SECTION 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Door hardware and related items necessary for complete installation and operation of doors.

1.2 RELATED WORK

A. Caulking: Section 07 92 00 JOINT SEALANTS.

B. Application of Hardware: Section 08 14 00, WOOD DOORS, Section 08 11 13, HOLLOW METAL DOORS AND FRAMES

C. Finishes: Section 09 06 00, SCHEDULE FOR FINISHES.

D. Painting: Section 09 91 00, PAINTING.

E. Electrical: Division 26, ELECTRICAL.

F. Fire Detection: Section 28 31 00, FIRE DETECTION AND ALARM.

1.3 GENERAL

A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.

B. Provide rated door hardware assemblies where required by most current version of the International Building Code (IBC).

C. Hardware for Labeled Fire Doors: Conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Provide hardware listed by UL, except where heavier materials, large size, or better grades are specified herein under paragraph HARDWARE SETS. In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements.

D. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.

E. The following items shall be of the same manufacturer, if possible, except as otherwise specified:

1. Hinges for hollow metal and wood doors.
2. Surface applied overhead door closers.

1.4 WARRANTY

A. The warranty period shall be two years in lieu of one year for all items except as noted below:

1. Locks and latch sets: 5 years.

2. Door closers and continuous hinges: 10 years.

1.5 MAINTENANCE MANUALS

A. In accordance with Section 01 00 00, GENERAL REQUIREMENTS Article titled "INSTRUCTIONS", furnish maintenance manuals and instructions on all door hardware.

1.6 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Submit 6 copies of the schedule per Section 01 33 23 plus 2 copies to the VAMC Locksmith (VISN Locksmith if the VAMC does not have a locksmith).

B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

C. Samples and Manufacturers' Literature:

1. Samples: All hardware items (proposed for the project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified.

D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

1.7 DELIVERY AND MARKING

A. Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to Resident Engineer for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in Resident Engineer's office until all other similar items have been installed in project, at which time the Resident Engineer will deliver items on file to Contractor for installation in predetermined locations on the project.

1.8 INSTRUCTIONS

A. Hardware Set Symbols on Drawings: Except for protective plates, door stops, mutes, thresholds and the like specified herein, hardware requirements for each door are indicated on drawings by symbols. Symbols for hardware sets consist of letters (e.g., "HW") followed by a number. Each number designates a set of hardware items applicable to a door type.

B. Manufacturers' Catalog Number References: Where manufacturers' products are specified herein, products of other manufacturers which are considered equivalent to those specified may be used. Manufacturers whose products are specified are identified by abbreviations as follows:

Adams-Rite	Adams Rite Mfg. Co.	Pomona, CA
Best	Best Access Systems	Indianapolis, IN
Don-Jo	Don-Jo Manufacturing	Sterling, MA
G.E. Security	GE Security, Inc.	Bradentown, FL
Markar	Markar Architectural Products	Pomona, CA
Pemko	Pemko Manufacturing Co.	Ventura, CA
Rixson	Rixson	Franklin Park, IL
Rockwood	Rockwood Manufacturing Co.	Rockwood, PA
Securitron	Securitron Magnalock Corp.	Sparks, NV
Southern Folger	Southern Folger Detention Equipment Co.	San Antonio, TX
Stanley	The Stanley Works	New Britain, CT
Tice	Tice Industries	Portland, OR
Trimco	Triangle Brass Mfg. Co.	Los Angeles, CA
Zero	Zero Weather Stripping Co.	New York, NY

C. Keying: All cylinders shall be keyed into existing Sargent Great Grand Master Key System. Provide removable core cylinders that are removable only with a special key or tool without disassembly of knob or lockset. Cylinders shall be 6 pin type. Keying information shall be furnished at a later date by the Resident Engineer.

1.9 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.

B. American Society for Testing and Materials (ASTM):

F883-04.....Padlocks

E2180-07.....Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials

C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):

A156.1-06.....Butts and Hinges

A156.2-03.....Bored and Pre-assembled Locks and Latches

A156.3-08.....Exit Devices, Coordinators, and Auto Flush Bolts

A156.4-08.....Door Controls (Closers)

A156.5-01.....Auxiliary Locks and Associated Products

A156.6-05.....Architectural Door Trim

A156.8-05.....Door Controls-Overhead Stops and Holders

A156.12-05 .....Interconnected Locks and Latches

A156.13-05.....Mortise Locks and Latches Series 1000

A156.14-07 .....Sliding and Folding Door Hardware

A156.15-06.....Release Devices-Closer Holder, Electromagnetic and Electromechanical

A156.16-08.....Auxiliary Hardware

A156.17-04 .....Self-Closing Hinges and Pivots

A156.18-06.....Materials and Finishes

A156.20-06 .....Strap and Tee Hinges, and Hasps

A156.21-09.....Thresholds

A156.22-05.....Door Gasketing and Edge Seal Systems
A156.23-04.....Electromagnetic Locks
A156.24-03.....Delayed Egress Locking Systems
A156.25-07 .....Electrified Locking Devices
A156.26-06.....Continuous Hinges
A156.28-07 .....Master Keying Systems
A156.29-07 .....Exit Locks and Alarms
A156.30-03 .....High Security Cylinders
A156.31-07 .....Electric Strikes and Frame Mounted Actuators
A250.8-03.....Standard Steel Doors and Frames

D. National Fire Protection Association (NFPA):
80-10.....Fire Doors and Fire Windows
101-09.....Life Safety Code

E. Underwriters Laboratories, Inc. (UL):
Building Materials Directory (2008)

PART 2 - PRODUCTS

2.1 BUTT HINGES

A. ANSI A156.1. Provide only three-knuckle hinges, except five-knuckle where the required hinge type is not available in a three-knuckle version (e.g., some types of swing-clear hinges). The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:
1. Interior Doors: Type A8112/A5112 for doors 900 mm (3 feet) wide or less and Type A8111/A5111 for doors over 900 mm (3 feet) wide. Hinges for doors exposed to high humidity areas (shower rooms, toilet rooms, kitchens, janitor rooms, etc. shall be of stainless steel material.

B. Provide quantity and size of hinges per door leaf as follows:
1. Doors up to 2260 mm (7 feet 5 inches) high: 3 hinges minimum.
2. Doors up to 900 mm (3 feet) wide, heavy weight: 114 mm x 114 mm (4-1/2 inches x 4-1/2 inches) hinges.
3. Doors over 900 mm (3 feet) to 1065 mm (3 feet 6 inches) wide, heavy weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
4. Doors over 1065 mm (3 feet 6 inches) to 1210 mm (4 feet), heavy weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
5. Provide heavy-weight hinges at all door locations.

6. At doors weighing 330 kg (150 lbs.) or more, furnish 127 mm (5 inch) high hinges.

C. See Articles "MISCELLANEOUS HARDWARE" and "HARDWARE SETS" for pivots and hinges other than butts specified above and continuous hinges specified below.

2.2 CONTINUOUS HINGES

A. ANSI/BHMA A156.26, Grade 1-600.

1. Listed under Category N in BHMA's "Certified Product Directory."

B. General: Minimum 0.120-inch- (3.0-mm-) thick, hinge leaves with minimum overall width of 4 inches (102 mm); fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete

C. Continuous, Barrel-Type Hinges: Hinge with knuckles formed around a Teflon-coated 6.35mm (0.25-inch) minimum diameter pin that extends entire length of hinge.

1. Base Metal for Interior Hinges: Stainless steel.
2. Base Metal for Hinges for Fire-Rated Assemblies: Stainless steel.
3. Provide with non-removable pin (hospital tip option) at lockable outswing doors.
4. Where required to clear adjacent casing, trim, and wall conditions and allow full door swing, provide wide throw hinges of minimum width required.
5. Provide with manufacturer’s cut-outs for separate mortised power transfers and/or mortised automatic door bottoms where they occur.
6. Where thru-wire power transfers are integral to the hinge, provide hinge with easily removable portion to allow easy access to wiring connections.
7. Where models are specified that provide an integral wrap-around edge guard for the hinge edge of the door, provide manufacturer’s adjustable threaded stud and machine screw mechanism to allow the door to be adjusted within the wrap-around edge guard.

2.3 DOOR CLOSING DEVICES

A. Closing devices shall be products of one manufacturer.

2.4 OVERHEAD CLOSERS

A. Conform to ANSI A156.4, Grade 1.

B. Closers shall conform to the following:

1. The closer shall have minimum 50 percent adjustable closing force over minimum value for that closer and have adjustable hydraulic

back check effective between 60 degrees and 85 degrees of door opening.

2. All closer shall have hold-open feature.
3. Size Requirements: Provide multi-size closers, sizes 1 through 6, except where multi-size closer is not available for the required application.
4. Material of closer body shall be forged or cast.
5. Arm and brackets for closers shall be steel, malleable iron or high strength ductile cast iron.
6. Where closers are mounted in rooms that experience high humidity (CART WASH ROOM B53A), provide closer body and arm assembly of stainless steel material.
7. Closers shall have full size metal cover; plastic covers will not be accepted.
8. Closers shall have adjustable hydraulic back-check, separate valves for closing and latching speed, adjustable back-check positioning valve, and adjustable delayed action valve.
9. Provide closers with any accessories required for the mounting application, including (but not limited to) drop plates, special soffit plates, spacers for heavy-duty parallel arm fifth screws, bull-nose or other regular arm brackets, longer or shorter arm assemblies, and special factory templating. Provide special arms, drop plates, and templating as needed to allow mounting at doors with overhead stops and/or holders.
10. Closer arms or backcheck valve shall not be used to stop the door from overswing, except in applications where a separate wall, floor, or overhead stop cannot be used.
11. Provide parallel arm closers with heavy duty rigid arm.
12. Where closers are to be installed on the push side of the door, provide parallel arm type except where conditions require use of top jamb arm.
13. Provide all surface closers with the same body attachment screw pattern for ease of replacement and maintenance.
14. All closers shall have a 1 ½″ (38mm) minimum piston diameter.

2.5 DOOR STOPS

A. Conform to ANSI A156.16.

B. Provide door stops wherever an opened door or any item of hardware thereon would strike a wall, column, equipment or other parts of

building construction. For concrete, masonry or quarry tile construction, use lead expansion shields for mounting door stops.

C. Where cylindrical locks with turn pieces or pushbuttons occur, equip wall bumpers Type L02251 (rubber pads having concave face) to receive turn piece or button.

D. Provide floor stops (Type L02141 or L02161 in office areas; Type L02121 x 3 screws into floor elsewhere. Wall bumpers, where used, must be installed to impact the trim or the door within the leading half of its width. Floor stops, where used, must be installed within 4-inches of the wall face and impact the door within the leading half of its width.

E. Where drywall partitions occur, use floor stops, Type L02141 or L02161 in office areas, Type L02121 elsewhere.

F. Omit stops where floor mounted door holders are required.

G. Where the specified wall or floor stop cannot be used, provide concealed overhead stops (surface-mounted where concealed cannot be used).

2.6 OVERHEAD DOOR STOPS AND HOLDERS

A. Conform to ANSI Standard A156.8. Overhead holders shall be of sizes recommended by holder manufacturer for each width of door. Set overhead holders for 110 degree opening, unless limited by building construction or equipment. Provide Grade 1 overhead concealed slide type: stop-only at rated doors and security doors, hold-open type with exposed hold-open on/off control at all other doors requiring overhead door stops.

2.7 LOCKS AND LATCHES

A. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Cylinders for all locksets shall be removable core type. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, cylindrical locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. All locksets or latches on double doors with fire label shall have latch bolt with 19 mm (3/4 inch) throw, unless shorter throw allowed by the door manufacturer’s fire label. Provide construction core of allow opening and closing during construction and prior to the installation of final cores.

B. In addition to above requirements, locks and latches shall comply with following requirements:

1. Cylindrical Lock and Latch Sets: levers shall meet ADA (Americans with Disabilities Act) requirements. Cylindrical locksets shall be series 4000 Grade I. All locks and latchsets shall be furnished with 122.55 mm (4-7/8-inch) curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 21mm (7/8-inch) lip-to-center dimension. Provide lever design to match design selected by Architect or to match existing lever design. Where two turn pieces are specified for lock F76, turn piece on inside knob shall lock and unlock inside knob, and turn piece on outside knob shall unlock outside knob when inside knob is in the locked position. (This function is intended to allow emergency entry into these rooms without an emergency key or any special tool.)
2. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5.

2.8 ELECTRIC STRIKES

A. ANSI/ BHMA A156.31 Grade 1.

B. General: Use fail-secure electric strikes at fire-rated doors.

2.9 KEYS

A. Stamp all keys with change number and key set symbol. Furnish keys in quantities as follows:

Locks/Keys	**Quantity**
Cylinder locks	2 keys each

2.10 ARMOR PLATES, KICK PLATES AND DOOR EDGING

A. Conform to ANSI Standard A156.6.

B. Provide protective plates and door edging as specified below:

1. Kick plates and armor plates of plastic, Type J100 series.
2. Provide kick plates and mop plates where specified. Kick plates shall be 254 mm (10 inches) high. Kick plates shall be minimum 1.27 mm (0.050 inches) thick. Provide kick plates beveled on all 4 edges (B4E). On push side of doors where jamb stop extends to floor, make kick plates 38 mm (1-1/2 inches) less than width of door, except pairs of metal doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other kick plates to within 6 mm (1/4 inch) of each edge of doors. Kick plates shall butt astragals.

For jamb stop requirements, see specification sections pertaining to door frames.

3. Kick plates plates are not required on following door sides:
   a. Armor plate side of doors;
4. Armor plates for doors are listed under Article "Hardware Sets". Armor plates shall be thickness as noted in the hardware set, 875 mm (35 inches) high and 38 mm (1-1/2 inches) less than width of doors, except on pairs of metal doors. Provide armor plates beveled on all 4 edges (B4E). Plates on pairs of metal doors shall be 25 mm (1 inch) less than width of each door. Where top of intermediate rail of door is less than 875 mm (35 inches) from door bottom, extend armor plates to within 13 mm (1/2 inch) of top of intermediate rail. On doors equipped with panic devices, extend armor plates to within 13 mm (1/2 inch) of panic bolt push bar.
5. Provide stainless steel edge guards where so specified at wood doors. Provide mortised type instead of surface type except where door construction and/or ratings will not allow. Provide edge guards of bevel and thickness to match wood door. Provide edge guards with factory cut-outs for door hardware that must be installed through or extend through the edge guard. Provide edge guards to height of bottom of typical lockset armor front. Forward edge guards to wood door manufacturer for factory installation on doors.

2.11 FLUSH BOLTS (AUTOMATIC)

A. Conform to ANSI A156.3. Dimension of flush bolts shall conform to ANSI A115. Bolts shall conform to Underwriters Laboratories, Inc., requirements for fire door hardware. Flush bolts shall automatically latch and unlatch. Furnish dustproof strikes conforming to ANSI A156.16 for bottom flushbolt. Face plates for dustproof strike shall be rectangular and not less than 38 mm by 90 mm (1-1/2 by 3-1/2 inches).

B. At interior doors, provide auto flush bolts less bottom bolt, unless otherwise specified, except at wood pairs with fire-rating greater than 20 minutes; provide fire pins as required by auto flush bolt and door fire labels.

2.12 COMBINATION PUSH AND PULL PLATES

A. Conform to ANSI 156.6. Type J303, stainless steel 3 mm (1/8 inch) thick, 80 mm (3-1/3 inches) wide by 800 mm (16 inches) high), top and bottom edges shall be rounded. Secure plates to wood doors with 38 mm

(1-1/2 inch) long No. 12 wood screws. Cut plates for turn pieces, and cylinders where required. Pull shall be mounted down.

2.13 COORDINATORS

A. Conform to ANSI A156.16. Coordinators, when specified for fire doors, shall comply with Underwriters Laboratories, Inc., requirements for fire door hardware. Coordinator may be omitted on exterior pairs of doors where either door will close independently regardless of the position of the other door. Coordinator may be omitted on interior pairs of non-labeled open where open back strike is used. Open back strike shall not be used on labeled doors. Paint coordinators to match door frames, unless coordinators are plated. Provide bar type coordinators, except where gravity coordinators are required at acoustic pairs. For bar type coordinators, provide filler bars for full width and, as required, brackets for push-side surface mounted closers, overhead stops, and vertical rod panic strikes.

2.14 MISCELLANEOUS HARDWARE

A. Access Doors (including Sheet Metal, Screen and Woven Wire Mesh Types): Equip each single metal access door with Lock Type E76213, conforming to ANSI A156.5. Key locks as directed. Ship lock prepaid to the door manufacturer. Hinges shall be provided by door manufacturer.

B. Mutes: Conform to ANSI A156.16. Provide door mutes or door silencers Type L03011 or L03021, depending on frame material, of white or light gray color, on each steel or wood door frame, except at fire-rated frames. Furnish 3 mutes for single doors and 2 mutes for each pair of doors, except double-acting doors.

2.15 FINISHES

A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, pivots, closers, thresholds, etc., shall be as specified below under "Miscellaneous Finishes." For field painting (final coat) of ferrous hardware, see Section 09 91 00, PAINTING.

B. 626 or 630: All surfaces on exterior and interior of buildings, except where other finishes are specified.

C. Miscellaneous Finishes:

1. Hinges --interior doors: 652 or 630.
2. Door Closers: Factory applied paint finish. Dull or Satin Aluminum color.
3. Other primed steel hardware: 600.

D. Hardware Finishes for Existing Buildings: U.S. Standard finishes shall match finishes of hardware in (similar) existing spaces except where otherwise specified.

E. Anti-microbial Coating: All hand-operated hardware (levers, pulls, push bars, push plates, paddles, and panic bars) shall be provided with an anti-microbial/anti-fungal coating that has passed ASTM E2180 tests. Coating to consist of ionic silver (Ag+). Silver ions surround bacterial cells, inhibiting growth of bacteria, mold, and mildew by blockading food and respiration supplies.

2.16 BASE METALS

A. Apply specified U.S. Standard finishes on different base metals as following:

Finish	**Base Metal**
652	Steel
626	Brass or bronze
630	Stainless steel

PART 3 - EXECUTION

3.1 HARDWARE HEIGHTS

A. For existing buildings locate hardware on doors at heights to match existing hardware. The Contractor shall visit the site, verify location of existing hardware and submit locations to VA Resident Engineer for approval.

B. Hardware Heights from Finished Floor:

1. Locksets and latch sets centerline of strike 1024 mm (40-5/16 inches).
2. Hospital arm pull 1168 mm (46 inches) to centerline of bottom supporting bracket.
3. Centerline of door pulls to be 1016 mm (40 inches).
4. Push plates and push-pull shall be 1270 mm (50 inches) to top of plate.
5. Locate other hardware at standard commercial heights. Locate push and pull plates to prevent conflict with other hardware.

3.2 INSTALLATION

A. Closer devices, including those with hold-open features, shall be equipped and mounted to provide maximum door opening permitted by building construction or equipment. Closers shall be mounted on side of door inside rooms and away from corridors. Where closers are mounted on

doors they shall be mounted with sex nuts and bolts; foot shall be fastened to frame with machine screws.

B. Hinge Size Requirements:

Door Thickness	**Door Width**	**Hinge Height**
45 mm (1-3/4 inch)	900 mm (3 feet) and less	113 mm (4-1/2 inches)
45 mm (1-3/4 inch)	Over 900 mm (3 feet) but not more than 1200 mm (4 feet)	125 mm (5 inches)

C. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim and surrounding conditions.

D. Hinges Required Per Door:

Doors over 1500 mm (5 ft) high and not over 2280 mm (7 ft 6 in) high	3 butts

E. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to concrete, ceramic or quarry floor tile, or solid masonry. Fiber or rawl plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.

F. After locks have been installed; show in presence of Resident Engineer that keys operate their respective locks in accordance with keying requirements. Installation of locks which do not meet specified keying requirements shall be considered sufficient justification for rejection and replacement of all locks installed on project.

3.3 FINAL INSPECTION

A. Installer to provide letter to VA Resident/Project Engineer that upon completion, installer has visited the Project and has accomplished the following:

1. Re-adjust hardware.
2. Evaluate maintenance procedures and recommend changes or additions, and instruct VA personnel.
3. Identify items that have deteriorated or failed.
4. Submit written report identifying problems.

3.4 DEMONSTRATION

A. Demonstrate efficacy of mechanical hardware and electrical, and electronic hardware systems, including adjustment and maintenance

procedures, to satisfaction of Resident/Project Engineer and VA Locksmith.

3.5 HARDWARE SETS

A. Following sets of hardware correspond to hardware symbols shown on drawings. Only those hardware sets that are shown on drawings will be required. Disregard hardware sets listed in specifications but not shown on drawings.

HW-1

Each Door to Have:		NON-RATED
1	Continuous Hinge	A51031B
1	Push/Pull Plate Set	1894-4 x 1195-1 PULL (TRIMCO), OR EQUAL
2	Kick Plate	J106
1	Closer	C02011/C02021 (PT4D)
1	Wall Stop	L52101 CONVEX
3	Silencers	L03011

HW-1A

Each Door to Have:		NON-RATED
	Hinges	QUANTITY & TYPE AS REQUIRED X HOSPITAL TIPS @ INSWING DOORS
1	Latchset	PASSAGE F01
1	Closer	C02011/C02021 (PT4D)
2	Kick Plate	J106
1	Overhead Stop	C01541-ADJUSTABLE

HW-1B

Each Door to Have:		NON-RATED
	Hinges	QUANTITY & TYPE AS REQUIRED X HOSPITAL TIPS @ INSWING DOORS
1	Latchset	PASSAGE F01
1	Closer	C02011/C02021 (PT4D)
2	Kick Plate	J106
1	Wall Stop	L52101 CONVEX

HW-2C

Each Door to Have:	NON-RATED
Hinges	QUANTITY & TYPE AS REQUIRED
1 Privacy Lock	F02-MOD X OCCUPANCY INDICATOR
2 Kick Plate	J106
1 Overhead Stop	C04541
3 Silencers	L03011

W-3A

Each Door to Have:	NON-RATED
Hinges	QUANTITY & TYPE AS REQUIRED
1 Office Lock	F04
1 Overhead Stop	C04541

HW-4

Each Door to Have:	NON-RATED
Hinges	QUANTITY & TYPE AS REQUIRED
1 Classroom Lock	F08
1 Wall Stop	L52101 CONVEX
3 Silencers	L03011

HW-4A

Each Door to Have:	NON-RATED
Hinges	QUANTITY & TYPE AS REQUIRED
1 Classroom Lock	F08
1 Overhead Stop	C04541
3 Silencers	L03011

HW-4B

Each Door to Have:	NON-RATED
1 Continuous Hinge	A51031B
1 Classroom Lock	F08
1 Electric Strike	E59311 (FAIL-SECURE), 24VDC
2 Kick Plate	J106
1 Edge Guard (@ Wood Doors)	J208M / J211 (VERIFY), CUT: HARDWARE
1 Wall Stop	L52101 CONVEX

HW-4D

Each Door to Have:	NON-RATED
1 Continuous Hinge	A51031B x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1 Classroom Lock	F08
1 Closer	C02061 P4H ARM
1 Armor Plate	J105 x 1.5 MM (0.060 INCH) THICKNESS
1 Kick Plate (@ Inswing Doors)	J106
1 Edge Guard (@ Wood Doors)	J208M / J211 (VERIFY), CUT: HARDWARE
1 Overhead Stop (@ Outswing Doors)	C01541-ADJUSTABLE
1 Wall Stop (@ Inswing Doors)	L52101 CONVEX
1 Set Self-Adhesive Seals	R0E154

HW-5A

Hinges	QUANTITY & TYPE AS REQUIRED
1 Storeroom Lock	F07
1 Closer	C02011/C02021 (PT4D, PT4F, PT4H)
1 Overhead Stop	C01541-ADJUSTABLE
1 Set Self-Adhesive Seals	R0E154

HW-10B

Each Pair to Have:	NON-RATED
2 Continuous Hinges	A51031B x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1 Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1 Classroom Hospital Lock	F08 x PADDLES POINTING DOWN
1 Closers (@ rated doors)	C02061 P4H ARM
2 Heavy-Duty Armor Plates	J105 x 1.5 MM (0.060 INCH) THICKNESS
1 Lock Trim Protector Bar	R111LPB-630 (ROCKWOOD), OR EQUAL
2 Edge Guard (@ Wood Doors)	J208M / J211 (VERIFY), CUT: HARDWARE
2 Wall Stops	L52101 CONVEX

INSTALL LOCK TRIM PROTECTOR BAR ON PUSH SIDE OF ACTIVE LEAF TO PROTECT LEVER TRIM.

- - - E N D - - -

SECTION 12 31 00
MANUFACTURED METAL CASEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies metal casework and related accessories, including base cabinets, wall cabinets, and full height cabinets.

B. Items specified in this section:

1. Hospital Casework: Including metal casework of the following types:
   a. Wall Cabinet, Metal

1.2 NOT USED

1.3 QUALITY ASSURANCE

A. Approval by Contracting Officer of proposed manufacturer, or suppliers, will be based upon submission by Contractor certification that, manufacturer regularly and presently manufactures casework specified as one of their principal products.

B. Installer has technical qualifications, experience, trained personnel, and facilities to install specified items.

C. Furnish supervision of installation at construction site by a qualified technician regularly employed by casework installer.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Certificates:

1. Manufacturer's Certificate of qualifications specified and finish on casework.
2. Contractor's Certificate of installer’s qualifications specified.
3. Safety glass meets requirements of ANSI Standard Z97.1.

C. Manufacturer's Literature and Data:

1. Brochures showing name and address of manufacturer, and catalog or model number of each item incorporated into the work.
2. Manufacturer's illustration and detailed description.
3. List of deviations from contract specifications.
4. Locks, each kind

D. Shop Drawings (1/2 Full Scale): Reference Contract Drawing AS230A

1. Showing details of casework construction, including kinds of materials and finish, hardware, accessories and relation to finish of adjacent construction, including specially fabricated items or components.
2. Fastenings and method of installation.
3. Location of service connections and access.

E. Samples:
   1. Metal plate, 150 mm (six inch) square, showing chemical resistant finish, in each color.
   2. One complete casework assembly, including cabinet(s) with drawers and cupboard.
   3. One glazed sliding door with track and pertinent hardware. A complete cabinet may be submitted to fulfill this requirement.
   4. Cabinets for subsequent installation may be submitted for above requirements.
   5. Color Sample Selector

1.5 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

A36/A36M-08.....Carbon Structural Steel

A167-99(R 2009).....Stainless and Heat-Resisting Chromium Steel Plate Sheet and Strip

A283/A283M-03(R 2007)...Low and Intermediate Tensile Strength Carbon Steel Plates

A568/A568M-09.....Steel, Sheet, Carbon and High-Strength, Low-Alloy Hot-Rolled and Cold-Rolled, General Requirements

A794/A794M-09.....Standard Specification for Commercial Steel (CS), Sheet, Carbon (0.16% Maximum to 0.25% Maximum) Cold Rolled

B456-03(R2009).....Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium

C1036-06.....Flat Glass

C. American National Standard Institute:

Z97.1-09.....Safety Glazing Material used In Buildings

D. Builders Hardware Manufacturers Association (BHMA):

A156.1-06.....Butts and Hinges

A156.9-10.....Cabinet Hardware

A156.5-10.....Auxiliary Locks and Associated Products

A156.11-10.....Cabinet Locks

A156.16-02.....Auxiliary Hardware

E. American Welding Society (AWS):

D1.1-10.....Structural Welding Code Steel

D1.3-08.....Structural Welding Code Sheet Steel

F. National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500-505-06 Series...Metal Finishes Manual

G. U.S. Department of Commerce, Product Standard (PS):
PS 1-95.....Construction and Industrial Plywood

H. Federal Specifications (Fed. Spec.):
FF-N-836D.....Nut, Square, Hexagon Cap, Slotted, Castle Knurled, Welding and Single Ball Seat
A-A-55615.....Shield, Expansion; Nail Expansion (Wood Screw and Lag Bolt Self-Threading Anchors)

PART 2 - PRODUCTS

2.1 MATERIALS

A. Sheet Steel:
1. ASTM A794, cold rolled, Class 1 finish, stretcher leveled.
2. Other types of cold rolled steel meeting requirements of ASTM A568 may be used for concealed parts.

B. Structural Steel: ASTM A283 or ASTM A36.

C. Stainless Steel: ASTM A167, Type 302B.

D. Glass:
1. ASTM C1036 Type I, Class 1, Quality q3,
2. For Doors: 6 mm (1/4 inch) thick.

E. Glazing Cushions:
1. Channel shaped, of rubber, vinyl or polyethylene plastic, with vertical flanges not less than 2 mm (3/32 inch) thick and horizontal web 3 mm (1/8 inch) thick.
2. Flanges may have bulbous terminals above the glazing heads or terminate flush with top of beads.

F. Plywood:
1. Fire Treated for blocking in walls.

G. Fasteners:
1. Exposed to view, chrome plated steel or stainless steel, or finished to match adjacent surface.
2. Use round head or countersunk fasteners where exposed in cabinets.
3. Expansion Bolts: Fed Spec. A-A-55615. Do not use lead or plastic shields.
4. Nuts: Fed Spec FF-N-836. Type III, Style 15 where exposed.
5. Sex Bolts: Capable of supporting twice the load.

2.2 MANUFACTURED PRODUCTS

A. When two or more units are required, use products of one manufacturer.

B. Manufacturer of equipment assemblies, which include components made by other, shall assume complete responsibility for the final assembled unit.

C. Constituent parts which are alike use products of a single manufacturer.

2.3 CASEWORK FABRICATION

A. General:

1. Welding: Comply with AWS Standards.
2. Reinforce with angles, channels, and gussets to support intended loads, notch tightly, fit and weld joints.
3. Constructed of sheet steel, except where reinforcing required.

B. Minimum Steel Thickness:

0.89 mm (0.035 inch) (20 gage)	Drawer fronts, backs, bodies, closure plates or scribe and filler strips less than 75 mm (three inches) wide, sloping top, shelf reinforcement channel and shelves. Toe space or casework soffits and ceilings under sloping tops.
1.20 mm (0.047 inch) (18 gage)	Base pedestals, casework top sides, back, and bottom panels, closure scribe and filler strips 75 mm (three inches) or more. Reinforcement for drawers with locks. Tables legs, spreaders and stretchers, when fabricated of cold rolled tubing. Metal for desks; except legs and aprons. Door exterior and interior panels, flush or glazed. Cross rails of base units. Front bottom rails, back bottom rails; rails may be 1.49 mm (0.059 inch) (16 gage) thick. Uprights or posts. Top corner gussets.
1.49 mm (0.059 inch) (16 gage)	Aprons, apron division, reinforcing gussets, table legs, desk legs and aprons, spreaders and stretchers when formed without welding. Toe base gussets, drawer slides, and other metal work. Front top rails and back rails except top back rails may be 1.2 mm (0.047 inch) (18 gage) thick.
1.88 mm (0.074 inch) (14 gage)	Drawer runners door tracks.
2.64 mm (0.104 inch) (12 gage)	Base unit bottom corner gussets and leg sockets.
3 mm (0.12 inch) (11 gage)	Reinforcement for hinge reinforcement inside doors and cabinets.

C. Casework Construction:

1. Welded assembly.
2. Fabricate with enclosed uprights or posts full height or width at front, include sides, backs, bottoms, soffits, ceilings under sloping tops, headers and rail, assembled to form an integral unit.
3. Form sides to make rabbeted stile 19 to 28 mm (3/4 to 1-1/8 inch) wide, closed by channel containing shelf adjustment slots.
4. Make bottom of walls units flush, double panel construction.

5. Make top and cross rails of "U" shaped channel.
6. Provide enclosed backs and bottoms in cabinets, including drawer units.
7. Provide finish panel on exposed cabinet backs.
8. Do not use screws and bolts in construction or assembly of casework, except to secure hardware, applied door stops, accessories, removable panels and where casework is required to fasten end to end or back to back.
9. Fabricate casework, except benches, and desks with finished end panels.
10. Close flush exposed soffits of wall hung shelving, knee spaces in counters, and toe spaces at bases.
11. In base units with sinks provide one piece, lowered backs.
12. In base units with doors provide removable backs.
13. Provide built-in raceways or tubular or channel shaped members of casework for installation of wiring and electric work. Mount junction boxes on rear of cabinets, Electric work is specified in electrical sections of specifications.
14. Provide reinforcing for hardware.
15. Size Dimensions:
    a. Used dimensions shown or specified within tolerances specified.
    b. Tolerance:
        1) Depth: 325 mm (13 inches) in lieu of 300 mm (12 inches), 450 mm (18 inches) in lieu of 400 mm (16 inches), except wall hung units above counter. 525 mm (21 inches) to 600 mm (24 inches) in lieu of 550 mm (22 inches).
        2) Width: Minus 25 mm (one inch).
        3) Height: 25 mm (one inch) plus or minus for wall hung cabinets and counter mounted cabinets, excluding sloping tops. 25 mm (one inch) plus for floor standing cabinets, excluding base and sloping tops. Full height cabinets shown back to back same height.
        4) Manufacturer's tolerance for the same length, depth or height: Not to exceed 1.58 mm (0.0625 inches).

D. Base Pedestals:
1. Provide adjustable leveling bolts accessible through stainless steel plugs, or notch in the base concealed when resilient base is applied.
2. Except where flush metal base is shown, provide toe space at front recessed 75 mm (3 inches).

E. Doors:

1. Hollow metal type, flush and glazed doors not less than 16 mm (5/8 inch) thick.
2. Fabricate flush metal doors of two panels formed into pans with corners welded and ground smooth. Provide flush doors with a sound deadening core.
3. Fabricate glazed metal doors with reinforced frame and construct either from one piece of steel, or have separate stiles and rails mitered and welded at corners, and welds ground smooth.
   a. Secure removable glazing members with screws to back of doors.
   b. Install glass in rubber or plastic glazing channels.
4. Provide sheet steel hinge reinforcement inside doors.
5. Sliding doors: Provide stops to prevent bypass.
6. Doors removable without use of tools except where equipped with locks.

F. Drawers:
1. Drawer fronts flush hollow metal type not less than 16 mm (5/8 inch) thick with sound deadening core. Fabricate of two panels formed into pans. Weld and grind smooth corners of drawer fronts.
2. Form bodies from one piece of steel, weld to drawer front.
3. Provide reinforcement for locks and provide rubber bumpers at both sides of drawer head to cushion closing.
4. Equip with roller suspension guides.

G. Sloping Tops:
1. Provide sloping tops for casework where shown.
2. Where ceilings interfere with installation of sloping tops. Provide filler plates as specified.
3. Omit sloping tops or filler plates whenever ceiling material is turned down and furred-in at face of casework.
4. Provide exposed ends of sloping tops with flush closures.
5. Fasten sloping tops with sheet metal screws inserted from cabinet interior; space fastener as recommended by manufacturer.

H. Shelves:
1. Capable of supporting an evenly distributed minimum load of 122 kg/m^2 (twenty-five pounds per square foot) without visible distortion.
2. Flange shelves down 19 mm (3/4 inch) on edges, with front and bearing edges flanged back 13 mm (1/2 inch).
3. For shelves over 1050 mm (42 inches) in length and over 300 mm (12 inches) in depth install 38 mm by 13 mm by 0.9 mm (1-1/2 x 1/2 x 0.0359 inch) thick sheet steel hat channel reinforcement welded to underside midway between front and back and extending full length of shelf.

4. Weld shelves to metal back and ends unless shown adjustable.
5. Provide means of positive locking shelf in position, and to permit adjustment without use of tools.

I. Undercounter Table and Bench Frames:
1. Using welded construction.
2. Open frame type with aprons and legs when required.
3. Aprons:
   a. Channels shaped welded at corners, with leg sockets and reinforcing triangular corner gussets welded in corners.
   b. Pierce sockets to receive leg bolts and notch gussets to receive legs.
   c. Upper flange perforated or slotted to receive screws at 200 mm (8 inch) centers, and back channels when installed against wall. Size slots for 6 mm (1/4 inch) anchor bolts.
   d. Pierce aprons to receive drawer formation, rail at top of drawer opening. Install channel shaped apron division welded at ends, 762 mm 30 inches apart to front and back aprons, or at each side of drawer.
   e. Fabricate metal components from sheet steel.
      1) Use 1.5 mm (0.0598 inch) thick sheet for gussets and channel aprons.
      2) Use 1.2 mm (0.0478 inch) thick sheet for other items.
   f. At knee space, provide exposed metal sides and metal closure plate for soffit. Where shown at knee space, provide exposed metal back secured with continuous angle closures at both side.
4. Legs:
   a. Cold rolled tubing or 1.5 mm (0.0598 inch) formed steel.
   b. Leveling-anchoring device at floor.
   c. Stud bolt at top for attachment to leg socket.
5. Leg Braces:
   a. Tables and benches not anchored to walls.
   b. Brace back against front legs near bottom with steel angle, channel or tubular braces.
   c. Fasten braces together with steel straps.
6. Leg Shoes:
   a. Fit casework legs at bottom with either stainless steel, aluminum, or chromium plated brass shoes, not less than 25 mm (one inch) in height.
   b. Fit other legs with a movable molded vinyl shoe 100 mm (four inches) high and coved at bottom.

J. Closures and Filler Strips at Pipe Spaces:
   1. Flat steel strips or plates.
   2. Openings less than 200 mm (8 inches) wide: 1.2 mm (0.047 inch) thick.
   3. Openings more than 200 mm (8 inches wide 0.9 mm (0.359 inches) wide.

2.4 NOT USED

2.5 HARDWARE

A. Factory installed.
B. Exposed hardware, except as specified otherwise, satin finished chromium plated brass or nickel plated brass or anodized aluminum.
C. Cabinet Locks:
   1. Door and Drawer: ANSI/BHMA A156.11 cam locks.
      a. Drawer and Hinged Door up to 900 mm (36 inches) high: E07261.
      b. Pin-tumbler, cylinder type lock with not less than four pins. Disc tumbler lock "duo A" with brass working parts and case, as manufactured by Illinois Lock Company are acceptable.
      c. Sliding Door: E07161.
   2. Key locks differently for each type casework and master key.
      b. Provide two keys per lock.
      c. Provide six master keys.
   3. Marking of Locks and Keys:
      a. Name of manufacturer, or trademark which can readily be identified legibly marked on each lock and key change number marked on exposed face of lock.
      b. Key change numbers stamped on keys.
      c. Key change numbers to provide sufficient information for manufacturer to replace key.
D. Cabinet Hardware: ANSI BHMA A156.9.
   1. Door/Drawer Pulls: B02011.
      a. One for drawers up to 575 mm (23 inches) wide.
      b. Two for drawers over 575 mm (23 inches) wide.
      c. Sliding door flush pull, each door: B02201.
   2. Cabinet Door Catch:
      a. Install at bottom of wall cabinets, top of base cabinets and top and bottom of full height cabinet doors over 1200 mm (48 inches).
      b. Omit on doors with locks.
   3. Drawer Slides:
      a. Use B05051 for drawers over 150 mm (6 inches) deep.
      b. Use B05052 for drawers 75 to 150 mm (3 to 6 inches) deep.
      c. Use B05053 for drawers less than 75 mm (3 inches) deep.
   4. Butt Hinges:

a. B01351, minimum 1.8 mm (0.072 inch) thick chrome plated steel leaves.
b. Minimum 3.5 mm (0.139 inch) diameter stainless steel pins.
c. Full mortise type, five knuckle design with 63 mm (2-1/2 inch) high leaves and hospital type tips.
d. Two hinges per door except use three hinges on doors 1200 mm (48 inches) and more in height. Use stainless steel leaves for tilting bin doors.
f. Do not weld hinges to doors or cabinets.

5. Pivot hinges: ANSI/BHMA A156.1 A875B.
6. Shelf Supports:
   a. install in casework where adjustable shelves are noted.
   b. Adjustable Shelf Standards: B04061 with shelf rest B04081.
   c. Vertical Slotted Shelf Standard: B04102 with shelf brackets B04112 sized for shelf depth.
7. Sliding Doors:
   a. Doors supported by two ball bearing bronze or nylon rollers or sheaves riding on a stainless steel track.
   b. Sliding Door Tracks: B07093. Plastic tracks not acceptable.
   c. Doors restrained by a nylon, polyvinylchloride, or stainless steel guide at opposite end.
8. Auxiliary Hardware: ANSI A156.16.
9. Door silencers: LO3011 or LO3031.
   a. Install two rubber bumpers each door.
   b. Silencers set near top and bottom of jamb.

2.6 METAL FINISHES

A. Comply with NAAMM 500 series and as specified.
B. Steel Cabinets including Closures and Filler Strips:
   1. Acid resisting finish except hardware and stainless steel.
   2. After fabrication of cabinet submerge in a degreasing bath, and thoroughly rinse to remove dirt and grease, and other foreign matter.
   3. Apply non-metallic phosphate coating, then finish with baked-on acid resisting enamel not less than one mil thick.
   4. Finish resistant to action of the following reagents when 10 drops (0.5 cm^3) are applied to the surface and left open to the atmosphere for period of one hour.

Hydrochloric Acid 37 percent	Ethyl Alcohol
Phosphoric Acid 75 percent	Methylethyl Keytone
Sulfuric Acid 25 percent	Acetone
Glacial Acetic Acid	Ethyl Acetate
Sodium Hydroxide 10 percent	Ethyl Ether
Sodium Hydroxide (concentrated)	Carbon Tetrachloride
Ammonia Hydroxide (concentrated)	Xylene
Hydrogen Peroxide 5 percent	Phenol 85 Percent
Formaldehyde 37 percent	

C. Brass:
   1. U.S. Standard Finish No. 26 for hardware items.
   2. Other brass items: ASTM B456, chromium plated finish meeting requirements for Service Condition SCI.

D. Aluminum: Chemically etched medium matte, clear anodic coating, Class II, Architectural, 0.4 mils thick.

E. Stainless Steel: Mechanical finish No. 4 on sheet except No. 7 on tubing.

PART 3 - EXECUTION

3.1 COORDINATION

A. Before installing casework, verify wall and floor surfaces covered by casework have been finished.

B. Verify location and size of mechanical and electrical services as required.

C. Verify reinforcement of walls and partitions for support and anchorage of casework.

3.2 FASTENINGS AND ANCHORAGE

A. Do not anchor to wood ground strips.

B. Provide hat shape metal spacers where fasteners span gaps or spaces.

C. Use 6 mm (1/4 inch) diameter toggle or expansion bolts, or other appropriate size and type fastening device for securing casework to walls or floor. Use expansion bolts shields having holding power beyond tensile and shear strength of bolt and breaking strength of bolt head.

D. Use 6 mm (1/4 inch) diameter hex bolts for securing cabinets together.

E. Use 6 mm (1/4 inch) by minimum 38 mm (1-1/2 inch) length lag bolt anchorage to wood blocking for concealed fasteners.

F. Use not less than No. 12 or 14 wood screws with not less than 38 mm (1-1/2 inch) penetration into fire treated wood blocking.

G. Space fastening devices 300 mm (12 inches) on center with minimum of three fasteners in 900 or 1200 mm (three or four foot) unit width.

H. Anchor floor mounted cabinets with a minimum of four bolts through corner gussets. Anchor bolts may be combined with or separate from leveling device.

I. Secure cabinets in alignment with hex bolts or other internal fastener devices removable from interior of cabinets without special tools. Do not use fastener devices which require removal of tops for access.

J. Where units abut end to end anchor together at top and bottom of sides at front and back. Where units are back to back anchor backs together at corners with hex bolts placed inconspicuously inside casework.

K. Where type, size, or spacing of fastenings is not shown or specified, show on shop drawings proposed fastenings and method of installation.

3.3 CLOSURES AND FILLER PLATES

A. Close openings larger than 6 mm (1/4 inch) wide between cabinets and adjacent walls with flat, steel closure strips, scribed to required contours, or machined formed steel fillers with returns, and secured with sheet metal screws to tubular or channel members of units, or bolts where exposed on inside.

B. Where ceilings interfere with installation of sloping tops, omit sloping tops and provide flat steel filler plates.

1. Secure filler plates to casework top members, unless shown otherwise.
2. Secure filler plates more than 150 mm (six inches) in width top edge to a continuous 25 by 25 mm (one by one inch) 0.889 mm thick steel formed steel angle with screws.
3. Anchor angle to ceiling with toggle bolts.

C. Install closure strips at exposed ends of pipe space and offset opening into concealed space.

D. Paint closure strips and fillers with same finishes as cabinets.

E. Caulk and seal laboratory furniture as specified in Section 07 92 00, JOINT SEALANTS.

3.4 CABINETS

A. Install in available space; arranged for safe and convenient operation and maintenance.

B. Align cabinets for flush joints except where shown otherwise.

C. Install cabinet’s level with bottom of wall cabinets in alignment and tops of base cabinets aligned.

D. Install corner cabinets with hinges on corner side with filler or spacers sufficient to allow opening of drawers.

E. Plug Buttons:

1. Install plug buttons in predrilled or prepunched perforations not used.

2. Use chromium plate plug buttons or buttons finish to match adjacent surfaces.

F. Cabinets 6D: Ground to nearest cold water pipe in accordance with NFPA, Underwriters Laboratories, Inc., or other nationally recognized laboratory approved ground specified system.

3.5 PROTECTION TO FIXTURES, MATERIALS, AND EQUIPMENT

A. Tightly cover and protect cabinets against dirt, water chemical or mechanical injury.

B. Thoroughly clean interior and exterior of cabinets, at completion of all work.

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SECTION 12 36 00
COUNTERTOPS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies casework countertops with integral accessories.

B. Integral accessories include:

1. Sinks without traps and drains.

1.2 RELATED WORK

A. DIVISION 22, PLUMBING.

B. DIVISION 26, ELECTRICAL.

1.3 SUBMITTALS

A. Submit in accordance with SECTION 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings

1. Show dimensions of section and method of assembly.
2. Show details of construction at 1/2 scale.

C. Samples:

1. 150 mm (6 inch) square samples each top.
2. Front edge, back splash, end splash.
3. Color selector for molded resin tops.

1.4 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

B. American Hardboard Association (AHA):

A135.4-95.....Basic Hardboard

C. Composite Panel Association (CPA):

A208.1-09.....Particleboard

D. American Society of Mechanical Engineers (ASME):

A112.18.1-05.....Plumbing Supply Fittings

A112.1.2-04.....Air Gaps in Plumbing System

A112.19.3-08(R2004).....Stainless Steel Plumbing Fixtures (Designed for Residential Use)

E. American Society for Testing and Materials (ASTM):

A167-99 (R2009).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

A1008-09.....Steel, Sheet, Cold-Rolled, Carbon, Structural, High Strength, Low Alloy

D256-06.....Pendulum Impact Resistance of Plastic

D570-98(R2005).....Water Absorption of Plastics

D638-08.....Tensile Properties of Plastics
D785-08.....Rockwell Hardness of Plastics and Electrical Insulating Materials
D790-07.....Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
D4690-99(2005).....Urea-Formaldehyde Resin Adhesives
G21-96 (R2002).....Determining Resistance of Synthetic Polymeric Materials to Fungi

F. Federal Specifications (FS):
A-A-1936.....Adhesive, Contact, Neoprene Rubber

G. U.S. Department of Commerce, Product Standards (PS):
PS 1-95.....Construction and Industrial Plywood

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A167, Type 304.

B. Sheet Steel: ASTM A1008, cold rolled, Class 1 finish, stretcher leveled.

C. Plywood: PS 1, Exterior type, veneer grade AC not less than five ply construction.

D. Fasteners:
1. Metals used for welding same metal as materials joined.
2. Use studs, bolts, spaces, threaded rods with nuts or screws suitable for materials being joined with metal splice plates, channels or other supporting shape.

E. Solid Polymer Material:
1. Filled Methyl Methacrylic Polymer.
2. Performance properties required:

Property	Result	Test
Elongation	0.3% min.	ASTM D638
Hardness	90 Rockwell M	ASTM D785
Gloss (60^0 Gordon)	5-20	NEMA LD3.1
Color stability	No change	NEMA LD3 except 200 hour
Abrasion resistance	No loss of pattern Max wear depth 0.0762 mm (0.003 in) - 10000 cycles	NEMA LD3
Water absorption weight (5 max)	24 hours 0.9	ASTM D-570
Izod impact	14 N·m/m (0.25 ft-lb/in)	ASTM D256 (Method A)

Property	Result	Test
Impact resistance	No fracture	NEMA LD-3 900 mm (36") drop 1 kg (2 lb.) ball
Boiling water surface resistance	No visible change	NEMA LD3
High temperature resistance	Slight surface dulling	NEMA LD3

3. Cast into sheet form and bowl form.
4. Color throughout.
5. Joint adhesive and sealer: Manufacturers silicone adhesive and sealant for joining methyl methacrylic polymer sheet.
6. Bio-based products will be preferred.

2.2 SINK – (MULTI-PURPOSE ROOM B56)

A. Sinks of Methyl Methacrylic Polymer:
1. Minimum 19 mm (3/4 inch) thick, cast into bowl shape with overflow to drain.
2. Provide for underhung installation to countertop.
3. Provide openings for drain.

2.3 COUNTERTOPS

A. Fabricate in largest sections practicable.
B. Fabricate with joints flush on top surface.
C. Fabricate countertops to overhang front of cabinets and end of assemblies 25 mm (one inch) except where against walls or cabinets.
D. Provide 1 mm (0.039 inch) thick metal plate connectors or fastening devices (except epoxy resin tops).
E. Join edges with epoxy cement, except weld metal tops.
F. Fabricate with end splashes where against walls or cabinets.
G. Splash Backs and End Splashes:
1. Not less than 19 mm (3/4 inch) thick.
2. Height 100 mm (4 inches) unless noted otherwise.
3. Laboratories and pharmacy heights or where fixtures or outlets occur: Not less than 150 mm (6 inches) unless noted otherwise.
4. Fabricate epoxy splash back in maximum lengths practical of the same material.
H. Stainless Steel Counter Tops:
1. Fabricate up to 3600 mm (12 feet) long in one piece, including nosing, backs and ends.
2. When counter tops exceed 3600 mm (12 feet) in length accurately fitted field welded joints are acceptable.
3. Finish thickness at edges 32 mm (1-1/4 inch).

4. Reinforced with minimum 1.5 mm (0.0598 inch) thick hat channel stiffeners, minimum of two stiffeners for units without sinks welded or soldered to underside of top full length.
5. Apply sound deadening material on underside.
6. Flange edges of tops down 32 mm (1-1/4 inch) and reinforce with a steel frame.
7. Grind welds smooth and finished on exposed surfaces to match finish specified.
8. Stainless Steel Counter Tops:
   a. Countertops indicated in all locations, except Multi Purpose Room shall be constructed of stainless steel.
   b. Use 1.5 mm (0.0598 inch) thick stainless steel.
   c. Depth of splash backs and splash ends 25 mm (one inch) and turned down at least 13 mm (1/2 inch) at wall.

9. a. Shelving indicated in all locations, except Multi Purpose Room shall be constructed of stainless steel.

I. Methyl Methacrylic Polymer Tops:
1. Fabricate countertop of methyl methacrylic polymer cast sheet, 19 mm (3/4 inch) thick.
2. Fabricate back splash and end splash to height shown.
3. Fabricate with marine edge where sinks occur.
4. Fabricate in one piece for full length from corner to corner up to 3600 mm (12 feet).
5. Join pieces with adhesive sealant.
7. Cut out countertop for lavatories, plumbing trim.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Secure countertops to supporting rails of cabinets with metal fastening devices, or screws through pierced slots in rails.
1. Where type, size or spacing of fastenings is not shown or specified, submit shop drawings showing proposed fastenings and method of installation.
2. Use round head bolts or screws.
3. Use epoxy or silicone to fasten the epoxy resin countertops to the cabinets.

B. Faucets, Fixtures, and Outlets:
1. Seal opening between fixture and top.
2. Secure to top with manufacturers standard fittings.

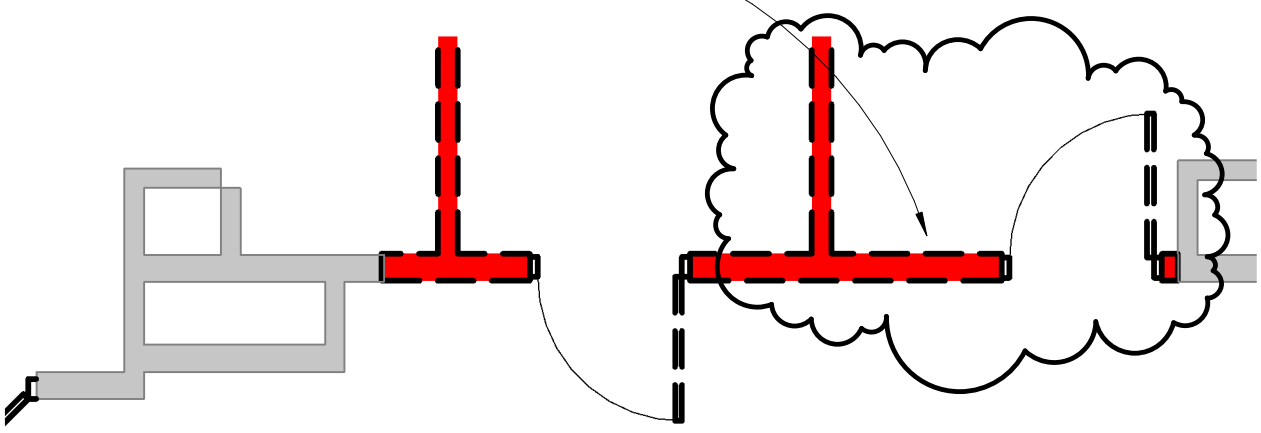
3.2 PROTECTION AND CLEANING

A. Tightly cover and protect against dirt, water, and chemical or mechanical injury.

B. Clean at completion of work.

- - - E N D - - -

SCOPE OF DEMOLITION AND WALL CONSTRUCTION EXPANDED TO INCORPORATE INSTALLATION OF ELECTRICAL PANEL 2/EMSPD IN NEW WALL CONSTRUCTION.



eppstein uhen : architects

ISSUANCE INFORMATION

ISSUANCE SET :	BID DOCUMENTS
PROJECT ISSUANCE DATE:	JUNE 15, 2011
VA PROJECT NUMBER :	607-10-105
EUA PROJECT NUMBER :	2010059

PROJECT INFORMATION

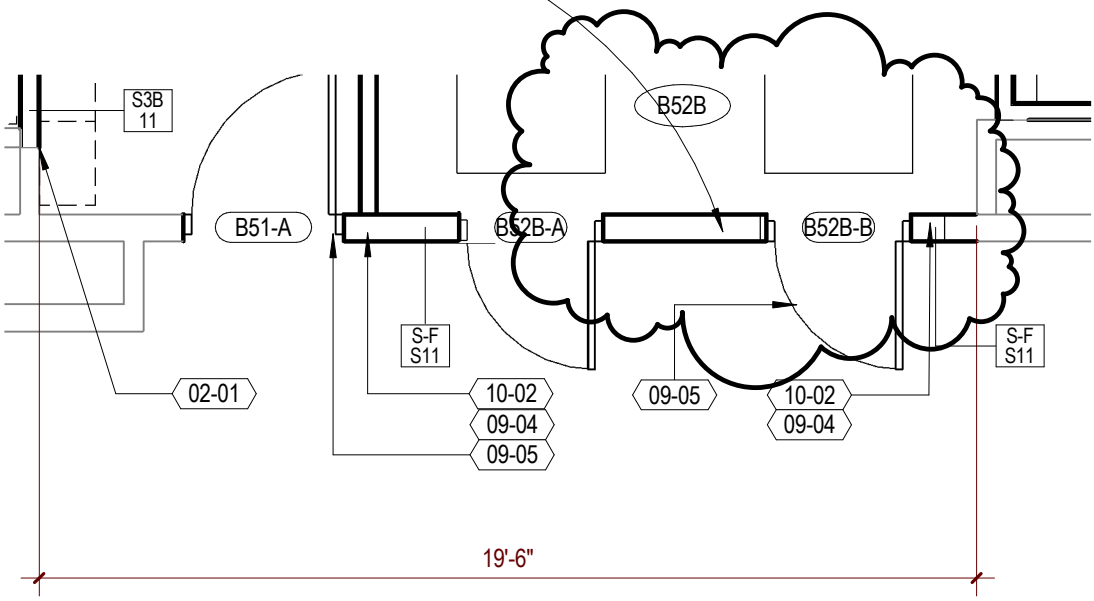
SPD UPGRADE PROJECT

WILLIAM S. MIDDLETON - V.A. HOSPITAL

SUPPLEMENTAL DRAWING

REVISION:	AMENDMENT 04
REVISION DATE :	DEC 5, 2011
SHEET NUMBER :	**AD100A-01**

SCOPE OF DEMOLITION AND WALL CONSTRUCTION EXPANDED TO INCORPORATE INSTALLATION OF ELECTRICAL PANEL 2/EMSPD IN NEW WALL CONSTRUCTION.



eppstein uhen : architects

ISSUANCE INFORMATION

ISSUANCE SET :	BID DOCUMENTS
PROJECT ISSUANCE DATE:	JUNE 15, 2011
VA PROJECT NUMBER :	607-10-105
EUA PROJECT NUMBER :	2010059

PROJECT INFORMATION

SPD UPGRADE PROJECT

WILLIAM S. MIDDLETON - V.A. HOSPITAL

SUPPLEMENTAL DRAWING

REVISION:	AMENDMENT 04
REVISION DATE :	DEC 5, 2011
SHEET NUMBER :	**AS100A-01**

EXHAUST FAN

		EF-1	EF-2	EF-3
PLAN DESIGNATION		GREENHECK	GREENHECK	GREENHECK
MANUFACTURER		SWB-118	BSQ-80	BSQ-140HP
MODEL		UTILITY	INLINE	INLINE
FAN TYPE		SPD	CART WASH	ETO
SERVES		OUTSIDE AIR WELL	TOILET ROOM	PENTHOUSE
LOCATION		2,250	300	2,000
FAN	CFM	1.0	0.75	3.00
	EXTERNAL STATIC PRESSURE (IN.W.C.)	BELT	BELT	BELT
	DRIVE	1,725	1,725	1,725
	MAX RPM	0.75	0.25	2.00
	NOM. FAN MOTOR (HP)	208 / 3	120 / 1	208 / 3
	VOLTAGE/PHASE	31.5x38x46	21x15x15	24x23x23
CABINET	SIZE (LxWxH) IN	279	75	88
	WEIGHT (LBS)	79	79	85
SOUND POWER MAX VALUES (INTAKE)	1ST OCTAVE	82	83	76
	2ND OCTAVE	70	72	82
	3RD OCATVE	68	72	81
	4TH OCTAVE	60	63	79
	5TH OCTAVE	56	59	73
	6TH OCTAVE	54	58	75
	7TH OCTAVE	50	53	74
	SONES	11	12	25
REMARKS		1 THRU 10	2,4,7,11	1,2,4,10

1. MOTOR SHALL BE INVERTER DUTY/PREMIUM RATED
2. SCHEDULED UNITS BASED ON SELECTIONS OF GREENHECK FANS
3. PROVIDE 1" STATIC DEFLECTION SPRING VIBRATION ISOLATORS FOR FANS
4. PROVIDE DISCONNECT
5. PROVIDE WEATHERHOOD
6. PROVIDE HINGED ACCESS DOOR
7. PROVIDE STAINLESS STEEL SHAFT
8. PROVIDE WITH HIGH PRO POLYESTER COATING
9. PLACE UNIT ON GALVANIZED STRUCTURAL FRAME
10. PROVIDE WITH VFD
11. PROVIDE WITH STARTER

LOUVER

PLAN DESIGNATION		EAL-1
MANUFACTURER		GREENHECK
MODEL		ESD-435
CONSTRUCTION	TYPE	EXHAUST
	MATERIAL	ALUMINUM
CFM		300
SIZE (INCHES)	WIDTH	14
	HEIGHT	14
	DEPTH	4
MAX FREE AREA VELOCITY - FPM		725
MAX PRESSURE DROP - IN WC		0.10
REMARKS		1, 2, 3

1. PROVIDE WITH INSECT SCREEN
2. COORDINATE FINISH AND COLOR WITH ARCHITECT
3. FIELD VERIFY LOUVER SIZES BEFORE INSTALLATION

VENTILATION SCHEDULE

ROOM NUMBER	ROOM NAME	AREA	ACH REQ'D SUPPLY	ACH REQ'D RETURN	ACH REQ'D EXHAUST	CFM REQ'D SUPPLY	CFM REQ'D RETURN	CFM REQ'D EXHAUST	CFM REQ'D BY LOAD CALCS	ROOM AIR BALANCE	CFM PROVIDED SUPPLY	CFM PROVIDED RETURN	CFM PROVIDED EXHAUST	SERVED BY
NA	CLEAN STORAGE	1400	4	NA	100%	747	NA	574	605	POSITIVE	2100	NA	1630	CV-01,02 X-EF
B56	MULTIPURPOSE	116	4	NA	100%	62	NA	62	212	NEUTRAL	225	NA	225	CV-09, EF-1
B59A	ANTE ROOM	51	10	NA	100%	68	NA	NA	7	POSITIVE	100	NA	NA	CV-06
B59B	TOILET	99	NA	NA	10	NA	NA	132	84	2X NEGATIVE	100	NA	150	CV-09, EF-1
B53B,C	DECONTAMINATION	683	10	NA	100%	911	NA	1,184	1,278	2X NEGATIVE	1300	NA	1700	CV-07,08, EF-1
B53	ANTE ROOM (DIRTY)	111	NA	NA	10	NA	NA	148	14	NEGATIVE	NA	NA	150	EF-2
B52	GAS STERILIZER	273	10	NA	100%	364	NA	419	902	NEGATIVE	925	NA	1075	CV-05, EF-3
B53A	CART WASH	92	10	NA	100%	123	NA	141	12	NEGATIVE	125	NA	150	CV-06, EF-2
B59A	INCUBATORS	56	10	NA	100%	88	NA	101	170	NEGATIVE	100	NA	125	CV-05, EF-1
B50	STERIL PREP	572	10	NA	100%	763	NA	534	1,161	2X POSITIVE	2400	NA	1845	CV-04, X-EF
B51	ANTE ROOM (CLEAN)	64	10	NA	NA	85	NA	NA	9	POSITIVE	100	NA	NA	CV-03
B49	WORKROOM	142	4	NA	100%	76	NA	76	195	NEUTRAL	200	NA	200	CV-03, X-EF
B49A	MANAGERS OFFICE	68	4	NA	100%	36	NA	36	50	NEUTRAL	50	NA	50	CV-03, X-EF
B53D	EQUIPMENT CHASE	116	NA	NA	NA	NA	NA	NA	NA	NA	1000	NA	1000	X-AHU, X-EF
B52A,B	EQUIPMENT CHASE	84	NA	NA	NA	NA	NA	NA	NA	NA	175	NA	475	X-AHU, EF-3
NA	DECON. STORAGE	119	NA	NA	10	NA	NA	159	14	NEGATIVE	NA	NA	175	EF-1
TOTAL						3322		3407	4064		8060		8620	

NA-NOT APPLICABLE

CV BOXES WITH REHEAT

		CV-01	CV-02	CV-03	CV-04	CV-05	CV-06	CV-07	CV-08	CV-09
PLAN DESIGNATION		CLEAN STORAGE	CLEAN STORAGE	B49	B50	B62	B53A	B53C	53B	B56
SERVES ROOM		PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE	PRICE
MANUFACTURER		SDV5	SDV5	SDV5	SDV5	SDV5	SDV5	SDV5	SDV5	SDV5
MODEL		10	14	7	14	10	4	10	10	8
INLET SIZE		500	1600	350	2400	1025	125	800	500	425
AIRFLOW	MAX - CFM	500	1600	350	2400	1025	125	800	500	425
	MIN - CFM	0.1	0.15	0.1	0.2	0.35	0.05	0.3	0.1	0.2
	MAX PRESSURE DROP - IN WC	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	MAX INLET PRESSURE - IN WC	53	57	55	58	57	47	55	53	56
SOUND POWER	2ND OCTAVE	45	53	49	54	49	42	48	45	47
(RADIATED) @	3RD OCTAVE	46	51	44	52	47	40	47	46	44
MIN OPERATING	4TH OCTAVE	39	43	38	45	40	32	40	39	38
STATIC PRESS)	5TH OCTAVE	34	38	34	39	35	29	35	34	32
	6TH OCTAVE	29	30	27	32	29	22	29	29	27
	7TH OCTAVE	20	25	--	26	21	--	21	20	--
	NC	61	65	60	66	64	55	63	61	60
SOUND POWER	2ND OCTAVE	61	63	61	64	62	59	62	61	59
(DISCHARGE @	3RD OCTAVE	61	64	59	65	62	564	62	61	57
MIN OPERATING	4TH OCTAVE	57	61	55	62	58	51	58	57	53
STATIC PRESS)	5TH OCTAVE	52	56	50	57	52	47	53	52	49
	6TH OCTAVE	50	53	48	54	50	44	50	50	46
	7TH OCTAVE	27	29	25	29	25	25	26	27	24
	NC	16.5	44.5	14.0	49.0	44.3	5.8	40.1	16.5	23.3
COIL OUTPUT @	CAPACITY - MBH	55	55	55	55	55	55	55	55	55
MIN AIRFLOW	ENTERING AIR TEMP - °F	85	80	90	75	99	97	102	85	106
	LEAVING AIR TEMP - °F	180	180	180	180	180	180	180	180	180
	ENTERING WATER TEMP - °F	160	160	160	160	160	160	160	160	160
	LEAVING WATER TEMP - °F	1	1	1	1	2	1	2	1	2
	ROWS	1.7	4.5	1.5	5.1	4.6	0.6	4.25	1.7	2.5
	FLOW RATE - GPM	0.35	3.75	1.5	4.8	4.35	0.25	3.7	0.35	1.0
	MAX PRESSURE DROP - FT WC									

DIFFUSERS & GRILLES

		S-1	S-2	S-3	S-4	S-5	S-6	E-1	E-2	E-3	E-4	E-5
PLAN DESIGNATION		TITUS	TITUS	TITUS	TITUS	NOT USED	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS
MANUFACTURER		PAS	PAS	PAS	PAS		301FL	PAR	PAS	PAR	350FL	350FL
MODEL		PERFORATED	PERFORATED	PERFORATED	PERFORATED		GRILLE	PERFORATED	PERFORATED	PERFORATED	GRILLE	GRILLE
CONSTRUCTION	TYPE	LAY-IN	SURFACE	LAY-IN	LAY-IN		SURFACE	LAY-IN	SURFACE	LAY-IN	SURACE	SURACE
	MOUNTING	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM		ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM
	MATERIAL	0 - 150	0-150	250-400	025		1000	0-225	0-700	1,700	1,500	325
CFM		12" x 12"	12" x 12"	24" x 24"	24" x 24"		24" x 12"	12" x 12"	12" x 12"	24" x 24"	36" x 12"	12"x6"
GRILLE SIZE		6" Ø	6" Ø	10"x 10"	24" x 24"		24" x 12"	10"x 10"	6" Ø	18" x 18"	36" x 12"	12"x6"
DUCT CONNECTION SIZE		20	20	25	5		24	24	17	35	20	30
NC		1,3,5	1,2,3	1,3,4	1,3,4		1,2,3	1,3,5	1,2,3	1,3	1,2,3	1,2,3
REMARKS												

1. COORDINATE COLOR WITH ARCHITECT
2. PROVIDE SURFACE MOUNTING FRAME
3. PROVIDE DAMPER
4. PROVIDE WITH 4-WAY PATTERN
5. PROVIDE 24x24 LAY IN

AIR CONTROL VALVES

		ACV-1	ACV-2	ACV-3	ACV-4	ACV-5
PLAN DESIGNATION		PRICE	NOT USED	PRICE	PRICE	PRICE
MANUFACTURER		RDVSS		RDVSS	RDVSS	RDVSS
MODEL		12" Ø		12" Ø	12" Ø	10" Ø
UNIT SIZE		B53B		B50	CLEAN STORAGE	B52
LOCATION		1,700		1,845	1,500	1,075
AIR FLOW	CFM	23 1/8		23 1/8	23 1/8	20 7/8
SIZE	LENGTH	66		70	66	48
SOUND DATA	2ND OCTAVE	64		65	63	45
MAX VALUES	3RD OCATVE	64		65	62	48
(RADIATED)	4TH OCTAVE	58		59	56	47
	5TH OCTAVE	55		56	54	48
	6TH OCTAVE	51		53	50	42
	7TH OCTAVE	1		1	1	1
REMARKS						

1. STAINLESS STEEL CONSTRUCTION

GENERAL NOTES

1. MECHANICAL CONTRACTOR SHALL COORDINATE WORK WITH EXISTING CONDITIONS AND WITH THE WORK OF OTHER TRADES.
2. THESE DRAWINGS ARE A DIAGRAMMATIC REPRESENTATION OF WORK TO BE ACCOMPLISHED AND AS SUCH DO NOT SHOW ALL REQUIRED OFFSETS OF PIPING. MECHANICAL CONTRACTOR SHALL INSTALL MATERIAL AND EQUIPMENT AS TO CONFORM TO THE STRUCTURE, EQUIPMENT CONNECTIONS AND MAINTAIN HEADROOM AND PASSAGEWAY.
3. ALL CUTTING AND PATCHING OF EXISTING STRUCTURE TO ACCOMMODATE NEW HVAC IS BY MECHANICAL CONTRACTOR.
4. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REINSTALLATION OF EXISTING CEILING (UNLESS WORK PERFORMED BY GENERAL CONTRACTOR AND IDENTIFIED ON ARCHITECTURAL DRAWINGS.) REPLACE ALL DAMAGED CEILING WITH NEW.
5. KEYNOTES PERTAIN ONLY TO THE DRAWING THEY ARE LOCATED ON.
6. DUCT SIZES ARE CLEAR INSIDE DIMENSIONS.
7. MECHANICAL CONTRACTOR SHALL CLEAN ALL EXISTING DUCTWORK, COILS AND DIFFUSERS THAT ARE DESIGNATED TO REMAIN WITHIN PROJECT LIMITATIONS PER SPECS.
8. ALL CONTROL WIRING SHALL BE RUN IN CONDUIT.
9. MAINTAIN 25' MINIMUM DISTANCE FROM OUTSIDE AIR INTAKE TO ANY EXHAUST OR TOILET VENTS.
10. ALL DUCTWORK AND PIPING FITTINGS SHALL BE INSTALLED IN A MANNER WHICH VA STAFF SHALL HAVE ACCESS.
11. CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE THE CONSTRUCTION BOUNDARY LIMITS UNLESS NOTED ON PLANS. COORDINATE SCHEDULE OF SUCH WORK WITH VA.
12. THE EXISTING OR DEMOLITION PLANS ARE BASED OFF OF EXISTING AS-BUILTS, CONSTRUCTION DRAWINGS & CASUAL SITE WALK-THROUGHS. THE CONTRACTOR SHALL VISIT THE SITE, REVIEW OTHER DISCIPLINE DEMOLITION DRAWINGS & PROVIDE DISCONNECTION OR RELOCATION OF ALL NECESSARY EQUIPMENT FOR THE COMPLETION OF THIS PROJECT.
13. CONTRACTOR SHALL PROVIDE OFFSETS OR TRANSITIONS OF ALL DUCTWORK AND PIPING AS NECESSARY.
14. EQUIPMENT SELECTIONS ARE BASED OFF NOTED MANUFACTURERS AND MODELS LISTED ON SCHEDULES. ANY ALTERNATE EQUIPMENT SUBMITTED SHALL MEET OR EXCEED ALL PERFORMANCE CAPACITIES AND FALL WITHIN PHYSICAL DIMENSIONS AND WEIGHTS OF SCHEDULED EQUIPMENT. ALTERNATE SUBMITTALS SHALL MEET ALL SYSTEM REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MODIFICATIONS (STRUCTURAL, ELECTRICAL, MECHANICAL, ETC.) NECESSARY TO ACCOMMODATE ALTERNATE EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER.
15. TEMPORARY CONNECTIONS TO X-64x14 SA DUCTWORK AND X-3"CHWSR PIPING SHALL BE PERFORMED DURING THE WEEKEND. CONTRACTOR SHALL COORDINATE SHUT DOWN OF X-AHU AND X-CHWSR PIPING WITH VA FACILITIES. MINIMUM ONE WEEK NOTICE SHALL BE GIVEN TO VA MANAGEMENT PRIOR TO INSTALLATION AND DEMOLITION.
16. AIR SUPPLY AND EXHAUST FOR THE SPD AREA CANNOT BE SHUT DOWN DURING SPD HOURS. ANY WORK THAT REQUIRES AIR SUPPLY AND EXHAUST TO BE TEMPORARILY SUSPENDED SHALL BE PERFORMED ON WEEKENDS AS NOT TO INTERRUPT SPD OPERATIONS. ONE WEEK NOTICE SHALL BE GIVEN TO VA FACILITIES AND MANAGEMENT PRIOR TO INSTALLATION OR DEMOLITION.
17. CONTRACTOR SHALL REBALANCE EXISTING AHU INCLUDING EXISTING CHILLED WATER COIL, STEAM COIL, CHILLED WATER PUMP, ETC SERVICING THE SPD AREA TO MATCH AIRFLOWS INDICATED. CONTRACTOR SHALL ALSO REBALANCE EXISTING EXHAUST FAN SERVICING THE SPD AREA TO MATCH AIRFLOWS INDICATED.

SPD EQUIPMENT CONTACT INFORMATION

STERIS EQUIPMENT
DUANE HUBING
ACCOUNT MANAGER, STERIS CORPORATION
duane_hubing@steris.com
VM: 800-989-7575 ext. 23251
Cell: 608-358-4859

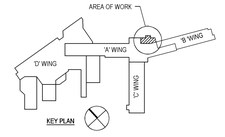
3M EQUIPMENT
Jim Heise
jfheise@mmm.com
800-688-5888

LEGEND

- NEW HVAC EQUIPMENT
- EXISTING HVAC EQUIPMENT
- NEW DUCTWORK
- EXISTING DUCTWORK
- S-* NEW SUPPLY DIFFUSER
- X-SD EXISTING SUPPLY DIFFUSER
- R-*E-* NEW RETURN/EXHAUST GRILLE
- R-*E-* NEW RETURN/EXHAUST GRILLE WITH DAMPER
- X-RG/X-EG EXISTING RETURN/EXHAUST GRILLE
- T-* NEW TRANSFER GRILLE
- X-TG EXISTING TRANSFER GRILLE
- SMOKE DETECTOR
- THERMOSTAT
- SP STATIC PRESSURE CONTROLLER
- CHWS NEW CHILLED WATER SUPPLY PIPING
- X-CHWS EXISTING CHILLED WATER SUPPLY PIPING
- CHWR NEW CHILLED WATER RETURN PIPING
- X-CHWR EXISTING CHILLED WATER RETURN PIPING
- CD NEW CONDENSATE DRAIN PIPING (COOLING COIL)
- X-CD EXISTING CONDENSATE DRAIN PIPING (COOLING COIL)
- LPS NEW LOW PRESSURE STEAM PIPING
- X-LPS EXISTING LOW PRESSURE STEAM PIPING
- LPC NEW LPOW PRESSURE CONDENSATE RETURN PIPING
- X-LPC EXISTING LOW PRESSURE CONDENSATE RETURN PIPING
- DUCT UP
- DUCT DOWN
- FLEX DUCT
- MOTORIZED DAMPER
- FIRE/SMOKE DAMPER
- BALANCING DAMPER
- TRANSFER/DOOR GRILLE
- ELBOW WITH TURNING VANES
- AIR FLOW INDICATOR
- UC DOOR UNDER CUT
- DUCT, PIPING, EQUIPMENT TO BE REMOVED
- KEY NOTE
- AIR VENT
- BALL VALVE
- BUTTERFLY VALVE
- GATE VALVE
- CONTROL VALVE
- 3-WAY CONTROL VALVE
- PIPE ELBOW DOWN
- PIPE ELBOW UP
- CAPPED PIPE END
- THERMOMETER

ABBREVIATIONS

AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CP	CONTROL PANEL
CR	CONDENSATE RETURN
CW	DOMESTIC COLD WATER
DN	DOWN
EA	EXHAUST AIR
FD	FIRE DAMPER
GLYS	GLYCOL SUPPLY
GLYR	GLYCOL RETURN
LPC	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
MIN	MINIMUM
MAX	MAXIMUM
MUA	MAKE UP AIR
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR
SD	START / DISCONNECT
SS	STAINLESS STEEL
STM	STEAM



DEPARTMENT OF VETERANS AFFAIRS

VA MEDICAL CENTER
2500 OVERLOOK TERRACE
MADISON, WISCONSIN 53705

SPD UPGRADE PROJECT

IBC ENGINEERING SERVICES INC.
N8 W22195 JOHNSON DR, STE 180, WAUKESHA, WI 53188
262.549.1190
fx 262.549.1620

eppstein uhen : architects
milwaukee 333 East Chicago Street Milwaukee, Wisconsin 53202 tel 414 271 5350 fax 414 271 7794
madison 222 West Washington Ave, Suite 660 Madison, Wisconsin 53703 tel 608 442 5350 fax 608 442 6680

#	REVISION	DATE
2	AMENDMENT #4	12-5-2011
1		

HVAC NOTES, LEGEND & SCHEDULES

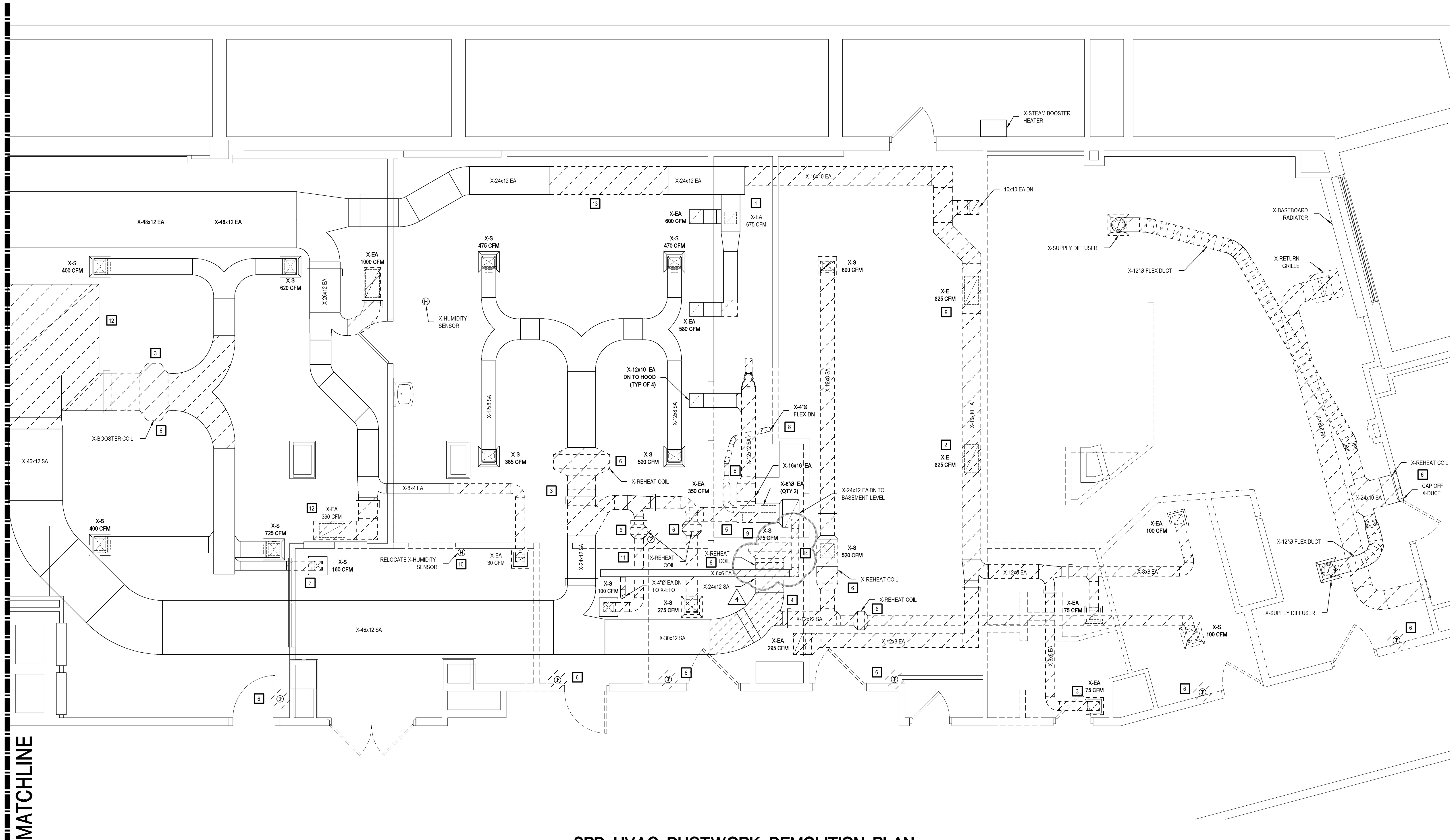
FULLY SPRINKLERED

VA PROJECT NO. 607-10-105
IBC PROJECT NO. 2010059

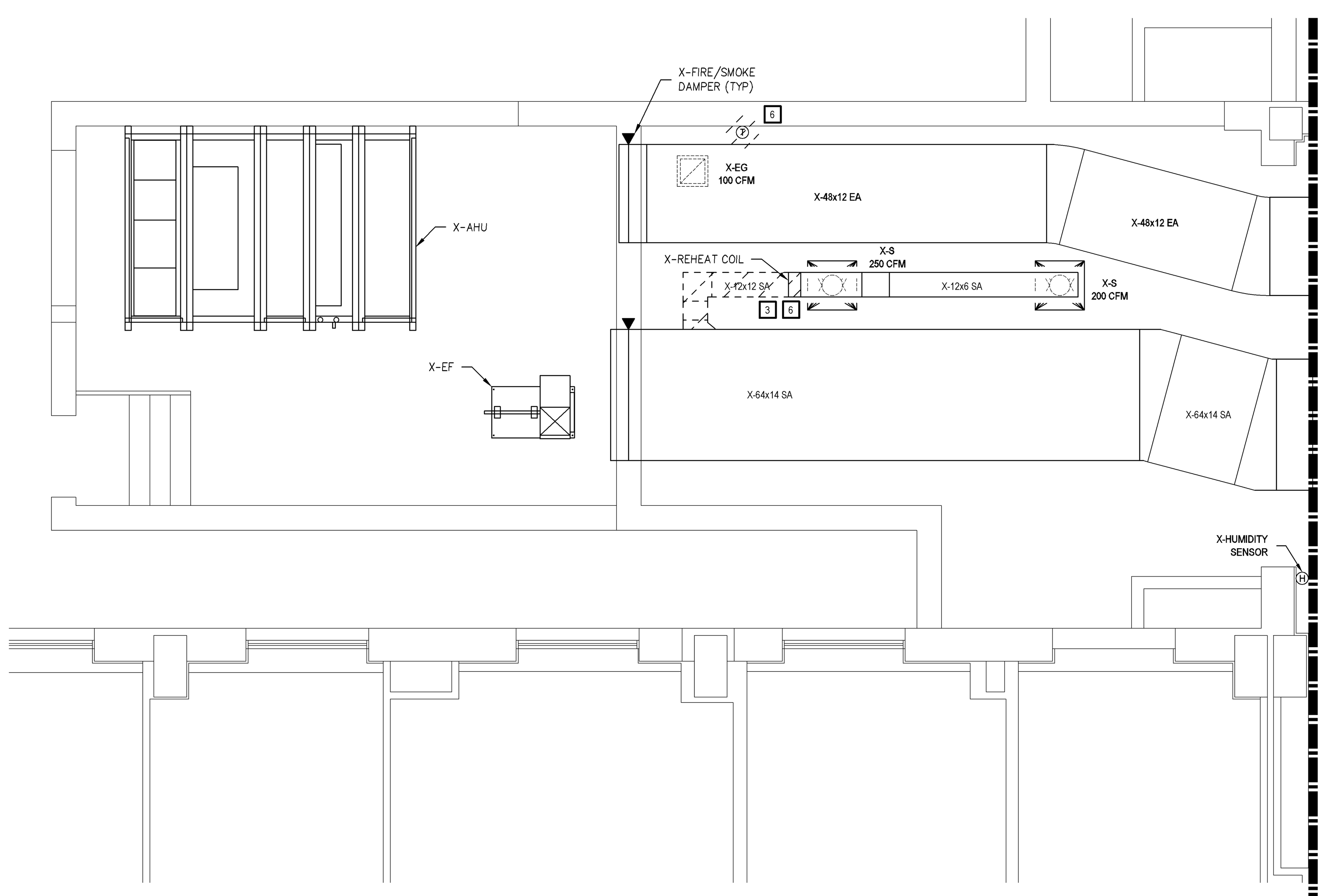
NORTH
BLDG. NO. VA HOSPITAL - 'B' WING
SCALE N.T.S.
DATE JUNE 15, 2011
DRAWN CDW

BID DOCUMENTS

MH001



1 SPD HVAC DUCTWORK DEMOLITION PLAN
1/4"=1'-0"



2 SPD HVAC DUCTWORK DEMOLITION PLAN
1/4"=1'-0"

DEMOLITION NOTES

1. REMOVE X-16x10 EA DUCT AND CAP OFF AT X-24x12 EA DUCT. FIELD VERIFY EXACT LOCATION AND SIZE.
2. REMOVE X-24x12 EA GRILLE AND CAP OFF X-EA DUCT. FIELD VERIFY EXACT LOCATION AND SIZE.
3. REMOVE CEILING AROUND X-BOOSTER COIL AND X-DUCT TO ACCOMMODATE FOR NEW EQUIPMENT. PROVIDE NEW STAINLESS STEEL ACCESS DOOR AND PATCH TO MATCH EXISTING CEILING.
4. REMOVE X-12x12 SA DUCT FROM X-30x12 SA. ACCOMMODATE NEW ELBOW FOR NEW 22x12 SA DUCT. FIELD VERIFY EXISTING SIZE AND LOCATION.
5. REMOVE X-12x10 EA AND SS HOOD FOR X-ETO STERILIZER. REMOVE X-16x16 EA ELBOW AND PREPARE FOR NEW FITTING.
6. REMOVE X-HW BOOSTER COIL, PIPING, CORRESPONDING THERMOSTAT AND PNEUMATIC CONTROLS.
7. REMOVE EXISTING SUPPLY GRILLE & DUCT AND CAP OFF. FIELD VERIFY EXACT LOCATION.
8. REMOVE EXISTING 4"Ø FLEX DUCT FOR EXISTING ETO STERILIZER AND X-6"Ø EA DUCT BACK TO MAIN AND SEAL OFF.
9. REMOVE EXISTING 36x18 GRILL AND DUCTWORK. PREPARE EXISTING WALL FOR NEW EXHAUST GRILLE.
10. RELOCATE X-HUMIDITY SENSOR FOR X-AHU IN OFFICE. REFER TO DRAWING MH100 FOR NEW LOCATION.
11. REMOVE EXISTING 4"Ø FLEX DUCT FOR EXISTING ETO STERILIZER AND ¾"Ø COPPER ETO VENT LINE AND PATCH FLOOR. CAP OFF ¾"Ø COPPER ETO VENT LINE AT FLOOR BELOW.
12. REMOVE EXISTING DUCT FITTING TO ACCOMMODATE NEW CONNECTION. FIELD VERIFY EXACT SIZE AND LOCATION PRIOR TO DEMOLITION. REMOVED EXISTING PLASTER CEILING TO ACCOMMODATE DEMOLITION AND NEW WORK. PATCH CEILING TO MATCH EXISTING.
13. REMOVE SECTION OF X-24x12 EA DUCT TO ACCOMMODATE FOR NEW EXHAUST AIR CONTROL VALVE. PROVIDE AN STAINLESS STEEL ACCESS PANEL AND CATCH CEILING TO MATCH EXISTING.
14. REMOVE EXISTING 6x6 EA FOR X-ETO STERILIZER AND PROVIDE NEW 10x8 EA.

GENERAL NOTES

1. THE EXISTING OR DEMOLITION PLANS ARE BASED OFF OF EXISTING AS-BUILTS, CONSTRUCTION DRAWINGS & CASUAL SITE WALK-THROUGHS. THE CONTRACTOR SHALL VISIT THE SITE, REVIEW OTHER DISCIPLINE DEMOLITION DRAWINGS & PROVIDE DISCONNECTION OR RELOCATION OF ALL NECESSARY EQUIPMENT FOR THE COMPLETION OF THIS PROJECT.
2. CONTRACTOR SHALL NOTIFY VA IF MAJOR DISCREPANCIES ARE FOUND AND COORDINATE THE RELOCATION OF EXISTING PIPING, CONDUIT AND EQUIPMENT PRIOR TO DEMOLITION OR INSTALLATION OF NEW PIPING, DUCTWORK AND EQUIPMENT.
3. CONTRACTOR IS RESPONSIBLE FOR RELOCATING EXISTING SPD EQUIPMENT AND PROVIDING ALL NECESSARY CONNECTIONS TO MAKE EQUIPMENT FUNCTIONAL. CONTRACTOR SHALL READ ALL MANUFACTURER'S INSTALLATION INSTRUCTIONS AND BE FAMILIARIZED WITH ALL EQUIPMENT PRIOR TO DEMOLITION AND INSTALLATION.
4. CONTRACTOR SHALL REMOVE ALL ABANDONED PIPING, CONDUIT, HANGERS, ETC. IN THE CEILING SPACE.
5. CONTRACTOR SHALL REBALANCE EXISTING AHU INCLUDING EXISTING CHILLED WATER COIL, STEAM COIL, CHILLED WATER PUMP, ETC SERVICING THE SPD AREA TO MATCH AIRFLOWS INDICATED . CONTRACTOR SHALL ALSO REBALANCE EXISTING EXHAUST FAN SERVICING THE SPD AREA TO MATCH AIRFLOWS INDICATED.

SPD EQUIPMENT CONTACT INFORMATION

STERIS EQUIPMENT
DUANE HUBING
ACCOUNT MANAGER, STERIS CORPORATION
duane_hubing@steris.com
VM: 800-989-7575 ext. 23251
Cell: 608-358-4859

3M EQUIPMENT
Jim Heise
jfheise@mmm.com
800-688-5888

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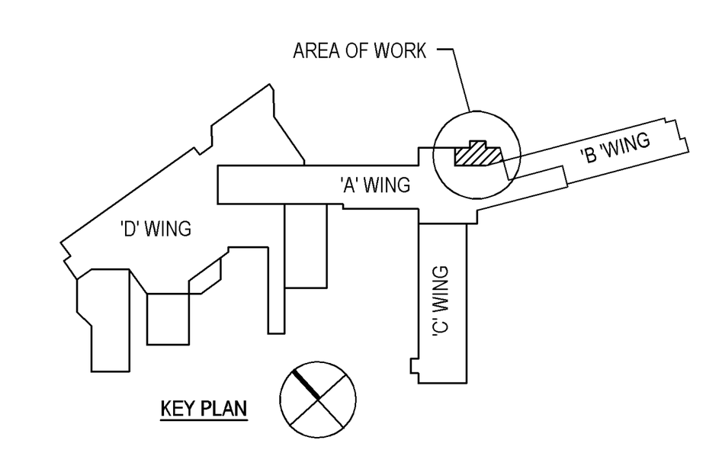
N8 W22195 JOHNSON DR, STE 180 262.549.1190
WAUKESHA, WI 53186 fx 262.549.1620

eppstein uhen : architects
milwaukee 333 East Chicago Street Milwaukee, Wisconsin 53202 tel 414 271 5350 fax 414 271 7794
madison 222 West Washington Ave, Suite 650 Madison, Wisconsin 53703 tel 608 442 5350 fax 608 442 6680



KEY PLAN

#	REVISION	DATE
4	AMENDMENT #4	12-5-2011

HVAC DUCTWORK DEMOLITION PLANS

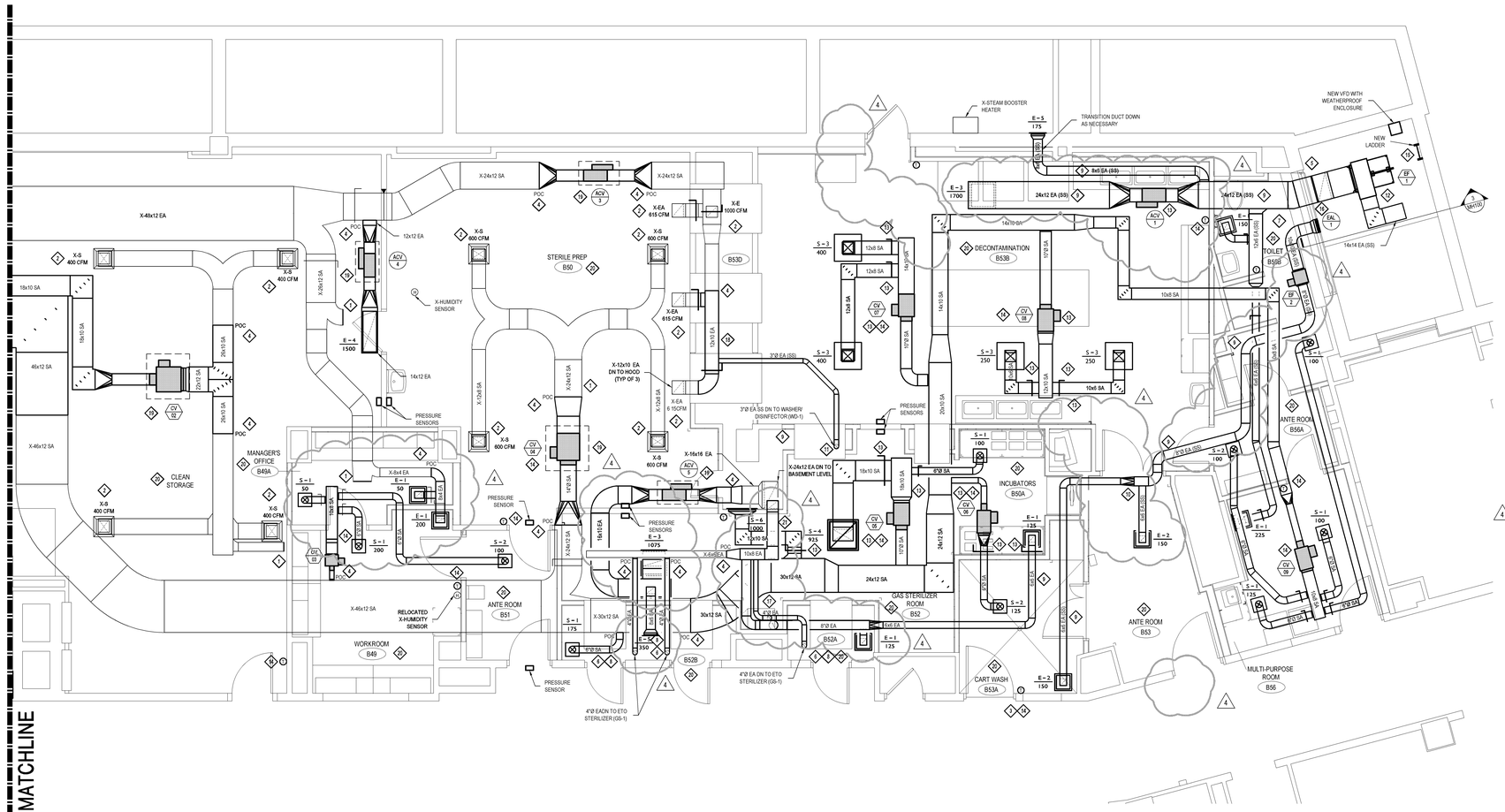
FULLY SPRINKLERED

VA PROJECT NO. 607-10-105
IBC PROJECT NO. 2010059

BLDG. NO. VA HOSPITAL - 'B' WING
SCALE 1/4"=1'-0"
DATE JUNE 15, 2011
DRAWN CDW

BID DOCUMENTS

MD100



MATCHLINE

1 SPD HVAC DUCTWORK PLAN
1/4"=1'-0"

KEY NOTES

1. CAP OFF EXISTING DUCTWORK AND PROVIDE AIR TIGHT SEAL.
2. RE-BALANCE EXISTING GRILLES AS SHOWN ON PLANS. PROVIDE NEW BALANCING DAMPERS AS NECESSARY.
3. PROVIDE MOISTURE REISISTANT COVER FOR NEW THERMOSTAT.
4. CONNECT NEW DUCTWORK TO EXISTING. FIELD VERIFY SIZE AND LOCATION OF EXISTING DUCTWORK PRIOR TO INSTALLATION.
5. TRANSITION 24x12 EA DUCT DN TO INLET CONNECTION SIZE OF EXHAUST FAN EF-1. FIELD VERIFY EXACT ROUTING OF EXHAUST DUCT.
6. CONNECT NEW 4"Ø EA DUCT TO ETO STERILIZER. FIELD VERIFY EXACT LOCATION AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
7. PROVIDE ACOUSTICAL LINER IN 24x12 EA DUCT AS INDICATED ON DRAWING. PROVIDE STEEL SUPPORTS FOR 24x12 EA DUCT AT WINDOW PENETRATION. COORDINATE WITH ARCHITECT.
8. PROVIDE NEW 1/2Ø COPPER TUBING VENT PIPING FOR RELOCATED X-ETO STERILIZER TO X-ABATOR IN THE BASEMENT. FIELD VERIFY EXACT ROUTING AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
9. PROVIDE NEW STAINLESS STEEL EXHAUST DUCTWORK. STAINLESS STEEL DUCTWORK NOTED AS (SS) ON PLANS.
10. FIELD VERIFY EXACT ROUTING OF DUCTWORK PRIOR TO INSTALLATION CONTRACTOR TO COORDINATE WITH DIVISION 22 & 26 CONTRACTORS.
11. COORDINATE EXACT ROUTING OF 3"Ø VENT FOR WASHER/DISINFECTOR UNIT (WD-1) WITH EXISTING CONDITIONS AND NEW WORK. CONNECT TO EXISTING EXHAUST SYSTEM. FIELD VERIFY EXACT LOCATION.
12. CONTRACTOR SHALL PLACE EF-1 ON A GALVANIZED STEEL STRUCTURAL STEEL FRAME ANCHOR SUPPORT FRAME TO THE CONCRETE SLAB.
13. PROVIDE A REMOVABLE ACCESS CEILING PANEL IN THE NEW GASKETED CEILING GRID FOR ALL HVAC EQUIPMENT AND DAMPERS. REFER TO PLAN FOR ALL LOCATIONS.
14. PROVIDE NEW ELECTRONIC THERMOSTAT AND CONTROLS FOR NEW CV BOX.
15. PROVIDE GALVANIZED STEEL NEW LADDER AND ACCESS HATCH FOR PIT AREA. COORDINATE WITH EXACT LOCATION WITH NEW EXHAUST FAN AND VA.
16. PROVIDE BACKDRAFT DAMPER AND FIELD VERIFY EXACT LOCATION OF EXHAUST LOUVER PRIOR TO INSTALLATION.
17. COORDINATE EXACT ROUTING OF 6x6 EA AND 6"Ø EA DUCTWORK WITH EXISTING MEDGAS PIPING.
18. COORDINATE EXACT 12x10 EA DUCT ROUTING WITH EXISTING PIPING IN CHASE.
19. PROVIDE NEW STAINLESS STEEL ACCESS PANEL IN CEILING FOR NEW HVAC EQUIPMENT. COORDINATE SIZE WITH NEW EQUIPMENT.
20. PROVIDE ALTERNATE BID PRICING PER PHASING PLAN G101.
21. REMOVE SECTION OF EXISTING WALL TO ACCOMMODATE FOR NEW 10x8 EA DUCT. FIELD VERIFY EXACT ROUTING.

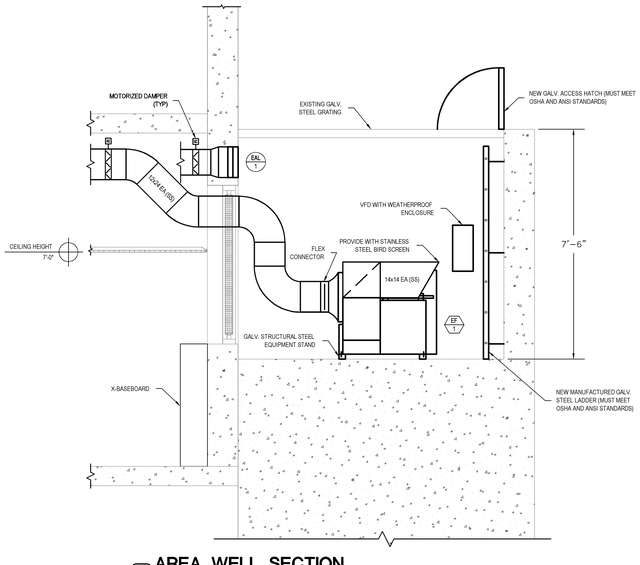
GENERAL NOTES

1. THE EXISTING OR DEMOLITION PLANS ARE BASED OFF OF EXISTING AS-BUILTS, CONSTRUCTION DRAWINGS & CASUAL SITE WALK-THROUGHS. THE CONTRACTOR SHALL VISIT THE SITE, REVIEW OTHER DISCIPLINE DEMOLITION DRAWINGS & PROVIDE DISCONNECTION OR RELOCATION OF ALL NECESSARY EQUIPMENT FOR THE COMPLETION OF THIS PROJECT.
2. CONTRACTOR SHALL NOTIFY VA IF MAJOR DISCREPANCIES ARE FOUND AND COORDINATE THE RELOCATION OF EXISTING PIPING, CONDUIT AND EQUIPMENT PRIOR TO DEMOLITION OR INSTALLATION OF NEW PIPING, DUCTWORK AND EQUIPMENT.
3. CONTRACTOR IS RESPONSIBLE FOR RELOCATING EXISTING SPD EQUIPMENT AND PROVIDING ALL NECESSARY CONNECTIONS TO MAKE EQUIPMENT FUNCTIONAL. CONTRACTOR SHALL READ ALL MANUFACTURER'S INSTALLATION INSTRUCTIONS AND BE FAMILIARIZED WITH ALL EQUIPMENT PRIOR TO DEMOLITION AND INSTALLATION.
4. CONTRACTOR SHALL REBALANCE EXISTING AHU INCLUDING EXISTING CHILLED WATER COIL, STEAM COIL, CHILLED WATER PUMP, ETC SERVICING THE SPD AREA TO MATCH AIRFLOWS INDICATED. CONTRACTOR SHALL ALSO REBALANCE EXISTING EXHAUST FAN SERVICING THE SPD AREA TO MATCH AIRFLOWS INDICATED.
5. CONTRACTOR SHALL GIVE ALTERNATE BID PRICING FOR THE VARIOUS PHASES FOR THIS PROJECT. REFER TO ARCHITECTURAL DRAWING G101 FOR PHASING.

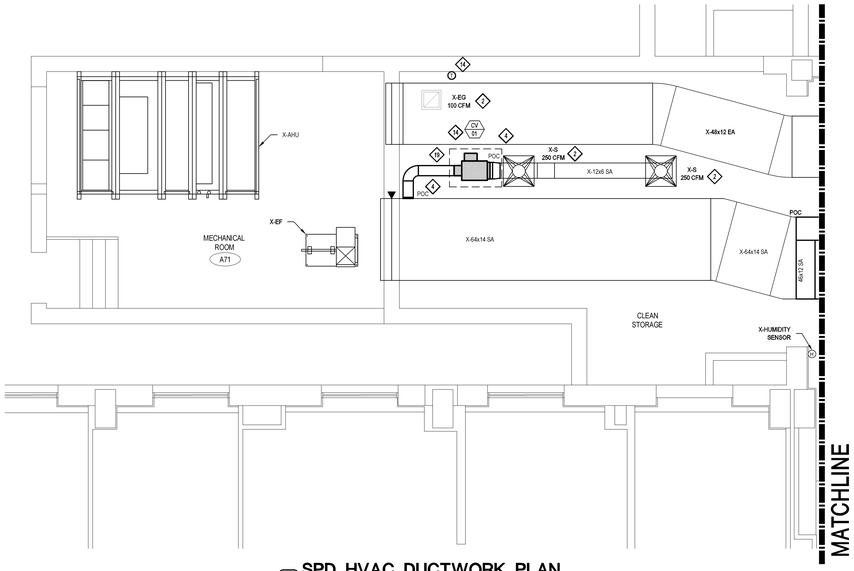
SPD EQUIPMENT CONTACT INFORMATION

STERIS EQUIPMENT
DUANE HUBING
ACCOUNT MANAGER, STERIS CORPORATION
duane_hubing@steris.com
VM: 800-989-7575 ext. 23251
Cell: 608-358-4859

3M EQUIPMENT
Jim Heise
jfheise@mmm.com
800-688-5888



3 AREA WELL SECTION
1/2"=1'-0"



2 SPD HVAC DUCTWORK PLAN
1/4"=1'-0"

DEPARTMENT OF VETERANS AFFAIRS

VA MEDICAL CENTER
2500 OVERLOOK TERRACE
MADISON, WISCONSIN 53705

SPD UPGRADE PROJECT

IBC ENGINEERING SERVICES INC.
NR W22195 JOHNSON DR, STE 180, WAUKESHA, WI 53186
262.549.1190
fx 262.549.1620

eppstein uhen : architects
milwaukee 333 East Chicago Street Milwaukee, Wisconsin 53202 tel 414 271 5350 fax 414 271 7794
madison 222 West Washington Ave, Suite 650 Madison, Wisconsin 53703 tel 608 442 5350 fax 608 442 6680

#	REVISION	DATE
1	AMENDMENT #4	12-5-2011

HVAC DUCTWORK PLANS (NEW WORK)

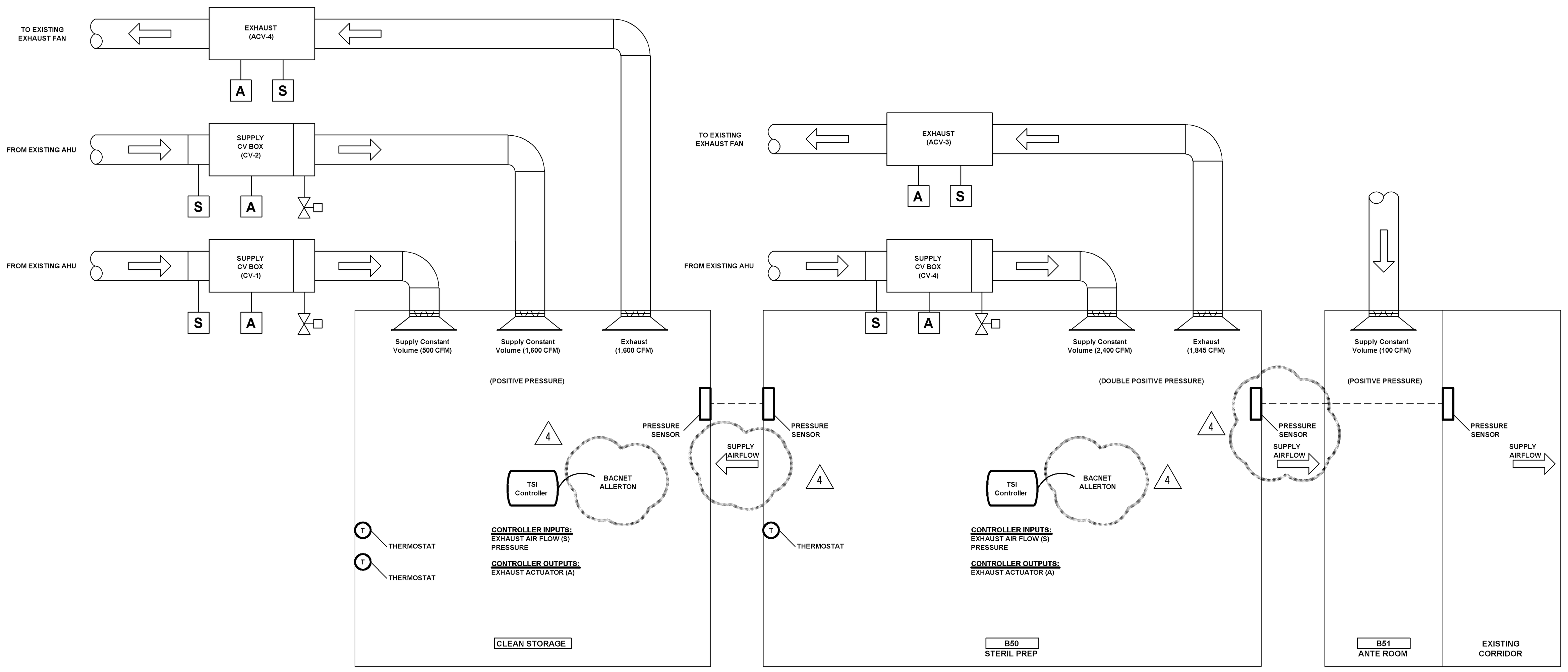
FULLY SPRINKLERED

VA PROJECT NO.	607-10-105
IBC PROJECT NO.	2010059
BLDG. NO.	VA HOSPITAL - 'B' WING
SCALE	AS INDICATED
DATE	JUNE 15, 2011
DRAWN	CDW

NORTH

BID DOCUMENTS

MH100



VA MIDDLETON SPD CONTROL SEQUENCE

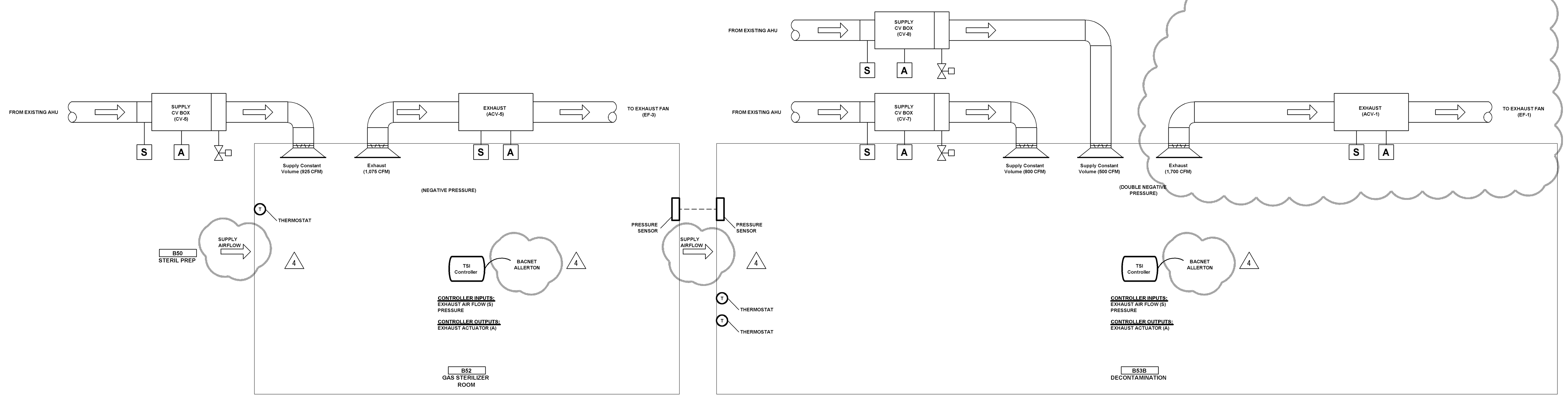
GENERAL SEQUENCE OF OPERATION:
THE ROOM CONTROLLER MAINTAINS THE SUPPLY AIR CFM'S AT OR ABOVE ITS MINIMUM SETPOINT.

ROOM BALANCE AND ROOM PRESSURE CONTROL SEQUENCE OF OPERATION:
1. SEE CONTROLS SCHEMATIC FOR DIRECTION OF AIRFLOW AND PLANS FOR LOCATION OF PRESSURE SENSORS
2. EXHAUST FANS TO MODULATE TO MAINTAIN CONSTANT AIRFLOW
3. DOORS/WINDOWS TO CONTROLLED AREAS SHALL HAVE CLOSURE SWITCHES
4. MODULATE EXHAUST AIR CONTROL VALVES TO MAINTAIN PRESSURE RELATIONSHIP OF CONTROLLED AREAS
5. IF DOOR/WINDOW OF CONTROLLED AREA IS OPEN, MODULATE EXHAUST AND DISABLE ALARM UNTIL DOORS/WINOWS AREA CLOSED AND PRESSURE IS STABILIZED

NOTE: CONTRACTOR SHALL CONNECT TSI CONTROLS TO EXISTING ALLERTON BACNET SYSTEM CONTROL. PROVIDE TOTAL CFM OF EXHAUST PER BOX/ROOM AND EXHAUST FANS TO EXISTING EXISTING ALLERTON BACNET SYSTEM CONTROL FOR MONITORING.

ALL SYSTEMS REQUIREMENTS ARE BASED ON CONTROL SYSTEM BY TSI INC. CONTRACTOR MAY SUBMIT WITH BID AN ACCEPTABLE ALTERNATE, WHICH IS SUBJECT TO VA APPROVAL. WIRING SCHEMATIC IS A DIAGRAMMATIC REPRESENTATION OF WORK TO BE COMPLETED. CONTRACTOR SHALL FIELD VERIFY INSTALLATION AND MODIFY THE CONTROL SYSTEMS AS NECESSARY TO MEET THE DESIGN INTENT.

4



SEQUENCE OF OPERATIONS, AIRFLOW & FIELD WIRING DIAGRAM SPD EXPANSION AREA

1 N.T.S.

DDC INPUT / OUTPUT SUMMARY TABLE

PROJECT: SPD EXPANSION
LOCATION: VA MIDDLETON
SYSTEM: Constant Volume Reheat Terminals (See plans for Qty)

HARDWARE – OUTPUT

POINT DESCRIPTION	DIGITAL: Control Relay	Solenoid	Contactor	24 VAC	ANALOG: Tri-State Actuator	Duration Adjust Actuator	4-20 mA	0-10 VDC
Hardware Points								
Zone Temperature								
Temperature Setpoint Adjust								
Air Valve/Damper							X	
Reheat Valve							X	
HW Radiation ACV	X							
Software Points								
Occupied Heating Setpoint								
Occupied Cooling Setpoint								
Unoccupied Heating Setpoint								
Unoccupied Cooling Setpoint								
Actual Heating/Cooling Setpoint								
Temperature Setpoint Adjust Range								

HARDWARE – INPUT

POINT DESCRIPTION	DIGITAL: Current Sensing Switch	Control Relay Contact	Switch Closure	Auxiliary Contact	Diff Pressure Switch	Flow Switch	ANALOG: Temperature	Resistive	Differential Pressure	Feedback for Tri-State	Static Pressure	Flow
Hardware Points												
Zone Temperature							X					
Temperature Setpoint Adjust												
Air Valve/Damper												
Reheat Valve												
HW Radiation ACV												
Software Points												
Occupied Heating Setpoint												
Occupied Cooling Setpoint												
Unoccupied Heating Setpoint												
Unoccupied Cooling Setpoint												
Actual Heating/Cooling Setpoint												
Temperature Setpoint Adjust Range												

SOFTWARE – ALARMS

POINT DESCRIPTION	DIGITAL: Equipment Status	Maintenance	Pressure	ANALOG: High Limit	Low Limit	Run Time
Hardware Points						
Zone Temperature						
Temperature Setpoint Adjust						
Air Valve/Damper						
Reheat Valve						
HW Radiation ACV						
Software Points						
Occupied Heating Setpoint						
Occupied Cooling Setpoint						
Unoccupied Heating Setpoint						
Unoccupied Cooling Setpoint						
Actual Heating/Cooling Setpoint						
Temperature Setpoint Adjust Range						

SOFTWARE – ENERGY MANAGEMENT SYSTEM FUNCTIONS

POINT DESCRIPTION	Day/Night Setback	Schedule Start/Stop	Optimum Start/Stop	Scheduled Occ/Unoc	Temperature Control	Totalization	Trend	Redundancy Control	Fire Alarm Integration	Security/Access Integration	Elect PQM Integration	CFM Offset	OA Lockout	Fire Alarm Override	Comments
Hardware Points															
Zone Temperature															
Temperature Setpoint Adjust					X										
Air Valve/Damper															
Reheat Valve															
HW Radiation ACV															
Software Points															
Occupied Heating Setpoint					X										
Occupied Cooling Setpoint					X										
Unoccupied Heating Setpoint					X										
Unoccupied Cooling Setpoint					X										
Actual Heating/Cooling Setpoint					X										
Temperature Setpoint Adjust Range					X										

Notes:
1. All outputs from these controllers shall be programmed by the contractor to be able to be overridden from the existing operator workstation and be mapped by the contractor.
2. All tuning parameters (I.e. gain, integral constant, etc.) and setpoints shall be adjustable from a hand-held device.
3. The minimum software points listed will be made available and mapped by the contractor. Any additional software points that are available and requested by the user Agency shall be mapped by the contractor.
4. The contractor will provide a program for commanding these software inputs based on outside air temperature setpoint.
5. The contractor will provide necessary number of schedules zoned per user Agency needs to command these software inputs.
6. Temperature set point should be a single input that will offset the heating and cooling supervisory setpoints up or down together by an adjustable range.
7. Can be tri-state or proportional actuation.
8. Contractor shall connect to existing Allerton BACNET System Control.

4

INPUT/OUTPUT SUMMARY TABLE

PROJECT: VA MADISON
SPD EXPANSION
ROOM CONTROLS WITH TSI MONITORING

HARDWARE – OUTPUT

POINT DESCRIPTION	DIGITAL: Control Relay	Solinoid	Contractor	Incremental	ANALOG: Pneumatic Transducer	Electrical ransducer	4-20 MA Module	Control Relay	Incremental
TSI CONTROLLERS									
ALL FROM JCI TRUNK									
ROOM AIRFLOW									
ROOM PRESSURE									
CALC. AIR CHANGES/HR									
STATUS INDEX									
LOW ALARM									
HIGH ALARM									
DATA ERROR									

HARDWARE – INPUT

POINT DESCRIPTION	DIGITAL: Pressure Switch	Flow Switch	Switch Closure	Auxiliary Contact	KW	Control Relay	Current Sensor	VSD Fault	ANALOG: Temperature	Relative Humidity	FPM	Position	Flow	Control Relay	Static Pressure
TSI CONTROLLERS															
ALL FROM JCI TRUNK															
ROOM AIRFLOW						X									
ROOM PRESSURE						X									
CALC. AIR CHANGES/HR															
STATUS INDEX															
LOW ALARM															
HIGH ALARM															
DATA ERROR															

SOFTWARE – ALARMS

POINT DESCRIPTION	DIGITAL: Equipment Status	Maintenance	Control Relay	ANALOG: High Limit	Low Limit	Run Time	Control Relay
TSI CONTROLLERS							
ALL FROM JCI TRUNK							
ROOM AIRFLOW							
ROOM PRESSURE							
CALC. AIR CHANGES/HR							
STATUS INDEX	X						
LOW ALARM					X		
HIGH ALARM				X			
DATA ERROR	X						

SOFTWARE – ENERGY MANAGEMENT SYSTEM FUNCTIONS

POINT DESCRIPTION	Schedule Start/Stop	Optimum Start/Stop	Point History	Day/Night Setback	Economizer	Temperature Control	Hot/Cold Deck Reset	Reheat Coil Reset	Steam Boiler OPtim.	Hot Water Boiler Optim.	HW OA Reset	Chiller Optimization	Chilled Water Reset	Condenser Water Reset	Chiller Demand Limit	VAV Control	Lighting Control	TOTALIZE
TSI CONTROLLERS																		
ALL FROM JCI TRUNK																		
ROOM AIRFLOW																		
ROOM PRESSURE																		
CALC. AIR CHANGES/HR			X															
STATUS INDEX																		
LOW ALARM																		
HIGH ALARM																		
DATA ERROR																		

4

INPUT/OUTPUT SUMMARY TABLE

PROJECT: VA MADISON
SPD
SYSTEM: EXHAUST FANS

HARDWARE – OUTPUT

POINT DESCRIPTION	DIGITAL: Control Relay	Solinoid	Contractor	Incremental	ANALOG: Pneumatic Transducer	Electrical ransducer	4-20 MA Module	Control Relay	Incremental
EXHAUST FAN									
EF-1									
EF-2									
EF-3									
CALC. AIRFLOW									

HARDWARE – INPUT

POINT DESCRIPTION	DIGITAL: Pressure Switch	Flow Switch	Switch Closure	Auxiliary Contact	KW	Control Relay	Current Sensor	VSD Fault	ANALOG: Temperature	Relative Humidity	FPM	Position	Flow	Control Relay	Static Pressure
EXHAUST FAN															
EF-1															
EF-2															
EF-3															
CALC. AIRFLOW															

SOFTWARE – ALARMS

POINT DESCRIPTION	DIGITAL: Equipment Status	Maintenance	Control Relay	ANALOG: High Limit	Low Limit	Run Time	Control Relay
EXHAUST FAN							
EF-1	X						
EF-2	X						
EF-3	X						
CALC. AIRFLOW							

SOFTWARE – ENERGY MANAGEMENT SYSTEM FUNCTIONS

POINT DESCRIPTION	Schedule Start/Stop	Optimum Start/Stop	Point History	Day/Night Setback	Economizer	Temperature Control	Hot/Cold Deck Reset	Reheat Coil Reset	Steam Boiler OPtim.	Hot Water Boiler Optim.	HW OA Reset	Chiller Optimization	Chilled Water Reset	Condenser Water Reset	Chiller Demand Limit	VAV Control	Lighting Control	TOTALIZE
EXHAUST FAN																		
EF-1	X																	
EF-2	X																	
EF-3	X																	
CALC. AIRFLOW			X															

CALCULATED AIRFLOW
TOTAL AIRFLOW OF CORRESPONDING EXHAUST VALVES

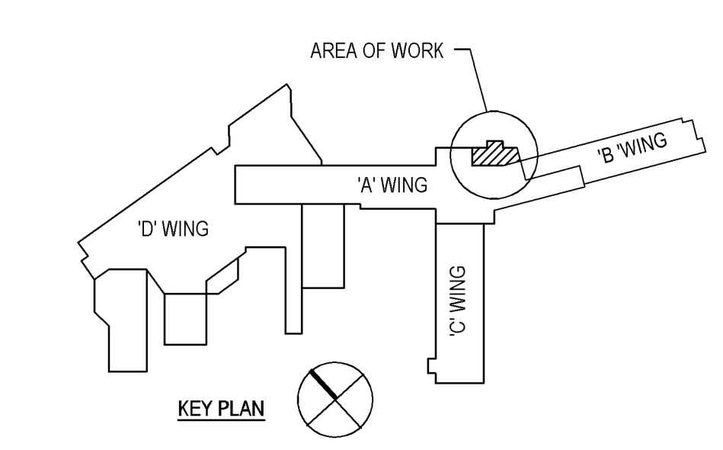
DEPARTMENT OF VETERANS AFFAIRS

VA MEDICAL CENTER
2500 OVERLOOK TERRACE
MADISON, WISCONSIN 53705

SPD UPGRADE PROJECT

IBC ENGINEERING SERVICES INC.
N8 W22195 JOHNSON DR, STE 180 262.549.1190
WAUKESHA, WI 53186 fx 262.549.1620

eppstein uhen : architects
milwaukee 333 East Chicago Street Milwaukee, Wisconsin 53202 tel 414 271 5350 fax 414 271 7794
madison 222 West Washington Ave, Suite 650 Madison, Wisconsin 53703 tel 608 442 5350 fax 608 442 6680



#	REVISION	DATE
4	AMENDMENT #4	12-5-2011

CONTROL SCHEMATICS POINT CHECKLISTS & AIRFLOW SCHEMATICS

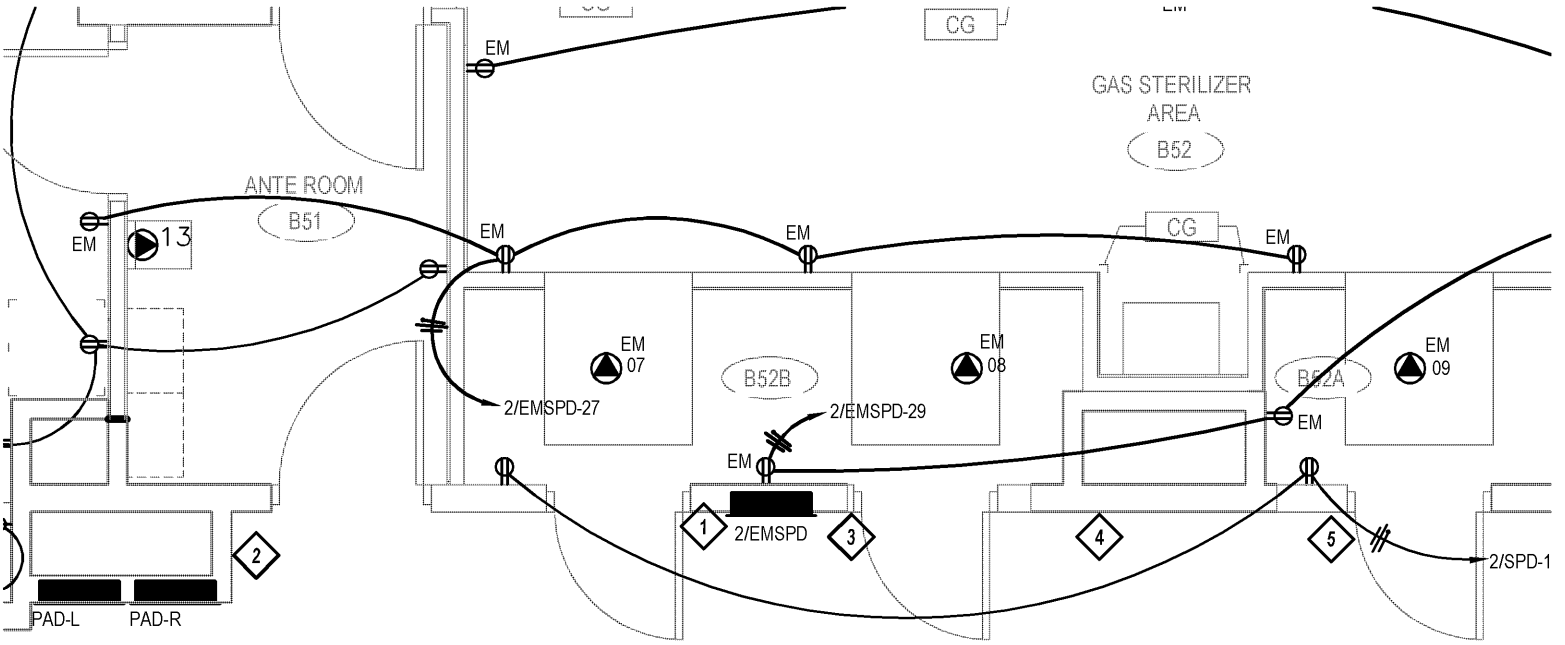
FULLY SPRINKLERED

VA PROJECT NO. 607-10-105
IBC PROJECT NO. 2010059

NORTH
BLDG. NO. VA HOSPITAL - 'B' WING
SCALE N.T.S.
DATE JUNE 15, 2011
DRAWN CDW

BID DOCUMENTS

MH002



KEY NOTES

1. FEEDER FOR PANEL 2/EMSPD SHALL BE TAPPED FROM FEEDER TO PANEL PAD-R IN COMPLIANCE WITH NEC 240.21(B)(2). PANEL 2/EMSPD FEEDER SHALL BE (4) #3/0, #6 GND IN 2" CONDUIT. PANEL 2/EMSPD IS A 120/208V, 225A, 42-CIRCUIT PANEL WITH A 200A MAIN BREAKER.
2. CUT AND PATCH WALL AS NEEDED. MATCH EXISTING CONDITIONS.
3. REMOVE SCONCE AND RELOCATE ABOVE PANEL 2/EMSPD. REMOVE LIGHT SWITCH AND RELOCATED AS NECESSARY.
4. TEMPORARILY REMOVE SPEAKER AND REINSTALL AFTER NEW WALLS ARE CONSTRUCTED.
5. REMOVE DOOR BELL.

1 SPD BASEMENT ELEC. FEEDER PLAN

1/4"=1'-0"

IBC ENGINEERING SERVICES, INC.
N8 W22195 JOHNSON DR, SUITE 180
WAUKESHA, WISCONSIN 53186
262.549.1190 fx 262.549.1620

PROJECT

VA MADISON - SPD UPGRADEPROJECT

VA MEDICAL CENTER - 2500 OVERLOOK TERRACE
MADISON, WI 53705

REVISION	Amendment 04
DATE	DEC 5, 2011
PROJECT NO.	VA: 607-10-105 IBC: 2010059
SHEET NO.	EP100 -01