# Supplemental Information Lee's Summit Medical Center CT Addition 2100 SE Blue Parkway Lee's Summit, MO 64063

Architect:

**MEP Consultant:** 

Struct. Consultant:

**Civil Consultant:** 

ACI/Boland, Inc. 1710 Wyandotte Street Kansas City, MO 64108

Henderson Engineers, Inc. 8345 Lenexa Dr., Suite 300. Lenexa, KS 66214

Bob D. Campbell & Company 4338 Belleview Ave. Kansas City, MO 64111

GBA 9801 Renner Blvd., Suite 300 Lenexa, KS 66219

### Construction Documents April 2, 2018

ACI/Boland, Inc. Project No. 4-15242



#### SUPPLEMENTAL INFORMATION

#### TABLE OF CONTENTS

#### 01. TECHNICAL SPECIFICATIONS

08 71 00 Door Hardware

#### **02. VENDOR DRAWINGS**

CT-M093551 – Revolution EVO CT-M093552 – Optima CT660

#### **03. RADIATION SHIELDING REPORTS**

GE Revolution EVO GE Optima CT 660

#### END OF TABLE OF CONTENTS

#### SECTION 08710 - FINISH HARDWARE

#### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Intent: The intent of this Section is to provide finish hardware for the proper operation and control of all wood, hollow metal and aluminum doors in the Project. Prior to bidding, notify the Architect of any doors that do not have hardware meeting this intention.
- B. The hardware supplier will be responsible to furnish correct hardware on labeled doors to satisfy State and Local Building Codes.
- C. Should items of hardware, not definitely specified, be required for completion of work, furnish such items of type and quality suitable to the services required and comparable to the adjacent hardware.
- D. Related work in other sections:
  - a. Hollow metal doors; frames and silencers: Section 08111.
  - b. Wood doors: Section 08211.
  - c. Aluminum doors: Section 08410.

#### 1.2 SUBMITTALS

- A. Comply with requirements of the Conditions of the Contract and Section 01300.
- B. Product Data: Submit manufacturer's technical product data for each hardware item. Include information necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finishes.
- C. Hardware Schedule: Submit a hardware schedule in a vertical format (horizontal format not acceptable), organized into sets, including the information below. Designations for door numbers and hardware sets in the schedule shall match those used in the Construction Documents.
  - 1. Hardware Schedule shall be coordinated with doors, frames, and related work to ensure proper size, thickness, hand function, and finish of door hardware. Provide index at end of submittal listing door and-specified hardware. In addition, indicate page on submittal where door is found.
  - 2. Catalog cuts of each type of exposed hardware unit, highlighted in color to indicate compliance with the Hardware Schedule.
    - a. Type, style, function, size send finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
    - e. Mounting locations for hardware.
    - f. Door and frame sizes and materials.
    - g. Deviations from Specifications shall be noted in cover letter.
  - D. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames), which is

critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

- E: Keying Schedule: Submit separate detailed schedule indicating keying for all locks. Keying schedule must be approved before ordering any locks.
- F. Templates: Furnish hardware templates to each fabricator of doors, frames and other work. To be factory-prepared for the installation of hardware: Upon request check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

#### 1.3 QUALITY ASSURANCE

- A. Supplier Qualifications: A recognized Architectural Finish Hardware Supplier, with warehousing facilities, who has been furnishing hardware in the Project's vicinity for a period of not less than two (2) years. Supplier shall be or employ an experienced Architectural Hardware Consultant (AHC) who is certified by and member of the Door and Hardware Institute. The Architectural hardware Consultant shall be available, at reasonable times during the course of the work, for consultation about Project's hardware requirements, to Owner, Architect and Contractor.
- B. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80, No. 101 and local building code requirements. Provide only hardware, which has been tested and listed, by UL, FM or Warnock Hersey for types and sizes of doors required and complies with requirements of door and door frame labels.
  - 1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL or FM label on exit devices indicating "Fire Exit Hardware".
- C. Standards: Comply with the requirements of the latest edition of the following standards, unless indicated otherwise:
  - 1. American National Standards Institute (ANSI) Publications:
    - a. A115 Series Door and Frame Preparation
    - b. A156 Series -Hardware
  - 2. Builders Hardware Manufacturers Association (BHMA) Publications:
    - a. 1201- Auxiliary Hardware
    - b. 1301 Materials and Finishes
  - 3. Door and Hardware Institute (DHI) Publications:
    - a. Keying Procedures, Systems, and Nomenclature
    - b. Abbreviations and Symbols
    - c. Hardware for Labeled Fire Doors
    - d. Recommended Locations for Builder's Hardware for Standard and Custom Steel Doors and Frames
    - e. Wood Door Standards W1, W2, WDHS-2 WDHS-3
  - 4. National Fire Protection Association (NFPA) Publications:

- a. NFPA Pamphlet No. 80 Standards for Fire Doors and Windows.
- b. NFPA Pamphlet No. 101.
- 5. International Building Code 2012 Edition.
- 6. Americans with Disabilities Act (ADA).

#### 1.4 DELIVERIES, STORAGE AND HANDLING

- A. Package each hardware item in separate containers with all screws, wrenches, installation instructions and installation templates. Mark each box with hardware heading and door number according to approved hardware schedule
- B. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation: Provide a complete packing list showing items, door numbers and hardware headings with each shipment.
- C. Store hardware in shipping cartons above ground and under cover to prevent damage. Provide secure lockup for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable -so that completion of the Work will not be delayed by hardware losses both before and after installation.
- D. Aluminum Door Hardware: Deliver hardware for aluminum doors as directed by the door supplier.

#### PART 2 - PRODUCTS

#### 2.1 HARDWARE – GENERAL

- A. Provide the materials or products indicated by trade names, manufacturer's name, or catalog number. Substitutions will not be permitted except as described in 01630.
  - B. Provide manufacturer's standard products meeting the design intent of this Specification, free of imperfections affecting appearance or serviceability.
    - 1. Provide hardware complete with all fasteners, anchors, instructions, layout templates, and any specialized tools as required for satisfactory installation and adjustment.
    - 2. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown
    - 3. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated or approved. Finish screws exposed under any condition to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible. Use machine screws for metal connections and wood screws for connections to wood. Use manufacturer's screws to secure hardware.
    - 4. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt, head or nut on opposite face is exposed in other work, except where indicated otherwise or where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.

- 5. Special Tools: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.
- C. Hardware is specified in the hardware schedule by set, type, and functions, which have been selected as best meeting the application requirements. Acceptable products for each category are specified in Paragraph 2.5, "Hardware Products".

#### 2.2 SPECIAL REQUIREMENTS

- A. Hinges:
  - 1. Provide non-removable pins for all exterior doors. Use nonrising pins for all other doors. Provide pivots or continuous hinges where specified.
- B. Locksets:
  - 1. All locksets to be grade 1 heavy duty cylindrical or as specified.
- C. Closers:
  - 1. Comply with manufacturer's recommendations for unit size based on door size, weather exposure and usage.
  - 2 Provide parallel arms for all overhead closers, except as otherwise indicated.
  - 3. All Closers UL Certified to be in compliance with UBC 7.2 and UL 10C.
  - 4. Closers with Pressure Relief Values will not be acceptable.
  - 5. Supplier to provide any brackets or plates required for proper Installation of door closers.
- D. Exit Devices:
  - 1. All latchbolts to be deadlatching type.
  - 2. All touchbars to be stainless steel.
- E. Special Notes:
  - 1. All doors to have operable hardware.
  - 2. Provide stop that is required for the application. A wall stop is preferred. If an overhead stop or floor stop is a better application, it is to be provided.
  - 3. Smoke seal and intumescent seal is to be provided as required on fire labeled openings.

#### 2.3 CYLINDERS AND KEYING

#### A. Cylinders:

- 1. Lock Cylinders: All cylinders to be Schlage Everest small format interchangeable core to match Owner's existing system.
- 2. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
- B. Keying:
  - 1. Keying of locks and cylinders throughout project shall be scheduled through a key meeting with Architect, Owner, and hardware supplier. Key schedule shall be prepared and submitted to the Owner for approval. Copies of final key schedule with the bitting instructions shall be submitted as part of the Project Record Documents.

- 2. All Locks shall be keyed to the existing Schlage master key system. Distributor to verify proper key system. Keying Schedule must be approved by the Owner prior to ordering any locks.
- 3. Key all locks separately, or alike, as directed by the Owner's Representative and Architect.
- 4. Provide keys as follows:
  - 1. Change Keys: 2 per lock.
  - 2. Master Keys: 6 required (per system).
- 5. Identification: Stamp all (master-type) keys with the following:
  - 1. Do Not Duplicate.
  - 2. Key change number (all keys).

#### 2.4 HARDWARE FINISHES

- A. Provide matching finishes for hardware units at each door to the greatest extent possible, unless otherwise indicated. In general, match items to the finish for the latch, lock or push pull unit for color and texture.
- B. Hardware finishes as follows:
  - 1. 626 Satin Chrome-plated.
  - 2. 630 Satin Stainless Steel

#### 2.5 HARDWARE PRODUCTS

ITEM	SPECIFIED	APPROVED EQUAL
Hinges	lves	Bommer, Hager
Locksets	Schlage	No Substitution
Exit Devices	Von Duprin	No Substitution
Closers	LCN	No Substitution
Flatgoods	lves	Burns, Rockwood
Stops	lves	Burns, Rockwood
Overhead Stops	Glynn Johnson	Rixson
Gasket	National Guard	Zero, Reese

#### PART 3 – EXECUTION

#### 3.1 PREPARATION

- A. Carefully inspect doors, and conditions under which hardware will be installed. Notify the Architect of any conditions that would adversely affect the installation or subsequent door operation. Do not proceed until unsatisfactory conditions are corrected.
- B. Refer to Section 08111 and 08410 for installation requirements.
  - 1. Prior to hardware installation, the General Contractor shall setup a meeting with the Hardware Supplier and the Hardware installer to ensure the installer has and understands the manufacturers installation requirements for all hardware items.
  - 2. The Supplier shall observe the installation of the first lockset, closer, and exit device.

#### 3.2 INSTALLATION

A. Mount Hardware units at heights indicated in respective DHI Standards, except as specifically indicated, or required to comply with governing regulations, and except as may be other wise directed by the Architect.

- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces, which are later to be field, finished, coordinate removal, storage and reinstallation or application of surface protections with finishing work. Do not install surface-mounted items until finishes have been completed on substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachments substrate as necessary for proper installation and operation.
- D. Provide fasteners and anchoring devices of suitable size, quantity and type to secure hardware in proper position for heavy use and long life.
  - 1. Drill and countersink unit, which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards
- E. Adjust door closers immediately upon installation. Adjust in exact conformance with manufacturer's printed instructions. Advance backcheck to eliminate shock at dead stop. Set closer latching speed to assure unassisted positive latching
  - 1. Degree of swing of door for self-limiting closers shall be maximum available
- F. Adjust all exit devices immediately upon installation. Adjust in exact conformance with manufacturers' printed instructions.
- G. Install each protection plate with a thinly spread of mastic at its center to assure even contact before fastening with screws. Install all such plates on visual center of closed doors. Set bottom edges of all such plates flush with door bottom.

#### 3.3 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units, which cannot be adjusted to operate freely and smoothly as intended for the applications made.
- B. Clean adjacent surfaces soiled by hardware installation
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

#### 3.4 INSTRUCTIONS AND INSPECTION

- A. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.
- B. After hardware is installed and adjusted, the Supplier shall inspect the job with the Architect and the General contractor to determine if the hardware is functioning properly.
  - 1. Maintain the instruction sheets, layout templates, and any supplementary literature regarding hardware in a readable condition. Transmit all such items to the Owner's Representative, together with all spare parts, specialized tools, other accessories supplied with the hardware, and a copy of the approved hardware schedule at the time of instruction.

#### DOOR NUMBER: 1-1602B

#### EACH TO HAVE:

QTY				FINISH	
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-L-17	626	VON
1	EA	SFIC EVEREST CORE	80-037	626	SCH
1	EA	SFIC RIM CYLINDER	80-159	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	65A-223	А	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY	PS902 900-2RS-FA	LGR	SCE
1	EA	WIRING DIAGRAM	BY SECURITY CONTRACTOR		B/O
1	EA	CARD ACCESS	BY SECURITY CONTRACTOR		B/O

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

#### HARDWARE SET 02

#### DOOR NUMBER:

1-1608 1-1609

#### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ELECTRIC LOCK	AD-200-CY-70-KP-SPA-BD	626	SCE
1	EA	SFIC CONST. CORE	80-035		SCH
1	EA	SFIC EVEREST CORE	80-037	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

OPERATION: PUSH BUTTON COMBINATION TO ENTER. ALWAYS FREE EGRESS.

DOOR NUMBER:

1-1610

### EACH TO HAVE:

QTY 3 1	EA EA	DESCRIPTION HINGE VANDL STOREROOM LOCK	CATALOG NUMBER 5BB1HW 4.5 X 4.5 ND96HD SPA	FINISH 652 626	MFR IVE SCH
1	EA	SFIC EVEREST CORE	80-037	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

#### HARDWARE SET 04

#### DOOR NUMBER:

1-1611

#### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	VANDL STOREROOM	ND96HD SPA	626	SCH
		LOCK			
1	EA	SFIC EVEREST CORE	80-037	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE

#### BALANCE BY STC DOOR MANUFACTURER

#### HARDWARE SET 05

DOOR NUMBER:

1-1605A

### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

#### DOOR NUMBER:

1-1603 1-1606

### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	626	IVE
1	EA	DOOR PULL, 1" FLAT	8105 10" STD (ACTIVE LEAF)	630	IVE
1	EA	PUSH PLATE	8200 4" X 16" (ACTIVE LEAF)	630	IVE
1	EA	COORDINATOR	COR X FL	628	IVE
1	EA	SURF. AUTO OPERATOR	9553	ANCLR	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-856	630	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	LEAD LINED ASTRAGAL	44XA (ACTIVE LEAF, PULL SIDE)	STST	ZER
1	EA	GASKETING	488SBK PSA (HEAD, JAMBS, ASTRAGAL)	BK	ZER

DOOR NUMBER:

1-1458

#### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ELEC FIRE EXIT HARDWARE	QEL-9927-EO-F-LBR-499F	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	QEL-9927-L-F-LBR-17-499F	626	VON
1	EA	DELAYED EXIT LOGIC CONTROLLER	DE5300	US32D	VON
2	EA	SFIC EVEREST CORE	80-037	626	SCH
1	EA	SFIC MORTISE CYL.	80-132	626	SCH
			(VERIFY TYPE REQ'D)		
1	EA	SFIC RIM CYLINDER	80-159	626	SCH
2	EA	MAGNETIC LOCK	M490P	628	SCE
1	EA	SURF. AUTO OPERATOR	9553	ANCLR	LCN
1	EA	SAFETY SENSOR	8310-877		LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	ASTRAGAL	8193AA	AA	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	POWER SUPPLY	PS906 900-2RS 900-2RS 900-4RL-FA	LGR	SCE
1	EA	WIRING DIAGRAM	BY SECURITY CONTRACTOR		B/O
2	EA	CARD ACCESS	BY SECURITY CONTRACTOR		B/O

OPERATION: DOORS ALWAYS CLOSED AND SECURED BY DELAYED EGRESS MAGNETIC LOCKS. MOVEMENT THROUGH DOORS IN EITHER EITHER DIRECTION REQUIRES VALID CARD READ WHICH DISABLES MAGNETIC LOCKS, RETRACTS DEVICE LATCHES, AND INITIATES AUTO OPERATOR CYCLE. ANY UNAUTHORIZED ATTEMPT AT EGRESS FROM PUSH SIDE SOUNDS LOCAL ALARM AND INITIATES 15 SECOND DELAY. AFTER 15 SECONDS, EGRESS IS PERMITTED. DELAYED EGRESS MAGNETIC LOCKS CONTROLLED BY WALL MOUNTED CONSOLE/KEYSWITCH. DELAYED EGRESS MAGNETICS LOCKS ARE TO ALSO AUTOMATICALLY RELEASE AND ALLOW IMMEDIATE EGRESS UPON FIRE ALARM ACTIVATION OR LOSS OF POWER.

DOOR NUMBER:

1-1601

#### EACH TO HAVE:

QTY		DESCRIPTION		FINISH	MFR
6	EA		5BB1HW 4.5 X 4.5	652	IVE
2	EA	POWER TRANSFER		689	VON
2	EA	ELEC FIRE EXIT HARDWARE	QEL-9927-EO-F-LBR-499F	626	VON
1	EA	DELAYED EXIT LOGIC	DE5300	US32D	VON
			~~~~		
1	EA	SFIC EVEREST CORE	80-037	626	SCH
1	EA	SFIC MORTISE CYL.	80-132	626	SCH
			(VERIFY TYPE REQ'D)		
2	EA	MAGNETIC LOCK	M490P	628	SCE
1	EA	SURF. AUTO	9553	ANCLR	LCN
		OPERATOR			
1	EA	SAFETY SENSOR	8310-877		LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	ASTRAGAL	8193AA	AA	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	POWER SUPPLY	PS906 900-2RS 900-2RS 900-4RL-FA	LGR	SCE
1	FA		BY SECURITY CONTRACTOR		B/O
2					B/O
2	LA	CAND ACCESS	DI SEGUNITI CONTRACTOR		0,0

OPERATION: DOORS ALWAYS CLOSED AND SECURED BY DELAYED EGRESS MAGNETIC LOCKS. MOVEMENT THROUGH DOORS IN EITHER EITHER DIRECTION REQUIRES VALID CARD READ WHICH DISABLES MAGNETIC LOCKS, RETRACTS DEVICE LATCHES, AND INITIATES AUTO OPERATOR CYCLE. ANY UNAUTHORIZED ATTEMPT AT EGRESS EITHER DIRECTION SOUNDS LOCAL ALARM AND INITIATES 15 SECOND DELAY. AFTER 15 SECONDS, EGRESS IS PERMITTED. DELAYED EGRESS MAGNETIC LOCKS CONTROLLED BY WALL MOUNTED CONSOLE/KEYSWITCH. DELAYED EGRESS MAGNETICS LOCKS ARE TO ALSO AUTOMATICALLY RELEASE AND ALLOW IMMEDIATE EGRESS UPON FIRE ALARM ACTIVATION OR LOSS OF POWER.

#### HARDWARE SET 09

#### DOOR NUMBER:

1-1602A

#### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	FIRE EXIT HARDWARE	9927-EO-F-LBR-499F	626	VON
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850	689	LCN
1	EA	ASTRAGAL	8193AA	AA	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER

MAGNETIC HOLD-OPENS TO BE TIED TO FIRE ALARM AND AUTOMATICALLY RELEASE UPON ALARM ACTIVATION.

#### DOOR NUMBER:

1-1604A 1-1607A

#### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	ND40S SPA	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE SET 11

#### DOOR NUMBER:

1-1604B 1-1607B

#### EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7255 SET	626	IVE
1	EA	PRIVACY LOCK	ND40S SPA	626	SCH
1	EA	RESCUE STRIKE	457 X SIZE AS REQ'D	626	HAG
1	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	EDGE SEAL	398V	V	ZER
			(HINGE/STRIKE EDGES)		

END OF SECTION

						LEES S		DICAL CENT	ER	
						LEE	S SUMMIT	, MISSOURI		
Α	06/MAR/2018		REFER TO DC-47116				USA	4		
REV	DATE		MODIFICATIONS							
01 02 03 04 05	- COVER SHEET - EQUIPMENT LAY - STRUCTURAL - E - FLOOR STRUCTU - RADIATION PRO	YOUT ELECTRICAL LAYOUT JRAL DETAILS ITECTION LAYOUT	11 - DELIVERY - DISCLAIMER 12 - SITE READINESS	(eg	G	E Health	care	C 9: CODY	CODY AYERS 13.251.0235 AYERS@GE.COM	
06 - POWER REQUIREMENTS - POWER DISTRIBUTION 07 - DETAILED PDB SCHEMATICS 08 - HVAC 09 - ENVIRONMENT - INTERCONNECTIONS 10 - EQUIPMENT DIMENSIONS						R	EVOLUTI FINAL S	ON EVO TUDY		
A mar	idatory component of this	drawing set is the GE Healthcare Pre Instal	lation manual. Failure to reference the Pre Installation manual will result in	Drav	vn by	Verified by	Concession	S.O. (GON)	PIM Manual	Rev
	Pre Installation doo	cuments for GE Healthcare products can be	accessed on the web at: www.gehealthcare.com/siteplanning	KI	MS	СРС		PR13-C25402v3	5866663-1EN	8
GE does set of f	not take responsibility fo inal issue drawing. GE c	r any damages resulting from changes on c annot accept responsibility for any dama	drawings made by others. Errors may occur by not referring to the complete ge due to the partial use of GE final issue drawings, however caused. All	Format	Scale		File Name		Date	Sheet
dimensi	ons are in millimeters un	less otherwise specified. Do not scale from due to scaling fror	printed pdf files. GE accepts no responsibility or liability for defective work m these drawings.	A3	1:48	CT-M	V1093551-00A.D	NG	06/MAR/2018	01/12





QUIPMENT LAYOUT					
DESCRIPTION	DIMENSIONS LxWxH (in)	WEIGHT (lb)			
	80.7x41x76.2	3990			
)	25.6x114.6x41.1	1113.3			
JNIT (PDU)	27.5x21.7x41.8	815.7			
	27.6x12x32.2	352.7			
BOX (PDB)	-	-			
	29x18.5x25.8	176.4			
EXAM ROOM HEIGHT					

L	
L	

-REC. 9'-0"



Rev A Date

## **STRUCTURAL - ELECTRICAL LAYOUT**

#### DESCRIPTION

GANTRY ANCHORING (SEE STRUCTURAL DETAILS)
TABLE ANCHORING (SEE STRUCTURAL DETAILS)
MAIN DISCONNECT PANEL @ 5'-0" A.F.F.
12" X 12" X 6" FLUSH FLOOR BOX
2.5" STUBBED CONDUIT RUNNING BELOW FLOOR
3.5" STUBBED CONDUIT RUNNING BELOW FLOOR
4" X 4" X 4" BOX @ 2'-0" A.F.F.
12" X 16" X 4" BOX @ 1'-6" A.F.F.
12" X 16" X 6" BOX @ 0'-8" A.F.F.
12" X 12" X 4" BOX @ 1'-6" A.F.F.
Basic system
RI 15 network socket

#### RJ 45 network socket

ΤO

то

то

то

то

то

то

то

то

PDU

UPS

UPS

QTY

System emergency off (SEO), (recommended height 4'-0" above floor) X-Ray room warning light control panel - Available from GEHC, Call: 800-279-7925 or local GE Installation Project Manager X-Ray ON lamp (L1) - 24V Door interlock switch (needed only if required by state/local codes)

120V Duplex hospital grade outlet

#### CONDUITS REQUIRED FOR BASE SYSTEM (CONDUITS ARE LOCATED ABOVE CEILING)

Warning Light Control	ONE 0.5" (13mm) CONDUIT
PDU	ONE 0.5" (13mm) CONDUIT
Main Disconnect Panel	ONE CONDUIT AS REQUIRED
Feeder	ONE CONDUIT AS REQUIRED
System Emergency Off (SEO)	ONE 0.5" (13mm) CONDUIT
120V 1Ø Power	ONE 0.5" (13mm) CONDUIT
PDU	ONE 0.5" (13mm) CONDUIT
Main Disconnect Panel	ONE 1.25" (31mm) CONDUIT
PDU	ONE 2" (51mm) CONDUIT (Optional)

### **ANCHORING/LOADING DISTRIBUTION TO THE FLOOR**





•

.

٠



(2)

(4)

(5) 

0

-@-

**REVOLUTION EVO** 

CT-M093551-00A.DWG

Rev A Date

## **FLOOR REQUIREMENTS**





**REVOLUTION EVO** 

SHIELDING REQUIREMENTS SCALING							
CHANGED PARAMETER (mAs) MULTIPLICATION FACTOR (new mAs/100							
80 kV	0.24						
100 kV	0.45						
120 kV	0.71						
140 kV	1.00						
1 mm aperture	0.20						
3 mm aperture	0.22						
5 mm aperture	0.27						
10 mm aperture	0.38						
15 mm aperture	0.48						
20 mm aperture	0.59						
30 mm aperture	0.79						
40 mm aperture	1.00						

### SHIELDING REQUIREMENTS:

- Equipment placement. •
- ٠
- •
- •
- •

technique used at the site.

equals ±40%.

CT-M093551-00A.DWG

## **RADIATION PROTECTION LAYOUT**

Engage a qualified radiological health physicist to review your scan room shielding requirements, taking into consideration:Scatter radiation levels within the scanning room

Weekly projected work-loads (number of patients/day technique (kvp\*ma))

Materials used for construction of walls, floors, ceiling, doors, and windows.

Activities in surrounding scan room areas.

Equipment in surrounding scan room areas (e.g., film developer, film storage)

Room size and equipment placement within the room relative to room size.

The Illustrations on this page depict measured radiation levels within the scanning room, while scanning a 32 cm or 16 cm CTDI phantom with the technique shown. Use the mAs, kV and aperture scaling factors in the table shown here to adjust exposure levels to the scan

**NOTE:** Actual measurements can vary. Expected deviations equals ±15%, expect for the 5 mA and 1mm techniques, where variations may be greater (up to a factor of 2), due to the inherent deviation in small values. The maximum deviation anticipated for tube output

## **POWER REQUIREMENTS**

POWER SUPPLY	3 PHASES+G 200/220/240/380/400/420/440/460/480 V ± 10%
FREQUENCIES	50/60Hz ± 3Hz
MAXIMUM POWER DEMAND	100 kVA
AVERAGE (CONTINUOUS) POWER DEMAND	20 kVA
POWER FACTOR	0.85

- Power supply should come into a power distribution box (PDB) containing the protective units and controls.
- The section of the supply cable should be calculated in accordance with its length and the maximum permissible voltage drops.
- There must be discrimination between supply cable protective device at the beginning of the installation (main low-voltage transformer side) and the protective devices in the PDB.

### SUPPLY CHARACTERISTICS

- Power input must be separate from any others which may generate transients (elevators, air conditioning, ٠ radiology rooms equipped with high speed film changers...).
- All equipment (lighting, power outlets, etc...) installed with GE system components must be powered separately.
- Phase imbalance 2% maximum.
- Transients must be less than 1500V peak. (on a 400V line) •

#### **GROUND SYSTEM**

- System of equipotential grounding. ٠
- Equipotential: The equipotential link will be by means of an equipotential bar. This equipotential bar should be connected to the protective earth conductors in the ducts of the non GE cableways and to additional equipotential connections linking up all the conducting units in the rooms where GE system units are located.

#### CABLES

- Power and cable installation must comply with the distribution diagram.
- All cables must be isolated and flexible, cable color codes must comply with standards for electrical • installation.
- The cables from signaling and remote control (Y, SEO, L...) will go to PDB with a pigtail length of 1.5m, and will be connected during installation. Each conductor will be identified and isolated (screw connector).

### **CABLEWAYS**

The general rules for laying cableways should meet the conditions laid down in current standards and regulations, with regard to:

- Protecting cables against water (cableways should be waterproof). •
- Protecting cables against abnormal temperatures (proximity to heating pipes or ducts). ٠
- Protecting cables against temperature shocks. ٠
- Replacing cables (cableways should be large enough for cables to be replaced).
- Metal cableways should be grounded.



PDB	Power distribution box
PDU	Power distribution unit
SEO 1-2-3	Emergency OFF button, located 1.50m above floo
Y	System remote control. "ON" and "OFF" impulse
	with indicator lamps (OFF = red, ON = green)
	1.50m above floor
L	System ON light
L1	X-Ray ON light (turned on for at least 5 seconds d
	X-Ray emission)
	•

Notes :	
(1)	Two dry contacts: "System ON" and "X-Ray ON' released by PDU. Max. voltage = 30 V
(2)	If length < 10 m
	Cable with 2m extra length on the floor behind th of PDU
(3)	Cable with 2m extra length on the floor behind th of PDU
(4)	Cable delivered with partial UPS installed by GE (Op
	PDB SCHE

", both

he back

he back

ption)

MATICS AND DETAILS THAT APPEAR ON THIS PAGE ARE THE PROPERTY OF "GE MEDICAL SYSTEMS FRANCE"

### **DETAILED SCHEMATICS OF POWER DISTRIBUTION BOX**



## **TEMPERATURE AND HUMIDITY SPECIFICATIONS**

### **IN-USE CONDITIONS**

	EXAM ROOM			CONTROL ROOM		
Temperature	Min	Recommended	Max	Min	Recommended	Max
	18°C	22°C	26°C	18°C	22°C	26°C
Temperature gradient		≤ 3°C/h		≤ 3°C/h		
Relative humidity (1)		30% to 60%		30% to 60%		
Humidity gradient		≤ 5%/h		≤ 5%/h		

#### **STORAGE CONDITIONS**

Temperature	0°C to +30°C
Temperature gradient	≤ 3°C/h
Relative humidity (1)	up to 70%
Humidity gradient	≤ 5%/h

Storage longer than 6 months is not recommended. (1) Non-condensing

#### **AIR RENEWAL**

According to local standards.

NOTE

In case of using air conditioning systems that have a risk of water leakage it is recommended not to install it above electric equipment or to take measures to protect the equipment from dropping water.

## **HEAT DISSIPATION DETAILS**

ROOM	DESCRIPTION	Max (kW)		
	Gantry	5.48		
Exam Room	Patient table GT1700V / VT2000 (Without patient)	0.3		
	TOTAL	6		
	Power distribution unit	1.0		
Exam Room or Technical	Partial UPS - Powerware 9155-10GE	1.0		
	TOTAL	2		
	Operator console	0.84		
Control Room	LCD monitor (Total amount of 2 monitors)	0.1		
	TOTAL	1		
*Technical Room is not mandatory, the placements of these elements are recommended in the Exam Room.				





### **ENVIRONMENT**

### MAGNETIC FIELD SPECIFICATIONS

• Limit the magnetic interference to guarantee specified imaging performance.

#### GANTRY:

- Ambient static magnetic fields less than 1 Gauss.
- Ambient AC magnetic fields less than 0.01 Gauss peak.

#### **OPERATOR CONSOLE:**

- Ambient static magnetic fields less than 10 Gauss.
- Use static dissipative vinyl.

### MAXIMUM AUDIBLE NOISE LEVEL OF THE SYSTEM

- The maximum ambient noise level is produced by the gantry during a CT scan acquisition.
- It is less than 70 dBA when measured at a distance of one meter from the nearest gantry surface, in any direction.
- Noise level produced by UPS system: 69 dBA.



## **CONNECTIVITY REQUIREMENTS**

Broadband Connections are necessary during the installation process and going forward to ensure full support from the Engineering Teams for the customers system. Maximum performance and availability for the customers system is maintained and closely monitored during the lifetime of the system.

Proactive and reactive maintenance is available utilizing the wide range of digital tools using the connectivity solutions listed below:

- Site-to-Site VPN/GE Solution
- Site-to-Site VPN/Customer Solution
- Connection through Dedicated Service Network
- Internet Access connectivity for InSite 2.0

The requirements for these connectivity solutions are explained in the broadband solutions catalogue (separate document).

| 09/12



### DELIVERY

### DISCLAIMER

#### THE CUSTOMER/CONTRACTOR SHOULD:

- Provide an area adjacent to the installation site for delivery and unloading of the GE equipment.
- Ensure that the dimensions of all doors, corridors, ceiling heights are sufficient to accommodate the movement of GE equipment from the delivery area into the definitive installation room.
- Ensure that access routes for equipment will accommodate the weights of the equipment and any transportation, lifting and rigging equipment.
- Ensure that all necessary arrangements for stopping and unloading on public or private property not belonging to the customer have been made.

#### DIMENSIONS OF DELIVERY WITH DOLLY TRANSPORT EQUIPMENT LENGTH 2810 mm GANTRY WIDTH 1290 mm 2050 kg HEIGHT 2000 mm LENGHT 2997 mm VT2000 TABLE WIDTH 762 mm 632 kg HEIGHT 1143 mm



#### **GENERAL SPECIFICATIONS**

- GE is not responsible for the installation of developers and associated equipment, lighting, cassette trays and protective screens or derivatives not mentioned in the order.
- The final study contains recommendations for the location of GE equipment and associated devices, electrical wiring and room arrangements. When preparing the study, every effort has been made to consider every aspect of the actual equipment expected to be installed.
- The layout of the equipment offered by GE, the dimensions given for the premises, the details provided for the pre-installation work and electrical power supply are given according to the information noted during on-site study and the wishes expressed by the customer.
- The room dimensions used to create the equipment layout may originate from a previous layout and may not be accurate as they may not have been verified on site. GE cannot take any responsibility for errors due to lack of information.
- Dimensions apply to finished surfaces of the room.
- Actual configuration may differ from options presented in some typical views or tables.
- If this set of final drawings has been approved by the customer, any subsequent modification of the site must be subject to further investigation by GE about the feasibility of installing the equipment. Any reservations must be noted.
- The equipment layout indicates the placement and interconnection of the indicated equipment components. There may be local requirements that could impact the placement of these components. It remains the customer's responsibility to ensure that the site and final equipment placement complies with all applicable local requirements.
- All work required to install GE equipment must be carried out in compliance with the building regulations and the safety standards of legal force in the country concerned.
- These drawings are not to be used for actual construction purposes. The company cannot take responsibility for any damage resulting therefrom.

### CUSTOMER RESPONSIBILITIES

- It is the responsibility of the customer to prepare the site in accordance with the specifications stated in the final study. A detailed site readiness checklist is provided by GE. It is the responsibility of the customer to ensure all requirements are fulfilled and that the site conforms to all specifications defined in the checklist and final study. The GE Project Manager of Installation (PMI) will work in cooperation with the customer to follow up and ensure that actions in the checklist are complete, and if necessary, will aid in the rescheduling of the delivery and installation date.
- Prior to installation, a structrual engineer of record must ensure that the floor and ceiling is designed in such a way that the loads of the installed system can be securely borne and transferred. The layout of additional structural elements, dimensioning and the selection of appropriate installation methods are the sole responsibility of the structural engineer. Execution of load bearing structures supporting equipment on the ceiling, floor or walls are the customer's responsibility.

### **RADIO-PROTECTION**

Suitable radiological protection must be determined by a qualified radiological physicist in conformation with local regulations. GE does not take responsibility for the specification or provision of radio-protection.

THE UNDERSIGNED, HEREBY CERTIFIES THAT I HAVE READ AND APPROVED THE PLANS IN THIS DOCUMENT.			
DATE	NAME	SIGNATURE	

| 11/12

## **GLOBAL SITE READINESS CHECKLIST (DI)**

DOC1809666 Rev. 5					
Customer Name:		PMI Name:			
GON/SO Number:		Field Service Name:			
Equipment:		Country/City or City/State:			
Required site assessment milestones		Date of completion (dd/mm/yyyy)			
1) Check site before Equipment Delive	ery to Storage				
2) Check site before installation start					
Place an "X" in either Y or N column					
Site Ready Checks at Installation			Y	N	
General Site Planning					
Room dimensions, including ceiling he	gight, for all Exam, Equipment/Technics	al & Control rooms meets GE specifications.			
Ceiling support structure, if indicated Original Equipment Manufacturer spe of any GE supplied components. Over GE provided criteria.	on the GE drawing, is in the correct loc cifications. Levelness and spacing has head support Structure has been confi	cation and at the correct height according to the been measured, and is ready for the installation irmed with customer/contractor to meet required			
Rooms that will contain equipment, ir taken to prevent debris from entering	icluding staging areas if applicable, are grooms containing equipment.	construction debris free. Precautions must be			
Finished ceiling is installed. If applicab	le ceiling tiles installed per PMI discret	tion.			
Adequate delivery route from truck to communications/notifications have or etc.). All floors along delivery route w	o final place of installation has been revocution for a second place of installation has been revocution for a second place of the second place	viewed with all stakeholders, all le for special handling (rigging, elevator, fork lift, emporary reinforcements arranged if needed.			
System power & grounding (PDB/MDI use. Lock Out Tag Out is available.	<ul> <li>) is available as per GE specifications,</li> </ul>	installed at point of final connection and ready to			
System power and grounded audit ha PM to confirmed if needed.	s been scheduled to be completed dur	ing installation of equipment. (If Required) GEHC			
Adequate room illumination installed	and working.				
Cable ways (floor/wall/ceiling/Access diameter. Cable ways routes per GE Fi PM. Surface floor duct can be installe	Flooring) are available for installation of inal drawings and cable access opening d at time of system installation.	of GE cables and are of correct length and gs areas installed at a time determined by GEHC			
HVAC systems Installed, and the site n	neets minimum environmental operat	ional system requirements.			
Network outlets installed and computer network available and working.					
Hospital IT/connectivity contacts have Required)	been engaged and information has be	een added to Project management tool. (If			
Floor levelness/flatness is measured a Strength and thickness have been disc	nd within tolerance, and there are no cussed with customer/contractor and t	visible defects per GEHC specifications. Floor hey have confirmed GE requirements are met.			
Customer supplied countertops where	e GE equipment will be installed are in	place.			
Specific for CT & X-ray					
Doors and windows complete or scher radioprotection regulatory approval for	duled to be installed. If applicable, radior installation obtained.	iation protection (shielding) finished &			
	Status of work		1	I	
General comments					
System can be delivered		PMI signature			
Site ready for installation		FS signature: optional			
, , , , , , , , , , , , , , , , , , , ,	L				

Site Readiness

| 12/12

A 08/MAR/2018 REFER T(	DDC-47118		LEES S LEE	UMMIT ME S SUMMIT, USA
NODIF01 - COVER SHEET10 - DE02 - EQUIPMENT LAYOUT11 - DIS03 - STRUCTURAL - ELECTRICAL LAYOUT11 - DIS04 - FLOOR STRUCTURAL DETAILS5 - RADIATION PROTECTION LAYOUT06 - POWER REQUIREMENTS - POWER DISTRIBUTION07 - HVAC08 - ENVIRONMENT - INTERCONNECTIONS00 - FOULDMENT DIMENSIONS	ILATIONS LIVERY SCLAIMER - SITE READINESS	G	E Health	OPTIMA
OS - EQUIPIVIENT DIVIENSIONS A mandatory component of this drawing set is the GE Healthcare Pre Installation manual. incomplete documentation required for site desig Pre Installation documents for GE Healthcare products can be accessed on the	Failure to reference the Pre Installation manual will result in gn and preparation.	Drawn by KMS	Verified by CPC	Concession

incomplete documentation required for site design and preparation. Pre Installation documents for GE Healthcare products can be accessed on the web at: www.gehealthcare.com/siteplanning

REV

GE does not take responsibility for any damages resulting from changes on drawings made by others. Errors may occur by not referring to the complete set of final issue drawing. GE cannot accept responsibility for any damage due to the partial use of GE final issue drawings, however caused. All dimensions are in millimeters unless otherwise specified. Do not scale from printed pdf files. GE accepts no responsibility or liability for defective work due to scaling from these drawings. Format Scale File Name CT-M093552-00A.DW0 A3 1:48

CT660 IUDY		
S.O. (GON)	PIM Manual	Rev
4107479	5368510-1EN	12
	Date	Sheet
'G	08/MAR/2018	01/11

## **CODY AYERS** 913.251.0235 CODY.AYERS@GE.COM

## **DICAL CENTER MISSOURI**





QUIPMENT LAYOUT				
DESCRIPTION	DIMENSIONS LxWxH (in)	WEIGHT (Ib)		
	80.7x40.9x76.3	3990		
	25.6x114.6x41.2	1113		
JNIT (PDU)	27.6x21.7x41.8	815		
	27.6x12x32.2	352.7		
BOX (PDB)	-	-		
TABLE	51.2x24.4x33.5	97		
	29x18.5x25.8	176.4		
	•			
FXAM ROOM HEIGHT				

-
REC. 9'-0"



## **STRUCTURAL - ELECTRICAL LAYOUT**

#### DESCRIPTION

NG (SEE STRUCTURAL DETAILS)
G (SEE STRUCTURAL DETAILS)
PANEL @ 5'-0" A.F.F.
SH FLOOR BOX
DUIT RUNNING BELOW FLOOR
DUIT RUNNING BELOW FLOOR
2'-0" A.F.F.
@ 1'-6" A.F.F.
@ 0'-8" A.F.F.
@ 1'-6" A.F.F.
Basic system
et

System emergency off (SEO), (recommended height 4'-0" above floor) X-Ray room warning light control panel - Available from GEHC, Call: 800-279-7925 or Door interlock switch (needed only if required by state/local codes)

#### CONDUITS REQUIRED FOR BASE SYSTEM (CONDUITS ARE LOCATED ABOVE CEILING)

Warning Light Control	ONE 0.5" (13mm) CONDUIT
PDU	ONE 0.5" (13mm) CONDUIT
Main Disconnect Panel	ONE CONDUIT AS REQUIRED
Feeder	ONE CONDUIT AS REQUIRED
System Emergency Off (SEO)	ONE 0.5" (13mm) CONDUIT
120V 1Ø Power	ONE 0.5" (13mm) CONDUIT
PDU	ONE 0.5" (13mm) CONDUIT
Main Disconnect Panel	ONE 1.25" (31mm) CONDUIT
PDU	ONE 2" (51mm) CONDUIT (Optional)

### **ANCHORING/LOADING DISTRIBUTION TO THE FLOOR**







### NOT TO SCALE

CT-M093552-00A.DWG

Min 102 mm thick concrete

NOTES:

•

.

٠

.

LEES SUMMIT MEDICAL CENTER

**OPTIMA CT660** 

## **RADIATION PROTECTION LAYOUT**



### SHIELDING REQUIREMENTS SCALING

ETER (mAs)	MULTIPLICATION FACTOR (new mAs/100)
	0.24
	0.45
	0.71
	1.00
	0.20
	0.22
	0.27
	0.38
	0.48
	0.59
	0.79
	1.00

Engage a qualified radiological health physicist to review your scan room shielding

Weekly projected work-loads (number of patients/day technique (kvp\*ma)).

Materials used for construction of walls, floors, ceiling, doors, and windows.

Equipment in surrounding scan room areas (e.g., film developer, film storage).

Room size and equipment placement within the room relative to room size.

The Illustrations on this page depict measured radiation levels within the scanning room, while scanning a 32 cm or 16 cm CTDI phantom with the technique shown. Use the mAs, kV and aperture scaling factors in the table shown here to adjust exposure levels to the scan

**NOTE:** Actual measurements can vary. Expected deviations equals ±15%, expect for the 5 mA and 1mm techniques, where variations may be greater (up to a factor of 2), due to the inherent deviation in small values. The maximum deviation anticipated for tube output

## **POWER REQUIREMENTS**

POWER SUPPLY	3 PHASES+G 200/220/240/380/400/420/440/460/480 V ± 10%
FREQUENCIES	50/60Hz ± 3Hz
MAXIMUM POWER DEMAND	100 kVA
AVERAGE (CONTINUOUS) POWER DEMAND	20 kVA
POWER FACTOR	0.85

- Power supply should come into a power distribution box (PDB) containing the protective units and controls.
- The section of the supply cable should be calculated in accordance with its length and the maximum permissible voltage drops.
- There must be discrimination between supply cable protective device at the beginning of the installation (main low-voltage transformer side) and the protective devices in the PDB.

#### SUPPLY CHARACTERISTICS

- Power input must be separate from any others which may generate transients (elevators, air conditioning, ٠ radiology rooms equipped with high speed film changers...).
- All equipment (lighting, power outlets, etc...) installed with GE system components must be powered separately.
- Phase imbalance 2% maximum.
- Transients must be less than 1500V peak. (on a 400V line) ٠

#### **GROUND SYSTEM**

- System of equipotential grounding. ٠
- Equipotential: The equipotential link will be by means of an equipotential bar. This equipotential bar should be connected to the protective earth conductors in the ducts of the non GE cableways and to additional equipotential connections linking up all the conducting units in the rooms where GE system units are located.

#### CABLES

- Power and cable installation must comply with the distribution diagram.
- All cables must be isolated and flexible, cable color codes must comply with standards for electrical ٠ installation.
- The cables from signaling and remote control (Y, SEO, L...) will go to PDB with a pigtail length of 1.5m, and will be connected during installation. Each conductor will be identified and isolated (screw connector).

### **CABLEWAYS**

The general rules for laying cableways should meet the conditions laid down in current standards and regulations, with regard to:

- Protecting cables against water (cableways should be waterproof). •
- Protecting cables against abnormal temperatures (proximity to heating pipes or ducts). ٠
- Protecting cables against temperature shocks. ٠
- Replacing cables (cableways should be large enough for cables to be replaced).
- Metal cableways should be grounded. •



PDU	Power distribution unit
SEO	Emergency OFF button (Control Room), located 1.50
	(4.9') above floor
WLC	Warning Light Control
WL	Warning Light
DLK1	Door Interlock Switch (needed only if required by
	state/local codes)
Notes ·	
(1)	Two dry contacts: "System ON" and "V Pay ON"
(1)	released by PDU
	Max voltage = $30 V$
(2)	If length $< 10 \text{ m} (32 \text{ g}^{1})$
(2)	Cable with 2m (6.6') extra length on the floor behi
	hack of PDI
(3)	Cable with 2m (6.6') extra length on the floor behi
(5)	hack of PDI
(A)	Cable delivered with partial LIPS installed by GE (On
(")	cubic derivered with partial of 5 instance by GE (Op

## **TEMPERATURE AND HUMIDITY SPECIFICATIONS**

### **IN-USE CONDITIONS**

	EXAM ROOM			CONTROL ROOM		
Temperature	Min	Recommended	Max	Min	Recommended	Max
	18°C	22°C	26°C	18°C	22°C	26°C
Temperature gradient		≤ 3°C/h		≤ 3°C/h		
Relative humidity (1)		30% to 60%		30% to 60%		
Humidity gradient	≤ 5%/h				≤ 5%/h	

### **STORAGE CONDITIONS**

Temperature	0°C to +30°C
Temperature gradient	≤ 3°C/h
Relative humidity (1)	≤ 70%
Humidity gradient	≤ 5%/h

Storage longer than 6 months is not recommended. (1) Non-condensing

#### **AIR RENEWAL**

According to local standards.

NOTE

In case of using air conditioning systems that have a risk of water leakage it is recommended not to install it above electric equipment or to take measures to protect the equipment from dropping water.

## **HEAT DISSIPATION DETAILS**

ROOM	DESCRIPTION	Max (kW)
Exam Room	Gantry	5.48
	Patient table GT1700V / VT2000 (Without patient)	0.3
	TOTAL	6
Exam Room or Technical Room*	Power distribution unit	1.0
	Partial UPS - Powerware 9155-10GE	1.0
	TOTAL	2
	Operator console	0.84
Control Room	LCD monitor (Total amount of 2 monitors)	0.1
	TOTAL	1
*Technical Room is not man	datory, the placements of these elements are recommended in the Exam Room.	

#### FEEDER TABLE

MIN. FEEDER WIRE SIZE,		MINIMUM FEEDER WIRE LENGTH - m (ft)							
awg OR MCM (sq. M)/VAC	15 (50)	30 (100)	46 (150	61 (200)	76 (250)	91 (300)	107 (350)	122 (400)	
480 VAC	3 (30)	3 (30)	3 (30)	3 (30)	3 (30)	2 (35)	1 (45)	1 (45)	
	GENERAL NOTES								
In all cases qualified personnel must verify that the feeder (at the point of take-off) and the run to the CT system meet all the requirements									
stated in the PIM									
For a single unit installation, the minimum transformer size is 112.5KVa, with 2.4% rated regulation at unity power factor. Resultant maximum									
allowable feeder regulation is 3.6%									
Grounding conductor will be a 1/0 minimum. this ground will run from the equipment back to the power source/main grounding point and									

always travel in the same conduit with the feeders

### **ENVIRONMENT**

### MAGNETIC FIELD SPECIFICATIONS

• Limit the magnetic interference to guarantee specified imaging performance.

#### GANTRY:

- Ambient static magnetic fields less than 1 Gauss.
- Ambient AC magnetic fields less than 0.01 Gauss peak.

#### **OPERATOR CONSOLE:**

- Ambient static magnetic fields less than 10 Gauss.
- Use static dissipative vinyl.

### MAXIMUM AUDIBLE NOISE LEVEL OF THE SYSTEM

- The maximum ambient noise level is produced by the gantry during a CT scan acquisition.
- It is less than 70 dBA when measured at a distance of one meter from the nearest gantry surface, in any direction.
- Noise level produced by UPS system: 69 dBA.



## **CONNECTIVITY REQUIREMENTS**

Broadband Connections are necessary during the installation process and going forward to ensure full support from the Engineering Teams for the customers system. Maximum performance and availability for the customers system is maintained and closely monitored during the lifetime of the system.

Proactive and reactive maintenance is available utilizing the wide range of digital tools using the connectivity solutions listed below:

- Site-to-Site VPN/GE Solution
- Site-to-Site VPN/Customer Solution
- Connection through Dedicated Service Network
- Internet Access connectivity for InSite 2.0

The requirements for these connectivity solutions are explained in the broadband solutions catalogue (separate document).

| 08/11



### DELIVERY

### THE CUSTOMER/CONTRACTOR SHOULD:

- Provide an area adjacent to the installation site for delivery and unloading of the GE equipment.
- Ensure that the dimensions of all doors, corridors, ceiling heights are sufficient to accommodate the movement of GE equipment from the delivery area into the definitive installation room.
- Ensure that access routes for equipment will accommodate the weights of the equipment and any transportation, lifting and rigging equipment.
- Ensure that all necessary arrangements for stopping and unloading on public or private property not belonging to the customer have been made.

DIMENSIONS OF DELIVERY WITH DOLLY TRANSPORT EQUIPMENT					
	LENGTH	2810 mm			
GANTRY	WIDTH	1290 mm	2050 kg		
	HEIGHT	2000 mm			
	LENGHT	2997 mm			
VT2000 TABLE	WIDTH	762 mm	632 kg		
	HEIGHT	1143 mm	-		







### DISCLAIMER

#### **GENERAL SPECIFICATIONS**

- GE is not responsible for the installation of developers and associated equipment, lighting, cassette trays and protective screens or derivatives not mentioned in the order.
- The final study contains recommendations for the location of GE equipment and associated devices, electrical wiring and room arrangements. When preparing the study, every effort has been made to consider every aspect of the actual equipment expected to be installed.
- The layout of the equipment offered by GE, the dimensions given for the premises, the details provided for the pre-installation work and electrical power supply are given according to the information noted during on-site study and the wishes expressed by the customer.
- The room dimensions used to create the equipment layout may originate from a previous layout and may not be accurate as they may not have been verified on site. GE cannot take any responsibility for errors due to lack of information.
- Dimensions apply to finished surfaces of the room.
- Actual configuration may differ from options presented in some typical views or tables.
- If this set of final drawings has been approved by the customer, any subsequent modification of the site must be subject to further investigation by GE about the feasibility of installing the equipment. Any reservations must be noted.
- The equipment layout indicates the placement and interconnection of the indicated equipment components. There may be local requirements that could impact the placement of these components. It remains the customer's responsibility to ensure that the site and final equipment placement complies with all applicable local requirements.
- All work required to install GE equipment must be carried out in compliance with the building regulations and the safety standards of legal force in the country concerned.
- These drawings are not to be used for actual construction purposes. The company cannot take responsibility for any damage resulting therefrom.

### CUSTOMER RESPONSIBILITIES

- It is the responsibility of the customer to prepare the site in accordance with the specifications stated in the final study. A detailed site readiness checklist is provided by GE. It is the responsibility of the customer to ensure all requirements are fulfilled and that the site conforms to all specifications defined in the checklist and final study. The GE Project Manager of Installation (PMI) will work in cooperation with the customer to follow up and ensure that actions in the checklist are complete, and if necessary, will aid in the rescheduling of the delivery and installation date.
- Prior to installation, a structrual engineer of record must ensure that the floor and ceiling is designed in such a way that the loads of the installed system can be securely borne and transferred. The layout of additional structural elements, dimensioning and the selection of appropriate installation methods are the sole responsibility of the structural engineer. Execution of load bearing structures supporting equipment on the ceiling, floor or walls are the customer's responsibility.

### **RADIO-PROTECTION**

Suitable radiological protection must be determined by a qualified radiological physicist in conformation with local regulations. GE does not take responsibility for the specification or provision of radio-protection.

THE UNDERSIGNED, HEREBY CERTIFIES THAT I HAVE READ AND APPROVED THE PLANS IN THIS DOCUMENT.					
DATE	NAME	SIGNATURE			

## **GLOBAL SITE READINESS CHECKLIST (DI)**

DOC1809666 Rev. 5

Customer Name:

GON/SO Number:

Equipment: **Required site assessment milestones** 

1) Check site before Equipment Delivery to Storage

2) Check site before installation start

Place an "X" in either Y or N column					
Site Ready Checks at Installation			Y	N	
General Site Planning					
Room dimensions, including ceiling he	eight, for all Exam, Equipment/Technica	I & Control rooms meets GE specifications.			
Ceiling support structure, if indicated Original Equipment Manufacturer spe of any GE supplied components. Over GE provided criteria.	on the GE drawing, is in the correct loca ecifications. Levelness and spacing has b head support Structure has been confir	ation and at the correct height according to the been measured, and is ready for the installation med with customer/contractor to meet required			
Rooms that will contain equipment, ir taken to prevent debris from entering	ncluding staging areas if applicable, are grooms containing equipment.	construction debris free. Precautions must be			
Finished ceiling is installed. If applicab	le ceiling tiles installed per PMI discreti	on.			
Adequate delivery route from truck to communications/notifications have or etc.). All floors along delivery route w	o final place of installation has been rev ccurred, arrangements have been made ill support weight of the equipment, ter	iewed with all stakeholders, all e for special handling (rigging, elevator, fork lift, nporary reinforcements arranged if needed.			
System power & grounding (PDB/MDI use. Lock Out Tag Out is available.	P) is available as per GE specifications, i	nstalled at point of final connection and ready to			
System power and grounded audit has been scheduled to be completed during installation of equipment. (If Required) GEHC PM to confirmed if needed.					
Adequate room illumination installed	and working.				
Cable ways (floor/wall/ceiling/Access diameter. Cable ways routes per GE F PM. Surface floor duct can be installe	Flooring) are available for installation o inal drawings and cable access opening d at time of system installation.	f GE cables and are of correct length and s areas installed at a time determined by GEHC			
HVAC systems Installed, and the site r	neets minimum environmental operation	onal system requirements.			
Network outlets installed and comput	er network available and working.				
Hospital IT/connectivity contacts have been engaged and information has been added to Project management tool. (If Required)					
Floor levelness/flatness is measured and within tolerance, and there are no visible defects per GEHC specifications. Floor Strength and thickness have been discussed with customer/contractor and they have confirmed GE requirements are met.					
Customer supplied countertops where	e GE equipment will be installed are in p	place.			
Specific for CT & X-ray					
Doors and windows complete or sche radioprotection regulatory approval for	duled to be installed. If applicable, radia or installation obtained.	ation protection (shielding) finished &			
	Status of work				
General comments					
System can be delivered		PMI signature			
Site ready for installation		FS signature: optional			

PMI Name: Field Service Name: Country/City or City/State: Date of completion (dd/mm/yyyy)

| 11/11



diagnostic technology consultants incorporated March 30, 2018

Keith Crane 1710 Wyandotte Kansas City, MO 64108

5930 roe ave.
mission
kansas
usa 66205

Dear Keith,

Enclosed is the Radiation Shielding Design Report for:

(913) 236-6000 (800) 753-4DTC fax: (913) 236-6655 Lee's Summit Medical CenterRoom:CT #2, 1-ED1606Equipment:GE Revolution Evo

In this design, I followed shielding methods outlined by NCRP Report No. 147 (11/19/04). The goal was to shield to 2 mrem per week (100 mrem per year) in uncontrolled areas and 10 mrem per week (500 mrem per year) in controlled areas.

9504 west cluster tampa, florida 33615-2767 If you have any questions, please feel free to call.

Sincerely,

(813) 885-7585

mhi

Josh McIlvain Diagnostic Physicist

specialists in medical physics Enclosure:

Radiation Shielding Report



### Diagnostic Technology Consultants, Inc. Shielding Design Recommendations

Client:	Lee's Summit Medical Center	Room:	CT #2, 1-ED1606
Equipment:	GE Revolution Evo		

#### **Recommendations:**

Calculations determine that one of the walls requires 1/16" of lead shielding, and four walls require at least 1/32". Because the difference in cost between these two sizes is often minimal, it is suggested to consider installing 1/16" on each wall, to simplify construction and leave room for increased use in the future. Note: Walls IJ and EF had their design goal reduced by half to account for their location between the two CT rooms.

						Shielding		
		Dist	ance			Calculated	Calculated	
				_				
				P				
				U=0.02				Recommended
Barrier*	Adj Space**	Feet	d (m)	C=0.10	Т	Lead or Concrete	Inches	Inches
IJ	Control 1605	14.00	4.95	0.05	1.000	Lead	0.0244	1/32
HI	Corridor 1602	14.03	4.96	0.02	0.200	Lead	0.0171	1/32
GH	Office 1608	8.53	3.14	0.02	1.000	Lead	0.0472	1/16
FG	Exterior	9.73	3.54	0.02	0.050	Lead	0.0104	1/32
EF	Exterior	17.85	6.22	0.01	0.050	Lead	0.0068	1/32
Ceiling	NA	-	NA	NA	NA	Lead	NA	NA
Floor	NA	-	NA	NA	NA	Lead	NA	NA
*See attached floor	plan	U = unco	ntrolled; C	C = controlled	T = occu	upancy factor		

#### Table 1: Shielding Design Details for Use of CT

\*\*Multple adjacent spaces may be considered for a barrier, with the most restrictive result shown here

#### **Comments:**

The wall shielding should extend to at least 7 feet above the finished floor. No holes or voids are acceptable in the shielded barrier. All outlet boxes, corners, joints, window frames, and door frames must be shielded to the same rating as the barrier.

Please be advised that any changes in the design of the room, designation of adjacent areas, type of radiation producing machine installed, or increases in the workload will necessitate reevaluation of the shielding requirements.

The integrity of the shielding should be checked post installation of all shielding.

Josh McIlvain Diagnostic Physicist Missouri Qualified Expert ID: QE273



Date



Diagnostic Technology Consultants, Inc.					
	Parameters used in Shielding Design				
Facility:	Lee's Summit Medical Center				
Room:	CT #2, 1-ED1606				
Shielding Designer:	Josh McIlvain				
Shielding Method:	NCRP Report 147				
Equipment:	GE Revolution Evo				
Equipment Uses:	CT				
CT Workload provided by client:	15 per week head; 50 per week other				
Workload used in calculations:	20 per week head; 60 per week other				
	Workload in this shielding design method is the average number of patients per week as provided by the client. For design purposes, this average number is increased to account for higher workload in any one week and to accommodate future growth in the program.				
Shielding Design Goals (P):	<ul><li>U: Uncontrolled area beyond the barrier. Barrier protects members of the public and non-radiation workers. Shield to 0.02 mGy per week (1 mGy per year).</li><li>C: Controlled area beyond the barrier. Barrier protects occupationally exposed radiation workers. Access to this area is controlled for radiation protection purposes. Shield to 0.1 mGy per week (5 mGy per year). Annual limit is 50 mGy per year.</li></ul>				
Occupancy (T):	Occupancy factor for the area beyond the barrier. Approximate amount of time during which the adjacent space will be occupied. (NCRP 147, Table 4.1) C: Controlled area beyond the barrier. Shield to 0.1 mGy per week (5 mGy per year)				
Occupancy (T):	Occupancy factor for the area beyond the barrier (NCRP 147, Table 4.1)				
Distance (d):	Distance from the isocenter to the occupied area (NCRP 147, Figure 5.1)				
Floor to Ceiling Height (ft):	NA				
Min. ConcreteThickness (in):	NA lightweight standard weight				
References:	A. National Council on Radiation Protection and Measurements. Structural Medical X-ray Imaging Facilities. Bethesda, MD: NCRP; NCRP Report 147; 2004				
	B. Information used in the design obtained from:				
	Architectural floor plans equipment vendor layout				
Assumptions:	☑ DIC Checklist ☑ e-mails and other communications				







PRELIMINARY, NOT FOR





diagnostic technology consultants incorporated March 30, 2018

Keith Crane 1710 Wyandotte Kansas City, MO 64108

5930 roe ave.
mission
kansas
usa 66205

Dear Keith,

Enclosed is the Radiation Shielding Design Report for:

(913) 236-6000 (800) 753-4DTC fax: (913) 236-6655

Lee's Summit Medical Center Room: CT #1, 1-ED1603 **Equipment:** GE Optima 660

In this design, I followed shielding methods outlined by NCRP Report No. 147 (11/19/04). The goal was to shield to 2 mrem per week (100 mrem per year) in uncontrolled areas and 10 mrem per week (500 mrem per year) in controlled areas.

9504 west cluster tampa, florida 33615-2767

(813) 885-7585

If you have any questions, please feel free to call.

hi.

Josh McIlvain **Diagnostic Physicist** 

specialists

Enclosure:

Sincerely,

**Radiation Shielding Report** 

in medical physics



### **Diagnostic Technology Consultants, Inc. Shielding Design Recommendations**

Client:	Lee's Summit Medical Center	Room:	CT #1, 1-ED1603
Equipment:	GE Optima 660		

#### **Recommendations:**

Calculations determine that two of the walls require 1/16" of lead shielding, and three walls require at least 1/32". Because the difference in cost between these two sizes is often minimal, it is suggested to consider installing 1/16" on each wall, to simplify construction and leave room for increased use in the future. Note: Walls AB and EF had their design goal reduced by half to account for their location between the two CT rooms.

	0 0							
						Shiel	ding	
		Distance				Calculated		
				_				
				P				
				U=0.02				Recommended
Barrier*	Adj Space**	Feet	d (m)	C=0.10	Т	Lead or Concrete	Inches	Inches
AB	Control 1605	14.00	4.95	0.05	1.000	Lead	0.0326	1/16
BC	Corridor 1601	14.03	4.96	0.02	0.200	Lead	0.0244	1/32
CD	Workroom 1425	8.53	3.14	0.02	1.000	Lead	0.0573	1/16
DE	Exterior	9.73	3.54	0.02	0.050	Lead	0.0170	1/32
EF	Exterior	17.85	6.22	0.01	0.050	Lead	0.0128	1/32
Ceiling	NA	-	NA	NA	NA	Lead	NA	NA
Floor	NA	-	NA	NA	NA	Lead	NA	NA
*See attached floor plan		U = uncontrolled; C = controlled; T = occupancy factor						

#### Table 1: Shielding Design Details for Use of CT

\*See attached floor plan

\*\*Multple adjacent spaces may be considered for a barrier, with the most restrictive result shown here

#### **Comments:**

The wall shielding should extend to at least 7 feet above the finished floor. No holes or voids are acceptable in the shielded barrier. All outlet boxes, corners, joints, window frames, and door frames must be shielded to the same rating as the barrier.

Please be advised that any changes in the design of the room, designation of adjacent areas, type of radiation producing machine installed, or increases in the workload will necessitate reevaluation of the shielding requirements.

The integrity of the shielding should be checked post installation of all shielding.

Josh McIlvain **Diagnostic Physicist** Missouri Qualified Expert ID: QE273



Date



Parameters used in Shielding Design								
Facility: Room:	Lee's Summit Medical Center CT #1, 1-ED1603							
Shielding Designer:	Josh McIlvain							
Shielding Method:	NCRP Report 147							
Equipment:	GE Optima 660							
Equipment Uses:	СТ							
CT Workload provided by client:	55 per week head; 100 per week other							
Workload used in calculations:	61 per week head; 110 per week other							
	Workload in this shielding design method is the average number of patients per week as provided by the client. For design purposes, this average number is increased to account for higher workload in any one week and to accommodate future growth in the program.							
Shielding Design Goals (P):	<ul> <li>U: Uncontrolled area beyond the barrier. Barrier protects members of the public and non-radiation workers. Shield to 0.02 mGy per week (1 mGy per year).</li> <li>C: Controlled area beyond the barrier. Barrier protects occupationally exposed radiation workers. Access to this area is controlled for radiation protection purposes. Shield to 0.1 mGy per week (5 mGy per year). Annual limit is 50 mGy per year.</li> </ul>							
Occupancy (T):	Occupancy factor for the area beyond the barrier. Approximate amount of time during which the adjacent space will be occupied. (NCRP 147, Table 4.1) C: Controlled area beyond the barrier. Shield to 0.1 mGy per week (5 mGy per year)							
Occupancy (T):	Occupancy factor for the area beyond the barrier (NCRP 147, Table 4.1)							
Distance (d):	Distance from the isocenter to the occupied area (NCRP 147, Figure 5.1)							
Floor to Ceiling Height (ft):	NA							
Min. ConcreteThickness (in):	NA lightweight standard weight							
References:	A. National Council on Radiation Protection and Measurements. Structural Medical X-ray Imaging Facilities. Bethesda, MD: NCRP; NCRP Report 147; 2004							
	B. Information used in the design obtained from:							
	Image: Architectural floor plans     Image: equipment vendor layout       Image: DTC Checklist     Image: equipment vendor layout							
Assumptions:								

٩.







PRELIMINARY, NOT FOR

