
Project Manual | Volume 1 (Divisions 00-13)
Intermountain Medical Center ED CT Remodel
Murray, Utah

Construction Documents
July 9, 2021

PROJECT MANUAL

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SECTION 00 2213

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

- A. The Supplementary Instructions to Bidders herein describe, contain changes and additions to Section 00 0100 - AIA A701 Instructions to Bidders (included by reference - copies may be obtained from the Architect's office for the cost of reproduction). Where any part of the Instructions to Bidders is modified by these Supplementary instructions, the unaltered provisions shall remain in effect.

3.1.5 COPIES

Add the following:

The title or cover sheet to the drawings and the index to the Project Manual contains a list of all documents which comprise a full set of bid documents for this project. Any Contractor, Subcontractor, vendor or any other person participating in or bidding on this project shall be responsible for the information contained in any and all sheets of drawings and all sections of the specifications. If any person, party or entity elects to submit bids for any portion, or all, of this project, that person, party or entity shall be responsible for any and all information contained in these drawings and specifications, including, but not limited to, any subsequent addendums or clarifications that may be issued.

3.3 SUBSTITUTIONS

Amend 3.3.2 to read:

No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least 7 days prior to the date for receipt of Bids. Such requests...

3.4 ADDENDA

Amend 3.4.3 to read:

No addenda will be issued later than 24 hours prior to the date for receipt of Bids except an addendum may be issued no later than 12 hours prior to the date for receipt of bids for the purpose of cancellation or postponement of receipt of bids. It is the responsibility of the Bidder to disseminate telephone addendum information to sub-bidders.

4.2 BID SECURITY

Delete this article in its entirety. Bid bonds will not be required for this project.

4.3 SUBMISSION OF BIDS

Amend 4.3.4 to read:

Bids shall be hand delivered in sealed envelope or emailed to the Owner at the address noted in the Invitation to Bid. Bids submitted orally, or by telephone or facsimile will not be considered.

5.3 ACCEPTANCE OF BID (AWARD)

Amend 5.3.2 to read:

The Owner shall ... to determine the low bidder on the basis of the sum of the Base Bid or on the basis of the sum of the Base Bid and any combined accepted Alternates. Cost of insurance will not be used as the basis of award.

ARTICLE 7 - PERFORMANCE AND PAYMENT BOND

Delete this Article in its entirety. Bonds will not be required for this Project.

END OF SECTION

SECTION 003100

AVAILABLE PROJECT INFORMATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section references other information relevant to the construction of this Project that is available project information.
- B. At the request of the Owner, the information identified below represents services that have been provided by others, not as an Architect's Consultant, regarding conditions that affect this Project that are beyond the responsibilities of the Architect and Architect's Consultants. Reference to such information herein is solely for the convenience of the Owner. Architect makes no representation, express or implied, as to the accuracy or validity of the information.
- C. Bidders are expected to examine the site and the information available from the Owner to determine for themselves the conditions to be encountered.
- D. If conditions other than those indicated in the information available from the Owner are encountered before or during construction, notify the Owner before work continues.

1.2 MEDICAL EQUIPMENT DOCUMENTS

- A. The Owner has developed medical equipment documents for the Owner's facility and has prepared construction documents.
- B. Copies will be provided by the Owner. A list of the equipment indicated with the Equipment Plan. Equipment information responsibilities are included in Division 11 section "Medical Equipment".
 - 1. A copy of the GE vendor drawings for the CT radiographic unit is attached to this section.
 - 2. A diagram of the requirements for the Injector is attached to this section.

1.3 RADIATION PROTECTION REPORT

- A. The Owner's Radiation Protection Consultant has determined the radiation protection that is required, and has prepared a report that contains specific requirements of the Contractor.
- B. Copies will be provided by the Owner. Copies of the documents have been included in the Contract Documents prepared by the Architect for the convenience of the Owner.
- C. The Owner retained the following company: MPC

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1.4 INFECTION CONTROL RISK ASSESSMENT REPORT


- A. The Owner's Risk Assessment Consultant has assessed the environmental impact of the work on the existing, adjacent healthcare functions, and has prepared an Infection Control Risk Assessment (ICRA) report that includes specific requirements of the Contractor.
- B. A copy of the ICRA Work Permit is attached. It is the responsibility of the Contractor to work with the facility ICRA director to provide the proper enclosures and ICRA measures.
- C. The ICRA establishes strategic infection control provisions and requirements for the purpose of controlling the dissemination of airborne micro-organism contaminants encountered or generated during the construction process through the use of containment protocols and environmental monitoring.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION



			Intermountain Medical Center Murray, Utah USA																												
B	21/Jun/2021	Revised final drawing based on DC-303588 (equipment locations)																													
A	24/May/2021	Final drawing based on DC-268382																													
REV	DATE	MODIFICATIONS																													
01 - C1 - Cover Sheet		10 - S2 - Structural Layout				<div><div> GE Healthcare</div><div>Wendel Larson 801-891-9934 wendel.larson@ge.com</div></div> <div>REVOLUTION FRONTIER FINAL STUDY</div> <table><tr><td>Drawn by</td><td>Verified by</td><td>Concession</td><td>S.O. (GON)</td><td>PIM Manual</td><td>Rev</td></tr><tr><td>JJL</td><td>JJL</td><td>-</td><td>5030419</td><td>5786386-1EN</td><td>7</td></tr><tr><td>Format</td><td>Scale</td><td colspan="2">File Name</td><td>Date</td><td>Sheet</td></tr><tr><td>A3</td><td>1/4"=1'-0"</td><td colspan="2">CT-M254612-FIN-00.DWG</td><td>21/Jun/2021</td><td>01/17</td></tr></table>		Drawn by	Verified by	Concession	S.O. (GON)	PIM Manual	Rev	JJL	JJL	-	5030419	5786386-1EN	7	Format	Scale	File Name		Date	Sheet	A3	1/4"=1'-0"	CT-M254612-FIN-00.DWG		21/Jun/2021	01/17
Drawn by	Verified by	Concession	S.O. (GON)	PIM Manual	Rev																										
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A3	1/4"=1'-0"	CT-M254612-FIN-00.DWG		21/Jun/2021	01/17																										
02 - C2 - Disclaimer - Site Readiness Checklist		11 - S3 - Structural Details (1)																													
03 - A1 - General Notes		12 - M1 - HVAC																													
04 - A2 - Equipment Layout		13 - E1 - Electrical Notes																													
05 - A3 - Radiation Protection		14 - E2 - Electrical Layout																													
06 - A4 - Radiation Protection Details		15 - E3 - Electrical Elevations																													
07 - A5 - Equipment Dimensions		16 - E4 - Power Requirements																													
08 - A6 - Delivery		17 - E5 - Electrical Details - Interconnect																													
09 - S1 - Structural Notes																															
A mandatory component of this drawing set is the GE Healthcare Pre Installation manual. Failure to reference the Pre Installation manual will result in 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																															
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.																															

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 structural 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. 7

Site Ready Checks at Installation
EHS Site Requirements
Overall access route to the scan room free from obstruction / high hazards.
Enough space to store tools, equipment, parts, install waste and the general area free from obstruction and trip hazards.
Enough necessary facilities for the GE employees available.
No 3rd parties working in the area that may affect the safety of the installation activity.
Area free from any chemical, gas, dust, welding fume exposure and has painting been completed and dry.
All emergency routes identified, signed and clear from obstruction.
Accessible single source lockable panel that LOTO can be applied to for GE equipment installation (MDP and/or PDU).
There are no other conditions or hazards that you have observed or have been made aware of by the customer or contractors on site.
Required for Mechanical Install start
Room dimensions, including ceiling height, for all Exam, Equipment/Technical & Control rooms meets GE specifications.
Ceiling support structure, if indicated on the GE drawing, is in the correct location and at the correct height according to the Original Equipment Manufacturer specifications.
Levelness and spacing has been measured, and is ready for the installation of any GE supplied components.
Overhead support Structure (unistrut) has been confirmed with customer/contractor to meet required GE provided criteria.
Finished ceiling is installed. If applicable ceiling tiles installed per PMI discretion.
Floor levelness/flatness is measured and within tolerance, and there are no visible defects per GEHC specifications.
Entry door threshold meets PIM requirement.
Rooms that will contain equipment, including staging areas if applicable, are construction debris free. Precautions must be taken to prevent debris from entering rooms containing equipment.
Cable ways (floor/wall/ceiling/Access Flooring) are available for installation of GE cables are of correct length and diameter.
Cable ways routes per GE Final drawings and cable access openings areas installed at a time determined by GEHC PM. Surface floor duct can be installed at time of system installation.
Adequate room illumination installed and working.
Customer supplied countertops where GE equipment will be installed are in place.
Required for Calibration Start
HVAC systems Installed, and the site meets minimum environmental operational system requirements.
System power & grounding (PDB/MDP) is available as per GE specifications.
System power & grounding (PDB/MDP) is installed at point of final connection and ready to use. Lock Out Tag Out is available.
PMI to confirm all feeder wires and breaker are size appropriately. EPO installed if needed.
PMI to confirm with electrician all power and signal cables are well terminated ensuring there are no loose connections.
Network outlets installed.
Computer network available and working.
Lead doors and windows complete or scheduled to be installed. If applicable, radiation protection (shielding) finished & radioprotection regulatory approval for installation obtained.

Note: The details shown here are only an extract from DOC1809666. For the complete document please contact your PMI.

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 GANTRY AUDIBLE NOISE LEVEL

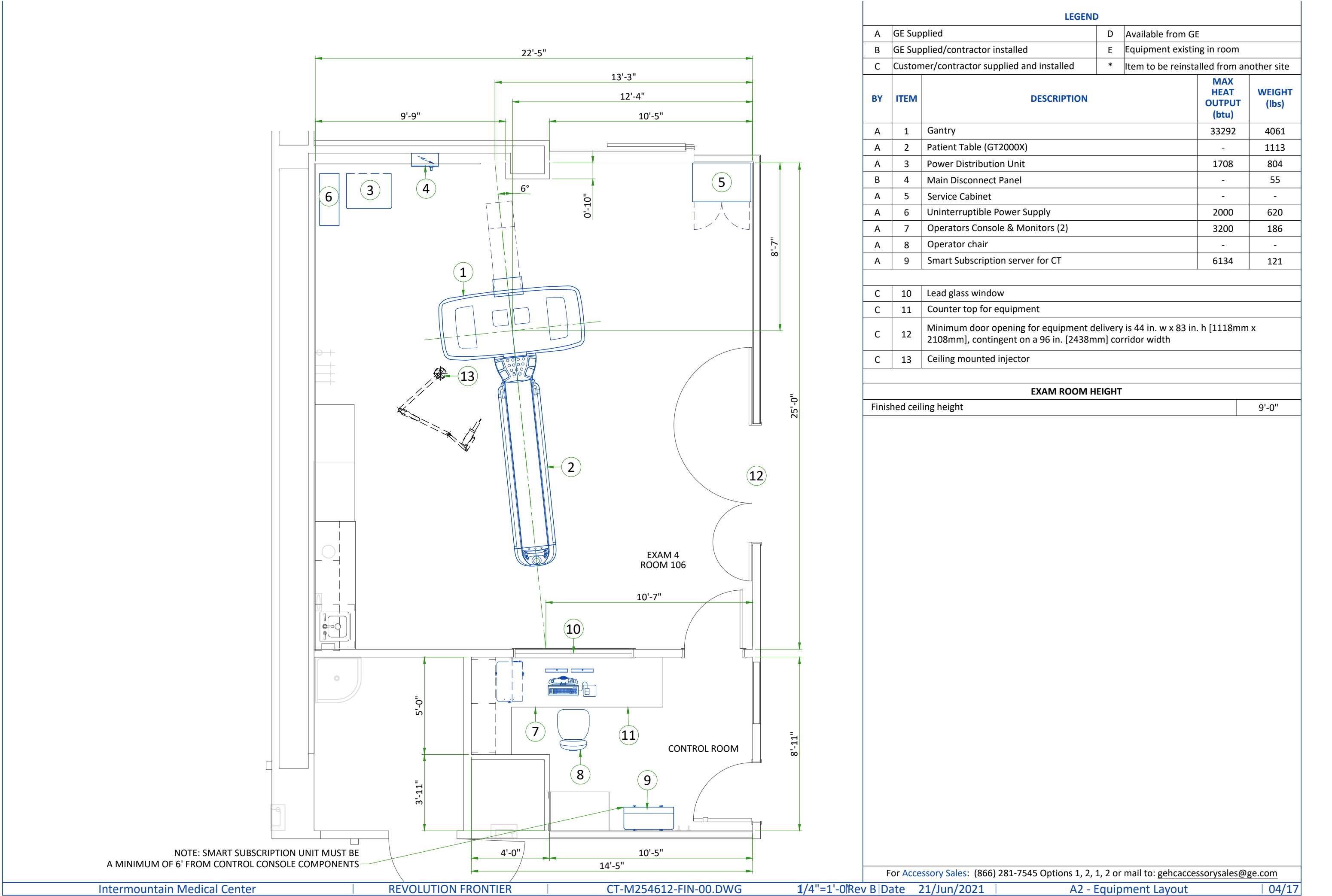
- The maximum ambient noise level is produced by the gantry during a CT scan acquisition.
- It is less than 70 dBA when measured at a distance of one meter from the nearest gantry surface, in any direction.

MAXIMUM CONSOLE AUDIBLE NOISE LEVEL

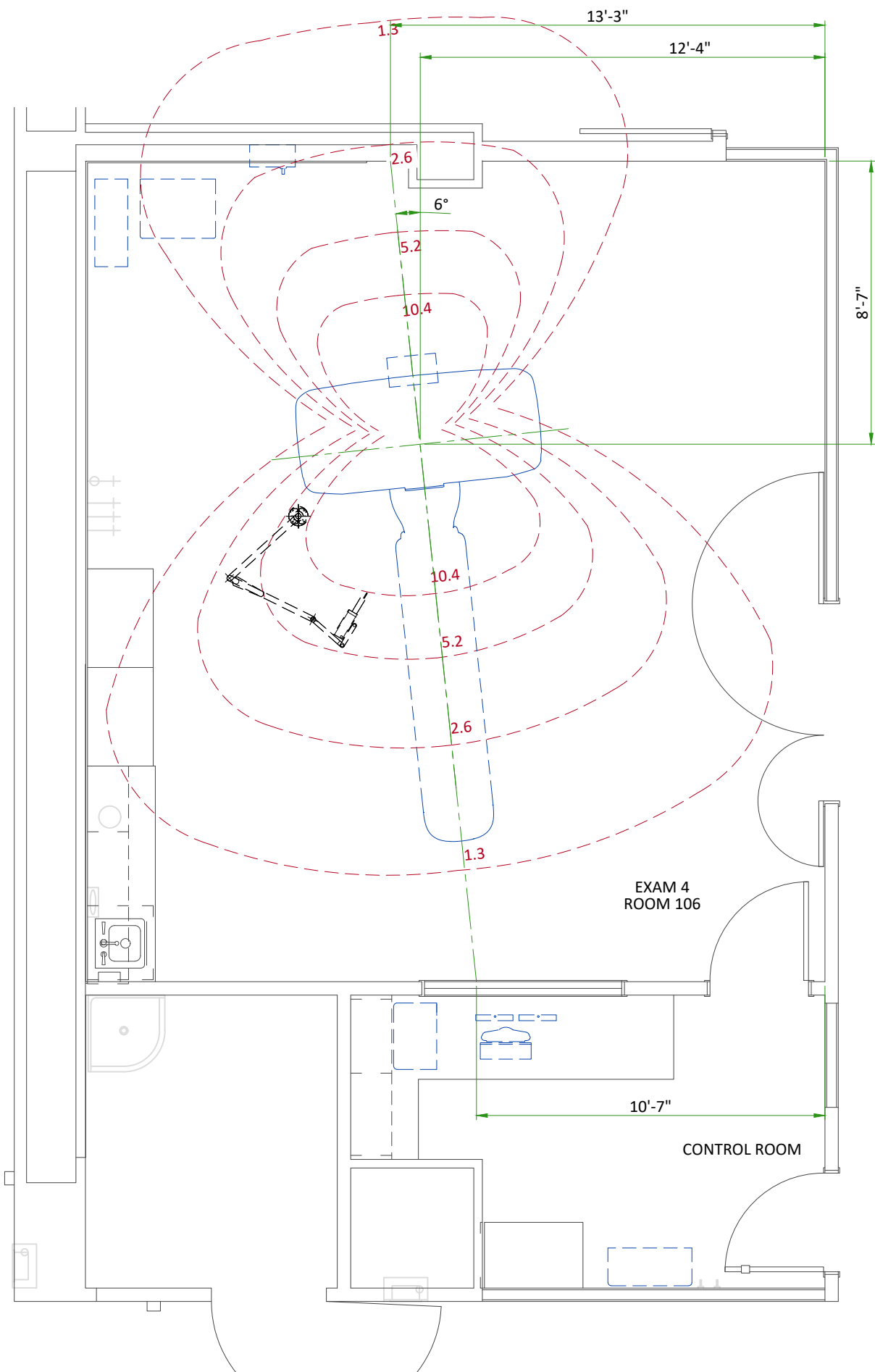
- The maximum ambient noise level is less than or equal to 56 dBA when measured 1m up and 1m away from the console at an ambient temperature of 26 °C.

CUSTOMER SITE READINESS REQUIREMENTS

- Any deviation from these drawings must be communicated in writing to and reviewed by your local GE healthcare installation project manager prior to making changes.
- Make arrangements for any rigging, special handling, or facility modifications that must be made to deliver the equipment to the installation site. If desired, your local GE healthcare installation project manager can supply a reference list of rigging contractors.
- New construction requires the following;
 1. Secure area for equipment,
 2. Power for drills and other test equipment,
 3. Capability for image analysis,
 4. Restrooms.
- Provide for refuse removal and disposal (e.g. crates, cartons, packing)
- For CT, MR, PET/CT, and SPECT systems it is required to minimize vibrations within the scan room. It is the customer's responsibility to contract a vibration consultant/engineer to implement site design modifications to meet the GE vibration specification. Refer to the system preinstallation manual for vibration specifications.



RADIATION PROTECTION LAYOUT



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:

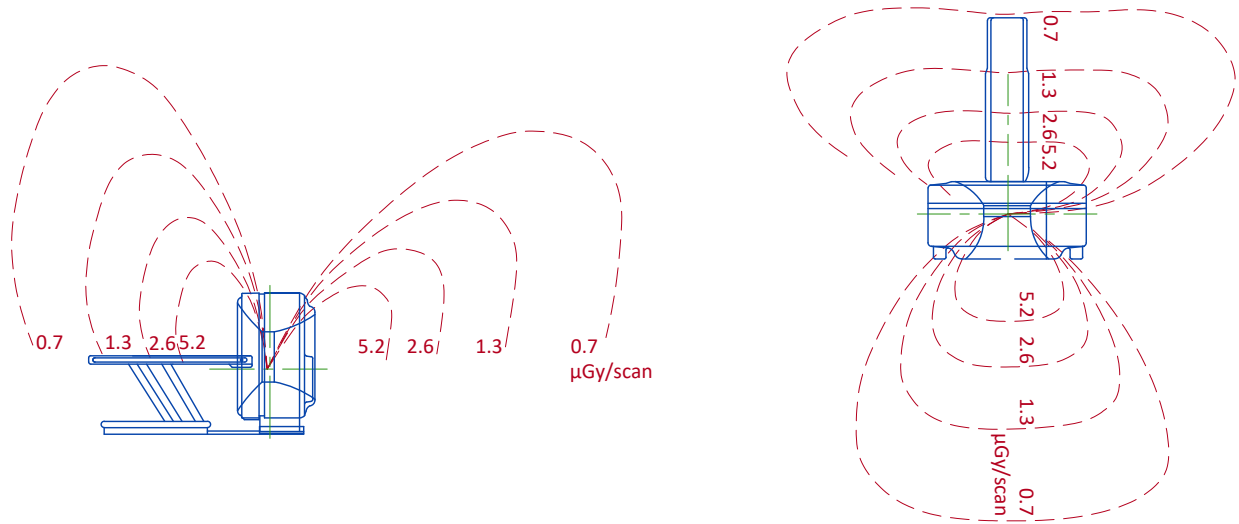
- Engage a qualified radiological health physicist to review your scan room shielding requirements, taking into consideration:
- Scatter radiation levels within the scanning room
 - Equipment placement.
 - Weekly projected work-loads (number of patients/day technique (kvp*ma))
 - Materials used for construction 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 CTDI phantom placed on the patient table and using a large filter, with the technique shown. Use the mAs, kV and aperture scaling factors in the table shown here to adjust exposure levels to the scan technique used at the site.
Example: (using the Illustration) The exposure level for a 120 kV, 800mA, 1 sec. scan at 1270 mm (50 in) away from the scan place is 10.4 μGy x 0.71 x 800/100 = 59.2 μGy.

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 equals ±40%.

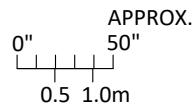
RADIATION SCATTER - HEAD PHANTOM

NOTE: 140 kV
100 mAs/scan
1 sec
40mm aperture



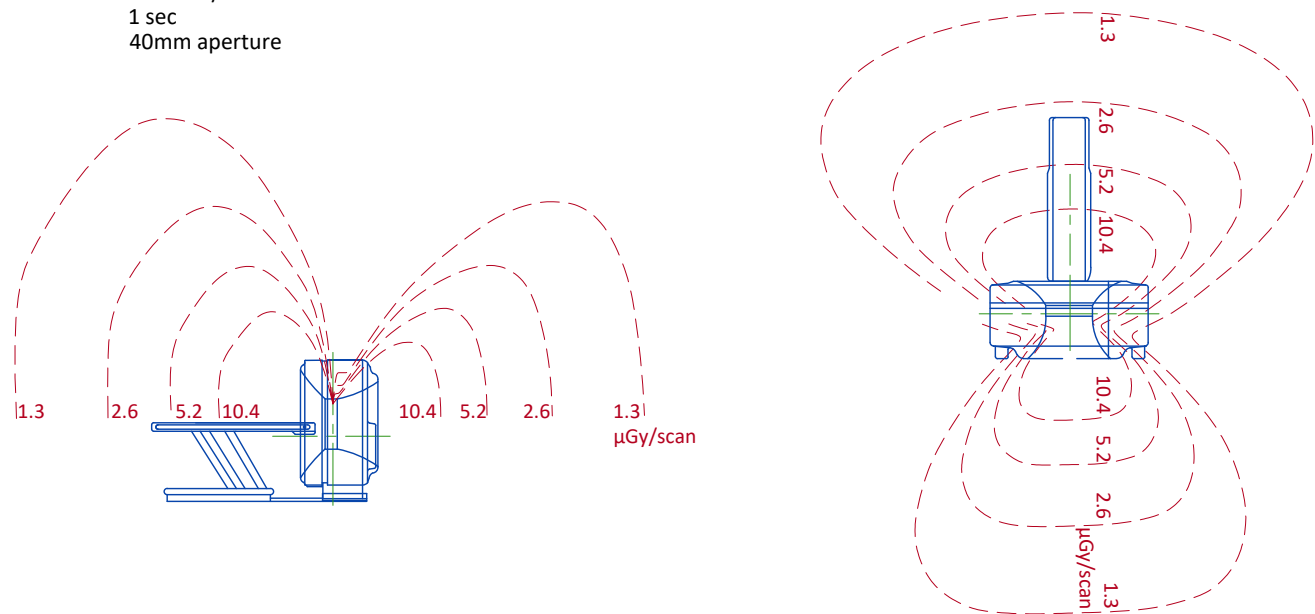
Elevation

Plan View



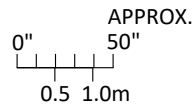
RADIATION SCATTER - BODY PHANTOM

NOTE: 140 kV
100 mAs/scan
1 sec
40mm aperture

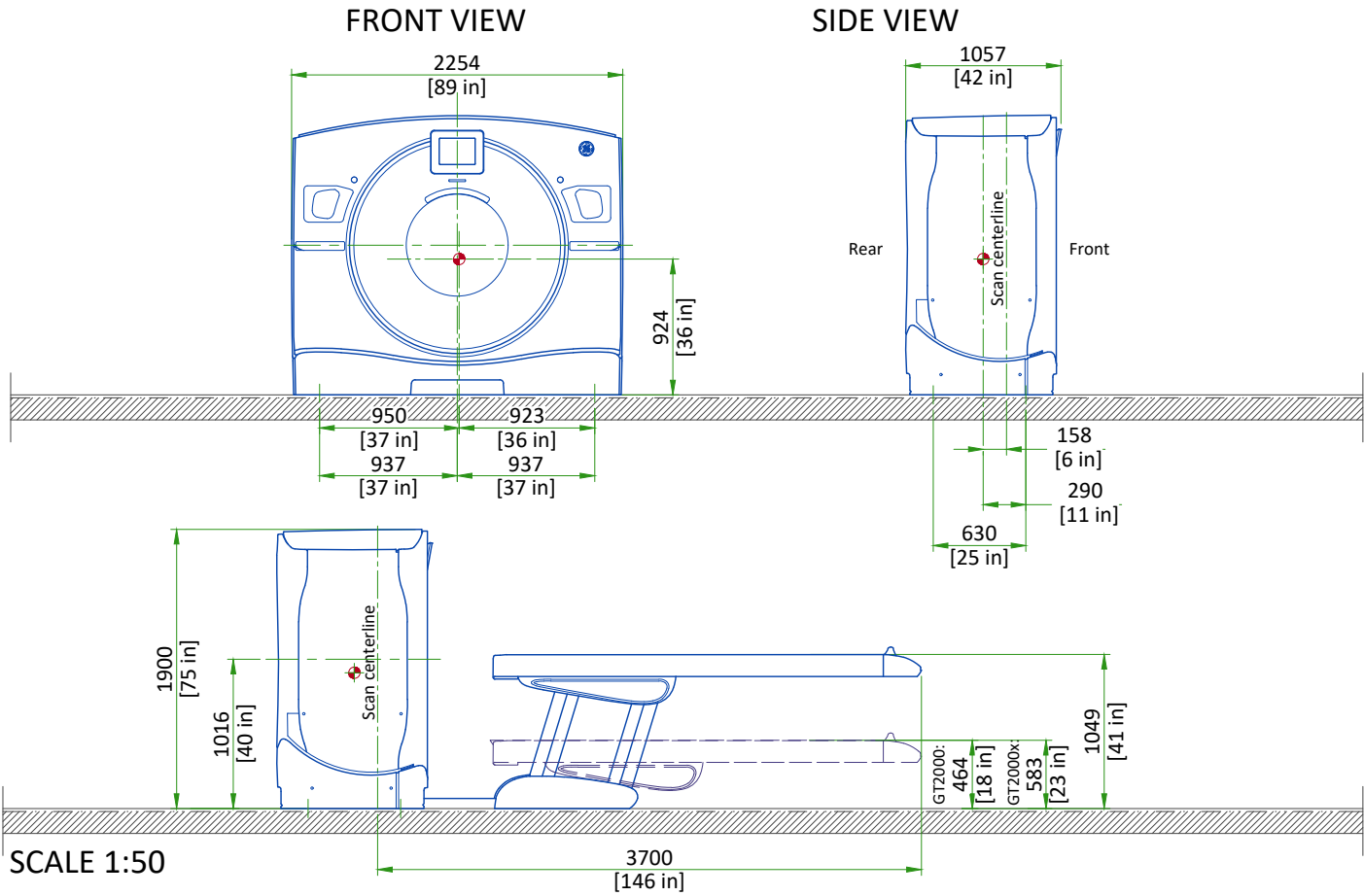


Elevation

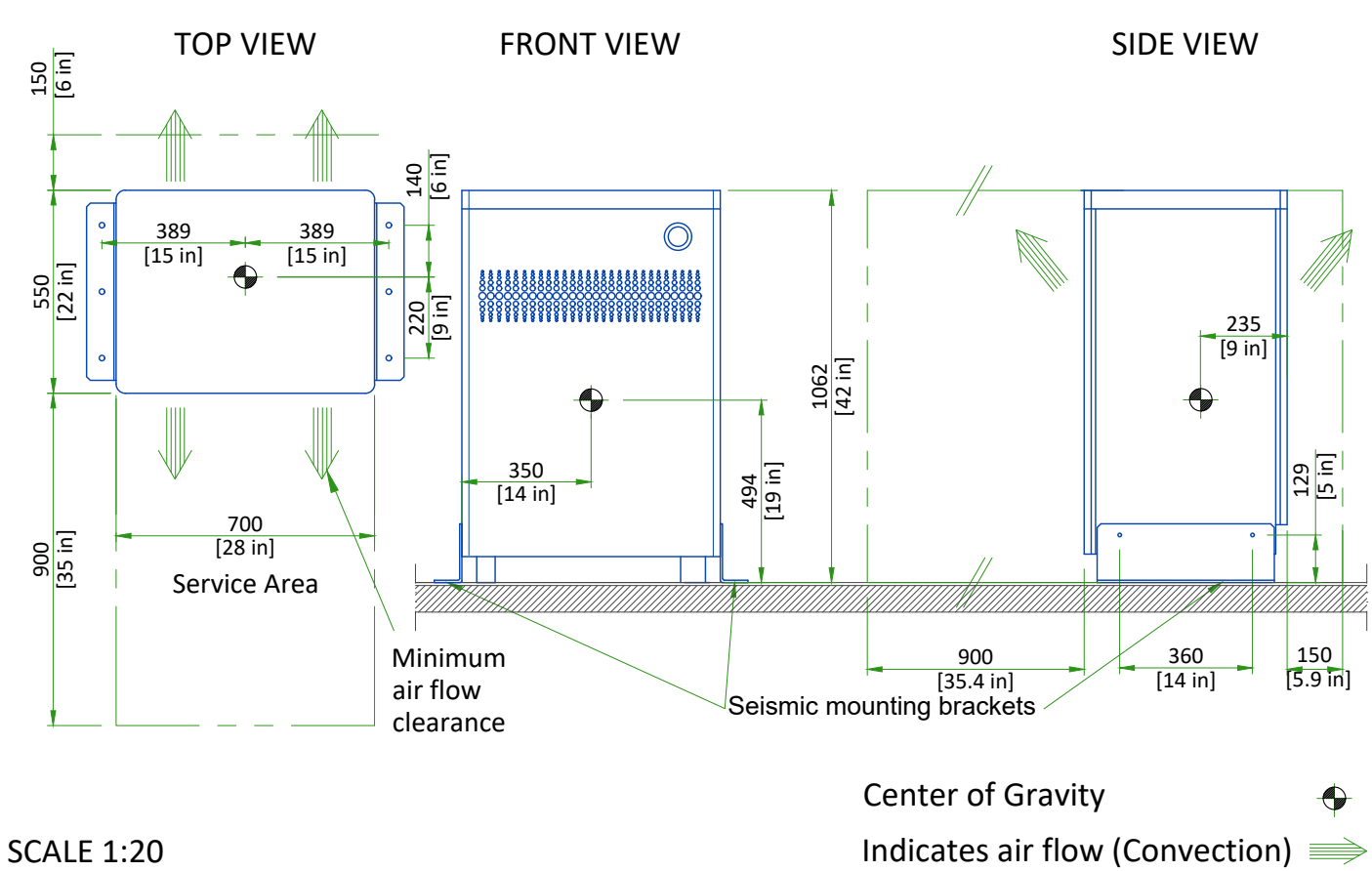
Plan View



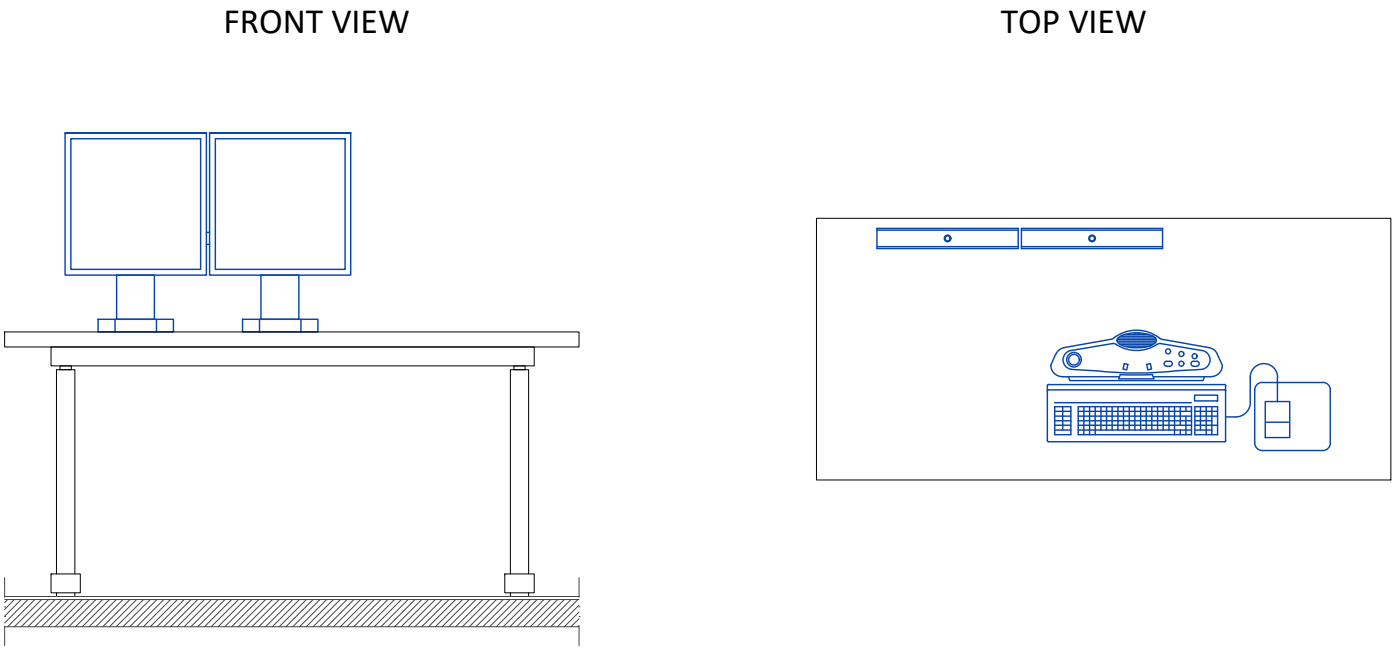
GANTRY WITH GT2000/GT2000X TABLE



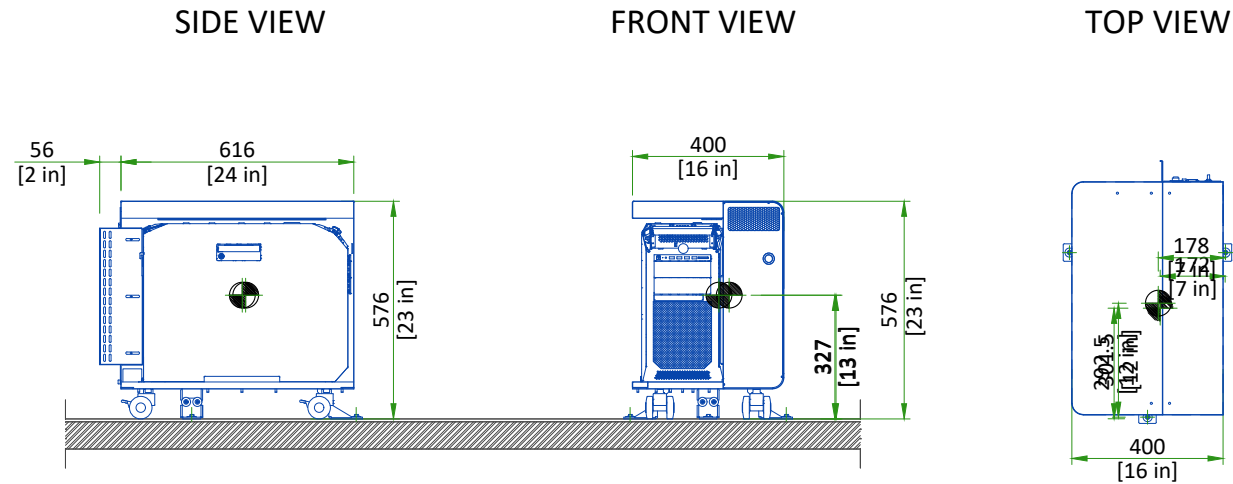
POWER DISTRIBUTION UNIT (PDU)



CUSTOMER SUPPLIED TABLE



OPEN CONSOLE WITH Z8G4 HOST PC



Weight: 64.5 kg [142.2 lbs]

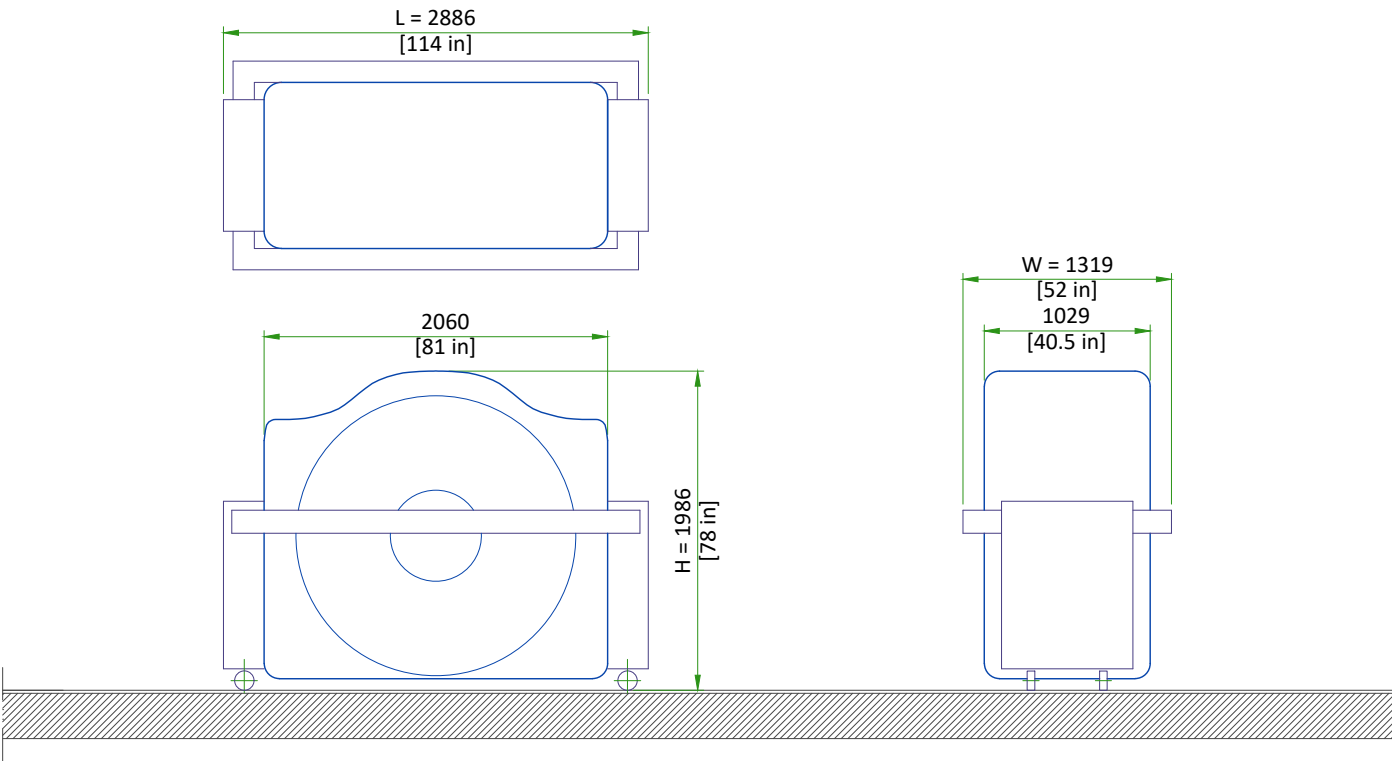
DELIVERY

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					
EQUIPMENT	DIMENSIONS			WEIGHT	
GANTRY	LENGTH	2886 mm	114 in	1982 kg	4370 lbs
	WIDTH	1319 mm	52 in		
	HEIGHT	1986 mm	78 in		
GT2000/GT2000X TABLE	LENGTH	2997 mm	118 in	632 kg	1392 lbs
	WIDTH	762 mm	30 in		
	HEIGHT	1143 mm	45 in		

GANTRY DELIVERY

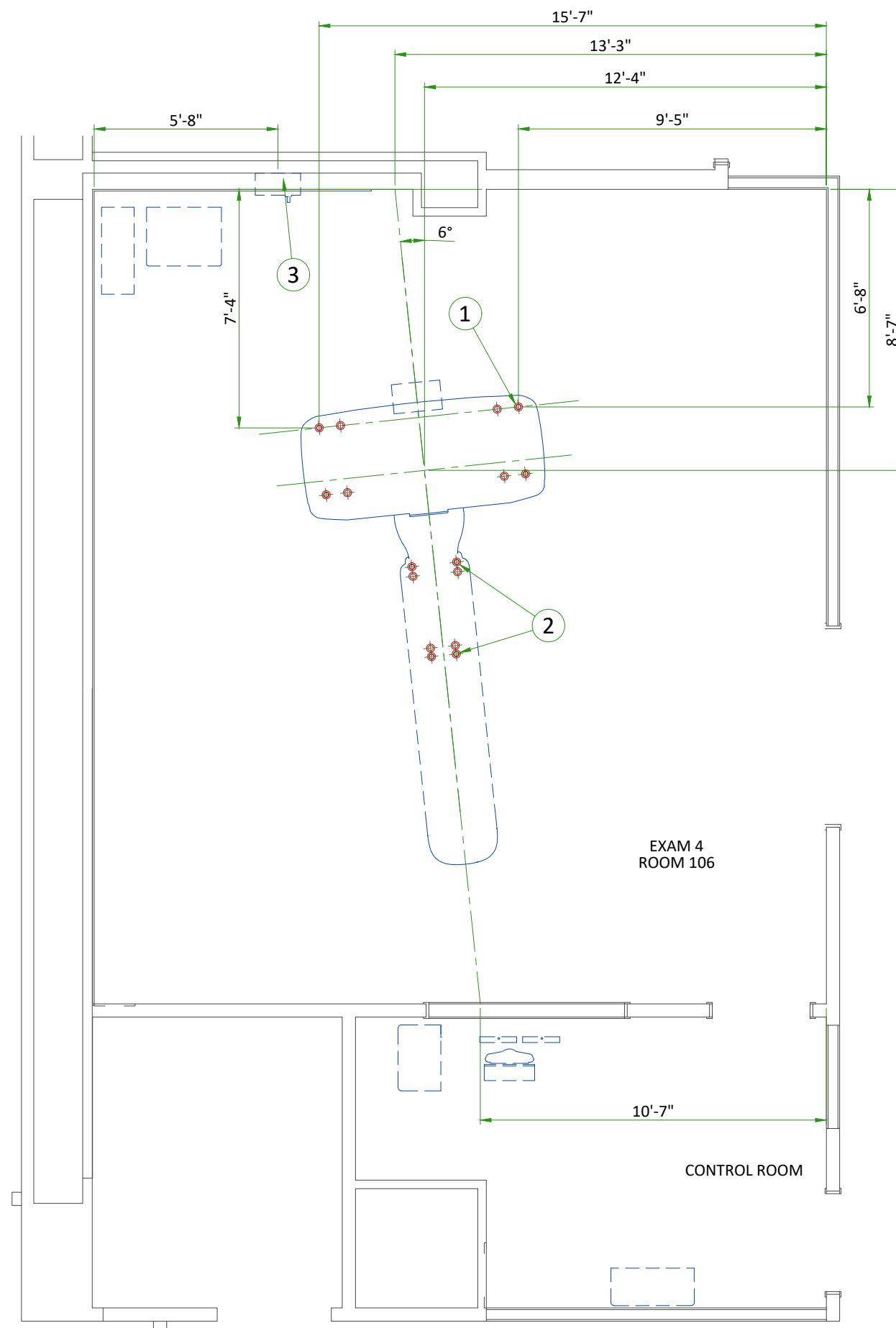


- The gantry is shipped on a dolly equipped with elevating casters (normal shipping configuration).

NOT TO SCALE

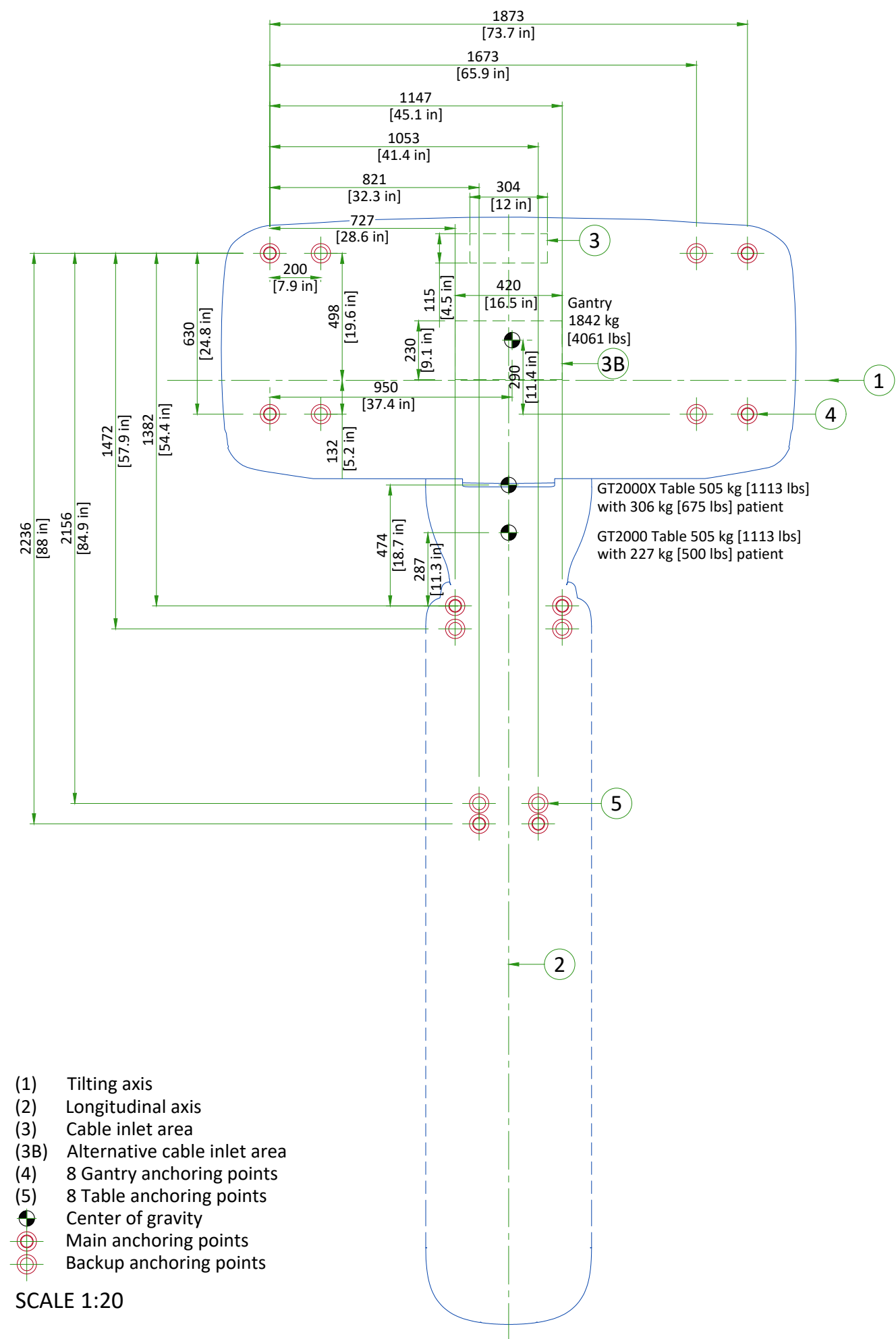
STRUCTURAL NOTES

- all steel work and parts necessary to support ceiling mounted equipment is to be supplied by the customer or his contractors.
- methods of support for the steelwork that will permit attachment to structural steel or through bolts in concrete construction should be favored. Do not use concrete or masonry anchors in direct tension.
- all units that are wall mounted or wall supported are to be provided with supports where necessary. Wall supports are to be supplied and installed by the customer or his contractors. See plan and detail sheets for suggested locations and mounting hole locations.
- all ceiling mounted fixtures, air vents, sprinklers, etc. To be flush mounted, or shall not extend more than 1/4" below the finished ceiling.
- floor slabs on which equipment is to be installed must be level to 1/4" in 10'-0"
- dimensions are to finished surfaces of room.
- customers contractor must provide all penetrations in post tension floors.
- customers contractor must provide and install any non-standard anchoring. Documents for standard anchoring methods are included with GE equipment drawings for geographic areas that require such documentation.
- customers contractor must provide and install hardware for "through the floor" anchoring and/or any bracing under access floors. This contractor must also provide floor drilling that cannot be completed because of an obstruction encountered while drilling by the GE installer such as rebar etc.
- it is the customer's responsibility to perform any floor or wall penetrations that may be required. The customer is also responsible for ensuring that no subsurface utilities (e.g., electrical or any other form of wiring, conduits, piping, duct work or structural supports (i.e. post tension cables or rebar)) will interfere or come in contact with subsurface penetration operations (e.g. drilling and installation of anchors/screws) performed during the installation process. To ensure worker safety, GE installers will perform surface penetration operations only after the customer's validation and completion of the "GE surface penetration permit"



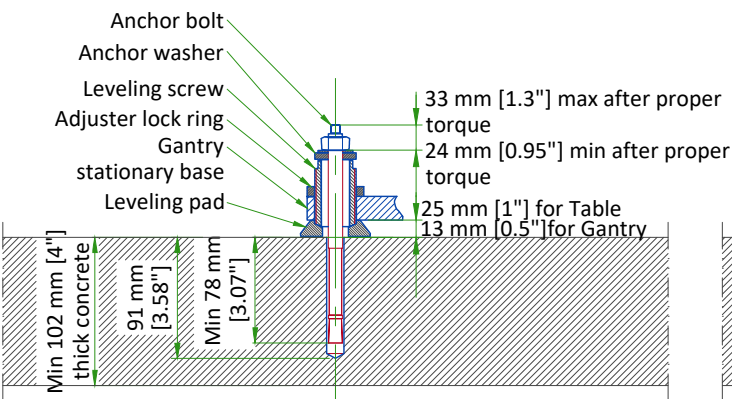
ITEM	DESCRIPTION
(CONTRACTOR SUPPLIED & INSTALLED)	
1	Gantry leveling pads. See Structural Detail
2	Table leveling pads. See Structural Detail
3	Support Backing, locate as shown

ANCHORING/LOADING DISTRIBUTION TO THE FLOOR



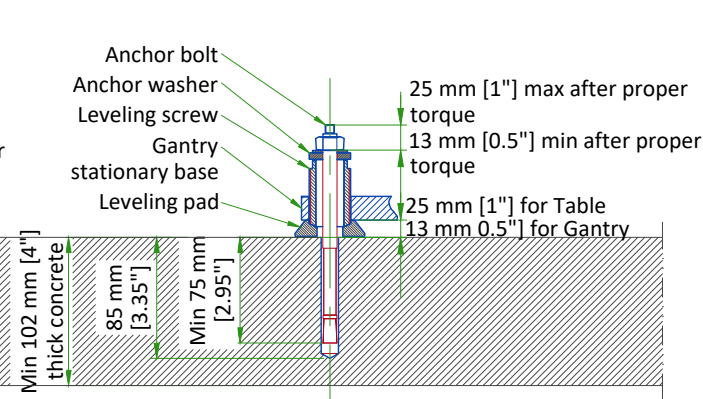
FLOOR REQUIREMENTS

GE SUPPLIED ANCHORS (2106573)



- NOTES:
- Required for GT2000X Table

GE SUPPLIED ANCHORS (5487992-2)



FINISHED FLOOR REQUIREMENTS

- Installation requires a finish floor in the scan and control rooms
- The floor surface in the scan room directly under the gantry and table must be level.
- The floor levelness tolerance of the floor surface that the gantry and table will rest on is 6 mm [0.24"] over a 3048 mm [10'] distance.
- Shims should not be used to compensate for a floor that does not meet this requirement.
- Eight or more floor covering openings that are 101.6 mm [4"] in diameter are made to ensure the table and gantry rest on a solid surface. These floor penetrations can be sealed if required.
- The distance from central line of anchor to the edge of concrete basement of Gantry/table should not be less than 178 mm [7"].
- These requirements apply to all installation types.

NOT TO SCALE

TEMPERATURE AND HUMIDITY SPECIFICATIONS

IN-USE CONDITIONS

Temperature	EXAM ROOM			CONTROL ROOM		
	Min	Recommended	Max	Min	Recommended	Max
	18°C	22°C	26°C	18°C	22°C	26°C
	64°F	72°F	79°F	64°F	72°F	79°F
Temperature gradient	≤ 3°C/h			≤ 3°C/h		
	≤ 5°F/h			≤ 5°F/h		
Relative humidity (1)	30% to 60%			30% to 60%		
Humidity gradient	≤ 5%/h			≤ 5%/h		

STORAGE CONDITIONS

Temperature	0°C to +30°C
	+32°F to +86°F
Temperature gradient	≤ 3°C/h
	≤ 5°F/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

ROOM	DESCRIPTION	HEAT DISSIPATION (kW)	HEAT DISSIPATION (BTU/hr)
		MAX	MAX
Exam Room	Gantry and Table (Without patient)	9.76	33292
	TOTAL	0'-10"	33292
Exam/Technical Room*	Power Distribution Unit (PDU)	0.50	1708
	Partial UPS	0.59	2000
	TOTAL	0'-1"	3708
Control Room	Console with 2 LCD monitors	0.94	3200
	TOTAL	0'-1"	3200
* Technical Room is not mandatory, the placements of these elements are recommended in the Exam Room.			

ELECTRICAL NOTES

1.

All wires specified shall be copper stranded, flexible, thermo-plastic, color coded, cut 10 foot long at outlet boxes, duct termination points or stubbed conduit ends. All conductors, power, signal and ground, must be run in a conduit or duct system. Electrical contractor shall ring out and tag all wires at both ends. Wire runs must be continuous copper stranded and free from splices.
- 1.1.

Aluminum or solid wires are not allowed.
2.

Wire sizes given are for use of equipment. Larger sizes may be required by local codes.
3.

It is recommended that all wires be color coded, as required in accordance with national and local electrical codes.
4.

Conduit sizes shall be verified by the architect, electrical engineer or contractor, in accordance with local or national codes.
5.

Convenience outlets are not illustrated. Their number and location are to be specified by others. Locate at least one convenience outlet close to the system control, the power distritbution unit and one on each wall of the procedure room. Use hospital approved outlet or equivalent.
6.

General room illumination is not illustrated. Caution should be taken to avoid excessive heat from overhead spotlights. Damage can occur to ceiling mounting components and wiring if high wattage bulbs are used. Recommend low wattage bulbs no higher than 75 watts and use dimmer controls (except MR). Do not mount lights directly above areas where ceiling mounted accessories will be parked.
7.

Routing of cable ductwork, conduits, etc., must run direct as possible otherwise may result in the need for greater than standard cable lengths (refer to the interconnection diagram for maximum usable lengths point to point).
8.

Conduit turns to have large, sweeping bends with minimum radius in accordance with national and local electrical codes.
9.

A special grounding system is required in all procedure rooms by some national and local codes. It is recommended in areas where patients might be examined or treated under present, future, or emergency conditions. Consult the governing electrical code and confer with appropriate customer administrative personnel to determine the areas requiring this type of grounding system.
10.

The maximum point to point distances illustrated on this drawing must not be exceeded.
11.

Physical connection of primary power to GE equipment is to be made by customers electrical contractor with the supervision of a GE representative. The GE representative would be required to identify the physical connection location, and insure proper handling of GE equipment.
12.

GEHC conducts power audits to verify quality of power being delivered to the system. The customer's electrical contractor is required to be available to support this activity.

- All junction boxes, conduit, duct, duct dividers, switches, circuit breakers, cable tray, etc., are to be supplied and installed by customers electrical contractor.

•

Conduit and duct runs shall have sweep radius bends

•

Conduits and duct above ceiling or below finished floor must be installed as near to ceiling or floor as possible to reduce run length.

•

Ceiling mounted junction boxes illustrated on this plan must be installed flush with finished ceiling.

•

All ductwork must meet the following requirements:

1.

Ductwork shall be metal with dividers and have removable, accessible covers.

2.

Ductwork shall be certified/rated for electrical power purposes.

3.

Ductwork shall be electrically and mechanically bonded together in an approved manner.

4.

PVC as a substitute must be used in accordance with all local and national codes.

•

All openings in raceway and access flooring are to be cut out and finished off with grommet material by the customers contractor.

•

General contractor to insert pull cords for all cable run conduits between the equipment room and the operators control room.

•

10 foot pigtails at all junction points.

•

Grounding is critical to equipment function and patient safety. Site must conform to wiring specifications shown on this plan.

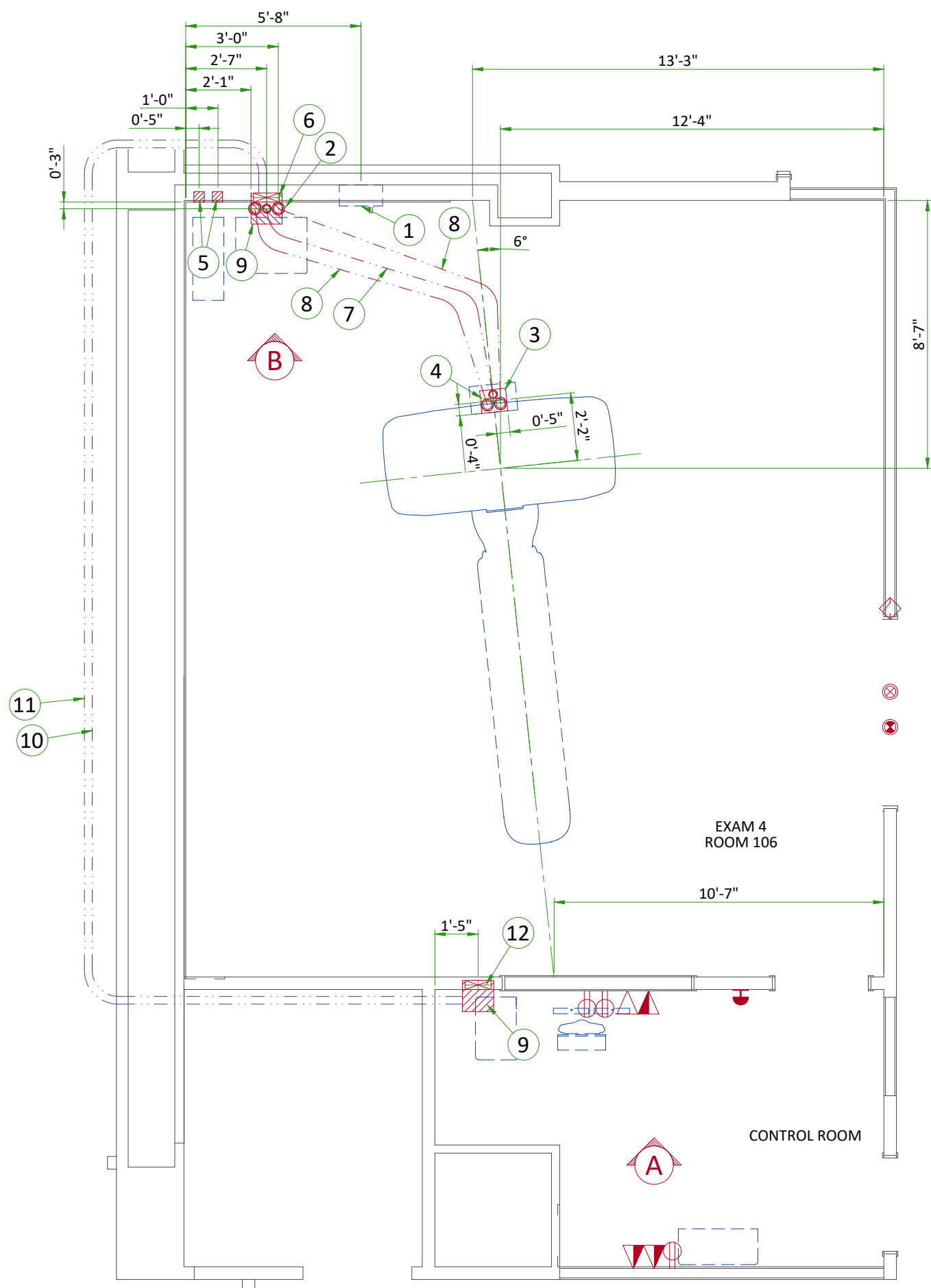
CONNECTIVITY REQUIREMENTS

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

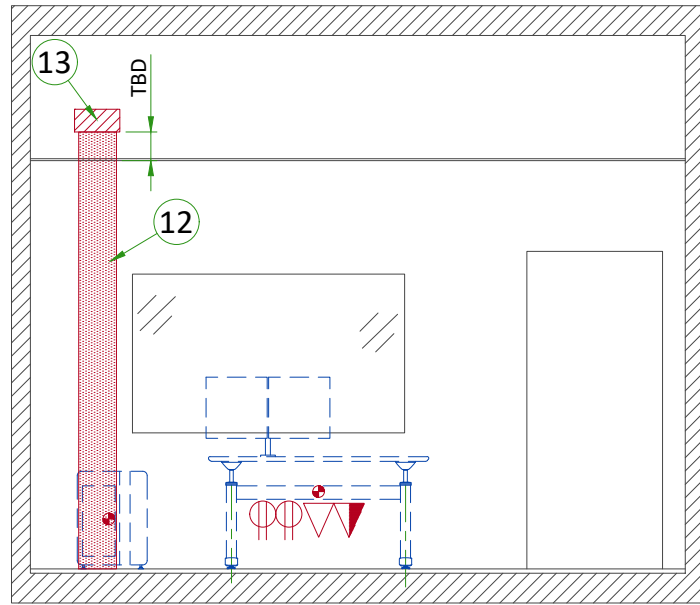
The requirements for these connectivity solutions are explained in the broadband solutions catalogue (separate document).



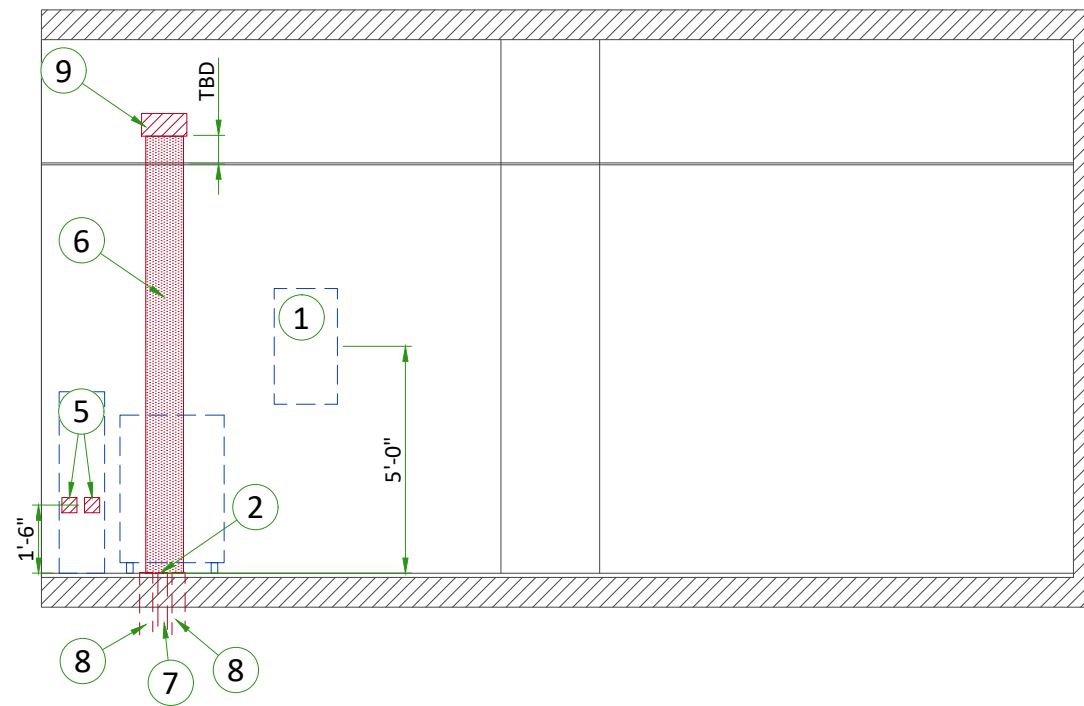
ITEM	DESCRIPTION
1	Main disconnect panel
2	Suitable bushings & lock nuts for PDU
3	Suitable bushings & lock nuts for Gantry
4	Area at gantry for conduit stub ups/terminations
5	4" x 4" x 4" box for partial UPS
6	10" x 3 1/2" flush wall duct in exam room
7	2 1/2" conduit below floor
8	3 1/2" conduit below floor
9	Box above ceiling in exam room, size as required
10	3 1/2" conduit above ceiling
11	2 1/2" conduit above ceiling
12	10" x 3 1/2" flush wall duct in control room
13	Box above ceiling in control, size as required

ITEM	QTY	Outlet Legend for GE Equipment
		System emergency off (SEO), (recommended height 1.2m [48"] above floor)
		X-Ray room warning light control panel
		X-Ray ON lamp (L1) - 24V
		Door interlock switch (needed only if required by state/local codes)
		Duplex hospital grade, dedicated wall outlet 120-v, single phase power
		Network outlet

Additional Conduit Runs (Contractor Supplied and Installed)						
From (Bubble # / Item)		To (Bubble # / Item)		Qty	Size	
					In.	mm
	3 Phase Power	1	Main Disconnect	1	As req'd	As req'd
1	Main Disconnect		Emergency Off	1	1/2	13
		9	Power Distribution Unit	1	As req'd	As req'd
9	Power Distribution Unit		Door Switch	1	1/2	13
		Warning Light Control		1	1/2	13
Warning Light			1	1/2	13	
1 Phase Power			1	1/2	13	
1	Main Disconnect Panel	5	UPS	1	1 1/4	30
6	Power Distribution Unit			1	2	50



A



B

POWER REQUIREMENTS

POWER SUPPLY	3 PHASES+G 380/400/420/440/460/480 V ± 10%
FREQUENCIES	50/60 Hz ± 3 Hz
MAXIMUM POWER DEMAND	150 kVA
AVERAGE (CONTINUOUS) POWER DEMAND	11 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, 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.
- 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).

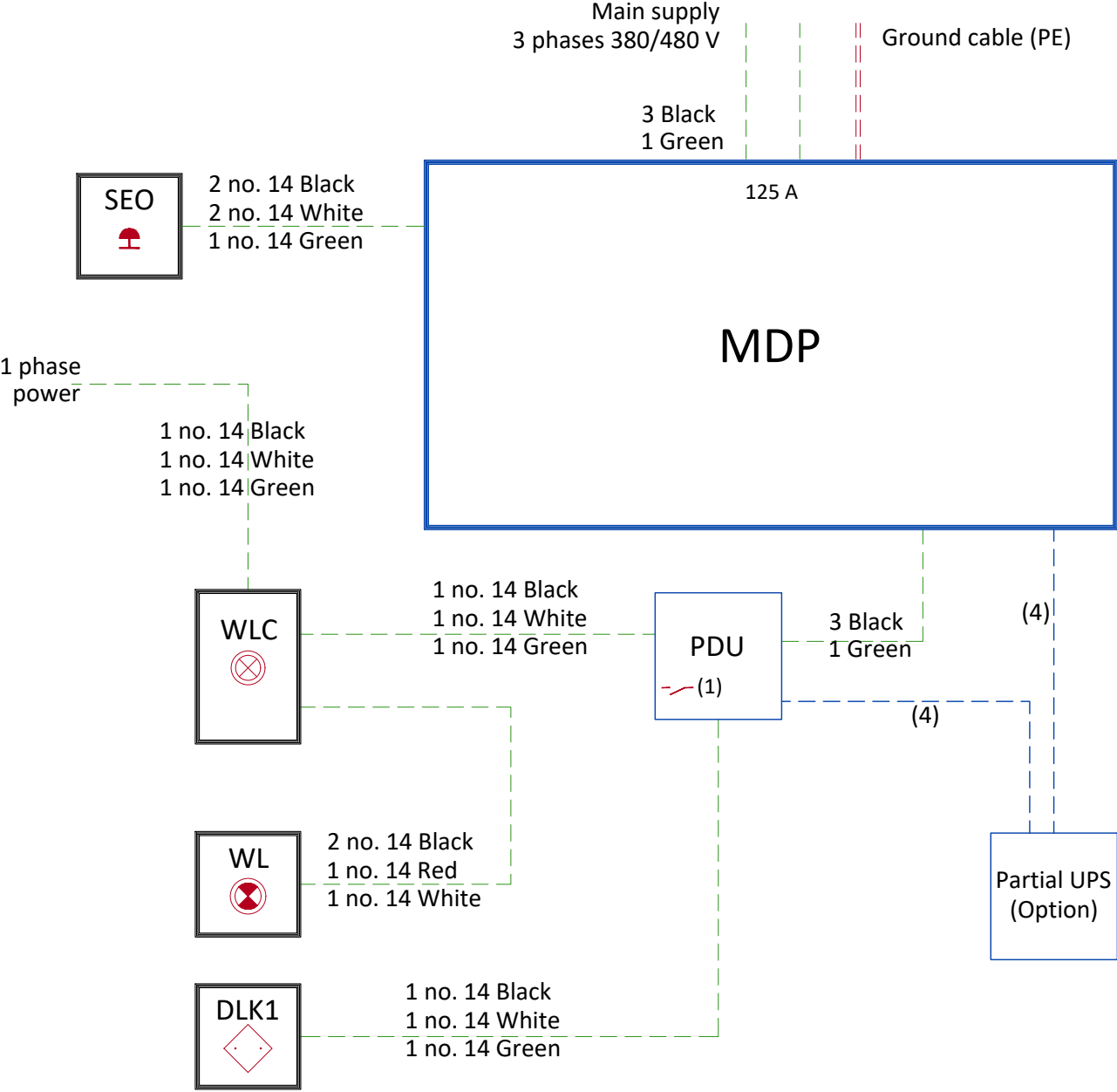
CABLEWAYS

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).
- Protecting cables against temperature shocks.
- Replacing cables (cableways should be large enough for cables to be replaced).
- Metal cableways should be grounded.

FEEDER TABLE								
MIN. FEEDER WIRE SIZE, AWG OR MCM (sq. mm)/VAC	MINIMUM FEEDER WIRE LENGTH - ft (m)							
	50 (15)	100 (30)	150 (46)	200 (61)	250 (76)	300 (91)	350 (107)	400 (122)
480 VAC	1 (45)	1 (45)	1 (45)	1 (45)	1 (45)	1/0 (55)	1/0 (55)	2/0 (70)
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 225KVa, with 2.4% rated regulation at unity power factor. Resultant maximum allowable feeder regulation is 3.4%								
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								

POWER DISTRIBUTION



- MDP Main Disconnect Panel
PDU Power distribution unit
SEO Emergency OFF button (Control Room), located 1.50m (4.9') above floor
WLC Warning Light Control
WL Warning Light
DLK1 Door Interlock Switch (needed only if required by state/local codes)

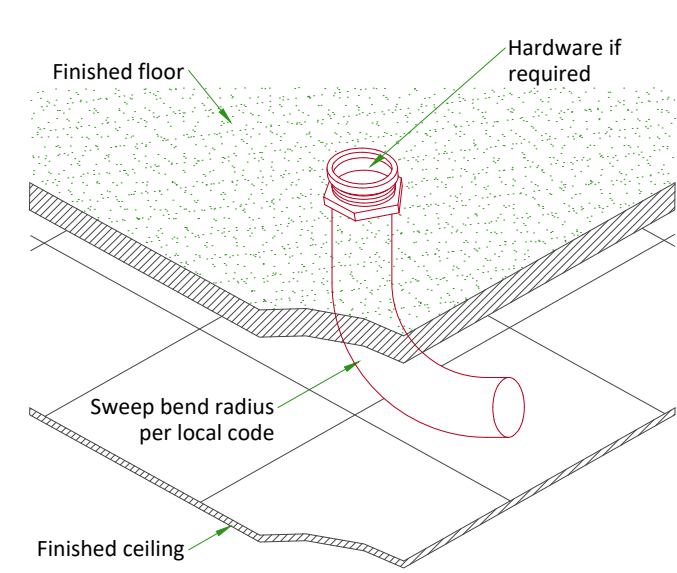
Notes :

- Two dry contacts: "System ON" and "X-Ray ON", both released by PDU. Max. voltage = 30 V
- If length < 10 m (32.8')
Cable with 2m (6.6') extra length on the floor behind the back of PDU
- Cable with 2m (6.6') extra length on the floor behind the back of PDU
- Cable delivered with partial UPS installed by GE (Option)

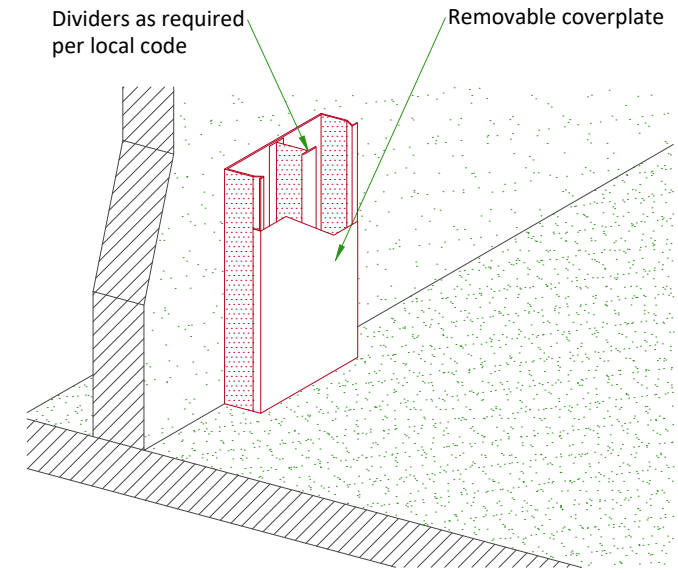
--- Cable SUPPLIED BY CUSTOMER
- - - Cable SUPPLIED BY GE
Equipment SUPPLIED BY CUSTOMER
Equipment SUPPLIED BY GE

TYPICAL CABLE MANAGEMENT

CONDUIT BELOW FLOOR

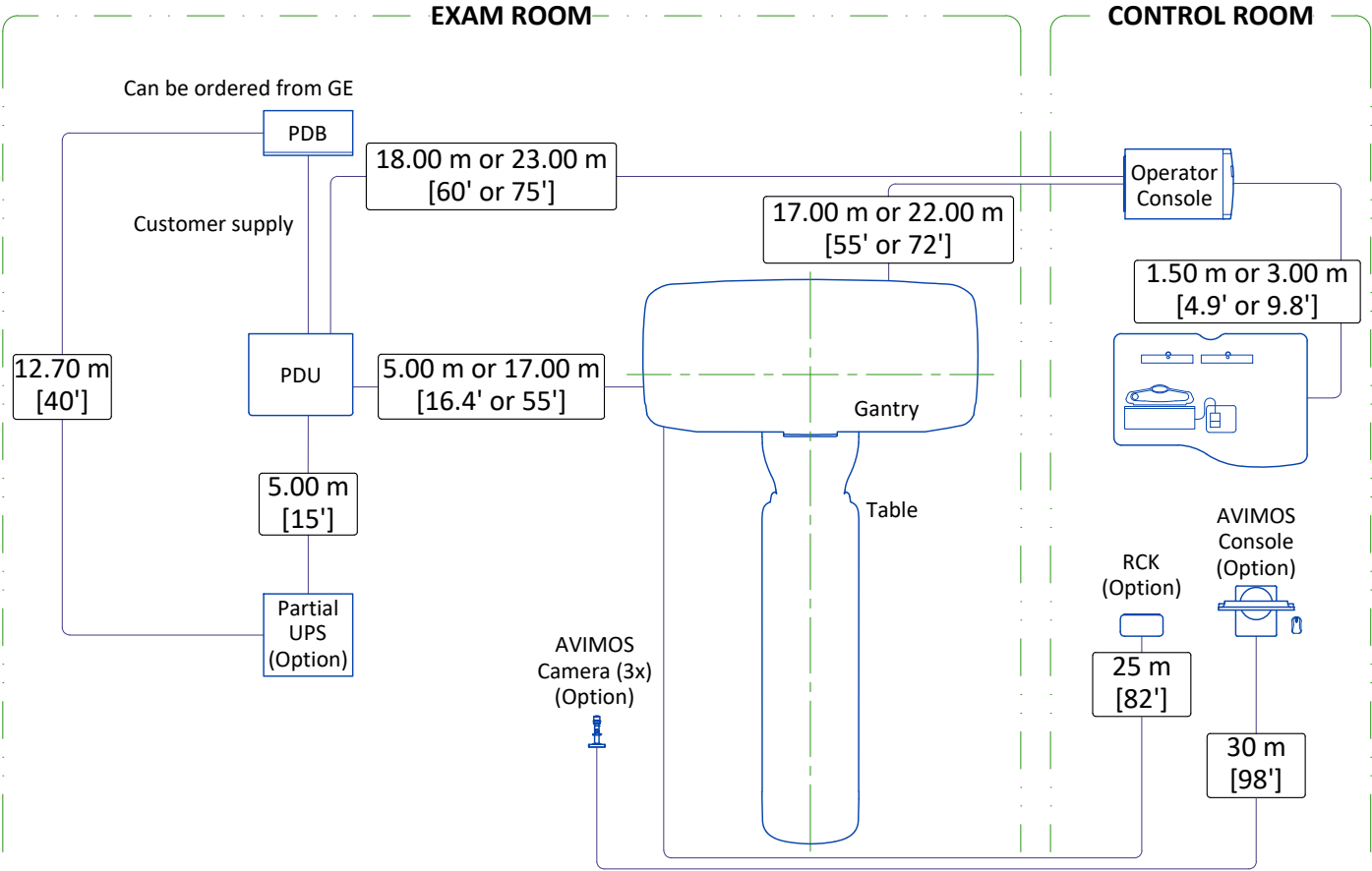


VERTICAL DUCT ON WALL



NOT TO SCALE

INTERCONNECTIONS



PeopleSoft Project # or Job Name:

Infection Control Risk Assessment (ICRA)

Work Permit

20190416



Facility or Location

Project Start Date:

Contractor Project Manager:

Estimated Completion Date:

Contractor Performing Work:

Need to Relocate Patients?

☐ Yes ☐ No

Affected Department Supervisor Signature:

Name:

Date:

Environmental Service Supervisor Signature:

Name:

Date:

Intermnt Hlthcare Project Manager Signature:

Name:

Date:

Construction Activity Class (Determine Class by using the Classification Table on pages 2 & 3):

Higher levels must include all lower levels. Example: a level III must also check I and II.

☐ Class I ☐ Class II ☐ Class III ☐ Class IV

Specific Areas to be Affected by This Work:

Initials:

Date:

Exceptions or Additions to This Permit:

Initials:

Date:

Signature of Permit Requested by:

Name:

Date:

Infection Prevention Approval Signature:

Name:

Date:

PeopleSoft Project # or Job Name:

Construction Activity Class Worksheet

Complete Steps 1 through 3, then see Step 4.

STEP 1. Determine Construction Activity Type:

<input type="checkbox"/> Type A:	Inspection and non-invasive activities Includes, but not limited to: <ul style="list-style-type: none">- window replacement.- ceiling tile replacement limited to 1 tile per 50 sf.- painting or wall covering, without sanding- finish electrical and minor plumbing work
<input type="checkbox"/> Type B:	Small scale, short duration activities that create minimal dust and disruption to patient population via noise, vibration, odors or ventilation systems Includes, but not limited to: <ul style="list-style-type: none">- installing telephone or computer cabling or access to chase or mechanical spaces- patch or replace vinyl and/or carpet floors- cutting walls or ceilings where dust migration can be controlled
<input type="checkbox"/> Type C:	Generates moderate or high levels of dust. Demolition or removal of ANY fixed building components or assemblies. Disruption to patients with noise, vibration, HVAC systems etc. Includes, but not limited to: <ul style="list-style-type: none">- sanding walls to remove paint or wall coverings- removal of floor coverings, ceiling tiles or casework- new wall construction, major cabling activities, or adding new floor
<input type="checkbox"/> Type D:	Major demolition or construction that creates major disruption, i.e. noise, dust, vibration, odor, or mechanical systems Includes, but not limited to: <ul style="list-style-type: none">- new construction or buildout of shelled space- heavy demolition. Removal of a complete cabling system, floor, wall or ceiling

STEP 2. Determine Infection Control Risk Group:

<input type="checkbox"/> Lowest	<input type="checkbox"/> Medium	<input type="checkbox"/> High	<input type="checkbox"/> Highest
<ul style="list-style-type: none">- Office areas- Admitting- Meeting rooms- Education centers- Copy centers- Fitness centers- Gift shops- Mail rooms- Plant engineering- EVS- Non-patient areas- Low risk areas not listed elsewhere	<ul style="list-style-type: none">- Cardiology- Resp. Therapy- Echocardiography- Radiology/MRI- Endoscopy- Physical therapy- Nuclear medicine- Wound Clinics- Outpatient Clinics- Laundry- Cafeteria/Foods- PT/OT/Speech- Materials Mgmt.	<ul style="list-style-type: none">- Acute Care Floors- Surgical Units- Emergency Dept.- Post Anesthesia CU- L&D- Pharmacy- Lab and specimens- Pediatrics- Medical Units- Outpatient Surg.- Newborn Nursery- Infusion Clinic- Dialysis	<ul style="list-style-type: none">- Burn Unit- Oncology or any immunocomp pts.- Catheter Labs- Cent Sterile Supply- Intensive Care Unit- Pos. Pressure Rm.- Angiography Rm.- Pharm compound areas- Level 3 Lab area- Micro Lab- Invasive proceed- OR & C-Section Rm

PeopleSoft Project # or Job Name:

STEP 3. Use the classifications from STEP 1 and 2 to determine the Construction Class below:

Higher classes include lower classes as well. Example, III includes I, II, & III.

Construction Activity Type*

Patient Risk	Type A	Type B	Type C	Type D
Lowest	Class I	Class I	Class I	Class III
Medium	Class II	Class II	Class III	Class IV
High	Class II	Class III	Class IV	Class IV
Highest	Class III	Class III	Class IV	Class IV

*Infection Control Approval is needed for all projects

4. Follow all the appropriate Infection Control Protocols below: (Hand hygiene stations must be available)

During Construction

Upon Completion

<input type="checkbox"/> Class I	<ul style="list-style-type: none"> - Perform work using methods to minimize raising dust or tracking dust into other areas. - Immediately replace ceiling tile upon completion of inspection. 	<ul style="list-style-type: none"> - Clean work area.
<input type="checkbox"/> Class II	<ul style="list-style-type: none"> - All measures for Class I work. - Use active dust control measures. - Use water mist to control dust while cutting. - Seal doors, ducts, vents and HVAC units. - Place dust control mats at entries to work area; keep them clean and effective. - Remove debris only in tightly covered containers. 	<ul style="list-style-type: none"> - All measures for Class I work. - Wipe all horizontal surfaces with disinfectant. - Remove debris only in tightly covered containers. - Vacuum using HEPA filtered vacuum; mop with disinfectant as appropriate. - Remove all seals from doors, ducts, vents and HVAC units.
<input type="checkbox"/> Class III	<ul style="list-style-type: none"> - All measures for Class II work. - Construct barriers to prevent dust and other contaminant migration prior to beginning work. - Maintain negative air pressure in work space using HEPA filtration units. 	<ul style="list-style-type: none"> - All measures for Class II work. - Remove construction barriers only after all needed inspections are complete and passed. - Remove construction barriers in a manner that minimizes the spread of dust and debris. - Use HEPA Filter vacuum on clothes.
<input type="checkbox"/> Class IV	<ul style="list-style-type: none"> - All measures for Class III work. - Seal all pipes, conduits and penetrations. 	<ul style="list-style-type: none"> - All measures for Class III work.

- ☐ **Non-construction visitors wear shoe covers when VISITING construction area**
- ☐ **Construction workers wear shoe covers when Leaving the construction area**
- ☐ **Provide Neg Pressure Air Monitoring Log During Construction**
- ☐ **Construct anteroom outside area of construction**
- ☐ **Workers to wear clean paper overalls and shoe covers when entering/exiting site**

PeopleSoft Project # or Job Name:	
Additional Requirements For This Area:	
Initials:	Date:

Other Considerations for Work Impact

1. Identify the risk levels of areas that are adjacent to the project:																							
Above				Below				Lateral				Lateral				Front				Other			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lowest	Medium	High	Highest	Lowest	Medium	High	Highest	Lowest	Medium	High	Highest	Lowest	Medium	High	Highest	Lowest	Medium	High	Highest	Lowest	Medium	High	Highest
2. Identify likely outages and their effects: plumbing, medical gas, ventilation, electrical, etc.:																							
3. Describe specific containment measures to be used:																							
4. Describe specific risks associated with water damage:																							
5. Describe noise and vibrations that will impact patient care areas and how you will mitigate that:																							
6. Identify the project work hours - avoiding patient care impact when possible:																							

- | | | | |
|--|------------------------------|-----------------------------|------------------------------|
| 7. Do plans allow for sufficient isolation/negative airflow rooms? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 8. Do plans allow for sufficient hand washing sinks per AIA guidelines? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 9. Do plans allow for sufficient access to clean and soiled utility rooms? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A |

PeopleSoft Project # or Job Name:

10. Describe the Project Communication Plan for traffic patterns, EVS, etc.:

11. Describe the Project Monitoring Plan for infection control, safety, etc.:

12. Contractor Acknowledgment and Compliance with ICRA Work Permit

Contractor Signature indicates compliance with the parameters associated with this ICRA Work Permit

Contractor Signature

Name:

Date:

13. Project Closeout (See last page for on-going review form)

Signature for project closure, final review and approval for using the area:

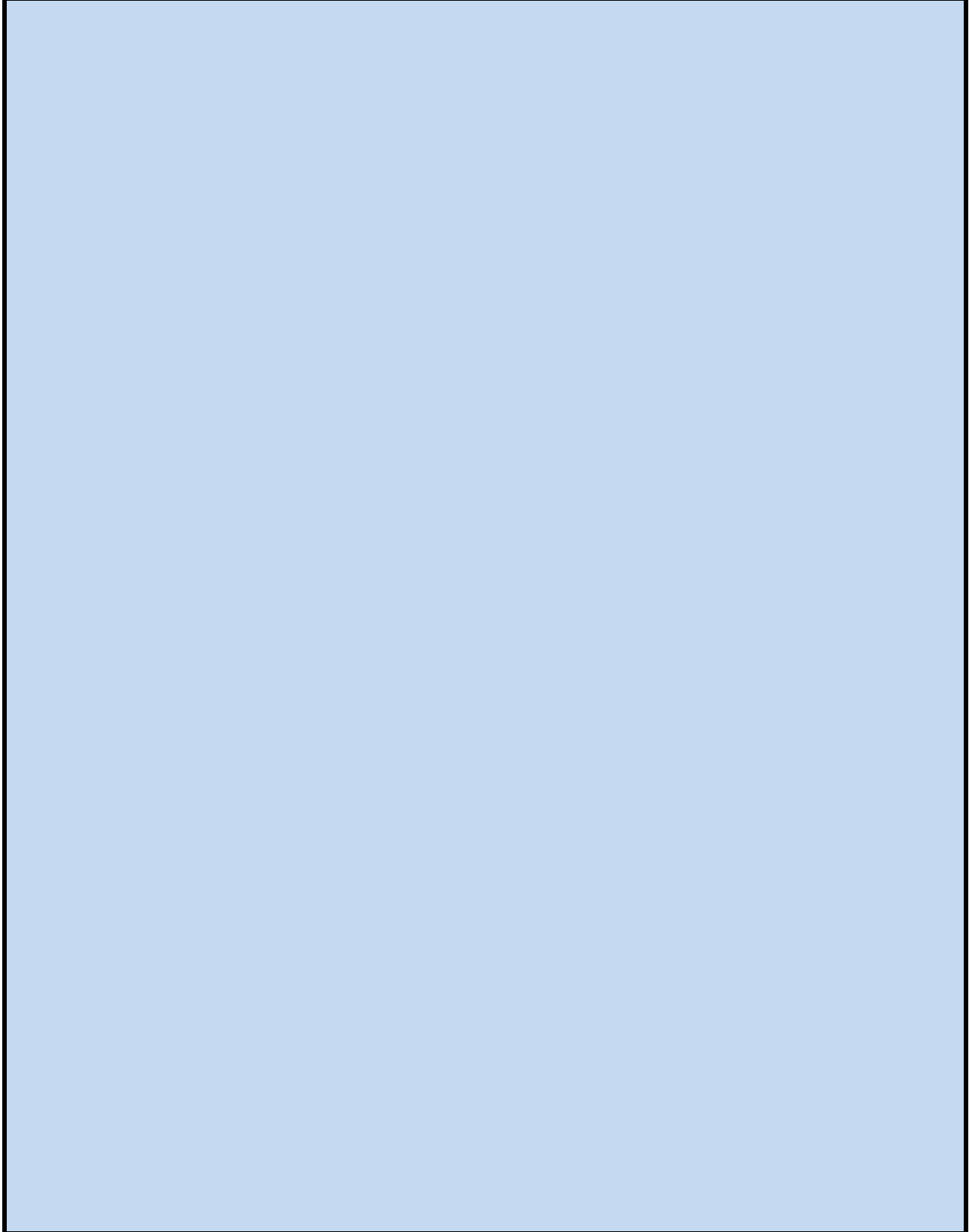
(Facility Maintenance for Class I & II, Infection Prevention for Class III & IV)

Name:

Date:

PeopleSoft Project # or Job Name:	
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File Upload - A PDF image or PDF form can be uploaded. Only the most recent upload will show.

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Intermountain Medical Center
ED CT Remodel
Murray, Utah

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Intermountain Medical Center
ED CT Remodel
Murray, Utah

SECTION 00 4000

BID FORM

TO: **IHC Health Services, Inc.** (Intermountain Healthcare)
Facility Planning and Development (FP&D)
36 South State Street, 16th Floor
Salt Lake City, Utah 84111-1486

Attention: Stephanie Joyner
Email: Stephanie.Joyner@imail.org

PROJECT: Intermountain Medical Center ED CT Remodel

NAME OF BIDDER: _____

DATE: _____

The undersigned, in compliance with your Invitation To Bid, having examined the Drawings and Specifications (Contract Documents) and related documents and the site of the proposed work and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of labor, hereby propose to furnish all labor, materials, services, equipment and appliances required in connection with or incidental to the construction of the above named project in strict conformance with the following specification and drawings:

Instructions to Bidders, General Conditions, Supplemental General Conditions, Specification Divisions as shown and all applicable addenda and Drawings as listed on the drawing cover sheets as prepared by HKS Architects, Inc.

I/We certify, by signing this BID FORM, that I/We have a working relationship with the proposed subcontractors and that Bids we're not solicited from; and/or the received Contract Documents were not listed in any Plan Rooms for distribution to subcontractors broadly.

BASE BID – for the Intermountain Medical Center ED CT Remodel:

For Work of the contract listed above and shown on the Drawings and described in the Project Manual, I/We agree to perform for the sum of:

_____ Dollars (\$_____)
(In the case of discrepancy, written amount shall govern)

(In the case of discrepancy, written amount shall govern)
Required additional calendar days: _____

CONTRACTOR'S PROPOSED CONSTRUCTION TIME PERIOD:

This Bid requires a construction time in **calendar days** from the date of authorization of _____ calendar days. The anticipated date of Substantial Completion is thus _____, 2021.

ADDENDA:

I/We acknowledge receipt of the following addenda for the above noted project: ____/____/____/____/____

SCHEDULE OF VALUES:

I/We have attached with this Bid Form our Schedule of Values (Section 00 4373) which reflects the above Base Bid. We submit this for Owner review of subcontractors that are being proposed for this Project.

TYPE OF ORGANIZATION:

(Corporation, Partnership, Individual, etc.) _____

SEAL (If a Corporation)

Respectfully Submitted,

Name of Bidder

Authorized Signature

Intermountain Medical Center
ED CT Remodel
Murray, Utah

SECTION 00 4373

SCHEDULE OF VALUES

NAME OF BIDDER: _____

DATE: _____

DIV	TITLE	AMOUNT	\$/SQ. FT	COMMENTS
01	General Conditions	\$ _____	\$ _____	
02	Demolition	\$ _____	\$ _____	
02	Saw cut slab	\$ _____	\$ _____	
03	Concrete	\$ _____	\$ _____	
04	Masonry	\$ _____	\$ _____	
05	Steel	\$ _____	\$ _____	
06	Woods and Plastics	\$ _____	\$ _____	
07	Thermal and Moisture Protection	\$ _____	\$ _____	
08	Openings	\$ _____	\$ _____	
09	Finishes	\$ _____	\$ _____	
10	Specialties	\$ _____	\$ _____	
12	Furnishings	\$ _____	\$ _____	
21	Fire Suppression	\$ _____	\$ _____	
22	Plumbing	\$ _____	\$ _____	
23	HVAC	\$ _____	\$ _____	
26	Electrical	\$ _____	\$ _____	
31	Earthwork	\$ _____	\$ _____	
32	Landscape	\$ _____	\$ _____	
33	Utilities	\$ _____	\$ _____	

	SUBTOTAL	\$ _____	\$ _____	
	OVERHEAD AND PROFIT	\$ _____	\$ _____	
	TOTAL COST	\$ _____	\$ _____	

END OF SECTION

Intermountain Medical Center
ED CT Remodel
Murray, Utah

SECTION 00 5200

OWNER/CONTRACTOR AGREEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Intermountain Healthcare's '**CONTRACTOR AGREEMENT**' (**Stipulated Sum**) for Construction between the Owner and General Contractor' where the basis of payment is a STIPULATED SUM, will *presumably* be used on this project. An electronic copy may be obtained from Intermountain Healthcare's Project Manager.

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Intermountain Medical Center
ED CT Remodel
Murray, Utah

SECTION 00 6000

BONDS, CERTIFICATES AND OWNER DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The following documents are incorporated by reference; copies may be obtained from Intermountain Healthcare or the Architect for the cost of reproduction, if necessary. Electronic copies of the Intermountain Healthcare Documents can be obtained by contacting the Intermountain Healthcare Project Manager.
1. Intermountain Healthcare Document – **'Application and Certificate for Payment'**
 2. Intermountain Healthcare Document – **'Application and Certificate for Payment – Continuation Sheet'**
 3. Intermountain Healthcare Document – **'Change Order' (CO)**
 4. Intermountain Healthcare Document – **'Proposed Change Order' (PCO)**
 5. Intermountain Healthcare Document – **'A/E Supplement Instructions' (ASI)**
 6. Intermountain Healthcare Document – **'Proposal Request' (PR)**
 7. Intermountain Healthcare Document – **'Construction Change Directive' (CCD)**
 8. Intermountain Healthcare Document – **'Request For Information' (RFI)**
 9. AIA Document G704 – **'Certificate of Substantial Completion'**

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Intermountain Medical Center
ED CT Remodel
Murray, Utah

SECTION 00 6276.13

EXEMPTION CERTIFICATE

PART 1 - GENERAL

1.1 SUMMARY

- A. Construction materials purchased by or on behalf of **Intermountain Healthcare** *may be* exempt from Utah sales and use taxes. Tax Exempt **Form TC-721** must be used by vendors when purchasing construction materials for **Intermountain Healthcare** projects. A copy of Form TC-721, with the Owner's pertinent tax information, follows this cover page.

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	Utah State Tax Commission • 210 N 1950 W • Salt Lake City, UT 84137 Exemption Certificate (Sales, Use, Tourism and Motor Vehicle Rental Tax)	TC-721 Rev. 5/17
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Name of business or institution claiming exemption (purchaser)		Telephone number	
Street address	City	State	ZIP Code
Authorized signature	Name (please print)	Title	
Name of Seller or Supplier:		Date	
Sales Tax License Number:		<i>Required for all exemptions marked with an asterisk (*)</i>	

The signer of this certificate **MUST** check the box showing the basis for which the exemption is being claimed.

DO NOT SEND THIS CERTIFICATE TO THE TAX COMMISSION
 Keep it with your records in case of an audit.

For purchases by government, Native American tribes and public schools, use form TC-721G.

☐ **Resale or Re-lease**

I certify I am a dealer in tangible personal property or services that are for resale or re-lease. If I use or consume any tangible personal property or services I purchase tax free for resale, or if my sales are of food, beverages, dairy products and similar confections dispensed from vending machines (see Rule R865-19S-74), I will report and pay sales tax directly to the Tax Commission on my next sales and use tax return.

☐ **Religious or Charitable Institution**

I certify the tangible personal property or services purchased will be used or consumed for essential religious or charitable purposes. **This exemption can only be used on purchases totaling \$1,000 or more, unless the sale is pursuant to a contract between the seller and purchaser.**

☐ **Construction Materials Purchased for Religious and Charitable Organizations**

I certify the construction materials are purchased on behalf of a religious or charitable organization and that they will be installed or converted into real property owned by the religious or charitable organization.
 Name of religious or charitable organization: _____

Name of project: _____

☐ **Machinery and Equipment and Normal Operating Repair or Replacement Parts Used in a Manufacturing Facility, Mining Activity or Web Search Portal or Electronic Payment Service**

I certify the machinery and equipment and normal operating repair or replacement parts have an economic life of three years or more and are for use in a Utah manufacturing facility described in SIC Codes 2000-3999; in a qualifying scrap recycling operation; in a co-generation facility placed in service on or after May 1, 2006; in the operation of a Web search portal by a new or expanding business described in NAICS Code 518112 between July 1, 2010 and June 30, 2014; in the operation of an electronic financial payment service described in NAICS Code 522320; or in a business described in NAICS 212, Mining (except Oil and Gas), or NAICS 213113, Support Activities for Coal Mining, NAICS 213114, Support Activities for Metal Mining, or NAICS 213115, Support Activities for Nonmetallic Minerals (except Fuels) Mining. For a definition of exempt mining equipment, see Utah Code §59-12-104(14).

☐ **Fuels, Gas, Electricity**

I certify all natural gas, electricity, coal, coke, and other fuel purchased will be used for industrial use only and not for residential or commercial purposes.

☐ **Auto, Industrial Gas, or Drilling Equipment Manufacturer**

I certify the machinery, equipment, normal operating or replacement parts are used or consumed in a manufacturing process as described in NAICS 336111 (Automotive Manufacturing), or 325120 (Industrial Gas Manufacturing) to manufacture hydrogen of the 2002 North American Industry Classifications Systems, or by a drilling equipment manufacturer as defined in Utah Code §59-12-102.

☐ **Pollution Control Facility**

I certify our company has been granted a "Certification of Pollution Control Facilities" as provided for by Utah Code §§19-12-101 - 19-12-305 by either the Air Quality Board or the Water Quality Board. I further certify each item of tangible personal property purchased under this exemption is qualifying.

☐ **Steel Mill**

I certify the rolls, rollers, refractory brick, electric motors or other replacement parts will be used in the furnaces, mills or ovens of a steel mill as described in Standard Industrial Classification (SIC) 3312.

☐ **Municipal Energy**

I certify the natural gas or electricity purchased: is for resale; is prohibited from taxation by federal law, the U.S. Constitution, or the Utah Constitution; is for use in compounding or producing taxable energy; is subject to tax under the Motor and Special Fuel Tax Act; is used for a purpose other than as a fuel; is used by an entity exempted by municipal ordinance; or is for use outside a municipality imposing a municipal energy sales and use tax. The normal sales tax exemptions under Utah Code §59-12-104 do not apply to the Municipal Energy Sales and Use Tax.

☐ **Short-term Lodging Consumables**

I certify the tangible personal property is consumable items purchased by a lodging provider as described in Utah Code §59-12-103(1)(i).

☐ **Direct Mail**

I certify I will report and pay the sales tax for direct mail purchases on my next Utah *Sales and Use Tax Return*.

☐ **Commercial Airlines**

I certify the food and beverages purchased are by a commercial airline for in-flight consumption; or, any parts or equipment purchased are for use in aircraft operated by common carriers in interstate or foreign commerce.

☐ **Commercials, Films, Audio and Video Tapes**

I certify that purchases of commercials, films, prerecorded video tapes, prerecorded audio program tapes or records are for sale or distribution to motion picture exhibitors, or commercial television or radio broadcasters. If I subsequently resell items to any other customer, or use or consume any of these items, I will report any tax liability directly to the Tax Commission.

☐ **Alternative Energy**

I certify the tangible personal property meets the requirements of Utah Code §59-12-104 and is leased or purchased by or for an alternative energy electricity production facility, a waste energy production facility, or a facility that produces fuel from alternative energy.

☐ **Locomotive Fuel**

I certify this fuel will be used by a railroad in a locomotive engine.

☐ **Research and Development of Alternative Energy Technology**

I certify the tangible personal property purchased will be used in research and development of alternative energy technology.

☐ **Life Science Research and Development Facility**

I certify that: (1) the machinery, equipment and normal operating repair or replacement parts purchased have an economic life of three or more years for use in performing qualified research in Utah; or (2) construction materials purchased are for use in the construction of a new or expanding life science research and development facility in Utah.

☐ **Mailing Lists**

I certify the printed mailing lists or electronic databases are used to send printed material that is delivered by U.S. mail or other delivery service to a mass audience where the cost of the printed material is not billed directly to the recipients.

☐ **Semiconductor Fabricating, Processing or Research and Development Material**

I certify the fabricating, processing, or research and development materials purchased are for use in research or development, manufacturing, or fabricating of semiconductors.

☐ **Aircraft Maintenance, Repair and Overhaul Provider**

I certify these sales are to or by an aircraft maintenance, repair and overhaul provider for the use in the maintenance, repair, overhaul or refurbishment in Utah of a fixed-wing, turbine-powered aircraft that is registered or licensed in a state or country outside Utah.

☐ **Ski Resort**

I certify the snow-making equipment, ski slope grooming equipment or passenger rope-ways purchased are to be paid directly with funds from the ski resort noted on the front of this form.

☐ **Machinery or Equipment Used by Payers of Admissions or User Fees**

I certify that: (1) the machinery or equipment has an economic life of three or more years and will be used by payers of admissions or user fees (Utah Code §59-12-103(1)(f)); (2) the buyer is in the amusement, gambling or recreation industry (NAICS Subsector 713); and (3) at least 51 percent of the buyer's sales revenue for the previous calendar quarter came from admissions or user fees.

☐ **Film, Television, Radio**

I certify that purchases, leases or rentals of machinery or equipment will be used by a motion picture or video production company for the production of media for commercial distribution.

☐ **Telecommunications Equipment, Machinery or Software**

I certify these purchases or leases of equipment, machinery, or software, by or on behalf of a telephone service provider, have a useful economic life of one or more years and will be used to enable or facilitate telecommunications; to provide 911 service; to maintain or repair telecommunications equipment; to switch or route telecommunications service; or for sending, receiving, or transporting telecommunications service.

☐ **Leasebacks**

I certify the tangible personal property leased satisfies the following conditions: (1) the property is part of a sale-leaseback transaction; (2) sales or use tax was paid on the initial purchase of the property; and, (3) the leased property will be capitalized and the lease payments will be accounted for as payments made under a financing arrangement.

☐ **Prosthetic Devices**

I certify the prosthetic device(s) is prescribed by a licensed physician for human use to replace a missing body part, to prevent or correct a physical deformity, or support a weak body part. This is also exempt if purchased by a hospital or medical facility. (Sales of corrective eyeglasses and contact lenses are taxable.)

☐ **Out-of-State Construction Materials**

I certify this tangible personal property will be shipped out of state and will become part of real property located in a state that does not have a sales tax or allow credit for tax paid to Utah.

☐ **Construction Materials Purchased for Airports**

I certify the construction materials are purchased by, on behalf of, or for the benefit of Salt Lake International Airport, or a new airport owned or operated by a city in Davis, Utah, Washington or Weber County. I further certify the construction materials will be installed or converted into real property owned by and located at the airport.

☐ **Agricultural Producer**

I certify the items purchased will be used primarily and directly in a commercial farming operation and qualify for the Utah sales and use tax exemption. **This exemption does not apply to vehicles required to be registered.**

☐ **Tourism/Motor Vehicle Rental**

I certify the motor vehicle being leased or rented will be temporarily used to replace a motor vehicle that is being repaired pursuant to a repair or an insurance agreement; the lease will exceed 30 days; the motor vehicle being leased or rented is registered for a gross laden weight of 12,001 pounds or more; or, the motor vehicle is being rented or leased as a personal household goods moving van. This exemption applies only to the tourism tax (up to 7 percent) and the short-term motor vehicle rental tax (Transportation Corridor Funding – 2.5 percent) – not to the state, local, transit, zoo, hospital, highways, county option or resort sales tax.

☐ **Textbooks for Higher Education**

I certify that textbooks purchased are required for a higher education course, for which I am enrolled at an institution of higher education, and qualify for this exemption. An institution of higher education means: the University of Utah, Utah State University, Utah State University Eastern, Weber State University, Southern Utah University, Snow College, Dixie State University, Utah Valley University, Salt Lake Community College, or the Utah System of Technical Colleges.

* **Purchaser must provide sales tax license number in the header on page 1.**

NOTE TO PURCHASER: You must notify the seller of cancellation, modification, or limitation of the exemption you have claimed.

Questions? Email taxmaster@utah.gov, or call 801-297-2200 or 1-800-662-4335.

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SECTION 00 7000

GENERAL CONDITIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. **INTERMOUNTAIN HEALTHCARE GENERAL CONDITIONS of the Contract for Construction** to be furnished, as requested. Where any part of the General Conditions is modified, the unaltered provisions shall remain in effect. An electronic copy may be obtained from Intermountain Healthcare's Project Manager.

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SECTION 011000

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work by Owner.
3. Purchase contracts.
4. Owner-furnished, Owner-Installed (OFOI) products.
5. Owner-furnished, Contractor-installed (OFCI) products.
6. Worker conduct and appearance - work rules.
7. Healthcare facility renovation work.
8. Access to site.
9. Coordination with occupants.
10. Work restrictions.
11. Specification and drawing conventions.
12. Miscellaneous provisions.

1.2 PROJECT INFORMATION

A. Project Identification: IMED ED CT Remodel

1. Project Location: Richfield, Utah.

B. Owner: INTERMOUNTAIN HEALTH SERVICES.

1. Owner's Representative: Walt Shumway

C. Architect: HKS ARCHITECTS, INC.

D. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. REFER TO DRAWINGS COVER SHEET FOR LIST

1.3 WORK BY OWNER

A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Concurrent Work: Owner will perform the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.

1. PROVIDING INTERIOR SIGNAGE.

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1.4 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.5 PURCHASE CONTRACTS

- A. General: Owner has negotiated purchase contracts with suppliers of material and equipment to be incorporated into the Work. Owner will assign these purchase contracts to Contractor. Include costs for purchasing, receiving, handling, storage if required, and installation of material and equipment in the Contract Sum, unless otherwise indicated.
1. Contractor's responsibilities are same as if Contractor had negotiated purchase contracts, including responsibility to renegotiate purchase and to execute final purchasing agreements.
- a. Paint
b. Flooring materials

1.6 OWNER-FURNISHED, OWNER-INSTALLED (OFOI) PRODUCT

- A. The specific product is not in this contract, and actual installation of the product will be made by the Owner.
- B. Products will be indicated as follows:
1. Product prefixed with "Space for"
2. N.I.C.
3. Owner Furnished - Owner Installed
4. Product noted as "Future"
- C. Roughing-in for Owner Furnished, Owner Installed Product is provided by applicable Sections governing the type of work. Obtain rough-in requirements from Owner.

1.7 OWNER-FURNISHED, CONTRACTOR-INSTALLED (OFCI) PRODUCT

- A. Install products indicated as follows:
1. "Owner Furnished, Contractor Installed".
2. "Reuse".
3. "Relocate".
- B. Provide labor, transportation, materials, tools, appliances and utilities necessary for the following:
1. Relocated Products:
- a. Removing installed product from the Owner's existing facility, as required.
b. Transportation of product from Owner's facility to the job site.
2. Receiving and storage of Owner furnished, Contractor installed product, as required.

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3. Providing materials and components for the product as necessary to install in an operating condition, but not including repairing of existing damages to the product.
4. Modification of product only as specified under the particular item.
5. Installation of product in this project, complete and in operating condition, including the adjusting and calibration of the product as necessary for proper operation.
6. Testing of product.
7. Paying of fees, licenses, and taxes in conjunction with the installation of the product.
8. Roughing-in and final utility connections for the Owner furnished, Contractor installed product remains the work of Sections governing the specific utility.

1.8 WORKER CONDUCT AND APPEARANCE - WORK RULES

- A. General: The conduct and appearance of each worker at the jobsite is of paramount importance. The Owner reserves the right to require any worker to be reassigned to work outside the Owner's property.
1. Privacy: Where applicable, conduct work of the Contract with the maximum effort to maintain the privacy of the Owner's operations, staff, and clientele. Do not permit workers to peer into other areas of the building visible from the work area. Invasion of privacy is a major infraction of the work rules.
 2. Conduct and Demeanor: Construction workers shall treat other construction workers, Owner's staff, clientele, and visitors (as applicable) professionally with respect and courtesy.
 3. Physical Appearance: Require each worker to dress appropriately in a clean, neat, and professional manner.
 4. Control the volume of communication radios and loudspeakers to avoid creating a nuisance.
 5. Tobacco Products: The use of tobacco products is prohibited.
 6. Language: The use of foul language is prohibited.
 7. Loud Conduct: Screaming, yelling, and unnecessary loud conduct is prohibited.
 8. Physical Actions: Running, horseplay, fighting, and other unprofessional conduct is prohibited. Fighting is a major infraction of the work rules.
 9. Stealing: Stealing of any material, objects, furnishings, equipment, fixtures, supplies, clothing, or other items is prohibited and a major infraction.
 10. Sexual Harassment: All forms of physical and verbal sexual harassment including, without limitation: touching; whistling; sexually explicit stories, jokes, drawings, photos, and representations; exhibitionism; and all other sexually oriented offensive behavior is prohibited.
 11. Parking: Construction personnel shall only park in designated areas reserved for construction parking.
 12. Penalties: First infraction of the work rules shall result in a verbal warning from the Owner. Second infractions shall result in being requested to leave the Owner's property. Owner's decision in such matters shall be final with no exceptions.
- B. Warnings and Dismissal: For minor infraction of the rules, the Owner may issue a warning. Only one warning will be allowed per worker, and a second infraction shall result in immediate dismissal of the worker from the Owner's property. For major infractions such as invasion of privacy, the worker shall be dismissed immediately without warning and possibly subject to criminal prosecution.
- C. Notification of Workers: Clearly notify and educate each worker about these Work Rules and the requirements for worker conduct and appearance.

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1.9 HEALTHCARE FACILITY RENOVATION WORK

- A. Interim Life Safety Measures (ILSM): The following Interim Life Safety Measures (ILSM) as established by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) shall be implemented, documented and enforced in and adjacent to all construction areas:
1. Ensure that exits provide free and unobstructed egress. Personnel shall receive training, and the Hospital shall be notified if alternative exits must be designated. Buildings/areas under construction must maintain escape facilities for construction workers at all times. Means of egress in construction areas must be inspected daily.
 2. Ensure free and unobstructed access to emergency department/service and for emergency forces.
 3. Ensure that fire alarm, detection, and suppression systems are not impaired. A temporary, but equivalent, system shall be provided, and the Hospital shall be notified, when any fire system is impaired. Temporary systems must be inspected and tested monthly.
 4. Ensure temporary construction partitions are smoke tight and built of non-combustible or limited combustible materials that will not contribute to the development or spread of fire.
 5. Prohibit smoking in or adjacent to all construction areas.
 6. Develop and enforce storage, housekeeping, and debris-removal practices that reduce the flammable and combustible fire load of the building to lowest level necessary for daily operations.
 7. Increase hazard surveillance of buildings, grounds, and equipment with special attention to excavations, construction areas, construction storage, and field offices.
 8. Train personnel, and notify the Hospital, when structural or compartmentation features of fire safety are compromised.
 9. Conduct organization wide safety education programs to assure awareness of deficiencies, construction hazards, and these ILSM.

1.10 ACCESS TO SITE

- A. General: Contractor shall have restricted use of Project site for construction operations during construction period. Contractor's use of Project site shall be limited to areas designated by the Owner for parking, etc.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Confine constructions operations to work in areas indicated on drawings.
 2. Allow for Owner occupancy of site and use by the public.
 3. Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times.
 4. Do not use drives and entrances for parking or storage of materials.
 5. Schedule deliveries to minimize use of driveways and entrances.
 6. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 7. Coordinate use of premises under direction of Owner.
 8. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on the site.
 9. Move any stored Products, under Contractor's control, which interfere with operations of the Owner or separate contractor.

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- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a clean condition throughout construction period. Repair damage caused by construction operations.

1.11 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing and/or adjacent building(s), as applicable, during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.12 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
- B. On-Site Work Hours: Hours shall be limited to normal business hours, unless authorized by the Owner.
- C. Existing Utility Interruptions: Refer to Division 01 Section "Execution" for requirements.

1.13 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
 - 3. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

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1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 COORDINATION

- A. Coordinate work of this Section with related work of other Sections to obtain proper installation of items. Become acquainted with the work of other Sections whose work abuts, adjoins or is in any way affected by or related to work under this Section.
- B. Carefully examine the drawings and directions and be responsible for proper installation of materials and product without substantial changes.
- C. Indication of pipe connection sizes on the plans shall in no way relieve Contractor of the responsibility of checking and verifying their sizes and locations from the actual product to be installed and any available roughing-in diagrams.

3.2 PRODUCT INSTALLATION - GENERAL

- A. Locations: The general arrangement of the Owner Furnished Product is indicated on the drawings.
- B. Roughing-in: When product is not available prior to the installation schedule, rough-in the utility service at walls or floors as directed, and leave ready for future connection.
- C. Installations: Install product and material in conformance with manufacturer's directions where available. Work shall be assembled and installed in harmony with other trades at such times and in such sequence as acceptable to the Owner.

3.3 PROTECTION TO PRODUCT AND MATERIALS

- A. Utilities: Close pipe openings with caps or plugs, and protect electrical work as necessary.
- B. Product: Tightly cover and protect product against dirt, water and mechanical or chemical injury.
- C. Damage to Owner's property due to fault or negligence of the Contractor shall be repaired or replaced at no additional expense to the Owner.

END OF SECTION

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 SUBMITTALS

- A. Substitution Requests: Submit electronic copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use scanned PDF electronic file of form provided at end of this section or annotated PDF electronic file of electronic form received from Architect matching form provided at end of this section.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

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- h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, with reasonable promptness, Architect will request additional information or documentation for evaluation. Architect will notify Contractor of acceptance or rejection of proposed substitution with reasonable promptness. Acceptance of proposed substitution does not constitute approval or inclusion in Contract Documents. Pay applications certification, change orders, and certificate of substantial completion will contain such qualification.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Prior to starting Substitution Process, review proposed recommendations with Architect.
- B. Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples for construction activities not complying with Contract Documents does not constitute acceptable or valid request for substitution, nor does it constitute approval.
- C. Contractor Representations: By making substitution request, Contractor:
 - 1. Recognizes burden of proof of equality for requested substitution rests with Contractor.
 - 2. Represents and warrants that Contractor has personally investigated requested substitution and determined that it is equal to or superior in all respects to specified Work.

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3. Represents and warrants that Contractor will provide same warranties for requested substitution that Contractor would for specified Work.
 4. Certifies that cost data presented is complete and includes all related costs under this Contract except for Architect's redesign cost, and waives all claims for additional costs related to requested substitution which may subsequently become apparent.
 5. Will coordinate installation of accepted substitution, making such other changes as may be required to make Work complete in all respects.
 6. Represents and warrants that accepted substitution will perform same as specified Work would have performed. Should accepted substitution fail to perform as required, Contractor shall replace accepted substitution with specified Work at no additional cost to Owner.
- D. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution provides sustainable design characteristics that specified product provided.
 - c. Substitution request is fully documented and properly submitted.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
- E. Substitutions for Convenience:
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution provides sustainable design characteristics that specified product provided.
 - e. Substitution request is fully documented and properly submitted.
 - f. Requested substitution will not adversely affect Contractor's construction schedule.

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- g. Requested substitution has received necessary approvals of authorities having jurisdiction.
- h. Requested substitution is compatible with other portions of the Work.
- i. Requested substitution has been coordinated with other portions of the Work.
- j. Requested substitution provides specified warranty.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 2600

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Section:
 - 1. Division 01 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after Contract award.

1.2 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, They will be provided on Intermountain's standard forms.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. They will be provided on Intermountain's standard forms. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request and after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

CONTRACT MODIFICATION PROCEDURES

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Architect. Provide on Contractor's standard forms.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 5. Comply with requirements in Division 01 Section "Product Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.4 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor. They will be provided on Intermountain's standard form.

1.5 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive. They will be provided on Intermountain's standard form. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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CONTRACT MODIFICATION PROCEDURES
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SECTION 012900

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Accepted Alternates.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange the schedule of values in tabular form, in format accepted by Architect, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.

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- 2) Materials.
- 3) Equipment.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts, where appropriate.
4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. ~~If required,~~ include evidence of insurance or bonded warehousing.
5. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
6. Change Orders: Provide a separate line item in the schedule of values for each change order.
7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
8. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
 1. If the Agreement does not state payment dates, establish dates at preconstruction conference.
 2. Submit draft, or pencil, copy of Application for Payment seven days prior to due date for review by Architect.
- C. Application for Payment Forms: Provide on Owner's standard form.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

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- E. **Stored Materials:** If accepted by Owner, include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. **Transmittal:** Submit signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. Copies shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. **Waivers of Mechanic's Lien:** With each Application for Payment, submit waivers of mechanic's liens from General Contractor, subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. **Waiver Delays:** Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.
 - a. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. **Waiver Forms:** Submit on Owner's standard form.
- H. **Initial Application for Payment:** Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.

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8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
- J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. Evidence that claims have been settled.
 5. If applicable, final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.

1.2 DEFINITIONS

- A. Project communications documents shall be defined as the following:
 - 1. Letters.
 - 2. Memoranda.
 - 3. RFI (Request for Information - Contractor).
 - 4. RFI-A (Request for Information - Architect).

1.3 FORMAT

- A. Letters and Memoranda: Submit in formats acceptable to the Architect.
- B. E-Mail Communications/Internet Communications/Project Management Software Communications: Submit in forms and formats acceptable to and as approved by the Architect.
- C. RFI (Request for Information - Contractor): Submit on forms furnished by the Architect, or on other forms as approved by the Architect.
- D. RFI-A (Request for Information - Architect), will be submitted by Architect to Contractor on Architects standard form.

1.4 PROJECT COMMUNICATIONS DOCUMENTS

- A. Letters and Memoranda documents shall be submitted in a timely manner so as to facilitate project delivery and coordination. Routing of communications shall be as established in the Contract, the Contract Documents and the Pre-Construction Conference. Communications documents shall be transmitted or forwarded in a manner consistent with the schedule and progress of the work.

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- B. E-Mail Communications, Internet Communications, and Project Management Software programs must be compatible with the Architect's and Owner's computer systems and equipment. The responsibility for all costs for management of these systems, including, but not limited to, licensing, on site training or other training necessary for the proper operation of such systems, shall be by the Contractor. The Contractor shall keep written records and hard file copies of all electronic communications. Failure of the Contractor to keep such records shall waive the Contractor's right to rely on such communications and such communications shall be deemed to have not taken place.
- C. RFI (Request for Information - Contractor) shall be defined and limited to a request from the Contractor seeking interpretation or clarification of the requirements of the Contract Documents. Such requests shall comply with the following requirements:
1. RFI requests shall be submitted in a timely manner, well in advance of related work, and allow sufficient time for the resolution of issues relating to the request for interpretation or clarification. Contractor shall schedule the submission of RFI's so as to moderate and manage the flow of RFI requests. RFI's shall be submitted in a manner consistent with the schedule and progress of the work, and shall not be submitted in a sporadic and/or excessive manner.
 2. RFI requests shall be numbered in a sequential manner and contain a detailed description of the areas of work requiring interpretation or clarification. Include drawing and specification references, sketches, technical data, brochures, or other supporting data as deemed necessary by the Architect, for the Architect to provide the interpretations and clarifications requested.
 - a. The Contractor shall include a "Proposed Solution" to the issue requiring interpretation or clarification.
 3. RFI's submitted to the Contractor by Sub-Contractors, vendors, suppliers, or other parties to the work shall be reviewed by the Contractor prior to submission to the Architect. If the Architect deems that such RFI requests have not been adequately reviewed by the Contractor, such requests will be returned to the Contractor for further action. Sub-Contractor's RFI shall contain a "Proposed Solution".
 4. RFI requests shall not contain submittals, substitutions requests, routine communications, correspondence, memos, claims, or any information required by other areas of the Contract Documents. RFI requests containing such information will be returned to the Contractor without action by the Architect.
 5. RFI requests are limited to a request for interpretation or clarification of the requirements of the Contract Documents. Interpretations provided by the Architect shall not change the requirements of the Contract or the Contract Documents. If the Contractor determines that the Architect's response to an RFI gives cause for a change in the Contract or the Contract Documents, the Contractor shall promptly, within 5 working days, give written notice to the Architect of request for adjustments. Requests for adjustments to the Contract shall be submitted in a manner consistent with the terms and conditions of the Contract Documents.
 6. If the Architect, after review, determines that any RFI has been submitted in an incomplete manner, is unnecessary, or does not otherwise comply with the requirements of this Section, the RFI will be returned without action to the Contractor. The Contractor shall delete the original submittal date from the RFI log and enter a new submittal date at the time of re-submittal.

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7. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site. Software log with not less than the following:
 - a. Project name.
 - b. Name and address of Contractor.
 - c. Name and address of Architect.
 - d. RFI number including RFIs that were returned without action or withdrawn.
 - e. RFI description.
 - f. Date the RFI was submitted.
 - g. Date Architect's response was received.
8. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
 - a. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

D. RFI-A (Request for Information - Architect) shall be defined as a request by the Architect for information relating to the obligations of the Contractor under the Contract.

1. After receipt of an RFI-A the Contractor shall provide a written response to the Architect within 5 working days. Responses shall be thorough, complete and shall contain all information requested by the Architect.
2. An RFI-A shall be limited to a request by the Architect for information related to the project. The RFI-A shall not be construed as authorizing or directing a change in the Contract or the Contract Documents.

E. Revisions to Construction Documents: Responses to requests for information (RFI) shall not serve as construction documents; and the Contractor shall not incorporate RFI responses into construction of the Project, unless such answers bear the seal and signature of a licensed design professional.

1.5 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.
 4. Post copies of list in project meeting room, in temporary field office, and Project Web site. Keep list current at all times.

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1.6 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1.7 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.

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- b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
- c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
- d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
- e. Indicate required installation sequences.
- f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 days of the meeting.
 - 4. Attendance: Document attendance of all participants.
- B. Progress Meetings: Owner shall conduct progress meetings at regular intervals.
 - 1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities may be asked to ~~shall~~ be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following or as needed:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) If applicable, resolution of BIM component conflicts.

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- 4) Status of submittals.
- 5) If applicable, status of sustainable design documentation.
- 6) Deliveries.
- 7) Off-site fabrication.
- 8) Access.
- 9) Site utilization.
- 10) Temporary facilities and controls.
- 11) Work hours.
- 12) Hazards and risks.
- 13) Progress cleaning.
- 14) Quality and work standards.
- 15) Status of correction of deficient items.
- 16) Field observations.
- 17) Status of RFIs.
- 18) Status of proposal requests.
- 19) Pending changes.
- 20) Status of Change Orders.
- 21) Documentation of information for payment requests.

- c. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.
- B. Electronic Signature: An electronic signature is any legally recognized electronic means that indicates that a person adopts the contents of an electronic message.
- C. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

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4. Format: Arrange the following information in a tabular format:
- a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow sufficient and reasonable time for submittal review, including time for resubmittals. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review.
- D. Paper Submittals: Architect reserves the right to require paper submittals.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number, including revision identifier.
 - a. File Naming Convention (separate by dashes - or underscores _):
 - 1) Specification Number / Revision Number / Submittal Sequence (A, B, C, etc.).pdf

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3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 4. Transmittal Form for Electronic Submittals: Use software-generated form from electronic project management software or electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.
 - j. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Indication of full or partial submittal.
 - o. Transmittal number, numbered consecutively.
 - p. Submittal and transmittal distribution record.
 - q. Other necessary identification.
 - r. Remarks.
 5. Utilize electronic project management software program to process submittals when feasible with the type and extent of submittals. Refer to Division 01 Section "Project Management and Coordination" for description of electronic project management software.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations and Additional Information: On page, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Resubmittals: Make resubmittals in same form as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in file name and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with notation from Architect's action stamp not requiring additional submittals.
- I. Distribution: Furnish electronic copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with appropriate notation from Architect's action stamp indicating for construction. Retain a separate copy for Owner to be delivered to Owner with Project Closeout documents.

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PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Submit electronic submittals as PDF electronic files directly to Architect's Project Web site specifically established for Project.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - b. Provide PDF electronic files from scanned paper originals at 300 dpi, minimum.
 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. When one or more individual Specification Sections includes requirements for notarized signature on certificates and certifications, provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's installation instructions.
 - c. Mill reports.
 - d. Standard product operating and maintenance manuals.
 - e. Certification that products are appropriate for installation indicated.
 - f. Manufacturer's catalog cuts.
 - g. Manufacturer's product specifications.
 - h. Standard color charts.
 - i. Statement of compliance with specified referenced standards.
 - j. Testing by recognized testing agency.
 - k. Application of testing agency labels and seals.
 - l. Notation of coordination requirements.
 - m. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.

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- d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
- 5. Submit Product Data before or concurrent with Samples.
- 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Dimensions.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Design calculations.
 - i. Schedules.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship and attachment to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer.
 - 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 - 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (212 by 275 mm), but no larger than 30 by 42 inches (750 by 1050 mm).
 - 4. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
 - b. Prepare Shop Drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.
 - c. Refer to Division 01 Section "Project Management and Coordination" for requirements for coordination drawings.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.

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- d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record. This is in addition to physical samples.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
- a. Number of Samples: Submit 4 full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
- a. Number of Samples: Submit 4 sets of Samples. Architect will retain 2 Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least 4 sets of paired units that show approximate limits of variations.
- E. Coordination Drawing Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- G. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

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- H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
- I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- J. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- K. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- L. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- M. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- N. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- O. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- P. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."

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- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
1. Final but Restricted Release: When submittals are marked "Accepted as Noted," the Work covered by the submittal may proceed provided it complies with both the Architect's notations and corrections on the submittal and requirements of the Contract Documents. Final acceptance will depend on that compliance.
 2. Returned for Resubmittal: When submittal is marked "Not Accepted" or "Revise Resubmit," do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the Architect's notations. Resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not permit submittals marked "Not Accepted or Revise Resubmit" to be used at the Project site, or elsewhere where construction is in progress.
 3. Other Action: Where a submittal is primarily for information or record purposes, or for special processing or other Contractor activity, the submittal will be returned, marked "Not Reviewed" or "Not Reviewed; submittal not required by Contract Documents".
- B. Architect's acceptance of Shop Drawings, Samples or Product Data which deviates from the Contract Documents does not authorize changes to the Contract Sum. Submit in writing at the time of submission any changes to the Contract Sum affected by such Shop Drawings, Samples or Product Data, otherwise, claim for extras will not be considered.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect. Review shall not be final until complete submittal has been reviewed by Architect.
- E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- F. Submittals not required by the Contract Documents may be returned by the Architect without action.
- G. Electronic File of Submittal Documents: Provide Architect with an independent electronic archive of project submittal documents using electronic project management software as defined in Division 01 Section "Project Management and Coordination".

END OF SECTION

SECTION 014200

REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. Submitted: The terms "submitted", "reported", "satisfactory" and similar words and phrases means submitted to Architect, reported to Architect and similar phrases.
- J. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

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- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
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ICC	International Code Council www.iccsafe.org	(888) 422-7233
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ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543
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UBC	Uniform Building Code (See ICC)	
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- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE	Army Corps of Engineers www.usace.army.mil	(202) 761-0011
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CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-7923
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DOC	Department of Commerce www.commerce.gov	(202) 482-2000
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DOD	Department of Defense http://dodssp.daps.dla.mil	(215) 697-6257
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DOE	Department of Energy www.energy.gov	(202) 586-9220
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EPA	Environmental Protection Agency www.epa.gov	(202) 272-0167
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FAA	Federal Aviation Administration www.faa.gov	(866) 835-5322
FCC	Federal Communications Commission www.fcc.gov	(888) 225-5322
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
GSA	General Services Administration www.gsa.gov	(800) 488-3111
HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
LBL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-4000
NCHRP	National Cooperative Highway Research Program (See TRB)	
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Buildings Service (See GSA)	
PHS	Office of Public Health and Science www.osophs.dhhs.gov/ophs	(202) 690-7694
RUS	Rural Utilities Service (See USDA)	(202) 720-9540
SD	State Department www.state.gov	(202) 647-4000
TRB	Transportation Research Board http://gulliver.trb.org	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791
USPS	Postal Service www.usps.com	(202) 268-2000

- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to

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change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	(215) 697-2664
DSCC	Defense Supply Center Columbus (See FS)	
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil Available from Defense Standardization Program www.dps.dla.mil Available from General Services Administration www.gsa.gov Available from National Institute of Building Sciences www.wbdg.org/ccb	(215) 697-2664 (202) 619-8925 (202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
MIL	(See MILSPEC)	
MIL-STD	(See MILSPEC)	
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	(215) 697-2664
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for utilities, support facilities, and security and protection facilities.

1.2 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6 "Requirements for Demolition Operations", NECA's "Temporary Electrical Facilities," and NFPA 241 "Standard for Safeguarding Construction, Alteration, and Demolition Operations".
 - 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
- B. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to, the following:
 - 1. Building Code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, Fire Department and Rescue Squad rules.
 - 5. Environmental protection regulations.
 - 6. City ordinances and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Materials and equipment may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.
- C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mil (0.25 mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

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PART 3 - EXECUTION

- A. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

3.2 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of Owner facilities. To minimize waste and abuse, limit availability of Owner facilities to essential and intended uses.
 - 1. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

SECTION 016000

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, and equipment from those required by the Contract Documents and proposed by Contractor. Refer to Division 01 Section "Substitution Procedures".
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "Product Standard," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other manufacturers
- D. Hazardous Substances Prohibited by Law: Including, but not limited to, any product, material, element, constituent, chemical, substance, compound, or mixture, which is defined in, included under, or regulated by any environmental laws.

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- E. Environmental Laws: Applicable local, state, and federal laws, rules, ordinances, codes, regulations, and requirements in effect at the time Contractor's services are rendered, any amendments for Contractor's services rendered after the effective date of any such amendments.

1.3 SUBMITTALS

- A. Comparable Product: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements. Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.
- C. Contractor shall submit an affidavit on construction company letterhead signed by an officer of the company, notarized by a notary public, which certifies compliance with the environmental laws controlling hazardous substances for the construction of this Project.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- B. Compliance: Contractor shall take whatever measures deemed necessary to insure that all employees, suppliers, vendors, fabricators, subcontractors, or their assigns, to comply with hazardous substance requirements.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.

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3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product, required by the Contract Documents to provide specific rights for Owner, and specifically endorsed by manufacturer to Owner.
 2. Warranties: Prepare a written document, on manufacturer's standard form, modified to include Project-specific information, that contains appropriate terms and identification, properly executed.
- B. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Products and materials brought onto the Project Site, and products and materials incorporated into the Work, shall comply with environmental laws.
- B. Product Selection Procedures:
 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.

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Comparable products or substitutions for Contractor's convenience will not be considered.

3. Products:

- a. Restricted List (Acceptable Manufacturers/Fabricators and Products): Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
- b. Nonrestricted List (Available Manufacturers/Fabricators and Products): Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

4. Manufacturers:

- a. Restricted List (Acceptable Manufacturers/Fabricators): Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
- b. Nonrestricted List (Available Manufacturers/Fabricators): Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product (Product Standard): Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers, or unnamed manufacturer's product.

C. Descriptive Specification Requirements: Where Specifications describe a product, or assembly, listing exact characteristics required, without use of a brand or trade name, provide a product, material or assembly that provides the characteristics and otherwise complies with Contract requirements.

D. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product or material is specified for a specific application.

1. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

E. Compliance with Standards, Codes and Regulations: Where Specifications only require compliance with imposed code, standard or regulation, select product that complies with standards, codes or regulations specified.

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- F. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's color, gloss, pattern, density, or texture" or similar phrase, select a product (and manufacturer) that complies with other specified requirements.
1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 2. Custom Range: Where Specifications include the phrase "custom range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents; that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION

3.1 RESTRICTION OF HAZARDOUS SUBSTANCES

- A. Contractor agrees that it shall not knowingly after reasonable diligence and effort, incorporate into the Work any hazardous substance other than as may be lawfully contained within products, except in accordance with applicable environmental laws. Further, in performing any of its obligations hereunder, Contractor shall not cause any release of hazardous substances into, or contamination of, the environment, including soil, the atmosphere, any watercourse or ground water, except in accordance with applicable environmental laws. In the event that Contractor engages in any of the activities prohibited in this paragraph, to the fullest extent permitted by law, Contractor hereby indemnifies and holds harmless Owner and its partners, members, officers, directors, agents, employees and consultants from and against any and all claims, damages, losses, causes of action, suits and liabilities of every kind, including, but not limited to, expenses of litigation, court costs, punitive damages and attorney's fees, arising out of, incidental to or resulting from the activities prohibited.

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- B. In the event Contractor observes on the Project Site any substance which Contractor reasonably believes to be a hazardous substance, and which is being introduced into the Work, or exists on the Project Site, in a manner violative of any applicable environmental laws, Contractor shall immediately notify Owner and report the condition to Owner in writing. The Work in the affected area shall not thereafter be resumed except by written authorization of Owner if in fact a hazardous substance has been encountered and has not been rendered harmless. In the event that Contractor fails to give Owner proper notification hereunder, upon knowingly observing a hazardous substance at the Project Site, to the fullest extent permitted by the law, Contractor hereby indemnifies and holds harmless Owner, and all of its partners, members, officers, directors, agents, employees and consultants from and against all claims, damages, losses, causes of action, suits and liabilities of every kind, including, but not limited to, expenses of litigation, court costs, punitive damages and attorneys' fees, arising out of, incidental to, or resulting from Contractor's failure to stop the Work.
- C. If Owner believes that hazardous substances may have been located, generated, manufactured, used or disposed of on or about the Project Site by Contractor or any of its employees, agents, subcontractors, suppliers, or invitees, Owner may have environmental studies of the Project Site conducted as it deems appropriate, and Contractor shall be responsible for the cost of such studies to the extent that Contractor or any of its employees, agents, subcontractors, suppliers or invitees are responsible for the presence of any hazardous substances.

END OF SECTION

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SECTION 017300

EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Installation of the Work.
 - 3. Cutting and patching.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.3 SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

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6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 1. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 2. Miscellaneous Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
 - a. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 01 sustainable construction requirements Section.

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- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
- B. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective manufacturer/fabricator's written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

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- B. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated, unless indicated otherwise in the Contract Documents.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located, aligned, and coordinated with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

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1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Existing Utility Services and Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

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1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - b. Patch fire rated assemblies with materials to match existing and maintain assembly fire rating.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: As applicable, provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).

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3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers specifically intended for holding types of waste materials identified where applicable, e.g. blue colored containers with labeling and symbols for bio-waste.
 - B. Site: Maintain Project site free of waste materials and debris.
 - C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills immediately.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
 - E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
 - F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
 - G. Remove construction markings not required and graffiti immediately, repairing or replacing damaged material.
 - H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
 - I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
 - J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- 3.8 STARTING AND ADJUSTING
- A. As applicable, coordinate startup and adjusting of equipment and operating components with commissioning requirements in Division 01 specification sections.
 - B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
 - C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

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- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

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SECTION 017700

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

1.2 SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit test/adjust/balance records.
- C. Inspection: Submit a written request for inspection to determine Substantial. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

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1. Reinspection: Request, in writing, reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

- D. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

1.4 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list). Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
4. Submit list of incomplete items in the format agreed upon by the Owner and Architect.

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1.6 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within minimum number days, as required by the Contract, of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations, as applicable, before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

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- c. Remove tools, construction equipment, machinery, and surplus material from Project site.
- d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- f. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- g. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
- h. Remove labels that are not permanent.
- i. Remove all graffiti and construction writing.
- j. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- k. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- l. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
- m. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
- n. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 4. Replace all lamps and starters to comply with requirements for new fixtures.
- C. All Warranties remain in effect.

END OF SECTION

SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.

1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Final Submittal:
 - 1) Submit PDF electronic files of scanned record.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.

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- c. Revisions to routing of piping and conduits.
 - d. Revisions to electrical circuitry.
 - e. Actual equipment locations.
 - f. Locations of concealed internal utilities.
 - g. Changes made by Change Order or Construction Change Directive.
 - h. Changes made following Architect's written orders.
 - i. Details not on the original Contract Drawings.
 - j. Field records for variable and concealed conditions.
 - k. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

END OF SECTION

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SECTION 024119

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes selective removal and subsequent offsite disposal of portions of existing building indicated on drawings and as required to accommodate new construction.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner's designated storage area.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Comply with applicable regulations, codes and ordinances.
- B. Proposed Dust-Control and Noise-Control Measures: Written statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.

1.5 PROJECT CONDITIONS

- A. Occupied Buildings:
 - 1. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
 - 2. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

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- B. Owner assumes no responsibility for condition of areas to be selectively demolished. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
- C. Hazardous Materials: If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
 - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. Use materials whose installed performance equals or surpasses that of existing materials.
- B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Occupied Buildings: Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.

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1. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

1. Arrange with Owner to shut off indicated utilities.
2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

A. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

B. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

3.4 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

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1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
 3. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 4. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 5. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, verify condition and contents before starting flame-cutting operations.
 6. Maintain portable fire-suppression devices during flame-cutting operations.
 7. Maintain adequate ventilation when using cutting torches.
 8. Dispose of demolished items and materials promptly.
 9. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.
- C. Removed and Salvaged Items: Comply with the following:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items: Comply with the following:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.
- 3.6 PATCHING AND REPAIRS
- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

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1. Completely fill holes and depressions in existing concrete or masonry that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION

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SECTION 054300

SLOTTED CHANNEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Slotted channel framing and accessories necessary to complete installation.

1.2 DELEGATED ENGINEERING REQUIREMENTS

- A. Contract Documents Design Intent: Drawings and Specifications indicate design intent for products and systems and do not necessarily indicate or specify total Work required. Contract Documents shall not be construed as an engineered design; furnish and install all Work required for a complete installation.
- B. Delegated Engineering Responsibility: Contractor shall employ a qualified professional engineer to provide engineering for products and systems including attachment to building structure required to meet design intent of Contract Documents.
 - 1. Preparation of structural analysis data including engineering calculations, shop drawings and other submittals signed and sealed by the qualified professional engineer.
- C. Delegated Engineering Professional Qualifications: Professional engineer legally authorized to practice in jurisdiction where Project is located and experienced in providing engineering services of kind indicated for products and systems similar to this Project and has a record of successful in-service performance.
- D. Coordination of Work:
 - 1. Product Variations: In the event of minor differences between products and systems of acceptable or available manufacturers, Contractor shall notify Architect of such differences and resolve conflicts in a timely manner. Failure of Contractor to provide notification shall be construed as acceptance of conditions indicated, and changes caused by minor differences between products and Contract Documents shall be included in the Work at no additional cost to Owner.
 - 2. Allowable Adjustments: Minor dimension and profile adjustments may be made in interest of fabrication or erection methods or techniques or ability to satisfy design intent, provided design intent is maintained as determined by Architect. Proposed deviations shall include a detailed analysis of impact to adjacent substrates or other building systems, including related design or construction cost impacts. If accepted by Architect, deviations causing changes in materials, constructability, substrates, or conditions shall be included in the Work at no additional cost to Owner.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details,

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installation instructions, and recommendations for maintenance.

- B. Shop Drawings: Show details of fabrication and installation, including plans, elevations, sections, details of components and attachments to other work. Distinguish between shop and field-assembled work. Include the following:

1. Strapping, bracing, bridging, splices, and connection details.
2. Materials, sizes, spacings, and thicknesses.
3. Specifics for equipment being supported by framing.
4. Adjacent building structure, mechanical and electrical elements.
5. Details for anchoring and attachment to building structure.

1.4 INFORMATIONAL SUBMITTALS

- A. Delegated Engineering Calculations: Informational submittal for products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation; test reports are not acceptable substitute for calculations.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:

1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.
2. Supervision: Installer shall maintain a competent supervisor at Project while the Work is in progress, and who has not less than 5 years of experience installing products and systems similar to scope of this Project.
3. Manufacturer/Fabricator Acceptance: Installer shall be certified, approved, licensed, or acceptable to manufacturer/fabricator to install products.

1.6 PRE-INSTALLATION CONFERENCE

- A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.

1.7 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".

1. Horizontal Spanning Members; Upper, Lower and Main Subrails:

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- a. Cooper B-Line, Inc.; B12A channels
 - b. Hilti; MQ-124X channels
 - c. Unistrut Corp.; P5501 channels
2. Vertical Columns:
- a. Cooper B-Line, Inc.; BTS 22TH struts
 - b. Hilti; MQ-41 channels
 - c. Unistrut Corp.; P9200 tubes
3. Diagonal and Horizontal Bracing:
- a. Cooper B-Line, Inc.; BTS 22 channels
 - b. Hilti; MQ-41 channels
 - c. Unistrut Corp.; P1000 channels
4. Inside Vertical Columns:
- a. Cooper B-Line, Inc.; BTS 22TH struts
 - b. Hilti; MQ-41 channels
 - c. Unistrut Corp.; P1000 H3 channels

2.2 SYSTEM DESCRIPTION

- A. Equipment Support: Framing consisting of necessary slotted channel framing members such as beams, columns, braces, fittings, spanning members, longitudinal rails, track supports, and components such as channel connectors, nuts, bolts, washers, shim plates, and general hardware, for a complete and properly functioning support structure for equipment.

2.3 PERFORMANCE REQUIREMENTS

- A. Structural Requirements: Engineer slotted channel framing according to delegated engineering quality standards to withstand live and dead loads according to authorities having jurisdiction, applicable local building codes, and information indicated within limits and under conditions indicated, without material failure or permanent deformation of structural members.
- 1. Structural Movement: Engineer to withstand movements of structure including, but not limited to, drift, twist, column shortening, long-term creep; accommodate 3/8 in (10 mm) differential vertical deflection of floors
 - 2. Design Loads: As required by scheduled equipment.
 - 3. Deflection: L/720 of span in either plane (vertical or horizontal) when maximum loading conditions is applied on either rail, due to equipment operation, including positioning of equipment at extremities of its travel.
 - 4. Seismic Loads: Engineer to withstand effects of earthquake motions.
 - 5. Design Criteria:
 - a. Equipment Information: Coordinate engineering with information provided by manufacturer of equipment being supported.
 - b. Minimum Factor of Safety: 2 based on ultimate strength under static loading conditions.
- B. Delegated Engineering Quality Standards: Determine allowable working stresses of materials

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according to authorities having jurisdiction, applicable local building codes, framing manufacturers design data, MFMA-4, and MFMA-103.

2.4 FRAMING MATERIALS AND COMPONENTS

A. Slotted Channels:

1. Product Quality Standard: MFMA-4.
2. Interior Locations: C-shape channels fabricated from ASTM A 1011 Grade 33 cold-rolled steel sheet or ASTM A 1008 Grade 33 for hot-rolled steel sheet, structural classification; with continuous open slot formed by inturned serrated or unserrated lips, and intermediate slots in back of channel; riveted back-to-back type for primary horizontal framing members; wall thickness as required by engineering design.
 - a. Painted Factory Finish: Chemically cleaned, phosphated, electro deposited acrylic or electrostatically-applied polyester finished, then baked; resisting minimum 300 hours of salt spray exposure according to ASTM B 117.

B. Channel Connectors: Standard 2 part connectors of type, size and material required by delegated engineering; fabricated from carbon steel with nuts and threaded bolts; with or without springs; electro-galvanized finish; from same manufacturer as slotted channels.

C. General Hardware: Standard fittings, bases, brackets, and clamps of three-dimensional shape suitable for condition and type, size and material required by delegated engineering; fabricated from carbon steel; same finish as slotted channels; from same manufacturer as slotted channels.

D. Fasteners to Building Structure: Welding rods and expansion anchors as specified in Division 5 Section "Metal Fabrications."

E. PVC Closure Strip: Paintable PVC closure strip; Unistrut Corp; P1184P, grey color.

PART 3 - EXECUTION

3.1 EXAMINATION

- #### A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- #### A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
1. MFMA-103.
 2. Respective manufacturer/fabricator's written installation instructions.
 3. Accepted submittals.
 4. Contract Documents.

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- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION

- A. Erection:

1. Install slotted channel framing members and components square, true to line, level and plumb; and securely in place to properly support schedule equipment.
2. Cut slotted channels with powered cutting saws; flame-cutting is not permitted.
3. Tighten all connections to torque required by engineering design

- B. Tolerances:

1. Horizontal Mounting Surfaces: Align within 1/32 in (0.8 mm) in 24 in (600 mm) and within 1/16 in (1.5 mm) in 18 ft (5.4 m).
2. Elevation Between Rails: Difference between 2 rails within 1/16 in (1.5 mm) in 24 in (600 mm).

- C. PVC Closure Strips: Install at all exposed rails.

END OF SECTION

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SECTION 055000

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Metal fabrications and supplementary items necessary for installation.

1.2 DEFINITIONS

- A. Protected Areas: Interior and exterior areas not directly exposed to the elements such as rain, snow, or ice.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer/fabricator's technical literature for each product and system indicated.
 - 1. Include manufacturer/fabricator's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.
- B. Shop Drawings: Show details of fabrication and installation, including plans, elevations, sections, details of components and attachments to other work. Distinguish between shop and field-assembled work.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.
 - 2. Supervision: Installer shall maintain a competent supervisor at Project while the Work is in progress, and who has not less than 5 years of experience installing products and systems similar to scope of this Project.
- B. Welding Qualifications: Qualify procedures and personnel according to following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel".

1.5 PRE-INSTALLATION CONFERENCE

- A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Where products and systems are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication.

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1.7 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.
- B. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".
- B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. Other available manufacturers/fabricators offering products having equivalent characteristics may be considered, provided deviations are minor and comply with requirements of Contract Documents as judged by the Architect.

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer/fabricator. Provide secondary materials only as recommended by manufacturer/fabricator of primary materials.

2.3 FERROUS METAL MATERIALS

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, blemishes, or other imperfections where exposed to view on finished units. Do not use steel sheet with variations in flatness exceeding those permitted by referenced standards for stretcher-leveled sheet.
 - 1. Marking Systems for Metal Fabrications: Where finished items are exposed to view, use temporary tags attached with wires or other system acceptable to Architect.
- B. Steel:
 - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.4 ANCHORS

- A. General: Provide anchors capable of sustaining, without failure, a load equal to 6 times load imposed when installed in unit masonry and 4 times load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

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- B. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Protected Areas:

- a. Steel: Carbon steel components zinc plated to comply with ASTM B 633 or ASTM F 1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
- b. Locations: Where specified or where indicated on drawings.

2.5 ACCESSORY ITEMS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.6 FABRICATION, GENERAL

- A. General: Fabricate metal fabrications, including clips, brackets, and other components necessary to support and anchor fabrications to supporting structure, and to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.

1. Join components by welding unless otherwise indicated.

- B. Shop Assembly: Assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces.

- C. Fabrication Requirements:

- 1. Shear and punch metals cleanly and accurately. Remove burrs and ease exposed edges to a radius of approximately 1/32 in (0.8 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- 2. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- 3. Form work true to line and level with accurate angles and surfaces and straight sharp edges.
- 4. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

- D. Assembly Requirements:

- 1. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- 2. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.
- 3. Complete fabrication prior to shop painting.

- E. Shop-Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings. Weld corners and seams continuously to develop full strength of member to comply with following:

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1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports that are not a part of structural framework as necessary to complete the Work.
- B. Fabricate units from structural-steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

2.8 STEEL FINISHES

- A. Protected Areas:
 1. Shop Priming: Comply with Division 09 Section "Painting" and as follows:
 - a. Preparation of Uncoated Surfaces: Prepare uncoated surfaces to comply with requirements of coating product to be used, but not less than minimum requirements of SSPC-SP 6/NACE No. 3 surface preparation specifications and environmental exposure conditions of installed fabrications.
 - b. Application: SSPC-PA 1; apply shop primer to uncoated surfaces. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive metal fabrications and associated Work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting Work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 1. Respective manufacturer/fabricator's written installation instructions.
 2. Accepted submittals.
 3. Contract Documents.

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- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

3.3 PREPARATION

- A. General: Comply with manufacturer/fabricator's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION OF METAL FABRICATIONS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, through bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Field Welding: Weld connections continuously to develop full strength of member to comply with following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Corrosion Protection: Coat concealed aluminum surfaces that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with heavy coat of bituminous paint.

3.5 INSTALLATION OF MISCELLANEOUS ITEMS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturer/fabricators' written instructions and requirements indicated on Shop Drawings.

3.6 ADJUSTING AND CLEANING

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces. Apply by brush or spray to provide a minimum 2.0 mil (0.05 mm) dry film thickness.

END OF SECTION

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SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Joint sealants, backing materials, and supplementary items necessary for installation.

1.2 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.

1.4 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to Conditions of the Contract and Division 01 Section "Substitution Procedures".

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.
- B. Compatibility: Joint sealants, backings, and other related materials shall be compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer based on testing and field experience.
- C. Sealant Color: As scheduled.

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2.3 INTERIOR ELASTOMERIC SEALANTS

A. Interior Non-sag Acrylic Latex Sealant:

1. Product Quality Standard: ASTM C 834, Type and Grade as required by conditions.
2. Description: Single component, non-sag, moisture curing, general purpose, paintable, siliconized acrylic latex sealant.
3. Joint Movement Capability: Plus 7.5 percent, minus 7.5 percent
4. Manufacturers and Products:
 - a. Pecora Corp.; AC 20+.
 - b. Tremco Commercial Sealants & Waterproofing; Tremflex 834.

B. Acoustical Sealants: As specified in Division 09 Section "Gypsum Board Assemblies".

2.4 ACCESSORIES

- A. Cleaners for Non-porous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent non-porous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- B. Masking Tape: Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrate surfaces to receive products and systems and associated Work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting Work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
1. Respective manufacturer's written installation instructions.
 2. Accepted submittals.
 3. Contract Documents.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

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- B. Cleaning of Joints: Clean out joints immediately before installing joint backings and sealants to comply with joint sealant manufacturer's written instructions and following requirements:
1. Remove foreign material that could interfere with adhesion of joint sealant, including, but not limited to, dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
 3. Remove laitance and form-release agents from concrete.
 4. Clean non-porous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
 5. Substrate material allowed by sealant's ASTM C 920 Use Classification.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.4 INSTALLATION

- A. Joint Sealants: Install at same time as backings using proven techniques that comply with following:
1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 4. Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - a. Remove excess sealant from surfaces adjacent to joints.
 - b. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - c. Use masking tape to protect surfaces adjacent to recessed tooled joints.
 5. Install joint sealants in accordance with ASTM C 1193 as applicable to materials, applications, conditions indicated, and with the following profile configurations:
 - a. Fillet: Figure 5.
 - b. Bridge: Figure 6.
 - c. Butt: Figure 8A (concave tooling), generally hour-glass shape with 2:1 width-to-depth ratio.

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3.5 CLEANING

- A. In-Progress Cleaning: Remove excess sealant or sealant smears adjacent to joints as Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. General Requirements: Protect during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original Work.

3.7 JOINT SEALANT SCHEDULE

- 1. Interior Non-sag Acrylic Latex Sealant:
 - a. Non-moving joints where another type of sealant is not otherwise specified or scheduled.
 - b. Minimal moving joints due to temperature change.

3.8 COLOR SCHEDULE

- A. Joint Sealant Colors:
 - 1. Interior Non-Sag Acrylic Latex Sealant:
 - a. Color Selection: As selected from Manufacturer's Standard and Custom Colors.

END OF SECTION

SECTION 081114

INTERIOR HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Interior custom hollow metal frames and supplementary items necessary for installation.

1.2 DEFINITIONS

- A. Custom Hollow Metal Work: Hollow metal work fabricated according to ANSI/NAAMM-HMMA 861.
- B. Interior: Areas located in conditioned spaces.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Where products and systems are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.
- B. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

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PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Engineer products and systems to withstand loads within limits of allowable working stresses of the materials involved under conditions indicated and without permanent deformation or failure of materials.
- B. Smoke-Control Frame Assemblies: Assemblies complying with UL 1784.

2.3 COMPONENT MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008 / A 1008M, Designation CS (Commercial Steel), Type B; suitable for exposed applications.
- B. Frame Anchors: ASTM A 591 / A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
- C. Inserts, Bolts, and Fasteners: Device type and size required, hot-dip galvanized according to ASTM A 153 / A 153M, Class B.
 - 1. Powder-Actuated Fasteners: Suitable for application indicated, ANSI A 10.3; low velocity, powder-actuated fasteners; drive pins and clip angles fabricated from corrosion-resistant materials, with clips or other devices for attaching frames into concrete substrate.
 - 2. Available Manufacturers:
 - a. Construction Materials, Inc.
 - b. Heckman Building Products, Inc.
 - c. Hilti Corp.
 - d. ITW Ramset/Red Head.
 - e. Powers Fasteners.
 - f. Simpson Strong Tie Anchor Systems.
- D. Mineral-Fiber Insulation for Installations in Sound-Rated Partitions: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6 to 12 lb/cu ft (96 to 192 kg/cu m) density; with following characteristics:
 - 1. Flame-Spread Index: 25 maximum.
 - 2. Smoke Development Index: 50 maximum.
 - 3. Combustion Characteristics: Passing ASTM E 136.
- E. Primer: Fast-curing, corrosion-inhibiting, lead and chromate free, universal primer complying with ANSI A224.1 acceptance criteria; compatible with substrate and field-applied finish paint system specified in Division 09 Section "Painting".

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2.4 FABRICATION, GENERAL

- A. Fabrication Quality Standard: ANSI/NAAMM-HMMA 861.
- B. General Requirements: Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit, and assemble units in manufacturer's plant.
- C. Accessories: Fabricate concealed stiffeners, edge channels, and hardware reinforcement from cold-rolled steel sheet.
- D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to templates furnished as specified in Division 08 Section "Door Hardware".
 - 1. Locate hardware according to ANSI/NAAMM-HMMA 861.
 - 2. Reinforce frames to receive non-templated, mortised, and surface-mounted door hardware.
 - 3. Comply with applicable requirements in ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

2.5 HOLLOW METAL FRAMES

- A. Fabrication Provisions:
 - 1. Fabricate frames of construction indicated below.
 - 2. Close contact edges of corner joints tight with faces mitered and full-profile continuously welded.
 - a. "Knock-down" frame construction is not acceptable and shall not be used.
 - 3. Close contact edges of stops butted or mitered.
 - 4. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
- B. Joinery:
 - 1. Fabrication Quality Standard: Head-to-jamb joints according to ANSI/NAAMM-HMMA 820 for either of following fabrication techniques with:
 - a. Saw-mitered corners, full-profile continuously welded.
 - b. Machine-mitered corners, full-profile continuously welded.
 - 2. Externally or internally weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and seamless.
 - 3. Internally weld rabbet and soffits continuously; grind, fill, dress, and make smooth.
 - 4. Use of gusset or splice plates as substitute for fully welding is not permitted.
- C. Materials and Thickness:
 - 1. Frames for Interior Openings: Fabricated from cold-rolled steel sheet of following thicknesses:

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- a. 48 in (1200 mm) Wide or Less: 0.053 in (1.3 mm) (16 gage) thick.
- D. Stops and Moldings:
 - 1. Form corners with butted or mitered hairline joints.
- E. Hardware Reinforcement: Fabricate from same material as frame. Minimum thickness of steel reinforcing plates for following hardware:
 - 1. Hinges: 0.167 in (4.2 mm) (7 gage) thick by 1-1/2 in wide by 6 in (38 mm by 150 mm) longer than hinge, secured by not less than 6 spot welds.
 - 2. Strikes, Flush Bolts, and Closers: 0.093 in (2.3 mm) (12 gage).
- F. Head Reinforcement: Provide minimum 0.093 in (2.3 mm) (12 gage) thick, steel channel or angle stiffener for opening widths more than 48 in (1200 mm).
- G. Lead-Lined Door Frames: Comply with standard frame requirements, except 0.067 in (1.7 mm) (14 gage) thick, and lined with lead sheet of thickness not less than required for adjacent walls.
 - 1. Provide additional reinforcements and internal supports to adequately carry weight of lead-lined doors. Install reinforcements and supports before installing lead lining.
 - 2. Form lead sheet to match frame contour, continuous in each jamb and across head, lapping stops. Form lead shields around areas prepared to receive hardware. Fabricate lead lining wide enough to maintain effective lap with lead in adjacent walls.
- H. Lead-Lined Window (Observation) Frames: Fabricate from 0.043 in (1.1 mm) thick, formed-steel sheet or 0.064 in (1.6 mm) thick aluminum extrusions with mitered corners, welded or bolted with concealed fasteners.
 - 1. Line with lead sheet formed to match frame contour, continuous in each jamb and across head and sill, lapping the stops, and fabricated wide enough to maintain an effective lap with lead of adjoining assemblies.
 - 2. Construct so lead lining overlaps glazing material perimeter by at least 3/8 in (10 mm) and provide removable stops.
- I. Jamb Anchors:
 - 1. Types: Fabricated of same material as frame:
 - a. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 in (1.10 mm) (18 gage) thick.
 - 2. Quantity and Location:
 - a. Stud-Wall Type: Locate anchors not more than 18 in (450 mm) from top and bottom of frame. Space anchors not more than 32 in (800 mm) on centers and as follows:
 - 1) Three anchors per jamb up to 60 in (1500 mm) high.
 - 2) Four anchors per jamb from 60 to 90 in (1500 to 2250 mm) high.

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- 3) Five anchors per jamb from 90 to 96 in (2250 to 2400 mm) high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 in (600 mm) or fraction thereof above 96 in (2400 mm) high.
 - 5) Two anchors per head for frames above 42 in (1050 mm) wide and mounted in metal-stud partitions.
- J. Floor Anchors: Formed from same material as frames welded to bottom of jambs and mullions with not less than 4 spot welds, not less than 0.0428 in (1.10 mm) (18 gage) thick, and as follows, terminating bottom of frames at finish floor surface:
1. Monolithic Concrete Slabs: Clip type anchors, with two holes to receive fasteners.
- K. Shipping Spreader Bars: Attach two removable metal spreader bars across bottom of frames, tack welded to jambs and mullions.
- L. Door Silencers: Drill holes to receive door silencers furnished under Division 08 Section "Door Hardware". Keep holes clear during construction.
1. Single-Door Frames: Strike jamb for 3 door silencers.
- 2.6 STEEL FINISHES
- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for cleaning, treating, priming, and when specified, finishing.
- B. Finish products specified in this Section after fabrication.
- C. Non-Coated Steel Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 3, "Power Tool Cleaning" or SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning".
- D. Prime Coat Finish: Apply manufacturer's standard primer specified below immediately after surface preparation and pretreatment.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
- E. Field-Applied Coatings: As specified in Division 09 Section "Painting".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

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3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
1. ANSI/NAAMM-HMMA 840.
 2. NFPA 80 for fire-rated frames.
 3. NFPA 105 for smoke control frames.
 4. DHI A115.IG.
 5. Respective manufacturer's written installation instructions.
 6. Accepted submittals.
 7. Contract Documents.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.
- B. Pre-Installation Tolerances: Prior to installation, adjust and securely brace hollow metal frames for squareness, alignment, twist, and plumbness to following:
1. Squareness: Plus or minus 1/16 in (1.5 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 2. Alignment: Plus or minus 1/16 in (1.5 mm), measured at jambs on a horizontal line parallel to plane of wall.
 3. Twist: Plus or minus 1/16 in (1.5 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 4. Plumbness: Plus or minus 1/16 in (1.5 mm), measured at jambs on a perpendicular line from head to floor.
- C. Hardware Preparation: Drill and tap frames to receive non-templated, mortised, and surface-mounted door hardware.

3.4 INSTALLATION OF INTERIOR HOLLOW METAL FRAMES

- A. Hollow Metal Frames: Install hollow metal frames of size and profile indicated.
1. Setting: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and welded-in shipping spreader bars. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
 - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - b. Install frames with removable glazing stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.
 - d. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

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2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors or powder actuated fasteners.
3. Sound-Rated Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
4. Installation Tolerances: Adjust hollow metal frames for squareness, alignment, twist, and plumb to following:
 - a. Squareness: Plus or minus 1/16 in (1.5 mm), measured at rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 in (1.5 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 in (1.5 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 in (1.5 mm), measured at jambs at floor.

3.5 ADJUSTMENTS

- A. Final Adjustments: Remove and replace defective hollow metal work, including work that is warped, bowed, or otherwise unacceptable.
- B. Prime Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of primer compatible with paint specified in Division 09 Section "Painting".
- C. Field-Applied Coatings: As specified in Division 09 Section "Painting".

END OF SECTION

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SECTION 081416

PREFINISHED FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Prefinished flush wood doors and supplementary items necessary for installation.

1.2 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.
 - 2. Include details of core and edge construction, light frames, and trim for openings.
 - 3. Include factory-finishing specifications.
 - 4. Include manufacturer's surface preparation instructions.
- B. Samples for Verification Purposes: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Wood Veneer Doors: Wood veneer factory finishes applied to actual door face materials, approximately 8 in by 10 in (200 mm by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of 3 samples showing typical range of color and grain to be expected in finished work.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty:
 - 1. Provide manufacturer's written warranty covering materials and installation (labor) stating obligations, remedies, limitations and exclusions.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with requirements of referenced quality standards and manufacturer's written instructions.
 - 1. Package doors individually.
 - 2. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration.

1.5 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

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1.6 WARRANTY

- A. Manufacturer's Warranty: Furnish manufacturer's written material and labor warranty signed by an authorized representative using manufacturer's standard form agreeing to furnish materials and labor required to repair or replace work which exhibits material defects caused by manufacture or design and installation of product. Warranty shall also include finishing that may be required due to repair or replacement of defective doors. "Defects" is defined to include but not limited to deterioration or failure to perform as required.

1. Defects include, but are not limited to, the following:
 - a. Warping (Bow, Cup, or Twist): Not more than 1/4 in (6 mm) in a 42 by 84 in (1050 by 2100 mm) section.
 - b. Telegraphing of Core Construction: Not more than 0.01 in in a 3 in (0.25 mm in a 75 mm) span in face veneers.
2. Warranty Period: Manufacturer shall warrant the products to be free from material and labor Defects for a period as follows:
 - a. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".
1. Algoma Hardwoods, Inc.
 2. Marshfield Door Systems, Inc.
 3. Oshkosh Architectural Door Company.
 4. VT Industries Inc.

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

2.3 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
1. Smoke-Control Door Assemblies: Comply with UL 1784.

2.4 DOOR CONSTRUCTION, GENERAL

- A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.

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B. Particleboard Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-2.
2. Blocking: Provide wood blocking as needed to eliminate through-bolting hardware and as follows:
 - a. Top Rail: 5 in (125 mm).
 - b. Bottom Rail: 5 in (125 mm).
 - c. Mid Rail: 5 in (125 mm), in doors indicated to have exit devices.
 - d. Lock Blocks: 5 in by 10 in (125 mm by 250 mm), one for lock and two for exit devices.

C. Lead-Lined Wood Doors: Solid-core, 5 ply flush bonded core construction with one or more continuous lead sheets to make up total lead thickness.

1. Core: Solid glued wood block or solid particleboard, glued to top and bottom rails and edge stiles. Lead lining may be constructed in the core or between the core and faces, at manufacturer's option.
2. Lead Lining: Extend lead sheet continuously from top to bottom and edge to edge. Assemble lead lining and core with poured lead fasteners or steel bolts. Space lead fasteners not more than 1-1/2 in (38 mm) from door edge and approximately 8 in (200 mm) on center. Countersink bolt heads and cover with poured lead.
3. Lead Thickness: Same as specified for walls in Division 13 Section "Radiation Protection".
4. Shield cutouts for locksets with sheet lead of the same thickness used in door. Lap lining of cutouts with the door lining.

2.5 WOOD VENEER FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Premium, with Grade AA wood veneer faces.
2. Species Cut Selection: As scheduled.
 - a. Assembly of Veneer Leaves on Door Faces: Balance or Center-Balance match.
3. Exposed Vertical Edges: Same wood veneer as face veneer with sanded eased edges.
4. Horizontal Edges: Unfaced, sanded smooth, with factory applied seal coat.
5. Core: Particleboard or mineral core as required by application.
6. Construction: 5 plies.
 - a. Stiles and rails bonded to core.
 - b. Entire unit abrasive planed before veneering.
 - c. Faces bonded to core using a hot press.

2.6 FABRICATION OF PREFINISHED FLUSH WOOD DOORS

A. Fabrication Quality Standards: In addition to standards listed elsewhere, comply with following, unless otherwise specified:

1. NFPA 80 for fire-rated doors.
2. DHI-WDHS-3 and DHI A115-W series standards for hardware.

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- B. Factory Fitting: Factory fit doors to suit frame opening sizes indicated according to installation quality standards. Do not trim stiles and rails in excess of limits permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining with seal coat.
- C. Hardware:
 - 1. Factory machine doors for hardware that is not surface applied according to installation quality standards.
 - 2. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - 3. For doors scheduled to have electrical locks, provide built-in 1/4 in (6 mm) diameter raceway through doors, from lockset location to nearest hinge location, for low voltage wiring for doors scheduled to have electric locks.

2.7 FACTORY FINISHING OF DOORS

- A. General:
 - 1. Comply with referenced quality standard for factory finishing.
 - 2. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 3. Finish faces, all four edges, edges of cutouts, and mortises.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective manufacturer's written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.

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3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION OF FLUSH WOOD DOORS

- A. Factory-Fitted Door Clearances: Fit accurately in frames, within following clearances for all doors (smoke control, fire-rated, and non-fire-rated):
1. Jambs and Head: 1/8 in (3 mm) maximum.
 2. Between Edges of Pairs of Doors: 1/8 in (3 mm) maximum.
 3. Between Bottom of Door and Top of Threshold: Maximum 3/8 in (10 mm).
 4. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 in (19 mm).
 5. Between Bottom of Door and Top of Finish Surface (No Threshold) when the bottom of the door is more than 38 in (965 mm) above the finished floor: Maximum 3/8 in (10 mm) or as specified by the manufacturer's label service procedure.
- B. Hardware: As specified in Division 08 Section "Door Hardware".
- C. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.5 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

3.6 FINISH SCHEDULE

- A. Wood Veneer Faced Doors for Transparent Finish:
1. Species and Cut Selection: As Scheduled
 2. Finish: As follows:
 - a. Grade: Premium.
 - b. Product Quality Standard Finish Designation: (Match existing finish)
 - 1) AWI conversion varnish system.
 - 2) WI System 4 clear conversion varnish system.
 - c. Effect: Filled finish.
 - d. Sheen: Satin.

END OF SECTION

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100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
- C. Related Sections:
 - 1. Division 08 Section “Hollow Metal Doors and Frames”.
 - 2. Division 08 Section “Flush Wood Doors”.
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series.
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies.
 - 3. CAN/ULC-S104 – Standard Method for Fire Tests of Door Assemblies.

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1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Informational Submittals:
 - 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop

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Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 3. Twenty five years for manual overhead door closer bodies.
 - 4. Two years for electromechanical door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

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2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 4. Manufacturers:
 - a. Hager Companies (HA).
 - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).

2.3 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.
1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
 2. Locks are to be non-handed and fully field reversible.
 3. Manufacturers:
 - a. Corbin Russwin Hardware (RU) – CL3300 Series.
 - b. Sargent Manufacturing (SA) – 10 Line.
 - c. Schlage (SC) – ND Series.

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2.4 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
- B. Standards: Comply with the following:
 - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 - 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 - 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 - 4. Dustproof Strikes: BHMA A156.16.

2.5 ARCHITECTURAL TRIM

- A. Door Protective Trim
 - 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 - 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 - 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
 - 4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
 - 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
 - 6. Manufacturers:
 - a. Hiawatha, Inc. (HI).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
 - c. Trimco (TC).

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2.6 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Manufacturers:
 - a. Hiawatha, Inc. (HI).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
 - c. Trimco (TC).

2.7 ARCHITECTURAL SEALS

- A. General: Gasket seals to be of type and design as specified below or in the Hardware Sets. Provide sound gasketing on interior doors where indicated.
- B. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- C. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- D. Manufacturers:
 - 1. National Guard Products (NG).
 - 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
 - 3. Reese Enterprises, Inc. (RE).

2.8 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.9 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

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- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 2. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

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3.4 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.5 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.6 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
 - 1. Quantities listed are for each pair of doors, or for each single door.
 - 2. The supplier is responsible for handling and sizing all products.
 - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
 - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Manufacturer's Abbreviations:
 - 1. MK – McKinney
 - 2. PE – Pemko
 - 3. MR – Markar
 - 4. RF – Rixson
 - 5. RO – Rockwood
 - 6. RU - Corbin Russwin
 - 7. SU – Securitron
 - 8. MC – Medeco

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- 9. RS - RITE Slide
- 10. NO – Norton
- 11. OT – Other

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SECTION 092900

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Metal framing systems, interior gypsum board faced walls, partitions, and ceiling assemblies, and supplementary items necessary for installation.

1.2 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 for definitions of terms not defined in this Section or in other referenced quality standards.
- B. Damage: Stored or installed gypsum board materials shall be classified as defective and nonconforming Work if they have been exposed to wetness or dampness at any time prior to Substantial Completion or if they exhibit evidence of active or dormant mold or mildew.

1.3 DELEGATED ENGINEERING REQUIREMENTS

- A. Contract Documents Design Intent: Drawings and Specifications indicate design intent for products and systems and do not necessarily indicate or specify total Work required. Contract Documents shall not be construed as an engineered design; furnish and install all Work required for a complete installation.
- B. Gypsum Board Assemblies Withstanding Seismic Loads - Delegated Engineering Responsibility: Contractor shall provide engineering for products and systems required to withstand seismic loads including attachment to building structure required to meet design intent of Contract Documents including, but not limited to, the following.
- C. Coordination of Contract Documents and Work:
 - 1. Product Variations: In the event of minor differences between products and systems of acceptable or available manufacturer/fabricators. Contractor shall notify Architect of such differences and resolve conflicts in a timely manner. Failure of Contractor to provide notification shall be construed as acceptance of conditions indicated, and changes caused by minor differences between products and Contract Documents shall be included in the Work at no additional cost to Owner.
 - 2. Allowable Adjustments: Minor dimension and profile adjustments may be made in interest of fabrication or erection methods or techniques or ability to satisfy design intent, provided design intent is maintained as determined by Architect. Proposed deviations shall include a detailed analysis of impact to adjacent substrates or other building systems, including related design or construction cost impacts. If accepted by Architect, deviations causing changes in materials, constructability, substrates, or conditions shall be included in the Work at no additional cost to Owner.

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1.4 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.

1.5 QUALITY ASSURANCE

- A. Smoke Resistance Rated Assembly Characteristics: Provide materials and construction identical to those tested according to indicated fire resistance rated assemblies by independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Sound (STC) Resistance Rated Assembly Characteristics: Provide materials and construction identical to those tested according to ASTM E 90 and classified according to ASTM E 413 by independent and testing agency acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Comply with ASTM C 840 requirements or respective gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Field Measurements: Where products and systems are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication.

1.8 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".
- B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. Other manufacturers offering products having equivalent characteristics may be considered, provided deviations are minor and comply with requirements of Contract Documents as judged by the Architect.

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2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

2.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Provide products and systems to withstand loads within limits of allowable working stresses of the materials involved under conditions indicated and without permanent deformation or failure of materials.
- B. Design Loads: Provide products and systems to withstand design loads including but not limited to gravity, wind, seismic, and erection design loads established by authorities having jurisdiction, applicable local building codes, and as indicated.
 - 1. Structural Movement: Provide products and systems to withstand movements of structure including, but not limited to, drift, twist, column shortening, long-term creep and deflection from uniformly distributed and concentrated live loads. Contractor shall obtain required design data and identify movements accommodated on submittal drawings.
- C. Dimensional Tolerances: Provide products and systems to accommodate dimensional tolerances of framing members and adjacent construction.

2.4 METAL FRAMING COMPONENTS

- A. Project Framing Analysis: Analyze each framing condition for design loads indicated in performance requirements.
 - 1. Provide framing products in sizes and thicknesses required to meet or exceed the criteria based on project loads, spans and in-service conditions.
- B. Material Quality Standard: Provide components of sizes indicated but not less than that required to comply with ASTM C 754 for conditions indicated.
 - 1. Sheet Steel: ASTM C 645 for metal.
 - 2. Protective Coating - Standard Applications: ASTM A 653/A 653M, not less than G40 (Z120), hot-dip galvanized coating, unless otherwise indicated.
- C. Metal Studs and Floor Track (Runners):
 - 1. Standard Metal Framing Components for Typical Partitions:
 - a. Stud Description: C-shaped members formed from galvanized sheet steel with 1 1/4 in (32 mm) flange edges bent back 90 degrees and doubled over to form 13/64 in (5 mm) wide minimum return lip; of web depth indicated on Drawings and uncoated base metal thickness indicated in "Metal Framing Schedule" at end of this Section; with web punchouts.
 - b. Track (Runner) Description: U-shaped members formed from galvanized sheet steel with depth compatible with studs and flange dimension indicated to hold studs by friction; of same web size and uncoated base metal thickness as studs.

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- 1) Floor Track (Runner): 1-1/4 in (32 mm).
- 2) Top of Wall Track (Runner): 3 in (75 mm).

2. Optional Equivalent Products - Deformed Metal Studs and Tracks (Runners):

- a. Evaluation Criteria: Product test reports and certifications from independent testing agency indicating products comply with requirements and are acceptable to authorities having jurisdiction.
- b. Material Quality Standard: ASTM A 1003 / A 1003M sheet steel with galvanized coating.
- c. Stud Description: C-shaped members formed from deformed surface galvanized sheet steel with 1-1/4 in (32 mm) flange edges bent back 90 degrees and bent again to form 3/16 in (5 mm) wide minimum return lip; of web depth indicated on Drawings and uncoated base metal thickness indicated in "Metal Framing Schedule" at end of this Section; with web punchouts.
- d. Track (Runner) Description: U-shaped members formed from deformed surface galvanized sheet steel with depth compatible with studs and flange dimension indicated to hold studs by friction; of same web size and uncoated base metal thickness as studs.
- e. Manufacturer and Product: ClarkDietrich Building Systems; ProSTUD.

D. Flat Straps and Back-Up Plates: Galvanized sheet steel for blocking and bracing in length and width indicated, of same uncoated base metal thickness as adjacent metal studs.

E. Bridging:

1. Channel: U-shaped members formed from galvanized sheet steel not less than 0.0566 in (16 gage) (1.44 mm) minimum uncoated base metal thickness, with 1/2 in (12 mm) flanges and depth fitting stud punchouts.
2. Clip Angle: 1-1/2 in by 1-1/2 in (38 mm by 38 mm) L-shaped members formed from galvanized sheet steel not less than 0.0713 in (14 gage) (1.81 mm) uncoated base metal thickness.

F. Manufacturers:

1. Building Products Division of Consolidated Fabricators Corp.
2. California Expanded Metal Products Co. (CEMCO).
3. ClarkDietrich Building Systems
4. Marino Ware; Division of Ware Industries.
5. MBA Metal Framing.
6. Scafco Corp.

2.5 GYPSUM BOARD PRODUCTS

A. Sizes: Maximum lengths and widths available that will minimize short edge-to-short edge butt joints and to correspond to support system indicated.

B. Typical Paper-Faced Gypsum Board Products:

1. Paper-Faced Type X Gypsum Board:
 - a. Material Quality Standard: ASTM C 1396 / C 1396M, Type X.

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- b. Description: Noncombustible fire resistant gypsum core with paper surfacing on face, back, and long edges; tapered long edges; 5/8 in (15 mm) thick.
 - c. Manufacturers and Products:
 - 1) American Gypsum Company; FireBloc Type X Gypsum Board.
 - 2) CertainTeed Corporation; Type X Gypsum Board.
 - 3) Georgia-Pacific Gypsum LLC; ToughRock Fireguard Gypsum Board.
 - 4) National Gypsum Company; Gold Bond Fire-Shield Gypsum board.
 - 5) United States Gypsum Company (USG); Sheetrock Firecode Core.
2. Sustainable Paper-Faced Type X Gypsum Board: At Contractors option, provide sustainable paper-faced Type X gypsum board or typical paper-faced Type X gypsum board.
- a. Material Quality Standard: ASTM C 1396 / C 1396M, Type X.
 - b. Description: Noncombustible fire resistant gypsum core with paper surfacing on face, back, and long edges; tapered long edges; 5/8 in (15 mm) thick. UL Type Designation ULIX.
 - 1) ISO 14040 Environmental Management, Life Cycle Assessment, Principles and Framework:
 - a) Carbon emissions per Gypsum Association; Industry Standard Type III EPD for North American Type X wallboard with a manufacturing Global Warming Potential of 317.4 kg CO₂-eq./1000MSF.
 - b) Water reduction per Gypsum Association; Industry Standard Type III EPD for North American Type X wallboard having net use of fresh water value of 1.329 m³/1000 ft².
 - c) Primary Energy from non-renewable resources per Gypsum Association; Industry Standard Type III EPD for North American Type X wallboard have a value of 5,291 MJ/1000 ft².
 - c. Basis of Design:
 - 1) United States Gypsum Company, LLC, USG Sheetrock Brand EcoSmart Panels Firecode X.
- C. Moisture-Resistant Gypsum Board Products:
1. Moisture-Resistant Paper-Faced Gypsum Board:
- a. Material Quality Standard: ASTM C 1396 / C 1396M, Type X.
 - b. Description: Enhanced moisture-resistant, noncombustible gypsum core, with moisture-resistant paper surfacing on face, back and long edges; tapered long edges; score of 10 according to ASTM D 3273; 5/8 in (15 mm) thick.
 - c. Manufacturers and Products:
 - 1) American Gypsum Company; M-Bloc Mold and Moisture Resistant Type X Gypsum Board.
 - 2) CertainTeed Corporation; M2Tech Moisture and Mold Resistant Type X Gypsum Board.
 - 3) National Gypsum Company; Gold Bond XP Gypsum Board.

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- 4) United States Gypsum Company (USG); Sheetrock Mold Tough Firecode Gypsum Board.

2.6 TRIM ACCESSORIES

A. Typical Drywall Trim Accessories:

1. Material Quality Standard: ASTM C 1047.
2. Description: Trim profile fabricated of galvanized steel sheet; of size suitable for gypsum board thickness; with recessed, perforated flange formed to receive joint compound.
3. Trim Products:
 - a. Cornerbead:
 - 1) Purpose: For protecting outside (external) corners.
 - 2) Basis of Design: United States Gypsum Company (USG); Dur-A-Bead Corner Bead, 103.
 - b. Optional Equivalent Products – Structural Laminate Cornerbead System: At Contractor's option, provide high strength tapered co-polymer core cornerbead with tight fibered paperboard facing and joint tape paper backing.
 - 1) Purpose: For protecting outside (external) corners.
 - 2) Basis of Design: Structus Building Technologies; No-Coat Structural Laminate Drywall Corner System.
 - c. LC-Bead (J-Bead):
 - 1) Purpose: For protecting exposed edges of gypsum board where back flange can be used.
 - 2) Basis of Design: United States Gypsum Company (USG); J-Trim, 200-A.
 - d. L-Bead:
 - 1) Purpose: For protecting exposed edges of gypsum board where back flange cannot be used.
 - 2) Basis of Design: United States Gypsum Company (USG); L-Trim, 200-B.
 - e. J-Stop:
 - 1) Purpose: For protecting edges of gypsum board that does not require finishing.
 - 2) Basis of Design: United States Gypsum Company (USG); J-Stop, 402.
 - f. Control Joint:
 - 1) Description: One-piece trim formed with V-shaped slot, with removable strip covering slot opening.
 - 2) Purpose: For conditions requiring expansion and contraction stresses of large areas of gypsum board to be relieved.
 - 3) Basis of Design: United States Gypsum Company (USG); Control Joint, 093.

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g. Other Trim or Special Shapes: Products as required by condition.

4. Manufacturers:

- a. Dietrich Industries, Inc.; Unimast.
- b. Fry Reglet Architectural Metals.
- c. Marino Ware; Division of Ware Industries.
- d. Niles Building Products Co.
- e. Superior Metal Trim; Division of Delta Star, Inc.
- f. United States Gypsum Company (USG).

2.7 FASTENERS

A. Limitations: Nails and staples are not permitted.

B. Fasteners for Attaching Metal Framing to Concrete Structure:

- 1. Powder-Actuated Fasteners: Suitable for application indicated, ANSI A 10.3; low velocity, powder-actuated fasteners; drive pins and clip angles fabricated from corrosion-resistant materials, with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, an ultimate load capacity not less than 10 times that imposed by construction as determined by testing according to ASTM E 1190 by a qualified independent testing agency.

2. Manufacturers:

- a. Construction Materials, Inc.
- b. Heckman Building Products, Inc.
- c. Hilti Corp.
- d. ITW Ramset/Red Head.
- e. Powers Fasteners.
- f. Simpson Strong Tie Anchor Systems.

C. Metal Framing Screws: Screw fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten metal framing and furring members securely to substrates involved; complying with recommendations of gypsum board manufacturers for applications indicated.

D. Gypsum Board Screws:

1. Material Quality Standards:

- a. Metal Framing Members less than 0.03 in (0.75 mm) Thick: ASTM C 1002, Type S.
- b. Metal Framing Members from 0.033 in to 0.112 in (0.79 mm to 2.9 mm) Thick: ASTM C 954, Type S-12.

- 2. Product Description - Standard Applications: Bugle head, self-drilling, self-tapping, steel screws with Phillips-head recess of size, holding power, and other properties recommended by respective gypsum board manufacturer; minimum 1 in (25 mm) long; with corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

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- E. Miscellaneous Fasteners: For conditions not indicated, fasteners shall be type, finish, size, and holding power recommended by respective gypsum board manufacturer and conditions.

2.8 JOINT TREATMENT MATERIALS

- A. Material Quality Standard: ASTM C 475 / C 475M.
- B. Joint Tape:
 - 1. Paper Tape: Nominal 2 in (50 mm) wide cross-fibered paper tape with finish suitable for bonding, creased in center for easy folding, and compatible with joint compound.
 - 2. Mesh Tape: Nominal 2 in (50 mm) wide self-adhering 10-by-10 fiberglass mesh tape.
- C. Joint Compound:
 - 1. Setting-Type: Job-mixed powder for mixing with water, chemical-hardening compound; includes taping types.
 - 2. Drying-Type: Ready-mixed or job-mixed powder for mixing with water, air-drying, vinyl based compounds; includes taping, topping, and all-purpose types.

2.9 RELATED MATERIALS

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced quality standards and recommendations of gypsum board manufacturer.
- B. Fiberglass Sound Attenuation Blankets:
 - 1. Material Quality Standard: ASTM C 665, Type I.
 - 2. Description: Unfaced blankets produced by bonding inorganic glass fibers with a thermosetting binder.
 - 3. Description: Unfaced blankets produced by bonding inorganic glass fibers with a thermosetting binder; free of formaldehyde.
 - 4. Surface Burning Characteristics: According to ASTM E 84/NFPA 255/UL 723:
 - a. Flame Spread: Class A - no greater than 25.
 - b. Smoke Developed: No greater than 50.
 - 5. Thickness: Not less than 2-1/2 in (62 mm), unless otherwise indicated.
 - 6. Manufacturers and Products:
 - 7. Basis of Design: Johns Manville; Sound Control Batts, Formaldehyde Free.
- C. Acoustical Sealant for Non-Fire Resistance Rated Joints:
 - 1. Description: Manufacturer's standard nonsag, paintable, nonstaining sealant complying with ASTM C 834 or ASTM C 920. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90 or other acceptable test method.

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- a. Preconstruction Compatibility Testing: Test sealant for compatibility with copper substrates. Testing will not be required if data submitted on previous testing of current sealant products matches those submitted.
- b. Do not use acrylic, neoprene, and nitrile based sealants that are not recommended for use with copper substrates.

D. Sealants: Sealant as specified in Division 07 Section "Joint Sealants".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective Manufacturer's written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.
 - 4. Gypsum Association GA 216.
 - 5. United States Gypsum Company (USG); Gypsum Construction Handbook, if no other installation quality standard applies to condition.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION OF GYPSUM BOARD ASSEMBLIES

- A. Comply with ASTM C 840.
- B. Resistance Rated Partitions: Construct fire resistance rated, smoke resistance rated, and sound resistance rated partitions according to respective assembly test reports. Ensure every material used within an assembly shall comply with manufacturers listed and product qualities indicated in respective assembly test report.
- C. Control Joints: Install control joints at locations indicated on Drawings, in specific locations approved by Architect for visual effect and according to the following:

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1. Spaced not more than 24 to 30 feet in either direction for uninterrupted straight planes of ceilings and walls.
 2. Where different substrates occur at ceilings and walls.
 3. Where control joints occur in substrates at ceilings and walls.
 4. Where L, U, or T shaped ceiling configurations are joined.
 5. At less-than-ceiling-height cased opening frames and gypsum board openings over 60 inches in width; extend control joints from both corners at top of frame or opening up to ceiling.
 6. Where less-than-ceiling-height door frames occur on walls more than 30 feet in length; extend control joints from top of frame up to ceiling at corner of hinge side of door
 7. Where less-than-ceiling-height borrowed lites occur on walls more than 30 feet in length; extend control joints from top of frame up to ceiling and from bottom of frame to floor at both corners.
- D. Isolation from Building Structure: Isolate gypsum board assemblies from building structure to prevent transfer of loading imposed by structural movement.
1. Provide isolation joints as indicated or required by installation quality standards.
 2. Isolate ceiling assemblies abutting or penetrated by building structure.
 3. Isolate partition framing and wall furring abutting or penetrated by building structure, except at floor.
- E. Supplemental Accessories: Install supplementary framing, blocking, reinforcing, and bracing in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, hand rails, furnishings, or similar construction. Comply with details indicated and recommendations of installation quality standards or manufacturer.

3.5 INSTALLING METAL FRAMING COMPONENTS

- A. Priority: Assemble various assemblies giving priority to partitions with higher rating; extend partition with higher rating intact through partition with lower rating.
- B. Joinery and Connections: Install various metal framing components according to details indicated; for situations and conditions not indicated, comply with installation quality standards and with respective manufacturer's recommendations.
- C. General Requirements: Construct partition framing of studs, tracks, and headers using screws of number and spacing required.
1. Install studs of uncoated base metal thickness as determined by Metal Framing Schedule at end of this Section.
 2. Extend partition framing full height to underside of structure above, except where partitions are indicated to terminate at, or immediately above, suspended ceilings.
 3. Continue framing over door frames and openings to provide support for gypsum board.
 4. Cut studs 1 in (25 mm) short of full height to provide deflection relief at head of wall conditions.
 5. Install studs so that flanges point in same direction.
 6. Attach with screws through each stud flange and track (runner) flange, except top deflection track assemblies.

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7. For fire resistance rated, smoke resistance rated, and sound resistance rated assemblies that are required to extend to underside of structure above to obtain ratings, install framing around structural and other members extending below floor slabs or roof decks, as needed to support gypsum board closures and make partitions continuous from floor to underside of structure above.
 8. Do not lap studs.
 9. At intersections and corners, locate studs no more than 2 in (50 mm) from partition intersections and corners and secure with screws through both flanges of studs and tracks.
- D. Metal Track (Runner) Requirements:
1. Floors: Install tracks (runners) using appropriate fasteners spaced not more than 16 in (400 mm) on centers.
 2. Head of Wall: Install deep leg deflection tracks using appropriate fasteners to laterally support assembly, and to avoid axial loading of assembly by deflection from building structure above.
 3. Head of Wall: Where indicated, install proprietary deflection and firestop track (runner) using appropriate fasteners for the substrate and installation conditions.
- E. Support for Wall Mounted Accessories or Equipment: Install back-up plate or track (runner) turned on its side, using screws as indicated or as required, to studs to properly transfer accessory or equipment load to metal framing.
- F. Supplementary Framing: Install around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by metal framing.
- G. Penetrations: Maintain fire-resistance rating of assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- H. Furred Walls:
1. Erect furring channels vertically, spaced 16 in (400 mm) on centers maximum, unless otherwise indicated.
 2. Attach with appropriate fasteners, staggered on flanges.
 3. Splice ends by nesting channels 8 in (200 mm) and securely anchoring to surface.
 4. Miter 24 in (600 mm) long horizontal furring channels at corners and space 24 in (600 mm) on centers vertically.
 5. Locate furring channels around perimeter of openings and secure to surfaces.
- I. Control Joints:
1. Construct metal framing as indicated by installation quality standard to allow gypsum board control joints to function as intended.
 2. For control joints located in fire resistance rated walls and partitions, construct of metal studs and mineral wool, full height of partition, according to assembly fire test reports.
- J. Installation Tolerances: Install each metal stud metal framing and furring member so that fastening surfaces do not vary more than 1/8 in (3 mm) from plane formed by faces of framing members.

3.6 INSTALLING GYPSUM BOARD PRODUCTS

A. General Requirements:

1. Install type of gypsum board at location indicated by gypsum board schedule at end of this Section.
2. Do not install damaged gypsum boards.
3. Install gypsum boards with finishable face side out.
4. Butt gypsum boards together for a light contact at edges and ends with not more than 1/16 in (1.5 mm) of open space between panels.
5. Do not force gypsum boards into place.
6. Do not place tapered edges against cut edges or ends.
7. Locate panel joints so that no joint will align with the edge of an opening unless control joints are installed at these locations.

B. Isolation from Building Structure:

1. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments or surfaces where movement is anticipated. Provide 1/4 in to 1/2 in (6 mm in 12 mm) wide spaces at these locations or as indicated below:
 - a. At top of wall or where partitions intersect open building structure members projecting below underside of floor slabs and roof decks, cut to fit profile formed by coffers, joists, beams, and other structural members; form proper annular joint to receive firestopping at rated partitions and form 3/4 in (20 mm) joint at top of wall at non-rated partitions.
2. Trim edges with edge trim where edges of gypsum boards are exposed.
3. Seal joints between edges and abutting structural surfaces with firestopping at rated locations and acoustical sealant at non-rated locations.

C. Single-Layer Board Assemblies:

1. At typical conditions, install gypsum board vertically (long dimension parallel to metal framing), to minimize short end-to-short end joints unless otherwise indicated or required by assembly fire test reports.
2. At interior of stairwells and other high walls, install gypsum boards horizontally, unless otherwise indicated or required by assembly fire test reports. Stagger abutting end joints not less than one framing member in alternate courses of gypsum boards.

D. Typical Wall Applications:

1. Attach gypsum boards to metal studs so that leading edge or end of each board is attached to open (unsupported) edges of stud flanges first.
2. Stagger vertical joints on opposite sides of partitions.
3. Do not make joints other than control joints at corners of framed openings.
4. Cover both faces of metal framing with gypsum boards as indicated, except in chase walls that are braced internally.
5. Cut and fit gypsum boards around ducts, pipes, conduits, and other penetrations to form proper annular joint to receive firestopping at rated partitions.
 - a. At non-rated partitions, annular space around ducts, pipes, conduit or other penetrations to be properly sized to receive sealant; 3/4 in (20 mm) maximum.
 - b. "Blow-out" patches are not allowed.

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6. Support both edge and end joints of gypsum boards over metal framing.

E. Screw Attachments:

1. Attach gypsum board to metal framing with screw fasteners of type appropriate for gypsum board materials and installation conditions:
 - a. Length shall be as required by condition and penetrating metal framing not less than 3/8 in (10 mm).
 - b. Spacing shall be as recommended by installation quality standard, gypsum board manufacturer, or respective assembly test report.
 - c. Use properly adjusted, positive-clutch electric power tool equipped with adjustable screw-depth head and a Phillips bit. Nails and staples are not permitted.
2. Drive screws to slightly dimple surface without breaking face paper, fracturing core, or stripping metal framing member around screw shank.
3. Space screws for non-fire resistance rated partitions and ceilings as recommended by installation quality standards.
4. Space screws for fire resistance rated partitions as required by assembly fire test reports.
5. Start field screwing near center and work towards edges.
6. Space screws not less than 3/8 in (10 mm) from gypsum boards edges.
7. Do not attach gypsum boards to top runner where wall or partition extends to building structure unless required by fire test reports.

- F. Control Joints: Form control joints and expansion joints at locations indicated with required space between edges of adjoining gypsum boards.

- G. Sound Attenuation Blankets: Install blankets within stud cavities set so that they are held in place by friction with metal studs; ensure blankets are secure within cavity and will not become displaced when second gypsum board side is closed.

H. Sealant:

1. Comply with ASTM C 919 and manufacturers written recommendations for closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
2. Seal wall assemblies at perimeters, behind control joints, and at openings and penetrations with a continuous bead of sealant material according to following:
 - a. Fire Resistance Sealant: Joints within fire resistance rated assemblies.
 - b. Water Resistance Sealant: Joints within non-fire resistance rated assemblies exposed to possible water infiltration.
 - c. Acoustical Sealant: All other joints.

3.7 INSTALLING TRIM ACCESSORIES

- A. General: Fasten trim accessories continuously according to accessory manufacturer's instructions using gypsum board screws; installation by clinch-on tool and staples not permitted.
- B. Interior Trim Accessories: Install in the following locations:

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1. Corner Beads: Install trim at external corners; use screws at each flange at 9 in (225 mm) on centers, opposite each other.
2. Edge Trim: Install trim where gypsum boards abut dissimilar material, and where edge of gypsum boards would otherwise be exposed; use screws at flange at 9 in (225 mm) on centers.
 - a. LC-Bead (J-Bead): Install trim at exposed conditions where back flange can be attached to framing or supporting substrate before gypsum board installation.
 - b. L-Bead: Install trim at exposed conditions where trim can only be installed after gypsum board installation.
 - c. J-Stop: Install trim at concealed conditions where trim can only be installed after gypsum board installation.
3. Control Joints: Install trim at appropriate locations, ensuring gypsum board is not continuous over joint; use screws at each flange at 6 in (150 mm) on centers.
 - a. Control joints to extend 4 in (100 mm) above finished ceiling at non-rated conditions and extend to structure at rated wall conditions.

3.8 FINISHING GYPSUM BOARD PRODUCTS

- A. General: Treat board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare surfaces for decoration.
- B. Joint Tape: Finish joints according to following:
 1. Typical Paper-Faced Gypsum Board: Paper.
 2. Moisture-Resistant Paper-Faced Gypsum Board: Mesh tape.
- C. Finishing: Finish boards and units to achieve specified level of finish as indicated in schedule at end of Section:
 1. Typical Paper-Faced Gypsum Board: Either or combination of the following as recommended by manufacturer:
 - a. Setting-type joint compounds.
 - b. Drying-type joint compounds.
 2. Moisture-Resistant Paper-Faced Gypsum Board: Setting-type joint compounds.

3.9 ADJUSTMENTS

- A. Damaged Materials: Stored or installed gypsum board materials shall be classified as damaged, defective, and nonconforming Work if they have been exposed to wetness or dampness at any time prior to Substantial Completion or if they exhibit evidence of active or dormant mold or mildew. Damaged materials and assemblies shall be replaced with new and dry materials and assemblies.

3.10 PROTECTION

- A. Procedures: Protect products and systems from damage during installation and remainder of construction period according to manufacturer's instructions.

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3.11 METAL FRAMING SCHEDULE

A. Metal Stud Framing Schedule:

1. Stud Depth: As indicated on Drawings.
2. Spacing: Maximum 16 in (400 mm) on centers, unless otherwise indicated, or as required to comply with respective assembly test report.
3. Minimum Performance Requirements: Lateral pressure loads (lb/sq ft) are allowable design values and shall not be reduced further by load combinations. Minimum performance requirements unless otherwise indicated:
 - a. Typical Partitions: L/240 at 5 lb/sq ft (239 Pa) lateral load.
 - b. Partitions with Tile Facing: L/360 at 7.5 lb/sq ft (359 Pa) lateral load.
 - c. Partitions supporting all other Concentrated Loads: Provide delegated engineering to comply with L/360 at 10 lb/sq ft (479 Pa) lateral load
4. Minimum Uncoated Base Metal Thickness:
 - a. Typical Gypsum Board Assemblies: As determined by manufacturer's limiting height engineering data unless otherwise indicated.
 - 1) 22 Gage Studs: Typical partitions unless otherwise indicated.
 - 2) 20 Gage or 20 Gage Equivalent Studs:
 - a) Partitions supporting ceramic tile.
 - b) Partitions with gypsum board on one side only.
 - c) At door jambs.
 - d) Partitions supporting wall hung cabinets or shelving.
 - 3) 20 Gage Equivalent Studs: Allowed only if part of a tested assembly.
 - b. Gypsum Board Assemblies required to Withstand Seismic Loads: As required by delegated engineering review but not less than minimum uncoated base metal thickness indicated above.

3.12 GYPSUM BOARD SCHEDULE

- A. Gypsum Board Schedule, General: Install the designated gypsum board product based on exposure classification to water and / or moisture and applied finish system as follows, unless otherwise indicated or scheduled on the Drawings.
- B. No Exposure: Surfaces not normally exposed to water and / or moisture sources including but not limited to the following:
 1. Typical walls and ceilings.
 - a. Paint and Wall Coverings Only: Typical paper-faced gypsum board.
 - b. Tile: Moisture-resistant coated-glass-mat gypsum board.
- C. Incidental Exposure: Surfaces immediately adjacent to water and / or moisture sources including, but not limited to, the following locations:
 1. Walls and ceilings in mechanical equipment rooms and janitor closets.

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2. Walls within 24 inches of centerline of drinking fountains, isolated wall-hung lavatories, and countertop sinks and other similar water sources.
 3. Interior face of exterior walls.
 4. Acceptable gypsum board products for the above listed conditions:
 - a. Paint: Moisture-resistant paper-faced or moisture-resistant paperless glass-mat gypsum board.
 - b. Tile: Moisture-resistant coated-glass-mat gypsum board.
 5. Top of walls above ceilings adjacent to mechanical equipment in corridors.
 - a. Moisture-resistant paperless glass-mat gypsum board.
- D. Direct Exposure: Surfaces normally soaked, saturated, or regularly and frequently exposed to water and / or moisture including, but not limited to, the following locations:
1. Walls and ceilings in toilet rooms and bathrooms including showers:
 - a. Paint: Moisture-resistant paper-faced or moisture-resistant paperless glass-mat gypsum board.
 - b. Tile: Moisture-resistant coated-glass-mat gypsum board.

3.13 GYPSUM BOARD FINISHING SCHEDULE

- A. Gypsum Board Finishing Schedule, General: Finish panels to Levels of Finish indicated below. Apply joint tape over panel joints, except those with trim having flanges not intended for tape. Sand between coats and after last coat to produce a surface free of defects and ready for applied finish system.
1. Levels of Finish: According to ASTM C 840.
- B. Preparation: Apply joint compound at open joints, panel edges, and damaged surface areas.
- C. Level 1: At following locations, embed tape at joints in joint compound unless a higher level of finish is required for fire resistance rated assemblies. Trim accessories to be installed but not embedded in joint compound unless required for fire rating:
1. Ceiling plenum areas above ceilings.
 2. Concealed areas.
- D. Level 5: At following locations, embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound or Level 5 Primer and Surfacer over entire surface:
1. Areas to receive paint.

END OF SECTION

SECTION 095113

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Acoustical lay-in ceiling panels, exposed metal suspension systems, and supplementary items necessary for installation.

1.2 DELEGATED ENGINEERING REQUIREMENTS FOR SUSPENDED CEILING ASSEMBLIES WITHSTANDING SEISMIC LOADS

- A. Contract Documents Design Intent: Drawings and Specifications indicate design intent for products and systems and do not necessarily indicate or specify total Work required. Contract Documents shall not be construed as an engineered design; furnish and install all Work required for a complete installation.
- B. Delegated Engineering Responsibility: Contractor shall provide engineering for products and systems including attachment to building structure required to meet design intent of Contract Documents.
 - 1. Preparation of structural analysis data including engineering calculations, shop drawings and other submittals signed and sealed by the qualified professional engineer.

C. Coordination of Work:

- 1. Product Variations: In the event of minor differences between products and systems of acceptable or available manufacturers, Contractor shall notify Architect of such differences and resolve conflicts in a timely manner. Failure of Contractor to provide notification shall be construed as acceptance of conditions indicated, and changes caused by minor differences between products and Contract Documents shall be included in the Work at no additional cost to Owner.
- 2. Allowable Adjustments: Minor dimension and profile adjustments may be made in interest of fabrication or erection methods or techniques or ability to satisfy design intent, provided design intent is maintained as determined by Architect. Proposed deviations shall include a detailed analysis of impact to adjacent substrates or other building systems, including related design or construction cost impacts. If accepted by Architect, deviations causing changes in materials, constructability, substrates, or conditions shall be included in the Work at no additional cost to Owner.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.
- B. Shop Drawings for Engineered Suspended Ceiling Assemblies - Seismic Loads: Show details

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of fabrication and installation, including plans, elevations, sections, details of components and attachments to other work showing suspended ceiling assemblies required to support concentrated loads; include seal and signature of delegated engineering professional responsible for their preparation.

- C. Product Schedule: Use same designations indicated on the Finish Schedule and Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Delegated Engineering Calculations: Informational submittal for products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: To include in maintenance manuals.

1.6 QUALITY ASSURANCE

1.7 PRE-INSTALLATION CONFERENCE

- A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.9 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed.
 - 1. Armstrong World Industries, Inc.
 - 2. CertainTeed Corporation.
 - 3. Chicago Metallic Corporation.
 - 4. USG Interiors, Inc.; Subsidiary of USG Corporation.

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- B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. The products scheduled on the drawings are to match the facility design. No substitutions shall be accepted for panels.

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.
1. Obtain both acoustical ceiling panels and suspension system from the same manufacturer if both are offered by the manufacturer.

2.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Products and systems shall be engineered to withstand loads within limits of allowable working stresses of the materials involved under conditions indicated and without permanent deformation or failure of materials.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 450 or less.
- C. Seismic Standards: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
1. ASCE/SEI 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
2. ASTM E 580, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.

2.4 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance's, unless otherwise indicated.
1. Selections: As scheduled- no substitutions.

2.5 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- C. Attachment Devices: Size for five times design load indicated in ASTM C 635/C 635, Table 1, Direct Hung, unless otherwise indicated.

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1. Comply with seismic design requirements.
2. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Cast-in-place anchors, designed for attachment to concrete.
 - b. Post-installed expansion anchors.
 - c. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 for Class SC1 service condition.
3. Powder-Actuated Anchors: Suitable for application indicated, ANSI A10.3; low velocity, powder-actuated fasteners; drive pins and clip angles fabricated from corrosion-resistant materials, with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, an ultimate load capacity not less than 10 times that imposed by construction as determined by testing according to ASTM E 1190 by a qualified independent testing agency.
 - a. Manufacturers:
 - 1) Construction Materials, Inc.
 - 2) Heckman Building Products, Inc.
 - 3) Hilti Corp.
 - 4) ITW Ramset/Red Head.
 - 5) Powers Fasteners.
 - 6) Simpson Strong Tie Anchor Systems.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Wire:
 - a. Zinc-Coated Carbon-Steel Wire: ASTM A 641 / A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106 in (2.69 mm) diameter wire.

E. Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces and complying with requirements of authorities having jurisdiction or as recommended by manufacturer.

F. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces and complying with requirements of authorities having jurisdiction.

G. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in-place and complying with requirements of authorities having jurisdiction.

2.6 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILINGS

A. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll

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formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653 / A 653M, not less than G30 (Z90) coating designation, with prefinished 15/16 in (24 mm) wide metal caps on flanges.

1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: Override (stepped) type.
3. Face Design: Flush face.
4. Cap Material: Steel sheet.
5. Cap Finish: Painted white, unless indicated otherwise.
6. Manufacturers and Products:
 - a. Armstrong World Industries, Inc.; Prelude XL.
 - b. CertainTeed Corporation; Classic Stab.
 - c. Chicago Metallic Corporation; 1200 System.
 - d. USG Interiors, Inc.; Donn DX.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 1. Respective manufacturer's written installation instructions.
 2. Accepted submittals.
 3. Contract Documents.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.
- B. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors. Furnish cast-in-place anchors and similar devices to other trades for installation well in advance of time needed for coordinating other work.
- C. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

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3.4 INSTALLATION OF ACOUSTICAL PANEL CEILINGS

- A. Installation Quality Standard: In addition to standards listed elsewhere, perform suspended ceiling work according to following, unless otherwise specified in this Section:
1. ASCE/SEI 7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
 2. ASTM E 580 / E 580M, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
- B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with mechanical and electrical equipment, insulation, or other objects within ceiling plenum that are not part of supporting structural frame or ceiling suspension system. Within limitations allowed by installation quality standards, splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by installation quality standards.
 3. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 4. Do not support ceilings directly from permanent metal forms. Fasten hangers to cast-in-place hanger inserts, power-actuated fasteners, or drilled-in anchors that extend through forms into concrete.
 5. Do not attach hangers to steel deck tabs.
 6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 7. Space hangers not more than 48 in (1200 mm) on center along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 in (200 mm) from ends of each member.
 8. Do not connect or suspend any ceiling components from ducts, pipes or conduit.
 9. Do not make local kinks or bends in hanger wires as a means of leveling.
- C. Install edge moldings and trim at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Screw attach moldings to substrate at intervals not more than 16 in (400 mm) on center and not more than 3 in (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 in per 12 ft (3 mm per 3.6 m). Miter corners accurately and connect securely.
 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
 3. Provide control joints where joints occur in abutting surfaces.
 4. Hold tees in place with concealed clips.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
1. Space steel main runners at 48 in (1200 mm) on center.

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- E. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. Arrange directionally patterned acoustical panels with pattern running in one direction parallel to long axis of space.
 - 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
 - 3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 - 4. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.
 - 5. Paint cut panel edges remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.5 PROTECTION

- A. Protect products and systems from damage during installation and remainder of construction period according to manufacturer's instructions.

3.6 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

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SECTION 096500

RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Resilient flooring products and systems and supplementary items necessary for installation.
 - 1. Resilient sheet flooring.

1.2 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, recommended adhesives, construction details, installation instructions, and recommendations for maintenance.

1.3 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Project Acceptance Document: Certification by the manufacturer that its product(s) are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required.
 - 1. Product Compatibility: On installations incorporating products provided by more than one manufacturer, each manufacturer's certificate shall include specific reference to and approval of the other manufacturer's products.

1.4 QUALITY ASSURANCE

- A. Slip Resistance: Provide products identical to those tested for slip resistance per ASTM D 2047 with a static coefficient of friction not less than 0.6 for level surfaces and 0.8 for ramped surfaces.
- B. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux: Class I, 0.45 W/sq. cm or greater when tested per ASTM E 648.
 - 2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E 662.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store flooring products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C).
 - 1. Resilient Sheet Flooring: Store sheet flooring rolls upright.

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1.6 PROJECT CONDITIONS

- A. Maintain flooring products prior to installation at the same temperature as the space where they are to be installed.
- B. Close spaces to traffic during flooring installation and for time period after installation recommended by manufacturer.
- C. Install flooring products after other finishing operations, including painting, have been completed.
- D. Do not install flooring over concrete substrates until slabs have cured and are sufficiently dry to bond with adhesive, as determined by flooring manufacturer's recommended tests. Refer to "Preparation" Article for requirements.

1.7 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".
 - 1. Vinyl Flooring:
 - a. Mannington Mills, Inc.
- B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. Other manufacturers offering products having equivalent characteristics may be considered, provided deviations are minor and comply with requirements of Contract Documents as judged by the Architect.
 - 1. Selections: As scheduled.

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

2.3 RESILIENT SHEET FLOORING MATERIALS

- A. Vinyl Sheet Floor Coverings: ASTM F 1303, Type I or II, Grade 1, Class A (fibrous) or B (nonfoamed plastic) backing or ASTM F 1913 unbacked as required by product selection.
- B. Sheet Flooring Thickness: 0.125 in (3 mm).

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- C. Heat-Welding Seam Bead: Solid-strand product of floor covering manufacturer for heat welding seams.
 - 1. Selections: As scheduled.
- D. Integral Cove Base Accessories: Resilient accessories recommended by flooring manufacturer with selections as follows:
 - 1. Basis of Design: Burke Mercer Flooring Products; Division of Burke Industries, Inc.
 - a. Cap Strip: Metal cap, match existing style and finish.
 - b. Cove Strip: No. 070 flexible vinyl cove stick with nominal 1 in (25 mm) radius.
 - c. Reducer: No. 633 vinyl reducer, 1 in (25 mm) wide by 1/8 in (3 mm) high.

2.4 ACCESSORY MATERIALS

- A. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, Portland-cement-based formulation provided or approved by flooring manufacturer for products and applications indicated.
- C. Adhesives: Water-resistant type recommended by flooring manufacturer suitable for products, applications, and substrate conditions indicated.
 - 1. Product Compatibility: Provide Manufacturer's written recommendation for each product within an assembly. On installations incorporating products provided by more than one manufacturer, each manufacturer shall approve in writing all adhesives that are in contact with their products.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective manufacturer's written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.

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3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that concrete substrates are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- D. Broom and vacuum clean substrates to be covered immediately before flooring product installation. After cleaning, reexamine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.4 INSTALLATION OF RESILIENT FLOORING, GENERAL

- A. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.
- B. Scribe, cut, and fit flooring to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- C. Extend flooring into toe spaces, door reveals, closets, and similar openings. Extend flooring to center of door openings.
- D. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on substrate. Use chalk or other nonpermanent, non-staining marking device.
- E. Adhere flooring to substrates using a full spread of adhesive applied to substrate to comply with flooring manufacturer's written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
 - 1. Provide completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- F. Hand-roll flooring in both directions from center out to embed flooring in adhesive and eliminate trapped air according to manufacturer's written instructions. At walls, door casings, and other locations where access by roller is impractical, press flooring firmly in place with flat-bladed instrument.

3.5 INSTALLATION OF RESILIENT SHEET FLOORING

- A. Unroll sheet flooring and allow it to stabilize before cutting and fitting, if recommended in writing by manufacturer.
- B. Lay out sheet flooring to comply with the following requirements:

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1. Maintain uniformity of sheet flooring direction.
 2. Arrange for a minimum number of seams and place them in inconspicuous and low-traffic areas, and not less than 6 in (150 mm) away from parallel joints in flooring substrates.
 3. Match edges of sheet flooring for color shading and pattern at seams according to manufacturer's written recommendations.
 4. Avoid cross seams.
- C. Integral Cove Base: Form integral cove base by flashing sheet flooring up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt flooring at top of base against cap strip.
- D. Heat-Welded Seams: Rout joints and heat weld with welding bead, permanently fusing sections into seamless flooring. Prepare, weld, and finish seams according to manufacturer's written instructions and ASTM F 1516 to produce surfaces flush with adjoining flooring surfaces.

3.6 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing flooring products:
1. Remove adhesive and other surface blemishes from exposed surfaces using cleaner recommended by flooring manufacturer.
 2. Sweep or vacuum floor thoroughly.
 3. Do not wash floor until after time period recommended by flooring manufacturer.
 4. Damp-mop floor to remove marks and soil.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods recommended in writing by flooring manufacturer.
1. Cover products installed on floor surfaces with undyed, untreated building paper until just prior to Substantial Completion.
 2. Do not move heavy and sharp objects directly over floor surfaces. Place plywood or hardboard panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION

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SECTION 099100

PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Surface preparation and field painting of exposed interior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where indicated that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels, unless indicated otherwise.
 - 1. Prefinished items include the following factory-finished components:
 - a. Prefinished wood doors.
 - b. Acoustical materials.
 - c. Prefinished Architectural woodwork and cabinets.
 - d. Elevator equipment.
 - e. Finished mechanical and electrical equipment.
 - f. Light fixtures.
 - g. Distribution cabinets.
 - h. Baked enamel coated items.
 - i. Fluorocarbon coated items.
 - j. Integral colored plaster.
 - k. Integral colored PVC.
 - 2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Ceiling plenums.
 - d. Utility tunnels.
 - e. Pipe spaces.
 - f. Duct shafts.
 - g. Elevator shafts.
 - 3. Finished metal surfaces include the following:
 - a. Anodized aluminum.

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- b. Stainless steel.
 - c. Chromium plate.
 - d. Copper and copper alloys.
 - e. Bronze and brass.
4. Operating parts include moving parts of operating equipment and the following:
- a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- a. Embossed UL labels may be used and painted where acceptable to authority having jurisdiction

D. Related Sections:

- 1. Division 09 Section "Gypsum Board Assemblies" for surface preparation of gypsum board assemblies.

1.2 DEFINITIONS

- A. Interior Painting: Generally includes surfaces located in conditioned spaces.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, installation instructions, and recommendations for maintenance.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.5 PROJECT CONDITIONS

- A. Apply paints only when temperatures of surfaces to be painted and surrounding air are between minimum and maximum range recommended by manufacturer.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

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1.6 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".
 - 1. Sherwin-Williams Company (The). **No substitutions – preferred Vendor agreement**
- B. Color and Gloss: As scheduled.

2.2 PAINT, GENERAL

- A. Source Limitations: Obtain field applied primers for each coating system from the same manufacturer as the finish coats.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to shop applicators to ensure use of compatible primers.

3.2 INSTALLATION

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform work according to the following, unless otherwise specified in this Section:
 - 1. Respective manufacturer's written installation instructions.
 - 2. Approved submittals.
 - 3. Contract Documents.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations and specifications for cleaning and surface preparation. Surfaces shall have no defects or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

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- B. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- C. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates, unless expressly permitted by authorities having jurisdiction for labels intended to be painted.
- D. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- E. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
 - 1. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
- F. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

3.4 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items, equipment, and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items, equipment, or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. The number of coats and film thickness required are the same regardless of application method.
 - 5. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 - 6. Omit primer over metal surfaces that have been shop primed and touchup painted.
 - 7. Allow sufficient time between successive coats to permit proper drying.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat. Tint per manufacturer's technical data for each type of primer or undercoat.

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- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve total dry film thickness of the entire system as recommended by manufacturer.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
- E. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces to match approved samples.

3.6 INTERIOR PAINTING SCHEDULE

- A. Steel Substrates:
 - 1. Institutional Low-Odor/VOC Latex System: MPI INT 5.1S.
 - a. Prime Coat: Sherwin Williams, Pro-Cryl Universal Primer.
 - b. Intermediate Coat: Sherwin Williams, Promar 200, semi-gloss
 - c. Topcoat: Sherwin Williams, Promar 200, semi-gloss
 - d. Colors: As noted in the finish schedule
- B. Gypsum Board Substrates:
 - 1. Institutional Low-Odor/VOC Latex System: MPI INT 9.2M.
 - a. Prime Coat: Sherwin Williams, Pro-Cryl Universal Primer.
 - b. Intermediate Coat: Sherwin Williams, Promar 200, semi-gloss
 - c. Topcoat: Sherwin Williams, Promar 200, semi-gloss
 - d. Colors: As noted in the finish schedule

END OF SECTION

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Sherwin Williams Contractor Job Tracking Form

To be included in Contractor Bid Package

Instructions for Contractor:

- Please complete this form with as much information as available
- If you have an assigned Sherwin Williams Sales Representative or a Home store that services, your account please contact them directly with this form
- If you do not have a Sherwin Williams assigned account manager, please email this form to Michael.J.Koncilja@Sherwin.com
- This form must be forwarded to Sherwin Williams prior to the start of any Capital Expenditure Project
- A job account must be assigned for every project

Instructions for Sherwin Williams Employees:

- Upon receiving this form please open a job account for the paint contractor
- The job account must read as follows: Intermountain Healthcare/Name of City/ Project Name
- A job account is strictly required for all IHC related projects
- Upon opening an IHC job account, an email containing the 9 digit job account number is to be sent to Michael.J.Koncilja@Sherwin.com for tracking purposes
- A request for this project to be linked to Parent #5540 will be communicated
- All Purchases associated with said project are to be made on this job account only

Project Tracking Form

Name of Contractor: _____

Sherwin Williams Account number (Existing): _____

IHC Job Account number (To be assigned): _____

Name and Address of IHC related

Project: _____

Name/Store of Sherwin Williams

Contact: _____

Estimated Materials Needed: _____

Estimated Project Start Date: _____

Additional Comments/Needs of Contractor: (I.E renderings needed,
drawdowns required, Special environmental
restrictions.) _____

SECTION 102115

IV TRACKS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work required for this section includes IV tracks and supplementary items necessary to complete their installation.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications to evidence compliance with these specifications.
- B. Shop Drawings:
 - 1. Show details of the system, related construction and reflected layout of ceiling areas showing location of tracks in relation to other ceiling mounted items.
 - 2. Indicate materials, finishes, dimensions, thicknesses and/or gages of parts, reinforcement, where applicable, and anchorage including items of hardware and accessories necessary for complete installation.
- C. Schedule: Use same room designations as indicated on Drawings.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each product if specified to include in maintenance manuals specified in Division 01.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install specialties until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where products and systems are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".

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- B. Available Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, manufacturers offering products that may be incorporated into the Work include, but are not limited to, those listed.

1. C/S Cubicle Curtains.
2. Imperial Fastener Company, Inc.
3. InPro Corporation.
4. A. R. Nelson Co.
5. Salsbury Industries.

2.2 IV SUPPORT SYSTEMS

- A. Extruded-Aluminum IV Track: Not less than 1-1/4 in (32 mm) wide by 3/4 in (19 mm) high; with minimum wall thickness of 0.058 in (1.47 mm).
1. Finish: Baked enamel, acrylic, or epoxy, white color.
- B. IV Carriers: Four nylon rollers and steel or stainless-steel axles, with hanger loop fabricated from 1/4-inch- diameter stainless steel.
- C. Telescoping IV Hangers: 3/4 in (19 mm) stainless-steel main shaft and a 3/8 in (10 mm) stainless-steel inner shaft, vertically adjustable 16 in (400 mm); with 4 non folding 1/4 in (6 mm) stainless-steel arms with loops and a stainless-steel top loop to attach to carrier.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of work.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install tracks level and plumb, according to manufacturer's written instructions. Provide track fabricated from one continuous length up to 16 feet.
1. Track Mounting:
 - a. Ceilings Heights 9'-0" and Less: Surface.
 - b. Ceilings Heights Greater than 9'-0": Suspended.
- B. Surface Track Mounting: Fasten surface-mounted tracks at intervals of not less than 24 in (600 mm). Fasten support at each splice and tangent point of each corner. Center fasteners in track to ensure unencumbered carrier operation. Mechanically fasten to suspended ceiling grid with screws.

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- C. Suspended Track Mounting for High Ceilings: At ceiling heights greater than 9'-0" Install track with suspended supports at intervals of not more than 48 in (1200 mm). Fasten support at each splice and tangent point of each corner. Secure ends of track to wall with flanged fittings or brackets.
- D. Track Accessories: Install splices, end caps, connectors, end stops, coupling and joining sleeves, and other accessories as required for a secure and operational installation.
- E. IV Hangers: Unless otherwise indicated, install one IV hook on each IV track and hang one telescoping IV hanger.

END OF SECTION

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SECTION 102613

WALL AND CORNER GUARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Scope: Impact-resistant wall protection systems, wall and corner guards, and supplementary items necessary for installation.

1.2 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, physical characteristics such as durability, resistance to fading, and flame resistance, construction details, installation instructions, and recommendations for maintenance
- B. Shop Drawings: Show details of fabrication and installation, including plans, elevations, sections, details of components and attachments to other work. Distinguish between shop and field-assembled work
- C. Plastic Samples for Verification Purposes: Submit for following products showing full range of color and texture variations expected in each wall protection system component:
 - 1. Wall Guards: 12 in (300 mm) long samples of each type of component indicated; include examples of joinery, corners, and field splices.
 - 2. Corner Guards: 12 in (300 mm) long samples of each type of component indicated; include examples of joinery.
 - 3. Wall Protection: 12 in (300 mm) square samples of each wall protection system component required with 6 inch long samples of moldings and trims.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Include for each wall protection system component to include in maintenance manuals specified in Division 1. Include recommended methods and frequency for maintaining optimum condition of plastic covers under anticipated traffic and use conditions, and precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.
 - 2. Supervision: Installer shall maintain a competent supervisor at Project while the Work is in progress, and who has not less than 5 years of experience installing products and systems similar to scope of this Project.

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- B. Fire-Test-Response Characteristics: Provide wall protection system components with surface-burning characteristics indicated, as determined by testing identical materials according to ASTM E 84 by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify wall protection system components with appropriate markings of applicable testing and inspecting agency.
- C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1.5 PRE-INSTALLATION CONFERENCE

- A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.
 - 1. Record discussions, including decisions and agreements, and prepare report.

1.6 COORDINATION

- A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements of Contract Documents as judged by the Architect, manufacturers offering products that may be incorporated into the Work include, but are not limited to, those listed.
 - 1. Construction Specialties, Inc. (C/S Group) **(Match existing – no substitutions unless different manufacturer is noted specifically for separate material matching)**
- B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. **INTENT IS TO MATCH THE MATERIALS AND MANUFACTURER USED IN THE HOSPITAL, unless noted otherwise.**

2.2 MATERIALS, GENERAL

- A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

2.3 MATERIALS

- A. Engineered PETG (Polyethylene Terephthalate Glycol) Material: Textured, chemical- and stain-resistant, high-impact-resistant co-polymer plastic with integral color throughout; PVC-free with no PBTs or BPA, extruded and sheet material, thickness as indicated.
 - 1. Impact Resistance: Minimum 25.4 ft-lbf/in. (1356 J/m) of notch when tested according to ASTM D 256, Test Method A.
 - 2. Chemical and Stain Resistance: Tested according to ASTM D 543 or ASTM D 1308.
 - 3. Self-extinguishing when tested according to ASTM D 635.
 - 4. Flame-Spread Index: 25 or less.
 - 5. Smoke-Developed Index: 450 or less.

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6. Color and Texture: As scheduled or as indicated in Design Selections.

- B. Aluminum Extrusions: Alloy and temper recommended by manufacturer for type of use and finish indicated, but with not less than strength and durability properties specified in ASTM B 221 (ASTM B 221M) for Alloy 6063-T5.
- C. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.
- D. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer.

2.4 WALL AND CORNER GUARDS

- A. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. Other manufacturers/fabricators offering products having equivalent characteristics may be considered, provided deviations are minor and comply with requirements of Contract Documents as judged by the Architect.

1. Manufacturers and Products: As scheduled.

2.5 PLASTIC / ALUMINUM RETAINER TYPE WALL GUARDS

- A. Drawing Designations CR-1, Surface-Mounted Crash Rail Type Wall Guards:

1. Description:

- a. Cover: Snap-on type, extruded plastic; nominal 0.078 in (1.98 mm) thick; continuous in profile indicated.
- b. Mounting Retainer: Continuous extruded aluminum retainer; nominal 0.062 in (1.57 mm) thick; with continuous rubber or vinyl bumper material horizontally in retainer.
- c. Accessories: Prefabricated, injection-molded matching end caps, inside and outside corners with concealed splices, mounting hardware and other accessories as required.

2. Product Standards:

- a. Drawing Designation CR-1: C/S Group; SCR-F-64M.

2.6 PLASTIC / ALUMINUM RETAINER TYPE CORNER GUARDS

- A. Drawing Designations CG-1, Surface-Mounted Corner Guards:

1. Description:

- a. Cover: Snap-on type, extruded plastic; nominal 0.078 in (1.98 mm) thick; continuous in profile indicated with 1/4 inch corner radius.
- b. Retainer: Continuous extruded aluminum retainer; nominal 0.070 in (1.78 mm) thick.
- c. Accessories: Prefabricated, injection-molded matching top cap with concealed splices, mounting hardware and other accessories as required.

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2. Product Standards:

- a. Drawing Designations CG-1: C/S Group; SM-20, partial height as indicated by drawing designation.

2.7 PLASTIC WALL PROTECTION

A. Drawing Designation WP - Surface-Mounted Plastic Wall Protection:

- 1. Description: Fabricated from nominal 0.060 in (1.52 mm) thick extruded plastic sheets; with match wainscot and joint moldings and outside and inside corner trims as required.
- 2. Mounting Method: Adhesive.
- 3. Product Standard: C/S Group; Acrovyn.

2.8 FABRICATION

A. General Requirements: Fabricate wall protection system components to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including thicknesses of components.

- 1. Preassemble components in shop to greatest extent possible to minimize field assembly.
- 2. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective manufacturer/fabricator's written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

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3.4 EXAMINATION

- A. Acceptance of Conditions: Examine substrate surfaces to which wall protection system components will be installed for compliance with requirements, installation tolerances and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance.

3.5 INSTALLATION

- A. General: Install impact-resistant wall protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
 - 1. Install impact-resistant wall protection units in locations and at mounting heights indicated on Drawings.
 - 2. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.
 - a. Provide anchoring devices to withstand imposed loads.
 - b. Where splices occur in horizontal runs of more than 20 ft (6.1 m), splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 in (300 mm).
 - c. Adjust end and top caps as required to ensure tight seams.
- B. Impact-Resistant Wall Covering: Install top and edge moldings, corners, and divider bars as required for a complete installation.

3.6 CLEANING

- A. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

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SECTION 117000

MEDICAL EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Work of this Section includes related wall support, mechanical and electrical connections for medical equipment provided by Owner.
- B. Medical equipment information at the end of this Section is for reference only.

1.2 ACTION SUBMITTALS

- A. Product Data: Furnished by Owner.
- B. Shop Drawings: Contractor shall furnish shop drawings of equipment installation when necessary to ensure coordination of the Work.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED / OWNER INSTALLED EQUIPMENT

- A. Products: Identified as "OFOI". Product is provided by Owner and installed by Owner.
- B. Contractor Responsibilities: Limited to interface, surface preparations and utilities indicated on the Drawings or specified in the Specifications.

2.2 OWNER FURNISHED / CONTRACTOR INSTALLED EQUIPMENT

- A. Products: Identified as "OFCI". Product is provided by Owner and installed by the Contractor.
- B. Contractor Responsibilities: Provide labor, transportation, materials, tools, appliances and utilities necessary for the following:
 - 1. Transportation of product from Owner's facility to the job site.
 - 2. Receiving and storage of product.
 - 3. Installation of product, complete and in operating condition, including adjusting and calibration of product as necessary for proper operation.
 - 4. Testing of product.
 - 5. Paying of fees, licenses, and taxes in conjunction with installation of the product.
 - 6. Roughing-in and final utility connections for product remain the work of specification sections governing the specific utility.

2.3 CONTRACTOR FURNISHED / CONTRACTOR INSTALLED EQUIPMENT

- A. Products: Identified as "CFCI". Product is provided by Contractor and installed by Contractor.

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- B. Contractor Responsibilities: Furnish equipment and installation as indicated in other specification sections.

2.4 OWNER FURNISHED / VENDOR INSTALLED EQUIPMENT

- A. Products: Identified as "OFVI". Product provided by Owner, and installed by Owner's vendor.
- B. Contractor Responsibilities: Limited to interface, surface preparations and utilities indicated on the Drawings or specified in the Specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. For Contractor installed medical equipment, examine substrate surfaces to receive medical equipment and associated work and conditions under which work will be installed. Do not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the Installer. Starting of work within a particular area will be construed as installer's acceptance of surface conditions.

3.2 PREPARATION

- A. Coordinate work of this Section with related work of other Sections to obtain proper installation of items. Become acquainted with the work of other Sections whose work abut, adjoin or are in any way affected by or related to work under this Section.
- B. Carefully examine the drawings and directions and be responsible for proper installation of materials and product without substantial changes.
- C. Indication of pipe connection sizes on the plans shall in no way relieve Contractor of the responsibility of checking and verifying their sizes and locations from the actual product to be installed and any available roughing-in diagrams.

3.3 SCOPE OF WORK

- A. Back-up Support: Provide wall reinforcing, backing and bracing for wall mounted equipment.
- B. Concrete: Provide work indicated or required including, but not limited to, the following:
 - 1. Housekeeping pads.
 - 2. Trenches.
 - 3. Anchor bolts.
 - 4. Vibration isolation devices.
 - 5. Core drilling.
 - 6. Sleeves.
- C. Plumbing: Provide work indicated or required, including, but not limited to, the following:
 - 1. Devices such as vacuum breakers, pressure reducing valves, shut-off valves, trim, traps, filters, etc.
 - 2. Water, waste, gas, and / or air to equipment.

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D. Electrical: Provide work indicated or required including, but not limited to, the following:

1. Wiring and devices.
2. Power and lighting service.
3. Connections to equipment.

3.4 SCHEDULE OF MEDICAL EQUIPMENT

A. Refer to schedule on the drawings. Additional information can be provided upon request.

END OF SECTION

RESPONSIBILITY MATRIX

The following list identifies the majority of the items that are to be included in the capital project build-out. All Owner items need to be coordinated with A/E (Design Team), Contractor, and Owner (Facility Design & Construction and Supply Chain Facility Equipment Planners). For OFOI or OFCI items, Contractor is required to track equipment on construction schedule and to notify Owner of required delivery times taking into account for equipment lead times.

ITEM	OWNER/VENDOR	NOTES	ADDITIONAL NOTES		
OFOI - (Owner Furnished / Owner Installed)	(Coordinate location of items with Owner and track within construction schedule)		Data	Power	Backlog
Art	Owner / Owner (Alpine Art)	All artwork to be coordinated with Dan Kohler. Provide power to required artwork.			
Brochure Racks	Owner / Owner	Contractor to provide proper backing.			
Chart Racks	Owner / Owner (Midwest)	Contractor to provide proper backing.			
Copiers, fax	Owner / Owner	A/E to locate where copy/fax/printer is not visual clutter.	Yes	Yes	
Cup Dispensers	Owner / Owner				
Exam Tables	Owner / Owner			Yes	
Systems Furniture (including demountable partitions)	Owner / Owner (Midwest & Steelcase)	Coordinate modesty panels with elec. outlets. Sit/Stand desks to have modesty panel on front. Attention to be given to cord management. A/E to coordinate data and power with Midwest.	Yes	Yes	
Receptionist Desk	Owner / Owner (Midwest & Steelcase)				
Moveable Metal Shelving	Owner / Owner				
Recliners / Draw Chairs	Owner / Owner				
Signage - Exterior	Owner / Owner (IG Group, YESCO)	Provide power and data to required exterior signage. Provide circuits for above ceiling signs. Coordinate thru-wall conduit sleeves with weather barrier. A/E to coordinate traffic signage and Contractor to install. Intermountain Logo Signs - (2) 20A Circuits - May vary. InstaCare and other Signs - (1) 20 A Circuits - May vary.	Yes	Yes	Yes
Signage - Interior (including Code Signage)	Owner / Owner (Scribbley, Hightech)	Provide power to required signage. Contractor to track in schedule and notify Owner for when Code Required signage is required to be installed.			
Radiology Equipment	Owner / Owner (See subject matter expert list)	A/E responsible to coordinate final site equipment drawings into Construction Documents from Owner's Vendor.	Yes	Yes	
Clinical Garbage Cans (Clinical, Office, PT, Etc.)	Owner / Owner				
Computers, Printers, Scanners, Keyboards, Mice, etc.	Owner / Owner	In-ceiling & wall mounts, conduits and boxes mounted by Contractor. Computers to be All-in-One, typ. in IMG exam rooms.	Yes	Yes	Yes
Televisions, Digital Projectors, similar devices, etc.	Owner / Owner	These items to be provided by Owner, but A/E to coordinate locations and infrastructure. Contractor to refer to OFCI section.	Yes	Yes	Yes
Keyboard Trays	Owner / Owner				
PACS	Owner / Owner				
Magnetic Marker Boards, Cork Boards, Huddle Boards, Idea Tracking Boards, etc.	Owner / Owner (Midwest)	A/E to coordinate location with Owner.			Yes
Emergency Evacuation Medical Sled (Med Sled)	Owner / Owner	A/E to coordinate location with Owner.			
Supply Area Panels	Owner / Owner	Contractor to provide proper backing, coordinate with Owner.			Yes
Audio/Video (A/V)	Owner / Owner	Intermountain SCO will source & supply the A/V system including specialized cabling (e.g. HDMI, etc). Refer to CFCI section for Contractor requirements. A/E to identify locations on drawings, coordinate with Owner. Contractor to provide infrastructure, back boxes, conduits, pathways and cabling (from wall side back).	Yes	Yes	
Nurse Notification Call (NNC) System & Devices (Hospital Campus)	Owner / Owner (Hill-Rom)	Hospital local facility team to work with Supply Chain Facility Equipment Planning team to contract directly with Nurse Notification Call (NNC) system vendor (Hill-Rom) for devices, equipment, monitors, etc. A/E to coordinate with Owner and Hill-Rom for all NNC infrastructure required to support the device locations and types designated by Hill-Rom on their site specific drawings. Hill-Rom site specific drawings to be coordinated and included in the A/E Contract Documents. Contractor to provide all infrastructure including conduits, back boxes, cabling (e.g. home-runs to RCB, RCB to device, device to device, etc.), etc. for all NNC devices (e.g. RCB, GSR-10, room devices, etc.). The cabling for the NNC system will be coordinated and installed by the Contractor/Subcontractor (i.e. low voltage sub). Contractor to coordinate with Hill-Rom.	Yes; see CFCI	Yes; see CFCI	
Staff Assist Notification Call System & Devices (Medical Group Clinics on hospital campuses to match NNC system)	Owner / Owner (Hill-Rom)	Hospital local facility/IMG Ops team to work with Supply Chain Facility Equipment Planning team to contract directly with Staff Assist Notification Call system vendor (Hill-Rom) for devices, equipment, monitors, etc. (from wall side out). Staff Assist Notification system to be coordinated with Hospital Campus NNC system, as applicable, Medical Group Strategic Planner, and IMG Operations Officer. A/E to coordinate with Owner and Hill-Rom for all Staff Assist Notification Call system infrastructure required to support the device locations and types designated by Hill-Rom on their site specific drawings. Hill-Rom site specific drawings to be coordinated and included in the A/E Contract Documents. Contractor to provide all infrastructure including conduits, back boxes, cabling (e.g. home-runs to RCB, RCB to device, device to device, etc.), etc. for all NNC and Staff Assist Notification Call devices (e.g. RCB, GSR-10, etc.). The cabling for the NNC and Staff Assist Notification Call system will be coordinated and installed by the Contractor/Subcontractor (i.e. low voltage sub). Contractor to coordinate with Hill-Rom.	Yes; see CFCI	Yes; see CFCI	
Staff Assist Notification Call System & Devices (Stand-alone Medical Group Clinics)	Owner / Owner (Hill-Rom)	IMG Ops team to work with Supply Chain Facility Equipment Planning team to contract directly with Staff Assist Notification Call system vendor (Hill-Rom) for devices, equipment, monitors, etc. (from wall side out). Staff Assist Notification Call system to be coordinated with Medical Group Strategic Planner and Operations Officer. A/E to coordinate with Owner and Hill-Rom for all Staff Assist Notification Call system infrastructure required to support the device locations and types designated by Hill-Rom on their site specific drawings. Hill-Rom site specific drawings to be coordinated and included in the A/E Contract Documents. Contractor to provide all infrastructure including conduits, back boxes, cabling (e.g. home-runs to RCB, RCB to device, device to device, etc.), etc. for all Staff Assist Notification Call devices (e.g. RCB, GSR-10, etc.). The cabling for the Staff Assist Notification Call system will be coordinated and installed by the Contractor/Subcontractor (i.e. low voltage sub). Contractor to coordinate with Hill-Rom.	Yes; see CFCI	Yes; see CFCI	

Patient Monitoring System & Devices (Hospital Campus)	Owner / Owner	Hospital local facilities to work with Supply Chain Facility Equipment Planning team to contract directly with Patient Monitoring vendors for devices, equipment, monitors, etc. (from wall side out). A/E to identify locations on drawings, coordinate with Owner. Contractor to provide all infrastructure including conduits, back boxes, and home-run cabling from Patient Monitoring devices to TEC/TDR rooms that connect to Intermountain's network (Intermountain Siemon certified installer low voltage subcontractor to install). The Patient Monitoring system device to device cabling is by Vendor.	Yes	Yes	
IV Hangar	Owner / Owner	A/E to identify locations on drawings, coordinate with Owner. Backing to be coordinated, if required.			
Sharps Disposal Container	Owner / Owner (Stericycle)	A/E to identify locations on drawings, coordinate with Owner. Backing to be coordinated, if required.			
Infant/Pediatric Security System	Owner / Owner (Totguard)	A/E to identify locations on drawings. This system is to be coordinated with Owner, Women's and Children's Operations, Clinical Programs and Security.	Yes	Yes	
OFCI - (Owner Furnished / Contractor Installed) (Coordinate location of items with Owner and track within construction schedule)			Data	Power	Backing
Automated External Defibrillator (AED)	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner, A/E to coordinate recess, semi-recessed, or surface mount options with Owner.			Yes
Time Clocks	Owner / Contractor	Conduit and boxes by Contractor, Coordinate location with Owner.	Yes	Yes	
Paper Towel Dispensers	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Soap Dispensers	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Toilet Paper Dispensers	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Sanitary Napkin Dispensers/Receptacles	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Diaper Changing Station	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.			Yes
Hand Sanitizer Dispensers (Avagard)	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Diagnostic Board (Otoscope / Ophthalmoscope)	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.		Yes	
Stadiometers, Recessed Scales	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner; coordinate power.		Yes	
Procedure Lights	Owner / Contractor	A/E to coordinate with Owner and Owner's selected equipment Vendor; A/E to identify locations on drawings, coordinate with Owner; A/E to coordinate the design of the procedure light support structure into drawings. Contractor to provide and install procedure light support structure.		Yes	Yes
Scrub Sinks & Carriers	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner. Contractor to coordinate with Owner for ordering and for install coordination.			Yes
IV Track	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner. Backing to be coordinated, if required.			Yes
Boom Mounting Plates (Equipment, Lighting, Anesthesia)	Owner / Contractor	A/E to coordinate with Owner and Owner's selected equipment Vendor; A/E to identify boom locations on drawings, coordinate with Owner; A/E to coordinate the design of the boom support structure into drawings. Final site specific equipment drawings from Vendor to be coordinated with Construction Documents. Contractor to coordinate with Owner and install boom support structure and boom mounting plates. Contractor to coordinate with Owner for ordering and install of boom mounting plates.	Yes	Yes	Yes
OR Clocks	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner. Contractor to coordinate with Owner for ordering and install coordination.	Yes	Yes	Yes
Clinical Clocks	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner. Contractor to coordinate with Owner for ordering and install coordination.		Yes	Yes
Shower Curtains & Rods	Owner (Medline) / Contractor	A/E to identify locations on drawings, coordinate with Owner. Contractor to coordinate with Owner for ordering and install coordination.			
Cubicle Curtains & Tracks	Owner (Medline) / Contractor	A/E to identify locations on drawings, coordinate with Owner. Contractor to coordinate with Owner for ordering and install coordination.			
Digital Projector Mounts, TV Mounts, & Computer Mounts (Ergotron Brackets/Mounts, etc.)	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner. Contractor to coordinate with Owner for ordering and install coordination. In-ceiling & wall mounts, conduits and boxes provide and installed by Contractor A/E to coordinate A/V requirements. Contractor to pull required A/V cabling.	Yes	Yes	Yes
Radiation Protection Calculations and Certification	Owner / Contractor	A/E to coordinate with Owner in the design phase for coordinating with Medical Physicists Consultants or others, when required. Contractor to coordinate prior to Gyp. Bd. install.			Yes
Patient Lifts	Owner (Liko, subsidiary of Hill-Rom) / Contractor	A/E to identify locations on drawings, coordinate with Owner. A/E to design required support structure for Contractor to install for necessary Liko patient lift connections (e.g. pendant / rails / etc). Contractor to coordinate shop drawings and installation requirements prior with Liko. Connect to equipment branch if provided.		Yes	
Building Alarms / Medication Refrigerator Alarm / Pharmacy Alarm System	Owner / Contractor	A/E to identify locations and infrastructure on drawings, coordinate with Owner. Contractor to provide conduit and infrastructure into accessible ceiling for access from equipment and/or devices. Local Facility to contract with alarm company for alarm, wire, and monitoring.		Yes	
UPS (MRI, Data Room, CPU, or other similar equipment)	Owner / Contractor	A/E to identify equipment locations on drawings, coordinate with Owner.	Yes	Yes	Yes
iCentra Tracking Boards	Owner / Contractor	A/E to identify locations on drawings, coordinate with Owner.	Yes	Yes	Yes
Distributed Antenna System (DAS) including Public Safety	Owner (DAS vendor selected and managed by Intermountain CTIS/Telecom) / Contractor	A/E to locate infrastructure on drawings to simplify the DAS install. Contractor to track on construction schedule and coordinate DAS install with Owner's Vendor.			
Alertus - Mass Notification System (Public Areas)	Owner (Alertus) / Contractor	A/E to identify locations on drawings, coordinate with Owner.	Yes	Yes	

CFCL - (Contractor Furnished / Contractor Installed)			Data	Power	Backlog
Blinds/Shades (manual and powered)	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.		Yes	
Apron Hooks/Rack (Heavy Duty in Radiology)	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.			Yes
Communication Boards (e.g. Patient Rooms)	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.			Yes
Emergency Phones, Kiosks - Exterior	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner. Conduit and boxes by Contractor.	Yes	Yes	Yes
Med Gas Certification	Contractor / Contractor	Contractor to coordinate Vendor with Owner			
Emergency Shower Station / Eye Wash Station	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner. These shall meet ANSI and Owner requirements.			
Fire Extinguishers	Contractor / Contractor	A/E to identify types and locations on drawings, coordinate with Owner. 10 lbs. minimum - refer to Intermountain Design Guidelines & Construction Standards.			Yes
Grab Bars (Rest rooms, Radiology, Exam rooms, etc.)	Contractor / Contractor	A/E to identify locations on drawings.			Yes
Coat Hooks (Rest rooms/Shower, Exam rooms, Offices/Workstations only)	Contractor / Contractor	A/E to identify locations on drawings.			
Mirrors (Rest rooms, Exams, Radiology, Rehab, etc.)	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.			Yes
Pneumatic Tube Systems	Contractor / Contractor (SwissLog, Atreo Group, or other approved)	A/E to identify locations on drawings, coordinate with Owner. If SwissLog, verify pricing is per Intalere (Amerinet) Contract Agreement. Design assistance fees are included in this agreement.	Yes	Yes	
Plumbing Shrouds	Contractor / Contractor				
Security Cameras, Video Surveillance	Contractor / Contractor (AlphaCorp/Convergint)	A/E to identify locations on drawings, coordinate with Owner.	Yes		
Voice/Data Cabling (all horizontal cabling)	Contractor / Contractor (Cache Valley Elec., IES Commercial, Data Tech Professionals, Hunt Electric, and others listed in Intermountain Div. 27)	Refer to Division 27 in the Intermountain Design Guidelines and Construction Standards. Coordinate with Owner/User on connections, pairs of fiber/copper, conduits, inner-ducts, etc.	Yes		
Support Bracing/Structure for Radiology and similar equipment	Contractor / Contractor	A/E to coordinate with Owner and Owner's selected Radiology equipment Vendor; A/E to coordinate the design of the support bracing/structure into drawings. Final site specific equipment drawings from Vendor to be coordinated with Construction Documents. Contractor to coordinate with Owner for install of support structure.	Yes	Yes	Yes
Wall Protection (Incl. Bumper and Corner Guards)	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Intrusion Detection	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Access Control, Card Readers (Lenel)	Contractor / Contractor (AlphaCorp/Convergint)	A/E to identify locations on drawings, coordinate with Owner.			
Communication Cabling	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
TV System Distribution	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner.			
Audio/Video (A/V)	Contractor / Contractor	Intermountain SCO will source & supply the A/V system including specialized cabling (e.g. HDMI, etc.). A/E to identify locations on drawings, coordinate with Owner. Contractor to provide infrastructure, back boxes, conduits, pathways and misc. cabling (from wall side back).	Yes	Yes	
Nurse Notification Call (NNC) System - Low Voltage Cabling (Hospital Campus)	Contractor / Contractor (Hill-Rom)	A/E to coordinate with Owner and Hill-Rom for all NNC infrastructure required to support the device locations and types designated by Hill-Rom on their site specific drawings. Hill-Rom site specific drawings to be coordinated and included in the A/E Contract Documents. Contractor to provide all infrastructure including conduits, back boxes, cabling (e.g. home-runs to RCB, RCB to device, device to device, etc.), etc. for all NNC devices (e.g. RCB, GSR-10, etc.). The cabling for the NNC system will be coordinated and installed by the Contractor/Subcontractor (i.e. low voltage sub). Contractor to coordinate with Hill-Rom.	Yes	Yes	
Staff Assist Notification Call System - Low Voltage Cabling (Medical Group Clinics on hospital campuses to match NNC system)	Contractor / Contractor (Hill-Rom)	A/E to coordinate with Owner and Hill-Rom for all Staff Assist Notification Call system infrastructure required to support the device locations and types designated by Hill-Rom on their site specific drawings. Hill-Rom site specific drawings to be coordinated and included in the A/E Contract Documents. Contractor to provide all infrastructure including conduits, back boxes, cabling (e.g. home-runs to RCB, RCB to device, device to device, etc.), etc. for all NNC and Staff Assist Notification Call devices (e.g. RCB, GSR-10, etc.). The cabling for the NNC and Staff Assist Notification Call system will be coordinated and installed by the Contractor/Subcontractor (i.e. low voltage sub). Contractor to coordinate with Hill-Rom.	Yes	Yes	
Staff Assist Notification Call System - Low Voltage Cabling (Stand-alone Medical Group Clinics)	Contractor / Contractor (Hill-Rom)	A/E to coordinate with Owner and Hill-Rom for all Staff Assist Notification Call system infrastructure required to support the device locations and types designated by Hill-Rom on their site specific drawings. Hill-Rom site specific drawings to be coordinated and included in the A/E Contract Documents. Contractor to provide all infrastructure including conduits, back boxes, cabling (e.g. home-runs to RCB, RCB to device, device to device, etc.), etc. for all Staff Assist Notification Call devices (e.g. RCB, GSR-10, etc.). The cabling for the Staff Assist Notification Call system will be coordinated and installed by the Contractor/Subcontractor (i.e. low voltage sub). Contractor to coordinate with Hill-Rom.	Yes	Yes	
Patient Monitoring System & Devices (Hospital Campus)	Contractor / Contractor	A/E to identify locations on drawings, coordinate with Owner. Contractor to provide all infrastructure including conduits, back boxes, and home-run cabling from Patient Monitoring devices to TEC/TDR rooms that connect to Intermountain's network (Intermountain Siemon certified installer low voltage subcontractor to install). The Patient Monitoring system device to device cabling is by Vendor.	Yes	Yes	

SECTION 134900

RADIATION PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Work required for this section includes radiation protection and supplementary items necessary to complete its installation.

1.2 DEFINITIONS

- A. Lead Equivalence: The thickness of lead that provides the same attenuation (reduction of radiation passing through) as the material in question under the specified conditions.
 - 1. Lead equivalence specified for materials used in diagnostic x-ray rooms is as measured at 100 kV unless otherwise indicated.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product and system indicated.
 - 1. Include manufacturer's specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.
- B. Shop Drawings: Show details of fabrication and installation, including plans, elevations, sections, details of components and attachments to other work. Distinguish between shop and field-assembled work
 - 1. Show layout of radiation-protected areas. Indicate lead thickness or lead equivalence of components. Show components and installation conditions not fully dimensioned or detailed in product data.
 - 2. Show ducts, pipes, conduit, and other objects that penetrate radiation protection; include details of penetrations.

1.4 INFORMATIONAL SUBMITTALS

- A. Field Quality Control Reports: Written report of testing and inspection required by "Field Quality Control".

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.
 - 2. Supervision: Installer shall maintain a competent supervisor at Project while the Work is in progress, and who has not less than 5 years of experience installing products and systems similar to scope of this Project.

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- 3. Manufacturer Acceptance: Installer shall be certified, approved, licensed, or acceptable to manufacturer to install products.
- B. Glazing: Comply with requirements in Division 08 Section "Glazing."
- 1.6 PRE-INSTALLATION CONFERENCE
 - A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Lead-Lined Gypsum Panels: Neatly stack panels flat to prevent deformation.
 - B. Lead-Lined Steel Frames: Comply with requirements in Division 08 Section "Hollow Metal Doors and Frames" for delivery, storage, and handling.
 - C. Lead-Lined Wood Doors: Comply with requirements in Division 08 Section "Prefinished Flush Wood Doors" for delivery, storage, and handling.
- 1.8 PROJECT CONDITIONS
 - A. Environmental Limitations: Do not deliver or install radiation protection until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - B. Field Measurements: Where products and systems are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication.
- 1.9 COORDINATION
 - A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Manufacturers: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to the Conditions of the Contract and Division 01 Section "Substitution Procedures".
 - 1. A & L Shielding Inc.
 - 2. NELCO, Inc.
 - 3. Radiation Protection Products, Inc.
 - 4. Ray-Bar Engineering Corp.
- B. Lead Glass Manufacturers Only:
 - 1. Amerope Enterprises, Inc.

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2. McGrory Glass, Inc.
3. Schott North America, Inc.

2.2 MATERIALS, GENERAL

- A. Source Limitations: Obtain each type of radiation protection product from single source from single manufacturer unless otherwise indicated.

2.3 PERFORMANCE REQUIREMENTS

- A. Provide materials and workmanship, including joints and fasteners, that maintain continuity of radiation protection at all points and in all directions equivalent to materials specified in thicknesses and locations indicated.
 1. Materials, thicknesses, and configurations indicated are based on radiation protection design prepared by Owner's radiation health physicist. Refer to Appendix at the end of this Section for availability of report.
 - a. Thicknesses:
 - 1) Lead Sheet Thickness: Refer to Owner-provided radiation health physicist report.
 - 2) Lead Sheet Thickness: As indicated on the drawings.
- B. Lead-Lined Assemblies: Unless otherwise indicated, provide lead thickness in doors, door frames, window frames, penetration shielding, joint strips, film transfer cabinets, and other items located in lead-lined assemblies not less than that indicated for assemblies in which they are installed.
- C. Lead Glazing: Unless otherwise indicated, provide lead equivalence not less than that indicated for assembly in which glazing is installed.

2.4 MATERIALS

- A. Lead Sheet, Strip, and Plate: ASTM B 749, alloy UNS No. L51121 (chemical-copper lead).
- B. Lead-Lined Gypsum Board: 5/8 in (15 mm) thick gypsum board complying with Division 09 Section "Gypsum Board Assemblies," of width and length required for support spacing and to prevent cracking during handling, and with a single sheet of lead laminated to the back of the board.
 1. Provide lead sheet lining the full width and length of board unless Owner's radiation health physicist report indicates coverage to only extend from floor to 84 in (2100 mm) above floor.
 2. Provide 3 in (75 mm) wide lead strips for wrapping metal stud flanges.
 3. Provide 2 in (50 mm) wide lead strips for backing joints.
 4. Provide 5/16 in (8 mm) lead disks for covering screw heads.
 5. Provide lead-headed nails for fastening gypsum board, accessories, and trim to wood members.
- C. Lead Glass: Lead-barium, polished float glass containing not less than 60 percent heavy metal oxides, including not less than 48 percent lead oxide by weight.

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1. Safety Glass: Where indicate or where required, provide fully tempered or laminated float glass.
 - a. Outer Lite: Clear float glass.
 - b. Interlayer: Clear polyvinyl butyral (PVB) or cured resin of manufacturer's standard thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.
 - c. Inner Lite: Lead-barium, polished float glass as specified above.
 - D. Accessories and Fasteners: Provide manufacturer's standard fasteners and accessories as required for installation, maintaining same lead equivalence as rest of system.
- 2.5 LEAD-LINED WOOD DOORS
- A. Comply with requirements of Division 08 Section "Prefinished Flush Wood Doors".
- 2.6 LEAD-LINED STEEL HOLLOW-METAL DOOR FRAMES
- A. Comply with requirements of Division 08 Section "Hollow Metal Doors and Frames".
- 2.7 LEAD-LINED OBSERVATION-WINDOW FRAMES
- A. Comply with requirements of Division 08 Section "Hollow Metal Doors and Frames".
- 2.8 INFORMATIONAL SIGNS
- A. Informational Signs, General: Fabricate signs by engraving lettering in high-pressure-laminate engraving stock with contrasting face and core. Machine-engrave copy using high-speed cutters mechanically positioned by master templates for accurately formed letters, numbers, and symbols.
 1. Color: As selected by Architect from manufacturer's full range of colors.
 2. Provide copy indicated or as directed. Provide signs of sufficient size to contain required information.
 3. Indicate lead equivalence in millimeters and heights of radiation protection in in (millimeters).
 - B. Rooms Where the Level of Protection Is Uniform Throughout: Provide one sign for each room indicating lead equivalence of partitions, ceilings, floors, doors, and other portions of radiation protection enclosure. Indicate height of radiation protection above floor or indicate that partitions are radiation protected to full height.
 - C. Rooms Where the Level of Protection Is Not Uniform Throughout: Provide one sign for each room with different lead equivalences in different locations. Indicate, in tabular form, lead equivalence of each wall, partition, ceiling, floor, door, and window. Indicate height of radiation protection above floor or indicate that partitions are radiation protected to full height. Indicate where lead equivalence changes or is not continuous.
 - D. Rooms Where Some Partitions Are without Radiation Protection: Provide one sign for each partition that contains radiation protection and indicate its lead equivalence. Indicate height of radiation protection above floor or indicate that partitions are radiation protected to full height.

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2.9 DOOR AND DOOR FRAME FABRICATION

- A. Hardware Preparation: Factory prepare doors and frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
 - 1. Respective manufacturer written installation instructions.
 - 2. Accepted submittals.
 - 3. Contract Documents.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by isolating metals and other materials from direct contact with incompatible materials.

3.3 PREPARATION

- A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION OF LEAD-LINED GYPSUM BOARD

- A. Install with long edge parallel to supports and lead lining facing supports. Provide blocking at end joints.
- B. Fastening to Metal Supports: Use steel drill screws spaced as recommended in writing by gypsum board manufacturer. Install lead strips covering face of framing and wrap around flange to cover points of screws.
 - 1. Where possible, install lead-lined gypsum board before installing gypsum board on other side of partition, and do not fold lead strips back over inside of flange until after lead-lined gypsum board is applied.
 - 2. Apply lead disks recessed flush with surface of board over heads of screws securing trim.

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- C. Openings: Extend lead-lined gypsum board into frames of openings, lapping lead lining with lead frames or frame linings at least 1 in (25 mm). Arrange board around openings so neither horizontal nor vertical joints occur at corners of openings.
- D. Install control and expansion joints where indicated, with appropriate trim accessories. Install lead strip on face of framing, extending across joint, and lap with lead lining of gypsum board.

3.5 INSTALLATION OF LEAD-LINED DOOR AND DOOR FRAMES

- A. Door Frames: Install lead-lined steel frames according to Division 08 Section "Hollow Metal Doors and Frames," unless otherwise indicated.
- B. Flush Wood Doors: Install lead-lined wood doors according to Division 08 Section "Prefinished Flush Wood Doors."
- C. Lap lead lining of frames over lining in walls at least 1 in (25 mm).
- D. Line astragals with lead sheet.
- E. Hardware: Line covers, escutcheons, and plates to provide effective shielding at cutouts and penetrations of frames and doors. See Division 08 Section "Door Hardware" for other installation requirements.

3.6 INSTALLATION OF LEAD-LINED OBSERVATION WINDOWS

- A. Install observation windows according to manufacturer's written installation instructions.
- B. Install windows level, plumb, square, true to line, and anchored securely in place to structural support.
- C. Install leaded side of frame on radiation side of wall. Lap lead lining of frames over lining in walls at least 1 in (25 mm).
- D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with manufacturer's written instructions.

3.7 INSTALLATION OF PENETRATING ITEMS

- A. At penetrations of lead linings, provide lead shields to maintain continuity of protection.
- B. Provide lead linings, sleeves, shields, and other protection in thickness not less than that required in assembly being penetrated.
- C. Secure shields at penetrations using adhesive or wire ties but not penetrating fasteners unless indicated on Drawings.
- D. Outlet Boxes and Conduit: Cover or line with lead sheet lapped over adjacent lead lining at least 1 in (25 mm). Wrap conduit with lead sheet for a distance of not less than 10 in (250 mm) from box.
- E. Piping: Unless otherwise indicated, wrap piping with lead sheet for a distance of not less than 10 in (250 mm) from point of penetration.

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3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections after radiology equipment has been installed and placed in operating condition.
- B. Correct deficiencies in or remove and replace radiation protection that inspection reports indicate does not comply with specified requirements.

3.9 PROTECTION

- A. Lock radiation-protected rooms once doors and locks are installed and limit access to only those persons performing work in the rooms.

3.10 APPENDIX

- A. Owner's Radiation Health Physicist Report: Refer to Division 00 Document "Available Project Information".

END OF SECTION

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