractor shall provide and install, unless noted to be supplied by others, each item listed of quality or subject to qualification noted. Each operation shall be performed according to standard practice, manufacturer's instructions and conditions stated, providing, therefore, all necessary labor, equipment, and incidentals.

13.03 The electrical Contractor shall schedule his work to conform to the progress of the other trades and Contractors and employed on this project.

13.04 The electrical work shall include but is not limited to the following:

A. Complete power and lighting distribution systems including panels and light fixtures, as shown on plans.

B. Temporary electric service as required for construction.

C. Testing of all electrical equipment.

14. MANDATORY SHOP DRAWINGS

14.01 Submit all required electrical shop drawings.

14.02 Shop Drawings shall be submitted for:

 Panels, Switchgear
 All Lighting Fixtures and lamps
 All Wiring Devices and Cover Plates

END OF SECTION 260500

SECTION 260519/260533 CONDUCTORS/RACEWAYS

I. CONDUIT

1.01 All wire shall be run in accordance with the applicable codes in corrosion resistant, rigid, threaded, metal conduit or electrical metallic tubing (E.M.T.), unless otherwise specifically stated herein.

A. Conduit below floor slab, exposed to weather, or underground shall be rigid, threaded, galvanized, heavy wall type.

B. Corlon PVC, Type 40 heavy wall conduit may be used underground below floor slab or pavement in lieu of rigid, threaded, galvanized conduit except where prohibited in NEC 511. PVC schedule 40 conduit shall not be run in or above floor slab. PVC conduit shall terminate below floor slab with rigid, threaded metal conduit adapter. Conduit above slab shall be metal.

C. A ground conductor shall be supplied in all conduits and raceways. The ground conductor shall be sized per the NEC, or as shown on drawing, whichever is larger.

1.02 Conduit and E.M.T. shall be delivered to the building in 10-foot lengths and each length shall have the Underwriter's Laboratories label.

1.03 Conduit and E.M.T. shall be run concealed in all finished areas of the building.

1.04 E.M.T. connectors and couplers shall be compression type made of steel as manufactured by Thomas & Betts, Steel City, or Appleton. Bends and offsets shall be made with a hickey or power bender without kinking or destroying the smooth bore of the conduit. Paralleled conduits shall run straight and true with offsets uniform and symmetrical. Conduit terminals at boxes and cabinets shall be rigidly secured with locknuts and bushings as required by the National Electrical Code and local electrical code. Insulated bushings shall be used on all conduit 1-1/4" trade size and larger.

1.05 Conduit shall be securely fastened in place at no more than 8-foot centers, and hangers, supports or fastenings shall be provided at each conduit, elbow and at the end of each straight run, terminating at a box or cabinet. Conduit shall not be suspended from the ceiling or ceiling suspension wires.

1.06 Horizontal and vertical conduit runs shall be supported by one-hole malleable straps or other approved metal device with suitable bolts, expansion shield or beam clamp for mounting to building structure or special brackets. Conduit shall be supported from structural steel or joist and independent of other piping. Do not support conduit from metal roof deck or any other support device of another trade.

1.07 Armored cable (BX) or nonmetallic sheathed cable (Romex) shall not be used. No aluminum conduit shall be used.

1.08 Only short runs of flexible metal conduit not over 6' in length and having a ground conductor, shall be used for terminal connections to motors and also for electrical equipment where it is not practical to make final connection with rigid conduit. Flexible conduit exposed to weather shall be Sealitte.

1.09 Exposed conduit and conduit in ceiling space shall be run parallel to the building structure.

1.10 Conduit system shall conform to all requirements of the National Electrical Code (N.E.C./N.F.P.A.-70) and local codes.

2. CONDUCTORS

2.01 Sizes of conductors for feeders are given on the drawings and no wire smaller than #12 gauge shall be used for branch lighting or power circuits. All wiring shall have the U.L. label and be of 98% conductivity copper. Aluminum wire or aluminum cable is not acceptable.

A. The gauge of all wire shall be in accordance with B&S standard.

2.02 All wire and cable for branch lighting or small power circuits shall have NEC Type "THHN" or "THWN" 600 volt insulation.

2.03 Wire and cable above #10 gauge shall be stranded Type "THHN" insulated for 600 volts

2.04 For special conditions, as provided by the National Electrical Code, Type "RHH, A.V.A." or other required insulation shall be used.

2.05 Where lighting fixtures are used as raceways, 90 degree C. minimum insulated wire shall be used.

3. GROUNDING

3.01 This Contractor shall provide, install and connect a complete system of grounding for all equipment and structures. A good mechanical and electrical connection shall be made with approved grounding connectors.

3.02 Electrical system and equipment grounds shall comply with the N.E.C. as well as all local and state codes and regulations.

3.03 Panels, conduit systems, motor frames, lighting fixtures and other equipment that are part of this installation shall be securely grounded both mechanically and electrically in accordance with all codes.

3.04 A ground conductor shall be supplied in ALL conduit. It shall be an insulated, stranded, annealed copper conductor.

4. BRANCH CIRCUIT WIRING

4.01 The Electrical Contractor shall provide and connect a complete system of panels, conduits, wire fittings, boxes, supports and all other miscellaneous materials required for equipment as indicated on the plans and ready for operation by the Owner.

4.02 All circuits shall be color coded.

END OF SECTION 260519/260533/262T26

SECTION 262416 PANELBOARDS

I. LIGHTING AND APPLIANCE PANELBOARDS

1.01 Panels shall be copper bus and shall have 20 amp, single, double, or three pole circuit breakers (capable of interrupting available short circuit current) as required in each branch circuit. Where breakers larger than 20 amperes are required, the sizes are noted on the drawings. Breakers shall be bolt-on, quick-make, quick-break and capable of interchanging 1, 2 or 3-pole units. Multiple units shall be common trip. Provide spare breakers in each panel as shown. All lugs shall be U.L. approved CU/AL type.

1.02 Electrical Contractor shall arrange circuits as near as possible to circuit numbers on the drawings. At finish of job, Electrical Contractor shall take current reading checks of respective phases. Contractor shall rearrange some circuit connections to balance the load across all phases as closely as possible.

1.03 Panels shall be mounted as indicated on the drawings. The fronts shall be made of code thickness sheet metal having door cutouts, leaving forms of proper width around the door. Doors shall be provided with an approved lock and shall be keyed alike. Provide new door fronts and keyed doors as required.

1.04 Breakers used for lighting circuits shall be switch duty style.

2. GENERAL (FOR ALL PANELS AND PANELBOARDS)

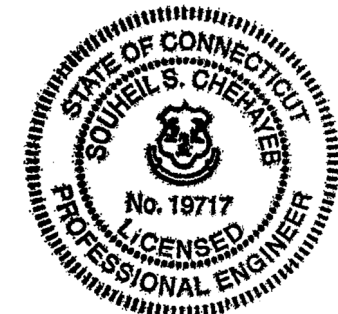
2.01 Metal framed card holders with typewritten circuit directory must be provided for each panel. Directory shall be clear and designation shall match identification on equipment. Panelboards (switchboard, distribution, power panels and lighting panels) shall be identified by a label on the switch and/or panel door. Provide engraved laminated phenolic nameplates with 3/8" letters engraved through black to white.

2.02 All panels, safety switches, starters and in general, all equipment requiring lugs shall be equipped with solderless type U.L. approved lugs.

2.03 Provide all necessary unistrut, channel, backing and supports to mount switchboard and panelboards securely in place.

END OF SECTION 262416

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☐ REVIEW	05/01/25
☐ BIDDING	_____
☐ PERMIT	_____
☒ CONSTRUCTION	07/02/25

SHEET TITLE

ELECTRICAL
SPECIFICATIONS

DATE
MAY 7, 2025
PROJECT NO.
0225-02

SHEET NO.

E-7

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SOUHEIL S. CHEHAYEB

CERT. #7340

25-33

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The equipment components shown in this drawing package are based on the current proposed purchase and are subject to change if modifications are made to the configuration.



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* Heat load indicated is peak dissipation for each cabinet measured individually. Peak room heat dissipation as indicated on Sheet AN and MP5 will be different than the sum of each individual cabinet in a given room due to the fact that not all cabinets will run peak heat loads at the same time.

*Ensure proposed locations shown on Sheet A2 for all components listed on the AL page is outside the Maximum Gauss restriction identified in the AL page.

Equipment Legend					
A Furnished and installed by Philips B Furnished by customer/contractor and installed by customer/contractor C Installed by customer/contractor D Furnished by Philips and installed by contractor E Existing F Future G Optional H Furnished by RF Enclosure Supplier and Installed by RF Enclosure Supplier J Furnished by Philips and Installed by Rigging Company K Furnished by Philips and Installed by LAP L Provided by Philips and Installed by RF Enclosure Supplier M Existing to be moved					
Equipment Designation		Detail Sheet			
Description		Max. Gauss	Weight (lbs)	Weight (kg)	
A	FT HA FlexTrak	---	113	52	AD4
D	UPS 125 kVA Staco UPS Cabinet	-	1742	790	AD6
D	BC Staco UPS Battery Cabinet	-	3700	1678	AD6
B	CBU Circuit Breaker (for UPS)	50	t.b.d.	t.b.d.	
D	RSP Remote Status Monitoring Panel	-	5	2.25	AD6
B	PDP Power Distribution Panel	-	t.b.d.	t.b.d.	
A	ACC Additional Components Cabinet (Multi Nuclei)	50	365	166	AD6
A	RAD Resoundant Active Driver	50	53	24	AD6
A	AECC Ambient Experience Control Cabinet	50	123	56	AD7
A	LED LED Module (not shown)	150	0.4	0.2	AD7
A	ATSW AE Touch Screen Elo 1515L (Wall mounted)	-	10.6	4.8	AD7
A	ATS AE Touch Screen Elo 1515L	-	10.6	4.8	AD7
A	ERD Exam Room Display	2,000	121	55	AD7
A	ERPS Power supply Box for the Exam Room Display	200	9	4	AD7
A	AVI AV Input Wall Plate (Extron WPB 108)		-	-	-
E	AEF AE System Filter Box		2.87	1.3	AD7
E	DB Distribution Box (Qty = 3)		1.54	0.7	AD7
E	AEP Ambient Experience Projector	50	67	31	AD7
E	HALO HALO (without center panel)	50	199	91	
E	LED LED Module (not shown)	150	24	11	AD8
E	POC Patient Observation Camera	150	3	1.4	AD8
E	POM Patient Observation Monitor	150	3	1.4	AD8
E	DCU Injector Display Control Unit	---	15	7	AD8
E	INJ Spectris Solaris EP Injector	---	60	28	AD8
E	AESC AE RF Coil Storage Cabinet	-	882	400	ADX

Equipment Legend					
A Furnished and installed by Philips B Furnished by customer/contractor and installed by customer/contractor C Installed by customer/contractor D Furnished by Philips and installed by contractor E Existing F Future G Optional H Furnished by RF Enclosure Supplier and Installed by RF Enclosure Supplier J Furnished by Philips and Installed by Rigging Company K Furnished by Philips and Installed by LAP L Provided by Philips and Installed by RF Enclosure Supplier M Existing to be moved					
Equipment Designation		Detail Sheet			
Description		Max. Gauss	Weight (lbs)	Weight (kg)	
E	OT Operator's Table	-	220	100	AD3
E	ERB Emergency Run-Down Button (Qty. = 2)	-	3	1.4	AD3
E	MAG Magnet Assembly	-	13889	6300	AD3
A	PS Patient Support (MT)	-	573	465	AD3
E	HEP Helium Gas Exhaust Pipe (Exam Room Only)	-	4/ft	0	
E	HWG Helium Gas Exhaust Wave Guide	-	10	4.5	
A	GAC Gradient Amplifier NG 2250 -XP	150	2425	1100	AD4
D	LCC Liquid Cooling Cabinet (Left Side of CombiCabinet)	50	705	320	AD4
D	DACC Data Acquisition and Control Cabinet (Right Side of CombiCabinet)	50	734	333	AD4
A	RTT 480V Ramp Tool Transformer Cabinet	100	298	135	AD4
A	SFB System Filter Box with Covers	70	175	80	AD4
E	CBS Circuit Breaker (For System)	50	t.b.d.	t.b.d.	
B	CBC Circuit Breaker (For Chiller)	-	t.b.d.	t.b.d.	
D	CH Haskris OPC24 Chiller	-	1860	844	AD5
D	CIP Haskris Chiller Interface Panel	-	162	74	AD5
E	SACU System Air Cooling Unit	50	55	25	AD5
E	PV Patient Ventilation	50	56	25	AD8
A	EA e-Alert	-	1	0.5	
A	SR Storage Rail	---	---	-	AD5
A	SP Service Platform	-	t.b.d.	t.b.d.	AD6

Project

Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

Philips Contacts

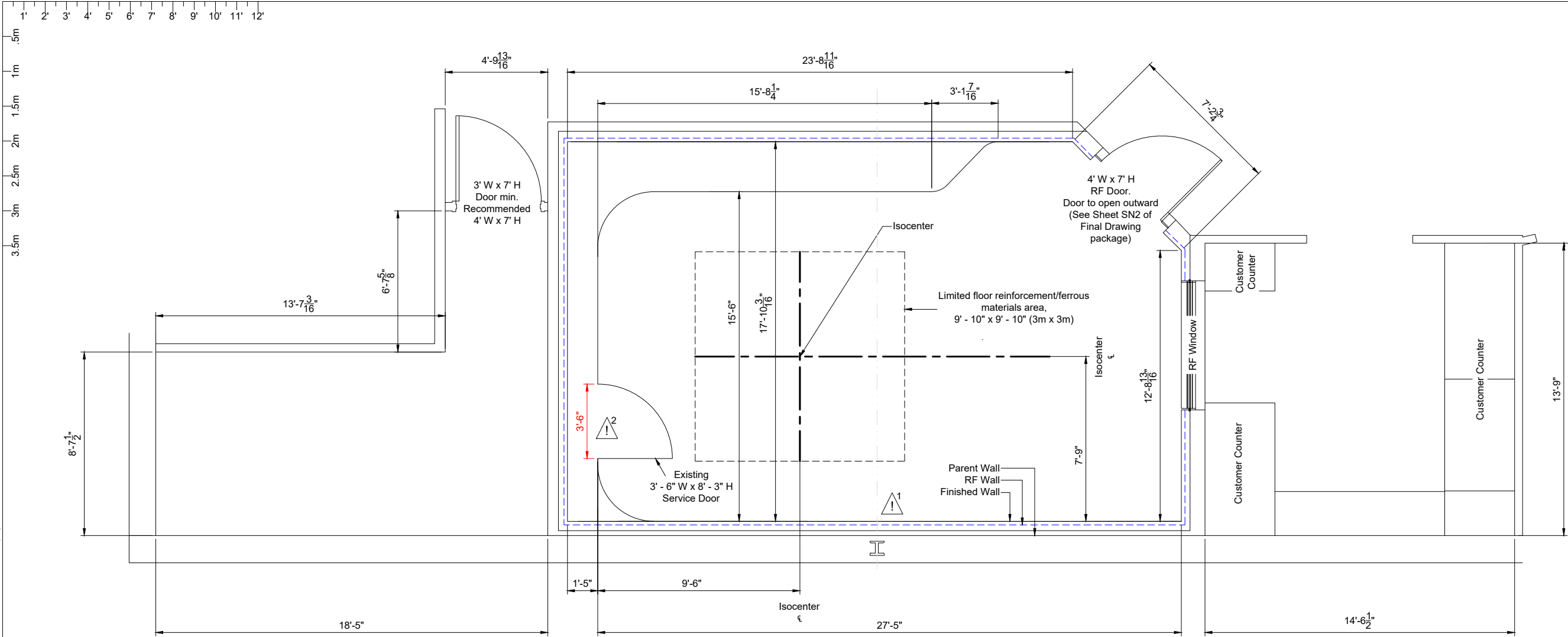
Project Manager: Taylor LaRosa
Contact Number: 516-848-7433
Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number
N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

AL



Site Layout

3/16" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	Minimum*
Exam Room Suspended Ceiling:		
To bottom of HALO Center Panel	8' - 3 ¹ / ₄ " (2520mm)	Required
To bottom of ceiling outside of HALO	8' - 5 ¹ / ₈ " (2568mm)	
HALO Support		
To the bottom of HALO Rafters	10' - 2" (3100mm)	Maximum**
Exam Room RF Ceiling:		
Helium Waveguide Through RF Wall	10' - 8" (3250mm)	Minimum*
Helium Waveguide Through RF Ceiling	11' - 4 ¹ / ₄ " (3460mm)	Minimum*
Control Room		
	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	Minimum

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.

Reported Ceiling Heights from finished floor to bottom of :
Deck above : Unknown
RF Ceiling : Unknown
Exam Room Suspended Ceiling: 8'-3"
Equipment Room Ceiling: Unknown

Legend

—	Walls
- - - - -	Soffit
- - - - -	Existing (to be removed)
— · — · —	Beams or other building construction elements

General Notes

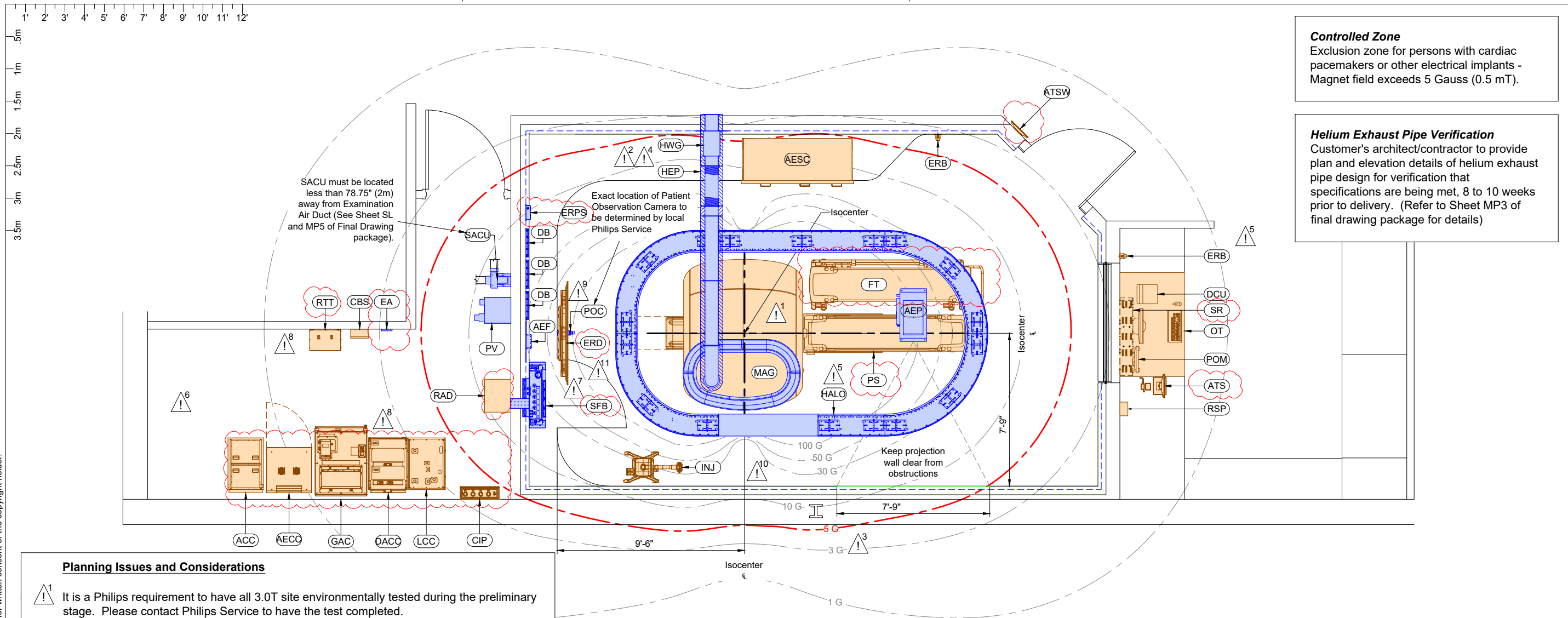
-  Field to verify exact location of existing beams inside the exam room. Verify that all ferromagnetic floor reinforcement and beams below the magnet meet the requirements shown on the SN1 page of the final drawing package.
-  Field to verify existing SFB closet dimensions will provide enough space for service. Existing SFB closet does not meet standard requirements of double 4' doors for proper service space.
- * Field to verify all room dimensions.
- * Location/ Distance of nearby electrical/mechanical rooms must be verified to meet the requirements shown on the SN1 page. Verify equipment will not affect the magnet.
- * If MRI is located on an upper floor, customer/contractor/architect to verify that all ferromagnetic floor reinforcement and beams below the magnet meet the requirements shown on the SN1 page of the final drawing package.

Project
Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

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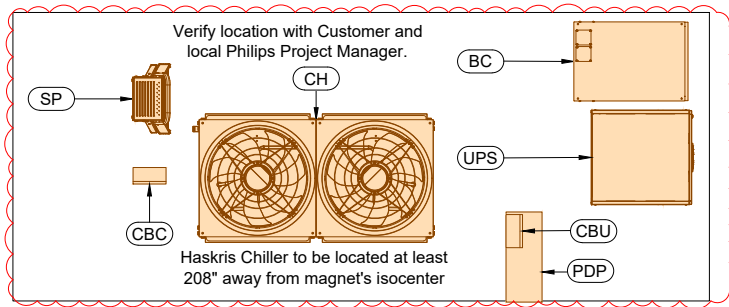
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Quote: Q-00361165
Order: 6600723105.010000

A1



Planning Issues and Considerations

- 1 It is a Philips requirement to have all 3.0T site environmentally tested during the preliminary stage. Please contact Philips Service to have the test completed.
- 2 Helium Exhaust Pipe (HEP) and Helium Waveguide (HWG) are shown in their default location. Existing installed locations of HEP and HWG are to be field verified and site drawings are to be revised to reflect those existing locations.
- 3 Passive magnetic shielding is needed to contain the 5 Gauss line within the controlled Philips MRI rooms. Refer to Safety Zones on page SN3 for more information
- 4 Existing Helium Exhaust Pipe (HEP) routing outside the RF enclosure must meet all specifications shown on sheet MP3 of the final drawing package. Existing Helium Exhaust Pipe must be reviewed and modified if the existing HEP outside the RF Room does not meet specifications.
- 5 If RF ceiling height is higher than 10' - 0 $\frac{13}{16}$ " (3068mm), RF vendor will need to provide additional strapping for HALO installation.
- 6 Field to verify location of existing equipment inside the equipment room to ensure that it does not interfere with the clearances of the electrical cabinets.
- 7 6" W x 8" H air grid to be installed on finished wall 5' - 6" A.F.F. with 6" W x 8" H air duct to the Air intake opening on the right side of SFB
- 8 Customer may need to provide additional cable length for the hospital supplied mains power from the existing MDU (now RTT) location, as it will now be terminated inside the DACC instead.
- 9 POC to be mounted above ERD monitor
- 10 Hose storage cart is included with MRElastography option but not shown. Included cart placement in the exam room is optional, as customer-provided hose storage solutions are acceptable. Storage cart can be utilized as space allows.
- 11 Custom ERD monitor swing out mount will be provided for ERD at location shown. ERD is shown 6" off the wall to show space for custom mount. Field to verify exact location.



- * All floor support below the magnet including floor reinforcement and beams must be verified to meet the requirements shown on the SN1 page of the final drawing package.
- * If metal is needed inside the Examination room for air ducts, suspended ceiling, wall construction, cabinets, etc; they must be non-ferromagnetic. This is to avoid potential image quality issues and missile effects due to attraction forces of the magnetic field.
- * Field to verify all existing Philips and/or third party equipment will not affect the functionality of the system and its components.

Equipment Layout

3/16" = 1'-0"

Ceiling Height Guide

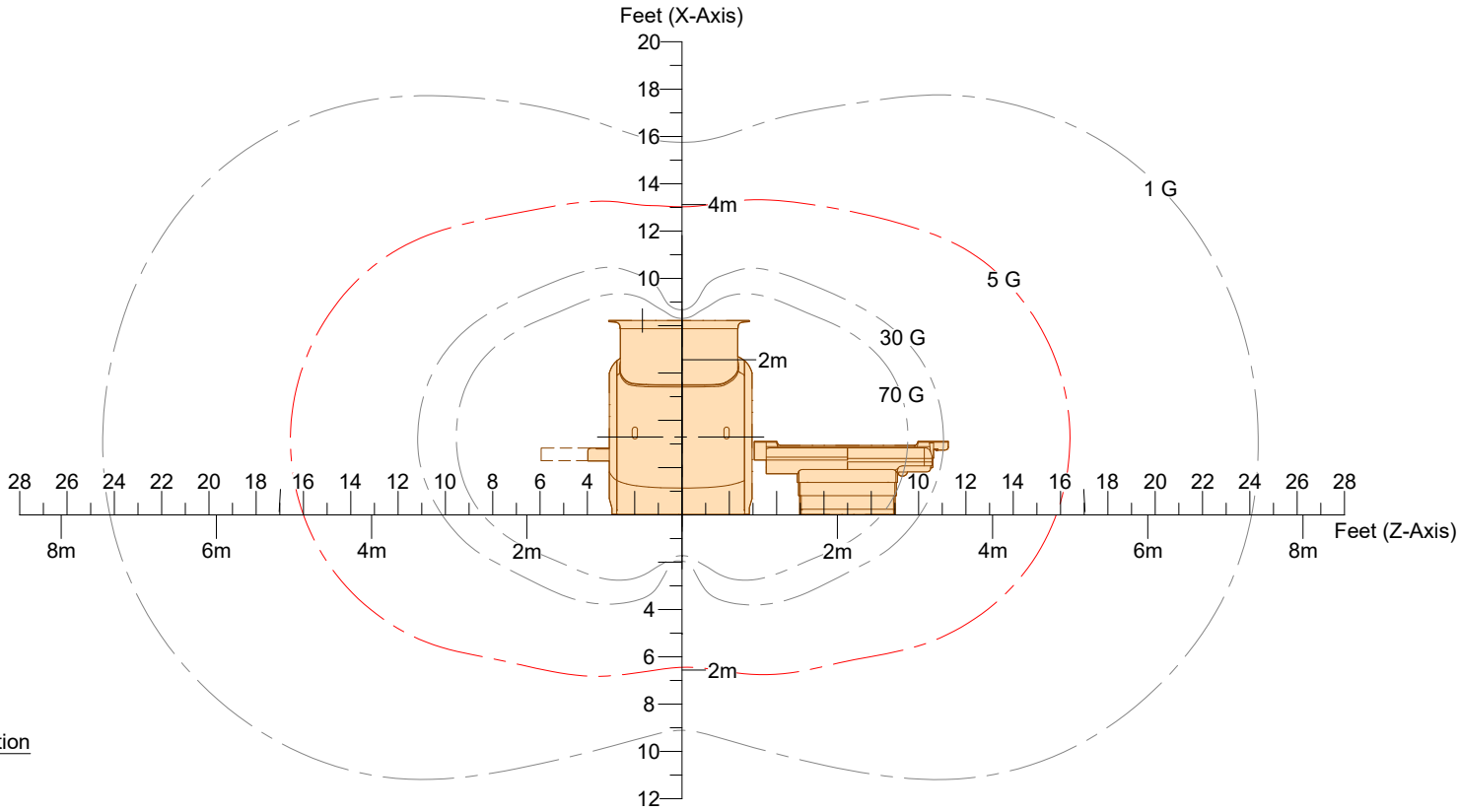
Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	Minimum*
Exam Room Suspended Ceiling:		
To bottom of HALO Center Panel	8' - 3 $\frac{1}{4}$ " (2520mm)	Required
To bottom of ceiling outside of HALO	8' - 5 $\frac{1}{8}$ " (2568mm)	
HALO Support		
To the bottom of HALO Rafters	10' - 2" (3100mm)	Maximum**
Exam Room RF Ceiling:		
Helium Waveguide Through RF Wall	10' - 8" (3250mm)	Minimum*
Helium Waveguide Through RF Ceiling	11' - 4 $\frac{1}{4}$ " (3460mm)	Minimum*
Control Room	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	Minimum

- * Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.
- ** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.

Project	Smartpath to MR 7700
	VA Medical Center West Haven West Haven, CT Room: MRI
Philips Contacts	Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com
	Drawn By: Alejandra Lozano
Project Details	Drawing Number N-EAS220370 B
	Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000
A2	

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Detail - Magnetic Field Plot, without Magnet Shielding
(Static fringe field shown / Not to scale)



(14.0)

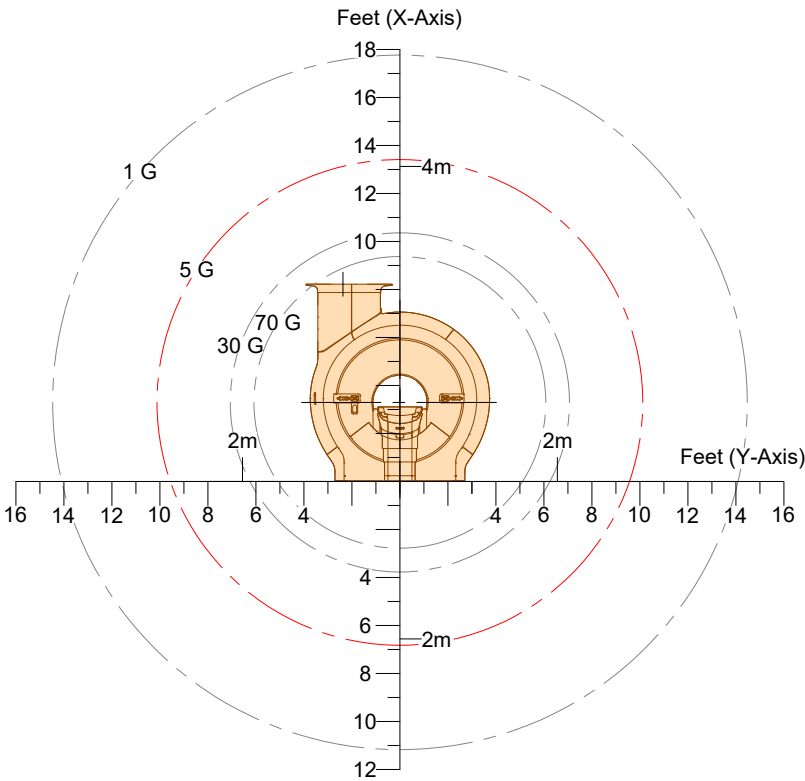
Typical Maximum Fringe Field

Equipment	
≤ 1.0 G (0.1 mT)	Nuclear Camera, PET Scanners, Linear Accelerators, Electron Microscopes, Gamma Camera, Image Intensifiers , Blood Chemistry Analyzers, Cyclotrons, X-ray CT Scanner with photo multipliers and CRT Monitors
2.0 G (0.2 mT)	CT Scanners manufactured after 2003
2.5 G (0.25 mT)	CT Scanners manufactured prior to 2003, Power and Main Distribution Transformers, and Ultrasound Machines
5.0 G (0.5 mT)	Neurostimulators, Biostimulation Devices, Power Conditioners, Flat Detectors, Video Monitor (monochrome), and Pacemakers
10.0 G (1.0 mT)	Computers, Tape Storage, Disc Drivers, HVAC Equipment, X-Ray Tubes, Emergency Generators, Food Prep Areas, Chillers, Telephone Switching, Credit Cards, Analog Watches and Clocks, Fuel Storage Tanks, ECG Equipment with LCD Display, and Motors/Pumps > 5 HP
15.0 G (1.5 mT)	Film Processors and Cardiac Recorders
25.0 G (2.5 mT)	Flat Panel (LCD) Monitors, Ultrasound with LCD
50.0 G (5.0 mT)	Laser Imagers, Telephones, X-Ray Electronics, Metal Detectors
100.0 G (10.0 mT)	Oxygen Monitor Sensor

Note:
The fringe field limits above are provided for preliminary planning purposes and represent the approximate exposure to magnet field acceptable for the type of instrument. It is the responsibility of the customer to have the vendor of the equipment in question set acceptable magnet field limits for proper operation of their equipment.

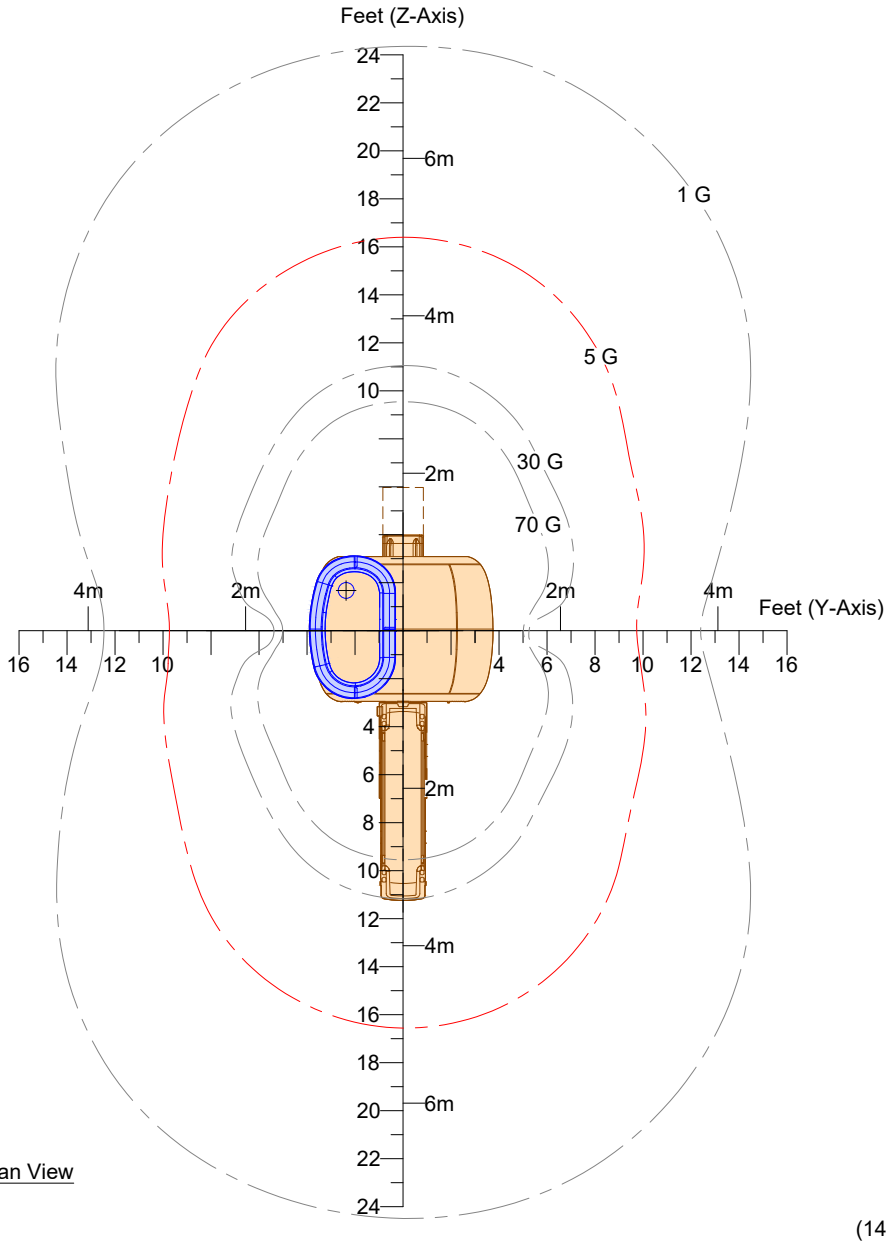
Valid for equipment located outside the RF Enclosure. In the examination room only MRI compatible equipment can be used. For specifications consult the supplier of the equipment.

(16.0)



Front Elevation

(14.0)



Plan View

(14.0)

- Notes:
- The fringe field diagrams indicated have been empirically confirmed under unobstructed, greenfield conditions. Actual environmental parameters at this site may influence the true extent of the fringe field and affect the accuracy of the field shown.
 - Isocenter in the X-Axis is 39.53" (1004mm) above finished floor.
 - Magnet shielding requirements are to be determined on a site by site basis. If additional shielding is required, consult with Philips Project Manager. The customer accepts full responsibility for all cost associated with additional magnet shielding.
 - Due to variability in the orientation of the site with respect to the earth's magnetic field and construction of the site, the tolerances in Table 1 should be taken into account.

Table 1- Fringe Field Tolerances	
Fringe Field	Tolerance
1 Gauss	± 2' - 8" (± 800mm)
5 Gauss	± 8" (± 200mm)
10 Gauss	± 4" (± 100mm)

(19.0)

Project

Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

Philips Contacts

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Contact Number: 516-848-7433
Email: taylor.larosa@philips.com
Drawn By: Alejandra Lozano

Project Details

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AD1

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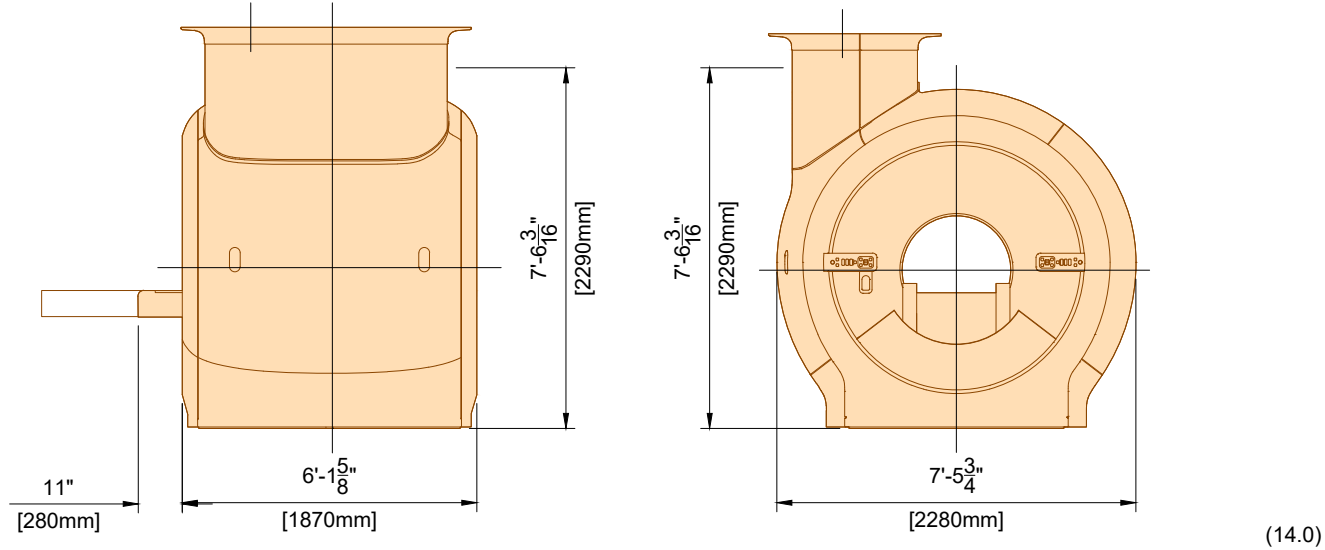
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Detail - Magnet Rigging - Pre-assembled Magnet

Magnet assembly dimensions including transport frame and wheels	Length	Width	Height
Pre-assembled magnet assembly including covers	6' - 1 ¹ / ₂ " (1870mm)	7' - 6" (2280mm)	
If transport width is > 7' - 6" (2280mm)			7' - 6 ¹ / ₄ " (2290mm)
If transport width < 7' - 6" (2280mm) *			7' - 7 ¹ / ₄ " (2320mm)

* If transport width is < 7' - 6" (2280mm), the magnet needs to be transported sideways. Now the height increases due to a different location of the wheels under the magnet.

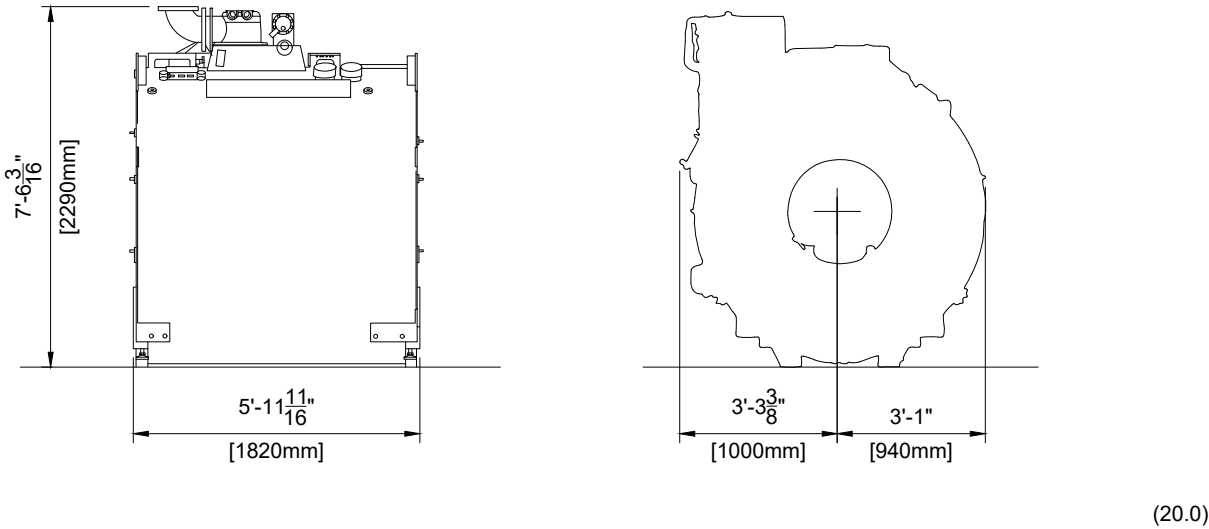
Note: Part of the patient support that is sticking out at the rear of the assembly has to be removed on site. This is a 15 minute job.



Detail - Magnet Rigging - With Covers Locally Removed

Magnet assembly dimensions including transport frame and wheels	Length	Width	Height
Pre-assembled magnet assembly with covers removed	6' - 0" (1820mm)	6' - 4 ³ / ₈ " (1940mm)	
If transport width is > 6' - 4 ³ / ₈ " (1940mm)			7' - 6 ¹ / ₄ " (2290mm)
If transport width < 6' - 4 ³ / ₈ " (1940mm) *			7' - 7 ¹ / ₄ " (2320mm)

* If transport width is < 6' - 4 ³/₈" (1940mm), the magnet needs to be transported sideways. Now the height increases due to a different location of the wheels under the magnet.

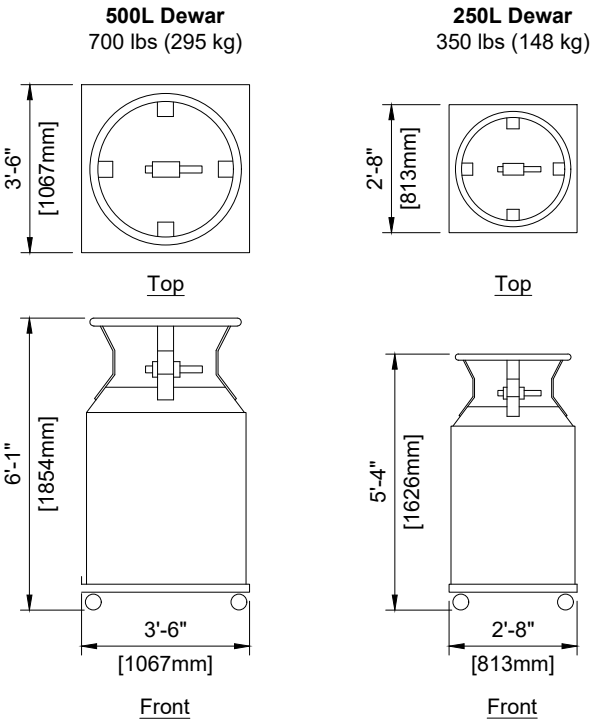


Detail - Helium Dewar Transport Path

MRI systems require occasional liquid helium refills. As such the following must be available for regular maintenance:

1. A minimum 34" (860mm) clear path from the loading and/or delivery area to the MRI exam room, preferably 44" (1120mm).
2. Sufficient floor loading capacity for Dewars along transport path.

Please refer to Sheet SN3 for details regarding liquid helium safety.



General Delivery and Rigging Notes

1. Additional height for protective floor covering, and/or other site-specific restrictions must be added to the transport height.
2. All magnets are delivered pre-assembled.
3. The transport beams, wheels and hydraulic lifting tool will be delivered by the Transport and Installation team. An additional order is not needed.
4. It is the rigger's responsibility to provide a spreader bar if a crane will be used.
 - a. Rigging is customer/contractor's responsibility unless specific arrangements have been made with Philips Sales/Service.
 - b. Assembled magnet weight is 13889 lbs (6300kg).
 - c. Transport via wall: A height of 7' - 10 ¹/₂" (2400mm) and a width of 8' - 3" (2500mm) is recommended. Transport via roof: A length of 8' - 3" (2500mm) and width of 8' - 3" (2500mm) is recommended. Openings with smaller dimensions are possible, but are site situation depended. The tables above provide the minimum dimensions of the magnet assembly.

Note:
Transport height can be reduced further, however, this is a costly exercise and needs to be planned in advance. Due to extra costs and potential mechanical risks related to the magnet, we strongly suggest avoiding this solution. Please investigate the costs associated with modifying the building.

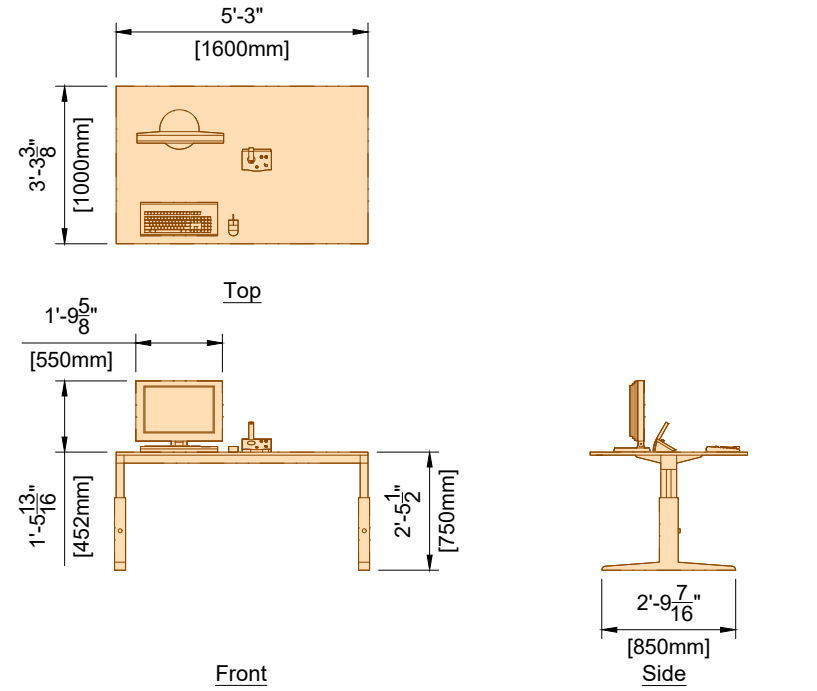
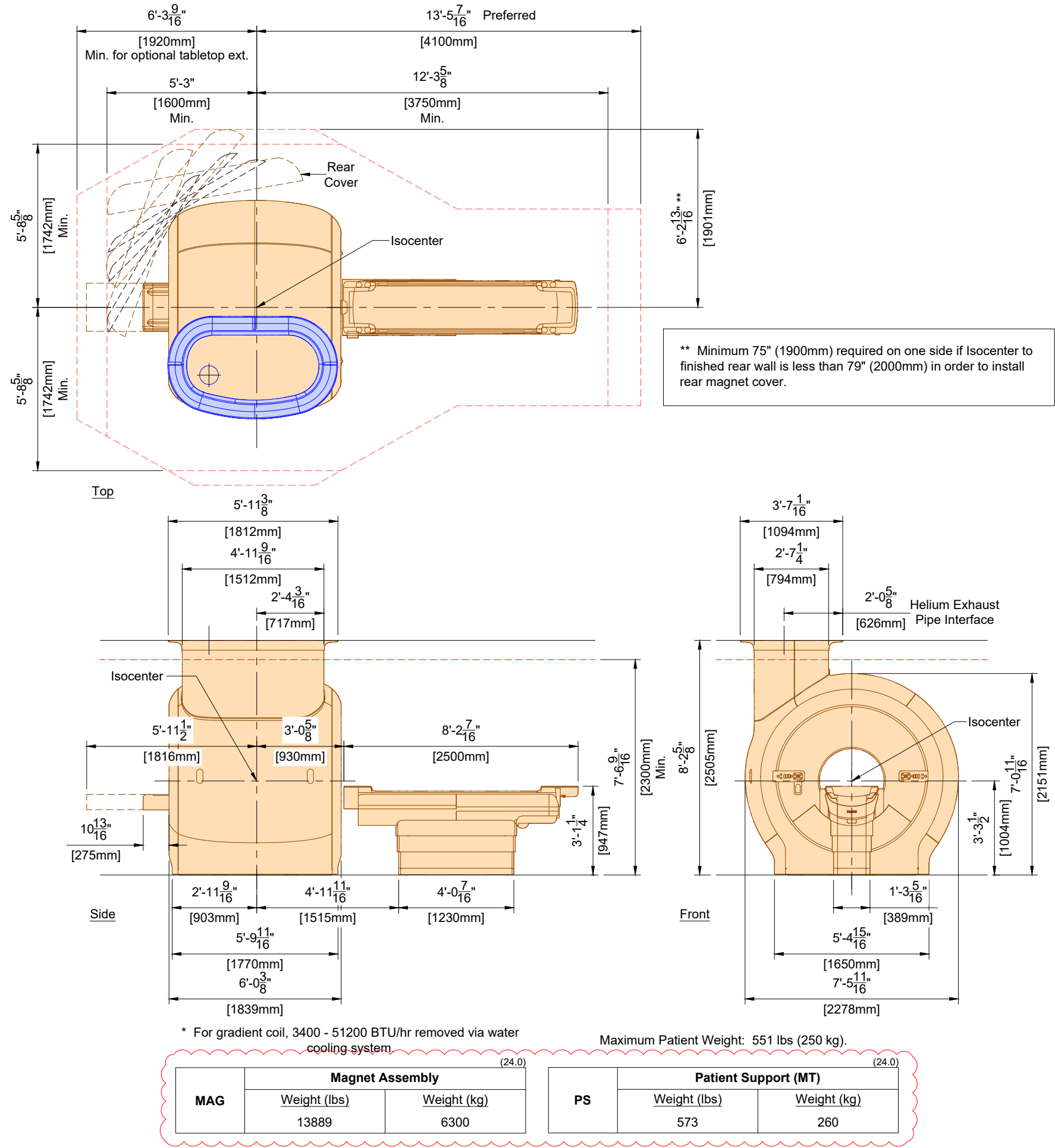
Additional lifting detail to be provided upon request.

Project
Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

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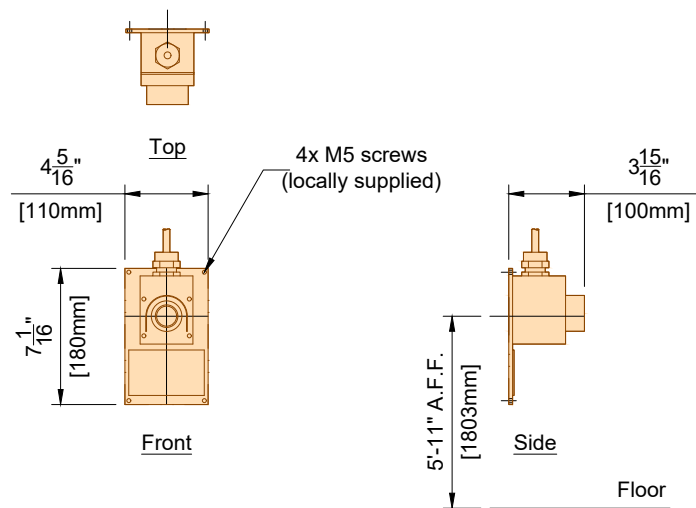
Project Details
Drawing Number
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AD2



* Maximum distance between Monitor/Keyboard and Storage Rail is 1' - 8" (510mm) if Operator Console table is not ordered

OT	Operator's Table	
	Weight (lbs)	Weight (kg)
	220	100



ERB	Emergency Run-Down Button	
	Weight (lbs)	Weight (kg)
	3	2

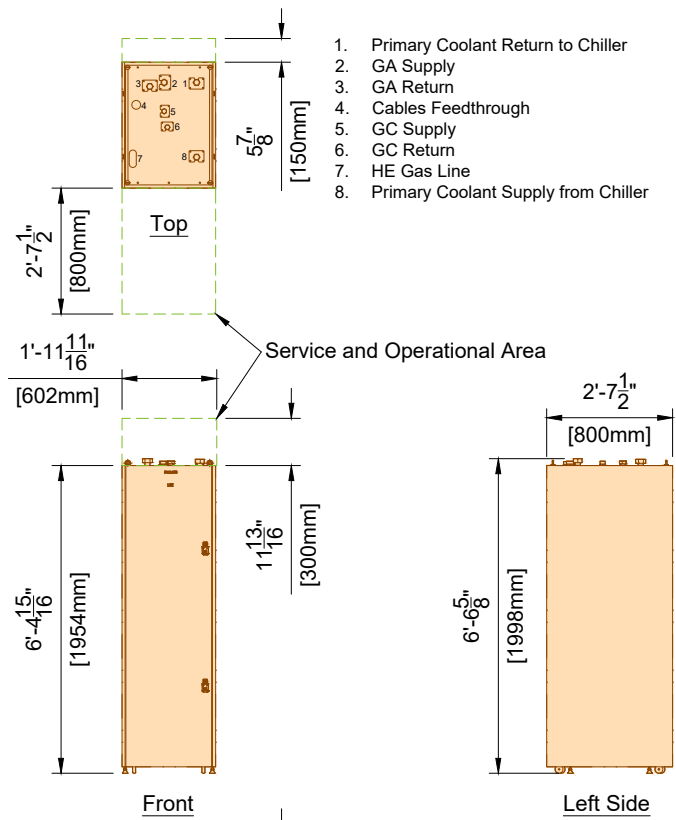
Project
Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

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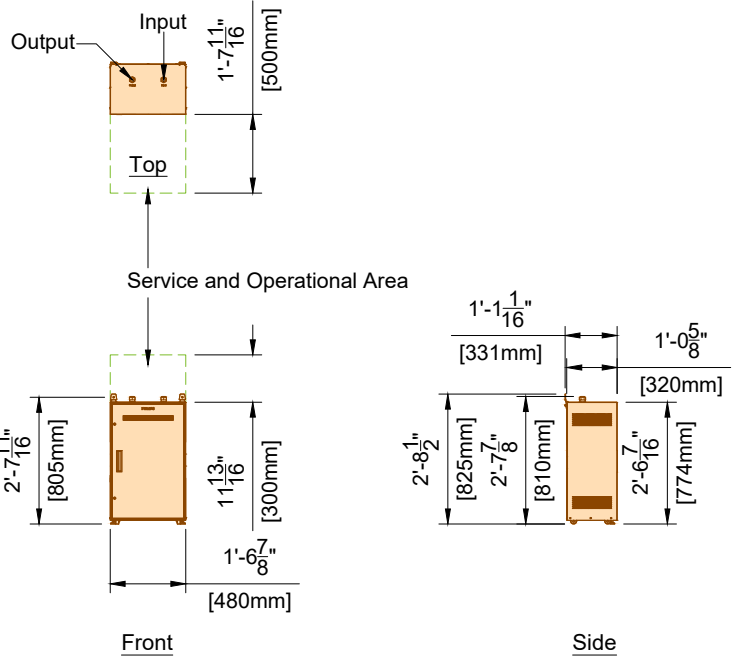
AD3

PHILIPS

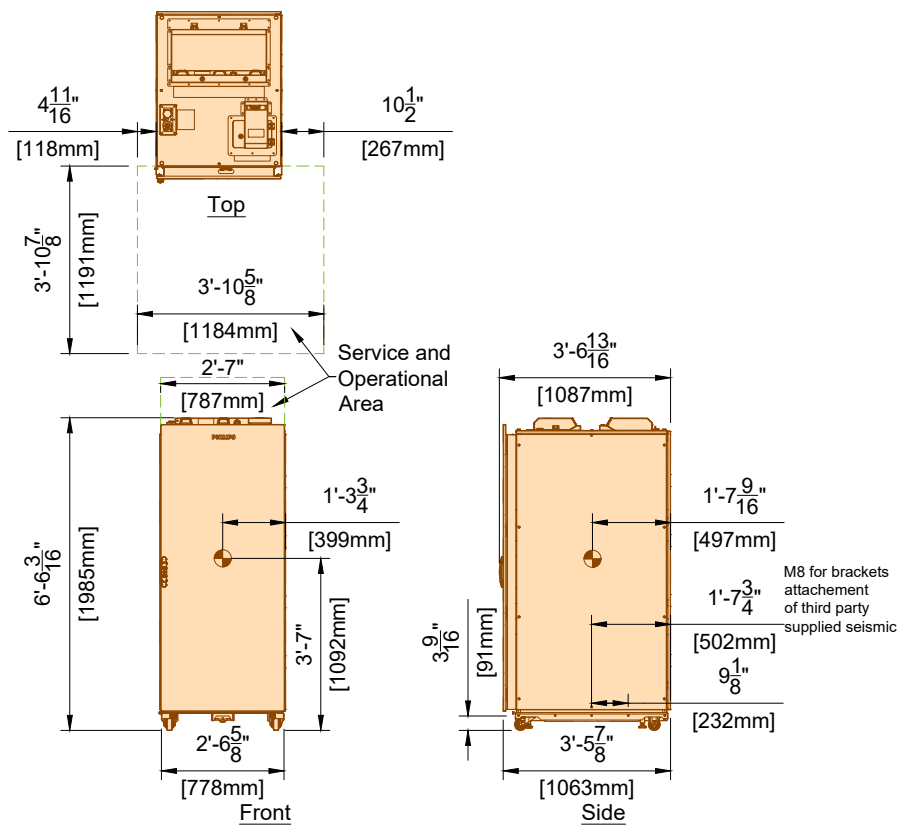


LCC	Liquid Cooling Cabinet (Left-side CombiCabinet)	
	Weight (lbs)	Weight (kg)
	705	320

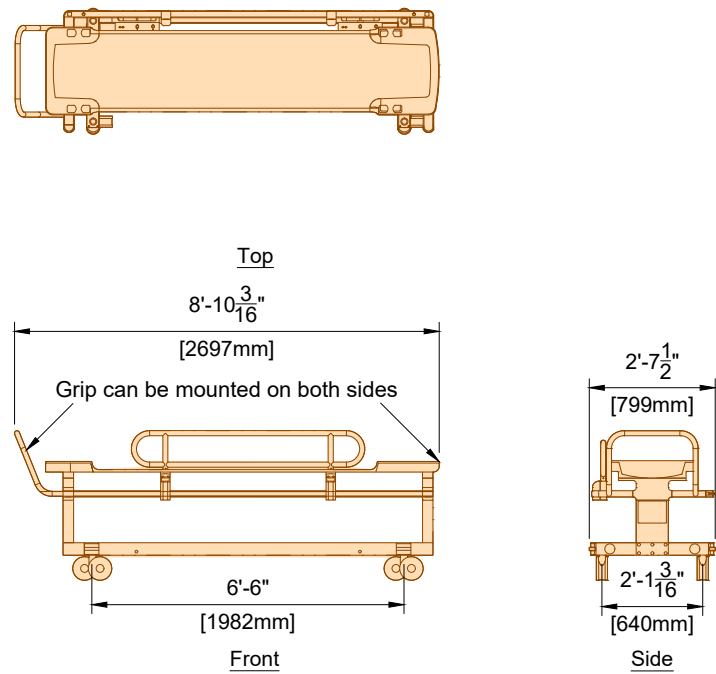
DACC	Data Acquisition and Control Cabinet (Right-side CombiCabinet)	
	Weight (lbs)	Weight (kg)
	734	333



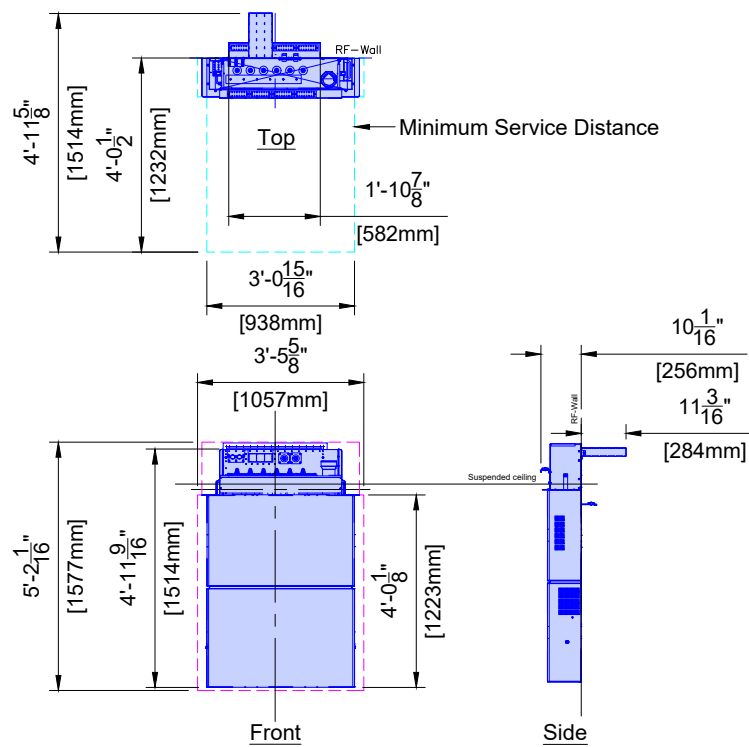
RTT	Ramp Tool Transformer Cabinet - 480V, 60Hz	
	Weight (lbs)	Weight (kg)
	298	135



GAC	Gradient Amplifier NG2250-XP	
	Weight (lbs)	Weight (kg)
	2425	1100



FT	HA FlexTrak	
	Weight (lbs)	Weight (kg)
	113	52



SFB	System Filter Box	
	Weight (lbs)	Weight (kg)
	175	80

Project

Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

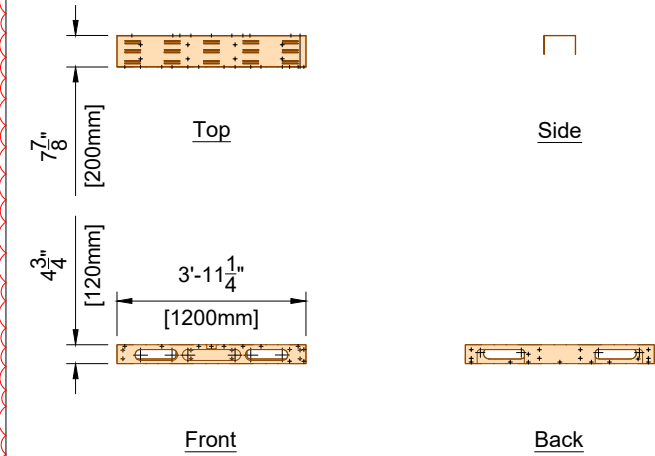
Philips Contacts

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Contact Number: 516-848-7433
Email: taylor.larosa@philips.com
Drawn By: Alejandra Lozano

Project Details

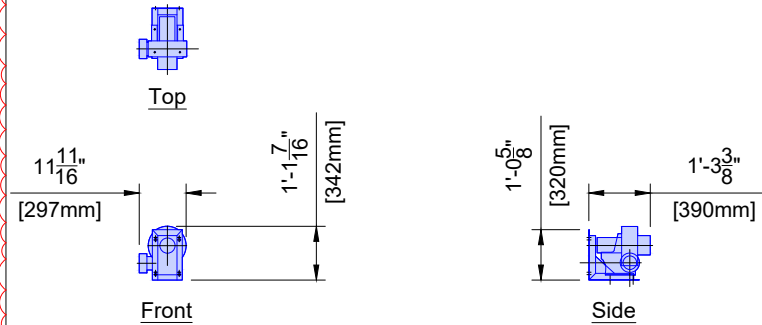
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AD4

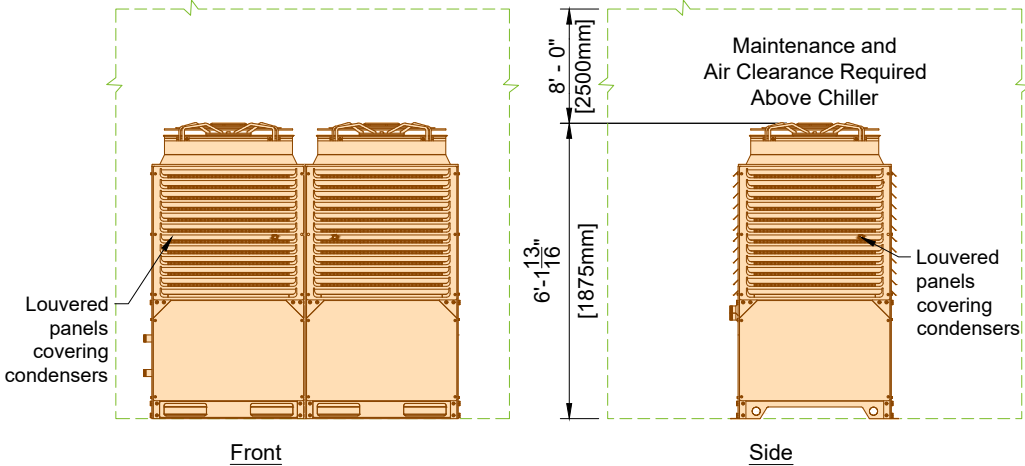
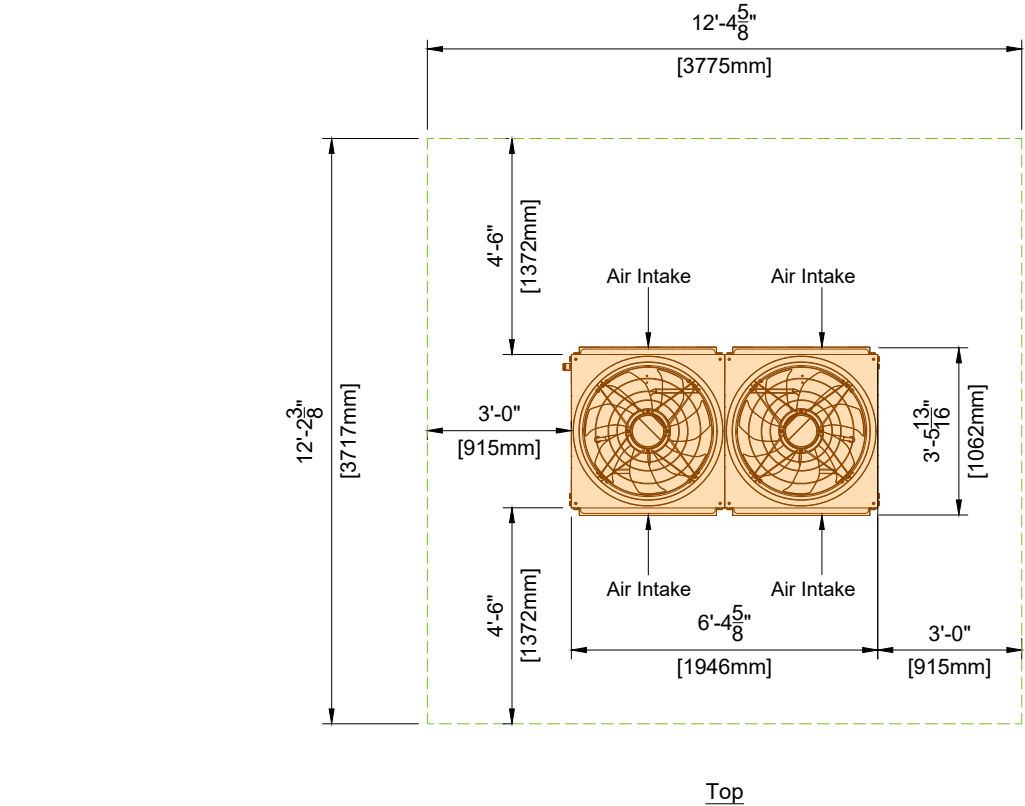


* For Mounting methods, see SD4 Page.

SR	Storage Rail	
	Weight (lbs)	Weight (kg)
	t.b.d.	t.b.d.



SACU	System Air Cooling Unit	
	Weight (lbs)	Weight (kg)
	55	25

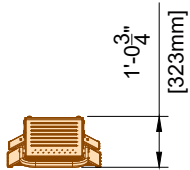


8' - 0" (2500mm) air clearance is required above the chiller. Refer to Sheet MP5 for additional notes and specifications regarding the chiller.

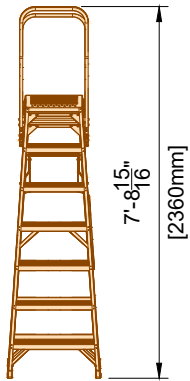
CH	Haskris OPC24	
	Weight (lbs)	Weight (kg)
	1860	844

Project Details	Philips Contacts	Project
Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI

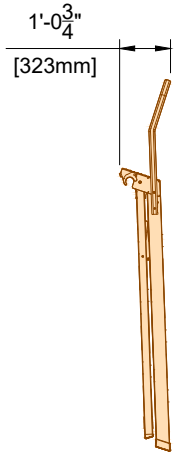
AD5



Top

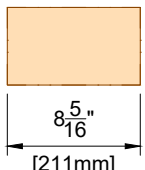


Front

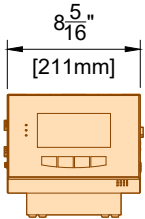


Side

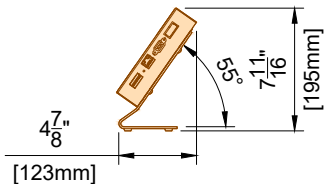
SP	Service Platform (24.0)	
	Weight (lbs)	Weight (kg)
	t.b.d.	t.b.d.



Front



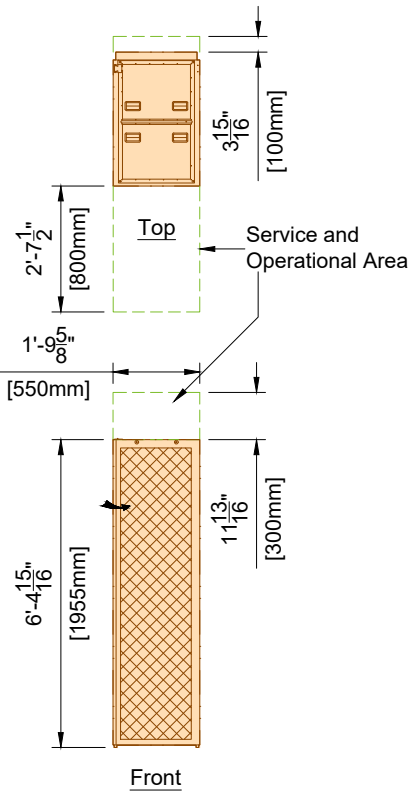
Front



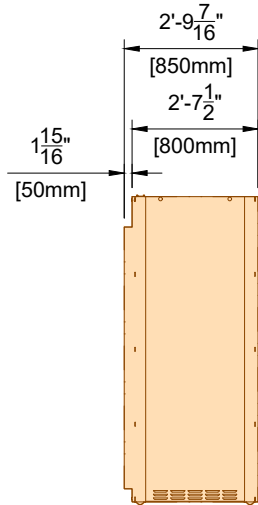
Right Side

Not to Scale

RSP	Remote Status Monitoring Panel (STACO UPS) (24.0)	
	Weight (lbs)	Weight (kg)
	5 lbs	2.25

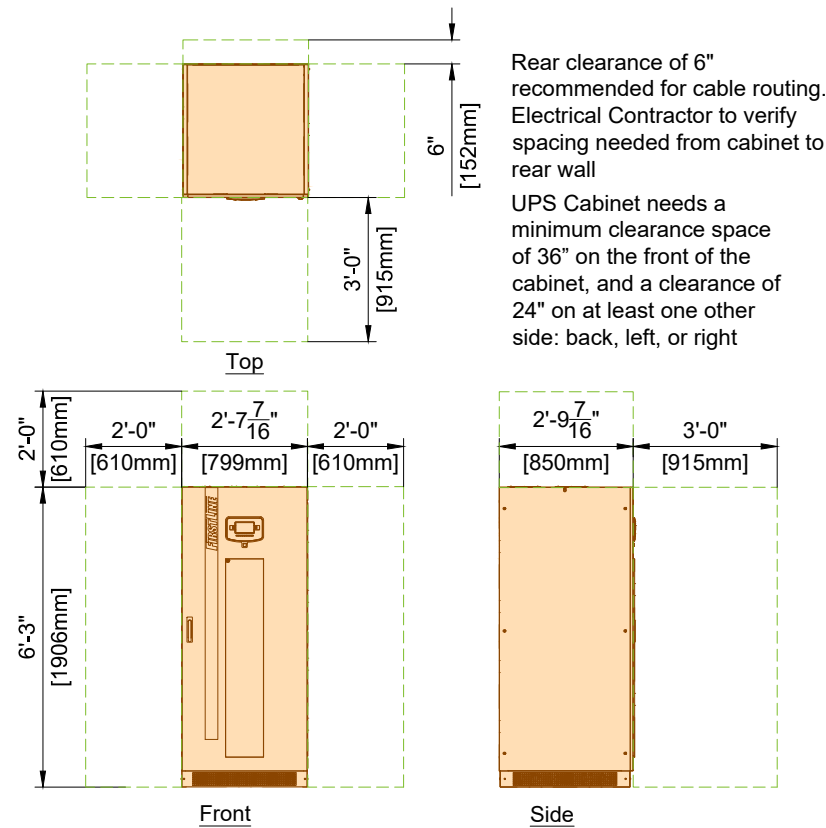


Front



Side

ACC	Additional Components Cabinet (25.0)	
	Weight (lbs)	Weight (Kg)
	365	166



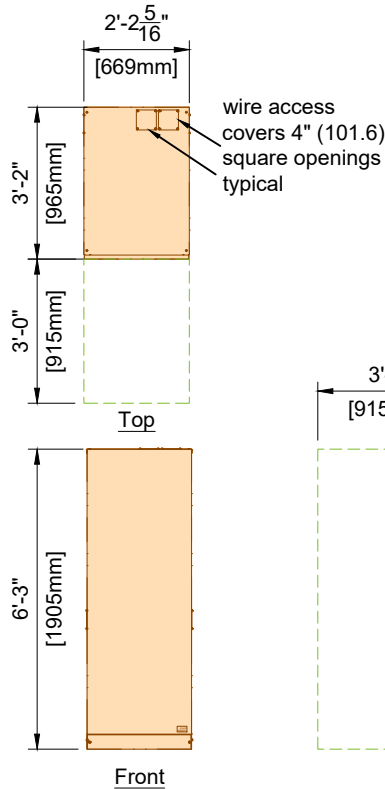
Front

Side

UPS	125 kVA Staco UPS Cabinet (24.0)	
	Weight (lbs)	Weight (kg)
	1742	790

Rear clearance of 6" recommended for cable routing. Electrical Contractor to verify spacing needed from cabinet to rear wall

UPS Cabinet needs a minimum clearance space of 36" on the front of the cabinet, and a clearance of 24" on at least one other side: back, left, or right

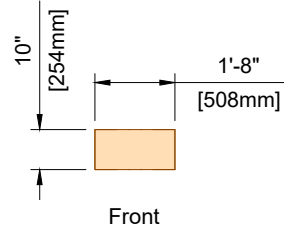


Front

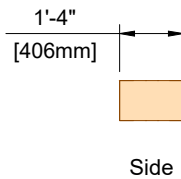
Side

BC	Staco UPS Battery Cabinet (24.0)	
	Weight (lbs)	Weight (kg)
	3700	1678

Battery Cabinet needs a minimum clearance space of 36" on the front of the cabinet.



Front



Side

RAD	Resondant Active Driver (24.0)	
	Weight (lbs)	Weight (kg)
	53	24

Project

Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

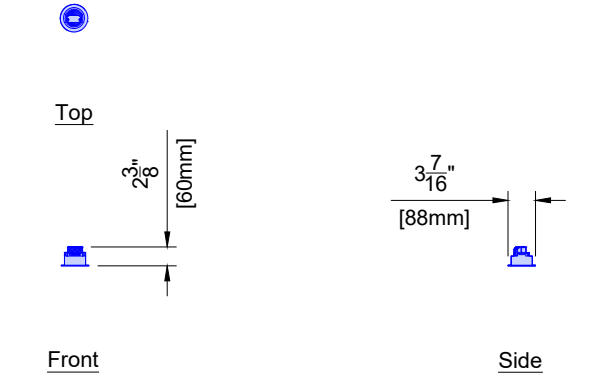
Philips Contacts

Project Manager: Taylor LaRosa
Contact Number: 516-848-7433
Email: taylor.larosa@philips.com
Drawn By: Alejandra Lozano

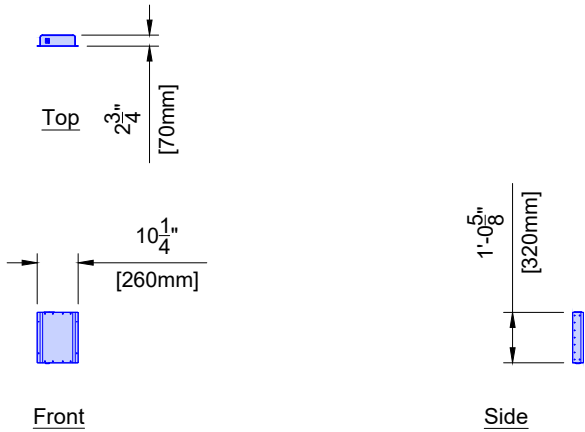
Project Details

Drawing Number: N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

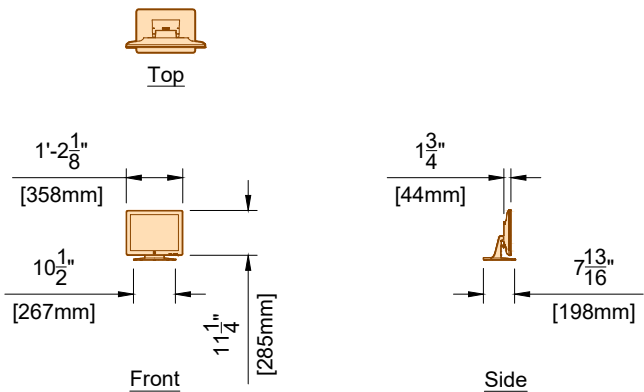
AD6



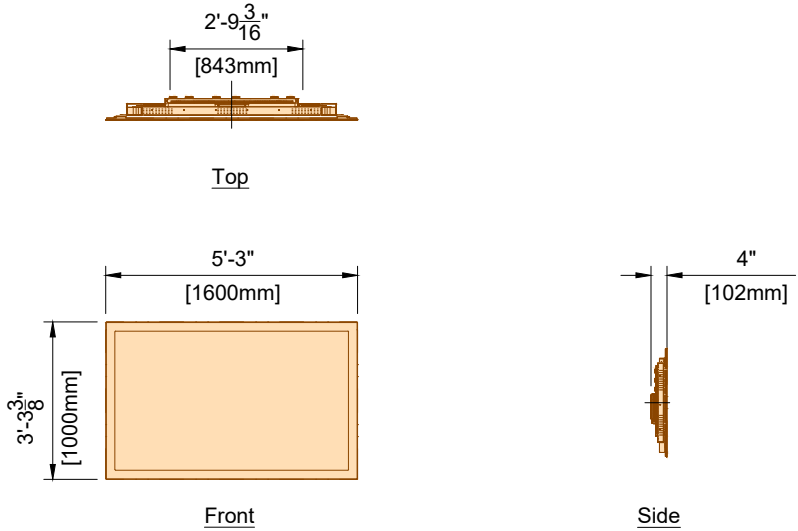
LED	LED Module	
	Weight (lbs)	Weight (kg)
	0.4	0.2



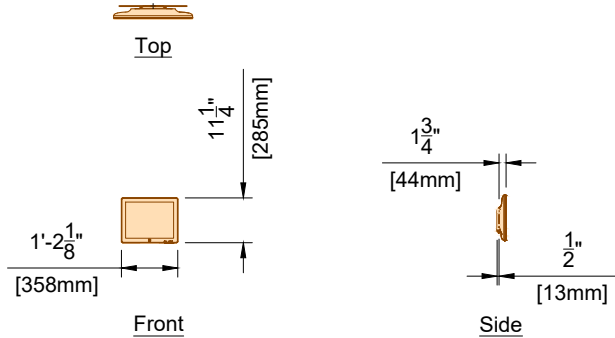
ERPS	Exam Room Display Power Supply	
	Weight (lbs)	Weight (kg)
	9	4



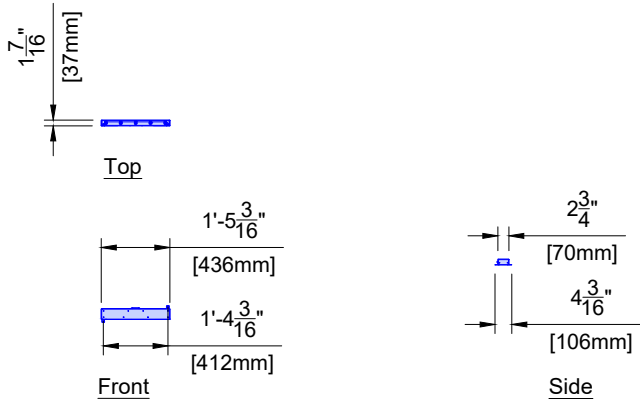
ATS	AE Touch Screen	
	Weight (lbs)	Weight (kg)
	10.6	4.8



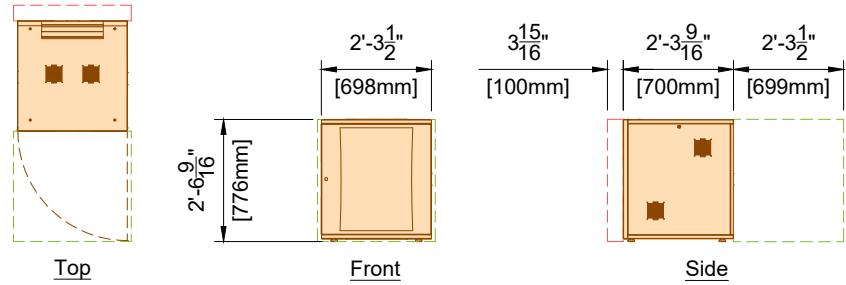
ERD	Exam Room Display (within RF)	
	Weight (lbs)	Weight (kg)
	121	55



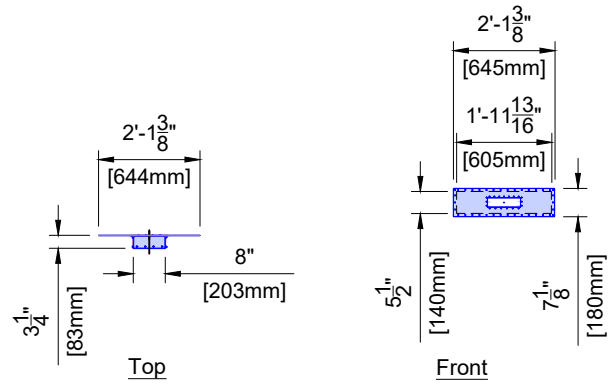
ATSW	AE Touch Screen (Wall Mounted)	
	Weight (lbs)	Weight (kg)
	10.6	4.8



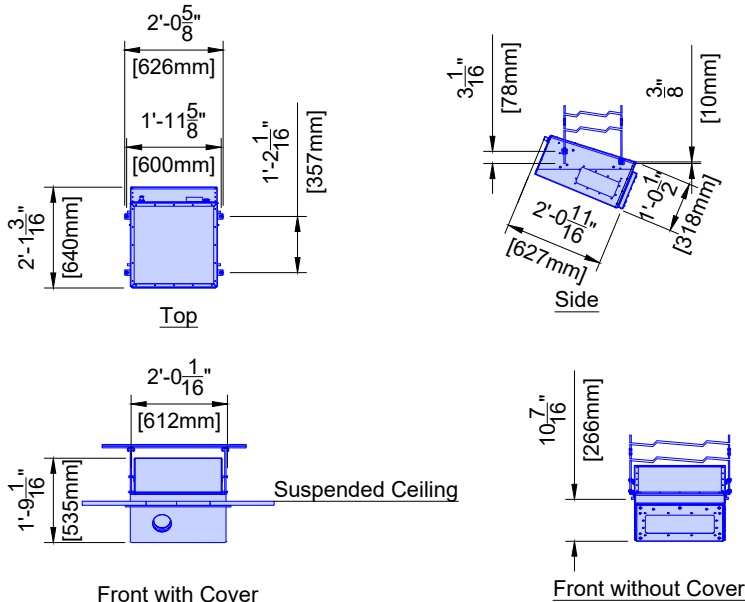
DB	Distribution Box	
	Weight (lbs)	Weight (kg)
	1.54	0.7



AECC	Ambient Experience Control Cabinet	
	Weight (lbs)	Weight (kg)
	123	56



AEF	AE System Filter Box and mounting Plate	
	Weight (lbs)	Weight (kg)
	2.87	1.3



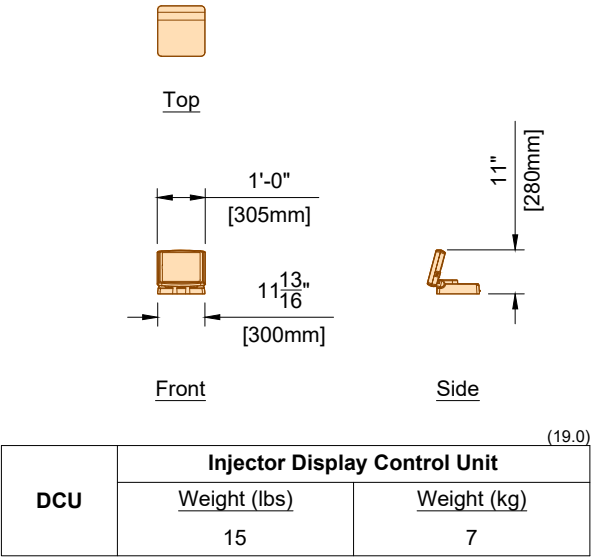
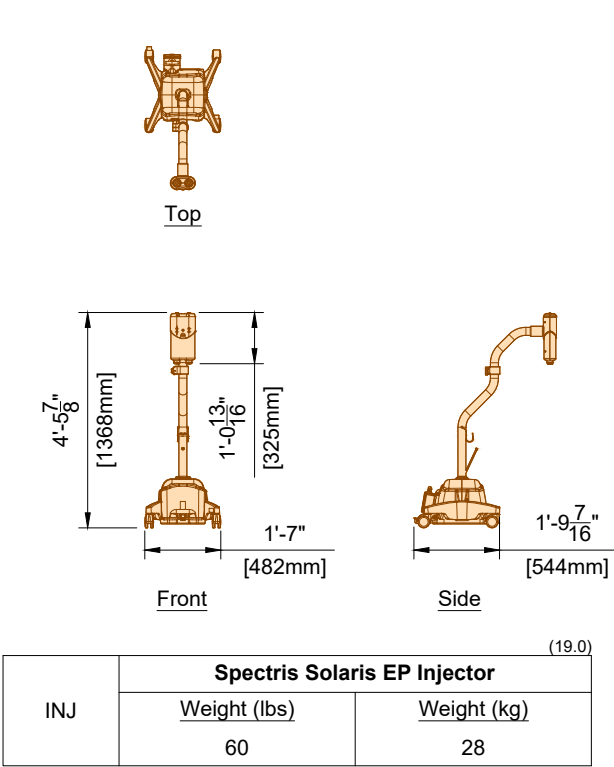
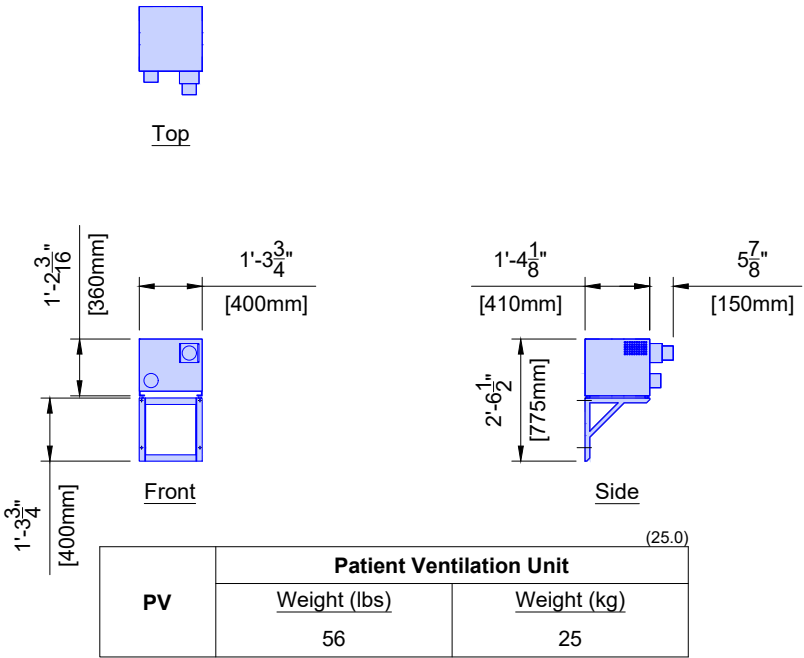
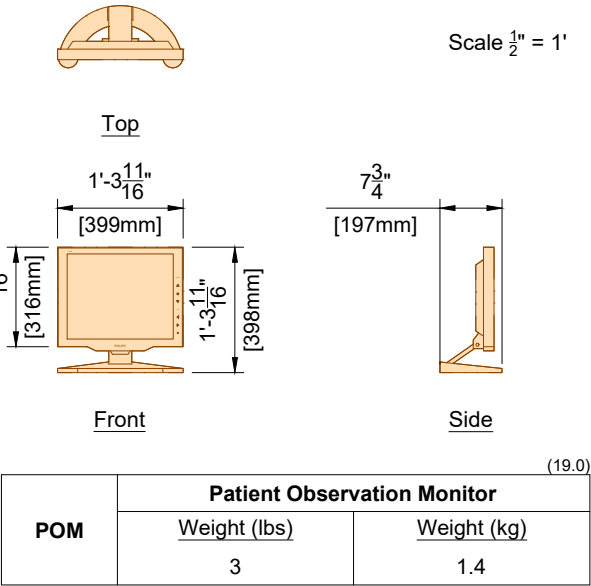
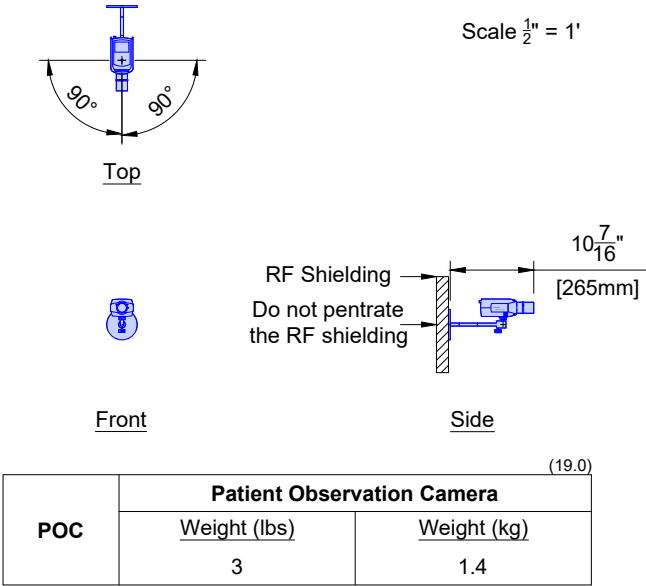
AEP	Ambient Experience Projector	
	Weight (lbs)	Weight (kg)
	70	32

Project
Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

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Project Details
Drawing Number
N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

AD7



Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

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Drawn By: Alejandra Lozano

Project Details

Drawing Number

N-EAS220370 B

Date Drawn: 4/11/2025

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Order: 6600723105.010000

AD8



Magnet Field Homogeneity Explained

Image quality is dependant on the homogeneity and stability of the magnetic field (B0). The homogeneity of B0 can be distorted by static ferromagnetic objects such as floor reinforcement (rebar, structural beams, etc.). The stability of the magnetic field (B0) can be disrupted by moving ferromagnetic objects (cars, trains, elevators, etc.). These can cause variations of B0 which will produce image artifacts such as ghosting.

Electromagnetic fields such as current in power lines, motors, generators, and transformers can also cause B0 variation. The magnitude of the variation will decrease as the source gets farther away from the magnet. As such, there are minimum required distances to the magnet for every type of disturbance, depending upon its properties (weight, current, etc.). Disturbances measured in the Z-axis (direction of the patient table) are most critical for image quality.

Solutions for sites violating requirements will depend on the source of disturbance and construction of the site. To help identify potential disturbances, sources can be classified into seven categories:

1. Static ferromagnetic objects (beams, stirrups, rebar, etc.)

2. Moving ferromagnetic objects (cars, trucks, etc.)

3. Moving magnetized objects

4. Electrically Powered Rail Systems (trains, trams, subways)

5. Electromagnetic fields (power lines, transformers, motors)

6. Static magnetic fields (other magnets)

7. Coherent and non-coherent vibrations

1. Static Ferromagnetic Objects - (see Figure 1)

a. Floor Reinforcement (i.e. rebar, stirrups, etc.):

For the square area of 9' - 10" x 9' - 10" (3 m x 3 m) symmetrically around magnet isocenter, ferromagnetic reinforcement must be:

- NOT allowed between the finished floor level and 1-15/16" (50mm) below the finished floor level.

- NO greater than 25 kg/m² average concentration between 1-15/16" (50mm) and 9-13/16" (250mm) below the floor slab, Ferromagnetic reinforcement in this area must be evenly distributed. Reinforcement below 9-13/16" (250mm) can be ignored.

b. Ferromagnetic beams perpendicular to the Z-axis of the magnet must be located at least 9-13/16" (250mm) below the finished floor level.

c. All other ferromagnetic beams must be located at least 1' - 11-5/8" (600mm) below the finished floor level.

d. Substantial ferro-magnetic objects or structures outside of the RF enclosure must be located at a minimum of 8' - 3" (2.5m) from magnet isocenter.

e. Inside the Examination Room, all metal must be non-ferromagnetic. This is to avoid potential image quality issues and missile effects due to attraction forces of the magnet field.

2. Moving Ferromagnetic and Magnetized Objects - (see Figure 2)

a. Minimum Distances: Ferromagnetic objects such as trucks, cars, and trolleys can be magnetized by the Earth's magnetic field and by the magnet's fringe field. Figure 2 shows the minimum distances moving ferromagnetic objects must be from isocenter.

b. Minimum Distances: Some ferromagnetic objects are magnetized because of high currents repeatedly entering the fringe field of the magnet (e.g. elevators). The safety distance for these objects can be calculated by multiplying their weight by 10 and using the chart in Figure 2.

3. Electrically Powered Rail Systems - (see Table 1)

a. Minimum Distances: Electric trains, tramways, and subways are typically powered by electrical traction. For railways with overhead power lines, the current through the power lines (and the returning current through the rails) will induce high magnetic field variations that will extend over a large region. These fields will have a small variation in the direction perpendicular to the power lines. Therefore, B0 variation depends on the distance from the power line to the isocenter, the current, and the angle between the power line and the magnet's Z-axis (0° is parallel to Z-axis). Table 1 shows the minimum distance allowed for electrically powered rail systems versus current and its angle to the magnet Z-axis.

4. Electromagnetic Fields - (see Table 2)

a. Minimum Distances: Currents in power lines, large transformers or electric motors near an MR system can affect the stability of the magnetic field since they also produce electromagnetic fields. Table 2 shows the minimum distances allowed.

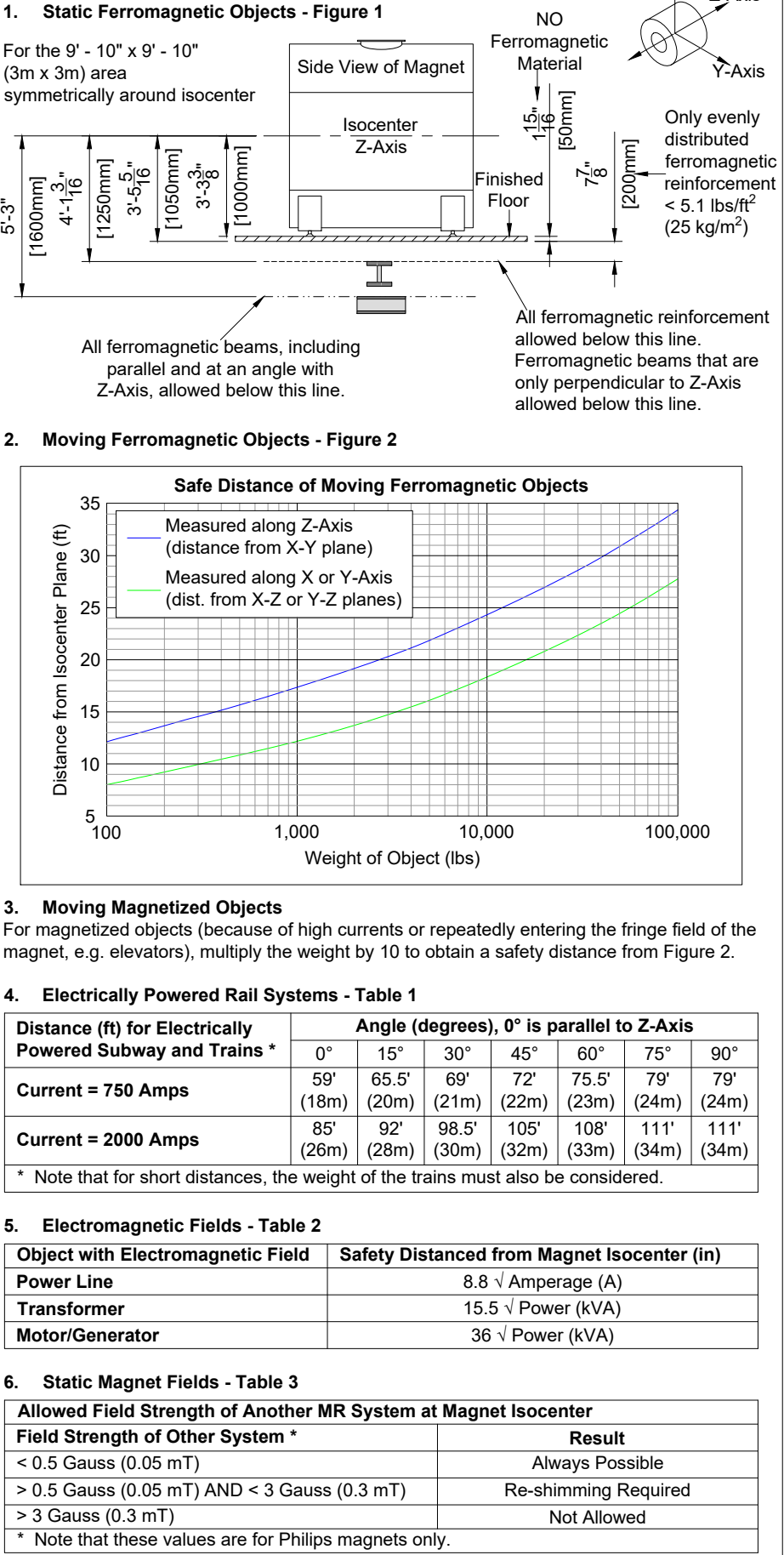
5. Static Magnetic Fields - (see Table 3)

a. Minimum Distances: If an MR system is installed next to another MR system, ensure that the strength of the magnet field from the other system does not exceed the specified values at isocenter of the future system. If the field is between certain values, then the magnet must be re-shimmed when the other system's field goes on or off. Table 3 shows the maximum gauss field allowed.

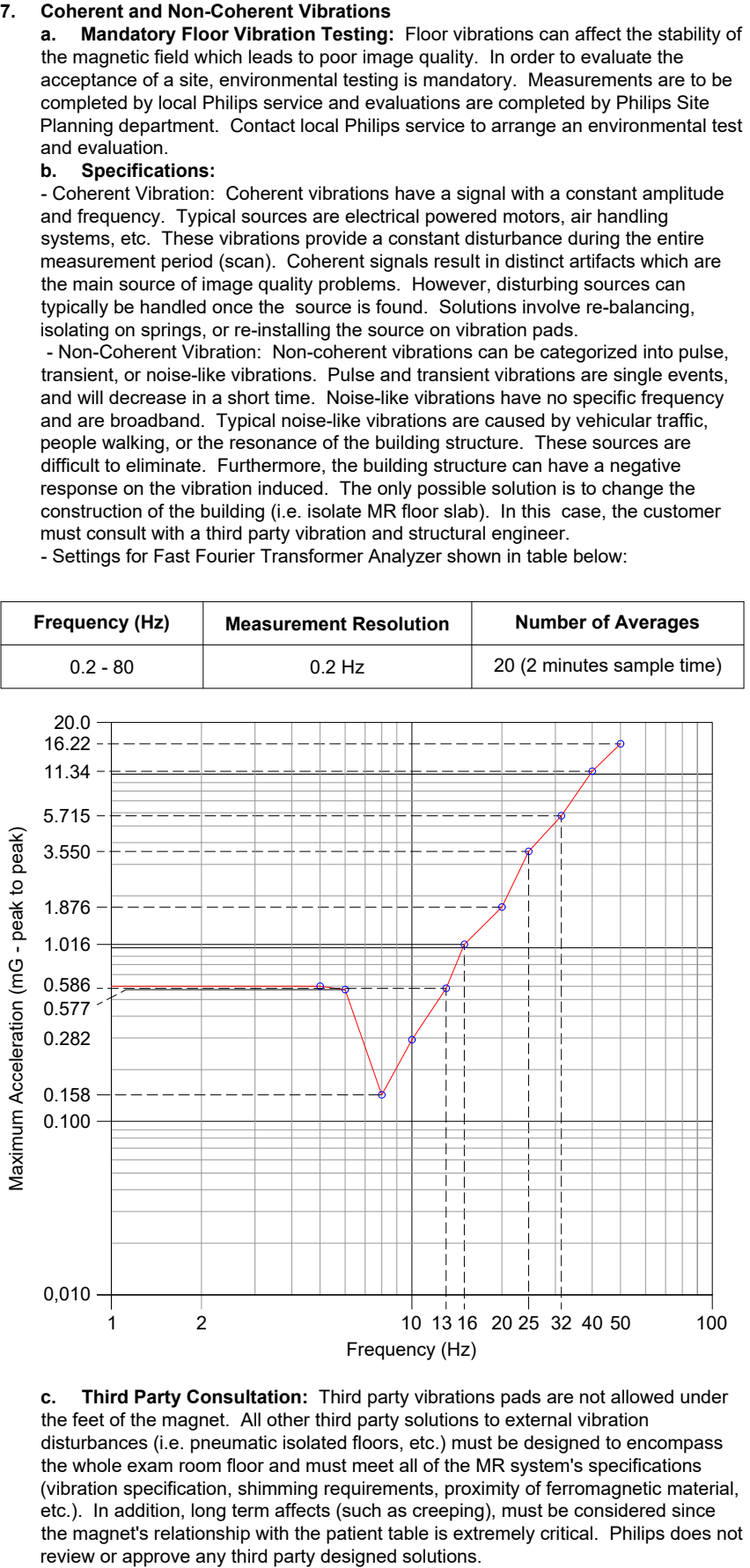
Possible Counter Measures:

If minimum distances are not met, image quality problems are likely to occur. B0 variations can be measured at various angles to find the most optimum angle to site the future Z-axis of the MR system if the distances or the angle to the isocenter are not exactly known. If minimum distances are not met, contact local Philips service to test and evaluate the site.

Magnet Field Homogeneity Specifications



Magnetic Field Homogeneity - Vibration Specifications



Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

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Drawn By: Alejandra Lozano

Project Details

Drawing Number

N-EAS220370 B

Date Drawn: 4/11/2025

Quote: Q-00361165

Order: 6600723105.010000

MRI Support Notes

1. Door(s)

For convenient and safe transport of patients on trolleys, and for installation and maintenance actions, a minimum clearance of 48" W x 84" H (1220mm W x 2130mm H) is recommended. Smaller doors may hinder facility staff in getting access to the patient and in transferring the patient to a place where life saving actions can be performed in an emergency situation. The size of the door(s) and access path to the magnet room may need to be greater than the above figures to allow access for helium refill dewars, which vary in size depending on where they are obtained. For safety reasons the door(s) should comply with the following:

- To be opened or closed within 3 sec., and with a force < 22.5 lbs (100 N).
- Manual operator action required to close the door (not automatic).
- Threshold no more than 0.8" (20mm), or 2.4" (60mm) if provided with ramps no steeper than 10%.
- Simple to operate.
- Opening direction outwards to enable the operator to open the door under conditions of pressure build-up during a quench and a venting system failure.
- A power-assisted door must, in the event of a failure, be opened within 10 seconds with a force no greater than 56.2 lbs (250 N).
- The design of the door posts should be such that they are not damaged by typical contact with patient gurneys and helium dewars.

2. Magnet Transfer Opening

The magnet is the only system part that in most cases cannot be transferred through the door of the RF enclosure. A special opening to allow its installation in the enclosure must therefore be made available. Refer to Sheet AD2 for required dimensions. The underside of the magnet transfer opening should be flush with the floor. If building constraints make this impossible, the RF enclosure supplier must deliver ramp(s) with slopes no steeper than 5% and a maximum height of 4.75" (120mm). The location of the transfer opening will naturally be site dependent. It should, however, comply with the following conditions:

- Preferably be accessible through existing hospital corridor(s), provided these meet other other necessary requirements (i.e. floor loading, corridor width and height).
- It should be accessible from outside through a wall or the roof.

If re-opening of magnet transfer opening is needed, it must be possible for Philips service to re-open the magnet transfer opening without invalidating the RF enclosure guarantee. Should specialist servicing be required, this should be done only by the RF shielding manufacturer's own personnel and any special tools used should be supplied by the RF shielding manufacturer.

3. RF Viewing Window

The recommended window size is 48" W x 40" H (1200mm W x 1000mm H) with the window base no more than 39" (1000mm) above finished floor level. The minimum window size is 36" W x 24" H (900mm x 600mm H). The transparency of window material (i.e. the mesh) must be better than:

- 30% for an angle between 40 and 140°.
- 50% for an angle between 70 and 110°.

The windowpane must be made of tempered safety glass. The window material must have an attenuation factor less than 2 in the light color range of 2600 to 4200 K. Moreover, it must cause no color change in the transmitted light to allow the operator to get an accurate impression of the patient's complexion. The window shielding material (mesh) must be sandwiched between two panes of glass. All parts of the window (e.g. the mesh) that contribute to the attenuation must be made of non ferro-magnetic material. For optional sound damping the two window panes should have a different thickness (e.g. 0.24" and 0.31" [6 and 8mm]).

4. Floor - Covering Material

To avoid electrostatic discharge problems, the floor must have a resistively of less than 1 x 10⁹ Ω / square or it must comply with NEN EN IEC 61340-4. Verify local codes before installing any flooring that is not rated as static dissipative.

5. Foundation of Magnet and Patient Support

Shocks and vibrations up to 0.1 g, in all directions, have to be anticipated. The friction between magnet and floor will normally be great enough to keep the magnet in place (friction factor > 0.1) so no fixing measures are required unless in a seismic area. The patient support is subject to forces induced by operators and patients. To prevent tilting, the patient support must be fastened to the floor.

6. Suspension Provisions

The provisions for system wiring, suspended ceiling, helium gas lines, and helium gas exhaust are not part of the RF enclosure delivery by Philips. However, fixing points for the suspension of these items must be available in the enclosure ceiling. Requirements are determined by the local situation. In addition, suspension points for the lighting, air-conditioning equipment, etc. maybe required. Finally, the suspension provisions must not affect RF enclosure integrity. The responsibility for ensuring this integrity lies with the manufacturer of the RF enclosure.

(14.0)

General Equipment Support Notes

1. General

The customer shall be solely responsible, at their expense, for preparation of the site, including any required structural alterations. The site preparation shall be in accordance with this plan and specifications, the architectural/construction drawings, and in compliance with all safety and building codes. The customer shall be solely responsible for obtaining all construction permits from jurisdictional authority.

2. Equipment Anchorage

Philips provides, with this plan and specifications, information relative to equipment size, weight, shape, anchoring hole locations and forces which may be exerted on anchoring fasteners. The customer shall be solely responsible, through the engineer of record for the building, to provide on the architectural/construction drawings confirmation of the structural adequacy of the floor upon which the equipment will be placed. Any load test required by local authority, shall be the customer's responsibility. The floor surface upon which Philips equipment and floor plates are to be placed/anchored shall be super flat and level to within +0" / - ¹/₈" (2.5mm).

3. Floor Loading and Surface

Philips provides, with this plan and specifications, information relative to size, weight and shape of floor mounted equipment. The customer shall be solely responsible, through the engineer of record for the building, to provide on the architectural/construction drawings confirmation of the structural adequacy of the floor upon which the equipment will be placed. Any load test required by local authority, shall be the customer's responsibility. The floor surface upon which Philips equipment and floor plates are to be placed/anchored shall be super flat and level to within +0" / - ¹/₈" (2.5mm).

4. Ceiling Support Apparatus (If Applicable)

Philips provides, with this plan and specifications, information relative to size, weight and shape of ceiling supported equipment. The customer shall be solely responsible, through the engineer of record for the building, to provide on the architectural/construction drawings, information regarding the approved method of structural support apparatus, fasteners and anchorage to which Philips will attach equipment. Any anchorage and/or load test required by local authority shall be the customer's responsibility.

The structural support apparatus surface to which Philips equipment is to be attached, shall have horizontal equipment attachment surfaces parallel, square and level to within plus or minus ¹/₁₆" (2mm) for the area the system covers.

Contractor to clearly mark Philips equipment longitudinal centerline on bottom of each structural support.

Any drilling and/or tapping of holes required to attach Philips equipment to the structural support apparatus shall be the responsibility of the customer.

Fasteners/anchors (i.e., bolts, spring nuts, lock and flat washers) and strip closures shall be provided by the customer.

5. Suspended Ceiling

Special requirements for the suspended ceiling within the RF enclosure:

- It must be constructed from non-ferrous material. Tiles composed of high recycle metal composition (ie. USG490) are not allowed as they often contain ferrous ferromagnetic metal.
- It is recommended to have sound damping
- No hanging objects such as spot lamps are to hang lower than 8' - 3 ¹/₄" (2520mm) in order to give clearance for the removal of the magnet covers for servicing.
- The access panel or opening in the ceiling to enable a cold head change shall comply with specifications given on SD1.
- Ceiling grid hangers must be made of non-ferromagnetic material and must be insulated.
- Any loose hardware or tools should not be installed or left above suspended ceiling. If the hardware vibrates it could cause image quality issues and if it is ferrous it could eventually end up inside the magnet gantry.

- To avoid spikes, (non ferromagnetic) metal e.g. aluminum strips, aluminum light fixtures, air handling grids etc. must be connected to the RF-enclosure grounding point. Beware of metal-on-metal connections where two metal parts rub against one another. This could cause image artifacts.
- In case of aluminum strips used for the suspended ceiling grid; each individual strip must be connected. In case aluminum tiles, each individual tile must be connected to the RF-enclosure grounding point.
- It is allowed to connect all individual parts to each other and finally to the RF-enclosure grounding point.

- For good electrical connection of the grounding wire a tooth washer is required.
- Before connection is made, coating / insulating finishing must be removed.
- The volume above the suspended ceiling above the magnet and service area must be free of obstacles for service activities. No third party equipment / installations are allowed here.
- The impedance between any conductive part and the central PE bus-bar/terminal must not exceed 100 Ω.

6. Lighting

Lighting fixtures shall be placed in such a position that they are not obscured by any equipment or its movement, nor shall they interfere with Philips ceiling service clearances. Such lighting fixture locations shall be the sole responsibility of the customer. Recommend plastic conduit when it does not interfere/violate with local codes.

7. Ceiling Obstructions

There shall be no obstructions that project below the finished ceiling in the area covered by ceiling suspended equipment travel (if applicable).

8. Floor Obstructions

There shall be no obstructions on the floor (sliding door tracks, etc.) in front of the Philips technical cabinets. Floor must be clear to allow cabinets to be pulled away from the wall for service.

9. Seismic Anchorage (For Seismic Zones Only)

All seismic anchorage hardware, including brackets, backing plates, bolts, etc., shall be supplied and installed by the customer/contractor unless otherwise specified within the support legend on these drawings.

Installation of electronic cabinets to meet seismic anchorage requirements must be accomplished using expansion type (HILT1 HDI, or eq.) anchor/bolt systems to facilitate the removal of a cabinet for maintenance. Do not use threaded rod/adhesive anchor systems for the cabinets. Consult with Philips regarding any anchor system issues.

10. Sprinkler System

All sprinkler pipes and sprinkler heads inside the RF-enclosure to be made of non-ferrous material. Supplier of sprinkler system must declare that the system works in high magnetic environments. The sprinkler pipe must enter the RF-enclosure via one feedthrough and sprinkler heads must be located outside of the magnet's body. Philips strongly suggests installation of dry sprinkler system to avoid possible attenuation of the RF enclosure due to contaminated water standing inside the pipes.

(18.0)

Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Project Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI

SN2

MRI Safety

1. Safety with Magnetic Fields

It is the responsibility of the customer to satisfy the following safety requirements:

a. Controlled Zone:

- During the siting of a Philips MR system, a controlled access area around the MR system must be defined where the field strength will exceed 5 Gauss (0.5 mT). Warning signs "CAUTION" - Magnetic field permanently switched on" should be used to indicate this area. The area must be clearly visible, e.g. by markings on the floor, barriers or other means to control access to this area by unauthorized persons.
- Persons having pacemakers, neuro-stimulators, insulin pumps or similar devices, or implants of ferromagnetic material (i.e. surgical clips, artificial cardiac valves, prostheses or metal splinters) must stay outside the controlled access zone.
- The security procedures at the entrances of the examination room should prevent prohibited objects from being brought into the examination room. Metal detection equipment can be used.
- No liquid helium containers may be brought into the exam room area unless it has been determined that the container is made of non-ferrous material. Special non-ferrous containers are available from liquid gas suppliers and must be appropriately labeled.
- Ferromagnetic objects, such as scissors, tools, gas bottles, vacuum cleaners and stretchers, must be kept outside the examination room. Such objects will be pulled to the magnet, and may cause injury to patients and staff, or may damage the equipment.
- Magnetic shielding requirements to minimize the controlled zone, or contain it within the exam room are to be determined on a site by site basis. If additional shielding is required, consult with Philips service. The customer accepts full responsibility for all costs associated with additional magnetic shielding.

b. Emergency Magnet Run-down:

- The MR system is provided with two magnet emergency run-down remote push buttons to terminate the magnetic field. This should only be used in case of an emergency.
- If in a medical emergency, non MRI-safe instruments must be used, the patient must be removed from the examination room first.
- In case of a deliberate quench (magnet run-down) by the operator to implement life supporting and other safety procedures, the magnet field strength at the isocenter is reduced to a value below 200 G (20 mT) within 30 seconds.

2. Safety with Liquid and Gaseous Helium

- a. A high concentration of helium gas in the examination room can lead to suffocation. When the magnet emergency run-down button is used for immediate shutdown of the magnetic field, or during a spontaneous magnetic field shutdown (quench) occurs, a large amount of helium will evaporate. The helium venting system ensures that the escaping helium gas is vented outside the building. In the unlikely event of a venting system failure (blockage, damage) during a quench, a high concentration of helium gas can disperse quickly into the examination room, visible as clouds of cold mist. In such an event, do not switch off the air conditioning in the room (normal procedure for fires). Instead, maintain circulation and replenishment the air to allow the helium gas to dissipate.
- b. Liquid helium is extremely cold and will cause frostbite when in contact with the human body. Use protective gloves, goggles and clothing when handling liquid helium.
- c. Only properly trained staff should handle cryogenic liquids.
- d. The magnet's helium venting system, connected to a helium exhaust quench pipe leading outside the building should have an opening/outlet located in a non-accessible area. It should be periodically checked to ensure the pipe is not blocked, dislocated, or damaged.
- e. Under no circumstances should the magnet be energized prior to the installation of the helium gas exhaust pipe and the emergency run-down buttons.
- f. Monitoring of the oxygen content of exam room air maybe required by local regulations. The magnet must occasionally have its liquid helium replenished. During these refills, a small amount of helium gas will evaporate in the exam room and dilute the oxygen in the air. As such, it is highly recommended to install an oxygen detector (customer/contractor provided) with an audible alarm, and a remote sensor in the return AC ducts.

3. Safety Zones

MRI safety guidelines recommend that facilities be zoned to ensure patient safety. It is the sole responsibility of the customer to regulate and/or restrict staff and patient flow within the MR environment as necessary. MR safety zones are described as follows:

Zone I - Entrance to facility, reception and waiting areas. No restrictions to patient access.

Zone II - Patient holding area and/or dressing rooms. Patient access may be restricted, or staff supervision may be required.

Zone III - MR control area and equipment room. Accessible only by authorized or properly trained MR personnel. It is recommended that a card-key locking device be used to gain access to these areas.

Zone IV - Scanner room. This area should be accessible solely from Zone III, and access to the scanner room should be observed and control by authorized MR personnel. It is recommended that a warning light be illuminated at all times, with a 24-hour backup power system in the event of a power outage.

(14.0)

Safety Marking Plate

An Examination / RF-door provide access to high static magnetic fields and RF-fields.

To guard against accidents and injuries to patients and others as well as damage to the MR scanner, warning signs are required to exclude:

- People who may have pace makers, implants, neuro-stimulators, etc.
- Ferromagnetic objects to avoid missile effects.
- Sensitive electronic devices.

The safety marking plate should be placed to be viewed if the door is closed, but especially also if the door is opened. Due to that, it is better to locate the sign near the door frame and not on the door.

An alternative is to locate adhesive signs on the floor in front of the door.

Presence of a safety marking plate will be checked as a part of the installation procedure and hand over. Is is not allowed to bring the magnet on field if safety marking plates are not installed.

Please check with local code and consult local end-users and safety-officers about the layout of Safety Marking Plate and if possible multiple languages are needed.

Please contact local Philips Project Manager for sample.

(14.0)

RF Enclosure Requirements

1. RF Shielding Effectiveness

The room has to be built and tested to the following specifications that apply to all parts of the shielded enclosure, including seams, doors, windows, vents and mechanical penetrations:

Values Measured Analogue to MIL-STD-285		
H Field	0 MHz - 10 MHz	Irrelevant
	10 MHz - 15 MHz	90 dB
	15 MHz - 130 MHz	100 dB
E Field and Plane Wave	5 MHz - 130 MHz	100 dB

These requirements are valid for Philips parts not installed and are subject to the following:

- a. The RF shielding is completely installed.
- b. Foundation provisions for the magnet and patient support are installed.
- c. Protective earth wiring (inside and outside the RF Enclosure) is installed.
- d. All components/equipment to be located inside the enclosure are installed and operational (including all external facilities and their interfaces to systems inside the enclosure, excluding Philips parts).
- e. All RF enclosure feedthrough frames covered with blind plates (provided by RF vendor).

2. RF Enclosure Materials

a. Copper RF Enclosures:

Philips recommends copper RF enclosures due to its shielding effectiveness, long term stability, flexible design capabilities, availability, and cost.

b. Ferrous Material RF Enclosures:

RF enclosures made of ferrous material may be acceptable, but are subject to restrictions:

- The floor of the RF Enclosure must be made of non-ferrous material (i.e. copper) within a 9' - 10" x 9' - 10" (3m x 3m) box from magnet isocenter.
- The total combined thickness of the ferrous material must achieve the specified shielding effectiveness with the magnetic field on.
- All walls must be at least 63" (1600mm) from magnet isocenter. The walls do not need to be symmetrically located around isocenter.
- The RF enclosure must not vibrate. This can introduce B0 variations, especially at the RF enclosure ceiling.

c. Aluminum RF Enclosures:

Aluminum RF enclosures are acceptable, but require special attention. Over time, a layer of aluminum oxide will form. This causes electrical contact between RF enclosure parts to degrade, especially around doors, feedthroughs, and windows. As such, extra measures (such as special coating) must be taken. Also, the RF enclosure quality between moving contact points (doors) will rapidly degrade. To reduce degradation, a thin sheet of brass can be used between such surfaces. If the connection is made by an appropriate screw connection, the electrical resistance between the brass and the aluminum must be less than 10 Ohms. The use of gaskets for the door, in addition to the issues mentioned above must not degrade the RF enclosure such that it no longer meets the shielding requirements. Therefore, Philips strongly recommends the use of "finger stocks".

3. Environmental Conditions

The shielding must operate effectively and not suffer damage under the following conditions:

Temperature Range		50° to 104° F (10° to 40° C)	
Humidity		20% to 90% non-condensing	
Air Pressure		7.25 to 16.0 PSI (50 to 110 kPa)	
Frequency		Drip	
Mechanical Vibration		Mechanical Shocks	
Water/Damp/Liquid	0 - 150 Hz	G-Value	0 - 0.1 g
G-Value	0 - 0.1 g	Pulse Duration	6 - 10 ms

These conditions also apply for the system wiring, ducts, gas exhausts and other interface provisions. During and shortly after installation, the shielding may be subject to extreme conditions due to construction activities. Power loss or temperature control failure can also cause extreme environmental conditions. Local earthquake regulations must be followed. Special measures may be required to fasten the magnet and patient support to the building.

4. Reliability / General Policy

- a. Specifications listed are MANDATORY REQUIREMENTS for the proper functionality of the MR system.
- b. Philips accepts no responsibility for correct operation of the RF enclosure. The performance of the MR system is only guaranteed if mandatory requirements are met.
- c. The RF enclosure effectiveness must be tested by the RF vendor, and the results accepted by Philips. If requested by the customer, a Philips representative can be present to witness the testing. The shielding effectiveness must be tested according to the following codes and standards applicable to the extent indicated:
 - MIL-STD-285: Method of attenuation measurements for electromagnetic shielding enclosures for electronic test purposes.
 - MIL-STD-220A: Standard of safety of electromagnetic interference filters.
 - UL 1283: Standard for safety of electromagnetic interference filters.
- d. The shielding must be designed for 100% operation throughout the year.
- e. There must be a gap between the RF Shield and finished wall in the exam room to ensure proper shielding grounding and isolation.
 - The gap prevents contractors from accidentally puncturing the shield with screws or nails.
 - The gap will ensure the shield stays electrically isolated except for approved connections

(14.0)

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number

N-EAS220370 B

Date Drawn: 4/11/2025

Quote: Q-00361165

Order: 6600723105.010000

SN3

Acoustical Noise and Vibration Forces

1. Exam Room

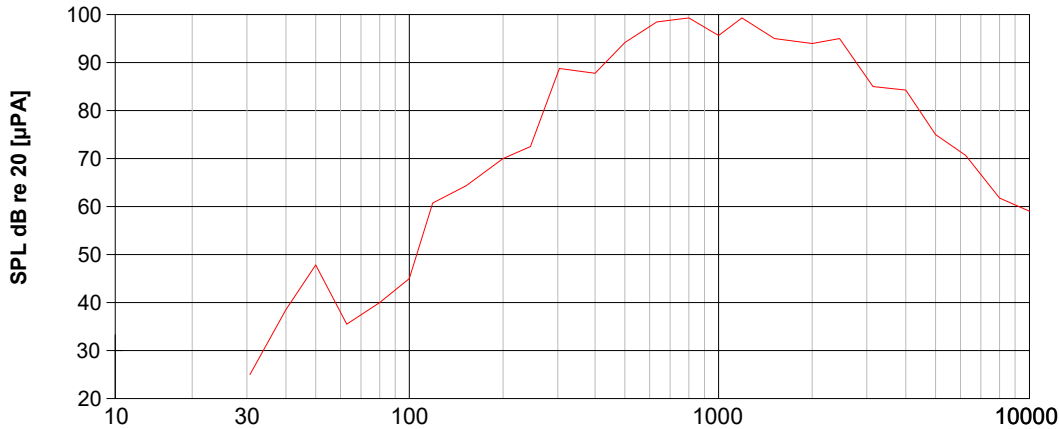
Acoustical noise produced is related to clinical use and the gradient system applied. During scanning acoustical noise originates from the gradient coil. Acoustical noise can vary.

To avoid possible acoustical nuisance the worst case situations must be considered for site design. The use of sound absorbent materials in the examination room is required.

Below a figure that shows peak hold SPL of each of > 30 clinical scans made.

Note: There is no individual/single scan that produces this SPL for the frequencies displayed.

Dynamic Forces Applied to floor in 1/3 Octave Bands, envelop of all sequences



To avoid possible acoustical nuisance the worst case situations must be considered for site design. The use of sound absorbent materials in the examination room is required. It is recommended to make the wall between the examination and control room of two panels. Sound absorbent materials can be mounted between these panels. Some RF Enclosure suppliers already use double-panel walls, one panel for RF shielding and one panel for room finishing. Contact an architect to determine which of the following acoustical noise means can be provided, if needed. Depending on the building construction additional acoustical noise suppression to the same floor level or to other floor levels can be achieved via the following means:

- Additional brick wall between the RF enclosure and technical/operator room or other room. Thickness: 4 3/8" to 4 3/4" (110mm to 120mm). Specific weight: 1.8, 250 kg/m2 R'w > 52 dB
- A double wooden wall (0.08" x 0.50" [2mm x 12.5mm] thick) with 3.15" (80mm) thick mineral fiber material in between, type W-w according DIN 18165 Teil 1.
- The RF door and RF window can be assembled to a construction with sufficient attenuation for acoustical noise:
- RF door : R'w > 32 dB
- RF window : R'w > 40 dB (panes of different thickness)
- The ceiling inside the RF-Enclosure can be finished with a 4" (100 mm) thick mineral fiber material, type W-w according DIN 18165 Teil 1.
- Avoid openings from examination room to other rooms (except needed openings to technical room).

Additional acoustical contact noise suppression can be achieved via the following means:

- Free standing RF enclosure.
- No other coupling to the building than the floor of the RF-Enclosure.
- All other interfaces off the RF enclosure to the building (wall and ceiling) must be de-coupled for to avoid noise (flexible connection of air conditioning pipes etc.).

2. Equipment and Control Room
Typical Acoustical Noise Levels*

39.37" (1m) from equipment room cabinet	75 dBA
39.37" (1m) from Operator's Console	55 dBA

Acoustical Noise Suppression

Sound Absorption Coefficient of Materials to be Used	
Suspended Ceiling - Control and Equipment Room	> 0.6
Main Frequency to be Attenuated	600 to 1000 Hz

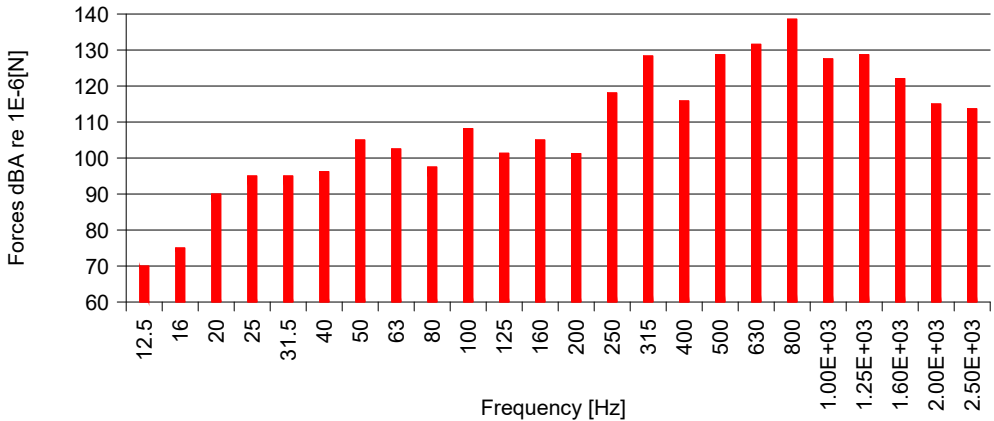
- * Maximum levels can increase by 4 dBA during various sequences and do not include noise produced by third party equipment.
- * The SACU is normally installed inside the equipment room. Anticipate 72 dBA acoustical noise generated by the SACU. Never install SACU in the Operators or Reporting Room.

Contact Noise

Due to mechanical vibration of the scanner during clinical use the building floor can start to vibrate and transport the acoustic energy through the floor to surrounding areas. This energy in the hospital structure will generate acoustic noise in the adjoining spaces. Depending on the building structure the energy can travel across large areas.

If needed an acoustic consultant can investigate if the contact noise could be a problem.

Below a figure that shows peak hold of each of > 30 clinical scans made. This is no representation of one individual clinical protocol, but an envelope of cumulative forces.



Third party delivered vibration pads are no longer allowed. Philips Healthcare newly designed vibration pads are now delivered and shall be used. Typical contact noise reduction is 20 dB compared to Achieva systems. Use of third party pads could interfere with the vibration specification of the magnet and the shimming of the magnet due to sinking. Weak pads can also affect the correct alignment of the magnet and patient table.

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

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Drawn By: Alejandra Lozano

Project Details

Drawing Number

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Date Drawn: 4/11/2025

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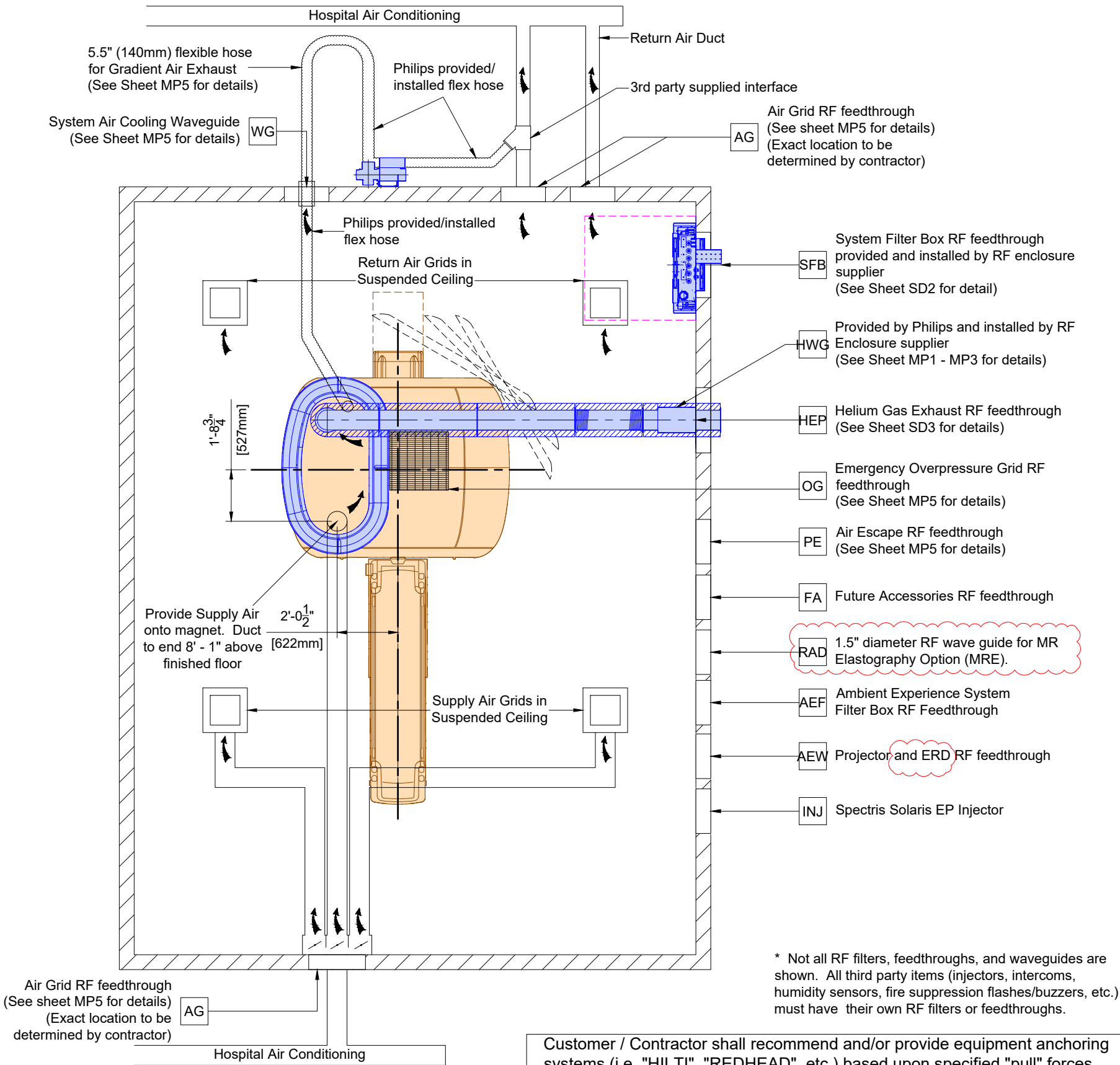
Order: 6600723105.010000

SN4

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Waveguide/Feedthrough Summary

For reference only. Exact locations to be determined by customer/contractor/RF Vendor



* Not all RF filters, feedthroughs, and waveguides are shown. All third party items (injectors, intercoms, humidity sensors, fire suppression flashes/buzzers, etc.) must have their own RF filters or feedthroughs.

Customer / Contractor shall recommend and/or provide equipment anchoring systems (i.e. "HILTI", "REDHEAD", etc.) based upon specified "pull" forces and wall/ceiling composition.

Floor & Wall Support Legend

- A Furnished and installed/anchored by Philips (exceptions may exist, see Note 2)
- B Furnished and installed by customer/contractor and installed/anchored by customer/contractor
- C Furnished by Philips and installed by RF Enclosure Supplier
- D Furnished by Philips and installed/anchored by contractor
- E Existing
- F Future
- G Optional
- H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier

Item Number		Description	Detail Sheet
E	MP	Aluminum magnet support pads (4x) by RF enclosure supplier.	SD1
E	PP	Aluminum patient support pads (2x) by RF enclosure supplier.	SD1
E	LF	Limited floor reinforcement/ferrous materials area, 9' - 10" x 9' - 10" (3m x 3m). No false ceiling (tile or grid) in this area, 28" x 56" (700mm x 1400mm). This service area must be clear of obstructions from top of magnet to 10' - 0" above finished floor except for the Supply Air exhaust duct. (See Waveguide/Feedthrough Summary for the location of duct).	S1 SN1
E	SA	Removable ceiling area 23.75" x 46" (600mm x 1170mm) for servicing equipment. Grid work must be easily removed for access.	SD1
E	CA	Wall anchorage for Ramp Tool Transformer Cabinet. Not to penetrate RF shield.	SD1
B	RTT	Wall anchorage for Emergency Run-Down Button mounted 71" (1805mm) A.F.F. Not to penetrate RF shield.	AD3
E	ERB	Opening in suspended ceiling for ceiling speakers - exact location to be determined. (Not shown on plan)	SD1
E	CS	System Filter Box RF feedthrough (frame to mount System Filter Box must be flush with finished wall).	SD2
E	SFB	Helium Gas Exhaust Pipe RF feedthrough.	SD3
E	HEP	Helium Wave Guide (HWG), installed at Helium Gas Exhaust Pipe RF feedthrough. System Air Cooling Waveguide, 6.25" (160mm) dia., do NOT use honeycomb-type wave guide. Must be located < 78.75" (2m) from exam room air out duct - exact location to be determined by customer. Emergency Overpressure Grid RF feedthrough - exact location to be determined. (Not shown on plan)	MP1 MP2 SD3 MP5
E	WG	Air Grid RF feedthrough for conditioned air entering/exiting exam room - exact location to be determined. (Not shown on plan)	MP5
E	OG	Air Escape RF feedthrough (optional - for pressure balancing between magnet room and adjacent room) - exact location and size to be determined. (Not shown on plan)	MP5
E	AG	12" (300mm) x 12" (300mm) RF panel with 3" (75mm) diameter waveguide for future accessories - exact location to be determined. (Not shown on plan)	
E	PE	Wall anchorage for Haskris Chiller Interface Panel.	SD4
E	FA	Storage Rail Mounting (Mounting option to be determined. Reference SD4 page.)	SD4
B	CIP	1.5" diameter RF wave guide for MR Elastography Option (MRE). (Recommended minimum height of waveguide is 2' - 3 9/16" (700mm) A.F.F.)	-
B	SR	Spectris Solaris EP Injector RF feedthrough. 1" Dia., location t.b.d. by RF enclosure supplier (not shown).	-
H	RAD	Wall anchorage for Patient Ventilation. Anchorage to be minimum 104" (2645mm) A.F.F. if placed above ceiling ladder trays in equipment room.	SD5
E	INJ		
E	PVA		

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number

N-EAS220370 B

Date Drawn: 4/11/2025

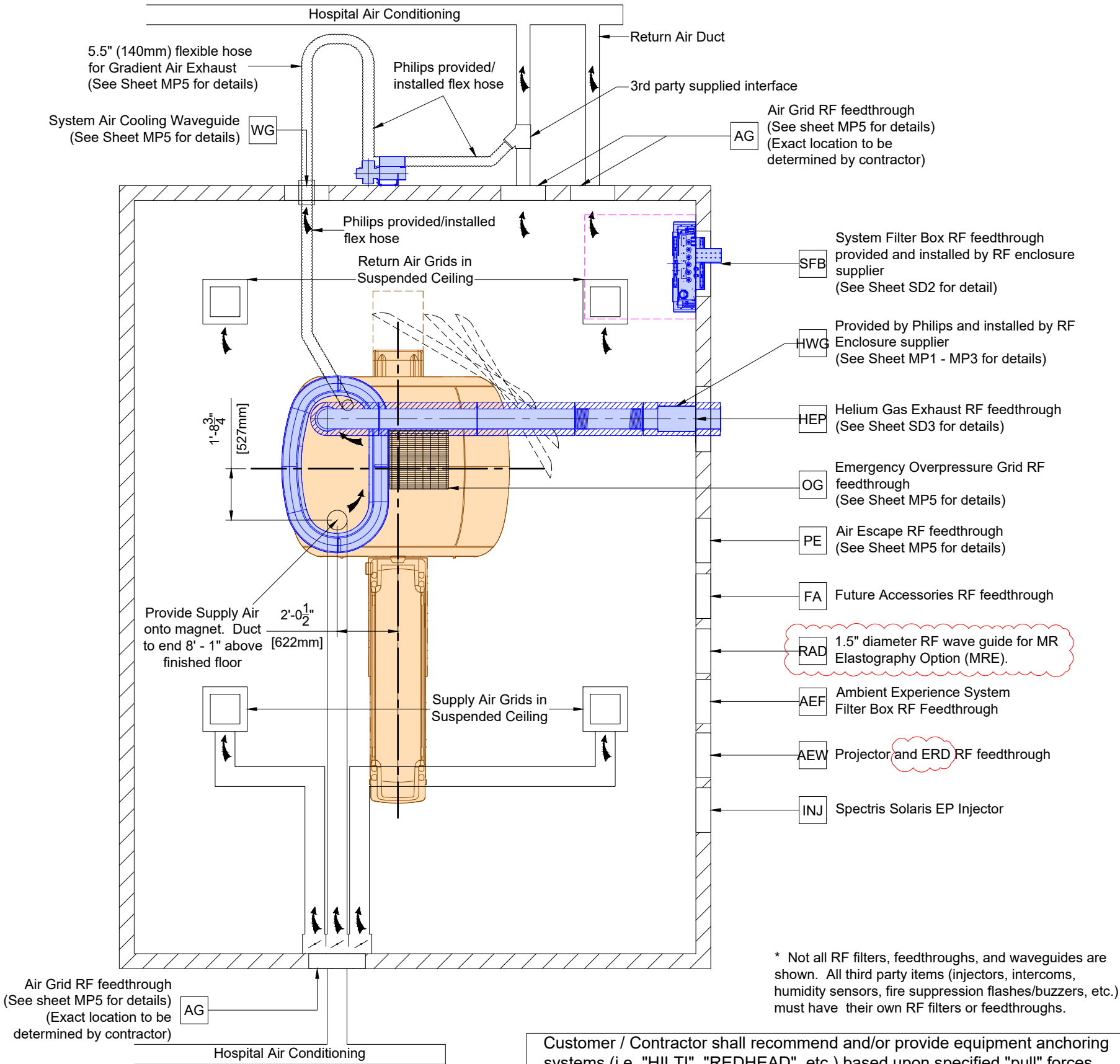
Quote: Q-00361165

Order: 6600723105.010000

SL1

Waveguide/Feedthrough Summary

For reference only. Exact locations to be determined by customer/contractor/RF Vendor



Customer / Contractor shall recommend and/or provide equipment anchoring systems (i.e. "HILTI", "REDHEAD", etc.) based upon specified "pull" forces and wall/ceiling composition.

Floor & Wall Support Legend

- A Furnished and installed/anchored by Philips (exceptions may exist, see Note 2)
- B Furnished and installed by customer/contractor and installed/anchored by customer/contractor
- C Furnished by Philips and installed by RF Enclosure Supplier
- D Furnished by Philips and installed/anchored by contractor
- E Existing
- F Future
- G Optional
- H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier

Item Number		Description	Detail Sheet
E	AEF	Ambient Experience System Filter Box RF Feedthrough located above suspended ceiling. Mounting plate provided by Philips and installed by RF enclosure supplier.	SD5
E	DB	3 x Distribution Box mounted to RF wall (above false ceiling) with two non-magnetic screws or double-sided adhesive tape.	SD5
B	ATSW	Anchorage for face plate required to flush-mount wall box for Touch Screen Monitor.	SD6
A	ERD	Exam Room Display Monitor mounting brackets. Brackets to be mounted on studs placed 4'-4 7/16" apart. (See SD sheet for detail of mounting height.)	SD9-SD11
B	WO	Opening in finished wall required for Exam Room Display Monitor. Opening to be 5' - 0 3/4" W x 3' - 1 11/16" H. See SD sheets for more information.	SD9-SD10
B	ERPS	Power Supply Box for the Exam Room Display Monitor. To be mounted above suspended ceiling and within 16' - 4 7/8" (5m) of ERD.	
E	AEW	Projector and ERD RF feedthrough. 1.5" Dia., location t.b.d. by RF enclosure supplier (general location shown).	
E	AESC	Open hole in wall framing needed for in-wall AE Coil Storage cabinet option. Size: 5'-7 5/16" x 2'-2" x 7'-1" (L x W x H)	

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number

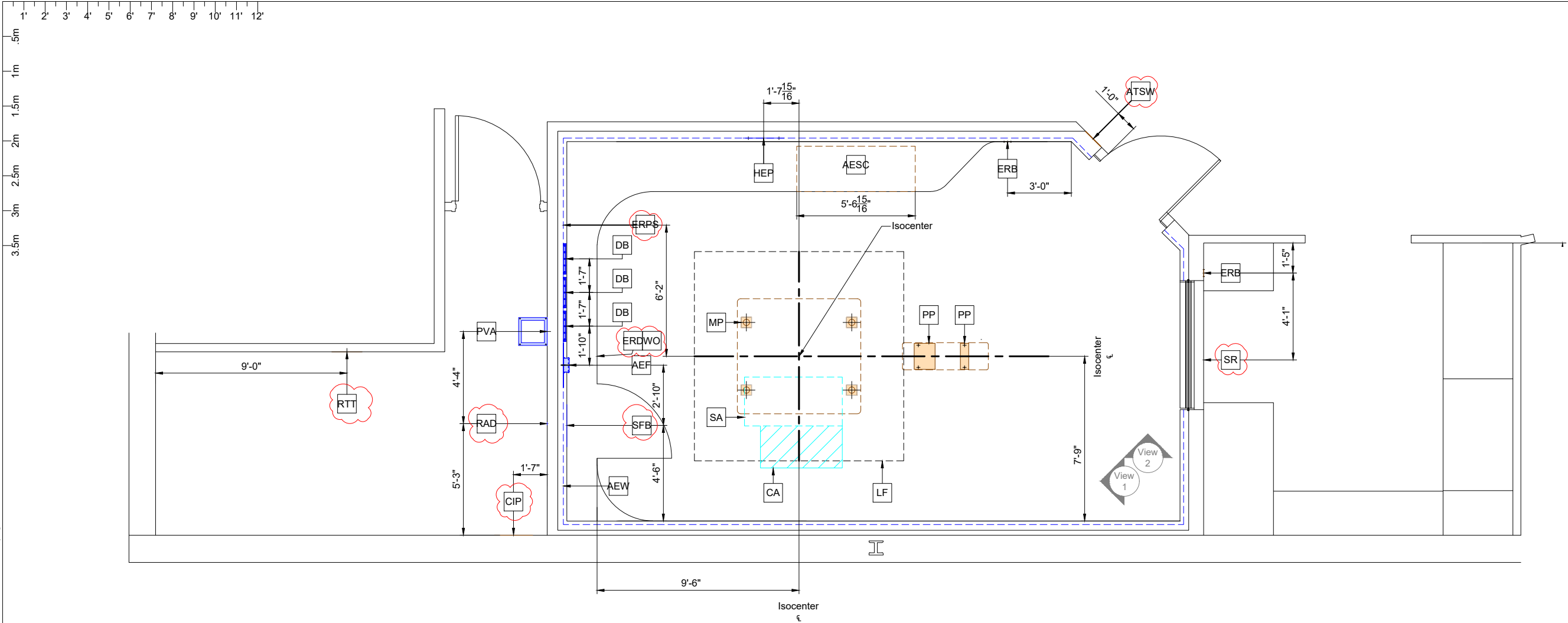
N-EAS220370 B

Date Drawn: 4/11/2025

Quote: Q-00361165

Order: 6600723105.010000

SL2



Support Layout

3/16" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	Minimum*
Exam Room Suspended Ceiling:		
To bottom of HALO Center Panel	8' - 3 1/4" (2520mm)	Required
To bottom of ceiling outside of HALO	8' - 5 1/8" (2568mm)	
HALO Support		
To the bottom of HALO Rafters	10' - 2" (3100mm)	Maximum**
Exam Room RF Ceiling:		
Helium Waveguide Through RF Wall	10' - 8" (3250mm)	Minimum*
Helium Waveguide Through RF Ceiling	11' - 4 1/4" (3460mm)	Minimum*
Control Room		
	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	Minimum

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.
** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.

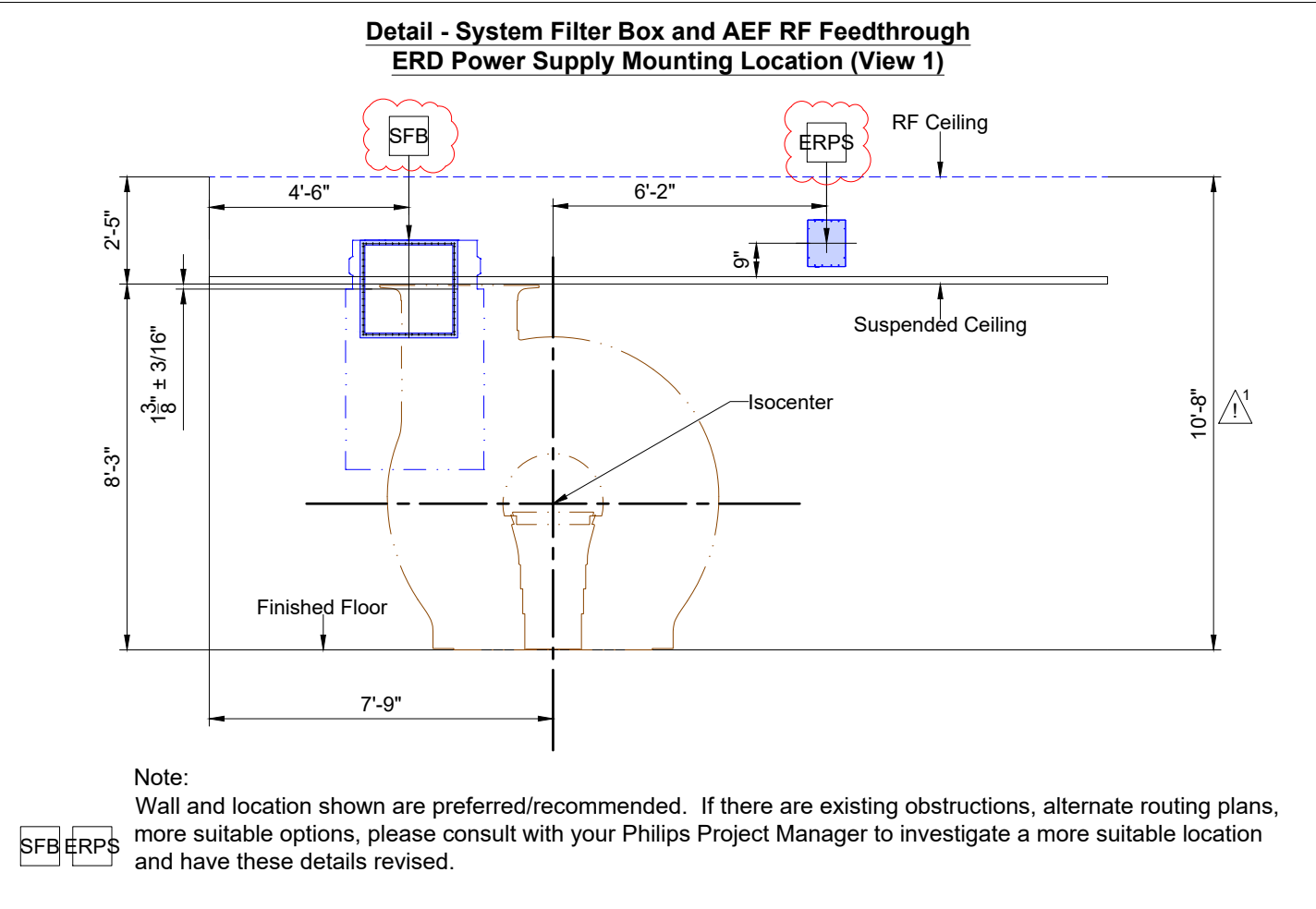
All wall anchorages are dimensioned to centerlines.

* All floor support below the magnet including floor reinforcement and beams must be verified to meet the requirements shown on the SN1 page of the final drawing package. The "LF" box shows the critical area below the magnet.

Project Details	Project	
	Smartpath to MR 7700	
Drawing Number	VA Medical Center West Haven	
	West Haven, CT	
Date Drawn:	Room: MRI	
	Room: MRI	
Quote:	Project Manager: Taylor LaRosa	
	Contact Number: 516-848-7433	
Order:	Email: taylor.larosa@philips.com	
	Drawn By: Alejandra Lozano	

S1

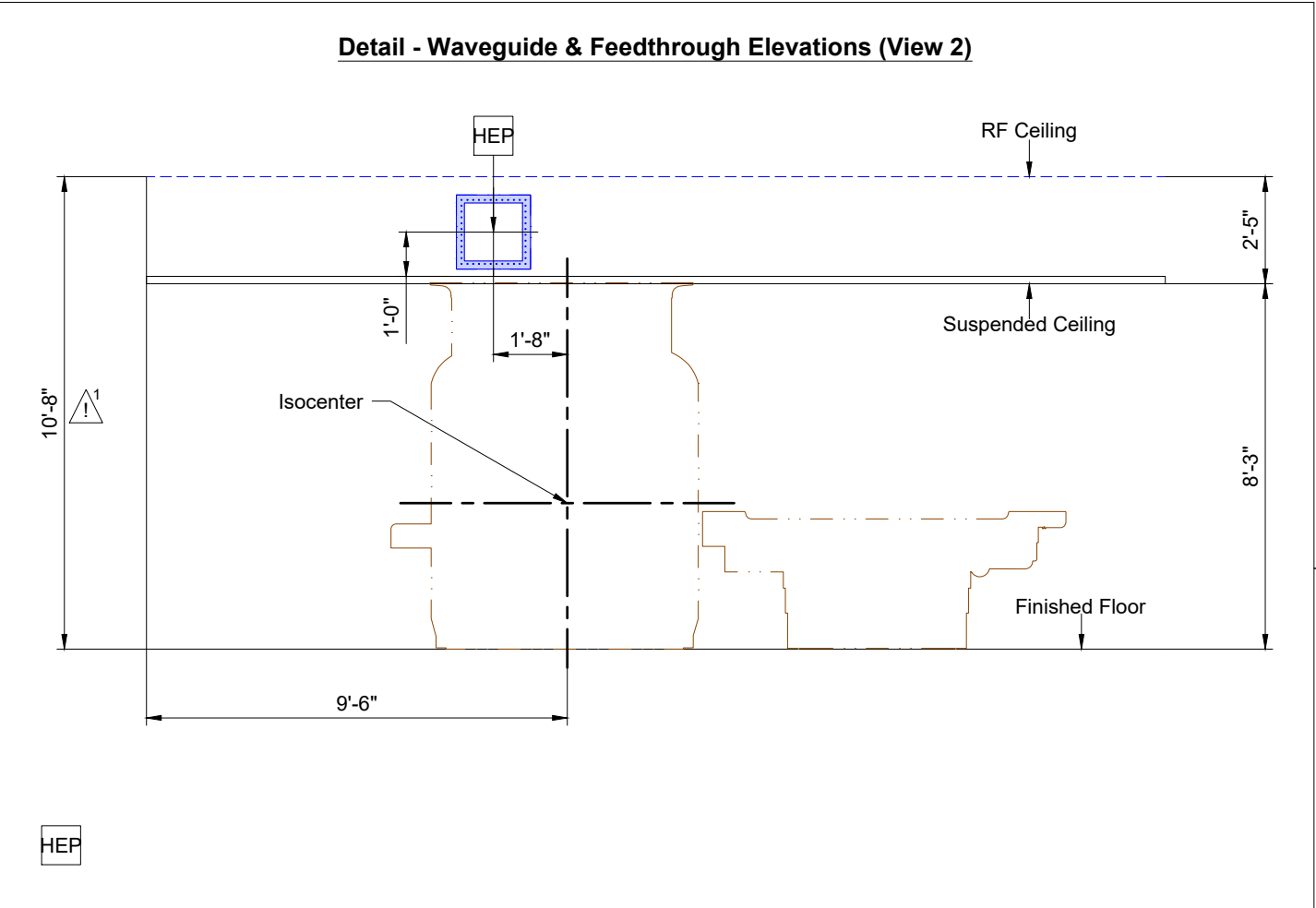
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General Notes:
RF and Suspended ceiling heights are shown using the best data available at the time. If actual or planned heights differ, please consult with your Philips Project Manager to have these details revised.

Reported Ceiling Heights from finished floor to bottom of :
Deck above : Unknown
RF Ceiling : Unknown
Exam Room Suspended Ceiling: 8'-3"
Equipment Room Ceiling: Unknown

Planning Issues and Considerations
Recommended Ceiling Heights shown. Plans must be revised to reflect the site specific ceiling heights and Helium Waveguide locations.



Gradient Exhaust Waveguide for System Air Cooling Unit (SACU) location to be determined based on final location of SACU. SACU must be located less than 78.75" (2m) away from Examination Air Out Duct (See Sheet MP5).

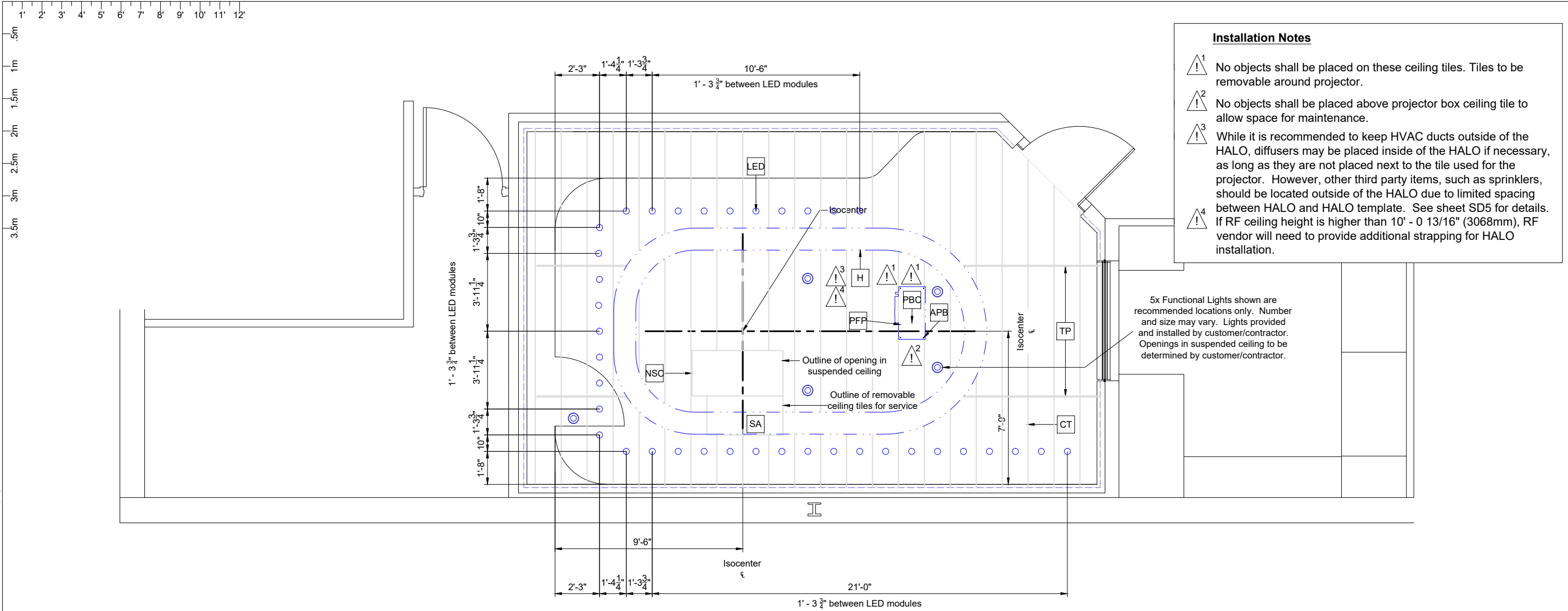
Ceiling Height Guide			
Equipment Room:	10' - 6" (3200mm)	Recommended	
	9' - 2" (2795mm)	Minimum*	
Exam Room Suspended Ceiling:			
To bottom of HALO Center Panel	8' - 3 1/4" (2520mm)	Required	
To bottom of ceiling outside of HALO	8' - 5 1/8" (2568mm)		
HALO Support			
To the bottom of HALO Rafters	10' - 2" (3100mm)	Maximum**	
Exam Room RF Ceiling:	10' - 8" (3250mm)	Minimum*	
	11' - 4 1/4" (3460mm)	Minimum*	
Control Room			
	9' - 10" (3000mm)	Recommended	
	7' - 3" (2200mm)	Minimum	
* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.			
** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.			

Project
Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

Philips Contacts
Project Manager: Taylor LaRosa
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Drawn By: Alejandra Lozano

Project Details
Drawing Number
N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

S2



Ceiling Support Legend		
A Furnished and installed/anchored by Philips (exceptions may exist, see Note 2)		
B Furnished by customer/contractor and installed by customer/contractor		
C Furnished by Philips and installed by RF Enclosure Supplier		
D Furnished by Philips and installed by contractor		
E Existing		
F Future		
G Optional		
H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier		
Item Number	Description	Detail Sheet
E LED	37 x LED modules (AE MR50 LED spot) and cabling.	AD7 ED2
E LED	37 x Openings in suspended ceiling, 3.07" (78 mm) diameter	AD7 ED2
E APB	Projector Box. RF Enclosure Supplier to provide a suitable means to support the full weight of the projector box and projector box cover from the RF ceiling.	SD5 SD7
E PBC	Projector Box Cover.	SD5
E PFP	Projector box fixation points (x 4). Distance between pickup points is 1' - 11 5/8" x 1' - 2 1/16". (See AD page for detail).	SD7
E H	HALO to be provided by Philips and installed by RF Enclosure Supplier.	SD8
CUSTOMER / CONTRACTOR SHALL RECOMMEND AND /OR PROVIDE EQUIPMENT ANCHORING SYSTEMS (I.E. "HILTI", "REDHEAD", ETC.) BASED UPON SPECIFIED "PULL" FORCES AND WALL / CEILING COMPOSITIONS.		

E	SA	31.5" W x 57.00" L (800 mm x 1440 mm) removable ceiling area for servicing equipment. Tile work must be easily removed for access (same as "S5", see SL page).	
E	CT	Suspended ceiling tiles. See sheet SN3 for suspended ceiling requirements.	SN3
E	NSC	No suspended ceiling (tile or grid) in this area, 28.35" W x 57.00" L (720 mm x 1440 mm) (same as "S4", see SL page).	SD1
E	TP	4 x T-profiles (2 x at front and 2 x at back) from HALO to double angle profile. Mounted 8'-5 1/16" (2568 mm) A.F.F. to bottom of T-profile.	
CUSTOMER / CONTRACTOR SHALL RECOMMEND AND /OR PROVIDE EQUIPMENT ANCHORING SYSTEMS (I.E. "HILTI", "REDHEAD", ETC.) BASED UPON SPECIFIED "PULL" FORCES AND WALL / CEILING COMPOSITIONS.			

Installation Notes

- 1 No objects shall be placed on these ceiling tiles. Tiles to be removable around projector.
- 2 No objects shall be placed above projector box ceiling tile to allow space for maintenance.
- 3 While it is recommended to keep HVAC ducts outside of the HALO, diffusers may be placed inside of the HALO if necessary, as long as they are not placed next to the tile used for the projector. However, other third party items, such as sprinklers, should be located outside of the HALO due to limited spacing between HALO and HALO template. See sheet SD5 for details. If RF ceiling height is higher than 10' - 0 13/16" (3068mm), RF vendor will need to provide additional strapping for HALO installation.
- 4

5x Functional Lights shown are recommended locations only. Number and size may vary. Lights provided and installed by customer/contractor. Openings in suspended ceiling to be determined by customer/contractor.

Ceiling Support Layout #1

3/16" = 1'-0"

Ceiling Height Guide

Equipment Room: 10' - 6" (3200mm) Recommended
9' - 2" (2795mm) **Minimum***

Exam Room Suspended Ceiling:

To bottom of HALO Center Panel 8' - 3 1/4" (2520mm) **Required**
To bottom of ceiling outside of HALO 8' - 5 1/8" (2568mm)

HALO Support

To the bottom of HALO Rafters 10' - 2" (3100mm) **Maximum****

Exam Room RF Ceiling:

Helium Waveguide Through RF Wall 10' - 8" (3250mm) **Minimum***
Helium Waveguide Through RF Ceiling 11' - 4 1/4" (3460mm) **Minimum***

Control Room 9' - 10" (3000mm) Recommended
7' - 3" (2200mm) **Minimum**

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

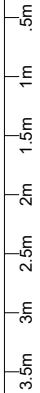
** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.

Project
Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

Philips Contacts
Project Manager: Taylor LaRosa
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Drawn By: Alejandra Lozano

Project Details
Drawing Number
N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

S3



-

Detail Sheet

E
E
E

HT
HR
HB

HALO template to be provided by Philips and installed by RF Enclosure Supplier.

2" W x 157.5" L (50mm W x 4000mm L) HALO ceiling rafters attached to RF enclosure ceiling. The rafters are provided and installed by the RF Enclosure Supplier.

Mounting Holes for HALO bracket (Not shown)

SD8

CUSTOMER / CONTRACTOR SHALL RECOMMEND AND /OR PROVIDE EQUIPMENT ANCHORING SYSTEMS (I.E. "HILTI", "REDHEAD", ETC.) BASED UPON SPECIFIED "PULL" FORCES AND WALL / CEILING COMPOSITIONS.

$$3/16'' = 1'-0''$$

10' - 6" (3200mm) Recommended
9' - 2" (2795mm) **Minimum***

To bottom of ceiling outside of HALO

8' - 3 $\frac{1}{4}$ " (2520mm) **Required**
8' - 5 $\frac{1}{8}$ " (2568mm)

To the bottom of HALO Rafters

10' - 2" (3100mm) **Maximum****

Helium Waveguide Through RF Ceiling

10' - 8" (3250mm) **Minimum***
11' - 4 $\frac{1}{4}$ " (3460mm) **Minimum***

9' - 10" (3000mm) Recommended
7' - 3" (2200mm) **Minimum**

** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.

VA Medical Center West Haven
West Haven, CT
Room: MRI

Project Manager: Taylor LaRosa
Contact Number: 516-848-7433
Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Date Drawn: 4/11/20:

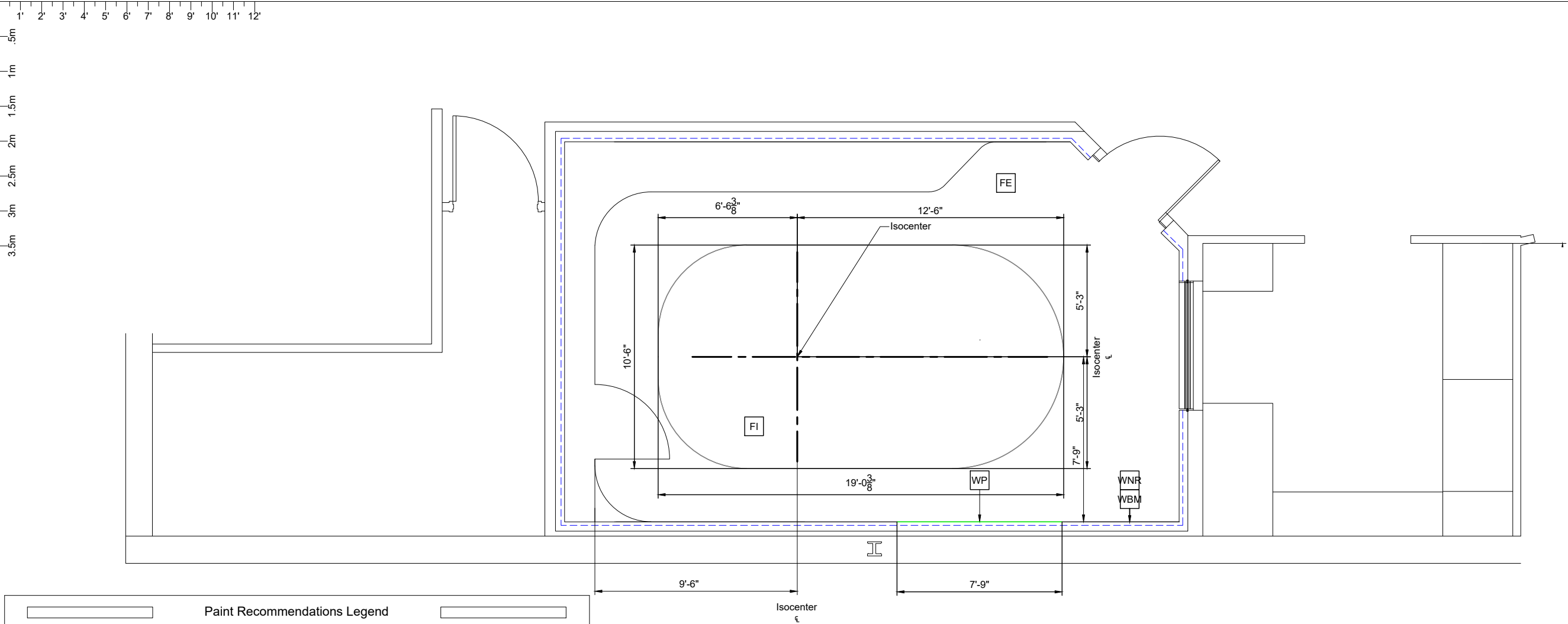
Quote: Q-00361165

Order: 6600723105.010000

S4

6.30.2020

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Paint Recommendations Legend		
A Furnished and installed/anchored by Philips (exceptions may exist, see Note 2) B Furnished by customer/contractor and installed by customer/contractor C Furnished by Philips and installed by RF Enclosure Supplier D Furnished by Philips and installed by contractor E Existing F Future G Optional H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier		
Item Number Detail Sheet		
Description		
E	FI	Exam room floor island. Floor must meet specifications stated on SN1 under "Finished Floor Covering". Recommend "Forbo Colorex EC" out of the classic color range (Forbo Colorex Quartz EC).
E	FE	Remaining exam room floor. Floor must meet specifications stated on SN1 under "Finished Floor Covering". Recommend "Forbo Colorex EC" out of the classic color range (Forbo Colorex Montblanc EC).
E	WNR	Finished wall in examination room to be made out of non-reflecting material. Recommend to plaster wall and paint white (Sherwin Williams SW 7005 Pure White matte recommended). If walls are currently made from "wood", paint them along with the strips between them using non-reflecting white paint (Sherwin Williams SW 7005 matte recommended). Walls must have a level 5 finish.
E	WBM	Wall base molding. Color to match Sherwin Williams SW 7005 Pure White (matte)
E	WP	Wall projection area. Power sockets, switches, "ERB", medical gasses, "RFSC", etc. are not allowed in this area. Projection area width = distance between isocenter and side wall. (See A2 page).
CUSTOMER / CONTRACTOR SHALL RECOMMEND AND /OR PROVIDE EQUIPMENT ANCHORING SYSTEMS (I.E. "HILTI", "REDHEAD", ETC.) BASED UPON SPECIFIED "PULL" FORCES AND WALL / CEILING COMPOSITIONS.		

Paint Recommendations

3/16" = 1'-0"		
Ceiling Height Guide		
Equipment Room:	10' - 6" (3200mm) 9' - 2" (2795mm)	Recommended Minimum*
Exam Room Suspended Ceiling:		
To bottom of HALO Center Panel	8' - 3 1/4" (2520mm)	Required
To bottom of ceiling outside of HALO	8' - 5 1/8" (2568mm)	
HALO Support		
To the bottom of HALO Rafters	10' - 2" (3100mm)	Maximum**
Exam Room RF Ceiling:		
Helium Waveguide Through RF Wall	10' - 8" (3250mm)	Minimum*
Helium Waveguide Through RF Ceiling	11' - 4 1/4" (3460mm)	Minimum*
Control Room	9' - 10" (3000mm) 7' - 3" (2200mm)	Recommended Minimum
* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved. ** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.		

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number

N-EAS220370 B

Date Drawn: 4/11/2025

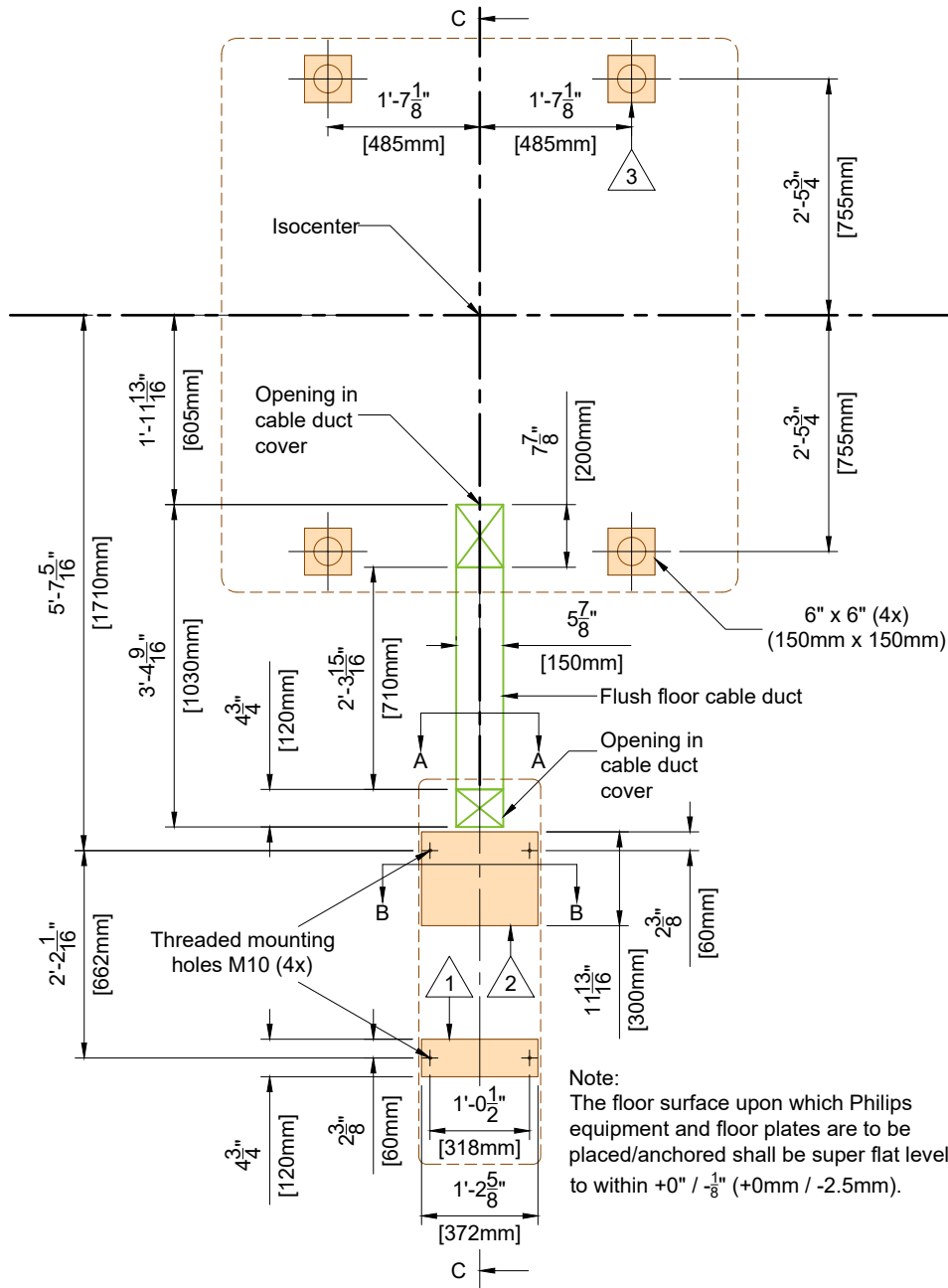
Quote: Q-00361165

Order: 6600723105.010000

S5

Detail - Magnet and Patient Support

(Not to scale)



Floor Pads - Minimum Thickness

Pad 3 0.4" (10mm) for stainless steel for 0.6" (15mm) for aluminum
Pad 1 & 2 0.6" (15mm) for stainless steel or aluminum

Patient Table threaded mounting holes must have at least 0.6" thread depth

Floorload Forces on Floor Pads

	Pad 1 & 2	Pad 3
Horizontal	900 lbs (4 kN)	340 lbs (1.5 kN)
Upwards	2250 lbs (10 kN) per bolt or 3600 lbs (16 kN) per pad	N/A
Downwards	560 lbs (2.5 kN) per pad	3597 lbs (16 kN) per foot 13713 lbs (61 kN) in total for 4 feet

The support plate itself, due to the floorload, must be electrically isolated and a mechanical fixation of the pads through the RF-floor into the building structure is required.

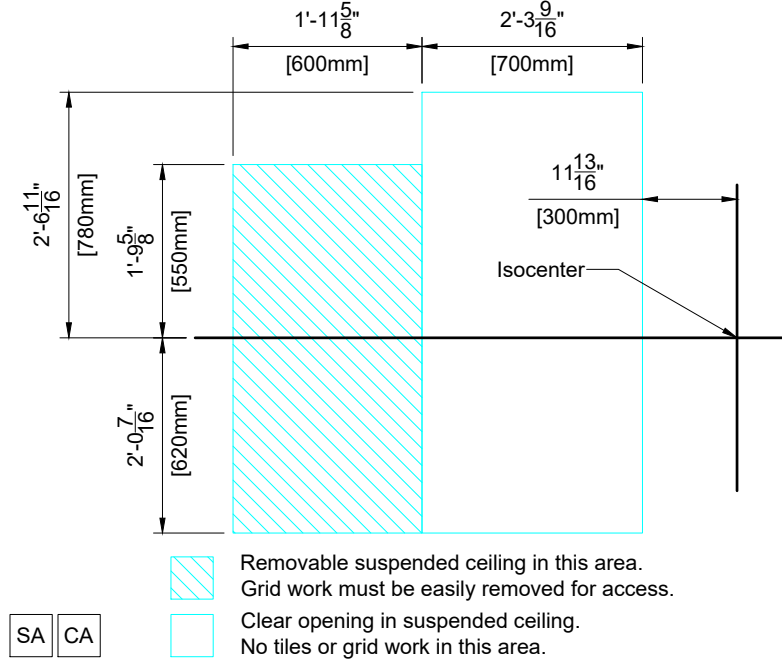
Customer / Contractor shall recommend and/or provide equipment anchoring systems (i.e. "HILTI", "REDHEAD", etc.) based upon specified "pull" forces and wall/ceiling composition.

MP PP FR1

(24.0)

Detail - Suspended Ceiling Magnet Service Area

(Not to scale)



SA CA

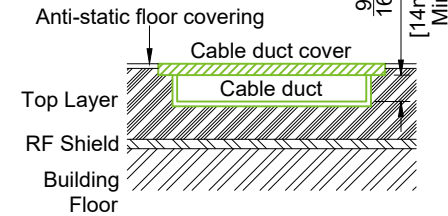
(23.0)

Detail - Cross Section A-A

(Not to scale)

Cable Duct Cover Requiriements

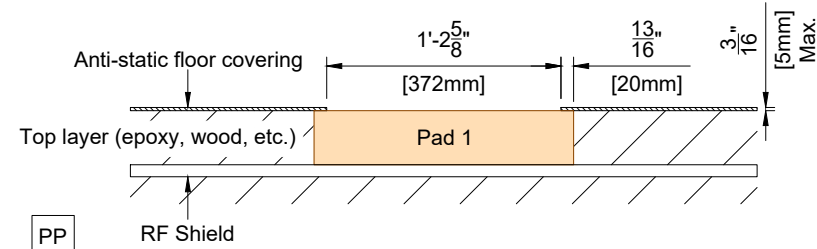
- 1 cover with length of 27.94" (710mm)
- Pressure force: 2000N
- Max. bending-through: 0.02" (0.4mm)
- Removable
- Smooth and well rounded edges
- Non-magnetic material
- Flush with finished floor



(23.0)

Detail - Cross Section B-B

(Not to scale)

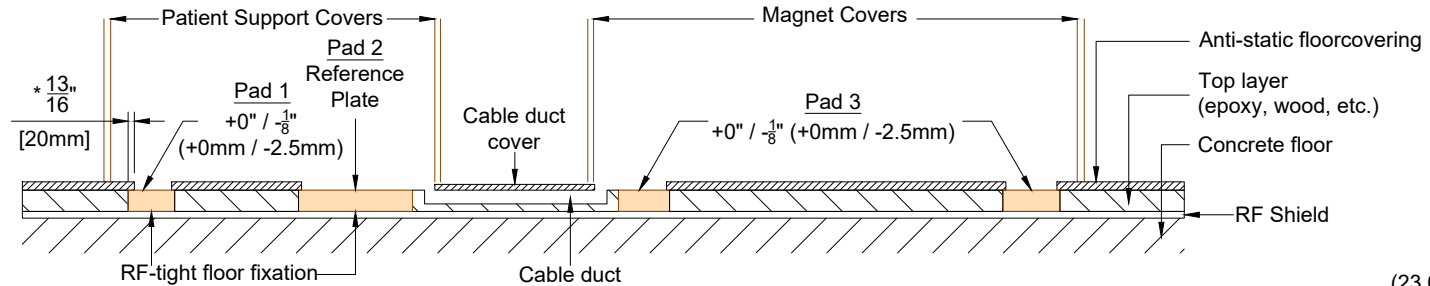


PP

(23.0)

Detail - Cross Section C-C

(Not to scale)

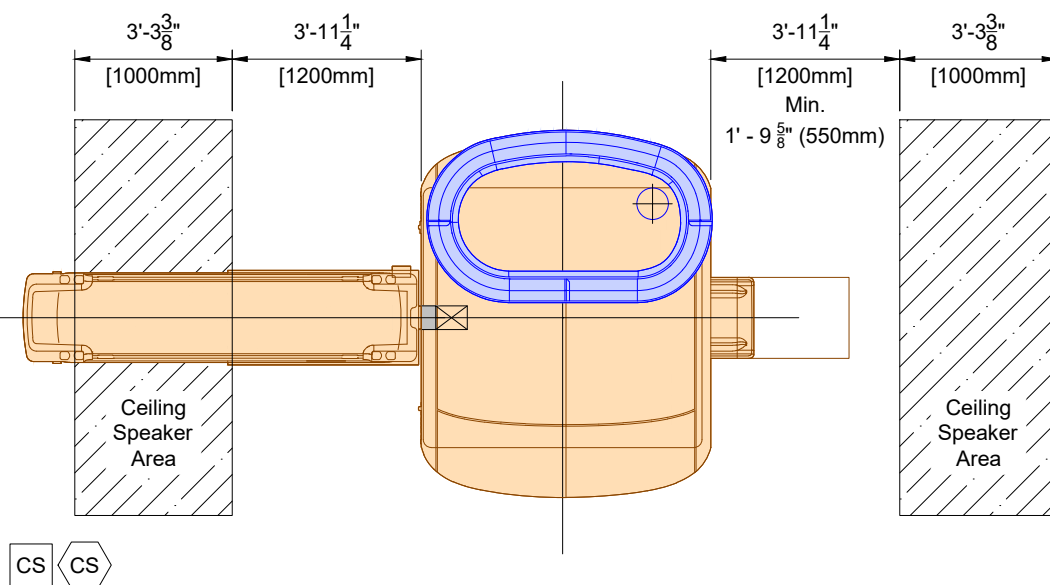


MP PP

(23.0)

Detail - Ceiling Speakers in Exam Room

(Not to scale)



CS CS

(23.0)

Notes:

- Two communication speakers are supplied by Philips. Customer/contractor to flush mount one speaker in the suspended ceiling in the rear of the magnet and on in the front of the magnet.
- Speakers must be located outside 100 Gauss line.
- The speaker must be mechanically attached to the underside of the RF-ceiling via an attachment point located above the suspended ceiling. This attachment point is to be supplied by a 3rd party, and it is strongly recommended that it be installed by the RF vendor. This attachment point must be able to hold 250N (56.2 lbf) impact in case the fixation of the loudspeaker in the suspended ceiling fails.
- An interconnecting cable kit (ceiling speaker grip_ will be supplied and installed by Philips. This extra ceiling speaker grip is required to handle possible unintended loss of fixation of the ceiling speaker and subsequent attraction by the MR magnet.

Project

Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa
Contact Number: 516-848-7433
Email: taylor.larosa@philips.com
Drawn By: Alejandra Lozano

Project Details

Drawing Number
N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

SD1

(Not to scale)

1. 60 M5 threaded holes included 60 stainless steel screws (10mm L) and washers (M5) to be provided by RF Enclosure supplier.
2. Mounting holes to be unblocked to ensure screws can fully penetrate frame. Leave a minimum 5mm clearance around mounting holes.
3. Cable feedthrough reinforcement/height adaptation dimension to be determined by RF Enclosure supplier.
4. Mounting Frame to be flush with finished wall.

5. Mounting Frame to be flush with finished wall.
 - a. *Aluminum shield + intermediate layer + copper or brass RF-frame by the RF-enclosure supplier.
 - b. *Galvanized shield + intermediate layer + copper or brass RF-frame by the RF-enclosure supplier
 - c. Copper shield + copper or brass RF-frame by the RF-enclosure supplier.
- s * For an aluminum or galvanized steel RF shielding material you need an intermediate metal to avoid galvanic corrosion between the brass/copper RF frame and the RF enclosure material.
This is the responsibility of the RF enclosure supplier.



(23.0)

(Not to scale)



Note:
Due to servicing requirements, suspended ceiling cannot be raised above 9' - 6" (2900mm). A ceiling height of 8' - 3 $\frac{1}{4}$ " (2520mm) strongly recommended.

Copper or brass frame to be provided by RF Enclosure Supplier. Frame to be flushed with finished wall and may need an intermediate layer based on the material used for RF enclosure. (See Note 5a, 5b, 5c on top left of page)

(Not to scale)

The SFB consists of the following parts:

- * No Third-Party cables allowed through the SFB.



Smartpath to MR 7700

VA Medical Center West Haven
West Haven, CT
Room: MRI

Drawn By: Alejandra Lozano

Project Manager: Taylor LaRosa
Contact Number: 516-848-7433
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Drawn By: Alejandra Lozano

Project Details

Drawing Number

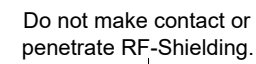
Date Drawn: 4/11/2025

Quote: Q-00361165

Order: 6600723105.010000

SD2

(Not to scale)



(18.0)

(Not to scale)

1. Threaded holes shall provide reliable electrical contact with RF Shield and RF tight fixation screws for interface plate.
2. 44x stainless steel screws and washers (M8) to be delivered by RF Enclosure supplier.
3. Mounting holes to be unblocked to ensure screws can fully penetrate frame. Leave a minimum 5mm clearance around mounting holes.
4. Wooden Mounting Frame to be provided and installed by RF Enclosure supplier.

Technical drawing of a square feedthrough aperture. The overall dimensions are 510mm by 510mm. The central aperture is 400mm by 400mm. The mounting flange is 5mm thick. The drawing shows 44 mounting points (0.5mm M8 screws and washers) arranged in a grid. The dimensions between the mounting points are 40mm. The drawing also shows the aperture is suspended from a ceiling, with a note indicating the suspension height depends on the local situation and should be at least 50mm.

(23.0)

SD3

6.30.2020

Smartpath to MR 7700

VA Medical Center West Haven
West Haven, CT
Room: MRI

Project Manager: Taylor LaRosa
Contact Number: 516-848-7433
Email: taylor.larosa@philips.com

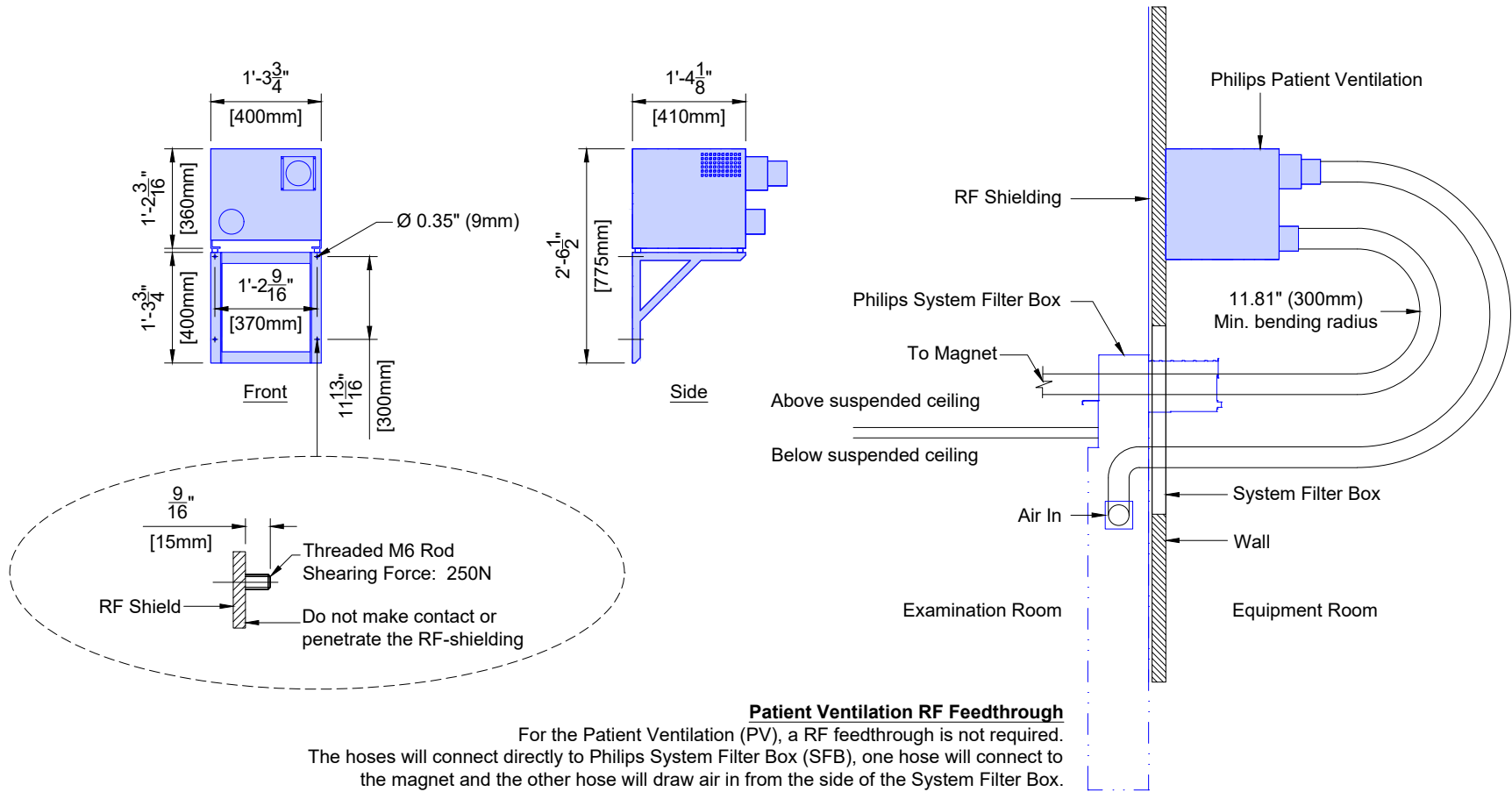
Drawn By: Alejandra Lozano

Project Details
Drawing Number **N-EAS220370 B**
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

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PVA

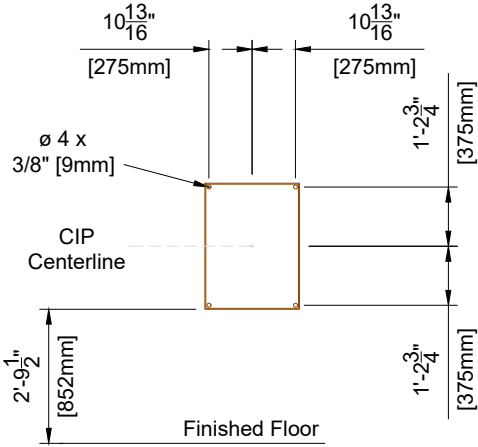
Detail - Patient Ventilation Mounting
(Not to scale)



Patient Ventilation RF Feedthrough

For the Patient Ventilation (PV), a RF feedthrough is not required. The hoses will connect directly to Philips System Filter Box (SFB), one hose will connect to the magnet and the other hose will draw air in from the side of the System Filter Box.

Detail - Haskris Chiller Interface Panel Mounting

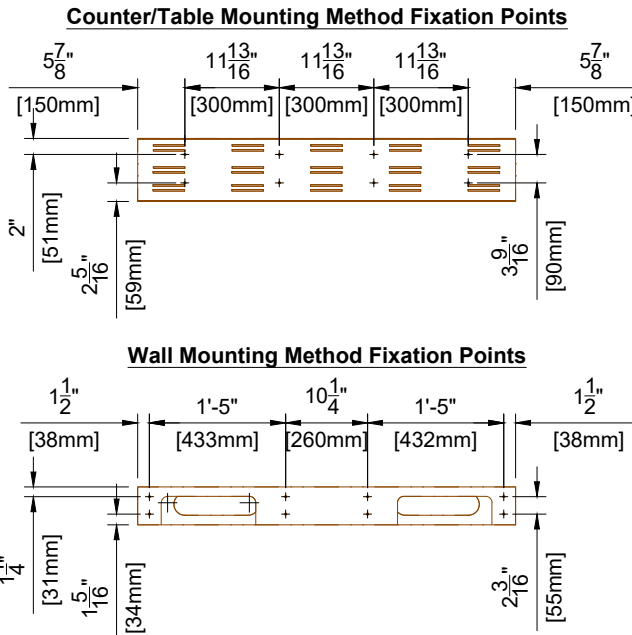


Anchor the unit securely to wall studs using hardware that can support the full weight.

CIP

(24.0)

Detail - Storage Rail Mounting



Mounting Methods

1. Mounted to wall using 8 fixation points*.
2. Mounted to underside of counter/table using 8 fixation points*.
3. Suspended from counter/table using clamps
 - a. Clamps (provided by Philips) can only be used when counter/table thickness is 1¹/₈" (28mm) or less.

* Fixation points have a 1/4" (6mm) diameter

SR

(23.0)

Project

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Order: 6600723105.010000

Quote: Q-00361165

Date Drawn: 4/11/2025

Drawing Number

N-EAS220370 B

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

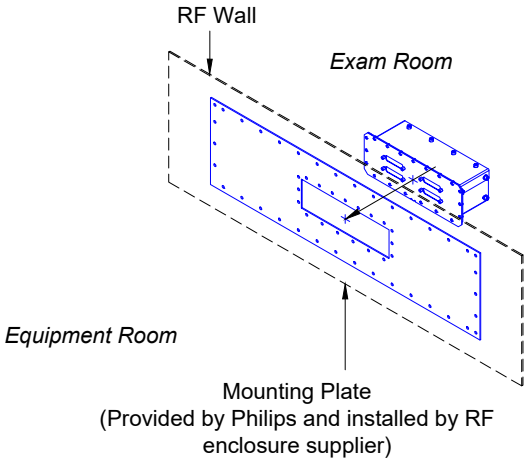
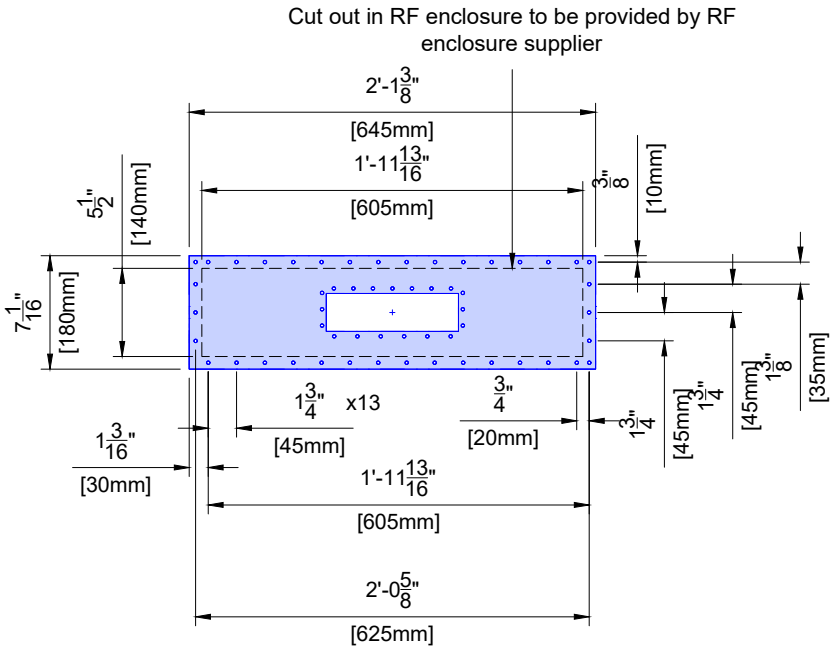
SD4

6.30.2020

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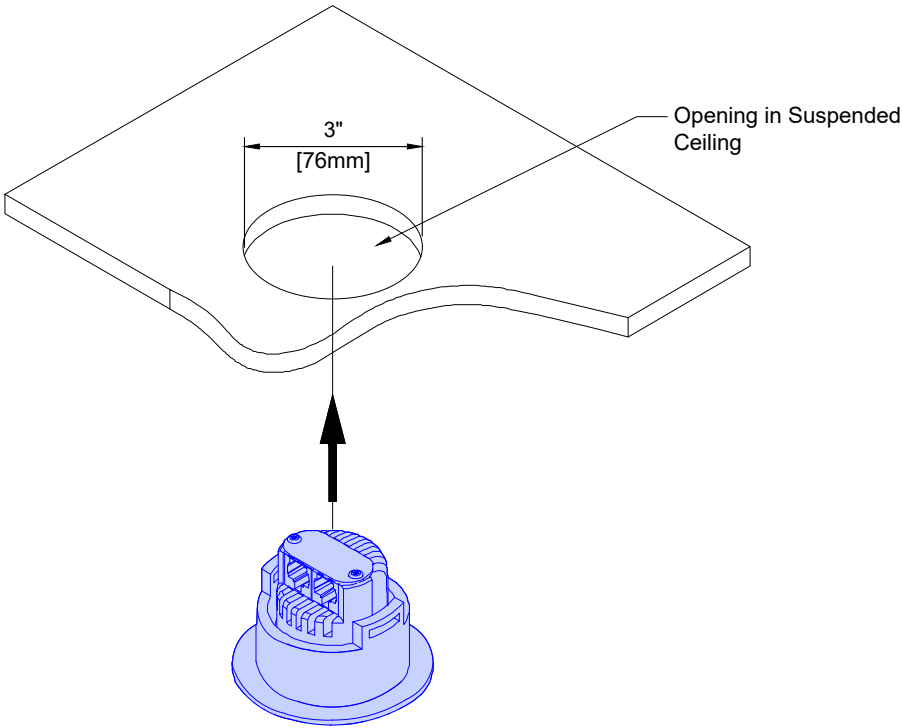
AEF

Detail - Ambient Experience System Filter Box Mounting Plate
(Not to scale)



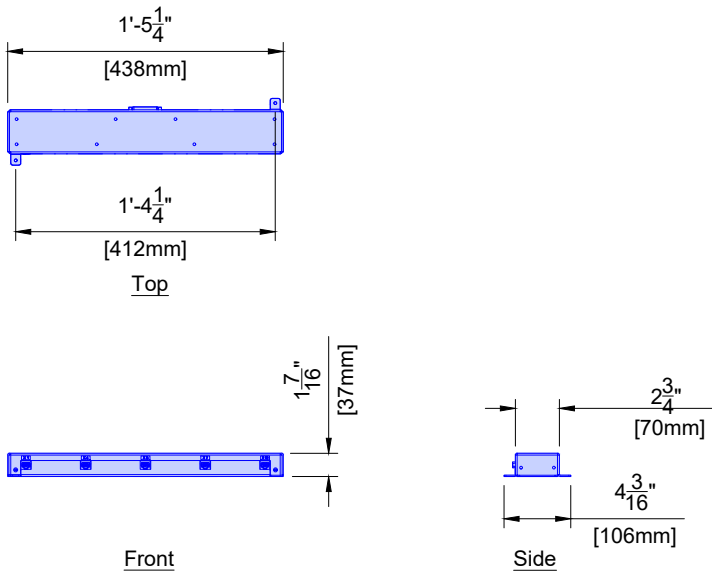
(15.0)

Detail - Ambient Experience LED Opening in the Ceiling
(Not to scale)



DB

Detail - Distribution Box
(Not to scale)



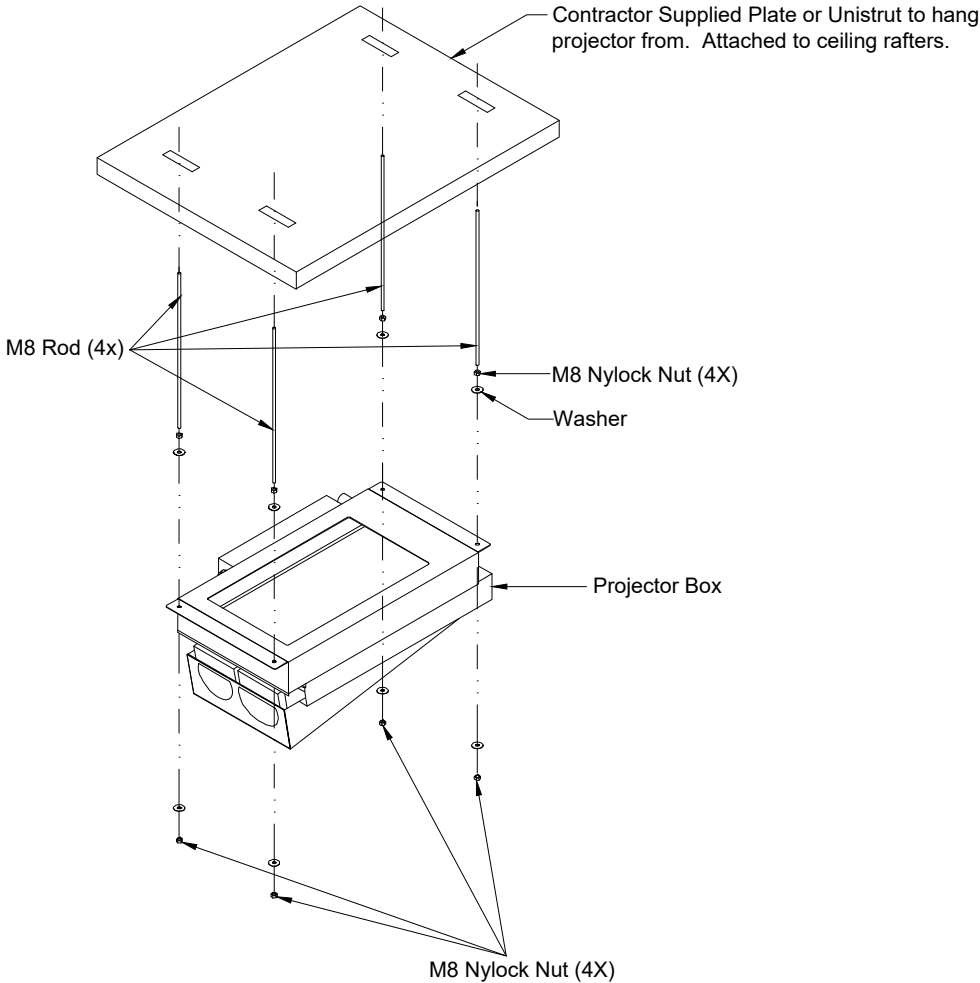
(15.0)

Project	Philips Contacts	Project Details
Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI	Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000

SD5

Detail - Projector Fixation Points and Ceiling Mount

(Not to scale)



The projector box is delivered with M8 threaded rods, nuts, and washers for suspension from the ceiling mount.

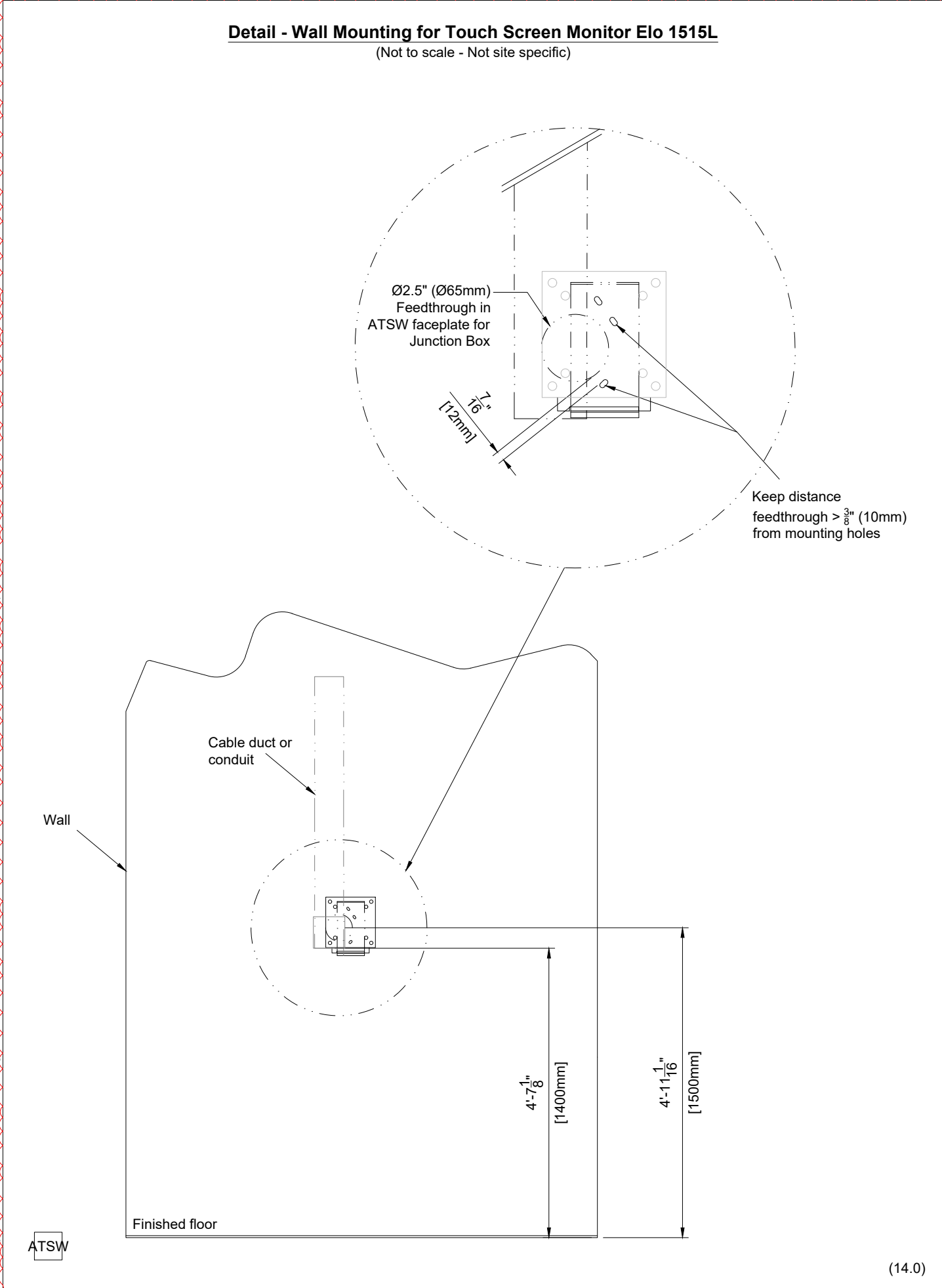
Rafters to hang projector box on unistrut to be provided by RF Shielding Supplier.

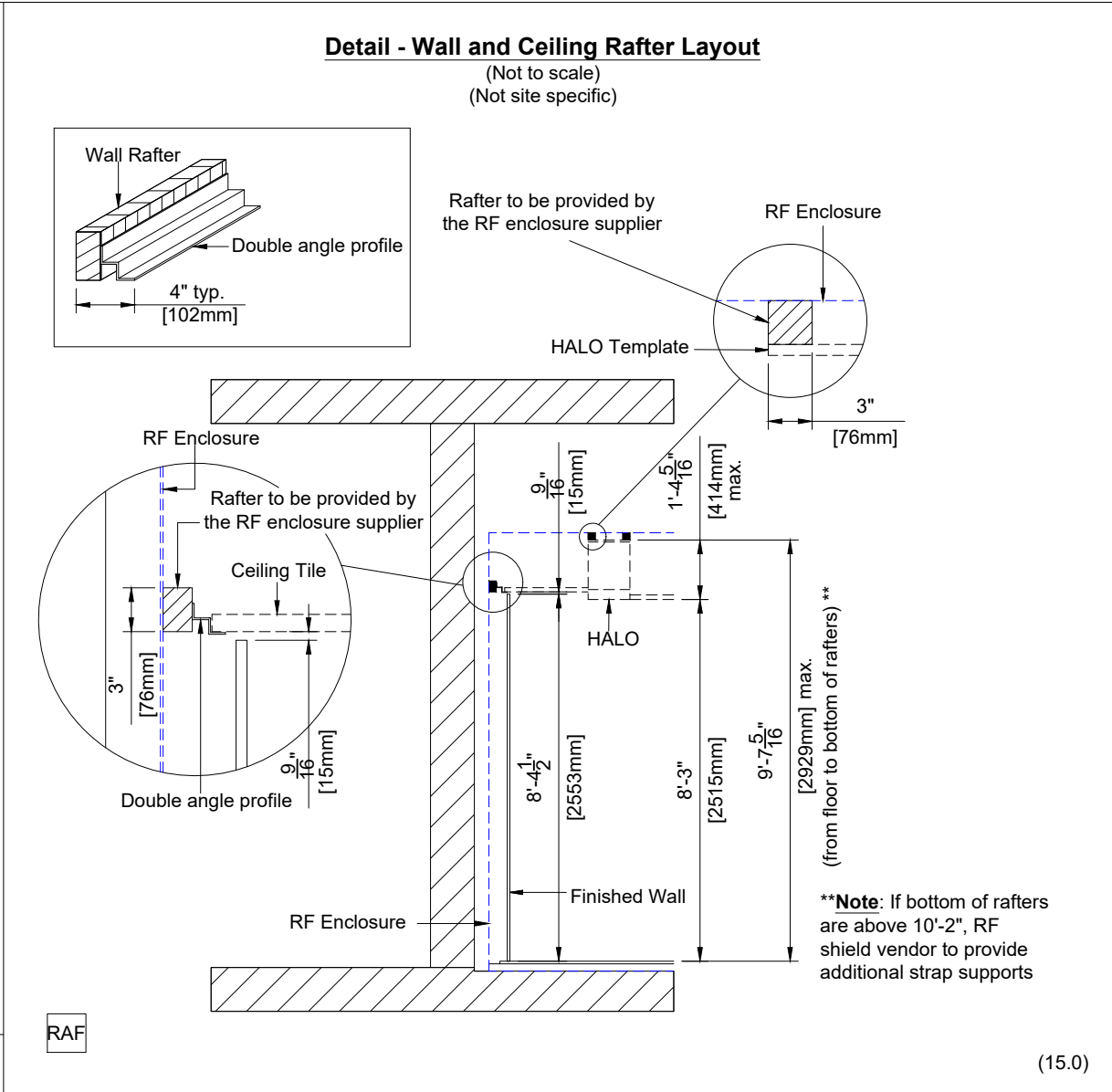
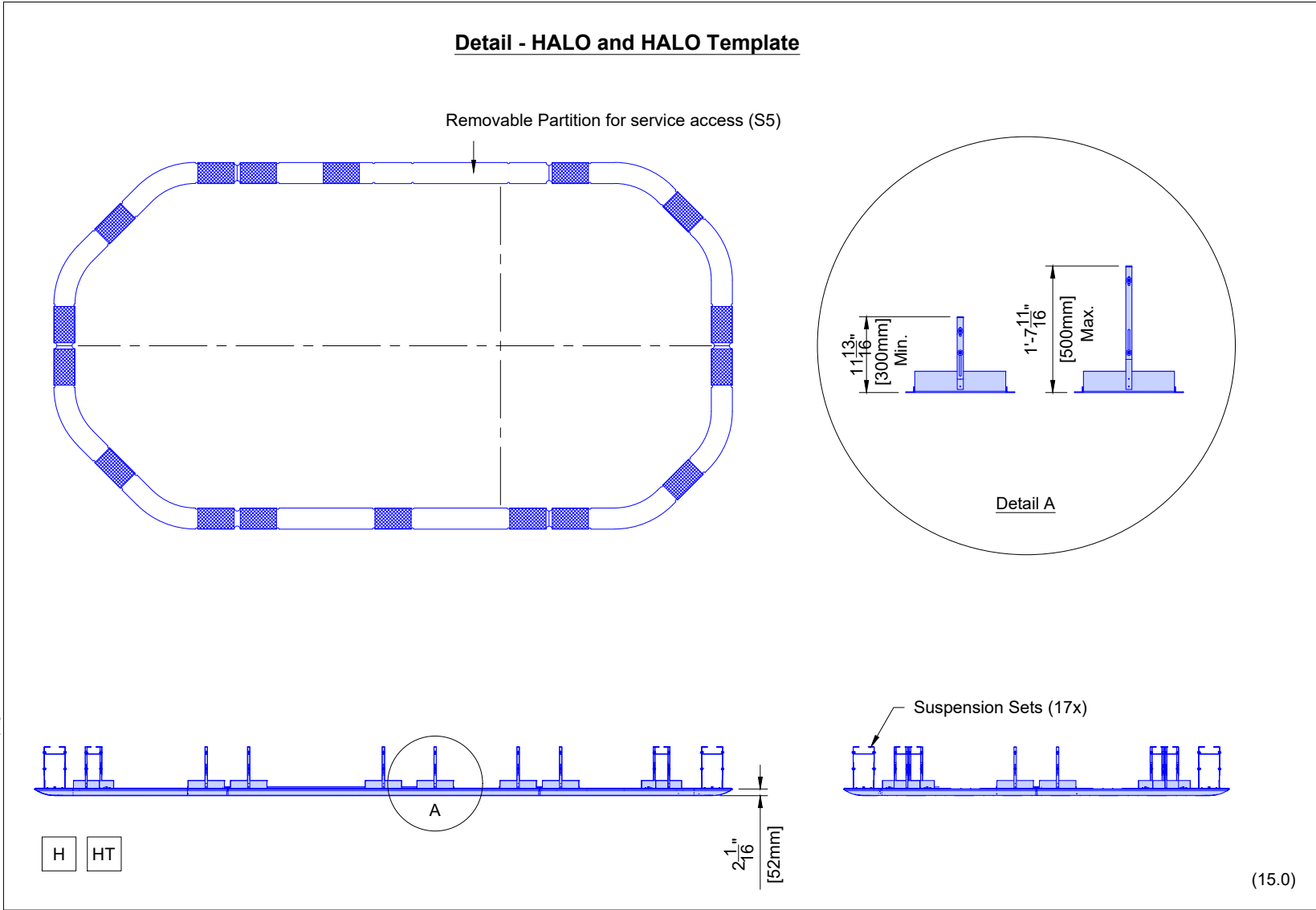
Installing the Projector-Box

1. Cut the (4x) M8 threaded rods to the necessary length according to the ceiling height.
2. Attach the threaded rods to the projector ceiling mount using suitable mounting hardware.
Caution (Two people are required to lift the projector box.)
3. Install the projector box on the M8 threaded rods with nuts and washers above and below.
4. Adjust the height of the projector box until the rear of the box is 1cm higher than the front. This will allow the installation of the cover tile.
5. The overall height of the salient angle of the box must be 1 cm higher than the height of the neighboring ceiling tiles.
- 6.Do not fully tighten the nuts. A re-adjustment will be required after the cover tile is installed.



SD6	Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Project Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI
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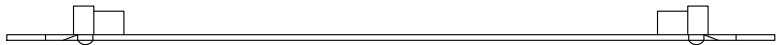
SD8	Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Project Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI	
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ERD

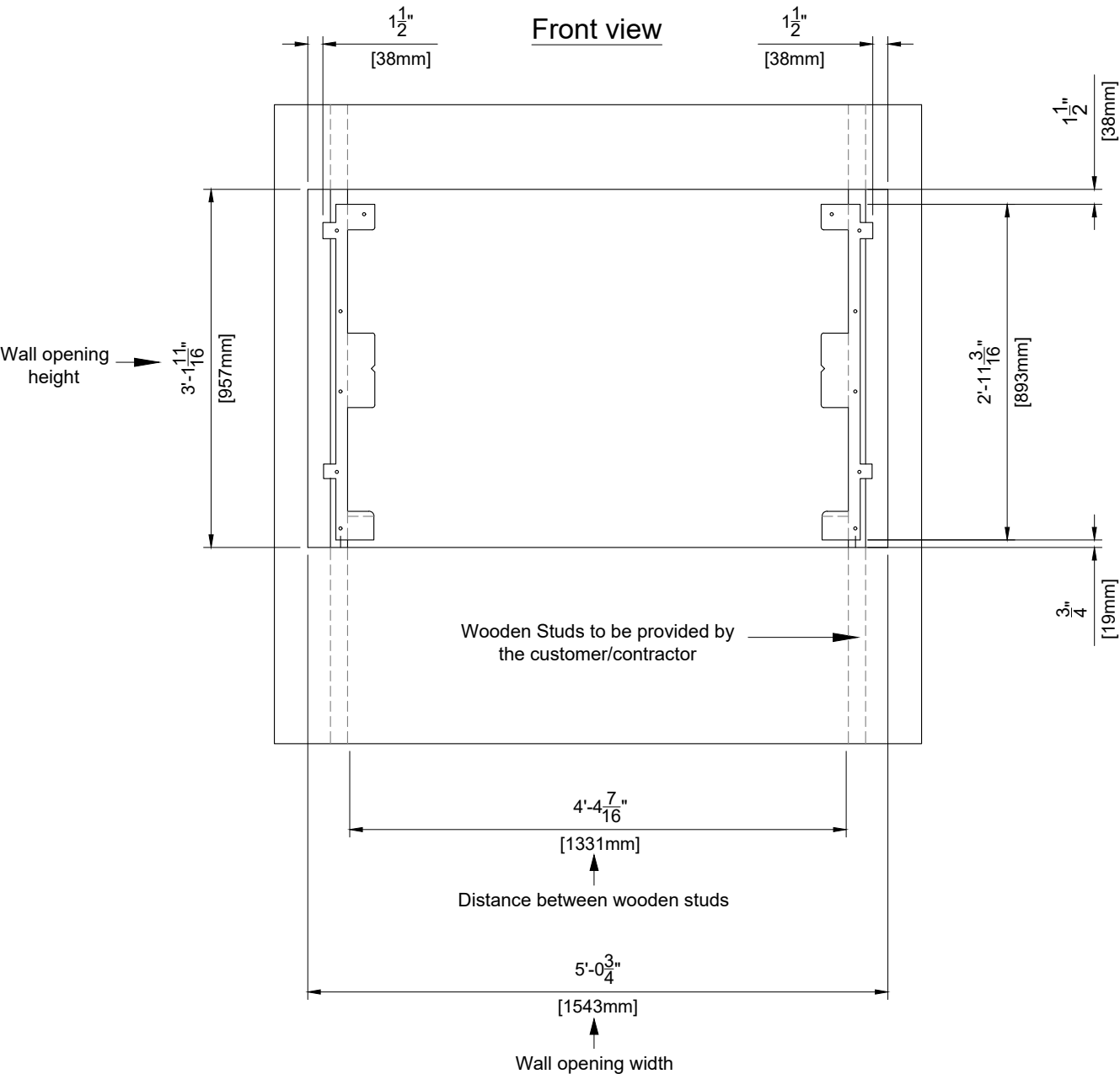
Detail - Installation of Exam Room Display in Wall

(Not to scale)

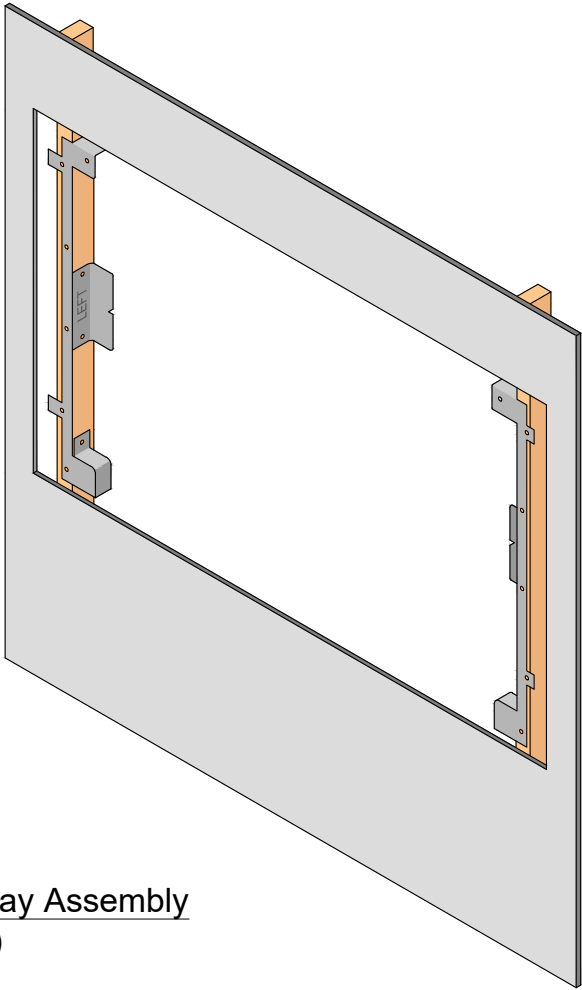
Top view



Front view

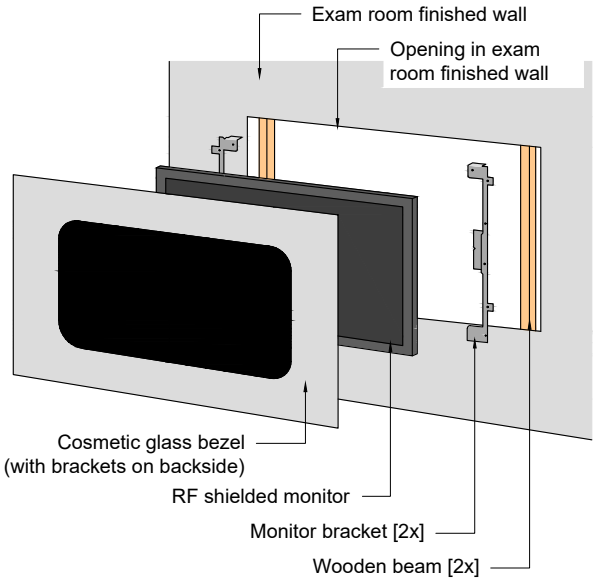


Bracket Behind Finished Wall



Detail - Exam Room Display Assembly

(Not to scale)



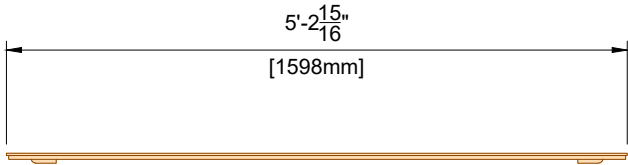
Project Details		Philips Contacts	Project
Drawing Number	N-EAS220370 B	Project Manager: Taylor LaRosa	Smartpath to MR 7700
Date Drawn:	4/11/2025	Contact Number: 516-848-7433	VA Medical Center West Haven
Quote:	Q-00361165	Email: taylor.larosa@philips.com	West Haven, CT
Order:	6600723105.010000	Drawn By: Alejandra Lozano	Room: MRI

SD9

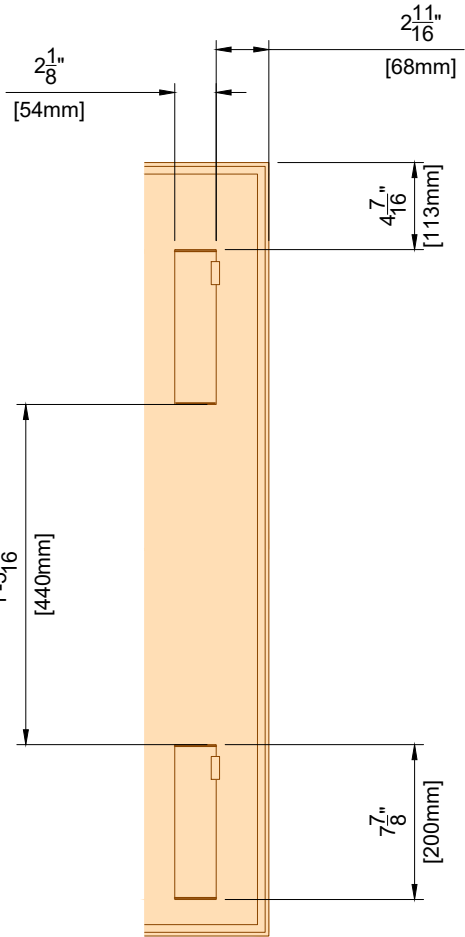
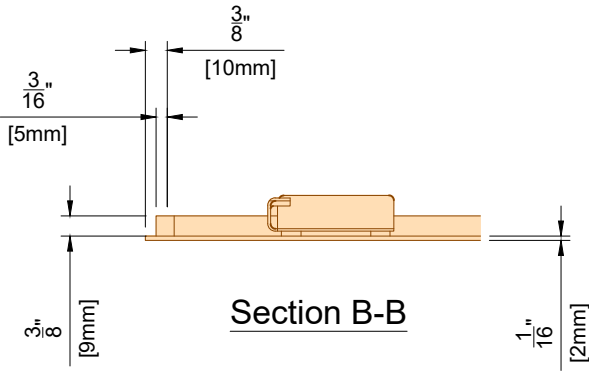
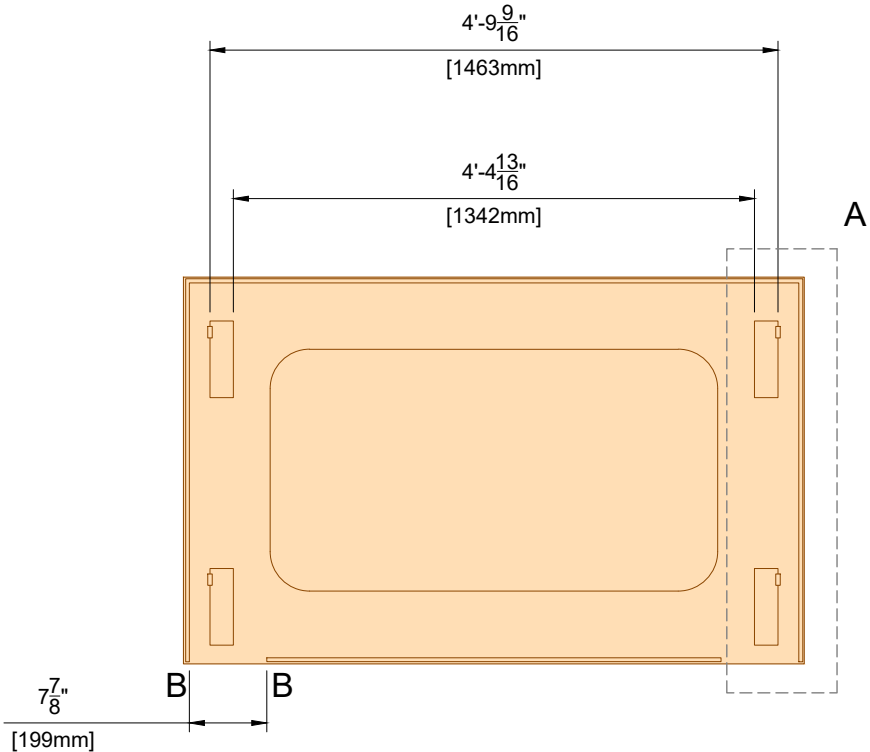
ERD

Detail - Exam Room Display Glass Bezel
(Not to scale)

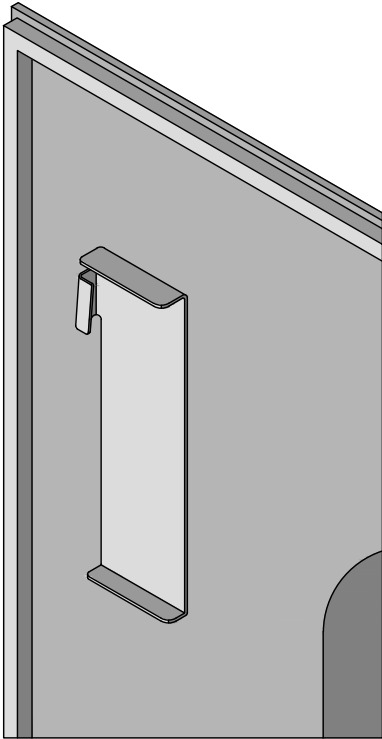
Top view



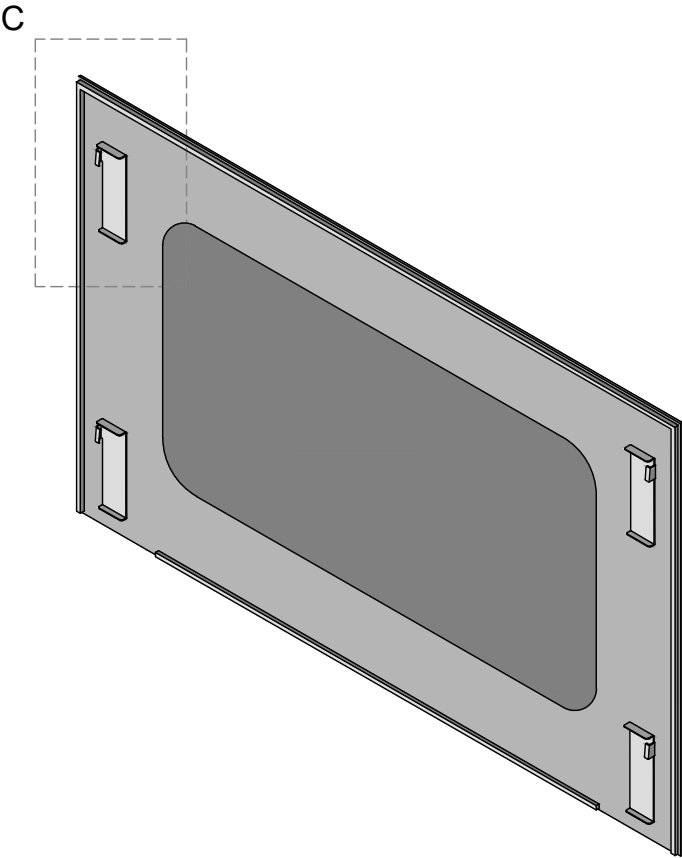
Front view



Detail A



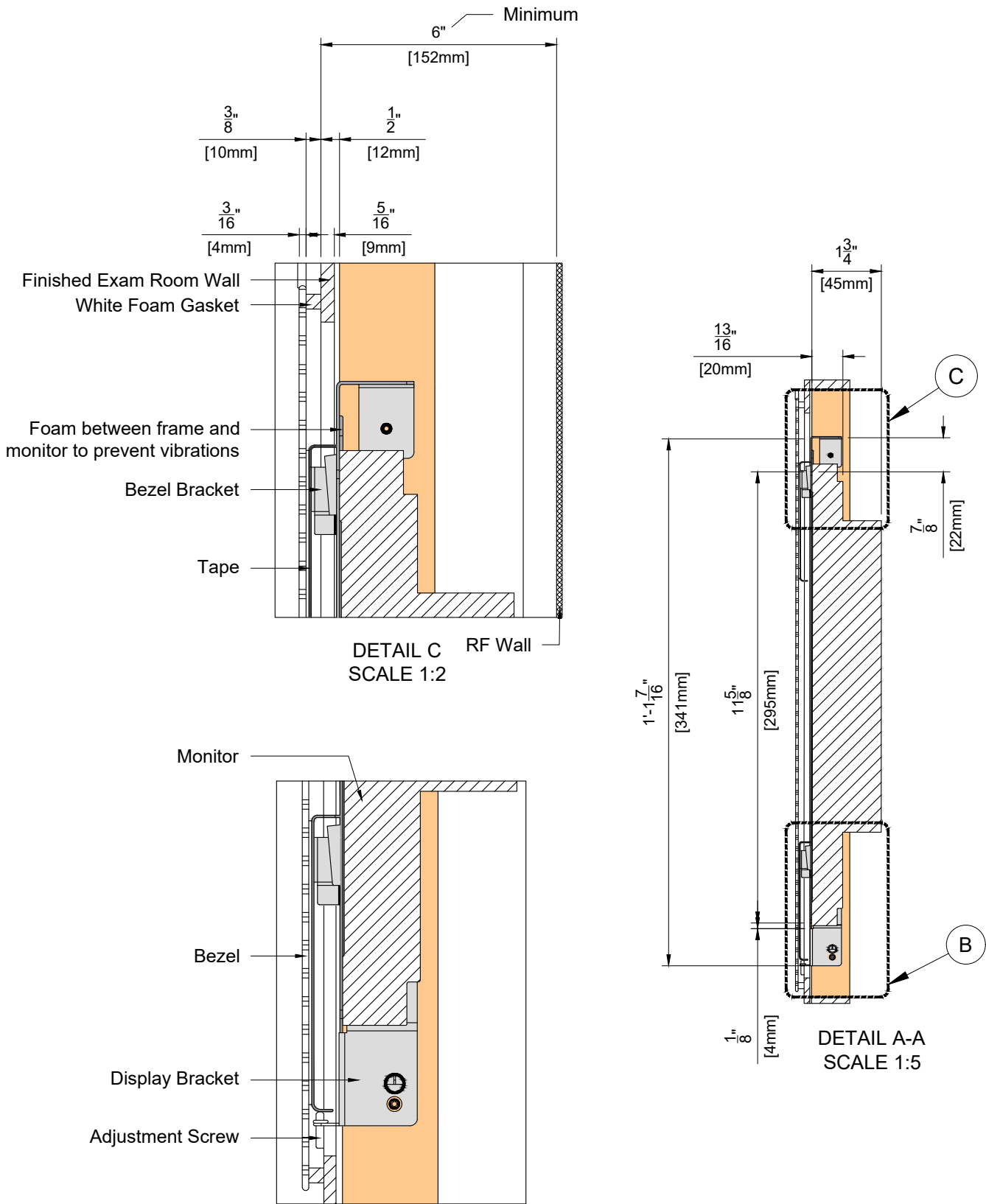
Detail C



Project Details		Philips Contacts		Project
Drawing Number	N-EAS220370 B	Project Manager:	Taylor LaRosa	Smartpath to MR 7700
Date Drawn:	4/11/2025	Contact Number:	516-848-7433	VA Medical Center West Haven
Quote:	Q-00361165	Email:	taylor.larosa@philips.com	West Haven, CT
Order:	6600723105.010000	Drawn By:	Alejandra Lozano	Room: MRI

SD10

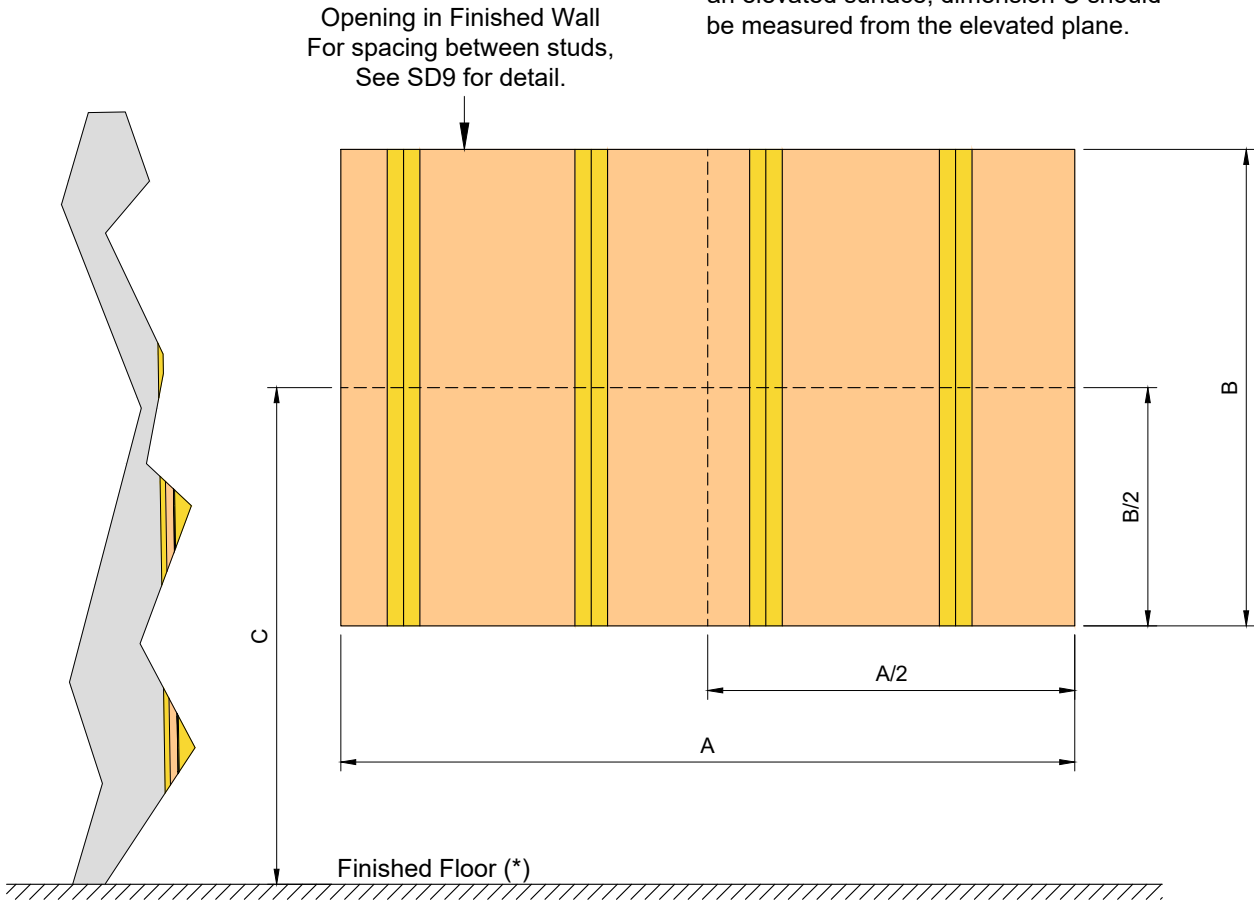
Detail - Exam Room Display Wall Distances
(Not to scale)



Detail - Opening for Monitor Support Frame
in Finished Wall
(Not to scale)

Dimensions
A = 5' - 0 3/4"
B = 3' - 1 11/16"
C = 3' - 3 3/8"
= 2' - 10 5/8" (for Prodiva)
Depth = 6" Minimum

Note:
Always measure the real distance of the Exam Room Display center to the floor to be sure that above mentioned dimensions are correct.
(*): Finished floor is the plane on which magnet is installed. When magnet is on an elevated surface, dimension C should be measured from the elevated plane.



Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Project Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI
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General Electrical Information 1. General The customer shall be solely responsible, at thier expense, for preparation of the site, including any required electrical alterations. The site preparation shall be in accordance with this plan and specifications, the architectural/construction drawings and in compliance with all safety and electrical codes, the customer shall be solely responsible for obtaining all electrical permits from jurisdictional authority. 2. Materials and Labor The customer shall be solely responsible, at its expense, to provide and install all electrical ducts, boxes, conduit, cables, wires, fittings, bushings, etc., as separately specified herein. 3. Electrical Ducts and Boxes Outside the RF Enclosure Electrical ducts and boxes shall be accessible and have removable covers. Floor ducts and boxes shall have watertight covers. Ducts shall be divided into as many as three separate channels by metal dividers, separately specified herein, to separate wiring and/or cables into groups as follows: Group a: power wiring and/or cables. Group b: signal and/or data and protective ground wiring and/or cables. The use of 90° ells is not acceptable. On ceiling duct and wall duct use 45° bends at all corners. All intersecting points in duct to have cross over tunnels supplied and installed by contractor to maintain separation of cables. 4. Conduit Outside RF Enclosure Conduit point-to-point runs shall be as direct as possible. Empty conduit runs used for cables may require pull boxes located along the run. Consult with Philips. A pull wire or cord shall be installed in each conduit run. All conduits which enter duct prior to their termination point must maintain separation from other cables via use of dividers, cross over tunnels, or flex conduit supplied and installed by contractor from entrance into duct to exit from duct. Maximum conduit lengths shown on these plans are calculated from electrical box entrance to electrical box entrance. Any conduit installed below grade must be water tight. 5. Conduits Inside RF Enclosure Conduits point-to-point runs shall be as direct as possible. Conduits to be made of non-ferromagnetic material and to be installed securely. If aluminum flex conduit is used, it needs to be secured so that it is not touching any other metal in the room. Common items that loose flex might rub against are ceiling grids and hangers, HVAC ducts, Ladder Tray, and cryogen gas lines. Metal-on-metal situations can cause artifacts that make patient images un-diagnostic. 6. Conductors / Earth Conductor All conductors, separately specified, shall be 75° C stranded copper, rung out and marked. Do not use metal conduit or raceway as a ground conductor. The earth conductor for the MRI system must be dedicated and totally separate from the conduit, raceway, or structural ground. This is required to maintain the MR system "Quiet Ground" as permitted by NFPA 99. The earth conductor to be the same size as incoming phase conductor wires. 7. Disconnecting Means A disconnecting means shall be provided as separately specified. 8. Grounding Grounding must conform with current requirements for electrically susceptible patient areas. See Article 517, National Electrical code. 9. Lighting and Wall Sockets Inside the RF Enclosure Incandescent AC lamps with reinforced filaments or quartz (halogen) lamps are acceptable. The use of linear fluorescent lamps, compact fluorescent lamps (CFL), energy saving lamps, electronic light dimmers and low voltage track lighting are strictly prohibited to avoid RF interference. - LED light fixtures are acceptable inside the RF enclosure, only if, they are non-ferrous low voltage DC LED light fixtures with their electronics (driver, power supply, power source, convertor) outside the RF enclosure. It is the LED supplier's responsibility to ensure their LED solution will not cause any interference for the magnet. If for whatever reason the LEDs negatively influence the magnet, the LED lighting supplier must be responsible for removing or correcting the issue. The magnetic field may shorten the lifetime of the light bulb. For patient comfort, avoid direct light above the patient support and the rear of the magnet. A spotlight with a separate switch to assist the doctor during intervention procedures is recommended. Two lighting levels (separate control) are required around the magnet: a. 200 lux for patient examination b. 500 lux for servicing Wall outlets should be located inside the RF enclosure for use of MRI compatible third party equipment. A duplex outlet (20 Amp) and a light with switch for servicing purposes must be provided above the suspended ceiling in the RF enclosure in the vicinity of the magnet turret. The location of the light switch must be reachable by the engineer when he/she opens the removable part of the suspended ceiling. (18.0)	RF Enclosure Electrical Notes 1. Mains Safety Switches - Mains safety switches may be installed inside the RF enclosure. Installation must follow all local regulations. There are no RF filters in the System Filter Box provided for this purpose. 2. Door Open / Closed Switch - Each door into the exam room must be provided with a switch that signals the open/closed status of the door to the system. The switch(es) must be mounted (mechanically or electrically) outside the RF enclosure and have a contact that closes when the door is closed. Switches must be wired in series with screened cable, and the wire must be rated at a minimum of 30 V DC, 100 mAmps. Use Grainger item 4B811, Telemecanique model XCKJ10541 or equivalent. 3. Protective Earth - The RF enclosure requires one central protective earth (PE) bus-bar/terminal. This PE point must be connected to the Hospital Earth Ground supplied near the Hospital Mains by a conductor at least #1 AWG. Refer to sheet ED1 for details. The central PE bus-bar/terminal must be located as close as possible to the earth point inside the System Filter Box (< 39.4" [< 1000mm]) and there cannot be any seams in the shielding between the two points. The MR system parts connect to the earth point inside the System Filter Box while all other items, (facilities heating and water supply, receptacles, etc.) must be connected to the central PE bus-bar/terminal. The following requirements apply: a. The impedance between any conductive part and the central PE bus-bar/terminal cannot exceed 100 mOhms. b. All PE conductors used must be at least #8AWG. An earth leakage switch is not required. c. For optimum shielding performance, "loops" inside the RF enclosure must be minimized. d. A galvanic isolation layer between the RF enclosure and the building is recommended. Local regulations or the the RF vendor may require the enclosure be isolated from the building. e. Isolated in this context means DC impedance greater than 3 kOhms. 4. Auxiliary Electrical Filters - Any electrical interconnection, that are not part of the MR system entering the RF enclosure requires an electrical filter. These filters may give rise to earth leakage currents in the RF enclosure, which could present a safety hazard. For complete safety, the total of all the earth leakage currents generated by all auxiliary electrical filters must not exceed 5 mAmps. If necessary, use an isolation transformer with the filters to minimize the effects of current leakage. Electrical filters are to be placed near the System Filter Box and they should be easily accessible. Beware of metal-on-metal connections that can occur near electrical filters which can cause imaging issues for the system. All 3rd party items (injectors, intercoms, humidity sensors, fire suppression flashers/buzzers, Invivo Esys, etc.) must have their own RF filters or feedthroughs. The filters and feedthrough of the PHILIPS System Filter Box cannot be used for these 3rd party items. RF Enclosure provider to verify that they have installed enough RF Filters for all the 3rd party items (14.0)	Electrical Power Distribution Requirement Notes Electrical power distribution at the facility shall comply with: - Utilization voltages per ANSI C84.1 - 1982 range A. - ANSI / NFPA 70 - National Electrical Code Article 250 - Grounding Article 517 - Healthcare facilities - ANSI / NFPA 99 - Healthccare facilities - NEMA standard XR9 - Power supply guideline for x-ray machines Phase conductors to be sized for instantaneous voltage drop per NEC 517 - 73 and Philips recommendations. On sites without a PDU (typical case for 480V branch supply), the ground conductor for the power feeder shall be the same size as the phase conductor wires. The separate ground wire connections from building steel to the ground busbar shall be sized per NEC at a minimum of #1 AWG. (20.0)	Power Quality Guidelines 1. Power supplied to medical imaging equipment must be separate from power feeds to air conditioning, elevators, outdoor lighting, and other frequently switched or motorized loads. Such loads can cause waveform distortion and voltage fluctuations that can affect MR image quality. 2. Equipment that utilizes the facility power system to transmit control signals (especially clock systems) may interfere with medical imaging equipment, thus requiring special filtering. 3. Static UPS systems, Series filters, Power conditioners, and Voltage regulators provide a high impedance, nonlinear voltage source, which may affect image quality. Do not install such devices at the mains supply to medical imaging equipment without consulting Philips installation or service personnel. 4. Line impedance is the combined resistance and inductance of the electrical system and includes the impedance of the power source, the facility distribution system, and all phase conductors between the source and the imaging equipment. Philips publishes recommended conductor sizes based on equipment power requirements, acceptable voltage drops, and assumptions about the facility source impedance. The minimum conductor size is based on the total line impedance and NEC requirements. Unless impedance calculations are performed by an electrical engineer, the recommended values must be used. (14.0)	Hospital Mains Switch According to IEC, the hospital mains switch: • shall switch all 3 phases simultaneously. • shall be capable of being locked in the OFF position. • shall comply with creepage distance and air clearance as specified in IEC 61058 -1 for Mains Transient Voltage of 4 kV. • shall have an actuator that comply with IEC 60447. (14.0)	Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000 Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano Project Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI EN
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Electrical Legend		
A Furnished and installed by Philips B Furnished by customer/contractor and installed by customer/contractor C Installed by customer/contractor D Furnished by Philips and installed by contractor E Existing F Future G Optional		
Item Number	Description	Detail Sheet
Duplexes		
E WS	Wall Socket (duplex, single phase) above finished ceiling. See Sheet EN for details.	EN
E S	120V/20A dedicated duplex outlet for service in the equipment room and control room. Additional outlets may be desired by customer or required by code. (Not shown on plan)	
B EA	120V/20A dedicated duplex outlet for "EA".	
B RC	120V/20A dedicated duplex outlet for Radiology Operations Command Center. Qty = 1	
B H	120V/20A dedicated duplex outlet for Haskris CIP in the equipment room.	
B RSP	120V/20A dedicated duplex outlet for RSP (Remote Status Panel). To be located within 5' (1525mm) from RSP.	
B RAD	120V/20A dedicated duplex outlet for RAD (Resoundant Active Driver). To be located within 20' (6100mm) of RAD.	
B ERD	120V/20A filtered duplex outlet for power supply unit and the projector in the exam room above suspended ceiling. Located within 5' (1500mm) of power supply unit, near ERD, and within the RF and 8' (2440mm) from Isocenter.	
B AW	120V/20A dedicated duplex outlet for ATSW. Outlet to be located inside ATSW wall box. Outlet to be facing toward the center of the box to allow faceplate to be added.	
B AT	120V/20A dedicated quad outlet for ATS, USB Extenders, and DVD.	
B AE	120V/20A dedicated duplex outlet for Ambient Experience Cabinet and external audio source.	
Network Connectors		
E N1	RJ45 type ethernet 10/100/1000 Mbit network connector. Access to customer's network via their remote access server is needed for Philips Remote Service (PRS) connectivity.	N1
E N2	RJ45 type ethernet 10/100/1000 Mbit network connector with access to customer's network. Locate within 10' of network. Network fiber optic and ethernet cabling, connectors, wall boxes, patch panels, etc. are the responsibility of the purchaser. Philips assumes no responsibility for procurement, installation, or maintenance of these components.	N1
E e	RJ45 type ethernet 10/100/1000 Mbit network connector with internet access for Philips Field Service Engineer connectivity to on-line system documentation.	
B N3	RJ45 type ethernet 10/100/1000 Mbit network connector with access to customer's network. Locate within 9' - 10" of "EA". Network fiber optic and ethernet cabling, connectors, wall boxes, patch panels, etc. are the responsibility of the purchaser. Philips assumes no responsibility for procurement, installation, or maintenance of these components.	N1
B RC	RJ45 type ethernet 100/1000 Mbit network connector. For Radiology Operations Command Center. Qty = 1	N1
B N4	RJ45 type ethernet 10/100/1000 Mbit network connector. Access to customer's network via their remote access server is needed for Remote Status Monitoring Panel.	

Electrical Legend		
A Furnished and installed by Philips B Furnished by customer/contractor and installed by customer/contractor C Installed by customer/contractor D Furnished by Philips and installed by contractor E Existing F Future G Optional		
Item Number	Description	Detail Sheet
Floor		
E FR1	Flush mounted floor duct. Refer to Sheet SD1 for details.	SD1
Ceiling		
B CR1	4" (100mm) H x 24" (600mm) W non-ferro magnetic cable ladder tray mounted above suspended ceiling from "SFB" to behind magnet. "CR1" must be between 13' (4m) and 30' (9m) in length and divided into 3 compartments: 8" (200mm) W, 10" (250mm) W, and 6" (150mm) W. Cable tray must be non-ferro magnetic material, such as aluminum or glass-reinforced plastic (GRP). GRP material is recommended and wooden trays are not allowed. Must be a minimum of 2" (50mm) above the top of suspended ceiling.	
E CR2	Upper Tray - 4" (100mm) H x 18" (460mm) W cable ladder tray mounted 4" (100mm) above "CR3", from "SFB" to above equipment cabinets. "CR2" must be at least 10' (3m) in length and divided into 2 compartments. Maximum cable weight will be 34 lbs/linear foot.	ED2
E CR3	Lower Tray - 4" (100mm) H x 18" (460mm) W cable ladder tray mounted 7' - 6" (2285mm) a.f.f. to bottom of tray, from "SFB" to above equipment cabinets. "CR3" must be at least 10' (3m) in length.	ED2
E JB	10" (250mm) W x 10" (250mm) H x 6" (150mm) D wall box with removable screw-type coverplate. Surface mounted above "CR2".	
D CS	Flush mounted ceiling speakers. (Not shown on plan)	SD1
G CRA	Recommend 1" flexible ENT "smurf tube" from AEW to the ERD. Located above the suspended ceiling	
E ISL	Incandescent Service Light (AC, 500 lux) above finished ceiling.	EN
E LS	Electrical switch for service light (ISL) above finished ceiling.	
E CZ	Patient comfort zone. No direct lighting in this area.	
B CR4	Upper Tray - 4" (100mm) H x 18" (460mm) W cable ladder tray mounted 4" (100mm) above "CRX3", from "SFB" to above equipment cabinets. "CRX2" must be at least 10' (3m) in length and divided into 2 compartments. Maximum cable weight will be 34 lbs/linear foot.	ED2
B CR5	Lower Tray - 4" (100mm) H x 18" (460mm) W cable ladder tray mounted 7' - 6" (2285mm) a.f.f. to bottom of tray, from "SFB" to above equipment cabinets. "CRX3" must be at least 10' (3m) in length.	ED2
See E1 - E2 sheets for conduit and raceway requirements.		

Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Project Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI
		EL1

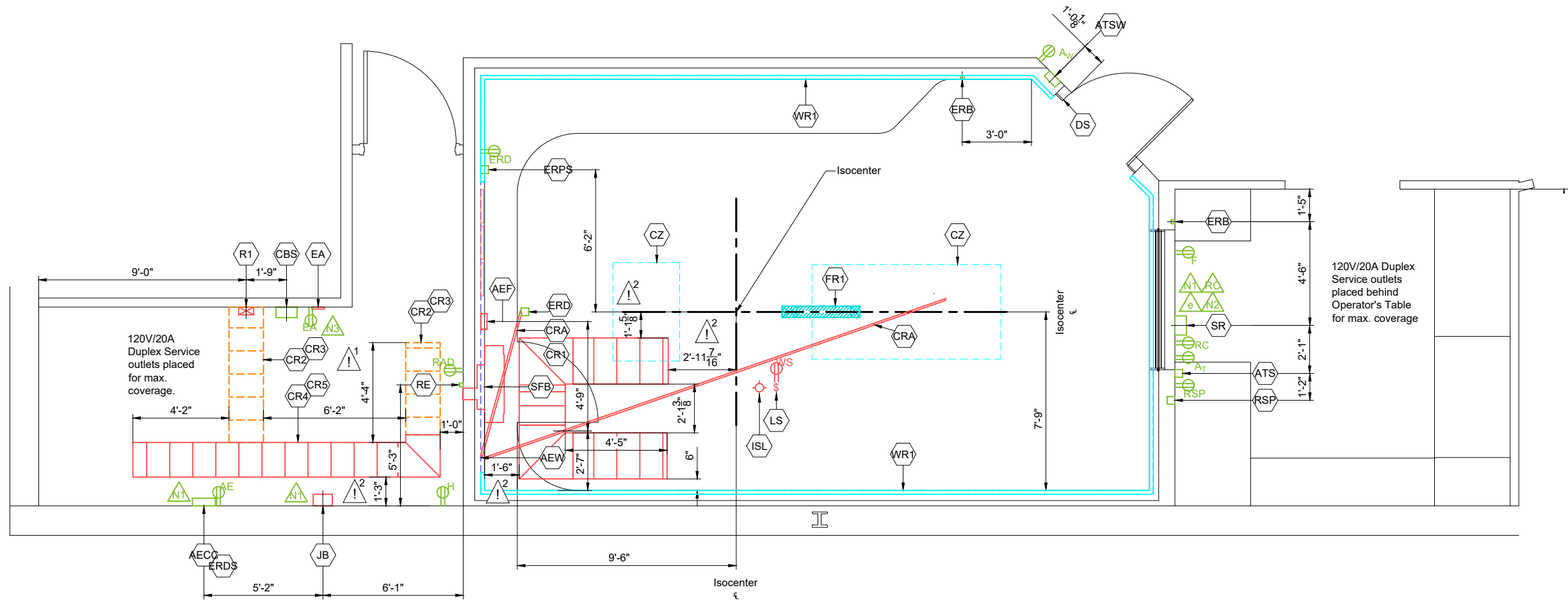


Electrical Legend			
A Furnished and installed by Philips B Furnished by customer/contractor and installed by customer/contractor C Installed by customer/contractor D Furnished by Philips and installed by contractor E Existing F Future G Optional			
Item Number	Description		Detail Sheet
D UPS	125 kVA Staco UPS Cabinet		ED1
D BC	Staco UPS Battery Cabinet		ED1
B CBU	480 V, 3 phase, 200 Amp circuit breaker for UPS system		ED1
B RSP	4" (102mm) W x 4" (102mm) L x 4" (102mm) D surface mounted wall box. Removable cover plate shall contain a grommated notch for cable access as required. Exact location to be determined by Philips Service.		
B PDP	Power Distribution Panel. Contains two output circuit breakers for MR system and chiller.		ED1
B RE	2" (50mm) W x 2" (50mm) D cable ladder tray mounted from "CR3" to "RAD".		
B AECC	12" (300mm) W x 12" (300mm) H x 4" (100mm) D wall box with removable screw-type cover plate, flush mounted. Location as shown or near AE Control Cabinet.		
E AEF	Ambient Experience System Filter Box		
E WR1	4" (100mm) H x 2" (50mm) D non-ferro magnetic wall raceway mounted above suspended ceiling and along perimeter of exam room for LED chains connecting to distribution box, "DB". J Hooks can be used instead of raceway, if local code allows.		ED2
B AVI	1-Gang box for customer's external audio source. Located per customer requirement, suggested placement shown.		
B ATSW	8" (200mm) W x 8" (200mm) H x 4" (100mm) D wall box flush mounted to wall located 57" (1450mm) A.F.F. with grommet opening in face plate 2" (50mm) off center 1" (25mm) from center. Duplex main outlet located inside the wall box.		
B ATS	4" (100mm) W x 4" (100mm) H x 4" (100mm) D wall box with removable screw-type cover plate, surface mounted 12" (300mm) A.F.F. to bottom of box. Location shown is recommended and may be changed - verify relocation with local Philips Service.		
B ERDS	Electrical switch to power off Exam Room Display Monitor. Location shown with placement near the AECC is recommended.		
B ERPS	Exam Room Power Supply 4" (100mm) W x 4" (100mm) D wall box located above suspended ceiling within 16' - 4" (5m) of the ERD.		
B ERD	Exam Room Display Monitor. 4" (100mm) W x 4" (100mm) D wall box located above the monitor and inside the RF cage.		
E AEW	Projector and ERD RF feedthrough. Final location to be determined by RF enclosure supplier, but general location shown.		

Electrical Legend			
A Furnished and installed by Philips B Furnished by customer/contractor and installed by customer/contractor C Installed by customer/contractor D Furnished by Philips and installed by contractor E Existing F Future G Optional			
Item Number		Detail Sheet	
Description			
Wall			
E	CBS	480V, 3 phase, 150 Amp circuit breaker. See Sheet ED1 for details.	ED1
B	CBC	480V, 3 phase, 70 Amp circuit breaker for Haskris OPC24 Chiller. Run power from breaker to chiller, refer to Sheet ED1. Exact location to be determined. (Not shown on plan)	ED1
B	RR	8" (200mm) W x 4" (100mm) H cable ladder tray mounted from "CR3" to "RTT".	ED2
B	SR	10" (250mm) W x 10" (250mm) H x 6" (150mm) D wall box with removable screw-type coverplate. Surface mounted near Storage Rail "SR".	
E	ERB	2" (50mm) W x 4" (100mm) H x 2" (50mm) D wall box with removable screw-type coverplate. Flush mounted 70" (1800mm) above finished floor to bottom of box.	
E	DS	RF Door Open Switch - 120 V, 5 Amp switch limited to open when door is open. Mounted in upper corner on strike side of entry door. Use Grainger item 4B811, Telemecanique model XCKJ10541 or equivalent.	
D	SFB	Wall mounted System Filter Box.	
B	EA	e-Alert box. Final location of "EA", to be determined and installed by Philips.	
See E1 - E2 sheets for conduit and raceway requirements.			

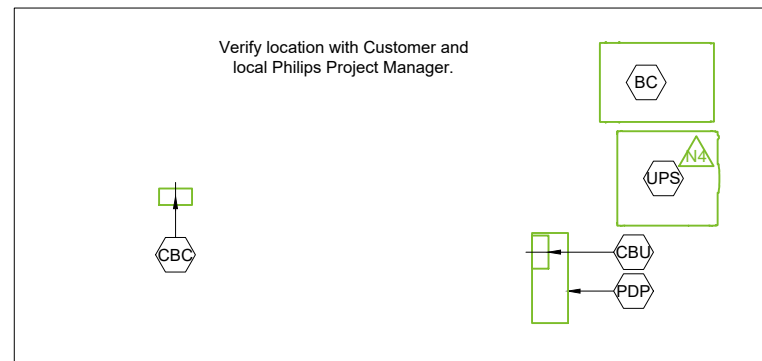
EL2	Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com Drawn By: Alejandra Lozano	Project Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI
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EL2



 Final location of e-Alert "EA", to be determined and installed by Philips.

 CR4, CR5 and CR1 are shown as new. They are adjusted to meet 1' - 3", 1' - 1 5/8", 2' - 11 7/16" and 1' - 6" required dimensions shown. Existing tray material can be re-used but needs to be adjusted to meet route and dimensions as reflected.



3/16" = 1'-0"

Ceiling Height Guide

<u>Equipment Room:</u>	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	Minimum*
<u>Exam Room Suspended Ceiling:</u>		
To bottom of HALO Center Panel	8' - 3 $\frac{1}{4}$ " (2520mm)	Required
To bottom of ceiling outside of HALO	8' - 5 $\frac{1}{8}$ " (2568mm)	
<u>HALO Support</u>		
To the bottom of HALO Rafters	10' - 2" (3100mm)	Maximum**
<u>Exam Room RF Ceiling:</u>		
Helium Waveguide Through RF Wall	10' - 8" (3250mm)	Minimum*
Helium Waveguide Through RF Ceiling	11' - 4 $\frac{1}{4}$ " (3460mm)	Minimum*
Control Room	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	Minimum

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

** RF shield vendor required to provide additional strapping if bottom of rafters exceeds maximum.

E1

THE INFORMATION IN THIS PACKAGE IS PROVIDED AS A CUSTOMER CONVENIENCE, AND IS NOT TO BE CONSTRUED AS ARCHITECTURAL DRAWINGS OR CONSTRUCTION DOCUMENTS. Phillips assumes no liability nor offers any warranty for the fitness or adequacy of the premises or the utilities available at the premises in which the equipment is to be installed, used, or stored.

Conduit Required								
General Notes								
1. All conduit runs must take most direct route point to point. 2. All conduit runs must have a pull string.								
↓	A Conduit supplied/installed by contractor - Philips cables installed by Philips B Conduit supplied/installed by contractor - Philips cables installed by contractor C Conduits and cables supplied and installed by contractor D Conduit existing - cables supplied and installed by Philips E Conduit existing - cables supplied by Philips and installed by contractor F Conduit existing - cables supplied and installed by contractor G Optional equipment, verify with local Philips Service							
	* P Power (AC) D Power (DC) G Ground S Signal H High Tension C Cooling Hose A Air Supply Hose							
Conduit			Conduit Quantity	Cable Type (*)	Minimum Conduit Size	Maximum Conduit Length	Special Requirements	
Run No.	From	To						
E 27	"AEP"	Mains RF filter	Per N.E.C.	(P)	Per N.E.C.	Per N.E.C.	Recommend 1" flexible ENT "smurf tube". See ED2 sheet for more information on Mains Filter. Only necessary if no filtered duplex is provided above ceiling to provide power to projector	
E 28	"DCU"	"INJ"	1	(P/S)	1"	200'	Fiber optic cable to be routed from "INJ" to "JB" through "INJ" - Injector RF feedthrough. Conduit to run from SR to JB.	!1
E 29	"POC"	"SFB"	1	(P/S)	1"	49.2'	"POC" = Patient Observation Camera "SFB" = System Filter Box	
E 30	"SFB"	"POM"	1	(S)	1"	98.4'	"POM" = Patient Observation Monitor	

Planning Issues and Considerations



Customer may need to provide additional cable length for the hospital supplied mains power from the existing MDU location, as it will now be terminated inside the DACC instead.

Standard Ingenia Elition 3T Cable Lengths Inside Equipment Room

From	To	Distance
SFB	CombiCabinet (DACC+LCC)	22' - 11 ³ / ₄ " (7m)
SFB	GAC*	22' - 11 ³ / ₄ " (7m)
CombiCabinet (DACC+LCC)	RTT (applicable for 480V/60 Hz site)	32' - 9 ³ / ₄ " (10m)
CombiCabinet (DACC+LCC)	GAC	22' - 11 ³ / ₄ " (7m)
SACU	Combicanet (LCC)	45' - 11 ³ / ₁₆ " (14m)

* Gradient cables are supplied in one set with a length of 49' - 3" (15m) to run from the magnet interface to GAC cabinet. Cable length can be divided / cut between length needed inside the Equipment room and length need inside the Exam room.

Conduit Required								
General Notes								
1. All conduit runs must take most direct route point to point. 2. All conduit runs must have a pull string.								
↓	A Conduit supplied/installed by contractor - Philips cables installed by Philips B Conduit supplied/installed by contractor - Philips cables installed by contractor C Conduits and cables supplied and installed by contractor D Conduit existing - cables supplied and installed by Philips E Conduit existing - cables supplied by Philips and installed by contractor F Conduit existing - cables supplied and installed by contractor G Optional equipment, verify with local Philips Service							
	* P Power (AC) D Power (DC) G Ground S Signal H High Tension C Cooling Hose A Air Supply Hose							
Conduit			Conduit Quantity	Cable Type (*)	Minimum Conduit Size	Maximum Conduit Length	Special Requirements	
Run No.	From	To						
E 1	Hosp. Power	RF Filters	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
E 2	Hosp. Power	CBS	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
E 3	CBS	Comb. Cabinet	1	P	Per N.E.C.	25'	See ED1 sheet for more information.	
E 4	ERB	"SFB"	1	P	³ / ₄ "	80'	ERB in control room.	
E 5	ERB	"SFB"	1	P	³ / ₄ "	49'	ERB in exam room.	
E 6	"DACC"	DS	1	S	1"	75'		
E 7	SR	JB	1	S	3"	65'	Conduits to be routed outside RF enclosure.	
E 8	SR	JB	1	P	2"	65'	Conduits to be routed outside RF enclosure.	
C 9	Hosp. Power	CBC	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
C 10	CBC	Chiller	1	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
A 11	"SACU"	"LCC"	1	P	1 ¹ / ₂ "	45'	Cable to routed from "SACU" to "JB" to "CR3" to "LCC". Conduit not needed if "SACU" is close enough for cable to be directly routed onto "CR3". Refer to Sheet MP5 for more details.	
C 12	Hosp. Power	CBU	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
C 13	CBU	UPS	1	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
C 14	UPS	BC	2	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
C 15	RSP	UPS	1	S	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.	
C 16	UPS	PDP	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	Customer to provide power distribution panel when connecting to system and chiller. See ED1 sheet for more information.	
C 17	PDP	CBS	1	P	Per N.E.C.	Per N.E.C.	Customer to provide power distribution panel when connecting to system and chiller. See ED1 sheet for more information.	
C 18	PDP	CBC	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	Customer to provide power distribution panel when connecting to system and chiller. See ED1 sheet for more information.	
A 20	AECC	AVI	1	S	1.5"	98'	For audio output cable from AECC to MR system audio switch in Control Room.	
A 21	ATSW	AECC	1	S	2"	65'	For DVI Connection between wall mounted Touch Screen and AECC and an additional USB cable.	
A 22	ATS	AECC	1	S	2"	65'	For DVI Connection between Touch Screen and AECC and an additional USB cable.	
A 23	ERPS	ERD	1	P	1 ¹ / ₂ "	16'	Connection from power box above suspended ceiling inside RF to ERD	
A 24	AECC	AEW	1	(S)	1/2"	98'	Connection from AECC to ERD via RF feedthrough waveguide.	
A 25	AEW	ERD	1	(S)	1/2"	98'	Connection from AEW to ERD via RF feedthrough waveguide.	
A 26	AECC	AEF	1	S	2 1/2"	32.8'		

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number

N-EAS220370 B

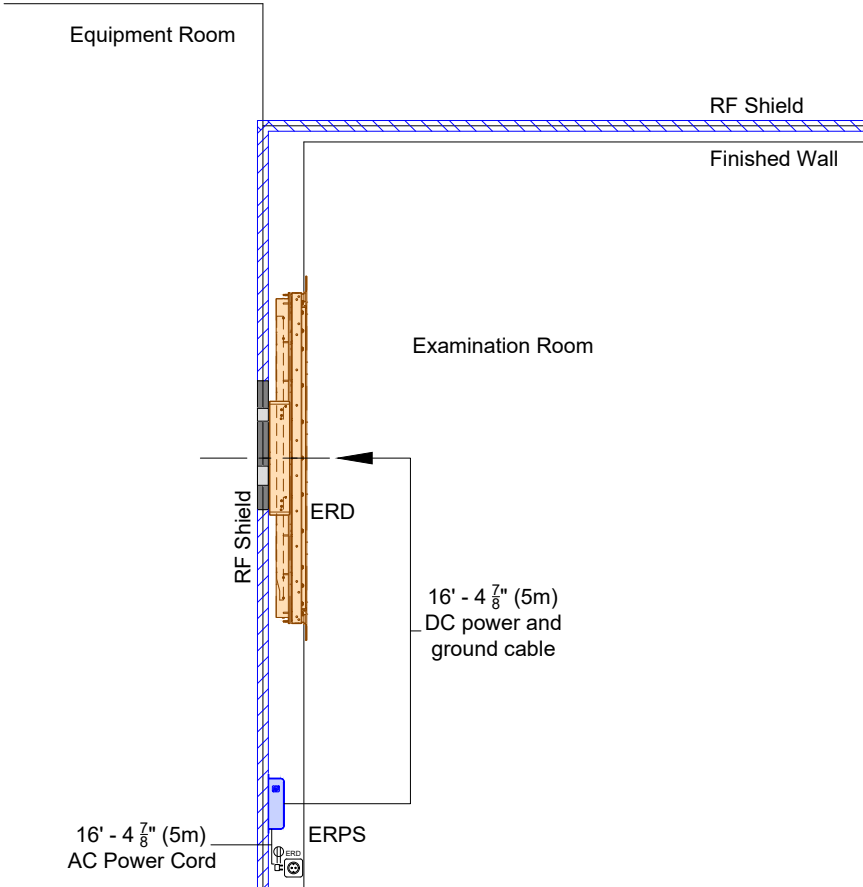
Date Drawn: 4/11/2025

Quote: Q-00361165

Order: 6600723105.010000

E2

Ambient Experience ERD and ERPS Cable Routing Schematic

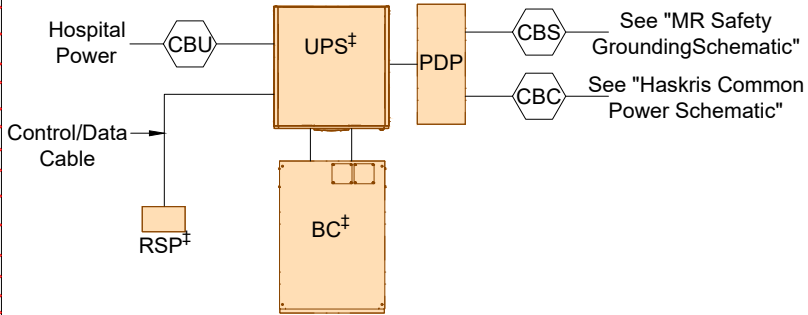


Project Details	Philips Contacts	Project
Π3	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com	Smartpath to MR 7700
Drawing Number N-EAS220370 B		VA Medical Center West Haven
Date Drawn: 4/11/2025		West Haven, CT
Quote: Q-00361165		Room: MRI
Order: 6600723105.010000	Drawn By: Alejandra Lozano	

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Power Quality Requirements (Incoming power to UPS)

Supply Configuration	3 Phase + isolated ground + equipment grounding conductor
Phase wires	Refer to "Maximum Cable length per Wire Size" chart
Isolated Ground	Same size as Phase wires
Equipment Grounding Conductor	Per NEC, #4 AWG minimum
Nominal Input Voltage	480 VAC
Input Circuit Breaker	200 Amps (CBU)
Power Distribution Panel Outputs	Refer to CBS and CBC
Power Factor	>0.99
Battery Feeder Wire Size (Min)	400 kcmil



For UPS purchased from PHILIPS, refer to Installation and Operation manual from the manufacturer for all detailed specification and installation requirements. Wiring and circuit sizes at supply and load side of UPS to meet UPS requirements and verified by contractor to meet building conditions and local codes.

Maximum Cable Length per Wire Size (Between Hospital Power and CBS)

(Based on 20° C copper ambient temperature)

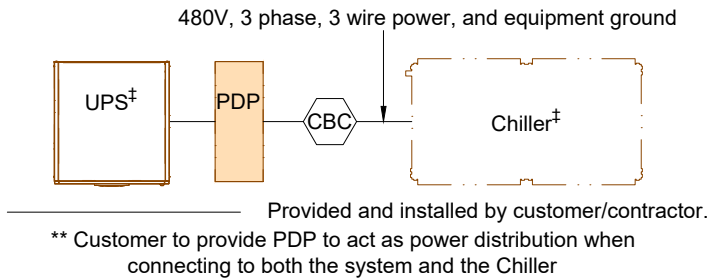
< 177'	#3/0 AWG
< 225'	#4/0 AWG
< 264'	250 MCM
< 316'	300 MCM
< 369'	350 MCM
< 426'	400 MCM

The ground conductor for the power feeder shall be the same size as the phase conductor wires. Ground conductor must be dedicated and totally separate from conduit, raceway, or structural ground. Wire sizes shown are factory recommendations: Adjustments may be acceptable as needed in the field per local electrical engineer.

(24.0)

Diagram - Common Haskris Chiller Power Schematic

(Not to scale)



Circuit Breaker for Chiller
Haskris OPC15 Chiller: 480V, 60 Hz, 3 ϕ + ground, 70 Amps.
Haskris OPC24 Chiller: 480V, 60 Hz, 3 ϕ + ground, 70 Amps.



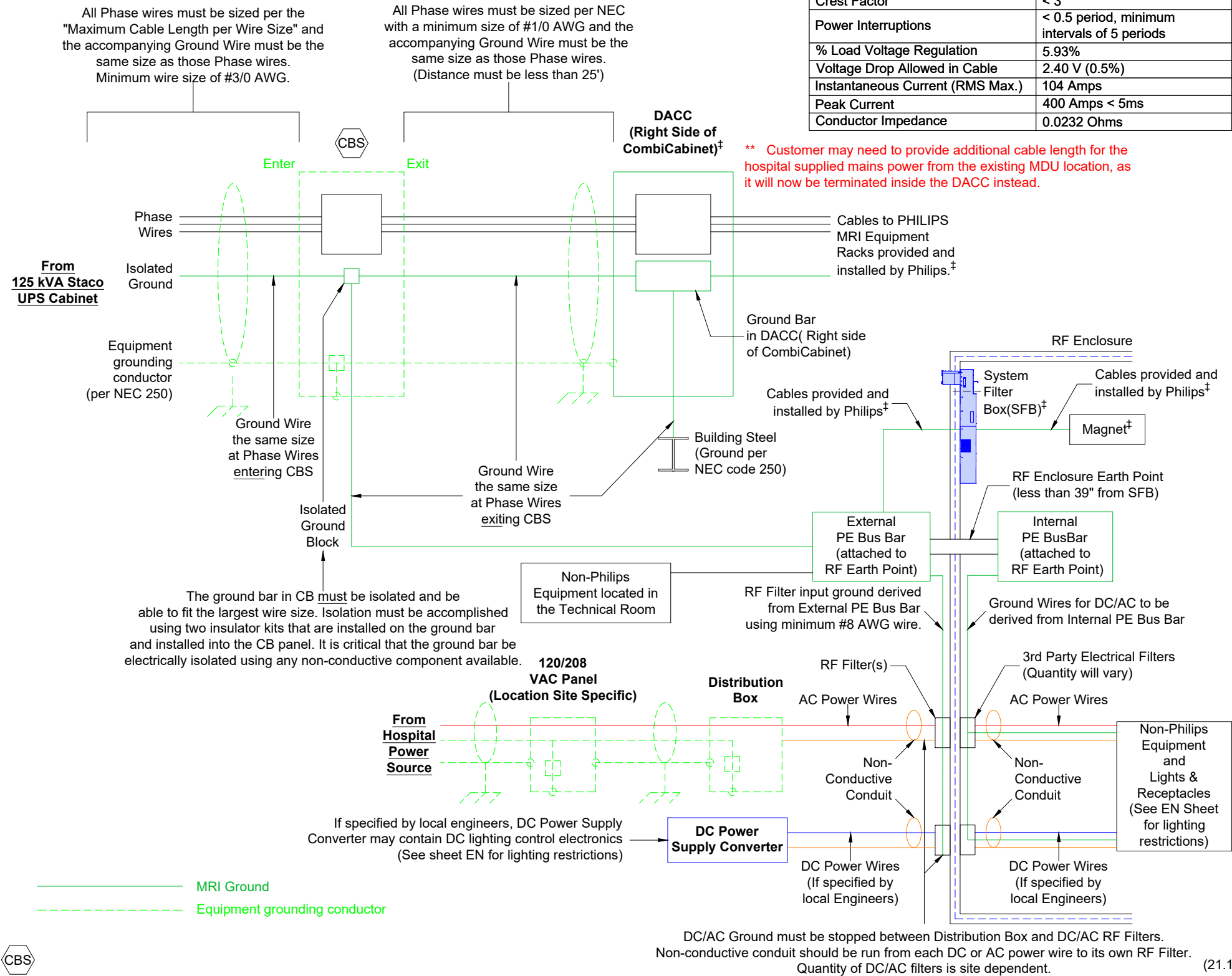
(24.0)

Diagram - MR Safety Grounding Schematic

(Not to scale)

Notes:

1. All items shown are to be provided and installed by contractor unless otherwise specified.
2. Philips provided equipment designated with †.
3. All ground conductors for power feeders must be the same size as the phase conductor wires.
4. All non-power feeder ground wires must be sized per NEC without going below the minimum size shown.
5. All wires and conduits must be insulated per NEC.
6. For additional notes, see Sheet EN (section "RF Enclosure Electrical Notes").



Power Quality Requirements into DACC

Branch/Max. Power Required	115 kVA
Supply Configuration	3 Phase, 3 Wire Power + Unity Ground + Bonded Ground
Nominal Input Voltage	480 VAC
Circuit Breaker (3 ϕ , 60 Hz, 3 pole)	150 Amps
Mains Impedance	< 0.110 Ohms
Distortion Power Factor	> 0.9
Cos phi	> 0.98
Total Harmonic Distortion (THD _i)	< 45% (current, not voltage)
K-factor	< 10
Crest Factor	< 3
Power Interruptions	< 0.5 period, minimum intervals of 5 periods
% Load Voltage Regulation	5.93%
Voltage Drop Allowed in Cable	2.40 V (0.5%)
Instantaneous Current (RMS Max.)	104 Amps
Peak Current	400 Amps < 5ms
Conductor Impedance	0.0232 Ohms

** Customer may need to provide additional cable length for the hospital supplied mains power from the existing MDU location, as it will now be terminated inside the DACC instead.

Project
Smartpath to MR 7700
VA Medical Center West Haven
West Haven, CT
Room: MRI

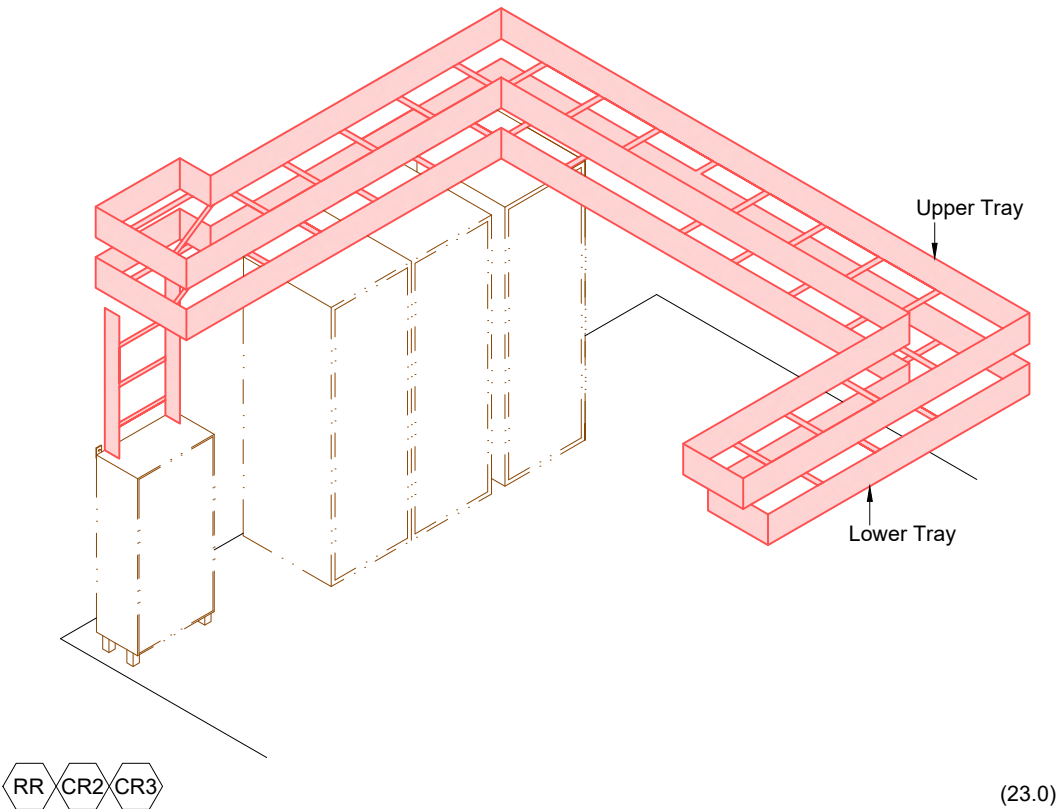
Philips Contacts
Project Manager: Taylor LaRosa
Contact Number: 516-848-7433
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Drawn By: Alejandra Lozano

Project Details
Drawing Number
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ED1

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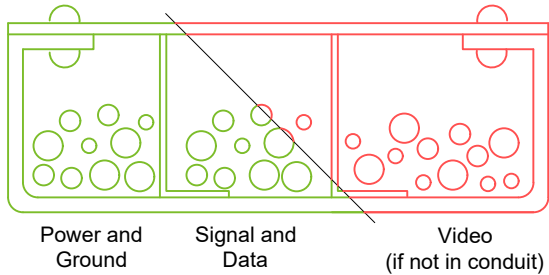
Detail - Equipment Room Isometric
(Not to scale - Not site specific)



Detail - Cable Trough Divisions Outside of RF Enclosure
(Or as directed by local code)
(Not to scale)

Ducts must be separated by metal barriers into three sections.

1. Power cables and ground cables can be run together.
2. Signal cables and data cables can be run together but must be separated from power cables.
3. Video cables must be run separately from all other cables.
4. It is important that all cables are placed in the appropriate through and at no given point do any cables from division cross with cables from another. Trough separation must be continuous from the beginning to the end of the run.
5. Trough or ducts: Steel with steel dividers grounded per local code.
6. Contractor to provide cable restraints in all troughs.
7. Low cable duct is for signal cables.
8. High cable duct is for:
 - Gradient cables (not allowed to route patient ventilation hose in gradient cable section)
 - RF send cable
 - Helium Gas Lines
 - Hoses for gradient coil cooling liquid
 - Power cables



USB Extender for Touch Screen Monitor

The USB Extender is required for each Touch Screen Monitor located >18' away from Ambient Experience AECC Cabinet.

It is composed of two units:

- a. LEX - Local Unit:
 - Located within 5m of the AE Server.
 - Receives power from the AE server via USB connection.
- b. REX - Remote Unit:
 - Located within 5m of the Touch Screen Monitor.
 - Receives power from the supplied 5 VCD power supply unit.
 - Installed inside ATSW junction box for the wall mounted Touch Screen Monitor, or on/under desk/counter for the Touch Screen Monitor in the control room.
- c. LEX and REX connected via a UTP (Cat 5e or better) cable.

(24.0)

Ambient Experience Additional Mains RF Filter

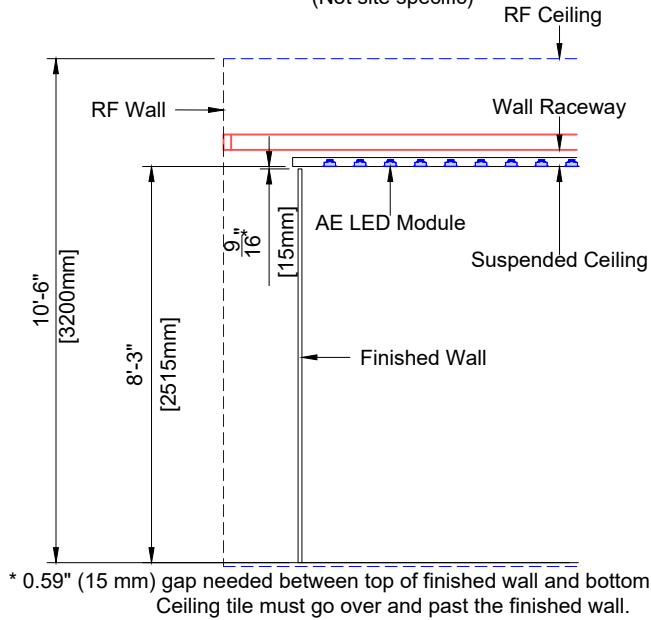
Customer/contractor must provide a suitable RF filter for the mains power supply to the projector and/or the ERD.

- a. 1 x 110V / 10 Amp with phase, neutral and earth wire connected at the inside and outside of the RF enclosure.
- b. RF filter should be mounted in the RF wall between the examination room and the equipment room above the suspended ceiling. It can be located next to the standard auxiliary filters.

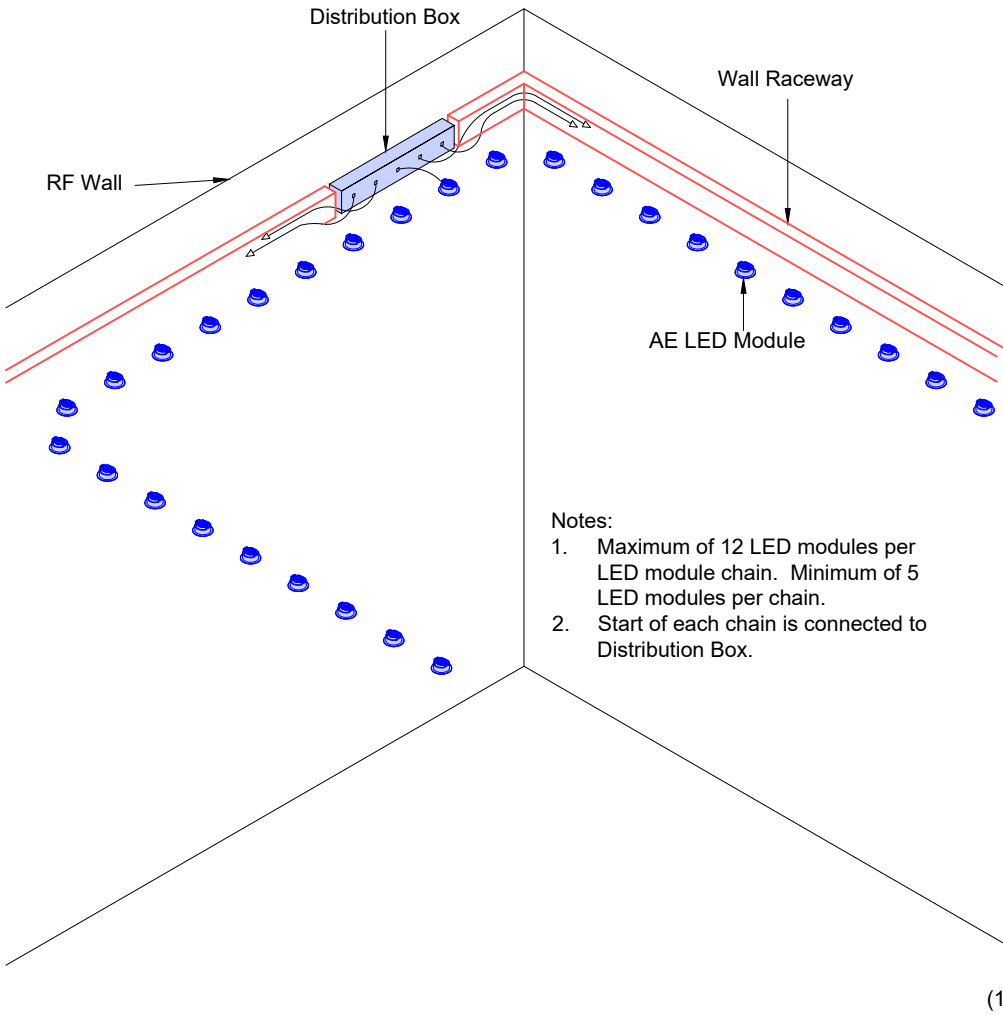
(24.0)

Detail - Exam Room

(Not to scale)
(Not site specific)



Detail - Isometric Diagram of Distribution Box and AE LED Modules
(Not to scale / Not site specific)



Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number

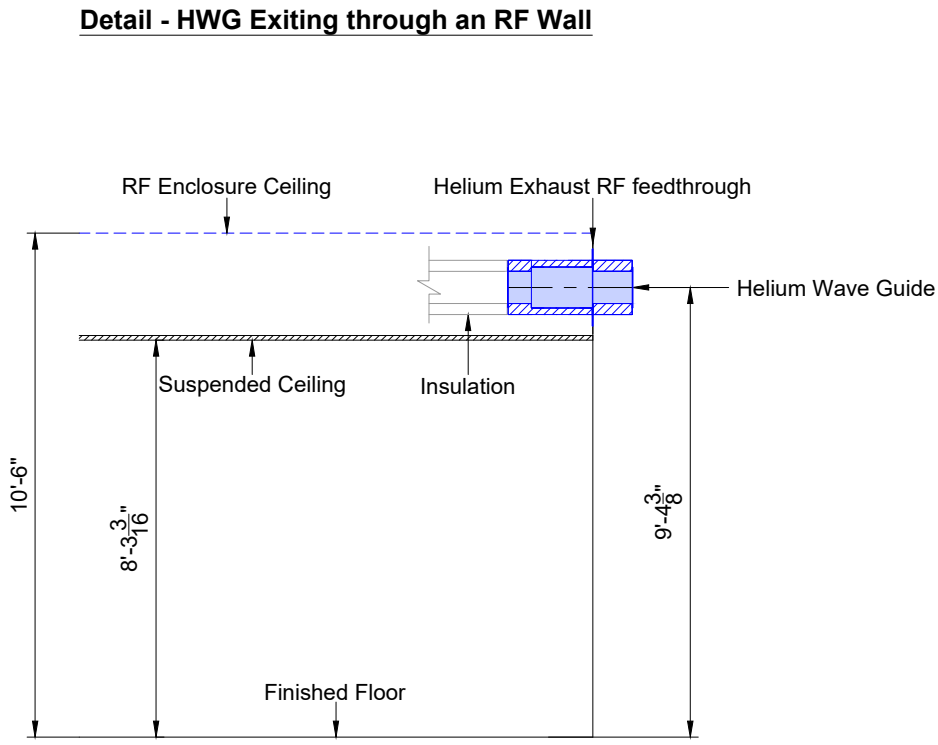
N-EAS220370 B

Date Drawn: 4/11/2025

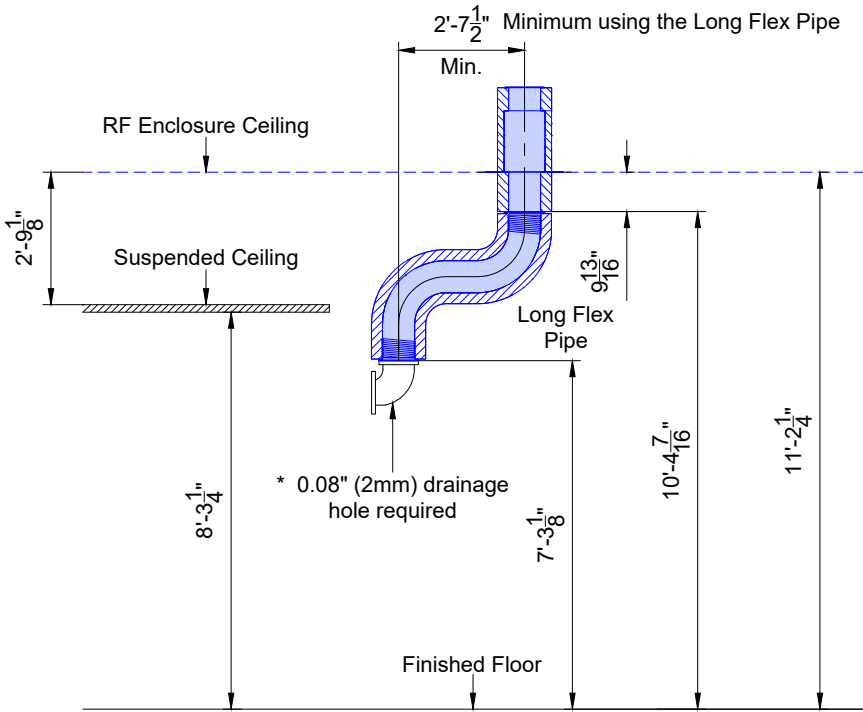
Quote: Q-00361165

Order: 6600723105.010000

ED2

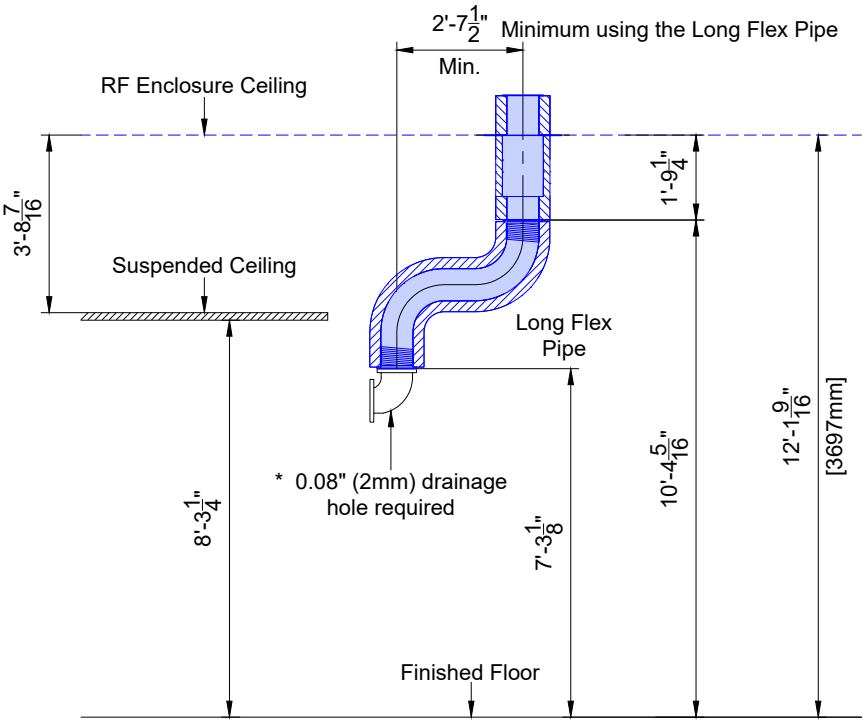


Minimum RF Ceiling Height for HWG exiting an RF Wall (no Soffit)

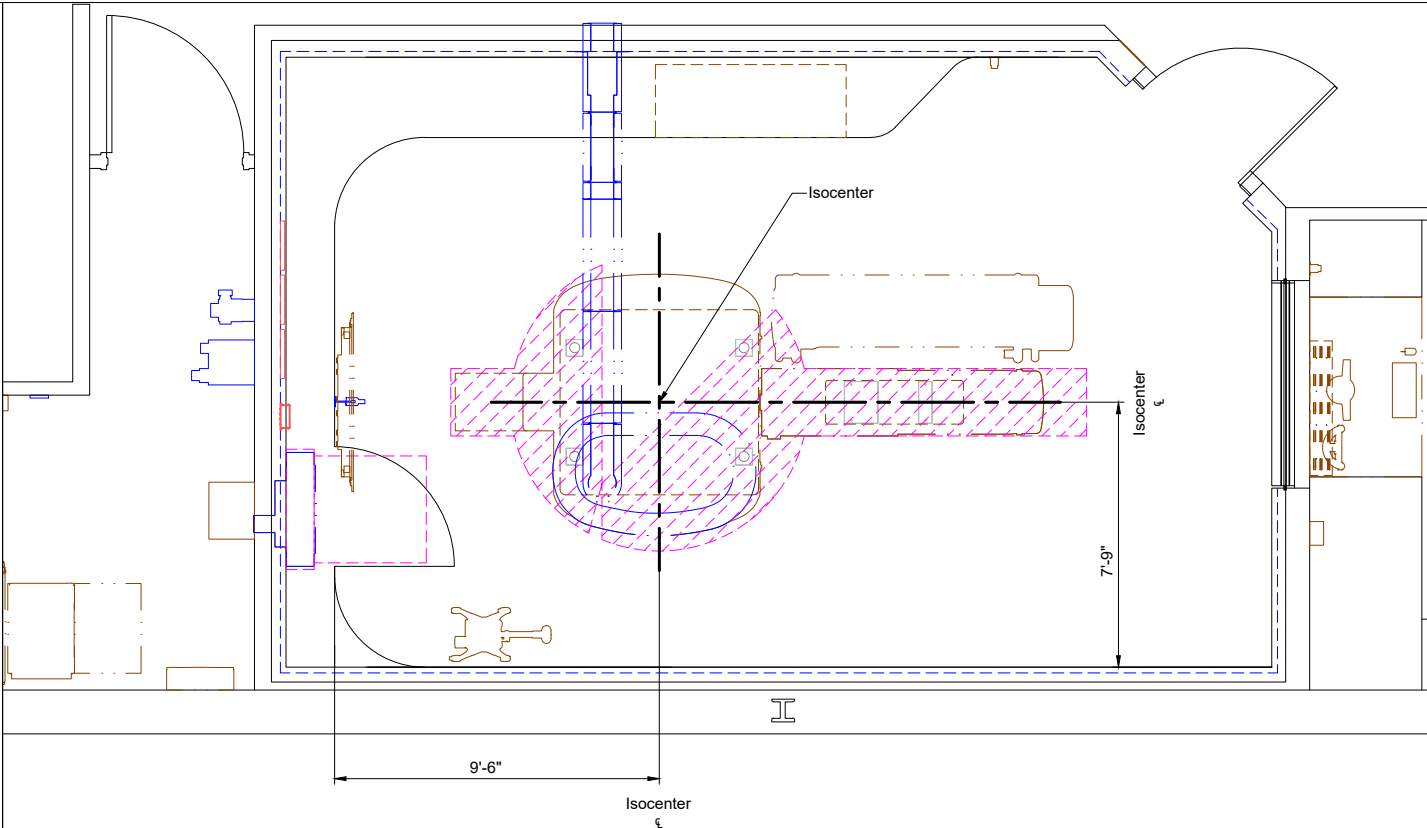


Short part of HWG installed inside RF Enclosure

Detail - HWG Exiting through the RF Ceiling
(Recommended scenario)



Long part of HWG installed inside RF Enclosure



Helium Gas Exhaust Pipe Exclusion Zone
(Site Specific)

Project		Philips Contacts	
Smartpath to MR 7700 VA Medical Center West Haven West Haven, CT Room: MRI	Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com	Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000	Drawn By: Alejandra Lozano

MP2

Helium Exhaust Pipe Verification

For patient and equipment safety, customer's architect or contractor to provide details of helium exhaust pipe design for verification that all life-safety requirements are being met, prior to installation. Please consult with your Philips Project Manager to begin the verification process as soon as possible. Coordinating a safe design prior to fabrication will help to avoid rework costs and installation delays.

Details must include:

- Completed HEP checklist that confirms design meets or will meet specifications.
- Inside the RF enclosure:
 - Indicate the location of the Helium Wave Guide on the RF wall or RF ceiling.
 - Ensure the HEP/HWG does not route over the Patient Exclusion Zone.
 - Provide the RF ceiling height.
 - Any other structural constraints.
- Outside the RF enclosure (including but not limited to)
 - Plan view of the piping.
 - Elevation view of the piping.
 - Include the diameter and number of all pipe bends and pipe lengths
 - Exit diagram plus physical exclusion area around exit outlet.
 - Location of drainage holes in the horizontal piping.
- Photos of the exit piping and area

(17.1)

Helium Gas Exhaust Pipe Outside of RF Enclosure

1. Material Requirement

- All materials including couplings, gaskets, insulation, etc. must withstand the minimum temperature of helium gas in the pipe during a quench. The minimum temperature is -450.7° F (5° Kelvin). Due to temperature variation/thermal contraction, length compensation pieces must be considered.
- The material of the pipe must be aluminum with a minimum wall thickness of 0.12" (3mm)(8 ga), or stainless steel (AISI 304) with a minimum wall thickness of 0.02" (0.5mm)(25 ga).
- During a quench, the helium exhaust pipe must be designed to handle a maximum pressure of 1 bar (14.5 PSI) for 1.0T / 1.5T MRI and 0.5 bar (7.25 PSI) for 3T MRI. No spiral duct or corrugated pipe or flex piping.
- All pipe joints need to be helium gas and water tight, preferably welded.
- Outside the RF enclosure, if a person cannot touch the pipe, be dripped on by liquid air, and no materials around the pipe can be damaged by liquid air, insulation is not required, however is still highly recommended to prevent structural damage and mold growth.
- Any insulation used to protect people must withstand a minimum temperature of -406.7° F (30° Kelvin) and consist of 3" (75mm) of 2.0 lbs/ft³ (32 kg/m³) expanded polystyrene or fiberglass insulation equivalent to R11 or better (e.g. Armaflex Cryogenic Cold Systems or Pittsburgh Corning FOAMGLAS ONE) and externally sealed by a vapor barrier. Do not use vapor material that has metal components, which can cause spikes and imaging issues. The insulation thickness can be reduced if higher R-value insulation is used. Insulation is provided and installed by customer/contractor.
- At every low spot of the vent pipe where water can accumulate, an 80mm (3.15") length drainage pipe with 2mm inner diameter opening must be installed, remain open, and not covered with insulation or a valve. Water can turn into ice during ramping or refilling and can block the helium exhaust pipe. A label must be placed close to the burst disk (located on the top of the magnet interface) and must provide information about the amount and location of all water drains installed. All drains must be checked prior to any cryogenic action.
- Suspension of the helium exhaust pipe must handle the weight and Helium flow reaction forces resulting from a quench. This is especially valid for corner pieces / elbows. Forces anticipated: 224.8 lbs (1000N).
- Suspension of the helium exhaust pipe must handle the possible thermal contraction of the helium vent pipe length when the vent temperature decreases from ambient to -451.8° F (5 Kelvin).
- Evaporating helium gas warms up and expands; therefore the diameter of the helium vent pipe length must increase (if applicable) away from the magnet. Expansions to larger diameter vent pipes be accomplished with a diffuser. See Detail - Helium Exhaust Diffuser.

2. Helium Exhaust Pipe Run and Size Requirements

- See Helium Gas Exhaust Pressure Drop Table to calculate the pipe diameter in relation to the pressure drop. The piping is measured by inside diameter and is valid for piping outside the RF enclosure.
- The helium exhaust pipe diameter must never decrease as it gets further away from the magnet.
- All centerline bend radii must be a minimum of 1.5 times the diameter of the pipe. Each bend should be made of one piece bend, or if not available, must be made of minimum 4 and maximum 6 segments. Inner wall must be smooth walled.
- It is not allowed to modify the Philips provided Helium Wave Guide that is installed on the RF enclosure.

(18.0)

Helium Gas Exhaust Pipe Exit Location Requirements

- For vertical discharge, there must be no human access around the pipe, extending in a 9' - 10" (3m) horizontal radius of the gas exhaust outlet and 26' - 3" (8m) directly below the outlet. A physical barrier is required if the lowest point of the vertical discharge exit outlet is less than 26' - 3" (8m) above the ground below. Even if the exhaust is in a restricted area (e.g. rooftop), a permanent restriction barrier (i.e. fence, guardrails) in a 9' - 10" (3m) radius with warning signs must be installed.
- For horizontal discharge, there must be no human access in a 9' - 10" (3m) radius. A physical barrier is required if the lowest point of the horizontal discharge exit outlet is less than 16' - 5" (5m) above the ground below.
- To prevent backpressure, between the exit outlet and any restricting area (e.g. roof, wall, deflector plate) there must be a minimum clearance of 1.5 x Diameter of the pipe before the exit outlet. Mandatory assessment by customer/contractor must include additional clearance for worst case snowfall/debris levels and the rooftop insulation thickness.
- Areas (e.g. roof, wall, doors, sealed windows) within 9' - 10" (3m) of the exhaust outlet must be protected against frost damage. Brick and concrete can crack due to the extreme cold temperatures of helium exhaust. No air inlets are allowed within 9' - 10" (3m) of the gas exhaust outlet. Windows must be sealed tight.
- Any existing equipment within 9' - 10" (3m) of the exhaust outlet should be relocated if possible, due to the risk of service personnel and possible equipment damage from the extreme cold temperature of helium exhaust. If equipment cannot be relocated, a deflector plate with insulation must be installed to guide the gaseous helium in a different direction.
- The exit outlet must be positioned such that no wind-driven rain, snow, small animals (birds, mice), or debris (paper, leaves) can enter the pipe or block the outlet.
- A screen is required on the exit. The net outlet area must be twice the preceding pipe cross-sectional area. A 12.7 mm - 15 mm x 12.7mm - 15 mm pitch with 1.3 +/- 0.3 mm thick round wires must be used. The resulting open square aperture must be between 11.1 mm and 14 mm in length and width. Mesh screen must be woven or welded square, NOT perforated or expanded. If the wire thickness is too thin, it can break. If the wire thickness is too thick, the effectiveness of the opening is reduced and will increase pressure drop. A smaller mesh is not allowed as this will increase the pressure drop too much and the maze can freeze up during a refill or magnet quench. A larger mesh is not allowed because it allows foreign objects and animals to enter the pipe. The pipe run and exit must be accessible to check periodically for build-up, blockages, etc. This is especially true after any quench.

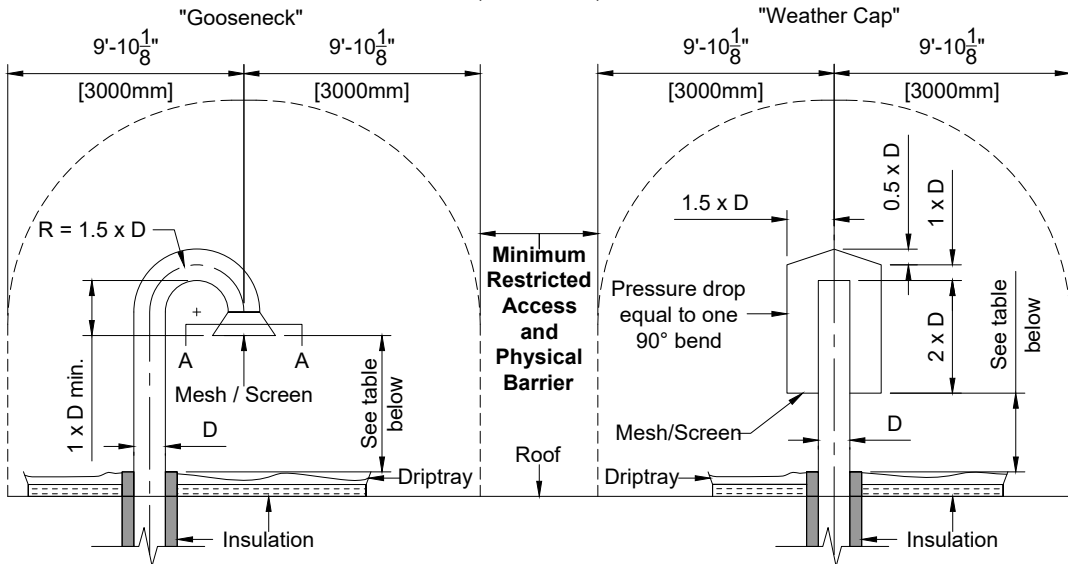
Helium Exhaust Vertical Discharge Option

- Frost Protection: In a 6' (1500mm) horizontal radius area from helium exhaust outlet, 12" (305mm) x 12" (305mm) x 1" (25mm) thick concrete tiles installed under the helium exit, on top of the exit surface(i.e. rooftop) and underneath a metal/concrete driptray. Recommend using insulation equivalent to R11 or better.
- Driptray: 6' (1500mm) horizontal radius metal/concrete driptray with 2" (50mm) upward folded edges installed under the helium exhaust outlet, on top of the exit surface (i.e. rooftop) and above the frost protection.

(19.0)

Detail - Vertical Discharge Options (Shown exiting roof)

(Not to scale)



Clearance Height from Exit Outlet*	D = 4"	D = 6"	D = 8"	D = 10"	D = 12"	D = 14"	D = 16"	D = 18"
	100mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm
Gooseneck	Min. 6"	Min. 9"	Min. 12"	Min. 15"	Min. 18"	Min. 21"	Min. 24"	Min. 27"
Weather Cap	Min. 16"	Min. 27"	Min. 36"	Min 40"	Min 40"	Min 40"	Min 40"	Min 40"

*Plus minimum distance above maximum expected snow/debris level

(18.0)

Helium Exhaust Pressure Drop Table

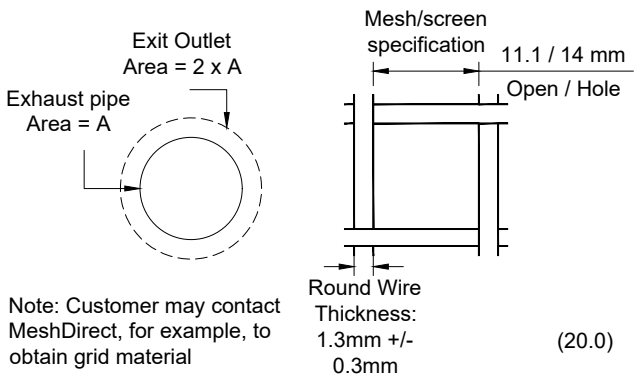
Internal Pipe Diameter	D = 8" 200mm	D = 10" 250mm	D = 12" 300mm	D = 14" 350mm	D = 16" 400mm
Pressure Drop	(mBar)	(mBar)	(mBar)	(mBar)	(mBar)
39.37" (1m) Pipe	10	3.4	1.4	0.7	0.5
45° Bend	25	11	5	3	1.5
90° Bend	46	19	9	5	2.5

- Maximum allowed pressure drop over exhaust pipe outside RF enclosure is 0.725 PSI (50 mBar).
- If a long distance is needed, it is recommended to transition immediately outside the RF enclosure to large diameter pipes.

(18.0)

Detail - Mesh/Screen Cross Section 2xA

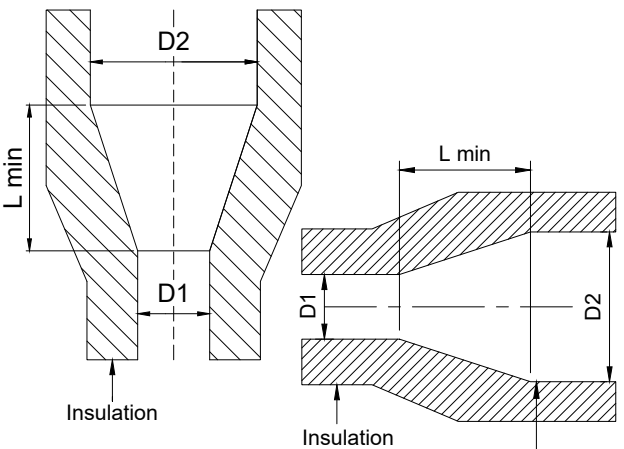
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(20.0)

Detail - Helium Exhaust Diffuser

Minimum length of the diffuser: 2.5 x (D2 - D1).



(17.0)

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

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Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number

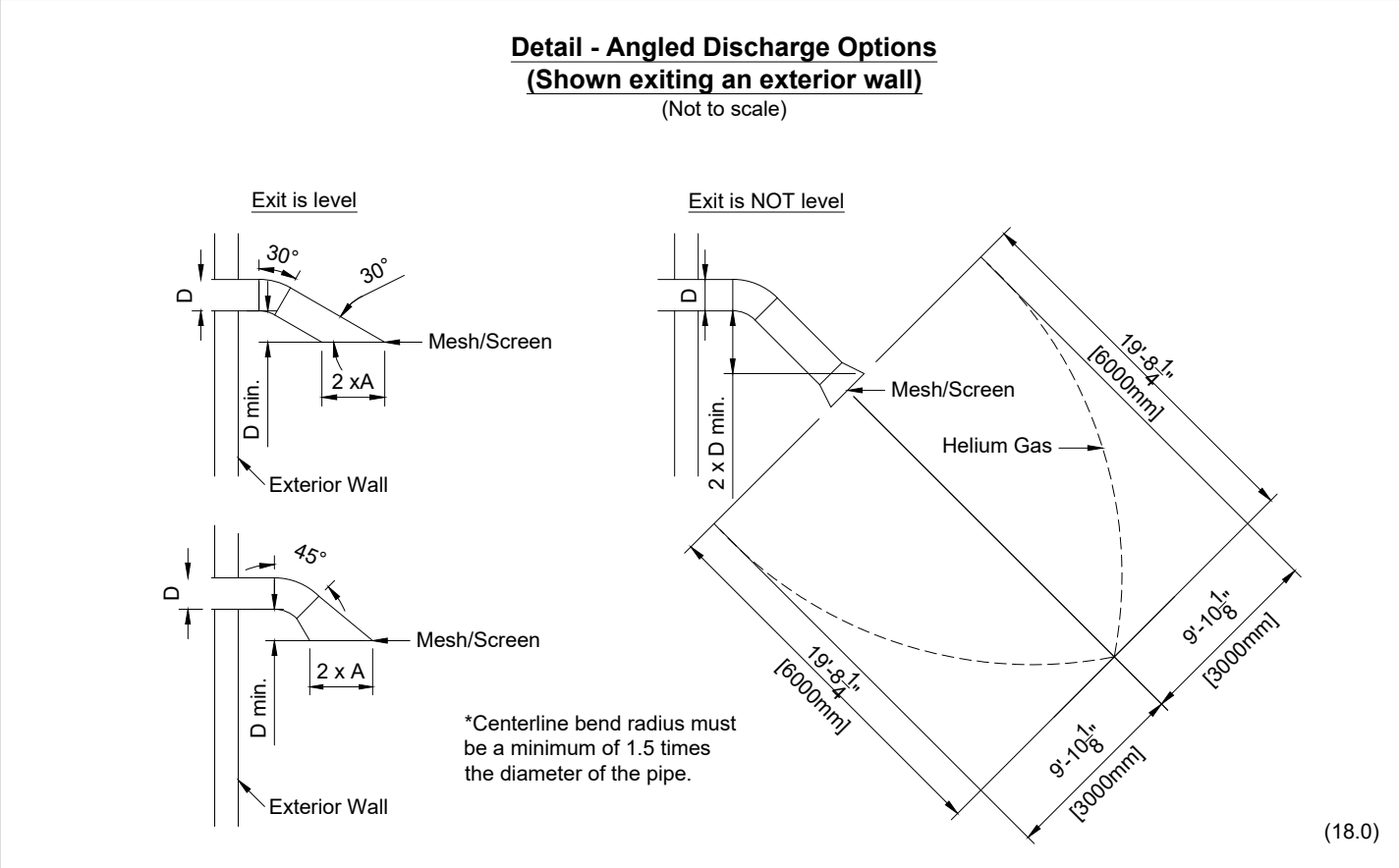
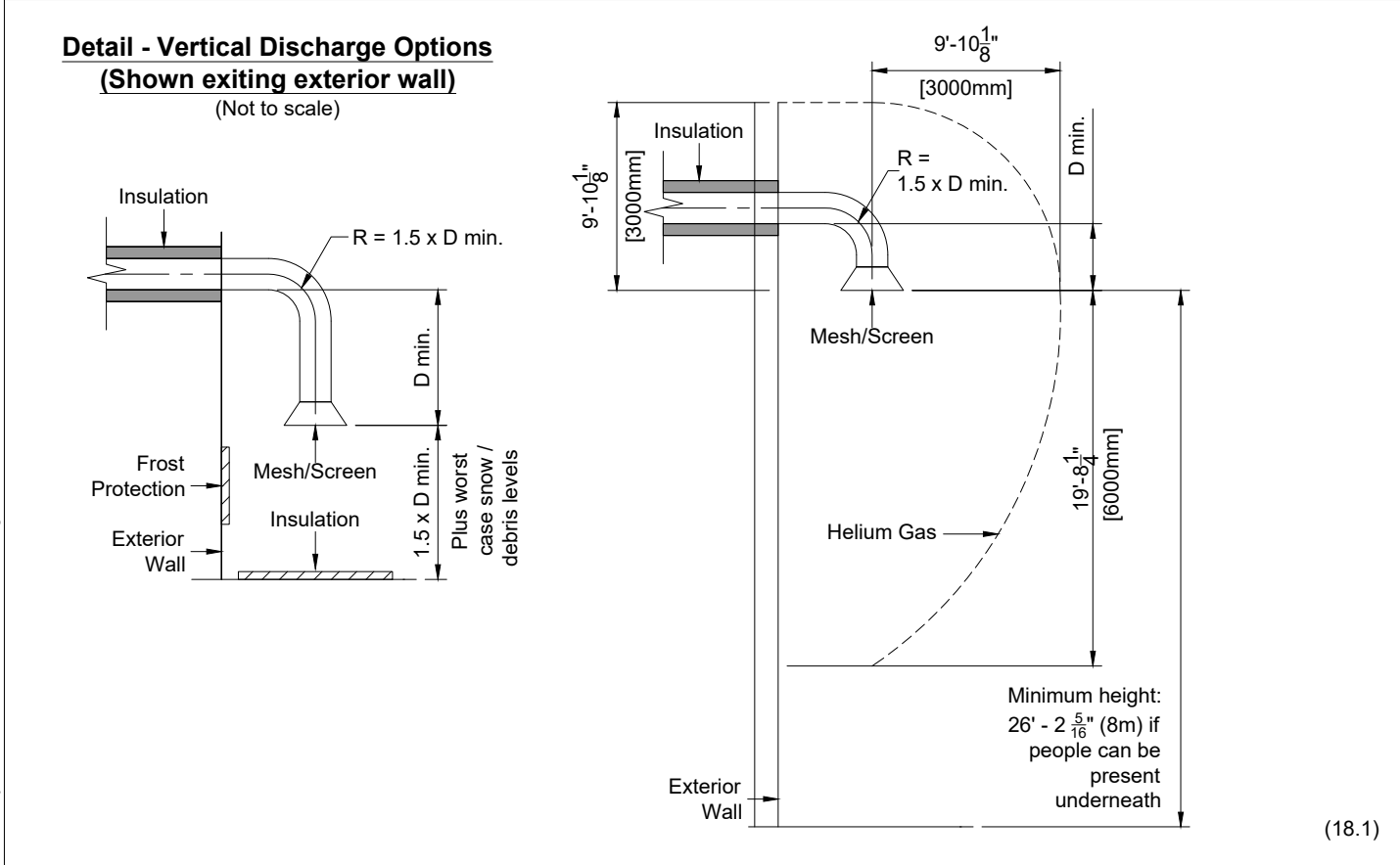
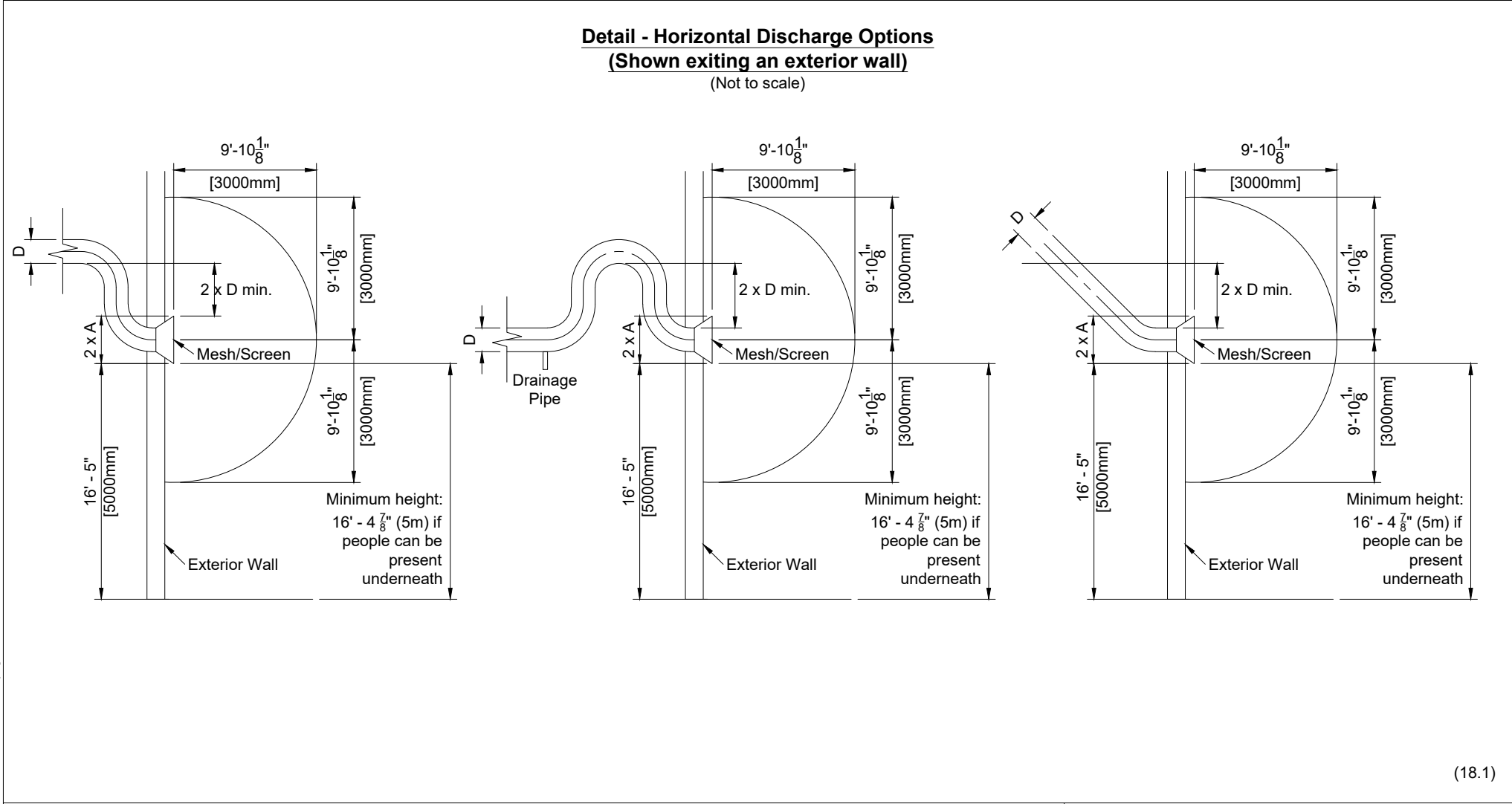
N-EAS220370 B

Date Drawn: 4/11/2025

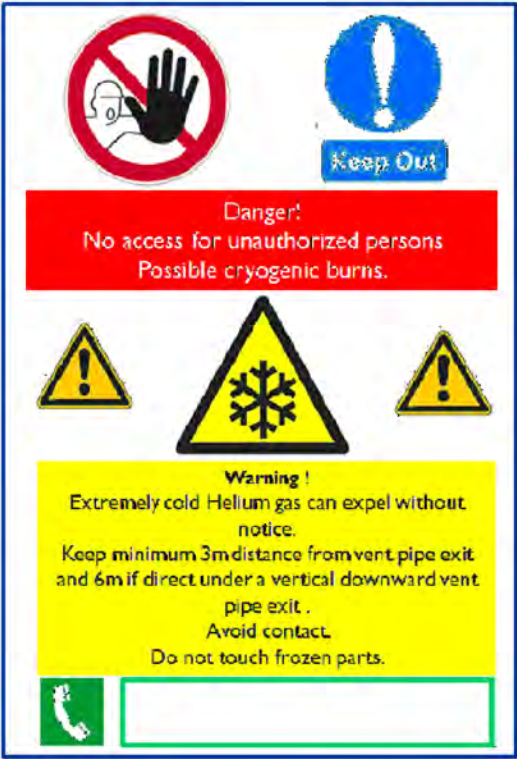
Quote: Q-00361165

Order: 6600723105.010000

MP3



Example Warning Sign



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VA Medical Center West Haven West Haven, CT		Drawn By: Alejandra Lozano		MP4	
Room: MRI					

Air Conditioning Requirements

1. Equipment Room Specifications

Ambient Requirements *	
Temperature	59° - 75° F (15° - 24° C)
Maximum Temperature Change	9° F (5° C) per 10 min.
Relative Humidity	30% to 70%, no condensation
Total Heat Dissipation to Air	
Dissipation Standby	6800 BTU/hr (2 kW)
Peak Dissipation Scanning	23885 BTU/hr (7 kW)
* Requirements given are specified at the cabinet air intake.	
** The temperature of the conditioned air that enters the room must not be less than 42° Fahrenheit (6° Celsius) below the mean room temperature.	

Note: Full Load UPS heat dissipation may increase peak dissipation by 28900 BTU/hr (8.5 kW).

- a. The MR system heat dissipation is dependant on the type and duration of the acquisition. Therefore, actual heat dissipation will vary greatly. Equipment room air conditioning provided at average heat dissipation will result in dangerously high temperatures during peak loads, causing permanent damage and voiding system warranty. As such, air conditioning must be designed to handle peak loads.
- b. Heat dissipation of an optional chiller, if installed in the equipment room, is not included.
- c. A slight air overpressure is recommended to avoid dust build-up.
- d. The HVAC system must be designed around equipment cabinet air flow/circulation. Modifying the room layout is allowed only after consulting the HVAC provider to avoid "hot spots".
- e. Pollution: The equipment room is equipped with highly technical medical electronics. To avoid any potential failures due to pollution, dust containment should be considered (despite individual system parts having air filters). Ceilings walls and floors must be sealed to prevent dust particles from releasing into the air. Special attention shall also be considered when there is a cement floor slab under raised computer floors. Before the delivery of any equipment and after any construction, the site must be cleaned before turning on the MR system. The air conditioning system must be equipped with 90% less than 10 micron particles and 80% less than 5 micron particles filters.

2. Control Room Specifications

- a. Comfort depends on local practice and preferences. For this reason, it is the responsibility of the customer to define the appropriate conditions of the control room for human comfort.

Ambient Requirements		
Temperature	MRI Equipment	50° - 95° F (10° - 35° C)
Maximum Temperature Change		9° F (5° C) per 10 min.
Relative Humidity		30% to 70%, no condensation
Total Heat Dissipation to Air		
Peak Dissipation Scanning		1024 BTU/hr (0.3 kW)

3. Exam Room Specifications

Scan procedures involves the emission of RF energy. This can raise patient temperature. The amount of energy absorption (Specific Absorption Rate) is directly related to the ambient conditions. Therefore, the ambient requirements for the exam room are mandatory for safety.

Ambient Requirements	
Temperature ***	65° - 72° F (18° - 22° C) Preferred for patient comfort: 70° F (21° C)
Maximum Temperature Change	9° F (5° C) per 10 min.
Relative Humidity ***	40% to 70%, no condensation
Total Heat Dissipation to Air	
Dissipation **	9895 BTU/hr (2.9 kW)
** Gradient coil heat dissipation (3400 - 51200 BTU/hr [1 - 15 kW]) will be removed by liquid cooling.	
*** Exam room temperature and humidity specifications are critical for the MR and must be met at all times. No exceptions are allowed.	

- a. The air under the suspended ceiling must be routed via an air grill (opening) in the suspended ceiling to the void above the suspended ceiling but remain inside of the RF enclosure.
- b. A slight overpressure is required to avoid dust penetration
- c. The air exchange rate in the examination room (for equipment under the suspended ceiling) must minimally be 5 times per hour at a minimum air flow of 235 CFM (400 m³/h). The air inflow under the suspended ceiling must disperse evenly to ensure comfort and avoid "hot spots". Additional 235 CFM (400 m³/h) must be supplied above the suspended ceiling in the top covers near the magnet shroud.

- d. The conditioned air must enter the examination room through RF feedthrough wave guides.
- e. If a dedicated HVAC system is used in the exam room, it is recommended that a system be designed to provide malfunction warnings, since excessive over/under temperatures or high/low relative humidity may damage the MR system.
- f. Due to the use of helium in the magnet room, various precautionary measures can be taken to assure safety. One precautionary solution is to have a high air refreshment degree (towards 100% ie. no re-circulation). Other solutions include having an oxygen monitor and emergency venting system. Consult an air conditioning supplier and/or RF enclosure supplier to determine the best solution. For all VA Medical Centers, Oxygen Monitors may be required in the air duct outside the RF room. Check local and VA codes.
- g. The air flow through the magnet assembly must always be maintained while the system is in use.
- h. Installation of Temperature and Humidity sensors in the RF-enclosure can be a problem due to the RF-filters required for each electrical cable entering and leaving the RF-enclosure and possible electrical interference. Best solution is to locate the sensors directly outside the RF Enclosure in the HVAC air return.
- i. Smoke / fire detection system to be installed according to local code, fire and smoke detection common for medical devices and equipment with corresponding power rating. The use of these detectors inside the RF-enclosure is limited due to possible RF-interferences. A possible alternative is to install the detection device inside the air out / return duct located outside the RF-enclosure. Another alternative is to install an Aspirating Smoke Detector.
- j. Smoke detection, temperature sensing, thermostats, humidity sensors, fire suppression duct control units, fire flashers/buzzers/annunciators and O2 Sensors, etc. inside exam room, MUST have a MR compatibility certification document. They must have NO INTELLIGENCE: No micro-processor control, no oscillators, no stepper motors, and no source of clock signal at all. If they do, and there is no MR compatibility certificate, it means that the device is disqualified for use inside the RF room.
- k. System Air Cooling Unit
- Heat from the magnet gradient coil will be removed via the SACU (System Air Cooling Unit). The SACU and ventilation hose are delivered by Philips.
 - The necessary 6.25" (160mm) System Air Cooling waveguide is to be provided by the RF enclosure supplier.
 - 235 CFM (400 m3/ h) of the inlet air will be directed through the magnet shroud. This will be pulled through the magnet by the SACU via the Gradient Exhaust RF Feedthrough and a Philips provided 5.5" hose (140mm).
 - The exhaust air from the SACU must be directed back into the return air by a customer/contractor provided interface.

(19.0)

Additional Exam Room Air Feedthrough Requirements

1. Emergency Overpressure Grid RF Feedthrough

It is required that an emergency overpressure RF feedthrough be installed. This will help avoid extreme pressure build-up if a quench were to ever occur and helium venting were to fail. Even if the door swings outwards, the emergency overpressure RF feedthrough is required, in case of an air exhaust or air conditioning malfunction. The volume behind this grid must be able to evacuate 24720 ft³ (700m³) of helium gas in approximately 20 minutes, or the emergency venting system must extract the volume of the examination room 20 times per hour. The minimum size of this grid is 24" x 24" (600mm x 600mm). The feedthrough can be coupled with an oxygen monitor which triggers a fan for added safety. To optimize air conditioning / air balancing of the Examination room, the overpressure RF-filter can be closed / covered with a lid or louvers (one direction valve) to avoid that air is routed inside the RF-enclosure from an unconditioned source. The lid or louvers must open automatically if an overpressure is present due to air handling or helium vent pipe failure.

2. Air Escape RF Feedthrough

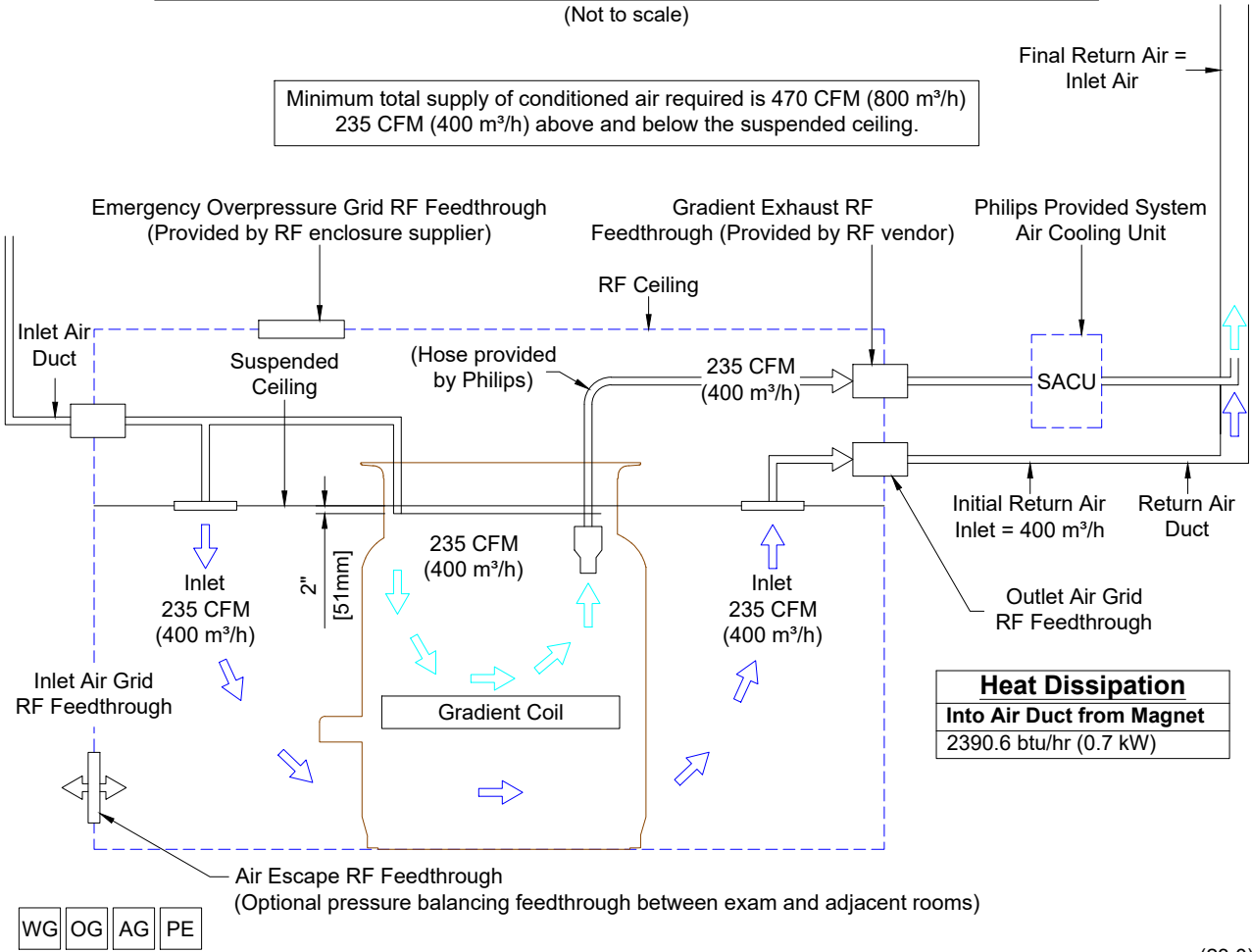
To ease the opening and closing of exam room entry doors, and prevent ceiling tiles from shifting when doors are opened or closed, an optional pressure balancing feedthrough can be installed between the exam room and adjacent room. Placing this feedthrough at the control room wall may lead to an increase in noise and affect comfort level.

(23.0)

OG PE

Detail - System Air Cooling, Emergency Overpressure Grid RF Feedthrough

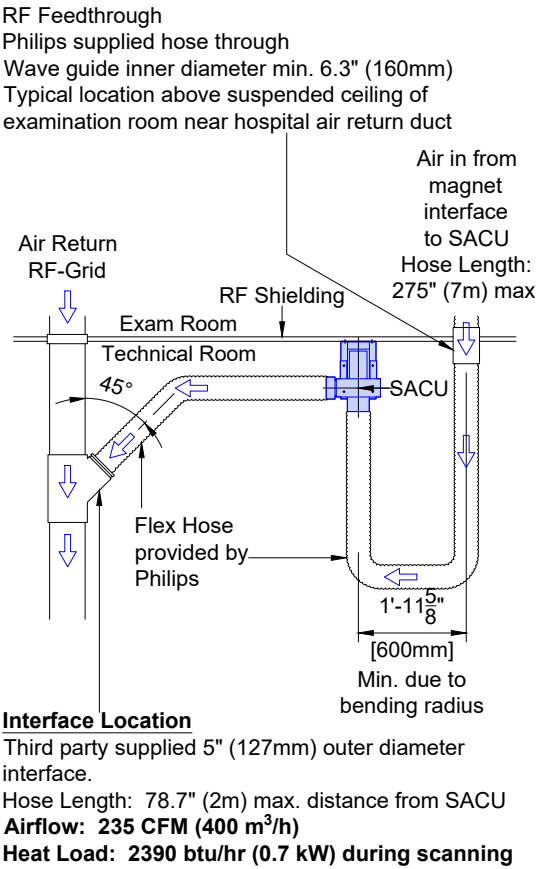
(Not to scale)



(23.0)

Detail - System Air Cooling Unit - Air Flow

(Not to scale)



Interface Location
Third party supplied 5" (127mm) outer diameter interface.
Hose Length: 78.7" (2m) max. distance from SACU
Airflow: 235 CFM (400 m³/h)
Heat Load: 2390 btu/hr (0.7 kW) during scanning

(16.1)

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

Drawing Number: N-EAS220370 B

Date Drawn: 4/11/2025

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Order: 6600723105.010000

MP5

Haskris OPC24 Chiller - Specifications/Notes

1. Haskris OPC24 AC Chiller Siting Requirements
- a. Customer/contractor required to flush out (with water) all piping prior to connecting to chiller. There must be no debris in the piping when final connections are made.

b. Mechanical contractors must supply and fill all chilled water systems, prior to "commissioning", with ethylene/propolene glycol and water solution. Haskris chillers require a water/glycol mixture of 35-40% glycol to water for regions with ambient temperatures greater than -13°F (-25°C). Regions with colder temperatures require a low ambient chiller model and higher glycol concentrations (up to 50%). Use Distilled, Demineralized, or Reverse Osmosis water. Customer/contractor responsible for providing and installing glycol.

c. Chiller must have a recommended minimum of 8' (2.5m) overhead clearance in order to allow proper discharge of warm air from the chiller. Siting must be such that the condenser constantly receives fresh outside air. In addition, chiller must be located such that there is no possibility of condenser fans ingesting lint (from hospital industrial dryers), leaves, sand, dirt or any other materials that can quickly obstruct the condenser fans.

d. The chiller cannot be located in any fully enclosed area (e.g. pits, unused stairwells, closets).

e. Chiller cannot be located next to other heat generating devices or systems (i.e. condenser exhaust or vents, veneration ducts, heating exhaust, etc.). Chiller must be positioned such that it avoids other systems hot air discharge.

f. Any actions and/or add-ons for noise abatement beyond what is provided with the chiller (if any) is solely and exclusively the responsibility of the customer/contractor and must not violate any service clearances or chiller warranty.

g. Maximum allowed elevation above sea level is 6562' (2000m).

h. Ambient temperature range must be between (-40° F to +122° F [(-40° C) to +50° C]).

i. Liquid feed temperature range is 46.4° F to 86° F (8° C to 30° C).
- Use only the following materials for the pipes: L Copper (recommended); Stainless steel (ensure that the appropriate steps are taken to protect the pipe along its length.) Never use black steel or PE or PVC piping. Insulate piping to minimize condensation.
- j. The maximum one-way linear piping distance between chiller and CIP is 600' (182.9m). (See table)

k. The maximum long radius allowed elbows in total piping run is 20 pieces.

l. Long radius elbows must be used.

m. Maximum height difference between chiller and MRI for chillers located above: 100' (30.5m), for chillers located below: 32' (9.8m).

n. Chiller must be located a minimum 208" from magnet isocenter to avoid Electromagnetic Field interference from the motor. Refer to Sheet SN1 for details.
2. Haskris OPC24 Chiller Commissioning Notes
- a. Haskris chillers shall commission the chiller. A completed "Pre-Startup Checklist" shall be forwarded to your Philips Project Manager prior to commissioning. Items incomplete at the time of the commissioning will generate delays and additional commissioning costs to be incurred by the installer. Philips Project Manager to schedule Startup with Haskris.

b. Mandatory Commissioning Conditions:

- The Startup must be scheduled no less than 10 business days in advance of the requested startup date. The "Pre-Startup Checklist" must be completed and returned prior to scheduling.

- The Startup visit will be conducted within standard business hours. Weekends and after hours Startup service may be available at an additional charge.

- 4 hours is allotted for the completion of this service. If the Startup is delayed due to the site not being adequately prepared, additional charges may apply.

- The Mechanical Contractor responsible for Electrical and Piping installation must be on site during the Startup visit.

- The site's plumbing lines must be flushed before connecting to the chiller.

Additionally, all lines must be leak checked with pressurized air (no water) prior to the arrival of Haskris technician. All wiring must be installed and connection made prior to Haskris technician's arrival. Additionally, safety disconnects must be installed and tested.

- A water sources must be available within close proximity (i.e. garden hose attached to a building water supply) for maintenance purposes.

- The Haskris technician will verify the chiller installation was completed per manufacturer's guidelines, and will complete the Startup Checklist while onsite.

c. Commission Summary - The commissioning technician will:

- Verify: inlet voltage, proper pump, compressor, and condenser fan rotation, clearances, control voltage (adjust primary multi-tap as required), water levels in tank.

- Start unit and check: refrigerant operation, pumps and water hose connections for leaks, operation of remote controller (per customer's requirements), amperage of compressor/pump/condenser fans, correct minor installation problems, review proper operation with maintenance personnel, provide report to Philips.

* Installation, rigging, and support (i.e. concrete pad or roof curbing) of Chiller to be provided by customer/contractor. Installation and support of Chiller to follow local codes.

(24.0)
- Mechanical / Plumbing Layout
- All piping to be minimum 1-1/2" (40mm) copper (recommended) or stainless steel with long radius bends, provided and installed by customer/contractor. All Full port ball valves and branching tees to be provided and installed by customer/contractor.
- Customer/contractor to insulate all piping to prevent condensation and to minimize heat gain from ambient air.
- Maximum long radius 90° elbows: 10 long radius elbows one way (or 20 round trip). Maximum elevation above sea level is 6562' (2000m).
- | Relation of Pipe Diameter to Distance between Chiller and CIP | | |
|---|------------------------|-------------------------------|
| CIP | Connections at Chiller | Max Allowed One Way Piping |
| OPC 24
87 LPM/ 23 GPM | 1-1/2" NPT | <=600' (182.9m) @ 1-1/2" Pipe |
| | | <=2400' (731.5m) @ 2" Pipe |
| For distances exceeding 2400' (731.5m) of straight pipe one way or actual pipe length, e-mail contact to service@haskris.com. | | |
- For CIP purchased from PHILIPS, refer to Installation and Operation manual from the manufacturer for all detailed specification and installation requirements.
- All flow, temperature, and pressure gauges shown on the diagram below are required and must be installed prior to chiller delivery. Required gauges are included with the Philips CIP.
- Outside

(Location t.b.d. by customer/contractor)

Haskris OPC24 Chiller

Equipment Room

1-1/2" (40mm) full port ball valves located at an accessible height above the CIP. Contractor to make final supply and return connections to CIP.

3/4" (19mm) NPT (Internal Thread)

Backup Water

CIP

LCC

1/2" (13mm) Drain Hose Connection

Drainage

Plumbing provided and installed by customer/contractor.

Plumbing provided and installed by Philips.

* Because the "LCC" is delivered with the magnet, customer/contractor must provide a closed loop system so the Chiller can be tested prior to magnet delivery.

** If a chilled water system is used, it is the customer/contractor responsibility to meet all codes concerning the dumping of glycol. The amount of glycol (by volume) drained during a switch-over is the total volume of piping between the CIP and LCC multiplied by the concentration.

** Maximum length hose between chiller and LCC is: 98' (30m).

(24.0)
- Mechanical / Plumbing Notes
1. Liquid cooling is required 24 hours / 7 days a week. It is the customer/contractor's responsibility to ensure the water source meets the Primary Coolant, Flow, and Pressure Drop Requirements below. Failure of the cold water distribution system will result in a shutdown of the MR system and very high liquid helium boil off.

2. Primary Coolant Requirements to the Liquid Cooling Cabinet (LCC):

Inlet Water Quality	Potable Distilled Water
Inlet Water Acidity	6.0 - 8.0 pH
CaCO ₃	< 250 ppm
Hardness	< 14 (degrees German hardness)
Chlorine	< 200 ppm
Maximum Suspended Matter	< 10 mg/L, <100 micron particle size
Inlet Water Temperature	43° - 59° F (6° - 15° C), 54° F (12° C) preferred
Maximum Flow	23.8 GPM
Maximum Inlet Pressure	87 PSI (6 Bar)
Inlet Water Temperature Stability	± 3.6° F (± 2° C) per 10 minutes
Ethylene/Propolene Glycol Concentration	MRI Chiller: Minimum 35% - Maximum 50%. Hospital Chilled Water: Minimum 0% - Maximum 50%.
Heat Dissipation to Liquid	23,900 - 204,730 btu/hr (7 - 60 kW)

3. Flow Requirements to the Liquid Cooling Cabinet (LCC):

- Flow in gallons per minute versus inlet temperature in Fahrenheit of the chilled water needs to fall into the area on or between curves A and B for each of the graphs in order to maintain enough cooling capacity.

- Maximum flow not to be exceeded to avoid temperature instability in the secondary circuit.

- If needed due to local requirements, it is allowed to use a mixture of maximum 50% of Glycol. Make sure that the supplier of the chilled water calculates the correct flow needed.
- (100% water)
4. Pressure drop through Liquid Cooling Cabinet (LCC):

- If needed due to local requirements, it is allowed to use a mixture of maximum 50% of Glycol. Make sure that the supplier of the chilled water calculates the correct flow needed.

(100% water)

5. It is recommended to provide a water back-up system in case the cold water supply to the LCC is down (due to servicing or failure) to reduce the amount of liquid helium evaporating. (Clinical use/scanning is not possible on tap/domestic water because it does not meet cooling requirements.) Maximum allowed time of tap/domestic water cooling is 2 weeks. Field to work with service team on final plumbing connection method to LCC.
- Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

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- MP6
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- 6.30.2020

Philips Healthcare Remote Services Network (RSN)

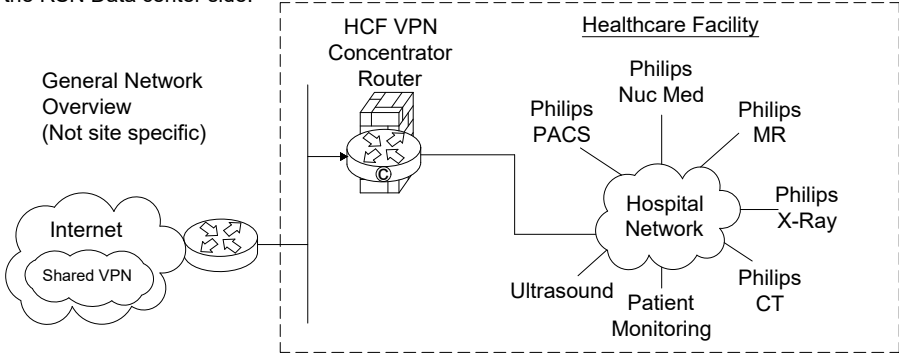
Secure broadband connection required for Philips remote technical support, diagnostics, and applications assistance

Broadband Site-to-Site Connectivity (Preferred)

This connectivity method is designed for customers who prefer a connection from the RSN Data Center to the Health Care Facility (HCF) utilizing their existing VPN equipment.

Connectivity Details:

- A Site-to-Site connection from the RSN data center's Cisco router will be established to the HCF's VPN concentrator.
- The VPN Tunnel will be an IPSEC, 3DES encrypted Tunnel using IKE as standard, but alternative standards are also available, such as AES, MD5, SHA, Security Association lifetime and Encryption Mode.
- Every system that we will be servicing remotely will have a static NAT IP that we configure on the RSN Data center side.



Action Required by Hospital:

- Review and approve connection details.
- Complete appropriate Site Checklist.
- Configure and allow Site-to-Site access prior to setting up connectivity depending on the access criteria that the HCF decides to implement (ex: Source IP filtering, destination IP filtering, NAT assignment, etc.).
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to the designed IP provided by Philips.

Broadband Router Installed at Health Care Facility

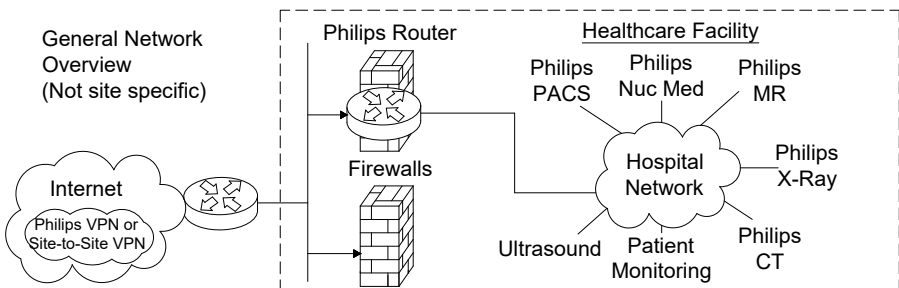
This connectivity method is designed for customers who have a dedicated high speed connection for Philips equipment.

Connectivity Details:

- An RSN Cisco 1711 or 1712 router will be preconfigured and installed at the HCF by Philips in conjunction with the HCF IT representative.
- The VPN Tunnel will be an IPSEC, 3DES encrypted Tunnel using IKE and will be established from the RSN-DC and terminated at the RSN Router on-site.
- One to One NAT is used to limit access to Philips equipment only.
- Router Config and IP auditing is enabled for Customer IT to view via website 24/7.
- Dedicated DSL connections are also supported.

Option 1: Parallel to HCF Firewall Connectivity Method

This connectivity method is designed for customers who prefer a Philips RSN Router installed on site utilizing all the security features provided and managed by Philips.

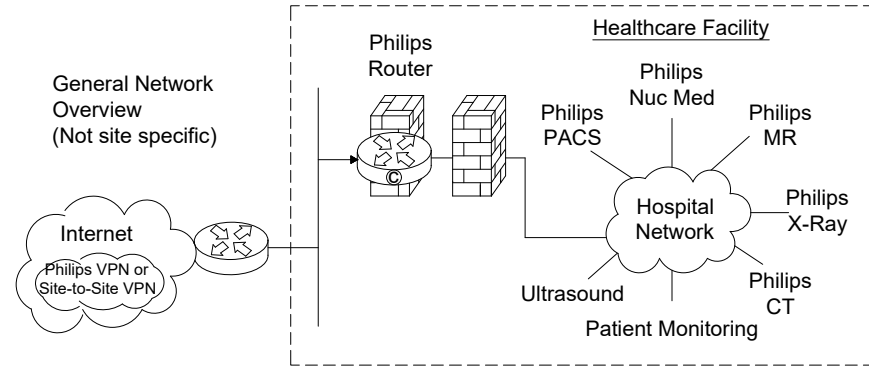


Action Required by Hospital:

- Assign a fixed public IP Address from the ISP to be configured on the Philips router. This is the DOTTED link on the picture connected to the firewall.
- Assign a Back end IP for the Philips router on the Hospital Network.
- Complete appropriate Site Checklist.
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to internal Philips router Ethernet interface. This is the DASHED line connected to the firewall.

Option 2: Back End Connected to the HCF Firewall Connectivity Method

This connectivity method is designed for customers who prefer a Philips RSN Router installed on site by setting up an IP-Based policy allowing access thru existing HCF Firewall to Philips equipment.

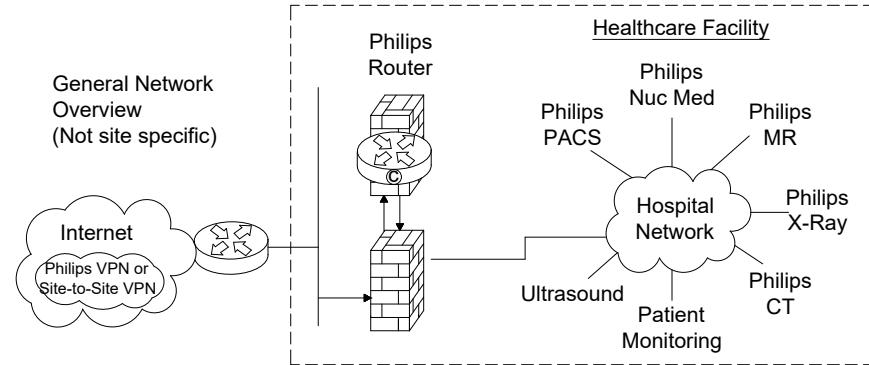


Action Required by Hospital:

- Assign a fixed public IP Address from the ISP to be configured on the Philips router. This is the DOTTED link on the picture connected to the firewall.
- Assign a Back end IP for the Philips router on the Hospital Network.
- Complete appropriate Site Checklist.
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to internal Philips router Ethernet interface. This is the DASHED line connected to the firewall.
- Configure and allow on the firewall on the DASHED line interface access between the IP address allocated by the hospital to the Philips internal Ethernet router interface and the target modality IP address.

Option 3: Router Installed Inside the HCF's DMZ

This connectivity method is designed for customers who prefer the RSN Router installed inside an existing, or new DMZ, allowing access to Philips equipment.



Action Required by Hospital:

- Assign a fixed public IP Address from the ISP to be configured on the Philips router. This is the DOTTED link on the picture connected to the firewall.
- Assign a Back end IP for the Philips router on the Hospital Network.
- Complete appropriate Site Checklist.
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to internal Philips router Ethernet interface. This is the DASHED line connected to the firewall.
- Configure and allow on the firewall on the DASHED line interface IPsec protocol communication by opening protocol 500, 50, 51, 47 and port 23 + TACACS. Traffic should be between external IP Address located on the Philips router and the RSN Data center IP address 192.68.48/24 and IP address AOSN TACAS.
- Configure and allow on the firewall on the DASHED line interface access between the IP address allocated by the hospital to the Philips internal Ethernet router interface and the target modality IP address.

System Network Information

IMPORTANT NOTE:

It is the customer's responsibility to coordinate with the local Philips Engineer to provide ALL required network information and install ALL required network and cabling & drops according to Philips specifications PRIOR to the scheduled installation start date. Failure to do so may delay system installation and jeopardize the customer hand over date.

MRI Scanner				
	Default	Hospital Preference		
AE Title:	MR1			
Port Number:	104 >= R2.6.3 3010 < R2.6.3			
IP Address:				
Subnet Mask:				
Default Gateway:				
Extended Work Station (EWS)				
	Default	Hospital Preference		
AE Title:	EWS1			
Port Number:	3010			
IP Address:				
Hospital Network				
	RIS	PACS (STORE)	PACS (Q/R)	DICOM PRINTER
AE Title:				
Port Number:				
IP Address:				
RSN Ports				
Application		Port		
Field Service Framework for MR		4440 and 80 (TCP)		
McAfee ePolicy Orchestrator		80 (TCP)		
Remote Desktop Sharing (Lots/To)		5900 (TCP)		
Secure FTP (Passive)		22 (TCP)		
Telnet SSH2		22 (TCP)		
Philips Service Agent (Outbound)		443 (TCP)		

PHILIPS

Project

Smartpath to MR 7700

VA Medical Center West Haven

West Haven, CT

Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa

Contact Number: 516-848-7433

Email: taylor.larosa@philips.com

Drawn By: Alejandra Lozano

Project Details

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N1

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Chiller Installation Checklist

It is the responsibility of the customer/contractor to ensure that this unit is properly installed before Philips begins installation and commissioning of your chiller. Philips can provide at additional charge, contractors who can install this system and/or glycol in premixed concentrations if you so desire. Please contact your Project Manager for assistance.

By signing the following checklist, you agree that all of the below steps have been properly completed before the commissioning begins. Additional charges may apply if any of the below are not completed properly. The unit must be powered (in operation) and meet all of the below a minimum of 8 hours before Haskris arrives on site to commission the chiller system.

- ☐ No refrigeration service contractor labels affixed to the interior or exterior of the Chiller.
- ☐ Chiller is securely mounted and level.
- ☐ Chiller is at an elevation <100 ft higher than the MRI or <32 ft lower than the MRI.
- ☐ Minimum 54" clearance on condenser sides, minimum 36" clearance on non-condenser sides, and unobstructed space above the unit. Consult Haskris if clearances will be smaller than these recommendations. Haskris will evaluate individual site conditions and provide guidance on how to use the smaller space to ensure proper operation.
- ☐ Chiller is not near another heat source. Examples: condenser vents, heating exhaust, etc.
- ☐ No visible damage to the unit due to transportation or rigging.
- ☐ Lines are nominal pipe size 1-1/2", 2", or larger in accordance with Haskris Manual.
- ☐ Lines are type L copper piping and non-ferrous materials.
- ☐ Lines are insulated.
- ☐ Beginning and ends of hard runs have vibration isolators.
- ☐ Air purge valves are installed at high points. Manual ball valves recommended. If automatic purge valves are used, isolation ball valves installed before the purge valves.
- ☐ Air purge valves closed.
- ☐ Drain valves are installed at the base of every rise.
- ☐ Heat trace is installed on any piping exposed to temperatures below +20°F (-6.7°C).
- ☐ Isolation ball valves installed on supply and return connections.
- ☐ Flush ports with isolation valves installed after supply and return ball valves.
- ☐ Isolation ball valves are open and flush ports are closed.
- ☐ Lines are connected to the Philips LCC.
- ☐ Reservoir and piping is filled with glycol mix (35-40%).
- ☐ Extra glycol mix is provided for replenishing the system during startup.
- ☐ All piping is free of leaks.
- ☐ Incoming electrical matches the nameplate on the chiller.
- ☐ All electrical terminations are tight, tighten if necessary.
- ☐ Electrical power has been applied (energized disconnect) for at least 12 hours.
- ☐ Remote Control Panel mounted indoors and wired to the chiller.
- ☐ Time and date displayed on controller are accurate.
- ☐ Solid green light on the phase monitor.
- ☐ No faults on the controller.

Chiller Installation Checklist One Week Prior to Delivery

- ☐ All criteria on Chiller Pre-Startup Checklist for commision completed and commissioning service scheduled.
- ☐ If a water bypass system is incorporated into the design, all associated plumbing completely installed.

Customer/Contractor Signature	Date	Print Name	Date
Title		Accepted By (Philips)	Date

Site Readiness Checklist

Instructions:

- This form is to be used by Project Manager and Customer/Contractor.
- Information is used to develop and determine site ready date.
- Be sure to contact Zone Installation Specialist (ZIS), Field Service Engineer (FSE), or National Support Specialist (NSS) if you have questions concerning any of these checklist items.

Site Planning Requirements/Req'd Prior to Z4:

- ☐ Environmental Survey: Completed. (Required for 3.0T and applicable for 1.5T if known disturbances are near the magnet).
- ☐ Ferro-Magnetic Reinforcement and Structural Beams: Have been verified by the Customer/Contractor and meet specifications per Philips Final Drawings.
- ☐ Drawings (Final): Approved by customer shows all room obstacles to include millwork, lighting overlay, structure overlay, medical gases and plumbing. Customer's Architect engaged (if applicable).Architect engaged (if applicable).
- ☐ **Site Preparation / REQ'D 30 days prior to final inspection:**
- ☐ GC Schedule aligns with Philips equipment delivery date. Permits and Inspections: completed by applicable governing authorities.
- ☐ Performance Testing Requirements Identified: Determine if certificate of compliance is required.
- ☐ Rigging: Plan is approved and Rigger is scheduled.
- ☐ Chiller Commissioning: Has been scheduled.
- ☐ Helium Exhaust Pipe (HEP) Design Approval (if applicable): Wave Guide location on the RF enclosure, and the Customer/Contractor HEP design, (outside the RF enclosure), have been reviewed and approved by Philips Site Planning.
- ☐ Table Isocenter: Verified per Philips Final Drawings.
- ☐ Passive Shielding Installed (if applicable): Verify per the Philips Final drawing the distance between the rear wall and the rear magnet feet, (use the middle point of the thread of the height adjustable foot).
- ☐ Existing Equipment: Is dismantled and removed from the site.
- ☐ **Site Preparation / REQ'D 15 days prior to final inspection:**
- ☐ Helium Exhaust Pipe (HEP) (Inside) RF Enclosure(if applicable):Can be mounted per Philips Final Drawing.
- ☐ Helium Exhaust Pipe (HEP) (Inside) RF Enclosure- Insulation (if applicable): Installation has been arranged for day 3 after magnet delivery.
- ☐ [USA Only] Helium Exhaust Pipe (HEP) Snapshot Approval: HEP photos have been sent to the BIU Snapshot Team, and approved 2 weeks prior to delivery, using document DMR 351123.
- ☐ Electrician: Is scheduled to connect facility Mains to MDU on delivery day.

Site Preparation / REQ'D 10 days prior to final inspection:

- ☐ Helium, (if applicable): Has been ordered through service for initial Helium fill of magnet.
- ☐ Suspended Ceiling Magnet Service Area: Installed and unobstructed, per Philips Final Drawings.
- ☐ Floor Plate Anchoring: MRI Floor Pad Containment Confirmation document submitted to and approved by Q&R (Snapshots).
- ☐ Chiller Startup: Chiller required operational 2 wks prior to magnet delivery (water, plumbing, valves are installed by Customer/Contractor, flushed, leak tested, free of air, functionally verified). If required facility water connections are prepared for LCC connections.
- ☐ RF Enclosure: Has been certified by RF Vendor, per Philips Final Drawings.
- ☐ Mains Power Supply: Installed per Philips Final Drawings. (Including impedance, isolated grounds, wire size verified, and distribution unit has been installed).
- ☐ Equi-Potential Reference Bar (ERB): Installed per Philips Final Drawings. All Philips-provided electrical boxes and contractor-provided raceway are grounded to the ERB.
- ☐ Floor Levelness: Checked with Laser Level and is level per Philips Final Drawings.
- ☐ Magnet and Table Mounting Pads: Have been checked for level, and location, per Philips Final Drawings.
- ☐ RF Doors: Installed.
- ☐ RF Glass: Installed.
- ☐ Ceiling (Hard/Gyp.): Installed.
- ☐ Walls: Installed.

Site Preparation / REQ'D 5 days prior to final inspection:

- ☐ Ceiling Ladder Trays: Installed and grounded, per Philips Final Drawings.
- ☐ Cable Trough/Cable Raceway/Conduit: Installed, cleaned and locations checked per Philips Final Drawings. Duct covers in place. Cable openings are clear, without sharp edges. A Greenlee pull string / measuring tape (part no. 435 or equivalent) has been installed by Customer/Contractor and validates runs are within Philips length restrictions.
- ☐ Ceiling: Ceiling grid installed, (ceiling tile may be excluded around the magnet and System Filter Box (SFB). Sprinklers, lighting, HVAC ducts, and all other 3rd party items above suspended ceiling are positioned correctly.

- ☐ RF Cage Grounding: Connected from Protective Earth (PE) Bus Bar to the facility PE point. Responsibility of the local electrical contractor.
- ☐ Mains Power and PE: Ready for connection to MDU on delivery day, per Philips Final Drawings.
- ☐ UPS: Fully installed per Philips Final Drawings, and startup has been scheduled with vendor.

Site Preparation / REQ'D at final inspection:

- ☐ Customer Site Preparation: Verified per Philips Final Drawings.
- ☐ CPM has coordinated any ongoing work that will overlap with the installation window with the lead installer.
- ☐ Service Light, Switch, and Receptacle: Installed above the ceiling, per Philips Final Drawings.
- ☐ Material within RF Enclosure: Is non-ferrous, to include ceiling raceway, ceiling tile grid, hangers, diffusers, nuts and bolts.
- ☐ Metals: (e.g. aluminum strips, light fixtures, air handling grids, supports, etc.) are connected to the central RF Enclosure grounding point using a toothed washer.
- ☐ HVAC (Climate Equipment): Customer/Contractor has installed and verified system is and operational and balanced to meet humidity and temperature requirements per Philips Final Drawings.
- ☐ Sprinklers: Installed.
- ☐ DC/AC Ground stopped between Distribtuion Box and DC/AC RF Filters. Non-conductive conduits run from each DC or AC power wire to its own RF filter as specified in ED1. (Only applicable outside the RF shield).
- ☐ SACU wall backing installed: SACU can be mounted at planned location.
- ☐ Door Interlock Switch: Installed per Philips Final Drawings.

Pre-Delivery day requirements:

- ☐ Ceiling Tiles (False/drop/suspended): Installed, excluding those in magnet service clearance area or below cable trays.
- ☐ Delivery Path Closure: Is planned to close the RF cage and complete cable ducts, wave guides, ceiling, floor, walls, PE, lights and electricity. Ceiling may be left open around the magnet, SFB and cable duct. All work to be done within 2 days after magnet delivery.
- ☐ Flooring: Installed and covered with protective covering (i.e. scratch protection).
- ☐ Room: cabinets, furniture, millwork, and counter tops installed.
- ☐ Restroom Facilities: Toilet facilities, including area to wash up, are available.
- ☐ Philips Project Space: Is clean, free of dust, all construction-related debris and tools have been removed.
- ☐ Ceiling (Hard): Painted.
- ☐ Walls: Final finish applied, (i.e. final coat painted and/or wall covering applied).
- ☐ Ferro-Magnetic Materials: Have been removed from the examination room.
- ☐ Network Connections: Hardware is installed and active per Philips Final Drawings.
- ☐ Site Is Safe To Work: PPE requirements identified (Construction and Hospital). No open Mains, slippery floors, sharp edges, or hazardous goods on site.
- ☐ Philips Field Pre-Job Safety Brief to be completed and posted on door.
- ☐ Installation Team: Has received the room drawings and necessary contact phone numbers.
- ☐ UPS: Commissioned and certified by UPS vendor (only applicable to full system UPS). Mid-tier UPS units are prepared to be handed over to the installer.
- ☐ Delivery Path and Truck Parking: Has been checked with the customer, including verifying floor loading, delivery route, elevator capacity, height, width and depth clearances, and a plan for bad weather.
- ☐ Delivery Route: Route is prepared as committed, checked for size, max floor load and all obstacles have been removed. Check on forecasted weather conditions. PM to have an operational plan.
- ☐ Transport & Handling Tools: Crane, forklift, wheels and trolleys have been specified with the LMP/rigging company. NOTE: If rigging provided by Philips, verify the vendor is on the Philips' approved suppliers list.
- ☐ Site Access: Is available for after hours. Storage for tools, parts, covers and packing material has been arranged.
- ☐ Room Security: Room is secure, with keys and alarm codes provided.
- ☐ Parking: Parking area identified for installers.

Prior to Philips system Power up:

- ☐ Wall Outlets: Installed and functional.
- ☐ Room Lighting: Installed and operational.

Prior to install complete:

- ☐ Network Connections: All network information provided by facility IT, i.e. IP addresses (static IPs only), AE Titles, SNM, GTWY and DNS server are available.
- ☐ Physicist: If required, verify the Physicist has been scheduled.

Site Requirements/Readiness - Signature

Approved for Delivery

Customer/Contractor	Date	Project Manager (Philips)	Date
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Project

Smartpath to MR 7700

VA Medical Center West Haven
West Haven, CT
Room: MRI

Philips Contacts

Project Manager: Taylor LaRosa
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Drawn By: Alejandra Lozano

Project Details

Drawing Number
N-EAS220370 B
Date Drawn: 4/11/2025
Quote: Q-00361165
Order: 6600723105.010000

CHK1

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AE MR Installation Responsibilities, Tier 3								Installation Item	Supplied by Philips	Installed by Philips	Supplied by Shield Vendor	Installed by Shield Vendor	Supplied by Contractor	Installed by Contractor	Category	Notes
AE MR Installation Responsibilities, Tier 3								Projector	X	X					Wall projection	
Installation Item	Supplied by Philips	Installed by Philips	Supplied by Shield Vendor	Installed by Shield Vendor	Supplied by Contractor	Installed by Contractor	Category	Notes	Fiber optic converters for projector	X	X				Wall projection	
									Projector box ventilation (if necessary)					X	X	Wall projection
RF Cage, door, window			X	X			Basic	If required; Site planning to check InBore specs	Power supplies for fiber converters	X	X				Wall projection	
Magnetic Shielding					X	X	Basic		ELO Touch Screens (wall and desk)	X	X				Touchscreen	
Floor covering					X	X	Basic									
Floor island					X	X	Basic	If to be included	Conduit runs from AECC to ATSW (wall mount touchscreen) and ATS junction box for video and USB							Can combine the two conduit runs for each touchscreen to one if local code allows. One 2" conduit per touchscreen
Exam room walls (including projection wall)					X	X	Basic	Projection wall clear of items that could obstruct image					X	X	Touchscreen	
Rounded corners					X	X	Basic	If to be included	Power for the touchscreens and USB extender (In ATSW junction box and under operator's console				X	X	Touchscreen	For ATSW, power located inside the ATSW box facing toward the center of the box.
All conduits/boxes/trays specified for AE cables					X	X	Basic	Listed below	Power cables for touchscreens	X	X				Touchscreen	
Exam room functional lighting					X	X	Basic	Functional lighting recommended locations shown on Philips site plans.	Remote USB extender for touchscreens (In ATSW JB and attached to operators touchscreen)	X	X				Touchscreen	
AE AECC cabinet	X	X					AECC Cabinet	Built at install	Junction box for ATSW and ATS				X	X	Touchscreen	
Location of AE AECC Cabinet in technical room					X	X	AECC Cabinet									
Mains electrical duplex outlet for AECC Cabinet					X	X	AECC Cabinet		Cables for USB and video for touchscreens	X	X				Touchscreen	
Junction box for AECC conduits					X	X	AECC Cabinet		Exam Room Display	X	X				Exam Room Inbore	MR Compatible monitor
Wireless access point (optional)	X	X					AECC Cabinet		Exam Room Display power supply	X	X				Exam Room Inbore	Mounted above ceiling near monitor and power outlet
External video (AVI) single gang box					X	X	Audio/ Video	Connects to MR AiBo	Opening in finished examination room wall centered on iso-center on rear wall					X	Exam Room Inbore	Dimensions on Philips site plans
External video(AVI) face plate	X	X					Audio/ Video		Distance between exam room wall and RF wall > 6"						X	Exam Room Inbore
AE audio output cable to MR system	X	X			X	X	Audio/ Video	Optional - if purchased from Philips	Monitor mounting frame					X	Exam Room Inbore	Needs built to specs in site plans.
Power outlet for External Video source					X	X	Audio/ Video	Optional - if including coil cabinets in the room	Local filtered mains power outlet near power supply in ceiling					X	Exam Room Inbore	Above ceiling. Can use the same filter power for projector
Coil cabinet(s)	X						Cabinets	Optional - If needed and not using aluminum ceiling tiles with Halo	Conduit runs from AE Cabinet for video and network fibers to waveguide					X	Exam Room Inbore	Fiber cables. Can use a larger conduit to for the projector fiber cables and monitor cables
Opening in wall for Coil Cabinets					X	X	Cabinets	Typically included with Halo unless purchases without aluminum ceiling tiles.	Power cable for InBore Monitor	X	X				Exam Room Inbore	5m cable that runs from the power supply in ceiling to the monitor
Ceiling tiles					X	X	Ceiling	Ground straps only required for HFO	Heating/Cooling for Exam room monitor space if required					X	Exam Room Inbore	
Grounding straps (Shield vendor supplied AL ceiling)			X	X			Ceiling	Rafters to attach double angle profile for aluminum ceiling	Waveguide for video and network fibers			X	X		Exam Room Inbore	Can run through the same waveguide for projector fibers
Aluminum ceiling for AE halo (inner and outer)	X			X			Halo	A 2.5" Conduits from AECC to AE RF Filter	Network and video fiber cables from VCU in AECC	X	X				Exam Room Inbore	Runs through waveguide
Grounding straps (Philips supplied AL ceiling) if required	X			X			Halo	Mounted on the Halo template	Power switch for exam room onitor in technical room					X	Exam Room Inbore	Need to control power to monitor
Wall rafters for ceiling tiles			X	X			Halo		Patient head coil mirror	X					Exam Room Inbore	
Conduit runs from AECC to AE RF Filter					X	X	Halo	Rafter layout provided on Philips site plans	External HDMI video cable	X	X				Exam Room Inbore	22.7m HDMI cable to be run from the AECC to control room
Cables from LED driver to AE RF Filter	X	X					Halo	Template installed by RF Vendor	Conduit run for HDMI cable					X	Exam Room Inbore	Cable can be ran in conduit with external audio until we start to supply a face plate.
AE distribution boxes for Halo (2)	X	X					Halo	Halo installed by RF Vendor								
Cabling from AE cage filter to Halo distribution boxes	X	X					Halo									
Cabling from halo distribution boxes to Halo LEDs	X	X					Halo									
Halo template rafters			X	X			Halo									
Halo template	X			X			Halo									
Halo	X			X			Halo									
Hardware to attach halo template to ceiling	X			X			Halo									
Additional straps for halo brackets for taller ceilings			X	X			Halo	Required for RF ceilings that are taller than recommended								
Raceway/J Hooks or equivalent above ceiling to support LED lighting cables					X	X	Lighting	Local code determines what can be used								
RF Shield penetration opening for AE RF Filter			X	X			Lighting									
AE RF Filter and mounting plate	X			X			Lighting	RF Vendor to install the Filter plate								
Perimeter LED ceiling holes			X	X			Lighting	3" holes around perimeter of room - depending on what type of ceiling is including								
Perimeter LED modules	X	X					Lighting									
Conduit run from AECC to AE RF Filter					X	X	Lighting	2" Conduit that is same for Halo								
Cable from AECC to AE RF Filter	X	X					Lighting									
AE distribution box, lighting	X	X					Lighting									
Cabling from AE RF filter to LED distribution box	X	X					Lighting									
Cabling from distribution boxes to LED modules	X	X					Lighting									
Cabling between LED modules	X	X					Lighting									
Terminator on LED module string	X	X					Lighting									
Projector box mounting plate					X	X	Wall projection	Projector plate or non - ferrous unistrut								
Support material for hanging projector box			X	X			Wall projection									
Projector box	X			X			Wall projection	Box to be installed in place of one of the ceiling tiles. Needs to be in place so tiles fit								
Projector box cover	X			X			Wall projection	Cover can be cut down to size to fit ceiling tiles								
RF mains filter for Ambient Experience				X	X	X	Wall projection	RF Mains filter required to bring power into room for projector								
Mains power receptacle at projector box location					X	X	Wall projection	Power cable provided by facility and ran from the RF mains filter to AECC cabinet.								
Projector power cable from projector box to mains outlet	X	X					Wall projection									
Projector fiber cables from AECC	X	X					Wall projection									
RF waveguide for projector fiber cables			X	X			Wall projection	2" waveguide called out for projector fiber cables								

THIS SHEET IS PART OF THE DOCUMENT SET LISTED ON SHEET C1 AND SHOULD NOT BE SEPARATED.

PHILIPS

Project	Smartpath to MR 7700	VA Medical Center West Haven West Haven, CT	Room: MRI
	Philips Contacts Project Manager: Taylor LaRosa Contact Number: 516-848-7433 Email: taylor.larosa@philips.com	Drawn By: Alejandra Lozano	
	Project Details Drawing Number N-EAS220370 B Date Drawn: 4/11/2025 Quote: Q-00361165 Order: 6600723105.010000		

CHK2

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