

#### **INVITATION FOR BIDS**

#### ALL PROSPECTIVE MECHANICAL CONTRACTORS

## INVITATION FOR BIDS Grady MRI Chiller

Grady Health System Department of Facilities Management is soliciting proposals for mechanical services for the *Marcus Trauma Tower 4<sup>th</sup> Floor Penthouse.* 

The project will be located at the main campus at 80 Jesse hill Dr., Atlanta, GA. 30303 in the Marcus Trauma Tower  $4^{th}$  Floor Penthouse.

The IFB (dated Monday, August 19, 2024) will be posted on the Grady website prior to the *mandatory pre-proposal* meeting Monday, September 16, 2024, at 3:00pm EST, in the offices of the Health System's Department of Facilities Management, Basement Floor, Grady Hospital. The driving address is 80 Jesse hill Dr., Atlanta, GA. 30303

Proposals will be due on **Tuesday**, <u>October 1</u>, <u>2024</u>, at 4:00 PM EST. Additional RFP documents will be presented at the <u>mandatory pre-proposal</u> meeting.

Additionally, registration with VendorMate (through the following website: <a href="https://registersupplier.ghx.com">https://registersupplier.ghx.com</a>) must be completed prior to proposal submission.

Please notify **Ron Henry** by email at <u>rehenry@gmh.edu</u> of your intention to attend the pre-proposal meeting by email no later than **Friday**, **September 13**, **2024**, at **4:00 PM EST**.

Please see the attached documents below for Project Background and New Scope Narrative.

Sincerely,

**Grady Health System** 





TLC Engineering Solutions 4360 Chamblee Dunwoody Rd., Ste 210 Atlanta, Georgia 30341



# GRADY HEALTH SYSTEMS

ATLANTA, GEORGIA

MRI CHILLER CONCEPT DESIGN

**JULY 12, 2024** 



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#### 1.0 Project Background and Existing Conditions

#### Background:

Grady operates three MRIs on the 3<sup>rd</sup> floor of the Marcus Trauma Building. The MRIs' cooling is supplied by the chiller plant located in the 4<sup>th</sup> floor Mechanical penthouse. Grady engaged TLC to produce a concept design to add dedicated chillers, one for each MRI. TLC brought on PES Structural Engineers to determine if additional roof supports would be required.

#### Mechanical:

The MRIs system is isolated from the main chilled water system with a heat exchanger, and there are three dedicated circulation pumps for the system. When the third MRI was installed in 2022, the heat exchanger was replaced with a larger capacity model and the third pump was added to maintain redundancy. The pump system operates at constant volume of approximately 90 GPM.

#### **Electrical:**

The existing chillers pumps will remain as they are. No changes to electrical installation is anticipated.

#### Structural:

The existing roof construction based on original design documents dated 11-6-2014 consists of a concrete beam and slab construction. The existing 5" thick reinforced slab spans to 21" deep cast in place beams at various spacings which are supported by concrete girders. The concrete strength is 5000 psi.





#### 2.0 New Scope Narrative

#### Mechanical:

Three air-cooled chillers will be installed on the 4<sup>th</sup> floor roof, one chiller dedicated to each MRI. Piping shall be routed through the 4<sup>th</sup> floor mechanical room to each MRI equipment room. All piping shall be insulated, and exterior piping will also be heat traced for freeze protection. The piping shall connect to the existing systems upstream of the components required by Siemens (Appendix C). The existing MRI chilled water loop shall remain in service to function as a backup system. Control valves and a bypass will be installed to ensure that cold water is available without interruption.

The new chillers shall have manufacturer provided, onboard controls. Integrate each chiller with the BMS for monitoring and alarms as indicated in Appendix A. Provide an add/alternate price to use a Filtrine Quick Connect Panel (or similar). Integrate the existing MRI loop pumps into the BMS and provide new controls as required per the sequence on the drawings.

At each location where piping penetrates the roof, provide a piping doghouse or box. Coordinate with Grady's preferred roofing vendor and provide proper installation.

One of the chiller locations is less than 10' from a roof edge and may require fall protection during maintenance activities. The connection work inside of the MRI rooms shall be coordinated with the Owner to minimize downtime.

#### **Electrical:**

The three air-cooled chillers will derive their power from existing distribution panel "4CED2". Panel 4CED2 will need to be metered for 30 days to confirm the electrical capacity of the panel. Each chiller will require a NEMA 3R disconnect rated at 200A and non-fused. 150A breaker will be provided at distribution panel "4CED2" for each chiller. Refer to Appendix B for wiring and conduit information. For the new chiller piping mounted on the exterior of the building, a new 277V, 30A breaker shall be utilized to power the heat traced that will be used on the exterior piping. This should be obtained from the existing 277/480V equipment distribution panel.

#### Structural:

PES has analyzed the existing structure for the weight of the 6,400# chillers. The existing roof slab, girders and columns are all capable of supporting the new units. However, not all the roof beams have the capacity to support the units. PES has worked with TLC to locate the units in the locations on their plan so that they are either on a girder line or supported directly over a beam that can support their weight.





# APPENDIX A

NOTE: SOME SYMBOLS SHOWN ON THIS LEGEND MAY NOT PERTAIN TO THIS PROJECT



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THINK. LISTEN. CREATE.

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Revisions:

No. Date Description

A 10 JUL 24 DRAFT FOR REVIEW

Seal:



B24101

Issue Date:

10 JULY 2024

Drawn By: Christian D.

Approved By: MDM

Scale:

MECHANICAL LEGENDS SHEET

Drawing No.:

Drawing Title:

1001

COMPLY WITH ALL RULES, REGULATIONS, STANDARDS, CODES, ORDINANCES AND LAWS OF LOCAL, STATE AND FEDERAL GOVERNMENTS AND THE AMENDMENTS AND INTERPRETATION OF SUCH RULES, REGULATIONS, STANDARDS, CODES, ORDINANCES AND LAWS OF LOCAL, STATE AND FEDERAL GOVERNMENTS BY THE AUTHORITIES HAVING LAWFUL JURISDICTION.

INTENT: THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO ESTABLISH MINIMUM ACCEPTABLE QUALITY STANDARDS FOR MATERIALS, EQUIPMENT AND WORKMANSHIP, AND TO PROVIDE OPERABLE MECHANICAL SYSTEMS COMPLETE IN EVERY RESPECT.

EQUIPMENT PLACEMENT: THE DRAWINGS ARE DIAGRAMMATIC, INTENDED TO SHOW GENERAL ARRANGEMENT, CAPACITY AND LOCATION OF VARIOUS COMPONENTS, EQUIPMENT AND DEVICES. EACH LOCATION SHALL BE DETERMINED BY REFERENCE TO THE GENERAL BUILDING PLANS AND BY ACTUAL MEASUREMENTS IN THE BUILDING AS BUILT. REASONABLE CHANGES IN LOCATIONS ORDERED BY THE ARCHITECT PRIOR TO THE PERFORMANCE OF THE AFFECTED WORK SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

DRAWING SCALE: DUE TO THE SMALL SCALE OF THE DRAWINGS, AND TO UNFORESEEN JOB CONDITIONS, ALL REQUIRED OFFSETS, TRANSITIONS AND FITTINGS MAY NOT BE SHOWN BUT SHALL BE PROVIDED AT NO ADDITIONAL COST.

CONFLICT: IN THE EVENT OF A CONFLICT, THE ARCHITECT WILL RENDER AN INTERPRETATION IN ACCORDANCE WITH THE GENERAL

ABBREVIATIONS: ABBREVIATIONS, WHERE NOT DEFINED IN THE CONTRACT DOCUMENTS, SHALL BE INTERPRETED TO MEAN THE NORMAL CONSTRUCTION INDUSTRY TERMINOLOGY, AS DETERMINED BY THE ARCHITECT. PLURAL WORDS SHALL BE INTERPRETED AS SINGULAR AND SINGULAR WORDS SHALL BE INTERPRETED AS PLURAL WHERE APPLICABLE FOR CONTEXT OF THE CONTRACT DOCUMENTS.

GENERAL: THE INSTALLATION OF MATERIALS AND EQUIPMENT SHALL BE DONE IN A NEAT, WORKMANLIKE AND TIMELY MANNER BY AN ADEQUATE NUMBER OF CRAFTSMEN KNOWLEDGEABLE OF THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THEY SHALL BE SKILLED IN THE METHODS AND CRAFTSMANSHIP NEEDED TO PRODUCE A FIRST-QUALITY INSTALLATION. PERSONNEL WHO INSTALL MATERIALS AND EQUIPMENT SHALL BE QUALIFIED BY TRAINING AND EXPERIENCE TO PERFORM THEIR ASSIGNED TASKS.

HOUSEKEEPING: KEEP INTERIORS OF DUCT AND PIPE SYSTEMS CLEAN AND FREE FROM DIRT, RUBBISH AND FOREIGN MATTER. CLOSE OPEN ENDS OF PIPING AND DUCTWORK AT ALL TIMES THROUGHOUT THE INSTALLATION.

EQUIPMENT PROTECTION: PROTECT FAN MOTORS, SWITCHES, EQUIPMENT, FIXTURES, AND OTHER ITEMS FROM DIRT, RUBBISH AND FOREIGN MATTER. DO NOT OPERATE AIR HANDLING EQUIPMENT IF THE BUILDING IS NOT CLEAN OR IF DUST CAN ENTER THE COILS OR THE FAN HOUSINGS.

EQUIPMENT CLEANING: THOROUGHLY CLEAN EQUIPMENT AND ENTIRE PIPING SYSTEMS INTERNALLY UPON COMPLETION OF INSTALLATION AND IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.

BUILDING CLEANUP: REMOVE DEBRIS, RUBBISH, LEFTOVER MATERIALS, TOOLS AND EQUIPMENT FROM WORK AREAS AND SITE. CLEAN TUNNELS AND CLOSED OFF SPACES OF PACKING BOXES, WOOD FRAME MEMBERS AND OTHER WASTE MATERIALS USED IN THE

FILTER REPLACEMENT: PROVIDE FILTERS, WITH THE SAME EFFICIENCY RATING AS REQUIRED FOR THE FINAL INSTALLATION, FOR THE PROTECTION OF THE AIR MOVING EQUIPMENT AND DUCTWORK CONTINUOUSLY THROUGHOUT THE CONSTRUCTION PHASE. PROVIDE A NEW SET OF CLEAN FILTERS FOR THE TEST AND BALANCE OF THE AIR SIDE EQUIPMENT.

PROTECTION OF FINISHED INSTALLATION: WHERE INSTALLATION IS REQUIRED IN AREAS PREVIOUSLY FINISHED BY OTHER TRADES, PROTECT THE AREA FROM MARRING. SOILING OR OTHER DAMAGE.

CLEAN-UP: DEBRIS AND RUBBISH SHALL NOT BE DISPOSED INTO THE OWNER'S CONTAINERS.

GENERAL: AT NO ADDITIONAL COST TO THE OWNER, RECTIFY DISCREPANCIES BETWEEN THE ACTUAL INSTALLATION AND CONTRACT DOCUMENTS WHEN IN THE OPINION OF THE T&B AGENCY OR THE ARCHITECT THE DISCREPANCIES WILL AFFECT SYSTEM BALANCE AND PERFORMANCE.

DRIVE CHANGES: INCLUDE THE COST OF ALL PULLEY, BELT, AND DRIVE CHANGES, AS WELL AS BALANCING DAMPERS, VALVES AND FITTINGS, AND ACCESS PANELS TO ACHIEVE PROPER SYSTEM BALANCE RECOMMENDED BY THE T&B AGENCY.

GENERAL: PROVIDE ALL LABOR, EQUIPMENT, TOOLS AND MATERIAL REQUIRED TO OPERATE THE EQUIPMENT AND SYSTEMS NECESSARY FOR THE TESTING AND BALANCING OF THE SYSTEMS.

COORDINATE THE OPERATION OF THESE SYSTEMS WITH THE T&B AGENCY. CORRECT DEFICIENCIES NOTED BY THE T&B AGENCY. THE CONTRACTOR WILL BE HELD LIABLE FOR RETEST/REBALANCE REQUIRED FROM CONTRACTOR RELATED SYSTEM DEFIECIENCES.

DRAWINGS AND SPECIFICATIONS: PROVIDE TO THE T&B AGENCY A COMPLETE SET OF PROJECT RECORD DRAWINGS AND SPECIFICATIONS AND AN APPROVED COPY OF ALL HVAC SHOP DRAWINGS AND EQUIPMENT SUBMITTALS. THE T&B AGENCY SHALL BE INFORMED OF ALL CHANGES MADE TO THE SYSTEM DURING CONSTRUCTION, INCLUDING APPLICABLE CHANGE ORDERS.

COORDINATION: COORDINATE THE WORK OF ALL TRADES AND EQUIPMENT SUPPLIERS TO COMPLETE THE MODIFICATIONS RECOMMENDED BY THE T&B AGENCY AND ACCEPTED BY THE ARCHITECT. CUT OR DRILL HOLES FOR THE INSERTION OF AIR MEASURING DEVICES AS DIRECTED FOR TEST PURPOSES; REPAIR TO AS-NEW CONDITION, INSERTING PLASTIC CAPS OR COVERS TO PREVENT AIR LEAKAGE. REPAIR OR REPLACE INSULATION AND RE-ESTABLISH THE INTEGRITY OF THE VAPOR RETARDANT.

COORDINATION DRAWINGS: CONTRACTOR WILL PROVIDE M, E, P, & FP COORDINATION DRAWINGS TO BE RECEIVED AND APPROVED BY THE ENGINEER AND ARCHITECT BEFORE FABRICATION OR INSTALLATION OF ANY SYSTEM. PROVIDE 6 COPIES OF COORDINATED 1/4" SCALE DRAWINGS FOR REVIEW. ALL CONFLICTS SHALL RESOLVED BEFORE FINAL ACCEPTANCE.

REPLACEMENT OF DAMAGED STORED MATERIAL AND EQUIPMENT: ANY MATERIAL AND EQUIPMENT THAT HAS BEEN WET OR OTHERWISE DAMAGED PRIOR TO INSTALLATION, IN THE OPINION OF THE ARCHITECT, SHALL BE REPLACED WITH NEW MATERIAL REGARDLESS OF THE CONDITION OF THE MATERIAL AND EQUIPMENT AT THE TIME OF INSTALLATION.

REPAIR OF DAMAGED EXISTING MATERIAL AND EQUIPMENT AFTER INSTALLATION: CORRECT OR REPAIR DENTS, SCRATCHES AND OTHER VISIBLE BLEMISHES. AT THE DIRECTION OF ARCHITECT REPLACE OR REPAIR TO "AS NEW" CONDITION EQUIPMENT THAT HAS BEEN DAMAGED DURING CONSTRUCTION.

ASBESTOS AND HAZARDOUS MATERIALS: GENERAL: SHOULD ASBESTOS OR OTHER HAZARDOUS MATERIAL BE ENCOUNTERED DURING EXECUTION OF THE WORK, OR SHOULD THE PRESENCE OF ASBESTOS OR OTHER HAZARDOUS MATERIAL BE SUSPECTED, IMMEDIATELY NOTIFY THE ARCHITECT AND SUSPEND WORK IN THE AFFECTED AREA. THE OWNER WILL INITIATE A STUDY TO DETERMINE IF ASBESTOS OR OTHER HAZARDOUS MATERIALS ARE PRESENT AND WILL DETERMINE WHAT ACTION WILL BE TAKEN. REMOVAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS WILL BE DONE UNDER A SEPARATE CONTRACT.

GENERAL: COORDINATE INTERRUPTION OF EXISTING SERVICES TO OWNER-OCCUPIED AREAS, IN WRITING, AT LEAST 1-WEEK IN ADVANCE WITH THE ARCHITECT. THE OWNER SHALL DECIDE SHUTDOWN TIME AND DURATION OF SERVICES INTERRUPTION. PROVIDE SHUTOFF VALVES AT POINTS OF INTERCONNECTION TO MINIMIZE DOWNTIME. PROCEDURES INCIDENTAL TO THE OUTAGE SHALL BE PREPARED IN ADVANCE TO MINIMIZE DOWNTIME.

DO NOT DECREASE THE FIRE RATING OF WALLS, PARTITIONS, CEILINGS, FLOORS, DOORS OR COMBINATIONS THEREOF IN ADJACENT AREAS OR MEANS OF EGRESS. DO NOT INTERRUPT FIRE SPRINKLING OR LIFE SAFETY SYSTEMS WITHOUT PRIOR COORDINATION WITH THE ARCHITECT. INFORM ALL NECESSARY PARTIES (FIRE DEPARTMENT, OWNER'S INSURANCE CARRIER, ETC.) IN ADVANCE, PRIOR TO AND IMMEDIATELY AFTER SHUTDOWN, DISCONNECTION OR ISOLATION OF ANY PORTION OF LIFE SAFETY OR FIRE SPRINKLER SYSTEM.

LAYOUT OF EXISTING EQUIPMENT: GENERAL: EXISTING EQUIPMENT, PIPING, DUCTWORK, ETC., AS INDICATED ON THE DRAWINGS HAVE, FOR THE MOST PART, BEEN PROVIDED TO THE ARCHITECT THROUGH EXISTING DRAWINGS. THE LAYOUTS SHOWN MAY NOT BE FROM AS-BUILT DRAWINGS AND MAY BE FROM PARTIAL COPIES OF ORIGINAL DESIGN DOCUMENTS NOT PRODUCED BY THE ARCHITECT. THE ARCHITECT IS NOT RESPONSIBLE FOR THE ACCURACY NOR COMPLETENESS OF THE EXISTING INSTALLATION AND ALL LAYOUTS ARE SHOWN FOR REFERENCE ONLY. IT IS TO BE UNDERSTOOD THAT UNFORESEEN CONDITIONS PROBABLY EXIST AND THAT EXISTING AND NEW WORK MAY NOT BE FIELD LOCATED EXACTLY AS SHOWN ON THE DRAWINGS. VERIFY EXISTING CONDITIONS IN THE FIELD AND NOTIFY THE ARCHITECT OF ANY DEVIATIONS REQUIRED TO INSTALL THE WORK AS SHOWN. COORDINATE NEW WORK WITH EXISTING EQUIPMENT, INCLUDING REMOVING, RELOCATING, REROUTING, EXTENDING WITH NEW MATERIALS, AND REINSTALL EXISTING PIPING, DUCTWORK, CONDUITS, WIRING, TUBING, SUPPORTS AND OTHER EQUIPMENT. THE ARCHITECT SHALL MAKE THE FINAL DECISION ON ALL DEVIATIONS OR MODIFICATIONS REQUIRED BY THE EXISTING CONDITIONS.

SUBMITTALS SHALL INCLUDE THE FOLLOWING DATA: MANUFACTURERS LITERATURE, SIZE, MAKE, MODEL NUMBER, THICKNESS, MERV RATING, AND EFFICIENCY OF FILTER SELECTED.

PERFORMANCE DATA: INITIAL AND RECOMMENDED FINAL PRESSURE DROP ACROSS EACH FILTER ASSEMBLY AT THE AIR FLOWS INDICATED.

GENERAL: UNLESS OTHERWISE INDICATED ALL PLEATED MEDIA FILTERS SHALL HAVE A FACE SIZE OF 24 INCHES BY 24 INCHES OR 24

30 PERCENT EFFICIENT/MERV 8 FILTERS: FILTER MEDIA SHALL BE REINFORCED NON- WOVEN COTTON WITH POLYESTER TRACE FIBERS. TREATED WITH ADHESIVE AND CONTINUOUSLY LAMINATED TO A SUPPORTED STEEL WELDED WIRE GRID. THE DISPOSABLE FILTER MEDIA ENCLOSING FRAME SHALL BE RIGID WET-STRENGTH BEVERAGE BOARD WITH DIAGONAL SUPPORT MEMBERS. THE INSIDE PERIPHERY OF THE FRAME SHALL BE BONDED TO THE FILTER MEDIA TO ELIMINATE AIR BYPASS. EACH FILTER SHALL CONTAIN A MINIMUM 3 SQUARE FEET OF MEDIA PER SQUARE FOOT OF FACE AREA, AND A MINIMUM 11 PLEATS PER LINEAR FOOT. UNLESS OTHERWISE INDICATED, MEDIA THICKNESS SHALL BE 2 INCHES; CLEAN RESISTANCE SHALL NOT EXCEED 0.30 INCHES OF WATER AT 500 FPM FACE VELOCITY.

MANUFACTURER AND MODEL: AMERICAN AIR FILTER, PERFECT PLEAT ULTRA, CAMFIL FARR, 30/30

90 PERCENT EFFICIENT/MERV 14 CARTRIDGE FILTERS: AIR FILTERS SHALL BE HIGH PERFORMANCE, EXTENDED AREA, DEEP PLEATED, CARTRIDGE TYPE CONSISTING OF A FILTER ELEMENT, MEDIA RETAINER HOLDING FRAME AND SEALER FRAME. THE MEDIA SHALL BE MICROFINE GLASS FIBER REINFORCED BY A LAMINATED SYNTHETIC BACKING. RETAINER SHALL BE OF WELDED STEEL CONSTRUCTION AND SHALL BE DESIGNED TO SUPPORT THE MULTIPLE PLEATS OF THE FILTER ELEMENT AGAINST THE DIRECTION OF AIRFLOW. THE WELDED WIRE GRID SHALL BE BONDED TO THE FILTER MEDIA.

ENCLOSURE FRAMES SHALL BE FACTORY FABRICATED OF GALVANIZED STEEL AND SHALL BE EQUIPPED WITH GASKETS AND FOUR SPRING-TYPE POSITIVE SEALING FASTENERS CAPABLE OF BEING ATTACHED OR REMOVED WITHOUT TOOLS. SEALER FRAMES SHALL BE FABRICATED OF 20 GAUGE GALVANIZED STEEL AND SHALL BE EQUIPPED WITH GASKETING MATERIAL ON THE FRAME REAR FLANGE. UNLESS OTHERWISE INDICATED, FILTER CLEAN RESISTANCE SHALL NOT EXCEED 0.70 INCHES OF WATER AT 500 FPM FACE VELOCITY.

MANUFACTURER AND MODEL: AMERICAN AIR FILTER, VARICEL DH, CAMFIL FARR, MICRETAIN

TEST AND BALANCE:

GENERAL: SHALL BE PERFORMED BY AN INDEPENDENT T&B AGENCY.

RENOVATION PROJECTS, PERFORMANCE VERIFICATION: PROVIDE A PRE-DEMOLITION TEST OF ALL AIR DEVICES AND EQUIPMENT WITHIN THE SCOPE OF WORK AREA OR AS OTHERWISE INSTRUCTED.

T&B FOR THE MECHANICAL EQUIPMENT SHALL INCLUDE: DIFFERENTIAL PRESSURE ON FILTER(S), COOLING COIL(S), AND FAN(S) INLET AND DISCHARGE STATIC PRESSURES TOTAL SUPPLY CFM

TOTAL RETURN CFM FAN MOTOR NAMEPLATE DATA

FAN MOTOR AMP DRAW

TEMPERATURE PROFILE

T&B REPORT SHALL BE FORWARDED TO ENGINEER BEFORE DEMOLITION OF SYSTEMS.

CERTIFICATION: THE T&B AGENCY SHALL BE A CERTIFIED MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). WORK INCLUDED: THE T&B AGENCY SHALL PROVIDE ALL LABOR, SUPERVISION, PROFESSIONAL SERVICES, TOOLS, TEST EQUIPMENT AND INSTRUMENTS (EXCEPT AS OTHERWISE INDICATED) TO PERFORM WORK OF THIS SECTION; INCLUDING BUT NOT LIMITED TO: REVIEW THE AUTOMATIC TEMPERATURE CONTROL AND AIR TERMINAL UNIT SPECIFICATIONS FOR THEIR EFFECTS ON THE TESTING AND

BALANCING PROCEDURES FOR THE AIR SYSTEMS. WHERE CONDITIONS MAY EXIST IN THE SYSTEM DESIGN OR CONSTRUCTION WHICH MAY ADVERSELY AFFECT SYSTEM PERFORMANCE, IDENTIFY THE CONDITIONS AND SUBMIT RECOMMENDED CORRECTIONS IN WRITING FOR CONSIDERATION BY THE ARCHITECT.

PERFORM A COMPLETE AIR TEST AND BALANCE OF ALL HEATING, VENTILATING, AIR CONDITIONING AND EXHAUST AIR SYSTEMS SHOWN AND DESCRIBED ON THE CONTRACT DOCUMENTS.

TAB REPORT: RECORDED TEST DATA SHALL BE AT THE FINAL BALANCED CONDITION FOR EACH SYSTEM, AND SHALL BE ARRANGED BY SYSTEM USING THE APPROPRIATE DESIGNATION AS ESTABLISHED ON THE CONTRACT DOCUMENTS. 6 COPIES OF THE TYPEWRITTEN. SIGNED, BOUND AND INDEXED FINAL REPORT SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW PRIOR TO REQUEST FOR SUBSTANTIAL COMPLETION INSPECTION. THE SUBSTANTIAL COMPLETION INSPECTION SHALL NOT BE SCHEDULED UNTIL THE FINAL REPORT HAS BEEN RECEIVED AND IS ACCEPTABLE TO THE ARCHITECT. REPORT FORMAT SHALL BE SIMILAR TO FORMS APPROVED FOR USE BY SMACNA OR AABC.

MEASUREMENTS: WHERE ACTUAL MEASUREMENTS RECORDED FOR THE FINAL BALANCE SHOW DEVIATIONS OF MORE THAN 10 PERCENT FROM THE DESIGN, THE T&B AGENCY SHALL NOTE SAME IN THE REPORT AND SUBMIT RECOMMENDATIONS FOR CORRECTIVE ACTION TO

VIBRATION: WHERE, IN THE OPINION OF THE T&B AGENCY, THERE IS EXCESSIVE VIBRATION, MOVEMENT OR NOISE FROM ANY PIECE OF EQUIPMENT, DUCTWORK, PIPES, ETC., THE T&B AGENCY SHALL NOTE SAME IN THE REPORT AND SUBMIT RECOMMENDATIONS FOR CORRECTIVE ACTION TO THE ARCHITECT.

TEST DATA: PROVIDE TEST AND BALANCE REPORT PRIOR TO AND AFTER THE BALANCING OF EACH CONSTRUCTION PHASE. INCLUDE THE FOLLOWING DATA IN THE SYSTEMS TEST AND BALANCE REPORT:

MANUFACTURER, MODEL AND SERIAL NUMBER, TYPE OF FAN, WHEEL DIAMETER RATED CFM, MEASURED CFM DESIGN INLET AND OUTLET TOTAL EXTERNAL STATIC PRESSURES, ACTUAL INLET AND OUTLET TOTAL AND EXTERNAL STATIC PRESSURES

2. AIR SYSTEMS (INCLUDING INLETS AND OUTLETS): GRILLE AND OR DIFFUSER: REFERENCE NUMBER, MANUFACTURER, SYSTEM TYPE AND LOCATION. DESIGN AND MEASURED CFM TABULATION OF DESIGN AND MEASURED CFM FOR EACH INLET OR OUTLET. A SUMMARIZATION BY SYSTEM TO COMPARE DESIGN DATA TO ACTUAL

3. AIR HANDLING UNITS: MANUFACTURER, MODEL AND SERIAL NUMBER A SUMMARIZATION BY SYSTEM TO COMPARE DESIGN DATA TO ACTUAL DESIGN AND MEASURED WATER FLOW

DESIGN AND MEASURED SUPPLY AND RETURN TEMPERATURES

DESIGN AND MEASURED AMP DRAW 5. CONTROLS: THE T&B AGENCY SHALL VERIFY THAT EACH CONTROLLER AND THE DEVICES IT CONTROLS. SUCH AS CONTROL VALVES. MOTORIZED DAMPERS, VAV BOXES, ETC., OPERATES IN THE EXACT SEQUENCE REQUIRED.

ALL PRESSURIZED PIPING SYSTEMS SHALL CONFORM TO ASME B31.9, CODE FOR PRESSURE PIPING, BUILDING SERVICES PIPING.

BEFORE FINAL TESTING. FLUSH PIPING SYSTEMS WITH CLEAN WATER TO REMOVE DEBRIS. DISCONNECT ALL COILS FROM SYSTEM BEFORE FLUSHING. FLUSH ALL COILS SEPARATE FROM SYSTEM. PROVIDE TEMPORARY VALVES AND DRAINS AS REQUIRED.

PRIOR TO INSULATING AND CONCEALING THE PIPING SYSTEM, APPLY A WATER PRESSURE TEST TO ALL PARTS OF EACH SYSTEM BEFORE EQUIPMENT IS CONNECTED. USE A HYDROSTATIC PRESSURE OF NOT LESS THAN 100 PSIG OR 150 PERCENT OF SYSTEM OPERATING PRESSURE WHICHEVER IS GREATER. TEST SYSTEM FOR A PERIOD NOT LESS THAN FOUR HOURS. THERE SHALL BE NO LEAKS AT ANY POINT IN THE SYSTEM AT THIS PRESSURE.

PROVIDE AND INSTALL PIPE AND FITTINGS AS INDICATED, INCLUDING ALL OFFSETS, FITTINGS, SLEEVES AND SIMILAR ITEMS REQUIRED BUT NOT NECESSARILY INDICATED DUE TO DRAWING SCALE FOR COMPLETE AND OPERABLE SYSTEMS. ALL PRESSURIZED PIPING SYSTEMS SHALL CONFORM TO ASME B31.9, CODE FOR PRESSURE PIPING, BUILDING SERVICES PIPING.

CHILLED WATER PIPING ABOVE TWO INCHES IN DIAMETER SHALL BE FORMED FROM WELDED, SEAMLESS ASTM A-53, GRADE B, AND

COPPER FITTINGS SHALL BE STREAMLINED PATTERN, WROUGHT OR CAST BRASS CONFORMING TO ANSI B16.22 OR WROUGHT BRONZE

SMALLER CHILLED WATER PIPING SHALL BE FORMED FROM TYPE L, ASTM B-88, COPPER WITH FITTINGS. COLD CONDENSATE PIPING SHALL

FITTINGS SHALL AT A MINIMUM, HAVE THE SAME WALL THICKNESS AS THE CONNECTED PIPING AND SHALL BE COMPATIBLE WITH THE PIPING

MATERIAL. THE USE OF FIELD FABRICATED FITTINGS IS PROHIBITED. DIELECTRIC UNIONS OR FLANGES SHALL BE PROVIDED AT ALL JUNCTIONS OF COPPER OR BRASS PIPE OR FITTINGS AND FERROUS

MATERIAL TO PREVENT ELECTROLYSIS AND GALVANIC CORROSION. WHERE COPPER OR BRASS COME IN CONTACT WITH FERROUS PIPING SYSTEMS MATERIALS, ISOLATE THE TWO MATERIALS WITH A NON-CONDUCTIVE NEOPRENE SPACER. DIELECTRIC COUPLINGS SHALL BE RATED FOR AT LEAST 150 PERCENT OF MAXIMUM WORKING PRESSURE OF THE PIPING SYSTEM AND AT

LEAST 50 F HIGHER THAN THE MAXIMUM OPERATING TEMPERATURE OF THE PIPING SYSTEM IN WHICH THEY ARE INSTALLED. COUPLINGS SHALL BE ELECTROPLATED STEEL OR BRASS WITH INERT AND NON-CORRISIVE THERMOPLASTIC LINING OR BRONZE FITTINGS. PROVIDE DIELECTRIC INSULATING UNIONS IN PIPING 2 INCH AND SMALLER WITH THREADED OR SOLDER JOINT CONNECTIONS.

PIPE AND FITTINGS SHALL BE INSTALLED WITH A MIN. OF JOINTS AND COUPLINGS BUT WITH ADEQUATE AND ACCESSIBLE UNIONS FOR DISASSEMBLY AND MAINTENANCE REPLACEMENT VALVES AND EQUIPMENT. REDUCE SIZES WERE INDICTED USING REDUCING FITTINGS. PIPING SHALL BE RAN WITHOUT TRAPS OR POCKETS AND A MIN. 1 INCH IN 40 FEET IN THE DIRECTION OF FLOW.

PIPING SHALL BE RAN PARALLEL TO THE WALLS AND CEILINGS WITH A MINIMUM OF 6 INCH CLEARANCE BETWEEN WALLS AND HORIZONTAL

PIPE REQUIRING INSULATION SHALL BE INSTALLED WITH SUFFICIENT CLEARANCES TO PERMIT PROPER APPLICATION OF INSULATION. DO NOT RUN PIPING OVER ELECTRICAL PANELS, TRANSFORMER VAULTS, ELEVATOR EQUIPMENT ROOMS OR ELECTRONIC EQUIPMENT

PIPING SHALL BE INSTALLED WITH PROVISION FOR PIPE EXPANSION BOTH HORIZONTALLY AND VERTICALLY.

PIPING IDENTIFICATION:

PROVIDE PIPE IDENTIFICATION CONSISTING OF SETON SNAP-ON PLASTIC SLEEVES OR EQUAL. INDICATE SYSTEM NAME, NOMINAL PIPE SIZE AND FLOW DIRECTION. PROVIDE PIPE IDENTIFIERS EVERY 50' IN OUTDOOR LOCATIONS AND EVERY 15' FOR INDOOR LOCATIONS. ALL FLOORS AND ROOMS THAT THE PIPING PASS THROUGH SHALL HAVE AT LEAST ONE LABEL.

PIPE INSULATION:

ACCEPTABLE INSULATION MANUFACTURERS OF FLEXIBLE ELASTOMERIC INSULATION PRODUCTS INCLUDE ARMSTRONG, HALSTEAD, MANVILLE, RUBATEX, OR SPECIFICALLY APPROVED EQUAL.

INSULATION AND ACCESSORIES SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS WHEN TESTED IN ACCORDANCE WITH ASTM E84-75, NFPA 225, UL 723, AND FURTHER MUST MEET THE REQUIREMENTS OF NFPA 90-A. PROVIDE FIRE-RETARDANT CLOSED-CELL SLIP-ON FLEXIBLE TYPE. PRODUCT SHALL HAVE CONTINUOUS OPERATIONAL TEMPERATURE LIMIT OF NOT LESS THAN 220 DEGREES F, AND A MINIMUM "F" VALUE OF ((3.70 DEGREE F/FT/HR) 1/2BTUH) PER INCH THICKNESS AT 75 DEGREES F

PIPE REQUIRING INSULATION SHALL BE INSTALLED WITH SUFFICIENT CLEARANCES TO PERMIT PROPER APPLICATION OF INSULATION AND MAINTAIN REQUIRED CLEARANCES.

USE FOAMGLASS PIPING INSULATION FOR THE FOLLOWING SERVICES: CHILLED WATER LINES 1-1/2" THK, 2" PIPE SIZE & UNDER

INSULATION TO INSURE A THOROUGH VAPOR BARRIER.

CHILLED WATER LINES 2" THK, 2-1/2" PIPE SIZE & GREATER JACKET SHALL BE REINFORCED KRAFT PAPER WITH ALUMINUM FOIL. PREMOLDING FITTING MATERIAL (INSERTS) SHALL BE PRECISELY CUT OR MITERED TO FIT AND TAPED TO FORM A FULLY INSULATED PIPE COVERING. USE ADHESIVE AND / OR TAPE SPECIFIED FOR TYPE OF

PRIOR TO INSULATING AND CONCEALING THE PIPING SYSTEM. APPLY A WATER PRESSURE TEST TO ALL PARTS OF EACH SYSTEM BEFORE EQUIPMENT IS CONNECTED. USE A HYDROSTATIC PRESSURE OF NOT LESS THAN 100 PSIG OR 150 PERCENT OF SYSTEM OPERATING PRESSURE WHICHEVER IS GREATER. TEST SYSTEM FOR A PERIOD NOT LESS THAN FOUR HOURS. THERE SHALL BE NO LEAKS AT ANY POINT IN THE SYSTEM AT THIS PRESSURE.

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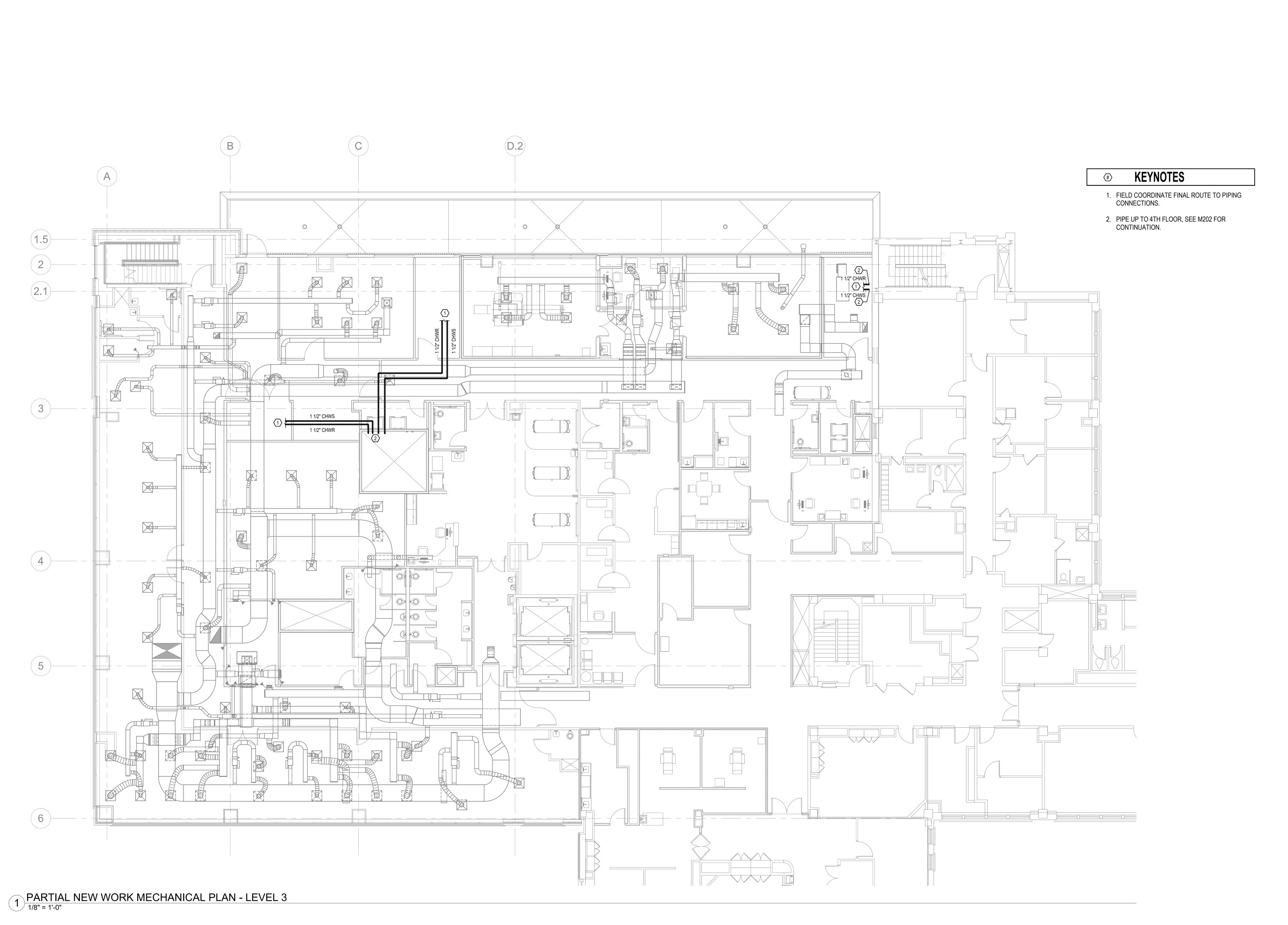
Approved By:

824101 Issue Date: 10 JULY 2024 Christian D. Drawn By:

MECHANICAL **SPECIFICATIONS** 

Drawing No.:

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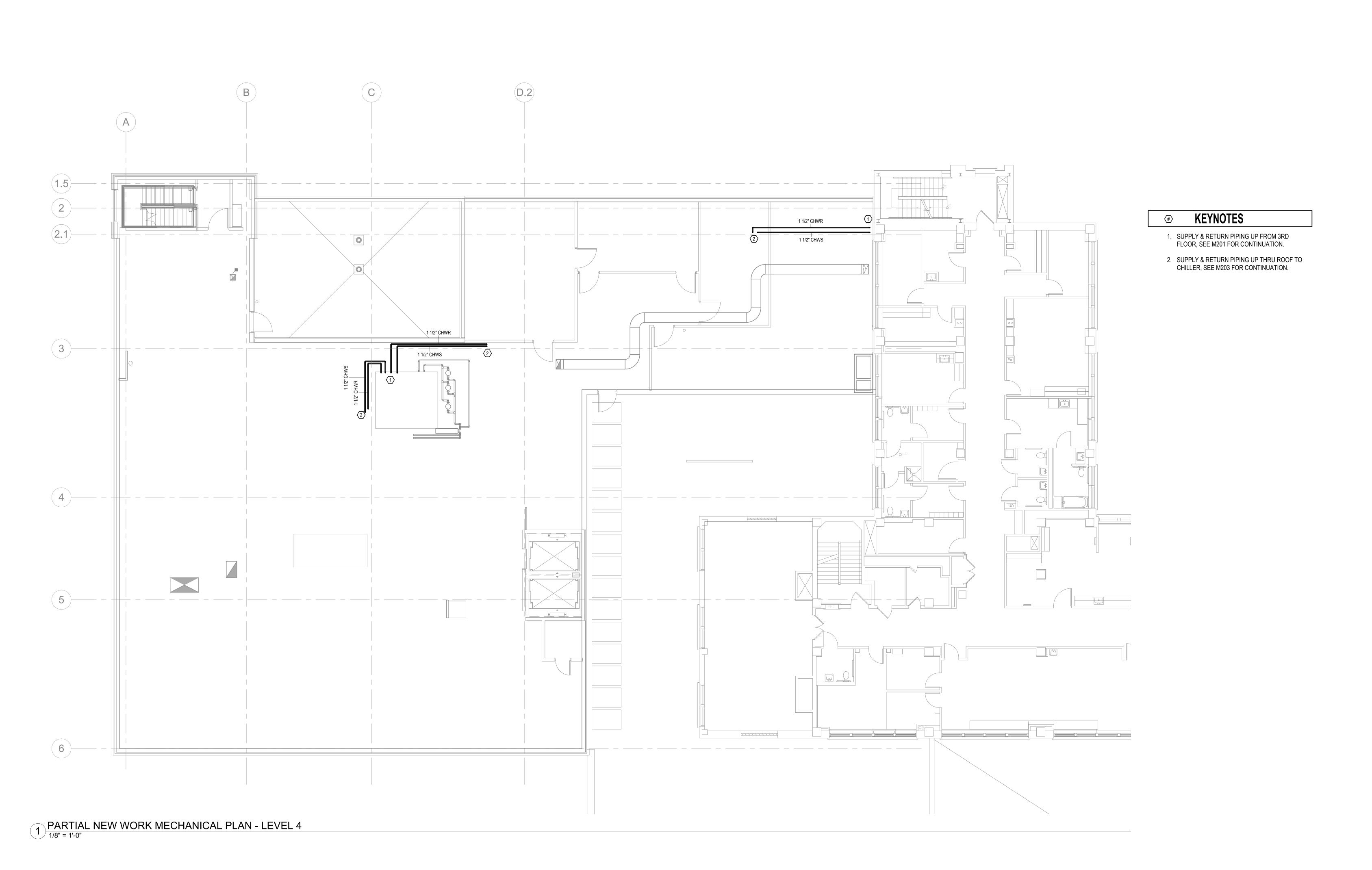
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WORK MECHANICAL
PLAN

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Drawn By:

Approved By:

10 JULY 2024

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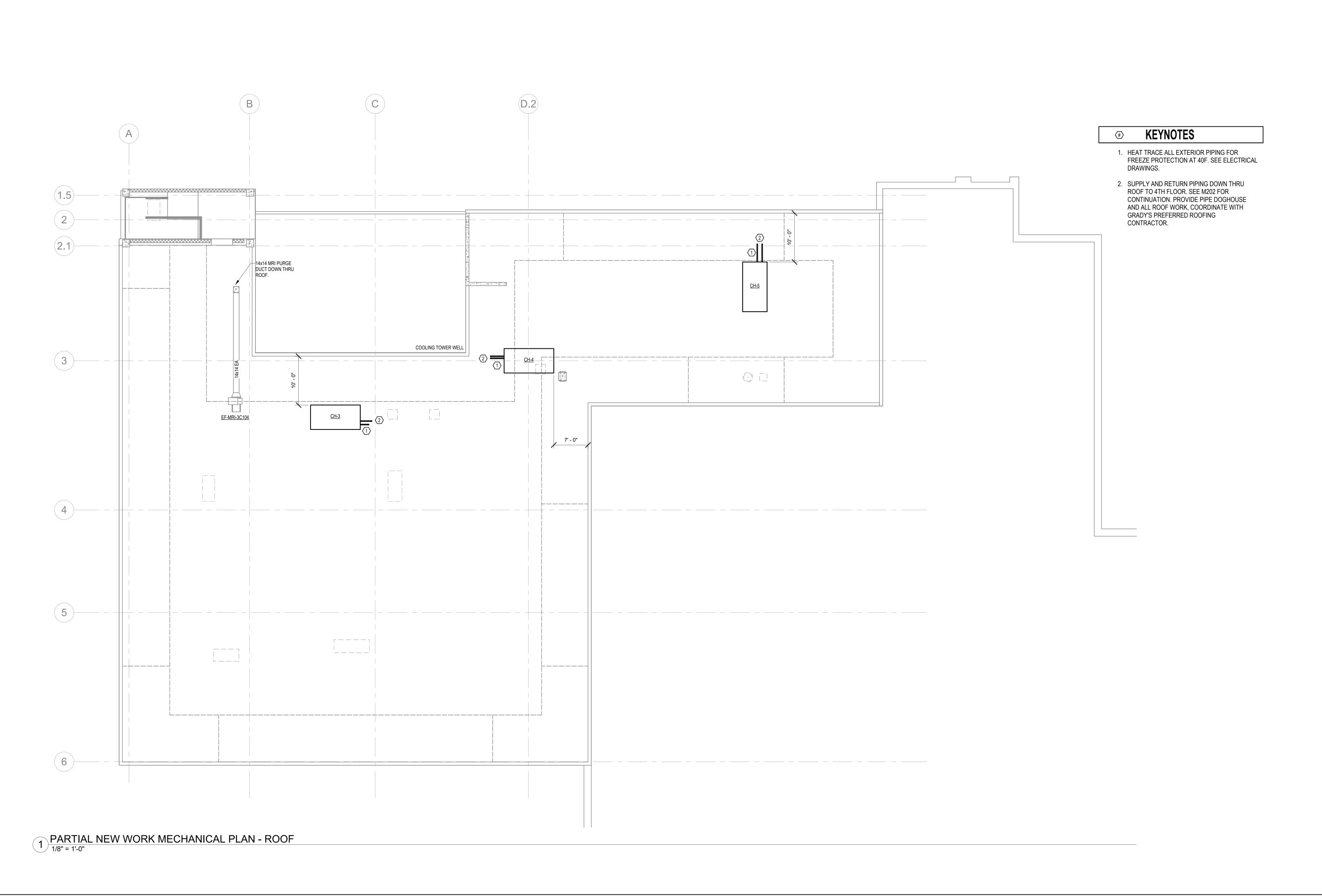
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LEVEL 4 - NEW

WORK MECHANICAL

PLAN

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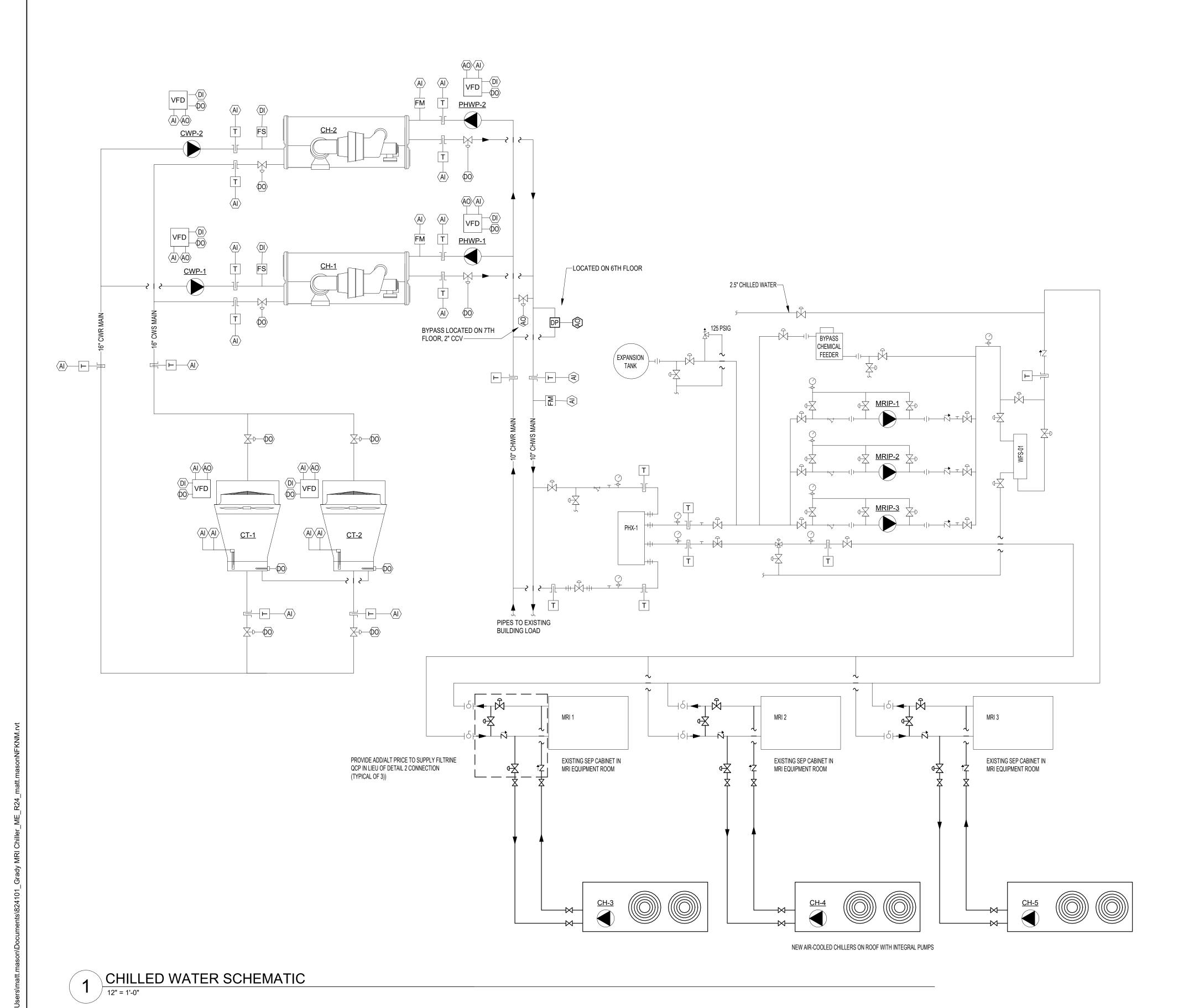
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ROOF LEVEL - NEW

WORK MECHANICAL

PLAN

Drawing No.:



CHILLED WATER PLANT - SEQUENCE OF OPERATIONS

CHILLER START SEQUENCE:

1. THE CHILLER SHALL USE FACTORY-PROVIDED CONTROLS TO MAINTAIN THE SUPPLY WATER SETPOINT REQUIRED PER SITE-SPECIFIC MRI DRAWINGS.

2. IF ONE OF THE ALARMS LISTED BELOW TRIGGERS, THE CHILLER SHALL SHUT DOWN.

CHILLER ALARMS:

1. FAN MOTOR FAILURE.
2. PUMP MOTOR FAILURE.
3. COMPRESSOR FAILURE.
4. CHILLED WATER TEMPERATURE OUT OF RANGE.
5. FLOW RATE OUT OF RANGE.

VALVE POSITIONS:

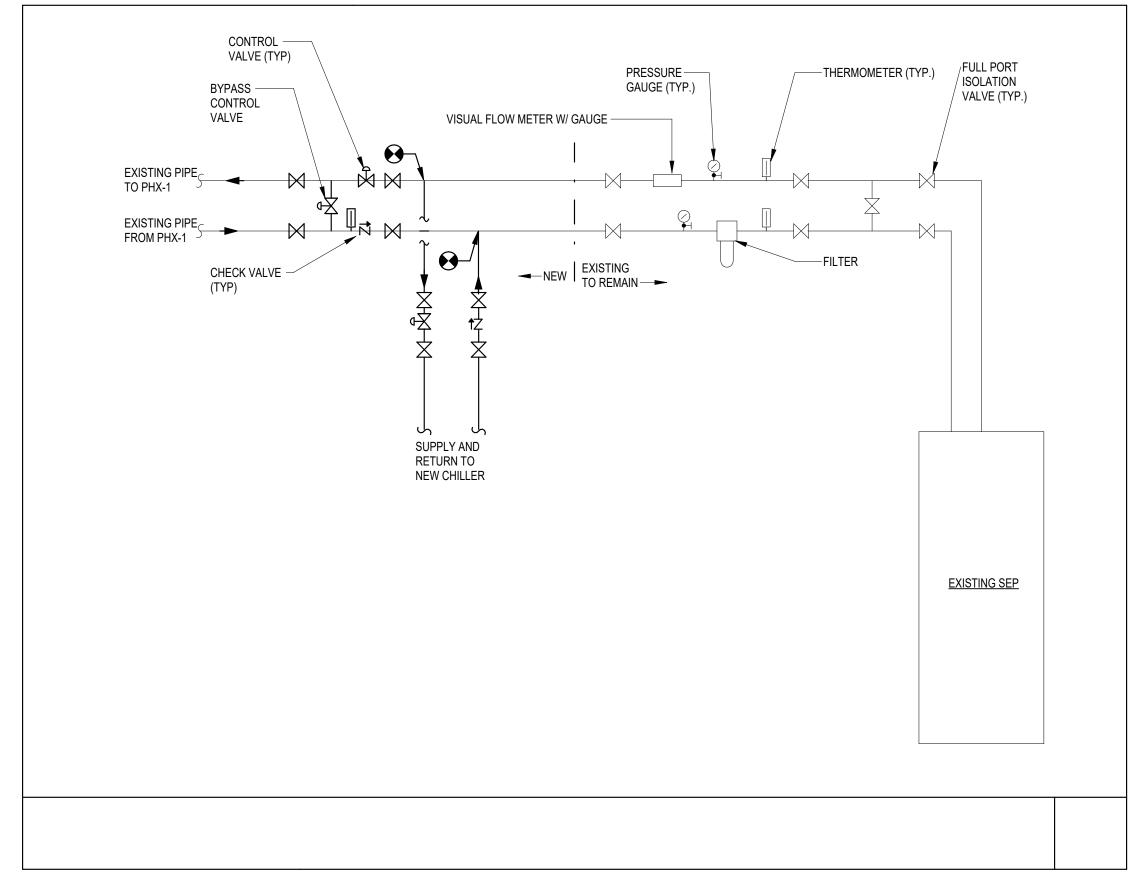
1. THE CONTROL VALVE FROM THE NEW CHILLER SHALL BE NORMALLY OPEN, FAIL OPEN.

2. THE CONTROL VALVE FROM THE EXISTING HEAT EXCHANGER SHALL BE NORMALLY CLOSED, FAIL OPEN.

3. THE BYPASS CONTROL VALVE SHALL BE NORMALLY OPEN, SET TO MAINTAIN MINIMUM FLOW ON THE EXISTING MRIP PUMP LOOP. FAIL CLOSED.

4. WHEN A CHILLER SHUTS DOWN, THE CHILLER CONTROL VALVE CLOSES, THE HX VALVE OPENS, AND THE BYPASS VALVE CLOSES. THE OTHER BYPASS VALVES SHALL REMAIN IN PARTIAL FLOW

MRIP PUMP LOOP CONTROL:
 THE PUMPS SHALL OPERATE IN LEAD/LAG CONFIGURATION TO EQUALIZE RUN TIME.
 IN NORMAL OPERATING CONDITIONS, EACH BYPASS VALVE SHALL BE PARTIALLY OPEN TO MAINTAIN MINIMUM FLOW FOR (1) MRIP PUMP. THIS SHALL MAINTAIN THE BACK-UP COOLING SYSTEM AND THE CORRECT WATER TEMPERATURE.
 WHEN A CHILLER SHUTS DOWN, THE MRIP SYSTEM SHALL RAMP UP TO PROVIDE MINIMUM FLOW AT THE SEP. THIS VALUE SHALL BE SET BY T&B AND WILL BE UNIQUE FOR EACH SEP.
 AFTER REACHING MINIMUM SPEED, THE MRIP SYSTEM SHALL CONTROL TO ENTERING WATER TEMPERATURE AT THE SEP.



2 SEP CONNECTION DETAIL NTS

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	EXISTING HEAT EXCHANGER SCHEDULE															
						COLD	SIDE				HC	T SIDE	_			
MARK	MANUFACTURER	MODEL	TYPE	SYSTEM	FLUID	FLOW (GPM)	EWT (°F)	LWT (°F)	MAX WPD (PSI)	SYSTEM	FLUID	FLOW (GPM)	EWT (°F)	LWT (°F)	MAX WPD (PSI)	LOCATION
PHX-1	BELL & GOSSETT	GPX	GASKETED PLATE HX	CHW	WATER	100.0	44.0	59.9	4.50	PROCESSED CHW	WATER	100.0	64.0	48.0	4.47	LEVEL 4 MECH PENTHOUSE
2. FOULING	S STEEL PLATES FACTOR: 0.000005 O SPECIFICATIONS FOR A	ADDITIONAL REQ	UIREMENTS													

	EXISTING PUMP SCHEDULE															
	BASIS	OF DESIGN		F	LUID DATA		PUN	MP DATA		PIPE D	ATA			MOTOR DATA		
MARK	MANUFACTURER	MODEL	SYSTEM SERVED	FLOW RATE (GPM)	HEAD (FT)	FLUID TEMP. (°F)	TYPE	IMPELLER SIZE (IN)	EFFICIENCY (%)	DISCHARGE SIZE (IN)	SUCTION SIZE (IN)	MOTOR HP	VFD	PUMP SPEED (RPM)	VOLTS	PHASE
MRIP-3	BELL & GOSSETT	e-80 2x2x9.5C	PCHW	70	75.0	48	INLINE	9.375	56.8	2	2	5	YES	1800		

1. SEE SPECIFICATIONS FOR OTHER APPROVED MANUFACTURERS AND ADDITIONAL REQUIREMENTS.

2. MOTORS SHALL BE HIGH EFFICIENCY AND TEFC TYPE. 3. PROVIDE PROPER PIPE TRANSITION TO PUMP INLET/OUTLET AS REQUIRED.

4. PROVIDE SUCTION DIFFUSERS AS REQUIRED.

5. PROVIDE FULL IMPELLER SIZE FOR ALL VFD DRIVEN PUMPS.

6. VFD DRIVEN PUMPS SHALL BE INVERTER DUTY. 7. PROVIDE SPRING VIBRATION ISOLATORS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

	NEW AIR COOLED CHILLER SCHEDULE																			
	BASIS OF DESIGN						EVAPORATOR DATA					CONDENSER DATA				ELECTRICAL DATA				
MARK	MANUFACTURER	MODEL	COMP. TYPE	NUMBER OF COMP.	REFRIG. B		EWT (°F)	LWT (°F)	FLOW (GPM)	MAX P.D. (FT)	FOULING FACTOR	DESIGN AMBIENT TEMP (°F)	NUMBER OF FANS	FAN TOTAL HP	EFFICIENCY (BTU/W.H)	IPLV.IP (BTU/W.H)	MCA	МОСР	VOLTS	PHASE
CH-3	FILTRINE	SMS-3000-330	VARIES	2	25	59,554	54	42	30			90	2	30			62	100	480	3
CH-4	FILTRINE	SMS-3000-330	VARIES	2	25	59,554	54	42	30			90	2	30			62	100	480	3
CH-5	FILTRINE	SMS-3000-330	VARIES	2	25	59,554	54	42	30			90	2	30			62	100	480	3

1. PROVIDE RAIL SYSTEM FOR ROOF MOUNTING.

2. PROVIDE WITH SINGLE-POINT POWER CONNECTION. SINGLE-POINT POWER CONNECTION SHALL INCLUDE ALL NECESSARY POWER NEEDS OF THE CHILLER. PROVIDE ANY NECESSARY STEP-DOWN TRANSFORMERS FOR COMPLETE SYSTEM.

3. PROVIDE UPS FOR CHILLER CONTROLS, SUCH THAT UPON POWER LOSS, THE CHILLER WILL RESTART AUTOMATICALLY, RESUMING ITS PREVIOUS STATUS AND SETTINGS.

4. PROVIDE LINE REACTORS FOR THE CONDENSER FAN VFDS FOR HARMONIC ISOLATION.

5. PERFORMANCE VALUES BASED ON AHRI TOLERANCES. 6. PROVIDE VARIABLE SPEED CONDENSER FANS FOR LOW AMBIENT CONTROL

7. PROVIDE CORROSION-RESISTANT BAKED ENAMEL FINISH ON CASING

8. PROVIDE FLEX CONNECTORS AND ISOLATION VALVES AT PIPE CONNECTIONS TO CHILLER INLET AND OUTLET.

9. PROVIDE FACTORY DISCONNECT AND CONTROL PANEL WITH NEMA 3R ENCLOSURE

10. PROVIDE FACTORY INSULATION.

11. PROVIDE PROTECTIVE CONDENSER GRILLES FOR PROTECTION OF CONDENSER FINS. 12. PROVIDE INTEGRAL 3 HP CENTRIFUGAL PUMP. STAINLESS STEEL CONSTRUCTION. PROVIDE RUBBER PAD ISOLATION.

13. INSULATE ALL INTERNAL PIPING AND FITTINGS WITH CLOSED CELL INSULATION.

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824101 Issue Date: 10 JULY 2024

Christian D.

Drawn By: Approved By:
Scale:

Drawing Title:
MECHANICAL
SCHEDULES

# APPENDIX B

ELECTRICAL	SHEET	INDEX

E001	ELECTRICAL SYMBOLS, LEGEND, AND INDEX
E002	ELECTRICAL NOTES AND SPECIFICATIONS
E003	PARTIAL ONE-LINE DIAGRAM
E202	PARTIAL LEVEL 4 - NEW WORK POWER PLAN
E203	PARTIAL ROOF LEVEL - NEW WORK POWER PLAN

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Approved By: FSS

Approved By: FSS

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ELECTRICAL SYMBOLS, LEGEND, AND INDEX

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PLENUM RATED SOLID COPPER OR STRANDED COPPER WITH MAXIMUM 19 STRANDS. LOW VOLTAGE CONDUCTORS: PROVIDE CONDUCTORS IN ACCORDANCE WITH NFPA 70 AND NFPA 72, AND AS RECOMMENDED BY THE FIRE ALARM SYSTEM MANUFACTURER. CONDUCTORS SHALL BE COPPER, MINIMUM NO. 14 AWG, TWISTED SHIELDED PAIR. 4. SURVIVABILITY: A 2-HOUR RATED CABLE ASSEMBLY SHALL BE PROVIDED FOR NOTIFICATION APPLIANCE CIRCUITS AND ANY

5. MANUAL PULL STATIONS ARE TO BE INSTALLED AT 42" TO BOTTOM OF DEVICE AND NO HIGHER THAN 48" TO HANDLE ABOVE 6. PROVIDE MINIMUM 3/4" CONDUIT AND WIRING BETWEEN EACH FIRE ALARM DEVICE AND FROM LAST DEVICE TO FACP UNLESS OTHERWISE NOTED.

OTHER CIRCUITS NECESSARY FOR THE OPERATION OF THE NOTIFICATION APPLIANCE CIRCUITS FROM THE POINT AT

WHICH THEY EXIT THE CONTROL UNIT UNTIL THE POINT THAT THEY ENTER THE NOTIFICATION ZONE THAT THEY SERVE.

DROVIDE DUCT DETECTOR (AND FIRE ALARM RELAY WHERE APPLICABLE) CONNECTED TO FIRE ALARM SYSTEM, WITHIN 5' OF ALL DUCT PENETRATIONS THROUGH FIRE/SMOKE WALLS, WHETHER INDICATED ON ELECTRICAL OR MECHANICAL PLANS

8. FIRE ALARM CONTROL PANEL IS TO BE PROVIDED WITH DEDICATED 120V CIRCUIT WITH EQUIPMENT GROUND CONNECTION PER MANUFACTURER'S RECOMMENDATIONS AND ARTICLE 760 OF THE NEC. PROVIDE MINIMUM #12 AWG FOR GROUND CONNECTION. NOTE: PANEL NEUTRAL OR CONDUIT GROUND IS NOT ACCEPTABLE. 120V CIRCUIT SHALL BE FROM EMERGENCY/LIFE SAFETY BRANCH WHERE AVAILABLE.

I. SECONDARY BACK-UP POWER SHALL BE PROVIDED BY INTEGRAL BATTERIES WITHIN THE FIRE ALARM CONTROL PANEL TO SUPPLY POWER TO THE SYSTEM UNDER QUIESCENT LOAD FOR A MINIMUM OF 24 HOURS, AND THEN BE CAPABLE OF AN ADDITIONAL 15 MINUTES (5 MINUTES FOR NON VOICE SYSTEMS) ALARM OPERATION AT MAXIMUM CONNECTED LOAD. 10. ALL FIRE ALARM POWER CIRCUITS SHALL HAVE A DEDICATED 120V 20A BREAKER THAT SHALL BE RED IN COLOR AND MECHANICALLY PROTECTED (LOCKABLE IN THE "ON" POSITION), MARKED AS "FIRE ALARM CIRCUIT". 1. A SUPERVISORY SIGNAL SHALL BE ANNUNCIATED UPON ANY TAMPER SWITCH ACTIVATION. FAILURE OR REMOVAL OF ANY DETECTION OR MANUAL DEVICE SHALL ACTIVATE A TROUBLE SIGNAL

A CERTIFICATION OF COMPLETION AND UL LISTING SHALL BE ISSUED AND INSTALLED ON THE FIRE ALARM CONTROL PANEL. SUBMIT NFPA RECORD OF COMPLETION FORM ALONG WITH SMOKE DETECTOR SENSITIVITY REPORT FOR ALL DETECTORS WITHIN THE PROJECT AREA TO ENGINEER AND MAKE AVAILABLE AT FINAL INSPECTION. 3. MINIMUM CANDELA RATING OF STROBES IS 75; "110" ADJACENT TO DEVICE INDICATES 110 CANDELA RATING. PROVIDE SYNCHRONIZATION OF STROBES IN ALL ADJACENT AREAS WHERE STROBES ARE VISIBLE TO EACH OTHER.

14. ALL STROBES SHALL ACTIVATE UPON INITIATION OF THE GENERAL ALARM. INSTALLED SO THAT THE BOTTOM OF THE STROBE LENS IS 80" AFF. 16. STROBES SHALL BE INSTALLED WITHIN 15' OF THE ENDS OF ALL CORRIDORS.

7. FIRE ALARM DEVICES INSTALLED OUTSIDE OR IN AREAS OPEN TO THE EXTERIOR SHALL BE WEATHERPROOF DEVICES IN 18. SMOKE DETECTORS SHALL BE PHOTO-ELECTRIC ADDRESSABLE TYPE, UNLESS SPECIFICALLY NOTED OTHERWISE. 19. SMOKE DETECTORS ARE TO BE INSTALLED PER NFPA 72. WALL MOUNTED SMOKE DETECTORS SHALL BE MOUNTED 4"-12' BELOW THE CEILING AND AWAY FROM CORNERS 20. SMOKE DETECTORS LOCATED IN ELEVATOR LOBBIES, ELEVATOR HOISTWAYS AND ELEVATOR MACHINE ROOMS SHALL

INITIATE ELEVATOR RECALL, ACTIVATE ELEVATOR WARNING LIGHTS AND CAUSE SEPARATE AND DISTINCT VISIBLE ANNUNCIATION AT THE FIRE ALARM CONTROL PANEL AND FIRE ALARM ANNUNCIATORS. 21. DUCT DETECTORS SHALL BE PHOTO-ELECTRIC ADDRESSABLE TYPE, AND RATED FOR VELOCITIES UP TO 5000 FT/MIN 22. HEAT DETECTORS SHALL BE ADDRESSABLE, FIXED TYPE @ 135 DEG F, UNLESS OTHERWISE NOTED. 3. FOR PROJECTS WITH AN ELEVATOR. THE ELEVATOR CONTROL PANEL SHALL HAVE TWO SIGNALS FROM THE FIRE ALARM CONTROL PANEL/ ASSOCIATED SMOKE DETECTORS - ONE FROM THE "DESIGNATED FLOOR" SMOKE DETECTOR AND

ANOTHER COMBINED SIGNAL FROM THE SMOKE DETECTORS AT THE OTHER LOBBY LANDINGS AND IN THE ELEVATOR 24. ACTIVATION OF ANY SMOKE DETECTOR IN THE ELEVATOR LOBBY OF THE DESIGNATED PRIMARY RECALL LEVEL OR ELEVATOR MACHINE ROOM SHALL ACTIVATE ALTERNATE LEVEL RECALL. 25. PRIOR TO INSTALLATION OF ELEVATOR HOISTWAY HEAT DETECTORS, VERIFY WITH LOCAL AUTHORITY HAVING

JURISDICTION IF THEY ARE REQUIRED. 26. HEAT DETECTORS SHALL BE LOCATED WITHIN 24" OF SPRINKLER HEADS LOCATED IN THE ELEVATOR MACHINE ROOM AND ALL HOISTWAY SPRINKLER HEADS LOCATED 24" ABOVE THE ELEVATOR PIT FLOOR. THESE HEAT DETECTORS SHALL HAVE BOTH A LOWER TEMPERATURE RATING AND HIGHER SENSITIVITY THAN THE SPRINKLER HEADS. HEAT DETECTORS SHALL OPEN THE MAIN DISCONNECT/POWER SUPPLY TO THE ELEVATOR CONTROLLER. CONTROL CIRCUITS TO SHUT OFF ELEVATOR POWER SHALL BE MONITORED BY THE FIRE ALARM CONTROL PANEL. CONTROL MODULE SHALL BE WITHIN 3 FFFT OF THE FLEVATOR CONTROLLER.

7. WHERE THERE IS A GENERATOR ON THE PROJECT, PROVIDE RELAYS AS REQUIRED FOR THE FIRE ALARM SYSTEM TO MONITOR THE FOLLOWING THREE CONDITIONS: GENERATOR RUNNING; GENERATOR FAULT; GENERATOR SWITCH NOT IN

28. WHERE THERE IS A FIRE PUMP ON THE PROJECT, PROVIDE RELAYS AS REQUIRED FOR THE FIRE ALARM SYSTEM TO MONITOR THE FOLLOWING THREE CONDITIONS: FIRE PUMP RUNNING; FIRE PUMP LOSS OF POWER; FIRE PUMP POWER

29. PROVIDE AN ADDRESSABLE FIRE ALARM SYSTEM PER NFPA AND ALL STATE AND LOCAL CODE REQUIREMENTS. COMPLY WITH NEPA 72 AND ADA REQUIREMENTS 30. FIELD VERIFY LOCATION OF AREA SMOKE DETECTORS AND HEAT DETECTORS. DO NOT LOCATE WITHIN 36" OF AN HVAC DIFFUSER (SUPPLY OR RETURN). IN DIRECT AIR FLOW PATH. OR WITHIN 24" OF A SPRINKLER HEAD UNLESS NOTED OTHERWISE. SMOKE DETECTORS FOR DOOR RELEASE SHALL BE LOCATED ON THE CENTERLINE OF THE DOOR AND A

SECTION ABOVE THE DOOR, BUT NOT LESS THAN 12". 11. PROVIDE LABELS FOR REMOTE ALARM INDICATORS FOR DUCT MOUNTED SMOKE DETECTORS (I.E., AHU-1 SUPPLY, AHU-2 RETURN, FIRE/SMOKE DAMPER, ETC.). DUCT DETECTORS SHOULD BE LOCATED WITHIN 6 TO 10 EQUIVALENT DIAMETERS OF STRAIGHT, UNINTERRUPTED DUCTWORK. DUCT DETECTORS FOR FIRE/SMOKE DAMPERS SHOULD BE LOCATED BETWEEN THE LAST INLET OR OUTLET UPSTREAM OF THE DAMPER AND THE FIRE INLET OR OUTLET DOWNSTREAM OF THE DAMPER. AND WITHIN FIVE FEET OF THE FIRE/SMOKE WALL

MAXIMUM OF FIVE FEET FROM THE DOOR. THE MINIMUM DISTANCE FROM THE DOOR SHALL BE THE DEPTH OF THE WALL

32. EQUIPMENT SHUT DOWN FIRE ALARM RELAYS SHALL BE LOCATED WITHIN THREE (3) FEET OF THE EQUIPMENT CONTROLS AND THE WIRING TO THE RELAY SHALL BE MONITORED BY THE FIRE ALARM SYSTEM. 33. ALL FIRE ALARM CABLE SHALL BE INSTALLED IN CONDUIT; NO FIRE ALARM CONDUIT SHALL BE INSTALLED UNDER SLAB. PROVIDE MANUFACTURED RED CONDUIT UNLESS OTHERWISE NOTED.

34. MINIMIZE EXPOSURE OF DETECTORS TO DIRT AND DUST FROM CONSTRUCTION. PROVIDE PLASTIC COVERS DURING 35. STATE CERTIFIED AND LICENSED FIRE ALARM CONTRACTOR SHALL PREPARE AND SUBMIT SIGNED AND SEALED DRAWINGS FOR THE LOCAL AUTHORITY HAVING JURISDICTION/ FIRE MARSHALL

36. FOR RENOVATION PROJECTS, CONTRACTOR SHALL PROVIDE MEANS OF AUTOMATIC SMOKE DETECTION VIA INSTALLED SMOKE DETECTORS CONNECTED TO THE FACILITY FIRE ALARM SYSTEM. FOR COVERAGE DURING NON-OCCUPIED PERIODS. WITHIN THE CONSTRUCTION AREA. ALTERNATIVELY, A DOCUMENTED FIRE WATCH OF THE ENTIRE AREA PERFORMED IN INCREMENTS NO GREATER THAN ONE HOUR MAY BE PERFORMED PROVIDED THAT IT IS DOCUMENTED IN FULL ACCORDANCE WITH NFPA 72. COORDINATE ACTIVITY IN FIELD WITH GENERAL CONTRACTOR. 37. ALL NOTIFICATION DEVICES SHALL MATCH EXISTING NOTIFICATION DEVICES IN COLOR. 38. FIRE ALARM CIRCUITS SHALL MATCH EXISTING CLASS IN EXISTING BUILDINGS.

40. FIRE ALARM CIRCUITS SHALL BE CLASS "A", 41. NOTIFICATION DEVICES SHALL BE ADDRESSABLE ELECTRIC-VIBRATING-POLARIZED HORNS, SELECTABLE FOR HIGH OR LOW dBA OUTPUT. THEY SHALL HAVE A SOUND PRESSURE LEVEL OF 90dBA MEASURED 10 FEET FROM HORN, USING CODED

## APPLICABLE CODES

ALL WORK UNDER THIS DIVISION SHALL BE IN STRICT COMPLIANCE AND IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE FOLLOWING CODES AND STANDARDS INCLUDING THE REGULATIONS OF GOVERNING LOCAL, STATE, COUNTY AND OTHER APPLICABLE CODES. REFER TO SPECIFICATIONS FOR ADDITIONAL CODE REQUIREMENTS:

BUILDING CODES:

 INTERNATIONAL BUILDING CODE, 2018 ADDITION, WITH GA AMENDMENTS INTERNATIONAL FIRE CODE, 2018 EDITION, WITH GA AMENDMENTS INTERNATIONAL ENERGY CONSERVATION CODE, 2015 EDITION, WITH GA AMENDMENTS

ADDITIONAL CODES, STANDARDS, AND REQUIREMENTS 1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).

2. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE). 3. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA).

4. REQUIREMENTS OF LOCAL POWER COMPANY. 5. THE AMERICANS WITH DISABILITIES ACT (ADA) 6. OWNER'S PUBLISHED DESIGN STANDARDS.

39. ALL NOTIFICATION DEVICES SHALL BE WHITE.

ALL MATERIALS SHALL BE NEW AND FREE OF DEFECTS. AND SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LAB. AS DEFINED BY OSHA. WHERE NO LABELING OR LISTING SERVICE IS AVAILABLE FOR CERTAIN TYPES OF EQUIPMENT, TEST DATA SHALL BE SUBMITTED TO VALIDATE THAT EQUIPMENT MEETS OF EXCEEDS AVAILABLE STANDARDS.

NATIONAL FIRE PROTECTION (NFPA) STANDARDS: NFPA 13, 2019 EDITION, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS.

NFPA 70, 2020 EDITION, NATIONAL ELECTRICAL CODE®. NFPA 72, 2019 EDITION, NATIONAL FIRE ALARM AND SIGNALING CODE

NFPA 90A, 2018 EDITION, STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS. NFPA 90B, 2018 EDITION, STANDARD FOR THE INSTALLATION OF WARM AIR HEATING AND AIR-CONDITIONING SYSTEMS.

NFPA 101, 2018 EDITION, LIFE SAFETY CODE®.

#### GENERAL REQUIREMENTS

AS A WHOLE.

THE DRAWINGS AND APPLICABLE SPECIFICATIONS SHALL BE CONSIDERED SUPPLEMENTARY, ONE TO THE OTHER AND ARE CONSIDERED THE "CONTRACT DOCUMENTS". ALL WORKMANSHIP, METHODS AND/OR MATERIALS DESCRIBED OR IMPLIED BY ON AND NOT DESCRIBED OR IMPLIED BY THE OTHER SHALL BE PROVIDED, FURNISHED OR PERFORMED AS IF IT HAD APPEARED IN BOTH SECTIONS. THE TERM "CONTRACT DOCUMENTS" DESCRIBED HEREIN IS NOT LIMITED SOLELY TO THE ELECTRICAL PORTION OF THE DRAWINGS AND SPECIFICATIONS, BUT ENCOMPASSES THE DRAWINGS AND SPECIFICATIONS OF ALL DIVISION

2. THE DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW EVERY DETAIL OF CONSTRUCTION. METHODS. MATERIALS AND EQUIPMENT, OR EXACT LOCATIONS, ROUTING, ETC. THEY INDICATE THE RESULT TO BE ACHIEVED BY THE ASSEMBLAGE OF SEVERAL SYSTEMS FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM. DO NOT SCALE THE CONTRAC DOCUMENTS. COORDINATE EXACT EQUIPMENT LOCATIONS WITH THE ARCHITECTURAL, CIVIL AND STRUCTURAL CONTRACT DOCUMENTS, AS WELL AS FIELD CONDITIONS, APPROVED SHOP DRAWINGS AND WORK OF ALL OTHER DIVISIONS/TRADES. 3. THE TERM "PROVIDE" USED IN THE CONTRACT DOCUMENTS INDICATES TO FURNISH AND INSTALL MATERIALS REQUIRED FOR CORRECT INSTALLATION OF A COMPLETE SYSTEM, UNLESS SPECIFICALLY NOTED OTHERWISE I. UNLESS NOTED AS EXISTING, ALL ELECTRICAL INDICATED ON THE CONTRACT DOCUMENTS SHALL BE NEW, SHALL BE U.L. LISTED AND SHALL BEAR A U.L. LABEL. WHERE NO U.L. LABEL OR LISTING IS AVAILABLE, THE MATERIAL SHALL BE LISTED WITH AN

APPROVED, NATIONALLY RECOGNIZED ELECTRICAL TESTING AGENCY. 5. PROVIDE EXPERIENCED, QUALIFIED AND RESPONSIBLE SUPERVISION FOR ALL WORK REQUIRED BY THE CONTRACT DOCUMENTS. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, TO THE SATISFACTION OF THE ARCHITECT/ENGINEER AND OWNER. S. CARRY ALL INSURANCE REQUIRED TO PROTECT AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF THIS

7. GUARANTEE ALL MATERIALS AND WORKMANSHIP ARE FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE ARCHITECT/ENGINEER AND OWNER. UNLESS NOTED OTHERWISE IN DIVISION 1. AT NO ADDITIONAL COSTS, PROVIDE THE CORRECTION OF ANY DEFECTS INCLUDING REPAIR OR REPLACEMENT. B. INCLUDE ALL COSTS ASSOCIATED WITH PERMITS, LICENSES, FEES, INSPECTIONS, TESTING AND TEMPORARY POWER IN THE BID PRICE, UNLESS NOTED OTHERWISE ). IF HAZARDOUS MATERIALS ARE ENCOUNTERED, COMPLY WITH ALL APPLICABLE RULES, REGULATIONS AND GUIDELINES

CONCERNING REMOVAL. HANDLING. DISPOSAL AND PROTECTION AGAINST ENVIRONMENTAL EXPOSURE OR POLLUTION. PROVIDE DOCUMENTATION OF SAID COMPLIANCE. IO. PROVIDE ELECTRONIC SUBMITTALS (PRODUCT DATA & SHOP DRAWINGS) FOR EACH MAJOR COMPONENT OF THE ELECTRICAL SYSTEM FOR REVIEW BY THE ARCHITECT/ENGINEER AND OWNER. MAJOR COMPONENTS INCLUDE. BUT ARE NOT LIMITED TO. RACEWAYS. BOXES. WIRE AND CABLE. EQUIPMENT, DEVICES, LIGHT FIXTURES, SWITCHGEAR, PANELBOARDS, CIRCUIT BREAKERS, SAFETY SWITCHES, FIRE ALARM SYSTEM, ETC. ALL SUBMITTALLS ARE TO BE REVIEWED AND APPROVED BY THE CONTRACTOR FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS PRIOR TO SUBMITTING TO THE ARCHITECT/ENGINEER ALLOW A MINIMUM OF TEN (10) BUSINESS DAYS FOR REVIEW BY ARCHITECT/ENGINEER. UNLESS NOTED OTHERWISE IN DIVISION

I1. THE ELECTRICAL PORTION OF THE CONTRACT DOCUMENTS ARE COORDINATED WITH THE DESIGN BASIS EQUIPMENT SPECIFIED BY DIVISION 26 AND OTHER DIVISIONS. WHERE THE CONTRACTOR ELECTS TO SUBSTITUTE A PRODUCT IN LIEU OF PROVIDING THE DESIGN BASIS, AND SAID SUBSTITUTION IS ACCEPTED BY THE ARCHITECT/ENGINEER AND OWNER, THE CONTRACTOR SHALL MAKE ALL CORRECTIONS TO THE ELECTRICAL SYSTEM NECESSARY IN ORDER TO ENSURE A COMPLETE AND OPERATIONAL INSTALLATION OF THE EQUIPMENT AT NO ADDITIONAL COSTS. WHERE THE CONTRACTOR'S DESIGN SUBSTITUTION RESULTS IN THE NEED FOR THE ENGINEER TO REVISE THE CONTRACT DOCUMENTS, THE ENGINEER RESERVES THE RIGHT TO REQUEST COMPENSATION FROM THE CONTRACTOR FOR SAID SERVICES. 12. MAINTAIN A CURRENT AND ACCURATE SET OF PROJECT RECORD DOCUMENTS (AS-BUILTS) AT THE SITE THROUGHOUT THE DURATION OF THE PROJECT. RECORD DRAWINGS SHALL BE UPDATED EACH DAY TO REFLECT THE ACTUAL LOCATIONS, SIZES,

ROUTING, ETC. OF EACH PORTION OF THE ELECTRICAL SYSTEM AFFECTED BY THIS WORK. A FINAL SET OF RECORD DOCUMENTS SHALL BE ISSUED TO THE ARCHITECT/ ENGINEER FOR REVIEW AND THEN SUBMITTED TO THE OWNER WITHIN 30 DAYS AFTER THE DATE OF FINAL ACCEPTANCE. PROVIDE RECORD DRAWINGS OF THE ACTUAL INSTALLATION INCLUDING SINGLE LINE DIAGRAM, POWER RISER DIAGRAM OF THE BUILDING ELECTRICAL DISTRIBUTION SYSTEM, SITE PLANS AND ALL ELECTRICAL FLOORPLANS, DETAILS, PANEL SCHEDULES, ETC 13. PROVIDE AN OPERATING AND MAINTENANCE MANUAL TO OWNER PRIOR TO THE FINAL ACCEPTANCE. THE MANUAL SHALL INCLUDE. AS A MINIMUM. (1) SUBMITTAL DATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. ALSO PROVIDE TWO OPERATIONS AND MAINTENANCE MANUALS FOR EACH PIECE OF

EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS AND METHOD OF OPERATION FOR EQUIPMENT SHALL BE CLEARLY IDENTIFIED, AND THE NAME, PHONE NUMBER AND ADDRESS OF AT LEAST ONE QUALIFIED 14. INCLUDE ALL COSTS FOR EXCAVATION, SAW CUTTING, DIRECTIONAL BORING, CORE DRILLING, BACKFILLING, SURFACE RESTORATION, REPAIR OF FINISHES, ETC. THAT IS REQUIRED IN ORDER TO MEET THE PROJECT REQUIREMENTS. 5. INCLUDE IN BID ALL COSTS ASSOCIATED WITH TEMPORARY ELECTRICAL SERVICE AS REQUIRED FOR USE BY ALL TRADES DURING CONSTRUCTION. REMOVE TEMPORARY POWER AT THE COMPLETION OF THE PROJECT. OBTAIN AND PAY FOR ALL REQUIRED PERMITS FOR TEMPORARY POWER. ENGINEER OF RECORD SHALL BE PROVIDED WITH ADDITIONAL COMPENSATION

RECORD IF REQUIRED BY THE AHJ FOR THE TEMPORARY POWER. 16. LOCATE, IDENTIFY, PROTECT AND DOCUMENT ALL UTILITY LINES LOCATED WITHIN THE PROJECT BOUNDARY. FOR LOCATING SITE UTILITIES, CONTACT ALL LOCAL MUNICIPALITIES AND UTILITIES AT LEAST 48 HOURS PRIOR TO DIGGING. 17. INCLUDE IN BID THE TRANSPORT AND DISPOSAL OR RECYLING OF ALL WASTE MATERIALS GENERATED BY THIS PROJECT IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL RULES, REGULATIONS AND GUIDELINES APPLICABLE. COMPLY FULLY WITH ALL APPLICABLE STATUTES REGARDING MERCURY- CONTAINING DEVICES. AND WITH ALL LOCAL. STATE AND FEDERAL APPLICABLE GUIDELINES AT THE TIME OF DISPOSAL. PROVIDE OWNER WITH WRITTEN CERTIFICATION OF ACCEPTED DISPOSAL.

FROM THE CONTRACTOR WHERE SIGNED & SEALED DRAWINGS ARE REQUESTED BY THE CONTRACTOR TO THE ENGINEER OF

#### COORDINATION

I. VERIFY AND COORDINATE LOCATIONS OF ANY MISCELLANEOUS EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS (I.E., COPIERS, FAX MACHINES, PRINTERS, KITCHEN APPLIANCES, LAUNDRY APPLIANCES, PROJECTION SCREENS, SHOP TOOLS, MACHINE, ELEVATORS, ETC.) WITH APPROVED SHOP DRAWINGS, OWNER-PROVIDED CUT SHEETS, MANUFACTURER'S INSTRUCTIONS, AND EQUIPMENT NAMEPLATE INFORMATION, PRIOR TO ROUGH IN, AND PROVIDE ALL NECESSARY ELECTRICAL

2. VERIFY AND COORDINATE LOCATIONS AND EXACT ELECTRICAL REQUIREMENTS FOR ALL MECHANICAL, PLUMBING AND FIRE PROTECTION EQUIPMENT PRIOR TO SUBMITTAL OF SHOP DRAWINGS OF ELECTRICAL EQUIPMENT. PROVIDE ALL NECESSARY RACEWAYS, CONDUCTORS, BOXES, EQUIPMENT, ACCESSORIES, ASSOCIATED DISCONNECT SWITCHES, CIRCUIT BREAKERS, CONTROL TRANSFORMERS, FIRE ALARM SHUTDOWN, FTC. REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. COORDINATE WITH APPROPRIATE TRADE'S APPROVED SHOP DRAWINGS, MANUFACTURER'S INSTRUCTIONS, AND EQUIPMENT NAMEPLATE INFORMATION, PRIOR TO ROUGH IN, AND PROVIDE ALL NECESSARY ELECTRICAL REQUIRED, UNLESS NOTED 3. THIS PROJECT REQUIRES COORDINATION DRAWINGS BY THE CONTRACTOR. PARTICIPATE IN THE COORDINATION DRAWING

PREPARATION PROCESS AND PROVIDE ALL NECESSARY INFORMATION REQUIRED TO COORDINATE ALL TRADE INFORMATION. I. ALL WORK ON THE ELECTRICAL SYSTEM REQUIRED BY THE CONTRACT DOCUMENTS SHALL BE COORDINATED WITH THE WORK OF ALL OTHER DIVISIONS/TRADES PRIOR TO COMMENCEMENT OF WORK, AVOID INTERFERENCES WITH THE PROGRESS OF OTHER DIVISIONS/TRADES. 5. WHERE WALLS ARE OF TILT-UP OR PRE-CAST CONSTRUCTION, PROVIDE COORDINATION FOR EXACT DIMENSIONS AND OPENINGS REQUIRED FOR ALL ELECTRICAL COMPONENTS INSTALLED WITHIN SUCH WALLSDURING THE SHOP DRAWING REVIEW

PROCESS OF THE WALLS, PRIOR TO CONSTRUCTION OF THE WALLS. S. LOCATIONS OF VFD'S, DISCONNECTS, MOTOR STARTERS, ETC. FOR HVAC EQUIPMENT ARE DIAGRAMMATIC ON THE PLAN DRAWINGS. EXACT LOCATIONS ARE TO BE COORDINATED WITH CONTRACTOR'S COORDINATION DRAWINGS PRIOR TO ROUGH-IN TO ENSURE PROPER NEC CLEARANCES AND APPROPRIATE MOUNTING SURFACE 7. REFER TO ARCHITECTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, CIVIL, LANDSCAPE, INTERIOR DESIGN, TECHNOLOGY,

STRUCTURAL, AND VENDOR EQUIPMENT DRAWINGS FOR RELATED INFORMATION AND ADDITIONAL INSTALLATION

REQUIREMENTS TO BE PERFORMED AS PART OF THE WORK. B. WHERE A DISCREPANCY OR CONFLICT IS FOUND BETWEEN ONE DRAWING AND ANOTHER, OR BETWEEN A DRAWING AND APPLICABLE SPECIFICATIONS. NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY IN WRITTEN FORM. IN GENERAL. THE MOST STRINGENT REQUIREMENT SHALL GOVERN UNLESS THE DISCREPANCY CONFLICTS WITH APPLICABLE CODES OR OWNER'S DESIGN STANDARDS, WHEREIN THE CODE OR OWNER'S DESIGN STANDARDS SHALL GOVERN. ). CAREFULLY EXAMINE THOSE PORTIONS OF THE BUILDING AND/OR SITE AFFECTED BY THIS WORK PRIOR  $\,\,$  TO SUBMITTING BID PRICE, SO AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT MAY AFFECT EXECUTION OF THE WORK. SUBMISSION OF A BID PRICE SHALL BE CONSTRUED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE. LATER CLAIMS FOR LABOR, EQUIPMENT AND/OR MATERIALS REQUIRED DUE TO DIFFICULTIES ENCOUNTERED THAT COULD HAVE BEEN REASONABLY OBSERVED WILL NOT BE RECOGNIZED

 $10.\,$  COORDINATE ALL PROJECT SCHEDULING AND PHASING REQUIREMENTS WITH ARCHITECT/ENGINEER  $\,$  AND OWNER PRIOR TO SUBMITTING BID PRICE. THIS PROJECT MAY REQUIRE PHASING SEQUENCES AND POTENTIAL PREMIUM TIME WORK AND ALL COSTS FOR SUCH SHALL BE INCLUDED IN THE BID PRICE. PROVIDE ADEQUATE WORK FORCE AND EQUIPMENT, AND INCLUDE PREMIUM TIME AS MAY BE REQUIRED IN ORDER TO ADHERE TO THE PROJECT SCHEDULE. ADDITIONALLY, ENSURE THAT LONG LEAD ITEMS DO NOT IMPACT THE PROJECT'S SCHEDULE OR PHASING. I1. ANY TEMPORARY INTERRUPTION OF POWER REQUIRED FOR THE SYSTEM TIE-IN OR SWITCHOVER FOR  $\,\,$  ANY PORTION OF THE ELECTRICAL SYSTEM SHALL BE PRE-APPROVED IN WRITING BY THE OWNER AND SCHEDULED IN ADVANCE. 2. COORDINATE EXACT REQUIREMENTS WITH THE LOCAL UTILITY COMPANIES AND PROVIDERS (ELECTRIC, TELEPHONE, CABLE TV, ETC.) AND INCLUDE ALL COSTS FOR PROVIDING TEMPORARY AND PERMANENT SERVICES REQUIRED FOR THIS PROJECT IN THE BID PRICE. BID PRICE SHALL INCLUDE, BUT NOT BE LIMITED TO, EXCAVATION, RACEWAYS, BACKFILL, EQUIPMENT,

EQUIPMENT PADS, BACKBOARDS, METERS, GROUNDING, UTILITY ENGINEERING AND IMPACT FEES. 3. CONDUCT WORK OPERATIONS AND DEBRIS REMOVAL IN A MANNER THAT ENSURES MINIMUM INTERFERENCE WITH NORMAL BUSINESS OPERATIONS, TRAFFIC, PARKING, ETC. ONGOING IN ADJACENT OCCUPIED SPACES OR FACILITIES. PROVIDE ALL THAT IS REQUIRED TO EFFECTIVELY PROTECT SURROUNDING OCCUPANTS, EQUIPMENT, FINISHES, FURNITURE, ETC. FROM DAMAGE OR EXCESSIVE NOISE THROUGHOUT THE DURATION OF THIS PROJECT. CONTRACTOR IS RESPONSIBLE FOR ANY LOSSES OR ANY DAMAGE RESULTING FROM THE FAILURE TO ADHERE TO THIS REQUIREMENT. RESTORE DAMAGED ELEMENTS TO ORIGINAL CONDITION TO THE SATISFACTION OF THE ARCHITECT/ENGINEER AND OWNER, AT NO ADDITIONAL COSTS. REPORT OF ANY SUCH OCCURRENCE TO THE ARCHITECT/ENGINEER AND OWNER IMMEDIATELY AND AWAIT WRITTEN DIRECTION PRIOR TO

PROCEEDING WITH REPAIRS. 14. COORDINATE THE LOCATION OF ALL LIGHT FIXTURES, DEVICES AND BOXES WITH WINDOWS, MIRRORS, MILLWORK, CABINETS, GLASS CURTAIN WALLS, AND GLASS WALLS PRIOR TO INSTALLATION OF CONDUITS OR BOXES. REVIEW ALL CONTRACT DRAWINGS TO ASCERTAIN ANY CONFLICTS PRIOR TO BIDDING. OBTAIN CLARIFICATION FROM THE ARCHITECT/ENGINEER PRIOR TO BID. CONTRACTOR SHALL NOT BE ENTITLED TO ADDITIONAL COMPENSATION FOR WORK REQUIRED TO RELOCATE OUTLET BOXES OR RACEWAYS FOR COORDINATION WITH OTHER TRADE'S WORK.

GROUNDING

1. FIRE PROTECTION PIPING SHALL NOT BE USED FOR GROUNDING.

INSTALLED WITHIN AN EXISTING ROOM.

2. ALL FEEDERS AND BRANCH CIRCUITS SHALL INCLUDE AN EQUIPMENT GROUND CONDUCTOR. METAL RACEWAYS SHALL NOT BE USED AS THE SOLE EQUIPMENT GROUND. 3. WHERE A PHASE CONDUCTOR IS INCREASED IN SIZE DUE TO VOLTAGE DROP, THE EQUIPMENT GROUND CONDUCTOR SHALL BE INCREASED IN SIZE PROPORTIONATELY. PROVIDE A GROUND BUS BAR IN EACH ELECTRICAL ROOM AND TELECOMMUNICATIONS / IDF/ MDF ROOM FOR ALL NEW

CONSTRUCTION AND NEW ROOMS IN EXISTING CONSTRUCTION, AND IN EXISTING CONSTRUCTION WHERE THERE IS NONE

A. 120V, 20A CIRCUITS SHALL BE: i. #12 FROM 0-70 FT ii. #10 FROM 71-115F1 iii. #8 FROM 116-180FT

B. 277V, 20A CIRCUITS SHALL BE

5. ALL CONDUCTORS SHALL BE COPPER, THHN/THWN; SOLID FOR #10 AWG AND SMALLER; STRANDED FOR #8 AWG AND LARGER. S. CONDUCTORS USED IN WET LOCATIONS, INCLUDING BUT NOT LIMITED TO UNDERGROUND CONDUITS/ DUCTBANKS AND EXTERIOR CONDUITS SHALL COMPLY WITH NEC 310.10 AND BE LISTED FOR USE IN WET LOCATIONS. 7. ALL POWER CIRCUITS HAVE BEEN DESIGNED TO MEET 2% OR LESS VOLTAGE DROP FOR FEEDERS. AND 3% OR LESS VOLTAGE DROP FOR BRANCH CIRCUITS

#### **ELECTRICAL GENERAL NOTES**

EQUIPMENT SHALL BE OF MATERIALS SUITABLE FOR AND RATED FOR THE ENVIRONMENT IN WHICH THEY ARE TO BE INSTALLED. ALL COMPONENTS OF THE ELECTRICAL SYSTEM LOCATED OUTDOORS OR INDOORS WHERE EXPOSED TO SIGNIFICANT MOISTURE SHALL BE WEATHERPROOF, NEMA 3R, AS A $\,$  MINIMUM, WHETHER INDICATED ON THE CONTRACT DRAWINGS OR NOT. TERMINATION PROVISIONS FOR ALL ELECTRICAL EQUIPMENT (PANELBOARDS, SWITCHBOARD, TRANSFORMERS, DISCONNECT SWITCHES, MOTOR CONTROLLERS, AUTOMATIC TRANSFER SWITCHES, ENCLOSED CIRCUIT BREAKERS, BUSWAYS, ETC.) SHALL BE LISTED AND IDENTIFIED FOR USE WITH MINIMUM 75 DEG. F CONDUCTORS IN ACCORDANCE WITH NEC. B. WORKING CLEARANCES FOR ELECTRICAL EQUIPMENT SHALL BE IN COMPLIANCE WITH NEC.

I. THE ELECTRICAL DEDICATED EQUIPMENT SPACE EXTENDING FROM FLOOR TO 6' ABOVE ELECTRICAL EQUIPMENT OR TO THE STRUCTURAL CEILING, WHICHEVER DISTANCE IS LOWER, WITH A WIDTH AND DEPTH OF THE PANELBOARD OR SWITCHBOARD MUST BE CLEAR OF ALL PIPING, DUCTS, ARCHITECTURAL APPURTENANCES AND OTHER EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION IN ACCORDANCE WITH NEC. PROVIDE A REINFORCED CONCRETE PAD, SIZED 4" LARGER IN ALL DIRECTIONS THAN THE FOOTPRINT OF THE EQUIPMENT, AND

4" HIGH, FOR ALL FREESTANDING, FLOOR-MOUNTED ELECTRICAL EQUIPMENT. PROVIDE VIBRATION ISOLATORS AND/OR ANCHORS PER MANUFACTURER'S INSTRUCTIONS 3. PROVIDE HACR RATED CIRCUIT BREAKER FOR ALL HVAC EQUIPMENT. ALL PANELBOARDS OR DISCONNECT SWITCHES LOCATED IN KITCHEN AREAS SHALL BE STAINLESS STEEL (COVER AND DOOR WHERE PANEL IS FLUSH MOUNTED; PANEL BOX, COVER & DOOR WHERE SURFACE MOUNTED).

B. PROVIDE SURGE PROTECTION DEVICE FOR ALL MAIN SERVICE EQUIPMENT, PANELBOARDS SERVING SENSITIVE ELECTRONIC EQUIPMENT (DATA RACKS) OR COMPUTERS, EMERGENCY SWITCHBOARDS AND PANELBOARDS, LIGHTING PANELS SERVING EXTERIOR LIGHTING, POWER CIRCUITS OR LOW VOLTAGE (FIRE ALARM, TELECOMMUNICATIONS) EXITING THE BUILDING. PROVIDE MINIMUM 30A/3P BREAKER IN BRANCH CIRCUIT PANELBOARDS AND 60A/3P IN DISTRIBUTION PANELBOARDS OR SWITCHBOARDS, UNLESS NOTED OTHERWISE, OR PER THE SPD MANUFACTURER'S RECOMMENDATIONS FOR SURGE PROTECTION DEVICE. ). PROVIDE ARC ENERGY REDUCING MAINTENANCE SWITCH FOR ANY BREAKER RATED (OR ABLE TO BE ADJUSTED TO) 1200A OR HIGHER UNLESS OTHER ARC ENERGY REDUCTION MEANS MEETING NEC 240.87 IS INDICATED ON DRAWINGS/SPECIFICATIONS OR

#### **ELECTRICAL DEVICES OUTLET BOXES, JUNCTION BOXES**

LIGHT SWITCHES SHALL BE MOUNTED 48 INCHES ABOVE FINISHED FLOOR TO CENTER LINE OF DEVICE, UNLESS NOTED 2. RECEPTACLES, VOICE/DATA OUTLETS AND WALL FURNITURE FEEDS SHALL BE MOUNTED 18 INCHES — ABOVE FINISHED FLOOR TO CENTER LINE OF DEVICE, UNLESS NOTED OTHERWISE. ABOVE COUNTER RECEPTACLES SHALL BE MOUNTED 6" ABOVE BACK

SPLASH TO CENTERLINE OF DEVICE, UNLESS NOTED OTHERWISE. . IT IS THE INTENT THAT ALL DEVICE OUTLET BOXES (POWER AND SYSTEMS) BE FLUSH MOUNTED IN WALLS, CEILINGS OR FLOOR: AND JUNCTION BOXES FLUSH MOUNTED IN WALLS, CEILINGS, OR FLOORS, OR CONCEALED ABOVE ACCESSIBLE CEILINGS, AND NOT SURFACE MOUNTED, UNLESS SPECIFICALLY NOTED ON THE CONTRACT DRAWINGS, OR UNLESS THE ARCHITECT/ENGINEER GRANTS WRITTEN PERMISSION 4. ALL COMPONENTS OF THE ELECTRICAL SYSTEM (INCLUDE RACEWAYS, ELECTRICAL EQUIPMENT, OUTLET BOXES, JUNCTION

BOXES, ETC.) LOCATED IN A HAZARDOUS (CLASSIFIED) LOCATION SHALL BE APPROVED FOR USE IN SAID LOCATION. AS DEFINED BY THE NEC, WHETHER INDICATED ON THE CONTRACT DOCUMENTS OR NOT. 5. ALL DEVICES SHALL BE MOUNTED VERTICALLY, UNLESS NOTED OTHERWISE. 6. ALL RECEPTACLES SHALL BE MOUNTED SUCH THAT THE GROUND PIN IS MOUNTED UP.

Y. WHERE DEVICES ARE SHOWN IN WALLS BACK-TO-BACK ON OPPOSITE SIDES, INSTALL SO THAT THEY ARE SEPARATED BY AT B. RECEPTACLES OR JUNCTION BOXES FOR ELECTRIC WATER COOLERS AND VENDING MACHINES. SHALL BE LOCATED DIRECTLY BEHIND SAID APPLIANCE. CONCEALED FROM DIRECT VIEW. RECEPTACLES AND/OR HARD WIRED EQUIPMENT CONNECTIONS SHALL BE PROTECTED BY A READILY ACCESSIBLE GFCI FEED-THRU DEVICE LOCATED IMMEDIATELY ADJACENT TO THE APPLIANCE OR BE PROTECTED BY GFCI BREAKER IN THE PANELBOARD. ALL GFCI DEVICES MUST BE READILY ACCESSIBLE PER

9. ALL EXTERIOR RECEPTACLES OR RECEPTACLES LOCATED IN AREAS SUBJECT TO MOISTURE (PARKING GARAGE, WASHDOWN AREAS IN KITCHEN, ETC) SHALL BE GFCI TYPE. ALL EXTERIOR RECEPTACLES SHALL WE PROVIDED WITH CAST METAL, IN-USE COVER UNLESS NOTED OTHERWIS 0. ALL RECEPTACLES LOCATED IN KITCHENS, BATHROOMS, MECHANICAL ROOMS, JANITOR CLOSETS, ELEVATOR SHAFTS,

ELEVATOR EQUIPMENT ROOMS, FOR ELEVATOR SUMP PUMP(S) OR INSTALLED WITHIN 6' OF THE INSIDE FACE OF A SINK, SHALL BE GFCI TYPE OR GFCI PROTECTED. 1. ALL RECEPTACLES LOCATED IN CHILD-CARE FACILITIES. DWELLING UNITS. HOTEL/MOTEL GUEST ROOMS. PEDIATRIC CLINICS OR PEDIATRIC CAREA AREAS, AND OTHER AREAS AS REQUIRED BY NEC AND LOCAL CODE REQUIREMENTS SHALL BE TAMPER

2. WHEN ELECTRICAL BOXES ARE LOCATED IN VERTICAL FIRE-RESISTIVE ASSEMBLIES, THEY SHALL BE INSTALLED WITHOUT A. ALL ELECTRICAL BOXES SHALL BE METALLIC.

B. BOX OPENING SHALL OCCUR ONLY ON ONE SIDE OF FRAMING SPACE. C. BOX OPENING SHALL NOT EXCEED 16 SQUARE INCHES.

D. ALL CLEARANCES BETWEEN OUTLET BOX AND GYPSUM BOARD SHALL BE COMPLETELY FILLED WITH JOINT COMPOUND (OR OTHER APPROVED MATERIAL). PROVIDE A WALL AROUND OUTLETS LARGER THAN 16 SQUARE INCHES. THE INTEGRITY OF THE WALL RATING SHALL BE

THE TOTAL AGGREGATE SURFACE AREA OF THE BOXES SHALL NOT EXCEED 100 SQUARE INCHES PER 100 SQUARE FEET. 6. OUTLET BOXES LOCATED ON OPPOSITE SIDES OF FIRE RESISTIVE ASSEMBLIES SHALL BE SEPARATED BY A MINIMUM

HORIZONTAL DISTANCE OF 24 INCHES. OUTLET BOXES SHALL BE SECURELY FASTENED TO WALL FRAMING MEMBERS. THE OPENING IN THE GYPSUM BOARD FACING SHALL BE CUT NOT TO EXCEED 1/8 INCH BETWEEN THE EDGES OF THE

OUTLET BOX AND THE EDGES OF THE OPENING.

FLEXIBLE METAL CONDUIT AND LIQUIDTIGHT FLEXIBLE METAL CONDUIT (FMC & LFMC) SHALL NOT BE USED IN LENGTHS THAT EXCEED 6'-0" UNLESS SPECIFICALLY NOTED OTHERWISE, OR UNLESS THE ARCHITECT/ENGINEER GRANTS WRITTEN 2. ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS, INCLUDING LOW VOLTAGE SYSTEMS, SHALL BE 🛮 INSTALLED IN A COMPLETE RACEWAY SYSTEM (CONDUIT) UNLESS SPECIFICALLY NOTED OTHERWISE. 3. THE USE OF ELECTRICAL NON-METALLIC TUBING (ENT) AND LIQUIDTIGHT FLEXIBLE NON-METALLIC CONDUIT (LFNC) ARE PROHIBITED UNLESS SPECIFICALLY NOTED OTHERWISE, OR UNLESS THE ARCHITECT/ENGINEER OR OWNER GRANTS

WRITTEN PERMISSION. I. CONNECTIONS TO TRANSFORMERS, AHU'S, AND PUMPS SHALL BE WITH LIGUIDTIGHT, FLEXIBLE METAL CONDUIT. 5. NO PVC CONDUIT MAY BE USED INSIDE OF BUILDING UNLESS ROUTED UNDERGROUND, AND UNLESS NOTED OTHERWISE. 6. ALL CONDUIT TERMINATIONS AT TERMINAL BOARDS ARE TO HAVE GROUNDING BUSHINGS AT CONDUIT ENDS. ALL CONDUITS ARE TO BE CONCEALED UNLESS IMPOSSIBLE DUE TO EXISTING CONDITIONS (I.E., EXPOSED CEILINGS, BUILDING EXTERIOR WALL RUNS). CONCEAL ALL CONDUITS ABOVE CEILINGS OR IN WALLS AND MILLWORK. WHERE EXISTING CONDITIONS DICTATE THAT CONDUITS CANNOT BE CONCEALED, NOTIFY ARCHITECT/ENGINEER PRIOR TO

INSTALLING CONDUIT FOR RESOLUTION TO ROUTING. 8. SEAL ALL PENETRATIONS AND OPENINGS MADE DURING EXECUTION OF WORK IN FIRE-RATED AND SMOKE-RATED WALLS. WALLS SHALL BE SEALED WITH UL-APPROVED PRODUCT WITH THE SAME OR GREATER RATING OF WALL PENETRATED. 9. PROVIDE ALL PENETRATIONS THROUGH FLOORS, WALLS, CEILINGS AND ROOFS WHERE REQUIRED. COORDINATE LOCATIONS AND SIZES WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS, FIELD CONDITIONS AND WORK OF ALL OTHER DIVISIONS/TRADES. ALL OPENINGS ARE TO BE SEALED WATERTIGHT. 10. ALL RACEWAYS THAT TURN UP THROUGH THE SLAB OR INTO ELECTRICAL EQUIPMENT FROM UNDERGROUND SHALL BE

RIGID GALVANIZED STEEL (RGS) WITH BITUMASTIC COATING FOR AT LEAST THE FINAL 18" LENGTH. THE USE OF NON-METALLIC CONDUIT ABOVE GRADE IS PROHIBITED. 1. PANEL SCHEDULES AND FLOOR PLANS MAY INDICATE DEDICATED HOMERUNS FOR EACH BRANCH CIRCUIT. BRANCH CIRCUITS MAY BE GROUPED IN A COMMON HOMERUN WHERE THE HOMERUN DOES NOT EXCEED 3 PHASE CONDUCTORS, 3 NEUTRAL CONDUCTORS, AND 1 EQUIPMENT GROUND. THE HOMERUN RACEWAY SIZE AND CONDUCTOR SIZE SHALL BE INCREASED AS NECESSARY TO COMPLY WITH THE NEC FOR 40% MAXIMUM FILL AND DERATING REQUIREMENTS. 2. PROVIDE SEAL OFF FITTINGS, APPROVED FOR SUCH USE, WHERE RACEWAYS PENETRATE BETWEEN A DRY, CONDITIONED ENVIRONMENT AND THE EXTERIOR OR OTHER WET ENVIRONMENTS AND ADDITIONAL AREAS WHERE CONDUITS PASS FROM WARM TO COLD LOCATIONS SUCH AS WALK-IN COOLERS OR FREEZERS, BOILER ROOMS, ETC 3. PROVIDE POLYOLEFIN JET-LINE #232 (NYLON PULL STRING) IN EACH EMPTY CONDUIT WITH ENGRAVED METAL TAG

INDICATING CONDUIT DESIGNATION. 14. ALL HOMERUNS SHALL BE IN 3/4" RACEWAY MINIMUM. 1/2" RACEWAY IS ACCEPTABLE FOR A SINGLE CIRCUIT FROM THE HOMERUN TO REMAINING DEVICES. CONTRACTOR SHALL USE COMPRESSION FITTINGS ONLY FOR EMT CONDUIT.

6. WHERE RACEWAYS ARE INSTALLED IN SLABS, THE MINIMUM SPACING, MAXIMUM RACEWAY SIZE, AND ANY OTHER STRUCTURAL LIMITATIONS SHALL BE COORDINATED WITH THE STRUCTURAL DRAWINGS AND THE STRUCTURAL ENGINEER PRIOR TO INSTALLATION.

ALL WIRE SHALL BE SIZED AS SHOWN ON THE DRAWINGS. IF NO WIRE SIZE IS SHOWN, THEN WIRE SHALL BE #12 AWG. 2. BRANCH CIRCUITS SHALL BE INCREASED IN SIZE AS REQUIRED TO COMPENSATE FOR VOLTAGE DROP FROM LENGTH OF CIRCUIT DUE TO FIELD ROUTING. FINAL INSTALLATION SHALL NOT EXCEED A MAXIMUM OF 3% VOLTAGE DROP FOR BRANCH CIRCUITS. REFER TO VOLTAGE DROP TABLE BELOW FOR CONDUCTOR SIZES FOR BRANCH CIRCUITS AS FOLLOWS:

i. #12 FROM 0-140FT

ii. #10 FROM 141-220FT iii. #8 FROM 221-350FT

ANYTHING LONGER THAN THE ABOVE SHALL BE SUBMITTED TO THE ENGINEER WITH CALCULATIONS FOR APPROVAL. ALL CONDUCTORS IN CABINETS MUST BE CAREFULLY FORMED AND HARNESSED SO THAT EACH CONDUCTOR DROPS OFF IRECTLY OPPOSITE TO TERMINAL 4. ALL WIRE SIZES ARE BASED ON AMPACITIES FOR 60 DEG F TEMPERATURE RATING FROM 0-100A AND 75 DEG. F TEMPERATURE RATING LISTED IN NEC FOR 100A AND ABOVE

PROVIDE TYPED PANEL DIRECTORIES FOR ALL NEW PANELBOARDS, AND EXISTING PANELBOARDS AFFECTED BY THIS PROJECT. DIRECTORIES SHALL REFLECT PROJECT AS-BUILT CONDITIONS FOR ALL BRANCH CIRCUITS. DIRECTORIES SHALL INCLUDE WHER EACH PANEL IS FED FROM. ADDITIONALLY, EACH BRANCH CIRCUIT LOAD DESCRIPTION SHALL INCLUDE THE ROOM NUMBER(S) FOR EACH LOAD (I.E., RECEPTACLES-RMS 501,503), ROOM NUMBERS SHALL BE BASED ON ACTUAL ROOM SIGNAGE INSTALLED IN FIELD. COORDINATE EXACT ROOM NUMBERS WITH ARCHITECT/ENGINEER AND OWNER PRIOR TO COMPLETION OF PANEL DIRECTORIES

PROVIDE ENGRAVED PLASTIC LAMINATE NAME TAGS ON EACH SWITCHBOARD, SWITCHGEAR, DISTRIBUTION PANEL, PANELBOARD MOTOR CONTROL CENTER, SAFETY SWITCH, ENCLOSED CIRCUIT BREAKER, CABINET, STEP-DOWN TRANSFORMER, TRANSFER SWITCH, ETC., AND ANY OTHER MAJOR COMPONENT OF THE ELECTRICAL SYSTEM. B. PROVIDE ENGRAVED PLASTIC LAMINATE NAME TAGS FOR EACH DISTRIBUTION BREAKER OR BRANCH CIRCUIT BREAKER IN SWITCHGEAR, SWITCHBOARDS, MOTOR CONTROL CENTERS AND OTHER DISTRIBUTION EQUIPMENT. NAME TAG SHALL INCLUDE LOAD DESCRIPTION AND ROOM NUMBER FOR EACH LOAD. 4. ARC FLASH DANGER/WARNING LABELS SHALL BE APPLIED TO SWITCHBOARD, PANELBOARDS, AND EQUIPMENT CONTROLLERS PEF

5. PROVIDE LABELS ON THE INSIDE OF EACH DEVICE COVERPLATE, IDENTIFYING THE PANEL(S)/ CIRCUIT NUMBER(S) DEVICE IS 5. PROVIDE NEATLY, HANDWRITTEN IDENTIFICATION ON THE EXTERIOR COVER OF ALL JUNCTION BOXES, PULLBOXES AND

WIREWAYS, IDENTIFYING THE PANEL(S)/ CIRCUIT NUMBER(S) CONTAINED WITHIN. PROVIDE A PERMANENT SIGN ON THE MAIN ELECTRICAL ROOM DOOR TO THE BUILDING STATING THAT THE MAIN SERVICE DISCONNECTING MEANS IS LOCATED INSIDE. B. PROVIDE A PERMANENT LABEL ON ALL PANELBOARDS, SWITCHBOARDS, SWITCHGEAR, MOTOR CONTROL CENTERS AND DISTRIBUTION PANELS STATING "DO NOT WORK ON EQUIPMENT WHILE ENERGIZED. LOCK-OUT TAG-OUT REQUIRED". PROVIDE REQUIRED IDENTIFICATION PER ANSI STANDARDS, NEC REQUIREMENTS, AND OWNER'S PUBLISHED DESIGN STANDARDS WHERE APPLICABLE. 0. PROVIDE ENGRAVED PHENOLIC LABEL ON ALL NEW SERVICE EQUIPMENT TO INDICATE THE MAXIMUM AVAILABLE FAULT

CURRENT AND THE DATE THE FAULT CURRENT CALCULATION WAS PERFORMED. PROVIDE LABEL ON ALL EXISTING SERVICE

EQUIPMENT WHEN MODIFICATIONS OCCUR THAT AFFECT THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SERVICE.

LIGHT FIXTURES SUPPORTED BY CEILING GRID SHALL BE SUPPORTED AS FOLLOWS: LIGHT FIXTURES WEIGHING LESS THAN 10 POUNDS SHALL HAVE 12-GAUGE HANGER WIRE CONNECTED FROM THE LIGHT FIXTURE TO THE STRUCTURE ABOVE. LIGHT FIXTURES WEIGHING 10 POUNDS OR MORE SHALL HAVE (2) 12-GAUGE HANGER WIRES ATTACHED AT OPPOSITE CORNERS OF THE LIGHT FIXTURE TO THE STRUCTURE ABOVE.

2. COORDINATE EXACT LOCATIONS OF LIGHT FIXTURES IN LAY-IN AND GYPBOARD CEILINGS WITH —ARCHITECTURAL REFLECTED CEILING PLANS. AND WALL MOUNTED EXTERIOR AND INTERIOR LIGHT FIXTURES WITH ARCHITECTURAL ELEVATIONS PRIOR TO INSTALLATION. WHERE THE QUANTITY OF LIGHTS DIFFERS BETWEEN THE ARCHITECTURAL RCP AND THE ELECTRICAL LIGHTING PLANS, PROVIDE THE HIGHEST QUANTITY OF FIXTURES IN THE BID PRICE, THE DISCREPANCY IN QUANTITY SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER. THE HIGHEST QUANTITY SHALL BE CIRCUITED TO THE LOCAL ROOM OR AREA LIGHTING CIRCUITS AND LIGHTING CONTROL DEVICES, UNLESS OTHERWISE DIRECTED IN WRITING BY THE ARCHITECT/ENGINEER VERIFY ACTUAL CEILING CONSTRUCTION TYPE AS DEFINED ON THE ARCHITECTURAL DRAWINGS AND FURNISH ALL LIGHT FIXTURES WITH THE CORRECT MOUNTING DEVICES WHETHER OR NOT SUCH VARIATIONS ARE INDICATED BY THE LIGHT FIXTURE CATALOG NUMBER. VERIFY THE DEPTH OF ALL RECESSED LIGHT FIXTURES WITH THE ARCHITECTURAL DRAWINGS PRIOR TO ORDERING LIGHT FIXTURES. ANY DISCREPANCIES THAT WOULD CAUSE THE RECESSED LIGHT FIXTURES NOT TO FIT INTO CEILING SHALL BE REPORTED TO ARCHITECT/ENGINEER PRIOR TO ORDERING. LIGHT FIXTURES RECESSED IN FIRE-RATED CEILINGS SHALL BE PROVIDED WITH APPROVED FIRE-RATED ENCLOSURE WITH A

LIGHT FIXTURES. 5. MODIFY ALL LIGHT FIXTURE CATALOG NUMBERS AS REQUIRED TO COORDINATE WITH THE LIGHTING BRANCH CIRCUIT VOLTAGES INDICATED. COORDINATE THE CATALOG NUMBERS WITH THE EXACT FIXTURE MOUNTING AND TRIM REQUIRED BY THE CEILING IN WHICH EACH FIXTURE IS BEING INSTALLED. 5. ALL LIGHT FIXTURES SHALL BE PROVIDED COMPLETE WITH LAMPS, UNLESS OTHERWISE NOTED.

ALL EXIT LIGHTS. LIGHT FIXTURES INDICATED WITH UNSWITCHED CIRCUIT (NIGHTLIGHT N/L), EMERGENCY TWIN-HEAD

FIRE RATING EQUAL TO THAT OF THE CEILING. PROVIDE A MINIMUM OF 3" CLEARANCE FROM SIDES AND TOP OF RECESSED

FIXTURES WITH INTEGRAL BATTERY PACKS, AND BATTERY PACKS INTEGRAL TO LIGHT FIXTURES, SHALL BE WIRED AHEAD OF ANY LOCAL SWITCHING OR LIGHTING CONTROLS. B. PROVIDE UL WET LABEL OR IP67 RATED LIGHT FIXTURES FOR ALL FIXTURES LOCATED OUTSIDE OR IN PARKING GARAGES, IN SHOWERS, OR OPEN STRUCTURES. ). EXTERIOR LIGHTING BALLASTS/DRIVERS SHALL HAVE A MINMUM STARTING TEMPERATURE OF -40 DEGREE C, AND A NORMAL AMBIENT OPERATING TEMPERATURE OF 40 DEGREE C. ). PROVIDE FUSING FOR ALL EXTERIOR LIGHT FIXTURES, OR FIXTURES IN PARKING GARAGES OR OPEN STRUCTURES.

1. PROVIDE ALL TEMPORARY NORMAL LIGHTING, EMERGENCY LIGHTING AND EXIT SIGNS REQUIRED DURING THE PROJECT

CONSTRUCTION PHASE. 2. COORDINATE EXACT FOUNDATION AND/OR COMPACTING REQUIREMENTS FOR ALL POLE MOUNTED LIGHT FIXTURES WITH MANUFACTURER'S AND/OR INSTALLER'S STRUCTURAL ENGINEER. POLE BASES SHALL MEET OR EXCEED ALL WIND LOAD RATINGS. GUST FACTORS. IMPORTANCE FACTORS. ETC. REQUIRED BY NATIONAL AND/OR LOCAL CODES. SHOP DRAWINGS SHALL INCLUDE STRUCTURAL DRAWINGS FOR ALL POLE BASES, POLE, ASSEMBLY AND OVERTURN CALCULATIONS REQUIRED. IN THIS PROJECT, SIGNED AND SEALED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE PROJECT STATE. 3. REFER TO LIGHT FIXTURE SCHEDULE FOR LIGHT FIXTURE TYPES, DESCRIPTIONS, CATALOG NUMBERS AND ADDITIONAL INFORMATION PERTINENT TO THE LIGHT FIXTURE OR INSTALLATION THEREOF. 4. COORDINATE LIGHT FIXTURE TRIM TYPE AND FINISH COLOR WITH ARCHITECT PRIOR TO ORDERING.

### **HEALTHCARE NOTES**

15. EACH LIGHTING CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL.

#### ADDITIONAL PROJECT REQUIREMENTS

. THE EQUIPMENT GROUNDING TERMINAL BARS OF THE NORMAL AND ESSENTIAL ELECTRICAL SYSTEM PANELBOARDS SERVING THE SAME PATIENT VICINITY SHALL BE BONDED TOGETHER WITH AN INSULATED, CONTINUOUS, COPPER CONDUCTOR NOT SMALLER THAN #10 AWG. 2. CRITICAL AND LIFE SAFETY LIGHT SWITCHES SHALL BE ROUTED IN CONDUIT AND BOXES OTHER THAN THAT FOR NORMAL BRANCH, ESSENTIAL SYSTEM SWITCHES SHALL BE RED IN COLOR.

. MAINTAIN SEPARATION AMONG EACH TYPE OF ESSENTIAL AND NON-ESSENTIAL POWER WIRING. LIFE SAFETY, CRITICAL, EQUIPMENT, AND NORMAL WIRING SHALL BE INSTALLED TO MAINTAIN NEC REQUIRED SEPARATION OF EACH BRANCH OF ESSENTIAL POWER. 4. PATIENT CARE AREAS SHALL BE PROVIDED WITH GROUNDING IN ACCORDANCE WITH NEC 517. 5. NON-METALLIC RACEWAYS SHALL NOT BE USED TO SERVE ANY PATIENT CARE SPACE. ALL WIRING SHALL BE

MECHCANICALLY PROTECTED BY INSTALLATION IN METALLIC RACEWAYS. 6. CONTRACTOR SHALL PERFORM A COMPLETE EQUIPOTENTIAL GROUND TEST IN ACCORDANCE WITH NFPA 99. TEST ALL METAL CONDUCTIVE SURFACES LIKELY TO BECOME ENERGIZED WITHIN ALL PATIENT CARE AREAS. TEST ALL LARGE CONDUCTIVE SURFACES LIKELY TO BECOME ENERGIZED WITHIN A VOLUME DEFINED AS 6 FOOT FROM THE PATIENT BED HORIZONTALLY OR 7 FOOT 6 INCHES VERTICALLY AS FOLLOWS: A. LARGE METAL SURFACES NOT LIKELY TO BE ENERGIZED, WHICH DO NOT REQUIRE TESTING:

 WINDOW FRAMES ii. DOOR FRAMES

iii. FLOOR DRAINS

i. VOLTAGE: 20mV

i. SUBMIT COMPLETE TYPED GROUND TEST REPORT

iv. MOVEABLE METAL CABINETS B. VOLTAGE AND IMPEDANCE MEASUREMENTS SHALL BE TAKEN WITH RESPECT TO A REFERENCE POINT, WHICH SHALL BE

ONE OF THE FOLLOWING: i. THE GROUND BUS OF THE PANELBOARD OR ISOLATED POWER SYSTEM PANEL SUPPLYING THE PATIENT CARE ii. GROUNDING POINT, IN OR NEAR THE ROOM UNDER TEST, THAT IS ELECTRICALLY REMOTE FROM THE RECETPACLES.

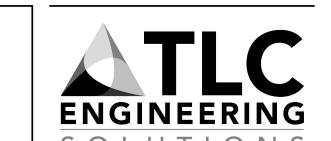
iii. GROUNDING CONTACT OF A RECEPTACLE THAT IS POWERED FROM A DIFFERENT BRANCH CIRCUIT FROM THE

RECEPTACLE UNDER TEST. C. TEST METHOD: i. MEASURE VOLTAGE FROM REFERENCE POINT TO CONDUCTIVE SURFACES AND ALL RECEPTACLE GROUND

ii. MEASURE IMPEDANCE BETWEEN REFERENCE POINT AND RECEPTACLE GROUND CONTACTS. iii. CHECK FOR PROPER POLARITY iv. IDENTIFY THE REFERENCE GROUND FOR EACH ROOM ON THE GROUND TEST REPORT. D. MAXIMUM ACCEPTABLE VALUES:

ii. IMPEDANCE 0.1ohm E. EQUIPMENT: i. MILLIVOLT METER WITH 1kohm IMPEDANCE AND PROPER FREQUENCY RESPONSE, IN ACCORDANCE WITH NFPA 99. ii. POLARITY TESTER GROUND TEST REPORT

MAKE COPIES AVAILABLE AT THE FINAL INSPECTION iii. ENSURE METER USED FOR EQUIPOTENTIAL TESTING IS ON-SITE DURING FINAL INSPECTION TO DEMONSTRATE A SAMPLING OF TEST LOCATIONS PER AUTHORITY HAVING JURISDICATION.



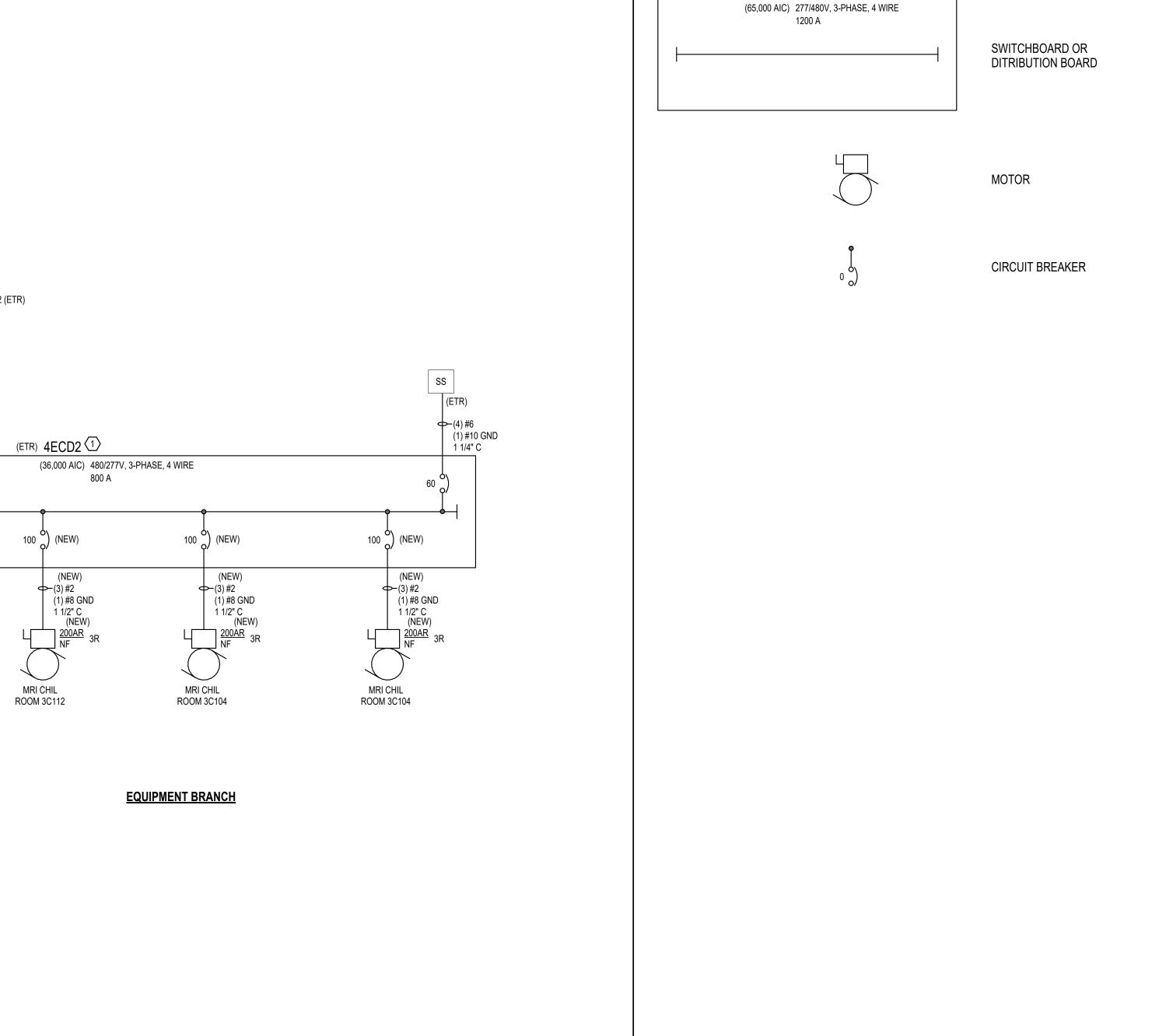
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A 10 JUL 24 DRAFT FOR REVIEW

Issue Date: 10 JULY 2024 N.T.S

**ELECTRICAL NOTES SPECIFICATIONS** 



ATS-4CED2 (ETR)

1 Existing Partial One-Line Diagram
N.T.S

ONE-LINE DIAGRAM SYMBOL LEGEND

<u>SYMBOL</u>

Panel Name

**DESCRIPTION** 

KEYNOTES

1 PROVIDE 30 DAY ELECTRICAL LOAD READING OF PANEL AS REQUIRED BY NEC.

Revisions:

No. Date Description

A 10 JUL 24 DRAFT FOR REVIEW

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Issue Date: 10 JULY 2024

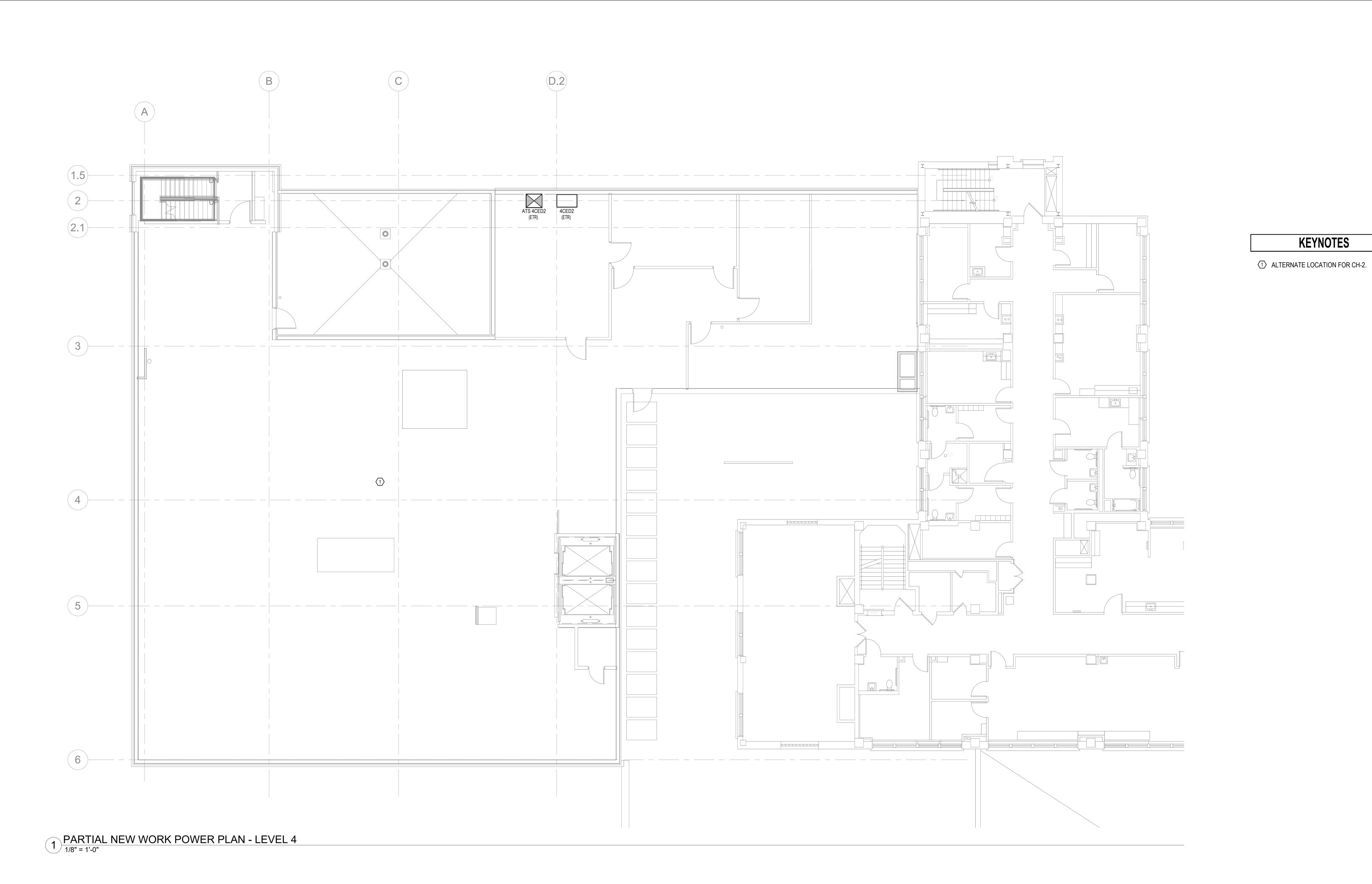
Drawn By: RLS

Approved By: FSS
Scale: N.T.S

Drawing Title:

PARTIAL ONE-LINE
DIAGRAM

g No.:



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**KEYNOTES** 

Revisions:

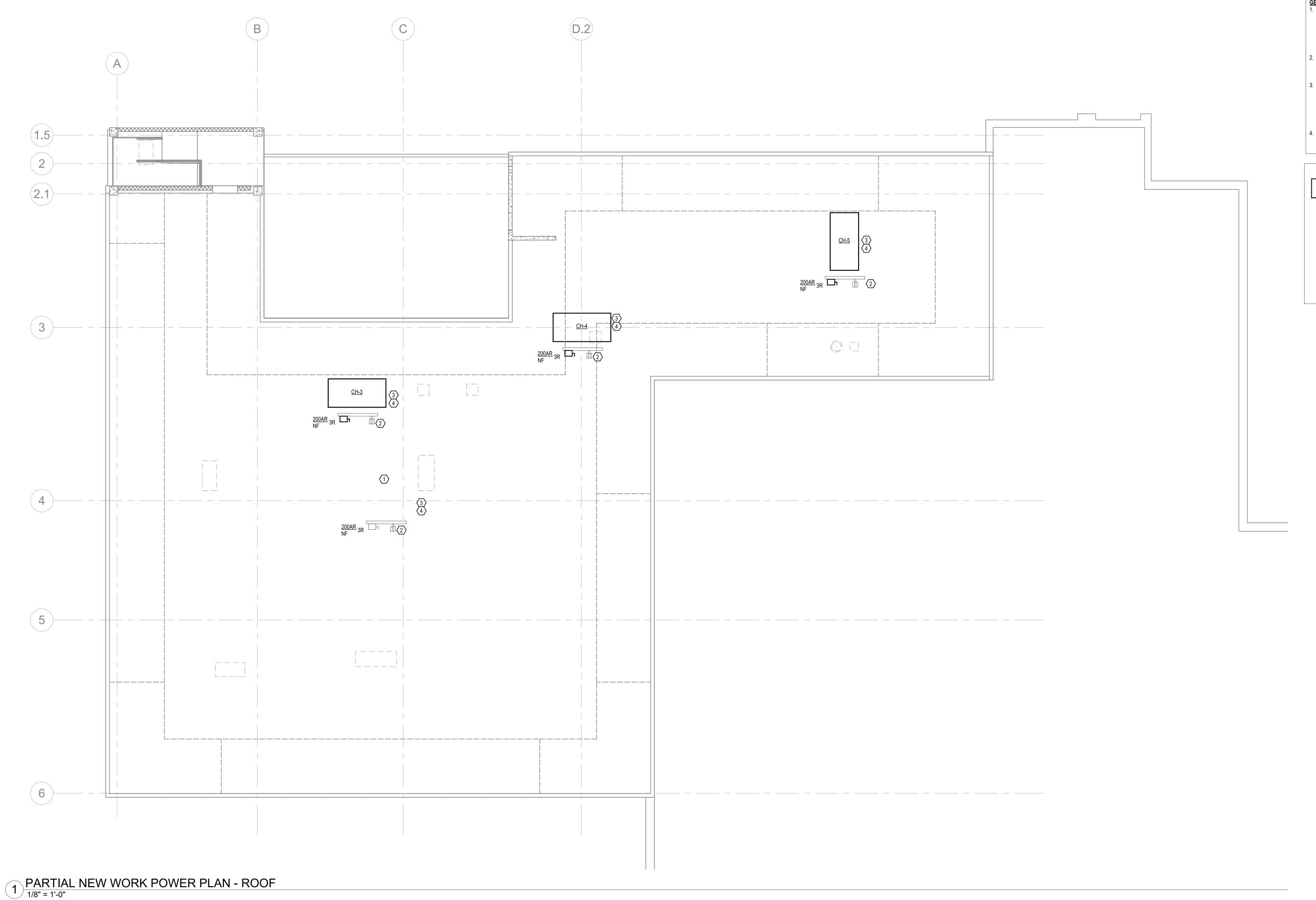
No. Date Description

A 10 JUL 24 DRAFT FOR REVIEW

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1/8" = 1'-0"

PARTIAL LEVEL 4 NEW WORK POWER PLAN



GENERAL LIGHTNING PROTECTION NOTES:

1. PROVIDE COMPLETE UL LISTED, LPI CERTIFIED LIGHTNING PROTECTION SYSTEM IN FULL COMPLIANCE WITH THE LATEST EDITION OF NFPA 780 FOR NEW PORTION OF BUILDING AND EXISTING PORTION INDICATED. PROVIDE AIR TERMINALS ON ALL ROOF MOUNTED MECHANICAL EQUIPMENT, AS REQUIRED. BOND ALL METALLIC BODIES WITHIN AREAS CALCULATED BY

- ALL ROOF MOUNTED EQUIPMENT SHALL BE ALUMINUM, ALL DOWN CONDUCTORS AND GROUND RODS SHALL BE COPPER. ALL DOWN CONDUCTORS SHALL BE CONTAINED IN MINIMUM 1" PVC CONDUIT.
- 3. SUBMIT COMPLETE SHOP DRAWINGS SHOWING ROOF LAYOUT, DOWN LOCATIONS, GROUND ROD LOCATIONS, ETC. AS WELL AS ALL CONNECTION DETAILS TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL PERFORM ALL REQUIRED RESISTANCE AND CONTINUITY TESTING AFTER INSTALLATION IS COMPLETED.
- COORDINATE EXACT LOCATION OF ALL ROOFTOP MECHANICAL EQUIPMENT WITH DIVISION 23 PRIOR TO INSTALLATION AND ROUGH-IN. FIELD LOCATIONS SHALL DICTATE.

## **KEYNOTES**

- ALTERNATE LOCATION FOR CH-2 AND DISCONNECT.
- PROVIDE WEATHER PROOF WHILE IN USE ALUMINUM COVER. WIRE TO 120V BRANCH CIRCUIT FOR EQUIPMENT BRANCH USING 2#10, 1#10 GROUND IN 3/4" CONDUIT.
- CONTRACTOR SHALL CONNECT NEW EQUIPMENT TO EXISTING LIGHTNING PROTECTION. PROVIDE UL CERTIFIED SYSTEM.
- PROVIDE 277, 30A GFCI PROTECTED CIRCUIT FOR HEAT TRACING OF MECHANICAL PIPES. COORDINATE WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH IN. INCREASE BREAKER SIZE AS NECESSARY. PROVIDE WIRE SIZE PER NEC.

ENGINEERING

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Consultants:

Revisions:

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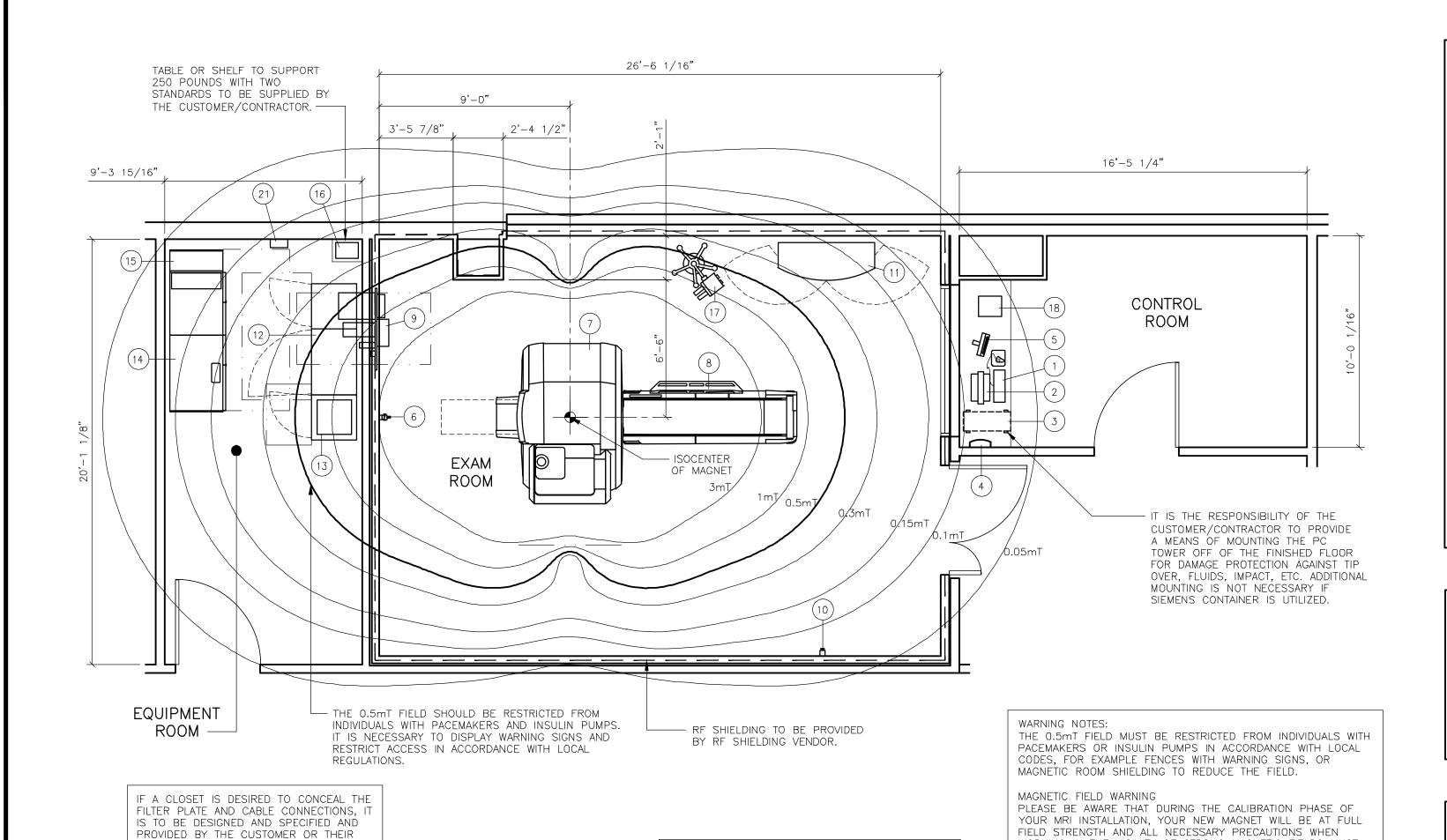
824101

Approved By: FSS
Scale: 1/8" = 1'-0"

PARTIAL ROOF
LEVEL - NEW WORK
POWER PLAN

Drawing No.:

# APPENDIX C



ARCHITECTURAL EQUIPMENT PLAN

PLAN MODIFICATION.

REPRESENTATIVE, A 30 1/4" CLEARANCE

IS REQUIRED FOR SERVICE AND CABLING.

THIS SET OF FINAL DRAWINGS IS REFLECTIVE OF THE LATEST SALES CONFIGURATION.

DRAWINGS TO REFLECT THE CHANGES, HOWEVER SIEMENS IS NOT RESPONSIBLE FOR

ANY CONSTRUCTION COSTS ASSOCIATED WITH THE CHANGES THAT OCCUR FROM THIS

ANY CHANGES TO THIS SALES CONFIGURATION MAY REQUIRE A REVISION TO THIS

PROJECT PLAN. IF REQUESTED, SIEMENS WILL PRODUCE A REVISED SET OF FINAL

#### ROOM MEASUREMENTS

ALL ROOM MEASUREMENTS AND ROOM DETAIL SPECIFICATIONS MUST BE VERIFIED ON SITE PRIOR TO BEGINNING ANY CONSTRUCTION WORK.

## CONSTRUCTION REQUIREMENTS

THE CUSTOMER/CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL' CONSTRUCTION MATERIALS INCLUDING ELECTRICAL AND MECHANICAL DEVICES REQUIRED BY SIEMENS SPECIFICATIONS AND TO ENSURE THAT THE MATERIAL USED INSIDE THE RF-SHIELDING IS AS FREE OF FERROMAGNETIC PROPERTIES AS POSSIBLE. ANY FERROUS MATERIAL INSIDE THE EXAM ROOM MAY BECOME A MISSILE AND CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT. FERROUS ITEMS INSIDE THE EXAM ROOM ARE THE LIABILITY OF THE CONTRACTOR AND/OR INSTALLER.

#### STATE AGENCY REVIEW

PRIOR TO SIEMENS EQUIPMENT INSTALLATION, APPROVAL OF CONSTRUCTION OR STRUCTURAL MODIFICATIONS FOR DIAGNOSTIC OR THERAPEUTIC PURPOSES, MUST BE OBTAINED BY THE CUSTOMER FROM THE APPROPRIATE STATE AGENCY, IF APPLICABLE.

## DC LIGHTING

HE MAGNETIC FIELD ADVERSELY AFFECTS THE OPERATING LIFE OF LIGHT BULBS LOCATED IN THE IMMEDIATE VICINITY OF THE MAGNET. THE FILAMENT IN THE BULBS OSCILLATES WITH THE FREQUENCY OF THE POWER SUPPLY. LIGHTS IN THE VICINITY OF THE MAGNET CONNECTED TO A DC POWER SUPPLY CAN REDUCE THIS EFFECT. RESIDUAL DC RIPPLE SHOULD BE LESS THAN 5%.

#### MAGNETIC FIELD WARNING

CHILLER TO BE SUPPLIED, LOCATED AND INSTALLED

THERE SHALL BE A SEPARATE RF ROOM PENETRATION

EQUIPMENT MANUFACTURER (OEM) WILL SPECIFY ANY AND

PANEL FOR NON-SIEMENS EQUIPMENT. THE OUTSIDE

BY CUSTOMER/CONTRACTOR. REFER TO

ALL FILTER AND PENETRATION REQUIREMENTS.

MANUFACTURER'S INFORMATION.

PLEASE BE AWARE THAT DURING THE CALIBRATION PHASE OF THE MRI INSTALLATION, THE MAGNET WILL BE AT FULL FIELD STRENGTH AND ALL NECESSARY PRECAUTIONS WHEN WORKING IN THE VICINITY OF STRONG MAGNETIC FIELDS MUST BE TAKEN. WHEN THE CALIBRATION OF THE MAGNET OVERLAPS WITH FINAL CONSTRUCTION ACTIVITIES, THERE IS THE POSSIBILITY OF THE INTRODUCTION OF FERROUS MAGNETIC OBJECTS BY WORKERS INTO THE MR ROOM. IT S THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THAT ALL PRECAUTIONS ARE TAKEN TO ENSURE THAT THIS DOES NOT HAPPEN, AS EQUIPMENT DAMAGE AND SERIOUS BODILY INJURY COULD OCCUR.

#### STATIC DISSIPATIVE FLOORING

SIEMENS RECOMMENDS "STATIC DISSIPATIVE" FLOOR COVERING WITH AN ELECTRICAL RESISTANCE OF ≤109 OHMS IN ALL AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. A STATIC DISSIPATIVE FLOOR REDUCES THE RISK OF STATIC ELECTRIC DISCHARGES THAT MAY DAMAGE SENSITIVE EQUIPMENT AND COMPONENTS.

## CASEWORK & ACCESSORY NOTES

1) ALL CASEWORK IS EITHER EXISTING OR IS TO BE DESIGNED, DETAILED, FURNISHED AND INSTALLED BY THE CUSTOMER AND/OR CONTRACTOR. FOLLOW DESIGN RECOMMENDATIONS INCLUDED HEREWITH, AS THEY ARE ESSENTIAL FOR THE SUCCESSFUL INSTALLATION & OPERATION OF THE SIEMENS EQUIPMENT.

2) ALL FURNITURE (CHAIRS, ETC.) FOR THE CONTROL ROOM ARE TO BÉ PROVIDED BY THE CUSTOMER.

# TRANSPORTING REQUIREMENTS

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

LARGEST ITEM - MAGNET - 10,361 LBS. MINIMUM MAGNET DIMENSIONS WITH TRANSPORT WHEELS UNDER MAGNET:

7'-7" HIGH X 7'-7" WIDE X 5'-2" DEEP WITHOUT TABLE SUPPORT, 6'-0" DEEP WITH TABLE SUPPORT.

WORKING IN THE VICINITY OF STRONG MAGNETIC FIELDS MUST

OF THE INTRODUCTION OF FERROUS MAGNETIC OBJECTS BY

TO ENSURE THAT THIS DOES NOT HAPPEN. AS EQUIPMENT

DAMAGE AND SERIOUS BODILY INJURY COULD OCCUR.

QUENCH VENT SPECIFICATIONS:

ON SHEET M-501 MUST BE MET.

WORKERS INTO THE MR ROOM. IT IS THE RESPONSIBILITY OF

BE TAKEN. WHEN THE CALIBRATION OF THE MAGNET OVERLAPS

WITH FINAL CONSTRUCTION ACTIVITIES, THERE IS THE POSSIBILITY

THE CUSTOMER TO ENSURE THAT ALL PRECAUTIONS ARE TAKEN

THE QUENCH VENT REQUIREMENTS AND SPECIFICATION DETAILED

THE ROOF HATCH/DELIVERY OPENING SHOULD BE 4" LARGER.

TO TRANSPORT THE GPA/EPC CABINET (3,307 POUNDS) A MINIMUM ROOM HEIGHT OF 6'-9" IS REQUIRED, 6'-3" WITH WHEELS REMOVED, 6'-1" WITH WHEELS AND MAINS CONNECTION REMOVED.

# NOISE LEVELS

SYSTEM ROOM	NOISE LEVEL / dB(A)
CONTROL ROOM	<55
EXAMINATION ROOM	XJ GRADIENTS 83.1 OVER 8 HOUR AVERAGE 101.5 MAXIMUM MEASURED IN THE EXAM ROOM  XQ GRADIENTS 86.1 OVER 8 HOUR AVERAGE 108.2 MAXIMUM MEASURED IN THE EXAM ROOM
EQUIPMENT ROOM	<65

NOISE LEVELS ARE BASED ON AN AVERAGE MEASUREMENT OVER 8 HOURS OF CLINICAL SCANNING. PEAK LEVELS MAY BE HIGHER FOR CERTAIN SEQUENCES.

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL/ STATE/OSHA NOISE REGULATIONS ARE ADHERED TO. ADDITIONAL NOISE DATA MAY BE PROVIDED BY SIEMENS PROJECT MANAGER UPON REQUEST.

#### EQUIPMENT LEGEND SMS | WEIGHT | BTU/HR | DESCRIPTION DIMENSIONS (INCHES) REMARKS (LBS) TO AIR ) | MRC KEYBOARD 1 3/4 ON CONSOLE/COUNTER COLOR MONITOR FOR MRC 239 18 5/16 16 15/16 4 3/4 ON CONSOLE/COUNTER HOST PC MRC 49 2,389 18 1/8 4) ALARM BOX 9 9 PATIENT MONITOR (OPTION) \_\_\_ 12 1/2 6) | PATIENT SUPERVISION CAMERA (OPTION) 6 3/4 WALL MOUNTED 3 1/8 6 3/4 AERA MAGNET WITH COVERS, COILS, ELECTRONICS 10,093 7,506 170 8) | PATIENT TABLE (MOBILE) 529 29 1/2 97 1/4 21 - 41) | RF-FILTER PLATE 287 853 46 1/2 35 1/8 21 5/8 MAGNET STOP 3 47 5/8 | WEIGHT WITHOUT COILS 110 SURFACE COIL CART (OPTION) 55 1/8 21 1/8 3,307 61 1/2 2) | ELECTRONICS CABINET (GPA/EPC CABINET) 3,412 B) | SEP CABINET 750 3,412 25 5/8 25 5/8 73 5/8 14) | POWERWARE 9390 U.P.S. WITH BATTERY (OPTION) 5,880 43,800 78 3/8 5) | POWERWARE 9390 ISOLATION TRANSFORMER (OPTION) 1,100 74 12 6) | POWERWARE 9130 UPS (OPTION) 1,257 8 3/8 16 1/4 76 12 7/8 52 1/4 | INJECTOR ON STAND MEDRAD ICBC INJECTOR STAND AND HEAD (OPTION) 37*.*5 19 1/4 10 7/8 ON CUSTOMERS COUNTER MEDRAD ICBC INJECTOR CRU (OPTION) 7.9 12 [19] | MEDRAD ICBC INJECTOR POWER SUPPLY (OPTION) OUTSIDE 5mT FIELD 3.5 3 1/4 10

#### PROTECTING THE MAGNETIC FIELD

HE SIEMENS MR SYSTEM UTILIZES A SUPERCONDUCTIVE MAGNET WITH AN EXTREMELY HOMOGENOUS FIELD WITHIN THE MAGNET TO PROVIDE DISTORTION REE IMAGING. THE PRESENCE OF FERROMAGNETIC MATERIAL WITHIN THE /ICINITY OF THE MAGNET CAN ADVERSELY AFFECT THE UNIFORMITY OF THE JSEFUL MAGNETIC FIELD. THIS APPLIES TO STATIONARY FERROUS MATERIAL STRUCTURAL STEEL) WHICH IS TO BE MINIMIZED. STATIONARY STEEL COMPENSATION MAY BE ACHIEVED BY MAGNET POSITIONING AND SELECTIVE SE OF SHIMS. DISTORTION CAUSED BY MOVING FERROMAGNETIC OBJECTS 'MOTOR VEHICLES. ELEVATORS) IS MORE DIFFICULT TO COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

## MAGNET SITING REQUIREMENTS

MUST BE ENSURED THAT THE MAGNET IS LOCATED SO THAT HE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD ARE NOT ADVERSELY AFFECTED BY EXTRANEOUS FIELDS AND STATIC OR DYNAMIC FERROMAGNETIC OBJECTS. X/Y AND Z AXIS SOURCE OF INTERFERENCE

4'-2"	FLOOR STEEL REINFORCEMENT<20 LBS./ FT <sup>2</sup> IRON BEAMS < 66 LBS./FT.
16'-1" / 19'-1"	STRETCHERS UP TO 110 LBS.
13'-1"	WATER COOLING UNIT (CHILLER)
17'-5" / 21'-40"	TRANSPORT DEVICES UP TO 440 LBS.
18'-5" / 24'-8"	VEHICLES UP TO 2,000 LBS.
20'-5" / 29'-7"	ELEVATORS, TRUCKS UP TO 10,000 LBS.
39'-5"/26'-2"	AC TRANSFORMERS LESS THAN 100 KVA
39'-5"/29'-7"	AC TRANSFORMERS LESS THAN 250 KVA
42'-7"/32'-10"	AC TRANSFORMERS LESS THAN 650 KVA
45'-11"/36'-2"	AC TRANSFORMERS LESS THAN 1600 KVA
9'-10"/6'-6"	AC CABLES, MOTORS LESS THAN 100 AMPS
19'-9"/6'-7"	AC CABLES, MOTORS LESS THAN 250 AMPS
29'-7"/36'-2"	AC CABLES, MOTORS LESS THAN 1000 AMPS

# ENVIRONMENTAL/POWER AUDIT

FOR IRON OBJECTS LOCATED UP TO 45° FROM THE Z AXIS, THE

DISTANCES FOR THE Z AXIS MUST BE USED. REDUCTION IS

POSSIBLE WITH STEEL SHIELDING.

AS AN INDICATION OF OUR COMMITMENT TO QUALITY, SIEMENS MAY, AT NO COST TO YOUR FACILITY, CHECK THE OPERATING ENVIRONMENT AFTER SYSTEM TURNOVER TO DETERMINE IF THE REQUIREMENTS FOR TEMPERATURE, HUMIDITY, POWER, AND GROUNDING ARE MET AS PER SIEMENS' PUBLISHED SPECIFICATIONS, SIEMENS WILL GENERATE A WRITTEN REPORT DETAILING THE ENVIRONMENTAL AND ELECTRICAL CONDITION OF THE SITE AFTER TURNOVER AND WILL SHARE THE REPORT WITH YOU. IN THE EVENT WE IDENTIFY ANY ENVIRONMENTAL/POWER DEFICIENCIES AT THE SITE, YOUR FACILITY WILL BE REQUESTED TO CORRECT DEFICIENCIES WITHIN THIRTY (30) DAYS. SHOULD ANY CORRECTIVE ACTIONS BE NECESSARY, AND UPON REQUEST SIEMENS WILL PROVIDE GUIDANCE IN AN EFFORT TO FACILITATE RESOLUTION. PLEASE BE ADVISED THAT AFTER 30 DAYS NOTICE ANY REPAIR OR MAINTENANCE SERVICES NECESSITATED BY SEVERE DEFICIENCIES WILL FALL OUTSIDE YOUR WARRANTY COVERAGE.

PROTECTING THE IMMEDIATE ENVIRONMENT FROM THE EFFECT OF THE MAGNETIC FIELD REQUIRES CONSIDERATION. INFORMATION STORED ON MAGNETIC DATA CARRIERS SUCH AS DISCS, TAPES AND CARDS MAY BE FRASED IF NEAR THE MAGNET. CAUTION WITH REGARD TO HEART PACEMAKERS MUST BE EXERCISED, MOST PACEMAKER UNITS EMPLOY A REED RELAY WHICH MAY CHANGE OPERATING MODE WHEN EXPOSED TO AN FXTERNAL MAGNETIC FIELD. PACEMAKER USERS MUST BE KEPT AT A SPECIFIED DISTANCE FROM THE MAGNET WHICH IS DETERMINED BY THE MAGNET FIELD STRENGTH.

PROTECTING THE ENVIRONMENT

#### MAGNETIC FRINGE FIELDS

MAGNETIC FIELDS MAY AFFECT THE FUNCTION OF DEVICES IN THE VICINITY OF THE MAGNET, THESE DEVICES MUST BE OUTSIDE CERTAIN MAGNETIC FIELDS. THE DISTANCES LISTED ARE FROM THE MAGNET ISOCENTER AND DO NOT CONSIDER ANY MAGNETIC ROOM SHIELDING. X/Y AND Z AXIS SMALL MOTORS, WATCHES, CAMERAS, CREDIT 6'-1" / 9'-2" CARDS, MAGNETIC DATA CARRIERS (SHORT-3.0mT COMPUTERS, MAGNETIC DISK DRIVES, OSCOPES, PROCESSORS INSULIN PUMPS, B/W MONITORS, MAGNETIC 0.5mT DATA CARRIERS (LONG-TERM STORAGE) 9'-9" / 16'-1" SIEMENS CT SCANNERS 0.2mT 10'-4" / 17'-1 COLOR MONITORS, SIEMENS LINEAR 0.15mT ACCELERATORS X-RAY IMAGE INTENSIFIERS, GAMMA 13'-1" / 22'-3 CAMERAS, PET/CYCLOTRON, ELECTRON 0.05mT MICROSCOPES, LINEAR ACCELERATORS THE OWNER/USER IS TO VERIFY THE LOCATION OF THE 0.5mT FIELD AND ENSURE THAT IT IS MAINTAINED AS A RESTRICTED AREA.

## MAGNET CO-SITING

MINIMUM DISTANCE MAGNET-MAGNET (SIEMENS) 0.2T | 0.35T | 1.0T | 1.5T | 3.0T 0.2T | 32'-9" | 32'-9" | 16'-5" | 19'-9" | 32'-9" 0.35T 32'-9" 32'-9" 16'-5" 19'-9" 32'-9" 1.0T | 16'-5" | 16'-5" | 14'-10" | 16'-5" | 19'-9" | 19'-9" | 19'-9" | 16'-5" | 16'-5" | 19'-9" 3.07 | 32'-9" | 32'-9" | 19'-9" | 19'-9" | 19'-9"

DO NOT RAMP ONE MAGNET WHILE THE OTHER IS RUNNING APPLICATIONS. SHIM IS ONLY OPTIMIZED WHEN BOTH MAGNETS ARE RAMPED UP DURING THE SHIMMING PROCEDURE.

WHEN CO-SITING AN MR SYSTEM WITH A MAGNETIC NAVIGATION SYSTEM THE MINIMUM DISTANCE FOR CLINICAL IMAGING IS 98'-6", FOR SPECTROSCOPY THE MINIMUM SEPARATION IS 121'-5".

#### ARCHITECTURAL NOTES

) ALL PRELIMINARY EQUIPMENT LAYOUTS SUBMITTED BY SIEMENS MEDICAL SOLUTIONS, INC. (SMS HEREAFTER) ARE BASED ON THE RECOMMENDED SPACE NECESSARY FOR THE OPERATION AND SERVICEABILITY OF THE EQUIPMENT BEING PROPOSED. SMS WILL NOT SUBMIT AN EQUIPMENT LAYOUT THAT IS NOT IN THE BEST INTEREST OF BOTH THE CUSTOMER AND SMS. ALL EQUIPMENT LAYOUTS ARE BASED EITHER ON AN ACTUAL SITE LOCATION SURVEY OR ARCHITECTURAL DRAWINGS SUPPLIED TO SMS. SMS WILL NOT BE RESPONSIBLE FOR ANY ALTERATIONS THAT ENCROACH WITHIN DESIGNATED SAFETY AND SERVICE CLEARANCE ZONES AS INDICATED ON DRAWINGS (IE. PIPE CHASES, VENTILATION DUCTS, CASEWORK, AND SOFFITS, ETC.) MADE BY THE CUSTOMER OR REQUIRED BY A CUSTOMER'S ARCHITECTURAL FIRM ONCE PRELIMINARY DRAWINGS HAVE BEEN SUBMITTED AND APPROVED. DO NOT ALTER ANY SPECIFICATIONS AND/OR DIMENSIONS WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SMS PROJECT MANAGER. 2) SMS IS NOT AN ARCHITECTURAL OR ENGINEERING FIRM. DRAWINGS SUPPLIED BY SMS ARE NOT CONSTRUCTION DRAWINGS. THEREFORE, THESE DRAWINGS ARE TO BE USED ONLY FOR INFORMATION TO COMPLEMENT ACTUAL CONSTRUCTION DRAWINGS AVAILABLE FROM A CUSTOMER APPOINTED ARCHITECTURAL REPRESENTATIVE OR A CUSTOMER'S ENGINEERING DESIGN GROUP. THE CUSTOMER'S ARCHITECT AND GENERAL CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE CODES AND PROFESSIONAL DESIGN REQUIREMENTS. 3) THE CUSTOMER IS RESPONSIBLE FOR ALL ROOM AND AREA

PREPARATION COSTS, PROFESSIONAL FEES, PERMITS, REPORTS, AND INSPECTION FEES. 4) EQUIPMENT WARRANTIES. EXPRESSED OR IMPLIED ON THE PART OF SMS SHALL BE CONTINGENT UPON STRICT COMPLIANCE WITH THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL AND RECOMMENDATIONS AND REQUIREMENTS CONTAINED IN THESE

DRAWINGS, UNLESS SPECIFIED OTHERWISE. 5) ALL DIMENSIONS SHOWN ARE TAKEN FROM FINISHED SURFACES UNLESS SPECIFIED OTHERWISE. 6) THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING

REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST. ACTUAL PROTECTION REQUIREMENTS SHALL BE SPECIFIED BY A REGISTERED RADIATION PHYSICIST AT CUSTOMER'S ENGAGEMENT AND EXPENSE, RESPONSIBILITY FOR ALL INFORMATION AS TO THE ROOM LOCATION, USE, AND NUMBER OF ANTICIPATED EXAMINATIONS TO BE PERFORMED PER TIME PERIOD SHALL BE

PROVIDED TO THE PHYSICIST BY THE CUSTOMER. THE CUSTOMER SHALL FURTHER TAKE ALL RESPONSIBILITY IN THE COMMUNICATION AND COORDINATION OF ACTIVITIES OF THE RADIATION PHYSICIST AND THE ARCHITECTURAL REPRESENTATIVE. 7) SMS SHALL BE RESPONSIBLE FOR SMS EQUIPMENT INSTALLATION

AND CALIBRATION, CONNECTION AND INSTALLATION OF SMS PROVIDED CABLES. AND CONNECTION OF CONTRACTOR PROVIDED WIRES TO SMS EQUIPMENT. IN THE EVENT THAT SPECIFIC TRADE RULES OR LICENSE EQUIREMENTS PROHIBIT THIS, THE CUSTOMER SHALL INITIATE THE SERVICES OF APPROVED OTHER CONTRACTORS AND PAY FOR SELECTED, APPROVED PARTIES TO PERFORM THIS WORK WITH JOB SUPERVISION TO BE PROVIDED BY SMS. CALIBRATION WHEN ACCOMPLISHED OUTSIDE OF NORMAL INSTALLATION SEQUENCES DUE TO CONTRACTOR OR TRADE RULE ACTIONS OR REQUIREMENTS SHALL BE SUPPORTED BY, CHARGED TO, AND ACCEPTED BY THE CUSTOMER AS AN ADDITIONAL INSTALLATION EXPENSE.

8) THE CUSTOMER SHALL VERIFY WITH SMS PROJECT MANAGER FINAL INSTALLATION DRAWINGS THE LOCATIONS AND TRAVEL OF ALL ANCILLARY EQUIPMENT TO BE CEILING OR WALL MOUNTED (IE: O.R. LIGHTS, MEDICAL GAS COLUMNS, PHYSIOLOGICAL MONITORING INJECTORS, CRT PLATFORMS, SPRINKLER HEADS, SMOKE DETECTORS, ELECTRICAL OUTLETS, HVAC GRILLES, SPEAKERS, AND GENERAL ROOM

9) THE GENERAL CONTRACTOR/CUSTOMER SHALL BE RESPONSIBLE FOR ALL FINAL PAINT, TOUCH-UP AND ANY COSMETIC OR TRIM WORK WHICH NEEDS TO BE OR IS REQUIRED TO BE COMPLETED AFTER THE INSTALLATION OF THE SMS EQUIPMENT AND ANY ASSOCIATED SUPPORT APPARATUS.

#### SITE READINESS GUIDELINES

THE FOLLOWING GENERAL CONDITIONS ARE NECESSARY TO HAVE THE

STATUS OF "READY SITE": PROPER POWER AVAILABLE AT SIEMENS EQUIPMENT POWER CABINET LOCATION AND ALL POWER OUTLETS FUNCTIONING. AIR CONDITIONING/HUMIDIFICATION SYSTEMS COMPLETE, TESTED, AND

FUNCTIONING PROPERLY ACCORDING TO SIEMENS SPECIFICATIONS. PROPER LIGHTING INSTALLED AND FUNCTIONING. PLUMBING COMPLETE EXCEPT FOR ANY FINAL CONNECTIONS

TO SIEMENS EQUIPMENT. ALL CABLE TRAYS/DUCTS/CONDUITS CORRECTLY SIZED, LOCATED,

AND INSTALLED ACCORDING TO THE SIEMENS DRAWINGS. ALL REINFORCEMENT PLATES/UNISTRUT INSTALLED AS REQUIRED. ROOM FOR EQUIPMENT INSTALLATION AND IMMEDIATE VICINITY IS DUST-FREE AND IS TO REMAIN SO FOR THE DURATION OF THE

A SECURE AREA (APPROXIMATELY 10' x 10') IS AVAILABLE AT EQUIPMENT DELIVÈRY FOR PARTS AND INSTALLATION TOOLS.

CUSTOMER SUPPLIED CAMERAS AND PROCESSORS INSTALLED. )) CUSTOMER APPROVAL FOR SIEMENS REMOTE SERVICES (SRS) CONNECTION, AND CUSTOMER'S I.T. CONTACT INFORMATION AND

) WALLS TO BE PRIMED AND PAINTED, FLOORS TO BE TILED EXCEPT IN AREAS OF THE EQUIPMENT BASE PLATES.

IP ADDRESSES ESTABLISHED.

THESE CONDITIONS ARE NOT MET. THE SIEMENS PROJECT MANAGER AND THE DESIGNATED SIEMENS INSTALLATION SUPERVISOR SHALL RESCHEDULE THE INSTALLATION START DATE. NOTE: ADDITIONAL COST MAY BE INCURRED BY THE CUSTOMER/CONTRACTOR AND DELIVERY DATES MAY NEED TO BE RESCHEDULED, WHEN THE SIEMENS SITE READINESS GUIDELINES ARE NOT MET.

# RESOURCE LIST (SMS USE ONLY)

	<b>,</b>	
DESIGNATION	PG NUMBER	DATE
PLANNING GUIDE	M7-010.891.01.08.02	08.14

AERA REV 8

**SIEMENS** 

(770) 330-1781 FAX: (770) 369-8232 -MAII · michael nowers@siemens.com GRADY HEALTH SYSTEM 191 PEACHTREE ST., ATLANTA, GA 30303 MRI SUITE - MAGNETOM AERA W/MOBILE TABLE THE USE OR REPRODUCTION OF PROJECT #: THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 1500201 101RA VERSION DATED 01 RESULT IN PROSECUTION UNDER APPROVED BY CUSTOMERS FOR FIN FULL EXTENT OF THE LAW.

RFV

ROJECT MANAGER: MICHAEL POWERS

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

-ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM

CONTROL ROOM 6'-11 MINIMUM

EQUIPMENT ROOM 7'-3" MINIMUM

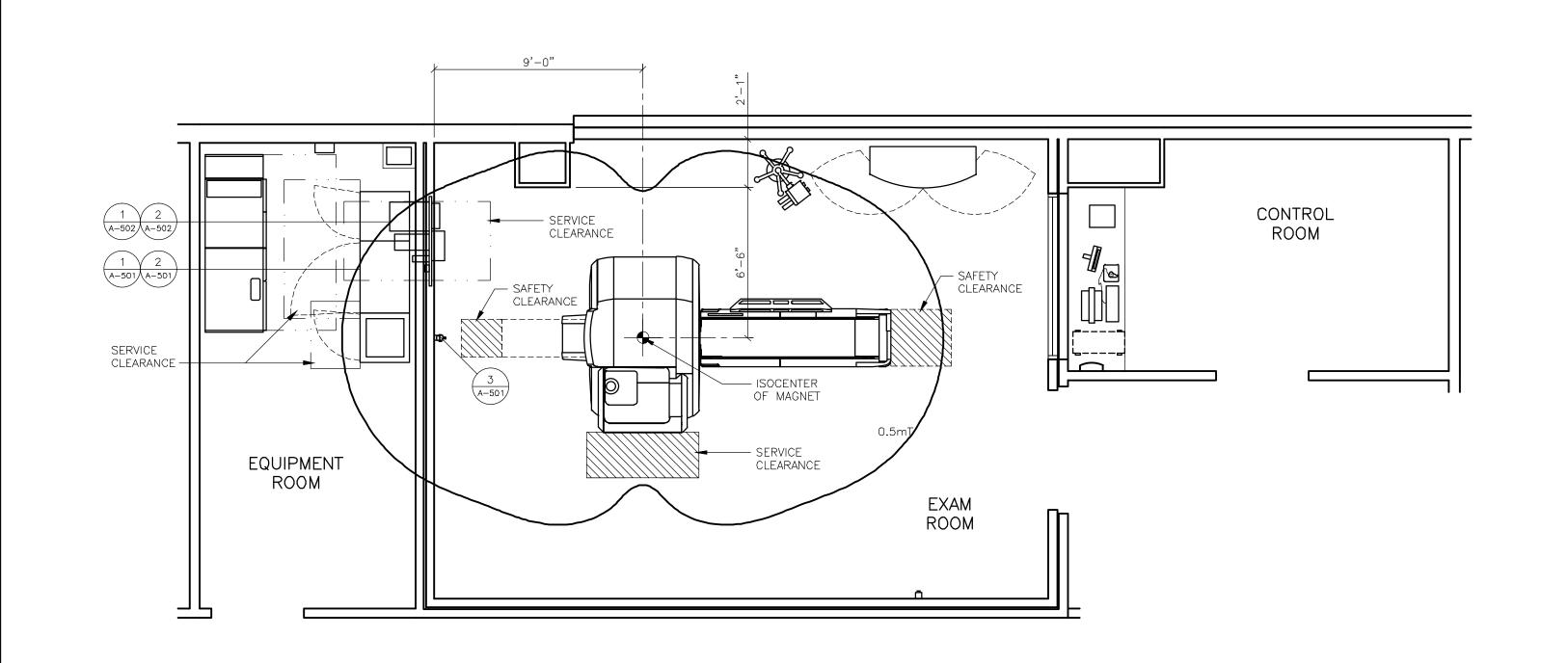
PHYSICIST TO SPECIFY RADIATION PROTECTION.

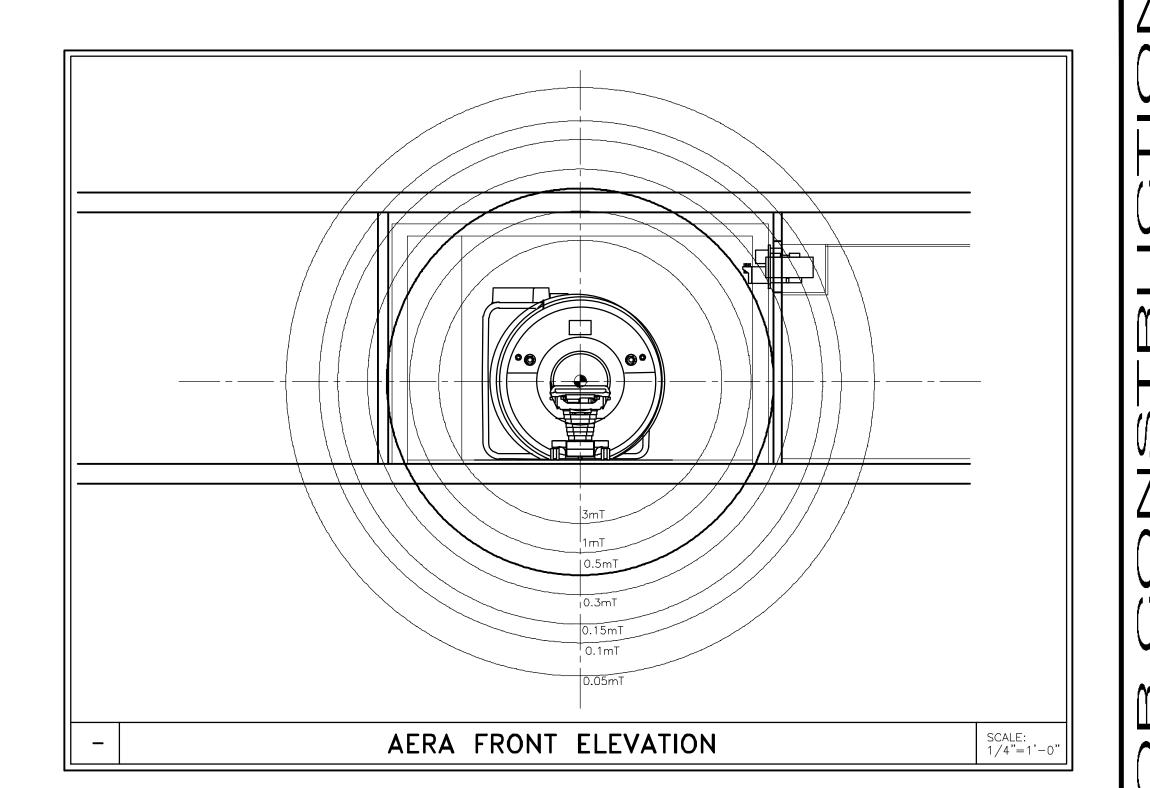
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ALL RIGHTS ARE RESERVED. <sup>KEF.</sup> 1<sup>#:</sup>49M1UW AS NOTED

03/18/15

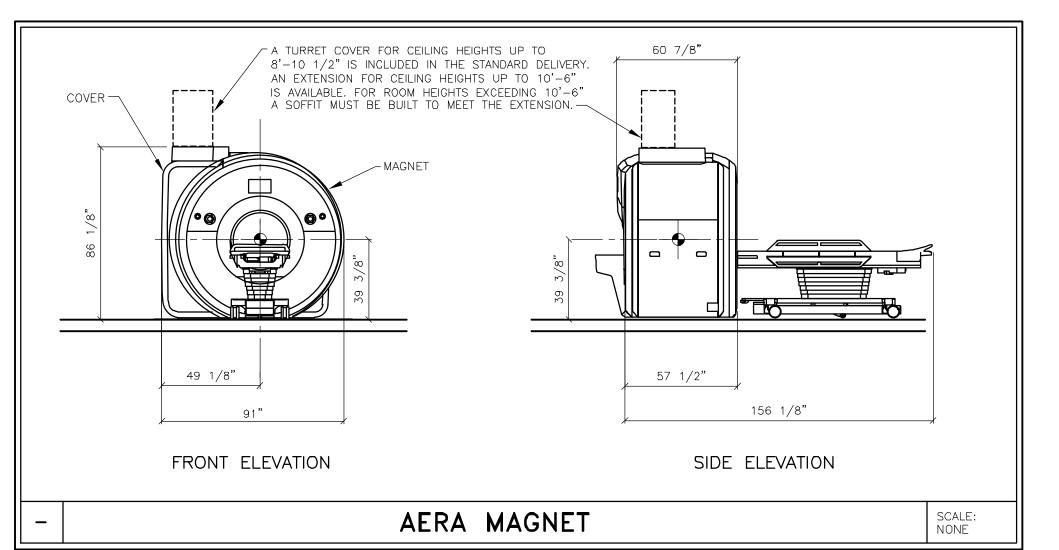
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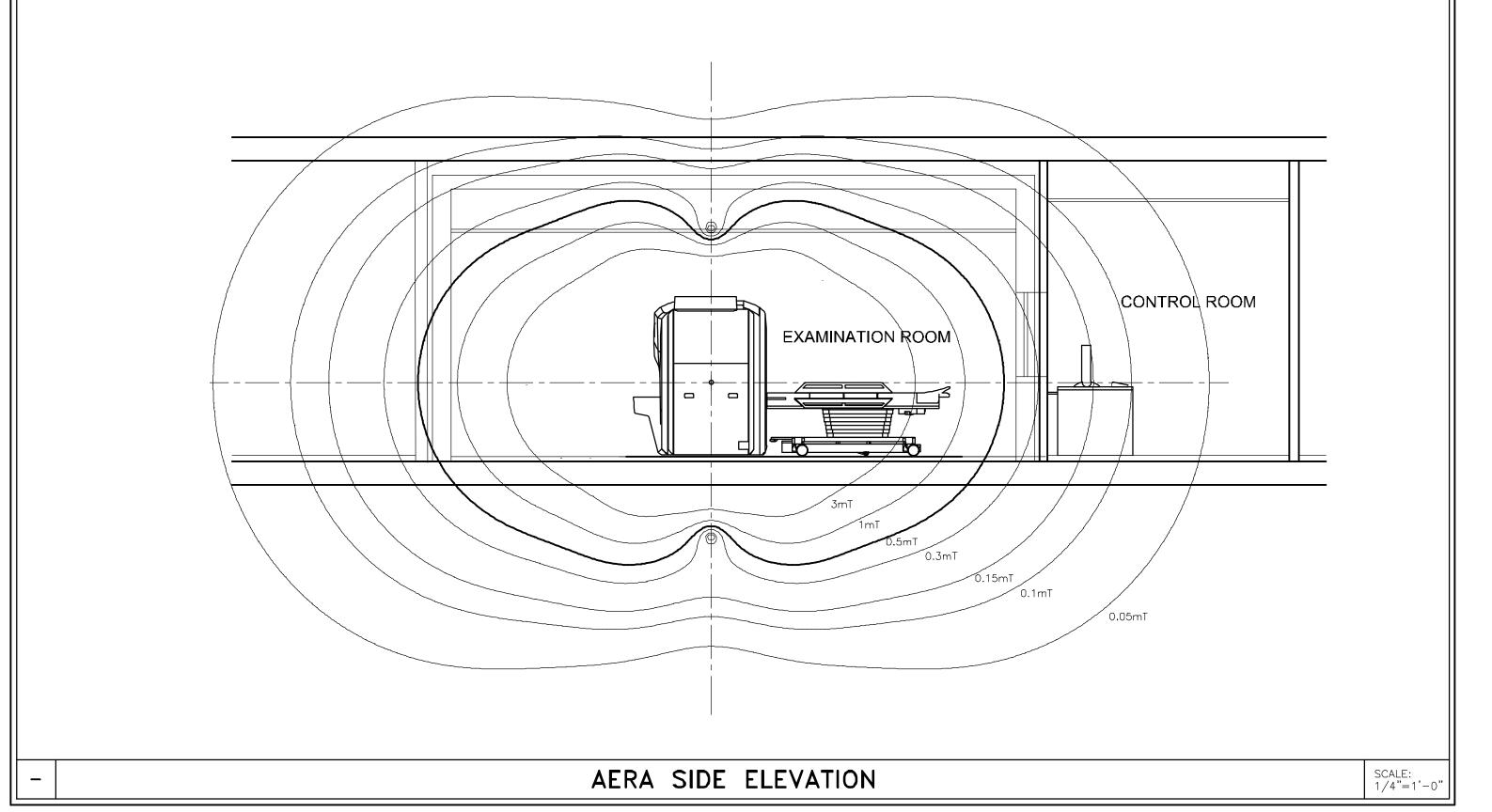




SAFETY/SERVICE CLEARANCE PLAN

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





CEILING HEIGHTS EXAM ROOM 7'-11" MINIMUM

CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

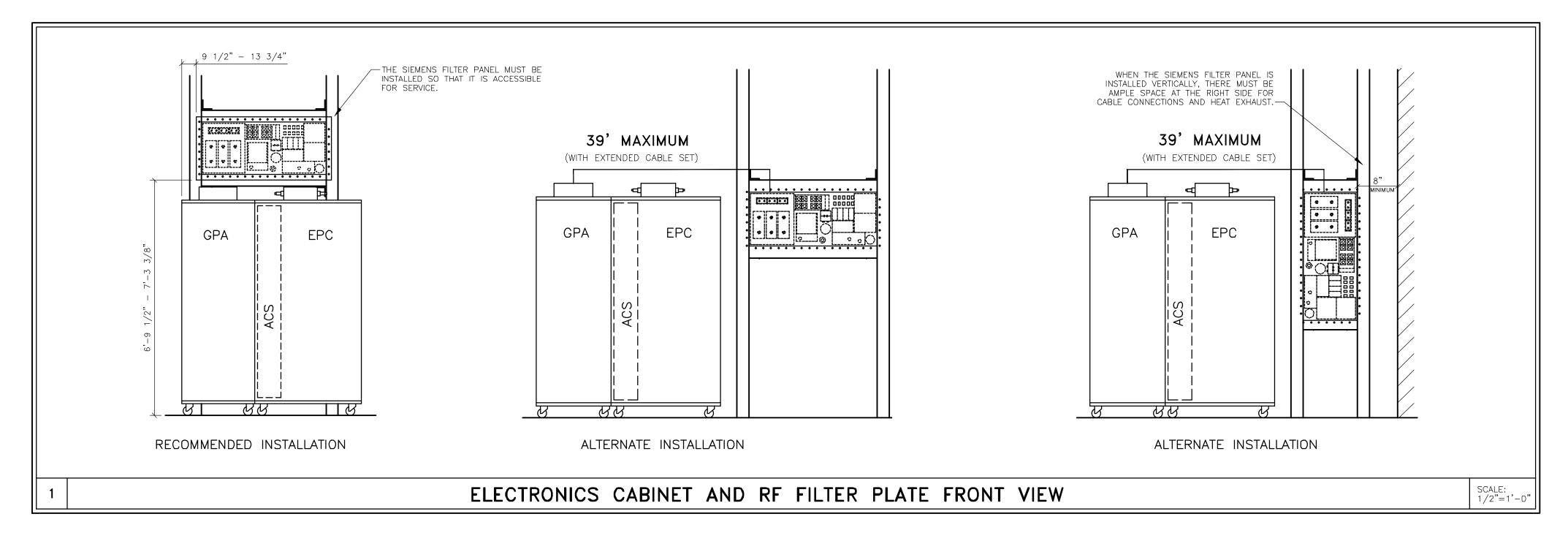
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			TEL: (770) 330- VMAIL: FAX: (770) 369-	EXT:				SIEM	ENS
			GR				TH S		EM
							AERA W/MOBILE TAE		
				EPRODUCTION OF LOCK WITHOUT	PROJ	ECT #:		SHEET:	
$\triangle$	03/18/15	R101RA VERSION DATED 01/19/15 APPROVED BY CUSTOMERS FOR FINALS	RESULT IN PROS	SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER			)201	ΙΛ 1	02
SYM	DATE	DESCRIPTION	ALL RIGHTS A	RE RESERVED.	SHEET	2 10	DRAWN BY: F. CARUSO	<del>                                    </del>	UZ
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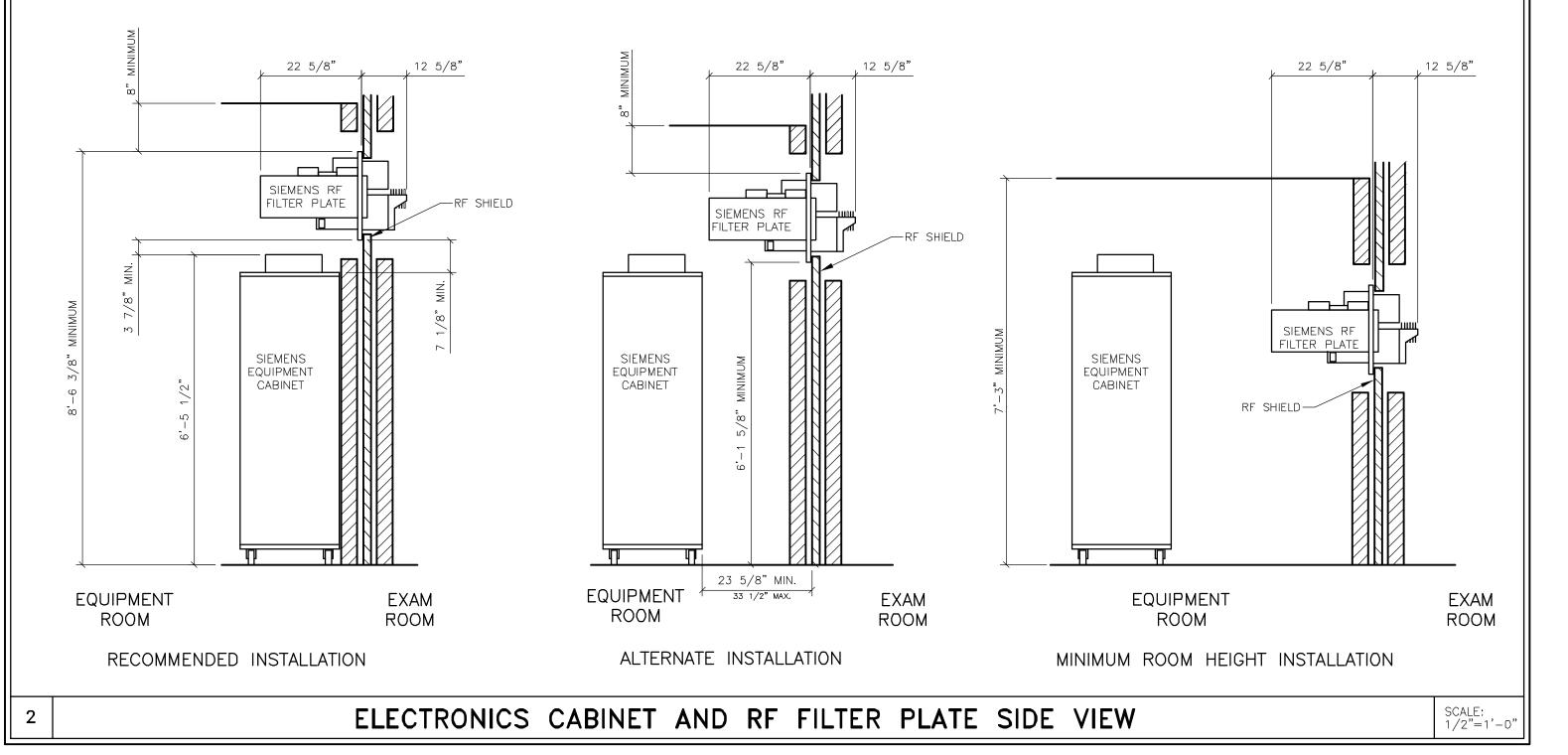
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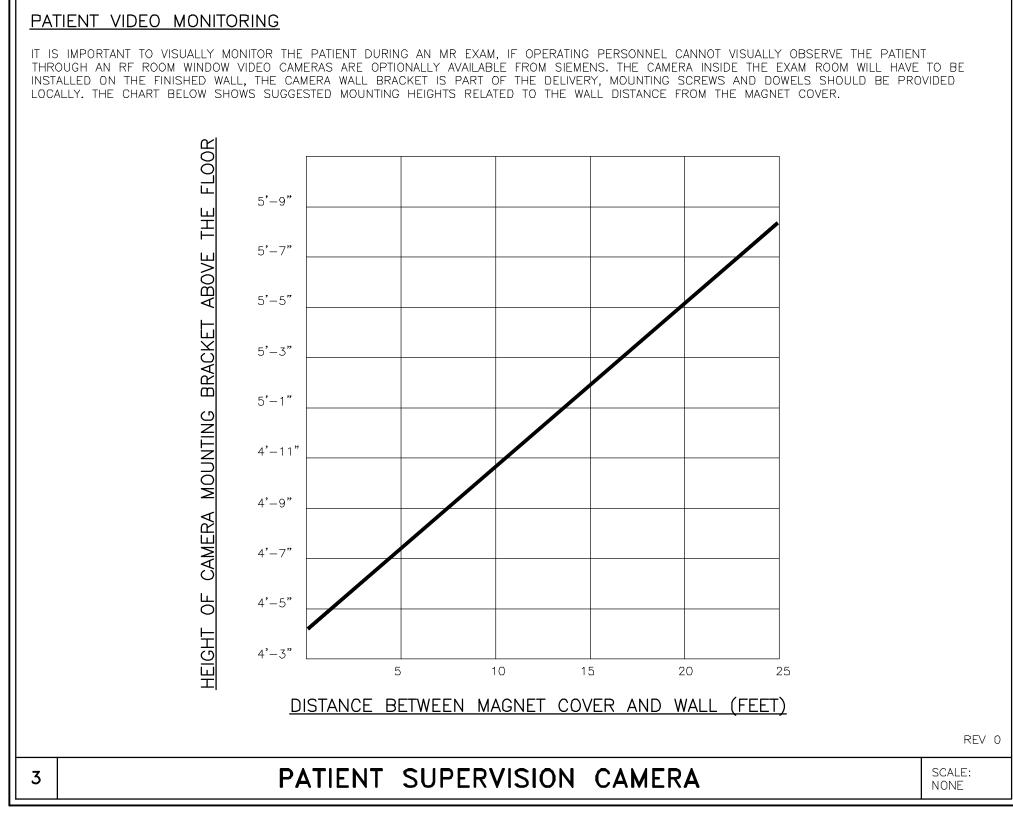
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COIL NAME	POUND		INCHES	
	WEIGHT	LENGTH	WIDTH	HEIGHT
BODY COIL 18	4	15 1/8	23 1/4	3
HEAD/NECK COIL 20	11	17 3/8	13	14 5/8
SPINE COIL 32	24	47 1/4	19 1/4	3
FLEX COIL LARGE 4	1.2	20 3/8	8 7/8	_
FLEX COIL SMALL 4	1	14 3/8	6 7/8	_
PERIPHERAL ANGIO 36	18	33 7/8	26	11
HAND/WRIST COIL 16	6	13 1/8	8 1/2	4 1/2
HAND/WRIST COIL BASE	4	20 5/8	12 3/8	1 1/4
FOOT/ANKLE COIL 16	7	16 1/8	13	15 3/8
FOOT/ANKLE COIL BASE	15	16 3/4	13 1/8	15 1/8
SHOULDER COIL LARGE 16	15	15	17	19
SHOULDER COIL SMALL 16	15	12	17	19
CP EXTREMITY	15	16	10 5/8	11 3/8
TX.RX 15 CHANNEL KNEE	15	10 1/8	14 1/8	12 1/4
BI BREAST COIL 4 CH.	23	34 5/8	18 1/2	8 1/4
AI BREAST COIL 16 CH.	24	28	18 1/2	7 7/8
SENTINELLE VANGUARD IMMOBILIZER	45	43 1/4	22 7/8	11





PROJECT MANAGER: MICHAEL POWERS
FEL: (770) 330-1781 SIEMENS VMAIL: EXT:
FAX: (770) 369-8232
EMAIL: michael.powers@siemens.com HEALTH SYSTEM 191 PEACHTREE ST., ATLANTA, GA 30303 MRI SUITE - MAGNETOM AERA W/MOBILE TABLE THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL PROJECT #: 1500201 R101RA VERSION DATED 01/19

ATTENTION:

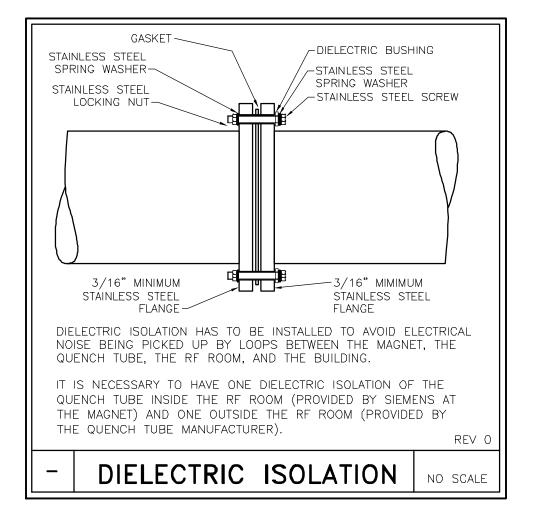
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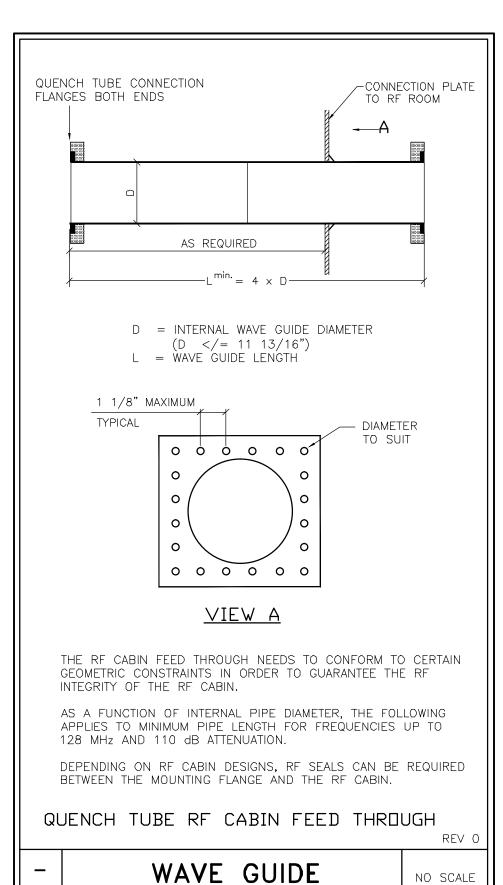
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RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. APPROVED BY CUSTOMERS FOR FINAL ALL RIGHTS ARE RESERVED. 10 F. CARUSO REF. 1<sup>#</sup>: 1—49M1UW SCALE: AS NOTED -ISSUE BLOCK-03/18/15

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## RF DOOR OPENING

IN THE EVENT OF A CATASTOPHIC FAILURE OF THE QUENCH VENT DURING A QUENCH, PRESSURE BUILT UP MAY PREVENT OPENING A DOOR THAT OPENS INTO THE RF ROOM, PREVENTING EVACUATION FROM LIFE THREATENING CONDITIONS.

FOR THIS REASON THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. IF THE DOOR CANNOT OPEN OUT FROM THE RF ROOM, OTHER APPROPRIATE MEANS HAVE TO BE PROVIDED SO THAT THE RF ROOM DOOR IS NOT PREVENTED FROM OPENING DUE TO PRESSURE.

IF THE DOOR OPENS INTO THE RF ROOM, A 24"x24" OPENING FOR PRESSURE EQUALIZATION INTO THE RF ROOM MUST BE INSTALLED. THIS IS MANDATORY. THIS IS NOT AN ESCAPE HATCH. THE PURPOSE OF THE OPENING IS TO RELIEVE PRESSURE AND ALLOW THE MAIN DOOR TO BE OPENED SO THAT OCCUPANTS CAN BE EVACUATED.

THE OPENINGS WILL HAVE PANELS INSTALLED IN THE RF ROOM OR THE DOOR THAT CAN BE UNLOCKED AND OPENED TO THE OUTSIDE IN CASE OF EMERGENCY. THESE PANELS REQUIRE AN RF SEALED INSTALLATION. AFTER OPENING THE PANEL, THE OUTLET SHOULD MEASURE AT LEAST 24"x24". WHEN USING RECTANGULAR PANELS, THE SHORTER SIDE SHOULD MEASURE OF MINIMUM OF 24".

TO ENSURE UNOBSTRUCTED VENTING, THIS OPENING CANNOT BE SUBDIVIDED. THIS MEANS THAT, FOR EXAMPLE, RF SEALED HONEYCOMB GRIDS ARE NOT PERMITTED.

EASY REMOVAL OF THE PANEL BY A PERSON HAS TO BE ENSURED AND A MINIMUM DISTANCE OF 40" TO A FIXED OBJECT MUST BE MAINTAINED. THE PANEL SHOULD BE INSTALLED IN AN ACCESSIBLE LOCATION AND ALLOW ESCAPE OF THE LOW DENSITY HELIUM.

AS AN ALTERNATIVE TO AN OUTSWING DOOR, THE STATIONARY OBSERVATION WINDOW IS REPLACED BY A WINDOW OPENING INTO THE CONTROL AREA OR THE DOOR IS REPLACED WITH AN RF SEALED SLIDING DOOR. IT SHOULD BE ENSURED THAT THE DOOR CLOSES IN A WAY THAT ALLOWS IT TO MOVE AWAY FROM THE

IF THE DOOR OPENS TO THE OUTSIDE, THE OPENING IN THE RF ROOM IS STILL RECOMMENDED.

FRAME IN CASE OF OVERPRESSURE.

THE RF ROOM MANUFACTURER CAN PROVIDE YOU WITH ADDITIONAL RF SEALED ROOM OPENINGS THAT LEAD DIRECTLY TO THE OUTSIDE. HOWEVER, THESE OPENINGS ARE ALSO CONDUITS FOR NOISE GENERATED OUTSIDE THE RF ROOM, UNOBSTRUCTED FLOW THROUGH THIS PIPE MUST BE GUARANTEED.

RF SHIELDING

THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION

TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY

RANGE OF 15-128 MHz. IF CO-SITING TWO SYSTEMS EACH ROOM

SHOULD BE 100 dB. THE RF SHIELD MUST BE TESTED BEFORE AND

AFTER MAGNET PLACEMENT IN THE RF ROOM AND AFTER THE SIEMENS

POINT GROUND ON THE OUTSIDE OF THE RF-ROOM WALL. RESISTANCE ≥ 100 OHMS. ALL ELECTRICAL LINES INTO THE RF ROOM MUST BE

OUTED THROUGH RF FILTERS (PROVIDED BY RF SHIELDING SUPPLIER)

ALL ELECTRICALLY NON-CONDUCTIVE SUPPLY LINES (E.G. FIBER OPTIC

CABLES, OR HOSES) INTO THE RF ROOM MUST BE ROUTED THROUGH

RF SEALED WAVE GUIDES (PROVIDED BY RF SHIELDING SUPPLIER). FOR

OPENING IN THE RF ROOM FOR PRESSURE EQUALIZATION IS REQUIRED.

EXAM ROOM INTERIOR NOTES

1) ONLY NON-MAGNETIC MATERIALS ARE TO BE USED AND INSTALLED

) CORRUGATED RODS IN SUSPENDED CEILINGS MUST BE INSTALLED

SÉCURELY, GALVANIC CONTENT BETWEEN THE CORRUGATED RODS MUST

BE GUARANTEED, THEY MUST NOT JUST LIE ON TOP OF ONE ANOTHER.

2) A SUSPENDED CEILING MUST BE STATICALLY SUSPENDED, NOT

SUSPENDED WITH MOVABLE CLAMPS, SPRINGS, ETC.

A WIRE JUMPER BETWEEN RODS MAY BE USEFUL.

OR INSIDE A CONDUIT TO PREVENT MOTION.

IN THE RF ROOM.

NO SCALE

PRESSURE EQUALIZATION PURPOSES THE RF DOOR SHOULD OPEN TO

THE OUTSIDE OF THE RF ROOM. AS AN ALTERNATIVE A 24"X24"

RF FILTER PANEL IS INSTALLED. THE RF-SHIELDING MUST BE INSULATED FROM ALL GROUNDS SUCH THAT THE ONLY GROUND IS THE SINGLE

OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL

EXHAUST AND INTAKE RF FILTER PANEL FOR AIR CONDITIONIN -QUENCH TUBE EXIT RF WINDOW 7 SHIELDING -RF ROOM DOOR OPFNING OPENING FOR -DIRECTION TO PRESSURE THE OUTSIDE EQUALIZATION

SAFETY ASPECTS FOR THE RF ROOM: IT MUST BE POSSIBLE TO LOCK THE RF ROOM (EXAMINATION ROOM) DOOR FROM THE OUTSIDE. IT MUST ALSO BE POSSIBLE TO OPEN THE DOOR FROM THE INSIDE WITHOUT A KEY OR ADDITIONAL DEVICE.

THE RF DOOR IS AN IMPORTANT COMPONENT FOR GOOD IMAGE QUALITY AS WELL AS SAFETY, THE OWNER/OPERATOR OF THE MR SYSTEM MUST MAINTAIN THE RF ROOM AS INSTRUCTED BY THE RF ROOM MANUFACTURER IN ORDER TO GUARANTEE CORRECT FUNCTION OF THE RF DOOR.

NO FERROMAGNETIC ITEMS CAN BE BROUGHT INTO THE RF ROOM AFTER THE MAGNET HAS BEEN RAMPED UP TO FIELD. MAGNETIC ITEMS WILL BECOME ATTRACTED TO THE MAGNET WITH NO WARNING AND DUE TO THE HIGH MAGNETIC FIELD, WILL BECOME MISSILES.

NOTE: FOR DOORS MOVED BY AN AUXILIARY DRIVES (ELECTRICAL OR PNEUMATIC), MANUAL OPERATION HAS TO BE ENSURED. AN OUTSIDE WINDOW SHOULD BE IN THE VICINITY TO ALLOW VENTING EXHAUSTED GAS TO THE OUTSIDE. THE INTEGRITY OF THE RF SHIELD MUST BE TESTED AFTER REMODELING.

SAFETY INFORMATION - PRESSURE EQUALIZATION

## SHIELDING GENERAL NOTES

SCALE: NONE

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) SIEMENS REQUESTS THAT THE SHIELDING MANUFACTURER(S) SUBMIT FINAL SHOP DRAWINGS TO SIEMENS FOR REVIEW PRIOR TO THEIR INCLUSION IN CONSTRUCTION DOCUMENTS, SIEMENS SHALL BE COPIED ON ALL FIELD ORDER CHANGES CONCERNING CHANGES IN RF AND MAGNETIC SHIELDING CONDITIONS, CONFIGURATION AND SPECIFICATION. THE RF AND MAGNETIC SHIELDING CONTRACTOR(S) SHALL FURNISH "AS BUILT" SCALED AND DIMENSIONED PLANS REFLECTING ANY AND ALL FIELD ORDER CHANGES PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.

) ALL CHANGES TO SIEMENS RECOMMENDED OPENINGS AND PÉNETRATIONS SHALL BE APPROVED BY THE SIEMENS PROJECT MANAGER PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS,

3) THE SIZE, LOCATION, AND DIMENSIONS OF ANY MAGNETIC SHIELDING REQUIRED HAS BEEN DETERMINED BY SIEMENS. THIS INFORMATION HAS BEEN SUPPLIED TO THE MAGNETIC SHIELDING FABRICATOR TO DESIGN THE STRUCTURAL SUPPORT SYSTEM REQUIRED FOR THE MAGNETIC SHIELDING MATERIAL.

## FILTER PLATE GENERAL NOTES

1) STRUCTURAL SUPPORT AND INTEGRATION OF THE SIEMENS SUPPLIED AND INSTALLED FILTER PLATE WITH MAGNETIC AND RF SHIELDING SHALL BE SPECIFIED, DETAILED AND NOTED BY THE RF AND MAGNETIC SHIELDING MANUFACTURER(S) WITH OVERALL COORDINATION WITH SIEMENS SITE SPECIFIC RECOMMENDATIONS TO BE THE RESPONSIBILITY OF THE ARCHITECT OF RECORD.

2) THE FILTER PLATE FRAME, RF FILTER PLATE BLANK, RF GASKET AND MOUNTING HARDWARE FOR THE PURPOSES OF TESTING THE INTEGRITY OF THE RF ENCLOSURE PRIOR TO THE INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED RF FILTER PLATE SHALL BE PROVIDED AND INSTALLED BY THE SHIELDING CONTRACTOR(S) UNLESS SPECIFIED OTHERWISE.

# LINE OF FINISHED FLOOR-REV (

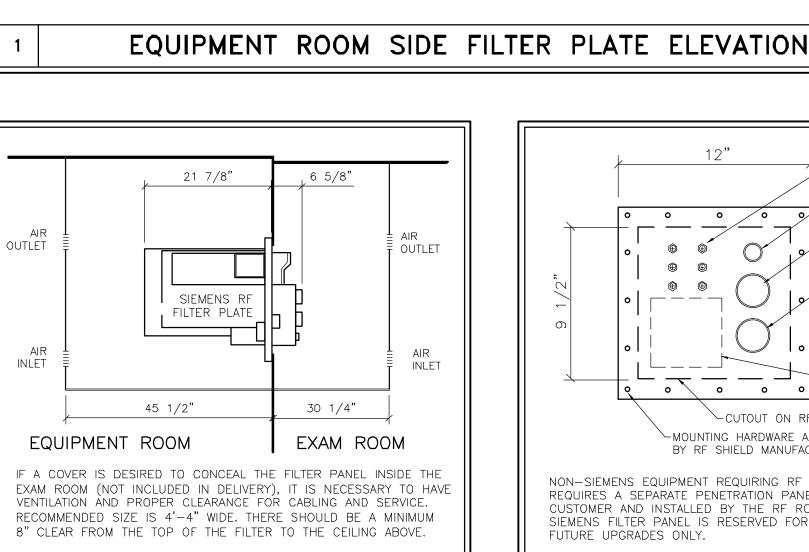
LINE OF FINISHED CEILING-

THE FINISHED WALL DIMENSION

APPLIES TO THE EQUIPMENT

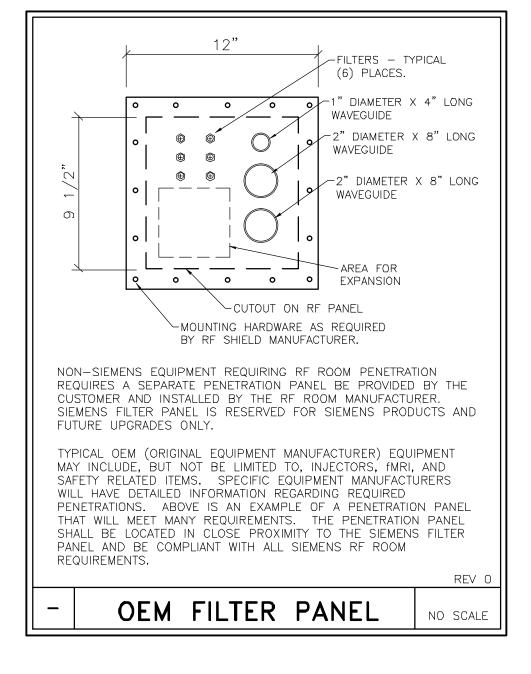
ROOM AND THE EXAM ROOM.

GRADIENT FILTERS —



FILTER PANEL COVERS

-ISSUE BLOCK-



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SCALE: 3/4"=1'-

4) ELECTRICAL WIRING, FOR AMBIENT LIGHTS FOR EXAMPLE, MUST NOT SÍMPLY REST ON THE SUSPENDED CEILING, THEY MUST BE FASTENED

REV 0

ROJECT MANAGER: MICHAEL POWERS **SIEMENS** (770) 330-1781 FAX: (770) 369-8232 EMAIL: michael.powers@siemens.com GRADY HEALTH SYSTEM 191 PEACHTREE ST., ATLANTA, GA 30303 MRI SUITE - MAGNETOM AERA W/MOBILE TABLE THE USE OR REPRODUCTION OF PROJECT #: THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 1500201 R101RA VERSION DATED 01/19 RESULT IN PROSECUTION UNDER 3/18/15 APPROVED BY CUSTOMERS FOR FINA FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED.

REF. 1#: 1**—49M1UW** 

AS NOTED

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03/18/15

F. CARUSO

4'-7 1/8"

FINISHED WALL OPENING

3'-6 3/4"

RF SHIELD OPENING

- LINE OF FINISHED

| 00000

-COOLING WATER

SUPPLY AND

RETURN LINES

WALL OPENING

RF CABLE ─

 $15 \times 2 9/16$ " TYP.

LINE OF RF -

SHIELDING

PENETRATIONS -

FOR CRYOGEN

SUPPLY LINES

2 15/16"

1 1/16" 🕌

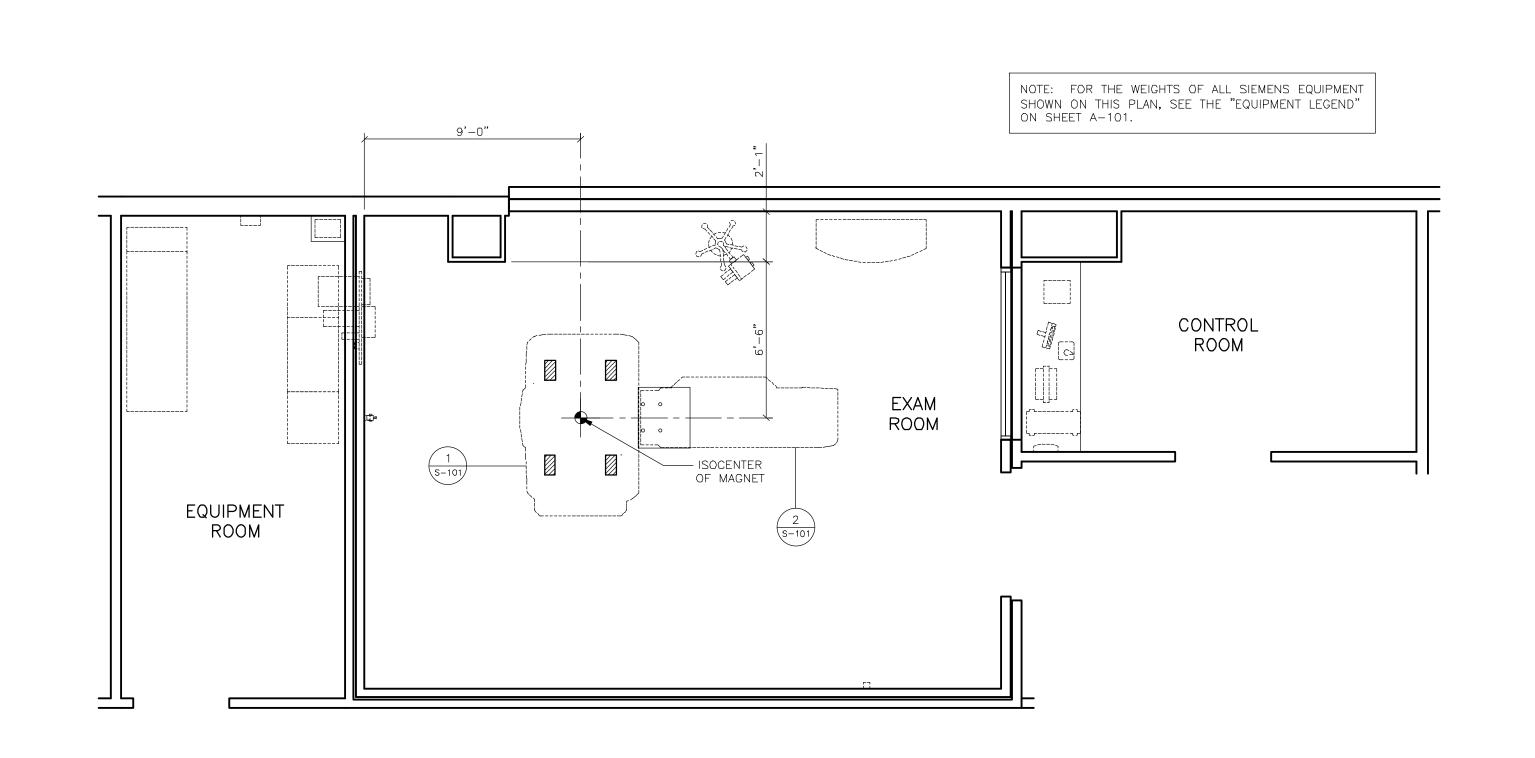
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- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

-ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. PHYSICIST TO SPECIFY RADIATION PROTECTION.

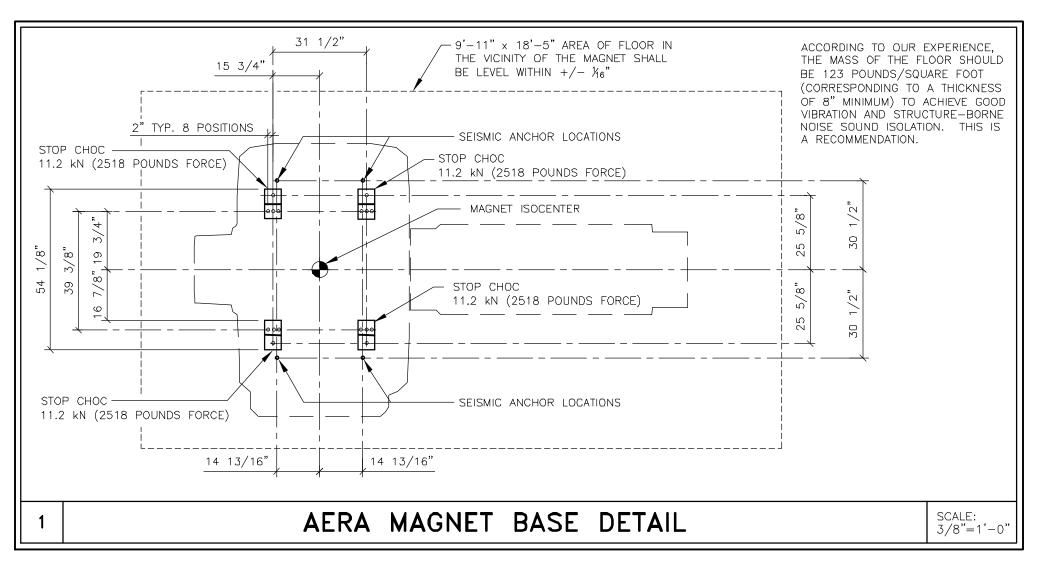
THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

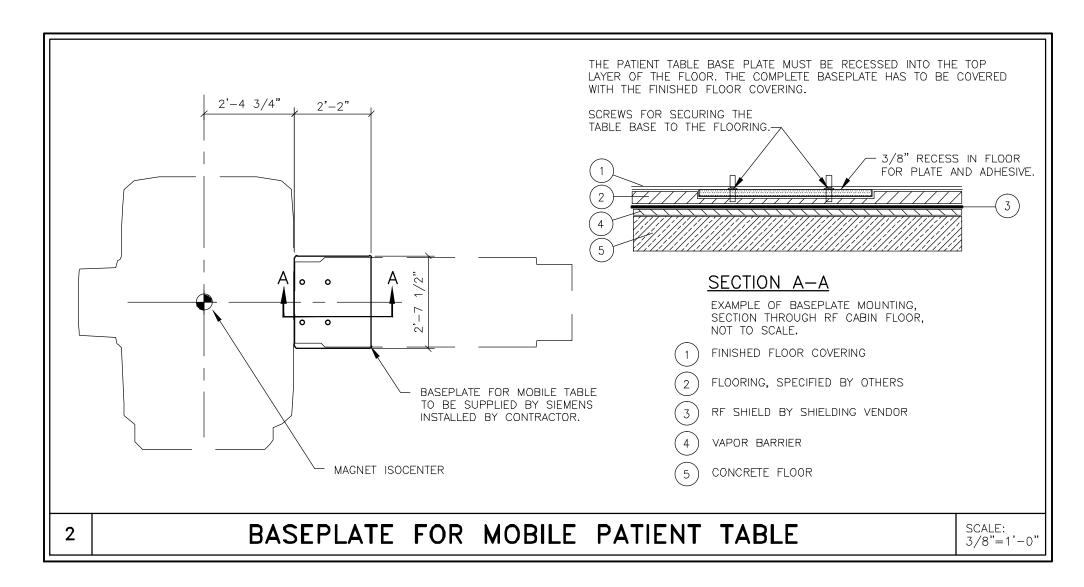
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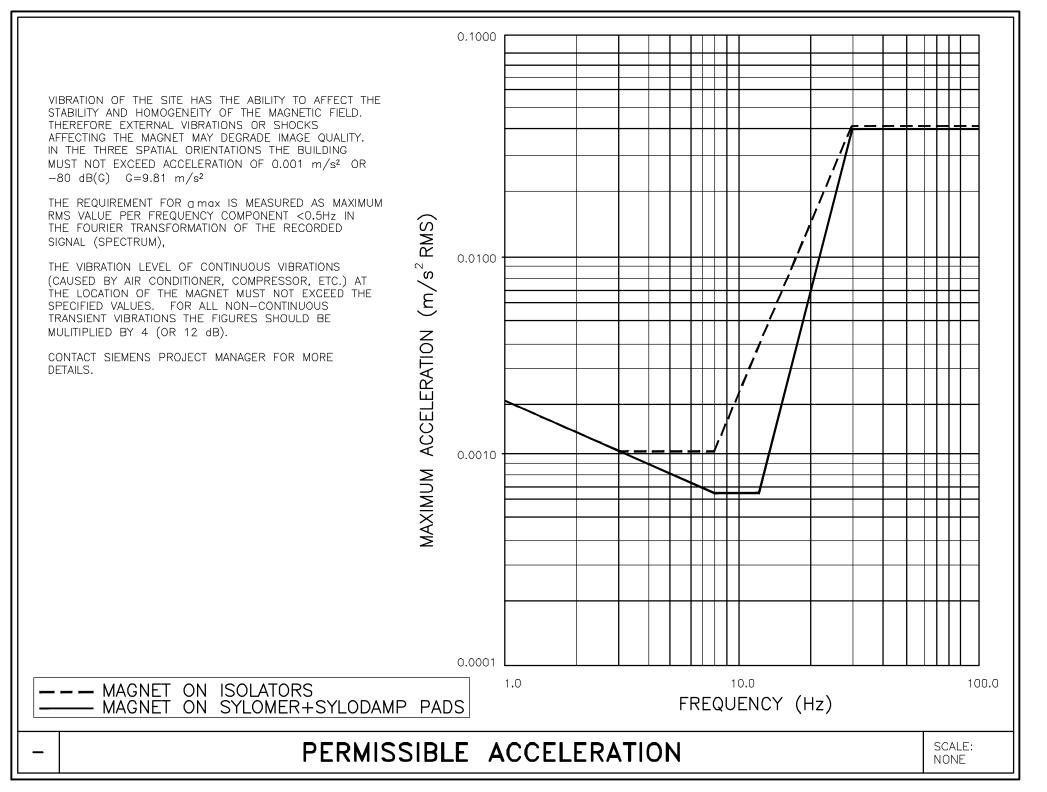


STRUCTURAL FLOOR PLAN

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







#### STRUCTURAL NOTES

- 1) THE CUSTOMER/CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL SUPPORT MEMBERS AND NEEDED HARDWARE FOR THE INSTALLATION OF THE SIEMENS EQUIPMENT.
- 2) THE OVERHEAD STRUCTURAL SUPPORT SYSTEM SHALL BE FIXED, RÍGID AND BRACED FOR SWAY.
- 3) ALL STRUCTURAL SUPPORT MEMBERS SHALL BE TRUE, SQUARE, LEVEL, PARALLEL AND COPLANAR WITH RESPECT TO EACH OTHER, WITH A HORIZONTAL STRUCTURAL SUPPORT MEMBER TO BE LOCATED AND SET WITH A TRANSIT.
- 4) ALL STRUCTURAL SUPPORT DETAILS SHOWN ARE SAMPLE DETAILS BASED UPON TYPICAL AND STANDARD BUILDING PRACTICES AND ARE NOT INTENDED AS ACTUAL CONSTRUCTION DETAILS. ALL CONSTRUCTION DETAILS AND SUPPORT CALCULATIONS SHALL BE PREPARED BY A PROFESSIONAL STRUCTURAL ENGINEER AT THE CUSTOMER'S EXPENSE. IN THE EVENT AN EXISTING SUPPORT SYSTEM IS TO BE USED, IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO VERIFY THE INTEGRITY OF THAT
- 5) MOUNTING PLATES, FRAMES, AND HARDWARE SUPPLIED BY SIEMENS AS DETAILED IN THIS DRAWING SET ARE INSTALLED BY SIEMENS UNLESS OTHERWISE REQUIRED. ANY DEVIATION FROM THE PROVIDED MATERIALS OR MOUNTING METHODS MUST BE DESIGNED AND DOCUMENTED BY THE STRUCTURAL ENGINEER OF RECORD. ALTERNATE MOUNTING MATERIALS (I.E. ANCHORS, THREADED ROD, BACKING PLATES, ETC.) MUST BE SUPPLIED BY THE CUSTOMER/CONTRACTOR. SIEMENS MAY REQUIRE ASSISTANCE FROM THE CUSTOMER/CONTRACTOR WITH INSTALLATION WHEN UTILIZING ALTERNATE MOUNTING MATERIALS.
- 6) ALL CEILING FIXTURES (I.E. AIR SUPPLY GRILLES, AIR RETURN GRILLES, EXHAUST GRILLES, SPRINKLER HEADS, INCANDESCENT AND FLUORESCENT LIGHT FIXTURES, INTERCOM SPEAKERS, MEDICAL GAS COLUMNS, ETC.) SHALL BE INSTALLED FLUSH MOUNTED WITH THE FINISHED CEILING TO PROVIDE FREE AND UNRESTRICTED TRAVEL OF THE SMS CEILING MOUNTED EQUIPMENT.
- 7) THE BOTTOM SIDE OF THE UNISTRUT CEILING GRID AND ANY CEILING MOUNTED SUPPORT PLATES ARE TO BE INSTALLED FLUSH WITH THE FINISHED CEILING. THE CUSTOMER/CONTRACTOR SHALL ALSO PROVIDE COVERSTRIPS FOR THE UNISTRUT.
- 8) THE STRUCTURAL PLANNING AS SHOWN ON THE 1/4" STRUCTURAL PLAN HAS BEEN COORDINATED WITH THE EQUIPMENT LOCATION AS SHOWN ON THE 1/4" EQUIPMENT LAYOUT PLAN. FOR THIS REASON, ANY DEVIATIONS FROM THE STRUCTURAL PLANNING AS SHOWN MUST BE APPROVED BY SMS PLANNING DEPARTMENT.
- 9) THE STRUCTURAL ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR THE DESIGN AND DETAIL OF FLOOR, WALL AND CEILING STRUCTURES IN ACCORDANCE WITH THE WEIGHTS, MOMENTS AND FORCES AS SHOWN ON OUR STRUCTURAL CALCULATIONS, OR INFORMATION, IN CONSIDERATION OF FORCES AS DETERMINED PER LOCAL GOVERNING BUILDING CODES.

AERA REV 8

CEILING HEIGHTS		PROJECT MANAGER: MICHAEL POWERS TEL: (770) 330-1781 VMAIL: EXT: FAX: (770) 369-8232	5	S
EXAM ROOM 7'-11" MINIMUM		EMAIL: michael.powers@siemens.com		
CONTROL ROOM 6'-11 MINIMUM		GRADY	HEALTH:	SY
QUIPMENT ROOM 7'-3" MINIMUM			191 PEACHTREE ST., ATLANTA, GA 303 SUITE — MAGNETOM AERA W/MOBILE	
		THE USE OR REPRODUCTION OF	PROJECT #:	SHE

ATTENTION:

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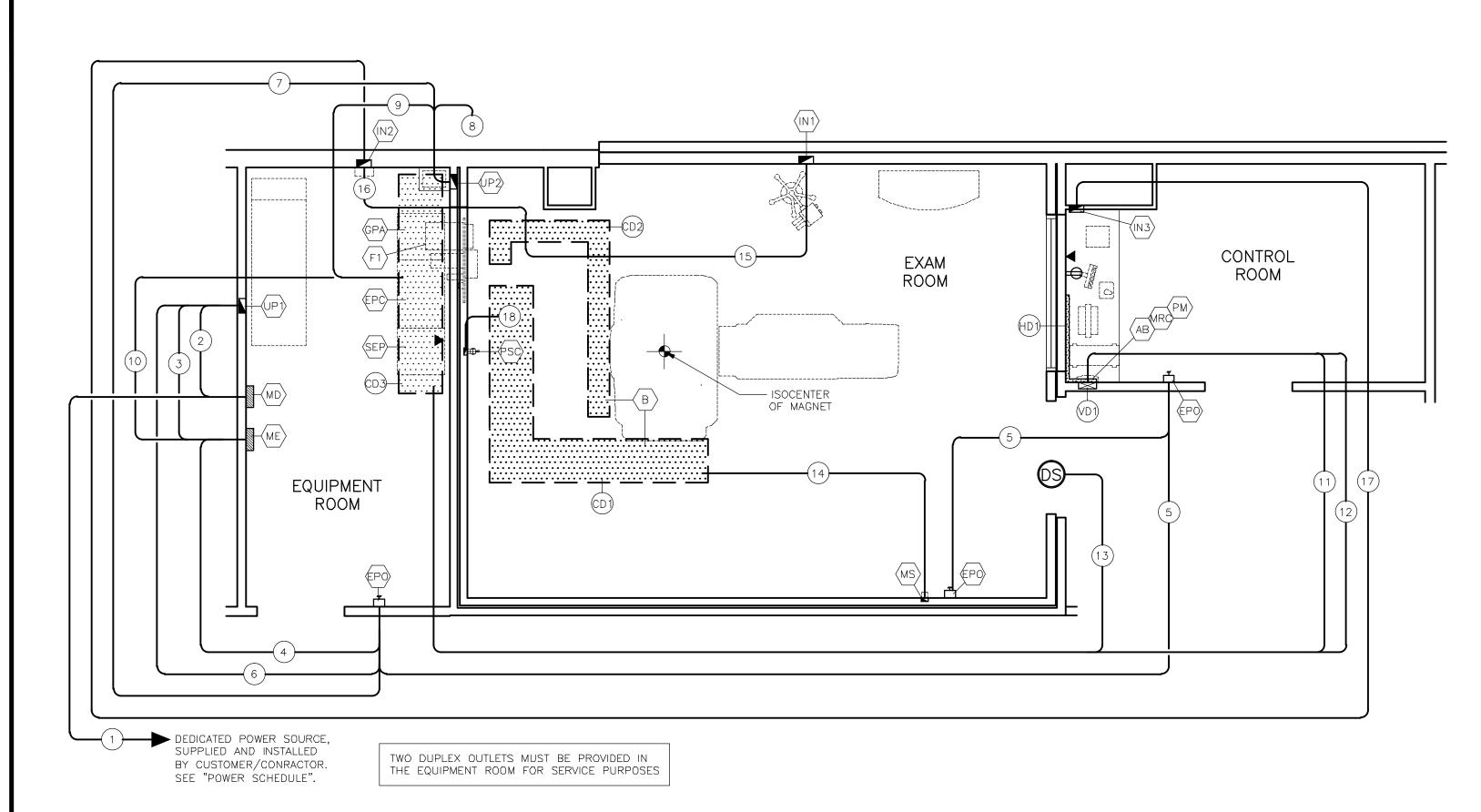
PHYSICIST TO SPECIFY RADIATION PROTECTION.

SIEMENS AUTHORIZATION WILL R101RA VERSION DATED 01/19 RESULT IN PROSECUTION UNDER APPROVED BY CUSTOMERS FOR FINA FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. -ISSUE BLOCK-

1500201 10 REF. 1<sup>#:</sup> 1—49M1UW AS NOTED 03/18/15

F. CARUSO

**SIEMENS** TH SYSTEM



#### ELECTRICAL RACEWAY PLAN

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

SYMBOLS					
	ALL MAY NOT APPLY				
	CAUTION OR WARNING				
Ü	CRITICAL NOTE(S)				
	PANEL OR ENCLOSURE BY CUSTOMER/CONTRACTOR				
	OPENING IN RACEWAY OR TRENCHDUCT				
	PULLBOX IN (FLOOR/WALL/CEILING)				
	OPENING IN ACCESS FLOORING				
(DS)	RF DOOR SWITCH — MCMASTER—CARR SUPPLY ROLLER LIMIT SWITCH 7076k14 PROVIDED BY CONTRACTOR, AND MOUNTED AT TOP OF DOOR. COORDINATE WITH SIEMENS PROJECT MANAGER.				
Н	(EPO) EMERGENCY POWER OFF BUTTON				
	CEILING DUCT				
	SURFACE MOUNTED DUCT				
VERTICAL DUCT					
ETHERNET CONNECTION TO CUSTOMER'S INFORMATION SYSTEMS NETWORK (VERIFY WITH SMS PROJECT MANAGER					
<del></del>	110 VOLT, 20 AMP, HOSPITAL GRADE DUPLEX OUTLET LOCATED NEAR THE ETHERNET CONNECTION.				

ATTENTION:

CONTRACTOR SUPPLIED CABLES						
FROM	VIA	то	DESCRIPTION	REMARKS		
SOURCE	1	MD	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.			
MD	2	UP1	3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE TO BE IZED BY ELECTRICAL CONTRACTOR/ENGINEER.			
UP1	3	ME	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.			
ME	4	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.			
EPO	5	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.			
EPO	6	UP1	DETERMINED BY ELECTRICAL CONTRACTOR.			
EPO	7	UP2	DETERMINED BY ELECTRICAL CONTRACTOR.			
ME	10	EPC	3) 2/0 AND (1) 2/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED. THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.			

SYM	SIZE	DESCRIPTION	REMARKS
		SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR	
(AB)	3"ø	OPENING IN FACE OF VERTICAL DUCT 5'-0" ABOVE FINISHED FLOOR IN LOCATION TO BE COORDINATED WITH THE ARCHITECT.	ALARM BOX
PC\CPA\SEP\	18" × 18"	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	ELECTRONICS CABINETS
B	AS REQUIRED	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	MAGNET CABLE ACCESS
<b>₽</b>		EMERGENCY POWER OFF BUTTONS, MOUNTED WITH CENTERLINE AT 5'-0" ABOVE FINISHED FLOOR. ALL PARTS ARE TO BE NONFERROUS INSIDE THE RF ROOM. EXACT LOCATIONS ARE TO BE VERIFIED WITH THE ARCHITECT OF RECORD.	SEE POWER SCHEDULE, SHEET E-102
F1)		SIEMENS RF FILTER PANEL TO BE MOUNTED ON RF SHIELDED WALL	FILTER PANEL
(NI)	AS REQUIRED	NON-FERROUS PULL BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR POWER SUPPLY— MUST BE LOCATED OUTSIDE OF 5mT FIELD
(N2 <b>&gt;</b>	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL IN EQUIPMENT ROOM, MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR POWER SUPPLY
(N3)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA, MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR CONTROL CONSOLE
<b>(II)</b>		MAIN FUSIBLE DISCONNECT. EXACT LOCATION DETERMINED BY CUSTOMER/CONTRACTOR	SEE POWER SCHEDULE
₩P		MAIN ENCLOSURE WITH MAIN BREAKER. EXACT LOCATION DETERMINED BY CUSTOMER/CONTRACTOR.	SEE POWER SCHEDULE
ØR\$€M	4" × 4"	OPENING IN FACE OF RACEWAY IN SHOWN LOCATION.	HOST COMPUTER/PATINET MONITOR
<b>(MS)</b>	AS REQUIRED	NON-FERROUS SINGLE GANG BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 6'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	
<b>(50)</b>	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL REFER TO HEIGHT CHART A-501-3. THE PULL BOX CAN BE MOUNTED AT APPROXIMATELY 5'-0" ABOVE THE FINISHED FLOOR IN MOST CASES, DEPENDING ON THE DISTANCE FROM THE MAGNET TO THE WALL.	PATIENT SUPERVISION CAMERA
(P)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT FLOOR LINE IN SHOWN LOCATION PROVIDED WITH 2"0 OPENING IN FINISHED COVER.	POWERWARE 9130
<b>₽</b>	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER AND EATON INSTALLATION MANUAL IN SHOWN LOCATION PROVIDED WITH 2" OPENING IN FINISHED COVER.	POWERWARE 9390
(31)	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER, IN THE EXAM ROOM, MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE FILTER PANEL AND THE MAGNET. A 15" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE RF FILTER PANEL (F1). WHEN ROUTING ALL RACEWAYS REFER TO DETAIL E-501/2 TAKING CARE SO THAT MAXIMUM CABLE LENGTHS ARE NOT EXCEEDED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/2
(D2)	12"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EXAM ROOM. A 12" SEPARATION BETWEEN CD1 AND CD2 MUST BE MAINTAINED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/2
(03)	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EQUIPMENT ROOM MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE EQUIPMENT ROOM AND THE RF FILTER PANEL (F1). AN 18" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE FILTER PANEL.	CABLE TRAY SEE DETAIL E-501/2
(HD1)	4" x 2"	WIREMOLD SURFACE MOUNTED ON WALL IN CONTROL AREA AT FLOOR LINE AS SHOWN, FINISHED TO MATCH WALLS.	
(VD1)	10" x 3-1/2"	VERTICAL DUCT MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA FROM ABOVE FINISHED CEILING TO FLOOR LINE PROVIDED WITH REMOVABLE FINISHED COVERS.	
(1)	AS PER NEC	CONDUIT FROM FACILITY POWER TO MAIN DISCONNECT (MD)	SEE POWER SCHEDULE,
2	AS PER NEC	CONDUIT FROM "MD" TO "UP1"	SHEET E-102 SEE POWER SCHEDULE,
			SHEET E-102
3	AS PER NEC	CONDUIT FROM "UP1" TO "ME".	SEE POWER SCHEDULE, SHEET E-102
4	AS PER NEC	CONDUIT FROM "ME" TO "EPO".	SEE POWER SCHEDULE, SHEET E-102
5	AS PER NEC	CONDUIT FROM "EPO" TO "EPO" TO BE NON-FERROUS WHEN INSIDE THE RF ROOM. CUSTOMER/CONTRACTOR IS TO PROVIDE RF FILTERS FOR ALL NON-SIEMENS WIRING.	SEE POWER SCHEDULE, SHEET E-102
6	AS PER NEC	CONDUIT FROM "EPO" TO "UP1".	SEE POWER SCHEDULE, SHEET E-102
7	AS PER NEC	CONDUIT FROM "EPO" TO "UP2".	SEE POWER SCHEDULE,
8)	(1) 3/4 <b>"</b> ø	SURFACE MOUNTED FLEX CONDUIT FROM "UP2" TO SIEMENS PROVIDED UPS/EPO CONTROL BOX,	SHEET E-102 MAXIMUM LENGTH 4 FEET
9	(1) 3/4 Ø (1) 1"ø	CONDUIT FROM "UP2" TO "EPC".	MAXIMUM LENGTH 29 FEET
10	(1) 2"ø	CONDUIT FROM "ME" TO END AT "EPC" VIA FLEX CONDUIT. THERE MUST BE A DIELECTRIC	SEE POWER SCHEDULE,
11)	(2) 2 1/2 <b>"</b> ø	SEPARATION BETWEEN THE CONDUIT AND THE CONNECTION AT THE SIEMENS EPC CABINET.  CONDUIT FROM "VD1" (MRC) TO "CD3" (EPC).	SHEET E-102  60' MAXIMUM CONDUIT
(12)	(1) 1 1/2"ø	CONDUIT FROM "VD1" (AB) TO "CD3" (EPC).	LENGTH  60' MAXIMUM CONDUIT
13	(1) 1/2"ø	CONDUIT FROM "DS" TO "CD3" (EPC).	LENGTH 55' MAXIMUM CONDUIT
(14)	(1) 3/4"ø	CONDUIT FROM "MS" TO "CD1" (WIRES TO MAGNET) TO BE NON-FERROUS WHEN INSIDE THE RF	LENGTH  20' MAXIMUM CONDUIT
15)	(2) 2 <b>"</b> ø	ROOM.  NON-FERROUS CONDUITS FROM NEAR "F1" TO "IN1" FOR INJECTOR CABLES.	NOT TO EXCEED 50 FEET
16)	(2) 2 °Ø	CONDUITS FROM NEAR FILTER LOCATION TO "IN2".	NOT TO ENOLED SO TELL
17)	(1) 1"ø	CONDUIT FROM "IN2" TO "IN3" FOR INJECTOR CABLES.	NOT TO EXCEED 200 FEET
(18)	(1) 1"ø	NON-FERROUS CONDUIT FROM "PSC" TO "CD1".	
$\smile$	(1) 1 %		

#### **ELECTRICAL NOTES**

) COMPLIANCE: ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA-70), O.S.H.A. REGULATIONS, AS WELL AS APPLICABLE REGULATIONS OF CITY, COUNTY, STATE AND FEDERAL AGENCIES. PROVIDE MATERIALS AND EQUIPMENT THAT COMPLY TO ANSI, IEEE AND NEMA STANDARDS. WHERE APPLICABLE, PROVIDE ONLY MATERIALS AND PRODUCTS THAT ARE U.L. LISTED AND LABELED, CUSTOMER'S/CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF NÉCA STANDARD OF INSTALLATION. 2) QUALITY ASSURANCE: THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN THE FIELD TO INSURE THAT THE NEW WORK WILL FIT TO THE EXISTING STRUCTURE AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST OR BE DISCOVERED THAT PREVENT THE INSTALLATION OF WORK AS SHOWN. THE CONTRACTOR SHALL NOTIFY THE OWNER'S

REPRESENTATIVE PRIOR TO FABRICATION OF EQUIPMENT, OR THE PERFORMANCE OF ANY WORK THAT MAY BE AFFECTED. DO NOT ALTER DRAWINGS, DIMENSIONS, OR SPECIFICATIONS IN ANY WAY WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SMS PROJECT MANAGER, ALL DIMENSIONS ARE FROM FINISHED SURFACES. CONDUIT AND PULL BOXES TO BE INSTALLED BY THE CUSTOMER/CONTRACTOR WITH LOCATIONS BEING FIELD VERIFIED BY SMS PROJECT MANAGER. ) POWER SUPPLY SOURCE: POWER SUPPLIES FOR SIEMENS MEDICAL SOLUTIONS EQUIPMENT SHALL BE DEDICATED SERVICES KEPT ENTIRELY FREE AND INDEPENDENT OF ALL OTHER BUILDING WIRING AND EQUIPMENT. SUCH AS: ELEVATORS, GENERATORS, PUMPS, HVAC SYSTEMS, ETC. THE CONTRACTOR SHALL COORDINATE THIS WORK WITH THE CUSTOMER/UTILITY

COMPANY FIELD REPRESENTATIVE. 4) WORK FURNISHED BY CUSTOMER/CONTRACTOR: WORK NOT PROVIDED BY SIEMENS MEDICAL SOLUTIONS BUT SHOWN ON DRAWINGS TO BE FURNISHED AND INSTALLED BY CUSTOMER/CONTRACTOR INCLUDES THE FOLLOWING BUT IS NOT LIMITED TO UNLESS NOTED OTHERWISE: ELECTRICAL RACEWAYS AND DUCTS. WIRING TROUGHS. PULL BOXES. CONDUITS, CIRCUIT BREAKERS, EMERGENCY OFF BUTTONS, DOOR SWITCHES, WARNING LIGHTS, WIRING, WIRING DEVICES, CONNECTORS,

LIGHTING EQUIPMENT AND GROUNDING. 5) RACEWAY AND CONDUIT NOTES: ALL ITEMS IN THE MAGNET ROOM SHALL BE NON-FERROUS. RACEWAY SHALL BE ELECTRIC METALLIC TUBING (EMT) FOR RIGID CONDUIT WORK, OR WHERE SHORT OFF-SET CONNECTIONS ARE REQUIRED LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE USED. FIELD BENDS SHALL NOT BE LESS THAN AS SHOWN IN TABLE 346-10 OF THE NATIONAL ELECTRICAL CODE. PROVIDE A JETLINE "SUPER TRUE TAPE", OR EQUIVALENT CONDUIT MEASURING TAPE FISH LINE IN ALL RACEWAYS AND CONDUITS. CONDUIT BODIES SHALL NOT BE USED. WHERE A CONDUIT ENTERS A BOX, FITTING, OR OTHER ENCLOSURE, AN INSULATED THROAT CONNECTOR SHALL BE PROVIDED TO PROTECT THE WIRE FROM ABRASION.

KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES OR STEAM AND HOT WATER PIPES, INSTALL RACEWAY RUNS ABOVE WATER AND STEAM PIPES PROVIDED THAT CABLE RUN DISTANCES ARE MAINTAINED. USE TEMPORARY CLOSURES TO PREVENT FOREIGN MATTER

CONNECTORS SHALL BE DOUBLE SET SCREW TYPE, STEEL CONCRETE

FROM ENTERING RACEWAY. CONDUIT RUNS ARE SHOWN SCHEMATICALLY. INSTALL CONDUIT WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE BUILDING CONSTRUCTION AND OBSTRUCTIONS, EXCEPT AS OTHERWISE INDICATED. THE CONTRACTOR SHALL MAKE CERTAIN THAT ANY CONDUIT/RACEWAY RUNS CONTAINING SIEMENS MEDICAL SYSTEMS CABLES DO NOT EXCEED THE SPECIFIED MAXIMUM DISTANCES AS SHOWN ON THE ELECTRICAL DETAILS.

PROVIDE ENCLOSED METAL RACEWAY SYSTEM (WIRE DUCT) WHERE SHOWN ON DRAWINGS WITH DIVIDERS TO SEPARATE THE DUCT (FOR POWER AND SIEMENS MEDICAL SOLUTIONS CABLING). DIVIDERS AND CROSSOVER PIECES TO BE PROVIDED AS NECESSARY. FOR UL CERTIFIED SYSTEMS, THE CABLE TO CABLE AS WELL AS THE CIRCUIT TO CIRCUIT SEPARATION REQUIREMENT WAS EVALUATED DURING THE UL SYSTEM INVESTIGATION OF THIS EQUIPMENT, ADDITIONAL SEPARATION OF THE SYSTEM CABLE ASSEMBLIES INTO SEPARATE OR PARTITIONED RACEWAYS UNLESS OTHERWISE NOTED, IS NOT NECESSARY TO INSURE SEPARATION OF CIRCUITS, AS THEY CAN BE IN THE SAME RACEWAY.

PROVIDE WIRE DUCT/RACEWAY WITH ACCESSIBLE REMOVABLE COVERS. LOCATIONS OF OPENINGS (I.E. ACCESS PANELS) TO BE CUT IN FIELD ARE TO BE COORDINATED WITH`SIEMENS PROJECT MANAGER. ELECTRICAL PULL BOXES AND RACEWAY COVERS SHALL BE INSTALLED IN A MANNER TO ALLOW ACCESSIBILITY FOR INSTALLATION AND MAINTENANCE, CONTRACTORS MUST PROVIDE PULL STRINGS FOR ALL CONDUIT AND WIRE DUCT/RACEWAY, IN-FLOOR TRENCH DUCT AND FLUSH FLOOR BOXES

SHALL BE PROVIDED WITH FULLY GASKETED REMOVABLE COVERS. WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED HIGHER THAN 14 FEET ABOVE FINISHED FLOOR, THE ÉLECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP THE SIEMENS INSTALL TEAM PULL SIEMENS SUPPLIED CABLES AT CUSTOMER EXPENSE. WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED ABOVE

A HARD CEILING (I.E. SHEET ROCK), A 24" x 24" ACCESS PANEL IS

REQUIRED AT EACH JUNCTION BOX AND WITHIN 2 FEET OF EACH 90 DEGREE ELBOW OR TEE IN WIRE DUCT/RACEWAY. THERE MUST BE FREE AND CLEAR ACCESS TO JUNCTION BOXES AND WIRE DUCT/RACEWAY. WHEN ACCESS PANELS ARE LOCATED MORE THAN 3 FEET FROM JUNCTION BOXES AND WIRE DUCT/RACEWAY THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP SIEMENS INSTALL TEAM PULL SIEMENS SUPPLIED CABLES AT CUSTOMER EXPENSE. 6) WIRING: WIRING SHALL BE INSTALLED IN METAL RACEWAY, 600 VOLT CLASS, STRANDED TYPE THHN—THWN, SINGLE CONDUCTOR ANNEALED

COPPER FOR A MAXIMUM OPERATING TEMPERATURE OF 75° C (165° F). SIZED AS INDICATED. THE CUSTOMER/CONTRACTOR SHALL LEAVE MINIMUM 10 FT. WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY SIEMENS MEDICAL 7) IN ADDITION TO THE CIRCUIT BREAKER LOAD CURRENT RATING,

CONSIDERATION MUST ALSO BE GIVEN TO SELECTING CIRCUIT BREAKERS THAT HAVE A HIGH ENOUGH SHORT CIRCUIT CURRENT WITHSTAND RATING TO SAFELY COORDINATE WITH THE POWER SYSTEM AVAILABLE SHORT CIRCUIT CURRENT. GENERALLY, WHEN THE 480 VOLT, 3 PHASE, MR EQUIPMENT IS SERVED FROM A POWER SUPPLY SYSTEM THAT IS PROVIDED WITH A 500 KVA OR SMALLER TRANSFORMER, A STANDARD 14,000 RMS AMPERE WITHSTAND RATED CIRCUIT BREAKER WILL BE ADEQUATE. HOWEVER, IF THE POWER SUPPLY SYSTEM TRANSFORMER IS LARGER THAN 500 KVA, THEN THE CIRCUIT BREAKERS HAVING A SHORT CIRCUIT WITHSTAND RATING GREATER THAN 14,000 RMS AMPERES MAY BE REQUIRED.

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

ROJECT MANAGER: MICHAEL POWERS (770) 330-1781 FAX: (770) 369-8232 EMAIL: michael.powers@siemens.com THE USE OR REPRODUCTION OF

R101RA VERSION DATED 01/19

APPROVED BY CUSTOMERS FOR FINA

3/18/15

SIEMENS

GRADY HEALTH SYSTEM 191 PEACHTREE ST., ATLANTA, GA 30303

MRI SUITE - MAGNETOM AERA W/MOBILE TABLE PROJECT #: THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 1500201 RESULT IN PROSECUTION UNDER

F. CARUSO

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DOCUMENTS FOR REFERENCE.

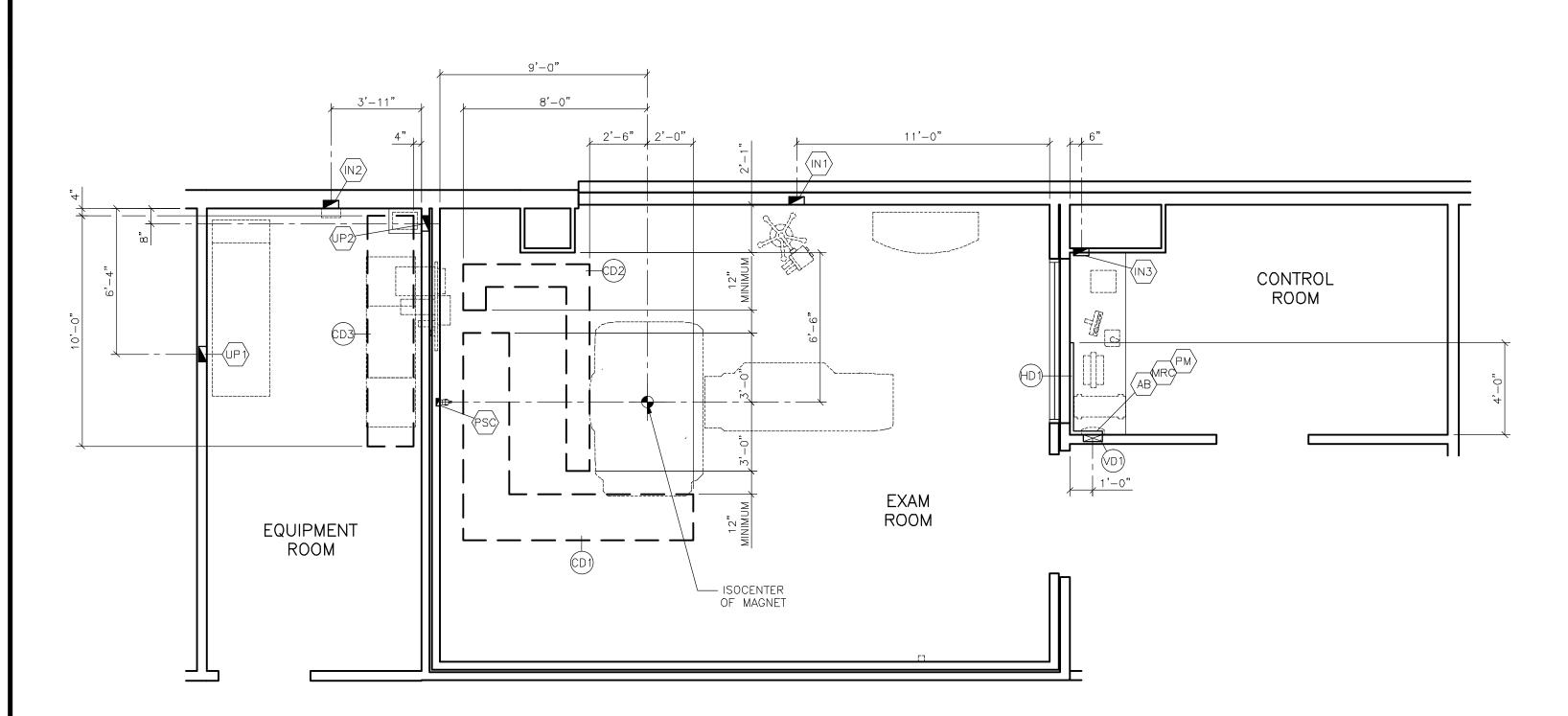
PHYSICIST TO SPECIFY RADIATION PROTECTION.

ALL RIGHTS ARE RESERVED. -ISSUE BLOCK-AS NOTED

FULL EXTENT OF THE LAW.

10 REF. 1<sup>#:</sup> 1—49M1UW 03/18/15

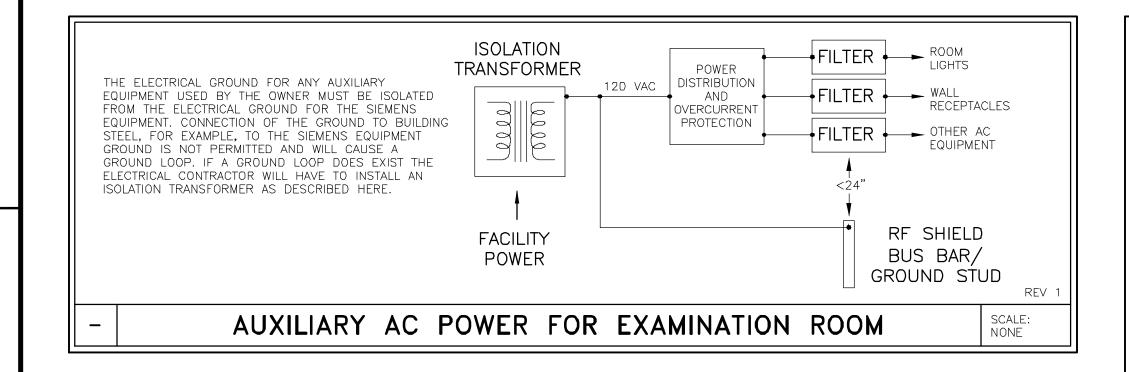
AERA |



#### ELECTRICAL DIMENSION PLAN

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

REV 0



#### POWER QUALITY NOTES

1) IT IS THE CUSTOMER'S RESPONSIBILITY TO COMPLY WITH THE POWER QUALITY REQUIREMENTS FOR SIEMENS MEDICAL SYSTEMS EQUIPMENT. ) THE ELECTRICAL FEEDER TO THE SIEMENS MEDICAL SYSTEMS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, OMPRESSORS. ELEVATORS. AND OTHER POTENTIAL SOURCES OF ELECTRICAL INTERFERENCE.

3) THE ELECTRICAL FEEDER TO THE IMAGING SYSTEM MUST BE RUN DÍRECTLY TO A MAIN FACILITY DISTRIBUTION PANEL OR TO THE FACILITY SERVICE ENTRANCE, WITH NO OTHER LOADS POWERED FROM 4) IN ORDER TO COMPLY WITH IMAGING SYSTEM POWER QUALITY

RÉQUIREMENTS. ADDITIONAL POWER CONDITIONING DEVICES MAY BE REQUIRED. EXAMPLES INCLUDE VOLTAGE REGULATORS, TRANSFORMERS, SURGE PROTECTIVE DEVICES, FILTERS, AND/OR UNINTERRUPTIBLE POWER SUPPLIES (UPS). RECOMMENDED FOR THE INSTALLATION OF ELECTRONIC EQUIPMENT CAN BE FOUND IN IEEE STANDARD 1100-1999 "POWERING AND GROUNDING ELECTRONIC **EQUIPMENT:** 5) POWER CONDITIONING DEVICES NOT APPROVED BY SIEMENS MÉDICAL SYSTEMS MAY NOT BE COMPATIBLE WITH THE MAGNETOM

SYSTEM. "FERRORESONANT" POWER CONDITIONING EQUIPMENT RE-APPLIED FROM PREVIOUS GENERATION SYSTEMS IS ALSO GENERALLY EXCLUDED DUE TO HIGHER POWER REQUIREMENTS OF THE NEWER SYSTEMS. 6) INCOMING SOURCE POWER WIRES MUST BE SEPARATED FROM ANY SIEMENS CABLING BY A MINIMUM OF 12".

#### CONTROL EXAM RODM EQUIPMENT ROOM ROOM MINIMUM 250 AMP WIRE RF ROOM -FURNISHED AND INSTALLED BY BY SIEMENS | UPS CABLE BY SIEMENS 29'-0" MAXIMUM LENGTH ¾" FLEX CONDUIT 4'-0" MAXIMUM LENGTH JPPLIED BY SIEMENS NSTALLED BY CONTRACTO ITEM QTY DESCRIPTION MAIN FUSIBLE DISCONNECT, 400 AMPS, FLUSH OR SURFACE MOUNTED, FUSED BY ENGINEER OF RECORD PER EATON POWERWARE PLANNING GUIDE. SIEMENS PROJECT MANAGER TO PROVIDE EATON POWERWARE PLANNING GUIDE. MAIN ENCLOSURE WITH MAIN BREAKER FLUSH OR SURFACE MOUNTED. MAIN BREAKER MUST HAVE A TRIPPING DEVICE SO WHEN ANY EPO IS PRESSED THE MAIN BREAKER TRIPS, THIS TRIPPING DEVICE CONTROL CIRCUIT MUST BE OF FAIL—SAFE DESIGN. THE CONTROL CIRCUIT FOR THE EPO'S MUST HAVE AN ENERGY STORAGE SOURCE SO THAT THE CONTROL CIRCUIT NEVER LOSES POWER. MAIN BREAKER AMPS: SEE POWER REQUIREMENTS PHASES | NEUTRAL GROUND | TOTAL WIRES 480 4 (NOTE 1 1) ALL WIRES MUST BE SAME SIZE. EPO VARIES EMERGENCY POWER OFF BUTTON WITH PROTECTIVE COVER THAT PREVENTS ACCIDENTAL ACTIVATION OF THE EPO BUTTON. THE EPO MUST BE OF FAIL-SAFE DESIGN, THE CONTROL CIRCUIT FOR THE EPO'S MUST HAVE AN ENERGY STORAGE SOURCE SO THAT THE CONTROL CIRCUIT NEVER LOSES POWER. ALL EPO'S ARE TO BE LATCHING TYPE AND MUST BE RESET BEFORE MAIN BREAKER CAN BE RESET. IF ANY OPTIONAL UPS EQUIPMENT IS PROVIDED BY SIEMENS. THE CUSTOMER/CONTRACTOR SHALL PROVIDE AN ADDITIONAL CONTACT IN EACH EPO AND PROVIDE SEPARATE WIRING FOR AN ADDITIONAL EPO CIRCUIT AS REQUIRED. PLEASE COORDINATE THE TYPE OF CONTACT REQUIRED FOR THE UPS CIRCUIT WITH SIEMENS PROJECT MANAGER. THE EPO'S MUST BE INSTALLED BY A QUALIFIED ELECTRICAL CONTRACTOR ACCORDING TO NATIONAL ELECTRICAL CODE, STATE AND LOCAL REGULATIONS. MEASURES SHOULD BE TAKEN TO DESIGN THE CIRCUIT IN SUCH A WAY THAT IT WILL ALWAYS WORK WHEN THE MEDICAL EQUIPMENT IS POWERED. THE CUSTOMER IS SOLELY RESPONSIBLE FOR THE IMPLEMENTATION OF THE EPOS AND THEIR ASSOCIATED CIRCUITS AND MUST MAKE THE FINAL DETERMINATION CONSIDERING ALL SITE CONDITIONS AND REGULATORY FACTORS. EACH EPO MUST HAVE 2 SETS OF CONTACTS. ALL ITEMS LISTED IN THIS SCHEDULE SHALL BE SUPPLIED AND

POWER SCHEDULE

L CONDUITS AND WIRES SIZES MUST BE

DETERMINED BY THE ELECTRICAL ENGINEER
OF RECORD PER N.E.C AND TO MAINTAIN

SIEMENS IMPEDANCE REQUIREMENTS.

MINIMUM 250 AMP WIRE

MINIMUM 250 AMP WIRE

60 KVA UPS PROVIDED

BY SIEMENS, INSTALLED BY CONTRACTOR.

## POWER REQUIREMENTS VOLTAGE VARIATION:480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS.

VOLTAGE UNBALANCE:2% MAXIMUM DIFFERENCE BETWEE	N PHASES
FREQUENCY:	60 Hz ± 1.0 Hz
LINE IMPEDENCE:	< 95 mOHMS
STAND BY POWER CONSUMPTION	9.0 kW
TYPICAL POWER CONSUMPTION DURING EXAM	20.1 KW
CONNECTION VALUE	110 kVA
MOMENTARY POWER	114 kVA
MR SYSTEM BREAKER SIZE	150 AMPS
RECOMMENDED UPS EATON 9390	160 kVA
UPS SYSTEM BREAKER SIZE	250 AMPS
ALL BREAKERS ARE RATED AT 100%	

## POWER QUALITY

POOR POWER WILL ALTER EQUIPMENT PERFORMANCE

IT IS IN THE CUSTOMER'S INTEREST THAT THE ELECTRICAL CONTRACTOR BE RESPONSIBLE FOR TESTING AND VERIFYING THAT THE EQUIPMENT POWER SUPPLY COMPLIES WITH THE SIEMENS SPECIFICATIONS.

#### DEMAND AND CAPACITY

) IF EQUIPMENT UPGRADE IS ANTICIPATED, INSTALLING ELECTRICAL POWER TO MEET THE REQUIREMENTS OF THE HIGHER POWER GRADIENT PACKAGE AT THE TIME OF INITIAL INSTALLATION WILL REDUCE THE COST TO UPGRADE THE ELECTRICAL SYSTEM LATER.

2) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS. AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET.

3) OVER CURRENT PROTECTION IS SPECIFIED FOR SYSTEMS WITHOUT AN UNINTERRUPTIBLE POWER SUPPLY (UPS). ADDITION OF A UPS REQUIRES A HIGHER CAPACITY MAINS CONNECTION (DEPENDENT UPON UPS MODEL AND SIZE). MAXIMUM FAULT CURRENT IS DEPENDENT UPON THE IMPEDANCE OF THE FACILITY ELECTRICAL SYSTEM. THE CUSTOMER'S ARCHITECT OR ELECTRICAL CONTRACTOR TO SPECIFY AIC RATING OF OVER CURRENT PROTECTION BASED ON FACILITY IMPEDANCE CHARACTERISTICS.

4) MOMENTARY POWER IS BASED ON A MAXIMUM RMS VALUE FOR A PERIOD NOT TO EXCEED FIVE (5) SECONDS, AS DEFINED IN NEC. 517.2. STAND-BY AND AVERAGE CURRENT ARE SUBSTANTIALLY

HE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VOLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS USED TO OBTAIN THE PROPER EQUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.

6) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.

7) A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (>8x RATED CURRENT) IS REQUIRED TO PERMIT SWITCH-ON OF THE UPS SYSTEM WITHOUT SPURIOUS TRIPPING, CIRCUIT BREAKERS WITH AN ADJUSTABLE MAGNETIC TRIP (SIEMENS FD6 SERIES OR SIMILAR) ARE HIGHLY RECOMMENDED.

#### CHILLER POWER REQUIREMENTS

480 VOLTS, 3-PHASE 60 AMPS KKT ECO CHILLER KKT MEDIX X 60 CHILLER 480 VOLTS, 3-PHASE 75 AMPS DIMPLEX 14 TON CHILLER 480 VOLTS, 3-PHASE 70 AMPS DIMPLEX 20 TON CHILLER 480 VOLTS, 3-PHASE 95 AMPS REFER TO CHILLER MANUFACTURER'S INFORMATION

#### ELECTRICAL INSTALLATION NOTES

1) INSTALL THE MR SYSTEM CIRCUIT BREAKER IN OR NEAR THE EQUIPMENT ROOM. THE PERMITTED FRINGE FIELD FOR THE PANEL IS UP TO 3mT. IF THE FRINGE FIELDS HAVE HIGHER VALUES, MAGNETIC SHIELDING MUST BE PROVIDED OR THE DISTANCE FROM THE MAGNET MUST BE INCREASED.

2) AN ACCEPTABLE MEANS FOR SWITCHING MAIN POWER ON AND OFF SHOULD BE INSTALLED IN THE MAIN BREAKER PANEL. INSTALL EMERGENCY SHUTDOWN BUTTONS IN EACH ROOM WHERE THERE IS

SIEMENS EQUIPMENT.

3) THE ELECTRICAL FEEDER TO THE SIEMENS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS AND OTHER POTENTIAL SOURCES OF ELECTRICAL

4) THE EMERGENCY POWER OFF (EPO) BUTTONS ARE TO BE MUSHROOM TYPE WITH PUSH LOCK AND PULL TO RELEASE.

WITH THE RF SHIELDING SUPPLIER.

EXAMINATION ROOM DETAIL.

5) WALL RECEPTACLES MADE OF FERROMAGNETIC MATERIALS ARE NOT PERMITTED IN THE EXAM ROOM, PERIPHERAL UNITS (SUCH AS VENTILATORS) NOT APPROVED FOR USE IN A HIGH MAGNETIC FIELD ENVIRONMENT CAN INFLUENCE THE MAGNETIC FIELD. COMPROMISING IMAGE QUALITY. THE CUSTOMER IS RESPONSIBLE FOR INSTALLATION AND USE OF RECEPTACLES IN THE EXAM ROOM. INSTALLATION OF RECEPTACLES AND THE FILTERS REQUIRED ARE TO BE COORDINATED

6) THE RF SHIELD MUST BE FITTED WITH A GROUND STUD OR BUS BAR, LOCATED WITHIN 24" OF THE AUXILIARY FILTERS FOR ROOM LIGHTS AND OUTLETS, SUPPLIED AND INSTALLED BY THE RF SHIELD

7) IN ORDER TO PREVENT GROUND LOOPS, ALL CUSTOMER OR CUSTOMER/CONTRACTOR SUPPLIED AC POWER ENTERING THE EXAMINATION ROOM (I.E. OUTLETS, EPO, ETC.) SHOULD BE SUPPLIED VIA AN ISOLATION TRANSFORMER. THE ISOLATION TRANSFORMER SECONDARY WINDING GROUND CONDUCTOR SHOULD BE CONNECTED TO THE RF SHIELD GROUND STUD OR BUS BAR. SEE NOTE 6 ABOVE AND THE AUXILIARY AC POWER FOR

#### **GROUNDING NOTES**

EQUIPMENT GROUND CONDUCTOR TO COMPLY WITH THE FOLLOWING:

1) SIZED EQUIVALENT TO THE PHASE CONDUCTORS (FULL SIZED GROUND). 2) DERIVED FROM THE ELECTRICAL SERVICE, TRANSFORMER OR MAIN DISTRIBUTION PANEL FEEDING THE SIEMENS

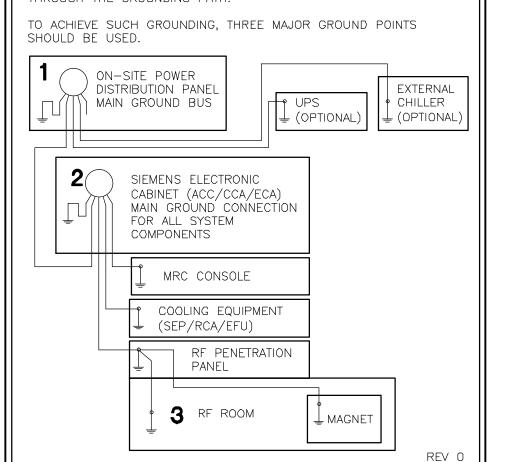
**EQUIPMENT** 3) RUN IN THE SAME CONDUIT, TROUGH OR RACEWAY AS THE

PHASE CONDUCTORS. 4) CONTINUOUS, WITH NO BREAKS OR USE OF CONDUIT, CHASSIS OR EARTH AS THE SOLE GROUNDING PATH. 5) BONDED TO CHASSIS AND/OR CONDUIT IN ACCORDANCE WITH THE NEC REQUIREMENTS.

6) MINIMIZE CONNECTIONS OR TERMINALS TO ENSURE CONTINUITY OVER THE LIFE OF THE INSTALLATION. 7) AS A NORM, THERE SHOULD NOT BE ANY CURRENT PRESENCE ON THE GROUND CONDUCTOR, BUT IT IS ACCEPTABLE TO HAVE <500mA DURING OPERATION OF THE IMAGING EQUIPMENT.

#### MR GROUNDING NOTES

THE INTERNAL GROUND WIRING OF THE MR SYSTEM MUST BE INSTALLED WITH MINIMUM GROUND LOOPS. THIS IS TO PREVENT NOISE CURRENTS AND GENERAL DISTURBANCES FROM FLOWING THROUGH THE GROUNDING PATH.



REV 8

#### CEILING HEIGHTS

INSTALLED BY CUSTOMER/CONTRACTOR.

EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

ROJECT MANAGER: MICHAEL POWERS **SIEMENS** (770) 330-1781 FAX: (770) 369-8232 GRADY HEALTH SYSTEM 191 PEACHTREE ST., ATLANTA, GA 30303 MRI SUITE - MAGNETOM AERA W/MOBILE TABLE THE USE OR REPRODUCTION OF PROJECT #: THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 1500201 R101RA VERSION DATED 01/19 RESULT IN PROSECUTION UNDER 3/18/15 APPROVED BY CUSTOMERS FOR FINA FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. DESCRIPTION 10 F. CARUSO

03/18/15

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

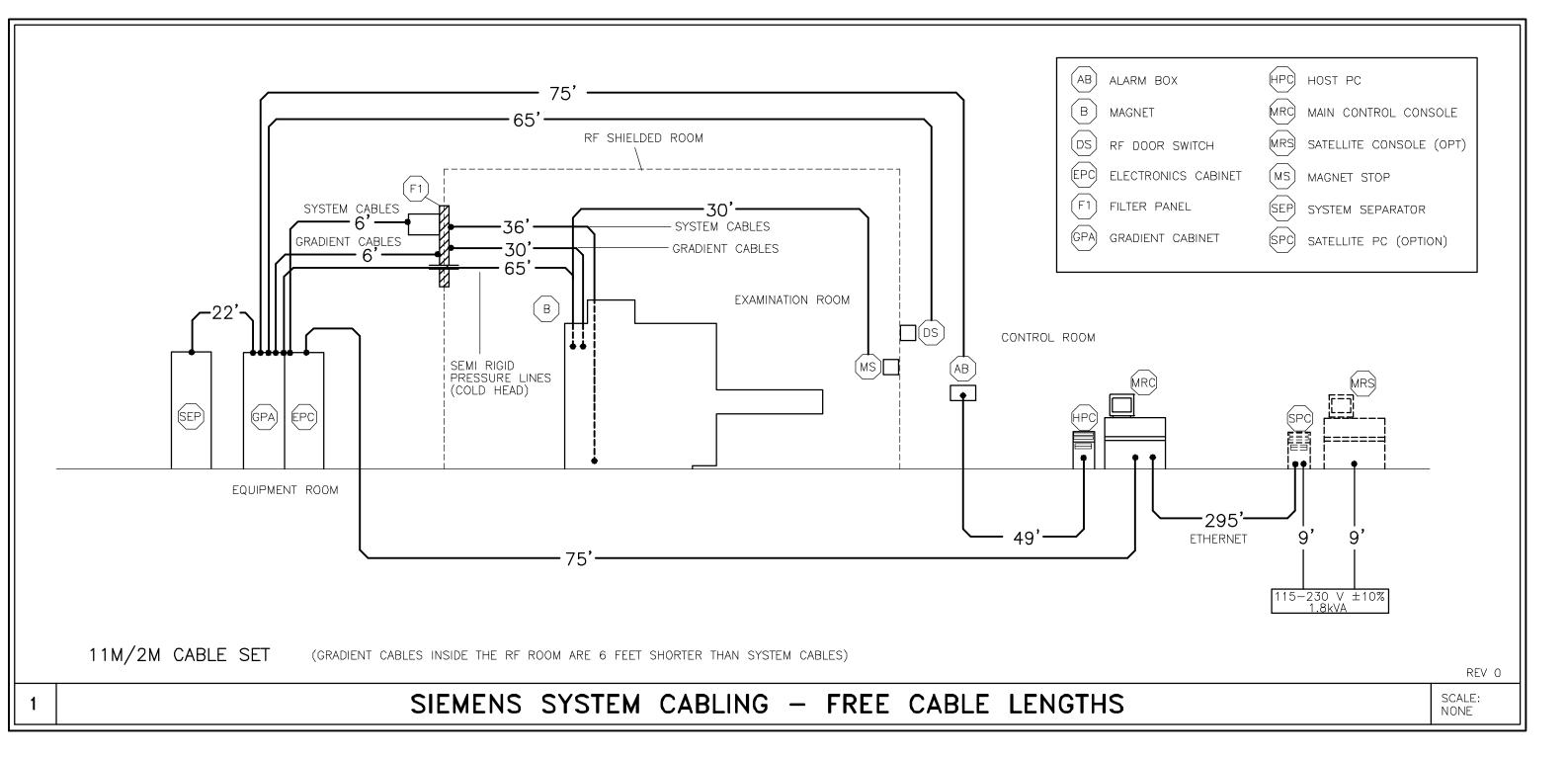
-IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

-ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

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REV 0

REF. 1#: 1**—49M1UW** AS NOTED



#### CONDUITS AND RACEWAYS

1) ALL POWER CONDUCTORS SUPPLIED BY THE CUSTOMER/ CONTRACTOR SHALL BE INSTALLED IN METAL RACEWAY, 600 VOLT CLASS, STRANDED TYPE THHN—THWN, RATED FOR 75°C (165°F) OPERATION. RECOMMEND MINIMUM 5 FEET WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY SIEMENS MEDICAL SYSTEMS.

2) THE CABLE GROUPS INCLUDED WITH THE MAGNETOM SYSTEM MAY BE ROUTED IN THE SAME CABLE TRAY IF PROVIDED WITH AN 8" SEPARATION BETWEEN SMALL SIGNAL LINES, GRADIENT CABLES, AND THE RF TRANSMIT CABLE. A 24" WIDE LADDER TYPE CABLE TRAY IS RECOMMENDED. CABLES SHOULD NOT BE BUNDLED TOGETHER.

3) NOTE THE CABLE CONNECTOR SIZES (LARGEST CONNECTOR SIZE IS 2  $1/2" \times 2 1/2"$ ) FOR CABLE FEED—THROUGHS AND CABLE

4) THE CABLE LENGTHS SPECIFIED ARE THE STANDARD LENGTHS. 5) THE SIEMENS SYSTEM CABLES ARE NOT PLENUM RATED AND SHOULD NOT BE RUN UNPROTECTED IN AN AIR PLENUM UNLESS ENCLOSED IN A SEALED CABLE TRAY OR CONDUIT.

#### SIEMENS REMOTE SERVICES (SRS)

TO ENSURE THE UPTIME OF YOUR SYSTEM DURING THE WARRANTY PERIOD (AND BEYOND WITH A SERVICE AGREEMENT), SIEMENS REMOTE SERVICES (SRS) REQUIRES REMOTE LOCAL AREA NETWORK ACCESS TO SIEMENS SYSTEMS.

SRS REQUIRES ONE OF THE FOLLOWING CONNECTION METHODS:

#### (PREFERRED) VPN CONNECTION

THE PREFERRED CONNECTION METHOD IS (VPN) VIRTUAL PRIVATE NETWORK (WHERE THE CUSTOMER HAS AVAILABLE A VPN CAPABLE FIREWALL OR OTHER VPN APPLIANCE), THIS METHOD PROVIDES THE POSSIBILITY FOR REMOTE SYSTEM DIÁGNOSTICS WITHOUT ADDITIONAL HARDWARE. PLEASE CONTACT SIEMENS REMOTE SERVICES (800-888-SIEM) TO DETERMINE IF THIS METHOD IS SUITABLE FOR

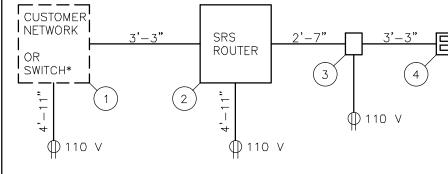
## (OPTIONAL) SRS ROUTER CONNECTION

- THE SRS ROUTER IS SUPPLIED BY SIEMENS AND INSTALLED AT THE CUSTOMER'S SITE, WHILE STILL REMAINING THE PROPERTY OF SIEMENS. THE CUSTOMER'S NETWORK ADMINISTRATOR AND SIEMENS REMOTE SERVICES SHALL DETERMINE THE TYPE AND LOCATION OF THE SRS ROUTER REQUIRED.

- THE SRS ROUTER IS CONNECTED TO AN ANALOG MODEM THAT IS SUPPLIED BY SIEMENS, WHICH THEN IN TURN IS CONNECTED TO AN ANALOG PHONE LINE THAT IS SUPPLIED BY THE CUSTOMER. ONE SRS ROUTER ALLOWS REMOTE DIAGNOSTICS TO MULTIPLE MEDICAL SYSTEMS.

- THE SRS ROUTER SHOULD BE INSTALLED IN A SECURE LOCATION (CUSTOMER'S NETWORK COMPUTER ROOM) THAT HAS LIMITED ACCESS. ÌT CAN BE LOCATED ON A SHELF, TABLE, OR IN A CABINET. THE CONNECTION CABLES (WITH INDICATED LENGTHS BELOW) ARE INCLUDED WITH DELIVERY.

#### SRS ROUTER CONNECTION DIAGRAM



NOTE: ALL POWER OUTLETS ARE SUPPLIED/INSTALLED BY CUSTOMER.

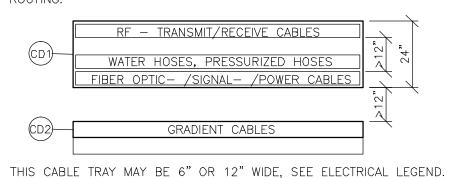
- (1) ETHERNET SWITCH OR HUB, SUPPLIED BY CUSTOMER
- SRS ROUTER, SUPPLIED BY SIEMENS (SIZE: 11.2"W X 8.7"D X 5.5"H, WEIGHT: 2 LBS.)
- (3) ANALOG MODEM, SUPPLIED BY SIEMENS
- (4) ANALOG PHONE LINE, SUPPLIED BY CUSTOMER

BE ORDERED FROM SIEMENS.

\* OPTIONAL SWITCH AND CABLES ARE NOT INCLUDED, BUT CAN

SIEMENS REMOTE SERVICE

THE PROPER ROUTING OF CABLES IS ESSENTIAL TO ACHIEVE GOOD IMAGE QUALITY. RF CABLES MUST BE SEPARATED FROM FIBER OPTIC BY AT LEAST 12" AND FROM THE GRADIENT CABLES BY AT LEAST 12".FIBER OPTIC CABLES MUST ALSO BE SEPARATED FROM THE GRADIENT CABLES BY AT LEAST 12". THIS SHOWS RACEWAY/CABLE



CABLE DESIGNATIONS ARE SHOWN AS AN EXAMPLE, ANY CATEGORY CABLE CAN BE LOCATED IN ANY OF THE COMPARTMENTS OF THE RACEWAY AS LONG AS CORRECT SEPARATIONS ARE MAINTAINED.

WHEN ROUTING RACEWAYS, DO NOT EXCEED THE MAXIMUM LENGTHS LISTED IN DETAIL E-501/2. EXCESS CABLE SHOULD BE ROUTED IN THE RACEWAY IN A MEANDERING METHOD, NEVER ROLLED IN LOOPS.

TRANSMITTER CABLE - 5" WHEN BENT ONCE. TRANSMITTER CABLE - 14.25 WHEN BENT SEVERAL TIMES. FIBER OPTIC CABLE - 6" GRADIENT CABLE - 5.5" (ONLY WITH EXTENDED CABLE SET) FIBER OPTIC CABLE FOR PATIENT OBSERVATION - 2"

THE BENDING RADIUS FOR THE CABLES MUST BE MAINTAINED.

CABLE SEPARATION NONE

#### LIGHTING GUIDELINES

EXAM, CONTROL, AND EVALUATION ROOMS:

1) THE ROOM LIGHTING MUST REMAIN FUNCTIONAL WHEN THE MR SYSTEM IS SWITCHED OFF AND/OR WHEN EMERGENCY SHUTDOWN BUTTONS ARE ACTIVATED.

2) IT MUST BE POSSIBLE TO CONTROL THE INTENSITY OF ILLUMINATION OF APPROXIMATELY 46 FOOT-CANDLES THROUGH GROUP CONNECTION. ALL LIGHTS IN THE EXAMINATION ROOM ARE CONNECTED TO A COMMON SWITCH IN THE CONTROL ROOM. THERE SHOULD BE SEPARATE SWITCHES IN THE EXAMINATION ROOM FOR THE GROUPS OF LIGHTS ABOVE AND NEAR THE PATIENT TABLE, AS WELL AS FOR THE GROUP OF LIGHTS ABOVE THE MAGNET. THE LOCATION OF THESE SWITCHES IS AT THE OWNER'S DISCRETION.

#### **EXAMINATION ROOM:**

1) THE MAGNETIC FIELD ADVERSELY AFFECTS THE OPERATING LIFE OF LIGHT BULBS LOCATED IN THE IMMEDIATE VICINITY OF THE MAGNET, THE FILAMENT IN THE BULB OSCILLATES WITH THE FREQUENCY OF THE POWER SUPPLY. DURING SCANNING, IT IS RECOMMENDED THAT LIGHT FIXTURES IN THE VICINITY OF THE MAGNET (IN EXAMINATION ROOM) BE CONNECTED TO A DC VOLTAGE SUPPLY. THE RESIDUAL RIPPLÉ OF THE DIRECT VOLTAGE SHOULD BE ±5%. WHEN INSTALLING THE LIGHT SOCKET, ENSURE THAT THE POLARITY IS CORRECT.

2) FLUORESCENT LIGHTS, ENERGY-SAVING LIGHTS, AND DIMMERS ARE NOT PERMITTED.

CONTROL AND EVALUATION ROOM:

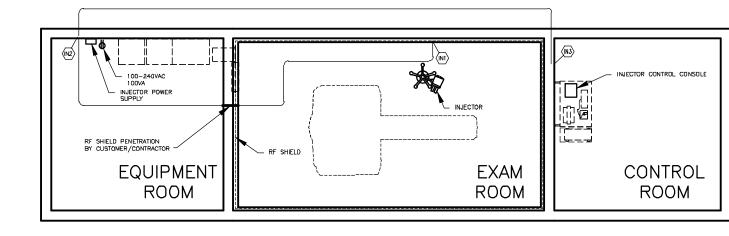
FOLLOW THE APPROPRIATE GUIDELINES FOR LIGHTING IN ROOMS WITH MONITOR WORKSTATIONS.

#### EQUIPMENT ROOM:

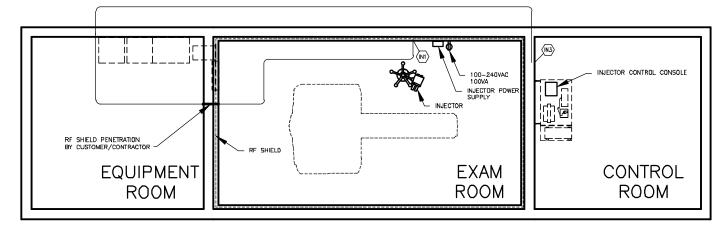
ILLUMINATION INTENSITY SHOULD BE APPROXIMATELY 46 FOOT-CANDLES.

#### INJECTOR INSTALLATION OPTIONS

INJECTORS THAT ARE USED IN MRI APPLICATIONS WILL HAVE THREE COMPONENTS; THE INJECTOR, THE POWER SUPPLY AND THE CONTROL UNIT. THE INJECTOR WILL BE LOCATED IN THE EXAM ROOM AND THE CONTROL UNIT WILL BE LOCATED IN THE CONTROL ROOM. THE POWER SUPPLY MAY BE LOCATED IN THE EQUIPMENT ROOM, OR OPTIONALLY WITHIN THE SCAN ROOM. IN EITHER SITUATION A PENETRATION OF THE RF SHIELD, SEPARATE FROM THE SIEMENS FILTER PANEL, IS REQUIRED.



METHOD 1 INJECTOR POWER SUPPLY IN EQUIPMENT ROOM, PENETRATION TO INCLUDE FILTER AND WAVEGUIDE.



METHOD 2 INJECTOR POWER SUPPLY IN EXAM ROOM, ELECTRICAL SUPPLY IN EXAM ROOM, PENETRATION TO INCLUDE WAVEGUIDE.

WITH EITHER METHOD IT IS CRITICAL THAT THE SINGLE POINT GROUND IS MAINTAINED AND THAT NO ELECTRICAL NOISE IS INTRODUCED TO THE MR SYSTEM DUE TO THE INJECTOR INSTALLATION. ALWAYS REFER TO THE MANUFACTURER'S INSTRUCTIONS.

MRI CONTRAST INJECTOR

SCALE: NONE

REV 1

#### CABLE LENGTH RESTRICTIONS

1) THE CABLE SET LENGTH IDENTIFIES THE "FREE CABLE LENGTH". THIS IS THE LENGTH FROM CONNECTION POINT TO CONNECTION POINT. THE CABLE LENGTH IS NOT THE DISTANCE BETWEEN COMPONENTS.

2) THE GRADIENT CABLES INSIDE THE RF SHIELDED ROOM ARE 6'-0" SHORTER THAN THE OTHER SYSTEM CABLES. THIS MEANS THAT IF THE 22' CABLE SET IS SELECTED, THE GRADIENT CABLES WILL BE 16' IN LENGTH. THE GRADIENT CABLES NEED TO GO UP INTO THE CABLE TRAY IN THE CEILING AT THE FILTER PLATE AND DOWN AT THE MAGNET. THESE VERTICAL RUNS MUST BE DEDUCTED FROM THE TOTAL CABLE LENGTH OF 16'.

REV 8

REV 0

			PROJECT MANAGER: MICHAEL POWERS TEL: (770) 330-1781 VMAIL: EXT: FAX: (770) 369-8232 EMAIL: michael.powers@siemens.com			SIEMENS
				191 PEACHTREE ST.,	ATLANTA, GA 30303 AERA W/MOBILE TAE	
$\triangle$	03/18/15	R101RA VERSION DATED 01/19/15 APPROVED BY CUSTOMERS FOR FINALS	THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.	PROJECT #: <b>150</b> 0	0201	SHEET:
SYM	DATE	DESCRIPTION	ALL RIGHTS ARE RESERVED.	SHEET OF 8 10	DRAWN BY: F. CARUSO	<b>         </b>

ATTENTION:

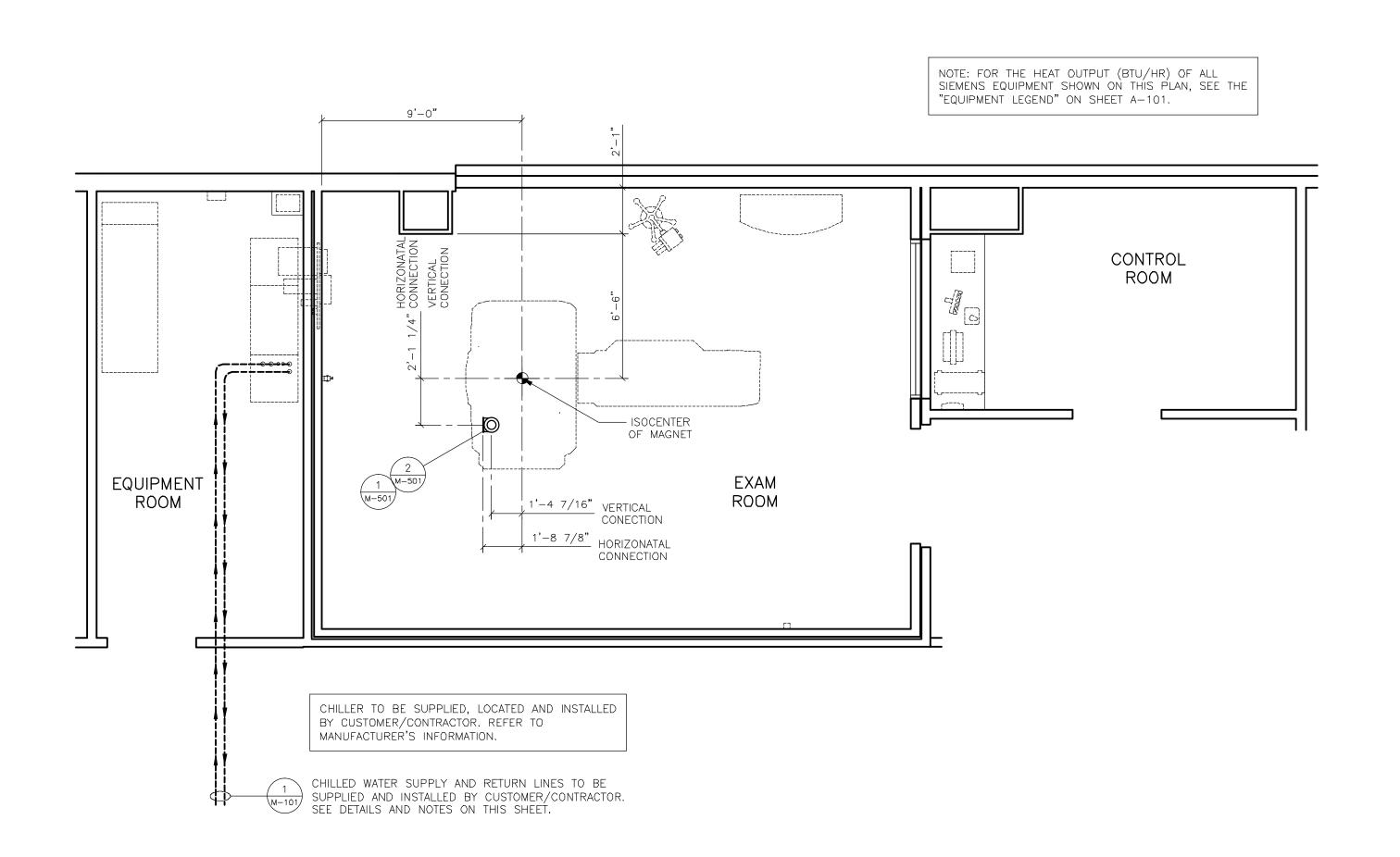
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-IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. PHYSICIST TO SPECIFY RADIATION PROTECTION.

- THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

| REF. 1#: 1-49M1UW | -ISSUE BLOCK-AS NOTED 03/18/15



MECHANICAL PLAN

ATTENTION:

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

#### ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE EXAM ROOM, 70°F±10°F IN THE EQUIPMENT & CONTROL AREAS, RELATIVE HUMIDITY OF 40-60% (NON-CONDENSING) IS REQUIRED EXAMINATION ROOM AND 40-80% (NON-CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK.

2) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS RECOMMENDED FOR THE EXAM ROOM. A MINIMUM AIR EXCHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED. IT IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-50% FRESH AIR INTAKE. AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED CONTROL AND SENSOR TO MONITOR AND ADJUST

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 3,412 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY. AUXILIARY SUPPORT EQUIPMENT (ie. UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.

4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST AIR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST AIR SHOULD BE INSTALLED AT LEAST 6'-6" ABOVE FINISHED FLOOR.

5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.

6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING, IT Ś RECOMMENDED TO INSTALL AN ON-SITE FILTER TO REMOVE DUST PARTICLES GREATER THAN 10 MICRONS.

7) DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET. THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET.

# CHILLED WATER SUPPLY

ALL PIPING AND PLUMBING FIXTURES SHALL BE FURNISHED,

INSTALLED, PRESSURE TESTED AND CHARGED BY THE MECHANICAL

SIEMENS SUPPLIED AND INSTALLED EQUIPMENT UNLESS SPECIFIED

AT THE HIGHEST POINT OF THE WATER SUPPLY PIPE FROM THE CHILLER AN AUTOMATIC DEAERATION DEVICE (AIR VENT) WITH BALL

VALVE MUST BE INSTALLED BY THE MECHANICAL CONTRACTOR.

LEAK TEST ALL PIPING WITH A MIXTURE OF R-22 TRACE GAS

AND NITROGEN. DO NOT PERFORM LEAK TEST WITH WATER.

CONTRACTOR PRIOR TO THE DELIVERY AND INSTALLATION OF THE

DEDICATED, STAND ALONE, CLOSED LOOP WATER CHILLER

OR FACILITY CENTRAL CHILLED WATER SUPPLY TO MEET

REQUIREMENTS LISTED ON THIS SHEET.

-SALL VALVE

中 BOILER DRAIN

-- VISUAL FLOW METER WITH GAUGE

TO 80°F (LOCATED NEAR SEP)

FILTER - 700 MICRONS MINIMUM

A BYPASS MAY BE BENEFICIAL

FOR MAINTENANCE PURPOSES

THERMOMETER WITH RANGE FROM 30°F

PRESSURE GAUGE WITH RANGE FROM 40

TO 110 PSI (LOCATED NEAR SEP)

A CHILLED WATER SUPPLY IS REQUIRED TO THE MRI SYSTEM 24 HOURS A DAY, YEAR ROUND FOR THE COLD HEAD AND GRADIENT SYSTEMS, THIS CAN BE PROVIDED BY A CENTRAL CHILLED WATER SUPPLY OR A SEPARATE STAND ALONE CHILLER THAT MEETS THE STATED REQUIREMENTS. THE CHILLED WATER CAN ALSO BE SUPPLIED BY A DEDICATED KRAUS ECO CHILLER AND INTERFACE PANEL. WITHOUT THE USE OF A DEDICATED KRAUS CHILLER A SEP (SYSTEM SEPARATOR CABINET), MUST BE INCLUDED WITH THE SIEMENS ORDER. THE PIPE SIZE BETWEEN THE KRAUS CHILLER AND INTERFACE PANEL, OR BETWEEN THE WATER SUPPLY AND SEP MUST BE 2 INCH UP TO 82 FEET, 2-1/2 INCH UP TO 148 FEET, CONSULT FOR LONGER PIPE. PERMISSIBLE MATERIALS THAT CAN BE USED FOR THE PIPING ARE: STAINLESS STEEL (V2A, V4A), NON-FERROUS METAL (COPPER, BRASS), SYNTHETIC MATERIAL, PLASTICS, BRAZING SOLDER, HARD SOLDER, OR FITTING SOLDER TYPE 3 AND 4. THERE ARE MATERIALS THAT MAY

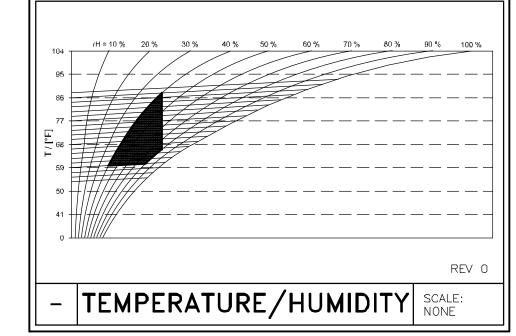
PLATED STEEL, OR STANDARD STEEL PIPES. THESE REQUIREMENTS ARE REQUIRED FOR NEW INSTALLATIONS, IF EXISTING WATER PIPES COMPLY WITH SIEMENS WATER SPECIFICATIONS. THEY DO NOT NEED TO BE REPLACED.

CAUSE DAMAGE TO THE COOLING SYSTEM AND CANNOT BE USED,

THESE MATERIALS ARE ALUMINUM, IRON, CARBON STEEL, ZINC, ZINC

NORMAL TAP WATER MUST BE AVAILABLE FOR FILLING THE SECONDARY WATER CIRCUIT. THERE SHALL BE A HOSE BIB LOCATED WITHIN 65' OF THE SEP, IFP, EPC OR THE KRAUS CHILLER. THE SUPPLY AND RETURN CHILLED WATER PIPES MUST BE LABELED. THE LOCATION OF THE LABELS MUST BE AT ALL CONNECTION AND

REFILLING POINTS AND MUST CONTAIN FLOW DIRECTION AND CONTENTS.



# PIPING SCHEMATIC FOR FACILITY PROVIDED CHILLED WATER

SHUT-OFF VALVES FOR SERVICING SEP CABINET.

kW SEP.

16 FOOT MAX. HOSE LENGTH

GPA

SIEMENS SUPPLIED AND

INSTALLED CABINETS

SEP

THE MECHANICAL ENGINEER OF RECORD SHALL BE ULTIMATELY RESPONSIBLE FOR THE SITE SPECIFIC DESIGN AND SPECIFICATION OF

ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL

CONTRACTOR AND SHALL BE SUBJECT TO COMPLIANCE WITH ALL

CODES. ALL WORK SHALL BE PERFORMED BY THE MECHANICAL

A TAP WATER SUPPLY MUST BE AVAILABE WITHIN 45' OF THE

SEP/IFP AND CHILLER CONNECTION FOR FILLING THE CIRCUIT.

APPLICABLE LOCAL, STATE AND NATIONAL CODES.

CONTENT (WATER/GLYCOL).

THE MECHANICAL AND PIPING SYSTEMS AS SHOWN AND SHALL BE I

THE SUPPLY AND RETURN PIPES FROM THE CHILLED WATER SUPPLY

TO THE SEP/IFP MUST BE LABELED TO SHOW FLOW DIRECTION AND

-6 FOOT MAX. HOSE LENGTH

SIEMENS FOR 45 kW SEP.

1-1/4" MALE THREAD

1" MALE THREAD PROVIDED BY

PROVIDED BY SIEMENS FOR 60

EPC

CHILLED WATER SYSTEM BYPASS WITH FULL SIZE PIPING TO

INCLUDE 3/4" MINIMUM BOILER DRAIN AND MINIMUM 3/4"

BYPASS PIPE WITH BALL VALVE AND 3/4" BOILER DRAIN

THE PIPE OR HOSE FROM THE CHILLED

WATER SUPPLY TO THE SEP CABINET

COOLING CIRCUIT. THE CONNECTION

MAINTAIN THE FUNCTION OF THE WATER

MUST BE 1" NPT FEMALE THREAD FOR

45KW SEP CABINET OR 1-1/4" FOR

MUST BE A MINIMUM 1-1/4"Ø TO

60KW SEP CABINET.

## CHILLED WATER REQUIREMENTS

WATER REQUIREMENTS TO BE MEASURED AT THE SEP CABINET.

FLOW RATE:	23.78-29.05 GPM
WATER TEMPERATURE:	42.8°F – 53.6°F
BTU DISCHARGE TO THE WATER	204,729 BTU/HR
WATER PRESSURE	MAXIMUM 87 PSI
LOSS OF PRESSURE FOR SEP CABINET	<14.5 PSI 11.6 TYPICAL
CHILLED WATER ACIDITY RANGE	6 pH TO 8 pH
CHILLED WATER HARDNESS	<250 ppm CALCIUM CARBONATE
CHLORINE GAS CONCENTRATION	<200 ppm
FILTRATION	500 มm

FOR INSTALLATION OF A DIMPLEX CHILLER, IT IS THE RESPONSIBILITY OF THE CUSTOMER/MECHANICAL CONTRACTOR TO PROVIDE A MIXTURE OF WATER WITH 40% ETHYLENE GLYCOL OR 50% PROPYLENE GLYCOL PRIOR TO CHILLER START UP. DO NOT USE AUTOMOTIVE ANTI-FREEZE.

DIMPLEX CHILLERS USE 70-100 GALLONS PLUS THE PIPE LENGTH. CONTRACTOR TO PROVIDE 65-95 GALLONS OF DE-MINERALIZED WATER. DO NOT USE TAP WATER.

FOR INSTALLATION OF A KKT CHILLER, IT IS THE RESPONSIBILITY OF THE CUSTOMER/MECHANICAL CONTRACTOR TO PROVIDE A MIXTURE OF WATER WITH 35%-38% ETHYLENE GLYCOL PRIOR TO CHILLER START UP. DO NOT USE PROPYLENE GLYCOL OR AUTOMOTIVE ANTI-FREEZE.

PIPING (SUPPLY AND RETURN), SEE EXAMPLES BELOW.

THE AMOUNT OF THE MIXTURE MUST FILL THE CHILLER, MR SYSTEM AND

(1) GALLON OF UNDILUTED GLYCOL, OR (2) GALLONS OF WATER/GLYCOL MIXTURE MUST REMAIN ON SITE FOR USE AFTER START UP.

MIXTURE VOLUME INCLUDING SUPPLY & RETURN+15 GAL. CHILLER & MR						
PIPE DIAMETER	TOTAL LENGTH	MIXTURE VOLUME	GLYCOL NEEDED			
2"	100'	31.3 GALLONS	11.9 GALLONS			
2"	200'	47.6 GALLONS	18.1 GALLONS			
2.5"	100'	40.5 GALLONS	15.4 GALLONS			
2.5"	200'	66.0 GALLONS	25.1 GALLONS			
MIXTURE VOLUME = $3.14 \times (PIPE RADIUS)^2 \times PIPE LENGTH + 15 GALLONS.$ GLYCOL AMOUNT = $35-38\%$ OF MIXTURE VOLUME.						

#### MECHANICAL NOTES

1) THE AIR H.V.A.C. SYSTEM MUST OPERATE FOR A MINIMUM OF 48 CONSECUTIVE HOURS PRIOR TO THE DELIVERY OF THE EQUIPMENT. 2) THE FILTERS MUST BE CHANGED IMMEDIATELY PRIOR TO THE

DELIVERY OF THE EQUIPMENT. 3) SIEMENS REQUIRES THE USE OF A DEDICATED H.V.A.C. SYSTEM FOR THE EQUIPMENT ROOM TO BE LOCATED, SIZED AND SPECIFIED BY THE MECHANICAL ENGINEER OF RECORD AND TO BE SUPPLIED

AND INSTALLED BY THE MECHANICAL CONTRACTOR.

4) SIEMENS RECOMMENDS THAT THE CUSTOMER PROVIDE AND INSTALL AN OXYGEN MONITORING SYSTEM WITH VISUAL AND AUDIBLE ALARMS TO INDICATE WHEN THE OXYGEN CONTAINED IN AMBIENT AIR FALLS BELOW PRE-PROGRAMMED SAFETY LEVELS WITH THE SENSOR TO BE LOCATED IN THE SCAN ROOM IN THE AREA DESIGNATED FOR CRYOGEN FILLING.

5) THE SIEMENS ACTIVE SHIELDED MAGNET RECIRCULATES LIQUID HELIUM, ELIMINATING THE NEED FOR A DEDICATED CRYOGEN STORAGE AREA. THE RECIRCULATING SYSTEM SIGNIFICANTLY REDUCES THE HELIUM "BOIL OFF". THE MAGNET WILL REQUIRE OCCASIONAL FILLING, A DELIVERY ROUTE FOR CRYOGEN DEWARS MUST BE ESTABLISHED. A MINIMUM 36" CLEARANCE IS REQUIRED.

REV C

#### FIRE CONTROL NOTES

) SIEMENS HAS NO SPECIFIC REQUIREMENT FOR FIRE PROTECTION. FÍRE PROTECTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH LOCAL CODES AND CUSTOMER'S INSURANCE REQUIREMENTS. ALL FIRE PROTECTION SYSTEMS SHALL BE DEFINED BY THE ARCHITECT OF RECORD WITH DESIGN, SPECIFICATION AND DETAILING OF THE FIRE PROTECTION SYSTEM BY THE MECHANICAL ENGINEER OF RECORD IN ACCORDANCE WITH SIEMENS GUIDELINES AS STATED HEREIN. THE ELECTRONIC EQUIPMENT OF THE MR SYSTEMS WILL BE DAMAGED BY WATER, REDUCTION OR ELIMINATION OF WATER USED FOR FIRE SUPPRESSION WILL REDUCE POTENTIAL WATER DAMAGE. PRE-ACTION INERT GAS, OR HALOCARBONS OR OTHER METHODS CAN REDUCE OR ELIMINATE WATER. REFER TO YOUR FIRE PROTECTION PROFESSIONAL

2) THE USE OF SMOKE DETECTORS INSIDE OF THE MR EXAMINATION ROOM IS NOT RECOMMENDED, SMOKE DETECTORS, BY DESIGN, CAN GENERATE NOISE THAT MAY INTERFERE WITH THE MRI EXAMINATION AND CAUSE IMAGE ARTIFACTS. IF THE USE OF A SMOKE DETECTOR IN THE EXAMINATION ROOM IS MANDATED BY LOCAL REQUIREMENTS, SPECIAL NOISE TESTS MUST BE PERFORMED BY SIEMENS SERVICE AFTER THE MRI IS OPERATIONAL. MRI EQUIPMENT PERFORMANCE PROBLEMS DUE TO SMOKE DETECTORS ARE THE RESPONSIBILITY OF THE CUSTOMER AND ARE NOT COVERED UNDER WARRANTY OR SERVICE AGREEMENT.

3) ALL MATERIAL USED INSIDE THE MAGNET ROOM SHALL BE NON-MAGNETIC.

4) ALL PENETRATIONS IN THE RF CABIN/SHIELD SHALL BE THROUGH A WAVE GUIDE TO BE EQUIPPED WITH A SIEMENS APPROVED DIELECTRIC COUPLER ON BOTH ENDS OF THE WAVE GUIDE. ALL WAVE GUIDES SHALL BE DESIGNED, DETAILED AND SPECIFIED BY THE RF CABIN/SHIELD CONTRACTOR WITH ALL LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND MECHANICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION, AND FABRICATION OF THE RF CABIN/SHIELD.

5) EACH ELECTRICAL PENETRATION OF THE RF CABIN/SHIELD FOR ELECTRICAL SERVICING OF THE FIRE PROTECTION SYSTEM SHALL BE HROUGH AN RF FILTER TO BE SUPPLIED BY THE RF SHIELD CONTRACTOR WITH FILTER LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND THE ELECTRICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION AND FABRICATION OF THE RF CABIN/SHIELD.

6) IT IS PERMISSIBLE TO RUN "BLACK PIPE" UP TO THE DIELECTRIC COUPLER ON THE OUTSIDE OF THE RF SHIELD.

7) THERE MUST BE NO GROUND CONNECTIONS MADE DURING THE THE INSTALLATION OF EITHER THE PIPING OR ELECTRICAL FOR THE FIRE PROTECTION SYSTEM.

8) THE USE OF HALON IS NOT ACCEPTABLE.

9) THE LOCATION OF FIRE CONTROL SYSTEM COMPONENTS SHALL BE COORDINATED THROUGH THE ARCHITECT OF RECORD WITH ALL LOCATIONS TO BE COORDINATED WITH SIEMENS EQUIPMENT LOCATIONS AS SHOWN ON THE 1/4" SCALE EQUIPMENT LOCATION PLAN.

10) THE FIRE CONTROL CONTRACTOR SHALL VERIFY EQUIPMENT MOUNTING PROCEDURES AND LOCATIONS ON ANY WALLS CONTAINING RF SHIELDING WITH THE SIEMENS PROJECT MANAGER PRIOR TO THE COMMENCEMENT OF WORK.

REV 0

#### COMPRESSOR LINE INSULATION

COMPRESSOR LINES RUNNING FROM THE COMPRESSOR (OR SEP CABINET) TO THE MAGNET ARE INSULATED BY SIEMENS. ADDITIONAL INSULATION (ARMAFLEX OR EQUIVALENT) FOR NOISE REDUCTION (CHIRPING) MAY BE REQUIRED. ADDITIONAL INSULATION NOT PROVIDED BY SIEMENS.

AERA

REV 8

## CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

(770) 330-1781 FAX: (770) 369-8232 EMAIL: michael.powers@siemens.com R101RA VERSION DATED 01/19 3/18/15 APPROVED BY CUSTOMERS FOR FINA -ISSUE BLOCK-

GRADY HEALTH SYSTEM | 191 PEACHTREE ST., ATLANTA, GA 30303 THE USE OR REPRODUCTION OF

ROJECT MANAGER: MICHAEL POWERS

MRI SUITE - MAGNETOM AERA W/MOBILE TABLE PROJECT #:

1500201 10 F. CARUSO

**SIEMENS** 

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

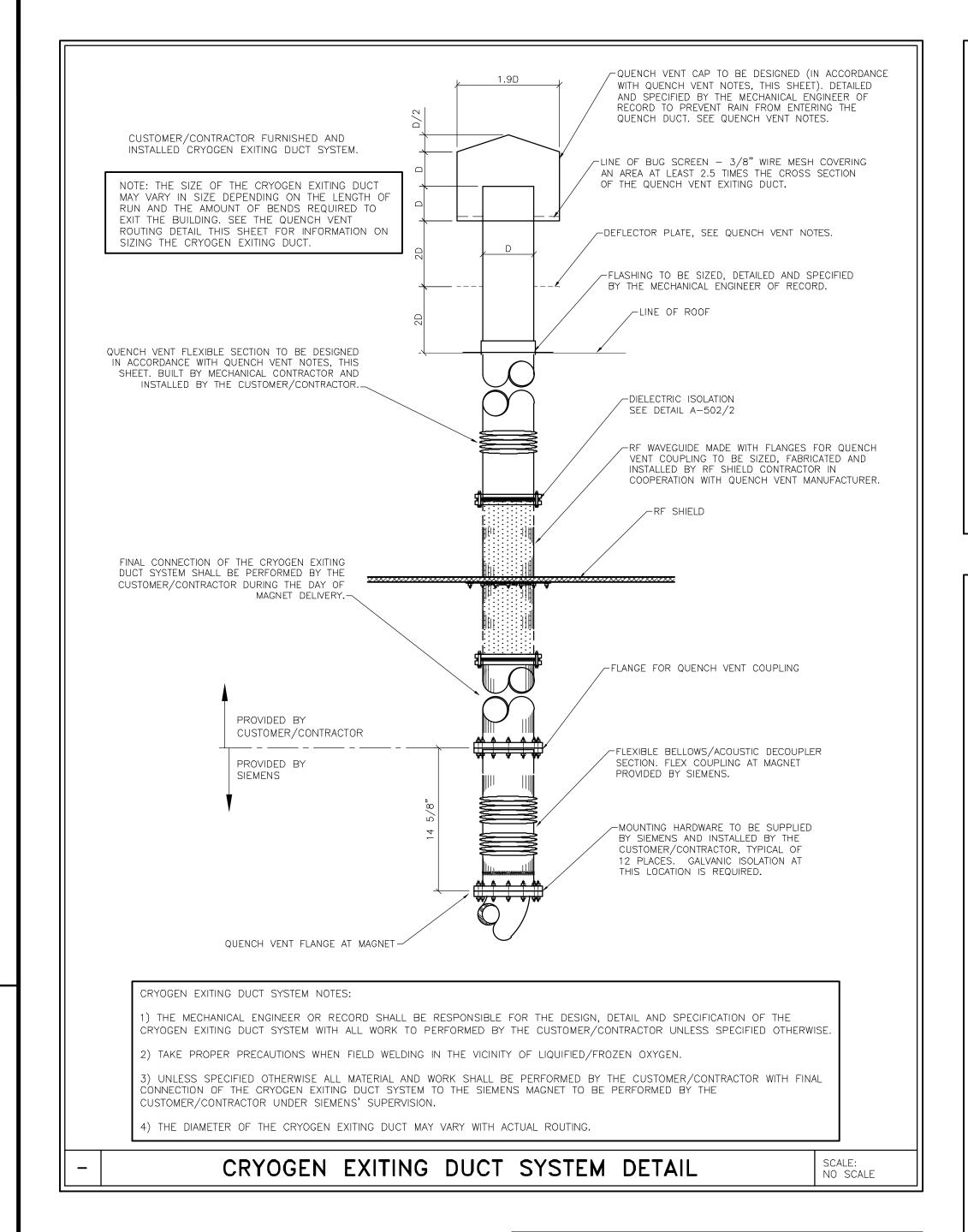
- THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

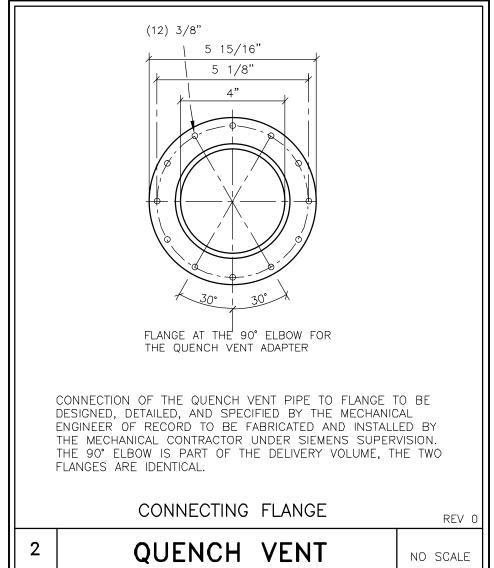
-IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION

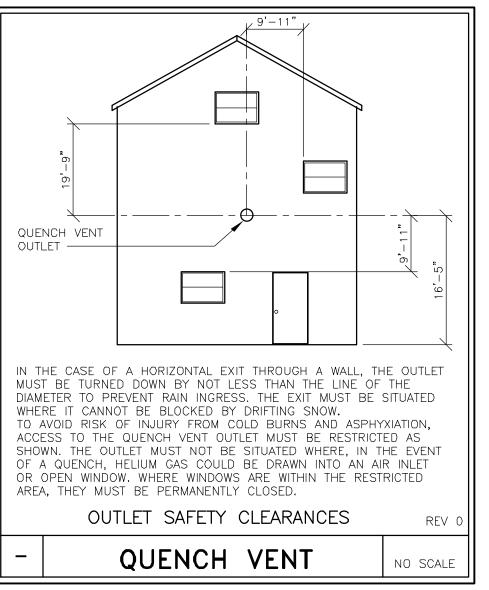
DOCUMENTS FOR REFERENCE.

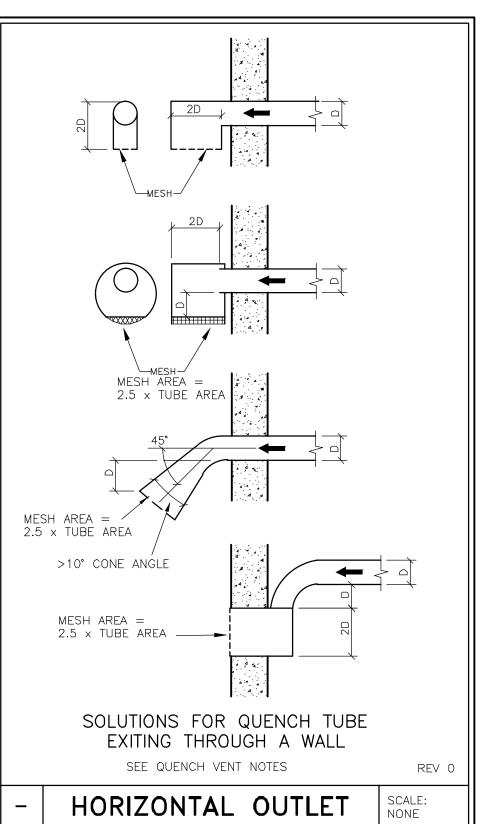
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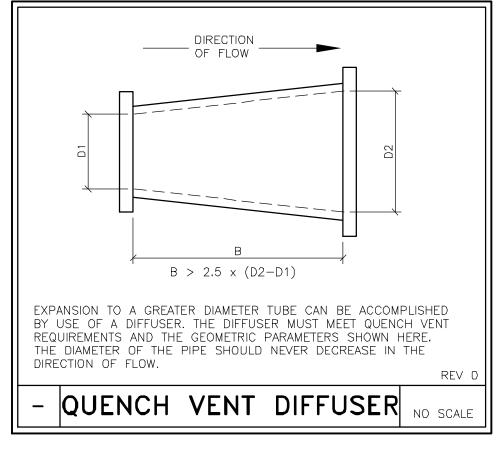
THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. REF. #: 1**—49M1U**W AS NOTED 03/18/15

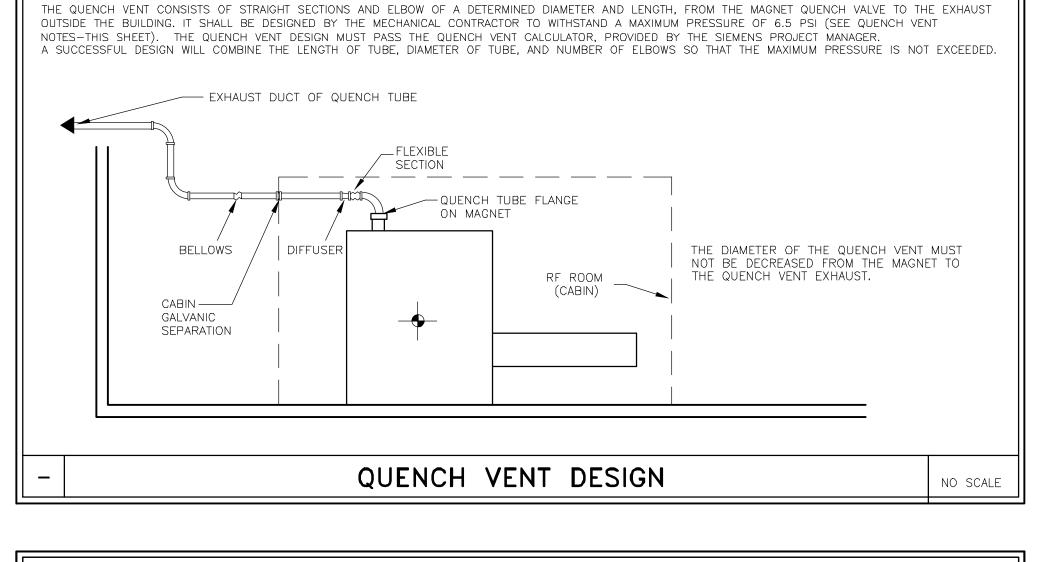


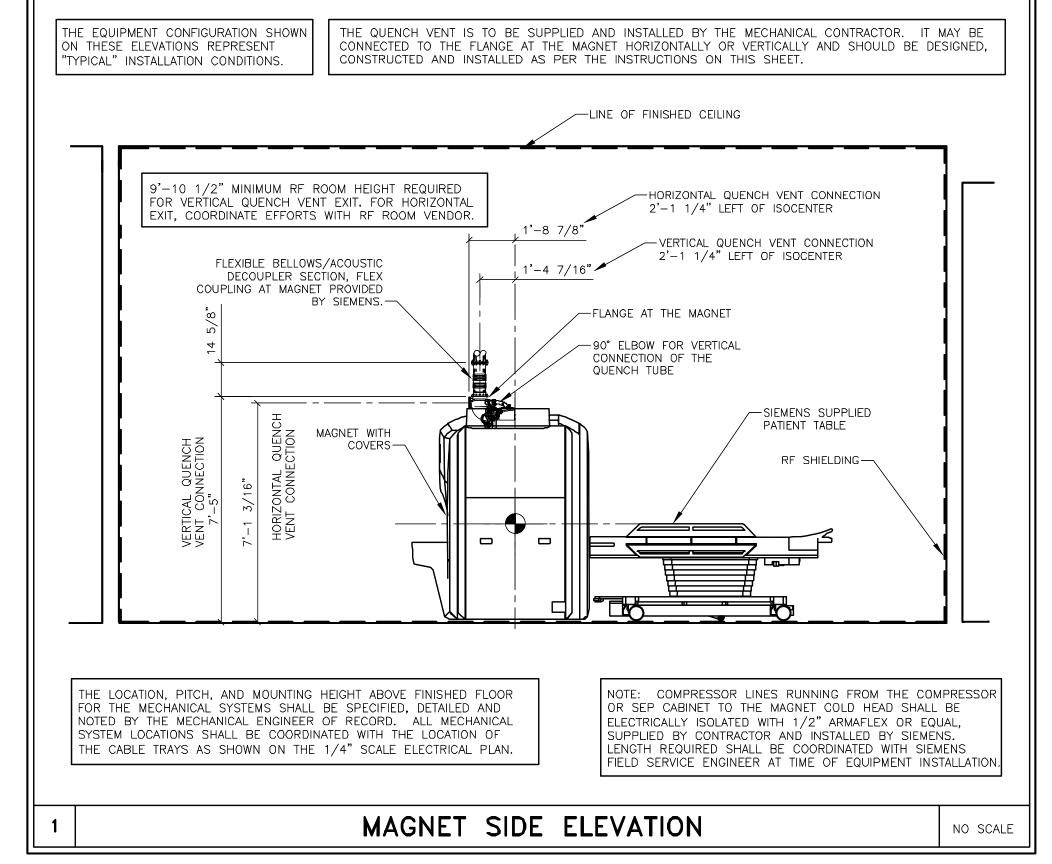


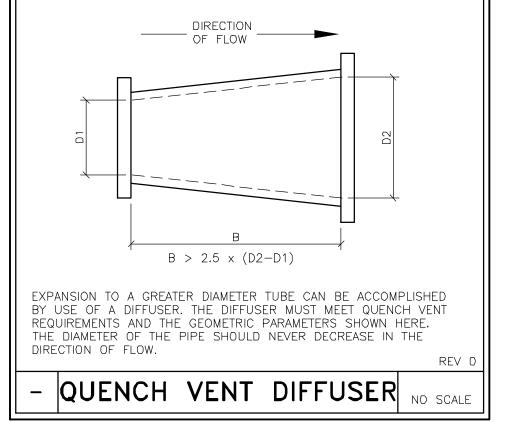












# CRYOGEN NOTES

) "CRYOGENS" IS A TERM USED TO IDENTIFY THE REFRIGERANT USED O MAKE THE MAGNET "SUPER—CONDUCTING", IN THIS APPLICATION, LIQUID AND GASEOUS HELIUM. SPECIAL CARÉ MUST BE TAKEN DURING THE TRANSFILLING OF THE MAGNET WITH CRYOGENS AND NORMAL EXHAUST OF CRYOGENS FROM THE SYSTEM. ASIDE FROM THE OBVIOUS DANGER OF FREEZING, HELIUM GAS WILL ALSO DISPLACE TH OXYGEN IN THE ROOM. THE INSTALLATION OF AN APPROVED TOXGARD MONITORING SYSTEM IS RECOMMENDED.

2) THERE SHALL BE A TRANSPORT ROUTE FOR DELIVERY OF CRYOGENS TO THE EXAM ROOM. SPECIAL VESSELS CALLED DEWARS ARE USED TO TRANSPORT HELIUM, A 250 LITER DEWAR WEIGHS 335 POUNDS AND HAS A 32" DIAMETER, A 500 LITER IS 540 POUNDS, AND IS 42" IN DIAMETER.

3) HELIUM GAS CYLINDERS MAY BE USED DURING THE INITIAL FILLING OF HELIUM INTO THE MAGNET. THE FACILITY IN WHICH THESE MAY BE USED NEEDS TO HAVE THE ABILITY TO TEMPORARILY STORE AND SECURE THESE CYLINDERS THAT WILL PREVENT THEM FROM INADVERTENTLY FALLING OVER.

4) OUTSIDE VENTING OF THE HELIUM IS TO BE PROVIDED BY MEANS OF A VENT PIPE OF NON-MAGNETIC MATERIAL CALLED A QUENCH

HELI	JM CON	TENT				
LITERS AT 100%	1,280					
TYPICAL BOIL OFF RATE	0.0 L/HR	FOR TYPICAL CLINICAL USE,				
TYPICAL REFILL INTERVAL 10 YEARS AND OPERATING TIME.						
WITHOUT THE COLD HEAD RUNNING THE LIQUID HELIUM WILL BOIL OFF FROM 97% TO 0% IN APPROXIMATELY 30 DAYS.						

THE LOSS DURING SHIPPING IS APPROXIMATELY 3.3% PER DAY.

#### QUENCH VENT NOTES

1) IN THE EVENT OF A QUENCH, THE THERMAL ENERGY DISSIPATED CAUSES AN EXTREMELY RAPID BOIL OFF OF THE LIQUID HELIUM. TH SYSTEM MUST BE CAPABLE OF VENTING THE LARGE VOLUME OF GAS GFNFRATED AT THE APPROXIMATE EXPANSION RATIO OF 1:700 FROM LIQUID AT 4.2°K TO ROOM TEMPERATURE GAS. THE EXHAUST SYSTEM IS CRITICAL FOR THE SAFE OPERATION OF THE MAGNET, THE DATA IN THIS DOCUMENT MUST BE FOLLOWED. SINCE HELIUM VENTED IN A QUENCH IS AN ASPHYXIANT & AN EXTREMELY COLD GAS, THE QUENCH TUBE MUST ALWAYS END AT A POINT WHERE ACCESS BY PEOPLE IS NOT POSSIBLE. QUENCH TUBE PLANNING MUST ONLY BE DONE BY QUALIFIED PERSONNEL. IT IS THE OWNER'S RESPONSIBILITY TO ENSURE

2) IF THE QUENCH VENT IS NOT CONFIGURED CORRECTLY THERE IS A RISK OF DANGER THAT MAY LEAD TO DEATH OR SERIOUS INJURY AND CAN RESULT IN STRUCTURAL DAMAGE. THE EXHAUST MUST NOT BE VENTED IN AN ENCLOSED SPACE, THE OPERATOR OF THE SYSTEM MUST PREPARE AN EMERGENCY PLAN IN THE EVENT OF A QUENCH. 3) THE QUENCH TUBE CONSISTS OF STRAIGHT, HYDRAULICALLY SMOOTH SECTIONS, BENDS UP TO 90° AND A DIFFUSER, IF REQUIRED. THE END OF THE TUBE MUST BE PROTECTED FROM RAIN, SNOW, AND FOREIGN OBJECTS. ROUND SECTIONS ONLY, NO SQUARE SECTIONS.

THAT THE QUENCH TUBE IS MAINTAINED IN AN OPERABLE STATE.

4) THE SIEMENS MAGNET HAS A QUENCH VALVE ASSEMBLY FOR CONNECTION TO THE TUBE LOCATED AT THE TOP LEFT SIDE OF THE MAGNET (SEE MAGNET ELEVATION). THE MECHANICAL CONTRACTOR WILL SUPPLY AND INSTALL A QUENCH VENT TUBE WITH CAP, TO BE NON-MAGNETIC STAINLESS STEEL (>22 GAUGE RECOMMENDED). GRADES AISI304, 309, 316, OR 321 ONLY. THERMAL CONDITIONS MAY CAUSE THE TUBE TO CONTRACT UP TO 3mm/METER SO A STAINLESS STEEL BELLOWS OR FLEXIBLE SECTION MUST BE INSTALLED A MINIMUM OF EVERY 32'-9" NOT TO EXCEED 2% OF THE OVERALL LENGTH. THE QUENCH TUBE MAY ALSO BE MADE OF ALUMINUM, EXTRUDED TUBE ALUMINUM GRADES 6063 AND 6082 ONLY MUST BE USED. ROLLED AND WELDED TUBE FROM SHEET ALUMINUM GRADE 5083 ONLY MUST BE USED. THE WALL SECTIONS OF ALUMINUM TUBE MUST BE A MINIMUM 14 GAUGE. THERMAL CONTRACTION OF 4.5 MM/METER MUST BE CONSIDERED FOR ALUMINUM QUENCH TUBES, THE MOVEMENT OF THE BELLOWS MUST BE RESTRICTED TO PREVENT EXCESSIVE EXPANSION DUE TO PRESSURE. THE WEIGHT OF THE TUBE MUST BE SUPPORTED BY THE BUILDING AND BE FLEXIBLE ENOUGH TO ALLOW MOVEMENT FROM THERMAL CONTRACTION. THE WALL EXIT SHOULD ALSO BE FLEXIBLE.

5) THE MAXIMUM INTERNAL PRESSURE IS CALCULATED AT 1.45 PSI. THE MAXIMUM PRESSURE SHOULD BE ENGINEERED FOR 6.5 PSI. 6) USE THE QUENCH VENT CALCULATOR PROVIDED BY SIEMENS TO DESIGN A QUENCH VENT THAT MEETS DESIGN REQUIREMENTS FOR DIAMETER, LENGTH, NUMBER OF ELBOWS AND PRESSURE DROP. ALL BENDS MUST BE SMOOTH WALLED AND HAVE A CENTERLINE TO INTERNAL PIPE DIAMETER RATIO OF 1.5 TO 5.0. EXPANSIONS TO PIPE DIAMETER CAN BE DONE WITH A DIFFUSER. ONLY ROUND TUBE SECTIONS MAY BE USED, RECTANGULAR SECTIONS ARE NOT ALLOWED 7) THERE MUST BE A 12-19 INCH FLEXIBLE SECTION OF PIPE FOR CONNECTION TO THE QUENCH VALVE AT THE MAGNET WITH AN INSIDE DIAMETER GREATER THAN 4" (1.5T) OR 6" (3.0T) AND ABLE TO WITHSTAND 6.5 PSI.

8) SECTIONS OF THE PIPE CAN ONLY BE JOINED BY WELDING OR BOLTED FLANGES WITH FIBER GASKETS. ROTARY FLANGES ARE PERMITTED, VEE CLAMPED FLANGES MAY NOT BE USED. 9) THE PROTECTION AT THE END OF THE TUBE SHALL BE 3/8"

WIRE MESH COVERING AN AREA AT LEAST 2.5 TIMES THE CROSS

SECTION AREA OF THE QUENCH PIPE. 10) WHERE THE QUENCH TUBE EXITS THROUGH A FLAT ROOF, THE THE OUTLET MUST BE ABOVE A LEVEL WHERE WATER COULD ENTER IN THE EVENT THAT THE ROOF DRAINS BECOME BLOCKED. IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET SHALL BE ANGLED DOWNWARD NOT LESS THAN 1 PIPE DIAMETER TO PREVENT RAIN INGRESS. THE EXIT SHALL BE LOCATED ABOVE THE LEVEL OF

11) WHERE THE QUENCH TUBE EXITS VERTICALLY, A RAIN COVER MUST ALSO BE FITTED WITH THE DIAMETER TO BE TWO TIMES THE DIAMETER OF THE QUENCH TUBE. THE CLEARANCE BETWEEN THE RAIN GUARD AND THE MESH SHALL 2 TIMES THE DIAMETER OF THE TUBE. A DEFLECTOR PLATE SHALL BE WELDED TO THE TUBE WHERE IT EXITS THE ROOF TO PREVENT HELIUM FROM RE-ENTERING THE BUILDING. THE DEFLECTOR SHALL BE AT LEAST THE DIAMETER OF THE RAIN GUARD AND LOCATED TWO PIPE DIAMETERS ABOVE

DURING A QUENCH THE HELIUM GAS EXITING THE QUENCH PIPE MAY BE AT TEMPERATURES OF LESS THAN -400°F. DUE TO THIS TEMPERATURE ROOFING MATERIALS OR ITEMS AROUND THE VENT EXIT MAY BE ADVERSELY AFFECTED. CONSIDERATION OF MATERIALS AND ITEMS PLACED NEAR THE VENT EXIT SHOULD BE TAKEN INTO ACCOUNT SO DAMAGE DOES NOT OCCUR.

THE ROOF AND TWO PIPE DIAMETERS BELOW THE RAIN GUARD.

12) TO AVOID INJURY FROM COLD BURNS AND ASPHYXIATION ACCESS TO THE QUENCH VENT MUST BE RESTRICTED BY 9'-11" ON EACH SIDE AND BELOW, AND 19'-9" ABOVE WITH WARNING SIGNS. THE EXIT MUST NOT BE LOCATED WHERE HELIUM GAS COULD BE DRAWN INTO AN AIR INLET OR OPEN WINDOW. A WARNING MUST BE PLACED NEAR THE QUENCH VENT OUTLET.

13) THE QUENCH TUBE MUST HAVE MINIMUM 1" INSULATION FOR THE FULL LENGTH. WITHIN THE RF ROOM THERE SHOULD BE A 1" LAYER OF MINERAL FIBER INSULATION WITH A VAPOR BARRIER AND " CLASS O OR CLASS AP ARMAFLEX. OUTDOOR PIPES MUST BE WEATHERPROOF. THE TUBE MUST HAVE A WARNING POSTED ALONG IT'S ENTIRE LENGTH FOR EXTREMELY COLD HELIUM GAS -AUTHORIZED PERSONNEL ONLY. THE INSULATION MUST NOT TOUCH THE MAGNET COVERS, TO AVOID RF DISTURBANCES THE INSULATION MUST NOT MAKE ELECTRICAL CONTACT WITH THE WAVEGUIDE.

14) GALVANIC SEPARATION MUST BE PROVIDED BETWEEN THE MAGNET, THE QUENCH VENT, THE RF ROOM, AND THE BUILDING, TWO SEPARATIONS ARE REQUIRED USING STAINLESS STEEL BOLTS, INSULATING BUSHES AND LOCKING NUTS. NO OTHER DESIGNS ARE PERMITTED FOR SAFETY.

15) THE DESIGN AND CONSTRUCTION OF THE QUENCH PIPE MUST BE DOCUMENTED WITH DRAWINGS AND CALCULATIONS THAT ARE KEPT WITH INSTALLATION DOCUMENTS. IT MUST COMPLY WITH THE REQUIREMENTS IN THIS DOCUMENT BEFORE BEING CONNECTED TO THE MAGNET.

AERA

									REV 8
			TEL: (770) 330- VMAIL: FAX: (770) 369-					SIEME	ENS
			GR		191 PEACHTREE	ST.,	ATLANTA, GA 30303 AERA W/MOBILE TAE		ΞM
$\triangle$	03/18/15	R101RA VERSION DATED 01/19/15 APPROVED BY CUSTOMERS FOR FINALS	SIEMENS AUTHORESULT IN PROS	PRODUCTION OF LOCK WITHOUT ORIZATION WILL SECUTION UNDER OF THE LAW.	PROJECT # <b>15</b> (		)201	SHEET:	Λ1
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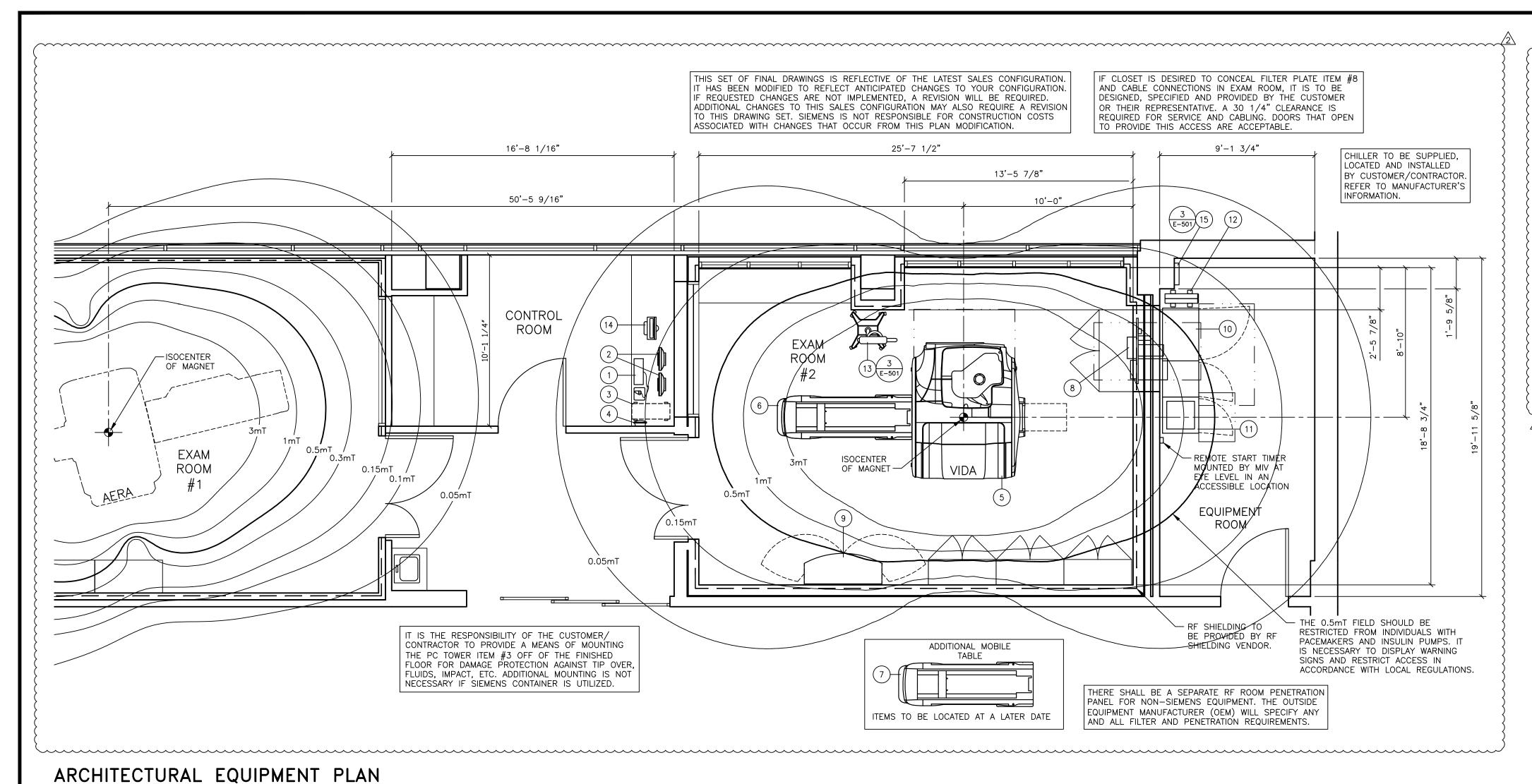
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SCALE: 1/4" = 1'-0'

#### OEM ACCESSORY ITEMS

FOR OEM (OUTSIDE EQUIPMENT MANUFACTURER) ITEMS THAT ARE SOLD AS ACCESSORIES TO THE SIEMENS MR SYSTEM (INJECTORS, LASER LIGHTS, ELASTOGRAPHY, CHILLERS, UPS, ETC.), PLEASE REFER TO THE SIEMENS PROJECT MANAGER AND THE ACTUAL EQUIPMENT VENDOR FOR TECHNICAL INFORMATION AND INSTALLATION REQUIREMENTS.

#### EXAM ROOM LIGHTING

THE MAGNETIC FIELD ADVERSELY AFFECTS THE OPERATING LIFE OF LIGHT BULBS LOCATED IN THE IMMEDIATE VICINITY OF THE MAGNET. THE FILAMENT IN THE BULBS OSCILLATES WITH THE FREQUENCY OF THE POWER SUPPLY. LIGHTS IN THE VICINITY OF THE MAGNET CONNECTED TO A DC POWER SUPPLY CAN REDUCE THIS EFFECT. RESIDUAL DC RIPPLE SHOULD BE LESS THAN 5%.

## NOISE LEVELS

SYSTEM ROOM	NOISE LEVEL / dB(A)
CONTROL ROOM	<55
EXAMINATION ROOM	XQ GRADIENTS 87.4 dB(A) — 8 HOUR AVERAGE 102.9 dB(A) MAXIMUM, MEASURED INSIDE THE EXAM ROOM.
EQUIPMENT ROOM	<65

NOISE LEVELS ARE BASED ON AN AVERAGE MEASUREMENT OVER 8 HOURS OF CLINICAL SCANNING. PEAK LEVELS MAY BE HIGHER FOR CERTAIN SEQUENCES.

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL/ STATE/OSHA NOISE REGULATIONS ARE ADHERED TO. ADDITIONAL NOISE DATA MAY BE PROVIDED BY SIEMENS PROJECT MANAGER UPON REQUEST

## CASEWORK & ACCESSORY NOTES

1) ALL CASEWORK IS EITHER EXISTING OR IS TO BE DESIGNED, DETAILED, FURNISHED AND INSTALLED BY THE CUSTOMER AND/OR CONTRACTOR. FOLLOW DESIGN RECOMMENDATIONS INCLUDED HEREWITH, AS THEY ARE ESSENTIAL FOR THE SUCCESSFUL INSTALLATION & OPERATION OF THE SIEMENS EQUIPMENT.

2) ALL FURNITURE (CHAIRS, ETC.) FOR THE CONTROL ROOM ARE TO É PROVIDED BY THE CUSTOMER. REV 0

#### CONSTRUCTION REQUIREMENTS

THE CUSTOMER/CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL CONSTRUCTION MATERIALS INCLUDING ELECTRICAL AND MECHANICAL DEVICES REQUIRED BY SIEMENS SPECIFICATIONS AND TO ENSURE THAT THE MATERIAL USED INSIDE THE RF-SHIELDING IS AS FREE OF FERROMAGNETIC PROPERTIES AS POSSIBLE. STEEL WALL STUDS ARE PERMITTED BUT MUST BE SECURED PROPERLY. ANY FERROUS MATERIAL INSIDE THE EXAM ROOM MAY BECOME A MISSILE AND CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT. FERROUS ITEMS INSIDE THE EXAM ROOM ARE THE LIABILITY OF THE CONTRACTOR AND/OR INSTALLER.

#### MAGNET CO-SITING

MINIMUM DISTANCE MAGNET-MAGNET (SIEMENS)					
	0.2T	0.35T	1.0T	1.5T	3.0T
0.2T	32'-9"	32'-9"	16'-5"	19'-9"	32'-9"
0.35T	32'-9"	32'-9"	16'-5"	19'-9"	32'-9"
1.0T	16'-5"	16'-5"	14'-10"	16'-5"	19'-9"
1.5T	19'-9"	19'-9"	16'-5"	16'-5"	19'-9"
3.0T	32'-9"	32'-9"	19'-9"	19'-9"	19'-9"

DO NOT RAMP ONE MAGNET WHILE THE OTHER IS RUNNING APPLICATIONS. SHIM IS ONLY OPTIMIZED WHEN BOTH MAGNETS ARE RAMPED UP DURING THE SHIMMING PROCEDURE.

WHEN CO-SITING AN MR SYSTEM WITH A MAGNETIC NAVIGATION SYSTEM THE MINIMUM DISTANCE FOR CLINICAL IMAGING IS 98'-6", FOR SPECTROSCOPY THE MINIMUM SEPARATION IS 121'-5".

## MAGNETIC FIELD WARNING

PLEASE BE AWARE THAT DURING THE CALIBRATION PHASE OF THE MRI INSTALLATION, THE MAGNET WILL BE AT FULL FIELD STRENGTH AND ALL NECESSARY PRECAUTIONS WHEN WORKING IN THE VICINITY OF STRONG MAGNETIC FIELDS MUST BE TAKEN. WHEN THE CALIBRATION OF THE MAGNET OVERLAPS WITH FINAL CONSTRUCTION ACTIVITIES, THERE IS THE POSSIBILITY OF THE INTRODUCTION OF FERROUS MAGNETIC OBJECTS BY WORKERS INTO THE MR ROOM. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THAT ALL PRECAUTIONS ARE TAKEN TO ENSURE THAT THIS DOES NOT HAPPEN, AS EQUIPMENT DAMAGE AND SERIOUS BODILY INJURY COULD OCCUR.

CEILING HEIGHTS

MAGNET EXAMINATION ROOM: 7'-11" MINIMUM EQUIPMENT ROOM: 7'-3" MINIMUM ALL ANCILLARY AREAS: 6'-11" MINIMUM

#### EQUIPMENT LEGEND DESCRIPTION SMS | WEIGHT | BTU/HR | DIMENSIONS (INCHES) REMARKS SYM | (LBS) | TO AIR W D 1) | MRC KEYBOARD --- 27 1/4 | 10 1/8 | 1 3/4 | ON CUSTOMER'S COUNTER COLOR MONITOR FOR MRC 239 | 18 5/16 | 16 15/16 | 4 3/4 | ON CUSTOMER'S COUNTER 11 | 27 | 18 1/8 | BELOW COUNTER TOP HOST PC MRC (4) | ALARM BOX 9 WALL MOUNTED 9 4 ---VIDA MAGNET IN OPERATION ⟨B⟩ | 16,204 9,383 96 1/2 | 80 5/8 (6) PATIENT TABLE (MOBILE) --- | 29 1/2 | 97 1/4 | 21-41 7) | ADDITIONAL PATIENT TABLE (MOBILE) 529 --- | 29 1/2 | 97 1/4 | 21-41 (8) | RF-FILTER PLATE (HORIZONTAL) 853 | 46 1/2 | 35 1/8 | 21 5/8 | WALL MOUNTED --- | 55 1/8 | 21 1/8 | 47 5/8 | WEIGHT WITHOUT COILS 9) | SURFACE COIL CART 110 GPA/EPC ELECTRONICS CABINET (XQ GRADIENTS) 3,307 <3,412 | 61 1/2 | 26 | 77 1/2 SEP CABINET 701 <3,412 | 25 5/8 | 25 5/8 | 73 5/8 LIEBERT GXT4 UPS WITH BATTERY 1,121 17 | 23 5/8 | 6 3/4 164 MRXPERION INJECTOR STAND AND HEAD --- 23 3/8 28 3/8 71 7/8 INJECTOR ON STAND MRXPERION ICBC INJECTOR CRU 15 3/4 | 10 1/4 | 13 1/2 | ON CUSTOMERS COUNTER 17.6 MRXPERION ICBC INJECTOR POWER SUPPLY | 15 1/2 | LOCATED IN EXAM ROOM 15 3/8 | 3 3/8 ---OUTSIDE 5mT FIELD

#### PROTECTING THE MAGNETIC FIELD

THE SIEMENS MR SYSTEM UTILIZES A SUPERCONDUCTIVE MAGNET WITH AN EXTREMELY HOMOGENOUS FIELD WITHIN THE MAGNET TO PROVIDE DISTORTION FREE IMAGING. THE PRESENCE OF FERROMAGNETIC MATERIAL WITHIN THE VICINITY OF THE MAGNET CAN ADVERSELY AFFECT THE UNIFORMITY OF THE USEFUL MAGNETIC FIELD. THIS APPLIES TO STATIONARY FERROUS MATERIAL (STRUCTURAL STEEL) WHICH IS TO BE MINIMIZED. STATIONARY STEEL COMPENSATION MAY BE ACHIEVED BY MAGNET POSITIONING AND SELECTIVE JSE OF SHIMS. DISTORTION CAUSED BY MOVING FERROMAGNETIC OBJECTS (MOTOR VEHICLES, ELEVATORS) IS MORE DIFFICULT TO COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

## PROTECTING THE ENVIRONMENT

PROTECTING THE IMMEDIATE ENVIRONMENT FROM THE EFFECT OF THE MAGNETIC FIELD REQUIRES CONSIDERATION. INFORMATION STORED ON MAGNETIC DATA CARRIERS SUCH AS DISCS, TAPES AND CARDS MAY BE ERASED IF NEAR THE MAGNET. CAUTION WITH REGARD TO HEART PACEMAKERS MUST BE EXERCISED. MOST PACEMAKER UNITS EMPLOY A REED RELAY WHICH MAY CHANGE OPERATING MODE WHEN EXPOSED TO AN EXTERNAL MAGNETIC FIELD. PACEMAKER USERS MUST BE KEPT AT A SPECIFIED DISTANCE FROM THE MAGNET WHICH IS DETERMINED BY HE MAGNET FIELD STRENGTH.

## MAGNET SITING REQUIREMENTS

T MUST BE ENSURED THAT THE MAGNET IS LOCATED SO THAT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD ARE NOT ADVERSELY AFFECTED BY EXTRANEOUS FIELDS AND STATIC OR DYNAMIC FERROMAGNETIC OBJECTS. X & Y AXES Z AXIS | SOURCE OF INTERFERENCE FLOOR STEEL REINFORCEMENT<20 LBS./ FT2 IRON BEAMS < 67 LBS./FT. 18'-1" | 21'-4" | MOVING METAL UP TO 110 LBS. WATER COOLING UNIT (CHILLER) 19'-9" | 23'-0" | MOVING METAL UP TO 440 LBS. 26'-3" MOVING METAL UP TO 2.000 LBS. 23'-0" 31'-2" ELEVATORS, TRUCKS UP TO 10,000 LBS. AC TRANSFORMERS UP TO 650 KVA 16'-5" AC TRANSFORMERS UP TO 1600 KVA 5'-0" AC CABLES, MOTORS LESS THAN 100 AMPS 5'-0" AC CABLES, MOTORS LESS THAN 250 AMPS 5'-0" 8'-3" AC CABLES, MOTORS LESS THAN 1000 AMPS

FOR IRON OBJECTS LOCATED UP TO 45° FROM THE Z AXIS, THE

DISTANCES FOR THE Z AXIS MUST BE USED. REDUCTION IS

POSSIBLE WITH STEEL SHIELDING.

#### MAGNETIC FRINGE FIELDS

MAGNETIC FIELDS MAY AFFECT THE FUNCTION OF DEVICES IN THE VICINITY OF THE MAGNET. THESE DEVICES MUST BE OUTSIDE CERTAIN MAGNETIC FIELDS. THE DISTANCES LISTED ARE FROM THE MAGNET ISOCENTER AND DO NOT CONSIDER ANY MAGNETIC ROOM SHIELDING.

FIELD	X & Y	Z AXIS	DEVICES
3.0mT	7'-2"	10'-8"	SMALL MOTORS, WATCHES, CAMERAS, CREDIT CARDS, MAGNETIC DATA CARRIERS.
1.0mT	8'-1"	13'-4"	COMPUTERS, MAGNETIC DISK DRIVES, OSCILLOSCOPES, PROCESSORS
0.5mT	8'-7"	15'-2"	CARDIAC PACEMAKERS, X-RAY TUBES, INSULIN PUMPS, B/W MONITORS, MAGNETIC DATA CARRIERS (LONG-TERM STORAGE)
0.2mT	10'-3"	18'-9"	SIEMENS CT SCANNERS
0.15mT	11'-0"	20'-1"	CRT MONITORS, SIEMENS LINEAR ACCELERATORS
0.05mT	15'-9"	26'-7"	X-RAY IMAGE INTENSIFIERS, GAMMA CAMERAS, PET/CYCLOTRON, ELECTRON

MICROSCOPES, LINEAR ACCELERATORS THE OWNER/USER IS TO VERIFY THE LOCATION OF THE 0.5mT FIELD AND ENSURE THAT IT IS MAINTAINED AS A RESTRICTED AREA.

#### PROJECT MILESTONES

Pf	ROJECT MILESTONES TO BE COMPLETED BEFORE EQUIPMENT DELIVERY	REFERENCE SHEET						
	DELIVERY PATH VERIFIED, COORDINATED DELIVERY PATH CLOSE UP PRIOR TO CALIBRATION	A-102						
	COORDINATE RF ROOM CONSTRUCTION/ROOM FINISH PRIOR TO CALIBRATION	A-102						
	FLOOR LEVEL MEETS SIEMENS SPECIFICATIONS AND ALL BASEPLATES INSTALLED	S-101						
	RF ROOM TEST COMPLETED AND MEETS SIEMENS SPECIFICATIONS	A-502						
	ALL RACEWAY, CONDUITS AND JUNCTION BOXES INSTALLED	E-101						
	ALL PLUMBING INSTALLED AND TESTED	M-101						
	POWER DISTRIBUTION COMPLETED PER SYSTEM REQUIREMENTS	E-102						
	ALL EPO BUTTONS INSTALLED AND TESTED	E-101						
	MR COMPATIBLE LIGHTING AND CEILING GRIDS INSTALLED IN MAGNET ROOM	A-101						
	CONTROL ROOM COMPLETED ENOUGH TO FACILITATE THE INSTALLATION	A-101						
	CHILLED WATER SUPPLY AVAILABLE AND MEETS SIEMENS SPECIFICATIONS	M-101						
	HVAC SYSTEM COMPLETE, TESTED AND WORKING PER SIEMENS SPECIFICATIONS	M-101						
	QUENCH PIPE CONSTRUCTED AND INSTALLED PER SIEMENS SPECIFICATIONS	M-501						
	ETHERNET CONNECTION INSTALLED AND IN OPERATION AT THE SHOWN LOCATIONS	E-101						

#### STATE AGENCY REVIEW

6/25/21 APPROVED BY CUSTOMERS FOR FINALS

PRIOR TO SIEMENS EQUIPMENT INSTALLATION, APPROVAL OF CONSTRUCTION OR STRUCTURAL MODIFICATIONS FOR DIAGNOSTIC OR THERAPEUTIC PURPOSES, MUST BE OBTAINED BY THE CUSTOMER FROM THE APPROPRIATE STATE AGENCY, IF APPLICABLE.

RESOURCE LIST	(SMS USE ONL	_Y)
DESIGNATION	PG NUMBER	DATE
PLANNING GUIDE	M11-030.891.01.03.02	11/19
MAGNETIC SHIELDING CALCULATIONS	89727-1357201	05/21
MAGNETIC SHIELDING CALCULATIONS	89727-1357686	05/21

VIDA REV 16

			PROJECT MANAGER: PATRICK RUIZ TEL: (770) 402-1365 VMAIL: EXT:		SIEMENS
7	06/25/21	COMPLETE NEW SET OF DWGS BASED ON LATEST WALL BACKGROUNDS/		_	SIEWIEW:
7	06/25/21	MODIFIED MAGNET GAUSS FIELDS TO REFLECT LATEST SHLD CALCS./	<b>GRADY MEMORI</b>	AL HOSPITAL CO	ORPORATIO
7	06/25/21	ALL LAYOUTS, LEGENDS NOTES & DETAILS UPDATED ACCORDINGLY		NIOR DRIVE, SOUTH EAST, ATLANTA, #2 — MAGNETOM VIDA XQ GRADIEN	
7	05/11/21	NEW WALL BACKGROUNDS/ ADD CASEWORK & SHIFT MAGNET	THIS THE BLOCK WITHOUT		SHEET:
		00077ECDDA DATED 00/10/00	SIEMENS AUTHORIZATION WILL 🖝	0002256	$\Lambda$

ALL RIGHTS ARE RESERVED.

SCALE: AS NOTED

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

DOCUMENTS FOR REFERENCE.

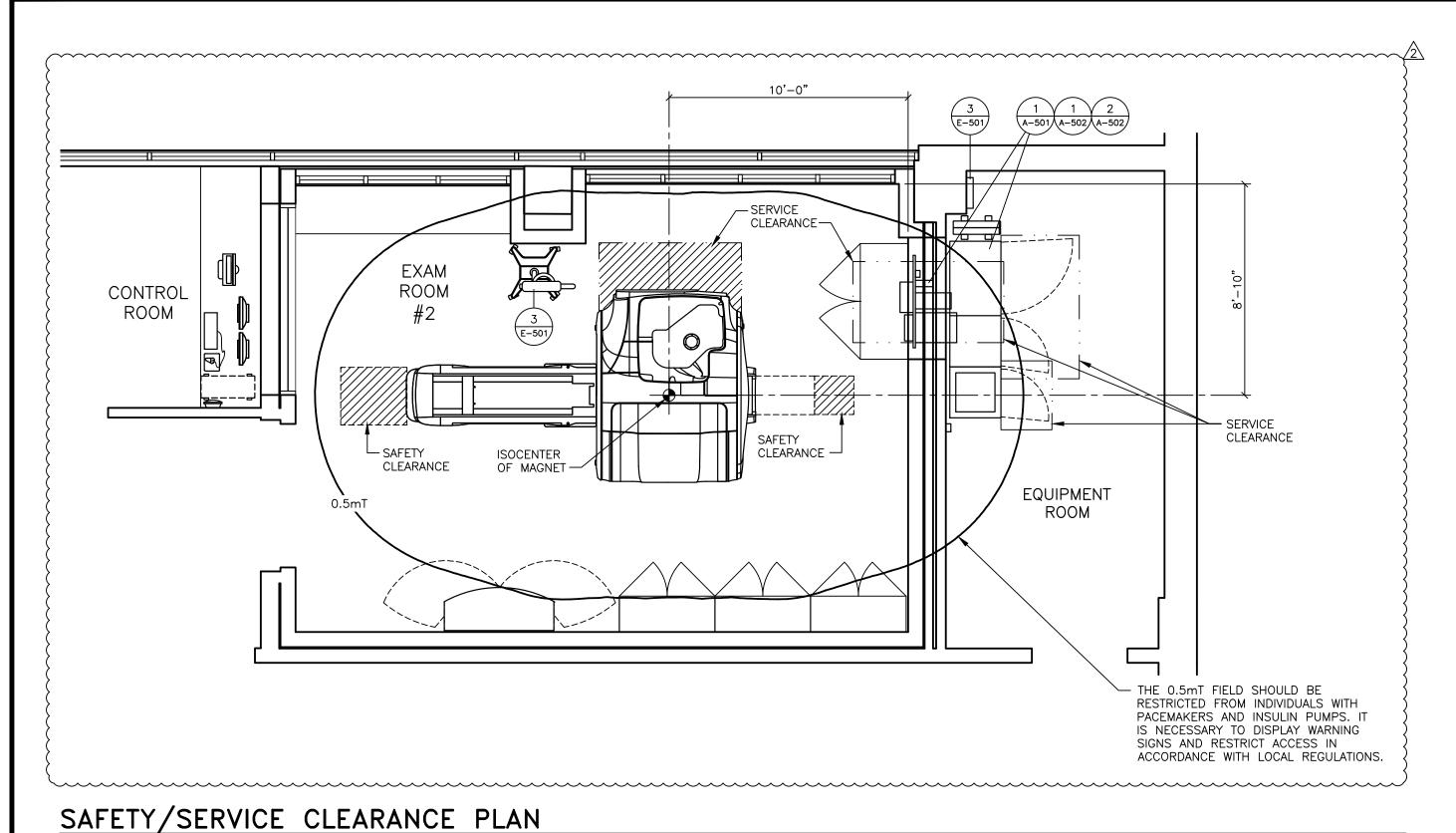
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION

REV 2

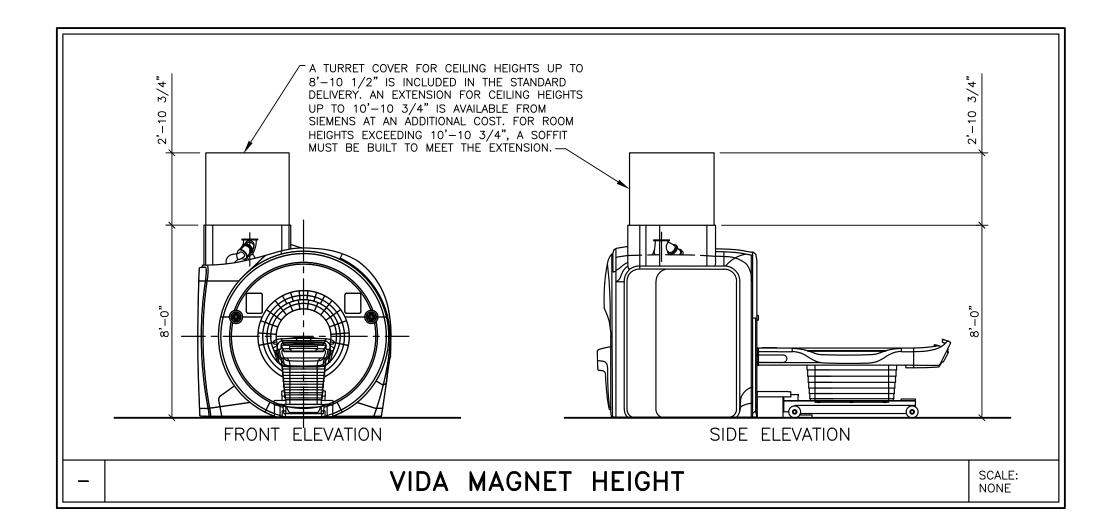
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

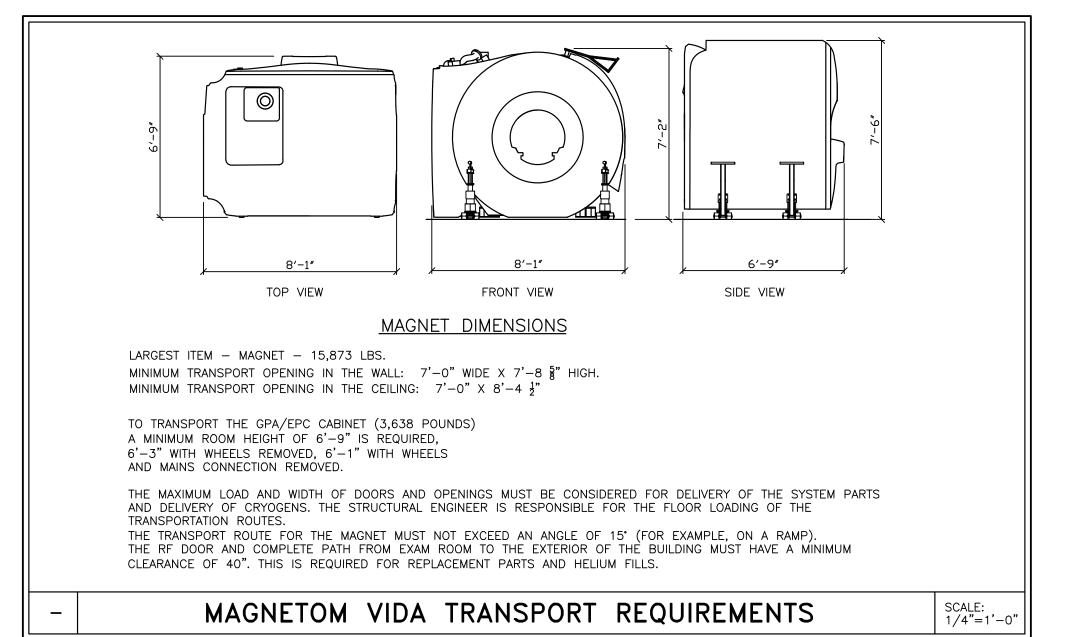
DESCRIPTION -ISSUE BLOCK-

2003356 RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. REF. #: 30238438 06/25/21



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





#### ARCHITECTURAL NOTES

1) ALL PRELIMINARY EQUIPMENT LAYOUTS SUBMITTED BY SIEMENS

HEALTHCARE ARE BASED ON THE RECOMMENDED SPACE NECESSARY FOR THE OPERATION AND SERVICEABILITY OF THE EQUIPMENT BEING PROPOSED. SIEMENS WILL NOT SUBMIT AN EQUIPMENT LAYOUT THAT IS NOT IN THE BEST INTEREST OF BOTH THE CUSTOMER AND SIEMENS. ALL EQUIPMENT LAYOUTS ARE BASED EITHER ON AN ACTUAL SITE SURVEY OR ARCHITECTURAL DRAWINGS SUPPLIED TO SIEMENS. SIEMENS WILL NOT BE RESPONSIBLE FOR ANY ALTERATIONS THAT ENCROACH WITHIN DESIGNATED SAFETY AND SERVICE CLEARANCE ZONES AS INDICATED ON DRAWINGS (I.E., PIPE CHASES, VENTILATION DUCTS, CASEWORK, AND SOFFITS, ETC.) MADE BY THE CUSTOMER OR REQUIRED BY A CUSTOMER'S ARCHITECTURAL FIRM ONCE PRELIMINARY DRAWINGS HAVE BEEN SUBMITTED AND APPROVED. DO NOT ALTER ANY SPECIFICATIONS AND/OR DIMENSIONS WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SIEMENS PROJECT MANAGER. 2) SIEMENS HEALTHCARE IS NOT AN ARCHITECTURAL OR ENGINEERING FIRM. DRAWINGS SUPPLIED BY SIEMENS ARE NOT CONSTRUCTION DRAWINGS. THEREFORE, THESE DRAWINGS ARE TO BE USED ONLY FOR INFORMATION TO COMPLEMENT ACTUAL CONSTRUCTION DRAWINGS AVAILABLE FROM A CUSTOMER APPOINTED ARCHITECTURAL REPRESENTATIVE OR A CUSTOMER'S ENGINEERING DESIGN GROUP. THE CUSTOMER'S ARCHITECT AND GENERAL CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE CODES AND PROFESSIONAL DESIGN REQUIREMENTS INCLUDING OSHA/NEC SAFETY CLEARANCE REQUIREMENTS IN ADDITION TO SIEMENS-REQUIRED SAFETY/SERVICE CLEARANCES SHOWN. 3) THE CUSTOMER IS RESPONSIBLE FOR ALL ROOM AND AREA

PREPARATION COSTS, PROFESSIONAL FEES, PERMITS, REPORTS, AND INSPECTION FEES. 4) EQUIPMENT WARRANTIES, EXPRESSED OR IMPLIED ON THE PART OF

SIEMENS SHALL BE CONTINGENT UPON STRICT COMPLIANCE WITH THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL AND RECOMMENDATIONS AND REQUIREMENTS CONTAINED IN THESE DRAWINGS, UNLESS SPECIFIED OTHERWISE. 5) ALL DIMENSIONS SHOWN ARE FROM FINISHED SURFACES UNLESS SPECIFIED OTHERWISE.

6) SIEMENS HEALTHCARE SHALL BE RESPONSIBLE FOR SIEMENS

EQUIPMENT INSTALLATION, CALIBRATION, CONNECTION AND INSTALLATION OF SIEMENS PROVIDED CABLES. THE CUSTOMER/ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR TERMINATIONS OF CUSTOMER/ELECTRICAL CONTRACTOR-SUPPLIED CABLES TO SIEMENS EQUIPMENT. IN THE EVENT THAT SPECIFIC TRADE RULES OR LICENSE REQUIREMENTS PROHIBIT THIS, THE CUSTOMER SHALL INITIATE THE

SERVICES OF APPROVED OTHER CONTRACTORS AND PAY FOR SELECTED, APPROVED PARTIES TO PERFORM THIS WORK WITH SUPERVISION PROVIDED BY SIEMENS. CALIBRATION WHEN ACCOMPLISHED OUTSIDE OF NORMAL INSTALLATION SEQUENCES DUE TO CONTRACTOR OR TRADE RULE ACTIONS OR REQUIREMENTS SHALL BE SUPPORTED BY, CHARGED TO, AND ACCEPTED BY THE CUSTOMER AS AN ADDITIONAL INSTALLATION EXPENSE. 7) THE CUSTOMER SHALL COORDINATE WITH SIEMENS PROJECT MANAGER THE LOCATIONS AND TRAVEL OF ALL ANCILLARY EQUIPMENT TO BE

CEILING OR WALL MOUNTED (I.E.: O.R. LIGHTS, MEDICAL GAS COLUMNS, PHYSIOLOGICAL MONITORING INJECTORS, CRT PLATFORMS, SPRINKLER HEADS, SMOKE DETECTORS, ELECTRICAL OUTLETS, HVAC GRILLES, SPEAKERS, AND GENERAL ROOM LIGHTING, ETC.). 8) THE GENERAL CONTRACTOR/CUSTOMER SHALL BE RESPONSIBLE FOR ALL FINAL PAINT, TOUCH-UP AND ANY COSMETIC OR TRIM WORK WHICH NEEDS TO BE OR IS REQUIRED TO BE COMPLETED AFTER THE INSTALLATION OF THE SIEMENS EQUIPMENT AND ANY ASSOCIATED SUPPORT APPARATUS.

9) CUSTOMER/CONTRACTOR MUST ASSIST SIEMENS INSTALLERS WITH INSTALLATION OF EQUIPMENT ABOVE 14'-0". REFER TO THE ELECTRICAL NOTES ON SIEMENS SHEET E-101 FOR MORE DETAILS.

#### SURFACE COIL STORAGE

SURFACE COILS ARE COMPONENTS OF THE MRI SYSTEM THAT ARE ATTACHED TO THE PATIENT TABLE DURING EXAMS. WHEN NOT IN USE COILS SHOULD BE STORED SO THAT THEY ARE FREE FROM DAMAGE. THE DESIGN OF THE MR EXAM ROOM MUST HAVE AMPLE STORAGE SPACE TO ACCOMMODATE ANY COILS THAT THE OWNER WILL HAVE. COILS MAY BE SELECTED FROM THE LIST BELOW.

POUND INCHES
WEIGHT LENGTH WIDTH HEIGHT DIAMETER COIL NAME MATRIX COILS BIOMATRIX HEAD/NECK 20 | 13 | 16 3/4 14 5/8 15 1/8 BIOMATRIX SPINE 32 24 | 47 1/4 | 19 1/4 | 2 1/2 BODY 18 26 | 15 1/4 | 19 1/8 | 23 1/4 | 2 | 20 1/4 | 8 7/8 | -FLEX LARGE 4 1 | 14 1/2 | 6 7/8 | -FLEX SMALL 4

COMBINATION OF ALL COILS IS POSSIBLE.

VIDA REV 16

			PROJECT MANAGER: PATRICK RUIZ TEL: (770) 402-1365 VMAII: FXT:		SIEMEN
2	06/25/21	COMPLETE NEW SET OF DWGS BASED ON LATEST WALL BACKGROUNDS/			SIEWIEW
<u>^</u>	06/25/21	MODIFIED MAGNET GAUSS FIELDS TO REFLECT LATEST SHLD CALCS./	<b>GRADY MEMO</b>	RIAL HOSPITAL C	ORPORATIO
2	06/25/21	ALL LAYOUTS, LEGENDS NOTES & DETAILS UPDATED ACCORDINGLY		LL JUNIOR DRIVE, SOUTH EAST, ATLANTA, ROOM #2 — MAGNETOM VIDA XQ GRADIE	
$\triangle$	05/11/21	NEW WALL BACKGROUNDS/ ADD CASEWORK & SHIFT MAGNET	THIS TITLE BLOCK WITHOUT	PROJECT #:	SHEET:
$\Diamond$	06/25/21	2003356RRA DATED 09/10/20 APPROVED BY CUSTOMERS FOR FINALS	SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL FXTENT OF THE LAW.	2003356	ለ 1በ4

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

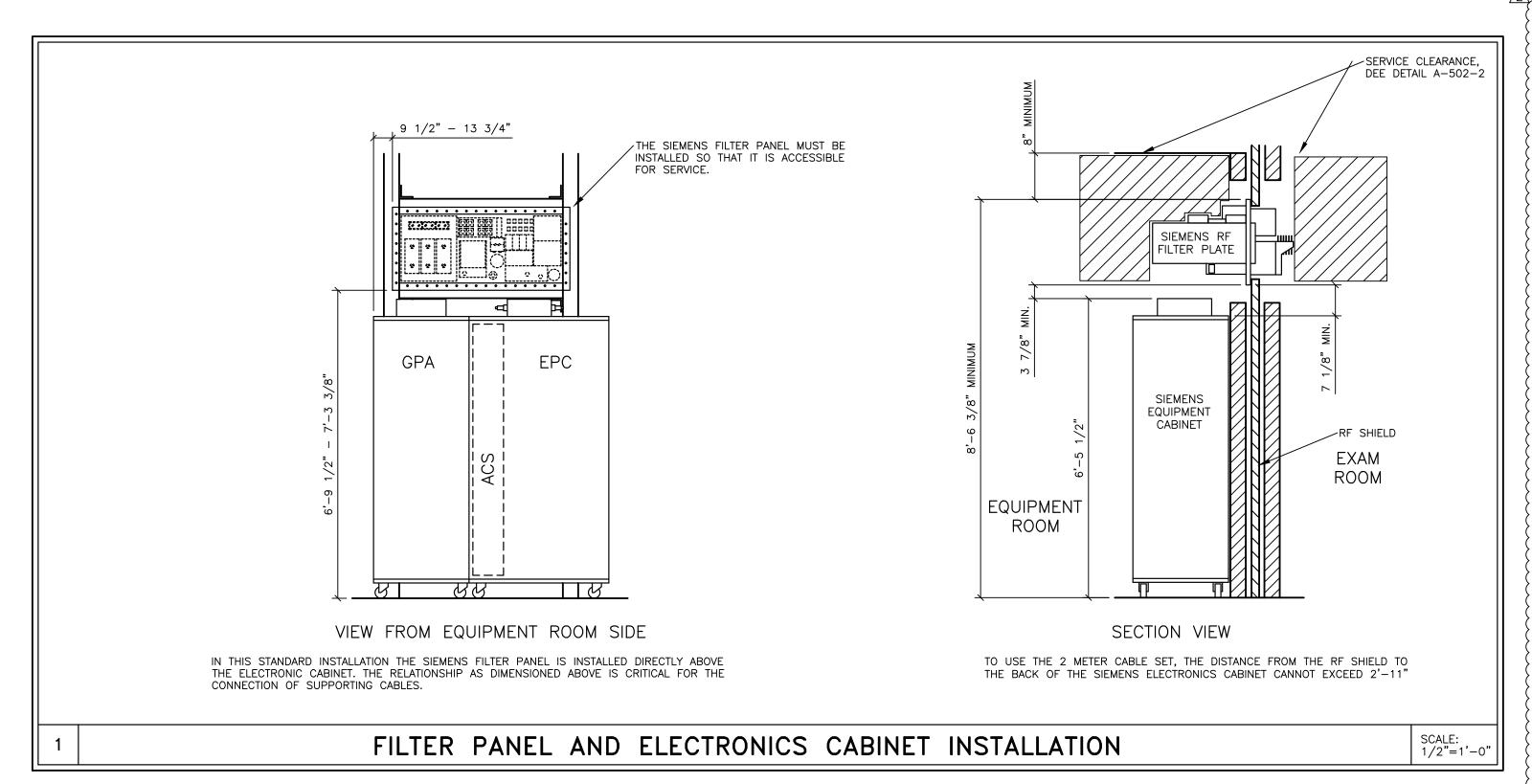
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

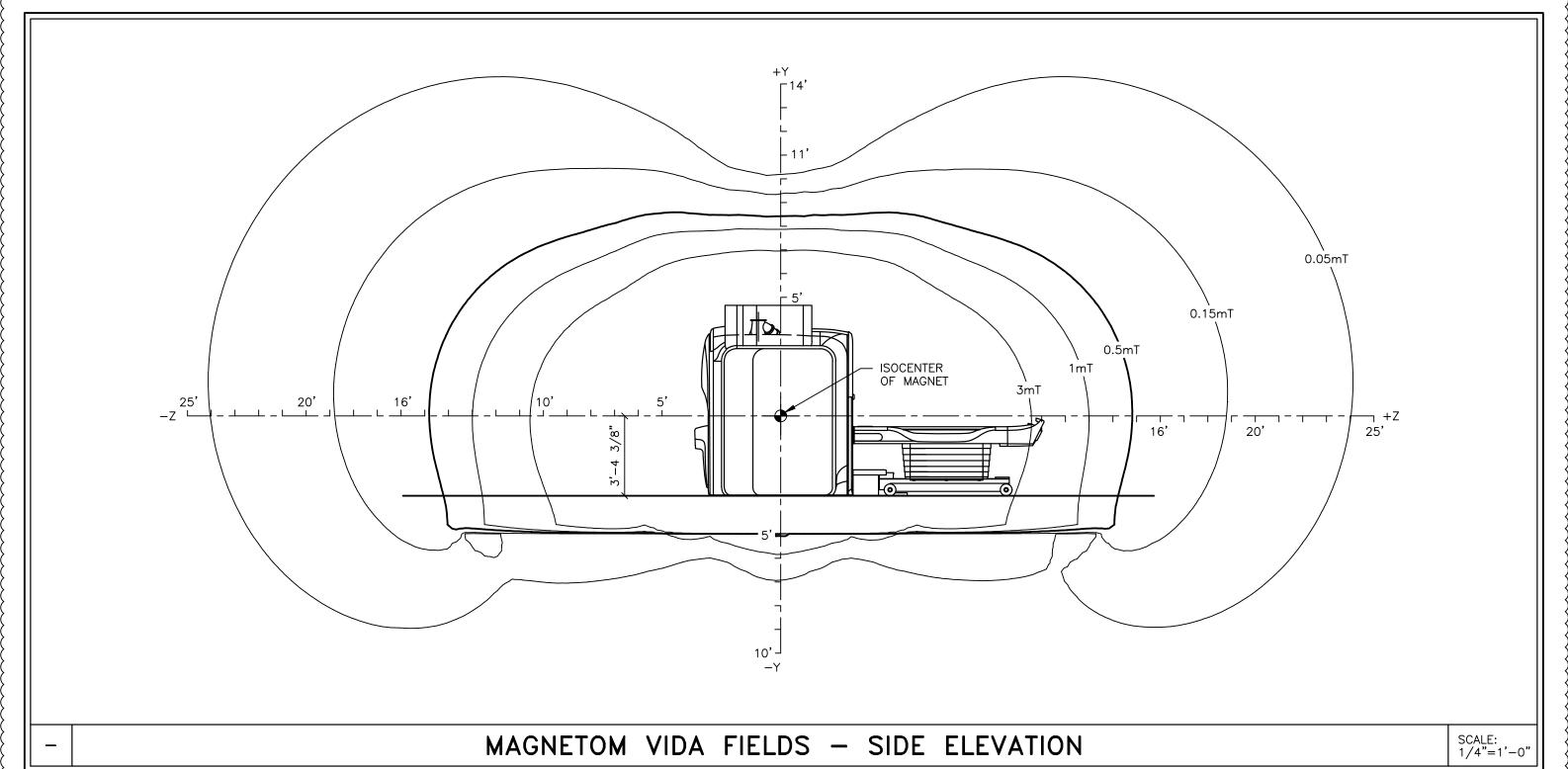
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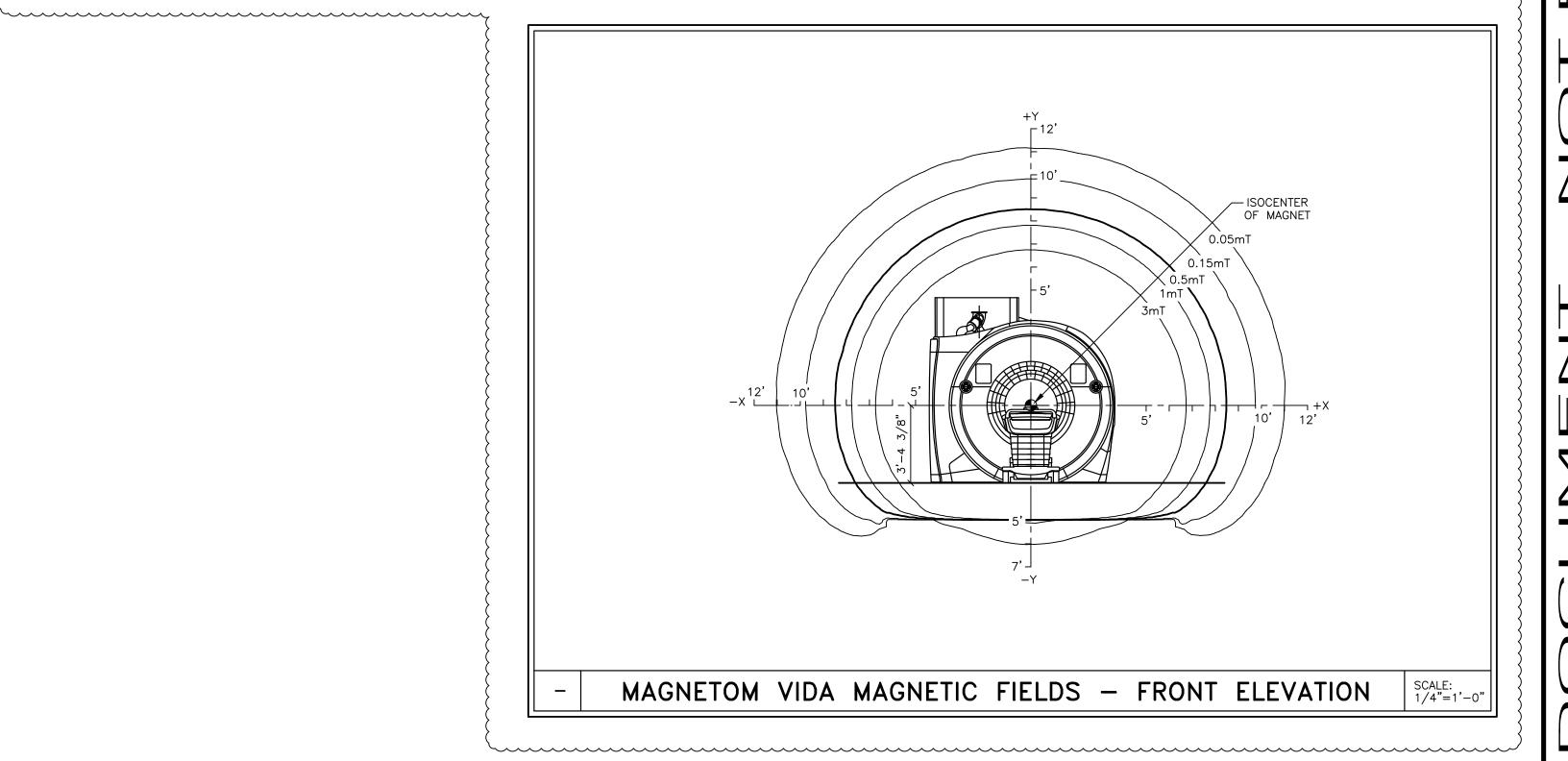
DATE DESCRIPTION SCALE: AS NOTED -ISSUE BLOCK-

2003356 RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. 10 REF. #: 30238438

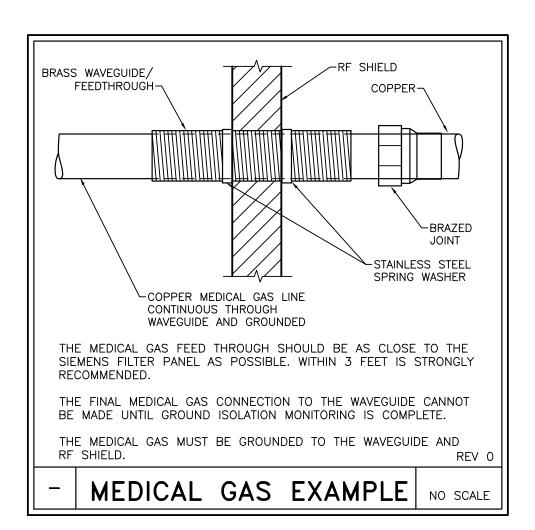
06/25/21

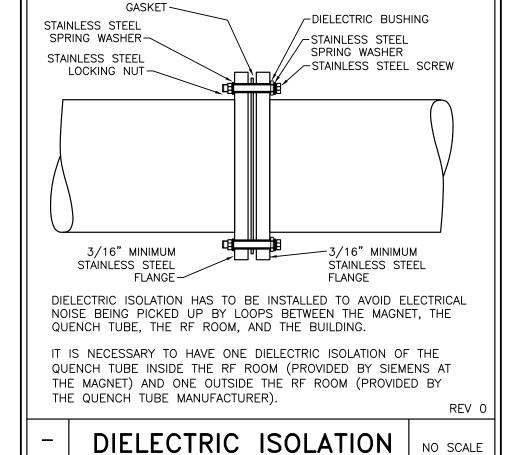






				REV 1
06/25/21	COMPLETE NEW SET OF DWGS BASED ON LATEST WALL BACKGROUNDS/	PROJECT MANAGER: PATRICK RUIZ TEL: (770) 402-1365 VMAIL: EXT: FAX: EMAIL: patrick.ruiz@siemens-healthinee		SIEMENS
<u>/</u> 2 06/25/21	MODIFIED MAGNET GAUSS FIELDS TO REFLECT LATEST SHLD CALCS./	<b>GRADY MEMO</b>	RIAL HOSPITAL C	ORPORATION
<u>/</u> 2 06/25/21	ALL LAYOUTS, LEGENDS NOTES & DETAILS UPDATED ACCORDINGLY		LL JUNIOR DRIVE, SOUTH EAST, ATLANTA ROOM #2 — MAGNETOM VIDA XQ GRADI	
<u> </u>	NEW WALL BACKGROUNDS/ ADD CASEWORK & SHIFT MAGNET	THIS TITLE BLOCK WITHOUT	PROJECT #:	SHEET:
<u></u> 06/25/21	2003356RRA DATED 09/10/20 APPROVED BY CUSTOMERS FOR FINALS	SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.	2003356	<b>」                                    </b>
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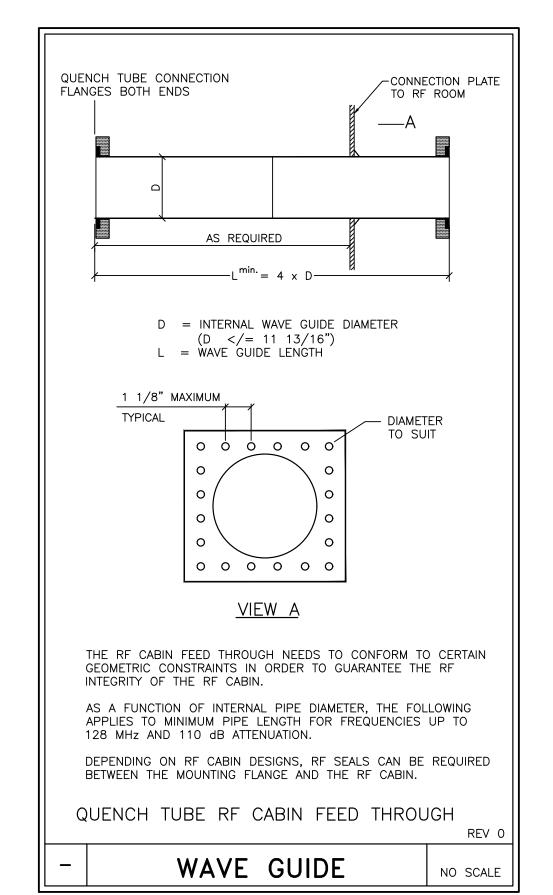


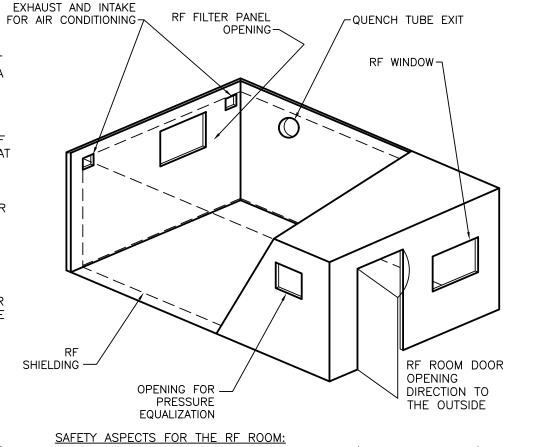
## IMAGE QUALITY CONCERNS

BROADBAND RF NOISE IS A SINGLE TRANSIENT OR CONTINUOUS SERIES OF TRANSIENT DISTURBANCES CAUSED BY AN ELECTRICAL DISCHARGE. LOW HUMIDITY ENVIRONMENTAL CONDITIONS WILL HAVE HIGHER PROBABILITY OF ELECTRICAL DISCHARGE. THE ELECTRICAL DISCHARGE CAN OCCUR DUE TO ELECTRICAL ARCING OR MERELY STATIC DISCHARGE. SOME POTENTIAL SOURCES CAPABLE OF PRODUCING ELECTRICAL DISCHARGE INCLUDE:

- LOOSE HARDWARE/FASTENERS-VIBRATION OR MOVEMENT (ELECTRICAL CONTINUITY MUST ALWAYS BE MAINTAINED).
- FLOORING MATERIAL INCLUDING RAISED ACCESS FLOORING (PANELS AND SUPPORT HARDWARE) AND CARPETING.
- ELECTRICAL FIXTURES (LIGHTING FIXTURES, TRACK LIGHTING, EMERGENCY LIGHTING, BATTERY CHARGERS, OUTLETS).
- DUCTING FOR HVAC AND CABLE ROUTING. RF SHIELD SEALS (WALLS, DOORS, WINDOWS, ETC.).

REV 0





IT MUST BE POSSIBLE TO LOCK THE RF ROOM (EXAMINATION ROOM) DOOR FROM THE OUTSIDE. IT MUST ALSO BE POSSIBLE TO OPEN THE DOOR FROM THE INSIDE WITHOUT A KEY OR ADDITIONAL DEVICE.

THE RF DOOR IS AN IMPORTANT COMPONENT FOR GOOD IMAGE QUALITY AS WELL AS SAFETY, THE OWNER/OPERATOR OF THE MR SYSTEM MUST MAINTAIN THE RF ROOM AS INSTRUCTED BY THE RF ROOM MANUFACTURER IN ORDER TO GUARANTEE CORRECT FUNCTION

NO FERROMAGNETIC ITEMS CAN BE BROUGHT INTO THE RF ROOM AFTER THE MAGNET HAS BEEN RAMPED UP TO FIELD. MAGNETIC ITEMS WILL BECOME ATTRACTED TO THE MAGNET WITH NO WARNING AND DUE TO THE HIGH MAGNETIC FIELD, WILL BECOME MISSILES.

NOTE: FOR DOORS MOVED BY AN AUXILIARY DRIVES (ELECTRICAL OR PNEUMATIC), MANUAL OPERATION HAS TO BE ENSURED. AN OUTSIDE WINDOW SHOULD BE IN THE VICINITY TO ALLOW VENTING EXHAUSTED GAS TO THE OUTSIDE. THE INTEGRITY OF THE RF SHIELD MUST BE TESTED AFTER REMODELING.

#### SAFETY INFORMATION - PRESSURE EQUALIZATION

SCALE:

NONE

#### RF SHIELDING

1) THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15-128 MHz. IF CO-SITING TWO SYSTEMS EACH ROOM SHOULD BE 100 dB.

RF DOOR OPENING

PRESSURE.

FROM LIFE THREATENING CONDITIONS.

IN THE EVENT OF A CATASTROPHIC FAILURE OF THE QUENCH VENT

DURING A QUENCH, PRESSURE BUILT UP MAY PREVENT OPENING A DOOR THAT OPENS INTO THE RF ROOM, PREVENTING EVACUATION

FOR THIS REASON THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. IF THE DOOR CANNOT OPEN OUT FROM THE RF ROOM, OTHER APPROPRIATE MEANS HAVE TO BE PROVIDED SO THAT

THE RF ROOM DOOR IS NOT PREVENTED FROM OPENING DUE TO

IF THE DOOR OPENS INTO THE RF ROOM, A 24"x24" OPENING FOR

PRESSURE EQUALIZATION INTO THE RF ROOM MUST BE INSTALLED.

PURPOSE OF THE OPENING IS TO RELIEVE PRESSURE AND ALLOW

THE OPENINGS WILL HAVE PANELS INSTALLED IN THE RF ROOM OR

THE DOOR THAT CAN BE UNLOCKED AND OPENED TO THE OUTSIDE

IN CASE OF EMERGENCY. THESE PANELS REQUIRE AN RF SEALED INSTALLATION. AFTER OPENING THE PANEL, THE OUTLET SHOULD

MEASURE AT LEAST 24"x24". WHEN USING RECTANGULAR PANELS,

TO ENSURE UNOBSTRUCTED VENTING, THIS OPENING CANNOT BE

EASY REMOVAL OF THE PANEL BY A PERSON HAS TO BE ENSURED

AND A MINIMUM DISTANCE OF 40" TO A FIXED OBJECT MUST BE

MAINTAINED. THE PANEL SHOULD BE INSTALLED IN AN ACCESSIBLE

LOCATION AND ALLOW ESCAPE OF THE LOW DENSITY HELIUM.

AS AN ALTERNATIVE TO AN OUT SWING DOOR. THE STATIONARY

THE CONTROL AREA OR THE DOOR IS REPLACED WITH AN RE

CLOSES IN A WAY THAT ALLOWS IT TO MOVE AWAY FROM THE

OBSERVATION WINDOW IS REPLACED BY A WINDOW OPENING INTO

SEALED SLIDING DOOR. IT SHOULD BE ENSURED THAT THE DOOR

IF THE DOOR OPENS TO THE OUTSIDE, THE OPENING IN THE RF

THE RF ROOM MANUFACTURER CAN PROVIDE YOU WITH ADDITIONAL

RF SEALED ROOM OPENINGS THAT LEAD DIRECTLY TO THE OUTSIDE

HOWEVER, THESE OPENINGS ARE ALSO CONDUITS FOR NOISE

GENERATED OUTSIDE THE RF ROOM. UNOBSTRUCTED FLOW

THROUGH THIS PIPE MUST BE GUARANTEED.

THE SHORTER SIDE SHOULD MEASURE OF MINIMUM OF 24".

SUBDIVIDED. THIS MEANS THAT, FOR EXAMPLE, RF SEALED

HONEYCOMB GRIDS ARE NOT PERMITTED.

FRAME IN CASE OF OVERPRESSURE.

ROOM IS STILL RECOMMENDED.

THE MAIN DOOR TO BE OPENED SO THAT OCCUPANTS CAN BE

THIS IS MANDATORY. THIS IS NOT AN ESCAPE HATCH. THE

2) THE RF SHIELD MUST BE TESTED BEFORE AND AFTER MAGNET PANEL IS INSTALLED. THE RF-SHIELDING MUST BE INSULATED FROM ALL GROUNDS SUCH THAT THE ONLY GROUND IS THE SINGLE POINT GROUND ON THE OUTSIDE OF THE RF-ROOM WALL. RESISTANCE  $\geq$  100 OHMS.

3) ALL ELECTRICAL LINES INTO THE RF ROOM MUST BE ROUTED THROUGH RF FILTERS (PROVIDED BY RF SHIELDING SUPPLIER). ALL ELECTRICALLY NON-CONDUCTIVE SUPPLY LINES (E.G. FIBER OPTIC CABLES, OR HOSES) INTO THE RF ROOM MUST BE ROUTED THROUGH RF SEALED WAVE GUIDES (PROVIDED BY RF SHIELDING SUPPLIER).

4) FOR PRESSURE EQUALIZATION PURPOSES THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. AS AN ALTERNATIVE A 24"X24" OPENING IN THE RF ROOM FOR PRESSURE EQUALIZATION IS REQUIRED. REV 1

## SHIELDING GENERAL NOTES

1) SIEMENS REQUESTS THAT THE SHIELDING MANUFACTURER(S) SUBMIT FINAL SHOP DRAWINGS TO SIEMENS FOR REVIEW PRIOR TO THEIR INCLUSION IN CONSTRUCTION DOCUMENTS. SIEMENS SHALL BE COPIED ON ALL FIELD ORDER CHANGES CONCERNING CHANGES IN RF AND MAGNETIC SHIELDING CONDITIONS, CONFIGURATION AND SPECIFICATION. THE RF AND MAGNETIC SHIELDING CONTRACTOR(S) SHALL FURNISH "AS BUILT" SCALED AND DIMENSIONED PLANS REFLECTING ANY AND ALL FIELD ORDER CHANGES PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.

2) ALL CHANGES TO SIEMENS RECOMMENDED OPENINGS AND PÉNETRATIONS SHALL BE APPROVED BY THE SIEMENS PROJECT MANAGER PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.

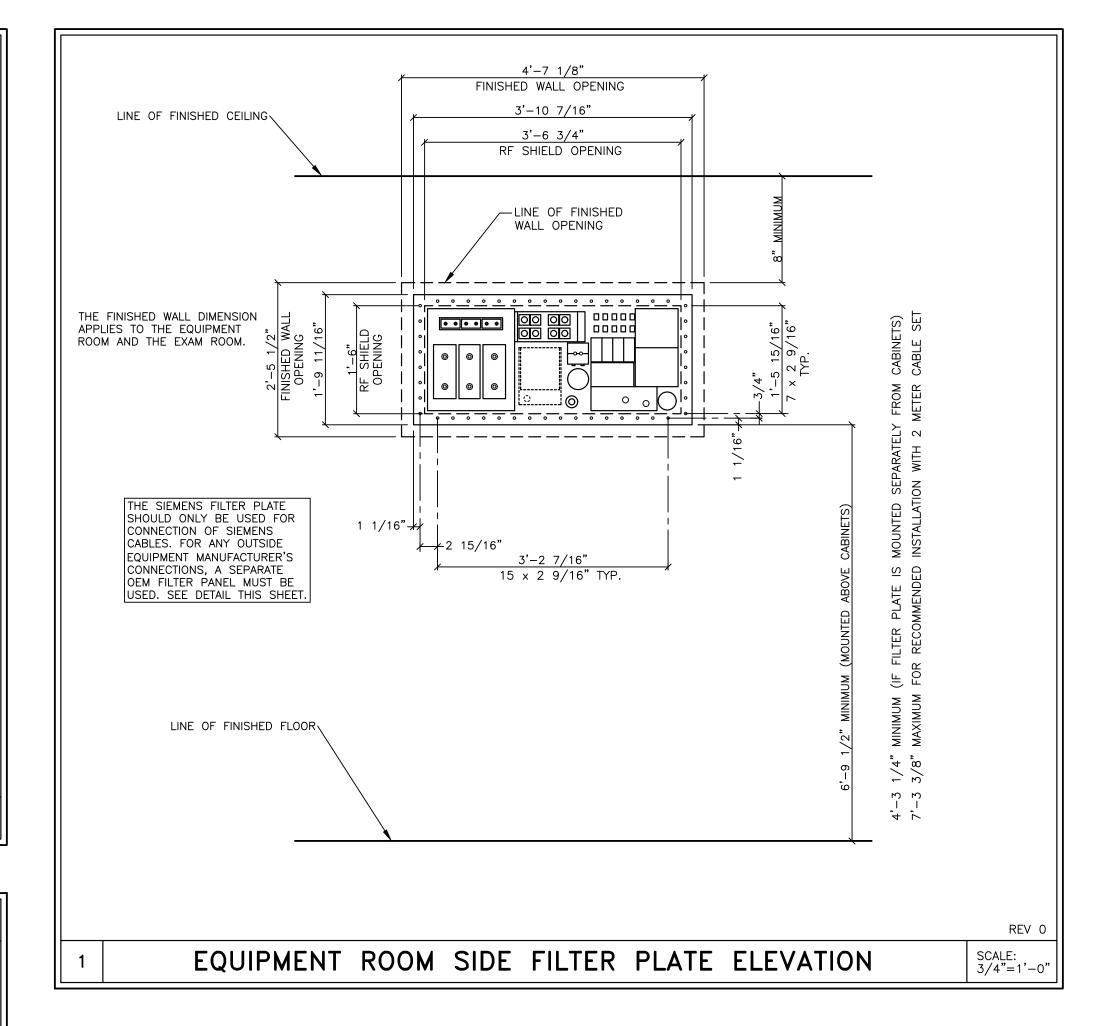
3) THE SIZE, LOCATION, AND DIMENSIONS OF ANY MAGNETIC SHIELDING REQUIRED HAS BEEN DETERMINED BY SIEMENS. THIS INFORMATION HAS BEEN SUPPLIED TO THE MAGNETIC SHIELDING FABRICATOR TO DESIGN THE STRUCTURAL SUPPORT SYSTEM REQUIRED FOR THE MAGNETIC SHIELDING MATERIAL.

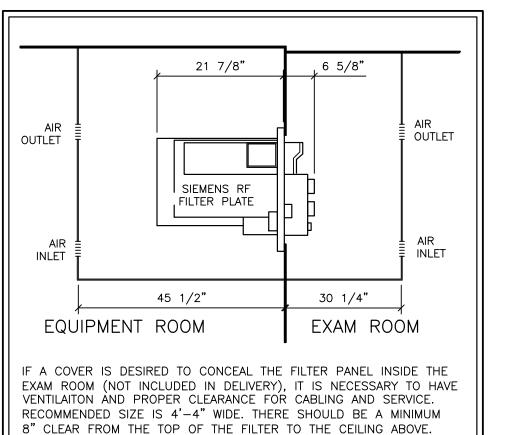
## FILTER PLATE GENERAL NOTES

1) STRUCTURAL SUPPORT AND INTEGRATION OF THE SIEMENS SUPPLIED AND INSTALLED FILTER PLATE WITH MAGNETIC AND RF SHIELDING SHALL BE SPECIFIED, DETAILED AND NOTED BY THE RF AND MAGNETIC SHIELDING MANUFACTURER(S) WITH OVERALL COORDINATION WITH SIEMENS SITE SPECIFIC RECOMMENDATIONS TO BE THE RESPONSIBILITY OF THE ARCHITECT OF RECORD.

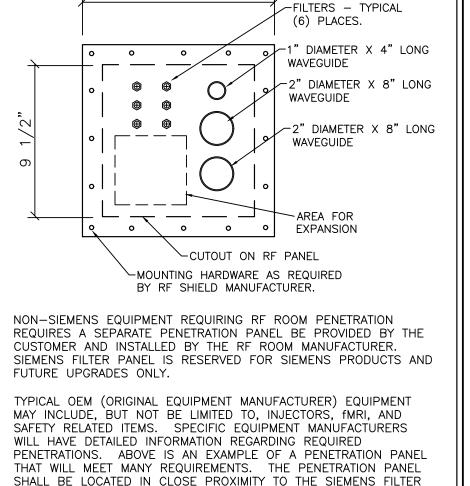
2) THE FILTER PLATE FRAME, RF FILTER PLATE BLANK, RF GASKET AND MOUNTING HARDWARE FOR THE PURPOSES OF TESTING THE INTEGRITY OF THE RF ENCLOSURE PRIOR TO THE INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED RF FILTER PLATE SHALL BE PROVIDED AND INSTALLED BY THE SHIELDING CONTRACTOR(S) UNLESS SPECIFIED OTHERWISE.

REV 0





FILTER PANEL COVERS | NO SCALE



SHALL BE LOCATED IN CLOSE PROXIMITY TO THE SIEMENS FILTER PANEL AND BE COMPLIANT WITH ALL SIEMENS RF ROOM REQUIREMENTS. REV 0 OEM FILTER PANEL NO SCALE

VIDA

		_		REV 16
			PROJECT MANAGER: PATRICK RUIZ TEL: (770) 402-1365 VMAIL: EXT:	SIEMENS
<u>^</u>	06/25/21	COMPLETE NEW SET OF DWGS BASED ON LATEST WALL BACKGROUNDS/		SIEWIENS
2	06/25/21	1 MODIFIED MAGNET GAUSS FIELDS TO REFLECT LATEST SHLD CALCS./	<b>GRADY MEMORIAL HOSPIT</b>	<b>AL CORPORATION</b>
2	06/25/21	1 ALL LAYOUTS, LEGENDS NOTES & DETAILS UPDATED ACCORDINGLY	80 JESSE HILL JUNIOR DRIVE, SOUTH EAS MRI ROOM #2 — MAGNETOM VIDA	
$\triangle$	05/11/21	1 NEW WALL BACKGROUNDS/ ADD CASEWORK & SHIFT MAGNET	THIS TITLE BLOCK WITHOUT	SHEET:
$\triangle$	06/25/21	2003356RRA DATED 09/10/20 APPROVED BY CUSTOMERS FOR FINALS	SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.	56」 / 「 <b>た</b> りつ
			CHEET OF DRAWN D	

REF. #: 30238438

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06/25/21

#### EXAM ROOM INTERIOR NOTES

1) ONLY NON-MAGNETIC MATERIALS ARE TO BE USED AND INSTALLED Ń THE RF ROOM. SEE CONSTRUCTION REQUIREMENTS.

2) A SUSPENDED CEILING MUST BE STATICALLY SUSPENDED, NOT SUSPENDED WITH MOVABLE CLAMPS, SPRINGS, ETC.

3) RODS IN SUSPENDED CEILINGS MUST BE INSTALLED SECURELY. GÁLVANIC CONTENT BETWEEN THE RODS MUST BE GUARANTEED, THEY MUST NOT JUST LIE ON TOP OF ONE ANOTHER. A WIRE JUMPER BETWEEN RODS MAY BE USEFUL.

4) ELECTRICAL WIRING, FOR AMBIENT LIGHTS FOR EXAMPLE, MUST NOT SÍMPLY REST ON THE SUSPENDED CEILING, THEY MUST BE FASTENED OR INSIDE A CONDUIT TO PREVENT MOTION.

REV 1

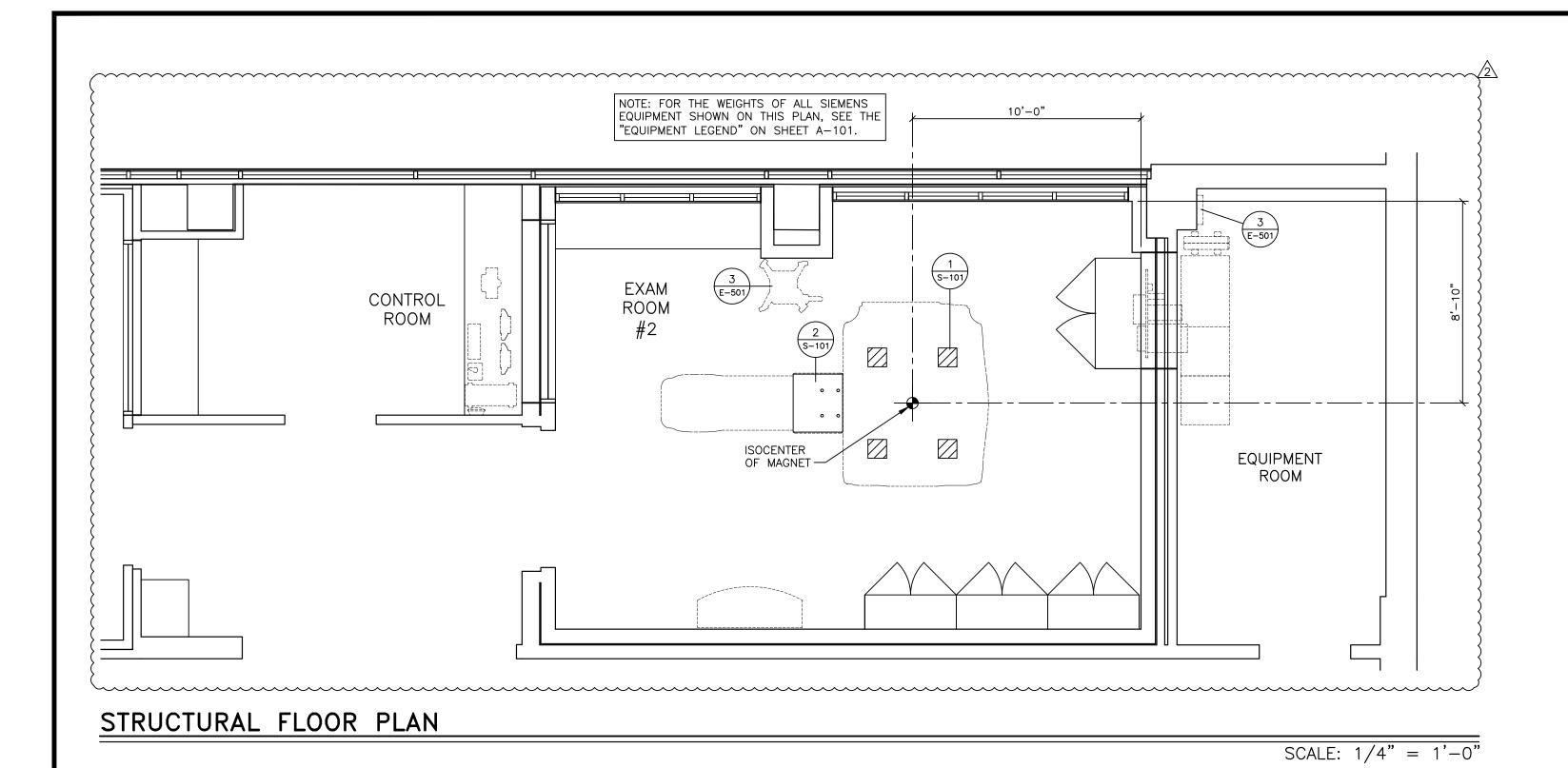
-ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

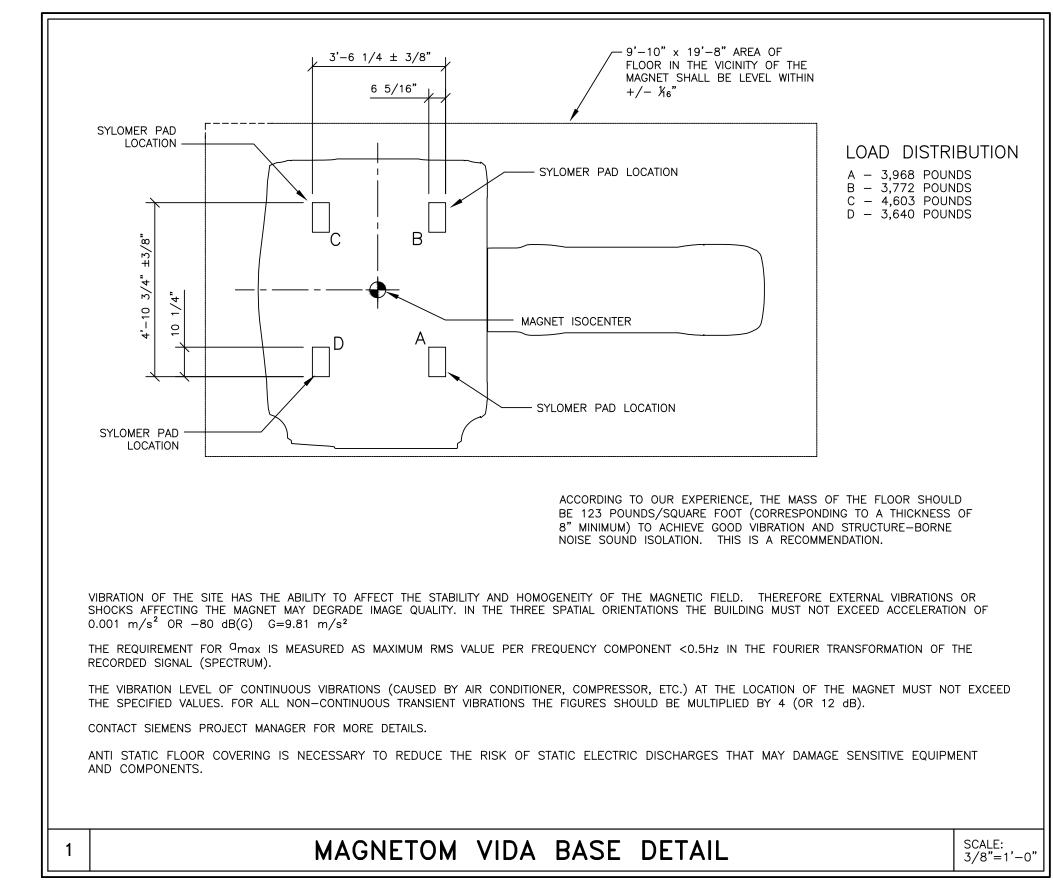
- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED ATTENTION: AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

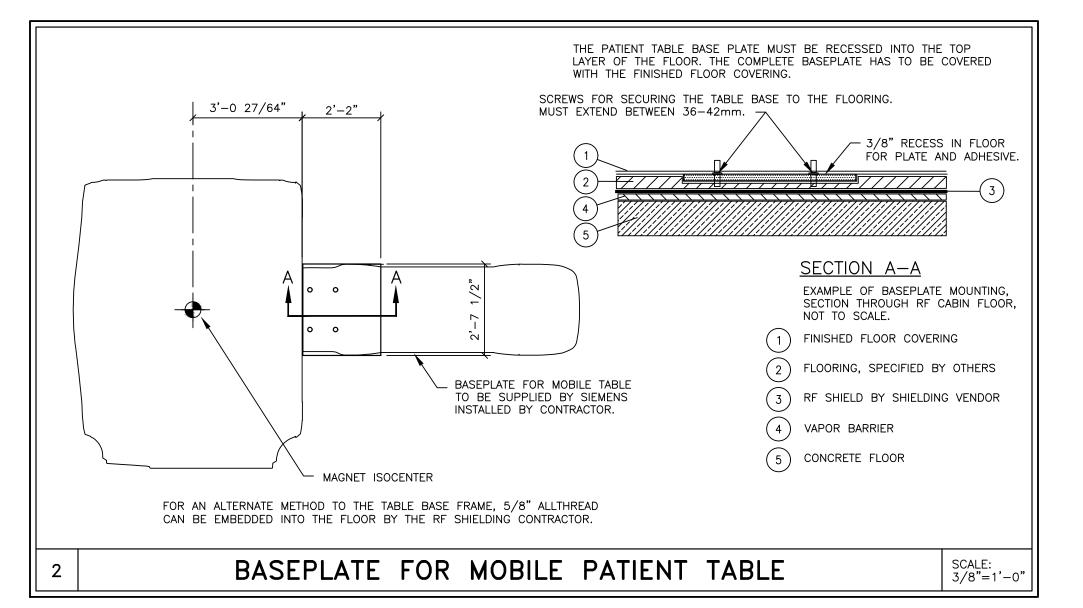
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

PHYSICIST TO SPECIFY RADIATION PROTECTION.

DATE DESCRIPTION SCALE: AS NOTED -ISSUE BLOCK-







#### STRUCTURAL NOTES

1) THE CUSTOMER/CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL SUPPORT MEMBERS AND NEEDED HARDWARE FOR THE INSTALLATION OF THE SIEMENS EQUIPMENT.

2) THE OVERHEAD STRUCTURAL SUPPORT SYSTEM SHALL BE FIXED,

WITH A TRANSIT.

RÍGID AND BRACED FOR SWAY. 3) ALL STRUCTURAL SUPPORT MEMBERS SHALL BE TRUE, SQUARE, LEVEL, PARALLEL AND COPLANAR WITH RESPECT TO EACH OTHER, WITH

4) ALL STRUCTURAL SUPPORT DETAILS SHOWN ARE SAMPLE DETAILS BÁSED UPON TYPICAL AND STANDARD BUILDING PRACTICES AND ARE NOT INTENDED AS ACTUAL CONSTRUCTION DETAILS. ALL CONSTRUCTION DETAILS AND SUPPORT CALCULATIONS SHALL BE PREPARED BY A PROFESSIONAL STRUCTURAL ENGINEER AT THE CUSTOMER'S EXPENSE. IN THE EVENT AN EXISTING SUPPORT SYSTEM IS TO BE USED, IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO VERIFY THE INTEGRITY OF THAT

A HORIZONTAL STRUCTURAL SUPPORT MEMBER TO BE LOCATED AND SET

5) MOUNTING PLATES, FRAMES, AND HARDWARE SUPPLIED BY SIEMENS AS DETAILED IN THIS DRAWING SET ARE INSTALLED BY SIEMENS UNLESS OTHERWISE REQUIRED. ANY DEVIATION FROM THE PROVIDED MATERIALS OR MOUNTING METHODS MUST BE DESIGNED AND DOCUMENTED BY THE STRUCTURAL ENGINEER OF RECORD. ALTERNATE MOUNTING MATERIALS (I.E. ANCHORS, THREADED ROD, BACKING PLATES, ETC.) MUST BE SUPPLIED BY THE CUSTOMER/CONTRACTOR. SIEMENS MAY REQUIRE ASSISTANCE FROM THE CUSTOMER/CONTRACTOR WITH INSTALLATION WHEN UTILIZING ALTERNATE MOUNTING MATERIALS.

6) ALL CEILING FIXTURES (I.E. AIR SUPPLY GRILLES, AIR RETURN GRILLES, EXHAUST GRILLES, SPRINKLER HEADS, INCANDESCENT AND FLUORESCENT LIGHT FIXTURES, INTERCOM SPEAKERS, MEDICAL GAS COLUMNS, ETC.) SHALL BE INSTALLED FLUSH MOUNTED WITH THE FINISHED CEILING TO PROVIDE FREE AND UNRESTRICTED TRAVEL OF THE SMS CEILING MOUNTED EQUIPMENT.

7) THE BOTTOM SIDE OF THE UNISTRUT CEILING GRID AND ANY CEILING MOUNTED SUPPORT PLATES ARE TO BE INSTALLED FLUSH WITH THE FINISHED CEILING. THE CUSTOMER/CONTRACTOR SHALL ALSO PROVIDE COVERSTRIPS FOR THE UNISTRUT.

8) THE STRUCTURAL PLANNING AS SHOWN ON THE 1/4" STRUCTURAL PLAN HAS BEEN COORDINATED WITH THE EQUIPMENT LOCATION AS SHOWN ON THE 1/4" EQUIPMENT LAYOUT PLAN. FOR THIS REASON, ANY DEVIATIONS FROM THE STRUCTURAL PLANNING AS SHOWN MUST BE APPROVED BY SMS PLANNING DEPARTMENT.

9) THE STRUCTURAL ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR THE DESIGN AND DETAIL OF FLOOR, WALL AND CEILING STRUCTURES IN ACCORDANCE WITH THE WEIGHTS, MOMENTS AND FORCES AS SHOWN ON OUR STRUCTURAL CALCULATIONS, OR INFORMATION, IN CONSIDERATION OF FORCES AS DETERMINED PER LOCAL GOVERNING BUILDING CODES.

FLOOR LOADING TAB	LE
	POUNDS
MAGNET AND PATIENT TABLE	16,513
MAGNET ONLY FLOOR LOADING	16,204
LOAD DISTRIBUTION PER SHIM PLATE	SEE DETAIL 1
PATIENT	550

CEILING HEIGHTS MAGNET EXAMINATION ROOM: 7'-11" MINIMUM EQUIPMENT ROOM: 7'-3" MINIMUM ALL ANCILLARY AREAS: 6'-11" MINIMUM

COMPLETE NEW SET OF DWGS BASEI ON LATEST WALL BACKGROUNDS/ MODIFIED MAGNET GAUSS FIE TO REFLECT LATEST SHLD CALCS., ALL LAYOUTS, LEGENDS NOTES DETAILS UPDATED ACCORDINGLY NEW WALL BACKGROUNDS/ A 05/11/21 CASEWORK & SHIFT MAGNET 2003356RRA DATED 09/10/ 06/25/21 APPROVED BY CUSTOMERS FÓR FÍNALS DATE DESCRIPTION

ROJECT MANAGER: PATRICK RUIZ (770) 402-1365 ALL RIGHTS ARE RESERVED.

MEMORIAL HOSPITAL CORPORATION 80 JESSE HILL JUNIOR DRIVE, SOUTH EAST, ATLANTA, GA 30303 USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL

MRI ROOM #2 - MAGNETOM VIDA XQ GRADIENTS PROJECT #: 2003356 RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.

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06/25/21

**SIEMENS** 

VIDA REV 16

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

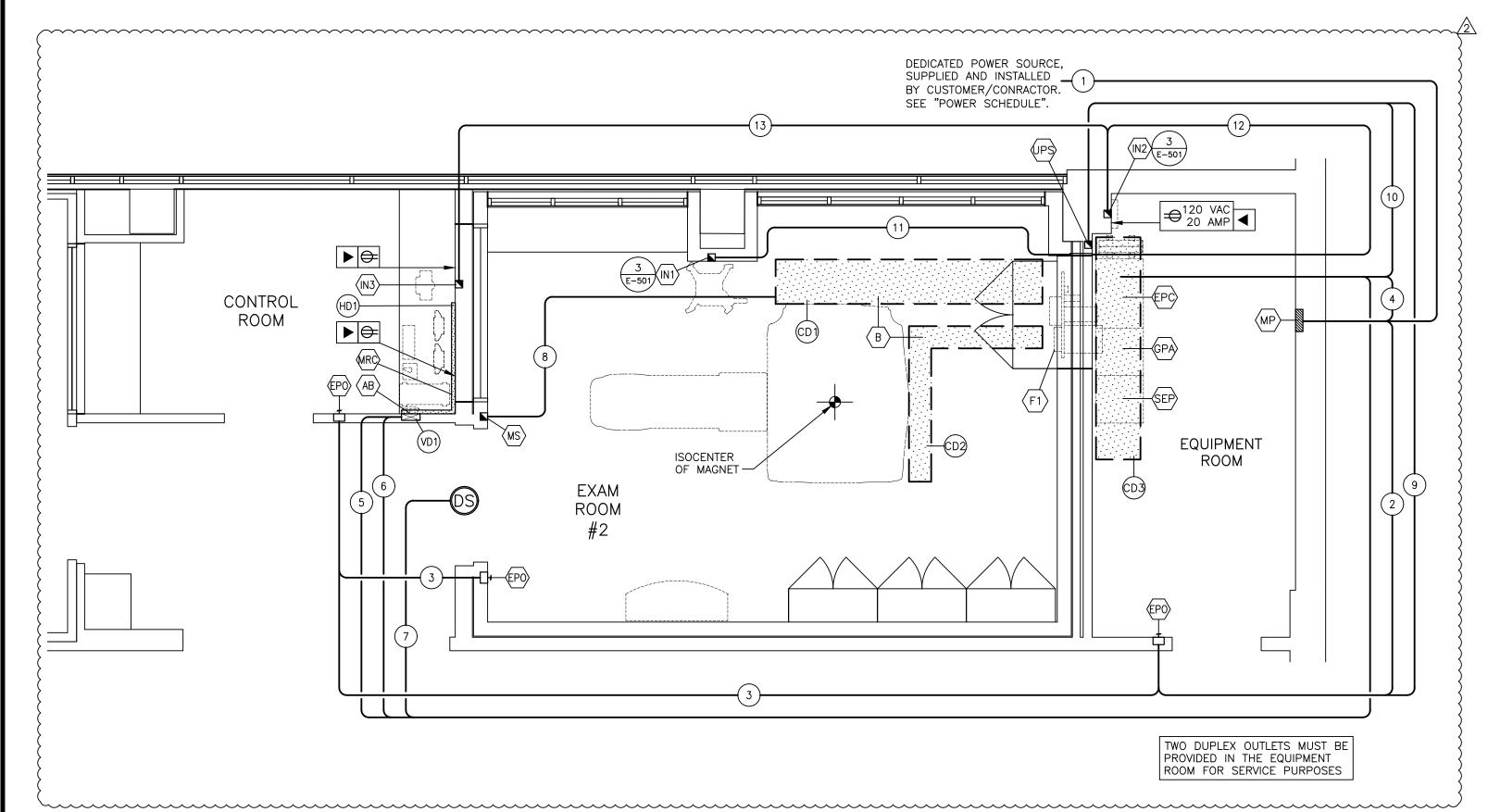
THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.

-ISSUE BLOCK-

REF. #: 30238438 SCALE: AS NOTED

D. BRISTOE



ELECTRICAL RACEWAY PLAN

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

	SYMBOLS
	ALL MAY NOT APPLY
	CAUTION OR WARNING
Ü	CRITICAL NOTE(S)
	PANEL OR ENCLOSURE BY CUSTOMER/CONTRACTOR
	OPENING IN RACEWAY OR TRENCHDUCT
	PULLBOX IN (FLOOR/WALL/CEILING)
	OPENING IN ACCESS FLOORING
(DS)	RF DOOR SWITCH - MCMASTER-CARR SUPPLY ROLLER LIMIT SWITCH 7076k14 PROVIDED BY CONTRACTOR, AND MOUNTED AT TOP OF DOOR. COORDINATE WITH SIEMENS PROJECT MANAGER.
Ю	(EPO) EMERGENCY POWER OFF BUTTON
	CEILING DUCT
	SURFACE MOUNTED DUCT
$\bowtie$	VERTICAL DUCT
<b>&gt;</b>	ETHERNET CONNECTION TO CUSTOMER'S INFORMATION SYSTEMS NETWORK IN AN ACCESSIBLE LOCATION (VERIFY WITH SIEMENS PROJECT MANAGER).
$\ominus$	110 VOLT, 20 AMP, HOSPITAL GRADE DUPLEX OUTLET LOCATED NEAR THE ETHERNET CONNECTION.  REV 2

SYM	SIZE	DESCRIPTION	REMARKS
		SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR	
(AB)	3 <b>"</b> ø	OPENING IN FACE OF VERTICAL DUCT 5'-0" ABOVE FINISHED FLOOR IN LOCATION TO BE COORDINATED WITH THE ARCHITECT.	ALARM BOX
(EPC) (EPA) (SEP)		LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	ELECTRONICS CABINETS
 B	AS REQUIRED	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	MAGNET CABLE ACCESS
₽		EMERGENCY POWER OFF BUTTONS, MOUNTED WITH CENTERLINE AT 5'-0" ABOVE FINISHED FLOOR. ALL PARTS ARE TO BE NONFERROUS INSIDE THE RF ROOM. EXACT LOCATIONS ARE TO BE VERIFIED WITH THE ARCHITECT OF RECORD.	SEE POWER SCHEDULE, SHEET E-102
(F1)		SIEMENS RF FILTER PANEL TO BE MOUNTED ON RF SHIELDED WALL	FILTER PANEL
(NI)	AS REQUIRED	NON-FERROUS PULL BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR POWER SUPPLY— MUST BE LOCATED OUTSIDE OF 5mT FIELD
(N2)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL IN EQUIPMENT ROOM, MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR POWER SUPPLY
(N3)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA, MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR CONTROL CONSOLE
MP⟩		MAIN PANEL WITH MAIN BREAKER. EXACT LOCATION DETERMINED BY CUSTOMER/CONTRACTOR	SEE POWER SCHEDULE
<b>€</b> RC>	4" × 4"	OPENING IN FACE OF RACEWAY IN SHOWN LOCATION.	HOST COMPUTER
(MS)	AS REQUIRED	NON-FERROUS SINGLE GANG BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 6'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	MAGNET STOP
(PS)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT FLOOR LINE IN SHOWN LOCATION PROVIDED WITH 2"Ø OPENING IN FINISHED COVER.	LIEBERT GXT4 UPS
(01)	24"×4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER, IN THE EXAM ROOM, MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE FILTER PANEL AND THE MAGNET. A 15" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE RF FILTER PANEL (F1). WHEN ROUTING ALL RACEWAYS REFER TO DETAIL E-501/2 TAKING CARE SO THAT MAXIMUM CABLE LENGTHS ARE NOT EXCEEDED. A 12" SEPARATION BETWEEN CD1 AND CD2 MUST BE MAINTAINED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/2
(02)	12 <b>"</b> ×4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER, IN THE EXAM ROOM, MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE FILTER PANEL AND THE MAGNET. A 15" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE RF FILTER PANEL (F1). WHEN ROUTING ALL RACEWAYS REFER TO DETAIL E-501/2 TAKING CARE SO THAT MAXIMUM CABLE LENGTHS ARE NOT EXCEEDED. A 12" SEPARATION BETWEEN CD2 AND CD1 MUST BE MAINTAINED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	
(03)	24"x4"	LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EQUIPMENT ROOM MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE EQUIPMENT ROOM AND THE RF FILTER PANEL (F1). AN 18" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE FILTER PANEL.	CABLE TRAY SEE DETAIL E-501/2
(HD1)	4" × 2"	HORIZONTAL DUCT SURFACE MOUNTED ON WALL IN CONTROL AREA AT FLOOR LINE AS SHOWN, FINISHED TO MATCH WALLS.	
<b>(</b> 0)	10" x 3-1/2"	VERTICAL DUCT MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA FROM ABOVE FINISHED CEILING TO FLOOR LINE PROVIDED WITH REMOVABLE FINISHED COVERS.	
1	AS PER NEC	CONDUIT FROM FACILITY POWER TO MAIN PANEL "MP"	SEE POWER SCHEDULE, SHEET E-102
2	AS PER NEC	CONDUIT FROM "MP" TO "EPO"	SEE POWER SCHEDULE, SHEET E-102
3	AS PER NEC	CONDUIT FROM "EPO" TO "EPO" TO BE NON-FERROUS WHEN INSIDE THE RF ROOM. CUSTOMER/CONTRACTOR IS TO PROVIDE RF FILTERS FOR ALL NON-SIEMENS WIRING.	SEE POWER SCHEDULE, SHEET E-102
4	(1) 2"ø	CONDUIT FROM "MP" TO END AT "CD3" (EPC) VIA FLEX CONDUIT. THERE MUST BE A DIELECTRIC SEPARATION BETWEEN THE CONDUIT AND THE CONNECTION AT THE SIEMENS EPC CABINET.	SEE POWER SCHEDULE, SHEET E-102
5	(2) 2 1/2"ø	CONDUIT FROM "VD1" (MRC) TO "CD3" (EPC)	NOT TO EXCEED 60 FT.
6	(1) 1 1/2"ø	CONDUIT FROM "VD1" (AB) TO "CD3" (EPC)	NOT TO EXCEED 60 FT.
7	(1) 1/2 <b>"</b> ø	CONDUIT FROM "DS" TO "CD3" (EPC)	NOT TO EXCEED 60 FT.
8	(1) 3/4 <b>"</b> ø	CONDUIT FROM "MS" TO "CD1" (WIRES TO MAGNET) TO BE NON-FERROUS WHEN INSIDE THE RF ROOM.	NOT TO EXCEED 20 FT.
9	(1) 3/4"ø	CONDUIT FROM "EPO" TO "UPS"	
10	(1) 2"ø	CONDUIT FROM "UPS" TO "CD3" (EPC)	MAXIMUM LENGTH 29 FEET
(1)	(1) 2"ø	NON-FERROUS CONDUIT FROM "IN1" TO RF PENETRATION/FILTER PANEL (LOCATED NEAR "F1"). CABLES RUN FROM INJECTOR AT "IN1" THRU RF PENETRATION/FILTER PANEL TO INJECTOR POWER SUPPLT AT "IN2". REFER TO MANUFACTURERS SPECIFICATIONS FOR ACTUAL ELECTRICAL REQUIREMENTS.	NOT TO EXCEED 30 FEET IN EXAM ROOM
12)	(1) 2"ø	CONDUIT FROM RF PENETRATION/FILTER PANEL (LOCATED NEAR "F1") TO "IN2. CABLES RUN FROM INJECTOR AT "IN1" THRU RF PENETRATION/FILTER PANEL TO INJECTOR POWER SUPPLT AT "IN2". REFER TO MANUFACTURERS SPECIFICATIONS FOR ACTUAL ELECTRICAL REQUIREMENT	NOT TO EXCEED 10 FEET OUTSIDE EXAM ROOM
(13)	(1) 2"ø	CONDUIT FROM "IN2" TO "IN3" FOR INJECTOR CABLES.	NOT TO EXCEED 150 FEET

CONTRACTOR SUPPLIED CABLES					
FROM	VIA	то	DESCRIPTION	REMARKS	
SOURCE	1	MP	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.		
MP	2	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.		
EPO	3	EP0	DETERMINED BY ELECTRICAL CONTRACTOR.		
MP	4	EPC	(3) 2/0 AND (1) 2/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED. THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.	LANDED BY ELECTRICAL CONTRACTOR	
EPO	9	UPS	DETERMINED BY ELECTRICAL CONTRACTOR.	6 FOOT TAILS	

#### **ELECTRICAL NOTES**

) COMPLIANCE: ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA-70), O.S.H.A. REGULATIONS, AS WELL AS APPLICABLE REGULATIONS OF CITY, COUNTY, STATE AND FEDERAL AGENCIES. PROVIDE MATERIALS AND EQUIPMENT THAT COMPLY TO ANSI, IEEE AND NEMA STANDARDS AND ARE U.L. LISTED AND LABELED. THE CUSTOMER'S/CONTRACTOR'S WORK AND ALL EQUIPMENT INSTALLED SHALL COMPLY WITH THE CURRENT EDITION OF NATIONAL ELECTRICAL CODE ADOPTED/ENFORCED BY THE AUTHORITY HAVING JURISDICTION. 2) QUALITY ASSURANCE: THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN THE FIELD TO INSURE THAT THE NEW WORK WILL FIT INTO THE EXISTING STRUCTURE AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST OR BE DISCOVERED THAT PREVENT THE INSTALLATION OF WORK AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO FABRICATION OF EQUIPMENT, OR THE PERFORMANCE OF ANY WORK THAT MAY BE AFFECTED. DO NOT ALTER DRAWINGS, DIMENSIONS, OR SPECIFICATIONS IN ANY WAY WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SIEMENS PROJECT MANAGER. ALL DIMENSIONS ARE FROM FINISHED SURFACES. CONDUIT AND PULL BOXES TO BE INSTALLED BY THE CUSTOMER/CONTRACTOR WITH LOCATIONS BEING FIELD VERIFIED BY SIEMENS PRÓJECT MANAGER. 3) POWER SUPPLY SOURCE: POWER SUPPLIES FOR SIEMENS HEALTHCARE EQUIPMENT SHALL BE FROM A MEDICAL IMAGING PANEL OR BUILDING SERVICE EQUIPMENT THAT IS A GROUNDED 3 OR 4-WIRE 'WYE' SOURCE PER THE SPECIFIC EQUIPMENT OPERATION REQUIREMENTS. A DEDICATED CIRCUIT SHALL BE PROVIDED THAT IS KEPT ENTIRELY FREE AND INDEPENDENT OF ALL OTHER BUILDING WIRING. NO ELEVATORS, GENERATORS, PUMPS, HVAC OF SIMILAR EQUIPMENT SHALL BE CONNECTED TO THE SAME CIRCUIT OR MEDICAL IMAGING PANEL THAT SERVES THE SIEMENS HEALTHCARE EQUIPMENT IF THE POWER SUPPLY SOURCE DOES NOT MEET THE SPECIFIC SIEMENS EQUIPMENT POWER REQUIREMENTS, THE CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT REQUIRED TO ESTABLISH THE POWER SUPPLY IN ACCORDANCE WITH THE REQUIRED POWER SUPPLY PARAMETERS OF THE SIEMENS EQUIPMENT. THE CONTRACTOR SHALL COORDINATE THIS WORK WITH THE CUSTOMER AND/OR UTILITY COMPANY FIELD REPRESENTATIVE. 4) WORK FURNISHED BY CUSTOMER/CONTRACTOR: WORK NOT PROVIDED BY SÍEMENS HEALTHCARE BUT SHOWN ON DRAWINGS TO BE FURNISHED AND INSTALLED BY CUSTOMER/CONTRACTOR INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING, UNLESS NOTED OTHERWISE: ELECTRICAL RACEWAYS AND DUCTS, WIRING TROUGHS, PULL BOXES, CONDUITS, CIRCUIT BREAKERS, ACCESS PANELS, EMERGENCY OFF BUTTONS, DOOR SWITCHES, WARNING LIGHTS, WIRING, WIRING DEVICES, CONNECTORS, LIGHTING EQUIPMENT AND GROUNDING. 5) RACEWAY AND CONDUIT NOTES: ALL ITEMS IN THE MAGNET ROOM SHALL

BÉ NON-FERROUS. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT ENFORCED EDITION OF THE NATIONAL ELECTRICAL CODE. CONDUIT BODIES SHALL NOT BE USED. WHERE A CONDUIT ENTERS A BOX, FITTING, OR OTHER ENCLOSURE, AN INSULATED THROAT CONNECTOR SHALL BE PROVIDED TO PROTECT THE WIRE FROM ABRASION. ALL CONNECTORS FOR EMT SHALL BE COMPRESSION OR DOUBLE SET SCREW

KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES OR STEAM AND HOT WATER PIPES. INSTALL RACEWAY RUNS ABOVE WATER AND STEAM PIPES PROVIDED THAT CABLE RUN DISTANCES ARE MAINTAINED. USE TEMPORARY CLOSURES TO PREVENT FOREIGN MATTER FROM ENTERING RACEWAY. CONDUIT RUNS ARE SHOWN SCHEMATICALLY. INSTALL CONDUIT WITH A

MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE BUILDING CONSTRUCTION AND OBSTRUCTIONS, EXCEPT AS OTHERWISE INDICATED. THE CONTRACTOR SHALL MAKE CERTAIN THAT ANY CONDUIT/RACEWAY RUNS CONTAINING SIEMENS HEALTHCARE CABLES DO NOT EXCEED THE SPECIFIED MAXIMUM DISTANCES AS SHOWN ON THE ELECTRICAL DETAILS. LISTED CONDUIT SIZES FOR SIEMENS-SUPPLIED CABLES MUST BE MAINTAINED IN ORDER TO ENABLE THE TOTAL CABLE BUNDLE INCLUDING CONNECTORS TO BE PULLED THROUGH WITHOUT DAMAGE.

PROVIDE ENCLOSED METAL WIRE DUCT RACEWAY SYSTEM WHERE SHOWN ON DRAWINGS WITH DIVIDERS TO SEPARATE THE DUCT INTO TWO OR THREE SEPARATE COMPARTMENTS AS SHOWN ON THE SIEMENS PLANS (FOR POWER AND SIEMENS HEALTHCARE CABLING). DIVIDERS AND CROSSOVER PIECES TO BE PROVIDED AS NECESSARY. THE CABLE TO CABLE AS WELL AS THE CIRCUIT TO CIRCUIT SEPARATION REQUIREMENT WAS EVALUATED DURING TH UL SYSTEM CERTIFICATION OF THE EQUIPMENT. ADDITIONAL SEPARATION OF THE SYSTEM CABLE ASSEMBLIES INTO SEPARATE OR PARTITIONED RACEWAYS, UNLESS OTHERWISE NOTED, IS NOT NECESSARY TO INSURE SEPARATION OF CIRCUITS.

PROVIDE WIRE DUCT/RACEWAY WITH ACCESSIBLE REMOVABLE COVERS LOCATIONS OF BUILDING MATERIAL OPENINGS (I.E. ACCESS PANELS) TO BE CUT IN FIELD ARE TO BE COORDINATED WITH THE DRAWING REQUIREMENTS AND BUILDING STRUCTURE. THOSE THAT ARE NOT INDICATED OR INTERFERE WITH BUILDING ELEMENTS SHALL BE COORDINATED WITH SIEMENS PROJECT MANAGER. ELECTRICAL PULL BOXES AND RACEWAY COVERS SHALL BE INSTALLED IN A MANNER TO ALLOW ACCESSIBILITY FOR INSTALLATION AND MAINTENANCE. CONTRACTORS MUST PROVIDE PULL STRINGS FOR ALL CONDUIT AND WIRE DUCT/RACEWAY. IN-FLOOR TRENCH DUCT AND FLUSH FLOOR BOXES SHALL BE PROVIDED WITH FULLY GASKETED REMOVABLE COVERS. WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED HIGHER THAN 14 FEET ABOVE FINISHED FLOOR, THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP THE SIEMENS INSTALL TEAM PULL SIEMENS SUPPLIED CABLES AT CUSTOMER EXPENSE.

WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED ABOVE A HARD CEILING (I.E. SHEET ROCK), A 24" x 24" ACCESS PANEL IS REQUIRED AT EACH JUNCTION BOX AND WITHIN 2 FEET OF EACH RACEWAY TRANSITION (SUCH AS A 90 DEGREE ELBOW OR TEE) IN DUCT/RACEWAY. THERE MUST BE FREE AND CLEAR ACCESS TO JUNCTION BOXES AND WIRE DUCT/RACEWAY. WHEN ACCESS PANELS ARE LOCATED MORE THAN 3 FEET FROM JUNCTION BOXES AND WIRE DUCT/RACEWAY THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP SIEMENS INSTALL TEAM PULL SIEMENS SUPPLIED CABLES AT CUSTOMER EXPENSE.

6) WIRING: ALL WIRING INSTALLED SHALL BE 600 VOLT CLASS, STRANDED TYPE THHN/THWN-2, SINGLE CONDUCTOR ANNEALED COPPER FOR A MAXIMUM OPERATING TEMPERATURE OF 90° C (194° F). SIZED AS INDICATED INSTALLED IN METAL RACEWAYS. THE CUSTOMER/CONTRACTOR SHALL LEAVE MINIMUM 10 FT. OF WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY THE CUSTOMER/ELECTRICAL CONTRACTOR.

7) SHORT CIRCUIT REQUIREMENTS: ALL CIRCUIT BREAKERS SUPPLIED FOR THE SIEMENS EQUIPMENT REQUIREMENTS SHALL BE RATED HIGHER THAN THI SHORT CIRCUIT AVAILABLE AT THE TERMINALS OF THE ELECTRICAL EQUIPMENT AS DETERMINED BY THE ENGINEER OF RECORD, BUT NOT LESS THAN 35,000A RMS SYMMETRICAL AT 480V, 3-PHASE, 60 HERTZ. THE CONTRACTOR SHALL OBTAIN THE CORRECT SHORT CIRCUIT CURRENT RATING OF ALL THE NEW EQUIPMENT FOR INSTALLATION FROM THE ENGINEER OF RECORD.

REV 16

CEIL	ING H	EIGHTS
MAGNET EXAMINATION ROC	ом: 7'—11"	MINIMUM
EQUIPMENT ROOM:	7'-3"	MINIMUM
ALL ANCILLARY AREAS:	6' <b>-</b> 11"	MINIMUM

			PROJECT
2	06/25/21	COMPLETE NEW SET OF DWGS BASED ON LATEST WALL BACKGROUNDS/	VMAIL: FAX: EMAIL: p
2	06/25/21	MODIFIED MAGNET GAUSS FIELDS TO REFLECT LATEST SHLD CALCS./	GF
2	06/25/21	ALL LAYOUTS, LEGENDS NOTES & DETAILS UPDATED ACCORDINGLY	
$\triangle$	05/11/21	NEW WALL BACKGROUNDS/ ADD CASEWORK & SHIFT MAGNET	THE U
$\triangle$	06/25/21	2003356RRA DATED 09/10/20 APPROVED BY CUSTOMERS FOR FINALS	SIEMEN RESUL FULL
SYM	DATE	DESCRIPTION	ALL F
	SCALE:		

USE OR REPRODUCTION OF TITLE BLOCK WITHOUT ENS AUTHORIZATION WILL JLT IN PROSECUTION UNDER EXTENT OF THE LAW.

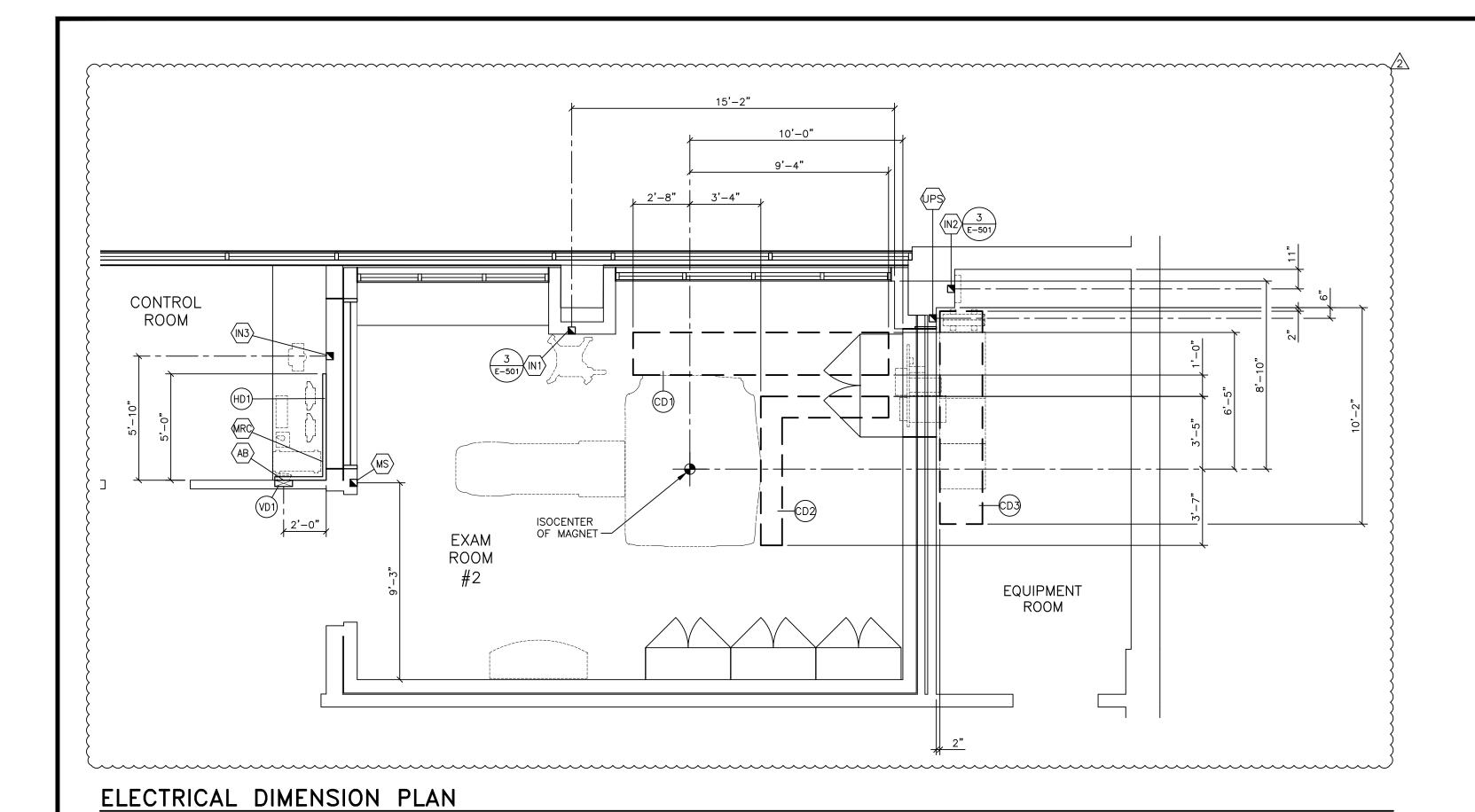
MANAGER: PATRICK RUIZ (770) 402 - 1365patrick.ruiz@siemens-healthineers.com

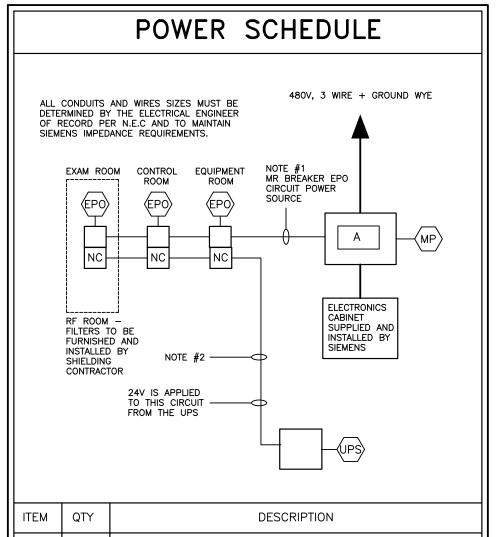
**SIEMENS** RADY MEMORIAL HOSPITAL CORPORATION

80 JESSE HILL JUNIOR DRIVE, SOUTH EAST, ATLANTA, GA 30303 MRI ROOM #2 - MAGNETOM VIDA XQ GRADIENTS

2003356

PROJECT #:





MP MAIN PANEL WITH MAIN BREAKER FLUSH OR SURFACE MR SYSTEM BREAKER MUST HAVE TRIPPING DEVICE SO WHEN ANY EPO IS PRESSED THE BREAKER TRIPS. MR BREAKER AMPS: SEE POWER REQUIREMENTS VOLTS PHASES NEUTRAL GROUND TOTAL WIRES 4 (NOTE 1)

1) ALL WIRES MUST BE SAME SIZE. NOTE: UNLESS OTHERWISE NOTED ALL BREAKERS WILL BE 80% RATED.

EPO VARIES NOTE 1 - EPO CIRCUIT #1

MAIN CIRCUIT BREAKER EMERGENCY POWER OFF BUTTON WITH PROTECTIVE COVER THAT PREVENTS ACCIDENTAL ACTIVATION. THE EPO MUST BE OF FAIL-SAFE DESIGN, ALL EPO'S TO HAVE MECHANICAL LATCHING MECHANISM. EPO MUST BE RESET BEFORE MR BREAKER CAN RESUME OPERATION. CONTACTS AND WIRING CONFIGURATION TO BE DESIGNED BY ELECTRICAL ENGINEER OF RECORD.

NOTE 2 - EPO CIRCUIT #2 EPO CONTACTS TO BE NORMALLY CLOSED, WIRED IN SERIES, CONNECTED TO GXT4 UPS ONLY.

THE EPO'S MUST BE INSTALLED BY A QUALIFIED ELECTRICAL CODE, STATE AND LOCAL REGULATIONS. THE CUSTOMER IS SOLELY RESPONSIBLE FOR THE IMPLEMENTATION OF THE EPO'S AND THEIR ASSOCIATED CIRCUITS AND MUST MAKE THE FINAL DETERMINATION CONSIDERING ALL SITE CONDITIONS AND REGULATORY

UNLESS OTHERWISE NOTED, ALL ITEMS LISTED IN THIS SCHEDULE SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR.

# POWER QUALITY NOTES

1) IT IS THE CUSTOMER'S RESPONSIBILITY TO COMPLY WITH THE POWER QUALITY REQUIREMENTS FOR SIEMENS MEDICAL SYSTEMS

2) THE ELECTRICAL FEEDER TO THE SIEMENS MEDICAL SYSTEMS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS, AND OTHER POTENTIAL SOURCES OF ELECTRICAL INTERFERENCE. 3) THE ELECTRICAL FEEDER TO THE IMAGING SYSTEM MUST BE RUN

DÍRECTLY TO A MAIN FACILITY DISTRIBUTION PANEL OR TO THE FACILITY SERVICE ENTRANCE, WITH NO OTHER LOADS POWERED FROM 4) IN ORDER TO COMPLY WITH IMAGING SYSTEM POWER QUALITY REQUIREMENTS, ADDITIONAL POWER CONDITIONING DEVICES MAY BE

REQUIRED. EXAMPLES INCLUDE VOLTAGE REGULATORS, TRANSFORMERS, SURGE PROTECTIVE DEVICES, FILTERS, AND/OR UNINTERRUPTIBLE POWER SUPPLIES (UPS). RECOMMENDED FOR THE INSTALLATION OF ELECTRONIC EQUIPMENT CAN BE FOUND IN IEEE STANDARD 1100-1999 "POWERING AND GROUNDING ELECTRONIC **EQUIPMENT:** 5) POWER CONDITIONING DEVICES NOT APPROVED BY SIEMENS

MÉDICAL SYSTEMS MAY NOT BE COMPATIBLE WITH THE MAGNETOM SYSTEM. "FERRORESONANT" POWER CONDITIONING EQUIPMENT RE-APPLIED FROM PREVIOUS GENERATION SYSTEMS IS ALSO GENERALLY EXCLUDED DUE TO HIGHER POWER REQUIREMENTS OF THE NEWER SYSTEMS. 6) INCOMING SOURCE POWER WIRES MUST BE SEPARATED FROM ANY

SIEMENS CABLING BY A MINIMUM OF 12".

POWER REQUIREMENTS VOLTAGE VARIATION:480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS VOLTAGE UNBALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES 60 Hz ± 1.0 Hz <150 mOHMS LINE IMPEDENCE: POWER CONSUMPTION READY FOR MEASUREMENT 8.35kW/1.8kW CHILLER/SEP POWER CONSUMPTION TYPICAL EXAM CHILLER/SEP 27.42kW/1.8kW CONNECTION VALUE 84 kVA MOMENTARY POWER 135 kVA

MR SYSTEM BREAKER SIZE (A)

ALL BREAKERS ARE RATED AT 80%

## POWER QUALITY

150 A

POOR POWER WILL ALTER EQUIPMENT PERFORMANCE

IT IS IN THE CUSTOMER'S INTEREST THAT THE ELECTRICAL CONTRACTOR BE RESPONSIBLE FOR TESTING AND VERIFYING THAT THE EQUIPMENT POWER SUPPLY COMPLIES WITH THE SIEMENS SPECIFICATIONS.

# DEMAND AND CAPACITY

1) IF EQUIPMENT UPGRADE IS ANTICIPATED, INSTALLING ELECTRICAL POWER TO MEET THE REQUIREMENTS OF THE HIGHER POWER GRADIENT PACKAGE AT THE TIME OF INITIAL INSTALLATION WILL REDUCE THE COST TO UPGRADE THE ELECTRICAL SYSTEM LATER.

2) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS, AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET.

3) OVER CURRENT PROTECTION IS SPECIFIED FOR SYSTEMS WITHOUT AN UNINTERRUPTIBLE POWER SUPPLY (UPS). ADDITION OF A UPS REQUIRES A HIGHER CAPACITY MAINS CONNECTION (DEPENDENT UPON UPS MODEL AND SIZE). MAXIMUM FAULT CURRENT IS DEPENDENT UPON THE IMPEDANCE OF THE FACILITY ELECTRICAL SYSTEM. THE CUSTOMER'S ARCHITECT OR ELECTRICAL CONTRACTOR TO SPECIFY AIC RATING OF OVER CURRENT PROTECTION BASED ON FACILITY IMPEDANCE CHARACTERISTICS.

4) MOMENTARY POWER IS BASED ON A MAXIMUM RMS VALUE FOR A PERIOD NOT TO EXCEED FIVE (5) SECONDS, AS DEFINED IN NEC. STAND-BY AND AVERAGE CURRENT ARE SUBSTANTIALLY

5) THE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VOLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS USED TO OBTAIN THE PROPER EQUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.

6) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.

7) A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (>8x RATED CURRENT) IS REQUIRED TO PERMIT SWITCH-ON OF THE UPS SYSTEM WITHOUT SPURIOUS TRIPPING. CIRCUIT BREAKERS WITH AN ADJUSTABLE MAGNETIC TRIP (SIEMENS FD6 SERIES OR SIMILAR) ARE HIGHLY RECOMMENDED.

REV 1

# ELECTRICAL INSTALLATION NOTES

1) INSTALL THE MR SYSTEM CIRCUIT BREAKER IN OR NEAR THE EQUIPMENT ROOM. THE PERMITTED FRINGE FIELD FOR THE PANEL IS UP TO 3mT. IF THE FRINGE FIELDS HAVE HIGHER VALUES, MAGNETIC SHIELDING MUST BE PROVIDED OR THE DISTANCE FROM THE MAGNET MUST BE INCREASED.

2) AN ACCEPTABLE MEANS FOR SWITCHING MAIN POWER ON AND OFF SHOULD BE INSTALLED IN THE MAIN BREAKER PANEL. INSTALL EMERGENCY SHUTDOWN BUTTONS IN EACH ROOM WHERE THERE IS SIEMENS EQUIPMENT.

3) THE ELECTRICAL FEEDER TO THE SIEMENS EQUIPMENT MUST FÉED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS AND OTHER POTENTIAL SOURCES OF ELECTRICAL

4) THE EMERGENCY POWER OFF (EPO) BUTTONS ARE TO BE MUSHROOM TYPE WITH PUSH LOCK AND PULL TO RELEASE.

5) WALL RECEPTACLES MADE OF FERROMAGNETIC MATERIALS ARE NOT PERMITTED IN THE EXAM ROOM. PERIPHERAL UNITS (SUCH AS VENTILATORS) NOT APPROVED FOR USE IN A HIGH MAGNETIC FIELD ENVIRONMENT CAN INFLUENCE THE MAGNETIC FIELD, COMPROMISING IMAGE QUALITY. THE CUSTOMER IS RESPONSIBLE FOR INSTALLATION AND USE OF RECEPTACLES IN THE EXAM ROOM. INSTALLATION OF RECEPTACLES AND THE FILTERS REQUIRED ARE TO BE COORDINATED WITH THE RF SHIELDING SUPPLIER.

6) THE RF SHIELD MUST BE FITTED WITH A GROUND STUD OR BUS BAR, LOCATED WITHIN 24" OF THE AUXILIARY FILTERS FOR ROOM LIGHTS AND OUTLETS, SUPPLIED AND INSTALLED BY THE RF SHIELD

7) IN ORDER TO PREVENT GROUND LOOPS, ALL CUSTOMER OR CUSTOMER/CONTRACTOR SUPPLIED AC POWER ENTERING THE EXAMINATION ROOM (I.E. OUTLETS, EPO, ETC.) SHOULD BE SUPPLIED VIA AN ISOLATION TRANSFORMER. THE ISOLATION TRANSFORMER SECONDARY WINDING GROUND CONDUCTOR SHOULD BE CONNECTED TO THE RF SHIELD GROUND STUD OR BUS BAR.

# **GROUNDING NOTES**

EQUIPMENT GROUNDING CONDUCTOR TO COMPLY WITH THE FOLLOWING:

1) SIZE GROUNDING WIRE TO SIEMENS EQUIPMENT PER POWER SCHEDULE REQUIREMENTS. 2) DERIVED FROM THE ELECTRICAL SERVICE, TRANSFORMER OR MAIN DISTRIBUTION PANEL FEEDING THE SIEMENS **EQUIPMENT** 

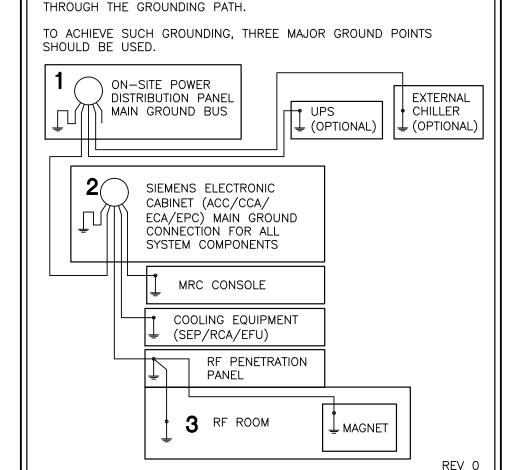
3) RUN IN THE SAME CONDUIT, TROUGH OR RACEWAY AS THE PHASE CONDUCTORS.

4) CONTINUOUS, WITH NO BREAKS OR USE OF CONDUIT, CHASSIS OR EARTH AS THE SOLE GROUNDING PATH. 5) BONDED TO CHASSIS AND/OR CONDUIT IN ACCORDANCE WITH THE NEC REQUIREMENTS.

6) MINIMIZE CONNECTIONS OR TERMINALS TO ENSURE CONTINUITY OVER THE LIFE OF THE INSTALLATION. 7) AS A NORM, THERE SHOULD NOT BE ANY CURRENT PRESENCE ON THE GROUND CONDUCTOR, BUT IT IS ACCEPTABLE TO HAVE <500mA DURING OPERATION OF THE IMAGING EQUIPMENT.

# MR GROUNDING NOTES

THE INTERNAL GROUND WIRING OF THE MR SYSTEM MUST BE INSTALLED WITH MINIMUM GROUND LOOPS. THIS IS TO PREVENT NOISE CURRENTS AND GENERAL DISTURBANCES FROM FLOWING



 $\bigvee$ IDA REV 16

# CEILING HEIGHTS

MAGNET EXAMINATION ROOM: 7'-11" MINIMUM EQUIPMENT ROOM: 7'-3" MINIMUM

ALL ANCILLARY AREAS: 6'-11" MINIMUM

ROJECT MANAGER: PATRICK RUIZ (770) 402-1365 COMPLETE NEW SET OF DWGS BASEI 06/25/21 ON LATEST WALL BACKGROUNDS/ MODIFIED MAGNET GAUSS FIE 06/25/21 TO REFLECT LATEST SHLD CALCS. ALL LAYOUTS, LEGENDS NOTES 06/25/21 DETAILS UPDATED ACCORDINGL NEW WALL BACKGROUNDS/ A 05/11/21 CASEWORK & SHIFT MAGNET 2003356RRA DATED 09/10/ 06/25/21 APPROVED BY CUSTOMERS FÓR FÍNALS FULL EXTENT OF THE LAW. DATE DESCRIPTION

**GRADY MEMORIAL HOSPITAL CORPORATION** 

80 JESSE HILL JUNIOR DRIVE, SOUTH EAST, ATLANTA, GA 30303 MRI ROOM #2 - MAGNETOM VIDA XQ GRADIENTS PROJECT #: HIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 2003356 RESULT IN PROSECUTION UNDER

D. BRISTOE

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED - IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

DOCUMENTS FOR REFERENCE.

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

PHYSICIST TO SPECIFY RADIATION PROTECTION.

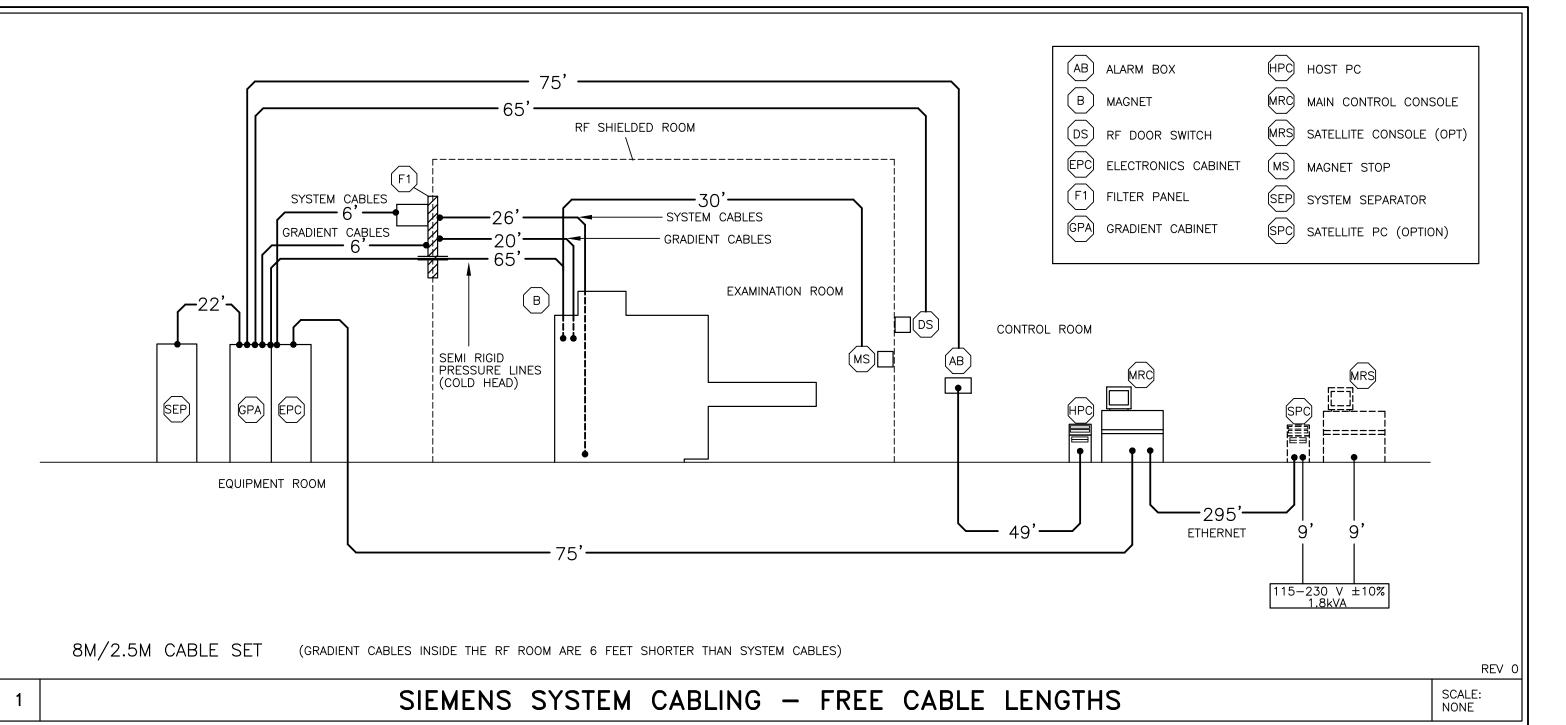
THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

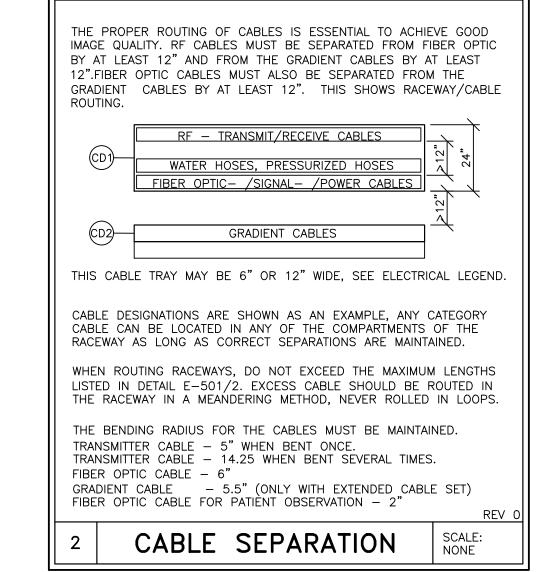
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.

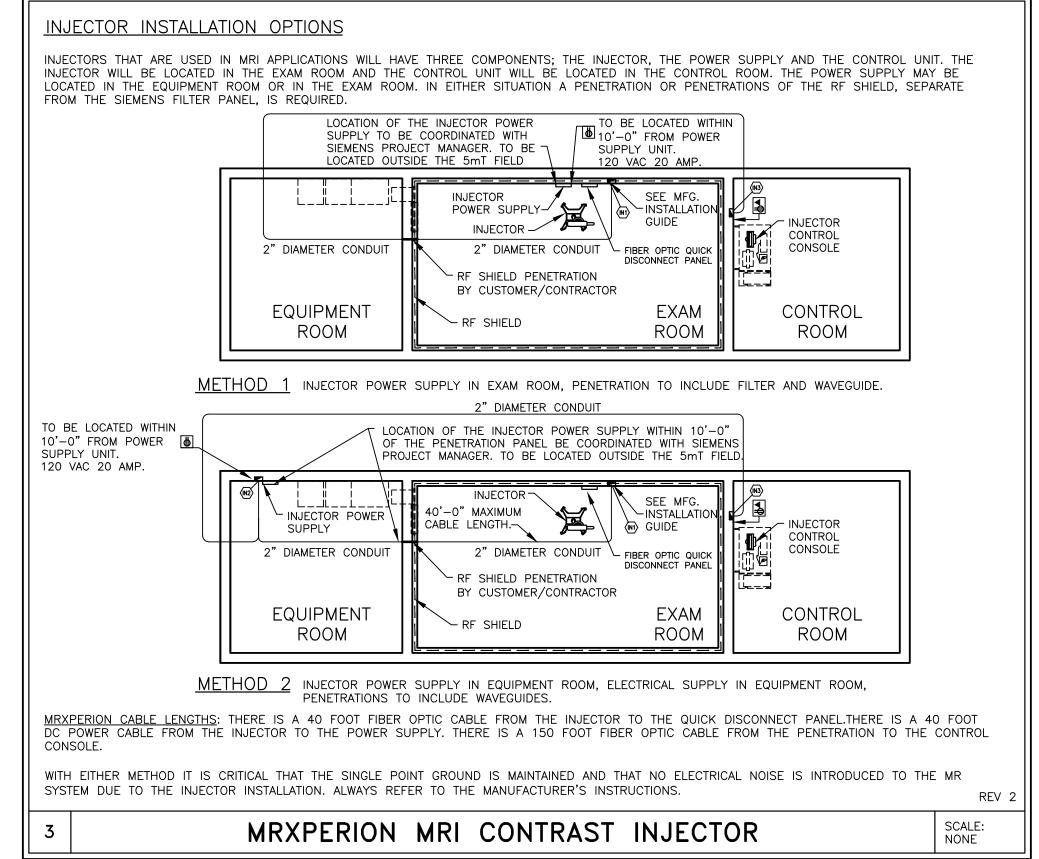
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**SIEMENS** 









1) ALL POWER CONDUCTORS SUPPLIED BY THE CUSTOMER/ CONTRACTOR SHALL BE INSTALLED IN METAL RACEWAY. 600 VOLT CLASS. STRANDED TYPE THHN-THWN. RATED FOR 75°C (165°F) OPERATION. RECOMMEND MINIMUM 5 FEET WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY SIEMENS MEDICAL SYSTEMS.

2) THE CABLE GROUPS INCLUDED WITH THE MAGNETOM SYSTEM MAY BE ROUTED IN THE SAME CABLE TRAY IF PROVIDED WITH AN 8" SEPARATION BETWEEN SMALL SIGNAL LINES, GRADIENT CABLES, AND THE RF TRANSMIT CABLE. A 24" WIDE LADDER TYPE CABLE TRAY IS RECOMMENDED. CABLES SHOULD NOT BE BUNDLED TOGETHER.

3) NOTE THE CABLE CONNECTOR SIZES (LARGEST CONNECTOR SIZE IS 2 1/2" x 2 1/2") FOR CABLE FEED-THROUGHS AND CABLE

4) THE CABLE LENGTHS SPECIFIED ARE THE STANDARD LENGTHS. 5) THE SIEMENS SYSTEM CABLES ARE NOT PLENUM RATED AND SHOULD NOT BE RUN UNPROTECTED IN AN AIR PLENUM UNLESS

ENCLOSED IN A SEALED CABLE TRAY OR CONDUIT.

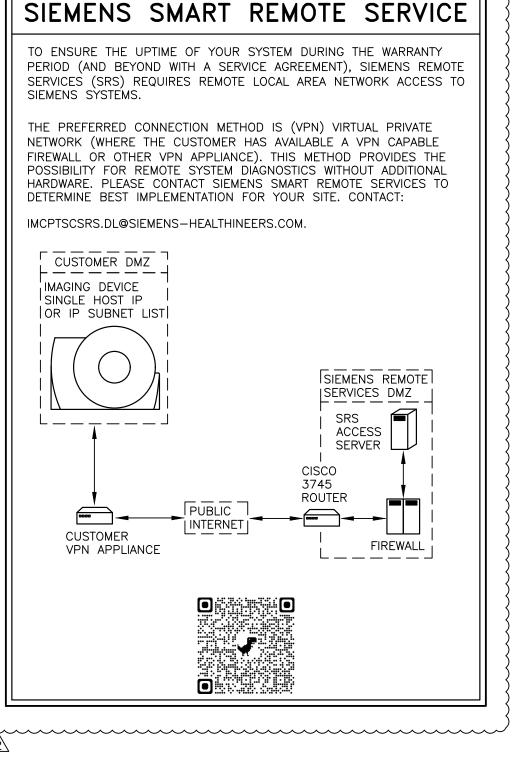
# CABLE LENGTH RESTRICTIONS

MAGNET. THESE VERTICAL RUNS MUST BE DEDUCTED FROM THE

TOTAL CABLE LENGTH OF 16'.

1) THE CABLE SET LENGTH IDENTIFIES THE "FREE CABLE LENGTH". THIS IS THE LENGTH FROM CONNECTION POINT TO CONNECTION POINT. THE CABLE LENGTH IS NOT THE DISTANCE BETWEEN COMPONENTS. 2) THE GRADIENT CABLES INSIDE THE RF SHIELDED ROOM ARE 6'-0" SHORTER THAN THE OTHER SYSTEM CABLES. THIS MEANS THAT IF THE 22' CABLE SET IS SELECTED, THE GRADIENT CABLES WILL BE 16' IN LENGTH. THE GRADIENT CABLES NEED TO GO UP INTO THE CABLE TRAY IN THE CEILING AT THE FILTER PLATE AND DOWN AT THE

REV C



REV 16

**SIEMENS** (770) 402-1365 COMPLETE NEW SET OF DWGS BASEI ON LATEST WALL BACKGROUNDS/ MODIFIED MAGNET GAUSS FIE **GRADY MEMORIAL HOSPITAL CORPORATION** TO REFLECT LATEST SHLD CALCS. 80 JESSE HILL JUNIOR DRIVE, SOUTH EAST, ATLANTA, GA 30303 ALL LAYOUTS, LEGENDS NOTES MRI ROOM #2 - MAGNETOM VIDA XQ GRADIENTS DETAILS UPDATED ACCORDINGL NEW WALL BACKGROUNDS/ A PROJECT #: CASEWORK & SHIFT MAGNET HIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 2003356 2003356RRA DATED 09/10/. RESULT IN PROSECUTION UNDER 06/25/21 APPROVED BY CUSTOMERS FÓR FÍNALS FULL EXTENT OF THE LAW.

ROJECT MANAGER: PATRICK RUIZ

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

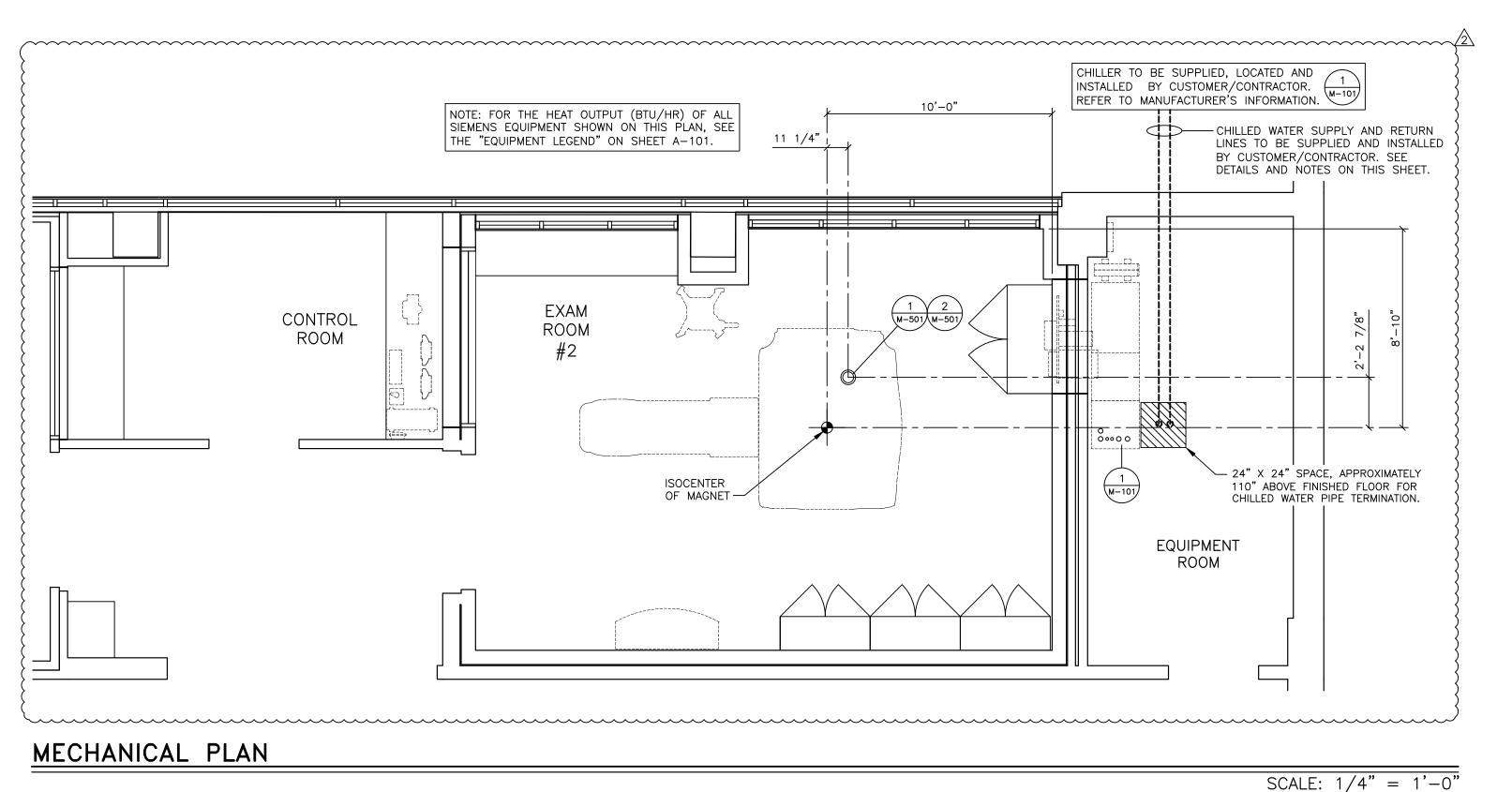
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

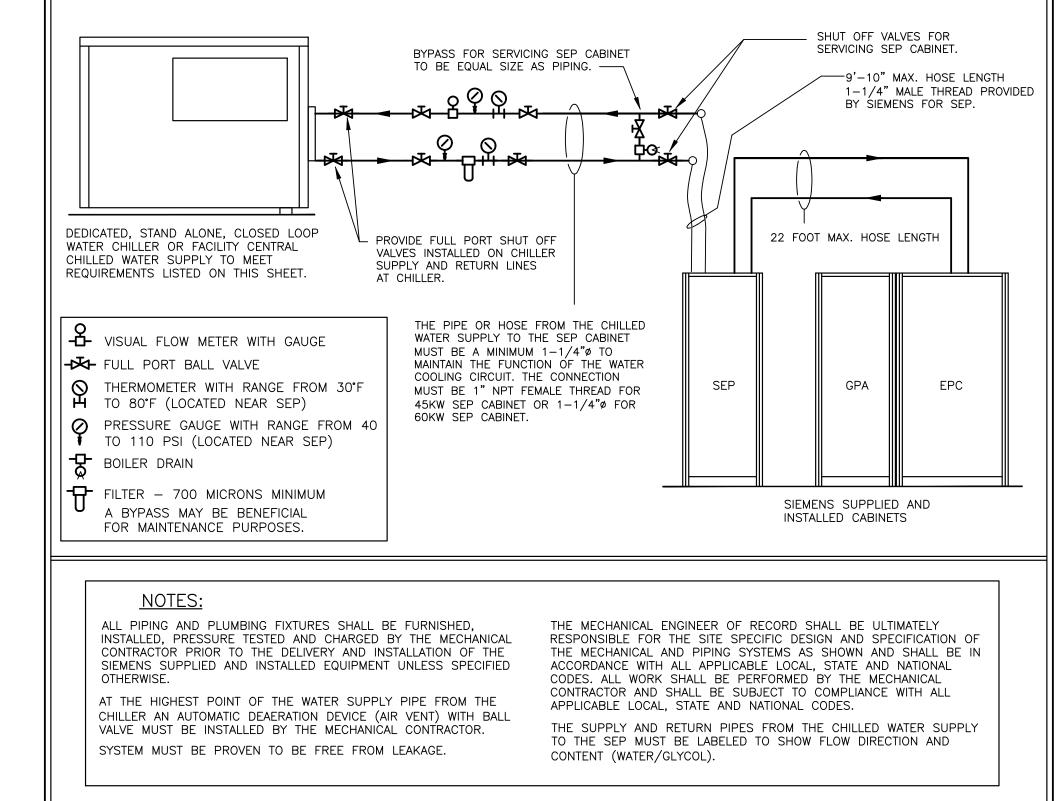
PHYSICIST TO SPECIFY RADIATION PROTECTION.

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

DATE DESCRIPTION SCALE: AS NOTED -ISSUE BLOCK-

ALL RIGHTS ARE RESERVED. REF. #: 30238438 06/25/21 D. BRISTOE





PIPING SCHEMATIC FOR FACILITY PROVIDED CHILLED WATER | SCALE

# CHILLED WATER SUPPLY

A CHILLED WATER SUPPLY IS REQUIRED TO THE MRI SYSTEM 24 HOURS A DAY, YEAR ROUND FOR THE COLD HEAD AND GRADIENT SYSTEMS. THIS CAN BE PROVIDED BY A CENTRAL CHILLED WATER SUPPLY OR A SEPARATE STAND ALONE CHILLER THAT MEETS THE STATED REQUIREMENTS. CHILLED WATER CAN ALSO BE SUPPLIED BY A CHILLER PROVIDED BY SIEMENS.

A SEPARATOR CABINET (SEP) OR INTERFACE PANEL (IFP) MUST BE INCLUDED WITH THE SIEMENS ORDER. THE PIPE SIZE BETWEEN THE WATER SUPPLY AND SEP MUST MEET MANUFACTURER AND SIEMENS REQUIREMENTS; LARGER DIAMETER PIPE MAY BE REQUIRED DUE TO LENGTH OF RUN. FLOW AND PRESSURE REQUIREMENTS MUST BE MET.

PERMISSIBLE MATERIALS THAT CAN BE USED FOR THE PIPING ARE: STAINLESS STEEL (V2A, V4A), NON-FERROUS METAL (COPPER, BRASS), SYNTHETIC MATERIAL, PLASTICS, BRAZING SOLDER, HARD SOLDER, OR FITTING SOLDER TYPE 3 AND 4. THERE ARE MATERIALS THAT MAY CAUSE DAMAGE TO THE COOLING SYSTEM AND CANNOT BE USED, THESE MATERIALS ARE ALUMINUM, IRON, CARBON STEEL, ZINC, ZINC PLATED STEEL, OR STANDARD STEEL PIPES.

27 GALLONS OF DISTILLED/DE-IONIZED WATER MUST BE PROVIDED AND INSTALLED BY CUSTOMER/CONTRACTOR FOR FILLING THE SECONDARY CHILLED WATER CIRCUIT.

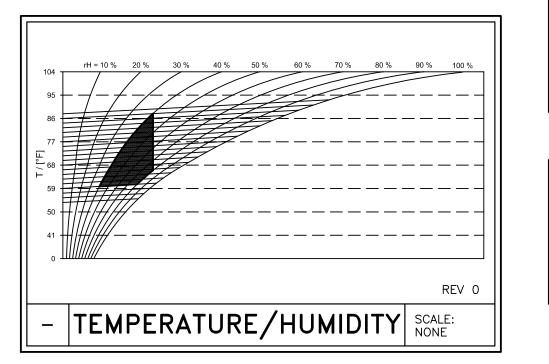
SEE MANUFACTURER'S REQUIREMENTS FOR GLYCOL AND WATER QUALITY TO BE PROVIDED AND FILLED BY CUSTOMER/CONTRACTOR.

THE SUPPLY AND RETURN CHILLED WATER PIPES MUST BE LABELED. THE LOCATION OF THE LABELS MUST BE AT ALL CONNECTION AND REFILLING POINTS AND MUST CONTAIN FLOW DIRECTION AND CONTENTS.

# CHILLED WATER REQUIREMENTS

WATER REQUIREMENTS TO BE MEASURED AT THE SEP CABINET.

1	
FLOW RATE:	26.42 GPM ±2.5GPM
WATER TEMPERATURE:	42.8°F - 57.2°F
BTU DISCHARGE TO THE WATER	204,911 BTU/HR
WATER PRESSURE	MAXIMUM 87 PSI
LOSS OF PRESSURE FOR SEP CABINET	<8.7 PSI AT 29 GPM
CHILLED WATER ACIDITY RANGE	6 pH TO 8 pH
CHILLED WATER QUALITY	200 ppm CHLORINE 200 ppm SUPPHATE
FILTRATION	700 µm



# MECHANICAL NOTES

) THE AIR H.V.A.C. SYSTEM MUST OPERATE FOR A MINIMUM OF 48 CONSECUTIVE HOURS PRIOR TO THE DELIVERY OF THE EQUIPMENT. 2) THE FILTERS MUST BE CHANGED IMMEDIATELY PRIOR TO THE

DELIVERY OF THE EQUIPMENT.

3) SIEMENS REQUIRES THE USE OF A DEDICATED H.V.A.C. SYSTEM FOR THE EQUIPMENT ROOM TO BE LOCATED, SIZED AND SPECIFIED BY THE MECHANICAL ENGINEER OF RECORD AND TO BE SUPPLIED

AND INSTALLED BY THE MECHANICAL CONTRACTOR.

4) SIEMENS RECOMMENDS THAT THE CUSTOMER PROVIDE AND INSTALL AN OXYGEN MONITORING SYSTEM WITH VISUAL AND AUDIBLE ALARMS TO INDICATE WHEN THE OXYGEN CONTAINED IN AMBIENT AIR FALLS BELOW PRE-PROGRAMMED SAFETY LEVELS WITH THE SENSOR TO BE LOCATED IN THE SCAN ROOM IN THE AREA DESIGNATED FOR CRYOGEN FILLING.

5) THE SIEMENS ACTIVE SHIELDED MAGNET RECIRCULATES LIQUID HELIUM, ELIMINATING THE NEED FOR A DEDICATED CRYOGEN STORAGE AREA. THE RECIRCULATING SYSTEM SIGNIFICANTLY REDUCES THE HELIUM "BOIL OFF". THE MAGNET WILL REQUIRE OCCASIONAL FILLING, A DELIVERY ROUTE FOR CRYOGEN DEWARS MUST BE ESTABLISHED. A MINIMUM 36" CLEARANCE IS REQUIRED.

REV 0

# FIRE CONTROL NOTES

1) SIEMENS HAS NO SPECIFIC REQUIREMENT FOR FIRE PROTECTION. FÍRE PROTECTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH LOCAL CODES AND CUSTOMER'S INSURANCE REQUIREMENTS. ALL FIRE PROTECTION SYSTEMS SHALL BE DEFINED BY THE ARCHITECT OF RECORD WITH DESIGN, SPECIFICATION AND DETAILING OF THE FIRE PROTECTION SYSTEM BY THE MECHANICAL ENGINEER OF RECORD IN ACCORDANCE WITH SIEMENS GUIDELINES AS STATED HEREIN. THE ELECTRONIC EQUIPMENT OF THE MR SYSTEMS WILL BE DAMAGED BY WATER, REDUCTION OR ELIMINATION OF WATER USED FOR FIRE SUPPRESSION WILL REDUCE POTENTIAL WATER DAMAGE. PRE-ACTION INERT GAS, OR HALOCARBONS OR OTHER METHODS CAN REDUCE OR ELIMINATE WATER. REFER TO YOUR FIRE PROTECTION PROFESSIONAL

2) THE USE OF SMOKE DETECTORS INSIDE OF THE MR EXAMINATION ROOM IS NOT RECOMMENDED. SMOKE DETECTORS, BY DESIGN, CAN GENERATE NOISE THAT MAY INTERFERE WITH THE MRI EXAMINATION AND CAUSE IMAGE ARTIFACTS. IF THE USE OF A SMOKE DETECTOR IN THE EXAMINATION ROOM IS MANDATED BY LOCAL REQUIREMENTS SPECIAL NOISE TESTS MUST BE PERFORMED BY SIEMENS SERVICE AFTER THE MRI IS OPERATIONAL. MRI EQUIPMENT PERFORMANCE PROBLEMS DUE TO SMOKE DETECTORS ARE THE RESPONSIBILITY OF THE CUSTOMER AND ARE NOT COVERED UNDER WARRANTY OR SERVICE AGREEMENT.

3) ALL MATERIAL USED INSIDE THE MAGNET ROOM SHALL BE NON-MAGNETIC. SEE CONSTRUCTION REQUIREMENTS.

4) ALL PENETRATIONS IN THE RF CABIN/SHIELD SHALL BE THROUGH A WAVE GUIDE TO BE EQUIPPED WITH A DIELECTRIC COUPLER ON BOTH ENDS OF THE WAVE GUIDE. ALL WAVE GUIDES SHALL BE DESIGNED, DETAILED AND SPECIFIED BY THE RF CABIN/SHIELD CONTRACTOR WITH ALL LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND MECHANICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION, AND FABRICATION OF THE RF CABIN/SHIELD.

5) EACH ELECTRICAL PENETRATION OF THE RF CABIN/SHIELD FOR ELECTRICAL SERVICING OF THE FIRE PROTECTION SYSTEM SHALL BE THROUGH AN RF FILTER TO BE SUPPLIED BY THE RF SHIELD CONTRACTOR WITH FILTER LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND THE ELECTRICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION AND FABRICATION OF THE RF CABIN/SHIELD.

6) IT IS PERMISSIBLE TO RUN "BLACK PIPE" UP TO THE DIELECTRIC COUPLER ON THE OUTSIDE OF THE RF SHIELD.

7) THERE MUST BE NO GROUND CONNECTIONS MADE DURING THE THE INSTALLATION OF EITHER THE PIPING OR ELECTRICAL FOR THE FIRE PROTECTION SYSTEM.

8) THE USE OF HALON IS NOT ACCEPTABLE.

9) THE LOCATION OF FIRE CONTROL SYSTEM COMPONENTS SHALL BE COORDINATED THROUGH THE ARCHITECT OF RECORD WITH ALL LOCATIONS TO BE COORDINATED WITH SIEMENS EQUIPMENT LOCATIONS AS SHOWN ON THE 1/4" SCALE EQUIPMENT LOCATION PLAN.

10) THE FIRE CONTROL CONTRACTOR SHALL VERIFY EQUIPMENT MOUNTING PROCEDURES AND LOCATIONS ON ANY WALLS CONTAINING RF SHIELDING WITH THE SIEMENS PROJECT MANAGER PRIOR TO THE COMMENCEMENT OF WORK.

REV 1

# COMPRESSOR LINE INSULATION

COMPRESSOR LINES RUNNING FROM THE COMPRESSOR (OR SEP CABINET) TO THE MAGNET ARE INSULATED BY SIEMENS. ADDITIONAL INSULATION (ARMAFLEX OR EQUIVALENT) FOR NOISE REDUCTION (CHIRPING) MAY BE REQUIRED. ADDITIONAL INSULATION NOT PROVIDED BY SIEMENS.

 $\bigvee$ IDA REV 16

# CEILING HEIGHTS

MAGNET EXAMINATION ROOM: 7'-11" MINIMUM EQUIPMENT ROOM: 7'-3" MINIMUM

ALL ANCILLARY AREAS: 6'-11" MINIMUM

COMPLETE NEW SET OF DWGS BASEI 06/25/21 ON LATEST WALL BACKGROUNDS/ MODIFIED MAGNET GAUSS FIE 06/25/21 TO REFLECT LATEST SHLD CALCS. ALL LAYOUTS, LEGENDS NOTES 06/25/21 DETAILS UPDATED ACCORDINGL NEW WALL BACKGROUNDS/ A 05/11/21 CASEWORK & SHIFT MAGNET 2003356RRA DATED 09/10/. 06/25/21 APPROVED BY CUSTOMERS FÓR FÍNALS FULL EXTENT OF THE LAW. DATE DESCRIPTION

ROJECT MANAGER: PATRICK RUIZ (770) 402-1365 TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER

**GRADY MEMORIAL HOSPITAL CORPORATION** 80 JESSE HILL JUNIOR DRIVE, SOUTH EAST, ATLANTA, GA 30303

2003356

MRI ROOM #2 - MAGNETOM VIDA XQ GRADIENTS PROJECT #:

D. BRISTOE

ATTENTION:

AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED

DOCUMENTS FOR REFERENCE.

- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION

ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE CONTROL & EQUIPMENT ROOMS 65°F-71°F IN EXAM ROOM. RELATIVE HUMIDITY OF 40-60% (NON-CONDENSING) IS REQUIRED

EXAMINATION ROOM AND 40-80% (NON-CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK.

2) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS

RECOMMENDED FOR THE EXAM ROOM. A MINIMUM AIR EXCHANGE

RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED.

IT IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-

AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM

ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 3,412 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY, AUXILIARY SUPPORT EQUIPMENT (ie. UPS) AND LIGHTING MUST BE

4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST AÍR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT

BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST

BÉ LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.

7) DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET.

THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET.

AIR SHOULD BE INSTALLED AT LEAST 6'-6" ABOVE FINISHED FLOOR. 5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT

6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING, IT

S RECOMMENDED TO INSTALL AN ON-SITE FILTER TO REMOVE DUST

CONTROL AND SENSOR TO MONITOR AND ADJUST THE AIR.

50% FRESH AIR INTAKE.

CONSIDERED FOR TOTAL HEAT LOADS.

PARTICLES GREATER THAN 10 MICRONS.

THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

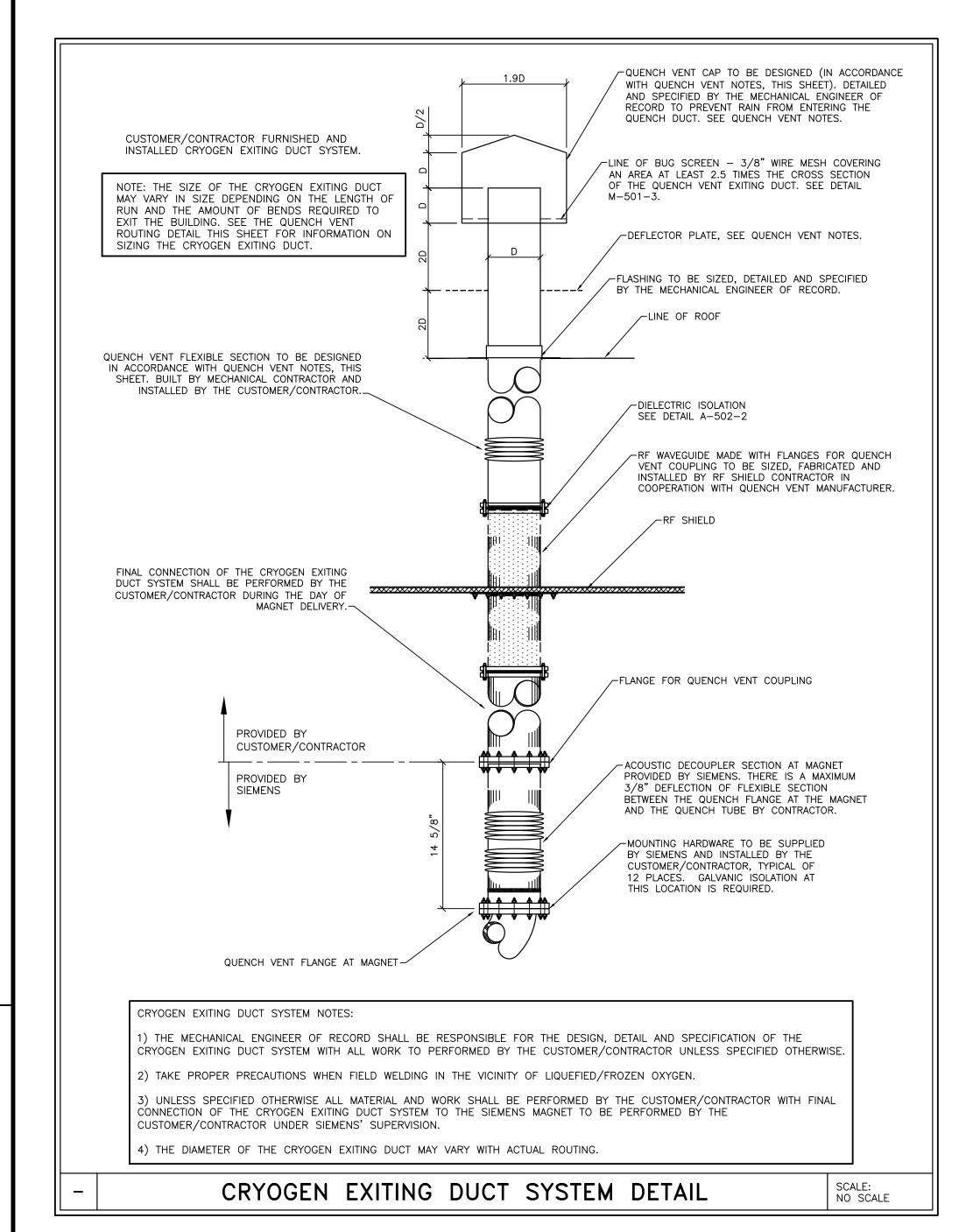
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.

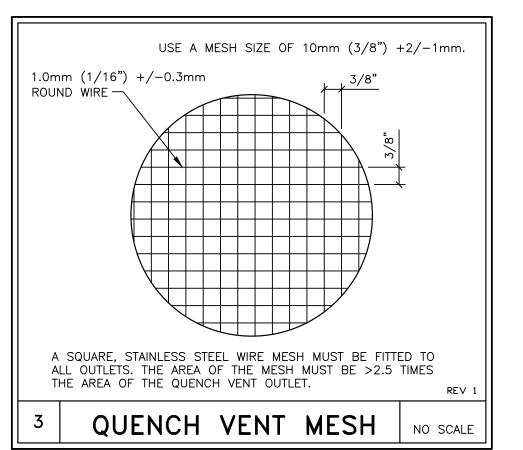
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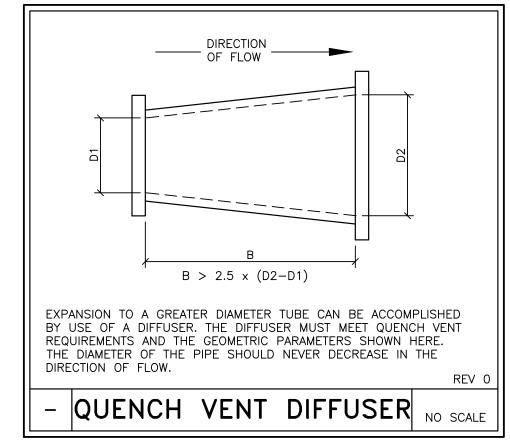
ALL RIGHTS ARE RESERVED. SCALE: AS NOTED REF. #: 30238438

06/25/21

**SIEMENS** 







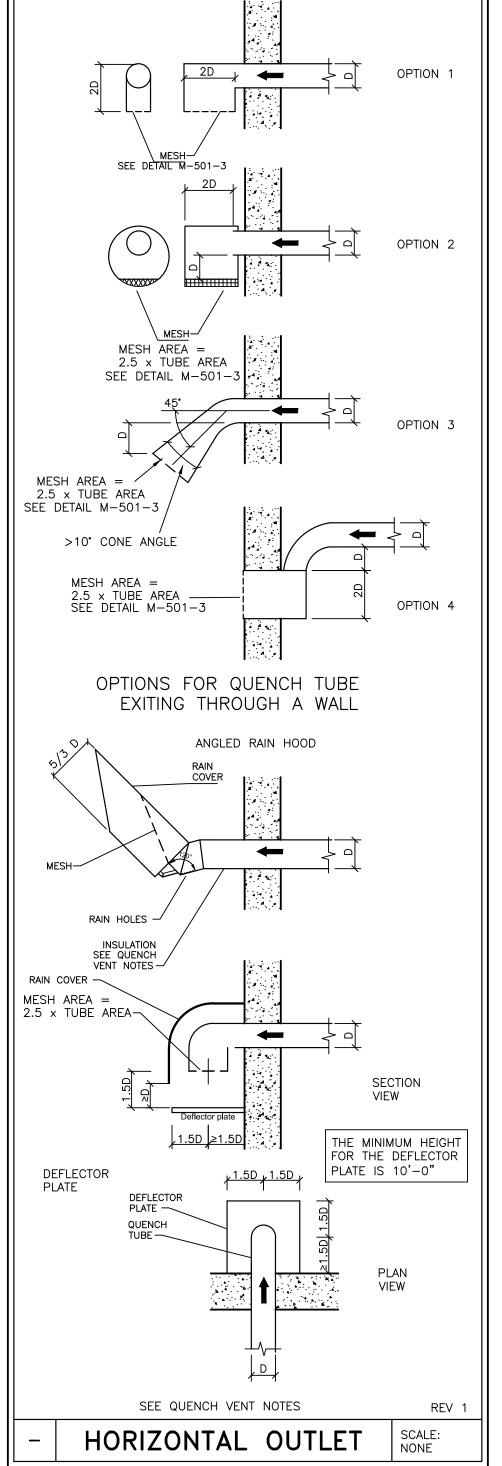
# CRYOGEN NOTES

) "CRYOGENS" IS A TERM USED TO IDENTIFY THE REFRIGERANT USED TO MAKE THE MAGNET "SUPER-CONDUCTING", IN THIS APPLICATION, LIQUID AND GASEOUS HELIUM. SPECIAL CARE MUST BE TAKEN DURING THE TRANSFILLING OF THE MAGNET WITH CRYOGENS AND NORMAL EXHAUST OF CRYOGENS FROM THE SYSTEM. ASIDE FROM THE OBVIOUS DANGER OF FREEZING. HELIUM GAS WILL ALSO DISPLACE THE OXYGEN IN THE ROOM. THE INSTALLATION OF AN APPROVED TOXGARD MONITORING SYSTEM IS RECOMMENDED.

2) THERE SHALL BE A TRANSPORT ROUTE FOR DELIVERY OF CRYOGENS TO THE EXAM ROOM. SPECIAL VESSELS CALLED DEWARS ARE USED TO TRANSPORT HELIUM. A 250 LITER DEWAR WEIGHS 335 POUNDS AND HAS A 32" DIAMETER, A 500 LITER IS 540 POUNDS, AND IS 42" IN DIAMETER.

3) HELIUM GAS CYLINDERS MAY BE USED DURING THE INITIAL FILLING OF HELIUM INTO THE MAGNET. THE FACILITY IN WHICH THESE MAY BE USED NEEDS TO HAVE THE ABILITY TO TEMPORARILY STORE AND SECURE THESE CYLINDERS THAT WILL PREVENT THEM FROM INADVERTENTLY FALLING OVER.

4) OUTSIDE VENTING OF THE HELIUM IS TO BE PROVIDED BY MEANS OF A VENT PIPE OF NON-MAGNETIC MATERIAL CALLED A QUENCH REV 0



QUENCH VENT DESIGN INSTRUCTIONS

A RISK OF DANGER THAT MAY LEAD TO DEATH OR SERIOUS INJURY AND CAN RESULT IN STRUCTURAL DAMAGE. THE EXHAUST MUST NOT BE VENTED IN AN ENCLOSED SPACE. THE OPERATOR OF THE SYSTEM MUST PREPARE AN EMERGENCY PLAN IN THE EVENT OF A QUENCH. 3) THE QUENCH TUBE CONSISTS OF STRAIGHT, HYDRAULICALLY SMOOTH SECTIONS. BENDS UP TO 90° AND A DIFFUSER, IF REQUIRED. THE END OF THE TUBE MUST BE PROTECTED FROM RAIN, SNOW, AND FOREIGN OBJECTS. ROUND SECTIONS ONLY, NO SQUARE SECTIONS.

SUPPLY AND INSTALL A QUENCH VENT TUBE WITH CAP, TO BE NON-MAGNETIC STAINLESS STEEL (≥22 GAUGE RECOMMENDED). OUFNCH TUBE MAY ALSO BE MADE OF ALUMINUM, EXTRUDED TUBE ALUMINUM GRADES 6063 AND 6082 ONLY MUST BE USED. ROLLED BE USED. THE WALL SECTIONS OF ALUMINUM TUBE MUST BE A THE BELLOWS MUST BE RESTRICTED TO PREVENT EXCESSIVE SUPPORTED BY THE BUILDING AND BE FLEXIBLE ENOUGH TO ALLOW MOVEMENT FROM THERMAL CONTRACTION. THE WALL EXIT SHOULD ALSO BE FLEXIBLE.

PRESSURE CALCULATION 5) THE MAXIMUM INTERNAL PRESSURE IS CALCULATED AT 1.45 PSI.

6) USE THE QUENCH VENT CALCULATOR PROVIDED BY SIEMENS TO DESIGN A QUENCH VENT THAT MEETS DESIGN REQUIREMENTS FOR DIAMETER. LENGTH. NUMBER OF ELBOWS AND PRESSURE DROP. ALL BENDS MUST BE SMOOTH WALLED AND HAVE A CENTERLINE TO INTERNAL PIPE DIAMETER RATIO OF 1.5 TO 5.0. EXPANSIONS TO PIPE DIAMETER CAN BE DONE WITH A DIFFUSER. ONLY ROUND TUBE

7) THERE MUST BE A 12-19 INCH FLEXIBLE SECTION OF PIPE FOR CONNECTION TO THE QUENCH VALVE AT THE MAGNET WITH AN INSIDE DIAMETER GREATER THAN 4" (1.5T) OR 6" (3.0T) AND ABLE TO WITHSTAND 6.5 PSI.

8) SECTIONS OF THE PIPE CAN ONLY BE JOINED BY WELDING OR BOLTED FLANGES WITH FIBER GASKETS. ROTARY FLANGES ARE PERMITTED, VEE CLAMPED FLANGES MAY NOT BE USED.

9) THE PROTECTION AT THE END OF THE TUBE SHALL BE 3/8" WIRE MESH WITH 1/16 INCH WIRES, COVERING AN AREA AT LEAST 2.5 TIMES THE CROSS SECTION AREA OF THE QUENCH PIPE.

10) WHERE THE QUENCH TUBE EXITS THROUGH A FLAT ROOF, THE THE OUTLET MUST BE ABOVE A LEVEL WHERE WATER COULD ENTER IN THE EVENT THAT THE ROOF DRAINS BECOME BLOCKED. IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET SHALL BE ANGLED DOWNWARD NOT LESS THAN 1 PIPE DIAMETER TO PREVENT RAIN INGRESS. THE EXIT SHALL BE LOCATED ABOVE THE LEVEL OF

11) WHERE THE QUENCH TUBE EXITS VERTICALLY, A RAIN COVER MUST ALSO BE FITTED WITH THE DIAMETER TO BE TWO TIMES THE DIAMETER OF THE QUENCH TUBE. THE CLEARANCE BETWEEN THE RAIN GUARD AND THE MESH SHALL 2 TIMES THE DIAMETER OF THE TUBE. A DEFLECTOR PLATE SHALL BE WELDED TO THE TUBE WHERE IT EXITS THE ROOF TO PREVENT HELIUM FROM RE-ENTERING THE BUILDING. THE DEFLECTOR SHALL BE AT LEAST 3 TIMES THE DIAMETER OF THE QUENCH TUBE AND LOCATED TWO PIPE DIAMETERS ABOVE THE ROOF AND TWO PIPE DIAMETERS BELOW THE

DURING A QUENCH THE HELIUM GAS EXITING THE QUENCH PIPE MAY BE AT TEMPERATURES OF LESS THAN -400°F. DUE TO THIS TEMPERATURE ROOFING MATERIALS OR ITEMS AROUND THE VENT EXIT MAY BE ADVERSELY AFFECTED. CONSIDERATION OF MATERIALS AND ITEMS PLACED NEAR THE VENT EXIT SHOULD BE TAKEN INTO ACCOUNT SO DAMAGE DOES NOT OCCUR.

12) WHERE THE QUENCH TUBE EXITS HORIZONTALLY, THE OUTLET MUST CONFORM TO OPTIONS 1-4 OR THE ANGLED RAIN HOOD. THE OUTLET SHOULD NOT BE LOCATED WHERE HELIUM GAS CAN BE DRAWN INTO AN AIR INLET, ENTER AN OPEN WINDOW, OR BLOW DIRECTLY ONTO STRUCTURE OR EQUIPMENT. RESTRICT ACCESS TO WINDOWS AND DOORS TO AVOID INJURY FROM COLD BURNS AND ASPHYXIATION BY 9'-11" ON EACH SIDE, BELOW AND 19'-9" ABOVE, IF THE OUTLET IS POSITIONED TOO LOW A

WARNING SIGNS AND OUTLET RESTRICTIONS
A WARNING SIGN MUST BE FIXED AND VISIBLE NEAR THE QUENCH VENT OUTLET. THE TUBE MUST HAVE A WARNING POSTED ALONG IT'S ENTIRE LENGTH FOR EXTREMELY COLD HELIUM GAS -AUTHORIZED PERSONNEL ONLY.

13) AREAS WITH ACCESS IN THE AREA OF THE OUTLET MUST BE CLÉARLY IDENTIFIED AND FENCED, FOR EXAMPLE, A ROOF OUTLET WITH MAINTENANCE ACCESS.

INSULATION AND GALVANIC SEPARATION 14) THE QUENCH TUBE MUST HAVE MINIMUM 1" INSULATION FOR

15) GALVANIC SEPARATION MUST BE PROVIDED BETWEEN THE MAGNET, THE QUENCH VENT, THE RF ROOM, AND THE BUILDING, TWO SEPARATIONS ARE REQUIRED USING STAINLESS STEEL BOLTS, INSULATING BUSHES AND LOCKING NUTS. NO OTHER DESIGNS ARE PERMITTED FOR SAFETY.

BE DOCUMENTED WITH DRAWINGS AND CALCULATIONS THAT ARE

# QUENCH VENT NOTES

1) IN THE EVENT OF A QUENCH, THE THERMAL ENERGY DISSIPATED CAUSES AN EXTREMELY RAPID BOIL OFF OF THE LIQUID HELIUM. THE SYSTEM MUST BE CAPABLE OF VENTING THE LARGE VOLUME OF GAS GENERATED AT THE APPROXIMATE EXPANSION RATIO OF 1:700 FROM LIQUID AT 4.2°K TO ROOM TEMPERATURE GAS. THE EXHAUST SYSTEM IS CRITICAL FOR THE SAFE OPERATION OF THE MAGNET, THE DATA IN THIS DOCUMENT MUST BE FOLLOWED. SINCE HELIUM VENTED IN A QUENCH IS AN ASPHYXIANT & AN EXTREMELY COLD GAS, THE QUENCH TUBE MUST ALWAYS END AT A POINT WHERE ACCESS BY PEOPLE IS NOT POSSIBLE. QUENCH TUBE PLANNING MUST ONLY BE DONE BY QUALIFIED PERSONNEL. IT IS THE OWNER'S RESPONSIBILITY TO ENSURE THAT THE QUENCH TUBE IS MAINTAINED IN AN OPERABLE STATE.

2) IF THE QUENCH VENT IS NOT CONFIGURED CORRECTLY THERE IS

4) THE SIEMENS MAGNET HAS A QUENCH VALVE ASSEMBLY FOR CONNECTION TO THE TUBE LOCATED AT THE TOP LEFT SIDE OF THE MAGNET (SEE MAGNET ELEVATION). THE MECHANICAL CONTRACTOR WILL GRADES AISI304, 309, 316, OR 321 ONLY. THERMAL CONDITIÓNS MAY CAUSE THE TUBE TO CONTRACT UP TO 3mm/METER SO A STAINLESS STEEL BELLOWS OR FLEXIBLE SECTION MUST BE INSTALLED A MINIMUM OF EVERY 32'-9" NOT TO EXCEED 2% OF THE OVERALL LENGTH. THE AND WELDED TUBE FROM SHEET ALUMINUM GRADE 5083 ONLY MUST MINIMUM 14 GAUGE. THERMAL CONTRACTION OF 4.5 MM/METER MUST BE CONSIDERED FOR ALUMINUM QUENCH TUBES. THE MOVEMENT OF EXPANSION DUE TO PRESSURE. THE WEIGHT OF THE TUBE MUST BE

THE MAXIMUM PRESSURE SHOULD BE ENGINEERED FOR 6.5 PSI.

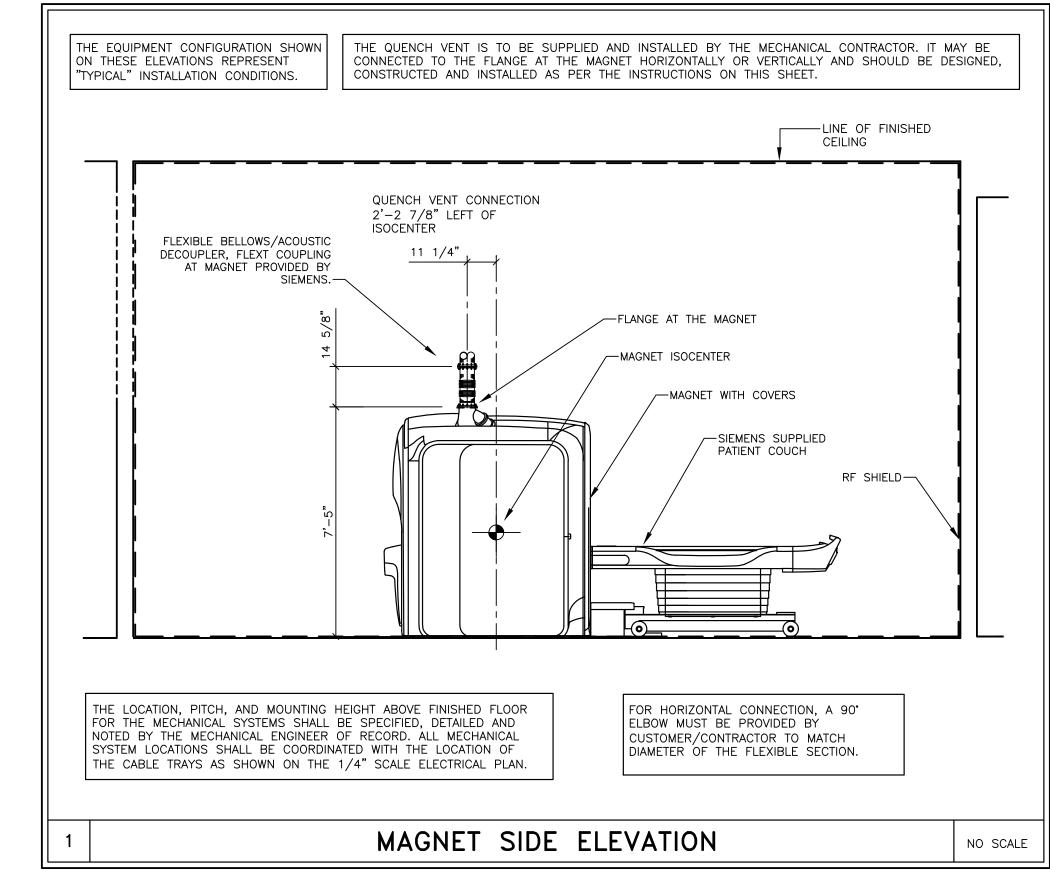
SECTIONS MAY BE USED, RECTANGULAR SECTIONS ARE NOT ALLOWED.

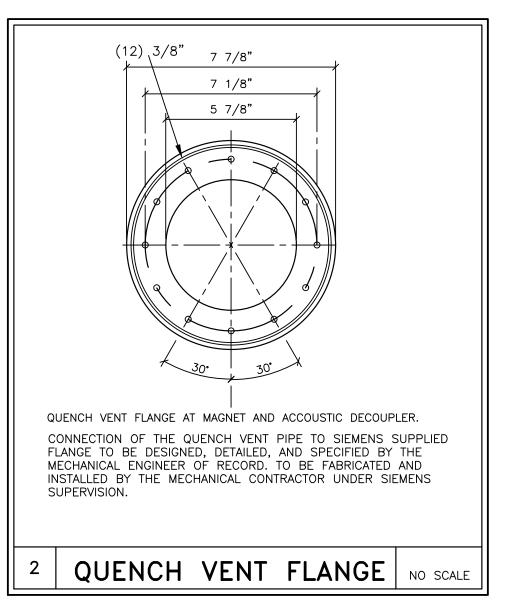
CONNECTING SECTIONS

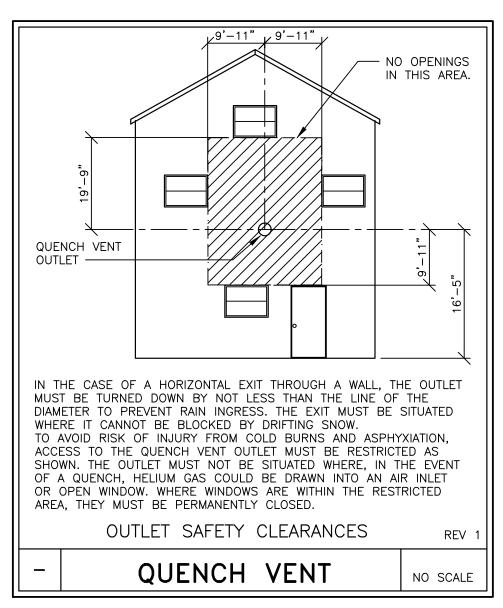
DEFLECTOR PLATE CAN BE USED WITH OPTION 1 AND 3.

THE FULL LENGTH. WITHIN THE RF ROOM THERE SHOULD BE A 1" LAYER OF MINERAL FIBER INSULATION WITH A VAPOR BARRIER AND 1" CLASS O OR CLASS AP ARMAFLEX. OUTDOOR PIPES MUST BE WEATHERPROOF. THE INSULATION MUST NOT TOUCH THE MAGNET COVERS. TO AVOID RF DISTURBANCES THE INSULATION MUST NOT MAKE ELECTRICAL CONTACT WITH THE WAVEGUIDE.

16) THE DESIGN AND CONSTRUCTION OF THE QUENCH PIPE MUST KEPT WITH INSTALLATION DOCUMENTS. IT MUST COMPLY WITH THE REQUIREMENTS IN THIS DOCUMENT BEFORE BEING CONNECTED TO THE MAGNET.







HELIUM CONTENT				
LITERS AT 100%	1,511	LIQUID HELIUM WEIGHT 417 LB.		
TYPICAL BOIL OFF RATE	0.0 L/HR	FOR TYPICAL CLINICAL USE, DEPENDING ON SEQUENCES		
TYPICAL REFILL INTERVAL	N.A.	AND OPERATING TIME.		
WITHOUT THE COLD HEAD RUNNING THE LIQUID HELIUM BOIL OFF IS APPROXIMATELY 3.5% PER 24 HOURS.				

VIDA

REV 16

			PROJECT MANAGER: PATRICK RUIZ TEL: (770) 402-1365 VMAII: FXT:		SIEMENS
2	06/25/21	COMPLETE NEW SET OF DWGS BASED ON LATEST WALL BACKGROUNDS/			21EMEM3
2	06/25/21	MODIFIED MAGNET GAUSS FIELDS TO REFLECT LATEST SHLD CALCS./	GRADY MEMO	RIAL HOSPITAL C	<b>ORPORATION</b>
2	06/25/21	ALL LAYOUTS, LEGENDS NOTES & DETAILS UPDATED ACCORDINGLY		ILL JUNIOR DRIVE, SOUTH EAST, ATLANTA ROOM #2 — MAGNETOM VIDA XQ GRADIE	
1	05/11/21	NEW WALL BACKGROUNDS/ ADD CASEWORK & SHIFT MAGNET	THIS TITLE BLOCK WITHOUT	PROJECT #:	SHEET:
$\overline{}$		2003356RRA DATED 09/10/20	SIEMENS AUTHORIZATION WILL	2003356	

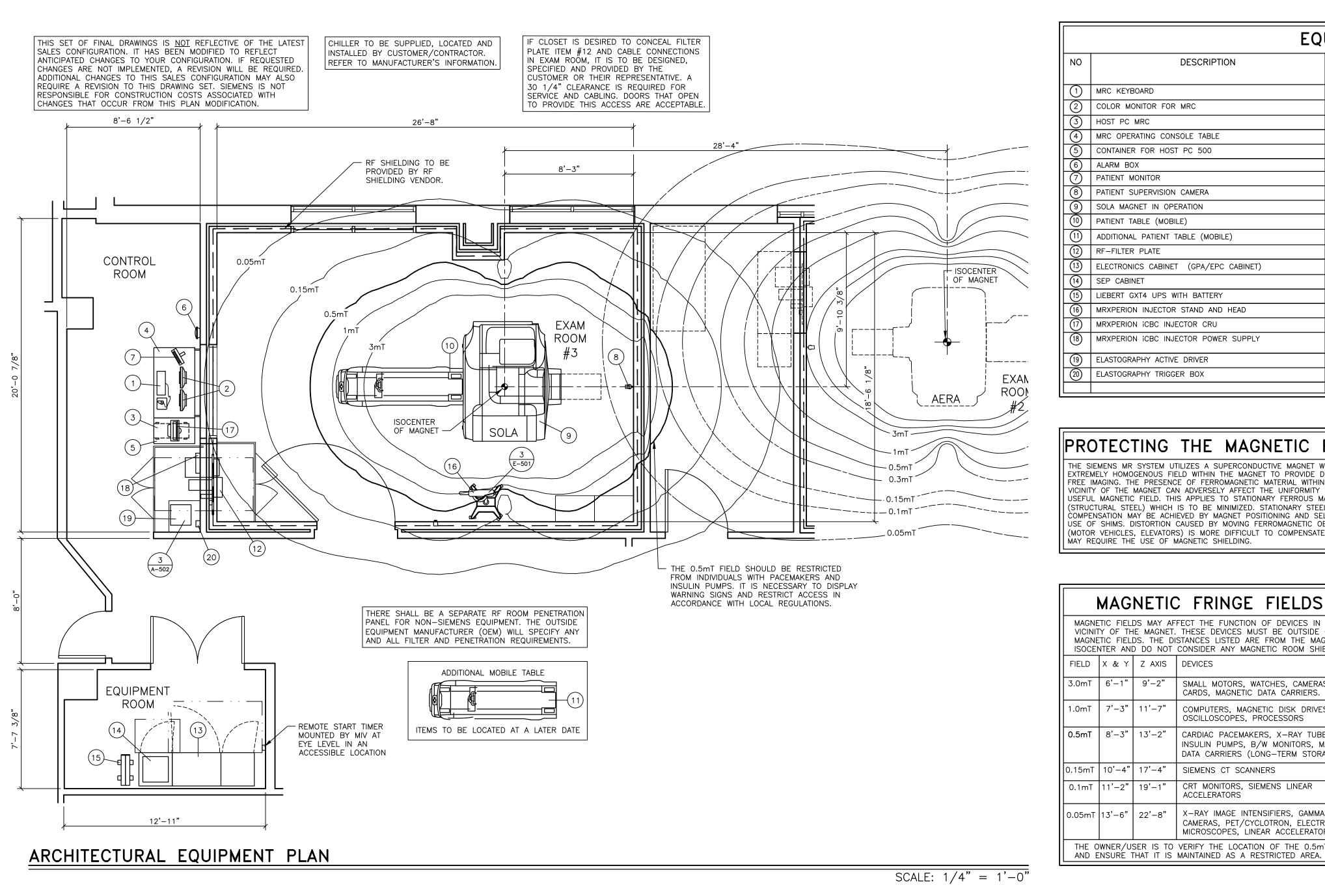
ATTENTION:

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- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

ON 06/25/21 APPROVED BY CUSTOMERS FÓR FÍNALS 2003336 FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. DATE DESCRIPTION SCALE: AS NOTED REF. #: 30238438 -ISSUE BLOCK-06/25/21



# STATE AGENCY REVIEW

PRIOR TO SIEMENS EQUIPMENT INSTALLATION, APPROVAL OF CONSTRUCTION OR STRUCTURAL MODIFICATIONS FOR DIAGNOSTIC OR THERAPEUTIC PURPOSES, MUST BE OBTAINED BY THE CUSTOMER FROM THE APPROPRIATE STATE AGENCY, IF APPLICABLE.

ATTENTION:

### MAGNETIC FIELD WARNING

PLEASE BE AWARE THAT DURING THE CALIBRATION PHASE OF THE MRI INSTALLATION, THE MAGNET WILL BE AT FULL FIELD STRENGTH AND ALL NECESSARY PRECAUTIONS WHEN WORKING IN THE VICINITY OF STRONG MAGNETIC FIELDS MUST BE TAKEN. WHEN THE CALIBRATION OF THE MAGNET OVERLAPS WITH FINAL CONSTRUCTION ACTIVITIES, THERE IS THE POSSIBILITY OF THE INTRODUCTION OF FERROUS MAGNETIC OBJECTS BY WORKERS INTO THE MR ROOM. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THAT ALL PRECAUTIONS ARE TAKEN TO ENSURE THAT THIS DOES NOT HAPPEN, AS EQUIPMENT DAMAGE AND SERIOUS BODILY INJURY COULD OCCUR.

# **EXAM ROOM LIGHTING**

THE MAGNETIC FIELD ADVERSELY AFFECTS THE OPERATING LIFE OF LIGHT BULBS LOCATED IN THE IMMEDIATE VICINITY OF THE MAGNET. THE FILAMENT IN THE BULBS OSCILLATES WITH THE FREQUENCY OF THE POWER SUPPLY. LIGHTS IN THE VICINITY OF THE MAGNET CONNECTED TO A DC POWER SUPPLY CAN REDUCE THIS EFFECT. RESIDUAL DC RIPPLE SHOULD BE LESS THAN 5%.

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED

AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN

- THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.

# MAGNET CO-SITING

MINIMUM MAGNET TO MAGNET DISTANCE (SIEMENS) 7.0T | 3.0T | 1.5T | 1.0T | 0.35T | 0.2T DISTANCE 32'-9" | 19'-9" | 19'-9" | 32'-9" | 32'-9"

WILL REQUIRE MORE SEPARATION DUE TO INCREASED RF COUPLING BETWEEN THE TWO SYSTEMS. THIS IS EVALUATED INDIVIDUALLY. DO NOT RAMP ONE MAGNET WHILE THE OTHER IS RUNNING

TWO MAGNETS WITH THE SAME FREQUENCY ALIGNED IN THE Z AXES

APPLICATIONS. SHIM IS ONLY OPTIMIZED WHEN BOTH MAGNETS ARE RAMPED UP DURING THE SHIMMING PROCEDURE.

WHEN CO-SITING AN MR SYSTEM WITH A MAGNETIC NAVIGATION SYSTEM THE MINIMUM DISTANCE FOR CLINICAL IMAGING IS 98'-6", FOR SPECTROSCOPY THE MINIMUM SEPARATION IS 121'-5". REV 0

# OEM ACCESSORY ITEMS

FOR OEM (OUTSIDE EQUIPMENT MANUFACTURER) ITEMS THAT ARE SOLD AS ACCESSORIES TO THE SIEMENS MR SYSTEM (INJECTORS, LASER LIGHTS, ELASTOGRAPHY, CHILLERS, UPS, ETC.), PLEASE REFER TO THE SIEMENS PROJECT MANAGER AND THE ACTUAL EQUIPMENT VENDOR FOR FECHNICAL INFORMATION AND INSTALLATION REQUIREMENTS.

#### EQUIPMENT LEGEND DESCRIPTION | SMS | WEIGHT | BTU/HR | DIMENSIONS (INCHES) REMARKS (LBS) TO AIR 1) | MRC KEYBOARD 10 1/8 1 3/4 ON CONSOLE/COUNTER ) COLOR MONITOR FOR MRC 18 5/16 | 4 3/4 | 16 15/16 | ON CONSOLE/COUNTER 22 239 3) | HOST PC MRC 2.389 18 1/8 49 MRC OPERATING CONSOLE TABLE 54 3/8 31 1/2 27-46 ADJUSTABLE HEIGHT 132 CONTAINER FOR HOST PC 500 ⟨−⟩ | 238 19 5/8 | 31 1/2 | 28 3/8 ---ALARM BOX 2 9 4 PATIENT MONITOR 13 8 12 1/2 PATIENT SUPERVISION CAMERA 6 3/4 | WALL MOUNTED 3 1/8 6 3/4 SOLA MAGNET IN OPERATION 8,779 7,506 91 170 97 1/4 PATIENT TABLE (MOBILE) 529 \_\_\_ 29 1/2 21-41 ADDITIONAL PATIENT TABLE (MOBILE) 29 1/2 | 97 1/4 529 21-41 2) | RF-FILTER PLATE 46 1/2 | 35 1/8 | 21 5/8 287 853 ELECTRONICS CABINET (GPA/EPC CABINET) 3,307 61 1/2 77 1/2 26 14) | SEP CABINET 750 <3,412 | 25 5/8 | 25 5/8 | 73 5/8 ) LIEBERT GXT4 UPS WITH BATTERY 23 5/8 | 6 3/4 164 1,121 6) | MRXPERION INJECTOR STAND AND HEAD 23 3/8 | 28 3/8 71 7/8 | INJECTOR ON STAND 94 MRXPERION ICBC INJECTOR CRU 17.6 15 3/4 | 10 1/4 13 1/2 ON CUSTOMERS COUNTER \_\_\_\_ MRXPERION ICBC INJECTOR POWER SUPPLY LOCATED IN CONTROL ROOM 15 3/8 3 3/8 CLOSET OUTSIDE 5mT FIELD **(ELS) |** 53.5 9) | ELASTOGRAPHY ACTIVE DRIVER PROVIDE SHELF 15 3/4 ELASTOGRAPHY TRIGGER BOX 4 3/4 | IN CONTROL ROOM CLOSET €TB> | 3 1/4 4 3/4 ---\_\_\_

# PROTECTING THE MAGNETIC FIELD

THE SIEMENS MR SYSTEM UTILIZES A SUPERCONDUCTIVE MAGNET WITH AN EXTREMELY HOMOGENOUS FIELD WITHIN THE MAGNET TO PROVIDE DISTORTION REE IMAGING. THE PRESENCE OF FERROMAGNETIC MATERIAL WITHIN THE VICINITY OF THE MAGNET CAN ADVERSELY AFFECT THE UNIFORMITY OF THE JSEFUL MAGNETIC FIELD. THIS APPLIES TO STATIONARY FERROUS MATERIAL STRUCTURAL STEEL) WHICH IS TO BE MINIMIZED. STATIONARY STEEL COMPENSATION MAY BE ACHIEVED BY MAGNET POSITIONING AND SELECTIVE JSE OF SHIMS. DISTORTION CAUSED BY MOVING FERROMAGNETIC OBJECTS (MOTOR VEHICLES, ELEVATORS) IS MORE DIFFICULT TO COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

# MAGNETIC FRINGE FIELDS

MAGNETIC FIELDS MAY AFFECT THE FUNCTION OF DEVICES IN THE VICINITY OF THE MAGNET. THESE DEVICES MUST BE OUTSIDE CERTAIN MAGNETIC FIELDS. THE DISTANCES LISTED ARE FROM THE MAGNET ISOCENTER AND DO NOT CONSIDER ANY MAGNETIC ROOM SHIELDING. FIELD X & Y Z AXIS DEVICES SMALL MOTORS, WATCHES, CAMERAS, CREDIT CARDS, MAGNETIC DATA CARRIERS. 1.0mT | 7'-3" | 11'-7" | COMPUTERS, MAGNETIC DISK DRIVES OSCILLOSCOPES, PROCESSORS 0.5mT | 8'-3" | 13'-2" | CARDIAC PACEMAKERS, X-RAY TUBES, INSULIN PUMPS, B/W MONITORS, MAGNETIC DATA CARRIERS (LONG-TERM STORAGE) .15mT | 10'-4" | 17'-4" | SIEMENS CT SCANNERS CRT MONITORS, SIEMENS LINEAR 0.1mT |11'-2" | 19'-1" ACCELERATORS D.05mT | 13'-6" | 22'-8" | X-RAY IMAGE INTENSIFIERS, GAMMA CAMERAS, PET/CYCLOTRON, ELECTRON MICROSCOPES, LINEAR ACCELERATORS

THE OWNER/USER IS TO VERIFY THE LOCATION OF THE 0.5mT FIELD

DELIVERY PATH VERIFIED

ALL PLUMBING INSTALLED AND TESTED

ALL EPO BUTTONS INSTALLED AND TESTED

POWER SCHEDULE COMPLETED

# PROTECTING THE ENVIRONMENT

PROTECTING THE IMMEDIATE ENVIRONMENT FROM THE EFFECT OF THE MAGNETIC FIELD REQUIRES CONSIDERATION. INFORMATION STORED ON MAGNETIC DATA CARRIERS SUCH AS DISCS, TAPES AND CARDS MAY BE ERASED IF NEAR THE MAGNET. CAUTION WITH REGARD TO HEART PACEMAKERS MUST BE EXERCISED. MOST PACEMAKER UNITS EMPLOY A REED RELAY WHICH MAY CHANGE OPERATING MODE WHEN EXPOSED TO AN EXTERNAL MAGNETIC FIELD. PACEMAKER USERS MUST BE KEPT AT A SPECIFIED DISTANCE FROM THE MAGNET WHICH IS DETERMINED BY THE MAGNET FIELD STRENGTH.

# MAGNET SITING REQUIREMENTS

IT MUST BE ENSURED THAT THE MAGNET IS LOCATED SO THAT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD ARE NOT ADVERSELY AFFECTED BY EXTRANEOUS FIELDS AND STATIC OR DYNAMIC FERROMAGNETIC OBJECTS. X & Y AXES | Z AXIS | SOURCE OF INTERFERENCE FLOOR STEEL REINFORCEMENT<20 LBS./ FT IRON BEAMS < 66 LBS./FT. 16'-1" | 19'-1" | MOVING METAL UP TO 110 LBS. WATER COOLING UNIT (CHILLER) 21'-4" | MOVING METAL UP TO 440 LBS. 24'-8" MOVING METAL UP TO 2,000 LBS. 18'-1" 29'-7" | ELEVATORS, TRUCKS UP TO 10,000 LBS. 20'-5" 13'-1" AC TRANSFORMERS LESS THAN 650 KVA 13'-1" 16'-5" 16'-5" AC TRANSFORMERS LESS THAN 1600 KVA 5'-0" AC CABLES, MOTORS LESS THAN 250 AMPS 5'-0" 8'-3" AC CABLES, MOTORS LESS THAN 1000 AMPS 8'-3" FOR IRON OBJECTS LOCATED UP TO 45° FROM THE Z AXIS, THE

DISTANCES FOR THE Z AXIS MUST BE USED. REDUCTION IS

REFERENCE SHEET

A - 102

S-101

A-502

E-101

M - 101

E - 102

E-101

A-101

A-101

M - 101

A - 101

M - 101

M - 501

E-101

POSSIBLE WITH STEEL SHIELDING.

# CONSTRUCTION REQUIREMENTS

THE CUSTOMER/CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL CONSTRUCTION MATERIALS INCLUDING ELECTRICAL AND MECHANICAL DEVICES REQUIRED BY SIEMENS SPECIFICATIONS AND TO ENSURE THAT THE MATERIAL USED INSIDE THE RF-SHIELDING IS AS FREE OF FERROMAGNETIC PROPERTIES AS POSSIBLE. STEEL WALL STUDS ARE PERMITTED BUT MUST BE SECURED PROPERLY. ANY FERROUS MATERIAL INSIDE THE EXAM ROOM MAY BECOME A PROJECTILE AND CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT. FERROUS ITEMS INSIDE THE EXAM ROOM ARE THE LIABILITY OF THE CONTRACTOR AND/OR INSTALLER.

ARCHITECTURAL NOTES

1) ALL PRELIMINARY EQUIPMENT LAYOUTS SUBMITTED BY SIEMENS

HEALTHCARE ARE BASED ON THE RECOMMENDED SPACE NECESSARY

FOR THE OPERATION AND SERVICEABILITY OF THE EQUIPMENT BEING

NOT IN THE BEST INTEREST OF BOTH THE CUSTOMER AND SIEMENS.

WILL NOT BE RESPONSIBLE FOR ANY ALTERATIONS THAT ENCROACH WITHIN DESIGNATED SAFETY AND SERVICE CLEARANCE ZONES AS

ALL EQUIPMENT LAYOUTS ARE BASED EITHER ON AN ACTUAL SITE

INDICATED ON DRAWINGS (I.E., PIPE CHASES, VENTILATION DUCTS,

HAVE BEEN SUBMITTED AND APPROVED. DO NOT ALTER ANY

SPECIFICATIONS AND/OR DIMENSIONS WITHOUT CONTACTING AND

INFORMATION TO COMPLEMENT ACTUAL CONSTRUCTION DRAWINGS

CUSTOMER'S ARCHITECT AND GENERAL CONTRACTOR SHALL BE

AND PROFESSIONAL DESIGN REQUIREMENTS INCLUDING OSHA/NEC

3) THE CUSTOMER IS RESPONSIBLE FOR ALL ROOM AND AREA

ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL AND

PREPARATION COSTS, PROFESSIONAL FEES, PERMITS, REPORTS, AND

4) EQUIPMENT WARRANTIES, EXPRESSED OR IMPLIED ON THE PART OF

SÍEMENS SHALL BE CONTINGENT UPON STRICT COMPLIANCE WITH THE

RECOMMENDATIONS AND REQUIREMENTS CONTAINED IN THESE DRAWINGS,

EQUIPMENT INSTALLATION, CALIBRATION, CONNECTION AND INSTALLATION

5) ALL DIMENSIONS SHOWN ARE FROM FINISHED SURFACES UNLESS

6) SIEMENS HEALTHCARE SHALL BE RESPONSIBLE FOR SIEMENS

CUSTOMER/ELECTRICAL CONTRACTOR-SUPPLIED CABLES TO SIEMENS

REQUIREMENTS PROHIBIT THIS, THE CUSTOMER SHALL INITIATE THE

NORMAL INSTALLATION SEQUENCES DUE TO CONTRACTOR OR TRADE

EQUIPMENT. IN THE EVENT THAT SPECIFIC TRADE RULES OR LICENSE

SERVICES OF APPROVED OTHER CONTRACTORS AND PAY FOR SELECTED, APPROVED PARTIES TO PERFORM THIS WORK WITH SUPERVISION

PROVIDED BY SIEMENS. CALIBRATION WHEN ACCOMPLISHED OUTSIDE OF

RULE ACTIONS OR REQUIREMENTS SHALL BE SUPPORTED BY, CHARGED

TO, AND ACCEPTED BY THE CUSTOMER AS AN ADDITIONAL INSTALLATION

THE LOCATIONS AND TRAVEL OF ALL ANCILLARY EQUIPMENT TO BE

PHYSIOLOGICAL MONITORING INJECTORS, CRT PLATFORMS, SPRINKLER

HEADS, SMOKE DETECTORS, ELECTRICAL OUTLETS, HVAC GRILLES,

NEEDS TO BE OR IS REQUIRED TO BE COMPLETED AFTER THE

NOTES ON SIEMENS SHEET E-101 FOR MORE DETAILS.

INSTALLATION OF THE SIEMENS EQUIPMENT AND ANY ASSOCIATED

SPEAKERS, AND GENERAL ROOM LIGHTING, ETC.).

CEILING OR WALL MOUNTED (I.E.: O.R. LIGHTS, MEDICAL GAS COLUMNS,

8) THE GENERAL CONTRACTOR/CUSTOMER SHALL BE RESPONSIBLE FOR

9) CUSTOMER/CONTRACTOR MUST ASSIST SIEMENS INSTALLERS WITH

INSTALLATION OF EQUIPMENT ABOVE 14'-0". REFER TO THE ELECTRICAL

ALL FINAL PAINT, TOUCH-UP AND ANY COSMETIC OR TRIM WORK WHICH

7) THE CUSTOMER SHALL COORDINATE WITH SIEMENS PROJECT MANAGER

OF SIEMENS PROVIDED CABLES. THE CUSTOMER/ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR TERMINATIONS OF

AVAILABLE FROM A CUSTOMER APPOINTED ARCHITECTURAL

SAFETY/SERVICE CLEARANCES SHOWN.

UNLESS SPECIFIED OTHERWISE.

SPECIFIED OTHERWISE.

EXPENSE.

SUPPORT APPARATUS

INSPECTION FEES.

PROPOSED. SIEMENS WILL NOT SUBMIT AN EQUIPMENT LAYOUT THAT IS

SURVEY OR ARCHITECTURAL DRAWINGS SUPPLIED TO SIEMENS. SIEMENS

CASEWORK, AND SOFFITS, ETC.) MADE BY THE CUSTOMER OR REQUIRED

BY A CUSTOMER'S ARCHITECTURAL FIRM ONCE PRELIMINARY DRAWINGS

RECEIVING WRITTEN CONFIRMATION FROM SIEMENS PROJECT MANAGER.

2) SIEMENS HEALTHCARE IS NOT AN ARCHITECTURAL OR ENGINEERING FÍRM. DRAWINGS SUPPLIED BY SIEMENS ARE NOT CONSTRUCTION

DRAWINGS. THEREFORE, THESE DRAWINGS ARE TO BE USED ONLY FOR

REPRESENTATIVE OR A CUSTOMER'S ENGINEERING DESIGN GROUP. THE

ULTIMATELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE CODES

SAFETY CLEARANCE REQUIREMENTS IN ADDITION TO SIEMENS-REQUIRED

REV 3

REV 0

# CASEWORK & ACCESSORY NOTES

1) ALL CASEWORK IS EITHER EXISTING OR IS TO BE DESIGNED, DETAILED, FURNISHED AND INSTALLED BY THE CUSTOMER AND/OR CONTRACTOR. FOLLOW DESIGN RECOMMENDATIONS INCLUDED HEREWITH, AS THEY ARE ESSENTIAL FOR THE SUCCESSFUL INSTALLATION & OPERATION OF THE SIEMENS EQUIPMENT.

2) ALL FURNITURE (CHAIRS, ETC.) FOR THE CONTROL ROOM ARE TO BÉ PROVIDED BY THE CUSTOMER.

RESOURCE LIST	(SMS USE ONL	.Y)
DESIGNATION	PG NUMBER	DATE
PLANNING GUIDE	M11-010.891.01.03.02	11.19

RESOURCE LIST	(2M2 02F 0NF	1)
DESIGNATION	PG NUMBER	DATE
PLANNING GUIDE	M11-010.891.01.03.02	11.19

S C L A

EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

**GRADY HEALTH SYSTEM** 200757RD DATED 05/17 6/06/22 APPROVED BY CUSTOMER FÓR FÍNAL DESCRIPTION

MRI SUITE - MRI 3 - MAGNETOM SOLA XQ GRADIENTS THE USE OR REPRODUCTION OF PROJECT #: THIS TITLE BLOCK WITHOUT

**SIEMENS** 

CEILING HE	IGH	HTS
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- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.

- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

PHYSICIST TO SPECIFY RADIATION PROTECTION.

THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

-ISSUE BLOCK-

PROJECT MILESTONES

PROJECT MILESTONES TO BE COMPLETED BEFORE EQUIPMENT DELIVERY

FLOOR LEVEL MEETS SIEMENS SPECIFICATIONS AND ALL BASEPLATES INSTALLED

MR COMPATIBLE LIGHTING AND CEILING GRIDS INSTALLED IN MAGNET ROOM

MR COMPATIBLE LIGHTING AND CEILING GRIDS INSTALLED IN MAGNET ROOM

QUENCH PIPE CONSTRUCTED AND INSTALLED PER SIEMENS SPECIFICATIONS

HVAC SYSTEM COMPLETE, TESTED AND WORKING PER SIEMENS SPECIFICATIONS

ETHERNET CONNECTION INSTALLED AND IN OPERATION AT THE SHOWN LOCATIONS

CONTROL ROOM COMPLETED ENOUGH TO FACILITATE THE INSTALLATION

CHILLED WATER SUPPLY AVAILABLE AND MEETS SIEMENS SPECIFICATIONS

RF ROOM TEST COMPLETED AND MEETS SIEMENS SPECIFICATIONS

ALL RACEWAY, CONDUITS AND JUNCTION BOXES INSTALLED

SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. REF. #: 3026131

MAIL: PATRICK.RUIZ@SIEMENS-HEALTHINEERS.COM

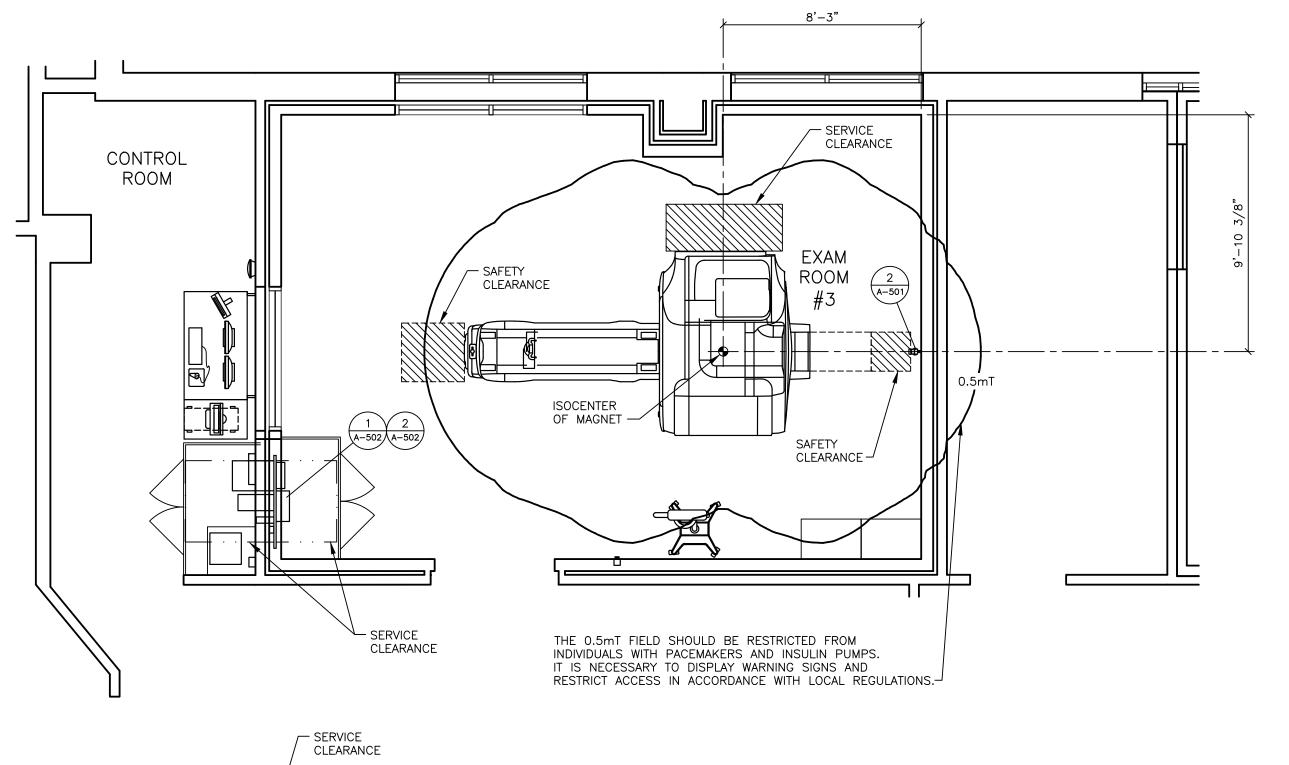
DJECT MANAGER: PATRICK RUIZ

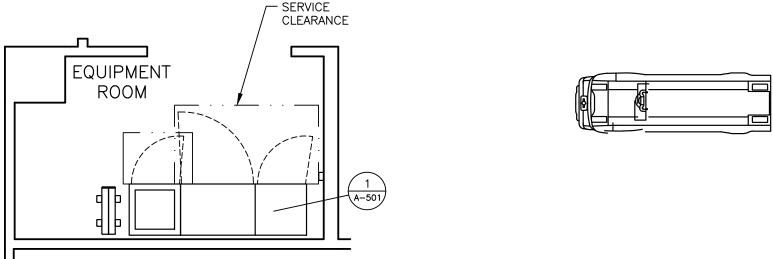
(770) 402-1365

AS NOTED

2200757 D. BRISTOE

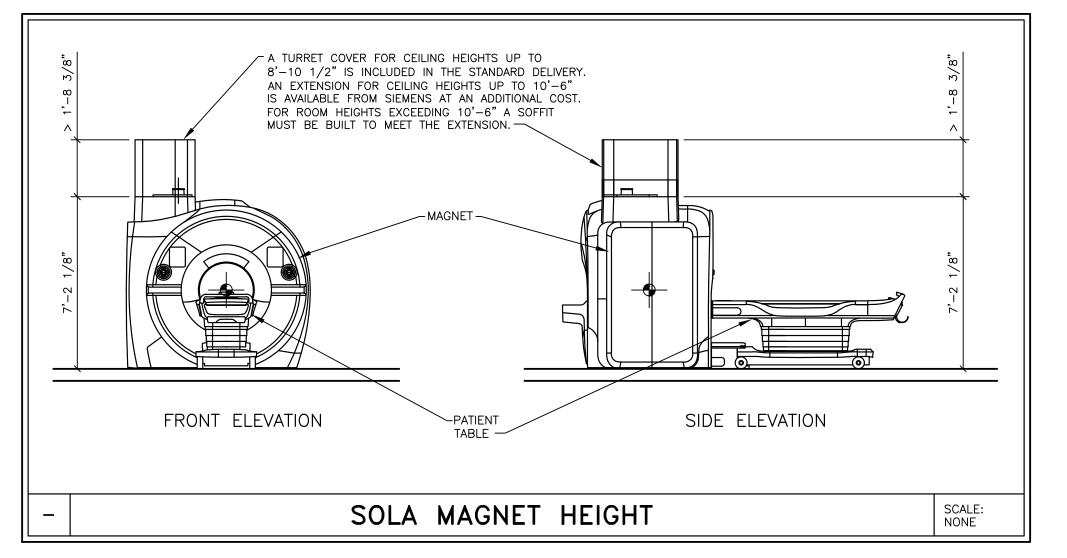
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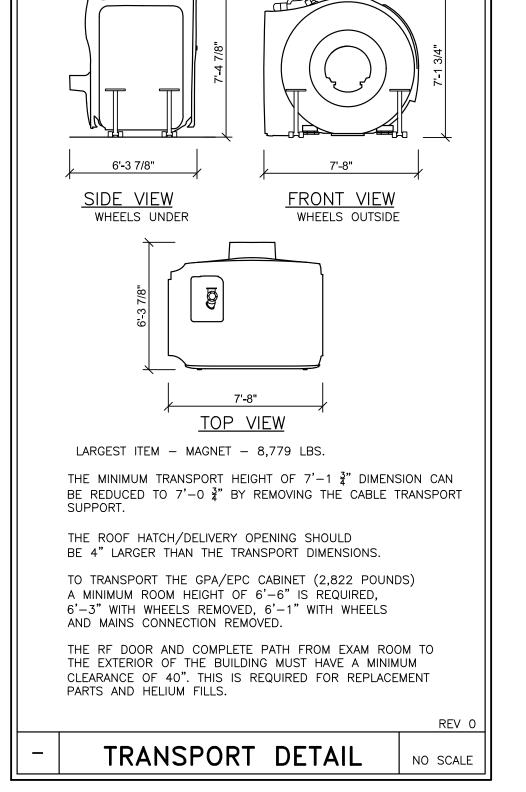
SAFETY/SERVICE CLEARANCE PLAN

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



NOISE LEVELS XQ GRADIENTS				
SYSTEM ROOM	NOISE LEVEL / dB(A)			
CONTROL ROOM	<55			
EXAMINATION ROOM	80.6 dB(A) — 8 HOUR AVERAGE 101.8 dB(A) MAXIMUM, MEASURED INSIDE THE EXAM ROOM.			
EQUIPMENT ROOM	<65			
NOISE LEVELS ARE BASED ON AN AVERAGE MEASUREMENT OVER 8 HOURS OF CLINICAL SCANNING. PEAK LEVELS MAY BE HIGHER FOR CERTAIN SEQUENCES.				

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL/ STATE/OSHA NOISE REGULATIONS ARE ADHERED TO. ADDITIONAL NOISE DATA MAY BE PROVIDED BY SIEMENS PROJECT MANAGER UPON REQUEST.



# SURFACE COIL STORAGE

SURFACE COILS ARE COMPONENTS OF THE MRI SYSTEM THAT ARE ATTACHED TO THE PATIENT TABLE DURING EXAMS. WHEN NOT IN USE COILS SHOULD BE STORED SO THAT THEY ARE FREE FROM DAMAGE. THE DESIGN OF THE MR EXAM ROOM MUST HAVE AMPLE STORAGE SPACE TO ACCOMMODATE ANY COILS THAT THE OWNER WILL HAVE.
COILS MAY BE SELECTED FROM THE LIST BELOW. STORAGE PROVIDED BY CUSTOMER/CONTRACTOR.

COIL NAME	POUND	INCHES		
	WEIGHT	LENGTH	WIDTH	HEIGHT
BIOMATRIX HEAD/NECK 20	13	16 3/4	14 5/8	15 1/8
BIOMATRIX SPINE 32	23	47 1/4	19 1/4	3
BODY 18	4	15 1/8	23 1/4	3
FLEX LARGE 4	1.2	20 3/8	8 7/8	_
FLEX SMALL 4	1	14 3/8	8 7/8	_

CEILING HEIGHTS EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

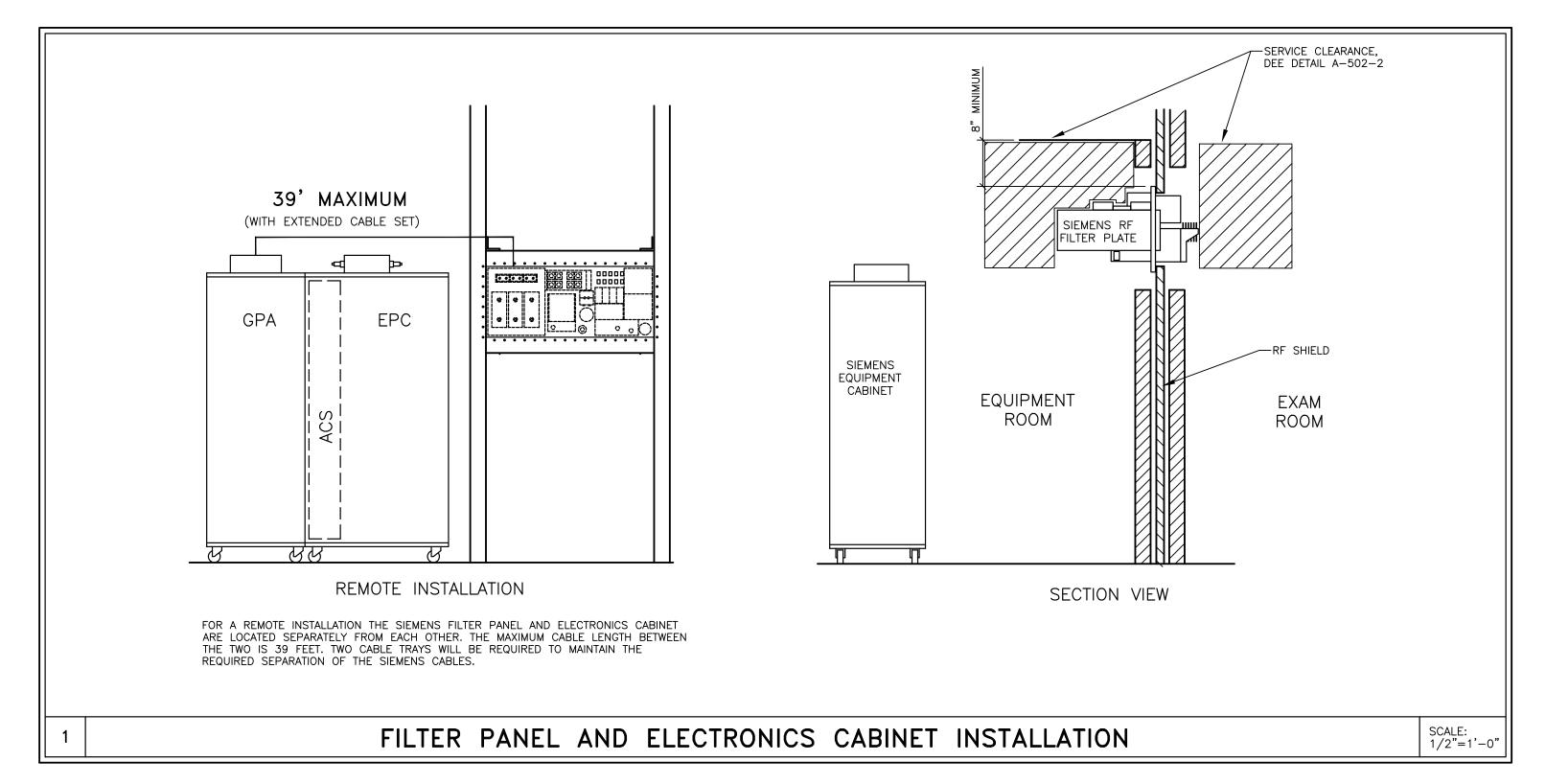
SOLA REV 14 ROJECT MANAGER: PATRICK RUIZ EL: (770) 402-1365 SIEMENS MAIL: PATRICK.RUIZ@SIEMENS—HEALTHINEERS.COM GRADY HEALTH SYSTEM 80 JESSE HILL JR DR SE, ATLANTA, GA 30303 MRI SUITE - MRI 3 - MAGNETOM SOLA XQ GRADIENTS THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER PROJECT #: 2200757 06/06/22 2200757RD DATED 05/17/22 APPROVED BY CUSTOMER FOR FINALS FULL EXTENT OF THE LAW. OF 2 10 ALL RIGHTS ARE RESERVED. DESCRIPTION D. BRISTOE DATE: 06/06/22 REF. #: 30261311 -ISSUE BLOCK-AS NOTED

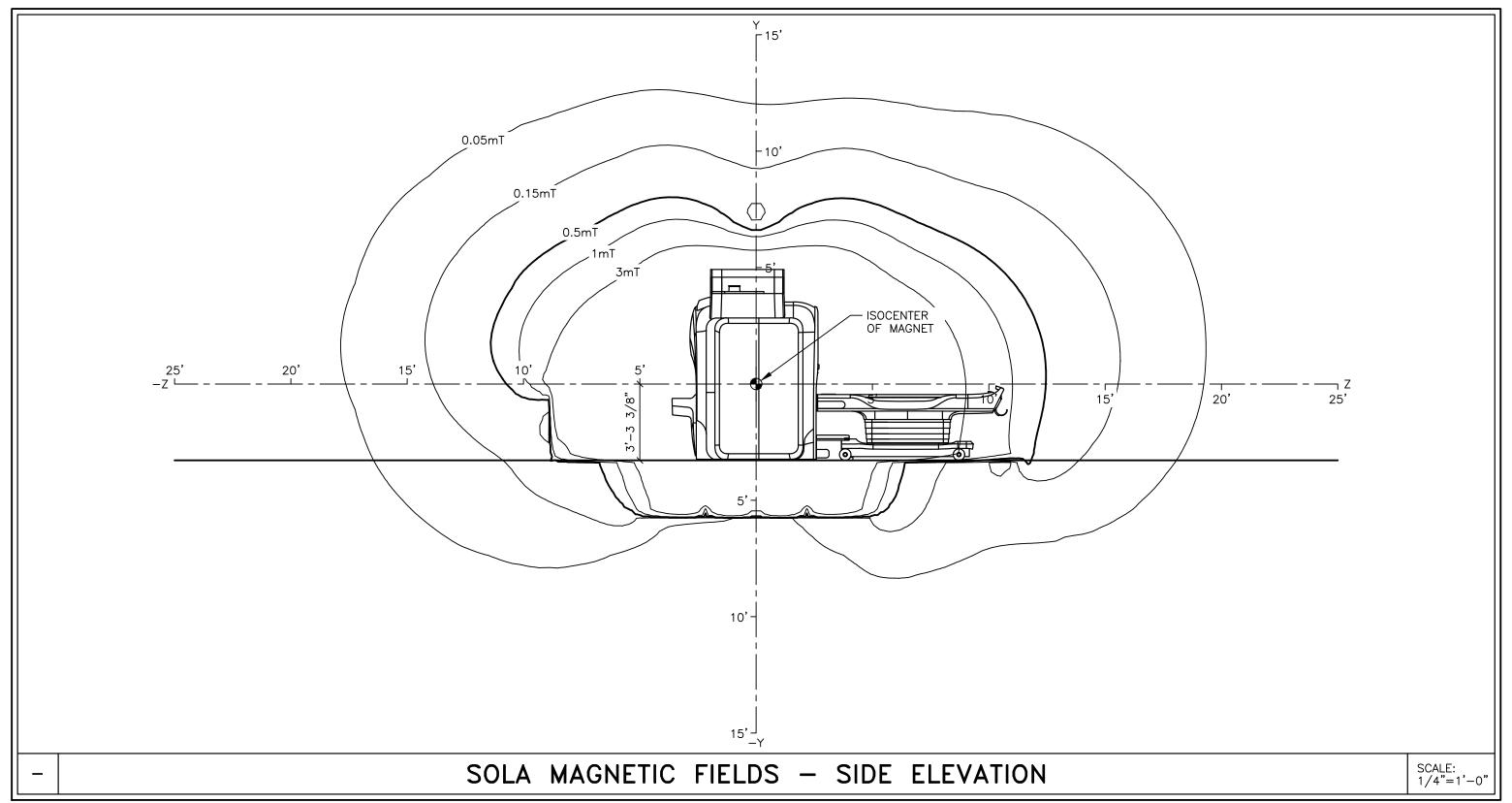
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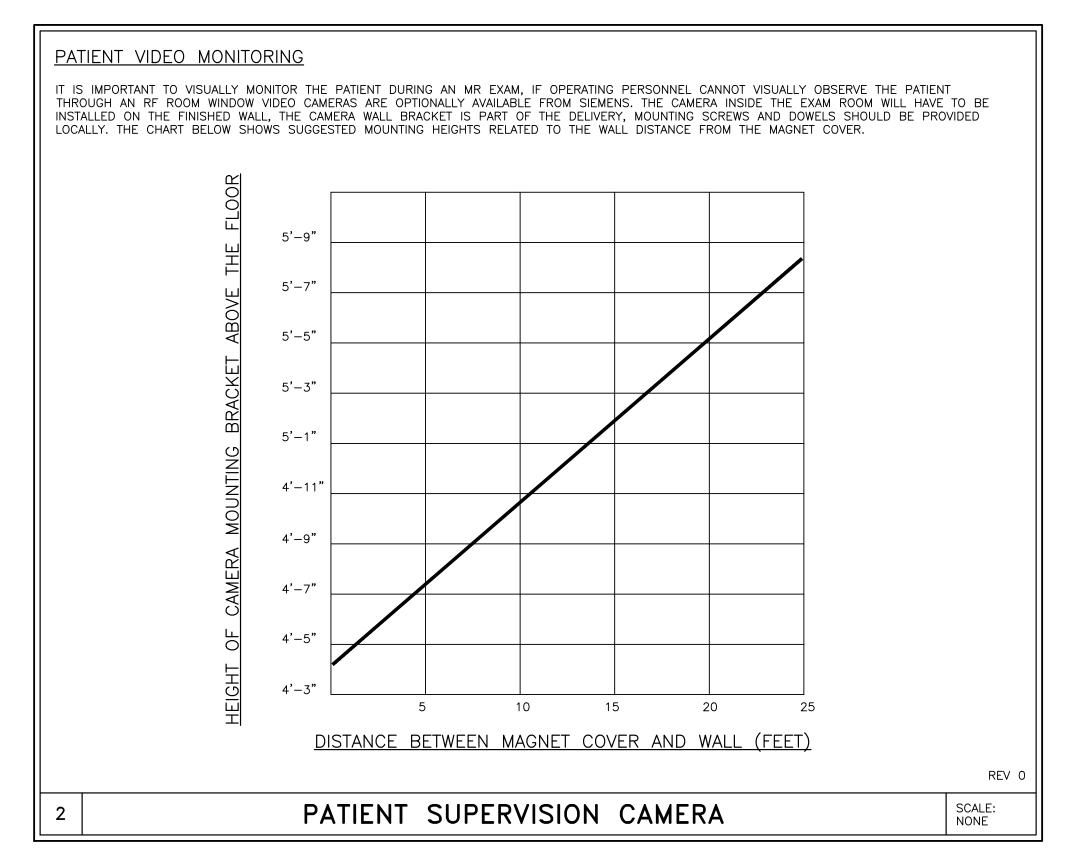
- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

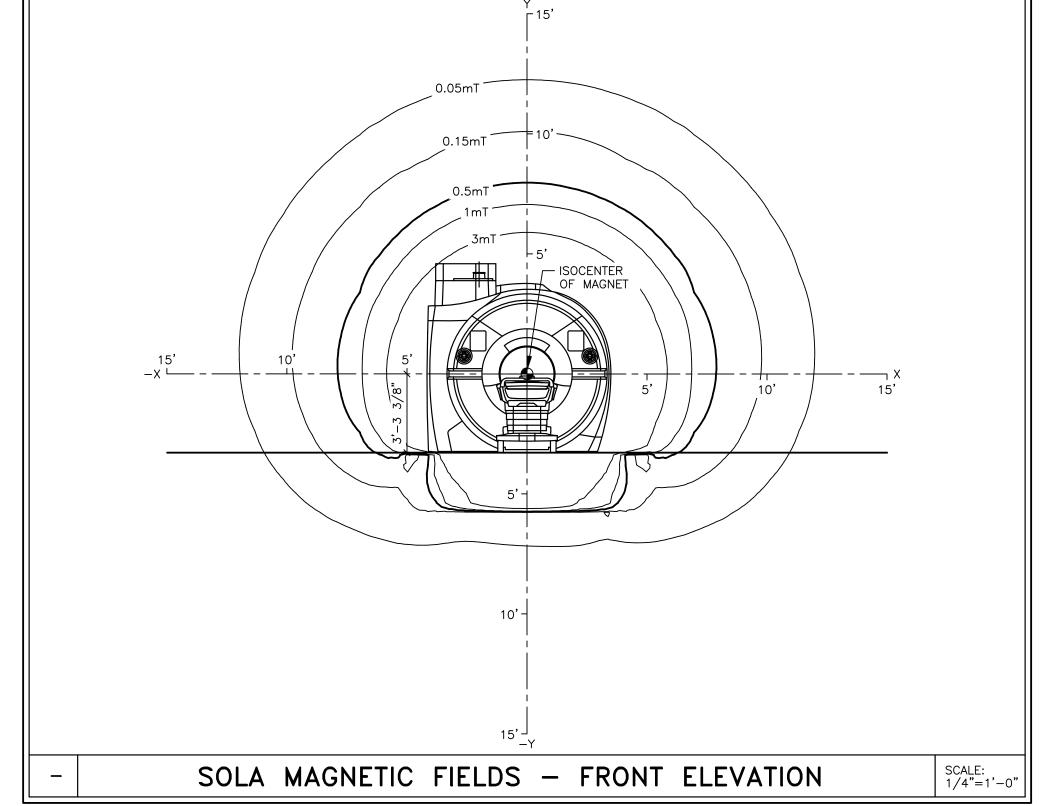
-IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

 $- \, \mbox{ALL}$  DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. - THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.



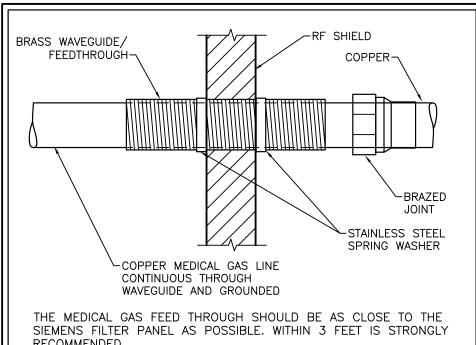






SOLA REV 14

				PROJECT MANAGEF TEL: (770) 402 VMAIL: FAX: EMAIL: PATRICK.RU		HINEERS	.COM		SIEMENS
				GR	80	JESSE	HILL JR DR S		SYSTEM D303 RADIENTS
	$\triangle$	06/06/22	2200757RD DATED 05/17/22 APPROVED BY CUSTOMER FOR FINALS	THIS TITLE B SIEMENS AUTH RESULT IN PROS	EPRODUCTION OF LOCK WITHOUT ORIZATION WILL SECUTION UNDER OF THE LAW.		JECT #: <b>220</b> 0	757	SHEET:
1	SYM	DATE	DESCRIPTION		RE RESERVED.	SHEET	3 10	DRAWN BY: D. BRISTOE	
		-ISSU	E BLOCK-	SCALE: AS NOTED	REF. #: 30261311	DATE:	06/06/22		



THE FINAL MEDICAL GAS CONNECTION TO THE WAVEGUIDE CANNOT BE MADE UNTIL GROUND ISOLATION MONITORING IS COMPLETE. THE MEDICAL GAS MUST BE GROUNDED TO THE WAVEGUIDE AND

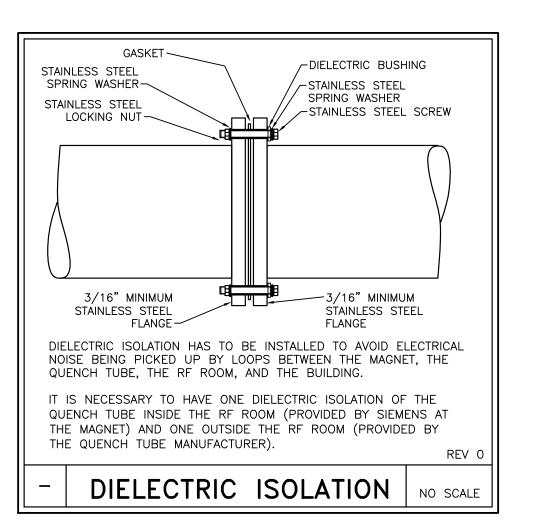
MEDICAL GAS EXAMPLE NO SCALE

# IMAGE QUALITY CONCERNS

BROADBAND RF NOISE IS A SINGLE TRANSIENT OR CONTINUOUS SERIES OF TRANSIENT DISTURBANCES CAUSED BY AN ELECTRICAL DISCHARGE. LOW HUMIDITY ENVIRONMENTAL CONDITIONS WILL HAVE HIGHER PROBABILITY OF ELECTRICAL DISCHARGE. THE ELECTRICAL DISCHARGE CAN OCCUR DUE TO ELECTRICAL ARCING OR MERELY STATIC DISCHARGE. SOME POTENTIAL SOURCES CAPABLE OF PRODUCING ELECTRICAL

- DISCHARGE INCLUDE: LOOSE HARDWARE/FASTENERS-VIBRATION OR MOVEMENT (ELECTRICAL CONTINUITY MUST ALWAYS BE MAINTAINED).
- FLOORING MATERIAL INCLUDING RAISED ACCESS FLOORING (PANELS AND SUPPORT HARDWARE) AND CARPETING.
- ELECTRICAL FIXTURES (LIGHTING FIXTURES, TRACK LIGHTING, EMERGENCY LIGHTING, BATTERY CHARGERS, OUTLETS).

DUCTING FOR HVAC AND CABLE ROUTING. • RF SHIELD SEALS (WALLS, DOORS, WINDOWS, ETC.). REV 0



# **EXAM ROOM INTERIOR NOTES**

1) ONLY NON-MAGNETIC MATERIALS ARE TO BE USED AND INSTALLED IN THE RF ROOM. SEE CONSTRUCTION REQUIREMENTS.

2) A SUSPENDED CEILING MUST BE STATICALLY SUSPENDED, NOT SUSPENDED WITH MOVABLE CLAMPS, SPRINGS, ETC.

3) RODS IN SUSPENDED CEILINGS MUST BE INSTALLED SECURELY. GALVANIC CONTENT BETWEEN THE RODS MUST BE GUARANTEED, THEY MUST NOT JUST LIE ON TOP OF ONE ANOTHER. A WIRE JUMPER BETWEEN RODS MAY BE USEFUL.

4) ELECTRICAL WIRING, FOR AMBIENT LIGHTS FOR EXAMPLE, MUST NOT SIMPLY REST ON THE SUSPENDED CEILING, THEY MUST BE FASTENED OR INSIDE A CONDUIT TO PREVENT MOTION.

REV 1

REV 2

NONE

# RF DOOR OPENING

IN THE EVENT OF A CATASTROPHIC FAILURE OF THE QUENCH VENT DURING A QUENCH, PRESSURE BUILT UP MAY PREVENT OPENING A DOOR THAT OPENS INTO THE RF ROOM, PREVENTING EVACUATION FROM LIFE THREATENING CONDITIONS.

FOR THIS REASON THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. IF THE DOOR CANNOT OPEN OUT FROM THE RF ROOM, OTHER APPROPRIATE MEANS HAVE TO BE PROVIDED SO THAT THE RF ROOM DOOR IS NOT PREVENTED FROM OPENING DUE TO PRESSURF.

IF THE DOOR OPENS INTO THE RF ROOM, A 24"x24" OPENING FOR PRESSURE EQUALIZATION INTO THE RF ROOM MUST BE INSTALLED. THIS IS MANDATORY. THIS IS NOT AN ESCAPE HATCH. THE PURPOSE OF THE OPENING IS TO RELIEVE PRESSURE AND ALLOW THE MAIN DOOR TO BE OPENED SO THAT OCCUPANTS CAN BE

THE OPENINGS WILL HAVE PANELS INSTALLED IN THE RF ROOM OR THE DOOR THAT CAN BE UNLOCKED AND OPENED TO THE OUTSIDE IN CASE OF EMERGENCY. THESE PANELS REQUIRE AN RF SEALED INSTALLATION. AFTER OPENING THE PANEL, THE OUTLET SHOULD MEASURE AT LEAST 24"x24". WHEN USING RECTANGULAR PANELS, THE SHORTER SIDE SHOULD MEASURE OF MINIMUM OF 24".

TO ENSURE UNOBSTRUCTED VENTING, THIS OPENING CANNOT BE SUBDIVIDED. THIS MEANS THAT, FOR EXAMPLE, RF SEALED HONEYCOMB GRIDS ARE NOT PERMITTED.

EASY REMOVAL OF THE PANEL BY A PERSON HAS TO BE ENSURED AND A MINIMUM DISTANCE OF 40" TO A FIXED OBJECT MUST BE MAINTAINED. THE PANEL SHOULD BE INSTALLED IN AN ACCESSIBLE LOCATION AND ALLOW ESCAPE OF THE LOW DENSITY HELIUM.

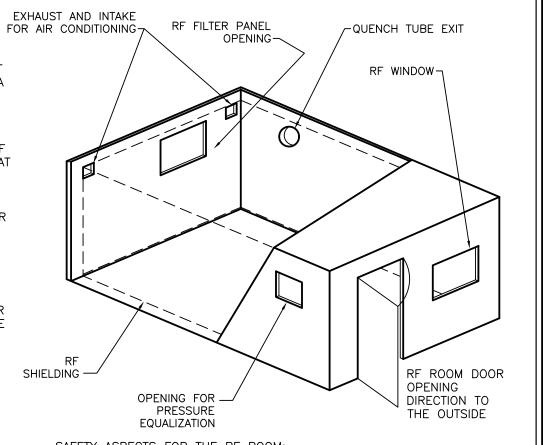
AS AN ALTERNATIVE TO AN OUT SWING DOOR, THE STATIONARY OBSERVATION WINDOW IS REPLACED BY A WINDOW OPENING INTO THE CONTROL AREA OR THE DOOR IS REPLACED WITH AN RE SEALED SLIDING DOOR. IT SHOULD BE ENSURED THAT THE DOOR

IF THE DOOR OPENS TO THE OUTSIDE, THE OPENING IN THE RF ROOM IS STILL RECOMMENDED.

CLOSES IN A WAY THAT ALLOWS IT TO MOVE AWAY FROM THE

FRAME IN CASE OF OVERPRESSURE.

THE RF ROOM MANUFACTURER CAN PROVIDE YOU WITH ADDITIONAL RF SEALED ROOM OPENINGS THAT LEAD DIRECTLY TO THE OUTSIDE. HOWEVER, THESE OPENINGS ARE ALSO CONDUITS FOR NOISE GENERATED OUTSIDE THE RF ROOM. UNOBSTRUCTED FLOW THROUGH THIS PIPE MUST BE GUARANTEED.



SAFETY ASPECTS FOR THE RF ROOM: IT MUST BE POSSIBLE TO LOCK THE RF ROOM (EXAMINATION ROOM) DOOR FROM THE OUTSIDE. IT MUST ALSO BE POSSIBLE TO OPEN THE DOOR FROM THE INSIDE WITHOUT A KEY OR ADDITIONAL DEVICE.

THE RF DOOR IS AN IMPORTANT COMPONENT FOR GOOD IMAGE QUALITY AS WELL AS SAFETY, THE OWNER/OPERATOR OF THE MR SYSTEM MUST MAINTAIN THE RF ROOM AS INSTRUCTED BY THE RF ROOM MANUFACTURER IN ORDER TO GUARANTEE CORRECT FUNCTION OF THE RF DOOR.

NO FERROMAGNETIC ITEMS CAN BE BROUGHT INTO THE RF ROOM AFTER THE MAGNET HAS BEEN RAMPED UP TO FIELD. MAGNETIC ITEMS WILL BECOME ATTRACTED TO THE MAGNET WITH NO WARNING AND DUE TO THE HIGH MAGNETIC FIELD, WILL BECOME MISSILES.

NOTE: FOR DOORS MOVED BY AN AUXILIARY DRIVES (ELECTRICAL OR PNEUMATIC), MANUAL OPERATION HAS TO BE ENSURED. AN OUTSIDE WINDOW SHOULD BE IN THE VICINITY TO ALLOW VENTING EXHAUSTED GAS TO THE OUTSIDE. THE INTEGRITY OF THE RF SHIELD MUST BE TESTED AFTER REMODELING.

SAFETY INFORMATION - PRESSURE EQUALIZATION

SCALE: NONE

REV C

REV 0



1 1/16"<del>↓</del>∤

LINE OF FINISHED CEILING

THE FINISHED WALL DIMENSION

THE SIEMENS FILTER PLATE

SHOULD ONLY BE USED FOR

CONNECTION OF SIEMENS

CABLES. FOR ANY OUTSIDE

EQUIPMENT MANUFACTURER'S

CONNECTIONS, A SEPARATE

OEM FILTER PANEL MUST BE

USED. SEE DETAIL THIS SHEET.

LINE OF FINISHED FLOOR

APPLIES TO THE EQUIPMENT

ROOM AND THE EXAM ROOM.

EQUIPMENT ROOM SIDE FILTER PLATE ELEVATION

4'-7 1/8"

FINISHED WALL OPENING

3'-10 7/16"

3'-6 3/4"

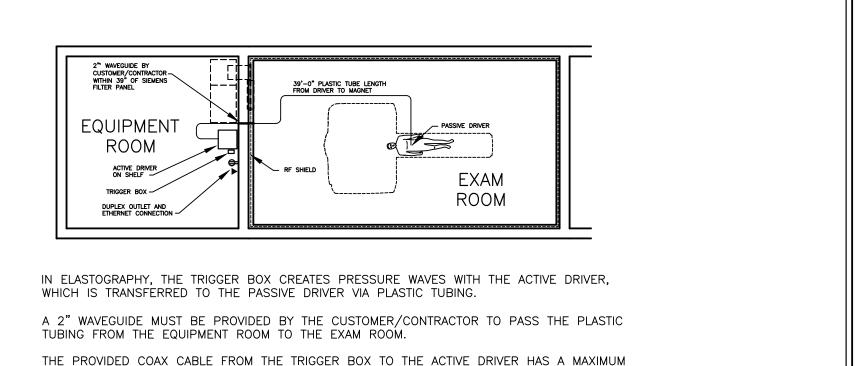
RF SHIELD OPENING

-LINE OF FINISHED WALL OPENING

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**ELASTOGRAPHY** 

50 FOOT LENGTH.

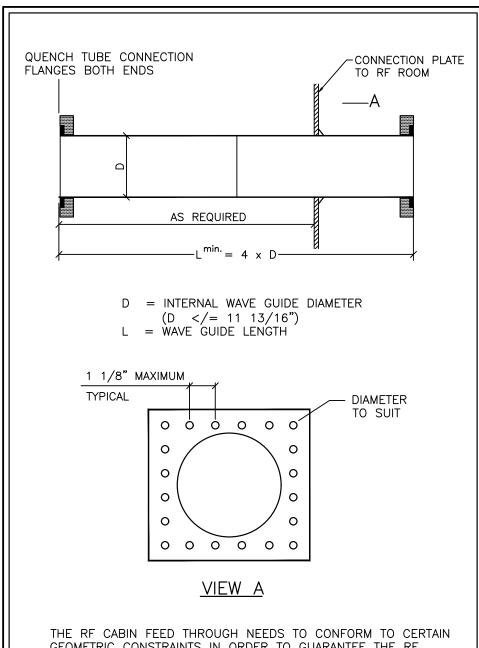
RF SHIELDING

1) THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15-128 MHz. IF CO-SITING TWO SYSTEMS EACH ROOM SHOULD BE 100 dB.

2) THE RF SHIELD MUST BE TESTED BEFORE AND AFTER MAGNET PLACEMENT IN THE RF ROOM AND AFTER THE SIEMENS RF FILTER PANEL IS INSTALLED. THE RF-SHIELDING MUST BE INSULATED FROM ALL GROUNDS SUCH THAT THE ONLY GROUND IS THE SINGLE POINT GROUND ON THE OUTSIDE OF THE RF-ROOM WALL. RESISTANCE  $\geq$  100 OHMS.

3) ALL ELECTRICAL LINES INTO THE RF ROOM MUST BE ROUTED THROUGH RF FILTERS (PROVIDED BY RF SHIELDING SUPPLIER). ALL ELECTRICALLY NON-CONDUCTIVE SUPPLY LINES (E.G. FIBER OPTIC CABLES, OR HOSES) INTO THE RF ROOM MUST BE ROUTED THROUGH RF SEALED WAVE GUIDES (PROVIDED BY RF SHIELDING SUPPLIER).

4) FOR PRESSURE EQUALIZATION PURPOSES THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. AS AN ALTERNATIVE A 24"X24" OPENING IN THE RF ROOM FOR PRESSURE EQUALIZATION IS REQUIRED.



QUENCH TUBE RF CABIN FEED THROUGH REV 0

WAVE GUIDE

NO SCALE

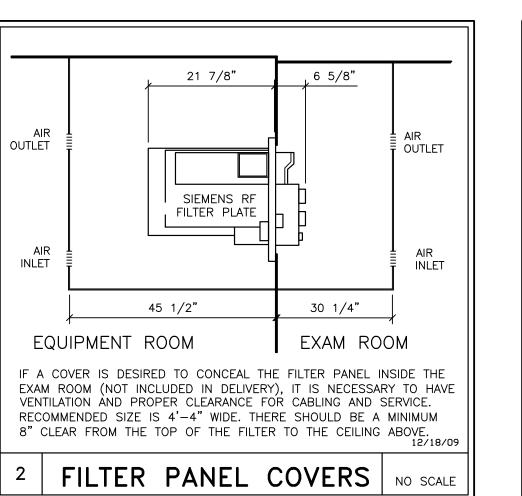
GEOMETRIC CONSTRAINTS IN ORDER TO GUARANTEE THE RF INTEGRITY OF THE RF CABIN. AS A FUNCTION OF INTERNAL PIPE DIAMETER, THE FOLLOWING APPLIES TO MINIMUM PIPE LENGTH FOR FREQUENCIES UP TO 128 MHz AND 110 dB ATTENUATION. DEPENDING ON RF CABIN DESIGNS, RF SEALS CAN BE REQUIRED BETWEEN THE MOUNTING FLANGE AND THE RF CABIN.

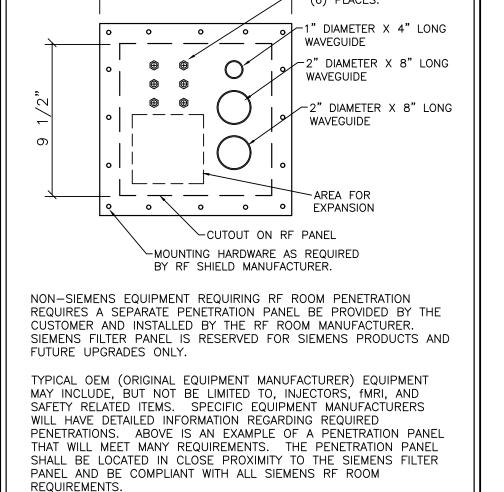
1) SIEMENS REQUESTS THAT THE SHIELDING MANUFACTURER(S) SUBMIT FINAL SHOP DRAWINGS TO SIEMENS FOR REVIEW PRIOR TO THEIR INCLUSION IN CONSTRUCTION DOCUMENTS. SIEMENS SHALL BE COPIED ON ALL FIELD ORDER CHANGES CONCERNING CHANGES IN RF AND MAGNETIC SHIELDING CONDITIONS, CONFIGURATION AND SPECIFICATION. THE RF AND MAGNETIC SHIELDING CONTRACTOR(S) SHALL FURNISH "AS BUILT" SCALED AND DIMENSIONED PLANS REFLECTING ANY AND ALL FIELD ORDER CHANGES PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS. 2) ALL CHANGES TO SIEMENS RECOMMENDED OPENINGS AND PÉNETRATIONS SHALL BE APPROVED BY THE SIEMENS PROJECT MANAGER PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS. 3) THE SIZE, LOCATION, AND DIMENSIONS OF ANY MAGNETIC SHIELDING REQUIRED HAS BEEN DETERMINED BY SIEMENS. THIS INFORMATION HAS BEEN SUPPLIED TO THE MAGNETIC SHIELDING FABRICATOR TO DESIGN THE STRUCTURAL SUPPORT SYSTEM REQUIRED FOR THE MAGNETIC SHIELDING MATERIAL. 1) STRUCTURAL SUPPORT AND INTEGRATION OF THE SIEMENS

# FILTER PLATE GENERAL NOTES

SUPPLIED AND INSTALLED FILTER PLATE WITH MAGNETIC AND RF SHIELDING SHALL BE SPECIFIED, DETAILED AND NOTED BY THE RF AND MAGNETIC SHIELDING MANUFACTURER(S) WITH OVERALL COORDINATION WITH SIEMENS SITE SPECIFIC RECOMMENDATIONS TO BE THE RESPONSIBILITY OF THE ARCHITECT OF RECORD.

2) THE FILTER PLATE FRAME, RF FILTER PLATE BLANK, RF GASKET AND MOUNTING HARDWARE FOR THE PURPOSES OF TESTING THE INTEGRITY OF THE RF ENCLOSURE PRIOR TO THE INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED RF FILTER PLATE SHALL BE PROVIDED AND INSTALLED BY THE SHIELDING CONTRACTOR(S) UNLESS SPECIFIED OTHERWISE.





OEM FILTER PANEL

**50** 50

REV 0

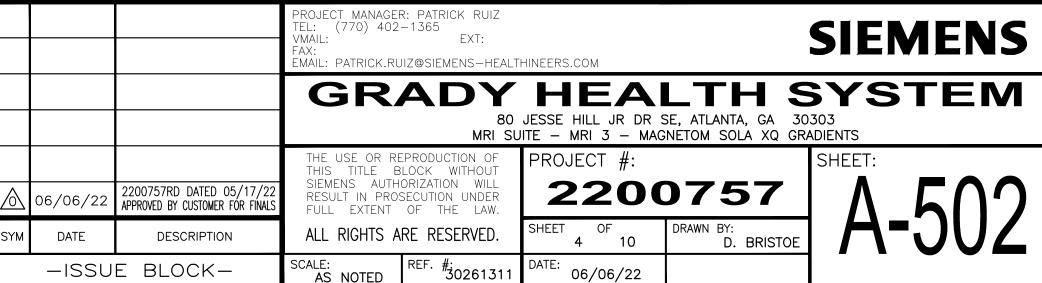
3/4"=1'-

FILTERS - TYPICAL

SOLA REV 14

REV 0

NO SCALE



AS NOTED

06/06/22

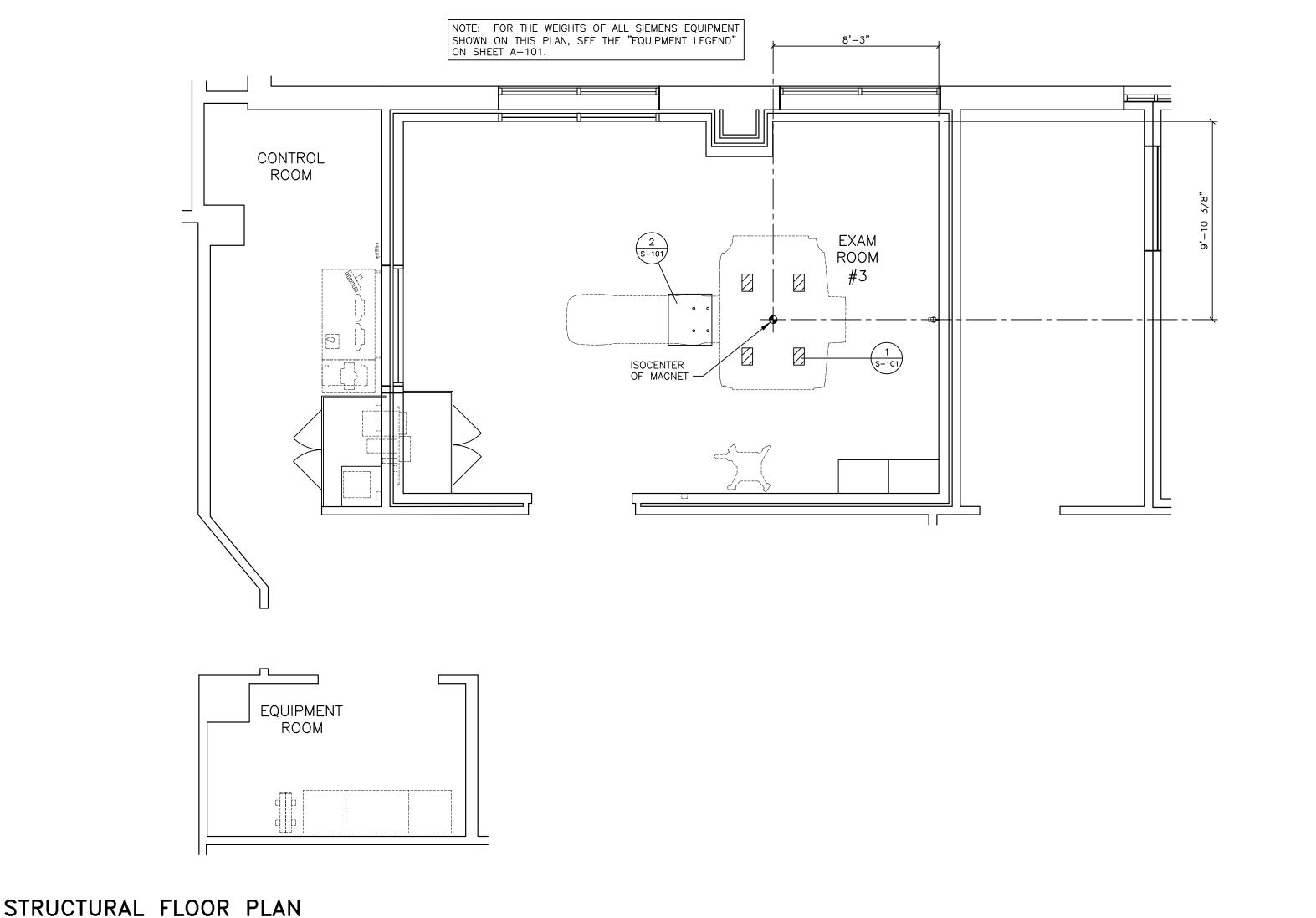
ATTENTION:

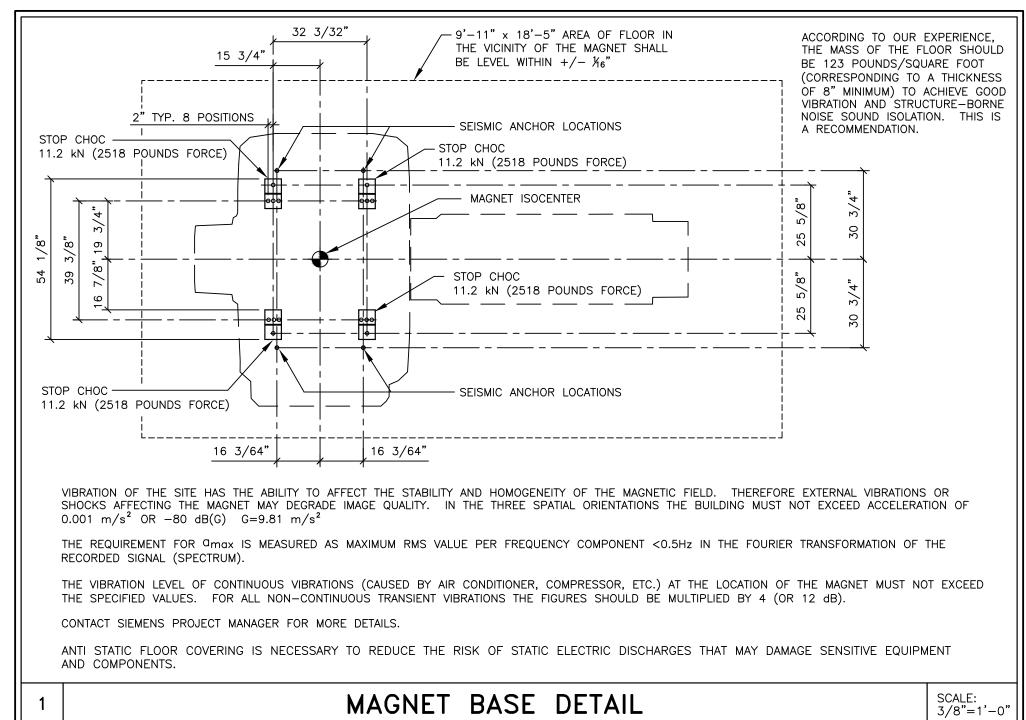
- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

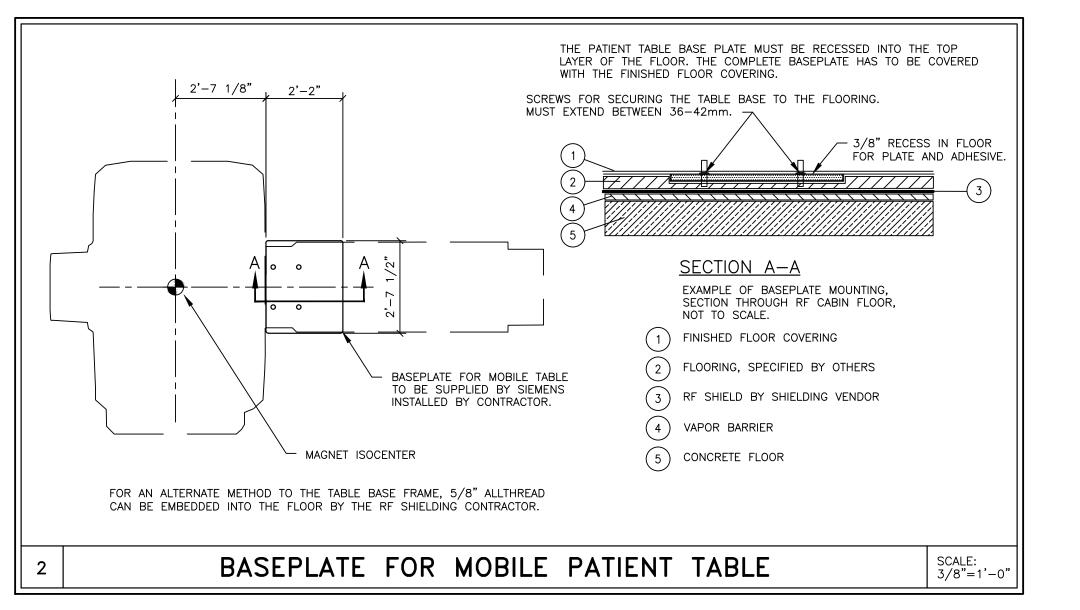
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

-ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. PHYSICIST TO SPECIFY RADIATION PROTECTION.

THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION







# STRUCTURAL NOTES

1) THE CUSTOMER/CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL SUPPORT MEMBERS AND NEEDED HARDWARE FOR THE INSTALLATION OF THE SIEMENS EQUIPMENT.

2) THE OVERHEAD STRUCTURAL SUPPORT SYSTEM SHALL BE FIXED,

WITH A TRANSIT.

RIGID AND BRACED FOR SWAY. 3) ALL STRUCTURAL SUPPORT MEMBERS SHALL BE TRUE, SQUARE, LEVEL, PARALLEL AND COPLANAR WITH RESPECT TO EACH OTHER, WITH A HORIZONTAL STRUCTURAL SUPPORT MEMBER TO BE LOCATED AND SET

4) ALL STRUCTURAL SUPPORT DETAILS SHOWN ARE SAMPLE DETAILS BÁSED UPON TYPICAL AND STANDARD BUILDING PRACTICES AND ARE NOT INTENDED AS ACTUAL CONSTRUCTION DETAILS. ALL CONSTRUCTION DETAILS AND SUPPORT CALCULATIONS SHALL BE PREPARED BY A PROFESSIONAL STRUCTURAL ENGINEER AT THE CUSTOMER'S EXPENSE. IN THE EVENT AN EXISTING SUPPORT SYSTEM IS TO BE USED, IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO VERIFY THE INTEGRITY OF THAT

5) MOUNTING PLATES, FRAMES, AND HARDWARE SUPPLIED BY SIEMENS AS DETAILED IN THIS DRAWING SET ARE INSTALLED BY SIEMENS UNLESS OTHERWISE REQUIRED. ANY DEVIATION FROM THE PROVIDED MATERIALS OR MOUNTING METHODS MUST BE DESIGNED AND DOCUMENTED BY THE STRUCTURAL ENGINEER OF RECORD. ALTERNATE MOUNTING MATERIALS (I.E. ANCHORS, THREADED ROD, BACKING PLATES, ETC.) MUST BE SUPPLIED BY THE CUSTOMER/CONTRACTOR. SIEMENS MAY REQUIRE ASSISTANCE FROM THE CUSTOMER/CONTRACTOR WITH INSTALLATION WHEN UTILIZING ALTERNATE MOUNTING MATERIALS.

6) ALL CEILING FIXTURES (I.E. AIR SUPPLY GRILLES, AIR RETURN GRILLES, EXHAUST GRILLES, SPRINKLER HEADS, INCANDESCENT AND FLUORESCENT LIGHT FIXTURES, INTERCOM SPEAKERS, MEDICAL GAS COLUMNS, ETC.) SHALL BE INSTALLED FLUSH MOUNTED WITH THE FINISHED CEILING TO PROVIDE FREE AND UNRESTRICTED TRAVEL OF THE SMS CEILING MOUNTED EQUIPMENT.

7) THE STRUCTURAL PLANNING AS SHOWN ON THE 1/4" STRUCTURAL PLAN HAS BEEN COORDINATED WITH THE EQUIPMENT LOCATION AS SHOWN ON THE 1/4" EQUIPMENT LAYOUT PLAN. FOR THIS REASON, ANY DEVIATIONS FROM THE STRUCTURAL PLANNING AS SHOWN MUST BE APPROVED BY SMS PLANNING DEPARTMENT.

8) THE STRUCTURAL ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR THE DESIGN AND DETAIL OF FLOOR, WALL AND CEILING STRUCTURES IN ACCORDANCE WITH THE WEIGHTS, MOMENTS AND FORCES AS SHOWN ON OUR STRUCTURAL CALCULATIONS, OR INFORMATION, IN CONSIDERATION OF FORCES AS DETERMINED PER LOCAL GOVERNING BUILDING CODES.

ROJECT MANAGER: PATRICK RUIZ L: (770) 402-1365

2200757RD DATED 05/17

APPROVED BY CUSTOMER FÓR FÍNALS

DESCRIPTION

06/06/22

SIEMENS MAIL: PATRICK.RUIZ@SIEMENS-HEALTHINEERS.COM **GRADY HEALTH SYSTEM** 

80 JESSE HILL JR DR SE, ATLANTA, GA 30303 MRI SUITE - MRI 3 - MAGNETOM SOLA XQ GRADIENTS

THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL PROJECT #:

SOLA REV 14

CEILING HEIGHTS EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

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

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED - IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN DOCUMENTS FOR REFERENCE. MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

ATTENTION:

PHYSICIST TO SPECIFY RADIATION PROTECTION.

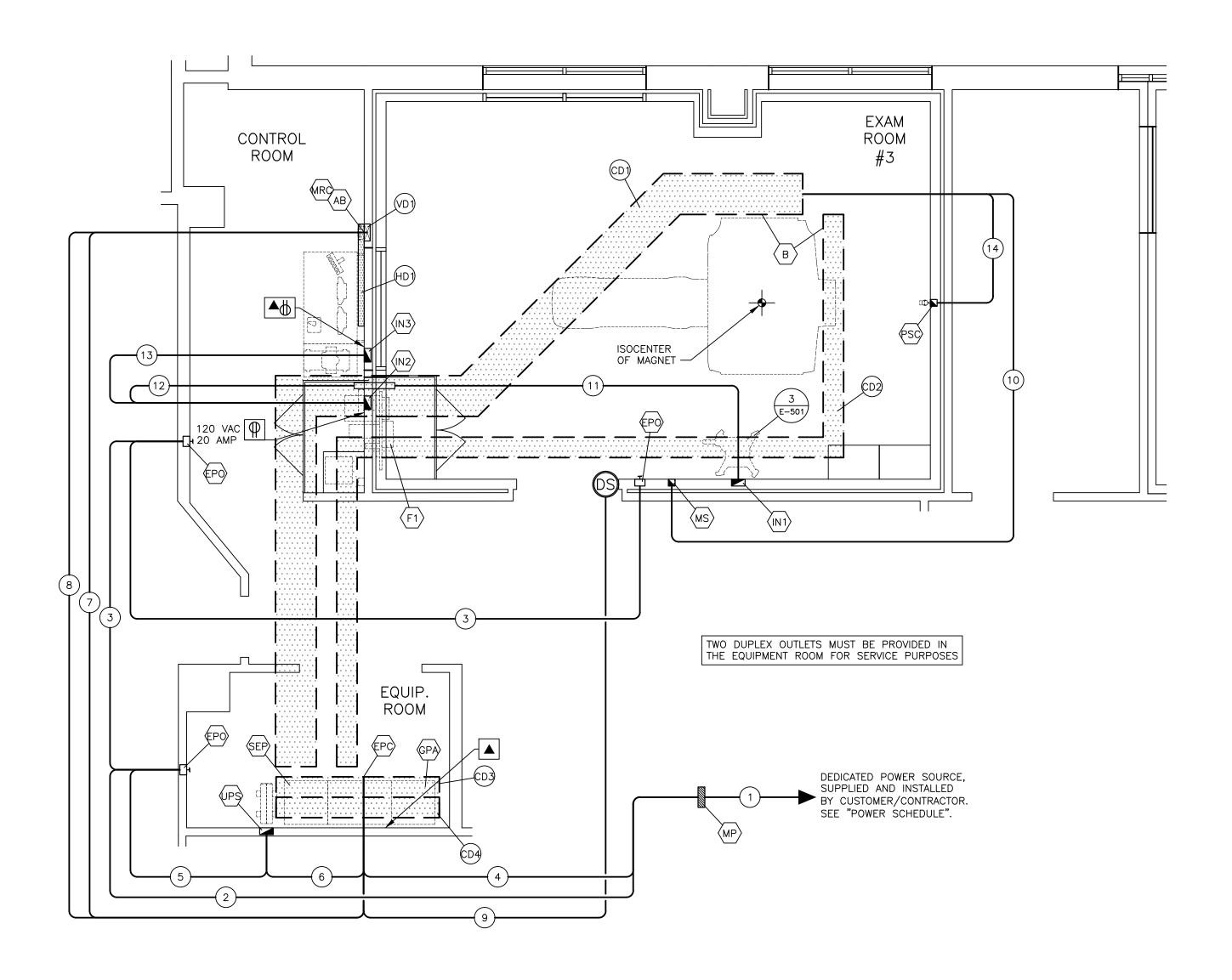
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

-ISSUE BLOCK-

FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. REF. #: 30261311 AS NOTED

RESULT IN PROSECUTION UNDER

2200757 5 10 D. BRISTOE 06/06/22



ELECTRICAL RACEWAY PLAN

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

	SYMBOLS
	ALL MAY NOT APPLY
	CAUTION OR WARNING
Ü	CRITICAL NOTE(S)
	PANEL OR ENCLOSURE BY CUSTOMER/CONTRACTOR
	OPENING IN RACEWAY OR TRENCHDUCT
	PULLBOX IN (FLOOR/WALL/CEILING)
	OPENING IN ACCESS FLOORING
(DS)	RF DOOR SWITCH - MCMASTER-CARR SUPPLY ROLLER LIMIT SWITCH 7076k14 PROVIDED BY CONTRACTOR, AND MOUNTED AT TOP OF DOOR. COORDINATE WITH SIEMENS PROJECT MANAGER.
Н	(EPO) EMERGENCY POWER OFF BUTTON
	CEILING DUCT
	SURFACE MOUNTED DUCT
$\boxtimes$	VERTICAL DUCT
<b>&gt;</b>	ETHERNET CONNECTION TO CUSTOMER'S INFORMATION SYSTEMS NETWORK IN AN ACCESSIBLE LOCATION (VERIFY WITH SIEMENS PROJECT MANAGER).
$\ominus$	110 VOLT, 20 AMP, HOSPITAL GRADE DUPLEX OUTLET LOCATED NEAR THE ETHERNET CONNECTION.
	REV 2

SYM	SIZE	DESCRIPTION  SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR	REMARKS
(AB)	3 <b>"</b> ø	OPENING IN FACE OF VERTICAL DUCT 5'-0" ABOVE FINISHED FLOOR IN LOCATION TO BE COORDINATED WITH THE ARCHITECT.	ALARM BOX
(P)(P)(P)	18" x 18"	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	ELECTRONICS CABINETS
B	AS REQUIRED	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	MAGNET CABLE ACCESS
<b>₽</b>		EMERGENCY POWER OFF BUTTONS, MOUNTED WITH CENTERLINE AT 5'-0" ABOVE FINISHED FLOOR. ALL PARTS ARE TO BE NONFERROUS INSIDE THE RF ROOM. EXACT LOCATIONS ARE TO BE VERIFIED WITH THE ARCHITECT OF RECORD.	SEE POWER SCHEDULE, SHEET E-102
<b>F1</b>		SIEMENS RF FILTER PANEL TO BE MOUNTED ON RF SHIELDED WALL	FILTER PANEL
(N1)	AS REQUIRED	NON-FERROUS PULL BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR POWER SUPPLY— MUST BE LOCATED OUTSIDE OF 5mT FIELD
⟨N2⟩	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL IN EQUIPMENT ROOM, MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR POWER SUPPLY
(N3)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA, MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR CONTROL CONSOLE
(MP)		MAIN PANEL WITH MAIN BREAKER. EXACT LOCATION DETERMINED BY CUSTOMER/CONTRACTOR	SEE POWER SCHEDULE
- (MRC)	4" × 4"	OPENING IN FACE OF RACEWAY IN SHOWN LOCATION.	HOST COMPUTER
MS>	AS REQUIRED	NON-FERROUS SINGLE GANG BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 6'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	MAGNET STOP
<b>(53)</b>	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL REFER TO HEIGHT CHART A-501-3. THE PULL BOX CAN BE MOUNTED AT APPROXIMATELY 5'-0" ABOVE THE FINISHED FLOOR IN MOST CASES, DEPENDING ON THE DISTANCE FROM THE MAGNET TO THE WALL.	PATIENT SUPERVISION CAMER.
(P)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT FLOOR LINE IN SHOWN LOCATION PROVIDED WITH 2"Ø OPENING IN FINISHED COVER.	LIEBERT GXT4 UPS
(iii)	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER, IN THE EXAM ROOM, MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE FILTER PANEL AND THE MAGNET. A 15" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE RF FILTER PANEL (F1). WHEN ROUTING ALL RACEWAYS REFER TO DETAIL E-501/2 TAKING CARE SO THAT MAXIMUM CABLE LENGTHS ARE NOT EXCEEDED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/1
(1)2	12"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EXAM ROOM. A 12" SEPARATION BETWEEN CD1 AND CD2 MUST BE MAINTAINED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/1
(03)	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EQUIPMENT ROOM MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE EQUIPMENT ROOM AND THE RF FILTER PANEL (F1). AN 18" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE FILTER PANEL.	CABLE TRAY SEE DETAIL E-501/1
(04)	12"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EQUIPMENT ROOM. A 12" SEPARATION BETWEEN CD3 AND CD4 MUST BE MAINTAINED.	CABLE TRAY SEE DETAIL E-501/1
<b>(P)</b>	4" x 2"	HORIZONTAL DUCT SURFACE MOUNTED ON WALL IN CONTROL AREA AT FLOOR LINE AS SHOWN, FINISHED TO MATCH WALLS.	
(N)	10" x 3-1/2"	VERTICAL DUCT MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA FROM ABOVE FINISHED CEILING TO FLOOR LINE PROVIDED WITH REMOVABLE FINISHED COVERS.	
1	AS PER NEC	CONDUIT FROM FACILITY POWER TO MAIN PANEL "MP".	SEE POWER SCHEDULE, SHEET E-102
2	AS PER NEC	CONDUIT FROM "MP" TO "EPO".	SEE POWER SCHEDULE, SHEET E-102
3	AS PER NEC	CONDUIT FROM "EPO" TO "EPO" TO BE NON-FERROUS WHEN INSIDE THE RF ROOM. CUSTOMER/CONTRACTOR IS TO PROVIDE RF FILTERS FOR ALL NON-SIEMENS WIRING.	SEE POWER SCHEDULE, SHEET E-102
4	(1) 2 <b>"</b> ø	CONDUIT FROM "MP" TO END AT "CD3" (EPC) VIA FLEX CONDUIT. THERE MUST BE A DIELECTRIC SEPARATION BETWEEN THE CONDUIT AND THE CONNECTION AT THE SIEMENS EPC CABINET.	SEE POWER SCHEDULE, SHEET E-102
5	(1) 3/4 <b>"</b> ø	CONDUIT FROM "EPO" TO "UPS".	
6	(1) 2 <b>"</b> ø	CONDUIT FROM "UPS" TO "CD3" (EPC)	MAXIMUM LENGTH 29 FEET
7	(2) 2 1/2 <b>"</b> ø	CONDUIT FROM "VD1" (MRC) TO "CD3" (EPC).	NOT TO EXCEED 54 FT.
8	(1) 1 1/2"ø	CONDUIT FROM "VD1" (AB) TO "CD3" (EPC).	NOT TO EXCEED 60 FT.
9	(1) 1/2"ø	CONDUIT FROM "DS" TO "CD3" (EPC).	NOT TO EXCEED 60 FT.
10	(1) 3/4"ø	CONDUIT FROM "MS" TO "CD1" (WIRES TO MAGNET) TO BE NON-FERROUS WHEN INSIDE THE RF ROOM.	NOT TO EXCEED 25 FT.
11)	(1) 2 <b>"</b> ø	NON-FERROUS CONDUITS FROM NEAR "F1" TO "IN1" FOR INJECTOR CABLES.	NOT TO EXCEED 40 FEET
(12)	(1) 2 <b>"</b> ø	CONDUITS FROM NEAR FILTER LOCATION TO "IN2".	
13	(1) 2"ø	CONDUIT FROM "IN2" TO "IN3" FOR INJECTOR CABLES.	NOT TO EXCEED 150 FEET
(14)	(1) 1"ø	NON-FERROUS CONDUIT FROM "PSC" TO "CD1".	

CONTRACTOR SUPPLIED CABLES				
FROM	VIA	ТО	DESCRIPTION	REMARKS
SOURCE	1	MP	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.	
MP	2	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.	
EPO	3	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.	
MP	4,CD3	EPC	(3) 2/0 AND (1) 2/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED. THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.	LANDED BY ELECTRICAL CONTRACTOR
EPO	5	UPS	DETERMINED BY ELECTRICAL CONTRACTOR.	6 FOOT TAILS

DATE

DESCRIPTION

-ISSUE BLOCK-

# **ELECTRICAL NOTES**

) COMPLIANCE: ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA-70), O.S.H.A. REGULATIONS, AS WELL AS APPLICABLE REGULATIONS OF CITY, COUNTY, STATE AND FEDERAL AGENCIES. PROVIDE MATERIALS AND EQUIPMENT THAT COMPLY TO ANSI, IEEE AND NEMA STANDARDS AND ARE U.L. LISTED AND LABELED. THE CUSTOMER'S/CONTRACTOR'S WORK AND ALL EQUIPMENT INSTALLED SHALL COMPLY WITH THE CURRENT EDITION OF NATIONAL ELECTRICAL CODE ADOPTED/ENFORCED BY THE AUTHORITY HAVING JURISDICTION. 2) QUALITY ASSURANCE: THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN THE FIELD TO INSURE THAT THE NEW WORK WILL FIT INTO THE EXISTING STRUCTURE AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST OR BE DISCOVERED THAT PREVENT THE INSTALLATION OF WORK AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO FABRICATION OF EQUIPMENT, OR THE PERFORMANCE OF ANY WORK THAT MAY BE AFFECTED. DO NOT ALTER DRAWINGS, DIMENSIONS, OR SPECIFICATIONS IN ANY WAY WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SIEMENS PROJECT MANAGER. ALL DIMENSIONS ARE FROM FINISHED SURFACES. CONDUIT AND PULL BOXES TO BE INSTALLED BY THE CUSTOMER/CONTRACTOR WITH LOCATIONS BEING FIELD VERIFIED BY SIEMENS PRÓJECT MANAGER. 3) POWER SUPPLY SOURCE: POWER SUPPLIES FOR SIEMENS HEALTHCARE EQUIPMENT SHALL BE FROM A MEDICAL IMAGING PANEL OR BUILDING SERVICE EQUIPMENT THAT IS A GROUNDED 3 OR 4-WIRE 'WYE' SOURCE PER THE SPECIFIC EQUIPMENT OPERATION REQUIREMENTS. A DEDICATED CIRCUIT SHALL BE PROVIDED THAT IS KEPT ENTIRELY FREE AND INDEPENDENT OF ALL OTHER BUILDING WIRING. NO ELEVATORS, GENERATORS, PUMPS, HVAC OR SIMILAR EQUIPMENT SHALL BE CONNECTED TO THE SAME CIRCUIT OR MEDICAL IMAGING PANEL THAT SERVES THE SIEMENS HEALTHCARE EQUIPMENT. IF THE POWER SUPPLY SOURCE DOES NOT MEET THE SPECIFIC SIEMENS EQUIPMENT POWER REQUIREMENTS, THE CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT REQUIRED TO ESTABLISH THE POWER SUPPLY IN ACCORDANCE WITH THE REQUIRED POWER SUPPLY PARAMETERS OF THE SIEMENS EQUIPMENT. THE CONTRACTOR SHALL COORDINATE THIS WORK WITH THE CUSTOMER AND/OR UTILITY COMPANY FIELD REPRESENTATIVE. 4) WORK FURNISHED BY CUSTOMER/CONTRACTOR: WORK NOT PROVIDED BY SIEMENS HEALTHCARE BUT SHOWN ON DRAWINGS TO BE FURNISHED AND INSTALLED BY CUSTOMER/CONTRACTOR INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING, UNLESS NOTED OTHERWISE: ELECTRICAL RACEWAYS AND DUCTS, WIRING TROUGHS, PULL BOXES, CONDUITS, CIRCUIT BREAKERS, ACCESS PANELS, EMERGENCY OFF BUTTONS, DOOR SWITCHES, WARNING LIGHTS, WIRING, WIRING DEVICES, CONNECTORS, LIGHTING EQUIPMENT AND GROUNDING.

5) RACEWAY AND CONDUIT NOTES: ALL ITEMS IN THE MAGNET ROOM SHALL BÉ NON-FERROUS. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT ENFORCED EDITION OF THE NATIONAL ELECTRICAL CODE. CONDUIT BODIES SHALL NOT BE USED. WHERE A CONDUIT ENTERS A BOX. FITTING, OR OTHER ENCLOSURE, AN INSULATED THROAT CONNECTOR SHALL BE PROVIDED TO PROTECT THE WIRE FROM ABRASION. ALL CONNECTORS FOR EMT SHALL BE COMPRESSION OR DOUBLE SET SCREW

KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES OR STEAM AND HOT WATER PIPES. INSTALL RACEWAY RUNS ABOVE WATER AND STEAM PIPES PROVIDED THAT CABLE RUN DISTANCES ARE MAINTAINED. USE TEMPORARY CLOSURES TO PREVENT FOREIGN MATTER FROM ENTERING RACEWAY. CONDUIT RUNS ARE SHOWN SCHEMATICALLY. INSTALL CONDUIT WITH A

MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE BUILDING CONSTRUCTION AND OBSTRUCTIONS, EXCEPT AS OTHERWISE INDICATED. THE CONTRACTOR SHALL MAKE CERTAIN THAT ANY CONDUIT/RACEWAY RUNS CONTAINING SIEMENS HEALTHCARE CABLES DO NOT EXCEED THE SPECIFIED MAXIMUM DISTANCES AS SHOWN ON THE ELECTRICAL DETAILS. LISTED CONDUIT SIZES FOR SIEMENS-SUPPLIED CABLES MUST BE MAINTAINED IN ORDER TO ENABLE THE TOTAL CABLE BUNDLE INCLUDING CONNECTORS TO BE PULLED THROUGH WITHOUT DAMAGE

PROVIDE ENCLOSED METAL WIRE DUCT RACEWAY SYSTEM WHERE SHOWN ON DRAWINGS WITH DIVIDERS TO SEPARATE THE DUCT INTO TWO OR THREE SEPARATE COMPARTMENTS AS SHOWN ON THE SIEMENS PLANS (FOR POWER AND SIEMENS HEALTHCARE CABLING). DIVIDERS AND CROSSOVER PIECES TO BE PROVIDED AS NECESSARY, THE CABLE TO CABLE AS WELL AS THE CIRCUIT TO CIRCUIT SEPARATION REQUIREMENT WAS EVALUATED DURING THE UL SYSTEM CERTIFICATION OF THE EQUIPMENT. ADDITIONAL SEPARATION OF THE SYSTEM CABLE ASSEMBLIES INTO SEPARATE OR PARTITIONED RACEWAYS, UNLESS OTHERWISE NOTED, IS NOT NECESSARY TO INSURE SEPARATION OF

PROVIDE WIRE DUCT/RACEWAY WITH ACCESSIBLE REMOVABLE COVERS. LOCATIONS OF BUILDING MATERIAL OPENINGS (I.E. ACCESS PANELS) TO BE CUT IN FIELD ARE TO BE COORDINATED WITH THE DRAWING REQUIREMENTS WITH BUILDING ELEMENTS SHALL BE COORDINATED WITH SIEMENS PROJECT MANAGER. ELECTRICAL PULL BOXES AND RACEWAY COVERS SHALL BE INSTALLED IN A MANNER TO ALLOW ACCESSIBILITY FOR INSTALLATION AND MAINTENANCE. CONTRACTORS MUST PROVIDE PULL STRINGS FOR ALL CONDUIT AND WIRE DUCT/RACEWAY. IN-FLOOR TRENCH DUCT AND FLUSH FLOOR BOXES SHALL BE PROVIDED WITH FULLY GASKETED REMOVABLE COVERS. WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED HIGHER THAN 14 FEET ABOVE FINISHED FLOOR, THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP THE SIEMENS INSTALL TEAM PULL SIEMENS

SUPPLIED CABLES AT CUSTOMER EXPENSE.

WHEN JUNCTION BOXES AND WIRE DUCT/RACEWAY ARE MOUNTED ABOVE A HARD CEILING (I.E. SHEET ROCK), A 24" x 24" ACCESS PANEL IS REQUIRED AT EACH JUNCTION BOX AND WITHIN 2 FEET OF EACH RACEWAY TRANSITION (SUCH AS A 90 DEGREE ELBOW OR TEE) IN DUCT/RACEWAY. THERE MUST BE FREE AND CLEAR ACCESS TO JUNCTION BOXES AND WIRE DUCT/RACEWAY. WHEN ACCESS PANELS ARE LOCATED MORE THAN 3 FEET FROM JUNCTION BOXES AND WIRE DUCT/RACEWAY THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO ELECTRICIANS TO HELP SIEMENS INSTALL TEAM PULL SIEMENS SUPPLIED CABLES AT CUSTOMER EXPENSE. 6) WIRING: ALL WIRING INSTALLED SHALL BE 600 VOLT CLASS, STRANDED

TYPE THHN/THWN-2, SINGLE CONDUCTOR ANNEALED COPPER FOR A MAXIMUM OPERATING TEMPERATURE OF 90° C (194° F). SIZED AS INDICATED INSTALLED IN METAL RACEWAYS. THE CUSTOMER/CONTRACTOR SHALL LEAVE MINIMUM 10 FT. OF WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY THE CUSTOMER/ELECTRICAL CONTRACTOR.

7) SHORT CIRCUIT REQUIREMENTS: ALL CIRCUIT BREAKERS SUPPLIED FOR THE SIEMENS EQUIPMENT REQUIREMENTS SHALL BE RATED HIGHER THAN THE SHORT CIRCUIT AVAILABLE AT THE TERMINALS OF THE ELECTRICAL EQUIPMENT AS DETERMINED BY THE ENGINEER OF RECORD, BUT NOT LESS THAN 35,000A RMS SYMMETRICAL AT 480V, 3-PHASE, 60 HERTZ. THE CONTRACTOR SHALL OBTAIN THE CORRECT SHORT CIRCUIT CURRENT RATING OF ALL THE NEW EQUIPMENT FOR INSTALLATION FROM THE ENGINEER OF RECORD.

SOLA REV 14

**SIEMENS** 

CEILING HEIC	SHTS
EXAM ROOM 7'-11"	MINIMUM
CONTROL ROOM 6'-11	MINIMUM

EQUIPMENT ROOM 7'-3" MINIMUM

OJECT MANAGER: PATRICK RUIZ (770) 402-1365 AIL: PATRICK.RUIZ@SIEMENS-HEALTHINEERS.COM **GRADY HEALTH SYSTEM** 80 JESSE HILL JR DR SE, ATLANTA, GA 30303 MRI SUITE - MRI 3 - MAGNETOM SOLA XQ GRADIENTS THE USE OR REPRODUCTION OF PROJECT #: THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 2200757RD DATED 05/17 RESULT IN PROSECUTION UNDER 06/06/22 APPROVED BY CUSTOMER FÓR FÍNALS

AS NOTED

FULL EXTENT OF THE LAW.

ALL RIGHTS ARE RESERVED.

REF. #: 3026131

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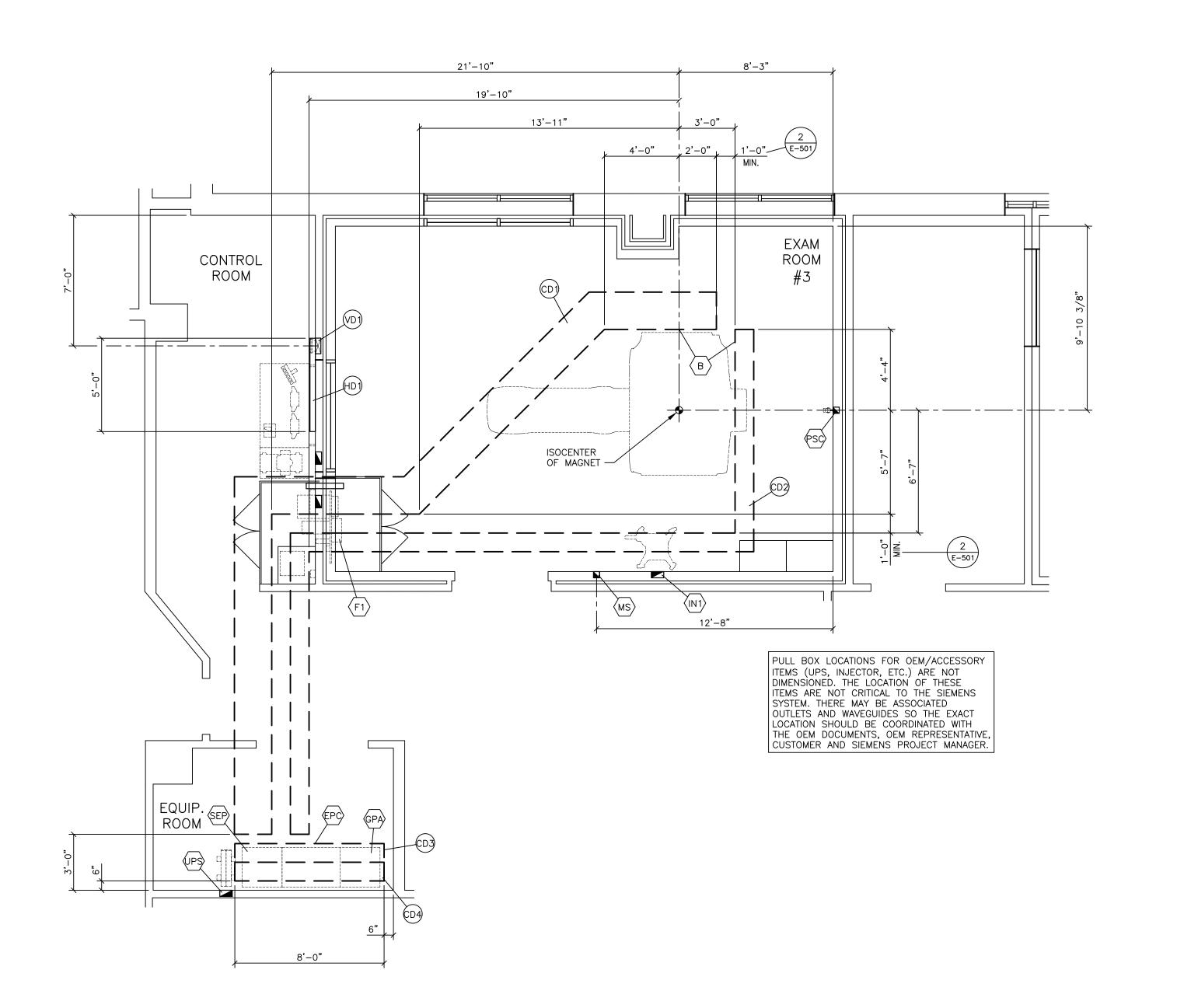
06/06/22

ATTENTION:

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- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

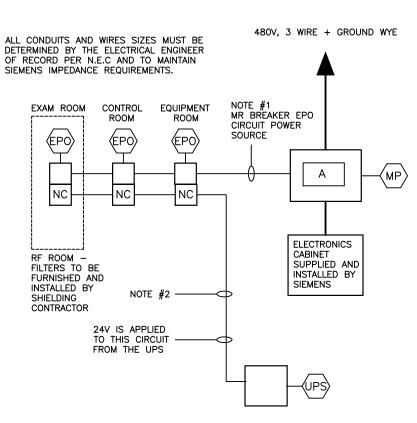
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.



ELECTRICAL DIMENSION PLAN

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

# POWER SCHEDULE



ITEM	QTY	DESCRIPTION						
MP	1	MAIN PANEL WITH MAIN BREAKER FLUSH OR SURFACE MOUNTED.						
Α	1	MR SYSTEM BREAKER MUST HAVE TRIPPING DEVICE SO WHEN ANY EPO IS PRESSED THE BREAKER TRIPS.						
		MR BREAKER AMPS: SEE POWER REQUIREMENTS						
VOLTS PHASES NEUT		NEUTRAL	GROUND	TOTAL WIRES				
		480	3	0	1	4 (NOTE 1)		
		· ·						

1) ALL WIRES MUST BE SAME SIZE. NOTE: UNLESS OTHERWISE NOTED ALL BREAKERS WILL BE 80% RATED.

EPO VARIES NOTE 1 - EPO CIRCUIT #1 MAIN CIRCUIT BREAKER EMERGENCY POWER OFF BUTTON WITH PROTECTIVE COVER THAT PREVENTS ACCIDENTAL ACTIVATION. THE EPO MUST BE OF FAIL-SAFE DESIGN, ALL EPO'S TO HAVE MECHANICAL LATCHING MECHANISM. EPO MUST BE RESET BEFORE MR BREAKER CAN RESUME OPERATION. CONTACTS AND WIRING CONFIGURATION TO BE DESIGNED BY ELECTRICAL ENGINEER OF RECORD. NOTE 2 - EPO CIRCUIT #2 EPO CONTACTS TO BE NORMALLY CLOSED, WIRED IN SERIES, CONNECTED TO 9130 UPS ONLY. THE EPO'S MUST BE INSTALLED BY A QUALIFIED ELECTRICAL CONTRACTOR ACCORDING TO NATIONAL ELECTRICAL CODE, STATE AND LOCAL REGULATIONS. THE CUSTOMER IS SOLELY RESPONSIBLE FOR THE IMPLEMENTATION OF THE EPO'S AND THEIR ASSOCIATED CIRCUITS AND MUST MAKE THE FINAL DETERMINATION

UNLESS OTHERWISE NOTED, ALL ITEMS LISTED IN THIS SCHEDULE SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR.

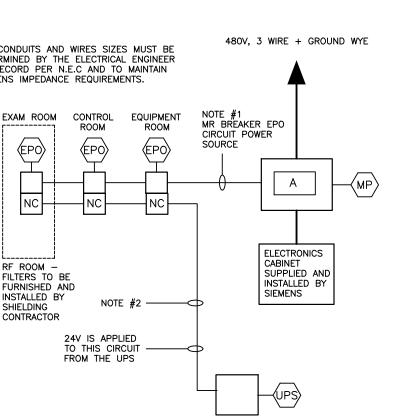
# POWER QUALITY NOTES

3) THE ELECTRICAL FEEDER TO THE IMAGING SYSTEM MUST BE RUN DÍRECTLY TO A MAIN FACILITY DISTRIBUTION PANEL OR TO THE FACILITY SERVICE ENTRANCE, WITH NO OTHER LOADS POWERED FROM THIS FEEDER.

REQUIRED. EXAMPLES INCLUDE VOLTAGE REGULATORS, TRANSFORMERS, SURGE PROTECTIVE DEVICES, FILTERS, AND/OR UNINTERRUPTIBLE POWER SUPPLIES (UPS). RECOMMENDED FOR THE INSTALLATION OF ELECTRONIC EQUIPMENT CAN BE FOUND IN IEEE STANDARD 1100-1999 "POWERING AND GROUNDING ELECTRONIC **EQUIPMENT:** 

GENERALLY EXCLUDED DUE TO HIGHER POWER REQUIREMENTS OF

6) INCOMING SOURCE POWER WIRES MUST BE SEPARATED FROM ANY SIEMENS CABLING BY A MINIMUM OF 12".



CONSIDERING ALL SITE CONDITIONS AND REGULATORY

REV 0

1) IT IS THE CUSTOMER'S RESPONSIBILITY TO COMPLY WITH THE POWER QUALITY REQUIREMENTS FOR SIEMENS MEDICAL SYSTEMS 2) THE ELECTRICAL FEEDER TO THE SIEMENS MEDICAL SYSTEMS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS, AND OTHER POTENTIAL SOURCES OF ELECTRICAL INTERFERENCE.

4) IN ORDER TO COMPLY WITH IMAGING SYSTEM POWER QUALITY REQUIREMENTS, ADDITIONAL POWER CONDITIONING DEVICES MAY BE

5) POWER CONDITIONING DEVICES NOT APPROVED BY SIEMENS MEDICAL SYSTEMS MAY NOT BE COMPATIBLE WITH THE MAGNETOM SYSTEM. "FERRORESONANT" POWER CONDITIONING EQUIPMENT RE-APPLIED FROM PREVIOUS GENERATION SYSTEMS IS ALSO

THE NEWER SYSTEMS. REV 0

# POWER REQUIREMENTS

VOLTAGE VARIATION:480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS VOLTAGE UNBALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES **VOLTAGE:** 480V - 3 PHASE FREQUENCY: 60 Hz ± 1.0 Hz <140 mOHMS LINE IMPEDANCE: 88 kVA CONNECTION VALUE SHORT TIME POWER (LESS THAN 3 SECONDS) 104 kVA 125 A MR SYSTEM BREAKER SIZE (A) ALL BREAKERS ARE RATED AT 80%

# POWER QUALITY

POOR POWER WILL ALTER EQUIPMENT PERFORMANCE

IT IS IN THE CUSTOMER'S INTEREST THAT THE ELECTRICAL CONTRACTOR BE RESPONSIBLE FOR TESTING AND VERIFYING THAT THE EQUIPMENT POWER SUPPLY COMPLIES WITH THE SIEMENS SPECIFICATIONS.

## DEMAND AND CAPACITY

1) IF EQUIPMENT UPGRADE IS ANTICIPATED, INSTALLING ELECTRICAL POWER TO MEET THE REQUIREMENTS OF THE HIGHER POWER GRADIENT PACKAGE AT THE TIME OF INITIAL INSTALLATION WILL REDUCE THE COST TO UPGRADE THE ELECTRICAL SYSTEM LATER.

2) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS, AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET

3) OVER CURRENT PROTECTION IS SPECIFIED FOR SYSTEMS WITHOUT AN UNINTERRUPTIBLE POWER SUPPLY (UPS). ADDITION OF A UPS REQUIRES A HIGHER CAPACITY MAINS CONNECTION (DEPENDENT UPON UPS MODEL AND SIZE). MAXIMUM FAULT CURRENT IS DEPENDENT UPON THE IMPEDANCE OF THE FACILITY ELECTRICAL SYSTEM. THE CUSTOMER'S ARCHITECT OR ELECTRICAL CONTRACTOR TO SPECIFY AIC RATING OF OVER CURRENT PROTECTION BASED ON FACILITY IMPEDANCE CHARACTERISTICS.

4) MOMENTARY POWER IS BASED ON A MAXIMUM RMS VALUE FOR A PERIOD NOT TO EXCEED FIVE (5) SECONDS, AS DEFINED IN NEC. 517.2. STAND-BY AND AVERAGE CURRENT ARE SUBSTANTIALLY

5) THE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VOLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS USED TO OBTAIN THE PROPER EQUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.

6) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VÁLUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.

7) A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (>8x RATED CURRENT) IS REQUIRED TO PERMIT SWITCH-ON OF THE UPS SYSTEM WITHOUT SPURIOUS TRIPPING. CIRCUIT BREAKERS WITH AN ADJUSTABLE MAGNETIC TRIP (SIEMENS FD6 SERIES OR SIMILAR) ARE HIGHLY RECOMMENDED.

# ELECTRICAL INSTALLATION NOTES

1) INSTALL THE MR SYSTEM CIRCUIT BREAKER IN OR NEAR THE EQUIPMENT ROOM. THE PERMITTED FRINGE FIELD FOR THE PANEL IS UP TO 3mT. IF THE FRINGE FIELDS HAVE HIGHER VALUES, MAGNETIC SHIELDING MUST BE PROVIDED OR THE DISTANCE FROM THE MAGNET MUST BE INCREASED.

2) AN ACCEPTABLE MEANS FOR SWITCHING MAIN POWER ON AND OFF SHOULD BE INSTALLED IN THE MAIN BREAKER PANEL. INSTALL EMERGENCY SHUTDOWN BUTTONS IN EACH ROOM WHERE THERE IS

SIEMENS EQUIPMENT.

3) THE ELECTRICAL FEEDER TO THE SIEMENS EQUIPMENT MUST FÉED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS AND OTHER POTENTIAL SOURCES OF ELECTRICAL

4) THE EMERGENCY POWER OFF (EPO) BUTTONS ARE TO BE MUSHROOM TYPE WITH PUSH LOCK AND PULL TO RELEASE.

5) WALL RECEPTACLES MADE OF FERROMAGNETIC MATERIALS ARE NOT PERMITTED IN THE EXAM ROOM. PERIPHERAL UNITS (SUCH AS VENTILATORS) NOT APPROVED FOR USE IN A HIGH MAGNETIC FIELD ENVIRONMENT CAN INFLUENCE THE MAGNETIC FIELD, COMPROMISING IMAGE QUALITY. THE CUSTOMER IS RESPONSIBLE FOR INSTALLATION AND USE OF RECEPTACLES IN THE EXAM ROOM. INSTALLATION OF RECEPTACLES AND THE FILTERS REQUIRED ARE TO BE COORDINATED

6) THE RF SHIELD MUST BE FITTED WITH A GROUND STUD OR BUS BAR. LOCATED WITHIN 24" OF THE AUXILIARY FILTERS FOR ROOM LIGHTS AND OUTLETS, SUPPLIED AND INSTALLED BY THE RF SHIELD

WITH THE RF SHIELDING SUPPLIER.

7) IN ORDER TO PREVENT GROUND LOOPS, ALL CUSTOMER OR CUSTOMER/CONTRACTOR SUPPLIED AC POWER ENTERING THE EXAMINATION ROOM (I.E. OUTLETS, EPO, ETC.) SHOULD BE SUPPLIED VIA AN ISOLATION TRANSFORMER. THE ISOLATION TRANSFORMER SECONDARY WINDING GROUND CONDUCTOR SHOULD BE CONNECTED TO THE RF SHIELD GROUND STUD OR BUS BAR.

### **GROUNDING NOTES**

EQUIPMENT GROUNDING CONDUCTOR TO COMPLY WITH THE FOLLOWING:

1) SIZE GROUNDING WIRE TO SIEMENS EQUIPMENT PER POWER SCHEDULE REQUIREMENTS. 2) DERIVED FROM THE ELECTRICAL SERVICE, TRANSFORMER OR MAIN DISTRIBUTION PANEL FEEDING THE SIEMENS

EQUIPMENT. 3) RUN IN THE SAME CONDUIT, TROUGH OR RACEWAY AS THE PHASE CONDUCTORS

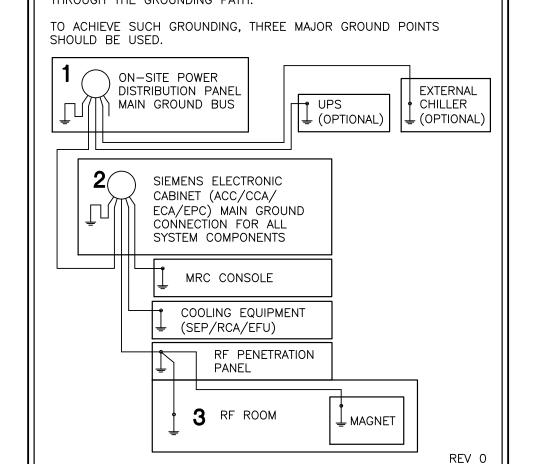
4) CONTINUOUS. WITH NO BREAKS OR USE OF CONDUIT. CHASSIS OR EARTH AS THE SOLE GROUNDING PATH. 5) BONDED TO CHASSIS AND/OR CONDUIT IN ACCORDANCE WITH THE NEC REQUIREMENTS.

6) MINIMIZE CONNECTIONS OR TERMINALS TO ENSURE CONTINUITY OVER THE LIFE OF THE INSTALLATION. 7) AS A NORM, THERE SHOULD NOT BE ANY CURRENT PRESENCE ON THE GROUND CONDUCTOR, BUT IT IS ACCEPTABLE TO HAVE <500mA DURING OPERATION OF THE

IMAGING EQUIPMENT.

# MR GROUNDING NOTES

THE INTERNAL GROUND WIRING OF THE MR SYSTEM MUST BE INSTALLED WITH MINIMUM GROUND LOOPS. THIS IS TO PREVENT NOISE CURRENTS AND GENERAL DISTURBANCES FROM FLOWING THROUGH THE GROUNDING PATH.



S C L A

**SIEMENS** 

# CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

DJECT MANAGER: PATRICK RUIZ (770) 402-1365 MAIL: PATRICK.RUIZ@SIEMENS-HEALTHINEERS.COM **GRADY HEALTH SYSTEM** 80 JESSE HILL JR DR SE, ATLANTA, GA 30303 MRI SUITE - MRI 3 - MAGNETOM SOLA XQ GRADIENTS PROJECT #: THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 2200757 2200757RD DATED 05/17 RESULT IN PROSECUTION UNDER 06/06/22 APPROVED BY CUSTOMER FOR FINALS FULL EXTENT OF THE LAW.

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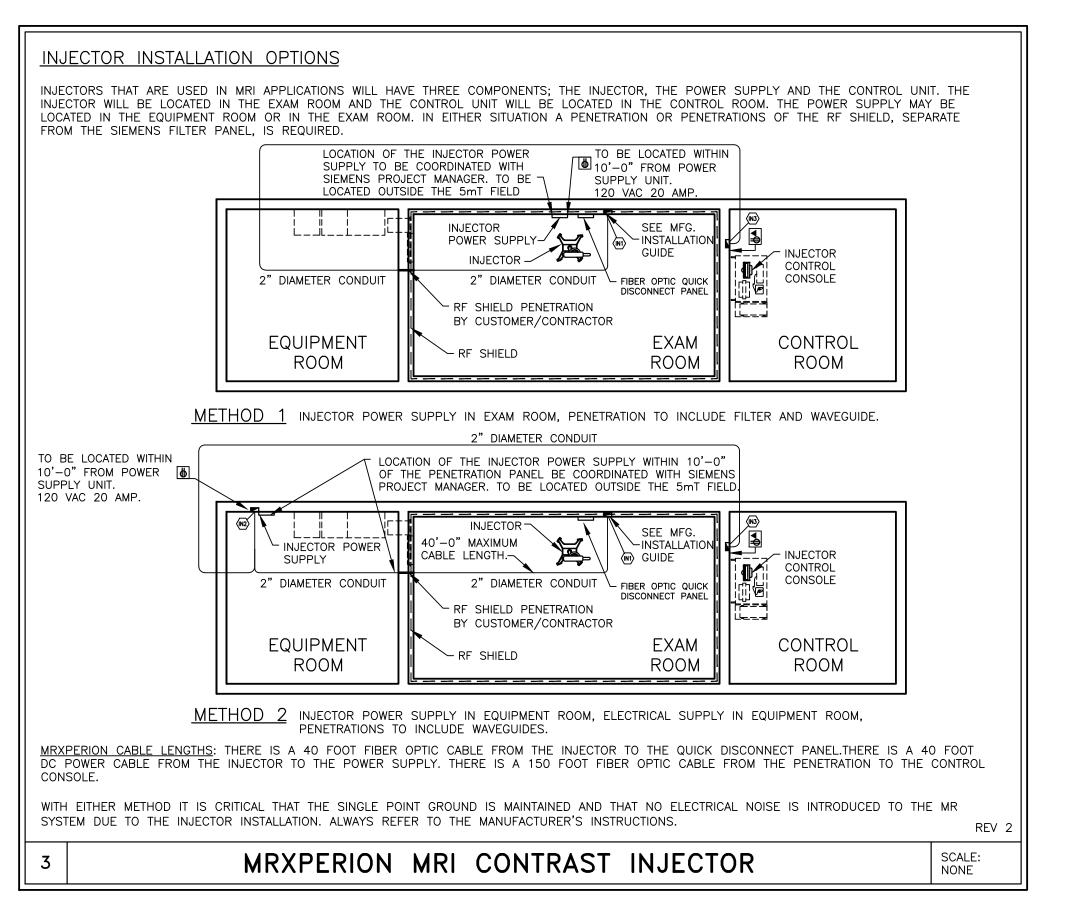
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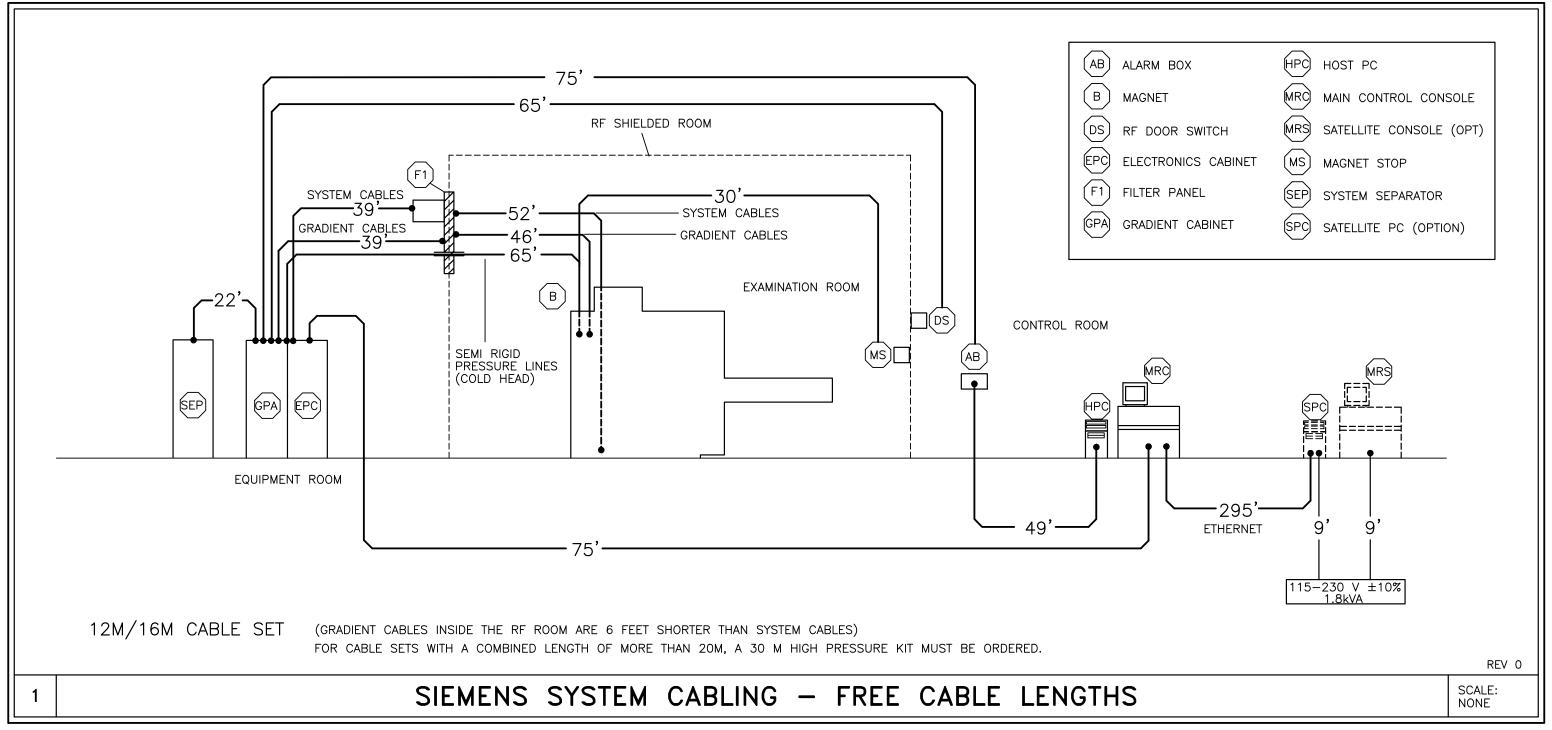
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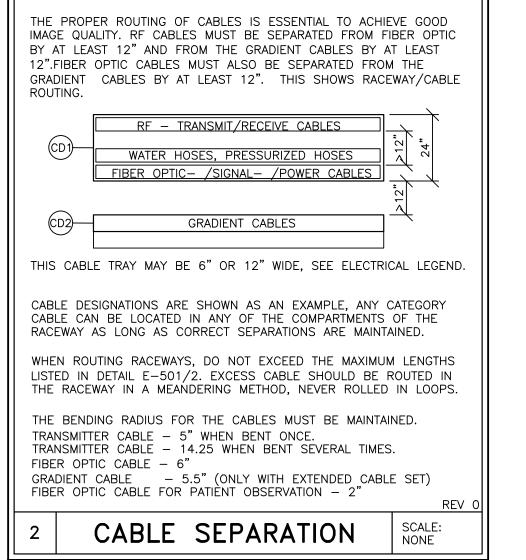
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PHYSICIST TO SPECIFY RADIATION PROTECTION.

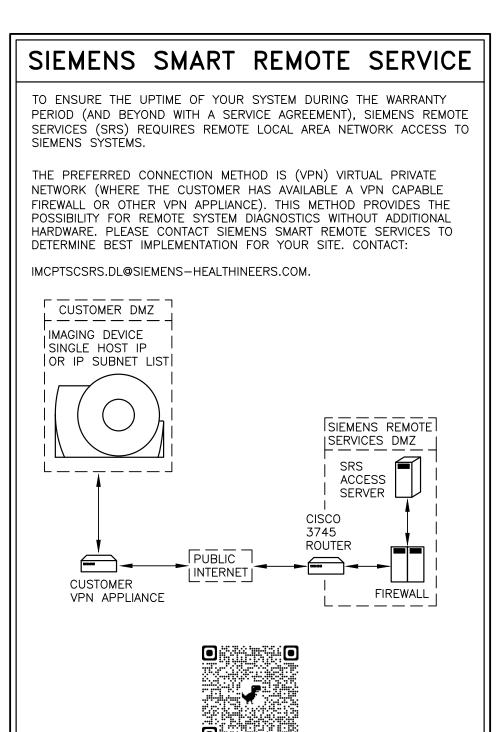
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CABLE PROTECTION CABLES ARE NOT PLENUM RATED. ALL CABLES MUST BE ROUTED IN CABLE DUCTS OR CABLE CONDUITS.



# CONDUITS AND RACEWAYS

1) ALL POWER CONDUCTORS SUPPLIED BY THE CUSTOMER/ CONTRACTOR SHALL BE INSTALLED IN METAL RACEWAY, 600 VOLT CLASS, STRANDED TYPE THHN-THWN, RATED FOR 75°C (165°F) OPERATION. RECOMMEND MINIMUM 5 FEET WIRE TAILS AT ALL OUTLET POINTS WITH WIRE IDENTIFICATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY SIEMENS MEDICAL SYSTEMS.

2) THE CABLE GROUPS INCLUDED WITH THE MAGNETOM SYSTEM MAY BE ROUTED IN THE SAME CABLE TRAY IF PROVIDED WITH AN 8" SEPARATION BETWEEN SMALL SIGNAL LINES, GRADIENT CABLES, AND THE RF TRANSMIT CABLE. A 24" WIDE LADDER TYPE CABLE TRAY IS RECOMMENDED. CABLES SHOULD NOT BE BUNDLED TOGETHER.

3) NOTE THE CABLE CONNECTOR SIZES (LARGEST CONNECTOR SIZE IS 2 1/2" x 2 1/2") FOR CABLE FEED-THROUGHS AND CABLE

4) THE CABLE LENGTHS SPECIFIED ARE THE STANDARD LENGTHS. 5) THE SIEMENS SYSTEM CABLES ARE NOT PLENUM RATED AND SHOULD NOT BE RUN UNPROTECTED IN AN AIR PLENUM UNLESS ENCLOSED IN A SEALED CABLE TRAY OR CONDUIT.

# CABLE LENGTH RESTRICTIONS

1) THE CABLE SET LENGTH IDENTIFIES THE "FREE CABLE LENGTH". THIS IS THE LENGTH FROM CONNECTION POINT TO CONNECTION POINT. THE CABLE LENGTH IS NOT THE DISTANCE BETWEEN COMPONENTS.

2) THE GRADIENT CABLES INSIDE THE RF SHIELDED ROOM ARE 6'-0" SHORTER THAN THE OTHER SYSTEM CABLES. THIS MEANS THAT IF THE 22' CABLE SET IS SELECTED, THE GRADIENT CABLES WILL BE 16' IN LENGTH. THE GRADIENT CABLES NEED TO GO UP INTO THE CABLE TRAY IN THE CEILING AT THE FILTER PLATE AND DOWN AT THE MAGNET. THESE VERTICAL RUNS MUST BE DEDUCTED FROM THE TOTAL CABLE LENGTH OF 16'.

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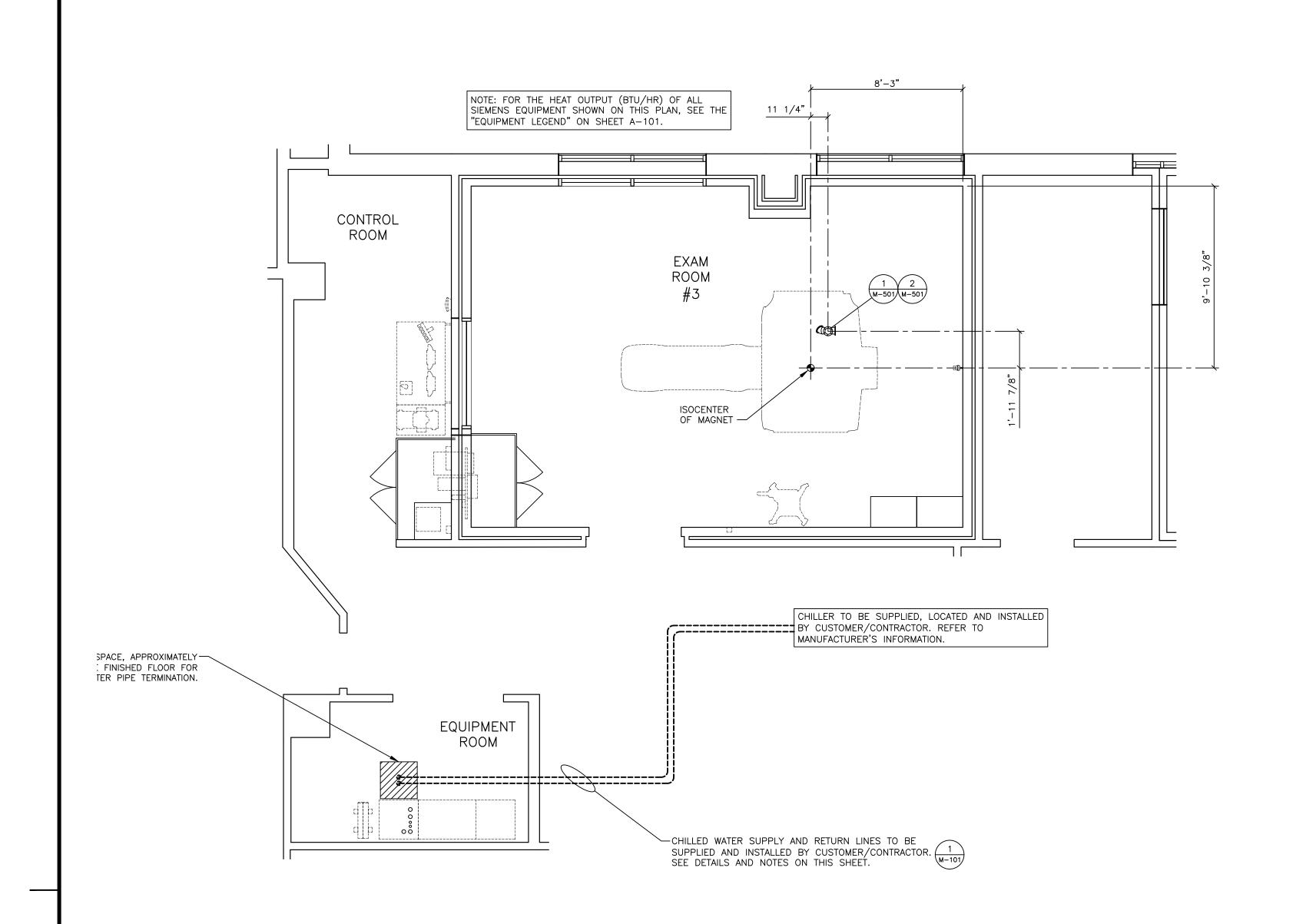
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<u></u>	06/06/22	2200757RD DATED 05/17/22 APPROVED BY CUSTOMER FOR FINALS	THIS TITLE B SIEMENS AUTHO RESULT IN PROS	PRODUCTION OF LOCK WITHOUT ORIZATION WILL SECUTION UNDER OF THE LAW.		JECT #: <b>220</b> (	0757	SHEET:	<u>'11</u>
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MECHANICAL PLAN

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

# ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE EXAM ROOM, 70°F±10°F IN THE EQUIPMENT & CONTROL AREAS, RELATIVE HUMIDITY OF 40-60% (NON-CONDENSING) IS REQUIRED EXAMINATION ROOM AND 40-80% (NON-CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK.

2) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS RECOMMENDED FOR THE EXAM ROOM. A MINIMUM AIR EXCHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED. IT IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-50% FRESH AIR INTAKE. AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED CONTROL AND SENSOR TO MONITOR AND ADJUST

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 3,412 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY, AUXILIARY SUPPORT EQUIPMENT (ie. UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.

4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST

AÍR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST AIR SHOULD BE INSTALLED AT LEAST 6'-6" ABOVE FINISHED FLOOR.

5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.

6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING, IT IS RECOMMENDED TO INSTALL AN ON-SITE FILTER TO REMOVE DUST PARTICLES GREATER THAN 10 MICRONS.

7) DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET. THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET. 12/11/12

#### FULL PORT SHUT OFF VALVES FOR SERVICING SEP CABINET. BYPASS FOR SERVICING SEP CABINET TO BE EQUAL SIZE AS PIPING. 9'-10" MAX. HOSE LENGTH 1-1/4" MALE THREAD PROVIDED BY SIEMENS FOR SEP. DEDICATED, STAND ALONE, CLOSED LOOP 22 FOOT MAX. HOSE LENGTH PROVIDE FULL PORT SHUT OFF WATER CHILLER OR FACILITY CENTRAL VALVES INSTALLED ON CHILLER CHILLED WATER SUPPLY TO MEET SUPPLY AND RETURN LINES AT REQUIREMENTS LISTED ON THIS SHEET. THE PIPE OR HOSE FROM THE CHILLED WATER SUPPLY TO THE SEP CABINET -Ŭ- VISUAL FLOW METER WITH GAUGE MUST BE A MINIMUM 1-1/4"Ø TO -X- FULL PORT SHUT OFF VALVE MAINTAIN THE FUNCTION OF THE WATER COOLING CIRCUIT. THE CONNECTION THERMOMETER WITH RANGE FROM 30°F TO 80°F (LOCATED NEAR SEP) SEP GPA EPC MUST BE 1-1/4" NPT FEMALE THREAD TO 80°F (LOCATED NEAR SEP) FOR 45KW SEP CABINET. PRESSURE GAUGE WITH RANGE FROM 40 TO 110 PSI (LOCATED NEAR SEP) **少** BOILER DRAIN FILTER - 700 MICRONS MINIMUM SIEMENS SUPPLIED AND A BYPASS MAY BE BENEFICIAL INSTALLED CABINETS FOR MAINTENANCE PURPOSES.

ALL PIPING AND PLUMBING FIXTURES SHALL BE FURNISHED. INSTALLED, PRESSURE TESTED AND CHARGED BY THE MECHANICAL CONTRACTOR PRIOR TO THE DELIVERY AND INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED EQUIPMENT UNLESS SPECIFIED **OTHERWISE** 

AT THE HIGHEST POINT OF THE WATER SUPPLY PIPE FROM THE CHILLER AN AUTOMATIC DEAERATION DEVICE (AIR VENT) WITH BALL VALVE MUST BE INSTALLED BY THE MECHANICAL CONTRACTOR. SYSTEM MUST BE PROVEN TO BE FREE FROM LEAKAGE.

THE MECHANICAL ENGINEER OF RECORD SHALL BE ULTIMATELY RESPONSIBLE FOR THE SITE SPECIFIC DESIGN AND SPECIFICATION OF THE MECHANICAL AND PIPING SYSTEMS AS SHOWN AND SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES. ALL WORK SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR AND SHALL BE SUBJECT TO COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES.

THE SUPPLY AND RETURN PIPES FROM THE CHILLED WATER SUPPLY TO THE SEP MUST BE LABELED TO SHOW FLOW DIRECTION AND CONTENT (WATER/GLYCOL).

# PIPING SCHEMATIC FOR FACILITY PROVIDED CHILLED WATER

# CHILLED WATER SUPPLY

A CHILLED WATER SUPPLY IS REQUIRED TO THE MRI SYSTEM 24 HOURS A DAY, YEAR ROUND FOR THE COLD HEAD AND GRADIENT SYSTEMS. THIS CAN BE PROVIDED BY A CENTRAL CHILLED WATER SUPPLY OR A SEPARATE STAND ALONE CHILLER THAT MEETS THE STATED REQUIREMENTS. CHILLED WATER CAN ALSO BE SUPPLIED BY A CHILLER PROVIDED BY SIEMENS.

、SEPARATOR CABINET (SEP) OR INTERFACE PANEL (IFP) MUST B INCLUDED WITH THE SIEMENS ORDER. THE PIPE SIZE BETWEEN THE WATER SUPPLY AND SEP MUST MEET MANUFACTURER AND SIEMENS REQUIREMENTS; LARGER DIAMETER PIPE MAY BE REQUIRED DUE TO LENGTH OF RUN. FLOW AND PRESSURE REQUIREMENTS MUST BE MET.

PERMISSIBLE MATERIALS THAT CAN BE USED FOR THE PIPING ARE:

STAINLESS STEEL (V2A, V4A), NON-FERROUS METAL (COPPER, BRASS). SYNTHETIC MATERIAL, PLASTICS, BRAZING SOLDER, HARD SOLDER, OR FITTING SOLDER TYPE 3 AND 4. THERE ARE MATERIALS THAT MAY CAUSE DAMAGE TO THE COOLING SYSTEM AND CANNOT BE USED, THESE MATERIALS ARE ALUMINUM, IRON, CARBON STEEL, ZINC, ZINC PLATED STEEL, OR STANDARD STEEL PIPES.

27 GALLONS OF DISTILLED/DE-IONIZED WATER MUST BE PROVIDED AND INSTALLED BY CUSTOMER/CONTRACTOR FOR FILLING THE SECONDARY CHILLED WATER CIRCUIT.

SEE MANUFACTURER'S REQUIREMENTS FOR GLYCOL AND WATER

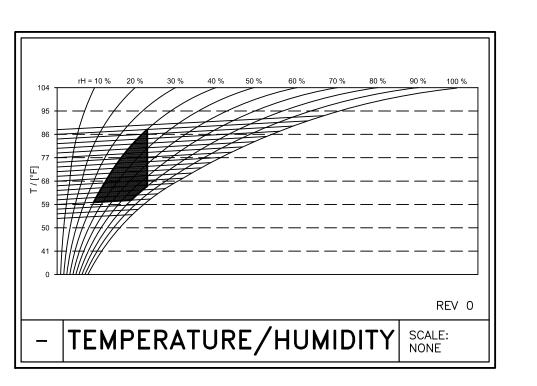
QUALITY TO BE PROVIDED AND FILLED BY CUSTOMER/CONTRACTOR.

THE SUPPLY AND RETURN CHILLED WATER PIPES MUST BE LABELED. THE LOCATION OF THE LABELS MUST BE AT ALL CONNECTION AND REFILLING POINTS AND MUST CONTAIN FLOW DIRECTION AND CONTENTS.

# CHILLED WATER REQUIREMENTS

WATER REQUIREMENTS TO BE MEASURED AT THE SEP CABINET.

FLOW RATE:	23.78-29.05 GPM
WATER TEMPERATURE:	42.8°F – 53.6°F
BTU DISCHARGE TO THE WATER	204,911 BTU/HR
WATER PRESSURE	MAXIMUM 87 PSI
LOSS OF PRESSURE FOR SEP CABINET	<14.5 PSI 11.6 TYPICA
CHILLED WATER ACIDITY RANGE	6 pH TO 8 pH
CHILLED WATER HARDNESS	<250 ppm CALCIUM CARBONATE
CHLORINE GAS CONCENTRATION	<200 ppm
FILTRATION	700 µm



### MECHANICAL NOTES

) THE AIR H.V.A.C. SYSTEM MUST OPERATE FOR A MINIMUM OF 48 CONSECUTIVE HOURS PRIOR TO THE DELIVERY OF THE EQUIPMENT.

2) THE FILTERS MUST BE CHANGED IMMEDIATELY PRIOR TO THE DELIVERY OF THE EQUIPMENT.

AND INSTALLED BY THE MECHANICAL CONTRACTOR.

3) SIEMENS REQUIRES THE USE OF A DEDICATED H.V.A.C. SYSTEM FOR THE EQUIPMENT ROOM TO BE LOCATED, SIZED AND SPECIFIED BY THE MECHANICAL ENGINEER OF RECORD AND TO BE SUPPLIED

4) SIEMENS RECOMMENDS THAT THE CUSTOMER PROVIDE AND INSTALL AN OXYGEN MONITORING SYSTEM WITH VISUAL AND AUDIBLE ALARMS TO INDICATE WHEN THE OXYGEN CONTAINED IN AMBIENT AIR FALLS BELOW PRE-PROGRAMMED SAFETY LEVELS WITH THE SENSOR TO BE LOCATED IN THE SCAN ROOM IN THE AREA DESIGNATED FOR CRYOGEN FILLING.

5) THE SIEMENS ACTIVE SHIELDED MAGNET RECIRCULATES LIQUID HELIUM, ELIMINATING THE NEED FOR A DEDICATED CRYOGEN STORAGE AREA. THE RECIRCULATING SYSTEM SIGNIFICANTLY REDUCES THE HELIUM "BOIL OFF". THE MAGNET WILL REQUIRE OCCASIONAL FILLING, A DELIVERY ROUTE FOR CRYOGEN DEWARS MUST BE ESTABLISHED. A MINIMUM 36" CLEARANCE IS REQUIRED.

REV 0

#### FIRE CONTROL NOTES

1) SIEMENS HAS NO SPECIFIC REQUIREMENT FOR FIRE PROTECTION. FIRE PROTECTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH LOCAL CODES AND CUSTOMER'S INSURANCE REQUIREMENTS. ALL FIRE PROTECTION SYSTEMS SHALL BE DEFINED BY THE ARCHITECT OF RECORD WITH DESIGN, SPECIFICATION AND DETAILING OF THE FIRE PROTECTION SYSTEM BY THE MECHANICAL ENGINEER OF RECORD IN ACCORDANCE WITH SIEMENS GUIDELINES AS STATED HEREIN. THE ELECTRONIC EQUIPMENT OF THE MR SYSTEMS WILL BE DAMAGED BY WATER, REDUCTION OR ELIMINATION OF WATER USED FOR FIRE SUPPRESSION WILL REDUCE POTENTIAL WATER DAMAGE. PRE-ACTION INERT GAS, OR HALOCARBONS OR OTHER METHODS CAN REDUCE OR ELIMINATE WATER. REFER TO YOUR FIRE PROTECTION PROFESSIONAL

2) THE USE OF SMOKE DETECTORS INSIDE OF THE MR EXAMINATION ROOM IS NOT RECOMMENDED. SMOKE DETECTORS, BY DESIGN, CAN GENERATE NOISE THAT MAY INTERFERE WITH THE MRI EXAMINATION AND CAUSE IMAGE ARTIFACTS. IF THE USE OF A SMOKE DETECTOR IN THE EXAMINATION ROOM IS MANDATED BY LOCAL REQUIREMENTS, SPECIAL NOISE TESTS MUST BE PERFORMED BY SIEMENS SERVICE AFTER THE MRI IS OPERATIONAL. MRI EQUIPMENT PERFORMANCE PROBLEMS DUE TO SMOKE DETECTORS ARE THE RESPONSIBILITY OF THE CUSTOMER AND ARE NOT COVERED UNDER WARRANTY OR SERVICE AGREEMENT.

3) ALL MATERIAL USED INSIDE THE MAGNET ROOM SHALL BE NON-MAGNETIC. SEE CONSTRUCTION REQUIREMENTS.

4) ALL PENETRATIONS IN THE RF CABIN/SHIELD SHALL BE THROUGH A WAVE GUIDE TO BE EQUIPPED WITH A DIELECTRIC COUPLER ON BOTH ENDS OF THE WAVE GUIDE. ALL WAVE GUIDES SHALL BE DESIGNED, DETAILED AND SPECIFIED BY THE RF CABIN/SHIELD CONTRACTOR WITH ALL LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND MECHANICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION, AND FABRICATION OF THE RF CABIN/SHIELD.

5) EACH ELECTRICAL PENETRATION OF THE RF CABIN/SHIELD FOR ELECTRICAL SERVICING OF THE FIRE PROTECTION SYSTEM SHALL BE HROUGH AN RF FILTER TO BE SUPPLIED BY THE RF SHIELD CONTRACTOR WITH FILTER LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND THE ELECTRICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION AND FABRICATION OF THE RF CABIN/SHIELD.

6) IT IS PERMISSIBLE TO RUN "BLACK PIPE" UP TO THE DIELECTRIC COUPLER ON THE OUTSIDE OF THE RF SHIELD.

7) THERE MUST BE NO GROUND CONNECTIONS MADE DURING THE THE INSTALLATION OF EITHER THE PIPING OR ELECTRICAL FOR THE FIRE PROTECTION SYSTEM.

8) THE USE OF HALON IS NOT ACCEPTABLE.

9) THE LOCATION OF FIRE CONTROL SYSTEM COMPONENTS SHALL BE COORDINATED THROUGH THE ARCHITECT OF RECORD WITH ALL LOCATIONS TO BE COORDINATED WITH SIEMENS EQUIPMENT LOCATIONS AS SHOWN ON THE 1/4" SCALE EQUIPMENT LOCATION PLAN.

10) THE FIRE CONTROL CONTRACTOR SHALL VERIFY EQUIPMENT MOUNTING PROCEDURES AND LOCATIONS ON ANY WALLS CONTAINING RF SHIELDING WITH THE SIEMENS PROJECT MANAGER PRIOR TO THE COMMENCEMENT OF WORK.

REV 1

# COMPRESSOR LINE INSULATION

COMPRESSOR LINES RUNNING FROM THE COMPRESSOR (OR SEP CABINET) TO THE MAGNET ARE INSULATED BY SIEMENS. ADDITIONAL INSULATION (ARMAFLEX OR EQUIVALENT) FOR NOISE REDUCTION (CHIRPING) MAY BE REQUIRED. ADDITIONAL INSULATION NOT PROVIDED BY SIEMENS.

SOLA REV 14

# CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

**GRADY HEALTH SYSTEM** 2200757RD DATED 05/17 06/06/22 APPROVED BY CUSTOMER FÓR FÍNAL DATE DESCRIPTION

-ISSUE BLOCK-

80 JESSE HILL JR DR SE, ATLANTA, GA 30303 MRI SUITE - MRI 3 - MAGNETOM SOLA XQ GRADIENTS THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED.

AS NOTED

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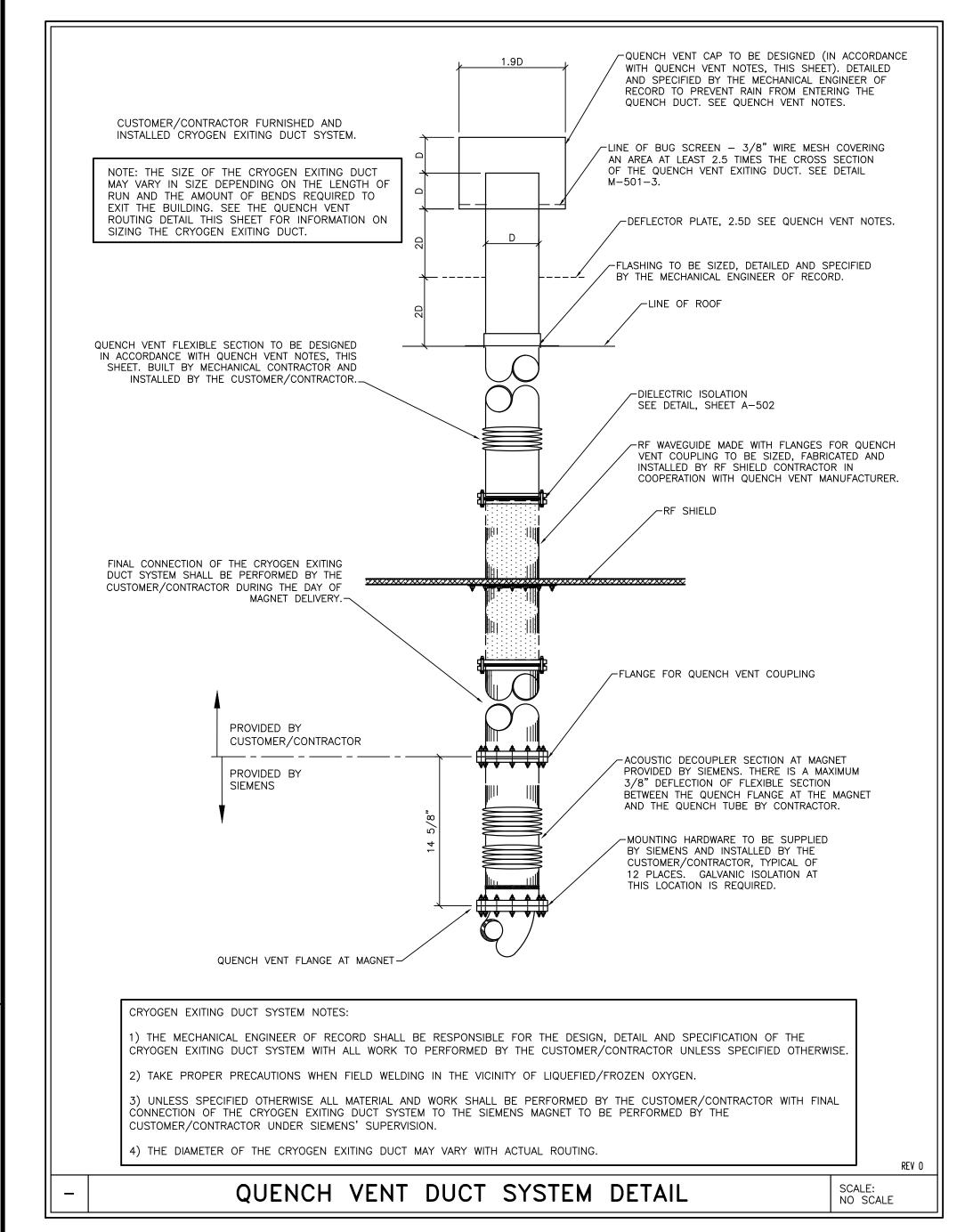
PROJECT #: 2200757

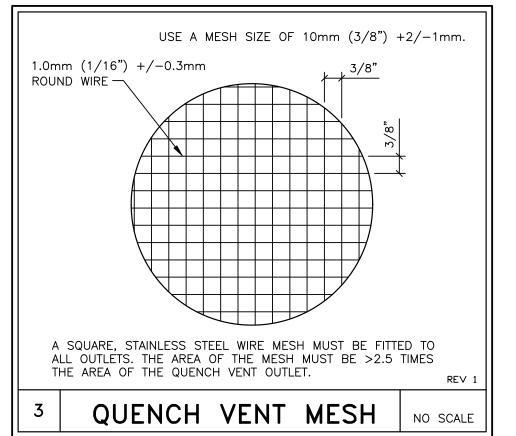
06/06/22

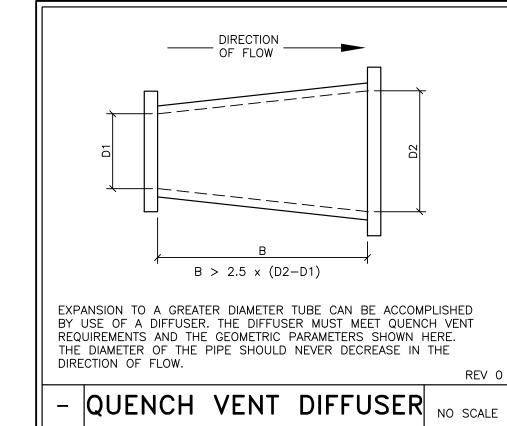
**SIEMENS** 

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

- THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.







# CRYOGEN NOTES

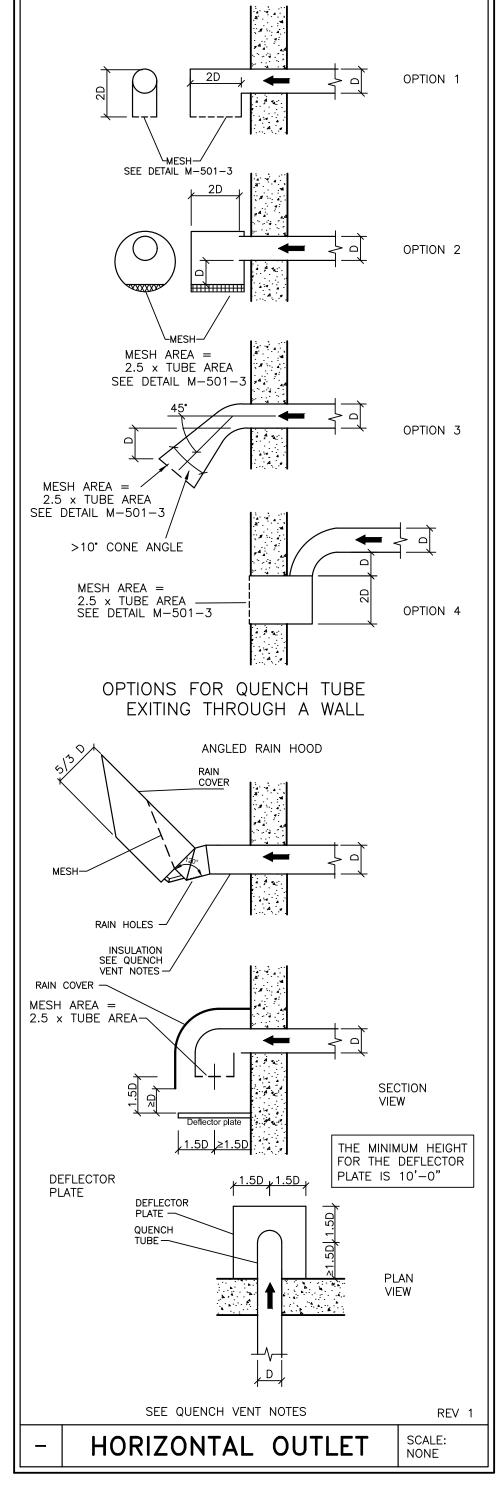
I) "CRYOGENS" IS A TERM USED TO IDENTIFY THE REFRIGERANT USED TO MAKE THE MAGNET "SUPER-CONDUCTING", IN THIS APPLICATION, LIQUID AND GASEOUS HELIUM. SPECIAL CARE MUST BE TAKEN DURING THE TRANSFILLING OF THE MAGNET WITH CRYOGENS AND NORMAL EXHAUST OF CRYOGENS FROM THE SYSTEM. ASIDE FROM THE OBVIOUS DANGER OF FREEZING. HELIUM GAS WILL ALSO DISPLACE THE OXYGEN IN THE ROOM. THE INSTALLATION OF AN APPROVED TOXGARD MONITORING SYSTEM IS RECOMMENDED.

2) THERE SHALL BE A TRANSPORT ROUTE FOR DELIVERY OF CRYOGENS TO THE EXAM ROOM. SPECIAL VESSELS CALLED DEWARS ARE USED TO TRANSPORT HELIUM. A 250 LITER DEWAR WEIGHS 335 POUNDS AND HAS A 32" DIAMETER. A 500 LITER IS 540 POUNDS. AND IS 42" IN DIAMETER.

3) HELIUM GAS CYLINDERS MAY BE USED DURING THE INITIAL FILLING OF HELIUM INTO THE MAGNET. THE FACILITY IN WHICH THESE MAY BE USED NEEDS TO HAVE THE ABILITY TO TEMPORARILY STORE AND SECURE THESE CYLINDERS THAT WILL PREVENT THEM FROM INADVERTENTLY FALLING OVER.

4) OUTSIDE VENTING OF THE HELIUM IS TO BE PROVIDED BY MEANS OF A VENT PIPE OF NON-MAGNETIC MATERIAL CALLED A QUENCH

REV 0



### QUENCH VENT NOTES

I) IN THE EVENT OF A QUENCH, THE THERMAL ENERGY DISSIPATED CAUSES AN EXTREMELY RAPID BOIL OFF OF THE LIQUID HELIUM. THE SYSTEM MUST BE CAPABLE OF VENTING THE LARGE VOLUME OF GAS GENERATED AT THE APPROXIMATE EXPANSION RATIO OF 1:700 FROM LIQUID AT 4.2°K TO ROOM TEMPERATURE GAS. THE EXHAUST SYSTEM IS CRITICAL FOR THE SAFE OPERATION OF THE MAGNET, THE DATA IN THIS DOCUMENT MUST BE FOLLOWED. SINCE HELIUM VENTED IN A QUENCH IS AN ASPHYXIANT & AN EXTREMELY COLD GAS, THE QUENCH TUBE MUST ALWAYS END AT A POINT WHERE ACCESS BY PEOPLE IS NOT POSSIBLE. QUENCH TUBE PLANNING MUST ONLY BE DONE BY QUALIFIED PERSONNEL. IT IS THE OWNER'S RESPONSIBILITY TO ENSURE THAT THE QUENCH TUBE IS MAINTAINED IN AN OPERABLE STATE.

THE END OF THE TUBE MUST BE PROTECTED FROM RAIN, SNOW, AND FOREIGN OBJECTS. ROUND SECTIONS ONLY, NO SQUARE SECTIONS.

5) THE MAXIMUM INTERNAL PRESSURE IS CALCULATED AT 1.45 PSI.

SHOULD ALSO BE FLEXIBLE.

6) USE THE QUENCH VENT CALCULATOR PROVIDED BY SIEMENS TO DÉSIGN A QUENCH VENT THAT MEETS DESIGN REQUIREMENTS FOR DIAMETER, LENGTH, NUMBER OF ELBOWS AND PRESSURE DROP. ALL BENDS MUST BE SMOOTH WALLED AND HAVE A CENTERLINE TO INTERNAL PIPE DIAMETER RATIO OF 1.5 TO 5.0. EXPANSIONS TO PIPE DIAMETER CAN BE DONE WITH A DIFFUSER. ONLY ROUND TUBE

7) THERE MUST BE A 12-19 INCH FLEXIBLE SECTION OF PIPE FOR CONNECTION TO THE QUENCH VALVE AT THE MAGNET WITH AN INSIDE DIAMETER GREATER THAN 4" (1.5T) OR 6" (3.0T) AND ABLE TO WITHSTAND 6.5 PSI.

**CONNECTING SECTIONS** 8) SECTIONS OF THE PIPE CAN ONLY BE JOINED BY WELDING OR BÓLTED FLANGES WITH FIBER GASKETS. ROTARY FLANGES ARE

9) THE PROTECTION AT THE END OF THE TUBE SHALL BE 3/8" WIRE MESH WITH 1/16 INCH WIRES, COVERING AN AREA AT LEAST 2.5 TIMES THE CROSS SECTION AREA OF THE QUENCH PIPE.

10) WHERE THE QUENCH TUBE EXITS THROUGH A FLAT ROOF, THE THE OUTLET MUST BE ABOVE A LEVEL WHERE WATER COULD ENTER IN THE EVENT THAT THE ROOF DRAINS BECOME BLOCKED. IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET SHALL BE ANGLED DOWNWARD NOT LESS THAN 1 PIPE DIAMETER TO PREVENT RAIN INGRESS. THE EXIT SHALL BE LOCATED ABOVE THE LEVEL OF

11) WHERE THE QUENCH TUBE EXITS VERTICALLY, A RAIN COVER MUST ALSO BE FITTED WITH THE DIAMETER TO BE TWO TIMES THE DIAMETER OF THE QUENCH TUBE. THE CLEARANCE BETWEEN THE RAIN GUARD AND THE MESH SHALL 2 TIMES THE DIAMETER OF THE TUBE. A DEFLECTOR PLATE SHALL BE WELDED TO THE TUBE WHERE IT EXITS THE ROOF TO PREVENT HELIUM FROM RE-ENTERING THE BUILDING. THE DEFLECTOR SHALL BE AT LEAST 3 TIMES THE DIAMETER OF THE QUENCH TUBE AND LOCATED TWO PIPE DIAMETERS ABOVE THE ROOF AND TWO PIPE DIAMETERS BELOW THE

ACCOUNT SO DAMAGE DOES NOT OCCUR.

12) WHERE THE QUENCH TUBE EXITS HORIZONTALLY, THE OUTLET MUST CONFORM TO OPTIONS 1-4 OR THE ANGLED RAIN HOOD. THE OUTLET SHOULD NOT BE LOCATED WHERE HELIUM GAS CAN BE DRAWN INTO AN AIR INLET, ENTER AN OPEN WINDOW, OR BLOW DIRECTLY ONTO STRUCTURE OR EQUIPMENT. RESTRICT ACCESS TO WINDOWS AND DOORS TO AVOID INJURY FROM COLD BURNS AND ASPHYXIATION BY 9'-11" ON EACH SIDE, BELOW AND 19'-9" ABOVE, IF THE OUTLET IS POSITIONED TOO LOW A DEFLECTOR PLATE CAN BE USED WITH OPTION 1 AND 3.

WARNING SIGNS AND OUTLET RESTRICTIONS A WARNING SIGN MUST BE FIXED AND VISIBLE NEAR THE QUENCH VENT OUTLET. THE TUBE MUST HAVE A WARNING POSTED ALONG IT'S ENTIRE LENGTH FOR EXTREMELY COLD HELIUM GAS -AUTHORIZED PERSONNEL ONLY.

CLEARLY IDENTIFIED AND FENCED, FOR EXAMPLE, A ROOF OUTLET WITH MAINTENANCE ACCESS.

14) THE QUENCH TUBE MUST HAVE MINIMUM 1" INSULATION FOR

15) GALVANIC SEPARATION MUST BE PROVIDED BETWEEN THE MAGNET, THE QUENCH VENT, THE RF ROOM, AND THE BUILDING, TWO SEPARATIONS ARE REQUIRED USING STAINLESS STEEL BOLTS, INSULATING BUSHES AND LOCKING NUTS. NO OTHER DESIGNS ARE PERMITTED FOR SAFETY.

16) THE DESIGN AND CONSTRUCTION OF THE QUENCH PIPE MUST BE DOCUMENTED WITH DRAWINGS AND CALCULATIONS THAT ARE KEPT WITH INSTALLATION DOCUMENTS. IT MUST COMPLY WITH THE REQUIREMENTS IN THIS DOCUMENT BEFORE BEING CONNECTED TO

QUENCH VENT DESIGN INSTRUCTIONS

2) IF THE QUENCH VENT IS NOT CONFIGURED CORRECTLY THERE IS A RISK OF DANGER THAT MAY LEAD TO DEATH OR SERIOUS INJURY AND CAN RESULT IN STRUCTURAL DAMAGE. THE EXHAUST MUST NOT BE VENTED IN AN ENCLOSED SPACE. THE OPERATOR OF THE SYSTEM MUST PREPARE AN EMERGENCY PLAN IN THE EVENT OF A QUENCH. 3) THE QUENCH TUBE CONSISTS OF STRAIGHT, HYDRAULICALLY SMOOTH SECTIONS, BENDS UP TO 90° AND A DIFFUSER, IF REQUIRED.

4) THE SIEMENS MAGNET HAS A QUENCH VALVE ASSEMBLY FOR CONNECTION TO THE TUBE LOCATED AT THE TOP LEFT SIDE OF THE MAGNET (SEE MAGNET ELEVATION). THE MECHANICAL CONTRACTOR WILL SUPPLY AND INSTALL A QUENCH VENT TUBE WITH CAP, TO BE NON-MAGNETIC STAINLESS STEEL (≥22 GAUGE MINIMUM). GRADES AISI304, 309, 316, OR 321 ONLY. THERMAL CONDITIONS MAY CAUSE THE TUBE TO CONTRACT UP TO 3mm/METER SO A STAINLESS STEEL BELLOWS OR FLEXIBLE SECTION MUST BE INSTALLED A MINIMUM OF EVERY 32'-9" OF STRAIGHT SECTIONS, NOT TO EXCEED 2% OF THE OVERALL LENGTH. THE QUENCH TUBE MAY ALSO BE MADE OF ALUMINUM, EXTRUDED TUBE ALUMINUM GRADES 6063 AND 6082 ONLY MUST BE USED. ROLLED AND WELDED TUBE FROM SHEET ALUMINUM GRADE 5083 ONLY MUST BE USED. THE WALL SECTIONS OF ALUMINUM TUBE MUST BE A MINIMUM 14 GAUGE. THERMAL CONTRACTION OF 4.5 MM/METER MUST BE CONSIDERED FOR ALUMINUM QUENCH TUBES. THE MOVEMENT OF THE BELLOWS MUST BE RESTRICTED TO PREVENT EXCESSIVE EXPANSION DUE TO PRESSURE. THE WEIGHT OF THE TUBE MUST BE SUPPORTED BY THE BUILDING AND BE FLEXIBLE ENOUGH TO ALLOW MOVEMENT FROM THERMAL CONTRACTION. THE WALL EXIT

THE MAXIMUM PRESSURE SHOULD BE ENGINEERED FOR 6.5 PSI.

SECTIONS MAY BE USED, RECTANGULAR SECTIONS ARE NOT ALLOWED.

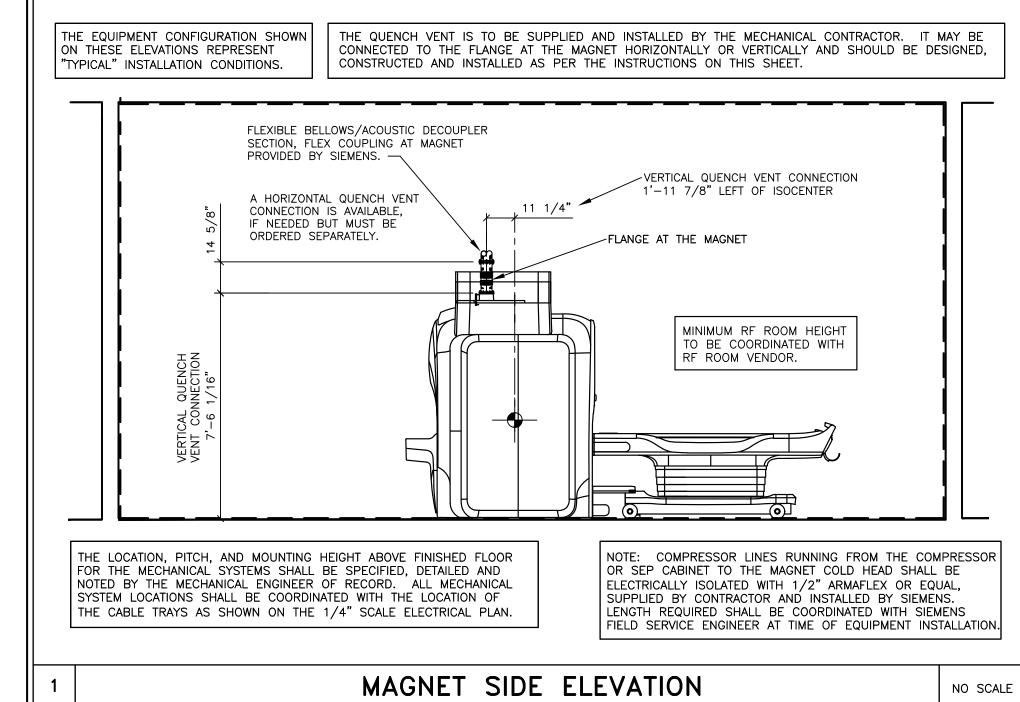
PERMITTED, VEE CLAMPED FLANGES MAY NOT BE USED.

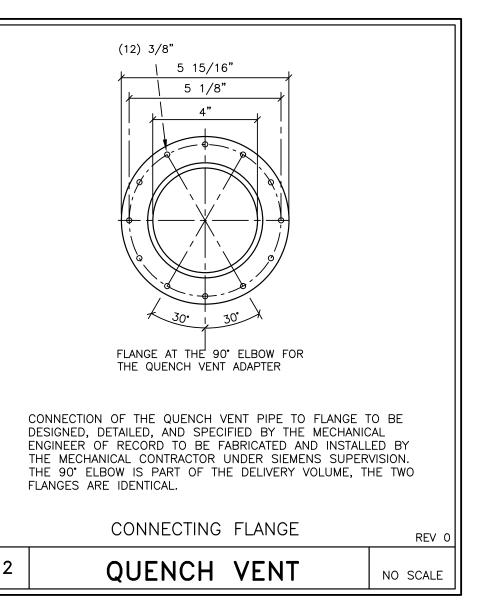
DURING A QUENCH THE HELIUM GAS EXITING THE QUENCH PIPE MAY BE AT TEMPERATURES OF LESS THAN -400°F. DUE TO THIS TEMPERATURE ROOFING MATERIALS OR ITEMS AROUND THE VENT EXIT MAY BE ADVERSELY AFFECTED. CONSIDERATION OF MATERIALS AND ITEMS PLACED NEAR THE VENT EXIT SHOULD BE TAKEN INTO

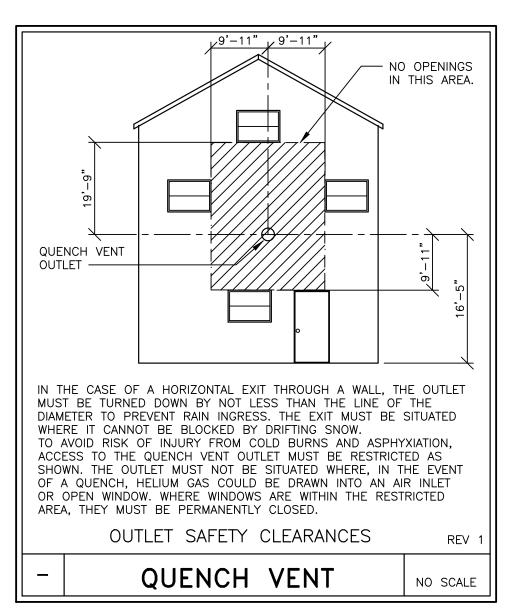
13) AREAS WITH ACCESS IN THE AREA OF THE OUTLET MUST BE

INSULATION AND GALVANIC SEPARATION

THE FULL LENGTH INSIDE THE BUILDING. WITHIN THE RF ROOM THERE SHOULD BE A 1" LAYER OF MINERAL FIBER INSULATION WITH A VAPOR BARRIER AND 1" CLASS O OR CLASS AP ARMAFLEX. OUTDOOR PIPES MUST BE WEATHERPROOF. THE INSULATION MUST NOT TOUCH THE MAGNET COVERS. TO AVOID RF DISTURBANCES THE INSULATION MUST NOT MAKE ELECTRICAL CONTACT WITH THE WAVEGUIDE.







HELIUM CONTENT					
MAXIMUM LIQUID FILL 1,356 LITERS					
TYPICAL BOIL OFF RATE	0.0 L/HR	FOR TYPICAL CLINICAL USE, DEPENDING ON SEQUENCES			
TYPICAL REFILL INTERVAL	NA	AND OPERATING TIME.			
WITHOUT THE COLD HEAD RUNNING THE LIQUID HELIUM WILL BOIL OFF FROM 97% TO 0% IN APPROXIMATELY 30 DAYS. THE LOSS DURING SHIPPING IS APPROXIMATELY 65 LITERS PER DAY.					

		-				
			PROJECT MANAGER: PATRICK RUIZ TEL: (770) 402-1365 VMAIL: EXT: FAX: EMAIL: PATRICK.RUIZ@SIEMENS-HEALT	HINEERS.COM		SIEMENS
				HEA JESSE HILL JR DR S ITE – MRI 3 – MAG	SE, ATLANTA, GA 30	303
$\triangle$	06/06/22	2200757RD DATED 05/17/22 APPROVED BY CUSTOMER FOR FINALS	THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.	PROJECT #: <b>220</b> 0	757	SHEET:
SYM	DATE	DESCRIPTION	ALL RIGHTS ARE RESERVED.	SHEET OF 10 10	DRAWN BY: D. BRISTOE	

SCALE:
AS NOTED

-ISSUE BLOCK-

ATTENTION:

- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

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