PROJECT NUMBER: 2021-23

MEDICAL EQUIPMENT SITE PLANNING INFORMATION

PROVIDED BY

PRIZMED IMAGING SOLUTIONS
5335 AVION PARK DR. UNIT A
HIGHLAND HEIGHTS, OH 44143
PROJECT MANAGER
(888) 505-0319

PROJECT TEAM

CUSTOMER:

ARCHITECT:

CONTRACTOR: TO BE DETERMINED

EQUIPMENT: PRE-OWNED
TOSHIBA MEDICAL SYSTEMS AMERICA
VANTAGE TITAN 1.5T MRI

THESE DRAWINGS ARE ISSUED TO THE CUSTOMER FOR THE SOLE PURPOSE OF COORDINATING THE EQUIPMENT REQUIREMENTS WITH THE CUSTOMER'S PROFESSIONAL DESIGN TEAM AND ARE NOT TO BE USED FOR PERMITTING OR CONSTRUCTION PURPOSES.

PRELIMINARY DRAWING PACKAGE INDEX

ADDITIONAL DRAWINGS IN FINAL DRAWING PACKAGE

SUBMISSION HISTORY

1-5-22	MRI PRELIMS ISSUED
1-18-22	MRI FINALS ISSUED

***** ADDITIONAL REQUIRED REFERENCE MATERIAL, SEPARATE DOCUMENTS *****

OEM STANDARD REFERENCE DRAWINGS
DRAKE OUTDOOR CHILLER MANUAL

THESE DRAWINGS ARE FORMATTED FOR 11 X 17 PAPER

NOTE TO CUSTOMER:

AFTER YOU HAVE REVIEWED THESE PLANS, PLEASE SIGN WHERE INDICATED BELOW AND RETURN TO THE PROJECT MANAGER TO CONFIRM YOUR RECEIPT, ACKNOWLEDGEMENT AND APPROVAL OF THIS DRAWING PACKAGE. YOUR APPROVAL AUTHORIZES THE PRODUCTION OF YOUR FINAL & COMPLETE DRAWING PACKAGE. TYPICAL TURN-AROUND TIME FOR FINAL DRAWINGS IS TWO (2) WEEKS AFTER RECEIPT OF YOUR APPROVAL OF THIS PACKAGE.

EQUIPMENT PLANNING PROCESS

THE EQUIPMENT PLANNING PROCESS IS ACCOMPLISHED IN TWO-PARTS.

1. PART 1 IS THE "PRELIMINARY DRAWINGS". THE INTENT OF THIS PACKAGE IS TO SHOW HOW THE EQUIPMENT CAN BE PLACED WITHIN THE SPACE AND IDENTIFY ANY ISSUES. THE CUSTOMER IS ENCOURAGED TO "MARK-UP" THE DRAWINGS AS MAY BE REQUIRED AND MUST APPROVE AND ACKNOWLEDGE IN WITTING THE RECEIPT OF THE PACKAGE OF INFORMATION IN THE BLOCK BELOW. ANY CONCERNS, CHANGES OR NOTATIONS MADE WILL BE INCORPORATED INTO THE NEXT PHASE OF DRAWINGS.
2. PART 2 IS THE "FINAL EQUIPMENT DRAWINGS". THE FINAL EQUIPMENT DRAWINGS WILL SPECIFY ALL REQUIREMENTS FOR THE EQUIPMENT SO THE CUSTOMER'S DESIGN TEAM CAN PREPARE CONSTRUCTION AND PERMITTING DRAWINGS. THESE DRAWINGS MAY BE SHARED WITH THE DESIGN TEAM AND CONTRACTORS AS "FOR REFERENCE ONLY", THEY ARE NOT TO BE USED FOR PERMITTING OR ACTUAL CONSTRUCTION. THE CUSTOMER IS ALSO REQUIRED TO APPROVE AND ACKNOWLEDGE IN WITTING THE RECEIPT OF THIS PACKAGE WITHIN FIVE (5) BUSINESS DAYS. THE RECEIPT OF THIS APPROVAL MOVES THE EQUIPMENT ORDER FROM "SALES" STATUS TO "STAGING" STATUS.

PRELIMS APPROVED

THE CUSTOMER HEREBY ACKNOWLEDGES, CONFIRMS, AND ACCEPTS THIS DRAWING PACKAGE AS OUTLINED ABOVE.

XXXXXXX 01/05/2022 XXXXXXXXXXXXX

(SIGNATURE OF AUTHORIZED INDIVIDUAL) (DATE SIGNED) (PRINTED NAME & TITLE) (COMPANY)

PART 2 - FINAL EQUIPMENT PLAN APPROVAL AND ACKNOWLEDGEMENT

THIS IS YOUR PHASE II, "FINAL" DRAWING PACKAGE ISSUED FOR USE OF YOUR DESIGN PROFESSIONALS TO GENERATE CONSTRUCTION DRAWINGS. THE CUSTOMER MUST SIGN BELOW AND RETURN A COPY OF THIS SHEET WITH SIGNATURE TO THE PRIZMED PROJECT MANAGER WITHIN FIVE (5) WORKING DAYS TO MOVE YOUR EQUIPMENT ORDER FROM THE SALES PHASE TO THE STAGING PHASE.

THE DRAWINGS WILL BE DEEMED TO BE ACKNOWLEDGED AND APPROVED BY THE CUSTOMER, AS IF SIGNED BY THE CUSTOMER, IF THIS SHEET IS NOT RETURNED AS STATED ABOVE.
HAVING REVIEWED THE FINAL DRAWINGS WE HEREBY ACKNOWLEDGE, CONFIRM AND ACCEPT THAT:

1. THE EQUIPMENT PLANNING REQUIREMENTS INDICATED HEREIN ARE SUBJECT TO CHANGE UNTIL THE ACTUAL EQUIPMENT FOR THE PROJECT HAS BEEN PHYSICALLY RETAINED AND INSPECTED AND WE UNDERSTAND THAT THE EQUIPMENT SUPPLIER IS NOT RESPONSIBLE FOR ANY COSTS RESULTING FROM ADDED OR CHANGED DESIGN OR CONSTRUCTION REQUIREMENTS DUE TO THE FINAL EQUIPMENT CONFIGURATION.
2. THE CUSTOMER WILL RETAIN DESIGN PROFESSIONALS WHO SHALL BE SOLELY RESPONSIBLE FOR PREPARING CONSTRUCTION DRAWINGS AND INCORPORATING THE EQUIPMENT REQUIREMENTS INTO THE CONSTRUCTION DRAWINGS AND THESE EQUIPMENT PLANS WILL NOT TO BE USED FOR PERMITTING OR CONSTRUCTION PURPOSES.
5. ALL INFORMATION HEREIN IS BASED ON INFORMATION OBTAINED FROM 3RD PARTY SOURCES AND IS INTENDED TO CONVEY TO THE CUSTOMER'S PROFESSIONAL DESIGN TEAM THE EQUIPMENT REQUIREMENTS AND NECESSARY SITE PREPARATION. THE EQUIPMENT PROVIDER AND SITE PLANNER ARE NOT LICENSED DESIGN OR ENGINEERING PROFESSIONALS AND DO NOT PROVIDE ANY SUCH SERVICES. THE CUSTOMER AGREES TO INDEMNIFY AND HOLD HARMLESS THE EQUIPMENT PROVIDER, SITE PLANNER AND ANYONE FOR WHOM THEY ARE LEGALLY LIABLE, FROM AND AGAINST ANY AND ALL DAMAGE, LOSSES OR COST, (INCLUDING ARCHITECT FEE'S, ENGINEERING FEE'S, ATTORNEYS' FEES AND DEFENSE COSTS), CAUSED IN WHOLE OR IN PART BY ITS ACTS, ERRORS OR OMISSIONS IN PROVIDING THESE DRAWINGS AND THE INFORMATION CONTAINED HEREIN.
6. THE CUSTOMER SHALL AT HIS OWN EXPENSE WILL PERFORM ALL RECOMMENDED TESTING AND MONITORING AS IDENTIFIED HEREIN TO CONFIRM SITE SUITABILITY INCLUDING ANY NECESSARY SHIELDING DESIGNS, PERFORM ANY MITIGATION REQUIRED AS A RESULT OF TESTING AND MONITORING AND PROVIDE THE RESULTS OF ANY SUCH ACTIONS TO THE EQUIPMENT SUPPLIER. SHOULD THE CUSTOMER ELECT NOT TO PERFORM ANY RECOMMENDED TESTING, MONITORING, SHIELD DESIGNS OR MITIGATION ,THE CUSTOMER SHALL BE SOLELY RESPONSIBLE FOR ANY IMPACT ON THE INSTALLATION, SERVICE OR OPERATION OF THE EQUIPMENT, SAFETY OF PERSONS, EFFECTS TO OTHER EQUIPMENT AND OPERATIONS.
7. THE CUSTOMER SHALL FURNISH TO THE EQUIPMENT SUPPLIER A COPY OF THE COMPLETED CONSTRUCTION DRAWINGS AND ANY RELEVANT TEST REPORTS AND KEEP THE EQUIPMENT SUPPLIER CURRENT ON ANY CHANGES THAT MAY AFFECT THE EQUIPMENT OR IT'S INSTALLATION AND OPERATION.
8. THE CUSTOMER SHALL COORDINATE AS NECESSARY WITH THE EQUIPMENT SUPPLIER IN ALL ASPECTS TO ENSURE THE PROPER AND TIMELY PREPARATION OF THE SITE TO ACCEPT THE EQUIPMENT.
9. THE CUSTOMER SHALL SUPPLY TO THE EQUIPMENT SUPPLIER AS SOON AS AVAILABLE A COPY OF THE PROJECT SCHEDULE AND IDENTIFY THE EQUIPMENT DELIVERY DATE ON THE PROJECT SCHEDULE.
10. ALL EQUIPMENT BEING FURNISHED BY THE SUPPLIER IS "PRE-OWNED" UNLESS OTHERWISE SPECIFIED IN THE EXECUTED SALES AGREEMENT.
11. THE EQUIPMENT PROVIDER AND SITE PLANNER MAKE NO GUARANTEES AND SHALL NOT BE LIABLE FOR ANY IMPACT THE INSTALLATION OF THE EQUIPMENT MAY HAVE ON OTHER EQUIPMENT IN OR NEAR THE SPACE WHERE THIS EQUIPMENT WILL BE INSTALLED AND THE CUSTOMER ACCEPTS ALL LIABILITIES AND RESPONSIBILITIES THEREOF.
12. THE CUSTOMER ACKNOWLEDGES THAT THIS FLOOR PLAN DOES NOT CONTAIN THE 5 GAUSS MAGNETIC FIELD WITHIN THE MRI EXAM ROOM AND THAT MAGNETIC SHIELDING WILL BE REQUIRED. THE CUSTOMER IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH MAGNETIC SHIELDING.

THE CUSTOMER ACKNOWLEDGES AS OUTLINED ABOVE:

_____ _____ _____ _____

(SIGNATURE OF AUTHORIZED INDIVIDUAL) (DATE SIGNED) (PRINTED NAME & TITLE) (COMPANY)

PRIZMED IMAGING SOLUTIONS
5335 Avion Park Drive
Unit A
Highland Heights, Ohio
(888) 505-0319

EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

CUSTOMER APPROVALS

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
2. 1-18-22 FINALS ISSUED
3.
4.
5.
6.
7.
8.

FILENAME
2021-23

SHEET
APRV

ISSUED FOR COORDINATION PURPOSES ONLY - NOT TO BE USED FOR PERMITTING OR CONSTRUCTION PURPOSES

EQUIPMENT DELIVERY AUTHORIZATION

THIS FORM MUST BE COMPLETED AND RETURNED TO YOUR EQUIPMENT PROVIDER'S PROJECT MANAGER NOT LESS THAN TEN (10) CALENDAR DAYS PRIOR TO THE SCHEDULED EQUIPMENT DELIVERY DATE, FAILURE TO PROVIDE THIS SHEET MAY DELAY THE SCHEDULED DELIVERY OF YOUR EQUIPMENT!

THE CUSTOMER HEREBY CERTIFIES THAT THE SITE WILL BE READY FOR THE DELIVERY AND INSTALLATION OF THE EQUIPMENT IN ALL REGARDS AS SPECIFIED WITHIN THIS DRAWING PACKAGE ON _____, AT WHICH TIME THE INSTALLATION OF THE EQUIPMENT WILL IMMEDIATELY WILL COMMENCE. IF THE SITE IS NOT PROPERLY PREPARED UPON DELIVERY OF THE EQUIPMENT AND THE INSTALLATION IS DELAYED AS A RESULT, ADDITIONAL CHARGES MAY BE INCURRED BY THE CUSTOMER, ALL CONSTRUCTION WORK MUST BE COMPLETE IN THE SPACE THE EQUIPMENT IS TO BE INSTALLED.

SITE READINESS CHECKLIST

1. THE UNLOADING AREA AND THE DELIVERY PATH ARE CLEAR OF ALL OBSTRUCTIONS THAT WOULD HINDER THE DELIVERY OR INSTALLATION AND THE PATH HAS ADEQUATE SPACE FOR THE MOVEMENT OF THE EQUIPMENT. IF THERE ARE ANY RAMPS, STAIRS, ELEVATORS, DOCKS, GARAGES OR OTHER HINDRANCES ALONG THE DELIVERY PATH THE PROJECT MANAGER MUST BE NOTIFIED IN ADVANCE OF THE DELIVERY.
2. ALL SURFACES ARE TO BE COMPLETELY FINISHED, THIS INCLUDES ALL WALLS, CEILINGS, FLOORS, CABINETS, ETC., (WITH EXCEPTION OF THE DELIVERY PATH). IT IS HIGHLY RECOMMENDED THAT THE GENERAL CONTRACTOR USE HEAVY CRAFT PAPER TO PROTECT ALL FINISHED FLOORING AND COUNTERTOPS PRIOR TO THE DELIVERY OF THE EQUIPMENT.
3. ALL SYSTEMS MUST BE COMPLETE AND OPERATIONAL, INCLUDING ALL HVAC SYSTEMS, ELECTRICAL SYSTEMS , LIGHTING, LIFE SAFETY SYSTEMS , AND LIVE PHONE AND DATA SYSTEMS.
4. THE SPACE THE EQUIPMENT IS BEING INSTALLED MUST BE DUST-FREE AND CLIMATE STABILIZED FOR A MINIMUM OF 72 HOURS PRIOR TO THE ARRIVAL OF THE EQUIPMENT.
5. THERE MUST BE ADEQUATE SPACE FOR THE STAGING OF EQUIPMENT IN THE AREA AND ALL CONTRACTOR TOOLS AND MATERIALS REMOVED FROM THE AREA.
6. A TRASH RECEPTACLE OR DUMPSTER IS AVAILABLE FOR DISPOSAL OF SHIPPING AND PACKING MATERIALS.
7. CEILING TILES MUST BE REMOVED IN AREAS WHERE ACCESS WILL BE REQUIRED FOR SYSTEM CABLING, THE CUSTOMER OR CONTRACTOR MUST HAVE SOMEONE ON SITE ON DELIVERY DAY FOR THIS PURPOSE. THE CUSTOMER OR CONTRACTOR IS RESPONSIBLE FOR RE-INSTALLING SAME AFTER SYSTEM CABLES HAVE BEEN INSTALLED.
8. THE CUSTOMER'S ELECTRICIAN MUST BE ON SITE AND AVAILABLE THE AFTERNOON THE EQUIPMENT IS DELIVERED TO CONFIRM THE POWER SOURCE HAS THE PROPER RATING, GROUNDING, AND ROTATION AND TO ASSIST THE EQUIPMENT INSTALLERS WITH TERMINATION OF THE MAIN POWER ONTO THE EQUIPMENT.

IF THERE ARE THERE ANY ITEMS THAT CAN NOT BE COMPLETED AS STATED ABOVE PRIOR TO EQUIPMENT DELIVERY, PLEASE EXPLAIN: _____.

_____

NETWORK CONNECTIVITY FOR MEDICAL EQUIPMENT: THE FOLLOWING INFORMATION IS REQUIRED FOR COMMUNICATION WITH YOUR DATA SYSTEMS , PROVIDE THE FOLLOWING INFORMATION:

MEDICAL EQUIPMENT

IP ADDRESS: _____ AE TITLE: _____ SUBNET MASK: _____ DEFAULT GATEWAY: _____ PORT NUMBER: _____

PACS OR IMAGE DESTINATION

IP ADDRESS: _____ AE TITLE: _____ SUBNET MASK: _____ DEFAULT GATEWAY: _____ PORT NUMBER: _____

WORKLIST

IP ADDRESS: _____ AE TITLE: _____ SUBNET MASK: _____ DEFAULT GATEWAY: _____ PORT NUMBER: _____

EMR OR MEDICAL RECORDS

IP ADDRESS: _____ AE TITLE: _____ SUBNET MASK: _____ DEFAULT GATEWAY: _____ PORT NUMBER: _____

OTHER: _____

IP ADDRESS: _____ AE TITLE: _____ SUBNET MASK: _____ DEFAULT GATEWAY: _____ PORT NUMBER: _____

EXCEPT AS MAY BE STATED ABOVE, ALL ITEMS WILL BE COMPLETED AND THE SITE READY FOR DELIVERY AND INSTALLATION ON THE DATE INDICATED ABOVE. WE ACKNOWLEDGE THAT ONCE THE EQUIPMENT HAS ARRIVED AT THE SITE, ANY ISSUES OR DELAYS DUE TO NON-CONFORMING SITE CONDITIONS AND PREPARATION MAY IMPACT THE EQUIPMENT INSTALLATION AND MAY RESULT IN ADDITIONAL CHARGES TO THE CUSTOMER.

ACKNOWLEDGED BY: _____ _____ _____ _____

(SIGNATURE) (DATE) (PRINT NAME) (COMPANY)

ISSUED FOR COORDINATION PURPOSES ONLY - NOT TO BE USED FOR PERMITTING OR CONSTRUCTION PURPOSES

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5335 Avion Park Drive
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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

DELIVERY AUTHORIZATION

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
2. 1-18-22 FINALS ISSUED
3.
4.
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FILENAME
2021-23

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DRAWING NOTES:

1. THESE DRAWINGS ARE FOR COORDINATION PURPOSES WITH THE CUSTOMER'S DESIGN TEAM AND ARE NOT TO BE USED FOR PERMITTING OR CONSTRUCTION PURPOSES.
2. THESE DRAWINGS ARE PROVIDED TO LOCATE THE EQUIPMENT WITHIN THE SPACE, SUGGEST THE PLACEMENT AND ROUTING OF RELATED SUPPORTING SYSTEMS, AND GUIDE THE CUSTOMER'S DESIGN TEAM TO INCORPORATE THE EQUIPMENT REQUIREMENTS INTO THE CONSTRUCTION DOCUMENTS. IN PREPARING THESE DRAWINGS, EVERY EFFORT HAS BEEN MADE TO CONFORM DETAILS TO THE ACTUAL EQUIPMENT EXPECTED TO BE INSTALLED. HOWEVER, BECAUSE THE INFORMATION CONTAINED HEREIN IS BEING PROVIDED IN ADVANCE OF THE RETENTION OF THE ACTUAL EQUIPMENT BEING PROVIDED, THESE DRAWINGS ARE SUBJECT TO CHANGE. THE INFORMATION CONTAINED HEREIN IS CORRECT TO THE BEST OF OUR KNOWLEDGE AT THE TIME THE INFORMATION WAS PREPARED.
3. THE EQUIPMENT PROVIDER AND SITE PLANNER ARE NOT RESPONSIBLE FOR ANY DAMAGES RESULTING FROM THE USE OF THESE DRAWINGS FOR ANY PURPOSES. THESE DRAWINGS ARE SCHEMATIC IN NATURE AND THE ROUTING AND LOCATIONS OF ANY CONDUITS, TROUGHS, WIREWAYS, BREAKERS, DISCONNECT SWITCHES, ETC. ARE SUGGESTIONS, ACTUAL LOCATIONS AND PLACEMENT ARE THE RESPONSIBILITY OF THE CUSTOMER'S DESIGN PROFESSIONALS.
4. ALL EQUIPMENT LAYOUTS ARE BASED ON THE RECOMMENDED SPACE NECESSARY FOR THE OPERATION AND SERVICEABILITY OF THE EQUIPMENT BEING PROPOSED AND ARE IN THE BEST INTEREST OF BOTH THE CUSTOMER AND EQUIPMENT SUPPLIER BASED ON ARCHITECTURAL DRAWINGS OR INFORMATION PROVIDED BY THE CUSTOMER. IF CHANGES ARE MADE TO THE LAYOUT OR DIMENSIONS THE SITE PLANNER IS TO BE NOTIFIED IMMEDIATELY AS CHANGES COULD RESULT IN CONFLICTS WITH THE EQUIPMENT CLEARANCES, PLACEMENT OF THE EQUIPMENT, AND POSSIBLY IMPACT THE CLINICAL USE OF THE EQUIPMENT. IF CHANGES ARE MADE TO THE FLOOR PLAN AFTER THE SUBMISSION OF THE INITIAL VERSION OF THESE PLANS ADDITIONAL DRAFTING CHARGES MAY BE INCURRED BY THE CUSTOMER.
5. ALL INFORMATION HEREIN IS BASED ON INFORMATION OBTAINED FROM 3RD PARTY SOURCES AND IS INTENDED TO CONVEY TO THE CUSTOMER'S PROFESSIONAL DESIGN TEAM THE EQUIPMENT REQUIREMENTS AND NECESSARY SITE PREPARATION. THE EQUIPMENT PROVIDER AND SITE PLANNER ARE NOT LICENSED DESIGN OR ENGINEERING PROFESSIONALS AND DO NOT PROVIDE ANY SUCH SERVICES. THE CUSTOMER AGREES TO INDEMNIFY AND HOLD HARMLESS THE EQUIPMENT PROVIDER, SITE PLANNER AND ANYONE FOR WHOM THEY ARE LEGALLY LIABLE, FROM AND AGAINST ANY AND ALL DAMAGES, LOSSES OR COSTS, (INCLUDING ARCHITECT FEE'S, ENGINEERING FEE'S, ATTORNEYS' FEES AND DEFENSE COSTS), CAUSED IN WHOLE OR IN PART BY ITS ACTS, ERRORS OR OMISSIONS IN PROVIDING THESE DRAWINGS AND THE INFORMATION CONTAINED HEREIN. .
6. THE CUSTOMER'S ARCHITECT AND GENERAL CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE CODES AND PROFESSIONAL DESIGN REQUIREMENTS. CONSTRUCTION DRAWINGS ARE TO BE SUBMITTED TO THE EQUIPMENT SUPPLIER FOR REVIEW PRIOR TO CONSTRUCTION.
7. ALL DIMENSIONS SHOWN ARE TAKEN FROM FINISHED SURFACES UNLESS SPECIFIED OTHERWISE.
8. THIS DRAWING PACKAGE DOES NOT PROVIDE SHIELDING DESIGNS, IF ANY SHIELDING IS REQUIRED IT SHALL BE THE RESPONSIBILITY OF THE CUSTOMER IN ALL REGARDS.
9. OWNERSHIP OF DOCUMENTS, DRAWINGS, SPECIFICATIONS AND OTHER INFORMATION, INCLUDING THOSE IN ELECTRONIC FORM, PREPARED BY THE EQUIPMENT PROVIDER AND THE EQUIPMENT PROVIDER'S CONSULTANTS ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THE EQUIPMENT PROVIDER AND THE EQUIPMENT PROVIDER'S CONSULTANTS SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS.

RESPONSIBILITIES & COORDINATION

PRIZMED IMAGING SOLUTIONS:

1. FURNISH AND INSTALL THE MRI SYSTEM AND ALL SYSTEM COMPONENTS INCLUDING SYSTEM CABLES AND DEVICES. PLEASE TAKE NOTE OF THE SITE REQUIREMENTS ON SHEET "PDCL", EQUIPMENT SHALL NOT BE RELEASED UNLESS THE SITE IS READY AS SPECIFIED.
2. PROVIDE RIGGING AND SETTING OF THE MRI SYSTEM AND COMPONENTS. THE RIGGING IS BASED UPON AN ALLOWANCE OF $6,500 .00. ANY RIGGING COSTS IN EXCESS OF THIS ALLOWANCE WILL BE BILLED TO THE CUSTOMER ONCE RIGGING IS COMPLETED.
3. PROVIDE WITH THE MRI SYSTEM THE DEDICATED OUTDOOR CHILLER. INFORMATION WILL BE PROVIDED WITH THE FINAL DRAWING PACKAGE. THE CHILLER WILL ARRIVE IN ADVANCE OF THE MRI SYSTEM AND BE DELIVERED TO THE JOB SITE. CUSTOMER IS RESPONSIBLE FOR:
4. OFF-LOADING THE MRI CHILLER AND SETTING IT IN PLACE.
5. INSTALLATION OF THE FURNISHED CHILLER INTERFACE COMPONENTS SHOWN AND DESCRIBED IN THE FINAL DRAWING PACKAGE.
6. THE DESIGN AND INSTALLATION OF ALL PLUMBING, PIPING, PIPE INSULATION, VALVES, STRAINERS, AIR VENTS, ETC. AS REQUIRED FOR THE MRI CHILLED WATER SYSTEM.
7. FILLING THE MRI CHILLED WATER SYSTEM WITH THE APPROPRIATE WATER/GLYCOL MIX AND LEAK TESTING THE ENTIRE WATER CIRCUIT PRIOR TO ARRIVAL OF THE MRI SYSTEM.
8. APPLICATIONS TRAINING FOR THE STAFF TECHNOLOGISTS, IF INCLUDED, WILL BE PROVIDED AS SPECIFIED WITHIN THE SALES AGREEMENT AND COORDINATED DIRECTLY WITH THE CUSTOMER IN ADVANCE OF THE EQUIPMENT INSTALLATION.

CUSTOMER & CUSTOMER'S CONTRACTORS:

1. THE CUSTOMER IS SOLELY RESPONSIBLE FOR RETAINING A PROFESSIONAL DESIGN TEAM TO PREPARE PERMIT AND CONSTRUCTION DRAWINGS, ENSURING COMPLIANCE WITH ALL EQUIPMENT REQUIREMENTS, CODES, REGULATORY REQUIREMENTS AND SECURING ALL APPROVALS, PERMITS AND LICENSES.
2. ALL WORK EXCEPT THE INSTALLATION OF THE EQUIPMENT IS THE RESPONSIBILITY OF THE CUSTOMER WITHOUT EXCEPTION AND THE EQUIPMENT PROVIDER ASSUMES NO RESPONSIBILITY FOR ANY CONSTRUCTION COSTS, WHETHER OR NOT RELATED TO THE INSTALLATION OF THE EQUIPMENT OR THE USE OF THESE DRAWINGS AND THE INFORMATION CONTAINED HEREIN.
3. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE REINSTALLATION OF CEILING TILES, TOUCH-UP AND ANY COSMETIC WORK AFTER THE INSTALLATION OF THE EQUIPMENT.
4. THE CUSTOMER SHALL BE RESPONSIBLE FOR ALL SAFETY SIGNAGE REQUIRED BY ACR, ISO, JCAHO, OSHA, ETC., INCLUDING SAFETY AND WARNING SIGNAGE FOR THE CRYOGEN EXHAUST SYSTEM.
5. THE CUSTOMER SHALL PERFORM AN INSPECTION AT LEAST FIVE (5) WORKING DAYS PRIOR TO DELIVERY OF THE EQUIPMENT AND VERIFY IN WRITING TO THE EQUIPMENT PROVIDER USING SHEET "PDCL" OF THESE DRAWINGS THAT THE SITE IS READY FOR DELIVERY AND INSTALLATION AS SCHEDULED. UPON DELIVERY OF THE EQUIPMENT, SHOULD THE SITE NOT BE READY AND CAUSE DELAY IN THE INSTALLATION, THE CUSTOMER SHALL REIMBURSE THE EQUIPMENT PROVIDER FOR ANY ASSOCIATED COSTS INCLUDING COSTS FOR ADDITIONAL STORAGE, WAGES, TRAVEL, LODGING, OR RE-MOBILIZATION COSTS.
6. EQUIPMENT WARRANTIES, EXPRESSED OR IMPLIED, ON THE PART OF EQUIPMENT SUPPLIER SHALL BE CONTINGENT UPON STRICT COMPLIANCE WITH ALL RECOMMENDATIONS AND REQUIREMENTS CONTAINED IN THESE DRAWINGS.
7. THE EQUIPMENT SUPPLIER SHALL BE RESPONSIBLE FOR THE EQUIPMENT INSTALLATION AND CALIBRATION WHICH INCLUDES INSTALLING SYSTEM CABLES AND TERMINATING CONTRACTOR PROVIDED CABLES TO THE 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 JOB SUPERVISION TO BE PROVIDED BY THE EQUIPMENT PROVIDER. 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.

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

GENERAL NOTES

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
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SHEET
N-1

RECOMMENDED TESTING AND ENVIRONMENTAL EVALUATION

THE CUSTOMER IS RESPONSIBLE FOR HAVING A COMPLETE ENVIRONMENTAL SURVEY PERFORMED OF THE PROPOSED SITE TO ENSURE ALL ENVIRONMENTAL CONDITIONS WILL MEET THE REQUIREMENTS OF THE ORIGINAL MANUFACTURER OF THE PROPOSED EQUIPMENT.

RECOMMENDED ENVIRONMENTAL TESTING INCLUDES THE FOLLOWING:

1. FOR ALL MEDICAL IMAGING EQUIPMENT THE PRIMARY ELECTRICAL SERVICE MUST BE THOROUGHLY EVALUATED TO INCLUDE A LOAD STUDY ON THE ELECTRICAL SERVICE INTENDED FOR THE IMAGING EQUIPMENT AND MONITORING TO ENSURE THE POWER QUALITY MEETS THE SPECIFICATIONS INCLUDING TRANSIENT VOLTAGES AND GROUNDING. THE CUSTOMER IS RESPONSIBLE FOR VERIFICATION THAT PRIOR TO THE SYSTEM BEING INSTALLED THE REQUIREMENTS ARE MET. IN THE EVENT THERE ARE ANY ENVIRONMENTAL OR POWER DEFICIENCIES AT THE SITE, THE FACILITY WILL BE REQUIRED TO CORRECT SUCH DEFICIENCIES PRIOR TO ENERGIZATION OF THE EQUIPMENT. **PLEASE BE ADVISED THAT ANY QUALITY ISSUES OR DAMAGE TO THE IMAGING SYSTEM AS A RESULT OF ENVIRONMENTAL OR POWER ISSUES WILL FALL OUTSIDE ANY WARRANTY OR SERVICE AGREEMENT COVERAGE.** A RECOMMENDED RESOURCE FOR THE MONITORING IS: RX MONITORING SERVICES, (888) 329-2321 http://www.rxms.com/
2. ALL MEDICAL IMAGING EQUIPMENT IS VERY SENSITIVE TO VIBRATION. THE EQUIPMENT MUST BE LOCATED AS FAR AS POSSIBLE FROM VIBRATION SOURCES SUCH AS ADJACENT ROADWAYS, PARKING LOTS, SUBWAYS, TRAIN TRACKS, HALLWAYS, ELEVATORS, WEIGHT MACHINES, ETC. FOR MRI SYSTEMS, IF THE MRI MAGNET IS NOT INSTALLED ON AN ISOLATED STRUCTURAL SLAB-ON-GRADE, (THE ENTIRE MRI SCAN ROOM INCLUDING THE RF SHIELDED CABIN), OR IF ANY ASPECT OF THE SITE IS IN QUESTION, THE CUSTOMER IS REQUIRED TO PERFORM A VIBRATION STUDY.
3. MRI SYSTEMS ARE HIGHLY SENSITIVE TO ELECTRO-MAGNETIC INTERFERENCE (EMI), RADIO FREQUENCY INTERFERENCE (RFI), AND LARGE OR MOVING MASS METALS, (CARS, TRUCKS, LARGE PIECES OF EQUIPMENT, WEIGHT MACHINES, ELEVATORS, HVAC UNITS AND VARIABLE DRIVE ELECTRIC MOTORS, ETC.). IT IS REQUIRED THAT ALL MRI SITES HAVE TESTING PERFORMED PRIOR TO THE COMPLETION OF CONSTRUCTION DRAWINGS TO CONFIRM THE SITE WILL BE SUITABLE, OR DETERMINE ANY REMEDIAL WORK REQUIRED TO ENSURE THE SITE WILL BE SUITABLE PRIOR TO THE DELIVERY OF THE EQUIPMENT.
4. FOR ANY MRI SITE THAT THE 5 GAUSS FIELD IS NOT CONTAINED WITHIN THE MRI SCAN ROOM AND ANY SUCH PROTRUSION OF THE 5 GAUSS FIELD IS INTO OCCUPIED SPACES THAT CAN NOT BE RESTRICTED, **THE CUSTOMER IS RESPONSIBLE FOR, AND REQUIRED TO, RETAIN THE RESOURCES NECESSARY TO PERFORM THE SHIELD MODELING** AND PREPARE A DESIGN TO CONTAIN THE 5 GAUSS LINES AND TO DETERMINE IF SUCH SHIELDING WOULD IMPACT THE SHIMMING OF THE MRI MAGNET OR THE IMAGE QUALITY OF THE SYSTEM.

SITE USAGE, DELIVERY AND INSTALLATION

1. THE MINIMUM STANDARD DELIVERY REQUIREMENTS FOR THE EQUIPMENT ARE INDICATED HEREIN, SPECIAL ATTENTION SHOULD BE PAID TO:
   - 1.1. THE ENTIRE DELIVERY PATH MUST BEING LARGE ENOUGH TO ACCOMMODATE ALL SYSTEM COMPONENTS AND BE FREE AND CLEAR OF ALL OBSTRUCTIONS.
   - 1.2. THE MINIMUM CEILING HEIGHTS AS NOTED IN THESE PLANS OR AS STATED IN THE O.E.M. REFERENCE DRAWINGS FOR THE SCAN AND EQUIPMENT ROOMS.
   - 1.3. ALL SURFACES AND FLOORS ALONG THE ENTIRE DELIVERY PATH MUST BE CAPABLE OF SUPPORTING THE WEIGHT OF ALL SYSTEM COMPONENTS.
2. FOR STANDARD RIGGING AND DELIVERY, ANY OPENINGS, DOORWAYS, OR TURNS IN THE DELIVERY PATH MUST BE ABLE TO ACCOMMODATE THE GANTRY AND TABLE AS AN ASSEMBLY. SEE DETAILS HEREIN.
3. ADEQUATE SPACE FOR STAGING THE EQUIPMENT DURING INSTALLATION. THE STORAGE SPACE MUST BE INSIDE THE BUILDING IN CLOSE PROXIMITY TO THE WORK AREA, BE CLIMATE CONTROLLED AND ABLE TO BE SECURED AFTER HOURS.
4. THE CUSTOMER SHALL PROVIDE AT NO COST TO THE EQUIPMENT SUPPLIER A CONTAINER, (DUMPSTER, ROLL-OFF, ETC.), FOR THE DISPOSAL OF ALL PACKAGING AND SHIPPING DEBRIS, GENERALLY CONSISTING OF PALLETS, CRATING, BOXES AND PROTECTIVE PLASTIC WRAP.
5. THE ANTICIPATED TIME FRAME FOR INSTALLATION OF THE MEDICAL EQUIPMENT IS TYPICALLY:

   TEN (10) WORKING DAYS FOR MRI SYSTEMS

   THREE (3) WORKING DAYS FOR CT SYSTEMS
6. THE INSTALLATION CREW RESERVES THE RIGHT TO HAVE ACCESS TO THE SITE AND PERFORM WORK OUTSIDE OF NORMAL WORKING HOURS, (7:30AM - 5:00PM), WITH ADVANCED NOTICE TO THE CUSTOMER.
7. THE CUSTOMER IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF CEILING TILES NECESSARY TO ACCESS LADDER TRAYS, BOXES, CONDUITS, ETC. ABOVE THE CEILING TO FACILITATE THE INSTALLATION OF THE EQUIPMENT.

FLOOR LEVELNESS

1. THE FLOOR MUST BE LEVEL TO WITHIN 1/8" IN 10'-0" WHERE THE EQUIPMENT IS BEING INSTALLED, THE EQUIPMENT CAN NOT BE SHIMMED. THE CONTRACTOR MUST VERIFY IN WRITING NOT LESS THAN 5 DAYS BEFORE DELIVERY THAT THE FLOOR MEETS THIS REQUIREMENT.

LAYOUT PRIORITY ITEMS

1. THE FOLLOWING ITEMS, IN ORDER TAKE PRECEDENCE IN LAYOUT OF THE SCAN ROOM CEILING.
   - 1.1. LADDER TRAYS
   - 1.2. QUENCH VENT
   - 1.3. LIGHT FIXTURES
   - 1.4. HVAC GRILLES
   - 1.5. SPRINKLER HEADS
2. EQUIPMENT ISO-CENTER IS THE CRITICAL POINT FOR ALL LAYOUT WORK IN THE SCAN ROOM. ANY DEVIATION MUST BE REPORTED TO THE SITE PLANNER IMMEDIATELY. THE GENERAL CONTRACTOR SHALL MAINTAIN MARKS FOR ISO-CENTER THROUGHOUT THE PROJECT.

USE OF MATERIALS IN THE MRI SCAN ROOM

1. AS A GENERAL RULE, ALL MATERIALS USED IN THE MRI SCAN ROOM MUST BE NON-FERROUS SUCH AS ALUMINUM, MOST STAINLESS STEELS, BRASS, BRONZE, PLASTIC, FIBERGLASS, ETC. SPECIAL ATTENTION SHOULD BE GIVEN TO THE CEILING GRID, HANGERS, REGISTERS, GRILLES & DIFFUSERS, CONDUITS, CABLE TRAYS, ELECTRICAL BOXES & LIGHT FIXTURES. THESE ITEMS IN PARTICULAR MUST BE NON-FERROUS AND MOUNTED IN SUCH A WAY THAT THEY WILL NOT VIBRATE WITH THE GRADIENT AND ACOUSTIC VIBRATIONS GENERATED BY THE MRI SCANNER WHEN HIGH-LEVEL SEQUENCES ARE RUNNING.
2. IT IS PERMISSIBLE TO USE STANDARD DRYWALL SCREWS OR FERROUS FASTENERS SO LONG AS THEY ARE SECURELY FASTENED, (HANGER DRYWALL SCREWS SHOULD BE REMOVED).
3. MOST STANDARD CABINET HARDWARE SUCH AS HINGES ARE FINE WHEN SECURELY FASTENED, IT IS SUGGESTED THAT IF CABINETRY IS IN CLOSE PROXIMITY TO THE MAGNET THE USE OF NON-FERROUS PULLS OR HANDLES ARE INSTALLED TO PREVENT "GHOST DOORS".
4. ALL LIGHT SWITCHES SHOULD BE OUTSIDE THE MRI SCAN ROOM AS THEY HAVE BEEN KNOWN TO BECOME MAGNETIZED OVER TIME AND LIGHTING NEEDS TO BE ABLE TO BE ADJUSTED BY THE STAFF FROM OUTSIDE THE SCAN ROOM.
5. AS NOTED ELSEWHERE, AVOID STEEL REINFORCING IN THE SLAB UNDER THE MAGNET IN A 10' X 10' AREA, USE OF FIBER MESH OR FIBERGLASS REBAR IS HIGHLY RECOMMENDED TO AVOID SHIMMING ISSUES WITH THE MAGNET.

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

GENERAL NOTES

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
2. 1-18-22 FINALS ISSUED
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FILENAME
2021-23

SHEET
N-2

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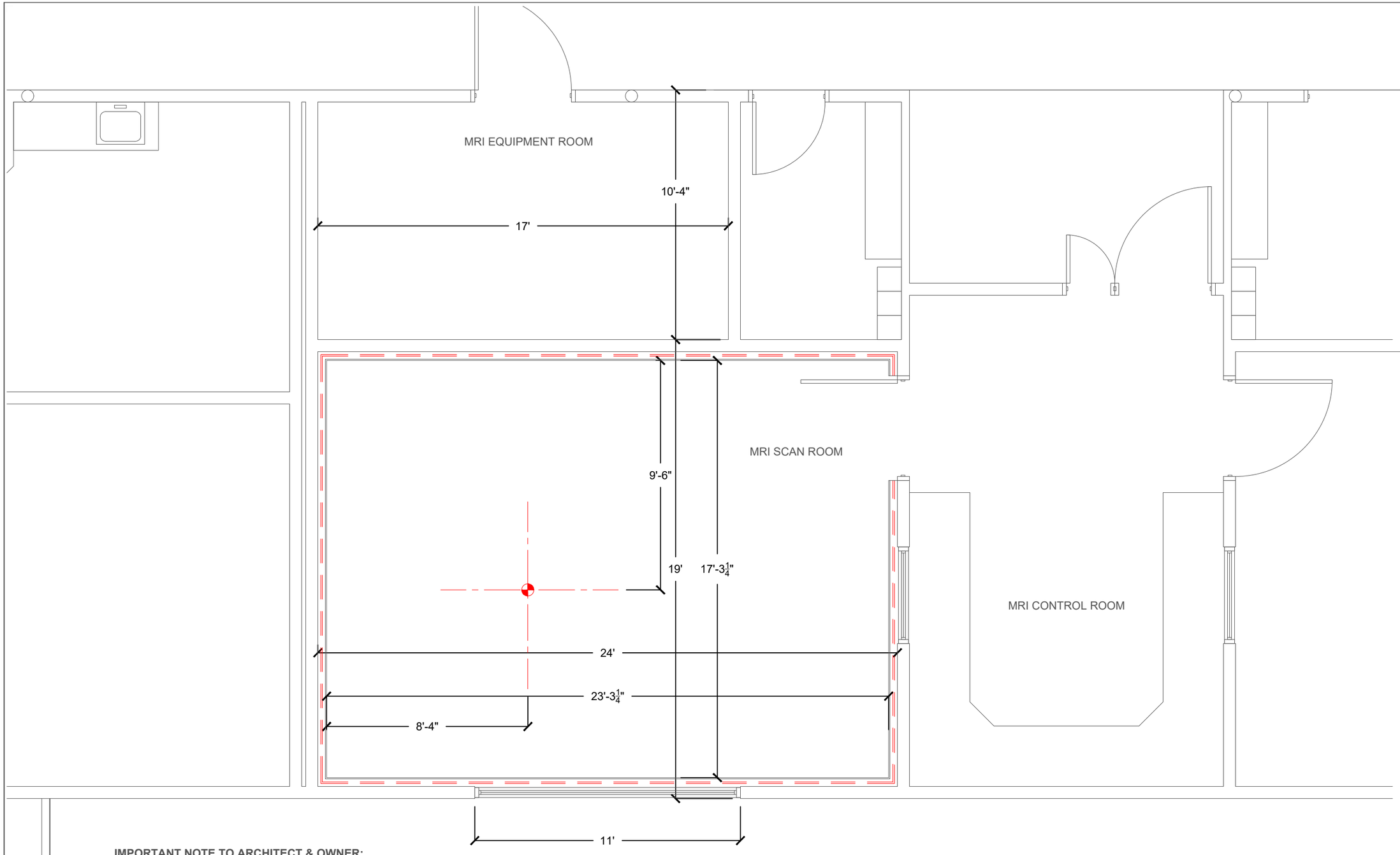

IMPORTANT NOTE TO ARCHITECT & OWNER:

THIS PLAN WAS PROVIDED BY THE ARCHITECT, RF SHIELDING WAS NOT SHOWN IN THE MRI SCAN ROOM, WE HAVE ADDED THE RF SHIELD AND INTERIOR FURRING AND DRYWALL THAT IS TYPICALLY USED BY MEDISHIELD, INC. FOR THE PURPOSES OF DETERMINING ISO-CENTER. WE HAVE NOT ACCOUNTED FOR MAGNETIC SHIELDING WHICH WILL BE REQUIRED FOR THIS PROJECT AS DETAILS FOR THAT VARY GREATLY.

PRIOR TO FINAL DRAWINGS BEING PRODUCED THE CUSTOMER SHOULD RETAIN THE SERVICES OF THE RF CONTRACTOR TO DETERMINE THE TYPE OF RF SHIELDING TO BE USED AND GUIDE THE ARCHITECT TO DETAIL THE EXACT SCAN ROOM WALL SECTIONS AND DETAILS SO THE EXACT FINISHED SCAN ROOM SIZE CAN BE DETERMINED.

ALL SHIELDING, RF AND MAGNETIC, IS THE RESPONSIBILITY OF THE CUSTOMER.

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

FLOOR PLAN

PROJECT DATE
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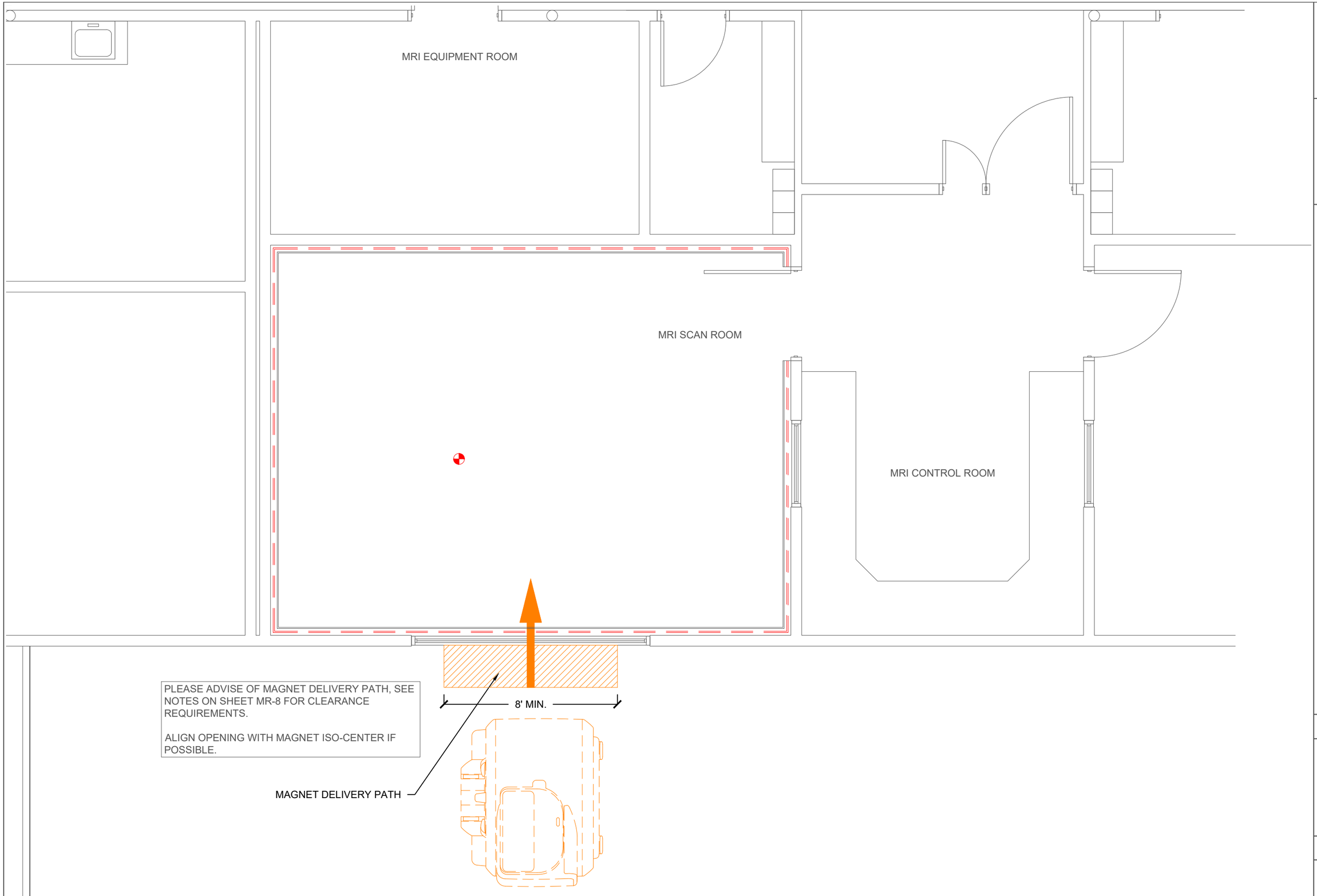
FILENAME
2021-23

SHEET
A-1



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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

EQUIPMENT RIGGING PATH

PROJECT DATE
12-2021

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IMPORTANT PLANNING NOTES

1. WE HAVE DEVELOPED THIS FLOOR PLAN BASED ON INFORMATION PROVIDED TO US, WE ARE NOT ARCHITECTS AND CAN NOT BE RESPONSIBLE FOR ANY BUILDING CODE COMPLIANCE, THAT WILL BE UP TO YOUR ARCHITECT.
2. ALL RF SHIELDING, AND IF REQUIRED MAGNETIC SHIELDING, IS THE RESPONSIBILITY OF THE CUSTOMER.

DEDICATED MRI WATER CHILLIER

CONSULT WITH EQUIPMENT PROVIDER FOR MRI CHILLIER SYSTEM SPECIFICATIONS, (IF ONE IS BEING PROVIDED WITH THE MRI SYSTEM).

ALL PIPE, FITTINGS, VALVES, INSULATION, COOLING FLUID (WATER & GLYCOL), AND START-UP IS TO BE FURNISHED, INSTALLED AND EXECUTED BY THE CUSTOMER'S CONTRACTORS.

MINIMUM CEILING HEIGHTS

THE MINIMUM FINISHED CEILING HEIGHT IS 7'-10 $\frac{1}{2}$", MAXIMUM 8'-10". CEILING MUST BE REMOVABLE ABOVE SERVICE AREA AT MAGNET TURRET.

THE MINIMUM RF CEILING HEIGHT IS 9'-0" CLEAR FROM FINISHED FLOOR TO ALLOW ENOUGH SPACE TO FILL THE MAGNET.

NOISE AND VIBRATION

NOISE IS GENERATED BY THE COOLING FANS IN EACH UNIT. THE NOISE LEVEL DIFFERS AMONG UNITS. THE REFERENCE NOISE LEVELS FOR UNITS THAT ARE PARTICULARLY LOUD ARE SHOWN BELOW.

REFRIGERATOR COMPRESSOR	75 dB (A)
TRANSFORMER CABINET	65 dB (A)
ECO CABINET	64 dB (A)
FAN BOX	67 dB (A)
FILTER PANEL	59 dB (A)

VIBRATION SPECIFICATIONS:
0.02 m/s² (PEAK TO PEAK) = 2.0 GAL OR LESS.

VIBRATION TESTING (IF REQUIRED) IS THE RESPONSIBILITY OF THE CUSTOMER.

ELECTRICAL REQUIREMENTS

SUPPLY CONFIGURATION: 3-PHASE DELTA

SUPPLY VOLTAGE: 480v - 150AMP (MRI SYSTEM ONLY)

VOLTAGE VARIATION: +/- 10%

HVAC REQUIREMENTS

EQUIPMENT ROOM:	68 - 75 F	40% - 70% RH
SCAN ROOM:	60 - 75 F	40% - 60% RH
CONTROL ROOM:	60 - 85 F	40% - 75% RH

ABOVE CONDITIONS MUST BE MAINTAINED AT ALL TIMES, DAY AND NIGHT.

DEDICATED HVAC UNIT IS REQUIRED FOR THE SCAN & EQUIPMENT ROOMS.

MRI SYSTEM EQUIPMENT LEGEND - VANTAGE TITAN 1.5T
(GEN II - VRDU WITH GECO CABINET CONFIGURATION)

ITEM NO	EQUIP TAG	ITEM DESCRIPTION	BTU/HR	WEIGHT (LBS)	REMARKS
1	MAG	TOSHIBA TITAN 1.5 TESLA MAGNET	4,095	11,905	
2	PT	PATIENT TABLE	---	706	
3	CON	OPERATORS WORKSTATION, (LCD, KEYBOARD, MOUSE PATIENT MONITOR SCREEN, CONTROL BOX)	683	32	ON COUNTER SUPPLIED BY CUSTOMER
4	HCC	HOST COMPUTER & CABINET	1,706	55	
5	EVFS	EXHAUST VENTILATION FAN SWITCH	---	---	LOCATION BY CUSTOMER
6	EVF	EXHAUST VENTILATION FAN	---	---	BY CUSTOMER'S CONTRACTORS
7	EPO	EMERGENCY POWER OFF BUTTON	---	---	BY CUSTOMER, LOCATED BY CUSTOMER'S ENGINEER
8	SUVS	SUPERVISORY SWITCH, (QUENCH BUTTON)	---	---	BY CUSTOMER, LOCATED BY CUSTOMER'S ENGINEER
9	CT	BUILT-IN COUNTER TOP & OPERATOR CHAIRS	---	---	BY CUSTOMER
10	MCB	MAIN CIRCUIT BREAKER, SHUNT TRIP (MRI ONLY)	---	---	BY CUSTOMER, LOCATED BY CUSTOMER'S ENGINEER
11	GECO	GRADIENT POWER SUPPLY & ECO CABINET	16,378	2,195	
12	TFR	TRANSFORMER CABINET & SUPERVISORY UNIT	3,070	600	"SUV" MOUNTS ON TOP OF TRANSFORMER CABINET
13	-----	NOT USED			
14	RFG	REFRIGERATOR CABINET	10,578	220	
15	VRDU	VOLTAGE REGULATING DISTRIBUTION UNIT	14,000	1,778	
16	MFB	MAGNET FAN BOX	343	38	
17	LFB	LINE FILTER BOX, (PEN PANEL)	683	265	MOUNTED BY CUSTOMER'S RF CONTRACTOR
18	FPC	FILTER PANEL COVERS	---	40 & 90	
19	FLS	FLOW SWITCH	---	12	MOUNTED AND PIPED BY CUSTOMER'S CONTRACTOR
20	----	NOT USED - OPTION	---	---	
21	CFP	CHILLER FLOW PANEL, (MANIFOLD)	---	80	MOUNTED BY CUSTOMER'S CONTRACTORS
22	IHE	INDOOR HEAT EXCHANGER	1,200	130	PROVIDED WITH SYSTEM, INSTALLED BY CUSTOMER'S CONTRACTORS ON WALL 48" ABOVE FLOOR.
23	OCU	OUTDOOR CHILLER UNIT, (SEE SHEET M-14)	12,800	1,200	LOCATED BY CUSTOMER, OFF-LOADED, SET, PIPED, AND FILLED BY CUSTOMER'S CONTRACTORS. REFER TO CHILLER MANUFACTURERS MANUAL FOR FURTHER DETAILS.
		OPTIONAL ITEMS, CONFIRM WITH EQUIPMENT ORDER IS ANY OF THESE ITEMS ARE INCLUDED			
	INJ	CONTRAST POWER INJECTOR	REQUIRES CONDUITS AND POWER, NOT SHOWN		
	CTV	CLOSE CIRCUIT TV MONITORING SYSTEM	REQUIRES CONDUITS AND CABLES, NOT SHOWN		
	AWS	ADVANCED WORK STATION	REQUIREMENTS VARY		

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI EQUIPMENT LEGEND

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
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2021-23

SHEET
MR-1

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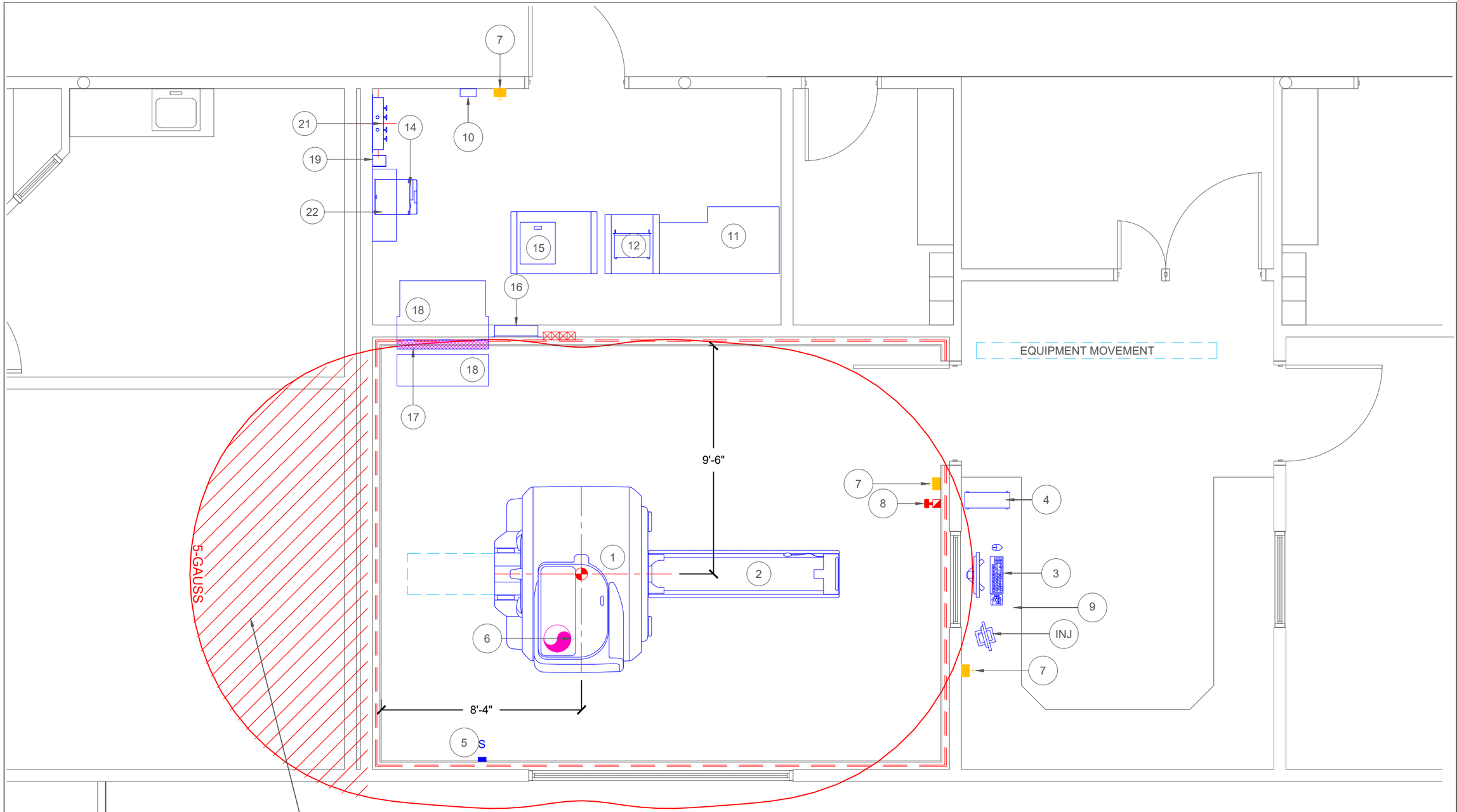

IMPORTANT NOTE

THE SHADED AREAS REPRESENT PROTRUSION OF THE 0.5mT MAGNETIC FIELD, MAGNETIC SHIELDING WILL BE REQUIRED TO CONTAIN THE 0.5Mt FIELD TO THE MRI SCAN ROOM.
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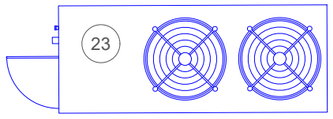

DEDICATED OUTDOOR WATER CHILLER
LOCATION DETERMINED BY CUSTOMER,
ADVISE SITE PLANNER OF LOCATION

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI EQUIPMENT PLACEMENT

PROJECT DATE
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SHEET
MR-2

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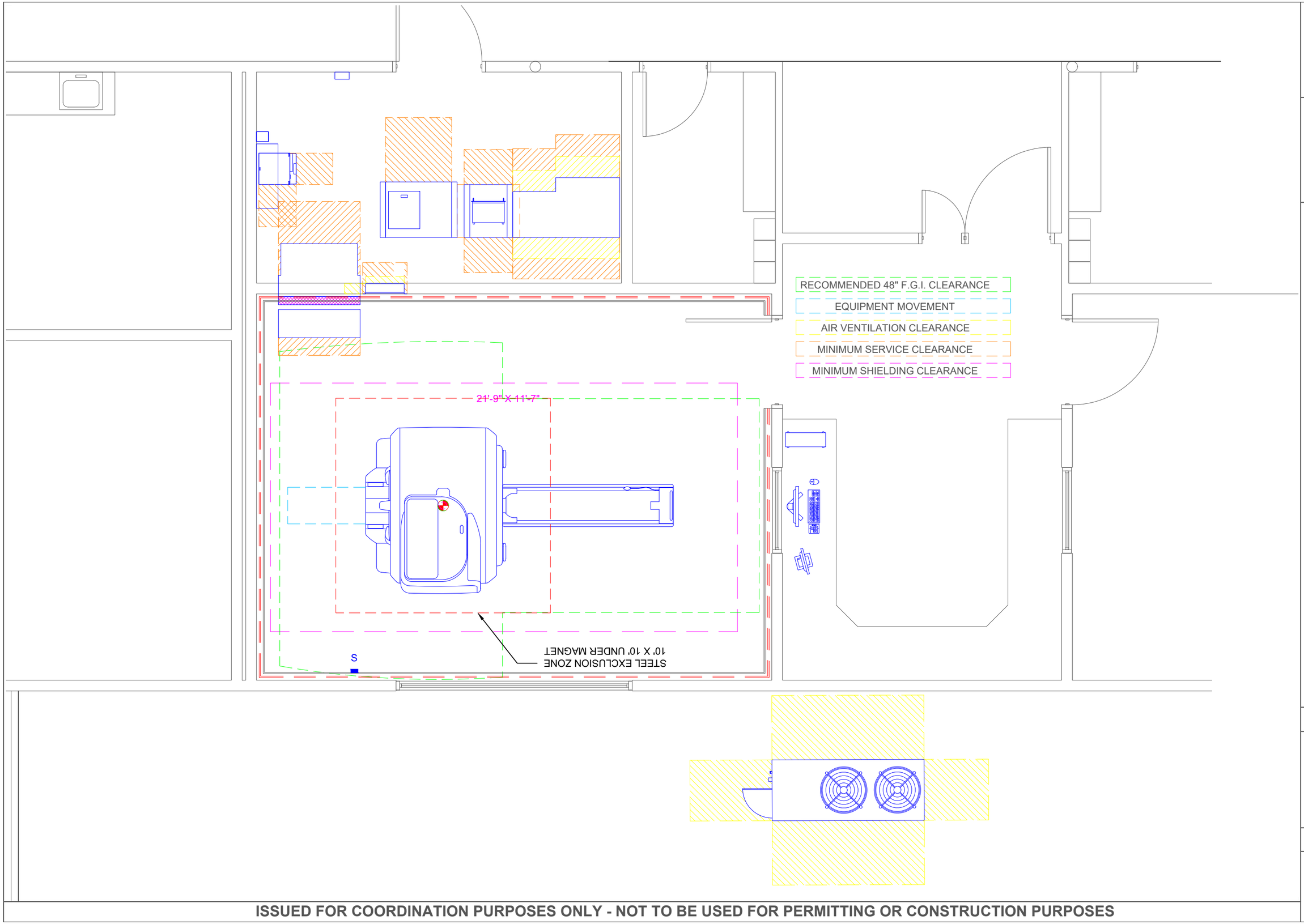

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI EQUIPMENT CLEARANCE

PROJECT DATE
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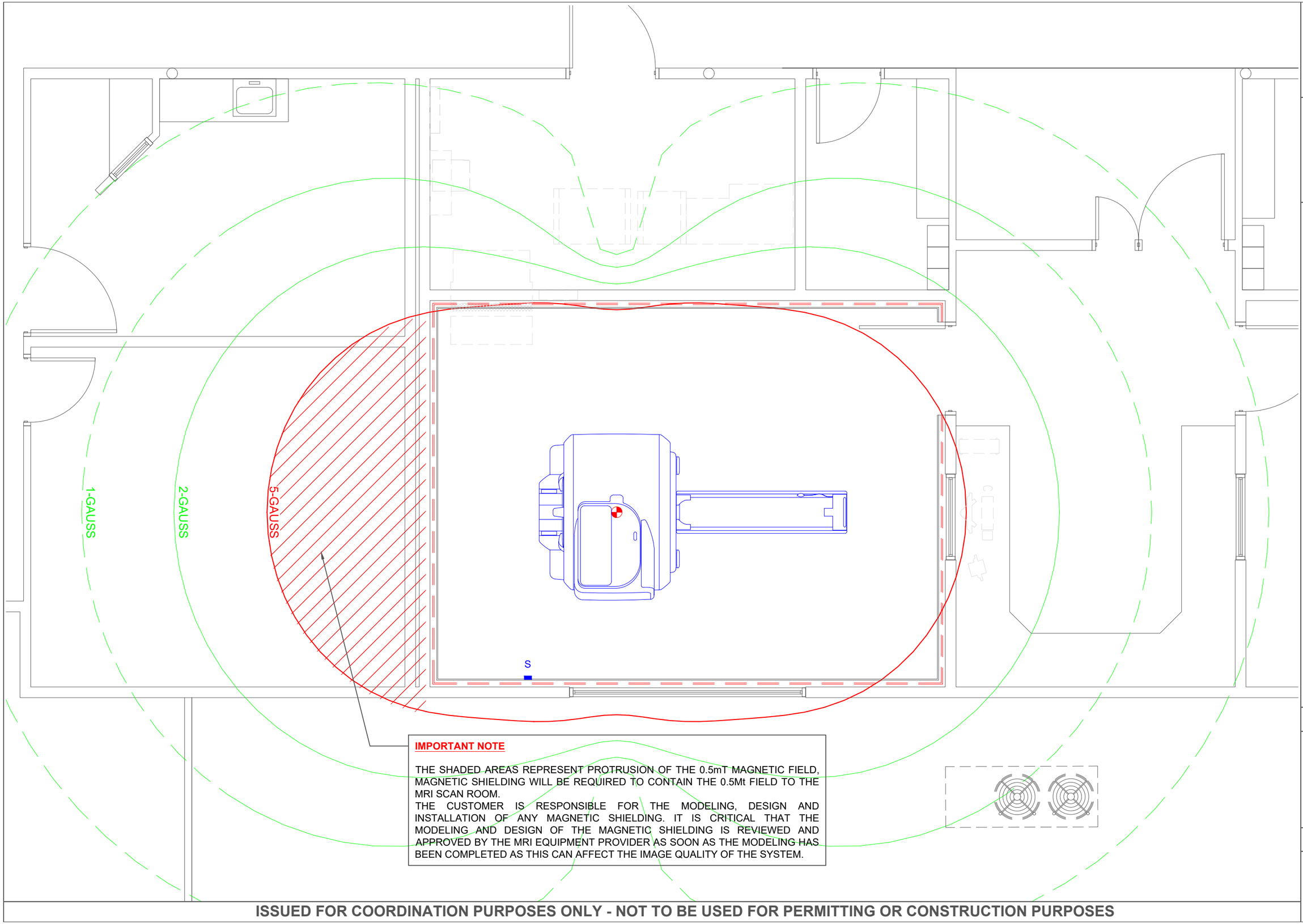

IMPORTANT NOTE

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI GAUSS FIELD PLOT

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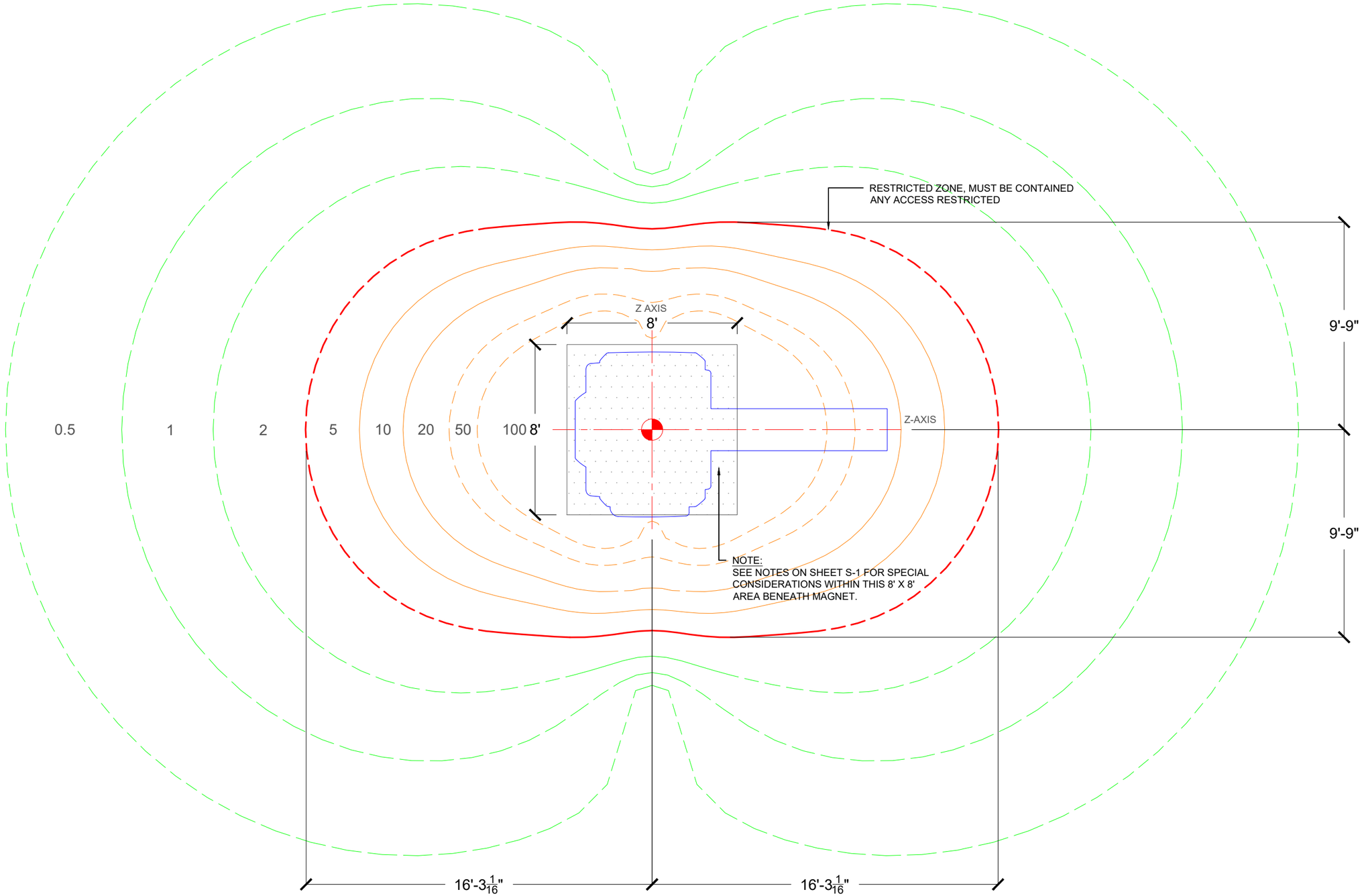
SHEET
MR-4



PLAN VIEW - FRINGE FIELD MEASUREMENTS

CRITICAL COMPLIANCE, THE 5 GAUSS FIELD (SHOWN IN RED) MUST BE RESTRICTED FROM ENTRY BY UNSCREENED HUMANS, IDEALLY WITHIN THE MRI SCAN ROOM, (ACR SAFETY ZONE IV) SOME FORMS OF PHYSICAL CONSTRAINT MAY BE POSSIBLE, CONSULT YOUR EQUIPMENT PROVIDER.

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI GAUSS FIELD - PLAN VIEW

PROJECT DATE
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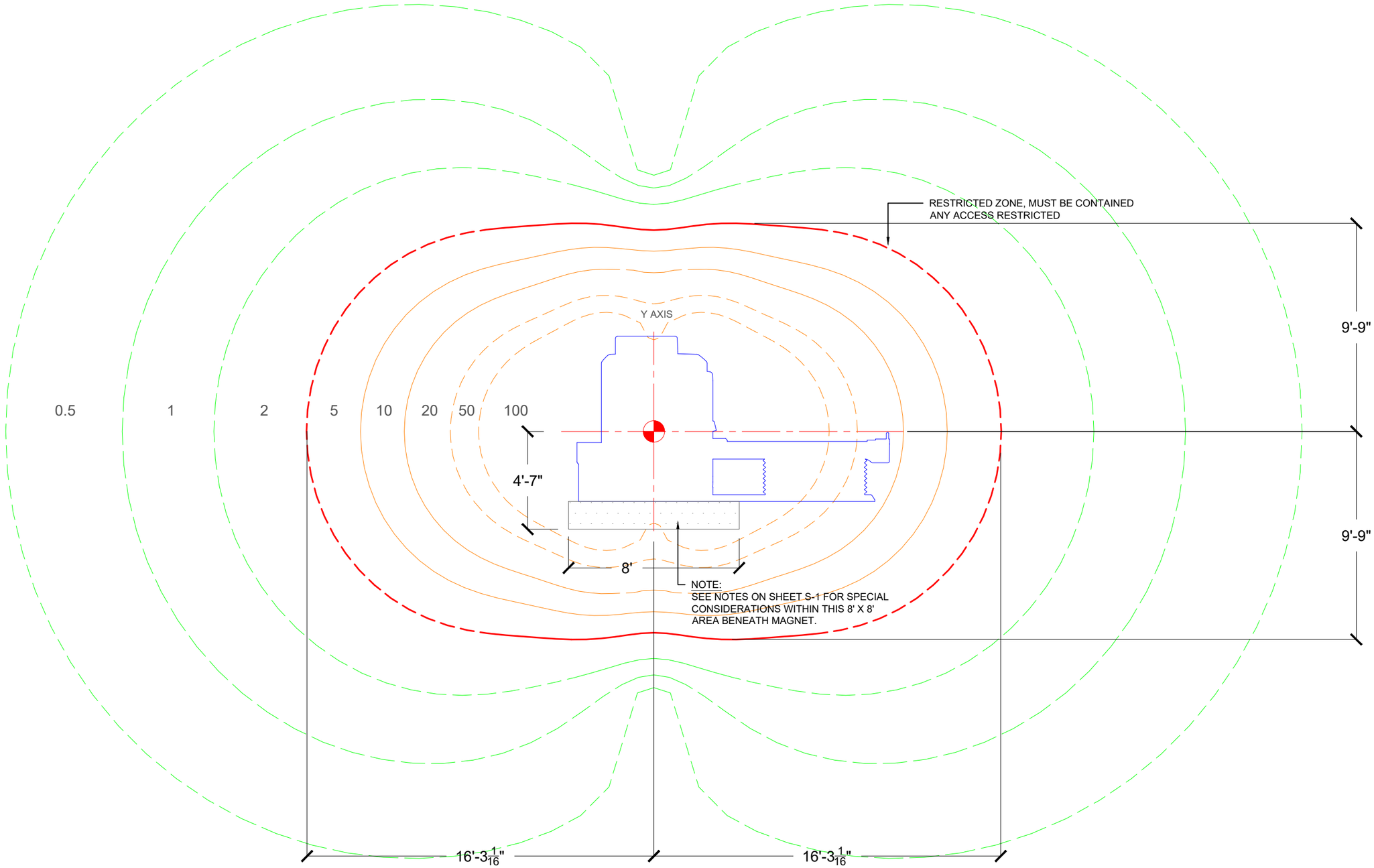
SHEET
MR-5



PLAN VIEW - FRINGE FIELD MEASUREMENTS

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI GAUSS FIELD - ELEVATION

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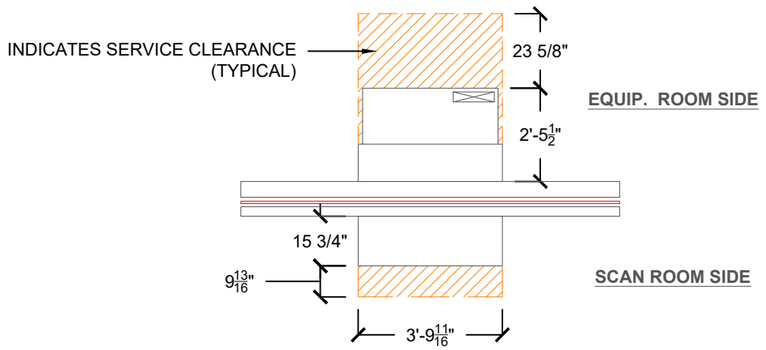
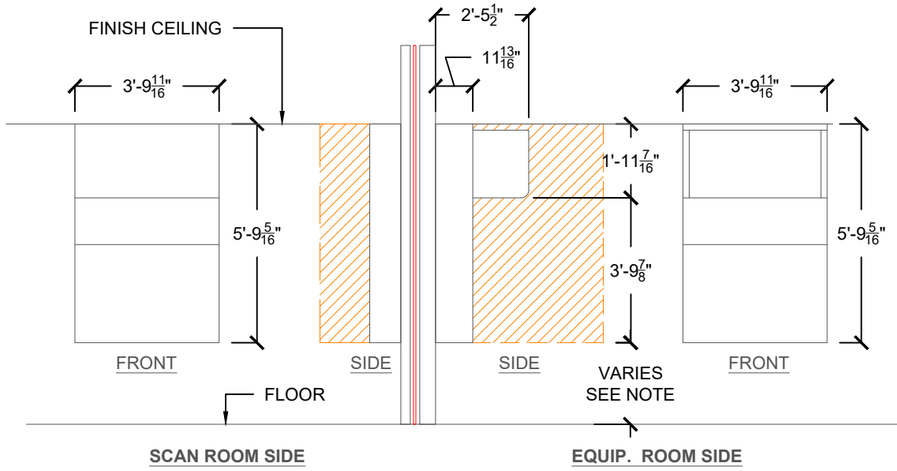


PLAN VIEW OF FILTER PANEL COVERS



ELEVATION OF FILTER PANEL COVERS

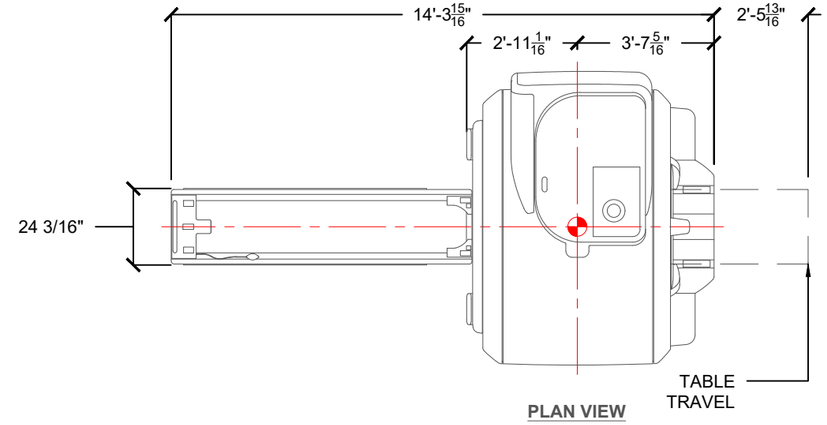
FILTER PANEL COVERS

SCAN SIDE WEIGHT	40LBS
EQUIP SIDE WEIGHT	93LBS

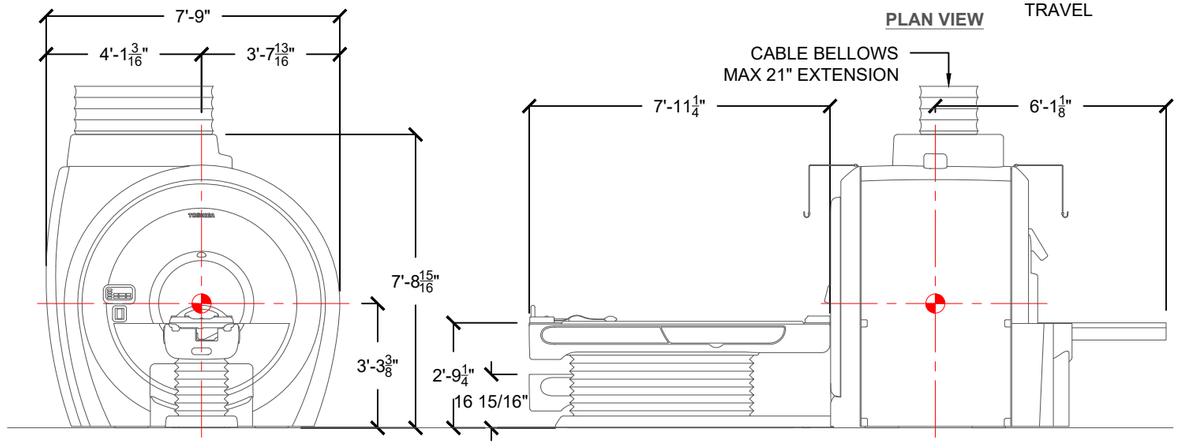
COORDINATION NOTE

THE FILTER PANEL COVERS SHOULD END AT THE FINISHED CEILING WITH A MAX CEILING HEIGHT OF 9'-2 1/2".

THIS WILL DETERMINED THE HEIGHT OF THE FILTER PANEL ABOVE FINISHED FLOOR, COORDINATION IS REQUIRED BETWEEN THE CEILING HEIGHT, THE RF SHIELD CONTRACTOR, THE FILTER PANEL OPENING, AND THE GC FOR THE ROUGH OPENING FOR THE FILTER PANEL.



PLAN VIEW



FRONT ELEVATION

SIDE ELEVATION

TITAN MAGNET AND PATIENT COUCH

HEAT OUTPUT	4,094 BTU'S
MAGNET WEIGHT	11,905 LBS
COUCH WEIGHT	705LBS

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI SYSTEM DETAILS AND NOTES

PROJECT DATE
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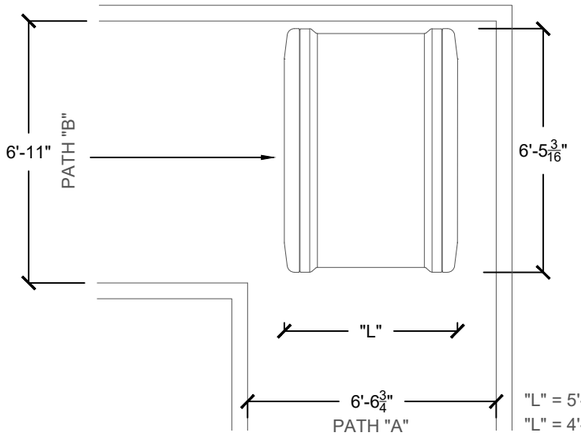


"L" = 5'-10 5/8", PATH = 6'-10 11/16" (ASSEMBLED GANTRY)
"L" = 4'-9 3/4", PATH = 6'-6¾" (MAGNET ONLY)

TRANSPORT REQUIREMENTS

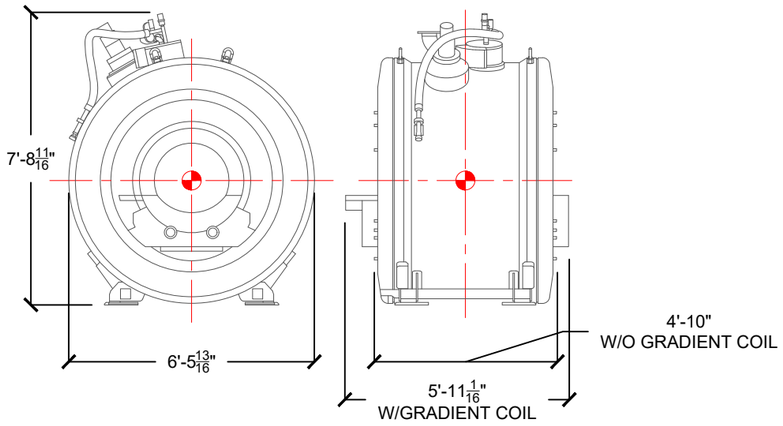
1) EQUIPMENT INGRESS ROUTE MUST BE CHECKED PRIOR TO EQUIPMENT DELIVERY TO INSURE THE LARGEST AND HEAVIEST ITEMS OF EQUIPMENT CAN BE ACCOMMODATED, DIMENSIONS OF CORRIDORS SHOULD BE NO LESS THAN 9'-6" IN WIDTH.

2) RECOMMENDED ENTRANCE TO SCAN ROOM SHOULD BE NO LESS THAN 9'-6"W X 8'-6"H FOR EQUIPMENT DELIVERY. SPECIAL ARRANGEMENTS MAY BE NECESSARY FOR MAGNET DELIVERY, INCLUDING A LARGER OPENING IN THE RF SHIELDING.

TRANSPORT PATH - CORNERS

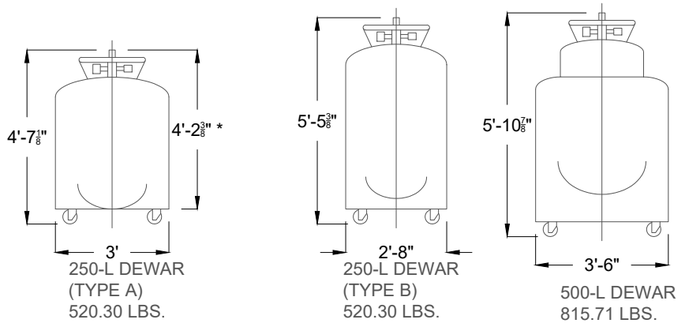
NOTES:

1. IF ORIENTATION IS NOT CHANGED AT THE CORNER, 6'-6 3/4" WIDTH IS SUFFICIENT FOR PATH "A" AND 6'-11" FOR PATH "B".
2. THE LARGEST SINGLE ITEM IS THE MRI MAGNET. IT'S WEIGHT AND SIZE IS INDICATED HEREIN, ALL OPENINGS MUST BE 4" LARGER IN EACH DIRECTION TO ALLOW FOR RIGGING HARDWARE AND CLEARANCES, (8' X 8' MINIMUM IS SUGGESTED).
3. CONSULT RIGGING CONTRACTOR FOR HEIGHT REQUIREMENTS FOR MATERIALS USED TO TRANSPORT MAGNET TO FINAL LOCATION.
   - 3.1. CASTER HEIGHTS WILL VARY.
   - 3.2. CARRYING IN WEIGHT WITHOUT GRADIENT COIL, COVER IS 8,800 LBS (FILLED).
   - 3.3. GRADIENT COIL WEIGHT IS 1,874 LBS



FRONT **SIDE**

MAGNET ASSEMBLY FOR RIGGING



HELIUM DEWAR PLANNING

HELIUM DEWAR NOTES

1. THE SIZE OF A LHe DEWAR DIFFERS ACCORDING TO SUPPLIER. BE SURE TO CHECK THE SHAPE OF THE DEWAR IN ADVANCE.
2. BE SURE TO USE A NON-MAGNETIC DEWAR (STAINLESS STEEL, ALUMINUM).
3. 11'-9 3/4" CLEARANCE IS REQUIRED TO INSERT THE TRANSFER TUBE INTO THE HELIUM CONTAINER.
4. ENSURE THE DEWARS HAVE A CLEAR DELIVERY PATH TO MAGNET (CONSIDER DOORS, HALLWAYS, ELEVATORS, ETC.).
5. SET ASIDE AREA FOR HELIUM DEWAR STORAGE DURING INSTALLATION.

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI SYSTEM DETAILS AND NOTES

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FILENAME
2021-23

SHEET
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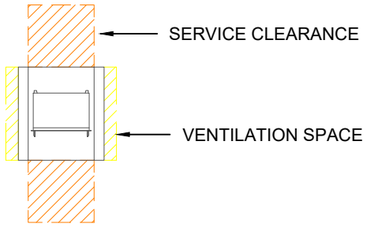
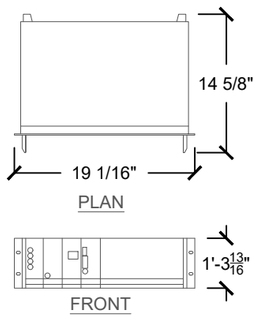


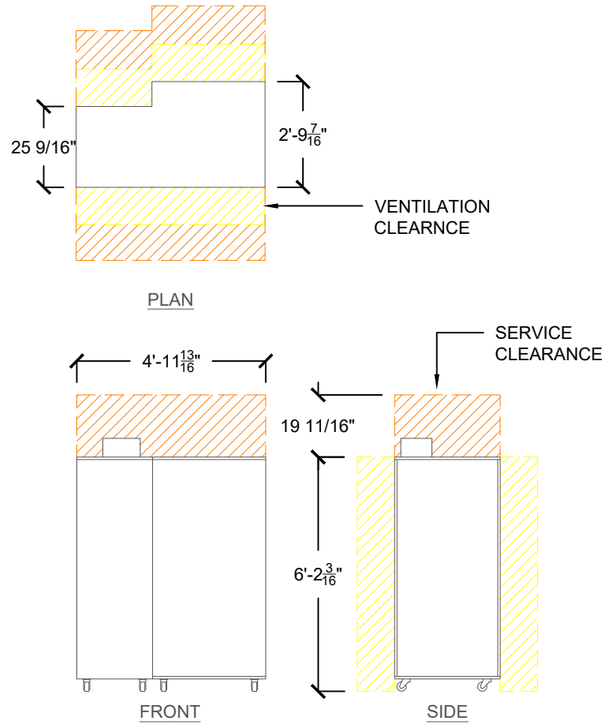
TRANSFORMER CABINET, (TFR)

HEAT OUTPUT 3,071 BTU'S
WEIGHT 574 LBS



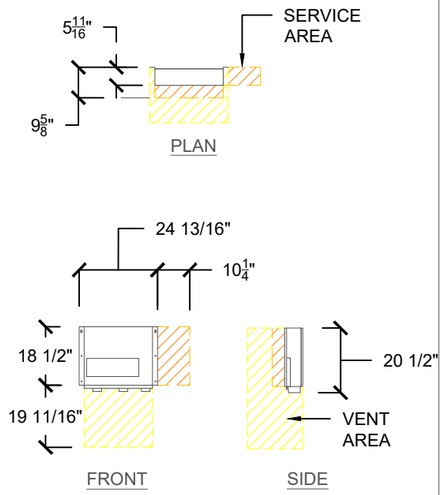
SUPERVISORY UNIT, (SUVU)

HEAT OUTPUT 0 BTU'S
WEIGHT 25 LBS



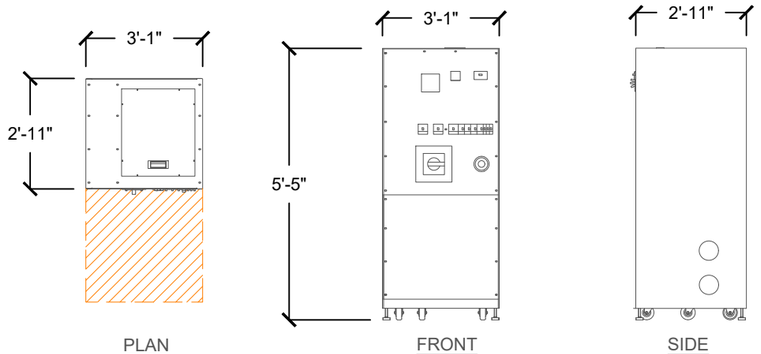
GRADIENT POWER SUPPLY/ECO CABINET

HEAT OUTPUT 16,378 BTU'S
WEIGHT 2,160 LBS



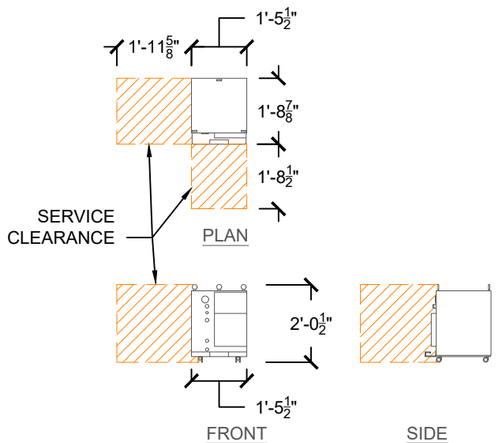
MAGNET FAN BOX, (MFB)

HEAT OUTPUT 683 BTU'S
WEIGHT 38 LBS



VOLTAGE REGULATING DISTRIBUTION UNIT, (VRDU)

HEAT OUTPUT 14,000 BTU'S
WEIGHT 1,778 LBS



REFRIGERATOR CABINET, (RFG)

HEAT OUTPUT 10,577 BTU'S
WEIGHT 221 LBS

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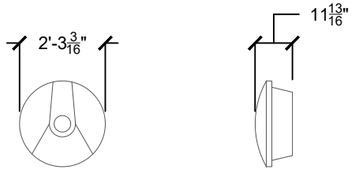
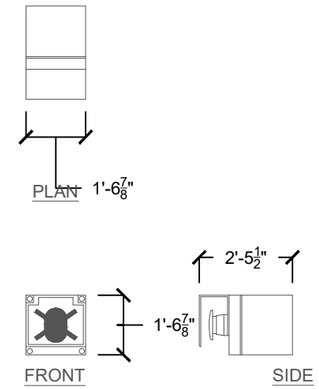


ALARM BOX, (ALRM)

HEAT OUTPUT	0 BTU'S
WEIGHT	5 LBS

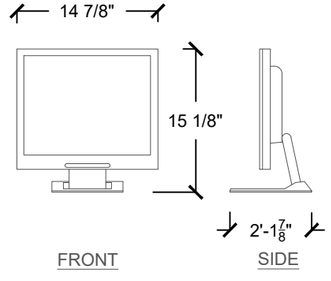


SUPERVISORY UNIT SWITCH, (SUSW)

HEAT OUTPUT	0 BTU'S
WEIGHT	25 LBS

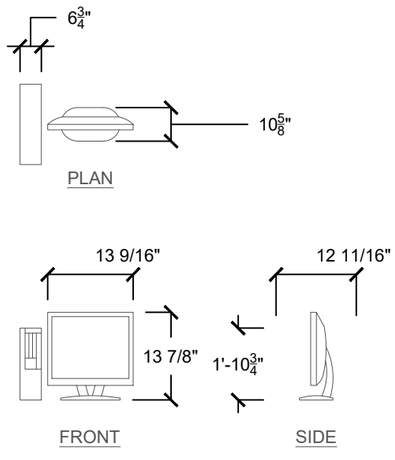
NOTE:

DESK OR BUILT-IN COUNTER TOP IS REQUIRED, FURNISHED AND INSTALLED BY CUSTOMER.



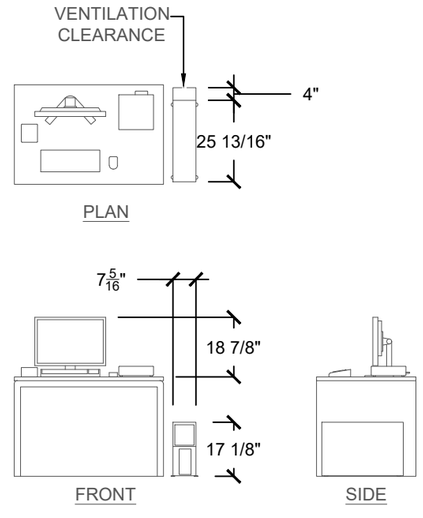
PATIENT OBSERVATION MONITOR, (POSM)

HEAT OUTPUT	0 BTU'S
WEIGHT	10 LBS



INNERVISION WORKSTATION

HEAT OUTPUT	500 BTU'S
WEIGHT	22 LBS



CONTROL CONSOLE & HOST, (CON) (HOST)

HEAT OUTPUT	2,388 BTU'S
WEIGHT	86 LBS

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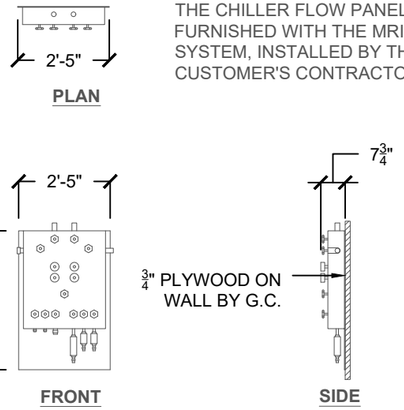
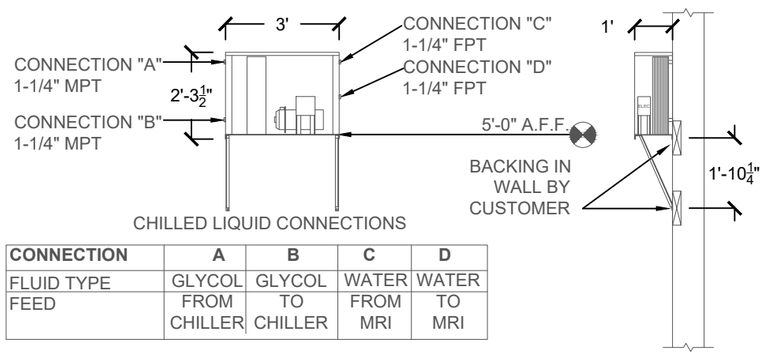
NOTE

THE CHILLER FLOW PANEL IS FURNISHED WITH THE MRI SYSTEM, INSTALLED BY THE CUSTOMER'S CONTRACTOR.



CHILLER FLOW PANEL, (CFP)

HEAT OUTPUT	0 BTU'S
WEIGHT	32 LBS



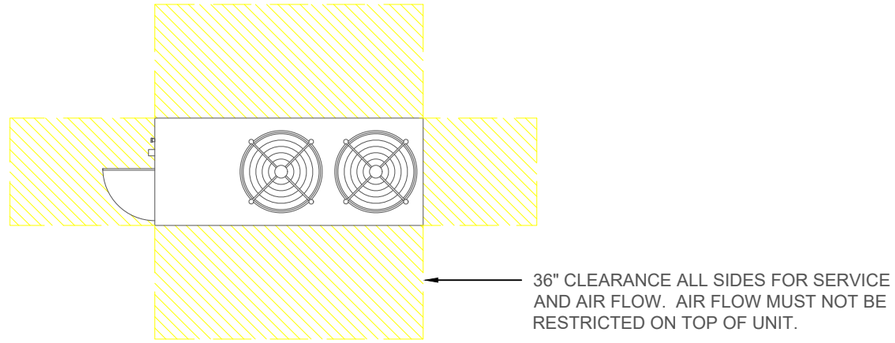
CONNECTION	A	B	C	D
FLUID TYPE	GLYCOL	GLYCOL	WATER	WATER
FEED	FROM CHILLER	TO CHILLER	FROM MRI	TO MRI

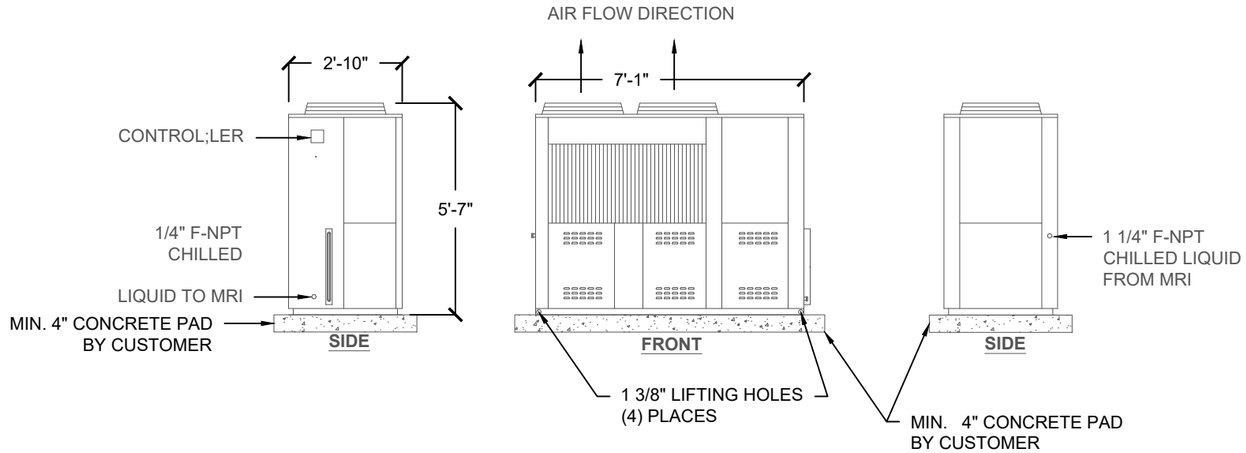
INDOOR HEAT EXCHANGER, (IHE)

DRAKE MODEL D500-854

HEAT OUTPUT	1,100 BTU'S
WEIGHT	130 LBS

REFER TO MANUFACTURER REQUIREMETNS FOR ELECTRICAL POWER SUPPLY





OUTDOOR CHILLER UNIT, (OCU)

DRAKE MODEL:	PACT 78S2-T3-ZT
HEAT OUTPUT:	SEE MANUFACTURE SPECS
WEIGHT:	SEE MANUFACTURE SPECS

VERIFY WITH CUSTOMER AND SALES ORDER TO CONFIRM THE CHILLER IS INCLUDED WITH THE MRI SYSTEM !

CONFIRM CHILLER BEING PROVIDED/USED IS THE CHILLER SHOWN HERE

CHILLER NOTES

1. IF CHILLER IS INCLUDED IN SALES ORDER, IT WILL BE SHIPPED IN ADVANCE OF THE MRI SYSTEM TO THE JOB SITE WITH THE INDOOR HEAT EXCHANGER AND CHILLER FLOW PANEL TO BE UNLOADED, SET, PIPED TO THE INDOOR HEAT EXCHANGER INSIDE THE EQUIPMENT ROOM, AND FILLED WITH WATER/GLYCOL BY THE CUSTOMER'S CONTRACTORS.
2. DRAKE CHILLER WATER RESERVOIR IS 60 GALLONS, TOTAL SYSTEM VOLUME MUST INCLUDE PIPING, CONTRACTOR TO PROVIDE PROPER WATER/GLYCOL MIX PER MANUFACTURER.
3. THE CHILLER MUST BE INSTALLED ON A RAISED CONCRETE HOUSEKEEPING PAD AT LEAST 6" LARGER THAN THE CHILLER ON ALL SIDES.
4. A 120V CONVENIENCE OUTLET MUST BE LOCATED NEAR THE CHILLER.
5. A WATER SOURCE MUST BE AVAILABLE WITHIN 50' OF THE CHILLER.
6. A SERVICE DISCONNECT MUST BE WITHIN 5'-0" OF THE CHILLER.

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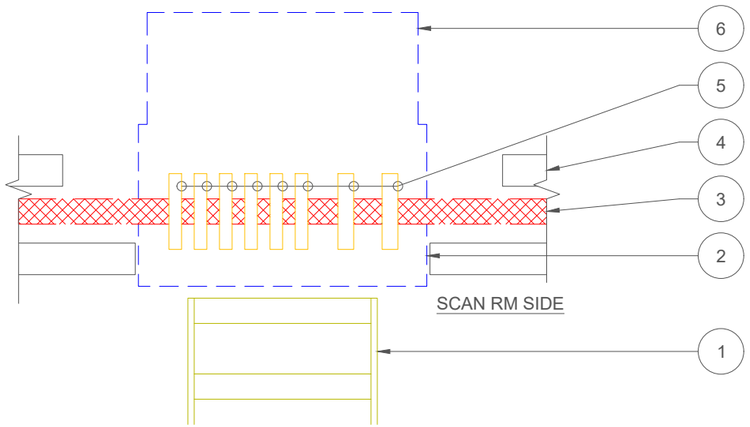
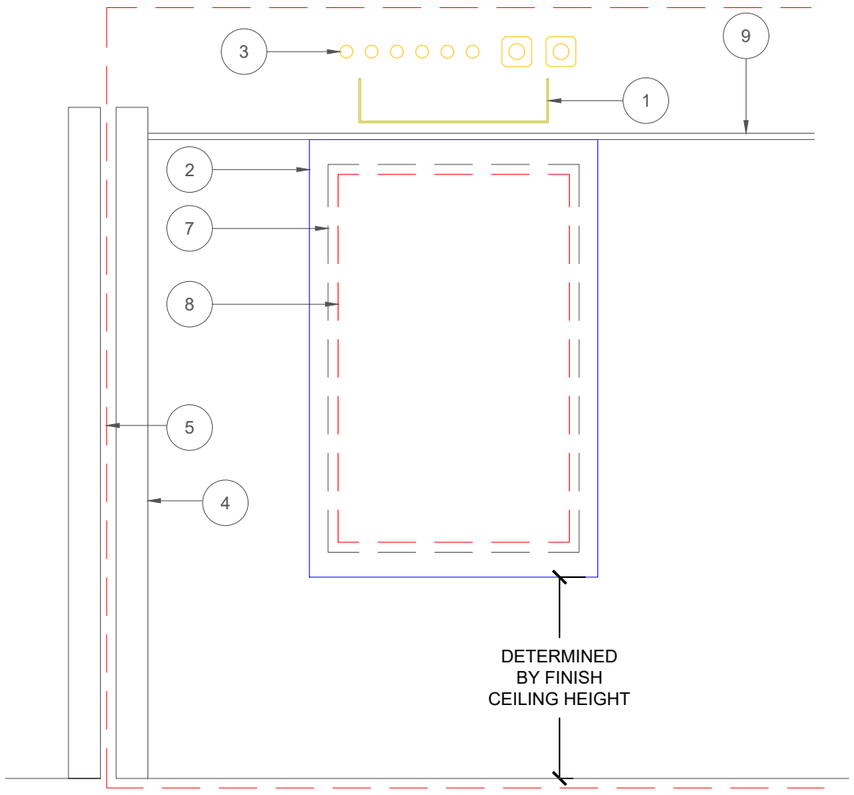
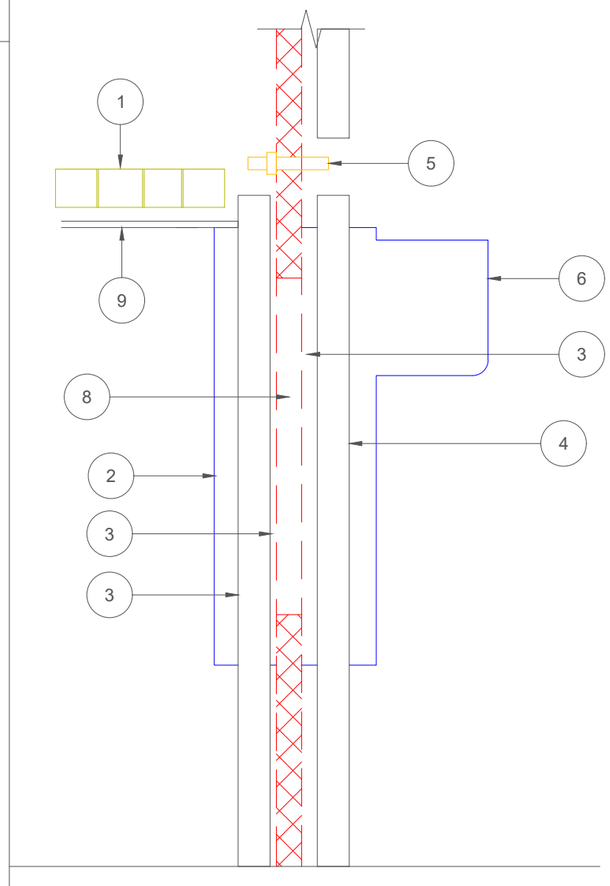


PLAN VIEW

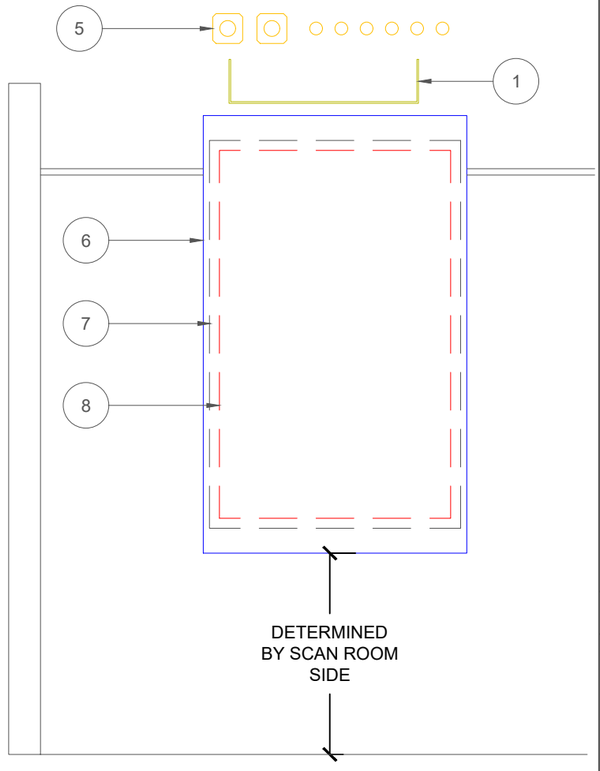
DETAIL LEGEND	
1	CABLE LADDER TRAY (SCAN ROOM SIDE).
2	FILTER PANEL COVER ON SCAN ROOM SIDE.
3	RF SHIELD (THICKNESS VARIES PER MANUFACTURER).
4	PARENT WALL.
5	WAVE GUIDES (SEE DETAILS SHEET M-6, FURNISHED & INSTALLED BY RF CONTRACTOR)
6	FILTER PANEL COVER ON EQUIPMENT ROOM SIDE.
7	INSTALLATION SURFACE OF THE FILTER PANEL (SEE DETAIL THIS SHEET)
8	OPENING FOR LINE FILTER PANEL (3'-0 5/8" WIDE X 4'-10 1/4" HIGH).
9	FINISHED CEILING



ELEVATION SCAN ROOM SIDE



SIDE ELEVATION



ELEVATION EQUIP. ROOM SIDE

FILTER PANEL DETAILS

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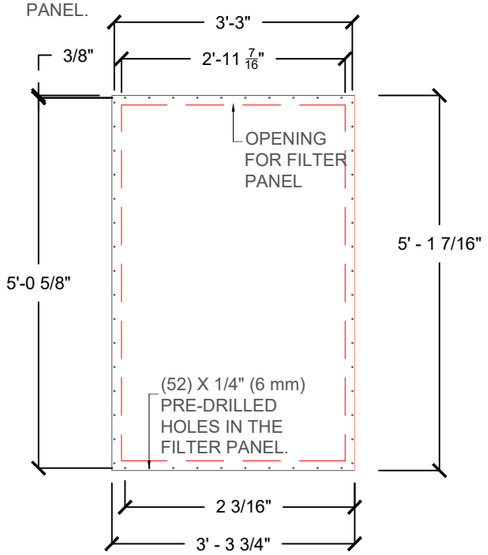
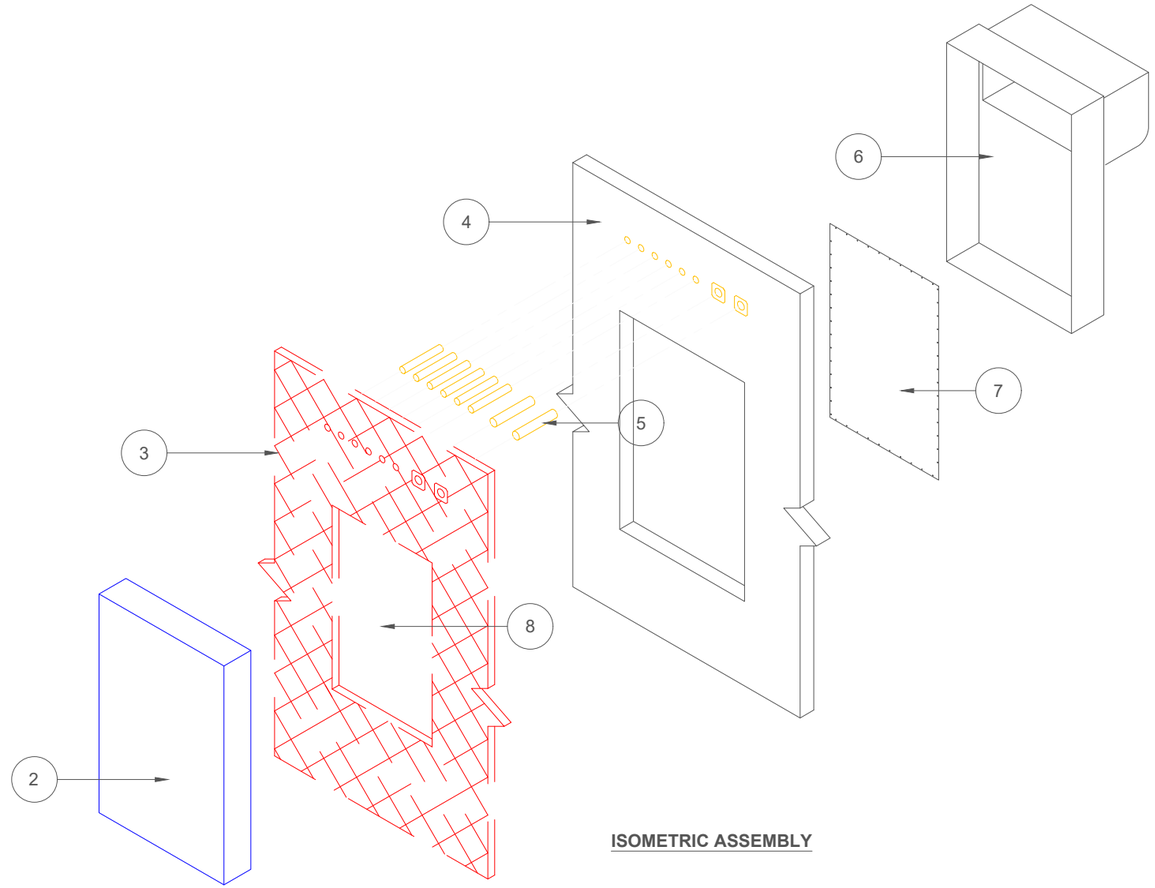
CUSTOMER / CONTRACTOR SUPPLIED RF FILTERS TO BE LOCATED AS CLOSE AS POSSIBLE TO TOSHIBA FILTER PANEL.



INSTALLATION SURFACE FOR THE FILTER PANEL
INSTALLED BY RF CONTRACTOR, RF VENDOR TO SUPPLY RF GASKET FOR FILTER PANEL.



ISOMETRIC ASSEMBLY

DETAIL LEGEND	
1	CABLE LADDER TRAY (SCAN ROOM SIDE).
2	FILTER PANEL COVER ON SCAN ROOM SIDE.
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4	PARENT WALL.
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9	FINISHED CEILING

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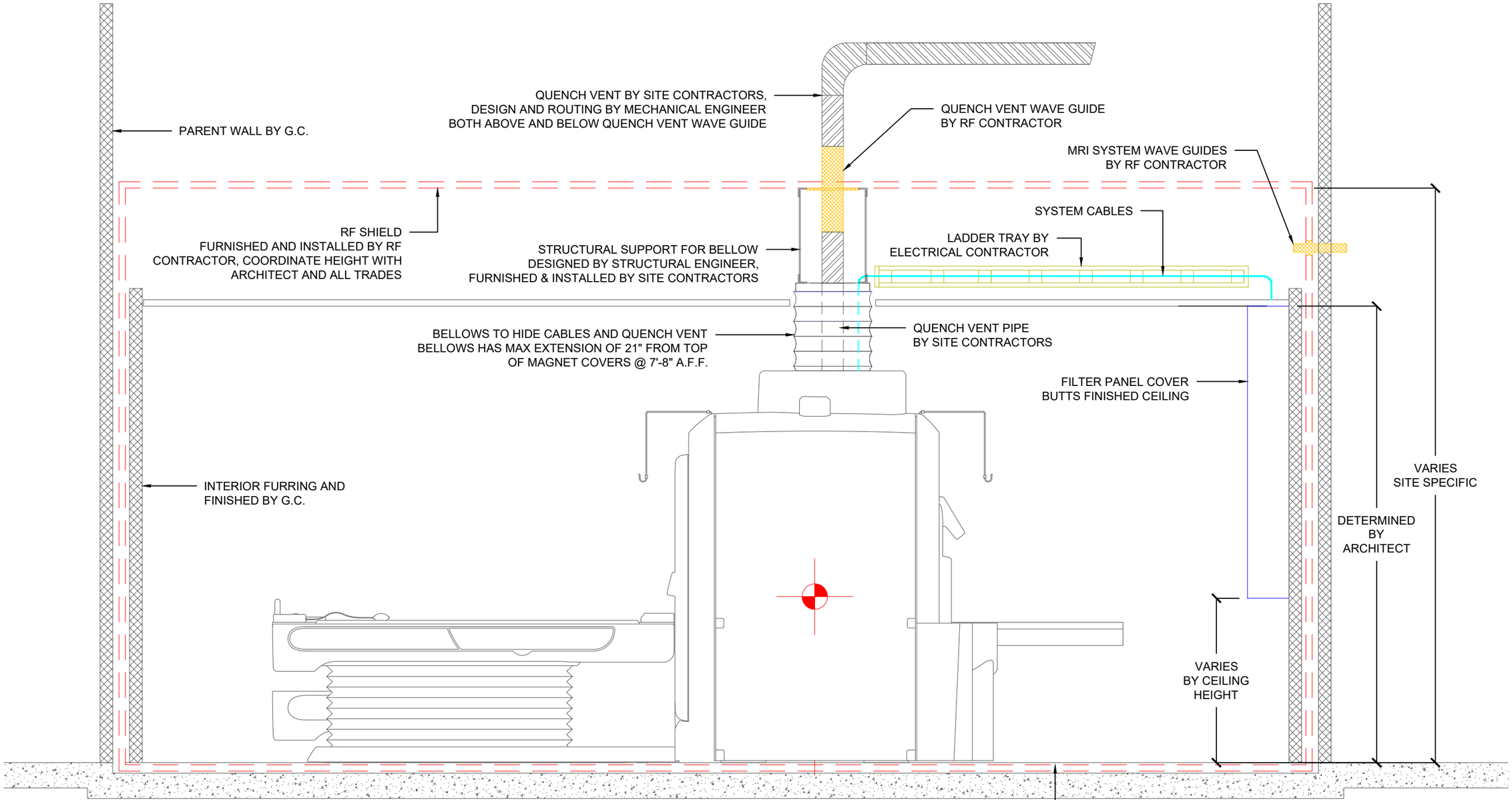

CROSS SECTION
TYPICAL SCAN ROOM

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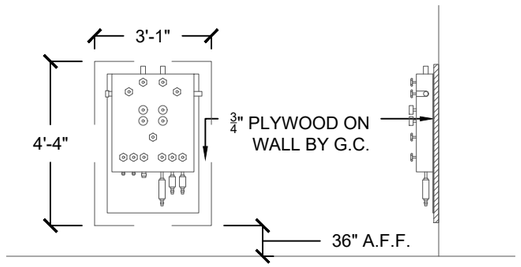
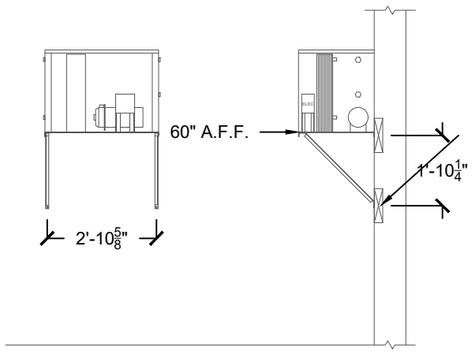
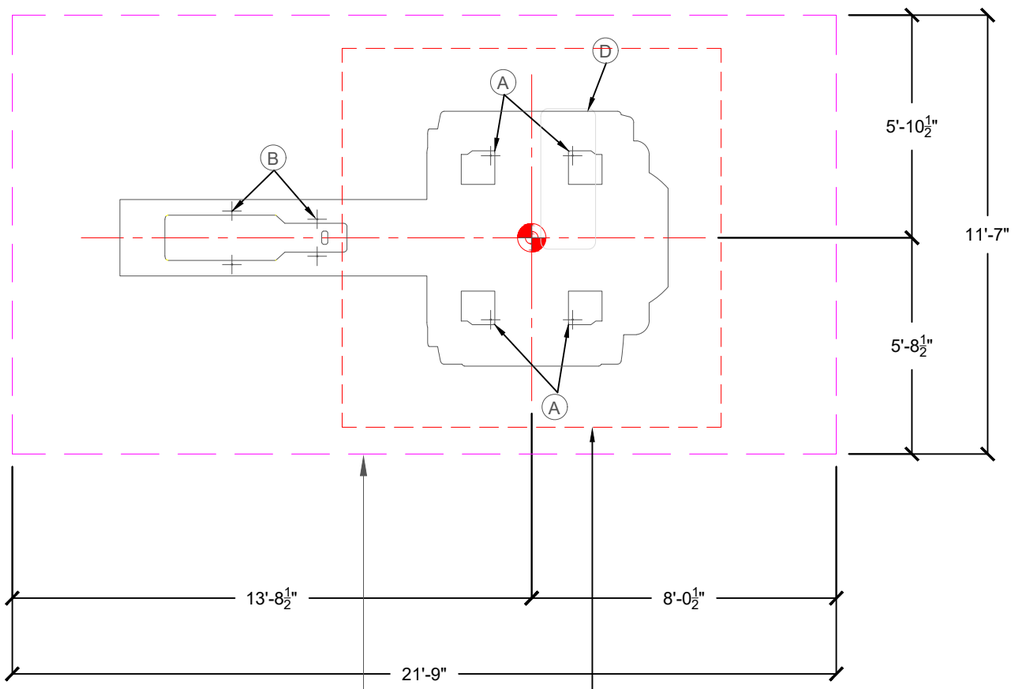


CHILLER MANIFOLD SUPPORT
SURFACE MOUNTED PLYWOOD DETAIL



INDOOR HEAT EXCHANGER SUPPORT
CONCEALED BLOCKING DETAIL

SUPPORTS DESIGNED BY STRUCTURAL ENGINEER, FURNISHED AND INSTALLED BY SITE CONTRACTORS



STEEL EXCLUSION ZONE OF MAGNET

ALL EXISTING AND PROPOSED MAGNETIC STEEL PLACEMENTS (IN THE WALLS ONLY) MUST BE LOCATED OUTSIDE THIS EXCLUSION AREA

STEEL EXCLUSION ZONE UNDER THE MAGNET

ON FERROUS METAL, INCLUDING REBAR, UNDER MAGNET IN 10' X 10' AREA.

STRUCTURAL SUPPORT LEGEND

ITEM	DESCRIPTION
A	SUPPORT BASE FOR MRI MAGNET, FURNISHED AND INSTALLED BY RF VENDOR
B	MAGNET COUCH SUPPORT, FURNISHED AND INSTALLED BY RF VENDOR
C	BACKING FOR MANIFOLD, FURNISHED AND INSTALLED BY G.C., LOCATED IN EQUIPMENT ROOM
D	BELLOWS SUPPORT AT CEILING, FURNISHED AND INSTALLED BY G.C.

STRUCTURAL NOTES

1. THE LOCATION OF EXISTING AND PROPOSED STRUCTURAL STEEL ITEMS WERE NOT SPECIFIED AT THE TIME THESE SITE PLANS WERE GENERATED. EXISTING AND PROPOSED STRUCTURAL AND ENVIRONMENTAL STEEL INFORMATION WITH RELATIONSHIP TO MAGNET MUST BE PROVIDED TO SITE PLANNING FOR REVIEW. ALL STRUCTURAL AND ENVIRONMENTAL STEEL SHOULD BE IDENTIFIED INCLUDING, BUT NOT LIMITED TO, REBAR, BEAMS, PIPES, DRAINS, AND ANY STEEL USED FOR MAGNETIC SHIELDING. (FOR ALL WALLS, CEILING AND FLOOR).
2. THE MAGNET ENVIRONMENT IS SENSITIVE TO FERROUS MATERIAL, WHICH CAN AFFECT IMAGE QUALITY. THE MOST SENSITIVE AREA IS WITHIN A 10' X 10' AREA BENEATH THE MAGNET TO A DEPTH OF 1'-4". THESE SITE PLANS MUST BE CONSIDERED TENTATIVE UNTIL THIS INFORMATION IS PROVIDED. THE FINAL SITTING OF THE MAGNET AND EQUIPMENT MAY BE AFFECTED BY ANY EXISTING OR PROPOSED STRUCTURAL STEEL OR STEEL SHIELDING. THE CUSTOMER IS RESPONSIBLE FOR ANY ASSOCIATED CONSTRUCTION THAT MAY RESULT. IT IS HIGHLY RECOMMENDED TO USE FIBER-MESH REINFORCING IN THE CONCRETE IN THE 10' X 10' AREA BELOW THE MAGNET RATHER THAN FERROUS REINFORCING.
3. ALL EXISTING AND PROPOSED MAGNETIC STEEL PLACEMENTS (IN THE WALLS ONLY) MUST BE LOCATED OUTSIDE THE INDICATED EXCLUSION AREA, SEE GENERAL NOTES AND DETAILS.
4. THESE SITE PLANS ARE INTENDED TO DEPICT ONLY A CONCEPT OF THE STRUCTURE REQUIRED FOR THE TOSHIBA EQUIPMENT. THE DESIGN OF ALL STRUCTURAL ELEMENTS MUST BE SPECIFIED BY A LICENSED STRUCTURAL ENGINEER IN ACCORDANCE WITH TOSHIBA SPECIFICATIONS AND ALL APPLICABLE CODES.
5. THE CUSTOMER/CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND PROPOSED DIMENSIONS AND SITE CONDITIONS PRIOR TO COMMENCING CONSTRUCTION.
6. THE INSTALLATION PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY FIELD CONDITIONS ENCOUNTERED THAT ARE CONTRADICTORY TO THOSE SHOWN IN THESE SITE PLANS.
7. THE DEMOLITION, FABRICATION AND ERECTION OF SUPPORT STRUCTURES FOR TOSHIBA EQUIPMENT SHALL BE PERFORMED BY THE CUSTOMER/CONTRACTOR IN ACCORDANCE WITH THE DESIGN AND SPECIFICATIONS SET FORTH BY THE STRUCTURAL ENGINEER OF RECORD.
8. VANTAGE TITAN MAGNET FEET MUST BE INSULATED - ISOLATED FROM SHIELDED ROOM. ALL INSULATION - ISOLATION FOR MAGNET FEET TO BE PROVIDED BY CUSTOMER OR CONTRACTOR. IT IS RF VENDOR'S RESPONSIBILITY TO ANCHOR THE MAGNET.
9. ALL STRUCTURAL MATERIAL IN SCAN ROOM MUST BE NON-FERROUS.
10. THE FLOOR MUST SUPPORT 11,904.96 LBS. FOR THE MAGNET, INCLUDING THE COVERS AND THE GRADIENT COIL. THE COMPLETE FLOOR MUST WITHSTAND A MAXIMUM CONCENTRATED MAGNET LOAD OF 3,903.27 LBS. PER SQUARE FOOT (2,976.24 LBS. PER MAGNET FOOT). THE FLOOR MUST BE ABLE TO WITHSTAND BOTH THE MAGNET AND THE WEIGHT OF THE MAGNETIC SHIELDING.

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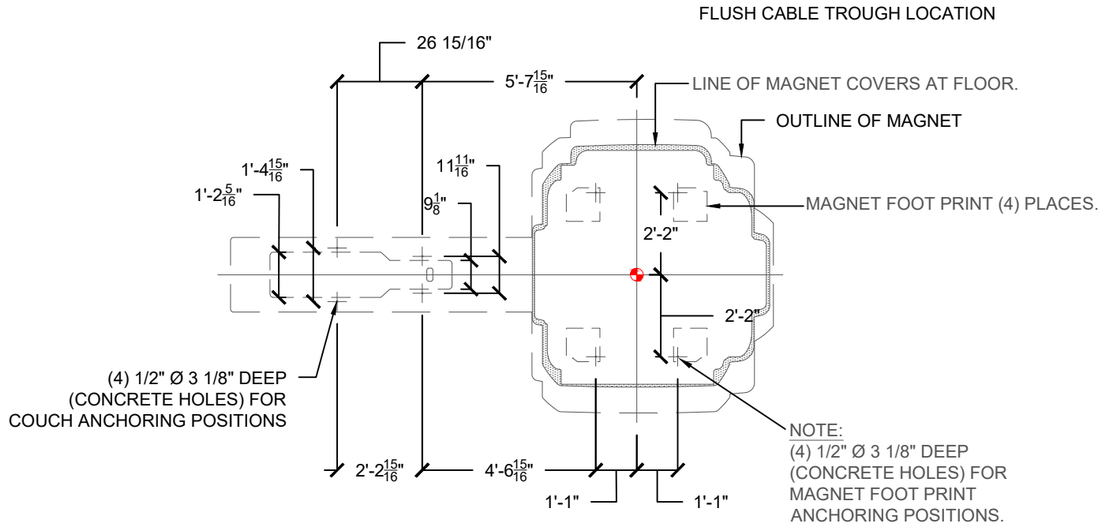
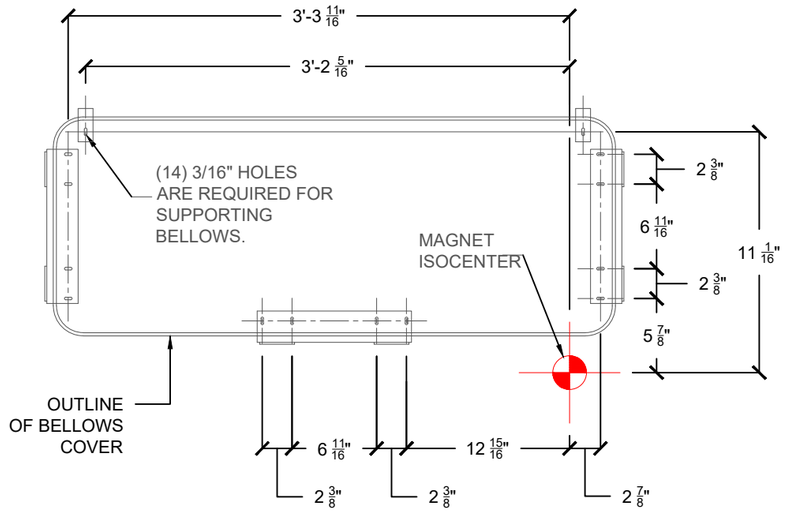
NOTES

1. IN CASE OF FIRE, THE FINISH MATERIAL OF THE FLOOR MUST BE NONFLAMMABLE AND HIGHLY FIRE RESISTANT, IN ORDER TO PREVENT THE FIRE FROM SPREADING.
2. FLOOR IN THIS AREA TO BE LEVEL WITHIN 1/16" OVER ENTIRE AREA.
3. THE FLOOR MUST SUPPORT 11,904.96 LBS. FOR THE MAGNET, INCLUDING THE COVERS AND THE GRADIENT COIL. THE COMPLETE FLOOR MUST WITHSTAND A MAXIMUM CONCENTRATED LOAD OF 3,796.04 LBS. PER SQUARE FOOT (2,976.24 LBS. PER MAGNET FOOT). THE FLOOR MUST BE ABLE TO WITHSTAND BOTH THE MAGNET AND THE WEIGHT OF THE MAGNETIC SHIELDING.
4. IT IS THE RF VENDOR'S RESPONSIBILITY TO PROVIDE BOLTS AND ANCHOR THE MAGNET.
5. IT IS THE CUSTOMER'S RESPONSIBILITY TO MEET SEISMIC REQUIREMENTS (IF NECESSARY).
6. ALL EXISTING AND PROPOSED MAGNETIC STEEL PLACEMENTS (IN THE WALLS ONLY) MUST BE LOCATED OUTSIDE THIS EXCLUSION AREA (13'-1 1/2" X 22'-5 7/16").
7. THE MAGNET ENVIRONMENT IS SENSITIVE TO FERROUS MATERIAL, WHICH CAN AFFECT IMAGE QUALITY. THE MOST SENSITIVE AREA IS WITHIN A 10' X 10' AREA BENEATH THE MAGNET TO A DEPTH OF 1'-4". CONTACT YOUR INSTALLATION PROJECT MANAGER TO HAVE A STEEL SURVEY COMPLETED TO EVALUATE SITE SPECIFIC CONDITIONS.
8. ALL MATERIALS IN THE SCAN ROOM MUST BE NON-FERROUS.



MAGNET FOOTPRINT AND COUCH LAYOUT



MAGNET BELLOWS SUPPORT DETAIL

BELLOWS WEIGHT IS 9LBS

BELLOWS NOTES

1. THE BELLOWS FOR HIDING CABLES WILL BE SECURED TO THE CEILING. IT IS THEREFORE NECESSARY TO SUPPORT THE BELLOWS WITH APPROPRIATE STRUCTURAL SUPPORT. THE STRUCTURAL SUPPORT IS TO BE DESIGNED BY THE CUSTOMERS STRUCTURAL ENGINEER AND FURNISHED AND INSTALLED BY THE CUSTOMER/CONTRACTOR.
2. USE THE MAGNET ISOCENTER AS A REFERENCE POSITION FOR LOCATING THE STRUCTURAL SUPPORT FOR THE BELLOWS.

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Unit A
Highland Heights, Ohio
(888) 505-0319

EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

STRUCTURAL DETAILS AND NOTES

PROJECT DATE
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REVISION HISTORY
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HVAC NOTES:

1. FINAL HEAT OUTPUT OF EQUIPMENT ROOM MUST INCLUDE SITE SPECIFIC POWER SYSTEM AND ANY OPTIONAL ITEMS. SEE PURCHASE AGREEMENT AND THE MRI EQUIPMENT LEGEND FOR HEAT OUTPUT OF YOUR SPECIFIC EQUIPMENT'S CONFIGURATION AND ANY OPTIONAL ITEMS BEING PROVIDED.
2. A MINIMUM OF 10 AIR CHANGES PER HOUR IS SUGGESTED, ALL HVAC SYSTEMS TO BE DESIGNED, FURNISHED AND INSTALLED BY CUSTOMER'S DESIGN TEAM AND CONTRACTORS.
3. AIR SUPPLY DUCTS SHOULD NOT BE PLACED DIRECTLY OVER EXAMINATION TABLES FOR PATIENT COMFORT.
4. EQUIPMENT IN ENCLOSED SPACES SUCH AS EQUIPMENT ROOMS, TRANSFORMER CLOSETS AND COMPUTER ROOMS MUST BE PROVIDED WITH ADEQUATE VENTILATION. THE AIRFLOW THROUGH TOSHIBA EQUIPMENT CABINETS IS FROM BOTTOM TO TOP. WHERE POSSIBLE, AIR CONDITIONING SUPPLY OUTLETS SHOULD BE LOCATED AT FLOOR LEVEL WITH RETURN GRILLES IN THE CEILING.
5. A DEDICATED AIR CONDITIONER IS REQUIRED FOR SCAN AND EQUIPMENT ROOM TO MAINTAIN THE PROPER TEMPERATURE AND HUMIDITY 24-7-365.
6. AIR CONDITIONING EQUIPMENT MUST HAVE THE ABILITY TO AUTOMATICALLY RESTART IN THE CASE OF A POWER OUTAGE.
7. THE EQUIPMENT ROOM MUST NOT HAVE SUPPLY AIR OR MAKE-UP AIR COMING FROM OUTSIDE DUE TO THE POSSIBLE RISE OF HUMIDITY. HUMIDITY RANGE SHOWN IS CRITICAL, NO CONDENSATION MUST BE ALLOWED.
8. AIR CONDITIONING UNIT OR FAN MUST NOT BE INSTALLED INSIDE OF THE MRI SCAN ROOM OR WITHIN THE RF SHIELD.
9. THE AIR CONDITIONING SENSOR FOR THE MRI SCAN ROOM SHOULD BE LOCATED IN A RETURN DUCT. DO NOT LOCATE THERMOSTAT OR SENSORS INSIDE RF CABIN.
10. ALL MATERIAL INSIDE THE MRI SCAN ROOM MUST BE NON-FERROUS, (DUCTWORK, REGISTERS, GRILLES, DIFFUSERS, ETC.).
11. A PRESSURE EQUALIZATION VENT IS REQUIRED IN THE MRI SCAN ROOM, CONSULT WITH RF VENDORS FOR SIZE, LOCATION AND DETAILS.
12. AN EMERGENCY VENTILATION SYSTEM CAPABLE OF 1,080 CFM IS HIGHLY RECOMMENDED.

EXHAUST VENTILATION SYSTEM NOTES:

1. AN EXHAUST VENTILATION SYSTEM IS REQUIRED IN THE MRI SCAN ROOM. THIS SYSTEM REQUIRED IS A SIMPLE "SWITCHED" SYSTEM WITH AN ON-OFF SWITCH LOCATED IN THE MRI CONTROL ROOM. OPTIONALLY, IF THE CUSTOMER IS GOING TO INSTALL AN OXYGEN MONITORING SYSTEM THE VENTILATION SYSTEM MAY BE "TIED-IN" BUT A MANUAL OVER-RIDE SWITCH WILL STILL BE REQUIRED.
2. THE EXHAUST FAN MUST BE LOCATED OUTSIDE THE RF SHIELD. IT IS RECOMMENDED TO USE A UNIT MOUNTED ON A ROOF CURB, IF THIS IS NOT POSSIBLE IT MAY BE LOCATED ABOVE THE CEILING IN THE MRI EQUIPMENT ROOM.
3. COORDINATE WITH THE RF CONTRACTOR TO PROVIDE AN APPROPRIATELY SIZED HVAC WAVE GUIDE IN THE RF SHIELD FOR THE EXHAUST FAN DUCTWORK. THE WAVE GUIDE SHOULD BE LOCATED ABOVE THE MAGNET AND WITHIN THE SPACE OF THE MRI MAGNET COVER BELLOWS. ALL DUCTWORK INSIDE THE RF SHIELD MUST BE NON-FERROUS, EITHER STAINLESS STEEL OR ALUMINUM.

HVAC REQUIREMENTS - TITAN

CUSTOMER TO PROVIDE THE NECESSARY HVAC REQUIREMENTS FOR THE TOSHIBA EQUIPMENT TO OPERATE PROPERLY. AMBIENT TEMPERATURE SHOULD BE IN ACCORDANCE WITH THE FOLLOWING FOR CORRECT EQUIPMENT OPERATION AND PATIENT/OPERATOR COMFORT.

ROOM NAME	HEAT OUTPUT		TEMP (F)	HUMIDITY (RH)
	IN USE	STAND BY		
MRI MAGNET	4,095	1,707	60-75	40-60%
WALL CABINET	371	371		
SCAN RM. TOTAL	**4,466**	**2,078**		
HOST CABINET	1,707	1,707	60-85	40-75%
MONITOR	342	342		
CONTROL BOX/PAD	342	342		
CONTROL RM. TOTAL	**2,391**	**2,391**		
TRANSFORMER CAB	2,730	2,730	60-75	40-70%
REFRIGERATOR CAB	11,260	11,260		
GRADIENT AMP CABINET	20,473	8,872		
RF AMP CABINET	10,246			
RF CABINET	2,050			
EQUIPMENT RM. TOTAL	**46,759**	**23,205**		
OPTIONAL ITEMS				
VRDU	14,000			
UPS	SEE MFG SPECS			
PDU	4,000			

***IMPORTANT NOTE ABOUT HEAT LOADS:**

CONFIRM THE ACTUAL HEAT LOAD WITH THE EQUIPMENT LISTED IN THE EQUIPMENT LEGEND ON SHEET MR-2 AS THE ABOVE TABLE IS BASED ON A STANDARD GENERATION 1 HEAT LOAD, YOUR ACTUAL HEAT LOADS MAY VARY BASED ON THE GENERATION OF EQUIPMENT BEING PROVIDED.

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Unit A
Highland Heights, Ohio
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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

HVAC & EXHAUST REQUIREMENTS

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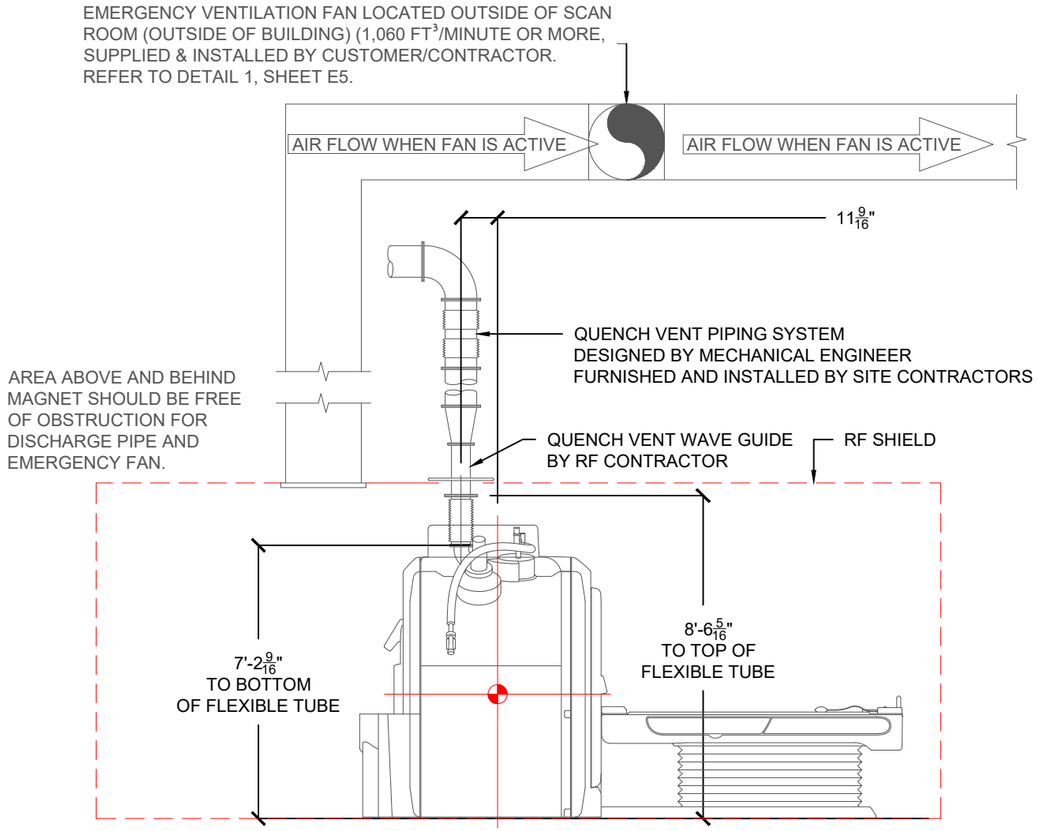
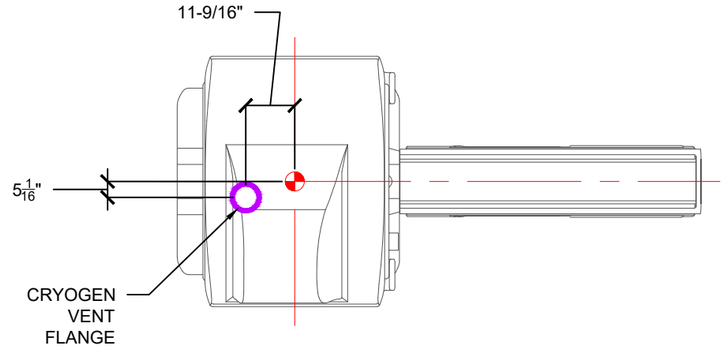
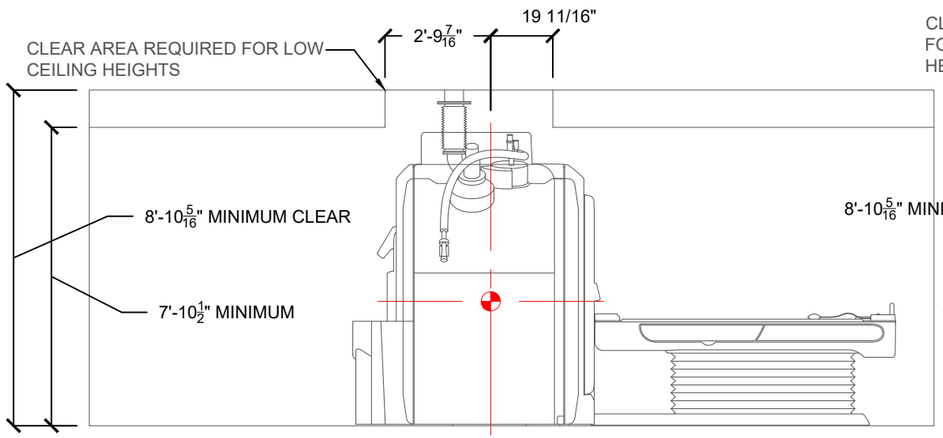


QUENCH LINE AND EMERGENCY VENTILATION FAN



CRYOGEN VENT LOCATION



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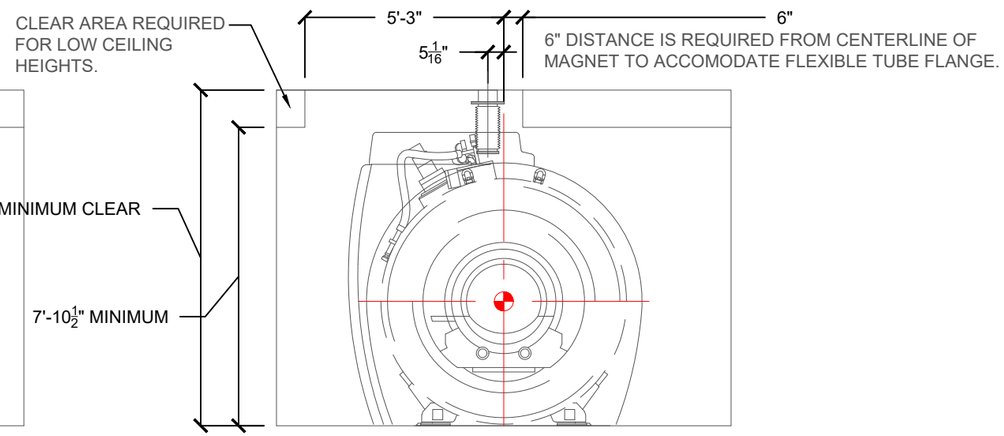

FRONT

INSTALLATION SPACE FOR THE GANTRY

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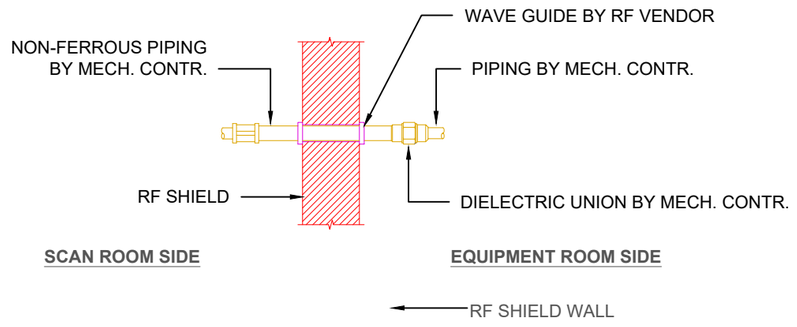
FIRE SUPPRESSION SYSTEM NOTES

1. TOSHIBA RECOMMENDS THAT IF A FIRE SUPPRESSION SYSTEM IS REQUIRED IT BE A PRE-ACTION PROTECTION SYSTEM, (DRY PIPE SPRINKLER SYSTEM), TO MINIMIZE GROUNDING ISSUES THAT CAN ARISE UTILIZING WET TYPE SPRINKLER SYSTEMS.
2. A WET TYPE SPRINKLER SYSTEM CAN BE UTILIZED PROVIDED THE CUSTOMER ASSUMES RESPONSIBILITY OF ALL GROUNDING AND IMAGE ARTIFACT ISSUES THAT MAY RESULT FROM THE USE OF WET SYSTEM, (STANDING WATER WITHIN THE SPRINKLER PIPES IN THE RF ENCLOSURE HAS BEEN KNOWN TO ACT AS A GROUND AND A CAUSE OF IMAGE ARTIFACTS AND CAN DEVELOP OVER TIME AND NOT BE IMMEDIATELY NOTICABLE).
3. IF A WET-TYPE SPRINKLER SYSTEM IS USED, THE LOCATION OF THE PIPE PENETRATION, MATERIAL AND CONSTRUCTION IS STRICTLY LIMITED AS SHOWN IN THE SPRINKLER PIPE PENETATION DETAIL.
4. EXCEPT FOR PVC PIPE FIRE SPRINKLER SYSTEMS, ALL SPRINKLER LINES ARE CONDUCTIVE AND ALSO MECHANICALLY ATTACHED TO THE BUILDING WHICH MAKES THEM GROUNDED AND IF A SPRINKLER LINE IS ATTACHED TO THE RF ENCLOSURE, THE RF ENCLOSURE ALSO BECOMES GROUNDED TO THE BUILDING.
5. ALL PIPING INSIDE THE SCAN RF ENCLOPSURE MUST BE NON-FERROUS, (PVC, COPPER, BRASS, OR 304 STAINLESS STEEL). THE SPRINKLER PIPE PENETRATION MUST BE LOCATED WITHIN 3' FROM THE EDGE OF THE FILTER PANEL AND 30" OF THE GROUND BUS BAR AND CONNECTED TO THE WAVE GUIDE VIA A DIELECTRIC UNION TO ISOLATE THE GROUNDED SPRINKLER PIPE FROM THE RF ENCLOSURE. INSTALLATION OF A DEDICATED SHUT-OFF VALVE FOR THE SPRINKLER SYSTEM FOR THE RF ENCLOSURE IS STRONGLY RECOMMENDED.
6. DIELECTRIC UNIONS MUST BE USED TO CONNECT PIPES TO THE WAVE GUIDE OUTSIDE THE RF ENCLOSURE. ALL WET PIPE SYSTEMS MUST ENTER THE RF ENCLOSURE DIRECTLY ABOVE THE FILTER PANEL.



FIRE SPRINKLER PENETRATION DETAIL

NOTE:
DIELECTRIC UNIONS MUST BE USED TO CONNECT PIPES TO THE WAVEGUIDE OUTSIDE THE RF ENCLOSURE.

CHILLED WATER SYSTEM NOTES

IF PURCHASING CHILLER WITH MRI SYSTEM, VERIFY MAKE AND MODEL WITH VENDOR. IF CUSTOMER IS SUPPLYING CHILLED WATER SYSTEM, PLEASE REFER TO SPECIFICATIONS BELOW:

1. SUPPLY FLOW RATE : 12.70 GAL. OR MORE/MIN (48 L) (24-HOUR CONTINUOUS SUPPLY)
   - GRADIENT POWER SUPPLY : 7.95 GAL. OR MORE/MIN (30 L)
   - GRADIENT COIL : 3.20 GAL. OR MORE/MIN (12 L)
   - REFRIGERATOR : 1.60 GAL. OR MORE/MIN (6 L)
2. PRESSURE LOSS IN THE SYSTEM
   - GRADIENT POWER SUPPLY : 0.28 MPa (@ 7.95 GAL./MIN, WITHOUT HOSE (30 L/MIN)
   - GRADIENT COIL : 0.38 MPa (@ 3.20 GAL./MIN, WITH HOSE (12 L/MIN)
   - REFRIGERATOR : 0.10 MPa (@ 1.60 GAL./MIN, WITHOUT HOSE (6 L/MIN)
3. MAXIMUM ALLOWABLE INPUT PRESSURE
   - GRADIENT POWER SUPPLY : 0.60 MPa
   - GRADIENT COIL : 0.50 MPa
   - REFRIGERATOR : 0.80 MPa
4. SUPPLY WATER TEMPERATURE : 64°F TO 71°F (18°C TO 22°C)
5. REQUIRED COOLING CAPABILITY
   - GRADIENT POWER SUPPLY : 50,545/13,661 BTU/HR (14.8/4.0 kW) (MAXIMUM DURING SCANNING/IN STANDBY STATUS)
   - GRADIENT COIL : 40,982 BTU/HR (12 kW) (MAXIMUM DURING SCANNING)
   - REFRIGERATOR : 14,003/16,734 BTU/HR (4.1/4.9 kW) (50/60 Hz)

   SYSTEM TOTAL
   - IN STANDBY STATUS [AT NIGHT ETC.] : 27,663/30,395 BTU/HR (8.1/8.9 kW) (50/60 Hz)
   - DURING SCANNING : 105,529/108,261 BTU/HR (30.9/31.7) kW (50/60 Hz)
   - REFRIGERATOR IS POWERED ONLY : 14,002/16,734 BTU/HR (4.1/4.9 kW) (50/60 Hz)

   IF THE COOLING WATER IS CIRCULATED USING THE CHILLER, ETC., THE COOLING PERFORMANCE MUST BE 1.2 TIMES THE STANDARD VALUES GIVEN ABOVE.
6. IF THE COOLING WATER SUPPLY IS INTERRUPTED, THE SYSTEM CANNOT BE USED. THE COOLING WATER MUST BE CHECKED AND REPLACED ONCE EVERY 6 MONTHS. IN COLD CLIMATES, CARE MUST BE TAKEN TO PREVENT THE COOLING WATER FROM FREEZING (USE OF ANTIFREEZE IS NOT ALLOWED).

NOTE: IF THE HEAD LOSS IN THE PIPING FROM THE HEAT EXCHANGER UNIT IS 65'-7" OR MORE, CONSULT THE INSTALLATION PROJECT MANAGER AND TAKE MEASURES TO ENSURE THAT THE MAXIMUM ALLOWABLE INPUT PRESSURE FOR EACH UNIT IS NOT EXCEEDED.

CHILLER NOTES

1. THE DEDICATED OUTDOOR CHILLER IS TO BE LOCATED BY THE CUSTOMER, OFF-LOADED, PIPED, FILLED AND READY TO PRIOR TO THE DELIVERY OF THE MRI MAGNET BY THE CUSTOMER'S CONTRACTORS. REFER TO MECHANICAL DETAILS AND NOTES FOR SITE PREP AND INSTALLATION REQUIREMENTS.
2. UNIT REQUIRES 480V, 3-PHASE XXAMP INCOMING POWER.
3. AN INTERFACE PANEL MAY BE PROVIDED AS A CONNECTION SEPARATION POINT BETWEEN THE CHILLER AND SYSTEM CABINETS. THE PANEL IS TO BE INSTALLED BY THE CUSTOMER'S CONTRACTORS.
4. A REMOTE CONTROL AND ALARM PANEL MAY BE PROVIDED FOR THE CHILLER. THE ALARM PANEL IS TO BE INSTALLED BY THE CUSTOMER'S CONTRACTORS, SEE ELECTRICAL REQUIREMENTS.
5. THE CHILLER MUST BE SET ON A RAISED CONCRETE PAD AT LEAST 12" LARGER THAN THE CHILLER FOOTPRINT IN ALL DIRECTIONS.
6. A WATER SOURCE MUST BE WITHIN 50' OF THE CHILLER LOCATION.

COOLING FLUID NOTES

1. TOSHIBA MRI SYSTEMS CAN ONLY USE DISTILLED WATER, (NO GLYCOL), TO CIRCULATE WITHIN THE SYSTEM COMPONENTS.
2. IF THE CUSTOMER'S CHILLER CONTAINS GLYCOL, THEN WE SUGGEST THE USE OF A HEAT EXCHANGER. THE FUNCTION OF THE HEAT EXCHANGER IS TO SEPARATE THE GLYCOL FROM THE WATER IN THE VANTAGE/TITAN SYSTEM COMPONENTS.
3. IF A HEAT EXCHANGER IS USED, COLDER WATER MAY BE REQUIRED. REQUIRED TEMPERATURE WILL VARY DEPENDING ON THE HEAT EXCHANGER SELECTED.
4. CARE SHOULD BE TAKING NOT TO EXCEED MAXIMUM ALLOWABLE INPUT PRESSURE AS STATED ABOVE.

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Unit A
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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

CHILLED WATER & FP REQUIREMENTS

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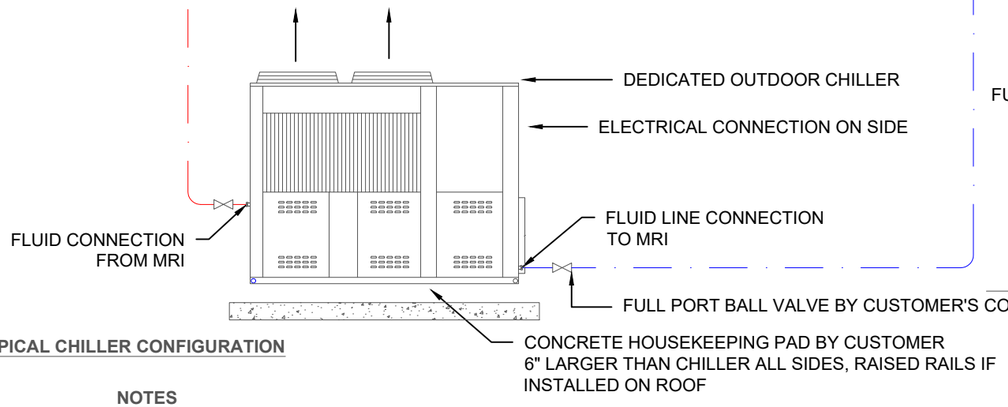
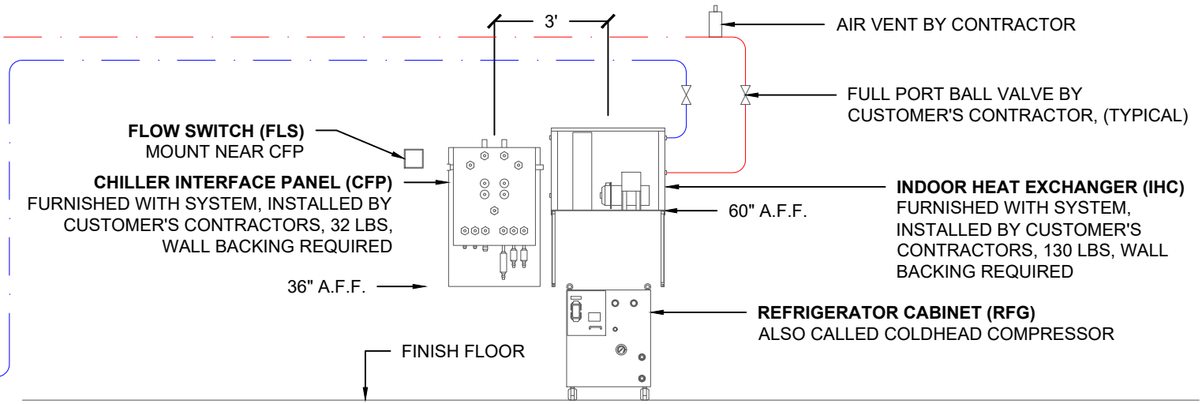


TYPICAL CHILLER CONFIGURATION



SUGGESTED CONFIGURATION FOR CFP, IHC, RFG

NOTES

1. THE MRI CHILLER, HEAT EXCHANGER AND FLOW PANEL WILL BE DELIVERED IN ADVANCE OF THE MRI SYSTEM FOR INSTALLATION BY THE CUSTOMER'S PLUMBING CONTRACTOR. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR OFF-LOADING AND SETTING THE ITEMS IN PLACE.
2. ALL PIPING, VALVES, AIR BLEEDERS, INSULATION, GLYCOL FURNISHED AND INSTALLED BY CUSTOMER'S CONTRACTORS.
3. CUSTOMER'S STRUCTURAL ENGINEER TO DESIGN ANY STRUCTURAL SUPPORT REQUIRED IN WALL TO PROPERLY SUPPORT THE CHILLER FLOW PANEL AND INDOOR HEAT EXCHANGER.
4. PRIOR TO THE DELIVERY OF THE MRI SYSTEM THE CHILLER IS TO BE TESTED, FILLED, AND READY TO STARTUP AS SOON AS POSSIBLE TO MINIMIZE HELIUM LOSS AND EXPEDITE SYSTEM INSTALLATION.
5. CUSTOMER'S ENGINEER TO DETERMINE LOCATION OF CHILLER. ALL PIPING, PIPE INSULATION AND WATER/GLYCOL TO BE FURNISHED AND INSTALLED BY CUSTOMER'S CONTRACTORS.
6. START-UP TO BE COORDINATED WITH MRI INSTALLATION TEAM.
7. PIPING BETWEEN THE INDOOR HEAT EXCHANGER AND CHILLER FLOW PANEL BY MRI INSTALLATION TEAM.

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

CHILLED WATER PIPING DIAGRAM

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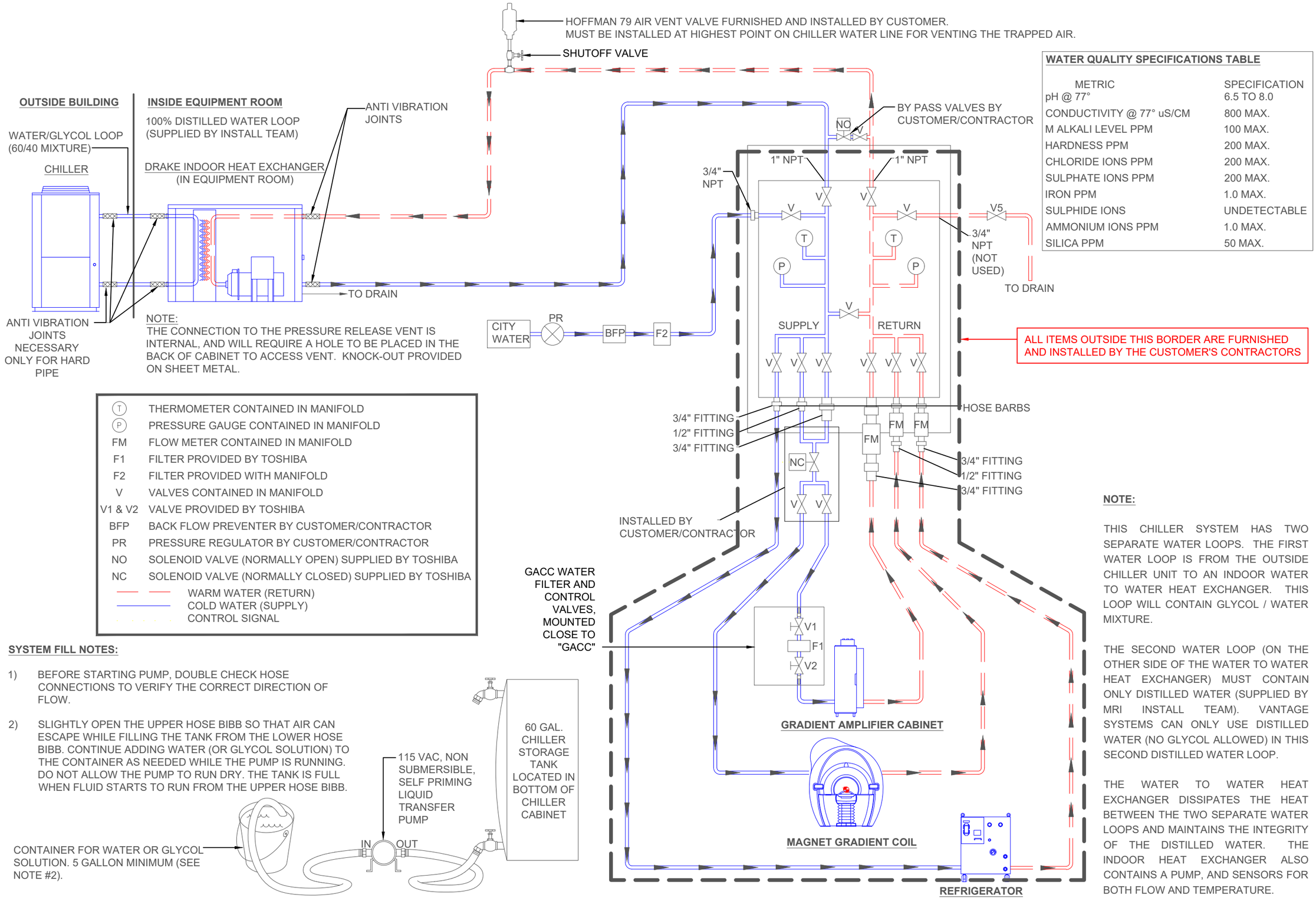

T	THERMOMETER CONTAINED IN MANIFOLD
P	PRESSURE GAUGE CONTAINED IN MANIFOLD
FM	FLOW METER CONTAINED IN MANIFOLD
F1	FILTER PROVIDED BY TOSHIBA
F2	FILTER PROVIDED WITH MANIFOLD
V	VALVES CONTAINED IN MANIFOLD
V1 & V2	VALVE PROVIDED BY TOSHIBA
BFP	BACK FLOW PREVENTER BY CUSTOMER/CONTRACTOR
PR	PRESSURE REGULATOR BY CUSTOMER/CONTRACTOR
NO	SOLENOID VALVE (NORMALLY OPEN) SUPPLIED BY TOSHIBA
NC	SOLENOID VALVE (NORMALLY CLOSED) SUPPLIED BY TOSHIBA
	WARM WATER (RETURN)
	COLD WATER (SUPPLY)
	CONTROL SIGNAL

WATER QUALITY SPECIFICATIONS TABLE

METRIC	SPECIFICATION
pH @ 77°	6.5 TO 8.0
CONDUCTIVITY @ 77° uS/CM	800 MAX.
M ALKALI LEVEL PPM	100 MAX.
HARDNESS PPM	200 MAX.
CHLORIDE IONS PPM	200 MAX.
SULPHATE IONS PPM	200 MAX.
IRON PPM	1.0 MAX.
SULPHIDE IONS	UNDETECTABLE
AMMONIUM IONS PPM	1.0 MAX.
SILICA PPM	50 MAX.

SYSTEM FILL NOTES:

1) BEFORE STARTING PUMP, DOUBLE CHECK HOSE CONNECTIONS TO VERIFY THE CORRECT DIRECTION OF FLOW.

2) SLIGHTLY OPEN THE UPPER HOSE BIBB SO THAT AIR CAN ESCAPE WHILE FILLING THE TANK FROM THE LOWER HOSE BIBB. CONTINUE ADDING WATER (OR GLYCOL SOLUTION) TO THE CONTAINER AS NEEDED WHILE THE PUMP IS RUNNING. DO NOT ALLOW THE PUMP TO RUN DRY. THE TANK IS FULL WHEN FLUID STARTS TO RUN FROM THE UPPER HOSE BIBB.

NOTE:

THIS CHILLER SYSTEM HAS TWO SEPARATE WATER LOOPS. THE FIRST WATER LOOP IS FROM THE OUTSIDE CHILLER UNIT TO AN INDOOR WATER TO WATER HEAT EXCHANGER. THIS LOOP WILL CONTAIN GLYCOL / WATER MIXTURE.

THE SECOND WATER LOOP (ON THE OTHER SIDE OF THE WATER TO WATER HEAT EXCHANGER) MUST CONTAIN ONLY DISTILLED WATER (SUPPLIED BY MRI INSTALL TEAM). VANTAGE SYSTEMS CAN ONLY USE DISTILLED WATER (NO GLYCOL ALLOWED) IN THIS SECOND DISTILLED WATER LOOP.

THE WATER TO WATER HEAT EXCHANGER DISSIPATES THE HEAT BETWEEN THE TWO SEPARATE WATER LOOPS AND MAINTAINS THE INTEGRITY OF THE DISTILLED WATER. THE INDOOR HEAT EXCHANGER ALSO CONTAINS A PUMP, AND SENSORS FOR BOTH FLOW AND TEMPERATURE.

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CHILLED WATER SYSTEM DETAILS

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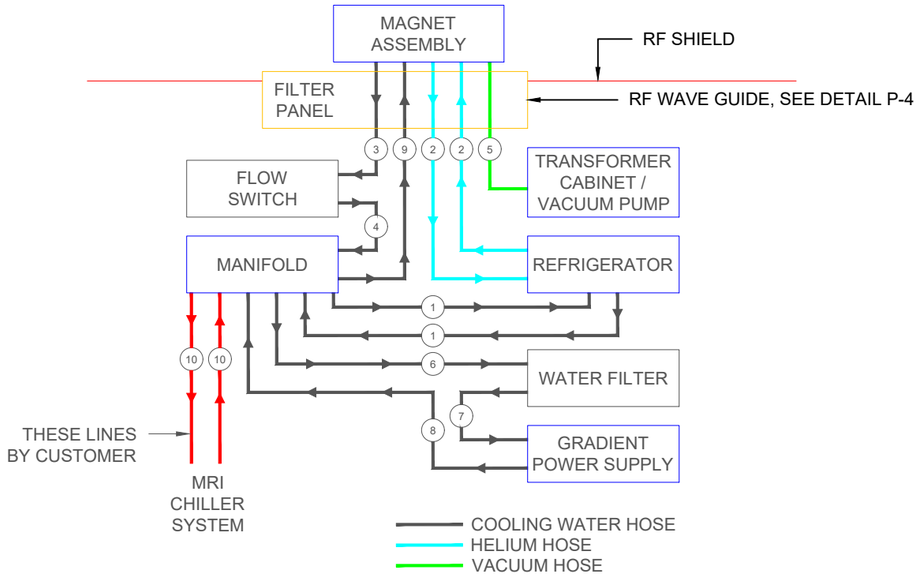
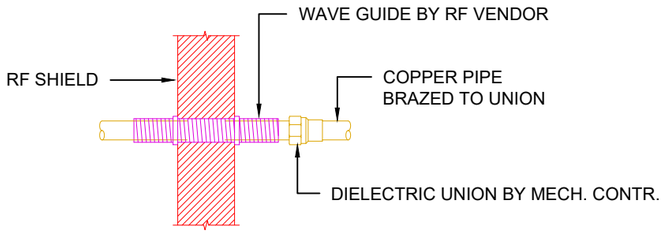


LIQUID AND GAS HOSE CONNECTIONS SCHEDULE

NO.	HOSE TYPE	CONNECTION 1	CONNECTION 2	LENGTH STD	LENGTH MAX	HOSE DIA.
1	COOLING WATER HOSE	MANIFOLD	REGRIGERATOR	16'	65'	1/2"
2	HELIUM HOSES	REFRIGERATOR	MAGNET GANTRY	65'	65'	N/A
3	COOLING WATER HOSE	MAGNET	FLOW SWITCH	49'	49'	1"
4	COOLING WATER HOSE	FLOW SWITCH	MANIFOLD	10'	10'	1"
5	VACUUM HOSE	TRANSFORMER	MAGNET GANTRY	49'	49'	1"
6	COOLING WATER HOSE	MANIFOLD	WATER FILTER	49'	49'	1"
7	COOLING WATER HOSE	WATER FILTER	GRADIENT PWR SUP.	65'	98'	1"
8	COOLING WATER HOSE	GRADIENT PWR SUP.	MANIFOLD	3'	3'	1"
9	VACUUM HOSE	MANIFOLD	MAGNET GANTRY	32'	65'	N/A
10	COOLING WATER HOSE	CHILLER	MANIFOLD	BY CUSTOMER		

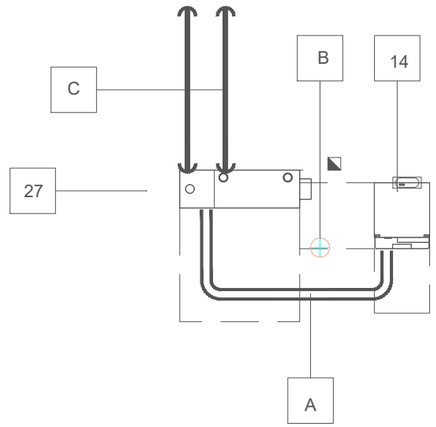


MEDICAL GAS PIPE PENETRATION

NOTES

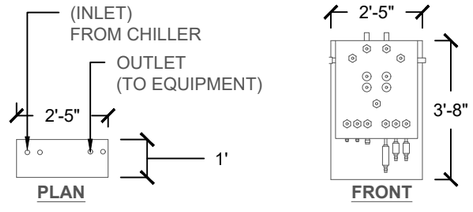
1. THE WAVE GUIDE FOR THE MEDICAL GAS PIPING MUST BE WITHIN 30" OF THE LINE FILTER PANEL.
2. THE FINAL MEDICAL GAS CONNECTION TO THE WAVE GUIDE CANNOT BE MADE UNTIL GROUND ISOLATION MONITORING IS COMPLETE.
3. THE MEDICAL GAS MUST BE GROUNDED TO THE WAVE GUIDE & RF SHIELDING.

MRI WATER CHILLER SYSTEM
VERIFY IF INCLUDED OR SUPPLIED WITH MRI SYSTEM BY EQUIPMENT SUPPLIER



PLUMBING LEGEND

TAG	ITEM & DESCRIPTION
14 27	REFRIGERATOR CABINET INDOOR HEAT EXCHANGER W/MANIFOLD
SUPPLIED AND INSTALLED BY CUSTOMER / CONTRACTOR	
A	(2) 1/2" FLEXIBLE HOSE FROM INDOOR HEAT EXCHANGER W/ MANIFOLD TO REFRIGERATOR UNIT.
B	DRAIN FOR MANIFOLD & REFRIGERATOR UNIT. FIELD VERIFY EXACT LOCATION AT TIME OF INSTALLATION. DRAIN CAPACITY MUST MEET OR EXCEED DISCHARGE CAPACITY. DRAIN MUST BE EQUIPPED WITH AN APPROPRIATE BACK FLOW PREVENTER (BFP).
C	SUPPLY AND VENT RETURN LINE FROM MANIFOLD TO CHILLER SYSTEM BY PLUMBING CONTRACTOR. PROVIDE 2" HIGH PRESSURE COPPER PIPE AFTER UNITS ARE SET IN PLACE.



CHILLER INTERFACE PANEL

NOTES

1. VERIFY WITH MRI EQUIPMENT SUPPLIER EXACT CHILLER SPECIFICATIONS IF INCLUDED WITH YOUR ORDER.
2. TYPICAL ELECTRICAL REQUIREMENT FOR MRI CHILLER IS 480V, 3-PHASE, 40AMP.
3. VERIFY WITH CHILLER MANUFACTURER INLET AND OUTLET PIPING SIZE BASED ON FLOAW AN DISTANCE FROM MRI SYSTEM COMPONENTS.

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5335 Avion Park Drive
Unit A
Highland Heights, Ohio
(888) 505-0319

EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

PIPE WAVE GUIDE DETAILS

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2. 1-18-22 FINALS ISSUED
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2021-23

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M-6

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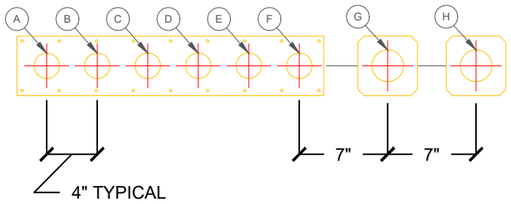
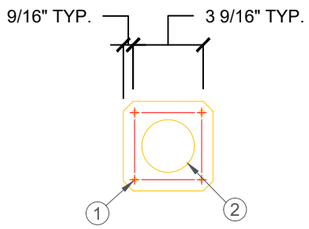
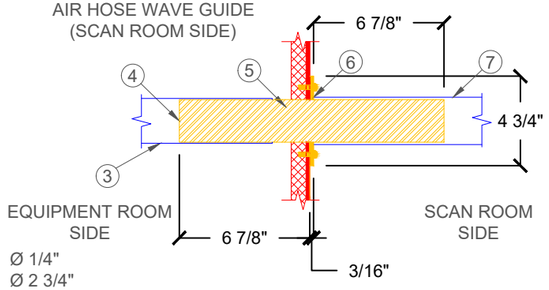


FILTER PANEL PIPE PENETRATION WAVE GUIDES
(SCAN ROOM SIDE)

ITEM	DESCRIPTION	SIZE (DIA.)	LENGTH (MINIMUM)	FURNISHED BY	INSTALLED BY
A	HELIUM SUPPLY	2"	12"	RF CONTR.	RF CONTR.
B	HELIUM RETURN	2"	12"	RF CONTR.	RF CONTR.
C	WATER HOSES	2"	12"	RF CONTR.	RF CONTR.
D	FIBER OPTIC LINES	2"	12"	RF CONTR.	RF CONTR.
E	VACUUM	2"	12"	RF CONTR.	RF CONTR.
F	SERVICE	2"	12"	RF CONTR.	RF CONTR.
G	AIR HOSE TO MAGNET FAN BOX	2.5"	12"	RF CONTR.	RF CONTR.
H	AIR HOSE TO MAGNET FAN BOX	2.5"	12"	RF CONTR.	RF CONTR.



AIR HOSE WAVE GUIDE
(SCAN ROOM SIDE)



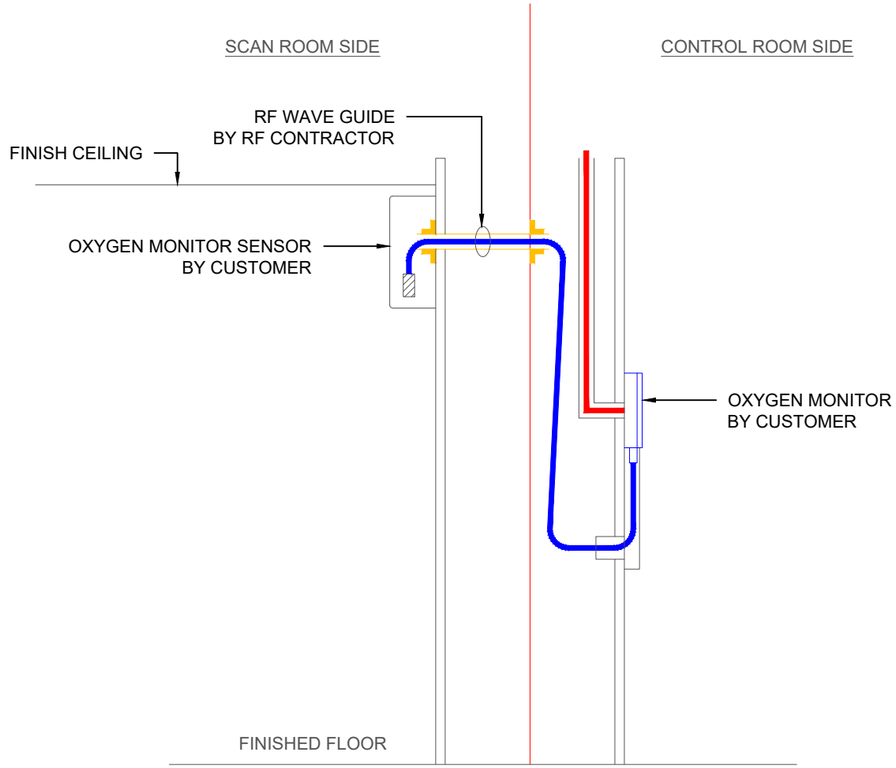
1. Ø 1/4"
2. Ø 2 3/4"
3. FLEXIBLE HOSE
4. COPPER MESH
5. WAVE GUIDE PROVIDED AND INSTALLED BY RF VENDOR.
6. RF SEAL
7. FLEXIBLE HOSE BY INSTALLERS

AIR HOSE WAVE GUIDE SECTION

ALL WAVE GUIDES ARE TO BE FURNISHED AND INSTALLED BY CUSTOMER'S RF CONTRACTOR

HOSE WAVE GUIDE NOTES:

1. THE WAVE GUIDES ARE TO BE FABRICATED, FURNISHED AND INSTALLED BY THE CUSTOMER'S RF CONTRACTOR. THEY MUST BE INSTALLED IN THE RF SHIELD PRIOR TO THE RF TESTING BEING PERFORMED AND PRIOR TO THE DELIVERY OF THE MRI EQUIPMENT.
2. WAVE GUIDE RECOMMENDED SIZE IS 2 1/2" IN DIAMETER (WAVE GUIDE SIZE RANGE IS BETWEEN 2 3/8" - 2 3/4" IN DIAMETER)
3. THE LENGTH OF HOSE FROM THE REAR OF THE GANTRY TO THE FAN BOX SHOULD BE LESS THAN 49'-2".
4. THE COPPER PLATE OF THE WAVE GUIDE MUST BE FULLY IN CONTACT WITH THE SHIELD AND PROPERLY SEALED USING RF GASKET MATERIALS.



OXYGEN MONITOR DETAIL

THE USE OF AN OXYGEN MONITOR AND THE ASSOCIATED WIRING TO THE FAN SWITCH BOX IS RECOMMENDED BY TOSHIBA BUT IS NOT REQUIRED, IT IS UP TO THE CUSTOMER TO DETERMINE IF IT IS TO BE INSTALLED. IF USED ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY CUSTOMER'S CONTRACTORS.

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Unit A
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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

CRYOGEN VENT NOTES

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QUENCH LINE DESIGN RULES

THE FOLLOWING INFORMATION COVERS THE DESIGN OF QUENCH LINES USED IN CONJUNCTION WITH TOSHIBA MAGNET TECHNOLOGY, (1.5T AND 3T MAGNETS). FOR CALCULATING THE PRESSURE DROP IN THE QUENCH LINE CALCULATION TOOLS ARE AVAILABLE FROM TOSHIBA AND MUST ALWAYS BE USED.

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, AND THE GUIDELINES SET OUT IN THIS SECTION MUST BE FOLLOWED. SINCE HELIUM VENTED IN A QUENCH IS AN ASPHYXIANT AND AN EXTREMELY COLD GAS, THE QUENCH LINE MUST ALWAYS END AT A POINT WHERE ACCESS BY PEOPLE IS NOT POSSIBLE. THE FOLLOWING SPECIFIC DESIGN RULES APPLY TO THE COMPONENTS MAKING UP THE QUENCH LINE:

1. THE MAXIMUM INTERNAL PRESSURE ALLOWED ON THE LINE IN THE DESIGN CALCULATIONS IS 100 MBAR. HOWEVER, THE QUENCH LINE AND ALL ITS ELEMENTS MUST BE DESIGNED TO WITHSTAND A PRESSURE OF 450 MBAR. THE LINE MUST BE CONSTRUCTED IN ACCORDANCE WITH SOUND ENGINEERING PRACTICE AS DESCRIBED BELOW.
2. THE QUENCH LINE WILL COMPRISE STRAIGHT, HYDRAULICALLY SMOOTH LINE SECTIONS, BENDS UP TO 90° AND DIFFUSERS IF REQUIRED. ALL BENDS MUST BE SMOOTH WALLED AND HAVE A CENTERLINE RADIUS TO INTERNAL LINE DIAMETER RATIO IN THE RANGE OF 1.5 TO 5.0. WHERE A ONE-PIECE BEND IS NOT READILY AVAILABLE, A FABRICATED BEND USING STRAIGHT SECTIONS IS PERMISSIBLE. EXPANSION FROM A SMALL TO LARGE LINE DIAMETER MUST BE ACCOMPLISHED USING A DIFFUSER. DIFFUSERS MUST CONFORM TO THE GEOMETRIC PARAMETERS SHOWN IN THE DETAILS. NEVER REDUCE THE DIAMETER OF A TUBE IN THE DOWNSTREAM DIRECTION. THIS WILL CAUSE SHOCK WAVE REFLECTIONS AND LOCAL PRESSURE PEAKS WHICH MAY DAMAGE THE MAGNET.
3. THE END OF THE LINE MUST BE TERMINATED IN A WAY TO PREVENT INGRESS OF RAIN, SNOW, AND FOREIGN OBJECTS, SEE TERMINATION NOTES.
4. IF A QUENCH LINE IS VERY SHORT AND STRAIGHT, A FLEXIBLE LINE MAY BE USED FOR THE WHOLE OF THE QUENCH LINE. NOTE, HOWEVER, THAT DUE TO THE HIGH PRESSURE DROP, THE MAXIMUM PERMISSIBLE LENGTH OF FLEXIBLE LINES IS VERY SHORT AS COMPARED TO STRAIGHT LINES.
5. THE QUENCH LINE MUST BE MADE FROM A NON-MAGNETIC STAINLESS STEEL OR ALUMINUM. ONLY STAINLESS STEEL GRADES AISI 304, 309, 316, and 321 [EN 1.4301, 1.4828, 1.4401, AND 1.4878] OR ALUMINUM MAY BE USED.
6. THE QUENCH LINE COMPONENTS OTHER THAN THOSE SUPPLIED WITH THE MRI SYSTEM (I.E. MAGNET ELBOW, HORIZONTAL ADAPTER, AND FLEXIBLE TUBE) MUST ONLY BE MADE OF STAINLESS STEEL OR ALUMINUM. THE WALL THICKNESS OF THE TUBE MUST BE A MINIMUM OF 0.7mm (22 S.W.G). ONLY ROUND SECTION TUBING MAY BE USED, SQUARE SECTIONS ARE NOT ALLOWED.
7. DUE CONSIDERATION MUST BE GIVEN TO THE THERMAL CONTRACTION (UP TO 3mm/METER FOR STAINLESS STEEL OR ALUMINUM). STAINLESS STEEL OR ALUMINUM BELLOWS MUST BE USED TO ALLOW FOR ADEQUATE CONTRACTION. BELLOWS SUPPLIED BY CUSTOMER/CONTRACTOR ARE TO BE FITTED AT A MINIMUM OF EVERY 10 METERS. THE MOVEMENT OF THE BELLOWS MUST BE LIMITED SO THAT THE LINE DOES NOT EXPAND EXCESSIVELY UNDER INTERNAL PRESSURE. BELLOWS ARE DESCRIBED AS "STRAIGHT FLEXIBLE" IN THE QUENCH LINE CALCULATION TOOL. FLEXIBLE LINES AND BELLOWS MAY ONLY BE MADE OF STAINLESS STEEL OR ALUMINUM. THE LENGTH OF THE BELLOWS IN TOTAL MAY NOT EXCEED 2% OF THE ALLOWED MAXIMUM LINE LENGTH, IN ORDER THAT THE LINE PRESSURE DROP DOES NOT INCREASE EXCESSIVELY. FLEXIBLE SECTIONS MUST NOT BE BENT IN A WAY TO REPLACE AN ELBOW.
8. THE WEIGHT OF THE LINE MUST BE SUPPORTED AGAINST THE BUILDING. IN ORDER THAT THE LINE SUSPENSION IS NOT OVER STRESSED DUE TO THE THERMAL CONTRACTION, THE SUSPENSION NEEDS TO BE FLEXIBLE ENOUGH TO ACCOMMODATE THE MOVEMENTS. ALSO, THE WALL EXIT IN GENERAL SHOULD NOT BE FIXED HARD TO THE WALL.
9. THE FLEXIBLE TUBE SUPPLIED WITH THE MRI SYSTEM MUST BE FITTED AT THE QUENCH VALVE END. ITS MAIN FUNCTION IS TO REDUCE NOISE TRANSMISSION. ITS SECONDARY FUNCTIONS ARE TO EASE THE FITTING OF THE QUENCH LINE AND TO ENSURE THAT THE QUENCH VALVE DOES NOT CARRY ANY LOAD FROM THE WEIGHT OF THE QUENCH LINE. THE FLEXIBLE TUBE MUST BE INSTALLED NOMINALLY STRAIGHT, I.E., TO ALLOW FOR MINOR MISALIGNMENT. IT SHOULD TYPICALLY NOT EXCEED ±5mm, AND NEVER EXCEED THE DESIGN LIMIT OF ±20mm. THE LENGTH OF THE FLEXIBLE TUBE IS INCLUDED IN THE QUENCH LINE CALCULATION TOOL.

1) JOINTS MAY ONLY BE MADE BY WELDING (BY COMPETENT WELDERS), OR BY BOLTED FLANGES. ROTARY FLANGES ARE PERMITTED TO EASE THE INSTALLATION PROCESS. V-CLAMPED FLANGES MAY NOT BE USED. GASKETS USED TO SEAL SECTION JOINTS HAVE TO BE MADE OF EITHER UHMW-PE [CESTILENE HD1000, HOSTALEN GC579, OR HOSTALEN GUR812], PTFE [BS EN 13000-1:1998, BS EN 13000-2:1998], OR FIBRE [ASTM F36, BS 7531, DIN 3754P]. NO OTHER MATERIALS ARE PERMITTED.

WARNINGS: RISK OF ASPHYXIATION, FAILURE TO OBSERVE THE FOLLOWING MAY RESULT IN DIZZINESS AND LOSS OF CONSCIOUSNESS.

- **DO NOT VENT HELIUM GAS DIRECTLY INTO THE MAGNET ROOM.**
- **DO NOT VENT EXHAUST GAS FROM THE QUENCH LINE INTO AN ENCLOSED SPACE.**
- **THE OPERATOR OF THE MRI SYSTEM MUST PREPARE AN "EMERGENCY PLAN".**
- **ONLY THE EXAMPLES OF THE TUBE IN THIS GUIDE MAY BE USED.**
- **PLANNING AND INSTALLATION OF QUENCH LINES MUST BE CONDUCTED BY QUALIFIED PERSONNEL.**
- **COMPONENTS USED FOR OTHER TUBING, E.G., IN AIR CONDITIONING OR ROOM VENTING, ARE GENERALLY NOT SUITABLE FOR QUENCH LINE CONSTRUCTION.**
- **THE QUENCH LINE MUST BE IDENTIFIED WITH A MARKER TAPE ALONG THE COMPLETE LENGTH OF THE QUENCH LINE. THE CONTENT COULD BE, E.G.: "DO NOT CUT, QUENCH LINE EXHAUST LINE".**
- **NEW CUSTOMER SITES MUST HAVE THE QUENCH LINE INSTALLED AND AVAILABLE FOR IMMEDIATE USE BEFORE THE MAGNET SYSTEM ARRIVES TO ALLOW SUITABLE VENTING FOR THE MAGNET DURING INSTALLATION.**

QUENCH LINE TERMINATION

1. THE END OF THE QUENCH LINE MUST BE PROTECTED FROM WEATHER CONDITIONS SUCH AS RAIN OR SNOW. IT MUST BE FITTED WITH A WIRE MESH. THE MESH SIZE MUST BE 3/8" (10 +2/-1mm) WITH 18 GAUGE (1.0 ±0.3mm) ROUND WIRES, TO PREVENT INGRESS OF FOREIGN BODIES [E.G. BIRDS AND RODENTS]. THE AREA OF THE MESH MUST BE AT LEAST 2.5 TIMES THE CROSS-SECTION AREA OF THE QUENCH TUBE.
2. WHERE THE QUENCH LINE EXITS VERTICALLY THROUGH A FLAT ROOF, THE OUTLET MUST BE ABOVE A LEVEL WHERE WATER COULD ENTER IT IN THE EVENT OF THE ROOF DRAINS BECOMING BLOCKED. WHERE THE QUENCH LINE EXISTS VERTICALLY, A RAIN SHIELD MUST BE FITTED (FIG. 4).
3. A DEFLECTOR PLATE MUST BE WELDED TO THE LINE WHERE IT EXITS THE ROOF TO PREVENT HELIUM FROM REENTERING THE BUILDING. THE DEFLECTOR PLATE MUST BE AT LEAST THE SAME DIAMETER AS THE RAIN GUARD. IT MUST BE LOCATED AT LEAST TWO LINE DIAMETERS ABOVE THE ROOF, AND TWO DIAMETERS BELOW THE BOTTOM OF THE RAIN GUARD (FIG. 4).
4. IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET MUST BE TURNED DOWN BY NOT LESS THAN THE LINE DIAMETER TO PREVENT RAIN INGRESS (FIG. 5-8). THE EXIT MUST BE SITUATED WHERE IT CANNOT BE BLOCKED BY DRIFTING SNOW.
5. ONLY USE THE QUENCH LINE OUTLET CONFIGURATIONS DESCRIBED HEREIN. IF THE QUENCH LINE IS NOT CONFIGURED CORRECTLY, SAFETY IS COMPROMISED.
6. TO AVOID THE RISK OF INJURY FROM COLD BURNS AND ASPHYXIATION, ACCESS TO THE QUENCH LINE MUST BE RESTRICTED BY 3m EACH SIDE AND BELOW, AND 6m VERTICALLY ABOVE THE OUTLET; WARNING SIGNS MUST BE PUT UP (FIG. 2, 3, & 9). THIS MEANS IN PARTICULAR, THAT THE OUTLET SHOULD BE NO LESS THAN 5m ABOVE SIDEWALKS. THE OUTLET MUST NOT BE SITUATED WHERE, IN CASE OF A QUENCH, HELIUM GAS MIGHT BE DRAWN INTO AN AIR INLET, OR WHERE GAS MIGHT ENTER OPEN WINDOWS. THE COLD GAS MUST NOT BE ALLOWED TO BLOW DIRECTLY ONTO A WINDOW. WHERE WINDOWS ARE WITHIN THE RESTRICTED ACCESS AREA, THEY MUST BE SEALED AND PERMANENTLY CLOSED. MEANS OF OPENING THE WINDOWS MUST BE REMOVED.

QUENCH LINE INSULATION

1. THE QUENCH LINE MUST BE THERMALLY INSULATED ALONG ITS FULL LENGTH. THIS IS TO AVOID CONDENSATION OF LIQUID AIR IN CASE OF A QUENCH, AS WELL AS WATER CONDENSATION ON THE INSIDE IN HUMID WEATHER CONDITIONS. A DOUBLE-WALLED STRUCTURE IS ALLOWED. MINERAL FIBER INSULATION (BRANDS SUCH AS ROCKWOOL DUCT WRAP OR OTHER) MUST NOT BE LESS THAN 25mm THICK. THE INSULATION MUST CONFORM TO LOCAL REGULATIONS FOR FIBROUS INSULATION MATERIALS.
2. WITHIN THE RF ROOM, THE LINE MUST BE INSULATED WITH ONE LATER OF MINERAL FIBER INSULATION 25mm THICK WITH VAPOR BARRIER, COVERED WITH ONE LAYER OF 25mm THICK CLASS O ARMAFLEX [ARMACELL]. THE QUENCH LINE INSULATION MUST EXTEND UP TO THE QUENCH VALVE ON THE MAGNET. VAPOR BARRIERS MUST NOT MAKE ELECTRICAL CONTACT BETWEEN THE MAGNET LINE WORK AND THE WAVE GUIDE IN ORDER TO AVOID RF DISTURBANCE TO THE IMAGING SYSTEM. THE OUTSIDE MAY BE COVERED WITH AN AESTHETIC FINISH. THERE MUST BE CLEARANCE BETWEEN THE FINISHED INSULATION AND THE MAGNET COVERS.
3. OUTDOOR LINES MUST BE COVERED IF ACCESS CANNOT BE EXCLUDED AT THE LINE OR BELOW,(IN CASE OF DRIPPING LIQUID AIR IN THE EVENT OF A QUENCH). OUTSIDE INSULATION MUST BE WEATHERPROOF.
4. THE FULLY INSULATED QUENCH LINE MUST BE MARKED ALONG ITS LENGTH WITH A WARNING TAPE STATING ITS FUNCTION.
5. THE DIMENSION FROM PARENT WALL TO FINISHED WALL WILL VARY FROM SITE TO SITE. IT IS THE RF VENDOR'S RESPONSIBILITY TO PROVIDE THIS DIMENSION AND ENSURE THE QUENCH PIPE WAVE GUIDE IS PLACED IN THE CORRECT LOCATION. IF THE WAVE GUIDE IS NOT PLACED IN THE CORRECT LOCATION, IT IS THE RF VENDOR'S RESPONSIBILITY TO MAKE THE REQUIRED ADJUSTMENT.

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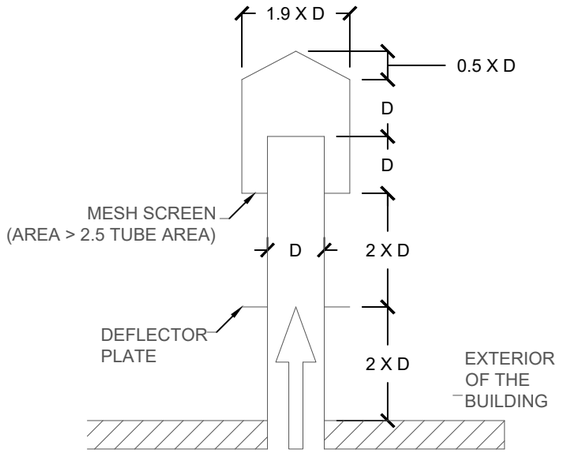
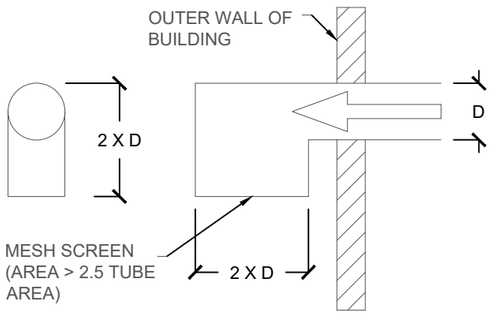


QUENCH LINE OUTLET TO ATMOSPHERE - VERTICAL



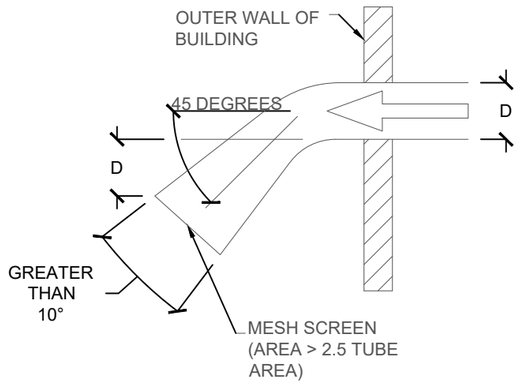
QUENCH LINE OUTLET TO ATMOSPHERE - HORIZONTAL OPTION 1

DIELECTRIC ISOLATION OF QUENCH LINE

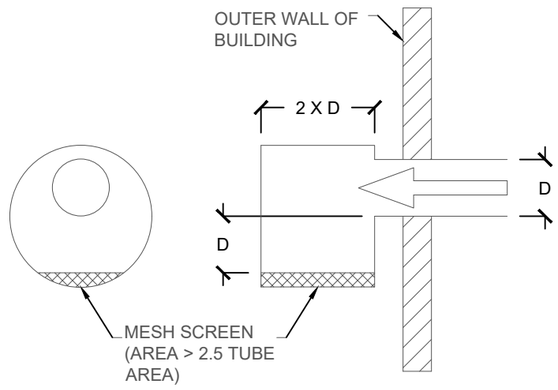
1. TO AVOID ELECTRICAL NOISES BEING PICKED UP BY LOOPS BETWEEN THE MAGNET, QUENCH LINE, THE RF ROOM AND THE BUILDING, IT IS NECESSARY TO HAVE GALVANIC SEPARATION AT THE MAGNET END AND AT THE BUILDING END OF THE QUENCH LINE.
2. THE GALVANIC SEPARATION AT THE MAGNET IS BETWEEN THE FLEXIBLE TUBE AND MAGNET ELBOW OR HORIZONTAL ADAPTER (WHICH EVER IS FITTED). THIS GALVANIC JOINT IS ACHIEVED BY USING THE GASKET, STAINLESS STEEL OR ALUMINUM BOLTS, INSULATING BUSHES NUTS AND WASHERS SUPPLIED WITH THE MAGNET SYSTEM.
3. A SECOND GALVANIC SEPARATION IS REQUIRED AT THE BUILDING END.

THE CUSTOMER IS RESPONSIBLE FOR

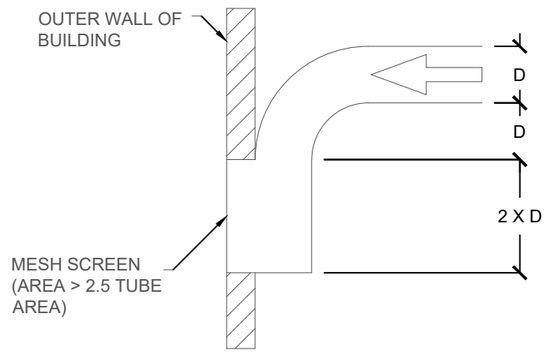
1. THE DESIGN, FABRICATION, AND INSTALLATION OF THE ENTIRE QUENCH LINE SYSTEM BY QUALIFIED INDIVIDUALS.
2. ENSURING THAT THE QUENCH LINE IS MAINTAINED IN AN OPERABLE STATE AT ALL TIMES.
3. PREPARING WRITTEN SAFETY POLICIES AND AN "EMERGENCY PLAN".
4. THE QUENCH LINE MUST BE IDENTIFIED WITH A MARKER TAPE ALONG THE COMPLETE LENGTH OF THE QUENCH LINE. THE CONTENT COULD BE, E.G.: "DO NOT CUT, QUENCH LINE EXHAUST LINE".
5. HAVING THE QUENCH LINE INSTALLED AND AVAILABLE FOR IMMEDIATE USE BEFORE THE MAGNET SYSTEM ARRIVES TO ALLOW SUITABLE VENTING FOR THE MAGNET DURING INSTALLATION.
6. THE DESIGN AND CONSTRUCTION OF THE QUENCH LINE MUST BE DOCUMENTED IN DRAWINGS AND CALCULATIONS, AND KEPT WITH THE "SYSTEM OWNER MANUAL".



QUENCH LINE OUTLET TO ATMOSPHERE - HORIZONTAL OPTION 2



QUENCH LINE OUTLET TO ATMOSPHERE - HORIZONTAL OPTION 3



QUENCH LINE OUTLET TO ATMOSPHERE - HORIZONTAL OPTION 4

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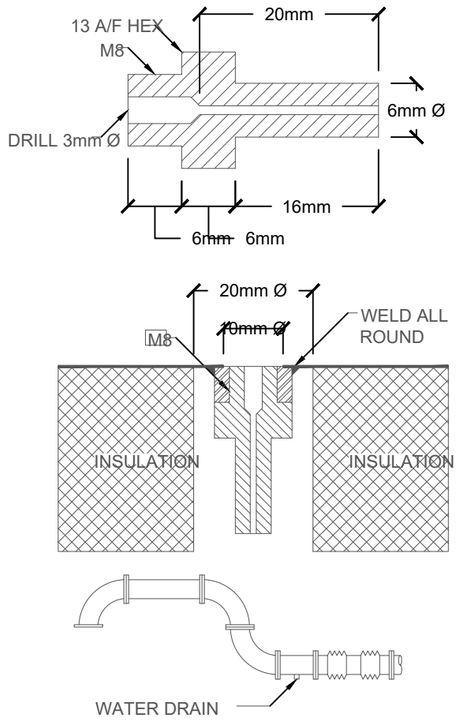
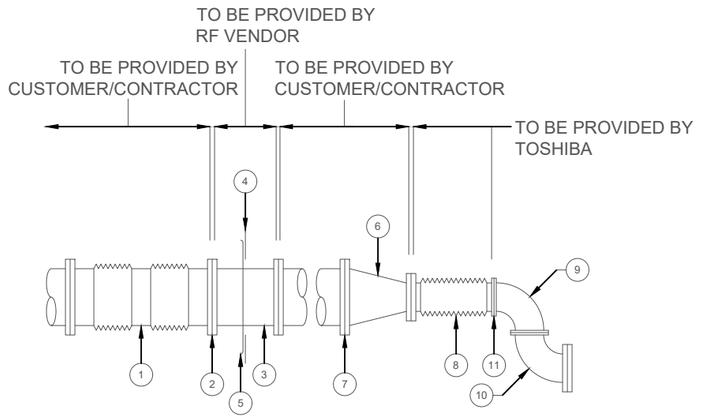
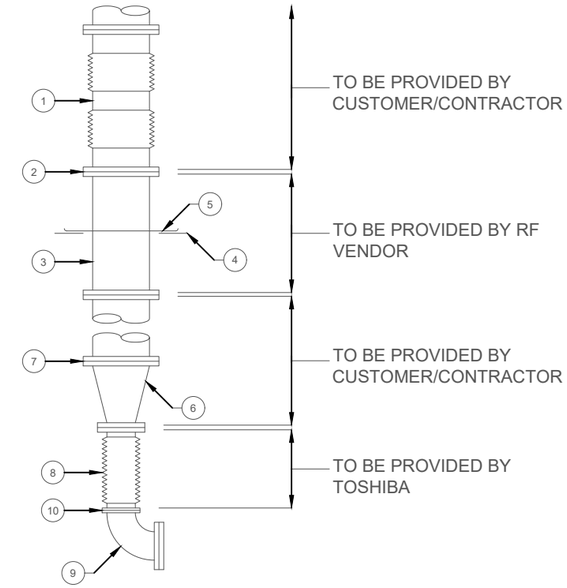


QUENCH LINE WATER DRAINS (AS REQUIRED)



1. BELLOWS (SUPPLIED BY CUSTOMER/CONTRACTOR)
2. GALVANIC SEPARATION (BY RF VENDOR)
3. RF FEED THROUGH
4. RF ROOM
5. CONNECTION PLATE TO RF ROOM
6. DIFFUSER (OPTIONAL)
7. FLANGE (E.G. WELDED, SCREW CONNECTION)
8. FLEXIBLE TUBE (SUPPLIED WITH MAGNET)
9. 90° ELBOW (SUPPLIED BY CUSTOMER/CONTRACTOR)
10. 90° ELBOW (SUPPLIED WITH MAGNET)
11. GALVANIC SEPARATION

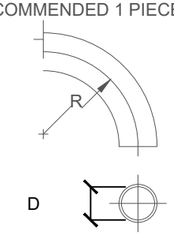
HORIZONTAL BELLOWS AND CABIN FEED-THROUGH



1. BELLOWS (SUPPLIED BY CUSTOMER/CONTRACTOR)
2. GALVANIC SEPARATION (BY RF VENDOR)
3. RF FEED THROUGH
4. RF ROOM
5. CONNECTION PLATE TO RF ROOM
6. DIFFUSER (OPTIONAL)
7. FLANGE (E.G. WELDED, SCREW CONNECTION)
8. FLEXIBLE TUBE (SUPPLIED WITH MAGNET)
9. 90° ELBOW (SUPPLIED WITH MAGNET)
10. GALVANIC SEPARATION

VERTICAL BELLOWS AND CABIN FEED-THROUGH

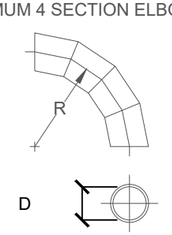
RECOMMENDED 1 PIECE ELBOW



R/D > 1.5 < 5.0

SMOOTH ELBOW

MINIMUM 4 SECTION ELBOW

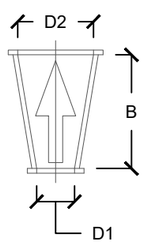


R/D > 1.5 < 5.0

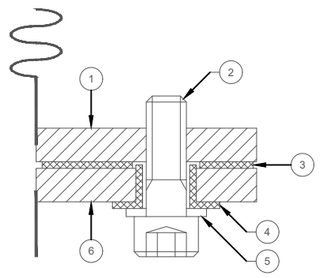
SEGMENTED ELBOW

THE RECOMMENDED DIFFUSER DESIGN FOR MINIMUM PRESSURE LOSS IS THE RATIO OF:

B > 2.5 X (D2 - D1)

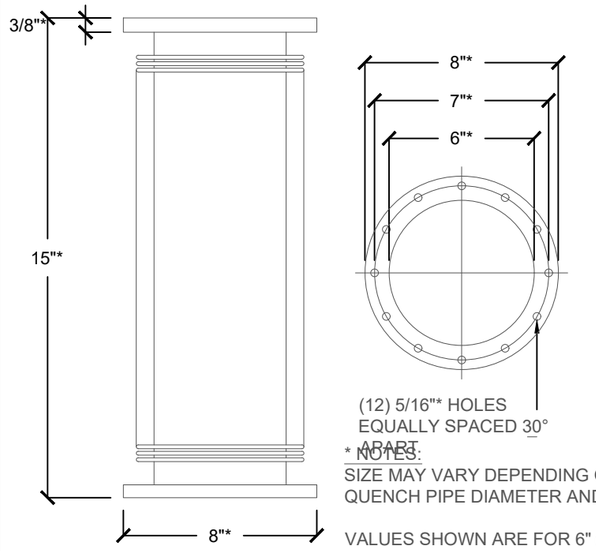


DIFFUSER CONFIGURATION



1. FLEXIBLE TUBE FLANGE
2. M8 HEX HEAD SCREWS (12 OFF)
3. FIBER GASKET
4. PTFE INSULATOR (12 OFF)
5. NORDLOCK WASHER (12 OFF)
6. TURRET FLANGE

GALVANIC JOINT AT FLEXIBLE TUBE



* NOTES:
SIZE MAY VARY DEPENDING ON QUENCH PIPE DIAMETER AND DESIGN.

VALUES SHOWN ARE FOR 6" (TYPICAL) QUENCH PIPE DIAMETER.

BELLOWS FOR 1.5 TESLA MAGNETS

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

CRYOGEN VENT SYSTEM DETAILS

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
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SHEET
M-10

ELECTRICAL LEGEND TOSHIBA TITAN 1.5T MRI SYSTEM, (GEN-II - VRDU & GECO CABINET)

ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY THE CUSTOMER'S CONTRACTORS

TAG	DESCRIPTION OF ITEM
MAIN	MAIN POWER SOURCE FROM FACILITY TO MRI SYSTEM, 480V, 3P WITH FULL SIZED GROUND TO "CB1".
CB1	CIRCUIT BREAKER FOR MRI SYSTEM, SHUNT TRIP TYPE BREAKER SIZED FOR MRI SYSTEM TIED INTO "EPO" CIRCUIT. EPO CIRCUIT TO BE DESIGNED BY ELECTRICAL ENGINEER.
EPO	"EMERGENCY POWER OFF" BUTTON - 4" STD. J-BOX WITH DPDT, NORMALLY OPEN MUSHROOM HEAD PUSH BUTTON WITH PROTECTIVE COLLAR OR COVER MOUNTED AT 60" A.F.F. WITH CONDUIT & CONDUCTORS AS REQUIRED TO OTHER EPO'S AND SHUNT TRIP BREAKER. CIRCUIT DESIGNED BY ELECTRICAL ENGINEER. BUTTONS SHOWN IN RECOMMENDED LOCATIONS, FINAL LOCATIONS TO BE DETERMINED BY ELECTRICAL ENGINEER.
MAG	CABLE ACCESS AREA AT TOP OF MAGNET FOR MRI SYSTEM CABLES.
OC	GROMMETED OPENING IN TOP OF WALL DUCT "WD" FOR SYSTEM CABLING, COORDINATE LOCATION WITH MRI INSTALLATION TEAM
ERDU	GROMMETED OPENING IN FACE OF VERTICAL RISER DUCT "VR" AT 60" A.F.F. COORDINATE WITH INSTALLERS.
SUVS	4" W X 4" H X 4" D J-BOX, FLUSH MOUNTED IN WALL FOR QUENCH BUTTON (PLASTIC OR ALUMINUM). +6'-0" A.F.F. TO CENTER OF BOX. ADJACENT TO SCAN ROOM DOOR.
EVS	BOX AND SWITCH FOR EMERGENCY VENTILATION EXHAUST FAN, SWITCH @ 4'-0" A.F.F. LOCATION BY ELECTRICAL ENGINEER. THE EXHAUST FAN IS LOCATED OUTSIDE THE RF SHIELD, SWITCH LEG TO FAN SWITCH INTO SCAN ROOM VIA ELECTRICAL FILTER PROVIDED BY RF CONTRACTOR.
EVF	POWER TO EMERGENCY VENTILATION EXHAUST FAN, FAN LOCATED OUTSIDE RF SHIELD, LOCATION AND POWER REQUIREMENTS DETERMINED BY MECHANICAL ENGINEER.
LFB	LINE FILTER BOX, FURNISHED WITH MRI SYSTEM AND INSTALLED BY RF SHIELDING CONTRACTOR. ALL RF ELECTRICAL FILTERS TO BE LOCATED WITHIN 36" OF "LFB".
GECO	SYSTEM CABLES DROP FROM LADDER TRAY ABOVE DOWN TO GRADIENT-ECO CABINET.
TRF	SYSTEM CABLES DROP FROM LADDER TRAY ABOVE DOWN TO TRASNFORMER CABINET.
OCU	OUTDOOR CHILLER UNIT, REFER TO SEPARATE DATA SHEETS AND SPECS FOR POWER REQUIREMENTS, LOCATION OF CHILLER DETERMINED BY ARCHITECT.
IHE	4" W X 4" H X 4" D, J-BOX FLUSH WITH FINISHED WALL, MOUNTED 5'-0" A.F.F. TO BOTTOM OF BOX.
SPK	SCAN ROOM SPEAKER, MOUNTED ATOP HD1, PROVIDE 1" GROMMETED OPENING.
RFEF	RF ELECTRICAL FILTERS FURNISHED AND INSTALLED BY RF CONTRACTOR, LOCATE WITHIN 36" OF LINE FILTER BOX CAREFUL GROUNDING PER RF CONTRACTOR, TYPICALLY ABOVE THE CEILING. FILTERS ARE FOR SITE PROVIDED ELECTRICAL ITEMS WITHIN MRI SCAN ROOM. I.E., LIGHT FIXTURES, RECEPTACLES, EPO WIRING, EXHAUST FAN WIRING, ETC.

TAG	DESCRIPTION OF ITEM
JB1	12" X 12" X 4" J-BOX SURFACE OR RECESS MOUNTED BEHIND "VRDU" @ 45" A.F.F TO BOTTOM. PROVIDE 6'-0" WHIP OF 2" LIQUID TIGHT FLEX WITH CONDUCTORS COMING FROM CB1 TO "VRDU".
JB2	12" X 12" X 4" J-BOX MOUNTED EITHER FLUSH IN CEILING ABOVE "CLT" AS CLOSE AS POSSIBLE TO "LFB" OR ATTACHED TO "CLT" AS CLOSE AS POSSIBLE TO "LFB".
JB3	12" X 12" X 4" J-BOX MOUNTED ATOP "VD1" ABOVE CEILING, NOT REQUIRED IF CONDUITS FROM "JB2" TERMINATE DIRECTLY INTO "VD1".
HD1	HORIZONTAL DUCT - CONTROL ROOM, 10" W X 3.5" DEEP TROUGH, 2 EQUALLY PARTITIONED COMPARTMENTS, REMOVABLE COVER ENTIRE LENGTH, SURFACE MOUNTED 12" ABOVE FLOOR WITH OPENING INTO "VD1" AND TWO (2) GROMMETED OPENINGS.
VD1	VERTICAL DUCT - CONTROL ROOM, 10" W X 3.5" DEEP TROUGH, 2 EQUALLY PARTITIONED COMPARTMENTS, REMOVABLE COVER ENTIRE LENGTH, SURFACE OR RECESS MOUNTED WITH OPENING INTO "HD1", EXTEND 12" ABOVE FINISH CEILING. "JB1" MOUNTS TO DUCT ABOVE CEILING, ALTERNATIVELY MAY JUST RUN CONDUITS INTO "VD1" AND OMIT "JB1".
LCT	ALUMINUM LADDER TYPE CABLE TRAY - SCAN & EQUIPMENT ROOMS, 24" W X 3.5" DEEP, WORKING LOAD TO BE A MINIMUM OF 100 LBS./L.F. MOUNTED ABOVE FINISHED CEILING IN SCAN ROOM WITH 8" CLEARANCE ABOVE, MOUNTED BELOW FINISHED CEILING IN EQUIPMENT ROOM WITH 8" CLEARANCE ABOVE.

CONDUIT AND CABLE SCHEDULE

ALL CONDUITS/RACEWAYS FURNISHED & INSTALLED BY THE CUSTOMER'S CONTRACTORS

RUN NO.	CONDUIT POINT-POINT		ROUTING	DIAMETER	CABLE POINT-POINT		MAX LENGTH	CABLE SUPPLIED BY/REMARKS
1	MAIN	CB1	AS REQ'D	CODE	MAIN	CB1	CODE	CONTRACTOR, DESIGNED BY ENGINEER
2	JB1	BS	AS REQ'D	CODE	VRDU	BS	CODE	CONTRACTOR, SEE GROUNDING NOTES
3	CB1	EPO	AS REQ'D	CODE	CIRCUIT		CODE	CONTRACTOR, DESIGNED BY ENGINEER
4	CB1	JB1	AS REQ'D	CODE	CB1	VRDU	CODE	CONTRACTOR, DESIGNED BY ENGINEER
5	JB1	GECO	OVERHEAD	2-1/2'	VRDU	GECO	20'-0"	CABLE WITH SYSTEM
6	LFB	SUVS	AS REQ'D	1"	LFB1	SUVS	35'-0"	CABLE WITH SYSTEM
7	EVS	RFEF	OVERHEAD	CODE	EVS	RFEF	CODE	CONTRACTOR, DESIGNED BY ENGINEER
8	JB2	JB3	OVERHEAD	(2) 3"	TRF	CON	26'-0"	CABLE WITH SYSTEM
					GECO	CON	26'-0"	CABLE WITH SYSTEM
9	OCU	MAIN	AS REQ'D	CODE	OCU	MAIN	CODE	CONTRACTOR, DESIGNED BY ENGINEER

NOTES:

1. THE LOCATION OF ELECTRICAL DEVICES IS SUGGESTION ONLY, CUSTOMER'S ELECTRICAL ENGINEER IS RESPONSIBLE FOR ALL ELECTRICAL DESIGN AND THE LOCATION OF ALL DEVICES.
2. ELECTRICAL ENGINEER RESPONSIBLE FOR ALL CODE COMPLIANCE CORRECTIONS WHERE CONFLICTS MAY OCCUR.
3. THE ELECTRICAL CONTRACTOR IS TO CONFIRM WITH THE MRI INSTALLATION TEAM THE EXACT LOCATION OF ALL OPENINGS IN TROUGHS AND CHASES PRIOR TO CUTTING THEM IN, REGARDLESS OF THE LOCATIONS SHOWN ON THESE PLANS, (THIS MAY REQUIRE THAT ALL EQUIPMENT CABINETS BE SET IN PLACE FIRST).

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI ELECTRICAL LEGEND & NOTES

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
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FILENAME
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SHEET
E-1

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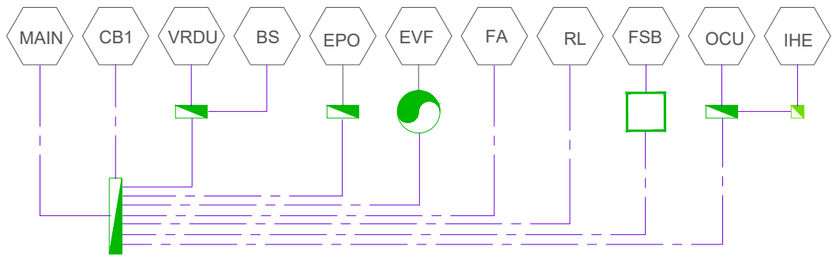

POWER ONE-LINE DIAGRAM

NOTES:

1. FOR ABOVE CONNECTIONS, SEE DETAIL.DETAILS HEREIN.
2. ADDITIONAL "EPO" SWITCHES TO BE LOCATED IN ADJACENT ROOMS WITH MRI EQUIPMENT IF MAIN "EPO" IS NOT ACCESSIBLE (VERIFY WITH LOCAL CODE). ALL "EPO" SWITCHES TO BE PROVIDED BY CUSTOMER/CONTRACTOR.
3. ALL CABLES AND CONDUITS REQUIRED ARE TO BE PROVIDED BY CUSTOMER/CONTRACTOR.

ELECTRICAL REQUIREMENTS

SUPPLY CONFIGURATION:	3-PHASE WITH DELTA GROUND, (ALL CONDUCTORS SAME SIZE)
SUPPLY VOLTAGE:	480v, 150 AMP, 140KVA MAX DEMAND
VOLTAGE VARIATION:	+/- 10% STEADY-STATE INCLUDING SAGS AND SURGE
PHASE-TO-PHASE:	+/- 2% MAXIMUM OF NOMINAL VOLTAGE, PHASE-TO-PHASE
FREQUENCY VARIATION:	+/- 1Hz
HARMONIC DISTORTION:	3% STEADY-STATE, 5% FOR SHORT PERIODS, (LESS THAN 1 MINUTE)
GROUND IMPEDANCE:	0.1 Ohms TO NEUTRAL-GROUND BOND POINT

ELECTRICAL NOTES:

1. FOR REFERENCE TO USABLE CABLE LENGTHS REFER TO THE MRI SYSTEM CABLE ROUTING DIAGRAM, LAST SHEET IN THIS SET. THE CUSTOMER'S ENGINEERS AND CONTRACTORS ARE RESPONSIBLE FOR ENSURING THAT ALL RUNS COMPLY WITH MAXIMUM LENGTHS OF CABLES AND THAT NO CONDUIT SHALL BE RUN IN SUCH A MANNER THAT WILL ALLOW CABLE POINT TO POINT LENGTHS TO BE EXCEEDED AS SHOWN IN CONDUIT LEGEND.
2. ALL CONDUITS ARE FURNISHED AND INSTALLED BY CUSTOMER'S CONTRACTORS. ALL EMPTY CONDUITS TO BE LABELED AT BOTH ENDS PER THIS SCHEDULE AND PULL STRINGS PROVIDED. ALL CONDUITS INSIDE THE MRI SCAN ROOM ARE TO BE NON-FERROUS.
3. ALL CONDUIT RUNS MUST TAKE THE SHORTEST MOST DIRECT ROUTE POSSIBLE AND MAY HAVE A MAXIMUM OF (3) 90° BENDS.
4. "EPO" CONNECTS TO SHUNT TRIP CIRCUIT BREAKER FOR MRI SYSTEM POWER.
5. CUSTOMER SUPPLIED CABLES INTO SCAN ROOM MUST RUN THROUGH CUSTOMER/CONTRACTOR SUPPLIED RF FILTERS. COORDINATE WITH RF VENDOR.
6. ALL GROUND WIRES NEED TO BE INSULATED - ISOLATED.
7. ALL "EPO" SWITCHES TO BE MUSHROOM HEAD PUSH BUTTON SWITCHES MOUNTED AT MIN. 60" A.F.F. LOCATED IN MRI SCAN, CONTROL AND EQUIPMENT ROOMS FURNISHED AND INSTALLED BY CUSTOMERS' ELECTRICAL CONTRACTOR.
8. J-BOX SIZES MAY BE INCREASED AS NEEDED WITH EXCEPTION TO THE "VRDU" J-BOX.
9. GROMMETED OPENINGS ARE SHOWN FOR REFERENCE ONLY. VERIFY SIZE AND LOCATION WITH SITE PLANNER.
10. CUSTOMER HAS THE OPTION TO FUR OUT WALL TO PROVIDE FOR FLUSH MOUNTED WALL DUCTS IF DESIRED.
11. IF NOT REQUIRED BY CODE THE DOOR INTERLOCK SWITCH MAY BE OMITTED.

CONDUIT NOTES:

1. MAXIMUM CABLE LENGTHS MUST NOT BE EXCEEDED, REFER TO CABLE LENGTH TABLE ON SHEET E-9, CONTRACTOR TO PROVIDE AS-BUILT DRAWING TO EQUIPMENT PROVIDER WITH ACTUAL LENGTHS NOTED PRIOR TO DRYWALL IS INSTALLED.
2. CONDUITS SUPPLIED/INSTALLED BY CUSTOMER/CONTRACTOR.
3. ALL CONDUIT RUNS MUST TAKE THE SHORTEST MOST DIRECT ROUTE POSSIBLE.
4. CONDUITS MAY HAVE A MAXIMUM OF (3) 90° BENDS.
5. CONDUIT IS NOT TO BE RUN IN SUCH A MANNER THAT WILL ALLOW CABLE POINT TO POINT LENGTHS TO BE EXCEEDED AS SHOWN IN CONDUIT LEGEND, PROVIDE MEASUREMENTS TO EQUIPMENT PROJECT MANAGER AFTER CONDUITS ARE RUN.
6. ALL GROUND WIRES NEED TO BE INSULATED/ISOLATED.
7. CONTRACTOR TO PROVIDE PULL STRINGS IN EACH CONDUIT.

ELECTRICAL SYMBOLS

- FLOOR TROUGH, SURFACE OR RECESSED AS DETERMINED BY ELECTRICAL ENGINEER & ARCHITECT.
- WALL TROUGH, SURFACE OR RECESSED AS DETERMINED BY ELECTRICAL ENGINEER & ARCHITECT.
- ELECTRICAL JUNCTION BOX, SURFACE OR RECESSED AS DETERMINED BY ELECTRICAL ENGINEER & ARCHITECT.
- DEDICATED CIRCUIT QUAD RECEPTACLE
- DUPLEX RECEPTACLE
- QUAD RECEPTACLE
- NETWORK DATA DROP
- TELEPHONE DROP
- EPO - SHUNT TRIP BUTTON
- MAGNET STOP BUTTON
- TRACK LIGHT FIXTURE
- 6" DOWN LITE FIXTURE
- BATTERY EMERGENCY LIGHT
- 24" X 24" FLUORESCENT LAY-IN FIXTURE
- 24" X 48" FLUORESCENT LAY-IN FIXTURE

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI ELECTRICALNOTES

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1. 1-5-22 PRELIMS ISSUED
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SHEET
E-2

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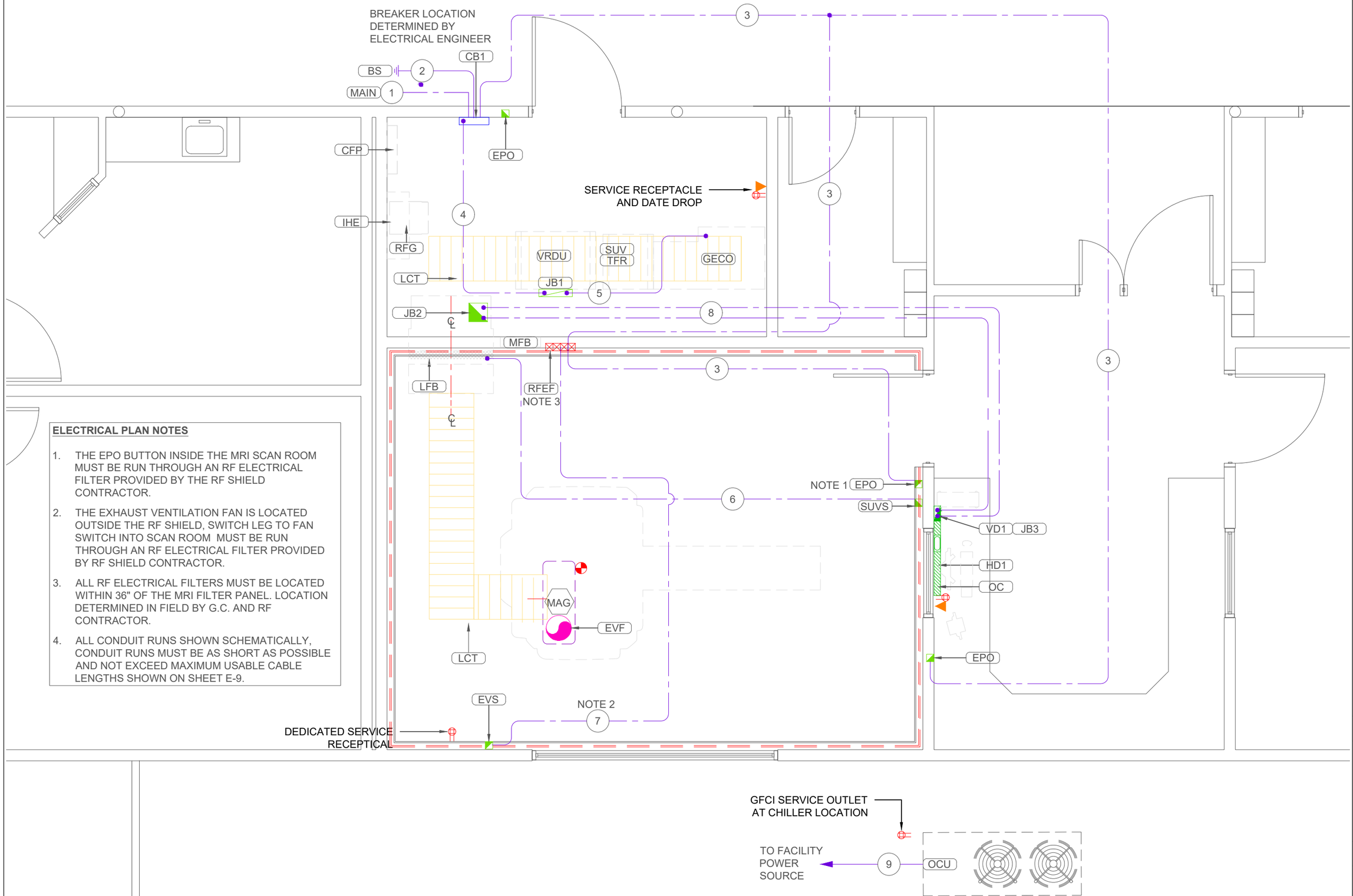

ELECTRICAL PLAN NOTES

1. THE EPO BUTTON INSIDE THE MRI SCAN ROOM MUST BE RUN THROUGH AN RF ELECTRICAL FILTER PROVIDED BY THE RF SHIELD CONTRACTOR.
2. THE EXHAUST VENTILATION FAN IS LOCATED OUTSIDE THE RF SHIELD, SWITCH LEG TO FAN SWITCH INTO SCAN ROOM MUST BE RUN THROUGH AN RF ELECTRICAL FILTER PROVIDED BY RF SHIELD CONTRACTOR.
3. ALL RF ELECTRICAL FILTERS MUST BE LOCATED WITHIN 36" OF THE MRI FILTER PANEL. LOCATION DETERMINED IN FIELD BY G.C. AND RF CONTRACTOR.
4. ALL CONDUIT RUNS SHOWN SCHEMATICALLY, CONDUIT RUNS MUST BE AS SHORT AS POSSIBLE AND NOT EXCEED MAXIMUM USABLE CABLE LENGTHS SHOWN ON SHEET E-9.

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI ELECTRICAL PLAN

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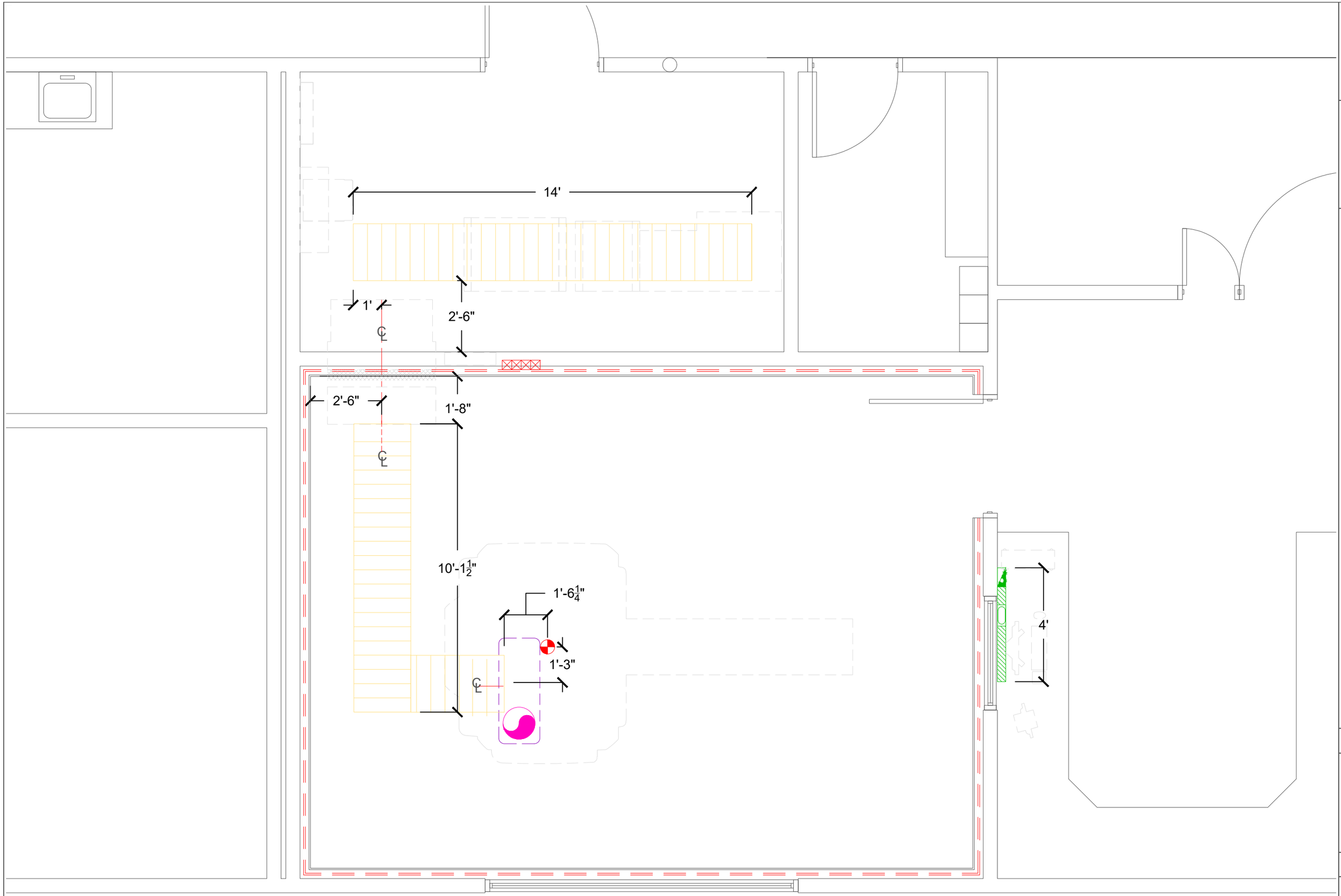

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

CABLE TRAY LAYOUT

PROJECT DATE
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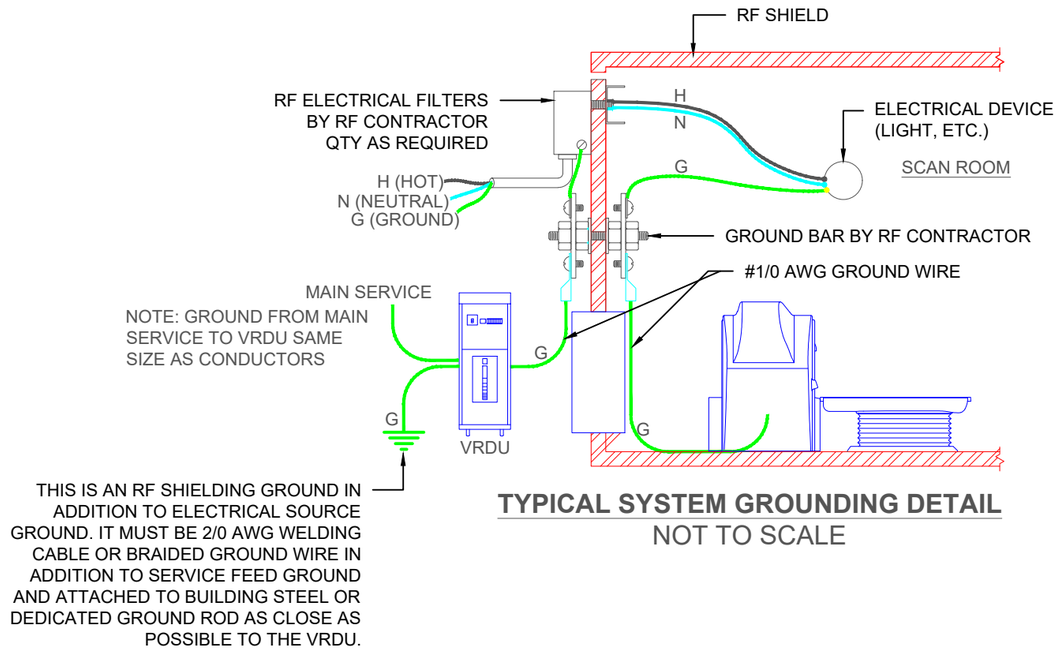
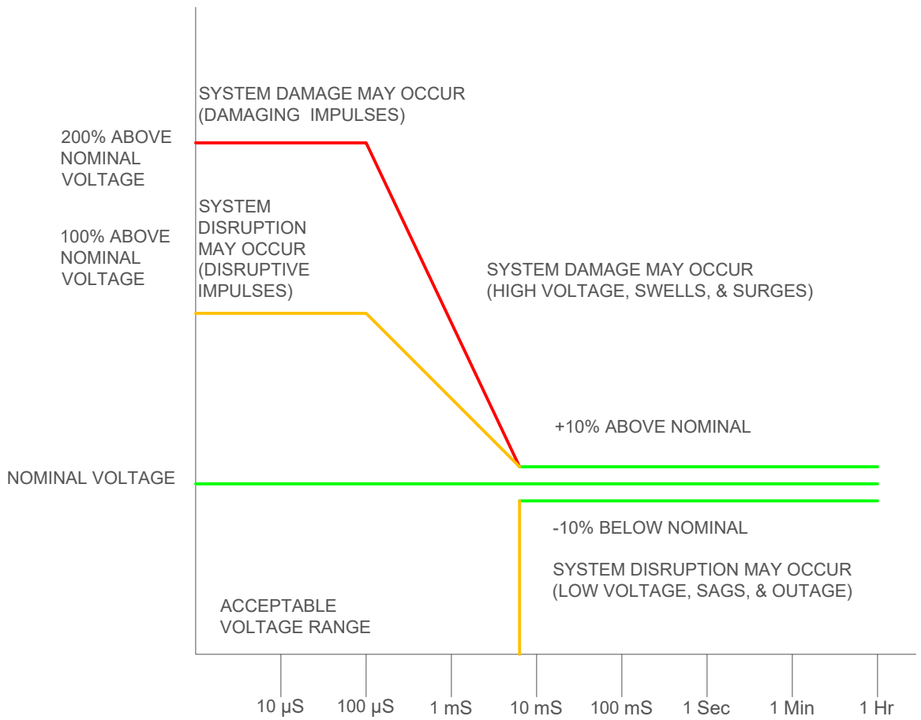


TYPICAL SYSTEM GROUNDING DETAIL

NOT TO SCALE



POWER REQUIREMENT'S WITH VRDU

STANDARD POWER QUALITY NOTES

1. A GROUNDED NEUTRAL POWER SOURCE IS REQUIRED TO ENSURE RELIABLE EQUIPMENT OPERATION, SAME SIZE AS THE CONDUCTORS, (THE NEUTRAL CONDUCTOR MAY NOT BE REQUIRED ON CERTAIN VARIANTS OF THE MRI SYSTEM).
2. IN CASES WHERE MULTIPLE VOLTAGES ARE PERMITTED, THE PREFERRED SYSTEM VOLTAGE IS SPECIFIED.
3. DUE TO THE HIGH INSTANTANEOUS POWER OF MEDICAL IMAGING SYSTEMS, USE THE HIGHEST AVAILABLE VOLTAGE SOURCE. ENSURE THAT LOWER VOLTAGE SOURCES ARE DERIVED DIRECTLY FROM THE SERVICE ENTRANCE OF THE FACILITY.
4. GROUND CONDUCTORS ARE REQUIRED TO BE THE SAME SIZE AS THE PHASE CONDUCTORS UNLESS OTHERWISE STATED.
5. THE MAINS GROUND CONDUCTOR IS TO BE RUN WITH THE POWER PHASE CONDUCTORS, THE GROUNDS TO BUILDING STEEL OR EARTH GROUND ARE NOT TO BE RUN WITH THE PHASE CONDUCTORS.
6. ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS MUST BE COPPER - ALUMINUM IS NOT PERMITTED.
7. IF THE EQUIPMENT CIRCUIT BREAKER IS NOT LOCATED IN THE CONTROL AREA, A SHUNT TRIP BREAKER MUST BE USED IN ORDER TO COMPLY WITH N.E.C. 517-72(B). A PUSH-BUTTON TO OPERATE THE SHUNT TRIP MUST BE LOCATED IN THE CONTROL AREA.
8. A SEPARATE CIRCUIT, FED FROM THE FACILITY RADIOLOGY PANEL OR A MAIN SERVICE PANEL IS REQUIRED. USE OF A SUB PANEL WITH LOADS SUCH AS ELEVATORS, HVAC, MOTORS, ETC., IS NOT PERMITTED.
9. DEVICES SUCH AS UN-INTERRUPTIBLE POWER SUPPLIES, POWER CONDITIONERS, VOLTAGE REGULATORS, AND FILTERS MAY BE INCOMPATIBLE WITH THIS IMAGING EQUIPMENT. CONSULT YOUR SITE PLANNING REPRESENTATIVE PRIOR TO PURCHASING OR INSTALLING THESE DEVICES.

RECOMMENDED CONDUCTOR SIZES

FOR 1.5% IMPEDANCE OF BRANCH CONDUCTORS (20%)

CONDUCTOR SIZE	208 VAC (SEE NOTE C)	480 VAC (SEE NOTE B)	BREAKER FRAME SIZE
1/0 AWG	----	321 FT.	250 A
2/0 AWG	----	403 FT.	250 A
3/0 AWG	----	511 FT.	250 A
4/0 AWG	----	650 FT.	250 A
250 MCM	----	761 FT.	250 A
300 MCM	----	913 FT.	250 A
350 MCM	200 FT.	1066 FT.	250 A
400 MCM	231 FT.	1230	400 A
500 MCM	289 FT.	1537	400 A
CIRCUIT BREAKER SIZE:	300 A	150 A	
MOMENTARYMAX CURRENT:	239 A	103 A	
MAXIMUM PH-PH IMPEDANCE:	0.044 OHMS	0.232 OHMS	
MAXIMUM VOLTAGE DROP:	10.4 V	24.0 V	
% REGULATION:	5.0%	5.0%	

*ALL CONDUCTORS MUST BE COPPER, ALUMINUM IS NOT PREMITTED

POWER QUALITY REQUIREMENTS

VANTAGE TITAN WITH VRDU

SUPPLY CONFIGURATION	3-PHASE DELTA
KVA RATING	102.00
VOLTAGE	480V, 60HZ
CALCULATED CURRENT (AMP)	122.69
CIRCUIT BREAKER (AMP)	150
IMPEDANCE %	5.00
LINE RESISTANCE SPEC	0.000
MAXIMUM CURRENT (AMPS)	122.69
VOLTAGE DROP 9VOLTS)	24.00
LINE RESISTANCE (OHMS)	0.196
LINE DROP %	1.50
LINE DROP (VOLTS)	7.20
CONDCUTOR (OHMS)	0.059
TEMPERATURE	68°F

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

ELECTRICAL NOTES & DETAILS

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ELECTRICAL NOTES

1. THESE SITE PLANS ARE INTENDED TO DEPICT ONLY A CONCEPT OF THE ELECTRICAL REQUIREMENTS FOR THE TOSHIBA EQUIPMENT. THE DESIGN OF ALL ELECTRICAL ELEMENTS MUST BE SPECIFIED BY A LICENSED ELECTRICAL ENGINEER IN ACCORDANCE WITH TOSHIBA SPECIFICATION AND ALL APPLICABLE CODES. ALL 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 NECA STANDARD OF INSTALLATION.
2. 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 THE SITE PLANNER. ALL DIMENSIONS ARE FROM FINISHED SURFACES. CONDUIT AND PULL BOXES TO BE INSTALLED BY THE CUSTOMER/CONTRACTOR WITH LOCATIONS BEING FIELD VERIFIED WITH THE EQUIPMENT INSTALLERS.
3. IN ACCORDANCE WITH NEC ARTICLE 517-72(B), THE EQUIPMENT CIRCUIT BREAKERS MUST BE LOCATED SO THAT THEY SHALL BE OPERABLE FROM A LOCATION READILY ACCESSIBLE FROM THE CONTROL AREA. IF THIS IS IMPOSSIBLE OR IMPRACTICAL, THE USE OF A SHUNT TRIP TYPE BREAKER WILL BE NECESSARY TO SATISFY THIS REQUIREMENT. THE EMERGENCY OFF BUTTON FOR THE SHUNT TRIP SHOULD BE LOCATED IN THE CONTROL AREA.
4. THE CUSTOMER/CONTRACTOR SHALL SUPPLY AND INSTALL ALL CIRCUIT BREAKERS, CONDUITS, JUNCTION BOXES, DUCTS, A/C POWER RECEPTACLES, THERMOSTATS, EMERGENCY OFF BUTTONS, AND 12 VOLT POWER, ETC. SPECIFIED HEREIN.
5. THE EQUIPMENT VENDOR WILL PROVIDE CONNECTING AND FILTER PANELS TO THE CUSTOMER'S RF CONTRACTOR FOR INSTALLATION.
6. ALL CONDUITS AND RACEWAYS FOR SYSTEM SUPPLIED CABLES SHALL BE PROVIDED WITH LONG SWEEP ELBOWS.
7. ALL CHASE OPENINGS SHALL HAVE PLASTIC OR NYLON BUSHINGS.
8. ALL DUCT AND CONDUITS SHALL BE ELECTRICALLY BONDED AS A GROUNDING PATH IN ACCORDANCE WITH NEC ARTICLE 517-13(B).
9. CUSTOMER/CONTRACTOR SHALL SUPPLY AND INSTALL NYLON MEASURING PULL STRING OR EQUIVALENT IN ALL CONDUITS AND CLOSED DUCT WORK.
10. CONDUIT RUNS SHOWN ARE SCHEMATIC ONLY. ALL CONDUIT RUNS MUST TAKE THE SHORTEST MOST DIRECT ROUTE POSSIBLE.
11. CUSTOMER/CONTRACTOR MUST SUPPLY AND INSTALL ALL INCOMING POWER CABLES FROM CIRCUIT BREAKERS TO TOSHIBA EQUIPMENT CONNECTION POINT. CABLE TYPE MUST BE MULTI-STRAND COPPER - NO ALUMINUM IS PERMITTED. CABLE SIZE MUST BE IN ACCORDANCE WITH TOSHIBA POWER QUALITY REQUIREMENTS.
12. CUSTOMER/CONTRACTOR IS TO SUPPLY AND INSTALL ALL NECESSARY HARDWARE TO ENCLOSE INCOMING POWER CABLES IN FLEXIBLE WATER TIGHT CONDUIT FROM CIRCUIT BREAKERS TO TOSHIBA EQUIPMENT CABINETS
13. ANY CHANGES IN THE LOCATION OR TYPE OF CONDUIT, DUCT WORK, JUNCTION BOXES, ETC. MUST BE SUBMITTED IN WRITING TO THE INSTALLATION PROJECT MANAGER FOR APPROVAL.
14. A SEPARATE DEDICATED CIRCUIT, FED FROM THE FACILITY MAIN SERVICE PANEL, IS REQUIRED FOR THE MRI SYSTEM. USE OF A SUB PANEL WITH LOADS SUCH AS ELEVATORS, HVAC, MOTORS, ETC.
15. RACEWAY SHALL BE ELECTRIC METALLIC TUBING (EMT) FOR RIGID CONDUIT WORK, OR WHERE SHORT OFFSET CONNECTIONS ARE REQUIRED LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE USED. FIELD BENDS SHALL NOT BE LESS THAN AS SHOWN IN 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. CONNECTORS SHALL BE DOUBLE SET SCREW TYPE, STEEL CONCRETE TIGHT. 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.
16. 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 THE EQUIPMENT INSTALL TEAM PULL SUPPLIED SYSTEM CABLES AT THE CUSTOMER EXPENSE.
17. 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 DEGREES C (165F). 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 THE EQUIPMENT INSTALL TEAM.
18. 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, X-RAY 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.
19. THE EPO CIRCUIT MUST BE DESIGNED BY A QUALIFIED ELECTRICAL ENGINEER 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.
20. WORK NOT PROVIDED BY THE EQUIPMENT INSTALLATION TEAM, 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 AND EMERGENCY OFF BUTTONS
    - DOOR SWITCHES AND WARNING LIGHTS
    - WIRING, WIRING DEVICES, CONNECTORS, LIGHT FIXTURES AND GROUNDING

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PRIZMED IMAGING SOLUTIONS
5335 Avion Park Drive
Unit A
Highland Heights, Ohio
(888) 505-0319

EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI ELECTRICALNOTES

PROJECT DATE
12-2021

REVISION HISTORY
1. 1-5-22 PRELIMS ISSUED
2. 1-18-22 FINALS ISSUED
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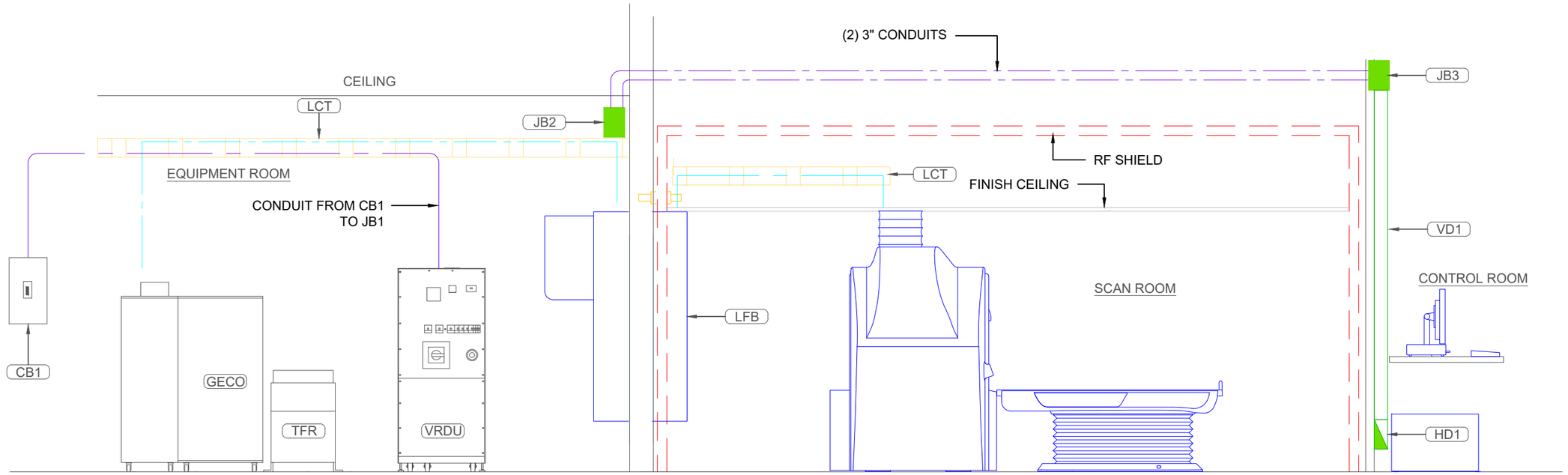
8.

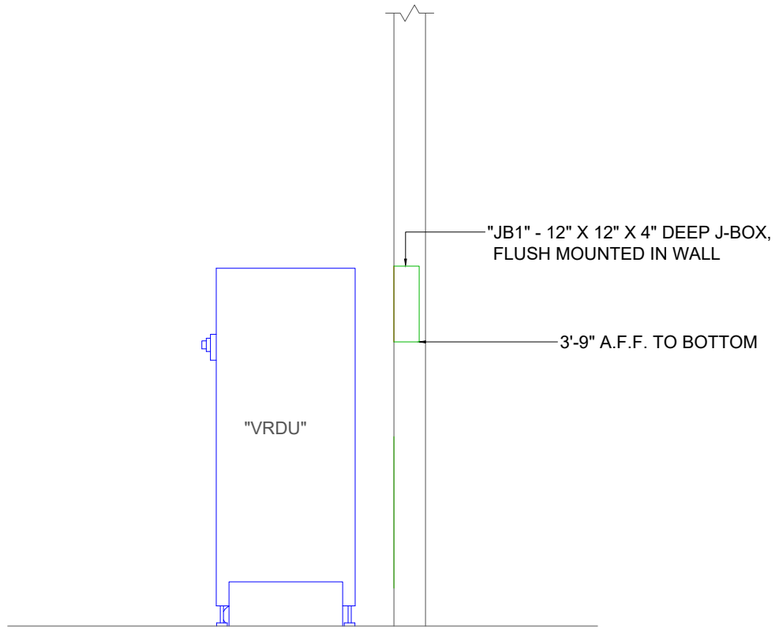
FILENAME
2021-23

SHEET
E-5



TYPICAL LADDER TRAY ELEVATION

NOT A SITE-SPECIFIC DETAIL



ELEVATION AT VRDU

(2) 3" CONDUITS

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MRI ELECTRICAL DETAILS

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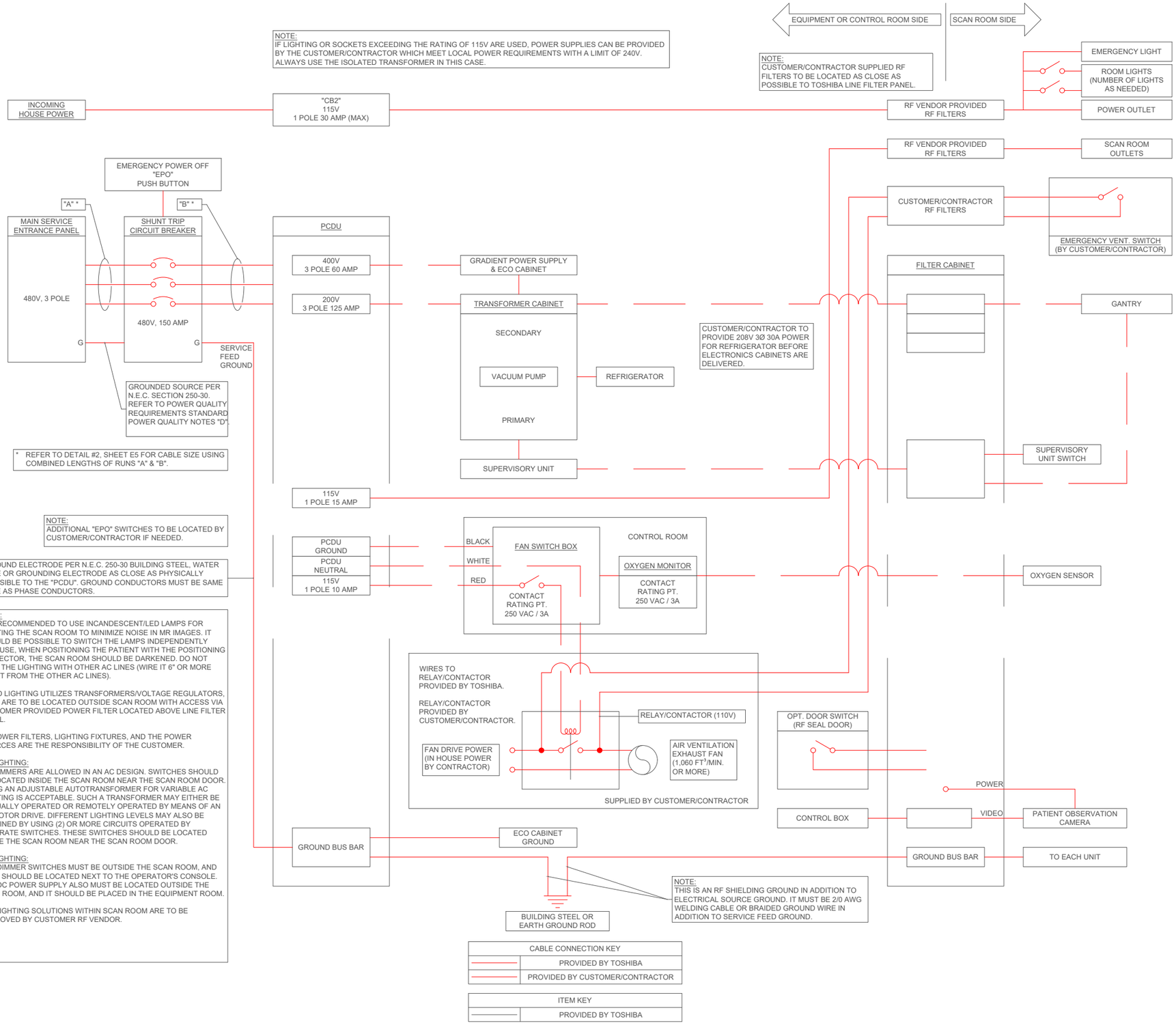
SHEET
E-6



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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI ELECTRICAL DETAILS

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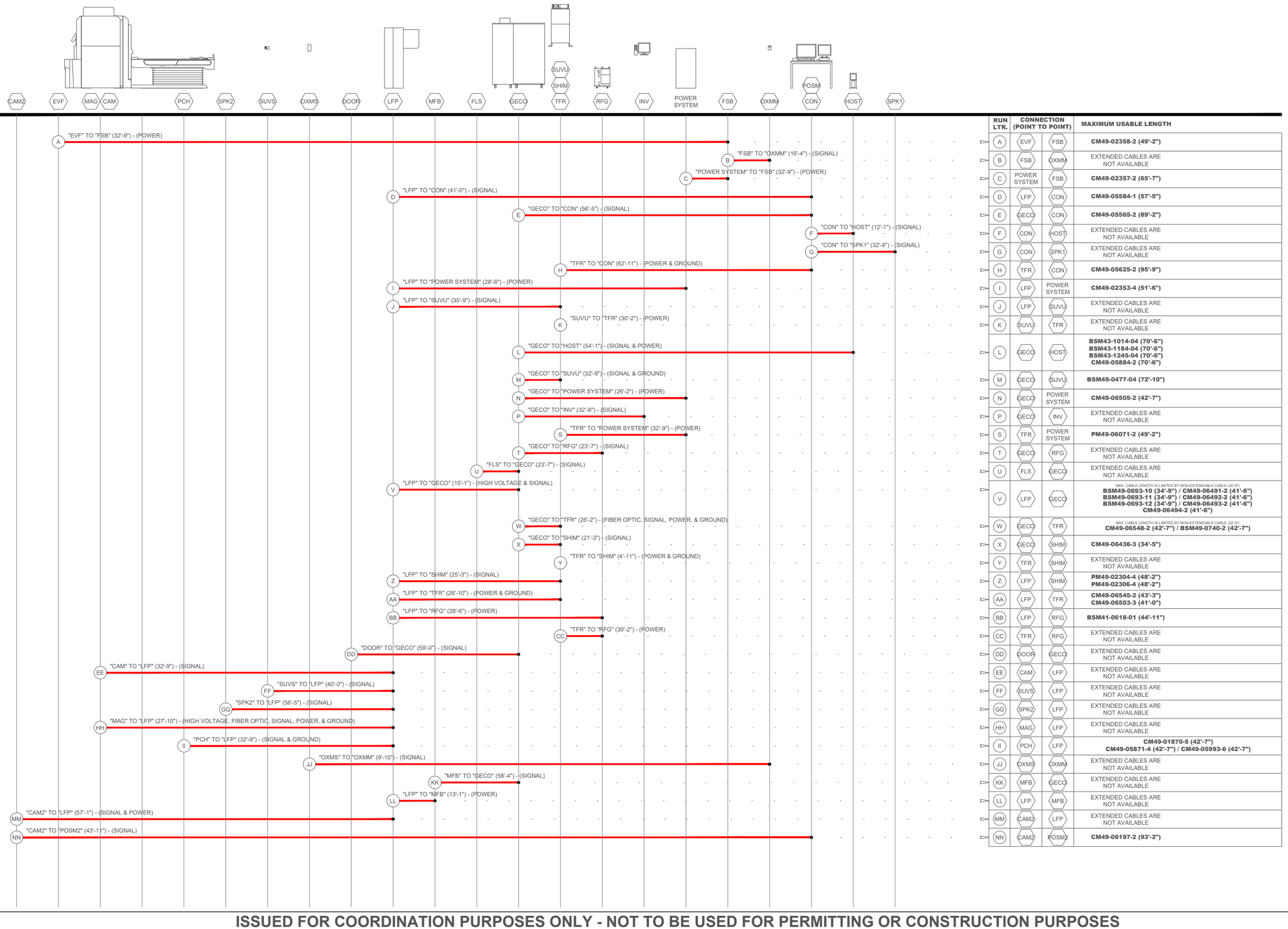

RUN LTR.	CONNECTION (POINT TO POINT)		MAXIMUM USABLE LENGTH
A	EVF	FSB	**CM49-02358-2 (49'-2")**
B	FSB	OXMM	EXTENDED CABLES ARE NOT AVAILABLE
C	POWER SYSTEM	FSB	**CM49-02357-2 (65'-7")**
D	LFP	CON	**CM49-05584-1 (57'-5")**
E	GECO	CON	**CM49-05565-2 (89'-2")**
F	CON	HOST	EXTENDED CABLES ARE NOT AVAILABLE
G	CON	SPK1	EXTENDED CABLES ARE NOT AVAILABLE
H	TFR	CON	**CM49-05625-2 (95'-9")**
I	LFP	POWER SYSTEM	**CM49-02353-4 (51'-6")**
J	LFP	SUVU	EXTENDED CABLES ARE NOT AVAILABLE
K	SUVU	TFR	EXTENDED CABLES ARE NOT AVAILABLE
L	GECO	HOST	**BSM43-1014-04 (70'-6")** **BSM43-1184-04 (70'-6")** **BSM43-1245-04 (70'-6")** **CM49-05884-2 (70'-6")**
M	GECO	SUVU	**BSM49-0477-04 (72'-10")**
N	GECO	POWER SYSTEM	**CM49-06505-2 (42'-7")**
P	GECO	INV	EXTENDED CABLES ARE NOT AVAILABLE
S	TFR	POWER SYSTEM	**PM49-06071-2 (49'-2")**
T	GECO	RFG	EXTENDED CABLES ARE NOT AVAILABLE
U	FLS	GECO	EXTENDED CABLES ARE NOT AVAILABLE
V	LFP	GECO	MAX. CABLE LENGTH IS LIMITED BY NON-EXTENDABLE CABLE (30'-9") **BSM49-0693-10 (34'-9") / CM49-06491-2 (41'-6")** **BSM49-0693-11 (34'-9") / CM49-06492-2 (41'-6")** **BSM49-0693-12 (34'-9") / CM49-06493-2 (41'-6")** **CM49-06494-2 (41'-6")**
W	GECO	TFR	MAX. CABLE LENGTH IS LIMITED BY NON-EXTENDABLE CABLE (32'-9") **CM49-06548-2 (42'-7") / BSM49-0740-2 (42'-7")**
X	GECO	SHIM	**CM49-06436-3 (34'-5")**
Y	TFR	SHIM	EXTENDED CABLES ARE NOT AVAILABLE
Z	LFP	SHIM	**PM49-02304-4 (48'-2")** **PM49-02306-4 (48'-2")**
AA	LFP	TFR	**CM49-06545-2 (43'-3")** **CM49-06503-3 (41'-0")**
BB	LFP	RFG	**BSM41-0618-01 (44'-11")**
CC	TFR	RFG	EXTENDED CABLES ARE NOT AVAILABLE
DD	DOOR	GECO	EXTENDED CABLES ARE NOT AVAILABLE
EE	CAM	LFP	EXTENDED CABLES ARE NOT AVAILABLE
FF	SUVS	LFP	EXTENDED CABLES ARE NOT AVAILABLE
GG	SPK2	LFP	EXTENDED CABLES ARE NOT AVAILABLE
HH	MAG	LFP	EXTENDED CABLES ARE NOT AVAILABLE
II	PCH	LFP	**CM49-01870-5 (42'-7")** **CM49-05871-4 (42'-7") / CM49-05993-6 (42'-7")**
JJ	OXMS	OXMM	EXTENDED CABLES ARE NOT AVAILABLE
KK	MFB	GECO	EXTENDED CABLES ARE NOT AVAILABLE
LL	LFP	MFB	EXTENDED CABLES ARE NOT AVAILABLE
MM	CAM2	LFP	EXTENDED CABLES ARE NOT AVAILABLE
NN	CAM2	POSM2	**CM49-06197-2 (93'-2")**

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EQUIPMENT PLANNING PACKAGE - TOSHIBA TITAN 1.5T MRI

MRI SYSTEM CABLE TABLE

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