

# ETS•LINDGREN™

An ESCO Technologies Company

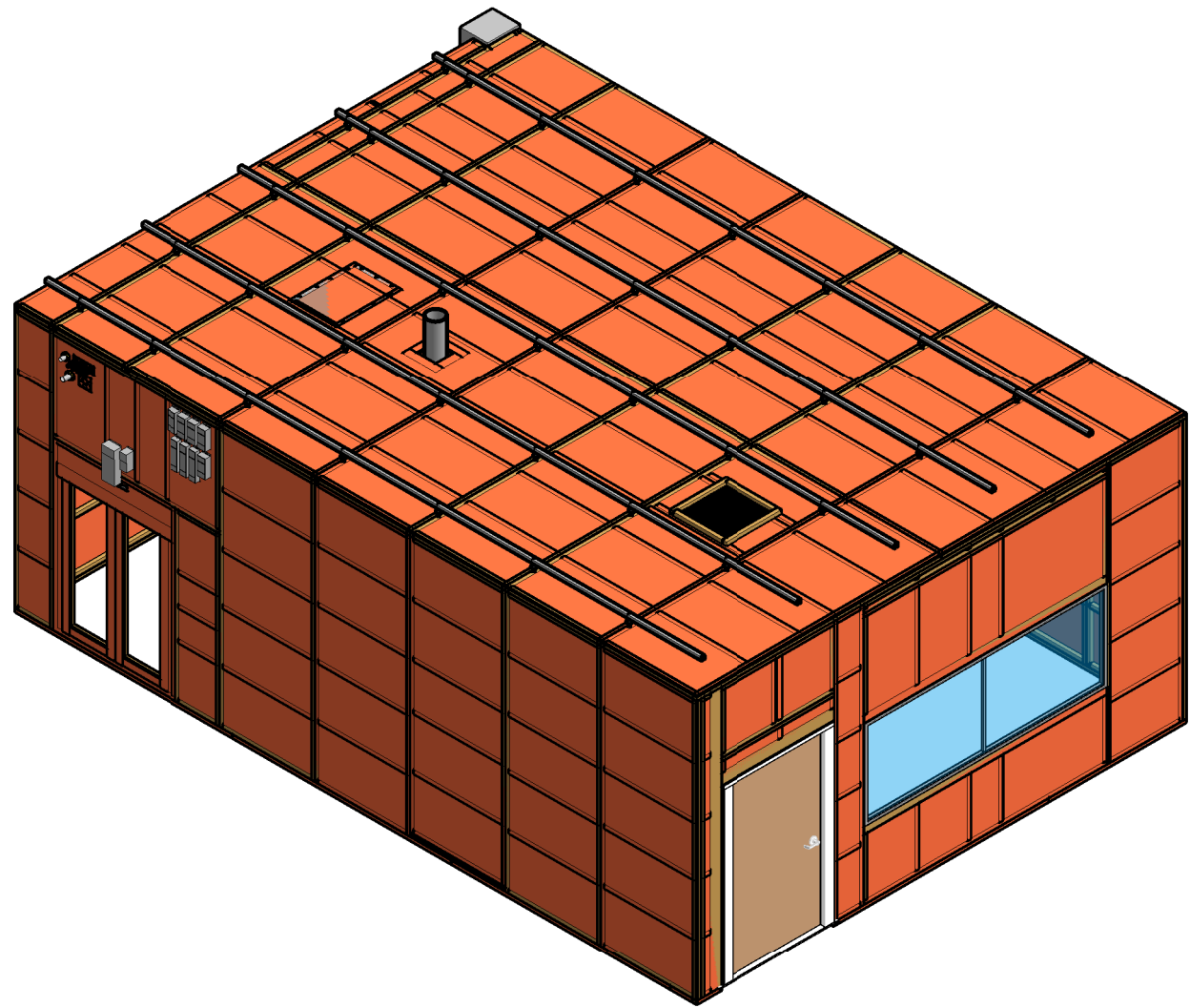
Wood Dale Office: Mark Paxson - Project Manager  
6810 Hennig Dr, Marengo, IL 60152-8315  
☎ 630-912-1907 630-912-1917 - Fax  
✉ Mark.Paxson@ETS-Lindgren.com

Vendor: GE Healthcare  
Magnet: [Type, 1.5T / (mobile/fixed plate?)]  
PIM: [xxxxxxx]  
Project #: [xxxxxxx]  
Revision: [X]

RADIO FREQUENCY SHIELD FOR:

## VA Hospital Iron Mountain, MI

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**ETS•LINDGREN**  
An ESCO Technologies Company  
Minneapolis Office: 7332 Giles Drive • Minneapolis, WI 55418  
715.356-2022 • 715.356-2022 - Fax  
Chicago Office: 1360 North Wood Dale Rd. Ste C • Wood Dale, IL 60191 • 1075  
630.307.7200 • 630.307.7571 - Fax

COVER

SHEET TITLE:

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### SITE PREPARATION CHECKLIST PRIOR TO RF SHIELD INSTALLATION

MODULAR RF WOOD FLOOR  
THE FOLLOWING ITEMS ARE REQUIRED / TO BE VERIFIED BY THE GENERAL CONTACTOR (GC)  
PRIOR TO THE RF SHIELDING INSTALLATION.  
CONTACT YOUR ETS-LINDGREN PROJECT MANAGER TO ADVISE OF ANY DISCREPENCIES.

- ☐ 1. THE FLOOR TRENCH, IF REQUIRED, SHALL COMPLY WITH THE ABOVE CONCRETE SLAB SPECIFICATIONS. THE TRENCH WALLS SHALL BE PLUMB, STRAIGHT, AND TRUE. THE TOP AND BOTTOM WALL CORNERS/EDGES SHALL BE CLEAN, SMOOTH, AND SQUARE.
- ☐ 2. THE PARENT ROOM STRUCTURE SHALL BE SQUARE, PLUMB, AND TRUE TO THE DIMENSIONS DETAILED ON THIS DRAWING, AS NOTED.
- ☐ 3. THE LOCATION OF THE MAGNET ISOCENTER AND RELATED MAGNET INTERFACE CONNECTIONS SHALL BE FURNISHED BY THE IMAGING SYSTEM SUPPLIER WITH THE APPROVAL OF THESE DRAWINGS. THESE LOCATIONS SHALL ALSO BE FIELD IDENTIFIED DURING THE RF ENCLOSURE INSTALLATION BY THE IMAGING SYSTEM SUPPLIER.
- ☐ 4. BEFORE THE RF COMPONENTS MAY BE INSTALLED, THE SHIELDED AREA SHALL BE **WEATHERPROOFED**. THIS SHALL INCLUDE, BUT NOT LIMITED TO, THE MAGNET ACCESS OPENING AREA, CRYOGEN EXHAUST VENTING, AND ALL OTHER ENCLOSURE PENETRATIONS.
- ☐ 5. THE MRI ROOM MUST BE HEATED TO A MINIMUM OF 68°F AT FLOOR LEVEL DURING THE RF SHIELD INSTALLATION AND 48 HOURS AFTER APPLICATION OF THE RF FLOORING FILLER TILES. THE TEMPERATURE REQUIREMENT IS TO ALLOW FOR PROPER CURE FOR THE TILE ADHESIVE THAT ETS-LINDGREN INSTALLS. NOTE: TEMPORARY HEAT IS ALLOWED, BUT CANNOT CAUSE EXCESSIVE HEAT & HUMIDITY. HUMIDITY EFFECTS CURING/CURE TIMES AND INCREASES CORROSION. HUMIDITY IN THE MRI ROOM IS NOT ACCEPTABLE.
- ☐ 6. INTERIOR DRY STORAGE AREA SHALL BE PROVIDED FOR THE RF COMPONENTS, MATERIALS, AND RELATED EQUIPMENT DURING INSTALLATION. THE APPROXIMATE STORAGE AREA REQUIRED IS 20ft. x 20ft. AND SHOULD BE REASONABLY CLOSE TO THE MRI ROOM AREA. THE CONTROL ROOM AND/OR EQUIPMENT ROOM AREAS WORK FOR STORAGE. THE GC IS RESPONSIBLE TO PROVIDE "OTHER" STORAGE IF NEARBY/INTERIOR STORAGE IS NOT AVAILABLE. CONTACT THE ETS-LINDGREN PROJECT MANAGER TO DISCUSS.
- ☐ 7. THE ROOM MUST BE DRY, EMPTY, AND BROOM SWEPT. TRASH CONTAINER, SHALL BE PROVIDED BY OTHERS, FOR THE REMOVAL OF WASTE AND CRATING MATERIALS.
- ☐ 8. TEMPORARY ELECTRIC POWER; 115V, SINGLE PHASE FOR HAND TOOLS IS REQUIRED FOR INSTALLATION OF THE RF ENCLOSURE.
- ☐ 9. TEMPORARY ELECTRIC POWER; 115v SINGLE PHASE NON-GFI FOR RF TESTING. CAUTION: DO NOT CONNECT UNTIL RF SHIELD HAS BEEN GROUNDED.
- ☐ 10. TEMPORARY LIGHTING; 4 LIGHTS 100 WATT MINIMUM.
- ☐ 11. ANY OVERHEAD MEP'S MUST CLEAR THE HEIGHT OF THE RF SHIELD. ANY OBSTRUCTIONS MUST BE RELOCATED OR ACCOUNTED FOR IN THE SHIELDING HEIGHT. PIPING THAT MAY SWEAT OR LEAK MUST HAVE DRIP PANS INSTALLED.
- ☐ 12. THE RF SHIELDED CEILING FRAMES SHALL BE SUPPORTED FROM THE PARENT ROOM STRUCTURE IMMEDIATELY ABOVE THE SCAN ROOM. REFER TO THE CEILING SUPPORT ANCHOR DETAIL ON THIS DRAWING SET FOR PARTICULAR APPLICATION.
- ANY INTERIOR ITEMS SHOULD BE CALCULATED BY THE STRUCTURAL ENGINEER OF RECORD.
  - THE RF PANEL WEIGHT IS 2.2 LBS/SF
- CAUTION: THE RF CEILING SYSTEM IS NOT A LOAD BEARING SURFACE.
- ☐ 13. IF THERE IS/ARE EXTERIOR WINDOW(S) TO BE MATCHED BY AN RF WINDOW(S) THE GC WILL NEED TO MAKE PREPARATIONS TO FRAME OUT THE AREA BETWEEN THE RF SHIELD AND THE PARENT WALL AROUND THE WINDOW PERIMETER(S). TYPICALLY THIS IS DONE WITH BLACK PAINTED DRYWALL OR PLYWOOD, OR SOME TYPE OF CUSTOM WINDOW FRAME. THIS WILL NEED TO BE READY TO BE INSTALLED DURING THE RF SHIELD INSTALLATION.

**NOTE: ALL DIMENSIONS ARE FINAL ON THIS LAYOUT, UNLESS NOTED OTHERWISE ON THE RETURNED SET OF APPROVED RF DRAWINGS.**

### GENERAL MRI ROOM CONSTRUCTION NOTES

- PLUMBING, SPRINKLER, MEDGAS AND ELECTRICAL ENTRIES INTO THE RF SHIELD SHOULD BE MADE AT THE PENETRATION PANEL LOCATION, THROUGH ETS-LINDGREN INSTALLED WAVEGUIDES/RF FILTERS, THEN ROUTED THROUGH THE ROOM AS REQUIRED. ALL PIPE PENETRATIONS SHALL BE INSTALLED AS DETAILED ON THESE DRAWINGS. ACCESS TO THESE PIPE CONNECTIONS SHALL COMPLY WITH LOCAL CODES.
  - FINAL BUILDING GROUND CONNECTION TO THE RF ENCLOSURE GROUND STUD (BY OTHERS) SHALL COMPLY WITH LOCAL CODES.
  - IF ANY RF COMPONENTS ARE DAMAGED AFTER THE INSTALLATION CREW HAS COMPLETED THE RF VERIFICATION TEST, CONTACT ETS-LINDGREN FOR INSTRUCTIONS AND/OR REPAIR SCHEDULE.
  - NO PENETRATIONS THROUGH THE RF SHIELD ARE ALLOWED WITHOUT A RF WAVEGUIDE OR RF FILTER.
  - FINAL ELECTRICAL CONNECTIONS AND ACCESS REQUIREMENTS TO THE RF POWER FILTERS SHALL COMPLY WITH LOCAL CODES AND DETAILS ON THESE DRAWINGS.
  - THE INTERIOR SCAN ROOM WALL FINISH MAY BE APPLIED TO THE VERTICAL 16" O.C. FURRING STRIPS, FURNISHED & INSTALLED PER CONTRACT.

### NEW CONCRETE SLAB SPECIFICATIONS

REFER TO RF1.0 "FOUNDATION" PAGE.

### EXIST. CONCRETE SLAB SPECIFICATIONS

REFER TO RF1.0 "FOUNDATION" PAGE

#### RF SHIELD FLOOR PANELS

- THE MODULAR FLOOR SYSTEM MUST NOT BE EXPOSED TO LIQUIDS OF ANY SORT, ie.(WATER, COFFEE, LIQUID CLEANER, ETC.) LIQUID WILL DEGRADE THE SHIELDING PROPERTIES IF EXPOSED TO THE MODULAR PANELS.
  - THERE MAY BE ADDITIONAL FLOOR PREP REQUIRED BY THE CUSTOMER ON THE MODULAR TYPE RF FLOOR SYSTEMS BEFORE FINISH FLOORING IS APPLIED.
- THIS FLOOR SYSTEM CONSISTS OF METAL LAMINATED WOOD PANELS WHICH ARE CLAMPED TOGETHER. FILLER TILE IS PLACED BETWEEN THE CLAMPS TO LEVEL OUT THE FLOOR SURFACE.
  - TYPICAL INSTALLATIONS REQUIRE THE GC/FLOORING CONTRACTOR TO PUT A "FLASH-PATCH" MATERIAL ON TOP OF THE RF FLOOR TO PROVIDE A BETTER SURFACE TO INSTALL THE FINISH FLOORING PRODUCT.
  - THE FLASH-PATCH MATERIAL MUST NOT CAUSE MOISTURE PROBLEMS WITH THE RF FLOOR.
  - NO POURING OF ANY SUBSTRATE FOR LEVELING PURPOSES, CRACK TROWEL FILL ONLY.
  - REFER TO RF1.0 "FOUNDATION" PAGE FOR ADDITIONAL NOTES

#### RF SHIELD FRAME CONSTRUCTION

- THE RF SHIELD IS CONSTRUCTED WITH; DIM. LVL LUMBER WITH 3oz. PAPER-BACKED COPPER WRAPPED TO THE OUTSIDE OF THE FRAME. THE LUMBER IS FIRE RETARDANT TREATED WOOD LVL LUMBER, CERTIFIED TO: ASTM E84, FLAME SPREAD 5, SMOKE DEVELOPED 40
- CAN/ULC S102, FLAME SPREAD 0, SMOKE DEVELOPMENT 30

#### TESTING PROCEDURE

RF TESTING PERFORMED IN GENERAL ACCORDANCE WITH MIL-STD 285. SHOULD A VERIFICATION TEST BE REQUIRED, IT IS THE RESPONSIBILITY OF THE MAGNET MANUFACTURER TO CORRECT ANY DEFICIENCIES IN RF ATTENUATION OF THE MRI SUPPLIED PENETRATION PANEL.

ETS-LINDGREN HAS AN ONGOING PRODUCT IMPROVEMENT PROGRAM. AS A RESULT, IT RESERVES THE RIGHT TO CHANGE SPECIFICATIONS AND DETAILS WITHOUT NOTICE. ANY ITEM(S) AND/OR QUESTION(S) NOT COVERED ABOVE OR ON THE ENCLOSED SHIELD SHOP DRAWINGS, SHOULD BE DIRECTED TO ETS-LINDGREN APPLICATIONS ENGINEERING DEPARTMENT AT (630) 307-7200.

#### GROUND ISOLATION GUIDELINES

- UNDER NO CIRCUMSTANCE CAN ANY CONDUCTIVE MATERIAL COME IN CONTACT WITH THE EXTERIOR OF THE ENCLOSURE OR THE STRUCTURAL SYSTEM OF THE SHIELDED ROOM.
- ANY DUCT OR PIPE WORK (INCLUDING ELECTRICAL CONDUIT) MUST BE BROKEN WITH A DIELECTRIC OUTSIDE THE SHIELD, AND PASS THROUGH A WAVEGUIDE OR FILTER AT THE PENETRATION POINT.
- THE CONCRETE SLAB SHALL BE FREE OF STANDING WATER AND/OR MOISTURE PRIOR TO INSTALLATION OF R.F. SHIELDING TO INSURE GROUND ISOLATION. FAILURE TO CONTROL THE MOISTURE MAY ADVERSELY AFFECT ADHESION AND DETERIORATE THE GROUND ISOLATION CHARACTERISTICS. UPON ESTABLISHING SPECIFIED GROUND ISOLATION, IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO INSURE GROUND ISOLATION IS MAINTAINED.
- PRIOR TO INSTALLATION OF THE COPPER RF FLOOR, THE UNDERLYING CONCRETE SLAB SHALL HAVE HAD A MINIMUM OF SEVEN DAYS CURE TIME WITH ABSOLUTELY NO CONCRETE SEALANT OR CURING COMPOUND APPLIED TO IT. THE SLAB MUST BE KEPT DRY AND CLEAN AT ALL TIMES.
- UPON COMPLETION OF THE RF SHIELDING INSTALLATION A GROUND ISOLATION TEST WILL BE PERFORMED BY LINDGREN AND SHALL BE WITNESSED AND SIGNED OFF BY A REPRESENTATIVE OF OUR CUSTOMER.

#### SEISMIC

- ETS-LINDGREN SHIELDS ARE NOT ENGINEERED FOR SEISMIC PERFORMANCE UNLESS SPECIFIED ON THESE DRAWINGS. CUSTOMERS ARE RESPONSIBLE FOR ANY SEISMIC ENGINEERING REQUIREMENTS PER APPLICABLE SITE BUILDING CODES.

## SPECIFICATIONS

#### INSTALLATION SCHEDULE

- SHIELD INSTALLATION IS 4-6 WEEKS AFTER DRAWING APPROVAL.

#### RF ENCLOSURE PERFORMANCE

- THE RF ENCLOSURE PERFORMANCE SHALL BE VERIFIED AFTER THE SHIELD INSTALLATION IS COMPLETE, AND SHALL COMPLY WITH THE FOLLOWING SPECIFICATIONS:

##### RF ATTENUATION:

- PLANE WAVE: 100 dB at 51.0 Mhz (+/- .5Mhz)  
100 dB at 63.86 Mhz (+/- .5Mhz)  
100 dB at 76.6 Mhz (+/- .5Mhz)  
100 dB at 102.20 Mhz (+/- .5Mhz)  
100 dB at 127.72 Mhz (+/- .5Mhz)  
100 dB at 153.30 Mhz (+/- .5Mhz)
- ISOLATION RESISTANCE: 1000 ohms MINIMUM

- THE RF PERFORMANCE SHALL BE WITNESSED BY OUR CUSTOMER OR THE CUSTOMER'S REPRESENTATIVE AND THE GE FIELD ENGINEER. THE TEST REPORT WILL BE GIVEN TO THE CUSTOMER AND GE PROJECT MANAGER.

#### RF DOOR

- THE DOOR FINISH MUST BE DETERMINED BY OUR CUSTOMER AT LEAST FOUR WEEKS PRIOR TO THE INSTALLATION DATE.
- THE RF DOOR PROVIDED IS NOT FIRE RATED
- THE FINISH FOR THE RF DOOR(S) MAY BE:

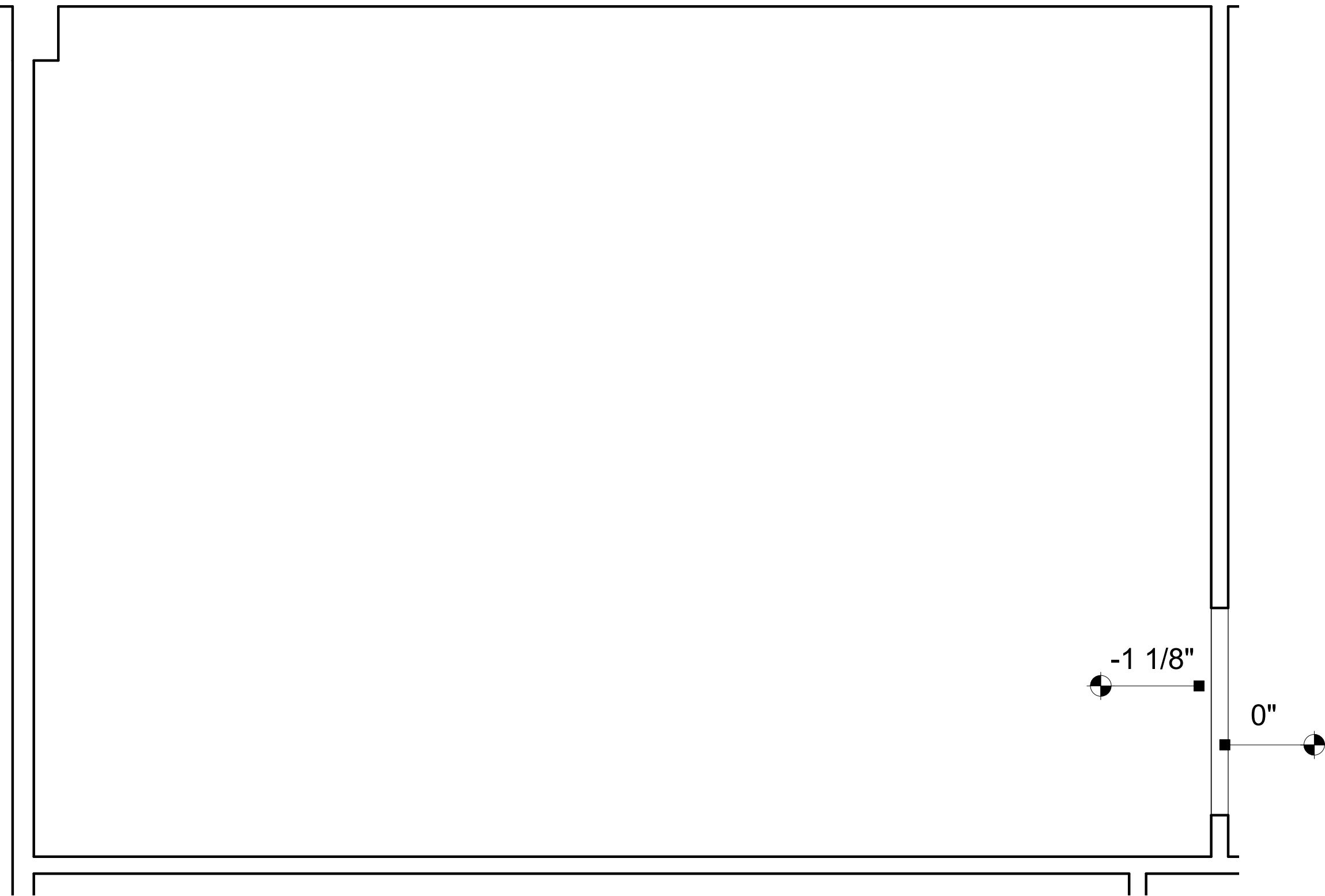
##### PLASTIC LAMINATES:

FORMICA #932-58 ANTIQUE WHITE  
FORMICA #756-58 NATURAL MAPLE  
FORMICA #949-58 4X8XPOST WHITE MATTE  
WILSONART #7919K-78 AMBER CHERRY  
WILSONART #7924K-07 BILTMORE CHERRY  
WILSONART #7909-60 FUSION MAPLE  
WILSONART #10745-60 FONTHILL  
WILSONART #10776-60 KENSINGTON MAPLE  
WILSONART #427-60 LINEN  
WILSONART #7965K-12 WALNUT HEIGHTS  
WILSONART #7965K-38 HARVEST MAPLE  
WILSONART #7054-60 WILD CHERRY

- CUSTOM PLASTIC LAMINATES CAN BE SELECTED FOR AN ADDITIONAL CHARGE.

- DOOR HARDWARE SPECIFICATIONS / SEE DOOR DETAIL THIS DRAWING SET.
- THE RF DOOR CONTACTS ARE NOT A WARRANTED ITEM. PRECAUTION SHOULD BE TAKEN TO PREVENT DAMAGE TO THE CONTACTS DURING THE CONSTRUCTION PHASE AND CUSTOMER USE.





1 FOUNDATION PLAN  
3/8" = 1'-0"

THE BELOW SPECIFICATIONS AND/OR PARENT FLOOR CONDITIONS MUST BE MET PRIOR TO THE RF SHIELD INSTALLATION.  
IT IS THE GC/CUSTOMER/OWNERS RESPONSIBILITY FOR GETTING THE SITE TO MEET SPECIFICATION.

ETS-LINDGREN INSTALLERS WILL INSPECT THAT THE SPECIFICATIONS HAVE BEEN MET AND WILL ACCEPT OR REJECT THE CONDITIONS TO BEGIN THE JOB BASED ON THOSE FINDINGS.

### SITE REQUIREMENTS

- CONCRETE SLAB SPECIFICATIONS**
- CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF:
- A. SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDING ACI301
  - B. GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION ACI 302.1
- ACI 302 CLASS 4 CONCRETE FLOOR.
  - TYPE PORTLAND CEMENT PER C150.
  - PARENT CONCRETE FLOOR MUST BE LEVEL WITHIN +/- 1/8". NOT TO EXCEED 1/4" ACROSS ENTIRE SCAN ROOM AREA AND/OR BE IN COMPLIANCE WITH MORE STRINGENT MAGNET VENDOR SPECIFICATIONS FOR SPECIALIZED ZONES UNDER MAGNET AND PATIENT TABLE (SEE MAGNET VENDOR SPECIFIC NOTES, SHEET RF3.1, IF APPLICABLE)
  - CONCRETE JOINTS/SEAMS MAY NEED SPECIAL TREATMENT AND NEED TO BE IDENTIFIED IN LOCATION AND PURPOSE. (IE: EXPANSION, CONTROL VIBRATION)
  - THE CONCRETE SLAB SHALL BE FREE OF STANDING WATER AND/OR MOISTURE PRIOR TO INSTALLATION OF R.F. SHIELDING TO INSURE GROUND ISOLATION. FAILURE TO CONTROL THE MOISTURE MAY ADVERSELY AFFECT AND/OR DETERIORATE THE GROUND ISOLATION CHARACTERISTICS. UPON ESTABLISHING SPECIFIED GROUND ISOLATION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO INSURE GROUND ISOLATION IS MAINTAINED.
  - TEMPERATURE: MAINTAIN ROOM TEMPERATURE AT 68 DEGREES F FOR 48 HOURS BEFORE, DURING AND 48 HOURS AFTER INSTALLATION.

THE ABOVE CONCRETE SLAB SPECIFICATIONS IS THE MINIMUM REQUIREMENT FOR INSTALLATION OF A PANELIZED R.F. FLOOR SHIELD AND IS IN ADDITION TO ARCHITECTURAL CONCRETE SPECIFICATIONS.

- SURFACE PREPARATION**
- SURFACE SHALL BE FREE OF ANY DELETERIOUS MATERIALS SUCH AS LAITANCE, DUST, DIRT, OIL AND MATERIALS RESULTING FROM SURFACE PREPARATION.
- REMOVE ALL PROJECTIONS AND OTHER CONDITIONS, WHICH AFFECT THE INSTALLATION OF THE FLOORING.

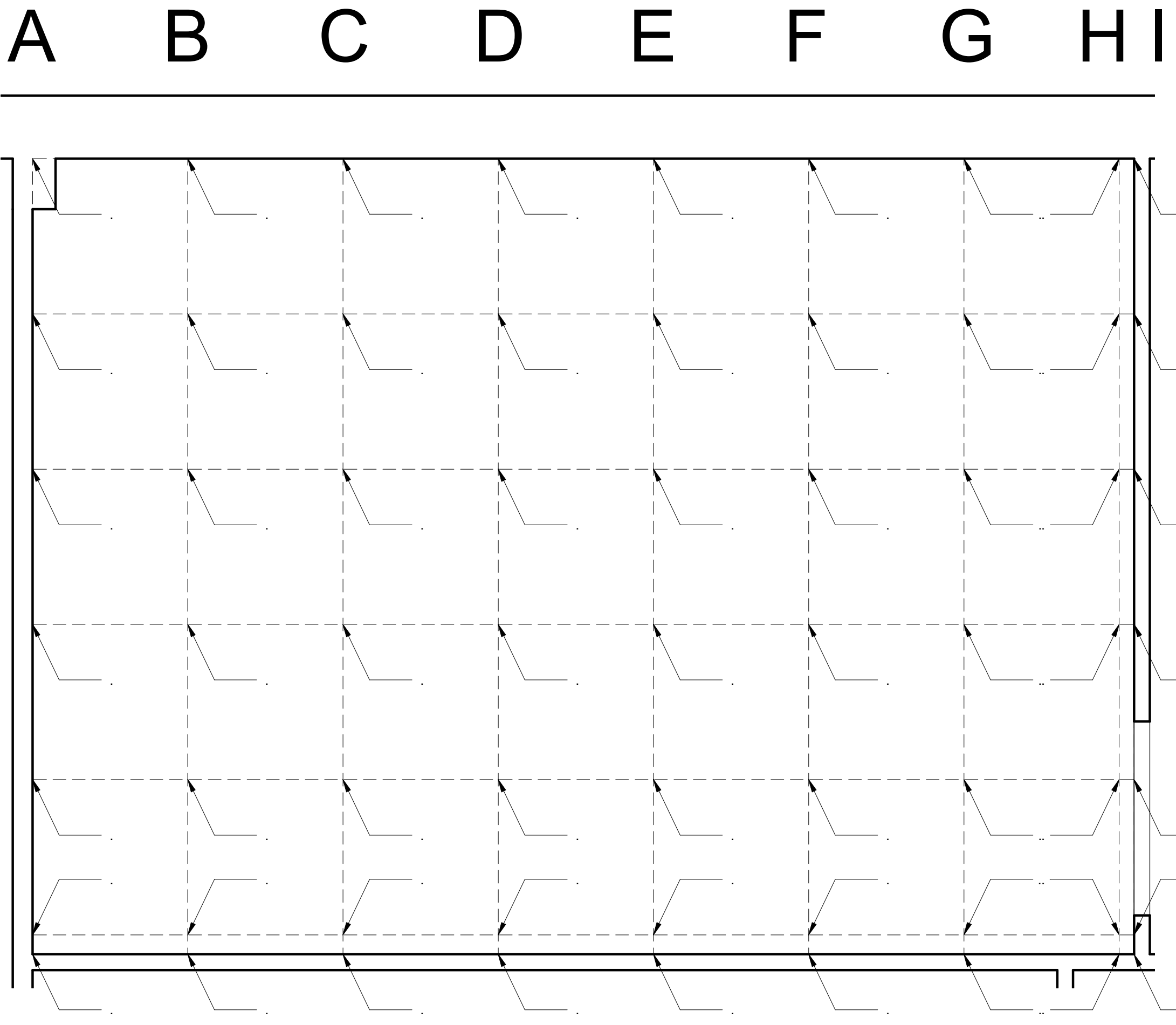
- RF SHIELD FLOOR PANELS**
- THE MODULAR FLOOR SYSTEM MUST NOT BE EXPOSED TO LIQUIDS OF ANY SORT, ie.(WATER, COFFEE, LIQUID CLEANER, ETC.) LIQUID WILL DEGRADE THE SHIELDING PROPERTIES IF EXPOSED TO THE MODULAR PANELS.
  - THERE MAY BE ADDITIONAL FLOOR PREP REQUIRED BY THE CUSTOMER ON THE MODULAR TYPE RF FLOOR SYSTEMS BEFORE FINISH FLOORING IS APPLIED.

THIS FLOOR SYSTEM CONSISTS OF METAL LAMINATED WOOD PANELS WHICH ARE CLAMPED TOGETHER. FILLER TILE IS PLACED BETWEEN THE CLAMPS TO LEVEL OUT THE FLOOR SURFACE.

TYPICAL INSTALLATIONS REQUIRE THE GC/FLOORING CONTRACTOR TO PUT A "FLASH-PATCH" MATERIAL TO FILL SMALL CRACKS OR VOIDS TO PROVIDE A BETTER SURFACE TO INSTALL THE FINISH FLOORING PRODUCT.

THE FLASH-PATCH MATERIAL MUST NOT CAUSE MOISTURE PROBLEMS WITH THE RF FLOOR.

NO POURING OF ANY SUBSTRATE FOR LEVELING PURPOSES, CRACK TROWEL FILL ONLY.



2 FLOOR LEVELNESS CHART  
3/8" = 1'-0"

## FLOOR LEVELNESS CHART: (48"x48" GRID)

GC TO VERIFY FLOOR LEVELNESS. READING SHOULD BE RECORDED USING LASER LEVEL AND RESULTS TO BE RECORDED ON THIS SHEET AND RETURNED TO ETS-LINDGREN.

SHEET TITLE: FOUNDATION PLAN

Description

REVISIONS:  
Rev Date By

PROJECT TITLE: VA Hospital

ADDRESS: Iron Mountain, MI

DRAWN BY: E.GONZALEZ

REFERENCE: --

DATE: 10/4/22

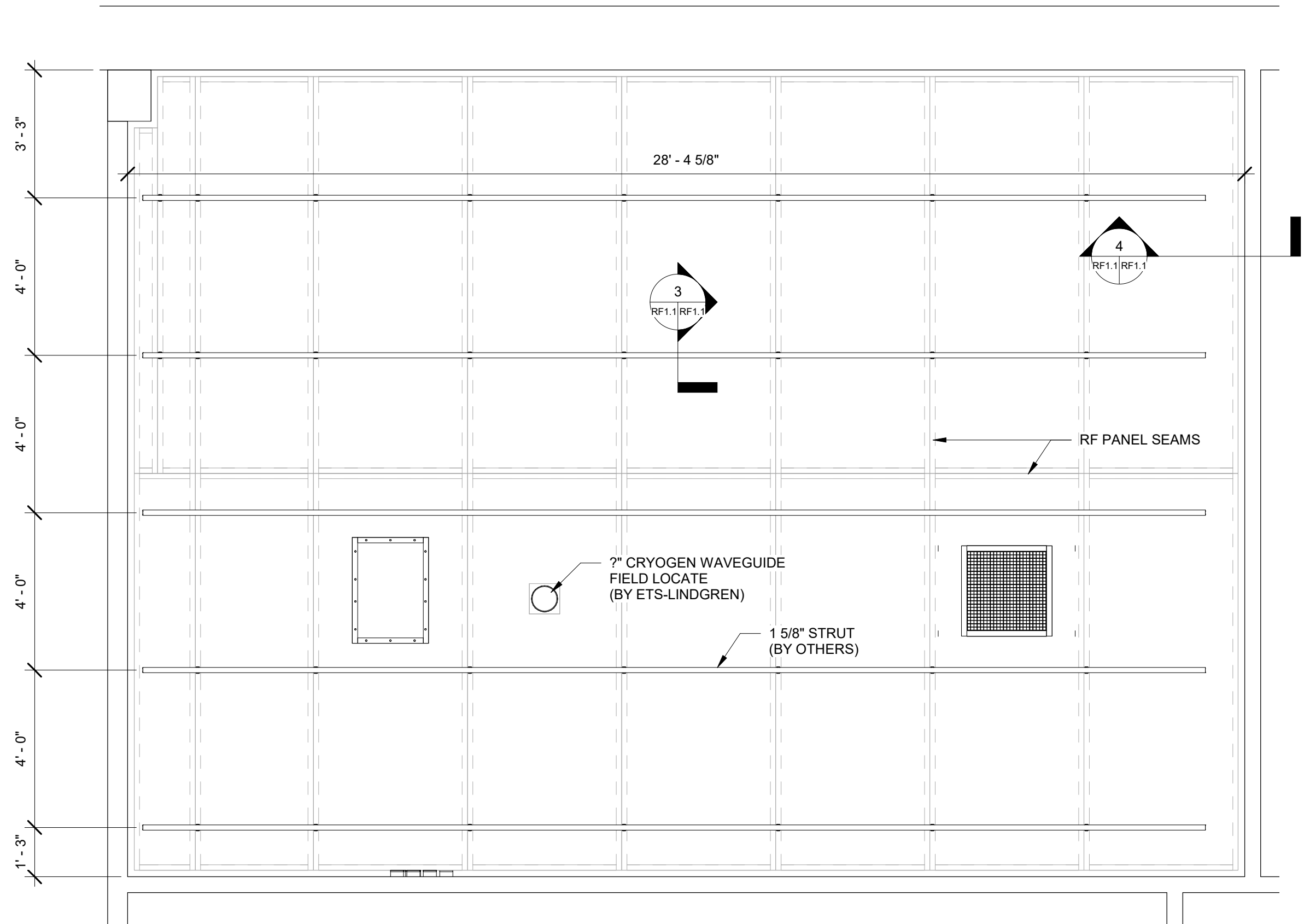
SCALE: 3/8" = 1'-0"

JOB NO: MD63377

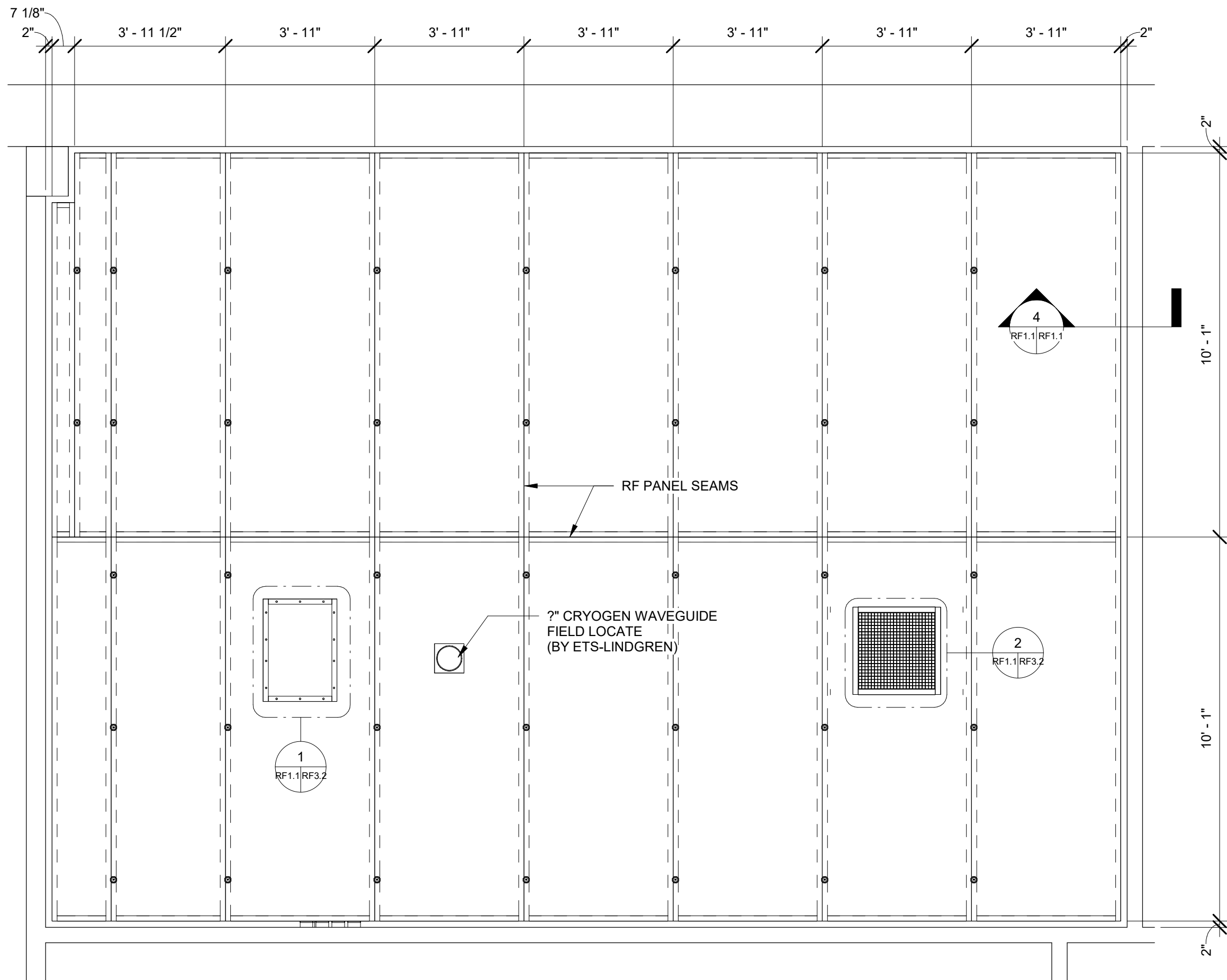
DRAWING NO:

RF1.0

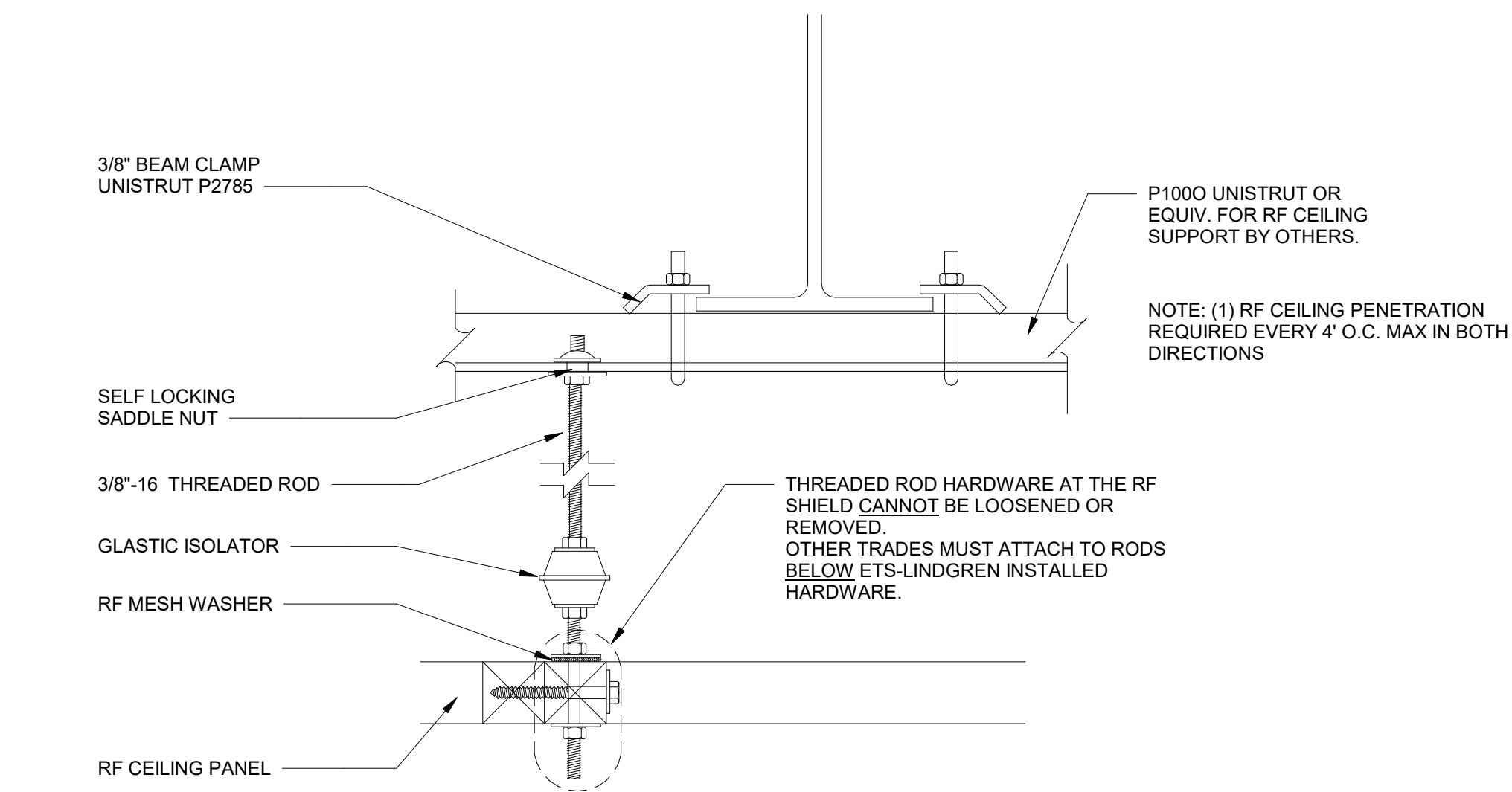




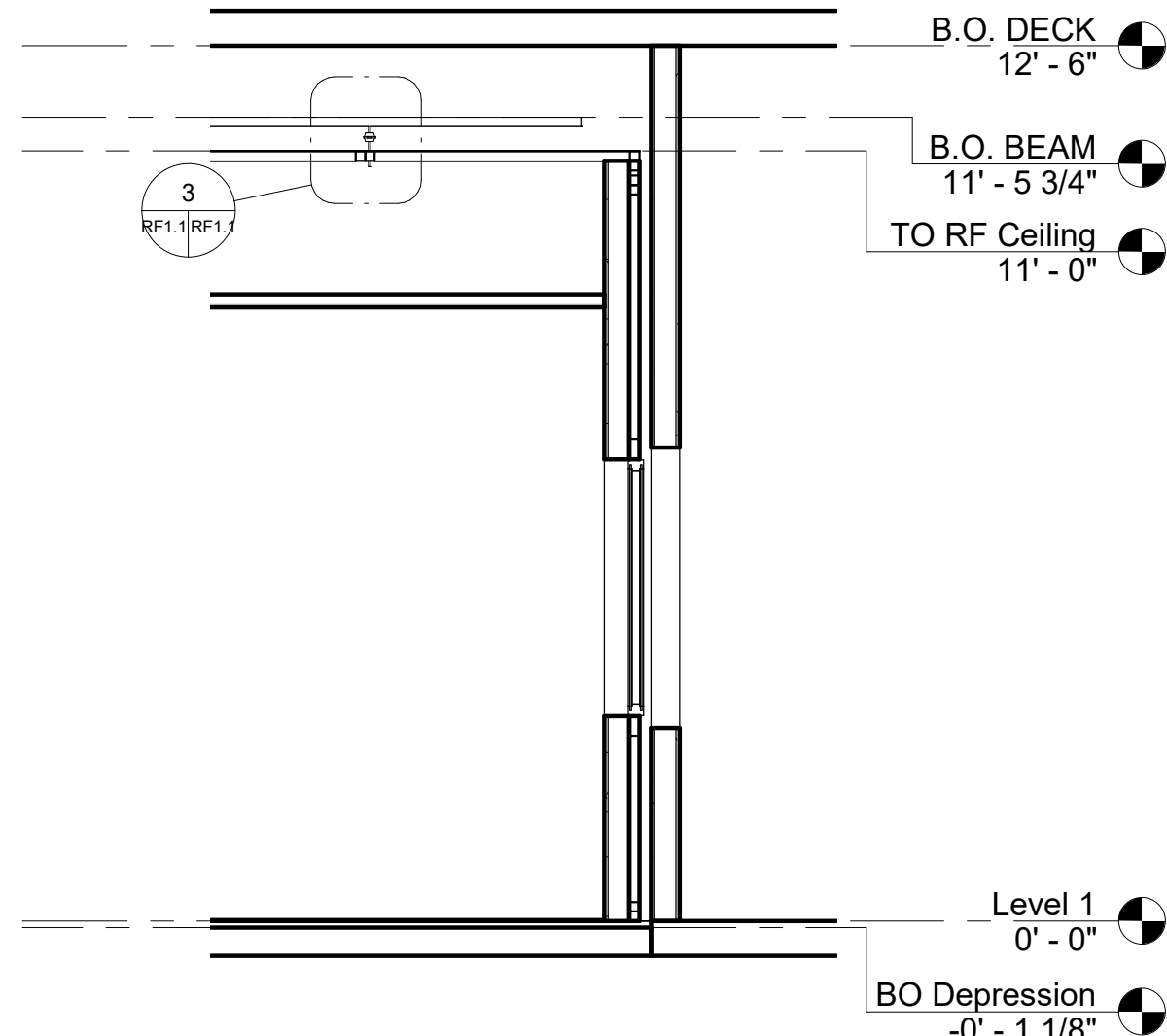
1 RF CEILING SUPPORT LAYOUT  
3/8" = 1'-0"



2 RF CEILING PANEL LAYOUT  
3/8" = 1'-0"



3 CEILING SUPPORT BEAM CLAMP  
3" = 1'-0"



4 Section 1  
3/8" = 1'-0"

ETS-LINDGREN PART NUMBERS - CEILING SUPPORTS	
300226	ISOLATOR, FOR 3/8-16 THREADED ROD
300519	NUT, 3/8-16HH,SS18-8, FN51
300793	L/WSHR, 3/8 MED SPLT, STL, ZN, ST67
300806	WSHR, 3/8 .437x1x.074, SS,18-8,92/#
304087	ROD, THRD, 3/8-16xFT, STL, ZN
304462	WSHR,MESH .25THKx.318 I.D. x 1 O.D. SNCUFE
1739531	NUT, 3/8, SADDLE, HILTI MQA-F 3/8
305270	WSHR, FLAT CU FOR 3/8 ROD SUPPORTS

SHEET TITLE:  
CEILING SUPPORT LAYOUT

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Rev.	Date	By	Description

PROJECT TITLE:	VA Hospital
DRAWN BY:	E. GONZALEZ
REFERENCE:	--
DATE:	10/4/22
SCALE:	As indicated
JOB NO:	MD63377
REV:	
DRAWING NO:	RF1.1

ETS-LINDGREN

An ESCO Technologies Company

Minneapolis Office:

7352 Giles Drive

Minneapolis, WI 55448

715.356.2022

715.356.2023

Fax

Chicago Office:

1360 North Wood Dale Rd. Ste. G

Wood Dale, IL 60191

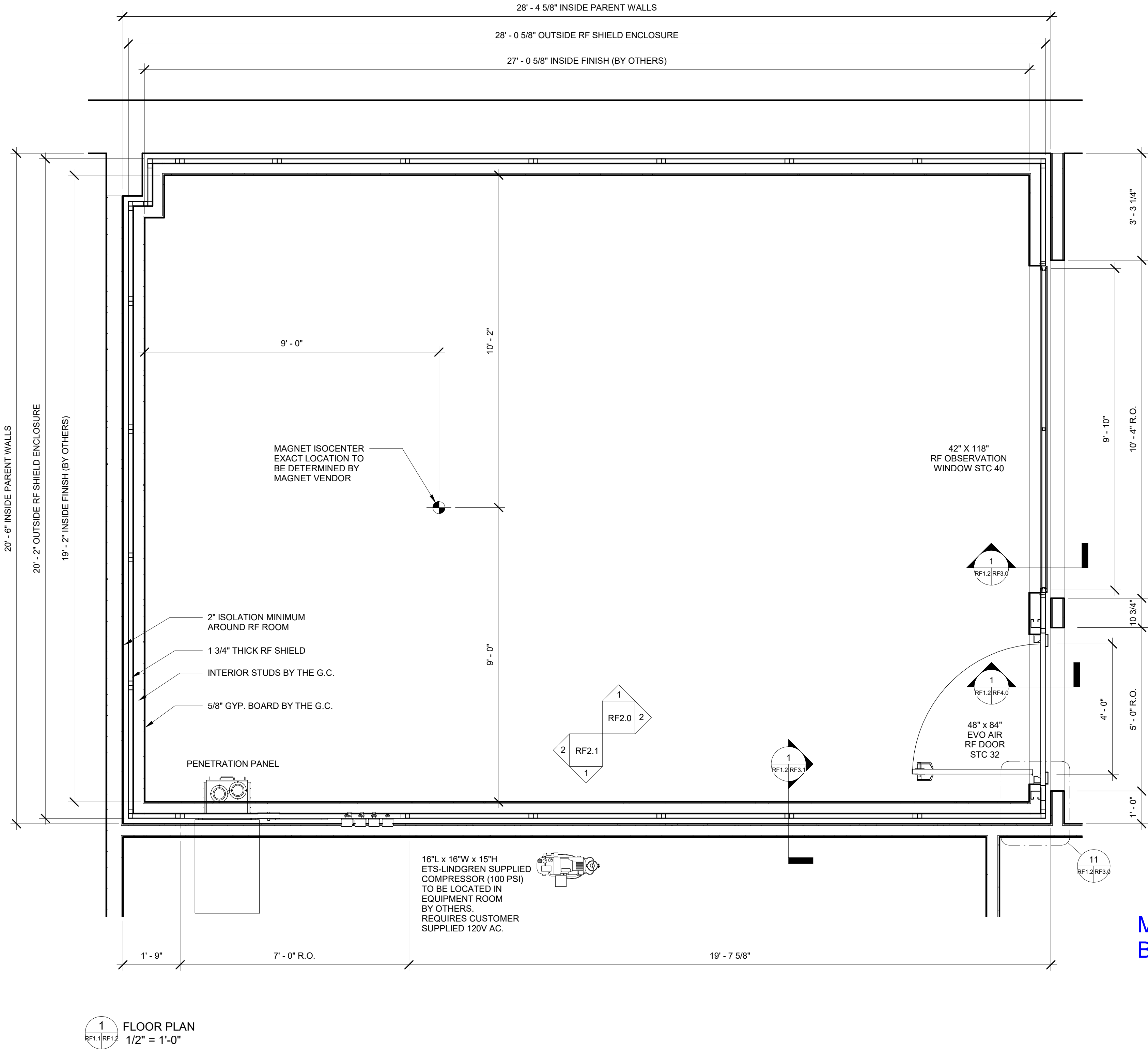
630.307.7269

630.307.7571

Fax

- NOTES:
1. GO TO FIELD VERIFY ALL PARENT ROOM DIMENSIONS.
2. FINAL R.O. FOR PENETRATION PANEL TO BE COORDINATED WITH MAGNET VENDOR DRAWINGS.
3. 20" x 29" CEILING HATCH IS FOR PRESSURE RELIEF AND ACCESS ABOVE SHIELD. NO DUCTWORK IS ATTACHED TO THIS ITEM.
4. INSTALLERS NOTE: MAGNET ANCHORS, PADS, BRACKETS, CRYOGEN VENT LOCATIONS TO BE LOCATED ON SITE WITH VENDOR DRAWINGS BY THE G.C.
5. SEE MAGNET VENDOR SPECIFIC NOTES, SHEET RF3.1, (IF APPLICABLE).
6. IF METAL STUDS ARE USED, THEY MUST BE ISOLATED FROM DIRECT CONTACT TO THE RF WALLS BY INSULATORS OR AIR SPACE. THIS IS TO AVOID METAL TO METAL CONTACT THAT CAUSE IMAGE QUALITY ISSUES. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
7. ALL CONDUITS AND THEIR SUPPORT STRAPS ARE TO BE SEPARATED WITH DUCT TAPE SO THERE IS NO METAL TO METAL CONTACT.

EVO DOOR NOTES:	
DOOR TYPE	CLEAR OPENING
48" WIDE DOOR EVO MANUAL (OR AIR) NON-ACOUSTIC	46.04"
48" WIDE DOOR EVO MANUAL (OR AIR) ACOUSTIC	43.95"
36" WIDE DOOR EVO MANUAL (OR AIR) NON-ACOUSTIC	34.04"
36" WIDE DOOR EVO MANUAL (OR AIR) ACOUSTIC	31.95"



MAGNET ACCESS TO  
BE VERIFIED

ETS-LINDGREN RF SHIELD ACOUSTIC RATING	
	STC RATING
COPPER WALL (ONLY)	14
COPPER WALL + MINERAL WOOL	19
COPPER WALL + INTERIOR STUD WALL & GYP BOARD FINISH	40
COPPER WALL + MINERAL WOOL + INTERIOR STUD WALL & GYP BOARD FINISH	46

CONTACT YOUR ETS-LINDGREN SALES OR PROJECT MANAGER FOR THE MINERAL WOOL ACOUSTIC DAMPENING OPTION.

ETS•LINDGREN

An ESCO Technologies Company

Minneapolis Office:

7352 Cities Drive  
Minneapolis, WI 55448  
715.336.2023 - Fax

Chicago Office:

1360 North Wood Dale Rd. Ste. G  
Wood Dale, IL 60191 - 1075  
630.307.7269 - 630.307.7571 - Fax

SHEET TITLE:

FLOOR PLAN

REVISIONS:

Rev.	Date	By	Description

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PROJECT TITLE:

VA Hospital

ADDRESS:

Iron Mountain, MI

DRAWN BY:

E. GONZALEZ

REFERENCE:

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DATE:

10/4/22

SCALE:

1/2" = 1'-0"

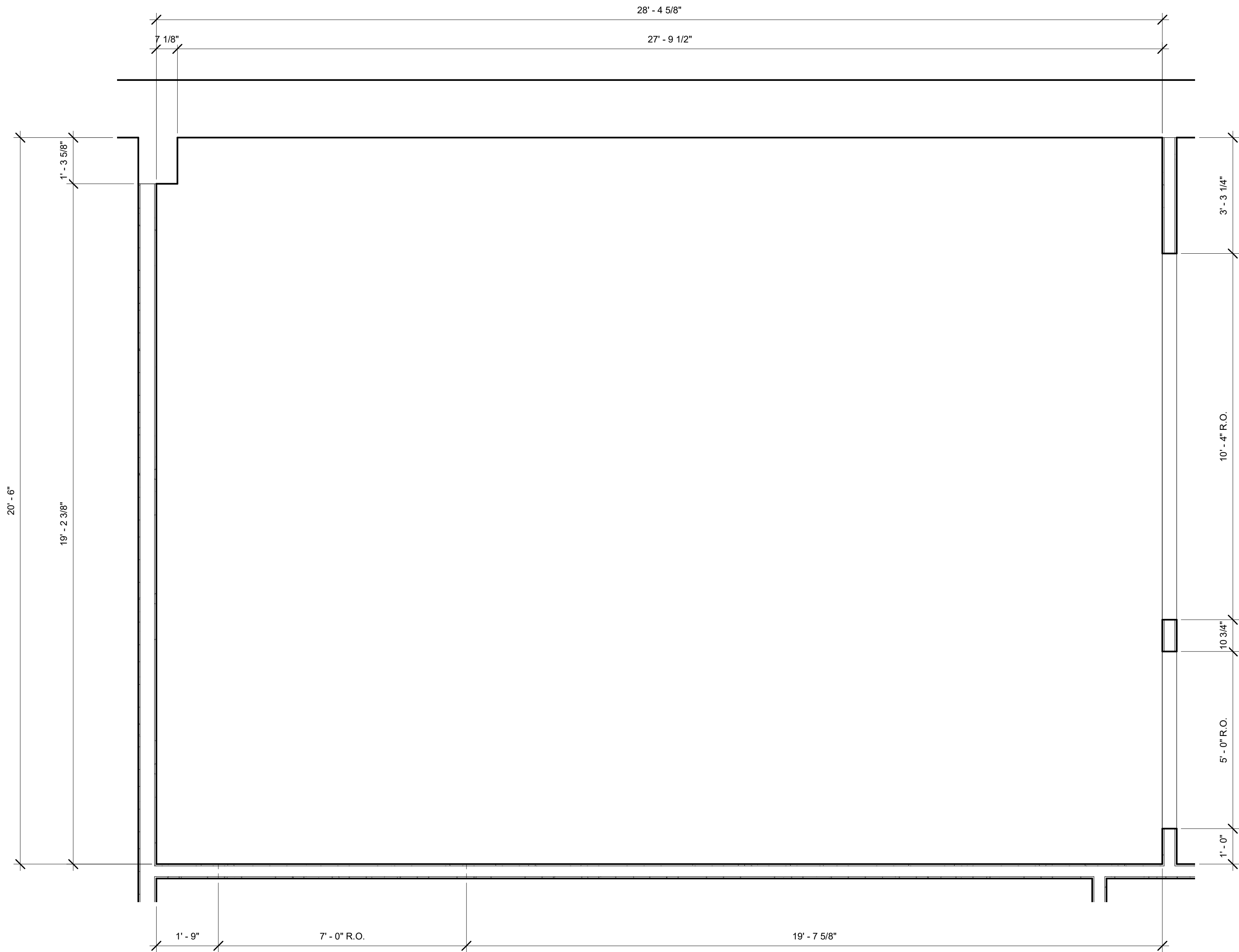
JOB NO:

MD63377

REV:

DRAWING NO:

RF1.2



1 PARENT WALL FRAMING PLAN  
RF1.1, RF1.3  
1/2" = 1'-0"

MAGNET ACCESS TO  
BE VERIFIED

PLEASE VERIFY ALL  
PARENT WALL  
DIMENSIONS AND  
ROUGH OPENINGS

PARENT WALL  
DIMENSIONS ARE TO  
FINISHED SURFACES  
(WITH DRYWALL IF  
APPLICABLE)  
UNLESS NOTED

SHEET TITLE:  
**PARENT WALL DIMENSIONS**

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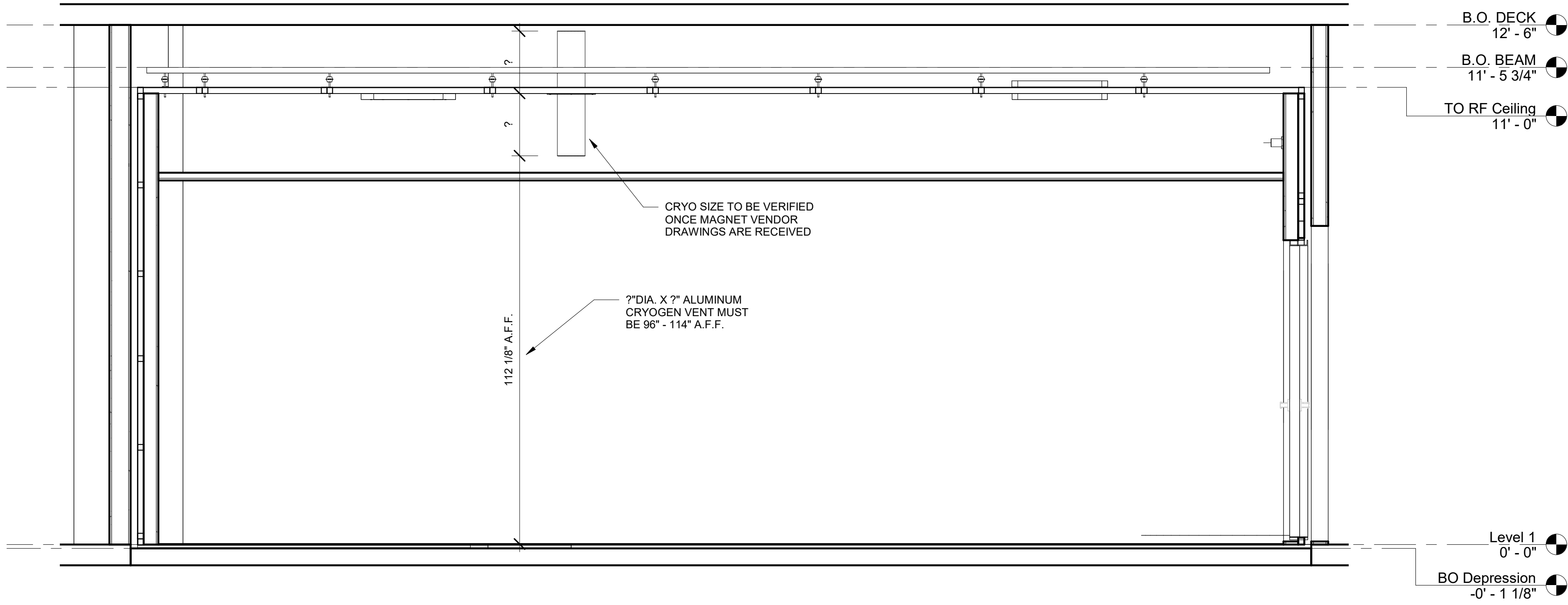
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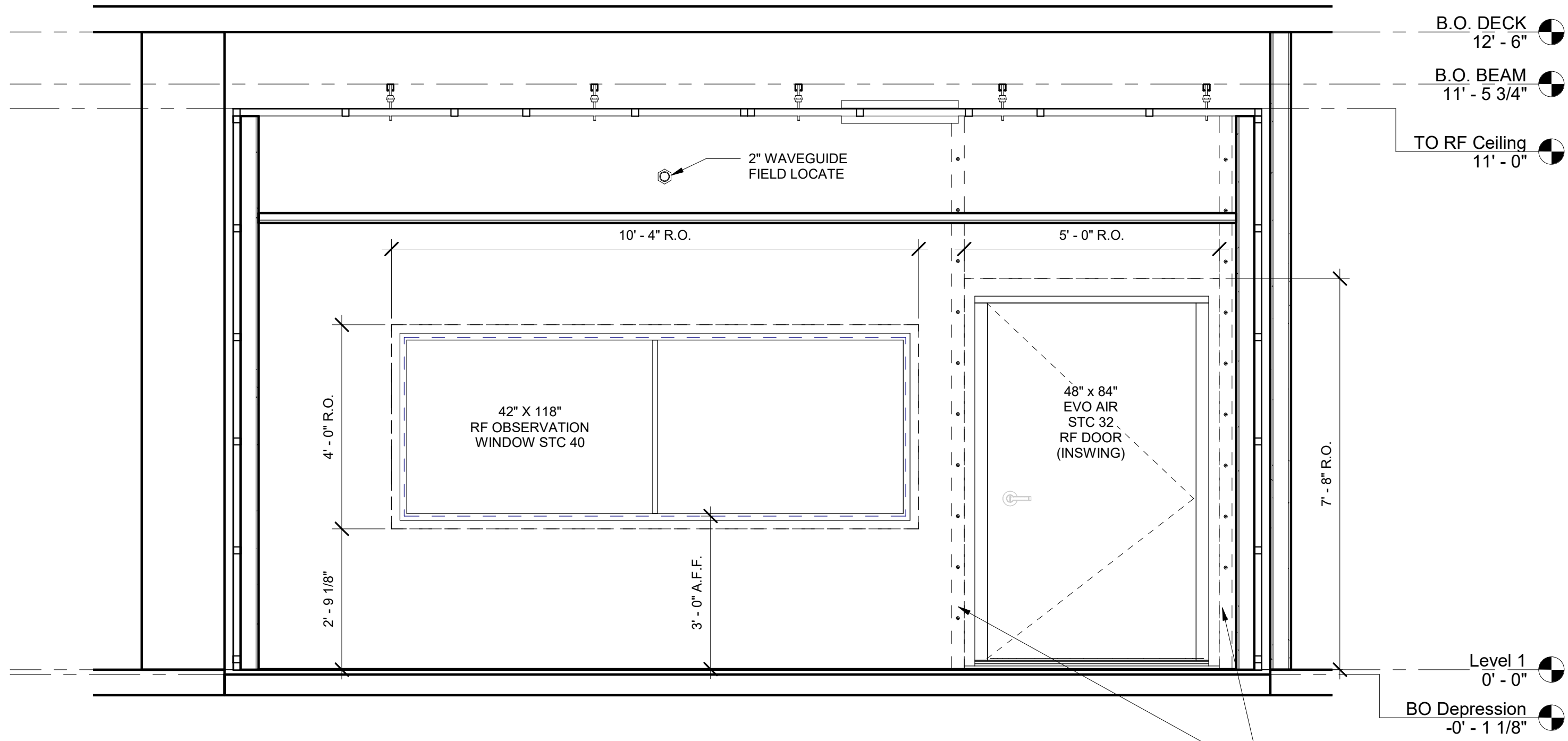
DRAWN BY:	E. GONZALEZ
REFERENCE:	--
DATE:	10/4/22
SCALE:	1/2" = 1'-0"

JOB NO:	REV:
MD63377	

DRAWING NO:  
**RF1.3**



1 Inside Elevation NORTH  
1/2" = 1'-0"



2 Inside Elevation EAST  
1/2" = 1'-0"

RF SHIELDING COMPONENT WEIGHTS FOR LOAD CALCULATIONS		
RF SHIELD PANELS	RF SHIELD PANELS	2.2 LBS SQ. FT.
	MINERAL WOOL INSERTS WITHIN RF PANELS (IF REQUIRED)	0.7 LBS SQ. FT.
RF CELL FLOOR	3/4" CELL FLOOR PANEL	2.9 LBS SQ. FT.
	1/8" THICK MASONITE (2 LAYERS TYPICAL)	0.625 LBS SQ. FT.
	1/4" THICK MASONITE (IF NEEDED FOR LEVELING)	1.25 LBS SQ. FT.
RF MONO FLOOR	ARDEX	5.0 LBS SQ. FT.
	EPOXY / SAND BROADCAST	0.5 LBS SQ. FT.
OTHER TRADES	1/2" GYPSUM BOARD	2.2 LBS SQ. FT.
	3/4" GYPSUM BOARD	2.8 LBS SQ. FT.
	3/4" PLYWOOD - FIRE TREATED	2.1 LBS SQ. FT.
	1/2" PLYWOOD - FIRE TREATED	1.5 LBS SQ. FT.
	P1000 UNISTRUT (OR EQUIVALENT)	1.9 LBS LN. FT.
PLEASE NOTE THE PROBABILITY OF ADDITIONAL WEIGHTS FOR CALCULATION; HVAC, LIGHTING, SOFFITS, SUSPENDED CEILING, ETC.		
HVAC	ETS-LINDGREN PROVIDED ALUMINUM HVAC AIR VENTS	14 LBS PER SQ. FT.

ETS•LINDGREN

An ESCO Technologies Company

Minneapolis Office:

7332 Giles Drive  
Minnetonka, WI 55348  
715.336.2023 – Fax

Chicago Office:

1360 North Wood Dale Rd. Ste. G  
Wood Dale, IL 60191 – 1075  
630.307.7289 • 630.307.7571 – Fax

SHEET TITLE:

ELEVATIONS

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REVISIONS:		Description	
Rev.	Date	By	

PROJECT TITLE:

VA Hospital

ADDRESS:

Iron Mountain, MI

DRAWN BY:

E. GONZALEZ

REFERENCE:

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DATE:

10/4/22

SCALE:

As indicated

JOB NO:

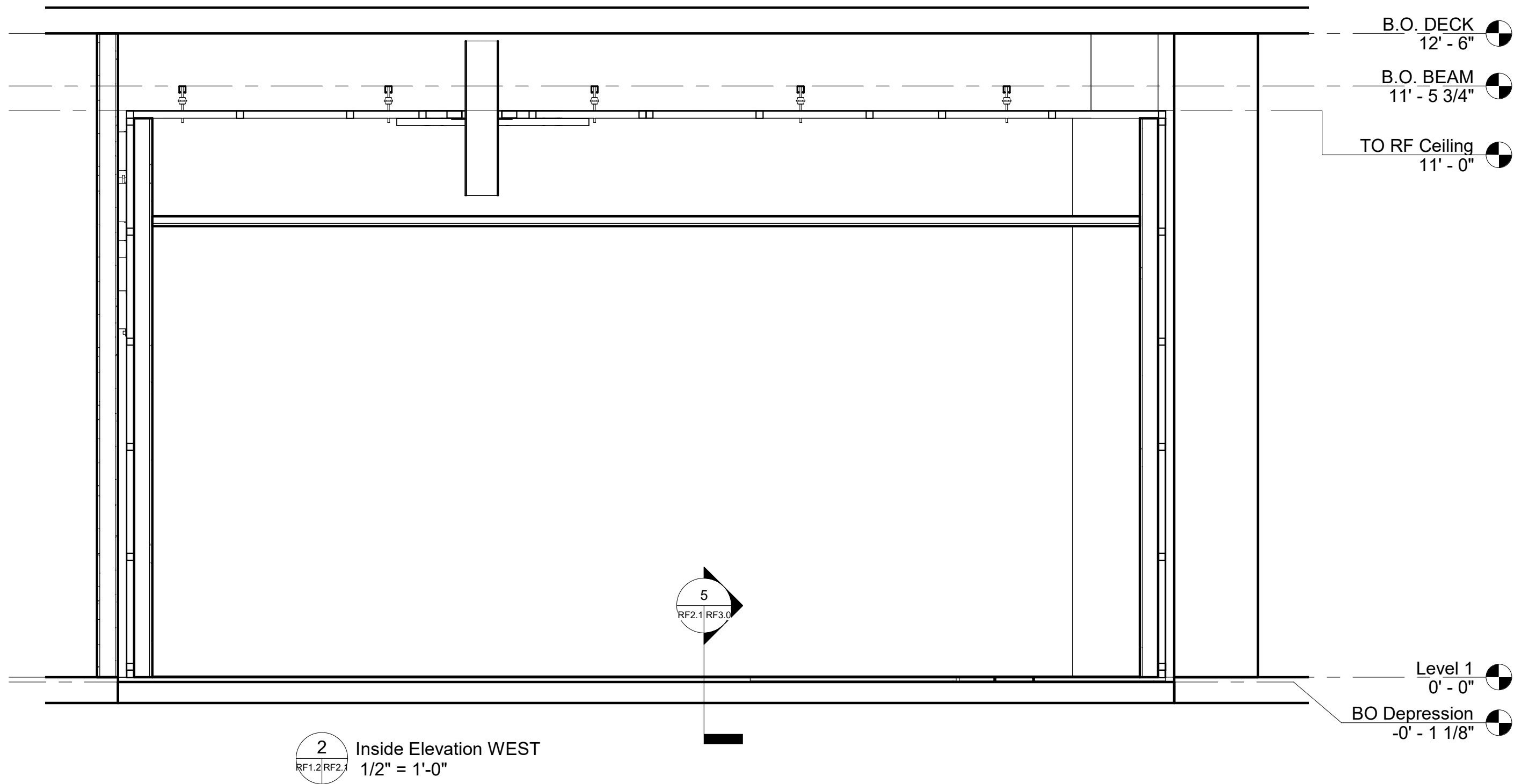
MD63377

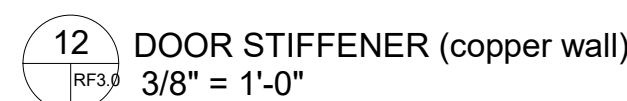
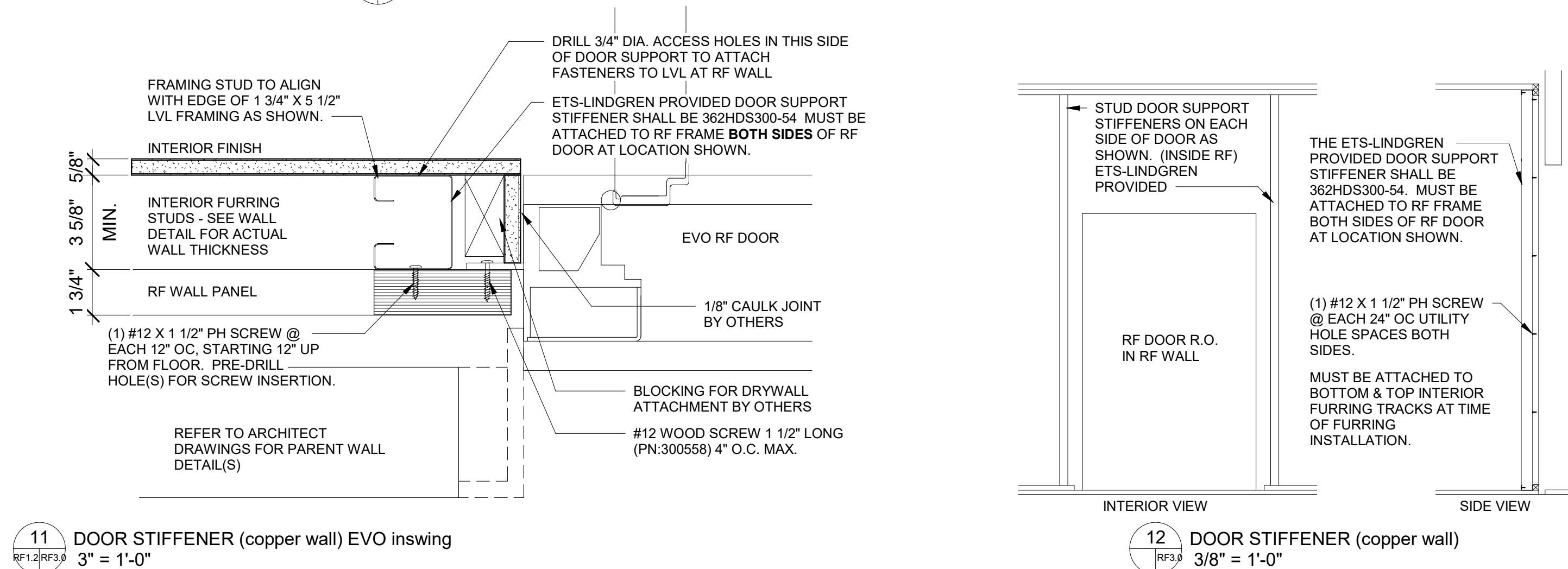
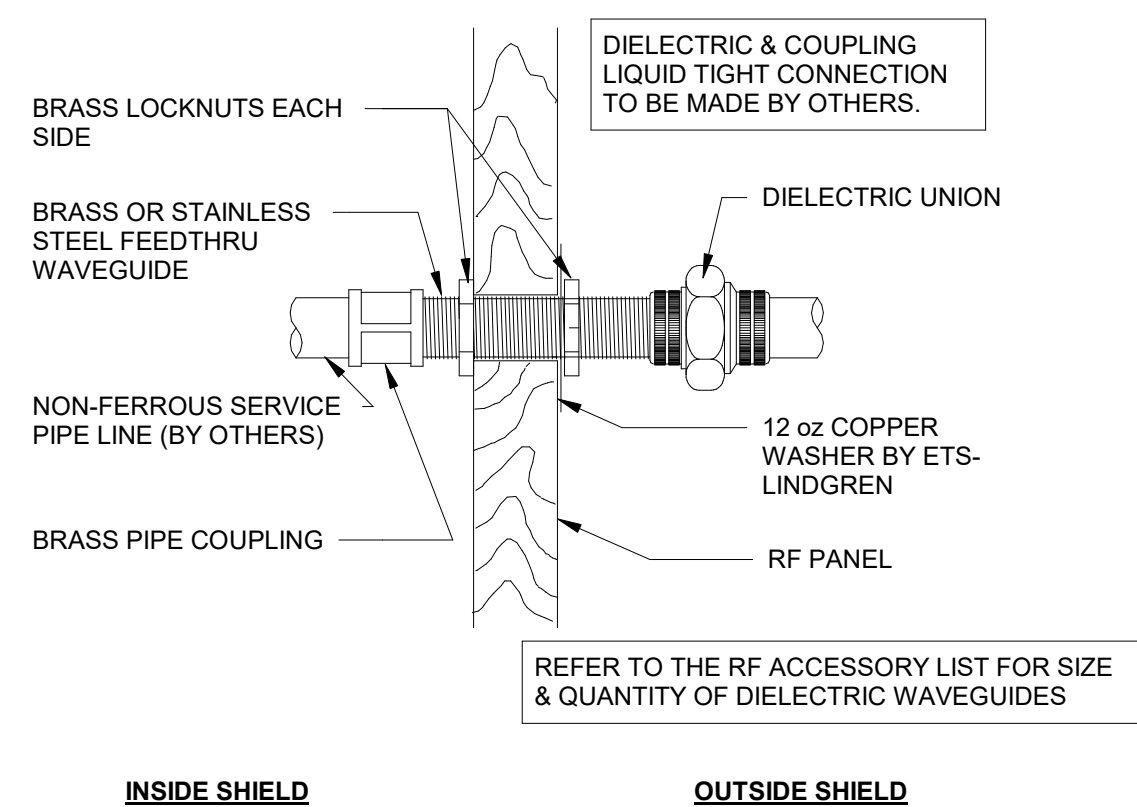
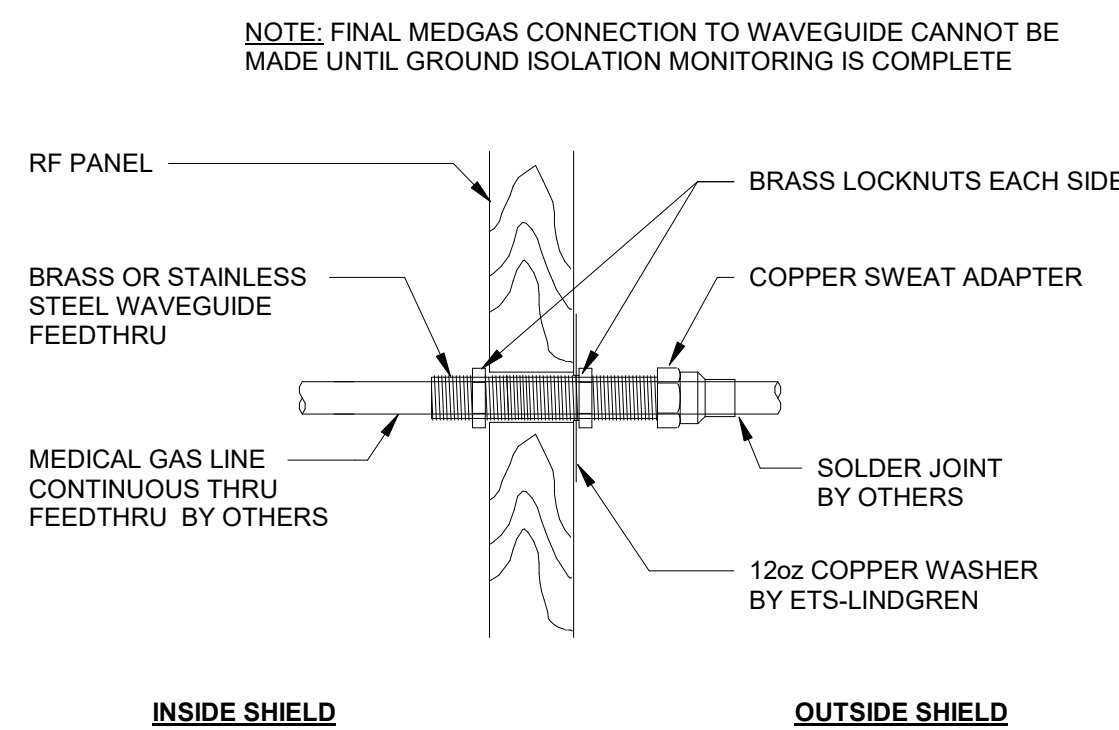
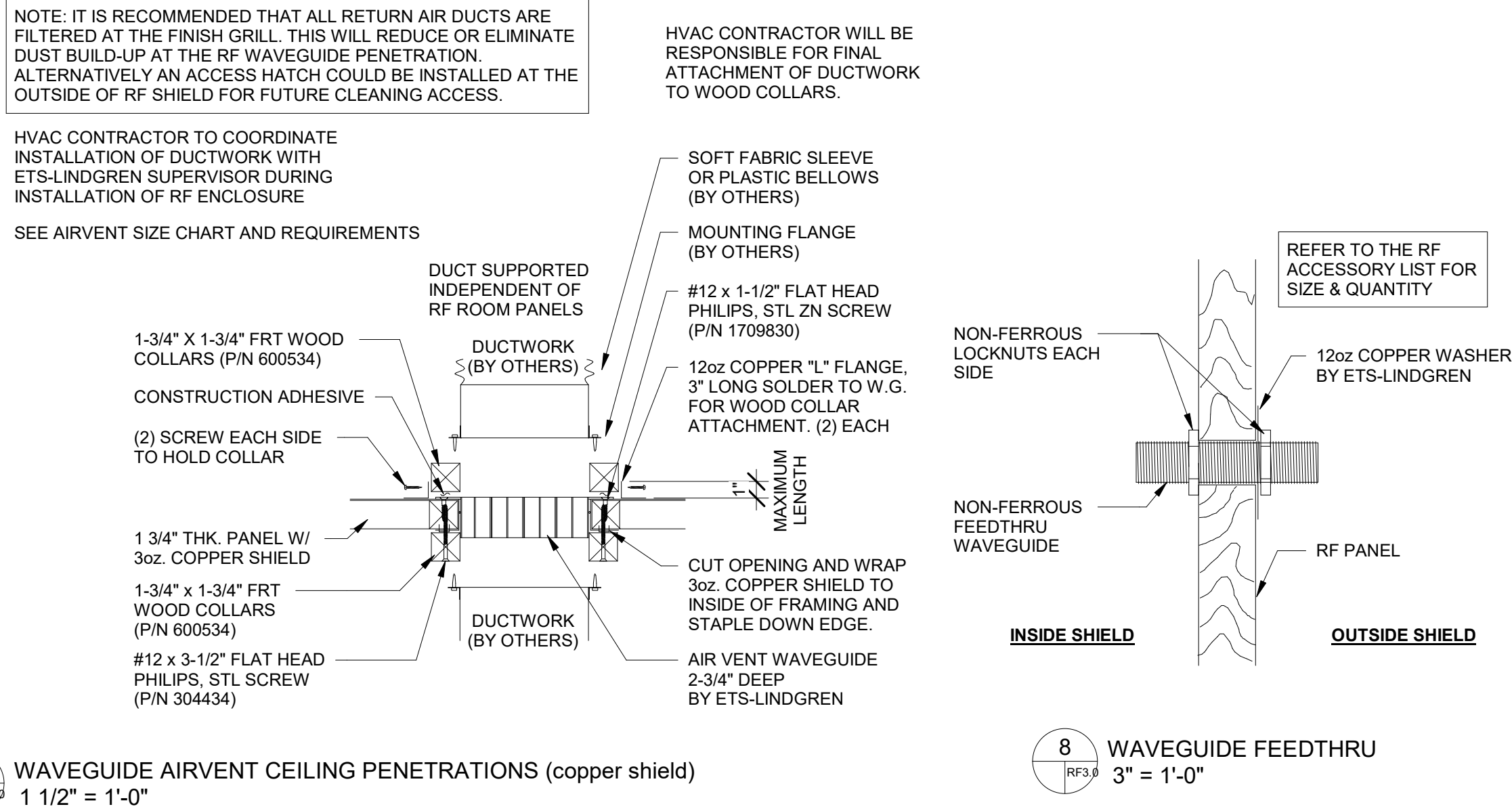
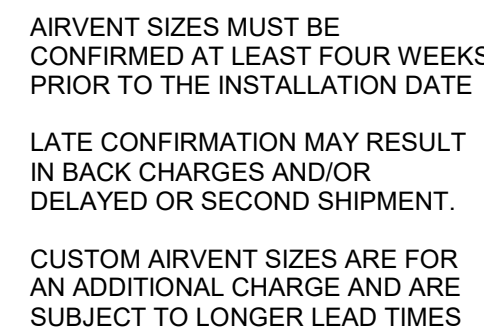
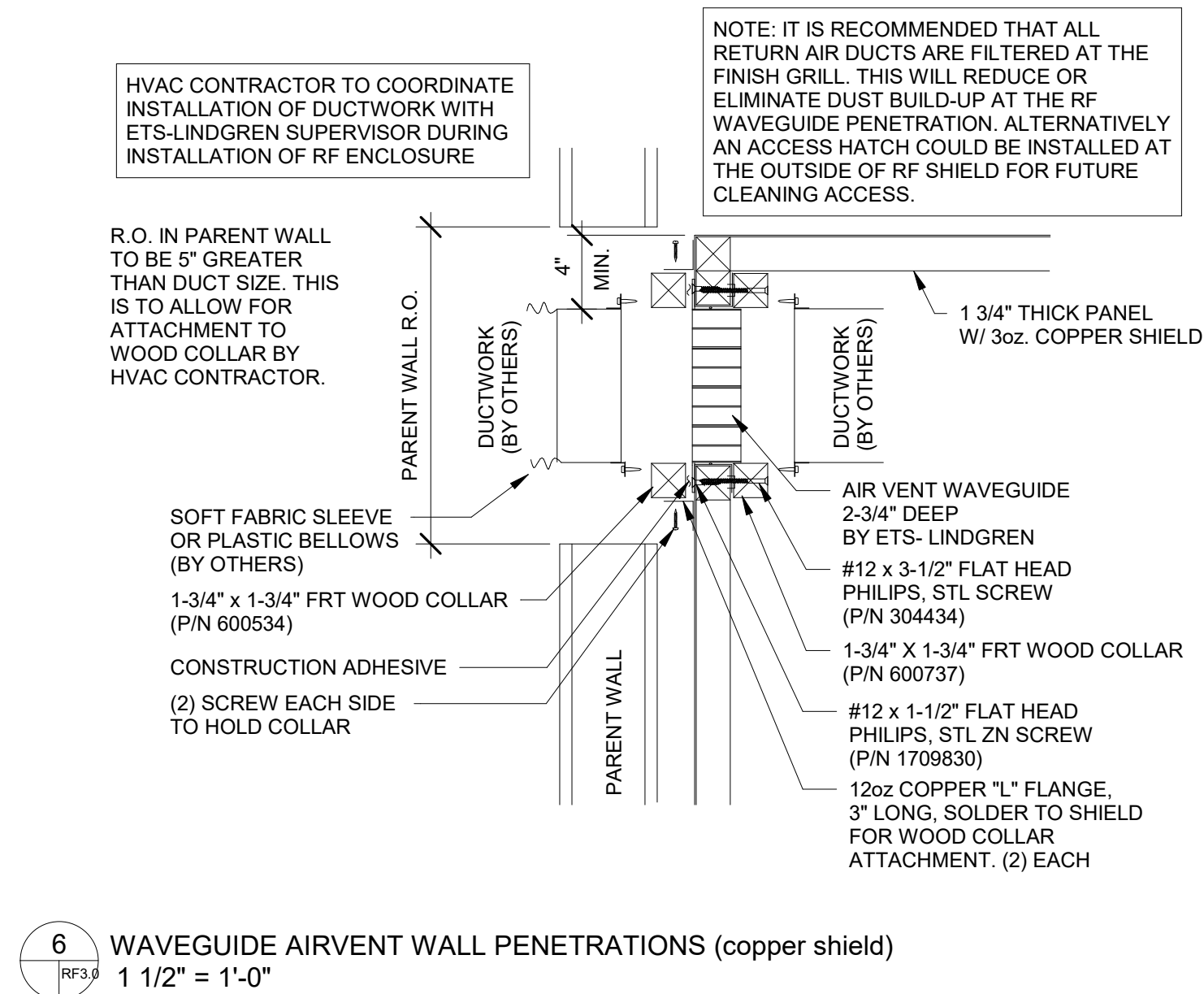
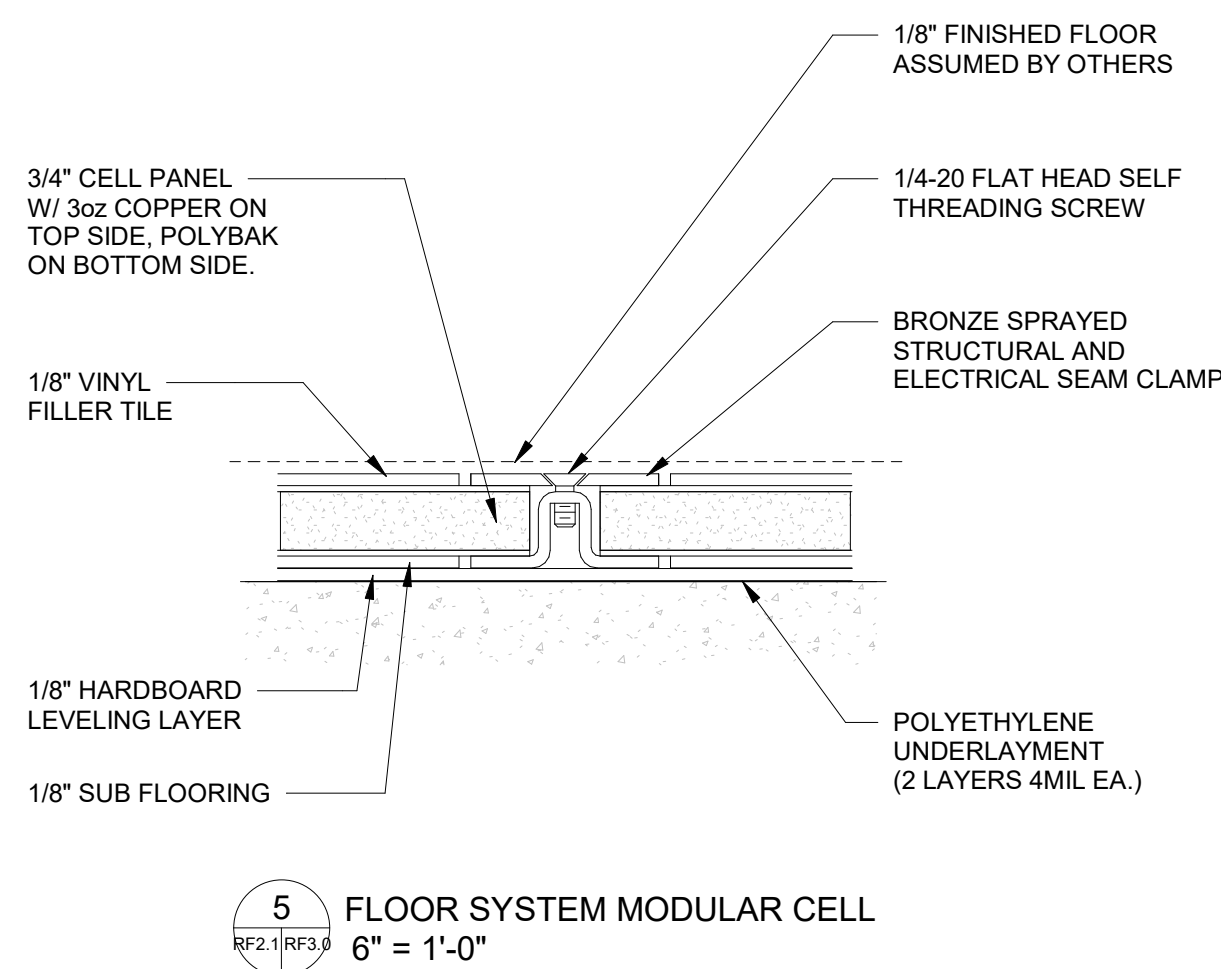
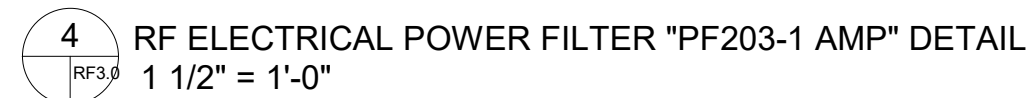
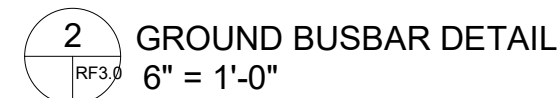
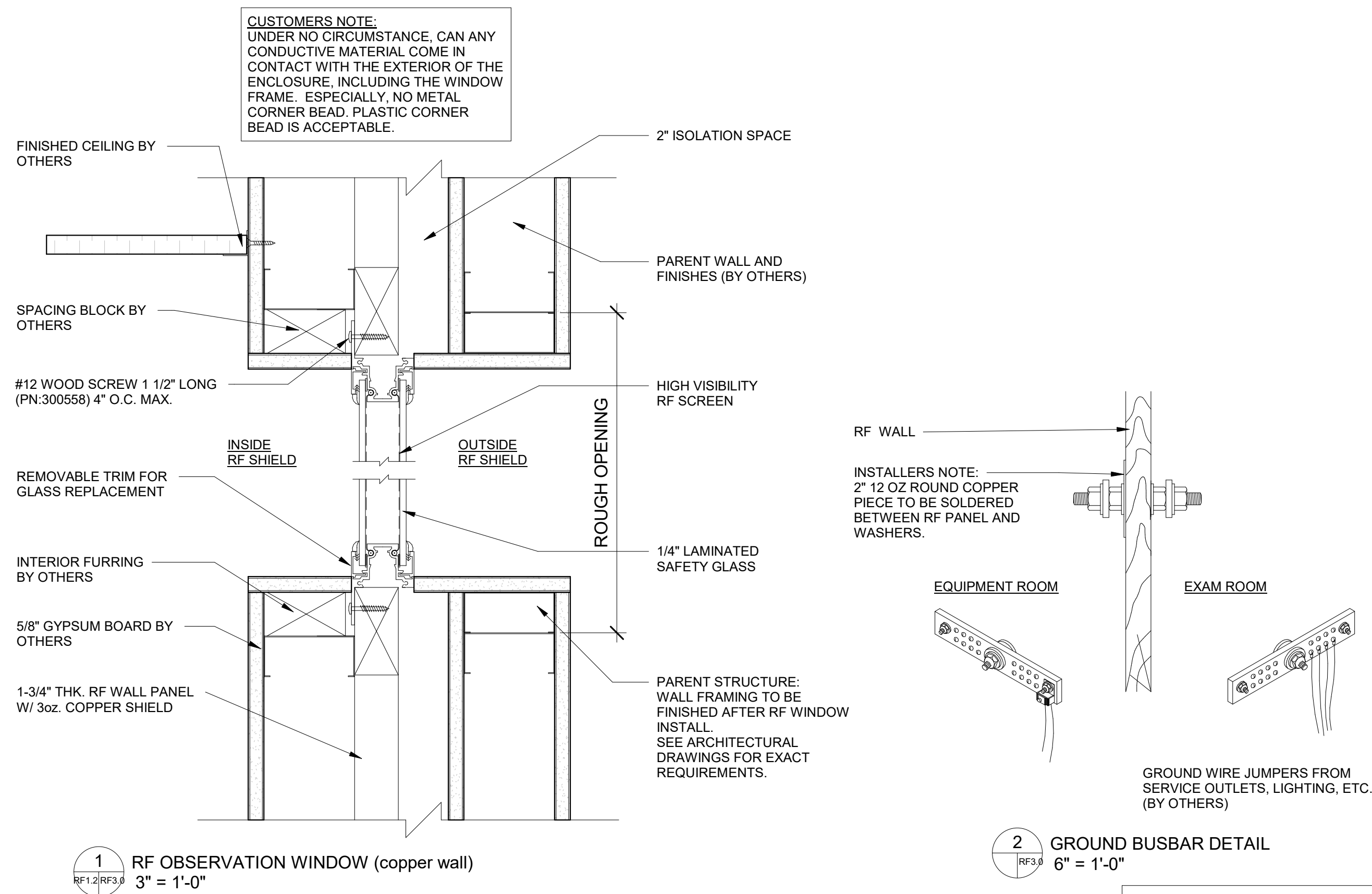
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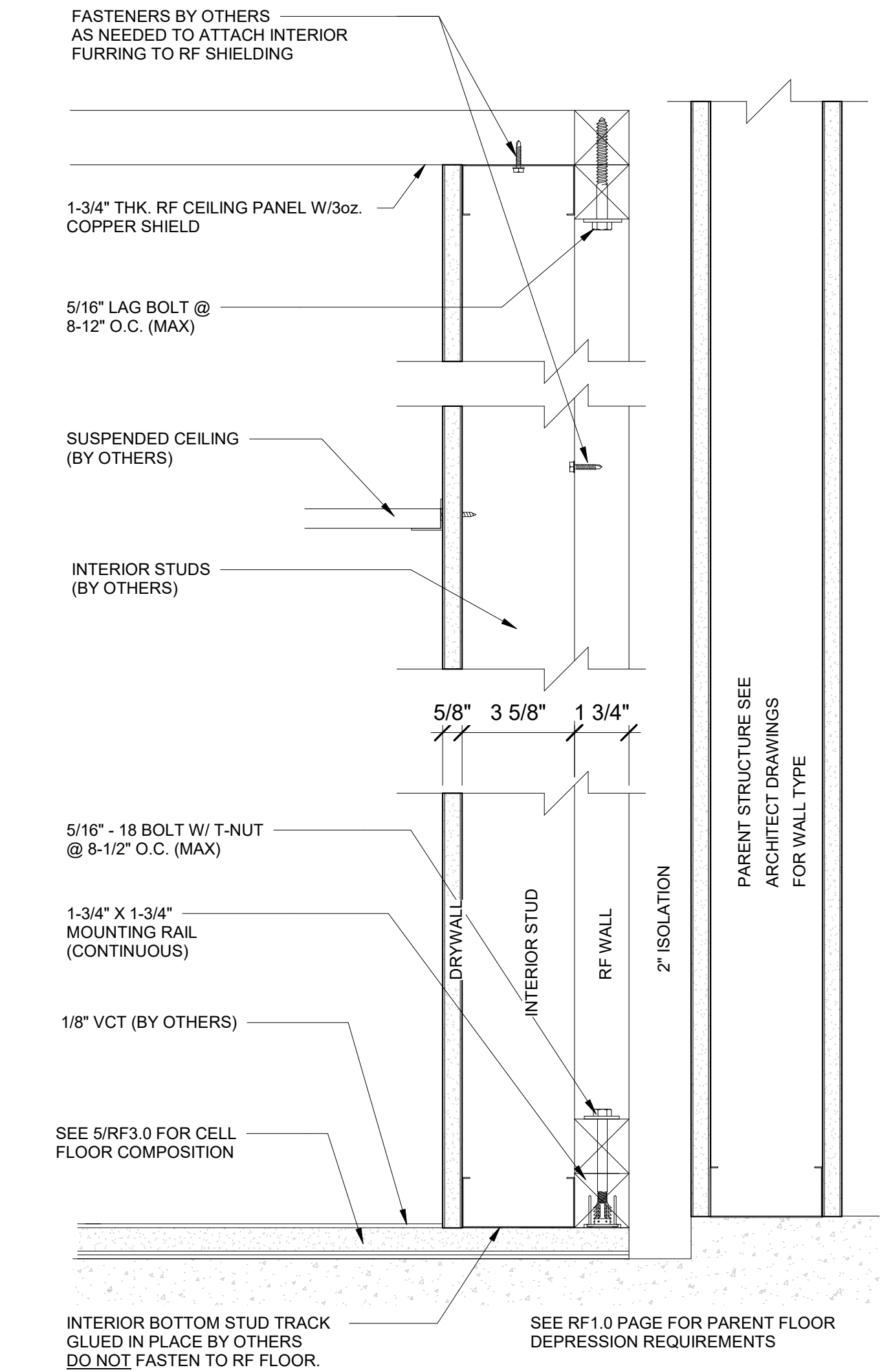
RF2.0





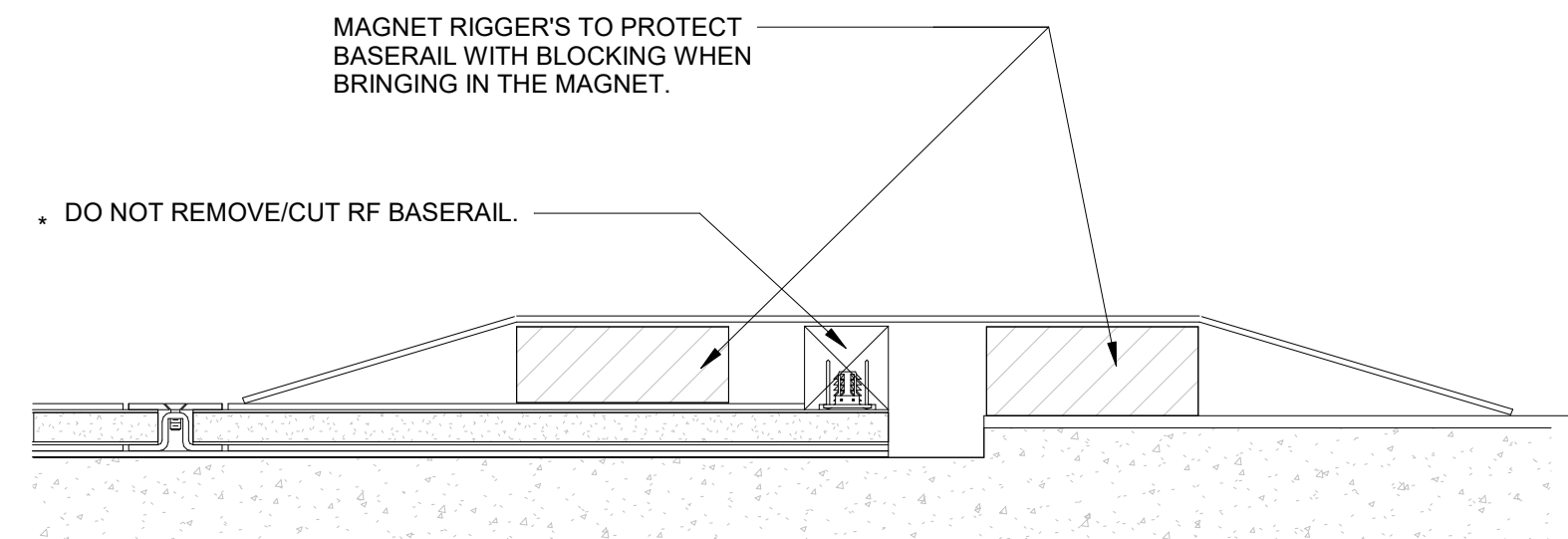




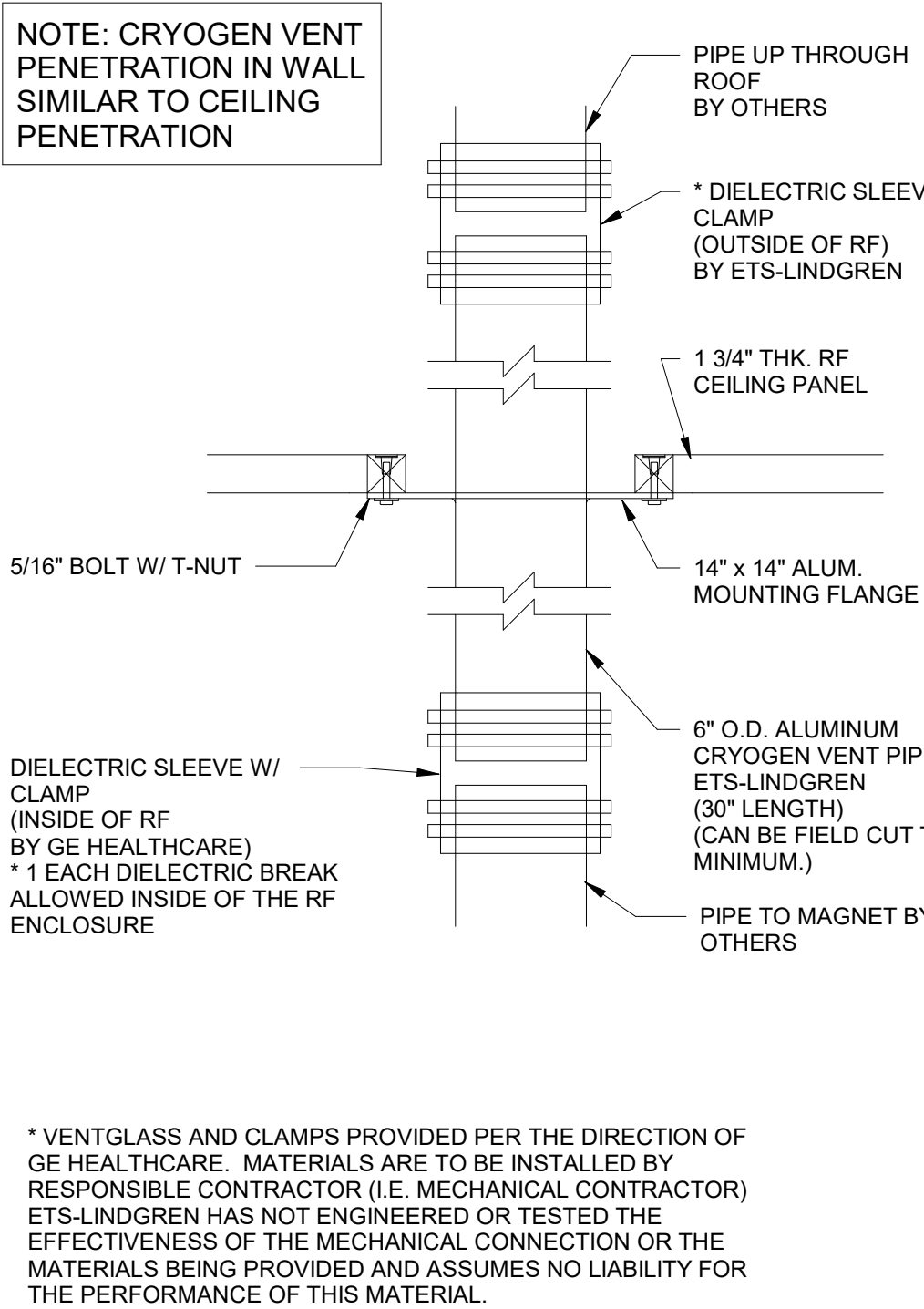


1 WALL SECTION (copper wall - cell floor, 3 5/8" stud)  
3" = 1'-0"

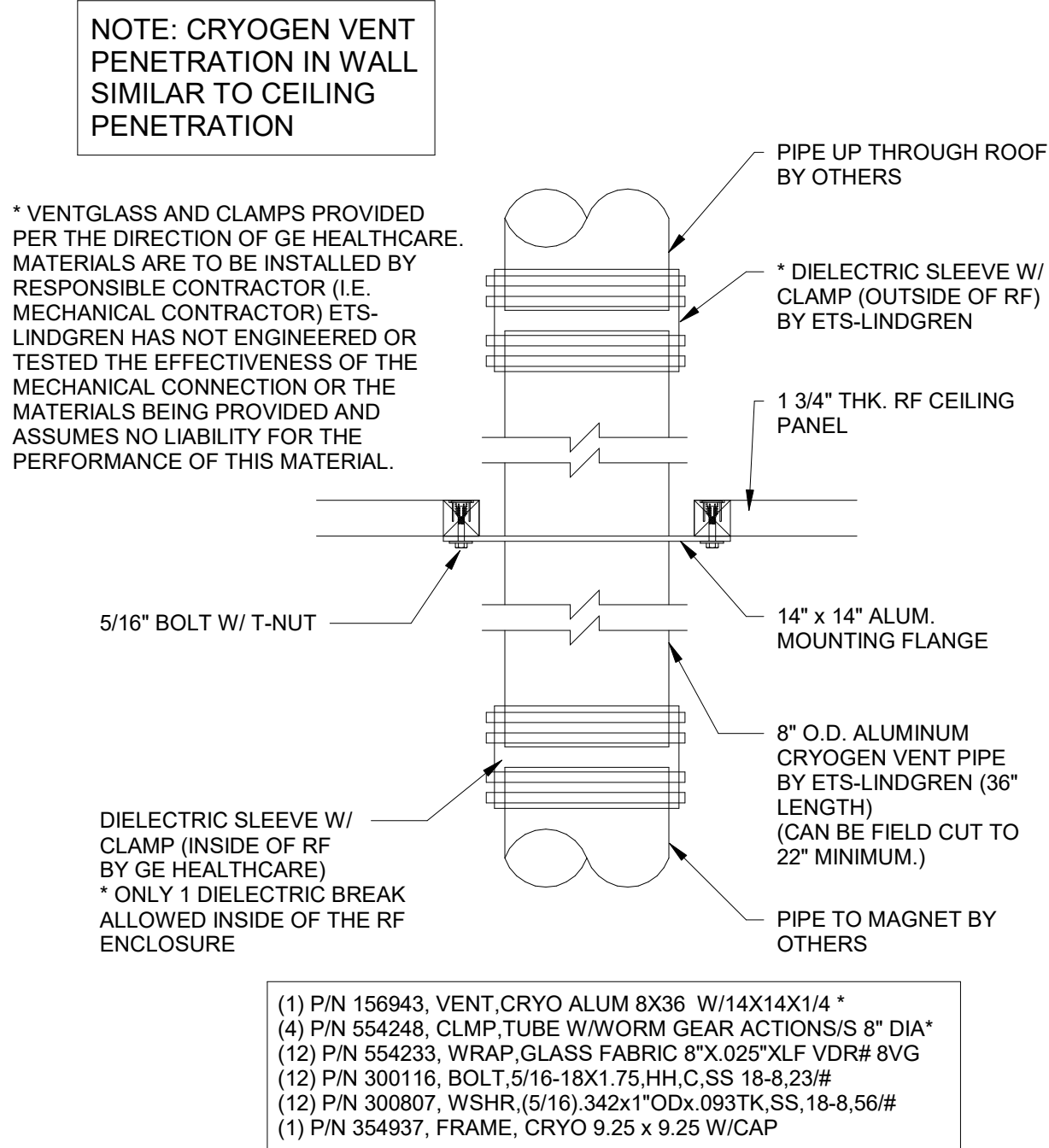
ETS-LINDGREN PART NUMBERS - PANEL CONNECTIONS		
	ASSM, SCR, 5/16x3 1/2 LAG W/ WASHERS	TYPICAL CONNECTIONS
300501	ASSM, SCR, 5/16x3 1/2 LAG W/ WASHERS	TYPICAL CONNECTIONS
300126	BOLT, 5/16-18x3.5,HH,C,STL, ZN GR5	AT T-NUTS
300800	L/WSHR, 5/16 SPLT, STL, ZN 45/#	AT T-NUTS
300827	WSHR, 5/16, .341 I.D x1.125 O.D.x .093 STL, ZN	AT T-NUTS
300108	BOLT, 5/16-18x3.5,HH,C,SS 18-8, 12.8/#	AT T-NUTS MAG. ACCESS
300798	L/WSHR, 5/16 MED SPLT, SS, 18-8, 270/#	AT T-NUTS MAG. ACCESS
300807	WSHR, 5/16, .342x1" O.D.x .093TK,SS,18-8,56/#	AT T-NUTS MAG. ACCESS
300109	BOLT, 5/16-18x4,HH,T,STL,ZN,ST 16, 13.0/#	FULLY THREADED BOLT



4 FLOOR DETAIL AT MAGNET ACCESS (copper wall - cell floor)  
3" = 1'-0"

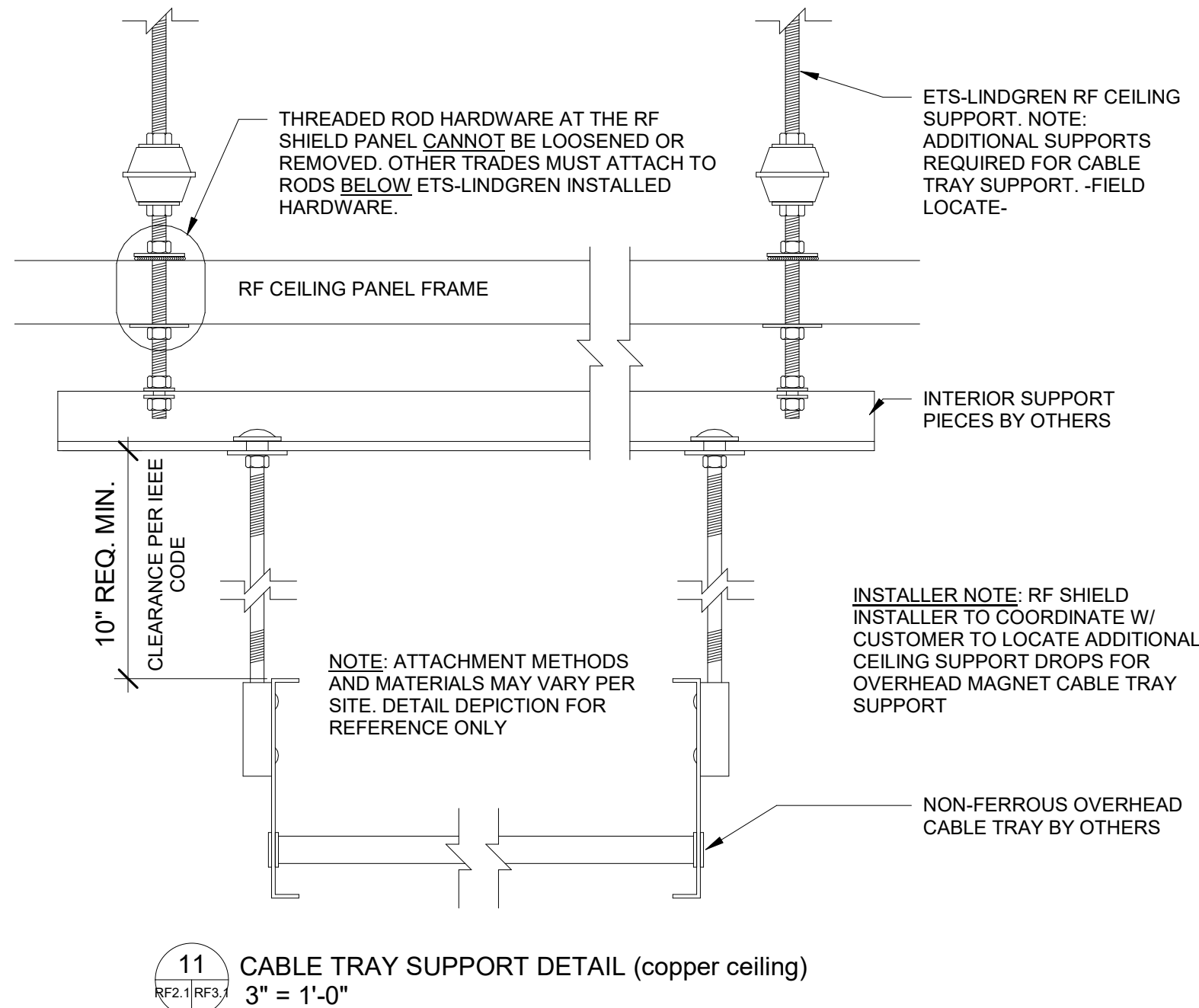


2 GE CRYOGEN VENT DETAIL (6")  
1 1/2" = 1'-0"



3 GE CRYOGEN VENT DETAIL (8" standard)  
1 1/2" = 1'-0"

- (1) P/N 156943, VENT, CRYO ALUM 8X36 W/14X14X1/4 \*  
(4) P/N 554248, CLMP, TUBE W/WORM GEAR ACTIONS/S 8" DIA \*  
(12) P/N 554233, WRAP, GLASS FABRIC 8"X.025"XLF VDR# 8VG  
(12) P/N 300116, BOLT, 5/16-18X1.75,HH,C,SS 18-8,23/#  
(12) P/N 300807, WSHR, (5/16),.342x1"ODx.093TK,SS,18-8,56/#  
(1) P/N 354937, FRAME, CRYO 9.25 x 9.25 W/CAP



MAGNET VENDOR (GE) SPECIFIC NOTES:

- A. IF METAL STUDS ARE USED, THEY MUST BE ISOLATED FROM DIRECT CONTACT TO THE RF WALLS BY INSULATORS OR AIR SPACE. THIS IS TO AVOID METAL TO METAL CONTACT THAT CAUSE IMAGE QUALITY ISSUES. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
- B. THE FINISHED FLOOR FLATNESS/LEVELNESS GE REQUIREMENT OF NO MORE THAN .0125" BETWEEN HIGH AND LOW SPOTS OVER AN AREA 245" X 93" AS SHOWN IN GE'S PREINSTALLATION MANUAL.
- C. AS FINAL ARCHITECTURAL PLANS DEVELOP, IT IS THE RESPONSIBILITY OF THE ARCHITECT TO NOTIFY GE'S PM OF ANY CHANGES THAT WILL SIGNIFICANTLY CHANGE THE MAGNETIC SHIELD DIMENSIONS (IF APPLICABLE TO PROJECT) OR THE LOCATION OF THE MAGNET ISOCENTER WITHIN THE SHIELD.
- D. THE 10' X 10' AREA BELOW THE MAGNET ISOCENTER MUST BE FREE OF ANY STEEL OR STEEL REBAR. REFER TO THE SITE SPECIFIC GE DRAWINGS AND THE PRE- INSTALLATION MANUAL.

ACCESSORIES LIST			
QTY	DESCRIPTION	REMARKS	REF.
2	G.E. SET UP PANEL	FOR RF TEST	
1	GROUND BUS BAR	REQUIRED SINGLE POINT GROUND	2/RF3.0
1	2" DIAMETER CRYOGEN VENT	HELIUM EXHAUST	?/RF3.1
4	FILTER, MRI, 250VAC, 2x30 AMP, 0-60Hz	DC LIGHTING / SERVICE OUTLETS	4/RF3.0
2	FILTER, MRI, 250VAC, 2x30 AMP, 0-60Hz	GE RUN DOWN / EF2 SWITCH	4/RF3.0
2	FILTER, 30VAC/50VDC, 2x1.0 AMP	FIRE DETECTION	3/RF3.0
3	1/2" DIA. WAVEGUIDE FEEDTHRUS	MEDGAS	9/RF3.0
1	3/4" DIA. MEDGAS FEEDTHRUS	VACUUM	9/RF3.0
1	1 1/2" DIA DIELECTRIC FEEDTHRUS	FIRE PROTECTION	10/RF3.0
1	MEDRAD W/ (2) 2" WAVEGUIDES		5/RF3.1
—	— "x" — WAVEGUIDE AIRVENTS	FOR HVAC	7/RF3.0
—	— "x" — WAVEGUIDE AIRVENTS	FOR HVAC	7/RF3.0
—	— "x" — WAVEGUIDE AIRVENTS	FOR HVAC	7/RF3.0
—	— "x" — WAVEGUIDE AIRVENTS	FOR HVAC	7/RF3.0

PLEASE NOTE THAT WE HAVE PROVIDED STANDARD FILTERS FOR A TYPICAL MRI PROJECT. ONCE ELECTRICAL DRAWINGS ARE AVAILABLE, WE WILL PRICE ACCORDINGLY.

PLEASE NOTE THAT WE HAVE PROVIDED STANDARD HVAC WAVEGUIDES FOR A TYPICAL MRI PROJECT. ONCE MECHANICAL DRAWINGS ARE AVAILABLE, WE WILL PRICE ACCORDINGLY.

DETAILS

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Description

By

REVISIONS:  
Rev. Date

PROJECT TITLE:  
VA Hospital

ADDRESS:  
Iron Mountain, MI

DRAWN BY: E.GONZALEZ

REFERENCE: --

DATE: 10/4/22

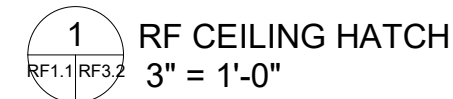
SCALE: As indicated

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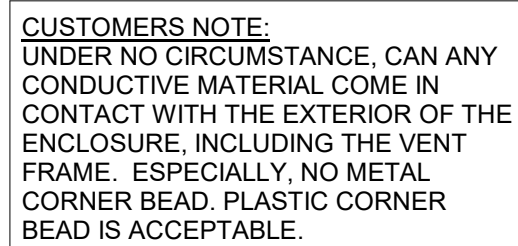
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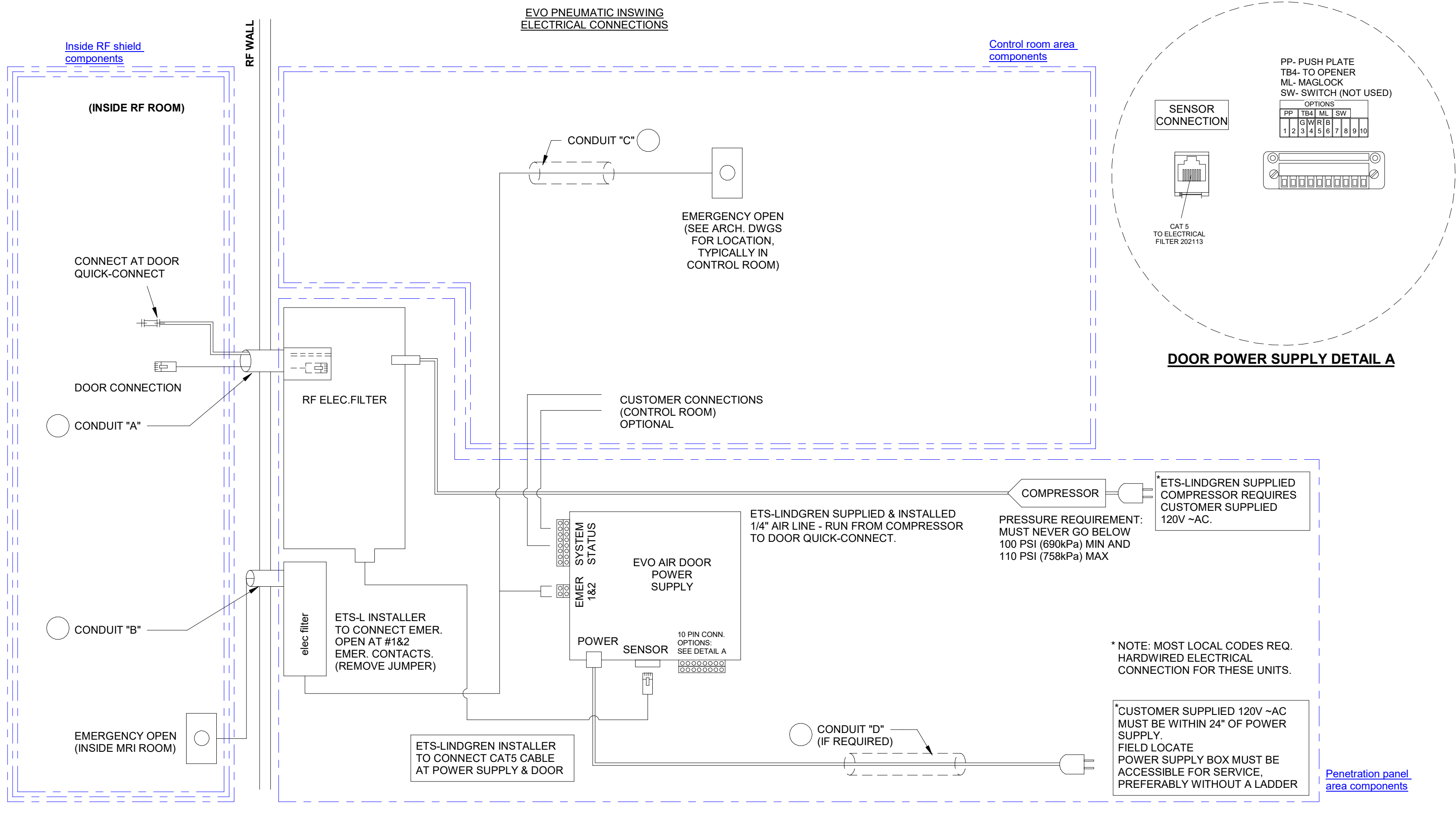
RF3.1



2 PRESSURE EQUALIZATION VENT (in copper ceiling)  
RF1.1/RF3.2 1 1/2" = 1'-0"







	= TYPICAL CONDUIT (BY OTHERS)
CONDUIT "A"	110 PSI AIR LINE & CAT-5 TO DOOR
CONDUIT "B"	EMERGENCY POWER OFF INSIDE ROOM
CONDUIT "C"	EMERGENCY POWER OFF OUTSIDE ROOM
CONDUIT "D"	120 VAC TO EVO AIR DOOR POWER SUPPLY (LOGIC BOX)

#### CUSTOMER SUPPLIED UTILITY ITEMS

Power:	Supply to:	Location:	Method:
120v - 15A	Compressor	Equipment Rm	Outlet or per code
120/240v - 15A	Door pwr supply	Equipment Rm	Outlet or per code

NOTE: IT IS RECOMMENDED THAT THE DOOR COMPONENTS BE PLACED ON EMERGENCY BACK-UP POWER COMPRESSOR IS REQUIRED TO BE ON A SEPARATE CIRCUIT THAN DOOR POWER SUPPLY. DOOR POWER SUPPLY AND AUTO OPENER-CLOSER (IF APPLICABLE) CAN BE ON THE SAME CIRCUIT.

#### DOOR CONDUITS

- 1) DOOR CONDUITS BY OTHERS MUST BE COMPLETELY INSTALLED DURING INITIAL RF SHIELD INSTALLATION. THE AREAS FOR RF SHIELD COMPONENTS MUST REMAIN ACCESSIBLE.
- 2) INFORMATION ON THIS SHEET MUST BE GIVEN TO THE ELECTRICAL CONTRACTOR PRIOR TO THE RF SHIELD INSTALLATION. ANY PREP WORK MUST BE DONE PRIOR TO RF SHIELD INSTALLERS ARRIVAL.

#### ETS-LINDGREN SUPPLIED AIR COMPRESSOR

ROLAIR JC10 PLUS (Size: 16" x 16" x 15") (38 lbs) (60db rating)  
Warranty: 1 yr. Limited

- NOTE 1: Compressor needs to be located in the Equipment room, in an area that is easily accessible for servicing. Please refer to Users Guide for further information.  
NOTE 2: Customer is responsible for locating and mounting compressor at time of RF installation.  
NOTE 3: Customer is responsible for 110 volt outlet at compressor location.

#### DOOR SYSTEM

KEEP ALUMINUM JAMB AND THRESHOLD CLEAN AND FREE OF WAX OR FLOOR POLISH.

USE THE FINE SIDE OF AN ALUMINUM OXIDE ABRASIVE SPONGE TO CLEAN THE JAMB AND THRESHOLD IN THE AREAS WHERE THE DOOR SEAL MAKES CONTACT.  
SAND ONLY THE THREE JAMB SURFACES AND THE THRESHOLD.

#### DO NOT SAND THE DOOR SEALS!

IT IS ONLY NECESSARY TO CLEAN AND BRIGHTEN THE SURFACE. GENERALLY SAND IN THE LENGTH DIRECTION.

USE A CLEAN CLOTH TO WIPE OFF THE PARTICLES AND DIRT FROM THE JAMB AND THRESHOLD.

FOR OPTIMUM PERFORMANCE, REPEAT THIS PROCEDURE MONTHLY.

THE DOOR MECHANISM AND PERIMETER SEALS ARE MAINTENANCE FREE. CAUTION SHOULD BE TAKEN TO NOT CLOSE THE DOOR WITH OBSTRUCTIONS ACROSS THE THRESHOLD OR IN THE DOOR OPENING. (POWER CORDS, ETC...)

#### AIR COMPRESSOR

CUSTOMER SHOULD COMPLETE WARRANTY REGISTRATION AND SEND TO MANUFACTURER. NOTE: NUMBER ON WARRANTY REGISTRATION MUST MATCH NUMBER ON COMPRESSOR.

DRAIN MOISTURE FROM DISPENSER REGULARLY. RECOMMEND TO LOCATE COMPRESSOR NEAR A DRAIN AND RUN A HOSE FROM THE DISPENSER TO THE DRAIN TO AVOID WEEKLY DRAIN MAINTENANCE OF DISPENSER.

BLOW DOWN RECEIVER (AIR TANK) AT LEAST ONCE A WEEK. CLOSE DRAIN COCK TIGHTLY AFTERWARDS.

ETS-LINDGREN TEL. (630) 307-7200 FAX (630) 307-7571

#### EMERGENCY AIR SUPPLY

A COMPRESSOR FAILURE CAN BE TEMPORARILY REPLACED BY A PORTABLE AIR TANK UNTIL A WARRANTED REPLACEMENT CAN BE SENT. CONTACT ETS-LINDGREN FOR THIS PROCEDURE.

#### ALTERNATE COMPRESSOR

IF YOU HAVE SUPPLIED YOUR OWN COMPRESSOR, FOLLOW THE MANUFACTURERS RECOMMENDED MAINTENANCE PROCEDURES.

#### HANDLE HARDWARE

SCHLAGE LEVER HANDLE WITH US-26D FINISH.

#### CONDUIT "A"

3/4" CONDUIT FROM RF FILTER AT PENETRATION PANEL

1-3/4" RF WALL PANEL W/ 3 oz COPPER SHIELD

5/8" INTERIOR FINISH BY OTHERS

3 1/2" MIN. INTERIOR FRAMING REQUIRED AT DOOR FOR DOOR BRACING SUPPORTS

#12 WOOD SCREW 1-1/2" LONG [PN:300558]

ALUMINUM DOORJAMB

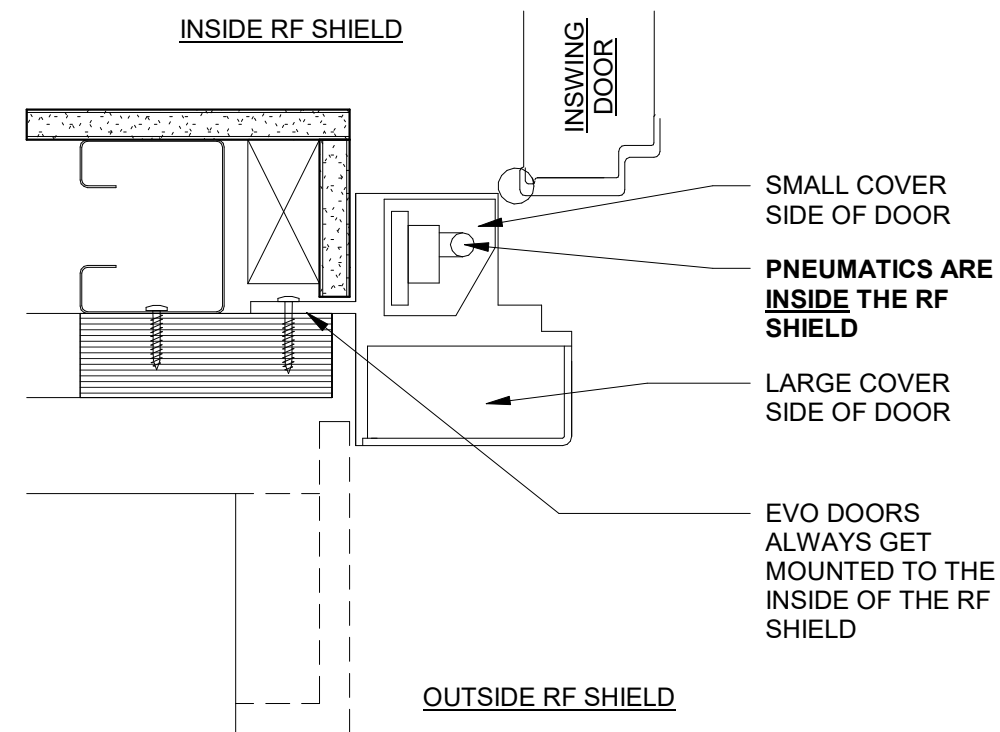
#### INSTALLERS NOTE:

RF RO TO BE: 56"W X 86.5"H

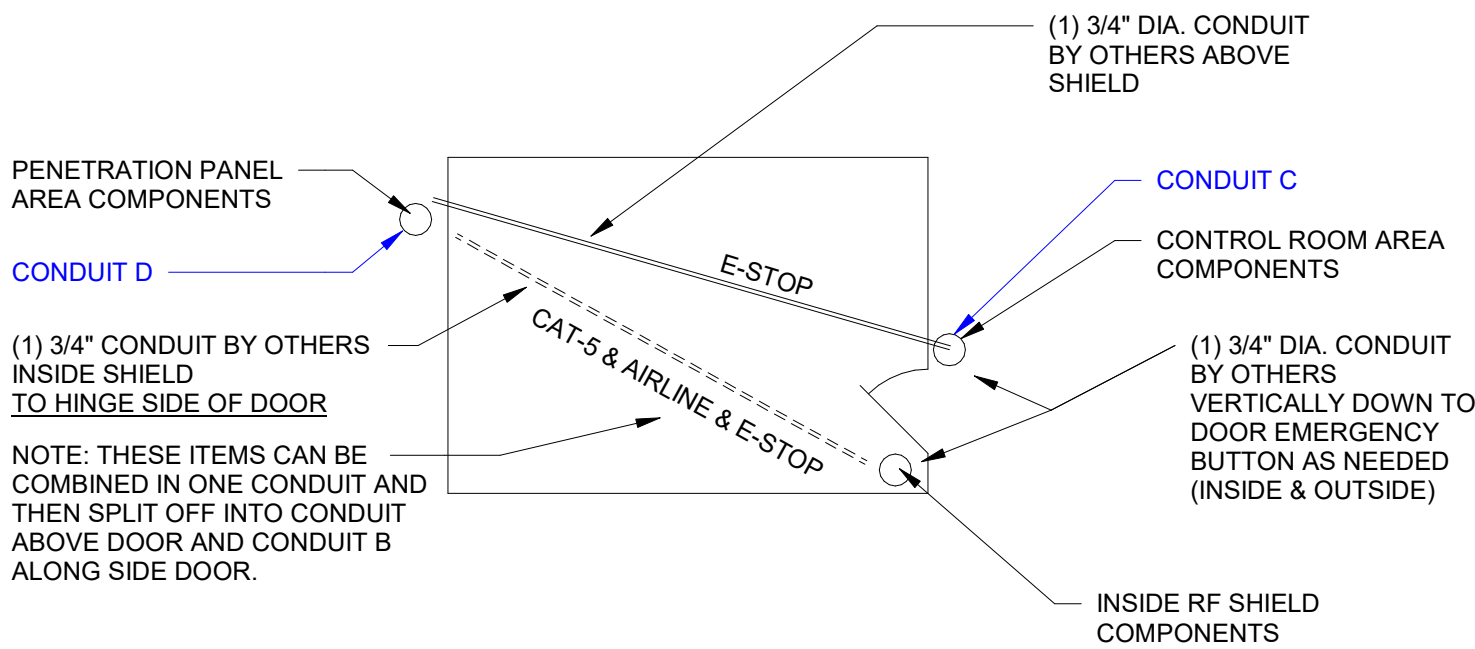
ALUMINUM THRESHOLD

SEE 5/RF3.0 FOR CELL FLOOR COMPOSITION

1 DOOR EVO AIR INSWING (copper wall)  
3" = 1'-0"



2 JAMB DETAIL - INSWING EVO RF DOOR (copper wall)  
3" = 1'-0"



3 Generic Plan View - EVO Air Inswing  
1/8" = 1'-0"

NOTE: CUSTOMER TO SUPPLY AND INSTALL CONDUIT FOR CAT5 CABLE & AIR LINE.

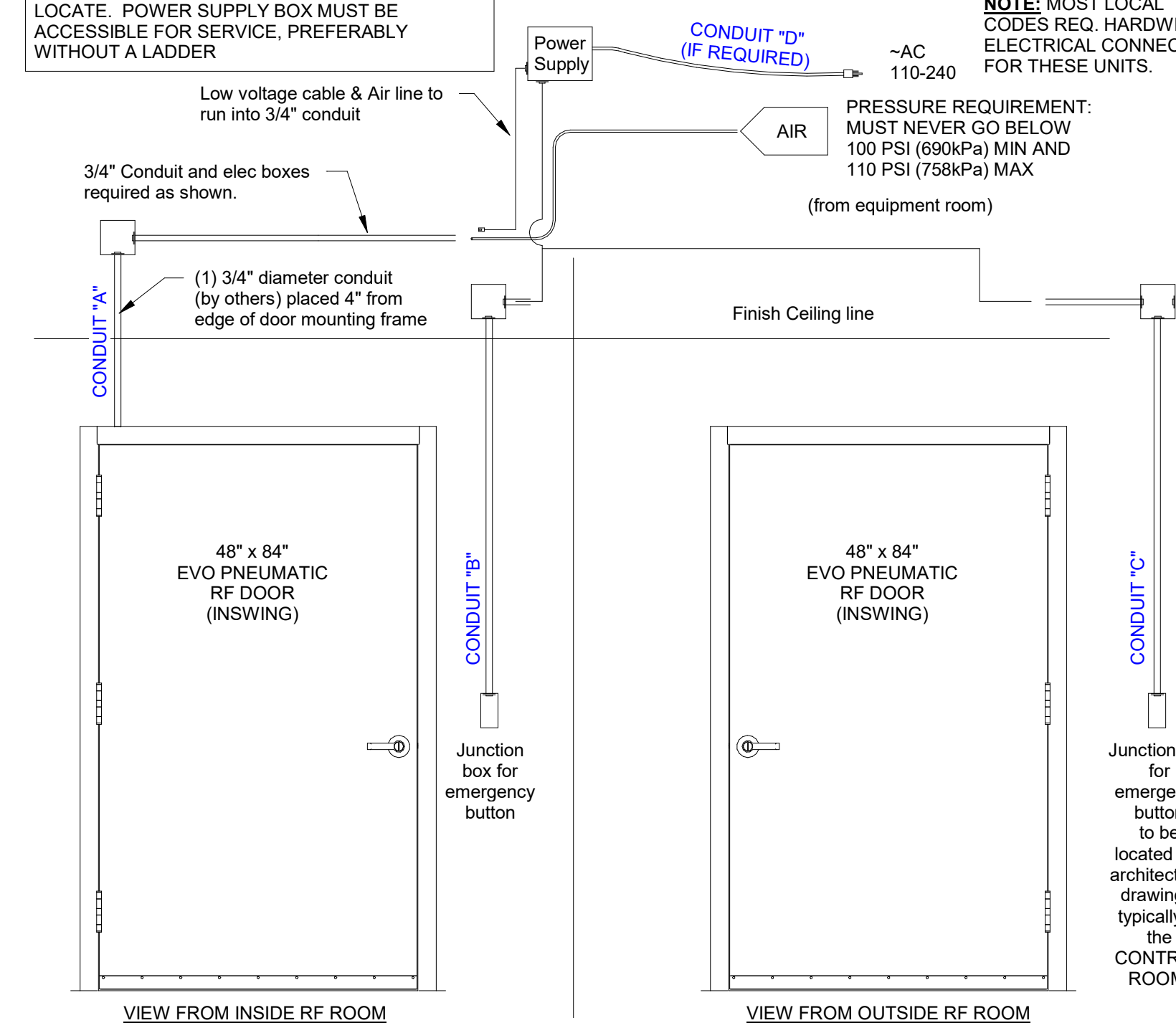
NOTE: DOOR POWER SUPPLY MUST BE LOCATED IN THE EQUIPMENT ROOM AT THE PENETRATION PANEL. INSTALL ON PARENT WALL ONLY. DO NOT PLACE ON RF WALL PANEL(S). FIELD LOCATE. POWER SUPPLY BOX MUST BE ACCESSIBLE FOR SERVICE, PREFERABLY WITHOUT A LADDER

#### EVO PNEUMATIC INSWING ELECTRICAL CONNECTIONS.

CUSTOMER SUPPLIED POWER TO BE WITHIN 24" OF THE DOOR POWER SUPPLY.

NOTE: MOST LOCAL CODES REQ. HARDWIRED ELECTRICAL CONNECTION FOR THESE UNITS.

PRESSURE REQUIREMENT: MUST NEVER GO BELOW 100 PSI (690kPa) MIN AND 110 PSI (758kPa) MAX



#### INSWING DOOR INSTALLATION GUIDE

USE ELECTRONIC VERSION TO ASSURE LATEST REVISION

DRAWINGS SUPPLIED BY ETS-LINDGREN ARE RF SHIELD SHOP DRAWINGS. THEY ARE NOT CONSTRUCTION DRAWINGS AND SHALL BE USED FOR REFERENCE ONLY.

#### EVO AIR DOOR INSWING

SHEET TITLE:

Description

REVISIONS:

Rev. Date By

PROJECT TITLE:

ADDRESS:

DRAWN BY: E. GONZALEZ

REFERENCE: --

DATE: 10/4/22

SCALE: As indicated

JOB NO: MD63377

REV:

DRAWING NO:

RF4.0