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NO	REVISIONS	DATE
1	ADDENDUM 2	03/25/2015
	ISSUE FOR BID	10/31/2014

VA FORM 08-6231

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Drawing Title: **DRAWING INDEX**

Approved: Project Director

Project Title: **VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B**

Location: **423 E 23RD STREET, NEW YORK, NY 10010**

Date: **08 / 25 / 2014** | Checked: **SK** | Drawn: **LT**

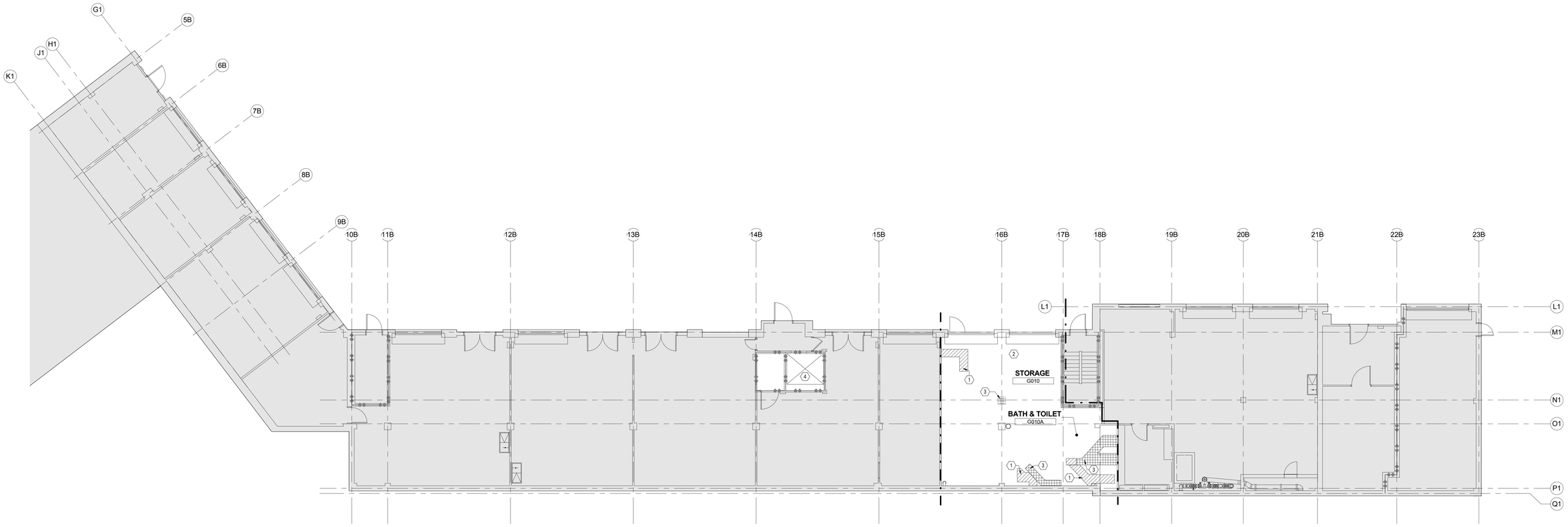
Project Number: **228727**

Building Number: **1, 2, & 6**

Drawing Number: **GI0001**

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs



D1 PARTIAL GROUND FLOOR DEMOLITION PLAN - PART 6

1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0"

DEMOLITION NOTES:

1. REFER TO SHEET AE0002 FOR PART PLAN TRUE NORTH LOCATION WITHIN BUILDINGS 1, 2, & 6.

2. REFER TO AE0001 FOR TYPICAL PLAN LEGENDS AND SYMBOLS.

3. REVIEW GENERAL NOTES PRIOR TO COMMENCEMENT OF THE WORK. SCOPE OF DEMOLITION WORK IS GENERALLY INDICATED ON DRAWINGS FOR THE CONTRACTORS INFORMATION. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE FULL SCOPE, EXTENT, NATURE AND MANNER OF DEMOLITION REQUIRED.

4. TAKE SPECIAL CARE TO DEMOLISH ONLY THAT WORK WHICH IS REQUIRED TO BE DEMOLISHED; DO NOT DISTURB WORK WHICH IS TO REMAIN. IF IN THE COURSE OF DEMOLITION, CONTRACTOR DESTROYS OR DISTURBS ANY OF THE WORK TO REMAIN, IT SHALL BE AT THE CONTRACTOR'S EXPENSE TO REPAIR OR REPLACE SUCH WORK AS NECESSARY TO RESTORE THE WORK TO THE ORIGINAL FOUND CONDITION. PROVIDE DUST BARRIERS FOR THE PROTECTION OF EXISTING AREAS TO REMAIN.

5. KEEP REQUIRED CUTS AND PENETRATIONS IN EXISTING WORK TO ACCOMPLISH NEW WORK TO AN ABSOLUTE MINIMUM. PERFORM WORK NEATLY AND WITHOUT DISTURBANCE TO ADJACENT WORK TO REMAIN. REPAIR CUTS AND PENETRATIONS TO MATCH EXISTING ADJACENT SURFACES/FINISHES TO REMAIN.

6. REMOVE EXISTING FLOOR FINISHES, BASE, UNDERLAYMENT, ETC., WITHIN THE PROJECT AREA LIMIT, UNLESS OTHERWISE NOTED. NOTIFY VA OF UNEVEN SLAB CONDITIONS RESULTING FROM BUILDING SETTLING, SLAB DEFLECTIONS, ETC.

7. PROTECT AT ALL TIMES THE PROPERTY OF THE VA, INCLUDING BUT NOT LIMITED TO WINDOWS, ELEVATORS, ELECTRICAL, AIR CONDITIONING EQUIPMENT, PERIPHERAL ENCLOSURES, ETC. (INSTALL TEMPORARY FILTERS ON RETURN AIR DUCTS ABOVE OR BELOW HUNG CEILING IN AREAS OF DEMOLITION, DURING DEMOLITION PHASE). CUT BACK DUCT WORK TO MAIN TRUNKS.

8. REMOVE EXISTING CEILING FINISHES, AND ABOVE CEILING CONSTRUCTION, INCLUDING UTILITIES, HANGERS, ANCHORS, ETC. IN ITS ETIRETY, WHICH SUPPORT THE PROJECT SCOPE. PROTECT ABOVE-CEILING UTILITIES, CONDUIT, DEVICES, ETC., SUPPORTING SPACES OUTSIDE THE SCOPE OF WORK.

9. REMOVE EXISTING ELECTRICAL WORK WITHIN THE PROJECT LIMIT, UNLESS OTHERWISE NOTED ON THE DEMOLITION, ELECTRICAL OR FIRE ALARM DRAWINGS. THIS SHALL INCLUDE PANELBOARDS, LIGHT FIXTURES, PULL BOXES, DISCONNECTS, RECEPTACLES, DEVICES, SWITCHES, CONDUITS, WIRES, WIREWAYS, SUPPORTS, ETC. ELECTRICAL CONTRACTOR SHALL DE-ENERGIZE ALL EQUIPMENT TO BE REMOVED. REFER TO DEMOLITION, ELECTRICAL AND FIRE ALARM DRAWINGS FOR ADDITIONAL REQUIREMENTS. FIRE ALARM DEVICES AND WIRING SHALL REMAIN OPERATIONAL DURING DEMOLITION WORK. COORDINATE ALL WORK WITH ELECTRICAL CONTRACTOR PRIOR TO REMOVAL.

10. THE SCOPE OF WORK SHALL INCLUDE ALL REMOVALS AS REQUIRED BY THE DRAWINGS AS WELL AS ALL REMOVALS NOT SPECIFICALLY INDICATED ON THE DRAWINGS BUT NECESSARY FOR THE COMPLETION OF THE WORK, INCLUDING, BUT NOT LIMITED TO THE FOLOWING:

a. REMOVE ALL WALL-MOUNTED ITEMS THROUGHOUT THE PROJECT AREA LIMIT, INCLUDING BUT NOT LIMITED TO, COAT HOOKS, SHELVING STANDARDS, CURTAINS, CHAIR RAILS, WALL PROTECTION, SHADES, BLINDS, ITEMS AFFIXED TO THE WALLS AND ANCHORING HARDWARE AND MISCELLANEOUS FASTENING DEVICES, UNLESS OTHERWISE NOTED.

b. REMOVE ALL EXISTING MILLWORK INDICATED. REMOVE ALL RELATED FASTENERS, BLOCKING, HARDWARE, ETC. CUT AND CAP ALL RELATED UTILITIES AS REQUIRED.

c. REMOVE ALL REMAINING FURNITURE, EQUIPMENT AND APPLIANCES, UNLESS OTHERWISE NOTED.

d. REMOVE ALL EXISTING CONDUIT, WIRING, BACKBOXES, AND DEVICES WITHIN WALLS TO BE DEMOLISHED. ALLWIRING TO BE REMOVED BACK TO RESPECTIVE CIRCUIT BREAKERS. EXISTING CIRCUIT BREAKERS TO REMAIN IN PANEL BOARDS. NO WIRING SHALL BE LEFT ABANDONED.

11. AREAS DESIGNATED AS NOT IN CONTRACT (N.I.C.) SHALL REMAIN FULLY FUNCTIONAL, WITH ALL SERVICES IN OPERATION AND FULL ACCESS TO EGRESS THROUGHOUT CONSTRUCTION. PROTECT THESE AREAS AND COORDINATE PHASING OF WORK WITH THE VA.

12. REMOVE AND STORE EXISTING FIRE EXTINGUISHERS AND BRACKETS PER VA DIRECTION.

13. REFER TO THE MEP/FP AND STRUCTURAL DRAWINGS FOR SCOPE AND LOCATIONS OF DEMOLITION WORK. CONFLICTS AND COORDINATION DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE A/E PRIOR TO COMMENCING THE WORK.

14. DOCUMENT EXISTING FLOOR SLAB ELEVATIONS (SPOT ELEVATIONS) AFTER COMPLETION OF DEMOLITION AND REMOVAL OF DEBRIS. THE "LASER LEVEL PER ASTM E 1155-96, 6.1.1.4 FOR FLATNESS METHOD" IS SUGGESTED. LEVEL FLOOR SLAB PER THE RECOMMENDATION OF THE MANUFACTURER OF THE PROPOSED FLOOR FINISH.

15. ACCESS EXISTING SHAFTS AS REQUIRED TO REMOVE EXISTING DUCTWORK AND ADD TO NEW DUCTWORK. ALL WORK TO GAIN ACCESS SHALL BE RESTORED TO EXISTING FOUND CONDITION AT CONTRACTORS EXPENSE.

16. MAINTAIN AT ALL TIMES REQUIRED FIRE RATING OF SHAFTS, ENCLOSURES, EGRESS COMPONENTS, AND ALL OTHER FIRE-RATED ENCLOSURES.

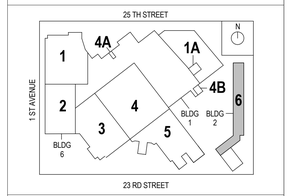
17. CONTRACTOR TO OBSERVE EXISTING WALLS TO REMAIN PRIOR TO ANY DEMOLITION WORK, AND ISSUE A REPORT TO THE VA ESTABLISHING EXTENT OF REPAIR WORK ANTICIPATED. EXTENT OF WORK IS TO BE RE-CONFIRMED AFTER DEMOLITION/REMOVAL OF WALL-MOUNTED SHELVING, EQUIPMENT, ETC., AND CONTRACTOR IS TO IDENTIFY ANY DEVIATIONS FROM THE REPORT PRIOR TO COMMENCEMENT OF THE PROPOSED WORK.

18. REFER TO SPECIFICATIONS AND GENERAL CONDITIONS FOR ANY ADDITIONAL DEMOLITION REQUIREMENTS.

KEYNOTES

1		MODIFY FLOOR SLAB TO ACCOMMODATE NEW PLUMBING. REFER TO DETAIL C1/AE5003 AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
2		REMOVE EXISTING RESINOUS FLOOR AND BASE DOWN TO EXISTING SLAB ON GRADE. PATCH/REPAIR AND SCARIFY FLOOR PER PROPOSED FLOORING MANUFACTURER'S RECOMMENDATION.
3		REMOVE EXISTING ABANDONED CLINIC PIPING STUB-UPS THROUGHOUT SPACE. CUT AND CAP AS REQUIRED TO ALLOW FOR FLOOR FINISHES AS INDICATED ON PROPOSED PLANS.
4	1	EXISTING ELEVATOR AND CONTROLS TO BE REMOVED. REFER TO ELEVATOR MANUFACTURER DRAWINGS AND SPECS TO DETERMINE FULL SCOPE OF WORK (VA CONSULTANT).

KEY PLAN:



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NO	REVISIONS	DATE
1	ADDENDUM 2	03/25/2015
	ISSUE FOR BID	10/31/2014

CONSULTANTS:

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ARCHITECT/ENGINEERS:

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500 Seventh Ave, 11th Floor, New York, NY 10018 . 212-904-1212

Drawing Title: **PARTIAL GROUND FLOOR DEMOLITION PLAN - PART 6**

Approved: Project Director

Project Title: **VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B**

Location: **423 E 23RD STREET, NEW YORK, NY 10010**

Date: **08 / 25 / 2014** | Checked: **SK** | Drawn: **LT/MC**

Project Number: **228727**

Building Number: **1, 2, & 6**

Drawing Number: **AD1006**

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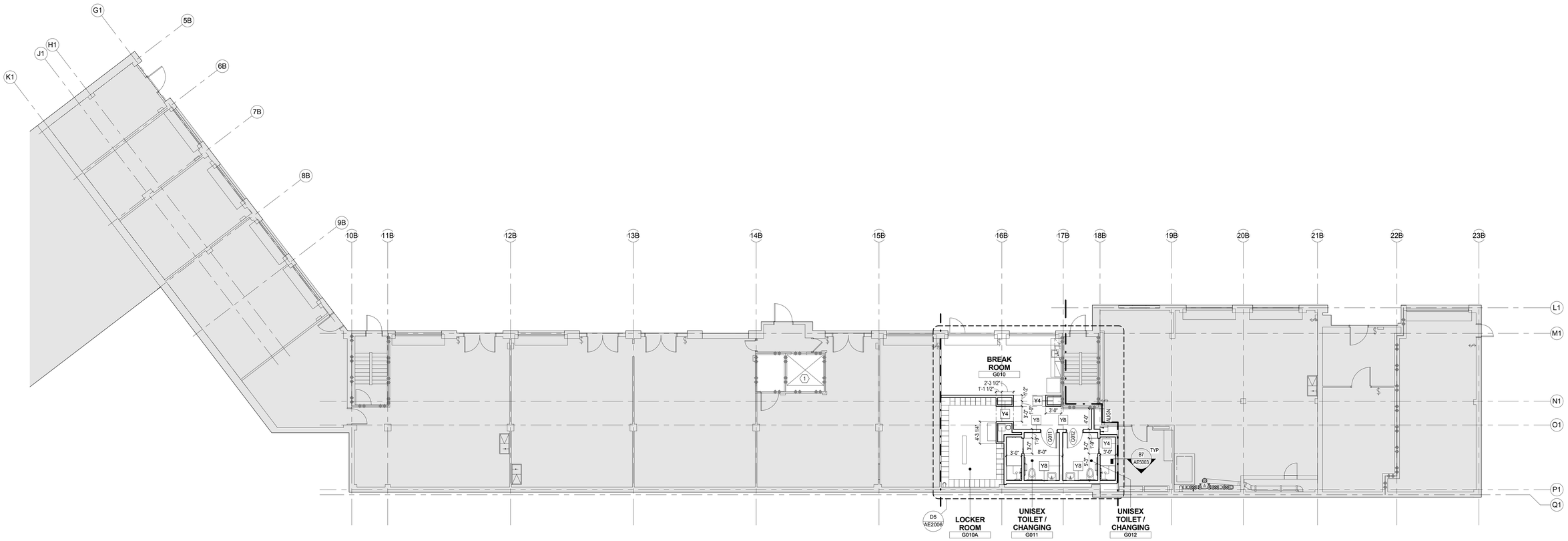


D1 PARTIAL GROUND FLOOR PLAN - PART 6

1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0"

NEW WORK NOTES:

1. REFER TO SHEET AE0002 FOR PART PLAN TRUE NORTH LOCATION WITHIN BUILDINGS 1, 2, & 6.

2. REFER TO AE0001 FOR TYPICAL PLAN LEGENDS AND SYMBOLS.

3. CONTRACTOR TO REVIEW GENERAL NOTES PRIOR TO COMMENCEMENT OF THE WORK.

4. CONTRACTOR TO REVIEW PROPOSED FLOOR PLANS PRIOR TO COMMENCEMENT OF THE WORK. CONFLICTS AND COORDINATION DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE A/E PRIOR TO COMMENCEMENT OF THE WORK.

5. CONTRACTOR TO ENSURE THE RATING INTEGRITY OF EXISTING WALLS TO REMAIN IS NOT COMPROMISED DURING DEMOLITION AND NEW CONSTRUCTION. EXISTING CONDITIONS WHICH COMPROMISE THE INTEGRITY OF THE WALL SHALL BE REPAIRED BY THE CONTRACTOR TO ENSURE THE INTENDED FIRE RATING IS MAINTAINED.

6. THE ENTIRE BUILDING, INCLUDING FLOORS AT WHICH WORK AREAS ARE LOCATED WILL BE OCCUPIED THROUGHOUT CONSTRUCTION. EXITS SHALL BE KEPT READILY AVAILABLE AND UNOBSTRUCTED AT ALL TIMES. NOISY WORK OR OTHER WORK THAT WOULD BE DISRUPTIVE TO ADJACENT SPACES, INCLUDING FLOOR(S) ABOVE, SHOULD BE COORDINATED WITH THE VA AND PERFORMED "OFF HOURS" IF DIRECTED BY THE VA.

7. ALL DIMENSIONS ARE TO FINISH FACE OF WALL, UNLESS OTHERWISE NOTED.

8. DOORS AND FRAMES IN NEW WALL CONSTRUCTION TO BE 4" FROM FACE OF WALL TO OUTSIDE FACE OF DOOR FRAME, U.O.N.

9. ALL PARTITIONS TO BE TYPE Y6, UNLESS OTHERWISE NOTED. EXPOSED CMU SHALL BE BULLNOSE AT OUTSIDE CORNERS; NO BULLNOSE AT CMU CORNERS WHERE CORNER GUARDS OR CERAMIC AND PORCELAIN WALL TILE ARE SCHEDULE.

10. NEW DOORS AND FRAMES IDENTIFIED IN LOCATIONS WHERE EXISTING DOORS AND FRAMES HAVE BEEN DEMOLISHED SHALL MATCH IN SIZE, TYPE AND DETAIL, UNLESS NOTED OTHERWISE. NOTATIONS ON DRAWINGS ARE TO BE VERIFIED IN THE FIELD FOR ACCURACY WITH EXISTING CONDITIONS. FIELD CONDITIONS WHICH DEVIATE FROM INFORMATION PROVIDED ON THE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE A/E FOR FINAL COORDINATION AND RESOLUTION PRIOR TO ORDERING OR INSTALLING NEW DOORS OR FRAMES.

11. PROVIDE CONTROL JOINTS AT 25'-0" O.C. MAXIMUM FOR CMU AND GYPSUM BOARD PARTITIONS, UNLESS OTHERWISE NOTED.

12. REVIEW FLOOR SLAB ACROSS ENTIRE SCOPE OF WORK PRIOR TO NEW CONSTRUCTION ACTIVITIES. INFILL DEMOLISHED FLOOR SLABS RESULTING FROM PREVIOUS REMEDIATION / ABATEMENT / DEMOLITION WORK. IN AREAS WHERE PREVIOUS DEMOLITION OR EXISTING CONDITIONS HAVE CAUSED UNEVENNESS OF THE FLOOR SLAB, CONTRACTOR SHALL PATCH AND LEVEL EXISTING SLAB TO MATCH ADJACENT SLAB CONSTRUCTION. COORDINATE WITH FINISH PLANS AND DETAILS.

13. SUB-FLOOR SHALL BE CLEAN AND FREE OF DUST, SOLVENTS, SEALERS, ADHESIVE RESIDUE, AND OTHER FOREIGN MATERIALS PRIOR TO FINISH FLOOR INSTALLATION.

14. VERIFY EXISTING COLUMN CENTERLINES, SIZES AND LOCATIONS PRIOR TO THE START OF WORK. BRING ANY DISCREPANCIES TO THE A/E'S ATTENTION PRIOR TO START OF WORK IN THAT AREA.

15. DIMENSIONS SHOWN AS V.I.F. SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR. CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCY IN DIMENSIONS PRIOR TO COMMENCEMENT OF THE WORK.

16. NEW CONSTRUCTION ADJOINING EXISTING CONSTRUCTION IN THE SAME PLANE SHALL BE FLUSH WITH NO VISIBLE JOINT, UNLESS OTHERWISE NOTED.

17. EXISTING FLOOR ACCESS HATCHES TO PERIMETER STEAM TRENCH ARE TO BE MAINTAINED AND COORDINATED WITH PROPOSED FLOOR FINISHES.

18. PATCH/REPAIR EXISTING CMU WALLS TO ORIGINAL CONDITION.

19. FURNITURE SHALL BE OFOI AND IS SHOWN IS FOR INFORMATION ONLY.

20. REFER TO AE4001 FOR ADDITIONAL TOILET ROOM ACCESSORY INFORMATION.

21. REFER TO AF6002 FOR ROOM FINISH SCHEDULE.

22. REFER TO AF1000 SERIES FOR EXTENT OF WALL PROTECTION.

23. NO INFRASTRUCTURE OR UTILITIES SHALL BE INSTALLED IN OR PASS THROUGH EXIT ENCLOSURES UNLESS IN COMPLIANCE WITH NFPA 101 SECTION 7.1.3.2.1.

ELECTRICAL DEVICE NOTES:

1. REFER TO AE0001 FOR TYPICAL PLAN LEGENDS AND SYMBOLS.

2. ELECTRICAL OUTLETS AND TELE/DATA HAVE BEEN BEEN INDICATED ON THE AE1XXX, AE2XXX AND AE4XXX SERIES DRAWINGS, AND DEMONSTRATE SPECIFIC LOCATIONS WHERE DEVICES ARE TO BE LOCATED. THE PLANS MAY NOT INCLUDE ALL DEVICES IN SCOPE, AND DO NOT INDICATE THE LOCATION OF ANY A/V DEVICES, UNLESS SPECIFIC LOCATION COORDINATION IS REQUIRED. COORDINATION WITH THE ELECTRICAL AND AV DRAWINGS INCLUDING ELECTRICAL AND AV DEVICE SYMBOLOGY, IS REQUIRED TO DETERMINE THE ENTIRE SCOPE OF WORK.

3. REFER TO AE4001 FOR TYPICAL MOUNTING HEIGHTS AND RELATIONSHIP OF DEVICE TO DOOR OPENING, WHERE APPLICABLE.

4. REFER TO ELECTRICAL DRAWINGS FOR CIRCUITING INFORMATION.

5. COORDINATE FURNITURE POWER AND DATA CONNECTIONS WITH THE VA FURNITURE VENDOR. LOCATIONS ON ARCHITECTURAL PLANS ARE FOR REFERENCE ONLY.

6. UNLESS OTHERWISE NOTED, LOCATE ALL OUTLETS 44 IN. ABOVE FINISHED FLOOR.

7. OUTLETS LOCATED WITHIN 72 IN. OF ANY SINK, CUPSINK OR OTHER WET SERVICE SHALL BE G.F.I. TYPE, TYPICAL.

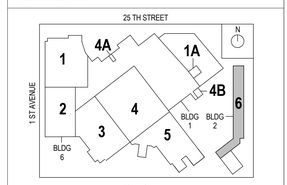
8. MAINTAIN A MINIMUM 16 IN. OFFSET DISTANCE BETWEEN OUTLETS ON ADJACENT SIDES OF A WALL.

9. CENTER RECEPTACLES/DEVICES LOCATED ON COLUMNS/COLUMN ENCLOSURES, UNLESS OTHERWISE NOTED.

KEYNOTES

1 | 1 | NEW ELEVATOR CAB AND CONTROLS. REFER TO ELEVATOR MANUFACTURER DRAWINGS AND SPECS TO DETERMINE FULL SCOPE OF WORK (VA CONSULTANT).

KEY PLAN:



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FIRE PROTECTION SYMBOLS AND ABBREVIATIONS

	ABBR.	SYMBOL	REMARKS
SUPPLY SYSTEMS	F	F	EXISTING FIRE PROTECTION PIPING (EX)
	S	S	EXISTING SPRINKLER PIPING (EX)
	F	F	FIRE PROTECTION PIPING
	S	S	SPRINKLER PIPING
		X" XX	(SIZE AND SYSTEM DESIGNATION) *FIRE PROTECTION SYSTEMS
		X" XX	(SIZE) DEMOLITION *FIRE PROTECTION SYSTEMS
		X" XX	(SIZE) DEMOLITION *FIRE PROTECTION SYSTEMS
			UPRIGHT SPRINKLER
			SIDEWALL SPRINKLER HEAD
			PENDANT SPRINKLER HEAD
		F	WATER FLOW DETECTOR
			BALL CHECK OR DRIP VALVE
			WALL TYPE INDICATOR ASSEMBLY HOSE VALVE MANIFOLD (PUMP FLOW TEST CONNECTION)
RATED WALL SYMBOLS			FIRE RESISTIVE RATED LINE, 1 HOUR
			FIRE RESISTIVE RATED LINE, 2 HOUR
			FIRE RESISTIVE RATED LINE, 3 HOUR
			FIRE RESISTIVE RATED LINE, 4 HOUR
		S S S S S	FIRE-RATED, SMOKE BARRIER LINE, 1 HOUR
		S S S	FIRE-RATED, SMOKE BARRIER LINE, 2 HOUR
		S S	FIRE-RATED, SMOKE BARRIER LINE, 3 HOUR
		S S	FIRE-RATED, SMOKE BARRIER LINE, 4 HOUR

FIRE PROTECTIONS SYMBOLS AND ABBREVIATIONS

ABBR.	2-LINE SYMBOL	1-LINE SYMBOL	REMARKS
		XX / X-XX	DETAIL OR SECTION DESIGNATION (* DETAIL OR SECTION REFERENCE) (* * SHEET NUMBER DETAIL OR SECTION DRAWN ON)
			NEW TO EXISTING DESIGNATION EXTENT OF DEMOLISHED PIPE
		*	EQUIPMENT DESIGNATION (* EQUIPMENT MARK NUMBER)
		*	REFERENCE DESIGNATION (* NOTE NUMBER)
		*	REFERENCE DESIGNATION (* RISER NUMBER)
		1	DEMOLITION KEYNOTE
		1	NEW WORK KEYNOTE
		P	PRESSURE SWITCH OR PRESSURE SENSOR
			ISOLATION VALVE (BALL/ BUTTERFLY/ GATE - SEE SPECIFICATIONS) *MECHANICAL/ SUPPLY SYSTEMS
			BALL VALVE *SUPPLY SYSTEMS
			BUTTERFLY VALVE *SUPPLY SYSTEMS
			GATE VALVE *SUPPLY SYSTEMS
O S & Y			OUTSIDE SCREW AND YOKE VALVE
PLV			PLUG VALVE *MECHANICAL SYSTEMS
CV			CHECK VALVE (ARROW INDICATES DIRECTION OF FLOW) *SUPPLY SYSTEMS
			PIPE ELBOW UP
			PIPE ELBOW DOWN
			PIPE TEE UP
			PIPE TEE DOWN

FIRE PROTECTION ABBREVIATIONS

ABBR.	REMARKS	ABBR.	REMARKS
AAP	AREA ALARM PANEL	KW	KILOWATT(S)
ADJ	ADJUSTABLE	LAT	LEAVING AIR TEMPERATURE
AFD	ADJUSTABLE FREQUENCY DRIVE	LBS	POUNDS
AFF	ABOVE FINISHED FLOOR	LF	LINEAR FOOT, LINEAR FEET
ALT	ALTERNATE	LWT	LEAVING WATER TEMPERATURE
AP	ACCESS PANEL	MAP	MASTER ALARM PANEL
APD	AIR PRESSURE DROP	MAX	MAXIMUM
AVG	AVERAGE	MBH	THOUSANDS BTU/HR
BAS	BUILDING AUTOMATION SYSTEM	MCC	MOTOR CONTROL CENTER
BDD	GRAVITY BACKDRAFT DAMPER	MFR	MANUFACTURER
BTUH	BRITISH THERMAL UNITS PER HOUR	MISC	MISCELLANEOUS
BV	BALANCING VALVE	MIN	MINUTE(S), MINIMUM
CAP	CAPACITY	MTD	MOUNTED
CFH	CUBIC FEET PER HOUR	NC	NORMALLY CLOSED, NOISE CRITERIA
CFM	CUBIC FEET PER MINUTE	NO	NORMALLY OPEN, NUMBER
CI	CAST IRON	NR	NOISE REDUCTION
CLG	CEILING, COOLING	NRC	NOISE REDUCTION COEFFICIENT
CM	COFFEEMAKER	NTS	NOT TO SCALE
COND	CONDENSER, CONDENSATE	OD	OUTSIDE DIAMETER
CONN	CONNECTION	OI	OIL INTERCEPTOR
DB	DRY BULB	O S & Y	OUTSIDE SCREW AND YOKE VALVE
dB	DECIBEL(S)	PD	PRESSURE DROP
DCA	DENTAL COMPRESSED AIR	PH	PHASE
DDC	DIRECT DIGITAL CONTROL	PLBG	PLUMBING
DIA	DIAMETER	PSI	POUND(S) PER SQUARE INCH
DLV	DENTAL LAB VACUUM	PSIA	POUND(S) PER SQUARE INCH ABSOLUTE
DN	DOWN	PSIG	POUND(S) PER SQUARE INCH GAGE
DX	DIRECT EXPANSION	QTY	QUANTITY
EAT	ENTERING AIR TEMPERATURE	REQD	REQUIRED
ED	FIRE STANDPIPE EXPRESS DRAIN	RH	RELATIVE HUMIDITY
EFF	EFFICIENCY	RL	REFRIGERANT LIQUID
ESP	EXTERNAL STATIC PRESSURE	RPM	REVOLUTIONS PER MINUTE
EVP	EVAC PUMP	RM	ROOM
EWT	ENTERING WATER TEMPERATURE	RS	REFRIGERANT SUCTION
EX	EXISTING	SAT	SATURATION
EXST	EXISTING	SCFM	STANDARD CFM
F	FAHRENHEIT	SHT	SHEET
FL	FLOOR	SIM	SIMILAR
FLA	FULL LOAD AMPS	SP	SUMP PUMP, STATIC PRESSURE
FLEX	FLEXIBLE	SQ	SQUARE
FPM	FEET PER MINUTE	TD	TEMPERATURE DIFFERENTIAL
FUT	FUTURE	TEMP	TEMPERATURE
FXTR	FIXTURE	TPV	TRAP PRIMER VALVE
GAL	GALLON(S)	TSP	TOTAL STATIC PRESSURE
GPH	GALLON(S) PER HOUR	UNO	UNLESS NOTED OTHERWISE
GPM	GALLON(S) PER MINUTE	V	VOLT(S)
HG	HOT GAS	VAP	VACUUM PUMP
HP	HORSEPOWER	VAV	VARIABLE AIR VOLUME
HR	HOUR	VEL	VELOCITY
HTG	HEATING HOT	VTR	VENT THRU ROOF
HZ	HERTZ	W	WATT (S)
ID	INSIDE DIAMETER	WB	WET BULB
IE	INVERT ELEVATION	WG	WATER GAUGE
IN	INCH (ES)	WPD	WATER PRESSURE DROP
I/O	INPUT/OUTPUT	ZVB	ZONE VALVE BOX
KEC	KITCHEN EQUIPMENT CONTRACTOR		

NOTE: NOT ALL SYMBOLS AND OR ABBEVIATIONS INDICATED APPLY TO THIS PROJECT

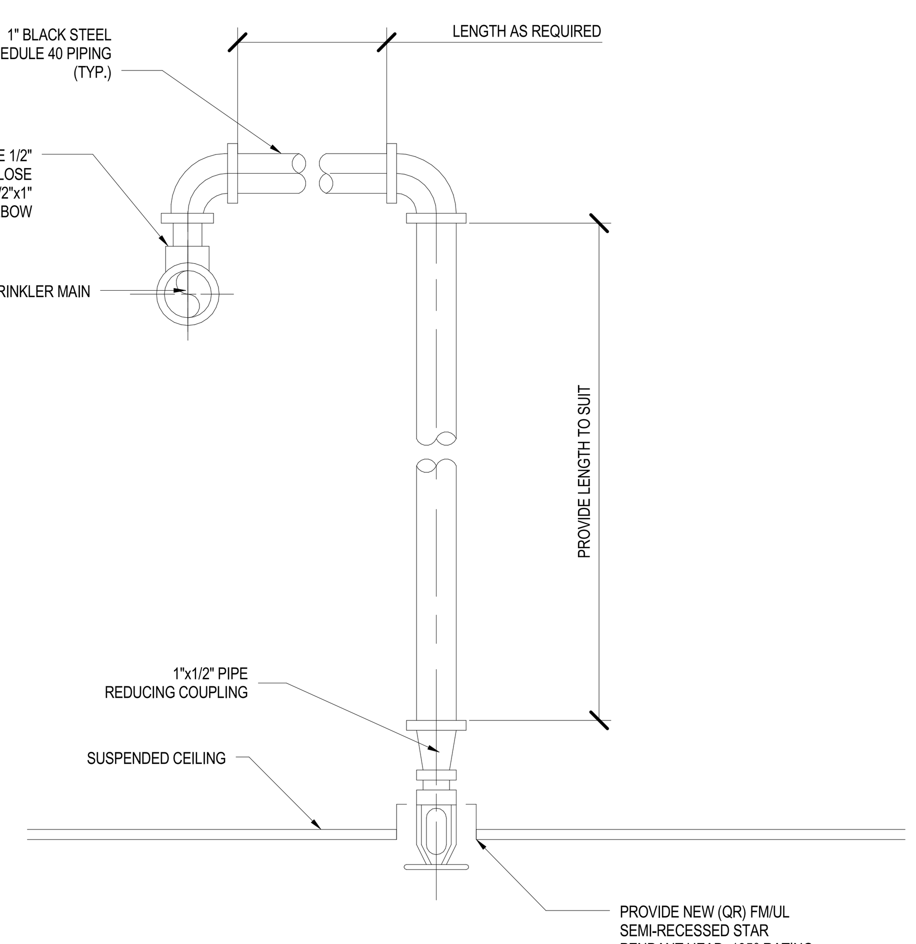
GENERAL FIRE PROTECTION SYSTEM NOTES

1. THE INDICATED SYSTEM(S) SHALL BE DESIGNED, FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH THE FOLLOWING CRITERIA (IN ORDER OF PREFERENCE):
   A. CODES/ REGULATIONS OF THE AUTHORITES HAVING JURISDICTION
   B. NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS
   C. THE CONTRACT DOCUMENTS.
2. THE SPRINKLER SYSTEM SHALL BE DESIGNED, FABRICATED AND INSTALLED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND REGULATIONS OF THE AUTHORITY HAVING JURISDICTION.
3. THE EXISTING SPRINKLER SYSTEM SHALL BE MODIFIED AS REQUIRED BY THE NEW SPACE AND CEILING LAYOUTS. NEW SPRINKLER SYSTEM COMPONENTS I.E. SPRINKLER HEADS, FITTINGS; ALARMS ETC. SHALL MATCH AND BE COMPATIBLE WITH THE EXISTING SPRINKLER SYSTEM COMPONENTS AND MATERIALS.
4. THE FIRE PROTECTION CONTRACTOR SHALL BE RESPONSIBLE FOR PRODUCING COMPLETE SHOP DRAWINGS AND HYDRAULIC CALCULATIONS FOR REVIEW. THE SHOP DRAWINGS AND CALCULATIONS SHALL BE PREPARED IN ACCORDANCE WITH NFPA AND LOCAL CODE STANDARDS.
5. THE FIRE PROTECTION CONTRACTOR SHALL BE RESPONSIBILE FOR ALL PERMITS AND ASSOCIATED FEES, AND SHALL SUBMIT DRAWINGS REQUIRED FOR REVIEW BY THE AUTHORITY HAVING JURISDICTION.
6. FIRE WATER FLOW TEST DATA - CONTRACTOR IS RESPONSIBLE FOR PERFORMING FIRE FLOW TEST WITHIN 6 MONTHS OF PREPARING THE HYDRAULIC CALCULATIONS.
7. ALL WORK SHOWN ON THE CONTRACT DOCUMENTS IS INTENDED AS A GUIDE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRODUCING COMPLETE SHOP DRAWINGS AND CALCULATIONS FOR REVIEW BY THE AUTHORITY HAVING JURISDICTION. THE SHOP DRAWINGS AND CALCULATIONS SHALL BE PREPARED IN ACCORDANCE WITH THE REFERENCED NFPA STANDARDS. THE CONTRACTOR SHALL MAINTAIN ON STAFF A MINIMUM OF ONE DESIGNER HOLDING A CURRENT CERTIFICATION FROM THE NATIONAL INSTITUTE FOR CERTIFICATION OF ENGINEERING TECHNOLOGIES (NICET) AS FIRE PROTECTION ENGINEERING TECHNICIAN III, AND SUBFIELD OF AUTOMATIC SPRINKLER SYSTEM LAYOUT. THE NICET CET III OR A REGISTERED PROFESSIONAL ENGINEER IN FIRE PROTECTION IN NEW YORK SHALL OVERSEE AND BE RESPONSIBLE FOR THE PROJECT. ALL DOCUMENTS INCLUDING BUT NOT LIMITED TO THE DRAWINGS, FIRE FLOW TEST DATA, HYDRAULIC CALCULATIONS, AND SPECIFICATIONS SHALL BE STAMPED/SEALED AND SIGNED BY THE RESPONSIBLE INDIVIDUAL.
8. ALL FIRE PROTECTION SYSTEM CONTROL VALVES SHALL BE PROVIDED WITH VALVE SUPERVISORY SWITCHES.
9. ALL ELECTRICAL DEVICES FOR THE FIRE PROTECTION SYSTEM SHALL BE COMPATIBLE WITH THE FIRE ALARM SYSTEM.
10. PIPING SHALL BE INSTALLED SUCH THAT ALL PORTIONS OF THE SYSTEM CAN BE DRAINED BACK THROUGH DRAIN VALVES IN ACCORDANCE WITH THE REFERENCED NFPA STANDARDS.
11. MAINTAIN A MINIMUM OF 6'-8 HEADROOM CLEARANCE BETWEEN BOTTOM OF PIPING, FITTING, VALVES (EXCEPT FIRE DEPARTMENT HOSE VALVES, SPRINKLER SYSTEM CONTROL VALVES, AND FLOW SWITCHES), AND SPRINKLERS, AND FINISHED FLOOR IN ALL AREAS OF EXPOSED PIPING. SPRINKLER SYSTEM CONTROL VALVES AND FLOW SWITCHES SHALL BE ACCESSIBLE FROM A STANDING POSITION
12. SPRINKLER SYSTEM DESIGN CRITERIA:
    LIGHT HAZARD - 0.10 GPM/SQFT OVER THE HYDRAULICALLY MOST REMOTE 1500 SQUARE FEET.
    ORDINARY HAZARD GROUP 1 - 0.15 GPM/SQFT OVER THE HYDRAULICALLY MOST REMOTE 1500 SQUARE FEET.
    INSIDE AND OUTSIDE HOSE DEMANDS SHALL BE ADDED TO SPRINKLER SYSTEM DEMAND.
    HAZARD OCCUPANCY SHALL BE BASED ON NFPA 13
13. WORK SHALL BE PERFORMED BY A LICENSED FIRE PROTECTION CONTRACTOR WHO CAN GIVE EVIDENCE OF THE SUCCESSFUL COMPLETION OF A MINIMUM OF 5 PROJECTS OF EQUAL SIZE AND COMPLEXITY AND WHO IS FAMILIAR WITH THE REQUIREMENTS OF THE APPROVING JURISDICTION.
14. THE CONTRACTOR SHALL SUBMIT SIGNED CERTIFIED TEST RESULTS FOR RECORD OF ALL ACCEPTANCE TESTS REQUIRED BY THE APPLICABLE NFPA STANDARDS FOR THE INSTALLED FIRE PROTECTION PIPING SYSTEMS. THE TEST RESULTS SHALL BE REPORTED UTILIZING NFPA STANDARD FORMS.
15. ALL EXISTING AND NEW EXPOSED SPRINKLER PIPING WITHIN THE PROJECT BOUNDARY SHALL BE PAINTED RED.
16. ALL EXPOSED SPRINLKERS (UPRIGHT OR PENDANT) IN MECHANICAL EQUIPMENT SPACES ARE REQUIRED TO BE PROVIDED WITH SPRINKLER GUARDS FOR PROTECTION.
17. THE EXISTING AND NEW 6" MAIN TO BE PAINTED RED AT THE FIRE PUMP ROOM.

FIRE PROTECTION SYSTEM DESIGN NOTES

1. THE EXISTING FIRE PUMP LOCATED ON THE GROUND FLOOR OF BUILDING 1 IS TO BE MOVED TO A NEW LOCATION. THE EXISTING FIRE SERVICE AND ALARM CHECK VALVE SHALL REMAIN IN THEIR CURRENT LOCATIONS. SEE NEW WORK DRAWINGS FOR NEW LOCATION AND CONNECTIONS.
2. A TEMPORARY FIRE PUMP WILL NEED TO BE PROVIDED DURING THE RELOCATION PERIOD. THIS TEMPORARY FIRE PUMP WILL BE NEEDED FOR UP TO 3 DAYS OF SERVICE. THE TEMPORARY FIRE PUMP WILL BE PROVIDED BY THE VA AND WILL BE COORDINATED THROUGH THE VA SAFETY OFFICER. THE EXISTING BUILDING FIRE PUMP CANNOT BE OUT OF SERVICE FOR MORE THAN 3 DAYS.
3. CONTRACTOR SHALL PROVIDE QUALIFIED FIRE WATCH ACCEPTABLE TO VA WHEN EVER THE SPRINKLER SYSTEM IS EITHER FULLY OR PARTIALLY SHUT DOWN. THE FIRE WATCH PERSONAL SHALL WALK THE ENTIRE AREA AFFECTED BY THE SHUTDOWN AT A MINIMUM OF EVERY 3 HOURS. COMPLETE DOCUMENTATION OF THE FIRE WATCH ACTIVITIES SHALL BE PROVIDED TO THE VA THE FOLLOWING DAY. A MINIMUM OF TWO FIRE WATCH PERSONNEL WILL BE ON DUTY DURING A COMPLETE SHUTDOWN OF THE BUILDINGS SPRINKLER SYSTEM. ONE FIRE WATCH PERSON FOR A LIMIT SYSTEM SHUTDOWN.

1



NOTES:

1. ADJUST SPRINKLER DROPS AS NECESSARY TO CLEAR OBSTRUCTIONS SUCH AS CEILING "T" BAR SUSPENSION SYSTEM. LIGHT FIXTURES, ETC. PROVIDE A PIPE HANGER IF THE HORIZONTAL OFFSET LENGTH EXCEEDS 24"
2. ALL NEW PENDENT HEADS SHALL BE FM APPROVED, SEMI-RECESSED, QUICK RESPONSE TYPE.
3. ALL NEW HEADS SHALL BE CENTER OF TILE

2 SPRINKLER HEAD DROP DETAIL

NTS

NO	REVISIONS	DATE
1	ADDENDUM 2	03/25/2015
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Drawing Title: **FIRE PROTECTION SYMBOLS AND ABBREVIATIONS**

Approved: Project Director

Project Title: **VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B**

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Date: 08 / 25 / 2014 | Checked: AB | Drawn: NM

Project Number: 228727

Building Number: 1, 2, & 6

Drawing Number: F001

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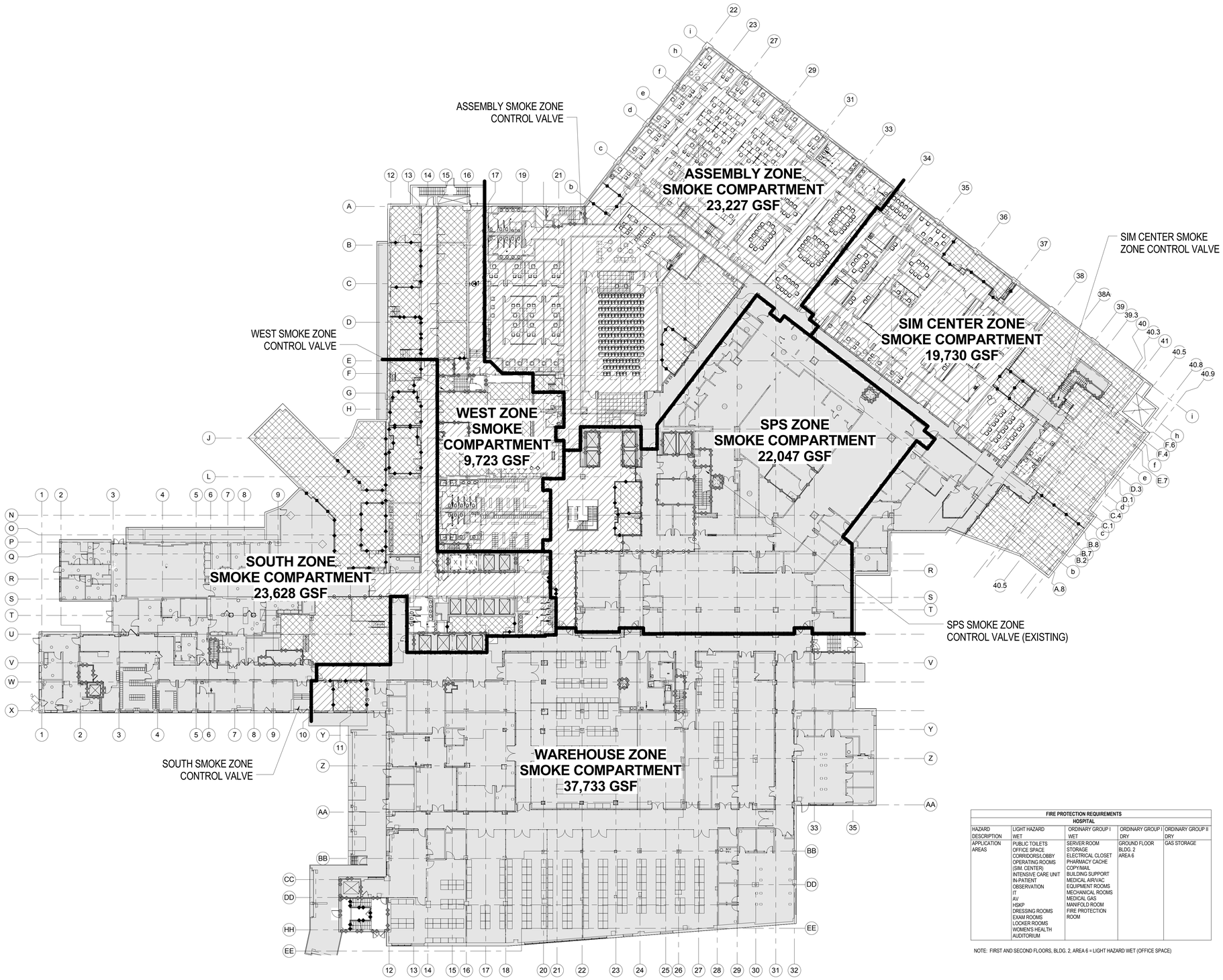
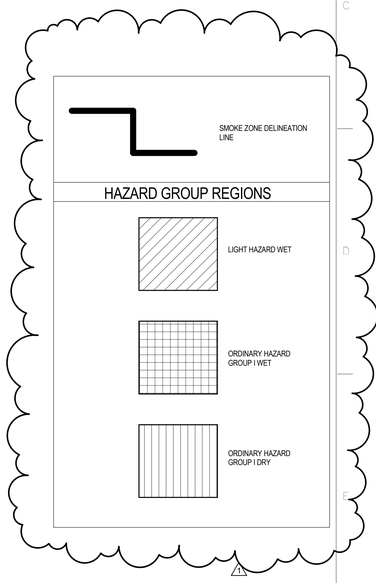


1 OVERALL PHASE 2B SMOKE ZONE PLAN
3/64" = 1'-0"



FIRE PROTECTION REQUIREMENTS				
HOSPITAL				
HAZARD DESCRIPTION	LIGHT HAZARD WET	ORDINARY GROUP I WET	ORDINARY GROUP I DRY	ORDINARY GROUP II DRY
APPLICATION AREAS	PUBLIC TOILETS OFFICE SPACE CORRIDORS/LOBBY OPERATING ROOMS (SIM. CENTER) INTENSIVE CARE UNIT IN-PATIENT OBSERVATION IT AV HSKP DRESSING ROOMS EXAM ROOMS LOCKER ROOMS WOMEN'S HEALTH AUDITORIUM	SERVER ROOM STORAGE ELECTRICAL CLOSET PHARMACY CACHE COPY/MAIL BUILDING SUPPORT MEDICAL AIR/VAC EQUIPMENT ROOMS MECHANICAL ROOMS MEDICAL GAS MANIFOLD ROOM FIRE PROTECTION ROOM	GROUND FLOOR BLDG. 2, AREA 6	GAS STORAGE

NOTE: FIRST AND SECOND FLOORS, BLDG. 2, AREA 6 = LIGHT HAZARD WET (OFFICE SPACE)

KEY PLAN:

FULLY SPRINKLERED

0 8'-0" 16'-0" 32'-0"

NO	REVISIONS	DATE
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Drawing Title: OVERALL PHASE 2B SMOKE ZONE PLAN

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

Date: 08 / 25 / 2014 | Checked: AB | Drawn: NM

Project Number: 228727

Building Number: 1, 2, & 6

Drawing Number: FP1000A

Office of Construction and Facilities Management

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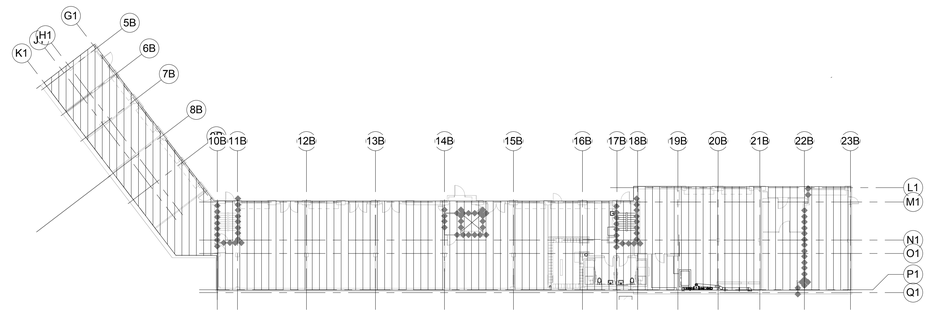
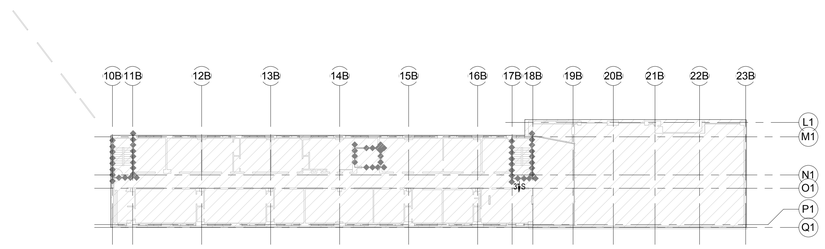
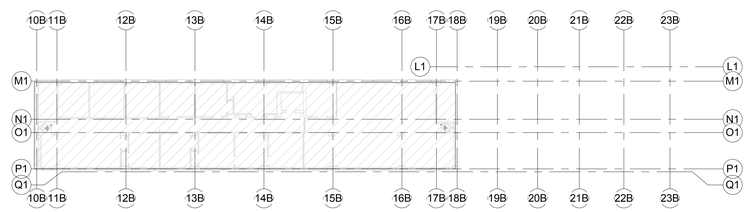


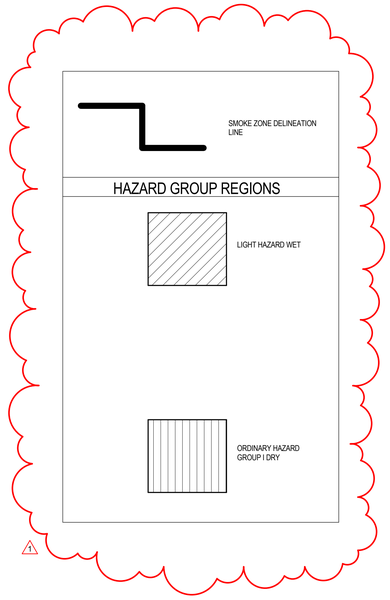
1 OVERALL PHASE 2B SMOKE ZONE PLAN PART 6
3/64" = 1'-0"



2 OVERALL PHASE 2B SMOKE ZONE PLAN FIRST FLOOR PART 3
3/64" = 1'-0"



3 OVERALL PHASE 2B SMOKE ZONE PLAN SECOND FLOOR
3/64" = 1'-0"



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Drawing Title: OVERALL PHASE 2B SMOKE ZONE PLAN PART 6

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

Date: 08 / 25 / 2014 | Checked: Checker | Drawn: Author

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Building Number: 1, 2, & 6

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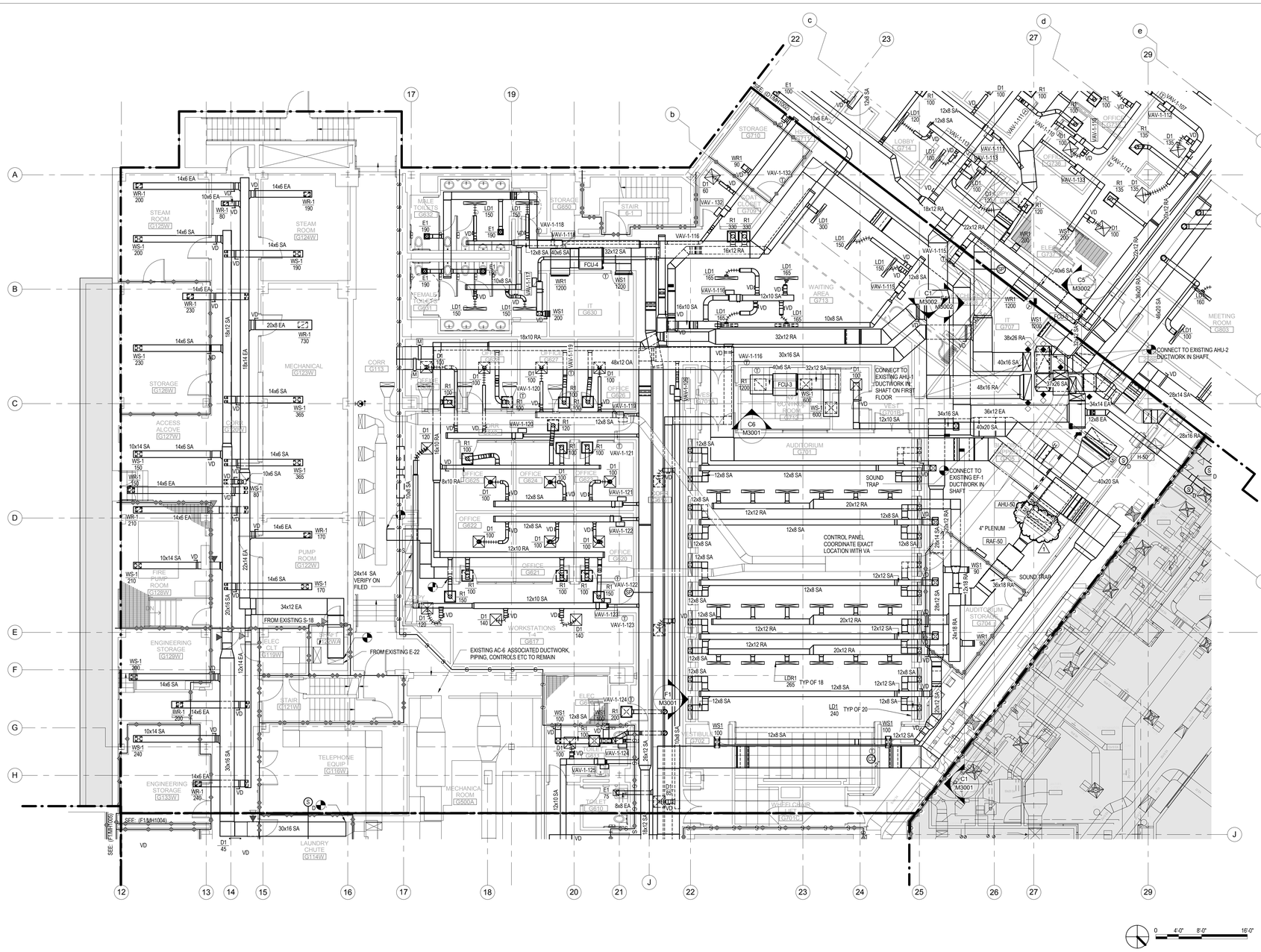

GENERAL NOTES:

A. UNLESS SIZING IS INDICATED ON PLANS, LOW PRESSURE SUPPLY DUCTWORK DOWN STREAM OF AIR TERMINAL UNITS SHALL BE SIZED AND CONSTRUCTED PER SMACNA-HVAC SYSTEMS DUCT DESIGN MANUAL. LATEST EDITION AT A MAXIMUM OF 0.1" FRICTION LOSS PER 100' OF DUCT AND A MAXIMUM VELOCITY OF 1,500 FPM. CONNECTION TO DIFFUSERS, REGISTERS AND GRILLES SHALL BE SIZED AS SCHEDULED IN DIFFUSER, REGISTER, AND GRILLE SCHEDULE.
B. ALL DIVISION 23 WORK SHALL BE COORDINATED WITH THAT OF OTHER DIVISIONS. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST.
C. PROVIDE DOUBLE RADIUS TURNING VANES IN ALL 90 DEGREE SQUARE ELBOWS (90° AND 45°) IN SUPPLY AIR DUCTWORK. PROVIDE ACCESS DOORS UP STREAM OF ALL ELBOWS EQUIPPED WITURNING VANES.
D. ACCESS DOORS/PANELS MAY BE SHOWN IN SOME CASES WHERE DEEMED NECESSARY FOR CLARITY OR WHERE REQUIRED FOR SPECIAL REASONS. ACCESS DOORS/PANELS SHALL BE PROVIDED WHERE SHOWN AND ALSO FOR EVERY LOCATION WHERE REQUIRED FOR ACCESS TO VALVES, SMOKE DETECTORS, VOLUME DAMPERS, FIRE DAMPERS, JUNCTION BOXES AND ALL MECHANICAL, FIRE PROTECTION, PLUMBING AND ELECTRICAL DEVICES AND/OR EQUIPMENT REQUIRING SERVICE/MAINTENANCE.
E. ALL DUCT SIZES SHOWN ARE CLEAR, INSIDE DIMENSIONS.
F. ALL MECHANICAL EQUIPMENT, DUCTWORK, PIPING ETC. SHALL BE SUPPORTED AS DETAILED OR AS SPECIFIED. SUPPORTS SHALL BE PROVIDED AS REQUIRED TO ENSURE A VIBRATION FREE INSTALLATION.
G. CONTRACT DOCUMENT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
H. UNLESS NOTED OTHERWISE, ALL MISCELLANEOUS STEEL REQUIRED FOR INSTALLATION OF DIVISION 15 PIPING, DUCTWORK, AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23 OF THE SPECIFICATIONS.
I. ALL EQUIPMENT, DUCTWORK AND PIPING INSTALLED ABOVE LAY-IN ACOUSTICAL CEILINGS SHALL BE INSTALLED SO THAT CEILING TILES CAN BE REMOVED.
J. ALL DUCTWORK, PIPING AND EQUIPMENT SUSPENDED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE STRUCTURAL ENGINEER. PROVIDE BEAM CLAMPS MEETING MANUFACTURER'S STANDARDIZATION SOCIETY (MSS) STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. USE OF C-CLAMPS SHALL NOT BE PERMITTED.
K. WHERE SPACE IS LIMITED, ADEQUATE CLEARANCE SHALL BE PROVIDED BETWEEN PIPING, DUCTWORK, EQUIPMENT, CEILINGS, UNDERSIDES OF BEAMS, RECESSED FIXTURES, AND OTHER INTERFERENCES. ADEQUATE CLEARANCE SHALL BE PROVIDED FOR INSTALLATION OF INSULATION.
L. PROVIDE SUFFICIENT CLEARANCE AT MECHANICAL AND ELECTRICAL EQUIPMENT TO MEET ALL CODES, TO ALLOW ACCESS FOR NORMAL MAINTENANCE AND TO ALLOW COMPONENT REMOVAL OR REPLACEMENT.
M. REFER TO SCHEDULE FOR DUCT SIZE CONNECTION TO TERMINAL UNIT BOXES.
N. FIRE AND SMOKE DAMPER SYMBOLS INDICATE LOCATION OF DAMPERS. INSTALL IN WALLS AS REQUIRED.
O. REFER TO ARCHITECTURAL FLOOR PLANS FOR WALL CONSTRUCTION.
P. WHERE A SMOKE DAMPER IS INSTALLED WITHIN A DUCT, A SMOKE DETECTOR SHALL BE INSTALLED IN THE DUCT WITHIN 5 FEET OF THE DAMPER WITH NO AIR OUTLETS OR INLETS BETWEEN THE DETECTOR AND THE DAMPER.
J. AIR VENTS SHALL BE PROVIDED AT ALL HIGH POINTS IN PIPING SYSTEMS. DRAINS SHALL BE PROVIDED AT ALL LOW POINTS IN PIPING SYSTEMS.
K. ALL PIPING TAKE-OFFS FROM MAINS SHALL BE WITH DOUBLE ELBOW SWING JOINT ARRANGEMENT.
L. REFER TO SCHEDULE FOR PIPE SIZE CONNECTION TO TERMINAL UNIT BOXES.
M. REFER TO ARCHITECTURAL FLOOR PLANS FOR WALL CONSTRUCTION.
N. STEAM LINES SHALL BE PROVIDED WITH STEAM TRAPS AND DRIP LINES PER DIVISION 23 SPECIFICATIONS.

KEY PLAN:

FULLY SPRINKLERED

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Drawing Title: PARTIAL GROUND FLOOR PLAN - PART 3

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

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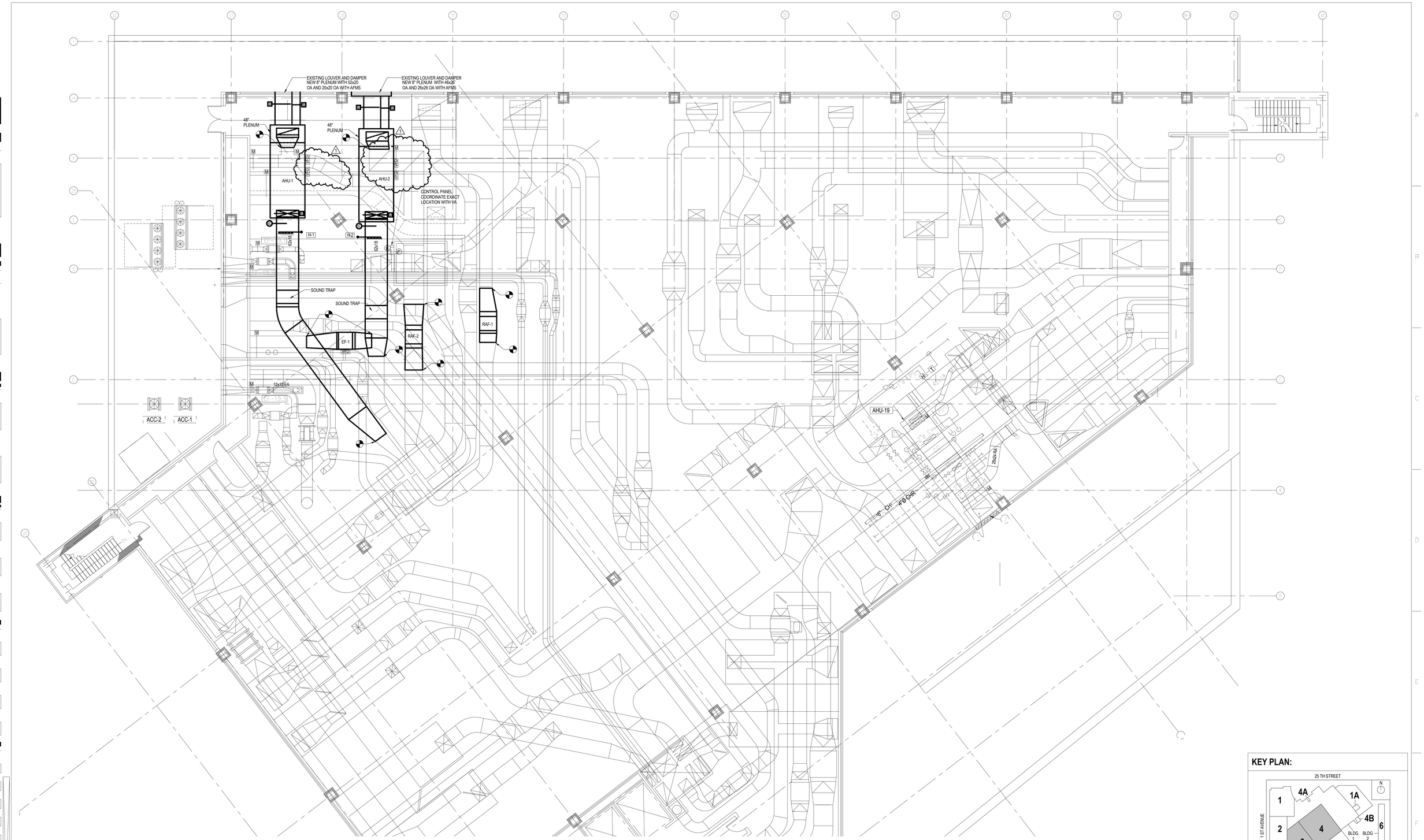

F1 07-SEVENTH FLOOR MECHANICAL PLAN - PART 3-4
1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0"

KEY PLAN:

FULLY SPRINKLERED

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Drawing Title: SEVENTH FLOOR PLAN - PART 3-4

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

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Date	Checked	Drawn
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Building Number: 1, 2, & 6

Drawing Number: MH1009

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AIR HANDLING UNIT CONTROL

A. AHU UNIT IS VARIABLE AIR VOLUME, USING STATIC PRESSURE CONTROL, PROVIDING AIR TO THE SYSTEM USING A VARIABLE FREQUENCY DRIVE (VFD). UNIT SHALL OPERATE PER TIME SCHEDULES VIA BMS BY OWNER.

B. A PROGRAMMABLE SYSTEM CONTROLLER SHALL BE PROVIDED FOR CONTROL OF AIR HANDLER SYSTEM.

C. AIR HANDLING UNIT STARTUP:

1. THE SUPPLY FAN AND RETURN FAN SHALL BE COMMANDED "ON" AT MINIMUM SPEED THROUGH THE BMS. THE MINIMUM SPEED SETTING IN THE VFD SHALL BE SET TO THE LOWEST SAFE OPERATING VALUE (AS DICTATED BY THE MANUFACTURER), MOST MANUFACTURERS ALLOW 8 HZ. ONCE AT MINIMUM SPEED, THE SUPPLY FAN SPEED SHALL RAMP TO THE CONTROL SETPOINT OVER A 600 SECOND (ADJ.) TIME PERIOD.
2. WHEN FANS ARE ENABLED THROUGH THE HOA SWITCH PROVIDED WITH THE VFD OR THROUGH THE BMS WHEN THE VFD IS IN THE "AUTO" POSITION, THE FOLLOWING SEQUENCE SHALL OCCUR:
   a. THE AIR HANDLER RETURN AIR DAMPER (D3) AND ISOLATION/SMOKE DAMPERS SHALL BE HARDWIRE-INTERLOCKED WITH THE SUPPLY AND RETURN FANS. WHEN THE UNIT IS COMMANDED "ON" THE RETURN DAMPER AND ISOLATION/ SMOKE DAMPERS SHALL OPEN, ONCE THE DAMPERS PROVE OPEN WITH THE ASSOCIATED LIMIT SWITCH THE FANS SHALL START
   IF AT ANY POINT DURING OPERATION, THE LIMIT SWITCH INDICATES THE RETURN AIR OR ISOLATION/SMOKE DAMPER IS CLOSING, THE FANS SHALL BE SHUTDOWN AND COMMANDED "OFF" BY THE BMS.

D. AIR HANDLING UNIT SHUTDOWN:

1. IN THE EVENT THE AIR HANDLER IS DISABLED THROUGH THE BMS, OR THROUGH HOA SWITCH PROVIDED WITH THE VFD THE FOLLOWING SHALL OCCUR.
   a. THE SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED, THE UNIT ISOLATION SMOKE DAMPERS, THE OUTSIDE AIR DAMPERS, PREHEAT COIL CONTROL VALVE, HUMIDIFIER CONTROL VALVE, AND COOLING COIL CONTROL VALVE SHALL CLOSE.

E. DAMPER CONTROLS:

1. PRIOR TO WARM UP OR COOL DOWN, THE RETURN AIR DAMPER (D3) SHALL BE FULLY OPENED. THE OUTSIDE AIR DAMPERS (D1 AND D2), AND RELIEF AIR DAMPER (D4) SHALL BE FULLY CLOSED.
2. DURING NORMAL OPERATION, THE OUTSIDE AIR DAMPER (D1) SHALL BE FULLY CLOSED. THE OUTSIDE AIR DAMPER (D2), RETURN AIR DAMPER (D3) AND RELIEF AIR DAMPER (D4) SHALL BE MODULATED TO MAINTAIN THE SETTING.
3. DURING ECONOMIZER OPERATION, THE OUTSIDE AIR DAMPER (D1) SHALL CLOSE. DAMPER (D2), RELIEF AIR DAMPER (D4) AND RETURN AIR DAMPER (D3) SHALL BE OPERATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET POINT. THE DAMPER (D1) SHALL START MODULATING WHEN DAMPER (D2) IS AT MAXIMUM STEEING.

F. AIR HANDLER PRESSURE CONTROL:

1. BMS SHALL MONITOR THE SUPPLY AIR DUCT SYSTEM STATIC PRESSURE. BMS SHALL CONTROL THE FAN'S SPEED, THROUGH THE VFD, TO MAINTAIN A DUCT STATIC PRESSURE SETTING, USING THE SIGNAL THAT IS LOWEST FROM SETPOINT. SPEED SIGNAL SETPOINT SHALL BE ESTABLISHED BY THE SYSTEM T&B CONTRACTOR TO MAINTAIN THE DUCT STATIC PRESSURE. THE RETURN FAN SHALL TRACK SUPPLY FAN SPEED.
2. THE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET AS FOLLOWS:
   a. THE BMS SHALL CONTINUOUSLY MONITOR THE ROOM'S TERMINAL BOXES DAMPER POSITION.
   b. THE BMS SHALL SLOWLY RESET THE STATIC PRESSURE SETPOINT DOWNWARDS UNTIL ONE OR MORE OF THE PRIMARY AIR TERMINAL BOXES IS 95% OF REQUIRED CFM (STARVED BOX STRATEGY).
   c. AS THE CONTROLLING TERMINAL DEVICE PRIMARY AIR DAMPER APPROACHES 100% OF DESIGN AIR FLOW, THE OPPOSITE SHALL OCCUR.
   d. THE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET BETWEEN ADJUSTABLE LOW AND HIGH LIMITS.

F. FANS SOFT START:

1. PROVIDE AN UNLOADED FAN START SEQUENCE (SOFT START) FOR EACH FAN. THIS FEATURE ENSURES THE BAS SLOWLY ACCELERATES FAN SPEED TO A MINIMUM SPEED UPON INITIAL STARTUP. THE VFD SHALL RAMP FAN SPEED TO THE CONTROL SET POINT IN A SMOOTH, BUMPLESS, TROUBLE-FREE MANNER OVER A 2 MINUTE TIME PERIOD.
2. THE BMS SHALL DECELERATE FAN SPEED TO MINIMUM AND DISABLE CONTROL LOOPS WHEN SYSTEM SHUTS DOWN.

G. AIR HANDLER TEMPERATURE CONTROL:

1. UPON STARTING THE AIR HANDLER THE TEMPERATURE CONTROL LOOPS SHALL BE ENABLED.
2. PRE-HEATING: PRE-HEATING OF THE OUTSIDE AIR IS ACHIEVED BY THE PRE-HEAT COIL CONTROL VALVE TO MAINTAIN A DISCHARGE TEMPERATURE AT SET POINT OF 55 DEGREES F (ADJ.).
   a. THE PRE-HEATING LOOP SHALL BE ENABLED WHENEVER OUTDOOR AIR TEMPERATURE IS BELOW 58 DEG F(ADJ.). BMS SHALL MODULATE THE TWO-WAY CONTROL VALVE TO MAINTAIN THE PREHEAT COIL DISCHARGE TEMPERATURE SETPOINT. ABOVE 58 DEG F OUTDOOR AIR TEMPERATURE, THE PRE-HEATING LOOP SHALL BE DISABLED AND THE TWO-WAY VALVE SHALL BE CLOSED.
   b. PRE-HEATING COIL SHALL BE PROVIDED WITH A CIRCULATION PUMP. WHEN THE PRE-HEATING LOOP IS ACTIVATED, THE BMS SHALL START THE PUMP, OTHERWISE PUMP IS OFF. BMS SHALL MONITOR PUMP'S STATUS AND ALARM UPON FAILURE TO OPERATE.
3. COOLING IS ACHIEVED BY MODULATING THE COOLING COIL CONTROL VALVE BETWEEN ITS NORMALLY CLOSED POSITION AND FULLY OPEN POSITION TO MAINTAIN A DISCHARGE AIR TEMPERATURE AT SET POINT OF 55 DEGREES F (ADJ.).
   c. UPON AN INCREASE IN THIS DISCHARGE AIR TEMPERATURE, THE COOLING COIL CONTROL VALVE SHALL BEGIN TO MODULATE OPEN TO INCREASE THE SUPPLY OF CHILLED WATER TO THE COIL TO MAINTAIN THE DISCHARGE AIR AT ITS SET POINT. THE REVERSE SEQUENCE SHALL OCCUR UPON A DROP IN THIS DISCHARGE AIR TEMPERATURE.
4. BMS SHALL PROVIDE A HEATING/COOLING MODE DEADBAND SO THAT HEATING AND COOLING ARE NOT IN OPERATION SIMULTANEOUSLY.

H. AIR SYSTEM HUMIDITY CONTROL:

1. UPON STARTING AND ANY RESTARTS OF THE SUPPLY FAN, THE BMS SHALL DELAY ACTIVATION OF HUMIDIFICATION CONTROL UNTIL AFTER THE UNIT DRY BULB TEMPERATURE HAS STABILIZED (10 MINUTE TIME-DELAY).
2. HUMIDIFIER SHALL ACTIVATE WHEN OUTDOOR AIR TEMPERATURE DROPS BELOW 55 DEGREE F (ADJ.) AND HEATING IS REQUIRED.
3. BMS SHALL MONITOR RETURN AIR HUMIDITY. UPON A DECREASE IN HUMIDITY, THE HUMIDIFIER CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN THE RETURN AIR HUMIDITY SETPOINT. THE REVERSE SEQUENCE SHALL OCCUR UPON A RISE IN THE SPACE HUMIDITY. THE SETPOINT SHALL BE 30% RH (ADJ.).
4. THE BMS SHALL MONITOR THE HUMIDITY AT THE DISCHARGE OF THE HUMIDIFIER. WHENEVER THE HUMIDIFIER DISCHARGE AIR HUMIDITY EXCEEDS 95% RH (ADJ.), THE HUMIDIFIER CONTROL VALVE SHALL BE MODULATED CLOSED OVER A 1 MINUTE PERIOD AND AN ALARM SHALL BE ANNUNCIATED ON THE BMS.
5. IF AHU IS "OFF" THEN THE STEAM ISOLATION AND STEAM CONTROLS VALVES SHALL CLOSE AS THE HUMIDIFICATION CONTROL LOOP IS DISABLED.

I. ECONOMIZER: WHEN BMS CALLS FOR COOLING AND OUTSIDE AIR TEMPERATURE IS ABOVE 55 DEGREES F (ADJUSTABLE) AND OUTSIDE AIR ENTHALPY IS LOWER THAN RETURN AIR. THE AHU SHALL ACTIVATE ECONOMIZER OPERATION. THE COOLING COIL SHALL MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT.

J. AIR HANDLER HARDWIRED SAFETIES:

1. ALL LOW TEMPERATURE DETECTORS (FREEZESTATS) PROVIDED BY THE BMS CONTRACTOR TO ADEQUATELY PROTECT THE COOLING COIL SHALL BE WIRED IN SERIES TO DISABLE THE SUPPLY FAN ASSOCIATED WITH THE AHU AND ANNUNCIATE AN ALARM ON THE BMS. THE LOW TEMPERATURE DETECTORS SHALL BE MANUAL RESET TYPE.
2. A HIGH AND LOW STATIC PRESSURE CONDITIONS UPSTREAM AND DOWNSTREAM OF THE SUPPLY FAN SHALL CAUSE THE FAN TO BE DE-ENERGIZED AND AN ALARM ANNUNCIATED ON THE BMS. HARDWIRE STATIC PRESSURE SWITCHES TO OVERRIDE TO THE SUPPLY FAN VFD CONTROL CIRCUITS TO SHUTDOWN BOTH ASSOCIATED SUPPLY AND EXHAUST FANS IN THE EVENT EITHER FAN EXPERIENCES A HIGH OR LOW PRESSURE CONDITION. PROVIDE SEPARATE ALARM SIGNALS TO BMS WHENEVER ANY OF THE STATIC PRESSURE SETPOINTS ARE EXCEEDED. THE SWITCHES SHALL BE A MANUAL RESET TYPE.
3. THE BMS SHALL MONITOR THE FIRE ALARM SYSTEM (FAS) VIA A FIRE ALARM RELAY. IN THE EVENT THE FAS SENSES SMOKE AND CHANGES THE STATE OF THE RELAY, AN ALARM SHALL BE ANNUNCIATED ON THE BMS AND THE ASSOCIATED FANS SHALL BE DE-ENERGIZED THROUGH A HARDWIRED INTERLOCK IN THE FAS RELAY.
4. BMS INITIATED HARDWIRED SHUTDOWN OF THE VFD. THE BMS SHALL PROVIDE AN OUTPUT CONTACT WIRED INTO THE SAFETY CIRCUIT OF THE FANS VFD. IN THE EVENT THAT EITHER OF THE FOLLOWING OCCURS, THE BMS SHALL SHUTDOWN THE VFD.
   a. IN THE EVENT OF A LOSS OF FLOW, THE VFD SHALL BE SHUTDOWN BY THE BMS.
   b. IN THE EVENT OF A POWER LOSS, THE BMS SHALL PREVENT THE VFD FROM STARTING THE FAN UNTIL 45 SECONDS AFTER THE POWER HAS BEEN RESTORED. THE TIME DELAY SHALL BE LONG ENOUGH TO ALLOW THE VFD TO COMPLETE ITS INTERNAL STARTUP ROUTINE.
5. SAFETY DEVICES SHALL BE HARDWIRED TO THE FANS' VFD. HARDWIRED SAFETY DEVICES MUST BE ACTIVE IN "HAND", "AUTO" AND "BYPASS" (IF PROVIDED) POSITIONS. WHEN A SAFETY IS ACTIVATED, THE SYSTEM SHALL SHUTDOWN IN A CONTROLLED MANNER.

K. AIR HANDLING UNIT START-UP AND FAILURE CONTROL:

1. INITIAL SYSTEM START-UP:
   a. WHEN SYSTEM IS COMMANDED "ON", SUPPLY AND RETURN FAN ARE STAGED "ON" IN A SYSTEMATIC MANNER.
   b. ONCE FANS AIRFLOW IS PROVEN VIA AIR FLOW STATION, CONTROL LOOPS ARE ACTIVATED.
   c. IF AN RETURN FAN OR SUPPLY FAN FAILS TO START THEN SYSTEM SHALL ALARM ON FAN FAILURE.
2. FAN FAILURE:
   a. ONCE SYSTEMS ARE FULLY OPERATIONAL AND SUPPLY FAN ARRAYS OR RETURN FAN FAILURE OCCUR FROM A LOSS OF AIR FLOW, ITS ASSOCIATED ISOLATION DAMPERS SHALL CLOSE AND AN ALARM IS GENERATED AT BMS.
   b. IF ONE SUPPLY FAN FAILS, THE SYSTEM SHALL STILL OPERATING. THE REMAINING SUPPLY FAN SHALL MAINTAIN STATIC PRESSURE SET POINT. AN ALARM SHALL BE GENERATED. BMS SHALL IDENTIFY FAILING FAN.
   c. REVERSE SEQUENCE SHALL APPLY AS SUPPLY FAN IS INDEXED BACK INTO OPERATION. RESTART FROM FAILURE.
      1) THE AHU STARTUP ROUTINE SHALL BE INITIATED AS INDICATED ABOVE.

L. AIR FLOW MONITORING:

1. BMS SHALL MONITOR THE SUPPLY, RETURN AND MIN OUTSIDE AIRFLOWS. BMS SHALL ALARM UPON A HIGH OR LOW AIRFLOW CONDITION.
2. BMS SHALL MONITOR DIFFERENTIAL ACROSS PRE AND FINAL FILTERS, AND ALARM UPON A HIGH CONDITION, NOTIFYING OPERATOR OF A POTENTIAL FILTER PROBLEM.

M. UTILITY POWER FAILURE:

1. UPON A UTILITY POWER FEED FAILURE, INDICATED VIA A LOSS OF POWER DISTRIBUTION TO THE BUILDING POWER MONITORING CONTACT, BMS SHALL ALARM AND INTERFACED AHU MECHANICAL EQUIPMENT IS DISABLED.
2. ONCE POWER IS RESTORED TO THE BUILDING EITHER STANDBY OR NORMAL POWER MONITORING CONTACT, BMS SHALL AUTOMATICALLY SEQUENCE MECHANICAL EQUIPMENT SIMILAR TO INITIAL START-UP.

N. FANS SHUTDOWN FOR MAINTENANCE:

1. THERE SHALL BE A SOFTWARE POINT DISPLAYED AT THE OPERATOR WORKSTATION FOR THE FANS ASSOCIATED WITH A SYSTEM INDICATING "SHUTDOWN FOR MAINTENANCE". THE OPERATOR WITH PROPER AUTHORIZATION SHALL COMMAND THE "SHUTDOWN FOR MAINTENANCE". ONCE THE SHUTDOWN AHU FAN IS COMMANDED BACK "ON" VIA THE BMS, THE UNIT SHALL START IN A SIMILAR MANNER AS STARTUP.

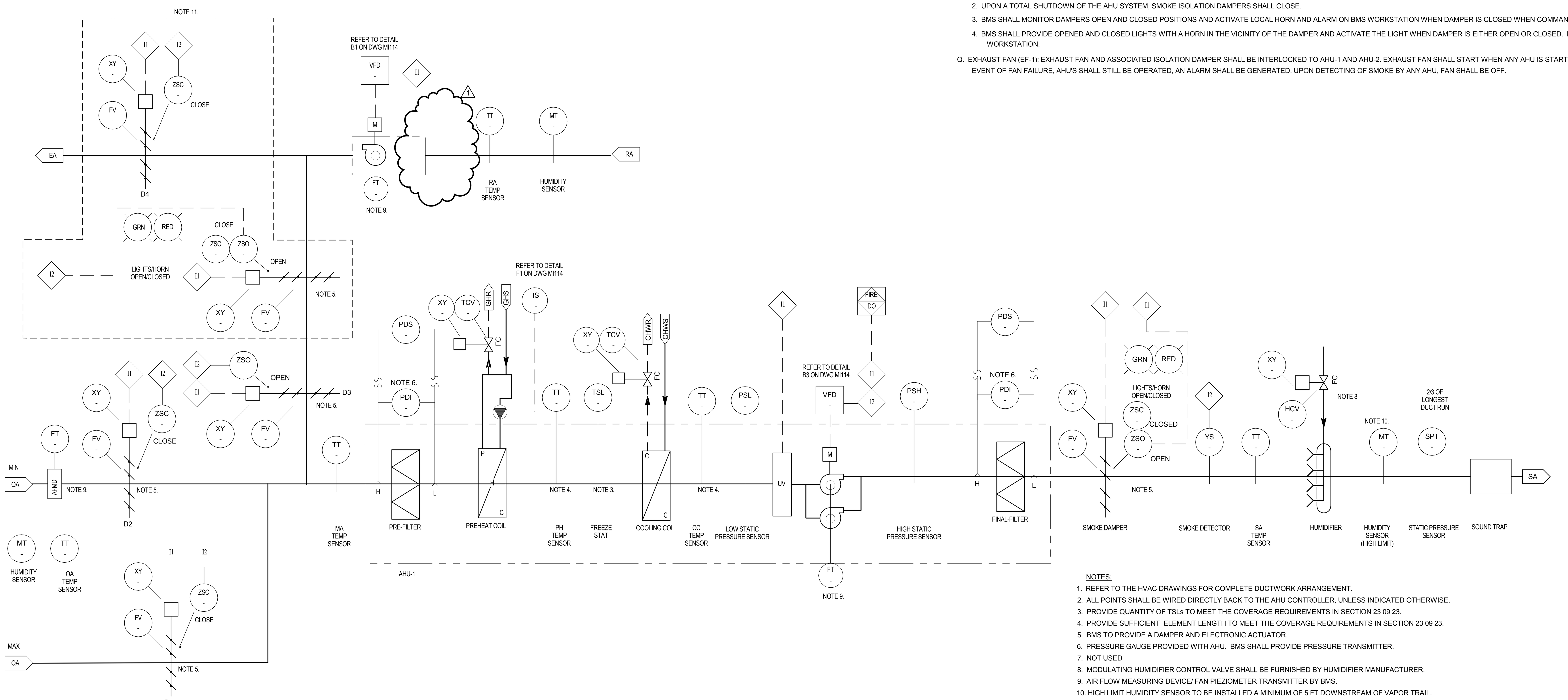
O. UV LIGHT CONTROL:

1. IN THE EVENT THE SUPPLY FAN IS "ON", THE UV LIGHTS SHALL BE COMMANDED "ON".
2. THE UV LIGHTS SHALL BE HARDWIRED TO THE AHU DOOR SWITCH. IN THE EVENT THAT THE DOOR IS OPENED, THE LIGHTS SHALL BE COMMANDED "OFF".
3. IN THE EVENT THE COMMANDED STATE OF THE LIGHTS DOES NOT COINCIDE WITH THE UV LIGHT STATUS, AFTER A 5 SECOND DELAY, AN ALARM SHALL BE INDEXED "ON" ON THE BMS WORKSTATION.

P. AHU SMOKE ISOLATION DAMPERS CONTROL:

1. BMS SHALL OPEN THE SMOKE ISOLATION DAMPERS WHENEVER AHU SYSTEM IS IN OPERATION.
2. UPON A TOTAL SHUTDOWN OF THE AHU SYSTEM, SMOKE ISOLATION DAMPERS SHALL CLOSE.
3. BMS SHALL MONITOR DAMPERS OPEN AND CLOSED POSITIONS AND ACTIVATE LOCAL HORN AND ALARM ON BMS WORKSTATION WHEN DAMPER IS CLOSED WHEN COMMANDED TO BE OPEN OR OPEN WHEN COMMANDED TO BE CLOSED.
4. BMS SHALL PROVIDE OPENED AND CLOSED LIGHTS WITH A HORN IN THE VICINITY OF THE DAMPER AND ACTIVATE THE LIGHT WHEN DAMPER IS EITHER OPEN OR CLOSED. HORN SHALL BE DE-ACTIVATED THROUGH THE BMS OPERATOR WORKSTATION.

Q. EXHAUST FAN (EF-1): EXHAUST FAN AND ASSOCIATED ISOLATION DAMPER SHALL BE INTERLOCKED TO AHU-1 AND AHU-2. EXHAUST FAN SHALL START WHEN ANY AHU IS STARTING. EXHAUST FAN SHALL BE OFF WHEN BOTH OF AHU'S SHUT DOWN. IN EVENT OF FAN FAILURE, AHU'S SHALL STILL BE OPERATED, AN ALARM SHALL BE GENERATED. UPON DETECTING OF SMOKE BY ANY AHU, FAN SHALL BE OFF.



F1 MECHANICAL CONTROL AHU1 AND AHU 2

NTS

NOTES:

1. REFER TO THE HVAC DRAWINGS FOR COMPLETE DUCTWORK ARRANGEMENT.
2. ALL POINTS SHALL BE WIRED DIRECTLY BACK TO THE AHU CONTROLLER, UNLESS INDICATED OTHERWISE.
3. PROVIDE QUANTITY OF TSLs TO MEET THE COVERAGE REQUIREMENTS IN SECTION 23 09 23.
4. PROVIDE SUFFICIENT ELEMENT LENGTH TO MEET THE COVERAGE REQUIREMENTS IN SECTION 23 09 23.
5. BMS TO PROVIDE A DAMPER AND ELECTRONIC ACTUATOR.
6. PRESSURE GAUGE PROVIDED WITH AHU. BMS SHALL PROVIDE PRESSURE TRANSMITTER.
7. NOT USED
8. MODULATING HUMIDIFIER CONTROL VALVE SHALL BE FURNISHED BY HUMIDIFIER MANUFACTURER.
9. AIR FLOW MEASURING DEVICE/ FAN PIEZIOMETER TRANSMITTER BY BMS.
10. HIGH LIMIT HUMIDITY SENSOR TO BE INSTALLED A MINIMUM OF 5 FT DOWNSTREAM OF VAPOR TRAIL.
11. EXISTING HARDWARE, VERIFY IN FILED AND PROVIDE ADDITIONAL CONTROL AND COMMUNICATION AS REQUIRED

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Drawing Title: MECHANICAL CONTROL DIAGRAMS

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

Date: 08 / 25 / 2014 | Checked: SS | Drawn: HH

Project Number: 228727

Building Number: 1, 2, & 6

Drawing Number: MI1112

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

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AIR HANDLING UNIT CONTROL

A. AHU UNIT IS VARIABLE AIR VOLUME, USING STATIC PRESSURE CONTROL, PROVIDING AIR TO THE SYSTEM USING A VARIABLE FREQUENCY DRIVE (VFD). UNIT SHALL OPERATE PER TIME SCHEDULES VIA BMS BY OWNER.

B. A PROGRAMMABLE SYSTEM CONTROLLER SHALL BE PROVIDED FOR CONTROL OF AIR HANDLER SYSTEM.

C. AIR HANDLING UNIT STARTUP:

1. THE SUPPLY FAN AND RETURN FAN SHALL BE COMMANDED "ON" AT MINIMUM SPEED THROUGH THE BMS. THE MINIMUM SPEED SETTING IN THE VFD SHALL BE SET TO THE LOWEST SAFE OPERATING VALUE (AS DICTATED BY THE MANUFACTURER), MOST MANUFACTURERS ALLOW 8 HZ. ONCE AT MINIMUM SPEED, THE SUPPLY FAN SPEED SHALL RAMP TO THE CONTROL SETPOINT OVER A 600 SECOND (ADJ.) TIME PERIOD.
2. WHEN FANS ARE ENABLED THROUGH THE HOA SWITCH PROVIDED WITH THE VFD OR THROUGH THE BMS WHEN THE VFD IS IN THE "AUTO" POSITION, THE FOLLOWING SEQUENCE SHALL OCCUR:
   a. THE AIR HANDLER RETURN AIR DAMPER (D3) AND ISOLATION/SMOKE DAMPERS SHALL BE HARDWIRE-INTERLOCKED WITH THE SUPPLY AND RETURN FANS. WHEN THE UNIT IS COMMANDED "ON" THE RETURN DAMPER AND ISOLATION/ SMOKE DAMPERS SHALL OPEN, ONCE THE DAMPERS PROVE OPEN WITH THE ASSOCIATED LIMIT SWITCH THE FANS SHALL START
   IF AT ANY POINT DURING OPERATION, THE LIMIT SWITCH INDICATES THE RETURN AIR OR ISOLATION/SMOKE DAMPER IS CLOSING, THE FANS SHALL BE SHUTDOWN AND COMMANDED "OFF" BY THE BMS.

D. AIR HANDLING UNIT SHUTDOWN:

1. IN THE EVENT THE AIR HANDLER IS DISABLED THROUGH THE BMS, OR THROUGH HOA SWITCH PROVIDED WITH THE VFD THE FOLLOWING SHALL OCCUR.
   THE SUPPLY AND RETURN FANS SHALL BE DE-ENERGIZED, THE UNIT ISOLATION SMOKE DAMPERS, THE OUTSIDE AIR DAMPERS, REHEAT COIL CONTROL VALVE, HUMIDIFIER SYSTEM, AND COOLING COIL CONTROL VALVE SHALL CLOSE.

E. DAMPER CONTROLS:

1. PRIOR TO WARM UP OR COOL DOWN, THE RETURN AIR DAMPER (D3) SHALL BE FULLY OPENED. THE OUTSIDE AIR DAMPERS (D1 AND D2), AND RELIEF AIR DAMPER (D4) SHALL BE FULLY CLOSED.
2. DURING NORMAL OPERATION, THE OUTSIDE AIR DAMPER (D1) SHALL BE FULLY CLOSED. THE OUTSIDE AIR DAMPER (D2), RETURN AIR DAMPER (D3) AND RELIEF AIR DAMPER (D4) SHALL BE MODULATED TO MAINTAIN THE SETTING.
3. DURING ECONOMIZER OPERATION, THE OUTSIDE AIR DAMPER (D1) SHALL CLOSE. DAMPER (D2), RELIEF AIR DAMPER (D4) AND RETURN AIR DAMPER (D3) SHALL BE OPERATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET POINT. THE DAMPER (D1) SHALL START MODULATING WHEN DAMPER (D2) IS AT MAXIMUM STEEING.

F. FANS SOFT START:

1. PROVIDE AN UNLOADED FAN START SEQUENCE (SOFT START) FOR EACH FANS. THIS FEATURE ENSURES THE BAS SLOWLY ACCELERATES FAN SPEED TO A MINIMUM SPEED UPON INITIAL STARTUP. THE VFD SHALL RAMP FAN SPEED TO THE CONTROL SET POINT IN A SMOOTH, BUMPLESS, TROUBLE-FREE MANNER OVER A 2 MINUTE TIME PERIOD.
2. THE BMS SHALL DECELERATE FAN SPEED TO MINIMUM AND DISABLE CONTROL LOOPS WHEN SYSTEM SHUTS DOWN.

G. AIR HANDLER TEMPERATURE CONTROL:

1. UPON STARTING THE AIR HANDLER THE TEMPERATURE CONTROL LOOPS SHALL BE ENABLED.
2. RE-HEATING: RE-HEATING IS ACHIEVED BY THE RE-HEAT COIL CONTROL VALVE TO MAINTAIN SPACE TEMPERATURE AT SET POINT OF 72 DEGREES F (ADJ.).
3. COOLING IS ACHIEVED BY MODULATING THE COOLING COIL CONTROL VALVE BETWEEN ITS NORMALLY CLOSED POSITION AND FULLY OPEN POSITION TO MAINTAIN SPACE TEMPERATURE AT SET POINT OF 72 DEGREES F (ADJ.).
   a. UPON AN INCREASE IN THIS SPACE AIR TEMPERATURE, THE COOLING COIL CONTROL VALVE SHALL BEGIN TO MODULATE OPEN TO INCREASE THE SUPPLY OF CHILLED WATER TO THE COIL TO MAINTAIN SPACE TEMPERATURE AT ITS SET POINT. THE REVERSE SEQUENCE SHALL OCCUR UPON A DROP IN THIS SPACE TEMPERATURE.
4. WHEN RETURN AIR HUMIDITY IS ABOVE 55% RH (ADJUSABLE). THE COOLING COIL MAINTAIN COIL DISCHARGE AIR TEMPERATURE AT 55 DEGREES F (ADJ.). THE REHEAT COIL SHALL MAINTAIN SPACE TEMPERATURE. NORMAL OPERATION SHALL OCCUR WHEN RETURN AIR HUMIDITY BELOW 50% RH FOR 1 MINS (ADJUSABLE)
5. BMS SHALL PROVIDE A HEATING/COOLING MODE DEADBAND SO THAT HEATING AND COOLING ARE NOT IN OPERATION SIMULTANEOUSLY.

H. AIR SYSTEM HUMIDITY CONTROL:

1. UPON STARTING AND ANY RESTARTS OF THE SUPPLY FAN, THE BMS SHALL DELAY ACTIVATION OF HUMIDIFICATION CONTROL UNTIL AFTER THE UNIT DRY BULB TEMPERATURE HAS STABILIZED (10 MINUTE TIME-DELAY).
2. HUMIDIFIER SHALL ACTIVATE WHEN OUTDOOR AIR TEMPERATURE DROP BELOW 55 DEGREE F (ADJ.) AND HEATING IS REQUIRED.
3. BMS SHALL MONITOR RETURN AIR HUMIDITY. UPON A DECREASE IN HUMIDITY, THE HUMIDIFIER CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN THE RETURN AIR HUMIDITY SETPOINT. THE REVERSE SEQUENCE SHALL OCCUR UPON A RISE IN THE SPACE HUMIDITY. THE SETPOINT SHALL BE 30% RH (ADJ.).
4. THE BMS SHALL MONITOR THE HUMIDITY AT THE DISCHARGE OF THE HUMIDIFIER. WHENEVER THE HUMIDIFIER DISCHARGE AIR HUMIDITY EXCEEDS 95% RH (ADJ.), THE HUMIDIFIER CONTROL VALVE SHALL BE MODULATED CLOSED OVER A 1 MINUTE PERIOD AND AN ALARM SHALL BE ANNUNCIATED ON THE BMS.
5. IF AHU IS "OFF" THEN STEAM CONTROLS VALVE AND ELECTRIC STEAM HUMIDIFIER SHALL CLOSED.

I. ECONOMIZER: WHEN BMS CALLS FOR COOLING AND OUTSIDE AIR TEMPERATURE IS ABOVE 55 DEGREES F (ADJUSTABLE) AND OUTSIDE AIR ENTHALPY IS LOWER THAN RETURN AIR. THE AHU SHALL ACTIVATE ECONOMIZER OPERATION. THE COOLING COIL SHALL MAINTAIN SPACE TEMPERATURE SET POINT.

J. AIR HANDLER HARDWIRED SAFETIES:

1. ALL LOW TEMPERATURE DETECTORS (FREEZESTATS) PROVIDED BY THE BMS CONTRACTOR TO ADEQUATELY PROTECT THE COOLING COIL SHALL BE WIRED IN SERIES TO DISABLE THE SUPPLY FAN ASSOCIATED WITH THE AHU AND ANNUNCIATE AN ALARM ON THE BMS. THE LOW TEMPERATURE DETECTORS SHALL BE MANUAL RESET TYPE.
2. A HIGH AND LOW STATIC PRESSURE CONDITIONS UPSTREAM AND DOWNSTREAM OF THE SUPPLY FAN SHALL CAUSE THE FAN TO BE DE-ENERGIZED AND AN ALARM ANNUNCIATED ON THE BMS. HARDWIRE STATIC PRESSURE SWITCHES TO OVERRIDE TO THE SUPPLY FAN VFD CONTROL CIRCUITS TO SHUTDOWN BOTH ASSOCIATED SUPPLY AND EXHAUST FANS IN THE EVENT EITHER FAN EXPERIENCES A HIGH OR LOW PRESSURE CONDITION. PROVIDE SEPARATE ALARM SIGNALS TO BMS WHENEVER ANY OF THE STATIC PRESSURE SETPOINTS ARE EXCEEDED. THE SWITCHES SHALL BE A MANUAL RESET TYPE.
3. THE BMS SHALL MONITOR THE FIRE ALARM SYSTEM (FAS) VIA A FIRE ALARM RELAY. IN THE EVENT THE FAS SENSES SMOKE AND CHANGES THE STATE OF THE RELAY, AN ALARM SHALL BE ANNUNCIATED ON THE BMS AND THE ASSOCIATED FANS SHALL BE DE-ENERGIZED THROUGH A HARDWIRED INTERLOCK IN THE FAS RELAY.
4. BMS INITIATED HARDWIRED SHUTDOWN OF THE VFD. THE BMS SHALL PROVIDE AN OUTPUT CONTACT WIRED INTO THE SAFETY CIRCUIT OF THE FANS VFD. IN THE EVENT THAT EITHER OF THE FOLLOWING OCCURS, THE BMS SHALL SHUTDOWN THE VFD.
   a. IN THE EVENT OF A LOSS OF FLOW, THE VFD SHALL BE SHUTDOWN BY THE BMS.
   b. IN THE EVENT OF A POWER LOSS, THE BMS SHALL PREVENT THE VFD FROM STARTING THE FAN UNTIL 45 SECONDS AFTER THE POWER HAS BEEN RESTORED. THE TIME DELAY SHALL BE LONG ENOUGH TO ALLOW THE VFD TO COMPLETE ITS INTERNAL STARTUP ROUTINE.
5. SAFETY DEVICES SHALL BE HARDWIRED TO THE FANS' VFD. HARDWIRED SAFETY DEVICES MUST BE ACTIVE IN "HAND", "AUTO" AND "BYPASS" (IF PROVIDED) POSITIONS. WHEN A SAFETY IS ACTIVATED, THE SYSTEM SHALL SHUTDOWN IN A CONTROLLED MANNER.

K. AIR HANDLING UNIT START-UP AND FAILURE CONTROL:

1. INITIAL SYSTEM START-UP:
   a. WHEN SYSTEM IS COMMANDED "ON", SUPPLY AND RETURN FAN ARE STAGED "ON" IN A SYSTEMATIC MANNER.
   b. ONCE FANS AIRFLOW IS PROVEN VIA AIR FLOW STATION, CONTROL LOOPS ARE ACTIVATED.
   c. IF AN RETURN FAN OR SUPPLY FAN FAILS TO START THEN SYSTEM SHALL ALARM ON FAN FAILURE.
2. FAN FAILURE:
   a. ONCE SYSTEMS ARE FULLY OPERATIONAL AND SUPPLY OR RETURN FANS FAILURE OCCUR, FROM A LOSS OF FLOW, ITS ASSOCIATED ISOLATION DAMPERS SHALL CLOSE, FANS SHALL OFF AND AN ALARM IS GENERATED AT BMS.
   b. REVERSE SEQUENCE SHALL APPLY AS FANS ARE INDEXED BACK INTO OPERATION. RESTART FROM FAILURE
      1) THE AHU STARTUP ROUTINE SHALL BE INITIATED AS INDICATED ABOVE.

L. AIRFLOW MONITORING:

1. BMS SHALL MONITOR THE SUPPLY, RETURN AND MIN OUTSIDE AIRFLOWS. BMS SHALL ALARM UPON A HIGH OR LOW AIRFLOW CONDITION.
2. BMS SHALL MONITOR DIFFERENTIAL ACROSS PRE AND FINAL FILTERS, AND ALARM UPON A HIGH CONDITION, NOTIFYING OPERATOR OF A POTENTIAL FILTER PROBLEM.

M. UTILITY POWER FAILURE:

1. UPON A UTILITY POWER FEED FAILURE, INDICATED VIA A LOSS OF POWER DISTRIBUTION TO THE BUILDING POWER MONITORING CONTACT, BMS SHALL ALARM AND INTERFACED AHU MECHANICAL EQUIPMENT IS DISABLED.
2. ONCE POWER IS RESTORED TO THE BUILDING EITHER STANDBY OR NORMAL POWER MONITORING CONTACT, BMS SHALL AUTOMATICALLY SEQUENCE MECHANICAL EQUIPMENT SIMILAR TO INITIAL START-UP.

N. FANS SHUTDOWN FOR MAINTENANCE:

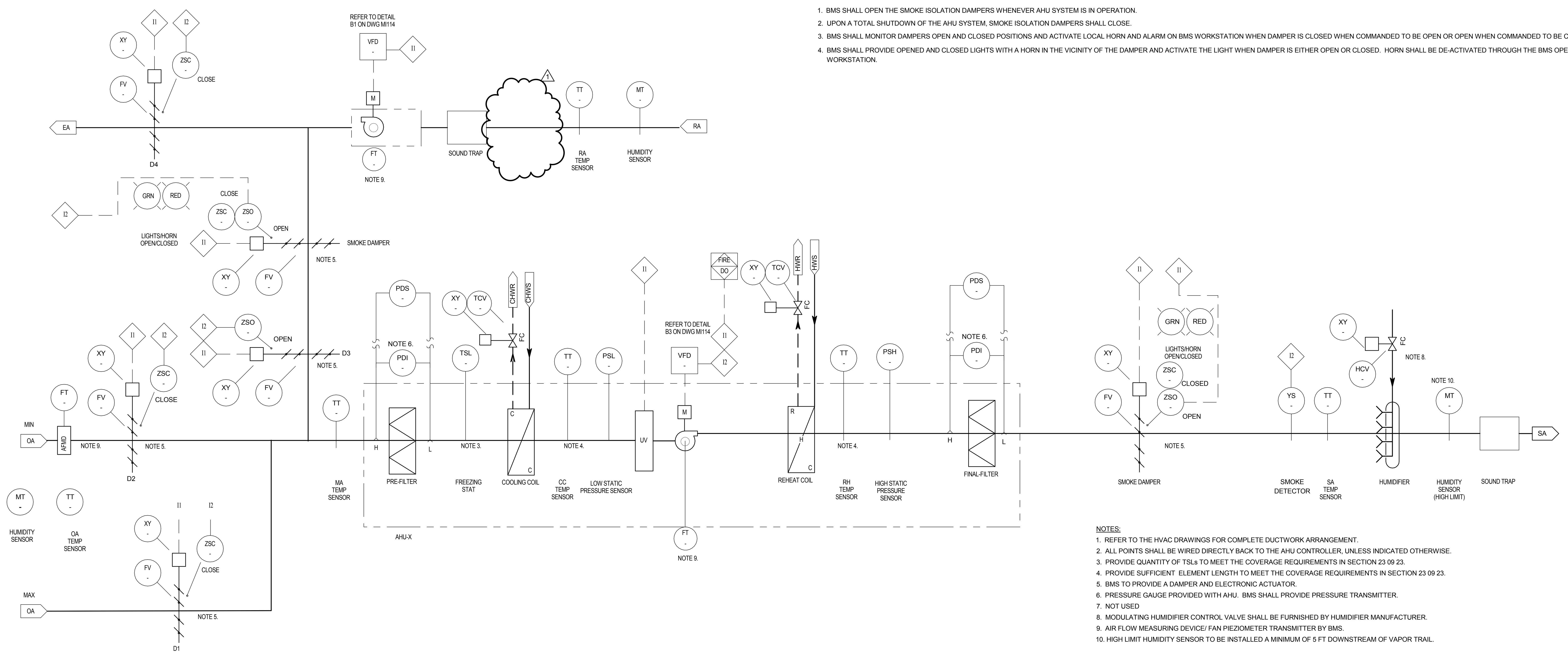
1. THERE SHALL BE A SOFTWARE POINT DISPLAYED AT THE OPERATOR WORKSTATION FOR THE FANS ASSOCIATED WITH A SYSTEM INDICATING "SHUTDOWN FOR MAINTENANCE". THE OPERATOR WITH PROPER AUTHORIZATION SHALL COMMAND THE "SHUTDOWN FOR MAINTENANCE". ONCE THE SHUTDOWN AHU FAN IS COMMANDED BACK "ON" VIA THE BMS, THE UNIT SHALL START IN A SIMILAR MANNER AS STARTUP.

O. UV LIGHT CONTROL:

1. IN THE EVENT THE SUPPLY FAN IS "ON", THE UV LIGHTS SHALL BE COMMANDED "ON".
2. THE UV LIGHTS SHALL BE HARDWIRED TO THE AHU DOOR SWITCH. IN THE EVENT THAT THE DOOR IS OPENED, THE LIGHTS SHALL BE COMMANDED "OFF".
3. IN THE EVENT THE COMMANDED STATE OF THE LIGHTS DOES NOT COINCIDE WITH THE UV LIGHT STATUS, AFTER A 5 SECOND DELAY, AN ALARM SHALL BE INDEXED "ON" ON THE BMS WORKSTATION.

P. AHU SMOKE ISOLATION DAMPERS CONTROL:

1. BMS SHALL OPEN THE SMOKE ISOLATION DAMPERS WHENEVER AHU SYSTEM IS IN OPERATION.
2. UPON A TOTAL SHUTDOWN OF THE AHU SYSTEM, SMOKE ISOLATION DAMPERS SHALL CLOSE.
3. BMS SHALL MONITOR DAMPERS OPEN AND CLOSED POSITIONS AND ACTIVATE LOCAL HORN AND ALARM ON BMS WORKSTATION WHEN DAMPER IS CLOSED WHEN COMMANDED TO BE OPEN OR OPEN WHEN COMMANDED TO BE CLOSED.
4. BMS SHALL PROVIDE OPENED AND CLOSED LIGHTS WITH A HORN IN THE VICINITY OF THE DAMPER AND ACTIVATE THE LIGHT WHEN DAMPER IS EITHER OPEN OR CLOSED. HORN SHALL BE DE-ACTIVATED THROUGH THE BMS OPERATOR WORKSTATION.



NOTES:
1. REFER TO THE HVAC DRAWINGS FOR COMPLETE DUCTWORK ARRANGEMENT.
2. ALL POINTS SHALL BE WIRED DIRECTLY BACK TO THE AHU CONTROLLER, UNLESS INDICATED OTHERWISE.
3. PROVIDE QUANTITY OF TSLs TO MEET THE COVERAGE REQUIREMENTS IN SECTION 23 09 23.
4. PROVIDE SUFFICIENT ELEMENT LENGTH TO MEET THE COVERAGE REQUIREMENTS IN SECTION 23 09 23.
5. BMS TO PROVIDE A DAMPER AND ELECTRONIC ACTUATOR.
6. PRESSURE GAUGE PROVIDED WITH AHU. BMS SHALL PROVIDE PRESSURE TRANSMITTER.
7. NOT USED
8. MODULATING HUMIDIFIER CONTROL VALVE SHALL BE FURNISHED BY HUMIDIFIER MANUFACTURER.
9. AIR FLOW MEASURING DEVICE/ FAN PIEZIOMETER TRANSMITTER BY BMS.
10. HIGH LIMIT HUMIDITY SENSOR TO BE INSTALLED A MINIMUM OF 5 FT DOWNSTREAM OF VAPOR TRAIL.

F1 MECHANICAL CONTROL - AHU-50

NTS

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Drawing Title: MECHANICAL CONTROL DIAGRAMS

Approved: Project Director

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Location: 423 E 23RD STREET, NEW YORK, NY 10010

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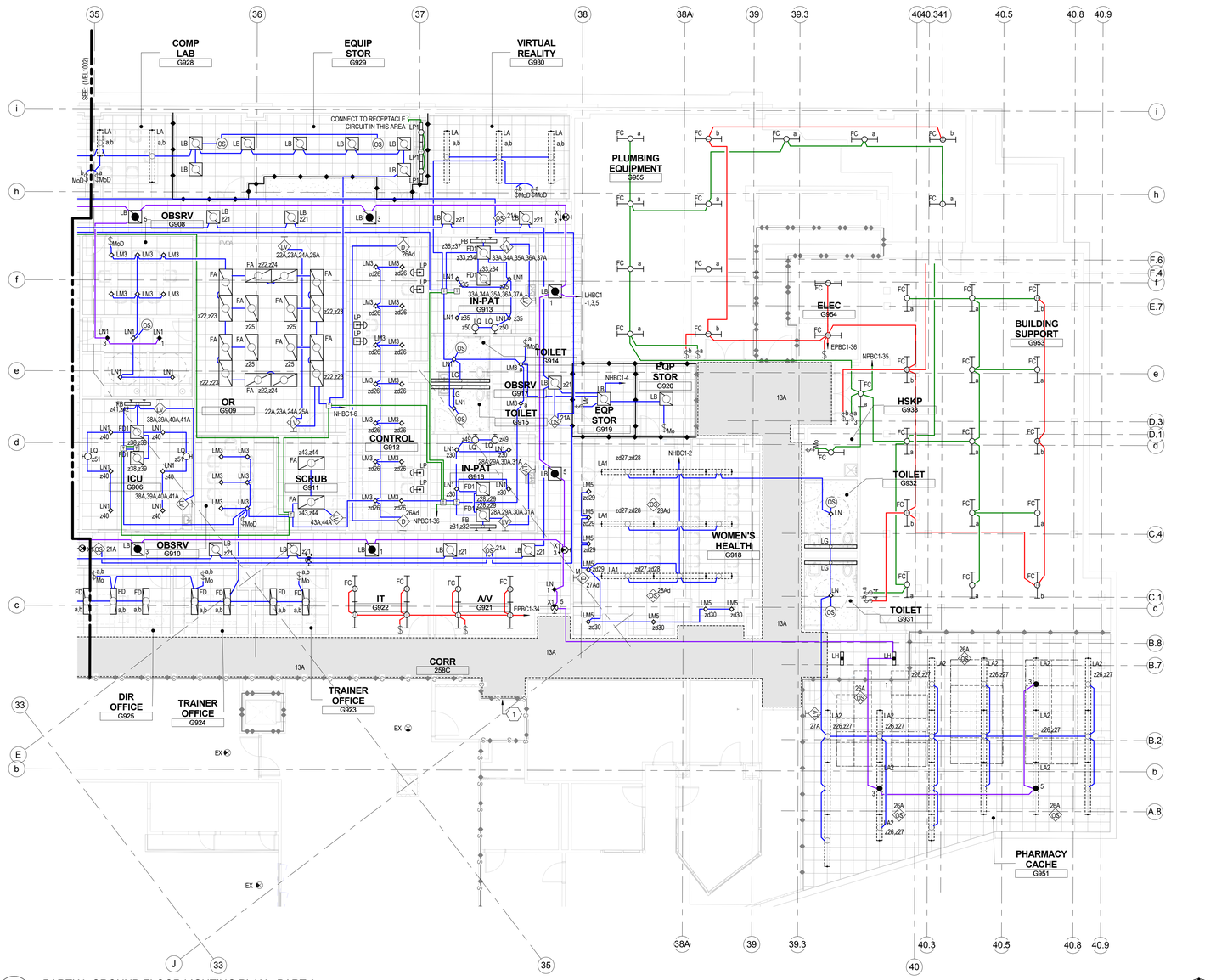


1 PARTIAL GROUND FLOOR LIGHTING PLAN - PART 1

1/8" = 1'-0"

DRAWING NOTES:

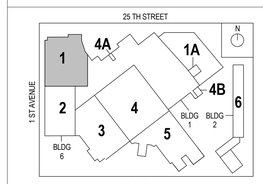
1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES, REFER TO DRAWING E-001.
2. FOR LIGHTING FIXTURE SCHEDULE AND DETAILS, REFER TO DRAWINGS EL-701 AND EL-702.
3. REFER TO REFLECTED CEILING PLANS FOR FINAL AND EXACT LOCATION OF ALL CEILING MOUNTED LIGHTING FIXTURES.
4. UNLESS OTHERWISE NOTED, LIGHTING FIXTURES DESIGNATED WITH A "zlt" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A SWITCHED LOAD AND LIGHTING FIXTURES DESIGNATED WITH A "zslt" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A DIMMING LOAD . REFER TO DRAWING EL-601 FOR ZONING SCHEDULES AND CONTROL DETAILS AND DIAGRAMS.
5. FOR LIGHTING DETAILS, REFER TO ARCHITECTURAL CEILING DETAILS DRAWINGS AE5003 AND AE5004 AND DRAWING EL-601.
6. REFER TO DRAWING E-402 FOR ENLARGED PARTIAL LIGHTING PLANS.

1

KEYED SHEET NOTES

1 DEMOLITION KEYNOTES

KEY PLAN:



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Drawing Title: PARTIAL GROUND FLOOR LIGHTING PLAN - PART 1

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

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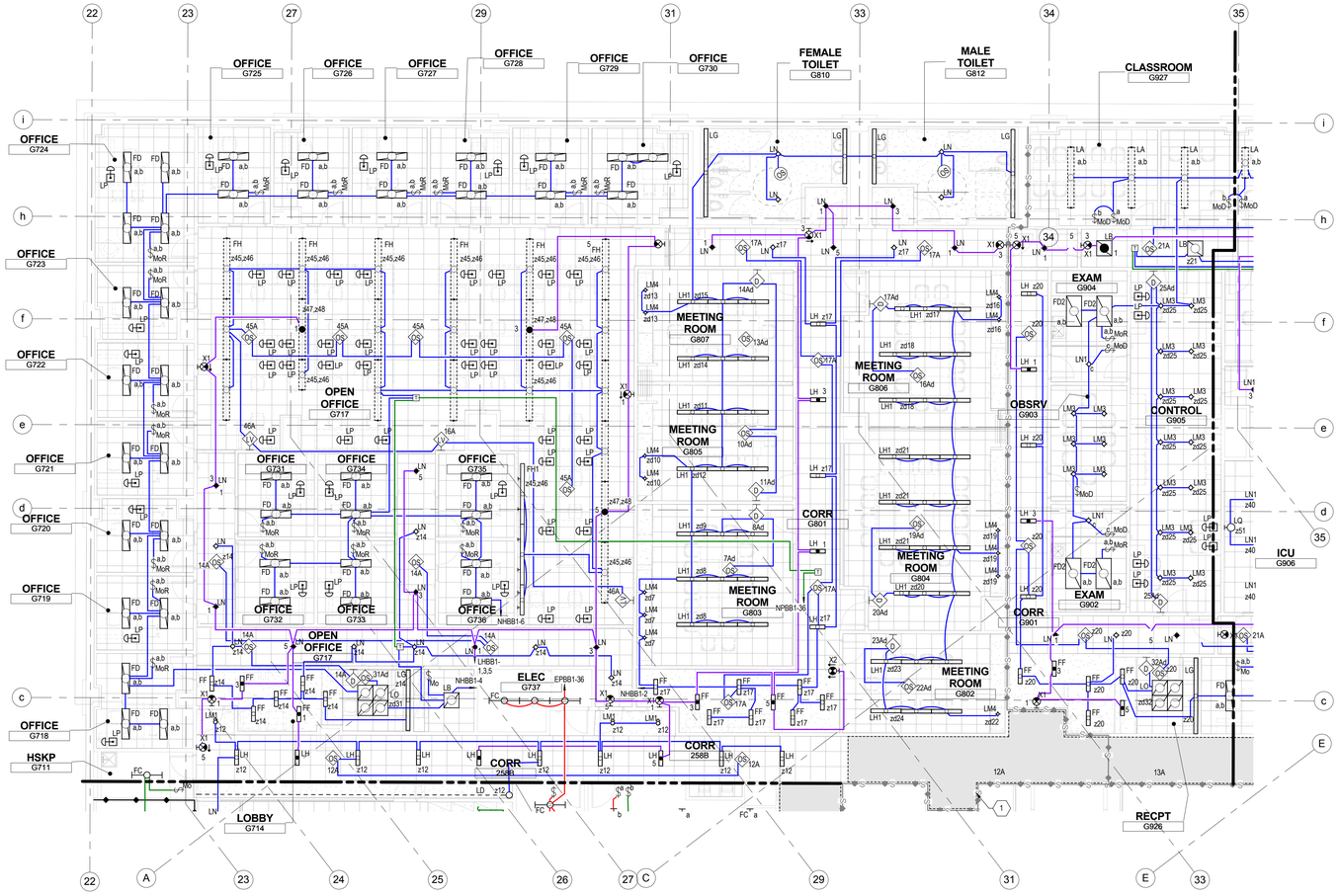

1 PARTIAL GROUND FLOOR LIGHTING PLAN - PART 2

1/8" = 1'-0"

0 4'-0" 8'-0" 16'-0"

DRAWING NOTES:

1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES, REFER TO DRAWING E-001.
2. FOR LIGHTING FIXTURE SCHEDULE AND DETAILS, REFER TO DRAWINGS EL-701 AND EL-702.
3. REFER TO REFLECTED CEILING PLANS FOR FINAL AND EXACT LOCATION OF ALL CEILING MOUNTED LIGHTING FIXTURES.
4. UNLESS OTHERWISE NOTED, LIGHTING FIXTURES DESIGNATED WITH A "zdl#" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A SWITCHED LOAD AND LIGHTING FIXTURES DESIGNATED WITH A "zdl#" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A DIMMING LOAD . REFER TO DRAWING EL-601 FOR ZONING SCHEDULES AND CONTROL DETAILS AND DIAGRAMS.
5. FOR LIGHTING DETAILS, REFER TO ARCHITECTURAL CEILING DETAILS DRAWINGS AE5003 AND AE5004 AND DRAWING EL-601.
6. REFER TO DRAWING E-402 FOR ENLARGED PARTIAL LIGHTING PLANS.

KEYED SHEET NOTES

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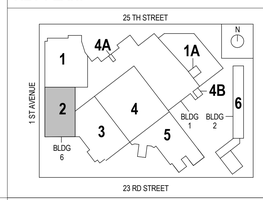
KEY PLAN:



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Drawing Title: PARTIAL GROUND FLOOR LIGHTING PLAN - PART 2

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

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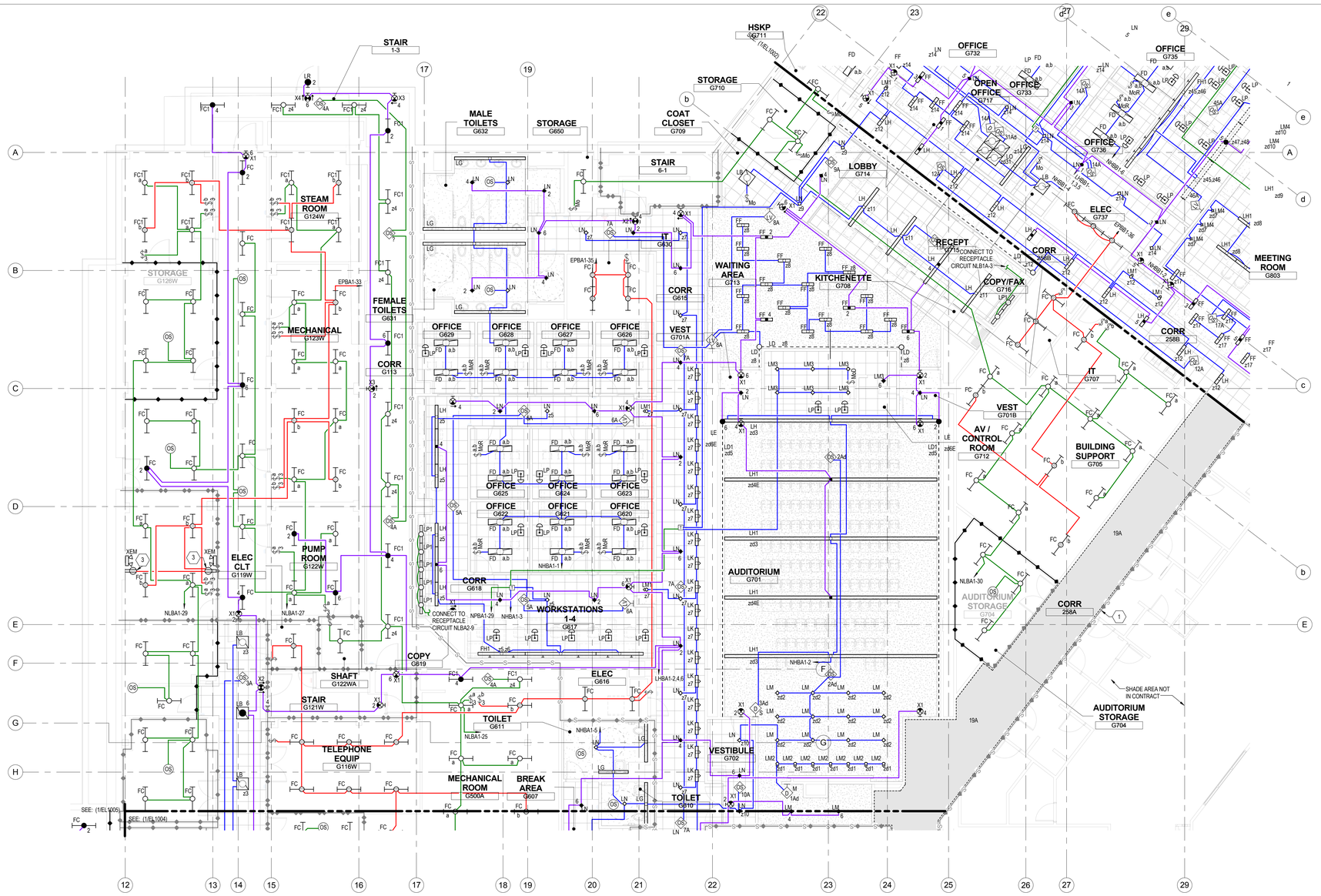

1 PARTIAL GROUND FLOOR LIGHTING PLAN - PART 3

1/8" = 1'-0"

DRAWING NOTES:

1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES, REFER TO DRAWING E-001.
2. FOR LIGHTING FIXTURE SCHEDULE AND DETAILS, REFER TO DRAWINGS EL-701 AND EL-702.
3. REFER TO REFLECTED CEILING PLANS FOR FINAL AND EXACT LOCATION OF ALL CEILING MOUNTED LIGHTING FIXTURES.
4. UNLESS OTHERWISE NOTED, LIGHTING FIXTURES DESIGNATED WITH A "zd" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A SWITCHED LOAD AND LIGHTING FIXTURES DESIGNATED WITH A "zdd" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A DIMMING LOAD . REFER TO DRAWING EL-601 FOR ZONING SCHEDULES AND CONTROL DETAILS AND DIAGRAMS.
5. FOR LIGHTING DETAILS, REFER TO ARCHITECTURAL CEILING DETAILS DRAWINGS AE5003 AND AE5004 AND DRAWING EL-601.
6. REFER TO DRAWING E-402 FOR ENLARGED PARTIAL LIGHTING PLANS.

KEYED SHEET NOTES

1 DEMOLITION KEYNOTES
2 PATCH/REPAIR WALLS AS REQUIRED TO MATCH EXISTING CONSTRUCTION WHERE SECURITY GATE AND PARTITION WAS REMOVED.
3. FOR PLUG-IN FIXTURE TYPE "XEM", MOUNT RECEPTACLE @ 80" AFF. CONNECT TO ROOM LIGHTING CIRCUIT AHEAD OF ANY SWITCH

KEY PLAN:

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Drawing Title: PARTIAL GROUND FLOOR LIGHTING PLAN - PART 3

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

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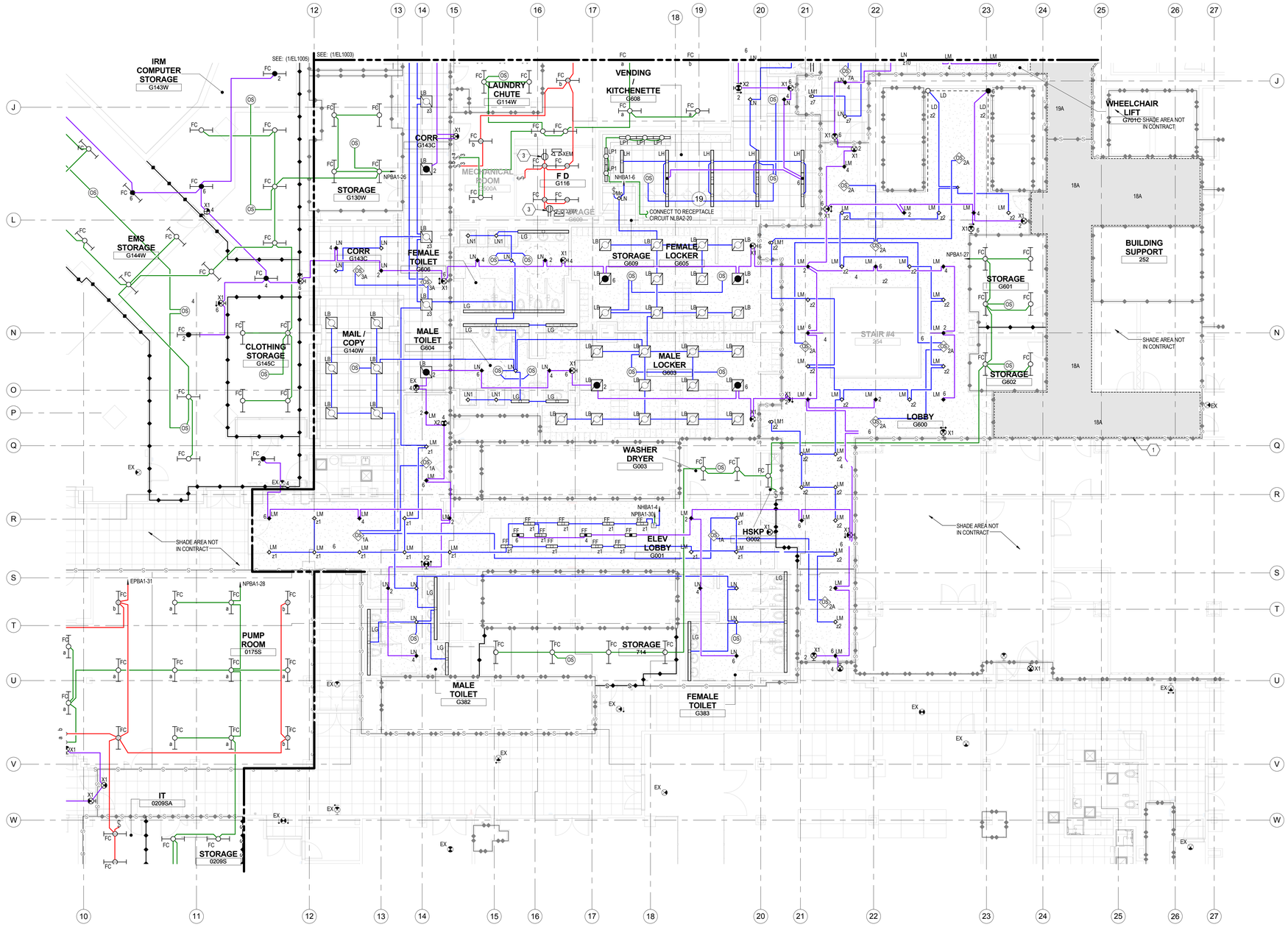


1 PARTIAL GROUND FLOOR LIGHTING PLAN - PART 4

1/8" = 1'-0"

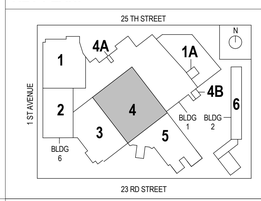
DRAWING NOTES:

1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES, REFER TO DRAWING E-001.
2. FOR LIGHTING FIXTURE SCHEDULE AND DETAILS, REFER TO DRAWINGS EL-701 AND EL-702.
3. REFER TO REFLECTED CEILING PLANS FOR FINAL AND EXACT LOCATION OF ALL CEILING MOUNTED LIGHTING FIXTURES.
4. UNLESS OTHERWISE NOTED, LIGHTING FIXTURES DESIGNATED WITH A "dif" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A SWITCHED LOAD AND LIGHTING FIXTURES DESIGNATED WITH A "ada" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A DIMMING LOAD . REFER TO DRAWING EL-601 FOR ZONING SCHEDULES AND CONTROL DETAILS AND DIAGRAMS.
5. FOR LIGHTING DETAILS, REFER TO ARCHITECTURAL CEILING DETAILS DRAWINGS AE5003 AND AE5004 AND DRAWING EL-501.
6. REFER TO DRAWING E-402 FOR ENLARGED PARTIAL LIGHTING PLANS.

KEYED SHEET NOTES

1 DEMOLITION KEYNOTES
2 PATCH/REPAIR WALLS AS REQUIRED TO MATCH EXISTING CONSTRUCTION WHERE SECURITY GATE AND PARTITION WAS REMOVED.
3 FOR PLUG-IN FIXTURE TYPE "XEM", MOUNT RECEPTACLE @ 60" AFF. CONNECT TO ROOM LIGHTING CIRCUIT AHEAD OF ANY SWITCH.

KEY PLAN:



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Drawing Title: PARTIAL GROUND FLOOR LIGHTING PLAN - PART 4

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

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VA U.S. Department of Veterans Affairs

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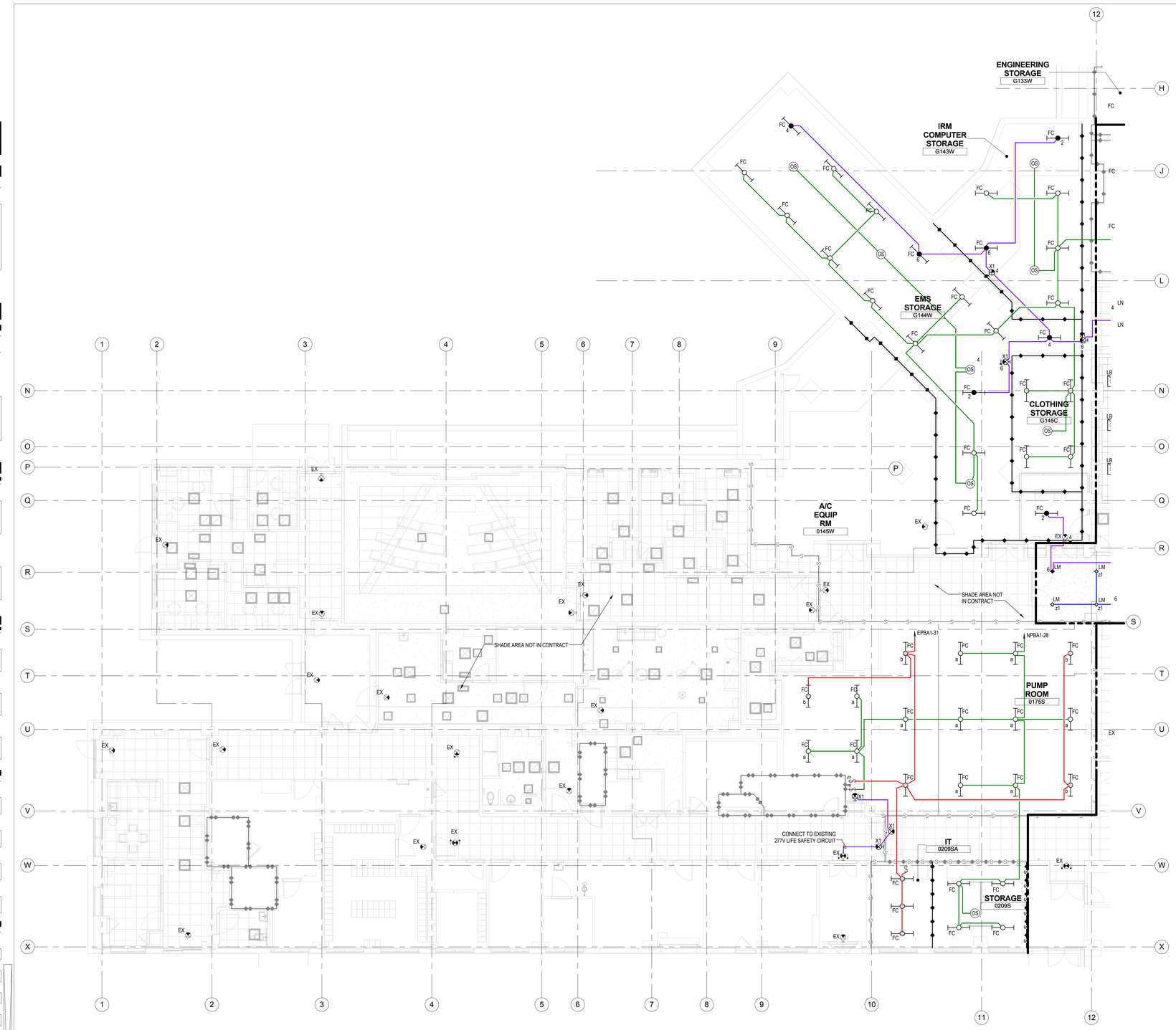


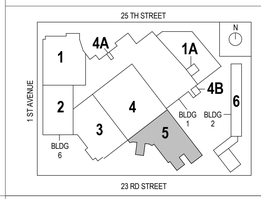
1 PARTIAL GROUND FLOOR LIGHTING PLAN - PART 5
1/8" = 1'-0"

DRAWING NOTES:

1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES, REFER TO DRAWING E-001.
2. FOR LIGHTING FIXTURE SCHEDULE AND DETAILS, REFER TO DRAWINGS EL-701 AND EL-702.
3. REFER TO REFLECTED CEILING PLANS FOR FINAL AND EXACT LOCATION OF ALL CEILING MOUNTED LIGHTING FIXTURES.
4. UNLESS OTHERWISE NOTED, LIGHTING FIXTURES DESIGNATED WITH A "zdl" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A SWITCHED LOAD AND LIGHTING FIXTURES DESIGNATED WITH A "zdlf" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A DIMMING LOAD . REFER TO DRAWING EL-601 FOR ZONING SCHEDULES AND CONTROL DETAILS AND DIAGRAMS.
5. FOR LIGHTING DETAILS, REFER TO ARCHITECTURAL CEILING DETAILS DRAWINGS AE5003 AND AE5004 AND DRAWING EL-501.
6. REFER TO DRAWING E-402 FOR ENLARGED PARTIAL LIGHTING PLANS.

1

KEY PLAN:



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NO	REVISIONS	DATE
1	ADDENDUM 2	03/25/2015
	ISSUE FOR BID	10/31/2014

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Drawing Title: PARTIAL GROUND FLOOR LIGHTING PLAN - PART 5

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

Date: 08 / 25 / 2014 | Checked: Checker | Drawn: DP

Project Number: 228727

Building Number: 1, 2, & 6

Drawing Number: EL1005

Office of Construction and Facilities Management

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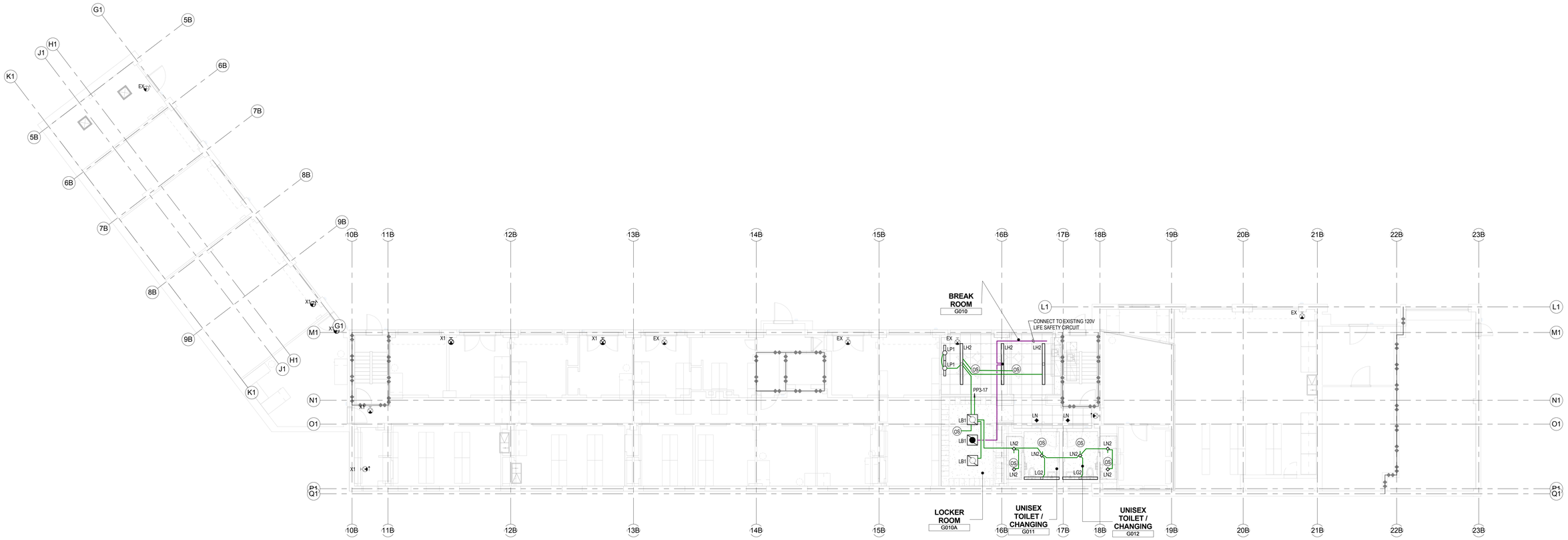


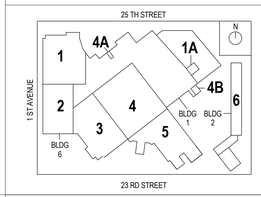
1 PARTIAL GROUND FLOOR LIGHTING PLAN - PART 6

1/8" = 1'-0"

DRAWING NOTES:

1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES, REFER TO DRAWING E-001.
2. FOR LIGHTING FIXTURE SCHEDULE AND DETAILS, REFER TO DRAWINGS EL-701 AND EL-702.
3. REFER TO REFLECTED CEILING PLANS FOR FINAL AND EXACT LOCATION OF ALL CEILING MOUNTED LIGHTING FIXTURES.
4. UNLESS OTHERWISE NOTED, LIGHTING FIXTURES DESIGNATED WITH A "zdf" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A SWITCHED LOAD AND LIGHTING FIXTURES DESIGNATED WITH A "zdlf" ARE CONTROLLED VIA A LOW VOLTAGE LIGHTING CONTROL SYSTEM WITH A DIMMING LOAD . REFER TO DRAWING EL-601 FOR ZONING SCHEDULES AND CONTROL DETAILS AND DIAGRAMS.
5. FOR LIGHTING DETAILS, REFER TO ARCHITECTURAL CEILING DETAILS DRAWINGS AE5003 AND AE5004 AND DRAWING EL-501.
6. REFER TO DRAWING E-402 FOR ENLARGED PARTIAL LIGHTING PLANS.

KEY PLAN:



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NO	REVISIONS	DATE
1	ADDENDUM 2	03/25/2015
	ISSUE FOR BID	10/31/2014

CONSULTANTS:

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Drawing Title: BUILDING 2 - GROUND FLOOR - LIGHTING

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

Date: 08 / 25 / 2014 | Checked: Checker | Drawn: DP

Project Number: 228727

Building Number: 1, 2, & 6

Drawing Number: EL1006

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

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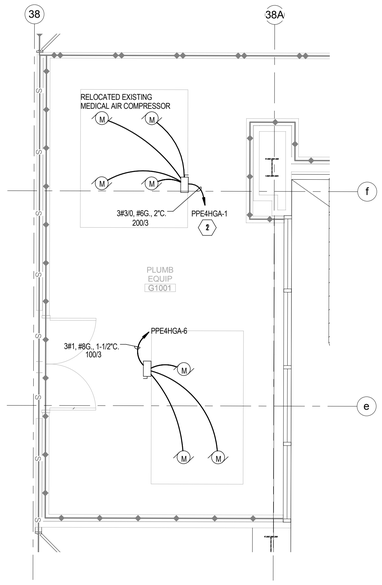
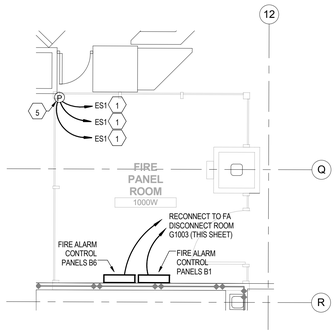
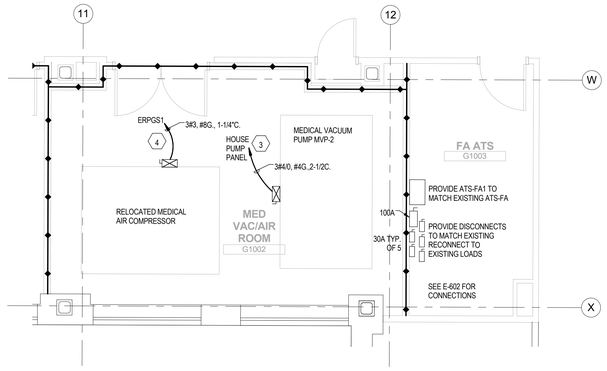


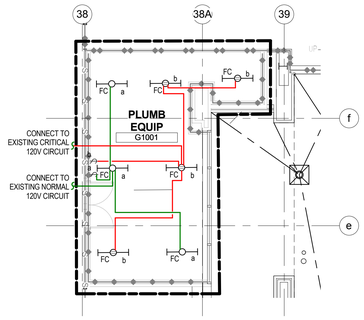
1C PLUMB EQUIP ROOM G1001 - POWER
1/4" = 1'-0"
REFER TO SHEET EP1101



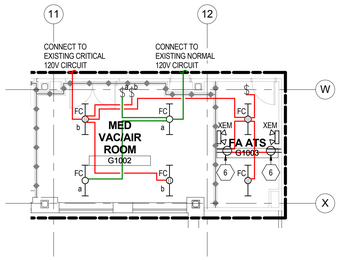
3C FIRE PANEL ROOM 1000W - POWER
1/4" = 1'-0"
REFER TO SHEET EP1104



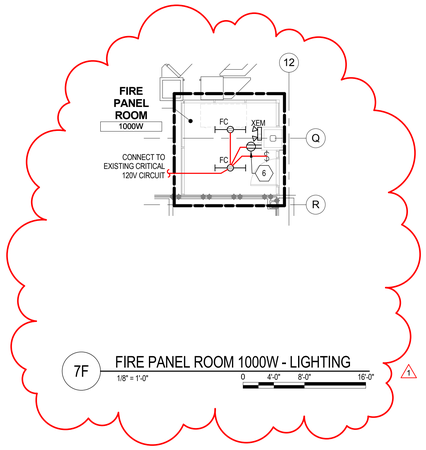
6C MED VAC/AIR - G1002 AND FA ATS - G1003 - POWER
1/4" = 1'-0"
REFER TO SHEET EP1104



1F PLUMB EQUIP - G1001 - LIGHTING
1/8" = 1'-0"
REFER TO SHEET EP1101



4F MED VAC/AIR - G1002 AND FA ATS G1003 - LIGHTING
1/8" = 1'-0"
REFER TO SHEET EP1104

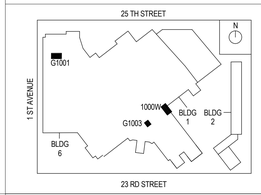


7F FIRE PANEL ROOM 1000W - LIGHTING
1/8" = 1'-0"

KEY NOTES:

1. CONNECT TO SPARE 20/1 CB IN EXISTING PANEL.
2. RECONNECT TO EXISTING PANEL 3#3/0, #6G., 2"C.
3. PROVIDE NEW 225/3 CB IN EXISTING SPACE.
4. RECONNECT TO EXISTING PANEL AND CIRCUIT BREAKER.
5. PROVIDE TELE/POWER POLE WITH 3 DUPLEX 20A RECEPTACLES. PROVIDE 1 DUPLEX RECEPTACLE PER CIRCUIT.
6. FOR PLUG-IN FIXTURE TYPE "XEM", MOUNT RECEPTACLE @ 60" AFF. CONNECT TO ROOM LIGHTING CIRCUIT AHEAD OF ANY SWITCH.

KEY PLAN:



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CONSULTANTS:

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ARCHITECT/ENGINEERS:

HDR
Henningson, Durham & Richardson, Architecture and Engineering, P.C.
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Drawing Title: ELECTRICAL PARTIAL PLANS

Approved: Project Director

Project Title: VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location: 423 E 23RD STREET, NEW YORK, NY 10010

Date: 08 / 25 / 2014 | Checked: Checker | Drawn: TP

Project Number: 228727

Building Number: 1, 2, & 6

Drawing Number: E-402

Office of Construction and Facilities Management

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ELECTRONIC SAFETY AND SECURITY SYMBOLS - SYSTEMS PLANS

CARD ACCESS READER, PROXIMITY. PROVIDE WALL MOUNTED BACK BOX AND CONDUIT WITH PULL CORDTO JUNCTION BOX ABOVE CEILING - SEE DWG. EY5001

S — ELECTRIC LOCK, DOOR FRAME MOUNTED. PROVIDE CONDUIT WITH PULL CORD FROM WIRING COMPARTMENT TO JUNCTION BOX ABOVE CEILING - SEE DWG. EY5001
S = STRIKE

MOTION DETECTOR, PASSIVE IR REQUEST-FOR-EXIT. PROVIDE CEILING MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO JUNCTION BOX ABOVE CEILING - SEE DWG. EY5001

SECURITY ACCESS, SWITCH, BALANCED MAGNETIC CONTROL, DOOR FRAME MOUNTED. PROVIDE CONDUIT WITH PULL CORD FROM WIRING COMPARTMENT TO JUNCTION BOX ABOVE CEILING - SEE DWG. EY5001.

B — EXIT HARDWARE, DELAYED EGRESS. PROVIDE CONDUIT TO POWER SUPPLY UNIT MOUNTED ABOVE CEILING - SEE DWG. EY5001

A1 — SECURITY ACCESS, NUMBER INDICATES WHICH DETAIL ON DWG. EY5001 SHOWS CONDUIT ROUGH-IN REQUIRED FOR DEVICES RELATED TO DOOR.

D EX — ALARM, FIRE, MANUAL PULL STATION
EX = EXISTING TO REMAIN

T — TELEPHONE, FIRE PUMP ROOM COMMUNICATION

DH EX — ELECTROMAGNETIC TYPE DOOR HOLDER
EX = EXISTING TO REMAIN

EX — DETECTOR, SMOKE, CEILING MOUNTED
EX = EXISTING TO REMAIN

S — DETECTOR, SMOKE, DUCT MOUNTED WITH HOUSING AND SAMPLING TUBES
S =SUPPLY DUCT MOUNTED
R = RETURN DUCT MOUNTED

RM EX — ADDRESSABLE CONTROL RELAY MODULE, FUNCTION AS NOTED ON PLANS AND/OR DIAGRAMS
EX = EXISTING TO REMAIN

MM — ALARM, INITIATING DEVICE MONITORING MODULE, FUNCTION AS NOTED ON PLANS AND/OR DIAGRAMS

SPRINKLER MONITORING DETECTION SWITCH, VALVE SUPERVISORY

SPRINKLER MONITORING DETECTION SWITCH, WATERFLOW ALARM

PR — FIRE PUMP CONTROLLER SUPERVISORY SIGNAL, FIRE PUMP RUNNING

PE — FIRE PUMP TRANSFER SWITCH SUPERVISORY SIGNAL, FIRE PUMP ON EMERGENCY POWER

PH — FIRE PUMP CONTROLLER SUPERVISORY SIGNAL, FIRE PUMP PHASE REVERSAL

PF — FIRE PUMP CONTROLLER SUPERVISORY SIGNAL, FIRE PUMP PHASE FAILURE

EX — AUDIBLE & VISUAL NOTIFICATION APPLIANCES, SPEAKER/STROBE, ONE ASSEMBLY VISUAL APPLIANCE RATED 15 CANDELA PER UL1971, UON
= UL1971 MINIMUM CANDELA RATING WHERE MORE THAN 15 CANDELA IS REQUIRED
EX = EXISTING TO REMAIN

EX — VISUAL NOTIFICATION APPLIANCE, 15 CANDELA PER UL1971, UON
= UL1971 MINIMUM CANDELA RATING WHERE MORE THAN 15 CANDELA IS REQUIRED
EX = EXISTING TO REMAIN

COMMUNICATION SYMBOLS - SYSTEMS PLANS

NCS — NURSE CALL MASTER STATION, DESKTOP MOUNTED. PROVIDE OUTLET BOX AND CONDUIT WITH PULL CORD TO NURSE CALL POE SWITCH IN TEL. CLOSET 6541

RCB # — NURSE CALL ROOM CONTROL BOARD. PROVIDE BACK BOX ABOVE CEILING AND CONDUIT WITH PULL CORD TO TEL/DATA CLOSET.
= ROOM CONTROL BOARD ID

N # — NURSE CALL ROOM STATION. PROVIDE WALL MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED NURSE CALL ROOM CONTROL BOARD ON PLANS.
= RELATED ROOM CONTROL BOARD ID

N # B — NURSE CALL BED CONNECTOR. PROVIDE WALL MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED NURSE CALL ROOM STATION NOTED ON PLANS.
= RELATED NURSE CALL STATION ID

N # D — NURSE CALL GRAPHICAL DUTY STATION. PROVIDE WALL MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED NURSE CALL ROOM CONTROL BOARD ON PLANS.
= RELATED ROOM CONTROL BOARD ID

N # E — NURSE CALL EMERGENCY CALL STATION. PROVIDE WALL MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED NURSE CALL ROOM CONTROL BOARD ON PLANS.
= RELATED ROOM CONTROL BOARD ID

N # S — NURSE CALL GRAPHICAL STAFF STATION. PROVIDE WALL MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED NURSE CALL ROOM CONTROL BOARD ON PLANS.
= RELATED ROOM CONTROL BOARD ID

N # — NURSE CALL DOME LIGHT. PROVIDE CEILING MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED ROOM CONTROL BOARD NOTED ON PLANS.
= RELATED ROOM CONTROL BOARD ID

N # 1 — NURSE CALL DOME LIGHT, SINGLE LAMP LED, WHITE. PROVIDE CEILING MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED ROOM CONTROL BOARD NOTED ON PLANS.
= RELATED ROOM CONTROL BOARD ID

N # Z — NURSE CALL DOME LIGHT, LED ZONE LIGHT. PROVIDE CEILING MOUNTED BACK BOX AND CONDUIT WITH PULL CORD TO RELATED ROOM CONTROL BOARD NOTED ON PLANS.
= RELATED ROOM CONTROL BOARD ID

POE — NURSE CALL POE ETHERNET SWITCH, RACK MOUNTED IN IT ROOM G922

GENERAL NOTES

1. VERIFY LOCATION AND CONNECTIONS REQUIREMENTS FOR EQUIPMENT PROVIDED BY OTHER TRADES PRIOR TO ROUGH-IN.
2. ACTIVATION OF ANY ALARM OR SUPERVISORY INITIATING DEVICE SHALL INITIATE FUNCTIONS CONSISTENT WITH THE EXISTING FIRE ALARM SYSTEM PROGRAMMING. ALARM SIGNALS IN INDIVIDUAL SMOKE COMPARTMENTS SHALL BE COORDINATED WITH THE FIRE/SMOKE BARRIERS AND SPRINKLER ZONES
3. COORDINATE CEILING MOUNTED SPEAKERS, STROBES AND OTHER DEVICES WITH CEILING CONTRACTOR AND INSTALL AS SHOWN ON THE REFLECTED CEILING PLANS. SMOKE DETECTORS TO BE A MINIMUM OF 3 FEET DISTANCE FROM ANY HVAC DIFFUSER.
4. COORDINATE ALL DIMENSIONS & WIRING REQUIREMENTS ON ALL PRE-PURCHASED EQUIPMENT WITH FINAL APPROVED SHOP DWGS.
5. FIRE SEAL ALL CONDUIT PENETRATIONS THROUGH FIRE RATED WALLS & SLABS. SEAL FIRE RATING SHALL BE EQUAL TO OR GREATER THAN THE FIRE RATING OF THE WALL OR SLAB THROUGH WHICH THE CONDUIT PASSES.
6. COORDINATE THE LOCATION AND MOUNTING HEIGHTS OF DEVICES AND APPLIANCES WITH ARCHITECTURAL FLOOR PLANS AND ELEVATION DRAWINGS.
7. PROVIDE BOXES AND RACEWAYS FOR FIRE ALARM SYSTEM. INSTALLATION SHALL COMPLY WITH COMMERCIAL BUILDING STANDARD FOR TELECOMMUNICATION PATHWAYS AND SPACES, ANSI/TIA/EIA-569-A.
8. FIRE ALARM DRAWINGS ARE CONSIDERED TO BE DIAGRAMMATIC CONCEPTUAL REPRESENTATIONS OF SCOPE OF WORK AND SYSTEM FUNCTIONS. CONTRACT DRAWINGS ARE NOT INTENDED TO SHOW EVERY COMPONENT OR TO DETAIL EACH ITEM REQUIRED FOR THE INSTALLATION NOR ARE THEY INTENDED TO BE USED AS WIRING DIAGRAMS. REFER TO PROJECT SPECIFICATIONS FOR DESCRIPTION OF WORK AND SYSTEM FUNCTIONS. PROVIDE ALL ITEMS REQUIRED FOR A COMPLETE SYSTEM THAT MEETS THE SPECIFICATIONS. CONFIGURE EQUIPMENT TO FIT THE SPACE ALLOCATED IN THE DRAWINGS. COORDINATE WITH OTHER TRADES. PROVIDE WORK SHOWN ON DIAGRAM WHETHER OR NOT DUPLICATED ON FLOOR PLAN DRAWINGS AND VICE VERSA. REFER TO PLANS AND SUPPLIER'S SHOP DRAWINGS FOR EQUIPMENT QUANTITY, LOCATION AND CIRCUITING INFORMATION.

GENERAL NOTES - DEMOLITION

A. EXISTING CIRCUITS AND EQUIPMENT SUCH AS SPEAKERS, STROBES, DETECTORS, PULL STATIONS, ETC., NOT SHOWN ON PLANS TO REMAIN OR TO BE RELOCATED SHALL BE REMOVED COMPLETELY FROM THE BUILDING AND THE SYSTEM PROGRAMMING. CUT/CAP CONDUITS AT THE AREA OF WORK PERIMETER AND REMOVE CONDUIT WITHIN THE WORK AREA. DISCONNECT POWER WIRING AT THE OVERCURRENT PROTECTIVE DEVICE AND REMOVE WIRING COMPLETELY FROM THE ABANDONED CONDUITS. ALL WIRING TO BE REMOVED SHALL BE REMOVED BACK TO SOURCE. 1

B. REMOVE ALL ACCESSIBLE ABANDONED WIRING OF ALL TYPES, OR CAP AND LABEL IN JUNCTION BOX FOR RE-USE, IN COMPLIANCE WITH THE NATIONAL ELECTRIC CODE.

C. ALL DISCONNECTED FIRE ALARM DEVICES NO LONGER REQUIRED SHALL BE REMOVED AND TURNED OVER TO OWNER. THERE SHALL BE NO DISCONNECTED FIRE ALARM DEVICES OR EQUIPMENT REMAINING IN BUILDING AT COMPLETION OF WORK.

D. MAINTAIN AND RESTORE, IF INTERRUPTED, ALL CIRCUITS PASSING THROUGH RENOVATED AREAS AND SERVICING UNDISTURBED AREAS. WHERE REMOVAL AND/OR RELOCATION AFFECTS ELECTRICAL SERVICES TO DEVICES, FIXTURES, OR EQUIPMENT OUTSIDE THE DEMOLITION SPACES, REROUTE SERVICES TO AFFECTED EQUIPMENT SO AS TO ENABLE ITS CONTINUED NORMAL FUNCTIONING. WHERE DEVICES TO REMAIN ARE CUT OFF FROM EXISTING FEED, REFEED THEM FROM ANOTHER DIRECTION IF POSSIBLE. PROVIDE NEW CONDUIT AND WIRE IF NECESSARY.

E. EXISTING FIRE ALARM CONTROL (FACP), FIRE COMMAND CENTER (FCC), DATA GATHERING (DGP), AND AMPLIFIER (AMP) PANELS SHALL BE RELOCATED AND MODIFIED IN ACCORDANCE WITH ALL CHANGES TO EXISTING SYSTEM.

NOTE:
SYMBOLS SHOWN ARE FOR REFERENCE ONLY AND DO NOT CONSTITUTE A CHECK LIST OF DEVICES REQUIRED BY THE CONTRACT

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CONSULTANTS:

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ARCHITECT/ENGINEERS:

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500 Seventh Ave, 11th Floor, New York, NY 10018 . 212-904-1212

Drawing Title: **SYSTEMS SYMBOLS AND GENERAL NOTES**

Approved: Project Director

Project Title: **VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B**

Location: **423 E 23RD STREET, NEW YORK, NY 10010**

Date: **08 / 25 / 2014** | Checked: **Checker** | Drawn: **KS**

Project Number: **228727**

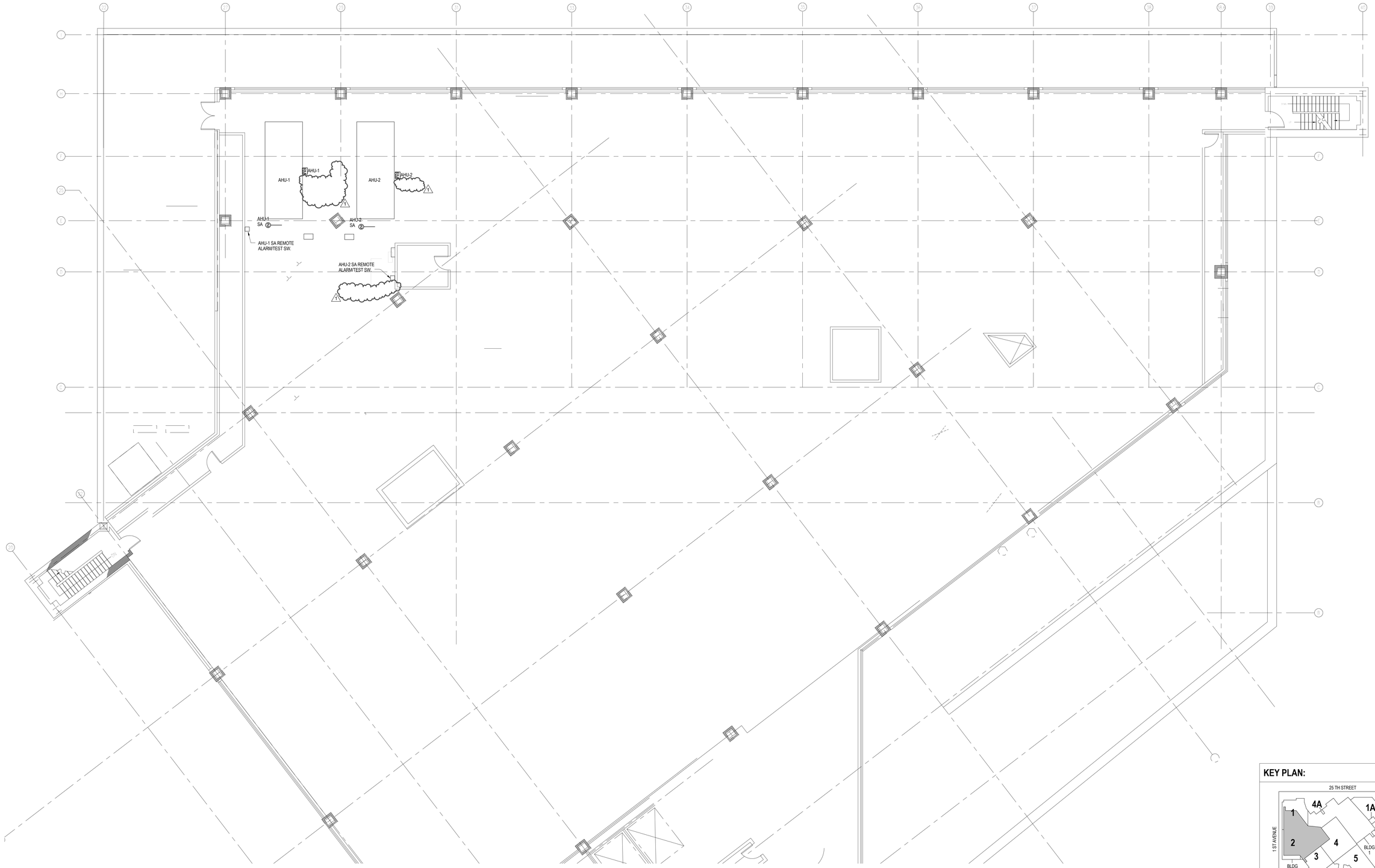
Building Number: **1, 2, & 6**

Drawing Number: **EY001**

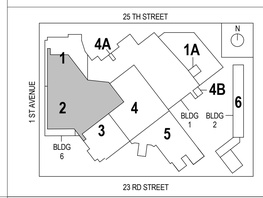
Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

VA FORM 08-6231



KEY PLAN:



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ARCHITECT/ENGINEERS:

HDR
Henningson, Durham & Richardson, Architecture and Engineering, P.C.
500 Seventh Ave, 11th Floor, New York, NY 10018 . 212-904-1212

Drawing Title
PARTIAL SEVENTH FLOOR SYSTEM PLAN - PART 3

Approved: Project Director

Project Title
VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B

Location
423 E 23RD STREET, NEW YORK, NY 10010

Date **08 / 25 / 2014** | Checked **Checker** | Drawn **Author**

Project Number **228727**

Building Number **1, 2, & 6**

Drawing Number **EY1073**

Office of Construction and Facilities Management

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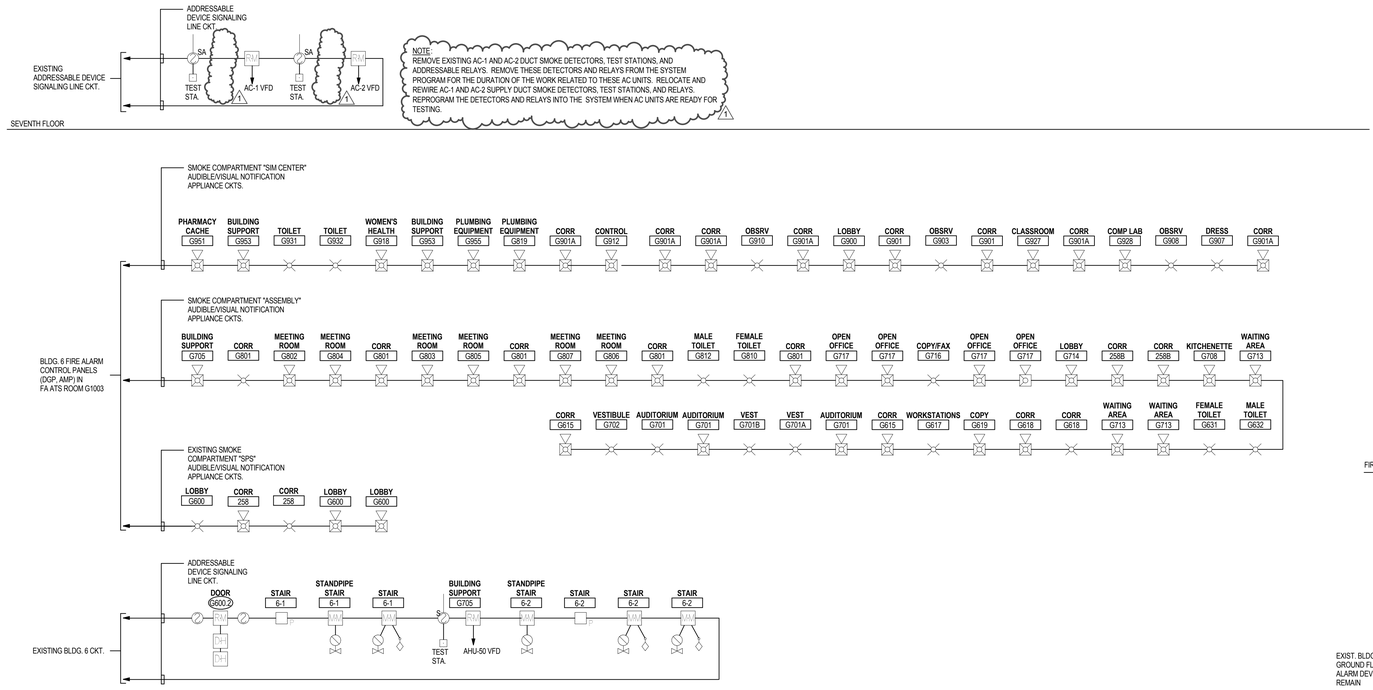
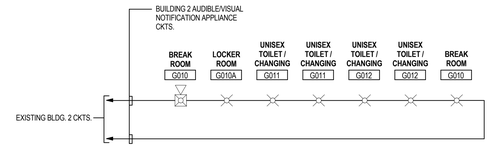


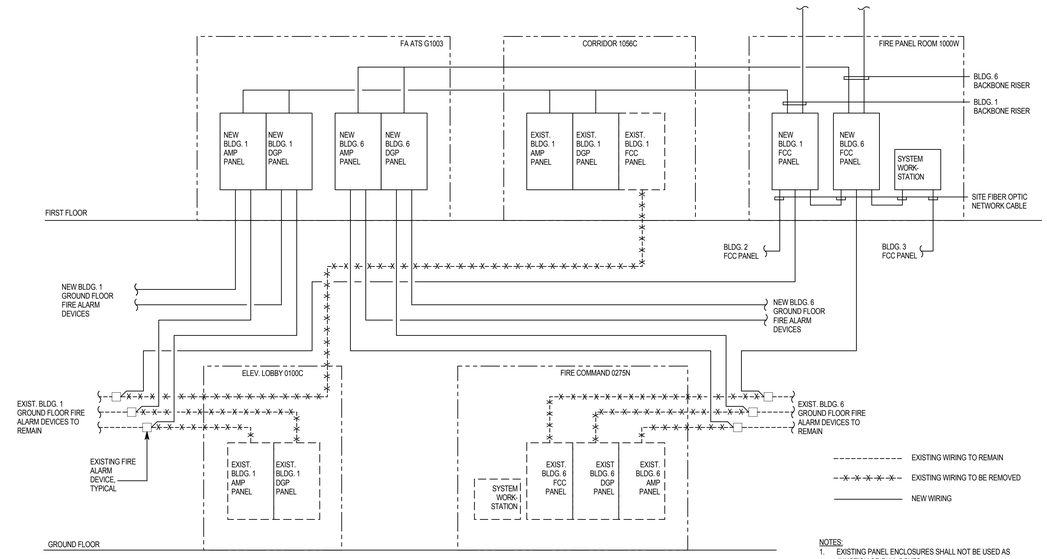
D1 BUILDING 6 FIRE ALARM SYSTEM RISER DIAGRAM

N.T.S.



A6 BUILDING 2 FIRE ALARM SYSTEM RISER DIAGRAM

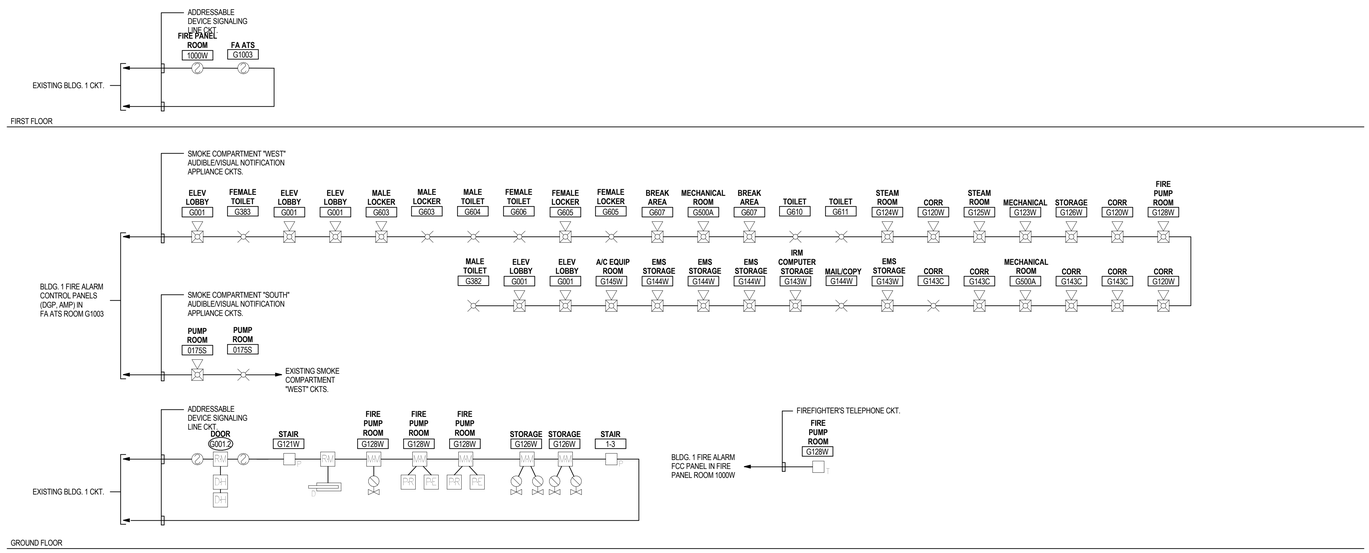
N.T.S.



NOTES:
1. EXISTING PANEL ENCLOSURES SHALL NOT BE USED AS JUNCTION OR PULL BOXES.
2. RELOCATE CONDUIT AND WIRING THAT INTERFERES WITH NEW BUILDING CONFIGURATION

D6 PARTIAL SITE FIRE ALARM NETWORK RISER DIAGRAM

N.T.S.



F1 BUILDING 1 FIRE ALARM SYSTEM RISER DIAGRAM

N.T.S.

ALARM / SUPERVISORY INPUTS \ NOTIFICATION / CONTROL OUTPUTS	1. SOUND GENERAL BUILDING ALARM FOR OTHER AND HIGH-RISE (NON-HEALTH CARE).	2. NOTIFY NECESSARY STAFF FOR RESPONSE FOR HEALTH CARE AND HIGH-RISE BUILDINGS ONLY (ALARM SIGNAL MAY BE DIFFERENT ON DIFFERENT FLOORS).	3. NOTIFY FIRE DEPARTMENT.	4. INITIATE SUPERVISORY SIGNAL TO A 24-HOUR MANNED APPROVED CENTRAL STATION.	5. CLOSE ASSOCIATED SMOKE BARRIER DOORS ON THE FLOOR.	6. SHUT DOWN AIR HANDLER SERVED BY DETECTOR.	7. RECALL ELEVATOR TO MAIN LANDING FLOOR OR ALTERNATE FLOOR IF THE ALARM IS FROM MAIN ELEVATOR.	8. RECALL ELEVATOR SHUTDOWN AND DISCONNECT ELEVATOR POWER.	9. OPEN LOCKED EGRESS DOOR ON THE FLOOR OF FIRE ORIGIN.
AREA SMOKE DETECTOR	X	X	X						X
HVAC UNIT SMOKE DETECTOR	X	X	X		X	X			X
DOOR RELEASE SMOKE DETECTOR	X	X	X		X				X
ELEVATOR SMOKE DETECTOR	X	X	X				X		
MANUAL PULL STATION	X	X	X		X				X
ELEVATOR MACHINE ROOM / HOISTWAY HEAT DETECTOR	X	X	X					X	
ELEVATOR SHUNT-TRIP POWER FAILURE				X					
SPRINKLER WATERFLOW / ALARM PRESSURE SWITCH	X	X	X		X				X
SPRINKLER CONTROL VALVE SUPERVISORY SWITCH				X					
FIRE PUMP SUPERVISORY RELAY CONTACT				X					

F7 BUILDING 1 FIRE ALARM SYSTEM INPUT/OUTPUT MATRIX

N.T.S.

FULLY SPRINKLERED

NO	REVISIONS	DATE
1	ADDENDUM 2	03/25/2015
	ISSUE FOR BID	10/31/2014

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Drawing Title: **SYSTEMS RISER DIAGRAMS**

Approved: Project Director

Project Title: **VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS / GROUND FLOOR PHASE 2B**

Location: **423 E 23RD STREET, NEW YORK, NY 10010**

Date: **08 / 25 / 2014** | Checked: **Checker** | Drawn: **KS**

Project Number: **228727**

Building Number: **1, 2, & 6**

Drawing Number: **EY6001**

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

VA FORM 08-6231

DEPARTMENT OF VETERANS AFFAIRS
VHA MASTER SPECIFICATIONS

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GI1001	Ground Floor Life Safety Plan – Buildings 1 & 6
GI1002	Life Safety Plan – Building 2
GI1101	First Floor Life Safety Plan – Buildings 1 & 6
GI2001	Partial ICRA Plan – Building 1 & 6
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AD1105	Partial First Floor Demolition Plan – Part 5
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SAFETY REQUIREMENTS

1.1 APPLICABLE PUBLICATIONS

A. Latest publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

B. American Society of Safety Engineers (ASSE):

A10.1-2011.....Pre-Project & Pre-Task Safety and Health Planning

A10.34-2012.....Protection of the Public on or Adjacent to Construction Sites

A10.38-2013.....Basic Elements of an Employer’s Program to Provide a Safe and Healthful Work Environment American National Standard Construction and Demolition Operations

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

E84-2013.....Surface Burning Characteristics of Building Materials

D. The Facilities Guidelines Institute (FGI):

FGI Guidelines-2010Guidelines for Design and Construction of Healthcare Facilities

E. National Fire Protection Association (NFPA):

10-2013.....Standard for Portable Fire Extinguishers

30-2012.....Flammable and Combustible Liquids Code

51B-2014.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work

70-2014.....National Electrical Code

70B-2013.....Recommended Practice for Electrical Equipment Maintenance

70E-2012 .....Standard for Electrical Safety in the Workplace

99-2012.....Health Care Facilities Code

241-2013.....Standard for Safeguarding Construction, Alteration, and Demolition Operations

F. The Joint Commission (TJC):

TJC Manual .....Comprehensive Accreditation and Certification Manual

G. U.S. Nuclear Regulatory Commission:

10 CFR 20 .....Standards for Protection Against Radiation

H. U.S. Occupational Safety and Health Administration (OSHA):

29 CFR 1904 .....Reporting and Recording Injuries & Illnesses

29 CFR 1910 .....Safety and Health Regulations for General Industry

29 CFR 1926 .....Safety and Health Regulations for Construction Industry

CPL 2-0.124.....Multi-Employer Citation Policy

I. VHA Directive 2005-007

1.2 DEFINITIONS

A. OSHA “Competent Person” (CP). One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).

B. "Qualified Person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

C. High Visibility Accident: Any mishap which may generate publicity or high visibility.

D. Medical Treatment: Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

E. Recordable Injuries or Illnesses: Any work-related injury or illness that results in:

1. Death, regardless of the time between the injury and death, or the length of the illness;
2. Days away from work (any time lost after day of injury/illness onset);
3. Restricted work;
4. Transfer to another job;
5. Medical treatment beyond first aid;
6. Loss of consciousness; or

7. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

1.3 REGULATORY REQUIREMENTS

A. In addition to the detailed requirements included in the provisions of this contract, comply with 29 CFR 1926, comply with 29 CFR 1910 as incorporated by reference within 29 CFR 1926, comply with ASSE A10.34, and all applicable [federal, state, and local] laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern except with specific approval and acceptance by the Resident Engineer or Contracting Officer Representative.

1.4 ACCIDENT PREVENTION PLAN (APP)

A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

B. The APP shall be prepared as follows:

1. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
2. Address both the Prime Contractors and the subcontractors work operations.
3. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.

4. Address all the elements/sub-elements and in order as follows:
   a. **SIGNATURE SHEET.** Title, signature, and phone number of the following:
      1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);
      2) Plan approver (company/corporate officers authorized to obligate the company);
      3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).
   b. **BACKGROUND INFORMATION**. List the following:
      1) Contractor;
      2) Contract number;
      3) Project name;
      4) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).
   c. **STATEMENT OF SAFETY AND HEALTH POLICY**. Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor’s written safety program goals, objectives, and accident experience goals for this contract should be provided.
   d. **RESPONSIBILITIES AND LINES OF AUTHORITIES**. Provide the following:
      1) A statement of the employer’s ultimate responsibility for the implementation of his SOH program;
      2) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes.
      3) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached.

4) Requirements that no work shall be performed unless a designated competent person is present on the job site.
5) Requirements for pre-task Activity Hazard Analysis (AHAs).
6) Lines of authority.
7) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified.

e. **SUBCONTRACTORS AND SUPPLIERS.** If applicable, provide procedures for coordinating SOH activities with other employers on the job site:
1) Identification of subcontractors and suppliers (if known);
2) Safety responsibilities of subcontractors and suppliers.

f. **TRAINING.**
1) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.
2) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc.) and any requirements for periodic retraining/recertification are required.
3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.
4) OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for Trade Competent Persons (CPs)

g. **SAFETY AND HEALTH INSPECTIONS.**
1) Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., “Site Safety and Health CP”), proof of inspector’s training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.
2) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT)

h. **ACCIDENT INVESTIGATION AND REPORTING.** The Contractor shall conduct mishap investigations of all OSHA Recordable Incidents. The APP shall include accident/incident investigation procedure and identify person(s) responsible to provide the following to the Resident Engineer and Facility Safety Officer:

1) Exposure data (man-hours worked);
2) Accident investigations, reports, and logs.

i. **PLANS (PROGRAMS, PROCEDURES) REQUIRED.** Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks in site-specific compliance and accident prevention plans. These Plans shall include but are not be limited to procedures for addressing the risks associates with the following:

1) Emergency response;
2) Contingency for severe weather;
3) Fire Prevention;
4) Medical Support;
5) Posting of emergency telephone numbers;
6) Prevention of alcohol and drug abuse;
7) Site sanitation (housekeeping, drinking water, toilets);
8) Night operations and lighting;
9) Hazard communication program;
10) Welding/Cutting “Hot” work;
11) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E);
12) General Electrical Safety
13) Hazardous energy control (Machine LOTO);
14) Site-Specific Fall Protection & Prevention;
15) Excavation/trenching;
16) Asbestos abatement;
17) Lead abatement;
18) Crane Critical lift;
19) Respiratory protection;
20) Health hazard control program;
21) Radiation Safety Program;
22) Abrasive blasting;
23) Heat/Cold Stress Monitoring;

24) Crystalline Silica Monitoring (Assessment);
25) Demolition plan (to include engineering survey);
26) Formwork and shoring erection and removal;
27) Precast Concrete.

C. Submit the APP to the Resident Engineer and Facility Safety Officer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

D. Once accepted by the Resident Engineer and Facility Safety Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

E. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Resident Engineer, project overall designated OSHA Competent Person, and facility Safety Officer. Should any severe hazard exposure (i.e., imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34) and the environment.

1.5 ACTIVITY HAZARD ANALYSES (AHAS)

A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site)

B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.

C. Work shall not begin until the AHA for the work activity has been accepted by the Resident Engineer and Facility Safety Officer or Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
   a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
   b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.
3. Submit AHAs to the Resident Engineer and Facility Safety Officer or Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, for review at least 15 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to the Resident Engineer and Facility Safety Officer or Contracting Officer Representative.

1.6 PRECONSTRUCTION CONFERENCE

A. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1), on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.

B. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.

C. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 days of submittal, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

1.7 “SITE SAFETY AND HEALTH OFFICER” (SSHO) AND “COMPETENT PERSON” (CP)

A. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. Each subcontractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.

B. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e., Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection,

Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).

C. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e., Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).

D. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.

E. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

F. **Interim Life Safety Measures (ILSM)- General Requirements:**

1. **Maintain free and unobstructed access to facility areas and exits.**
2. **Clearly mark all emergency exits and evacuation routes within construction areas.**
3. **Daily Health, Fire, and Safety observations required by GC's "competent person" for all ILSM, ICRA, and OSHA standards**.
   a. **Weekly inspections and "tool box" meetings required by GC's "competent person".**
   b. **Monthly OSHA inspections required by GC's third-party OSHA certified inspectors, reports to be sent to the RE**.
4. **Properly installed Temporary Construction Partitions for Dust, Smoke, and Fire. Access doors with self-closers and locked from outside with six (6) keys to RE.**
5. **Fire extinguishers provided and maintained as required.**
6. **All combustible debris and materials to be removed daily.**
7. **Temporary fire protections and emergency lighting required per VA Safety Engineer and/or RE.**

8. **Adequate temporary construction lighting, minimum 1 footcandle throughout construction areas. All bulbs with cages.**

1.8 TRAINING

A. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.

B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past five (5) years.

C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition and control associated with those high hazard work operations. Documented “repeat” deficiencies in the execution of safety requirements will require retaking the requisite formal course.

D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.

E. Submit training records associated with the above training requirements to the Resident Engineer and Facility Safety Officer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, 15 calendar days prior to the date of the preconstruction conference for acceptance.

F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures,

accident reporting, etc. Documentation shall be provided to the Resident Engineer that individuals have undergone contractor's safety briefing.

G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

1.9 INSPECTIONS

A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of the their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly to Resident Engineer and Facility Safety Officer.

B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.

1. Results of the inspection will be documented with tracking of the identified hazards to abatement.
2. The Resident Engineer and Facility Safety Officer will be notified immediately prior to start of the inspection and invited to accompany the inspection.
3. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
4. A report of the inspection findings with status of abatement will be provided to the Resident Engineer and Facility Safety Officer within one (1) week of the onsite inspection.

1.10 ACCIDENTS, OSHA 300 LOGS, AND MAN-HOURS

A. Notify the Resident Engineer and Facility Safety Officer as soon as practical, but no more than four hours after any accident meeting the definition of OSHA Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $5,000, or any weight handling equipment accident. Within notification include

contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Resident Engineer and Facility Safety Officer determine whether a government investigation will be conducted.

B. Conduct an accident investigation for recordable injuries and illnesses, for Medical Treatment defined in paragraph DEFINITIONS, and property damage accidents resulting in at least $20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162, and provide the report to the Resident Engineer and Facility Safety Officer within five (5) calendar days of the accident. The Resident Engineer and Facility Safety Officer will provide copies of any required or special forms.

C. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Resident Engineer and Facility Safety Officer monthly.

D. A summation of all OSHA recordable accidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Resident Engineer and Facility Safety Officer monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Resident Engineer and Facility Safety Officer as requested.

1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE)

A. PPE is governed in all areas by the nature of the work the employee is performing. For example, specific PPE required for performing work on electrical equipment is identified in NFPA 70E, Standard for Electrical Safety in the Workplace.

B. Mandatory PPE includes:

1. Hard Hats – unless written authorization is given by the Resident Engineer and Facility Safety Officer in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. With authorization to relax the requirement of hard hats, if a worker

becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.

2. Safety glasses - unless written authorization is given by the Resident Engineer and Facility Safety Officer appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.
3. Appropriate Safety Shoes – based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the Resident Engineer and Facility Safety Officer.
4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

1.12 INFECTION CONTROL

A. Infection Control is critical in all medical center facilities. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas.

B. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e., Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the Resident Engineer and Facility Safety Officer before beginning any construction work. Risk classifications of Class III or higher will require a permit before beginning any construction work. Infection Control permits will be issued by the Resident Engineer. The Infection Control Permits will be posted outside the appropriate construction area. More than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The primary project scope area for this project is: **Class III**, however, work outside the primary project scope area may vary. The required infection control precautions with each class are as follows:

1. Class I Requirements:
   a. During Construction Work:
      1) Notify the Resident Engineer and Facility Safety Officer.

2) Execute work by methods to minimize raising dust from construction operations.
3) Ceiling tiles: Immediately replace a ceiling tiles displaced for visual inspection.

b. Upon Completion:
1) Clean work area upon completion of task
2) Notify the Resident Engineer and Facility Safety Officer.

2. Class II Requirements:
a. During Construction Work:
1) Notify the Resident Engineer and Facility Safety Officer.
2) Provide active means to prevent airborne dust from dispersing into atmosphere such as wet methods or tool mounted dust collectors where possible.
3) Water mist work surfaces to control dust while cutting.
4) Seal unused doors with duct tape.
5) Block off and seal air vents.
6) Remove or isolate HVAC system in areas where work is being performed.

b. Upon Completion:
1) Wipe work surfaces with cleaner/disinfectant.
2) Contain construction waste before transport in tightly covered containers.
3) Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.
4) Upon completion, restore HVAC system where work was performed
5) Notify the Resident Engineer and Facility Safety Officer.

3. Class III Requirements:
a. During Construction Work:
1) Obtain permit from the Resident Engineer and Facility Safety Officer.
2) Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.
3) Complete all critical barriers (i.e., sheetrock, plywood, plastic), to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit)

before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.

4) Maintain negative air pressure, 0.01 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor.
5) Contain construction waste before transport in tightly covered containers.
6) Cover transport receptacles or carts. Tape covering unless it is a solid lid.

b. Upon Completion:

1) Do not remove barriers from work area until completed project is inspected by the Resident Engineer and Facility Safety Officer and thoroughly cleaned by the VA Environmental Services Department.
2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
3) Vacuum work area with HEPA filtered vacuums.
4) Wet mop area with cleaner/disinfectant.
5) Upon completion, restore HVAC system where work was performed.
6) Return permit to the Resident Engineer and Facility Safety Officer.

4. Class IV Requirements:

a. During Construction Work:

1) Obtain permit from the Resident Engineer and Facility Safety Officer.
2) Isolate HVAC system in area where work is being done to prevent contamination of duct system.
3) Complete all critical barriers (i.e., sheetrock, plywood, plastic), to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.

4) Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
5) Seal holes, pipes, conduits, and punctures.
6) Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.
7) All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.

b. Upon Completion:
1) Do not remove barriers from work area until completed project is inspected by the Resident Engineer and Facility Safety Officer with thorough cleaning by the VA Environmental Services Dept.
2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
3) Contain construction waste before transport in tightly covered containers.
4) Cover transport receptacles or carts. Tape covering unless it is a solid lid.
5) Vacuum work area with HEPA filtered vacuums.
6) Wet mop area with cleaner/disinfectant.
7) Upon completion, restore HVAC system where work was performed.
8) Return permit to the Resident Engineer and Facility Safety Officer.

C. Barriers shall be erected as required based upon classification (Class III and IV requires barriers) and shall be constructed as follows:
1. Class III and IV - closed door with masking tape applied over the frame and door is acceptable for projects that can be contained in a single room.
2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected and made presentable on hospital occupied side:
a. Class III and IV (where dust control is the only hazard, and an agreement is reached with the Resident Engineer and Medical

Center) - Airtight plastic barrier that extends from the floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping.

b. Class III and IV - Drywall barrier erected with joints covered or sealed to prevent dust and debris from escaping.

c. Class III and IV - Seal all penetrations in existing barrier airtight.

d. Class III and IV - Barriers at penetration of ceiling envelopes, chases and ceiling spaces to stop movement air and debris.

e. Class IV only - Anteroom or double entrance openings that allow workers to remove protective clothing or vacuum off existing clothing.

f. Class III and IV - At elevators shafts or stairways within the field of construction, overlapping flap minimum of two feet wide of polyethylene enclosures for personnel access.

D. Products and Materials:

1. Sheet Plastic: Fire retardant polystyrene, 6-mil thickness meeting local fire codes.
2. Barrier Doors: Self Closing Two-hour fire-rated solid core wood in steel frame, painted.
3. Dust proof two-hour fire-rated drywall.
4. High Efficiency Particulate Air-Equipped filtration machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer’s instructions.
5. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose.
6. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches.
7. Disinfectant: Hospital-approved disinfectant or equivalent product.
8. Portable Ceiling Access Module.

E. Before any construction on site begins, all contractor personnel involved in the construction or renovation activity shall be educated

and trained in infection prevention measures established by the medical center.

F. A dust control program will be establish and maintained as part of the contractor's infection preventive measures in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, prepare a plan detailing project-specific dust protection measures with associated product data, including periodic status reports, and submit to Resident Engineer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

G. Medical center Infection Control personnel will monitor for airborne disease (e.g., aspergillosis) during construction. A baseline of conditions will be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.

H. In general, the following preventive measures shall be adopted during construction to keep down dust and prevent mold.

1. **Dust control, both inside and outside the contract space is critical**.
2. **Approved smoke/dust barriers installed as required to seal/contain any dust/smoke in construction areas.**
3. **Dust off area, prior to exiting construction area. Inside the construction entry door should be a wipe off mat(S), rags/towels with wiping solution (and trash container that is emptied daily) and hand brushes in order to wipe or "dust off" clothing, equipment, carts before exiting.**
4. **Disable HVAC as to not allow duct/smoke/fumes/odors to be sent out beyond the contract area.**
5. **Maintain negative air pressure, metered at construction door, in the construction area. Vacuums ventilated properly.**
6. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. HEPA filtration is required where the exhaust dust may reenter the medical center.
7. Exhaust hoses shall be exhausted so that dust is not reintroduced to the medical center.

8. Adhesive Walk-off/Carpet Walk-off Mats shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
   a. "Tacky mats" shall be installed at each construction entry door just outside; peel off dirty mat midday and at the end of each day, more often if required.
9. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as it is created. Transport these outside the construction area in containers with tightly fitting lids.
   a. **Vacuum and mop with cleaner/disinfectant in work areas at the end of each work day AND in the corridor to work area, at least once midday and at the end of the work day OR as required**.
   b. **Carting: Carts and their wheels to be wiped down before passing through areas outside construction area (both from the construction space and from outside spaces). Also, all debris/trash from construction space through corridors shall be tightly covered.**
   c. **Vacuums with HEPA filters within construction area with filter change charts attached. Minimum four (4) air changes per hour.**
10. The contractor shall not haul debris through patient-care areas without prior approval of the Resident Engineer and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc., transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
11. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.

12. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.

I. Final Cleanup:

1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
3. All new air ducts shall be cleaned prior to final inspection.

J. Exterior Construction

1. Contractor shall verify that dust will not be introduced into the medical center through intake vents, or building openings. HEPA filtration on intake vents is required where dust may be introduced.
2. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary
3. All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e., vacuum systems) or wet suppression controls.

1.13 TUBERCULOSIS SCREENING

A. Contractor shall provide written certification that all contract employees assigned to the work site have had a pre-placement tuberculin screening within 90 days prior to assignment to the worksite and been found have negative TB screening reactions. Contractors shall be required to show documentation of negative TB screening reactions for any additional workers who are added after the 90-day requirement before they will be allowed to work on the work site. NOTE: This can be the Center for Disease Control (CDC) and Prevention and two-step skin testing or a Food and Drug Administration (FDA)-approved blood test.

1. Contract employees manifesting positive screening reactions to the tuberculin shall be examined according to current CDC guidelines prior to working on VHA property.
2. Subsequently, if the employee is found without evidence of active (infectious) pulmonary TB, a statement documenting examination by a

physician shall be on file with the employer (construction contractor), noting that the employee with a positive tuberculin screening test is without evidence of active (infectious) pulmonary TB.

3. If the employee is found with evidence of active (infectious) pulmonary TB, the employee shall require treatment with a subsequent statement to the fact on file with the employer before being allowed to return to work on VHA property.

1.14 FIRE SAFETY

A. Fire Safety Plan: Establish and maintain a site-specific fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Resident Engineer and Facility Safety Officer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. This plan may be an element of the Accident Prevention Plan.

B. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.

C. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

D. Temporary Construction Partitions:

1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, 3/4-hour fire/smoke rated doors with self-closing devices.

2. Install two-hour fire-rated temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous

areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.

3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.

E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Resident Engineer and Facility Safety Officer.

G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Resident Engineer and Facility Safety Officer.

H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

J. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.

K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Resident Engineer and Facility Safety Officer. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.

L. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Resident Engineer and Facility Safety Officer.

M. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Resident Engineer. Obtain

permits from Resident Engineer at least 72 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.

N. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Resident Engineer and Facility Safety Officer.

O. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.

P. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

Q. If required, submit documentation to the Resident Engineer that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.15 ELECTRICAL

A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J – General Environmental Controls, 29 CFR Part 1910 Subpart S – Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.

B. All qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.

C. All electrical work will be accomplished de-energized and in the Electrically Safe Work Condition (refer to NFPA 70E for Work Involving Electrical Hazards, including Exemptions to Work Permit). Any Contractor, subcontractor or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in rare circumstance where achieving an electrically safe work condition prior to beginning work would increase or cause additional hazards, or is infeasible due to equipment design or operational limitations is energized work permitted. The Resident Engineer and Facility Safety Officer with approval of the Medical Center Director will make the determination if the

circumstances would meet the exception outlined above. An AHA specific to energized work activities will be developed, reviewed, and accepted prior to the start of that work.

1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.
2. Verification of the absence of voltage after de-energization and lockout/tagout is considered “energized electrical work” (live work) under NFPA 70E, and shall only be performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.
3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the Resident Engineer and Facility Safety Officer.

D. Before beginning any electrical work, an Activity Hazard Analysis (AHA) will be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alterative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity has been accepted by the Resident Engineer and Facility Safety Officer and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

E. Ground-fault circuit interrupters. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites shall have approved ground-fault circuit interrupters for personnel protection. “Assured Equipment Grounding Conductor Program” only is not allowed.

1.16 FALL PROTECTION

A. The fall protection (FP) threshold height requirement is 6 feet (1.8 m) for ALL WORK, unless specified differently or the OSHA 29 CFR 1926 requirements are more stringent, to include steel erection activities,

systems-engineered activities (prefabricated) metal buildings, residential (wood) construction and scaffolding work.

1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require fall protection. No worker shall be allowed in the area between the roof or floor edge and the WLS without fall protection. Fall protection is required when working outside the WLS.
4. Fall protection while using a ladder will be governed by the OSHA requirements.

1.17 SCAFFOLDS AND OTHER WORK PLATFORMS

A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.

B. The fall protection (FP) threshold height requirement is 6 feet (1.8 m) as stated in Section 1.16.

C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.

1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.
3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
4. Emergency descent devices shall not be used as working platforms.

D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:

1. The Competent Person’s name and signature;
2. Dates of initial and last inspections.

E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 feet (6 m) in height, positive fall protection shall be used.

1.18 EXCAVATION AND TRENCHES

A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P.

B. All excavations and trenches 5 feet in depth or greater shall require a written trenching and excavation permit (NOTE – some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall be completed and provided to the Resident Engineer and/or Facility Safety Officer prior to commencing work for the day. At the end of the day, the permit shall be closed out and provided to the Resident Engineer and/or Facility Safety Officer. The permit shall be maintained onsite and include the following:

1. Determination of soil classification
2. Indication that utilities have been located and identified. If utilities could not be located after all reasonable attempt, then excavating operations will proceed cautiously.
3. Indication of selected excavation protective system.
4. Indication that the spoil pile will be stored at least 2 feet from the edge of the excavation and safe access provided within 25 feet of the workers.
5. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere.

C. If not using an engineered protective system such as a trench box, shielding, shoring, or other Professional Engineer designed system and using a sloping or benching system, soil classification cannot be Solid Rock or Type A. All soil will be classified as Type B or Type C and sloped or benched in accordance with Appendix B of 29 CFR 1926.

1.19 CRANES

A. All crane work shall comply with 29 CFR 1926 Subpart CC.

B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no “Phase In” date of November 10, 2014.

C. A detailed lift permit shall be submitted 14 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, siting of crane and path of swing. The lift will not be allowed without approval of this document.

D. Crane operators shall not carry loads
   1. over the general public or VAMC personnel; or
   2. over any occupied building unless;
      a. the top two floors are vacated.
      b. or overhead protection with a design live load of 300 psf is provided.

1.20 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

A. All installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment [1926.702(j)], heavy machinery & equipment [1926.600(a)(3)(i)], and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with Section 1.15 to include NFPA 70E and other VA specific requirements discussed in the section.

1.21 CONFINED SPACE ENTRY

A. All confined space entry shall comply with 29 CFR 1910.146 except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches [1926.651(g)].

B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the Resident Engineer and/or Facility Safety Officer.

1.22 WELDING AND CUTTING

As specified in section 1.14, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Resident Engineer. Obtain permits from Resident Engineer and/or Facility Safety Officer at least 72 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.

1.23 LADDERS

A. All Ladder use shall comply with 29 CFR 1926 Subpart X.

B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.

C. Manufacturer safety labels shall be in place on ladders.

D. Step Ladders shall not be used in the closed position.

E. Top steps or cap of step ladders shall not be used as a step.

F. Portable ladders, used as temporary access, shall extend at least 3 feet (0.9 m) above the upper landing surface.

1. When a 3-foot (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.

G. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "DO NOT USE," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

1.24 FLOOR AND WALL OPENINGS

A. All floor and wall openings shall comply with 29 CFR 1926 Subpart M.

B. Floor and roof holes/openings are any that measure over 2 inches (51 mm) in any direction of a walking/working surface which persons may trip or fall into or where objects may fall to the level below. See 21.F for covering and labeling requirements. Skylights located in floors or roofs are considered floor or roof hole/openings.

C. All floor, roof openings or hole into which a person can accidentally walk or fall through shall be guarded either by a railing system with toeboards along all exposed sides or a load-bearing cover. When the cover is not in place, the opening or hole shall be protected by a removable guardrail system or shall be attended when the guarding system has been removed, or other fall protection system.

1. Covers shall be capable of supporting, without failure, at least twice the weight of the worker, equipment and material combined.
2. Covers shall be secured when installed, clearly marked with the word “HOLE”, “COVER” or “Danger, Roof Opening-Do Not Remove” or color-coded or equivalent methods (e.g., red or orange “X”). Workers must

be made aware of the meaning for color coding and equivalent methods.

3. Roofing material, such as roofing membrane, insulation or felts, covering or partly covering openings or holes, shall be immediately cut out. No hole or opening shall be left unattended unless covered.
4. Non-load-bearing skylights shall be guarded by a load-bearing skylight screen, cover, or railing system along all exposed sides.
5. Workers are prohibited from standing/walking on skylights.

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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. Section 07 92 00 JOINT SEALANTS: Caulking.

B. Section 08 33 13, HOLLOW METAL DOORS AND FRAMES; Section 08 71 13, AUTOMATIC DOOR OPERATORS.

C. Section 09 91 00, PAINTING: Painting.

D. Division 26, ELECTRICAL: Electrical.

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

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 and Exit 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, except as otherwise specified:

1. Mortise locksets.
2. Hinges for hollow metal and wood doors.
3. Surface applied overhead door closers.
4. Exit devices.
5. Floor closers.

1.4 WARRANTY

A. Automatic door operators shall be subject to the terms of FAR Clause 52.246-21, except that the Warranty period shall be two (2) years in lieu of one (1) year for all items except as noted below:

1. Locks, latchsets, and panic hardware: Five (5) years.
2. Door closers and continuous hinges: Ten (10) years.

1.5 MAINTENANCE MANUALS

A. In accordance with Section 01 00 00, GENERAL REQUIREMENTS, Article INSTRUCTIONS, furnish maintenance manuals and instructions on all door hardware. Provide installation instructions with the submittal documentation.

1.6 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Submit six (6) copies of the schedule per Section 01 33 23. Submit two (2) final copies of the final approved schedules to VAMC Locksmith as record copies (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 (4) 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 PREINSTALLATION MEETING

A. Convene a preinstallation meeting not less than 30 days before start of installation of door hardware. Require attendance of parties directly affecting work of this section, including Contractor and Installer, Architect, Project Engineer and VA Locksmith, Hardware Consultant, and Hardware Manufacturer’s Representative. Review the following:

1. Inspection of door hardware.
2. Job and surface readiness.
3. Coordination with other work.
4. Protection of hardware surfaces.
5. Substrate surface protection.
6. Installation.
7. Adjusting.
8. Repair.
9. Field quality control.
10. Cleaning.

1.9 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. Keying: All cylinders shall be keyed into existing Best 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 7 pin type. Keying information shall be furnished at a later date by the Resident Engineer.

1.10 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 1210 mm (4 feet) high: 2 hinges.
   2. Doors 1210 mm (4 feet) to 2260 mm (7’-5”) high: 3 hinges minimum.
   3. Doors greater than 2260 mm (7’-5”) high: 4 hinges.
   4. Doors up to 900 mm (3 feet) wide, standard weight: 114 mm x 114 mm (4-1/2 inches x 4-1/2 inches) hinges.

5. Doors over 900 mm (3 feet) to 1065 mm (3’-6”) wide, standard weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
6. Doors over 1065 mm (3’-6”) to 1210 mm (4 feet), heavy weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
7. Provide heavy-weight hinges where specified.
8. 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 6.35 mm (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 for each type specified.

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. Where specified, 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 exposed to the exterior or are mounted in rooms that experience high humidity, 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 38 mm (1-1/2 inch) minimum piston diameter.

2.5 FLOOR CLOSERS AND FLOOR PIVOT SETS

A. Comply with ANSI A156.4. Provide stainless steel floor plates for floor closers and floor pivots, except where metal thresholds occur. Provide cement case for all floor closers. Floor closers specified for fire doors shall comply with Underwriters Laboratories, Inc., requirements for concealed type floor closers for classes of fire doors indicated on drawings. Hold-open mechanism, where required, shall engage when door is opened 105 degrees, except when door swing is limited by building construction or equipment, the hold-open feature shall engage when door is opened approximately 90 degrees. The hold-open mechanism shall be selectable on/off by turning a screw through the floor plate. Floor closers shall have adjustable hydraulic back-check, adjustable close speed, and adjustable latch speed. Provide closers with delayed action where a hold-open mechanism is not required. Floor closers shall be multi-sized. Single acting floor closers shall also have built in dead stop. Where required, provide closers with special cement cases appropriate for shallow deck installation or where concrete joint lines run through the floor blockout. At offset-hung doors installed in deep reveals, provide special closer arm and spindle to allow for installation. Where stone or terrazzo is applied over the floor closer case, provide closer without floor plate and with extended spindle (length as required) and special cover pan (depth as required) to allow closer to be accessed without damaging the material applied over the closer. Pivots for non-labeled doors shall be cast, forged or extruded brass or bronze.

B. Where floor closer appears in hardware set provide the following as applicable.
   1. Double Acting Floor Closers: Type C06012.
   2. Single Acting Floor Closer: Type C06021 (center pivoted). (Intermediate pivot is not required).
   3. Single Acting Floor Closers: Type C06041 (offset pivoted).

4. Single Acting Floor Closer for Labeled Fire Doors: Type C06051 (offset pivoted).
5. Single Acting Floor Closers For Lead Lined Doors: Type C06071 (offset pivoted).

2.6 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. Provide stop Type L02011, as applicable for exterior doors. At outswing doors where stop can be installed in concrete, provide stop mated to concrete anchor set in 76 mm (3-inch) core-drilled hole and filled with quick-setting cement.

G. Omit stops where floor mounted door holders are required and where automatic operated doors occur.

H. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where two doors would interfere with each other in swinging.

I. Provide appropriate door mounted stop on doors in individual toilets where floor or wall mounted stops cannot be used.

J. Provide overhead surface applied stop Type C02541, ANSI A156.8 on patient toilet doors in bedrooms where toilet door could come in contact with the bedroom door.

K. Provide door stops on doors where combination closer magnetic holders are specified, except where wall stops cannot be used or where floor stops cannot be installed within 4-inches of the wall.

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

2.7 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.

2.8 FLOOR DOOR HOLDERS

A. Conform to ANSI Standard A156.16. Provide extension strikes for Types L01301 and L01311 holders where necessary.

2.9 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. Lock cylinders shall have not less than seven pins. Cylinders for all locksets shall be removable core type. Cylinders shall be furnished with construction removable cores and construction master keys. 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 temporary keying device or 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. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets shall have lever handles fabricated from cast stainless steel. Provide sectional (lever x rose) lever design matching facility standard. No substitute lever material shall be accepted.

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. Lock function F02 shall be furnished with emergency tools/keys for emergency entrance. All lock cases installed on lead lined doors shall be lead lined before applying final hardware finish. Furnish armored fronts for all mortise locks. Where mortise locks are installed in high-humidity locations or where exposed to the exterior on both sides of the opening, provide non-ferrous mortise lock case.

2. 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 21 mm (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.)
3. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5.

2.10 ELECTRIC STRIKES

A. ANSI/ BHMA A156.31 Grade 1.

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

C. **Use fail-secure electric strikes at all doors receiving card readers.**

2.11 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
Cylinder lock change key blanks	100 each different key way
Master-keyed sets	6 keys each

Grand Master sets	6 keys each
Great Grand Master set	5 keys
Control key	2 keys

2.12 KEY CABINET

A. ANSI Standard A156.5. Provide key cabinet made of cold rolled, 1.2 mm (0.0478-inch) thick furniture steel electro-welded. Doors shall have "no sag" continuous brass-pin piano type hinge and be equipped with chrome plated locking door handles, hook cam and mechanical pushbutton door lock. Key Cabinet and Key Control System shall accommodate all keys for this project plus 25 percent. Provide minimum number of multiple cabinets where a single cabinet of largest size will not accommodate the required number of keys.

B. Key tags shall consist of two sets: Permanent self-locking and loan key snaphook type with tag colors as follows: Red fiber marker of the permanent self-locking type approximately 32 mm (1-1/4 inch) in diameter engraved with the legend "FILE KEY MUST NOT BE LOANED". Also furnish for each hook a white cloverleaf key marker with snap-hooks engraved with the legend "LOAN KEY".

C. The manufacturer of the lock cylinders and locks shall attach a key tag to keys of each lock cylinder and shall mark thereon the respective item number and key change number. Provide each group of keys in a key gathering envelope (supplied by Key Cabinet Manufacturer) in which the lock manufacturer shall include the following information: Item number, key change number and door number. The contractor shall furnish the Key Cabinet Manufacturer the hardware and keying schedules and change keys.

D. The Key Cabinet Manufacturer shall set up a three-way cross index system, including master keys, listing the keys alphabetically, the hooks numerically and the key changes numerically on different colored index cards. Index cards shall be typewritten and inserted in a durable binder. Attach the keys to the two sets of numbered tags supplied with the cabinet. (The permanent tag and the loan key tag). Instruct the Owner in proper use of the system. Install cabinet as directed by the Resident Engineer.

2.13 ARMOR PLATES, KICK PLATES, MOP PLATES AND DOOR EDGING

A. Conform to ANSI Standard A156.6.

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

1. Kick plates, mop plates and armor plates of metal, Type J100 series.
2. Provide kick plates and mop plates where specified. Kick plates shall be 254 mm (10 inches) or 305 mm (12 inches) high. Mop plates shall be 152 mm (6 inches) high. Both kick and mop plates shall be minimum 1.27 mm (0.050 inches) thick. Provide kick and mop 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 and mop plates to within 6 mm (1/4 inch) of each edge of doors. Kick and mop plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
3. Kick plates and/or mop plates are not required on following door sides:
   a. Armor plate side of doors;
   b. Exterior side of exterior doors;
   c. Closet side of closet doors;
   d. Both sides of aluminum entrance 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. Where louver or grille occurs in lower portion of doors, substitute stretcher plate and kick plate in place of armor plate. Size of stretcher plate and kick plate shall be 254 mm (10 inches) high.
6. 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 full-height edge guards except where door rating does not allow; in such cases, provide edge guards to height of bottom of typical lockset armor front. Forward edge guards to wood door manufacturer for factory installation on doors.

2.14 EXIT DEVICES

A. Conform to ANSI Standard A156.3. Exit devices shall be Grade 1; type and function are specified in hardware sets. Provide flush with finished floor strikes for vertical rod exit devices in interior of building. Trim shall have cast satin stainless steel lever handles of design similar to locksets, unless otherwise specified. Provide key cylinders for keyed operating trim and, where specified, cylinder dogging.

B. Surface vertical rod panics shall only be provided less bottom rod; provide fire pins as required by exit device and door fire labels. Do not provide surface vertical rod panics at exterior doors.

C. Concealed vertical rod panics shall be provided less bottom rod at interior doors, unless lockable or otherwise specified; provide fire pins as required by exit device and door fire labels. Where concealed vertical rod panics are specified at exterior doors, provide with both top and bottom rods.

D. Where removable mullions are specified at pairs with rim panic devices, provide mullion with key-removable feature.

E. At non-rated openings with panic hardware, provide panic hardware with key cylinder dogging feature.

F. Exit devices for fire doors shall comply with Underwriters Laboratories, Inc., requirements for Fire Exit Hardware. Submit proof of compliance. Provide fire-exit hardware at all rated doors.

2.15 FLUSH BOLTS (LEVER EXTENSION)

A. Conform to ANSI A156.16. Flush bolts shall be Type L24081 unless otherwise specified. Furnish proper dustproof strikes conforming to ANSI A156.16, for flush bolts required on lower part of doors.

B. Lever extension manual flush bolts shall only be used at non-fire-rated pairs for rooms only accessed by maintenance personnel.

C. Face plates for cylindrical strikes shall be rectangular and not less than 25 mm by 63 mm (1 inch by 2-1/2 inches).

D. Friction-fit cylindrical dustproof strikes with circular face plate may be used only where metal thresholds occur.

E. Provide extension rods for top bolt where door height exceeds 2184 mm (7 feet 2 inches).

2.16 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.

2.17 DOOR PULLS WITH PLATES

A. Conform to ANSI A156.6. Pull Type J401, 152 mm (6 inches) high by 19 mm (3/4 inches) diameter with plate Type J302, 90 mm by 350 mm (3-1/2 inches by 14 inches), unless otherwise specified. Provide pull with projection of 70 mm (2 3/4 inches) and a clearance of 51 mm (2 inches). Cut plates of door pull plate for cylinders, or turn pieces where required.

2.18 PUSH PLATES

A. Conform to ANSI A156.6. Metal, Type J302, 200 mm (8 inches) wide by 350 mm (14 inches) high. Provide metal Type J302 plates 100 mm (4 inches wide by 350 mm (14 inches) high) where push plates are specified for doors with stiles less than 200 mm (8 inches) wide. Cut plates for cylinders, and turn pieces where required.

2.19 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.

2.20 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.

2.21 THRESHOLDS

A. Conform to ANSI A156.21, mill finish extruded aluminum, except as otherwise specified. In existing construction, thresholds shall be installed in a bed of sealant with ¼-20 stainless steel machine screws and expansion shields. In new construction, embed aluminum anchors coated with epoxy in concrete to secure thresholds. Furnish thresholds for the full width of the openings.

B. For thresholds at elevators entrances see other sections of specifications.

C. Provide with miter returns where threshold extends more than 12 mm (0.5 inch) from fame face.

2.22 AUTOMATIC DOOR BOTTOM SEAL AND RUBBER GASKET FOR LIGHT PROOF OR SOUND CONTROL DOORS

A. Conform to ANSI A156.22. Provide mortise or under-door type, except where not practical. For mortise automatic door bottoms, provide type specific for door construction (wood or metal).

2.23 WEATHERSTRIPS (FOR EXTERIOR DOORS)

A. Conform to ANSI A156.22. Air leakage shall not to exceed 0.50 CFM per foot of crack length (0.000774m^3/s/m).

2.24 MISCELLANEOUS HARDWARE

A. Access Doors (including Sheet Metal, Screen and Woven Wire Mesh Types): Except for fire-rated doors and doors to Temperature Control Cabinets, equip each single or double 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. Cylinders for Various Partitions and Doors: Key cylinders same as entrance doors of area in which partitions and door occur, except as otherwise specified. Provide cylinders to operate locking devices where specified for following partitions and doors:
   1. Folding doors and partitions.
   2. Wicket door (in roll-up door assemblies).
   3. Slide-up doors.
   4. Swing-up doors.
   5. Fire-rated access doors-Engineer's key set.
   6. Doors from corridor to electromagnetic shielded room.
   7. Day gate on vault door.

C. 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, lead-lined frames and frames for sound-resistant, lightproof and electromagnetically shielded doors. Furnish 3 mutes for single doors and 2 mutes for each pair of doors, except double-acting doors. Provide 4 mutes or silencers for frames for each Dutch type door. Provide 2 mutes for each edge of sliding door which would contact door frame.

2.25 PADLOCKS FOR VARIOUS DOORS, GATES AND HATCHES

A. ASTM E883, size 50 mm (2 inch) wide chain; furnish extended shackles as required by job conditions. Provide padlocks, with key cylinders, for each door in following areas as noted.

B. Key padlocks as follows:
   1. Chain Link Fence Gates for Oxygen Storage Buildings: Maintenance supply set.

C. Omit padlocks on communicating refrigerator doors.

2.26 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. Pivots: Match door trim.
3. Door Closers: Factory applied paint finish. Dull or Satin Aluminum color.
4. Thresholds: Mill finish aluminum.
5. Cover plates for floor hinges and pivots: 630.
6. 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. Special Finish: Exposed surfaces of hardware for dark bronze anodized aluminum doors shall have oxidized oil rubbed bronze finish (dark bronze) finish on door closers shall closely match doors.

F. 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.

2.27 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. Exit devices centerline of strike (where applicable) 1024 mm (40-5/16 inches).
2. Locksets and latch sets centerline of strike 1024 mm (40-5/16 inches).
3. Deadlocks centerline of strike 1219 mm (48 inches).
4. Hospital arm pull 1168 mm (46 inches) to centerline of bottom supporting bracket.
5. Centerline of door pulls to be 1016 mm (40 inches).
6. Push plates and push-pull shall be 1270 mm (50 inches) to top of plate.
7. Push-pull latch to be 1024 mm (40-5/16 inches) to centerline of strike.
8. 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, inside stairs, and away from corridors - except bathroom and anteroom doors which shall have closer installed parallel arm on exterior side of doors. 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)
35 mm (1-3/8 inch) (hollow core wood doors)	Not over 1200 mm (4 feet)	113 mm (4-1/2 inches)

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

D. Where new hinges are specified for new doors in existing frames or existing doors in new frames, sizes of new hinges shall match sizes of

existing hinges; or, contractor may reuse existing hinges provided hinges are restored to satisfactory operating condition as approved by Resident Engineer. Existing hinges shall not be reused on door openings having new doors and new frames. Coordinate preparation for hinge cut-outs and screw-hole locations on doors and frames.

E. Hinges Required Per Door:

Doors 1500 mm (5 feet) or less in height	2 butts
Doors over 1500 mm (5 feet) high and not over 2280 mm (7’-6”) high	3 butts
Doors over 2280 mm (7’-6”) high	4 butts
Dutch type doors	4 butts
Doors with spring hinges 1370 mm (4’-6”) high or less	2 butts
Doors with spring hinges over 1370 mm (4’-6”)	3 butts

F. 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.

G. After locks have been installed; show in presence of Resident Engineer that keys operate their respective locks in accordance with keying requirements. (All keys, Master Key level and above shall be sent Registered Mail to the Medical Center Director along with the bitting list. Also a copy of the invoice shall be sent to the Resident Engineer for his records.) 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.

B. Hardware Consultant working on a project will be responsible for providing additional information regarding these hardware sets. The numbers shown in the following sets come from BHMA standards.

ELECTRIC HARDWARE ABBREVIATIONS LEGEND:
ADO = Automatic Door Operator
EMCH = Electro-Mechanical Closer-Holder
MHO = Magnetic Hold-Open (wall- or floor-mounted)

GENERAL NOTE: REFER TO SECURITY DRAWINGS FOR DOORS REQUIRING DOOR STATUS SWITCHES.

INTERIOR SINGLE DOORS

HW-1

Each Door to Have:	NON-RATED
Hinges	QUANTITY & TYPE AS REQUIRED
1 Door Pull w/ Plate	J401 x J302
1 Push Plate	J302
1 Kick Plate	J102
1 Mop Plate (@ Inswing Doors)	J103
1 Closer	C02011/C02021
1 Wall Stop	L02101 CONVEX
3 Silencers	L03011

HW-1A

Each Door to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
		X HOSPITAL TIPS @ INSWING DOORS
1	Latchset	F01
1	Closer	C02011/C02021
		x INSTALL OUTSIDE ROOM
1	Kick Plate	J102
1	Mop Plate (@ Inswing Doors)	J103
1	Wall Stop	L02101 CONVEX
1	Overhead Stop, at column	C01541-ADJUSTABLE
1	Set Seals	R0E154

HW-1B

Each Door to Have:		NON-RATED/RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Hospital Latchset	F01
1	Closer	C02011/C02021
1	Overhead Stop	C04541
1	Kick Plate	J102
1	Mop Plate	
1	Auto Door Bottom	R3C325 - HEAVY DUTY
1	Set Sound/Light Seals	R3E264

HW-1C

Sliding ICU Aluminum Doors.

1 Positive Self-Latching Lever Handle Hookbolt Deadlatch
Adams Rite 4570 Latch Operator x 130 Silver or Stanley equivalent
All other hardware and gasketing provided by Sliding Door Manufacturer

HW-1S

Each Door to Have: NON-RATED

	Hinges	QUANTITY & TYPE AS REQUIRED
1	Latchset	F01
1	Overhead Stop	C01541-ADJUSTABLE
3	Silencers	L03011

HW-2

Each Door to Have: RATED/NON-RATED

	Hinges	QUANTITY & TYPE AS REQUIRED
1	Keyed Privacy Indicator Lock	F13 x OCCUPANCY INDICATOR
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Mop Plate (@ Inswing Doors)	J103
1	Overhead Stop	C01541-ADJUSTABLE
1	Set Self-Adhesive Seals	R0E154

STONE THRESHOLD BY OTHER TRADES.

HW-2C

Each Door to Have: NON-RATED

	Hinges	QUANTITY & TYPE AS REQUIRED
1	Privacy Lock	F02-MOD X OCCUPANCY INDICATOR
1	Kick Plate	J102
1	Mop Plate (@ Inswing Doors)	J103
1	Wall Stop	L02101 CONVEX
3	Silencers	L03011

STONE THRESHOLD BY OTHER TRADES.

HW-2D

Each Door to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Privacy Lock	F02-MOD X OCCUPANCY INDICATOR
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Mop Plate (@ Inswing Doors)	J103
1	Wall Stop	L02101 CONVEX
1	Set Self-Adhesive Seals	R0E154

STONE THRESHOLD BY OTHER TRADES.

HW-3A

Each Door to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Office Lock	F04
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Wall Stop	L02121 CONVEX
1	Set Self-Adhesive Seals	R0E154

HW-3B

Each Door to Have:		NON-RATED/RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Office Lock	F04
1	Wall Stop	L02101 CONVEX
1	Set Self-Adhesive Seals	R0E154

HW-4A

Each Door to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Classroom Lock	F08
1	Closer	C02011/C02021
1	Overhead Stop	C04541
1	Kick Plate	J102
1	Auto Door Bottom	R3C325 - HEAVY DUTY
1	Set Sound/Light Seals	R3E264

HW-4B

Each Door to Have:		NON-RATED/RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Classroom Lock	F08
1	Closer	C02011/C02021
1	Overhead Stop	CO4541
1	Kick Plate	J102
1	Sets Self-Adhesive Seals	R0E154

HW-4L

Each Door to Have:		NON-RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Classroom Lock	F08
1	Kick Plate	J102
1	Floor Stop	L02121 x 3 FASTENERS
1	Auto Door Bottom	R3C325 – HEAVY DUTY
1	Set Sound/Light Seals	R3E264

HW-4M

Each Door to Have:		RATED/NON-RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Classroom Hospital Lock	F08
1	Closer	C02011/C02021
1	Overhead Stop	C04541
1	Kick Plate	J102
1	Auto Door Bottom	R3C325 – HEAVY DUTY
1	Set Sound/Light Seals	R3E264

HW-5

Each Door to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Storeroom Lock	F07
1	Closer	C02011/C02021
1	Kick Plate	J102 (@ STORAGE, EVM, & HAC ROOMS ONLY)
1	Wall Stop	L02101 CONVEX
1	Set Self-Adhesive Seals	R0E154

HW-5F

Each Door to Have:		RATED/NON-RATED
1	Continuous Hinge	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Storeroom Lock	F07
1	Closer (@ Rated Doors)	C02011/C02021
1	Heavy-Duty Armor Plate	J101 x 3.175 MM (0.125 INCH) THICKNESS
1	Edge Guard (@ Wood Doors)	J208M / J211 (VERIFY), CUT: HARDWARE
1	Wall Stop	L02101 CONVEX
1	Set Self-Adhesive Seals	R0E154

HW-5N

Each Door to Have:		RATED/NON-RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Storeroom Lock	F07
1	Electric Strike	ANSI/BHMA GRADE 1, UL1034 & UL10C, US32D
1	Power Supply	REGULATED, FILTERED, 24VDC, AMPERAGE AS REQUIRED
1	Kick Plate	J102
1	Set Self-Adhesive Seals	R0E154
1	Auto Door Bottom	R3C325 - HEAVY DUTY

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13.11, LOW ENERGY POWER ASSIST DOOR OPERATORS.

HW-6

Each Door to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Exit Device	TYPE 1 F14 LEVER
1	Closer	C02011/C02021
1	Overhead Stop	C01541-ADUSTABLE
1	Set Self-Adhesive Seals	R0E154

HW-6A

Each Door to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Exit Device	TYPE 1 F14 LEVER
1	Closer	C02011/C02021
1	Electromagnetic Holder, wall type	LCN SEM 7850
1	Set Self-Adhesive Seals	R0E154

HW-8

Each Door to Have:		RATED
2	Continuous Hinges	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	Type 25
1	Dust Proof Strike	L04021
1	Coordinator, bar type	A21
1	Latchset	F01
2	Closers	C02011/C02021
2	Wall Stops	L02101 CONVEX
2	Kick Plates	J102
1	Set Self-Adhesive Seals	R0E154
1	Set Meeting Stile Astragals	R3J735

HW-8H

Each Door to Have:		NON-RATED
2	Continuous Hinges	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
2	Push Plate	J304 8″ x 16″
1	Door Pull w/ Plate	J401 x J302
2	Kick Plate	J102
1	Set Sound/Light Seals	R3E264
1	Set Meeting Stile Astragals	R3J735
2	Auto Door Bottoms	R3C325 – HEAVY DUTY

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13.11, LOW ENERGY POWER ASSIST DOOR OPERATORS.

HW-8J

Each Door to Have:

2	Continuous Hinges	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
2	Push Plate	J304 8″ x 16″
1	Door Pull w/ Plate	J401 x J302
2	Closers	C02011/C02021
2	Electromagnetic Holders, wall type	LCN SEM 7850
2	Kick Plate	J102
1	Set Self-Adhesive Seals, H&J	R0E154
1	Set Meeting Stile Astragals,	integral to door

HW-10H

Each Pair to Have: NON-RATED

2	Continuous Hinges	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25
1	Dust Proof Strike	L04021
1	Coordinator, bar type	21A
1	Classroom Hospital Lock	F01
2	Closer	C02011/C02021
2	Wall Stop	L02101 CONVEX
2	Armor Plate	J101 x 1.275 MM (0.050 INCH) THICKNESS
1	Lock Trim Protector Bar	R111LPB-630 (Rockwood), OR EQUAL
1	Sets Self-Adhesive Seals	R0E154
1	Set Meeting Stile Astragals	R3J735

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

HW-11

Each Pair to Have: RATED/NON-RATED

	Hinges	QUANTITY & TYPE AS REQUIRED
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Storeroom Lock	F07
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 x R0Y154 x THRU-BOLTS
2	Closers	C02011/C02021
2	Kick Plates	J102 (@ STORAGE ROOMS ONLY)
2	Wall Stops	L02101 CONVEX
1	Set Self-Adhesive Seals	R0E154

HW-11A

Each Pair to Have: NON-RATED

	Hinges	QUANTITY & TYPE AS REQUIRED
1	Set Manual Flush Bolts	
1	Dust Proof Strike	L04021
1	Storeroom Lock	F07
1	Closer	C02011/C02021
2	Kick Plates	J102 (@ STORAGE ROOMS ONLY)
2	Wall Stops	L02101 CONVEX
2	Silencers	L03011

HW-11B

Each Pair to Have:		RATED
2	Continuous Hinges	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25
1	Dust Proof Strike	L04021
1	Coordinator, bar type	TYPE 21A
1	Storeroom Lock	F07
2	Closers	C02011/C02021
2	Overhead Stops	C04541
2	Armor Plates	J101 x 1.275 MM (0.050 INCH) THICKNESS
1	Set Self-Adhesive Seals	R0E154
1	Set Meeting Stile Astragals	R3J735

HW-12B

Each [ADO] Pair Doors to Have:		RATED
2	Continuous Hinge	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
2	Exit Device	TYPE 7 or 8 F3 x less bottom rod
2	Cylinders	
2	Electric Strike	ANSI/BHMA GRADE 1, UL1034 & UL10C, US32D, FAIL SECURE, mount in head to operate RH device top rod
1	Power Supply	REGULATED, FILTERED, 24VDC, AMPERAGE AS REQUIRED
1	Set Meeting Stile Astragals	R3J735
2	Kick Plates	J102
2	Edge Guard	J208M / J211 (VERIFY), CUT: HARDWARE
2	Door Bottom	R3A434 x NYLON BRUSH INSERT
2	Set Self-Adhesive Seals	R0E154

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13.11, AUTOMATIC DOOR OPERATORS.

HW-12C

Each Pair Doors to Have:		RATED
2	Continuous Hinge	x INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
2	Exit Device	TYPE 7 or 8 F14 x less bottom rod
2	Electric Strike	ANSI/BHMA GRADE 1, UL1034 & UL10C, US32D, FAIL SECURE, mount in head to operate RH device top rod
1	Power Supply	REGULATED, FILTERED, 24VDC, AMPERAGE AS REQUIRED
2	Kick Plates	J102
1	Set Meeting Stile Astragals	R3J735
2	Door Bottom	R3A434 x NYLON BRUSH INSERT
1	Set Self-Adhesive Seals	R0E154
1	Set Meeting Stile Astragals	R3J735

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13.11, LOW ENERGY POWER ASSIST DOOR OPERATORS.

HW-12L

Each Pair to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
2	Exit Device	TYPE 7 or 8 F14; PROVIDE FIRE EXIT DEVICES “LESS BOTTOM ROD” WITH FIRE PIN/SPRING LOADED AUXILIARY LATCH BOLT, TYPE AS REQUIRED BY EXIT DEVICE MANUFACTURER.
1	Set Meeting Stile Astragals	R3J735
2	Closers	C02011/C02021
2	Electromagnetic Holders, wall type	LCN SEM 7850
1	Set Self-Adhesive Seals	R0E154

HW-12M

Each Pair to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
2	Exit Device	TYPE 7 or 8 F14
1	Set Meeting Stile Astragals	R3J735
2	Closers	C02011/C02021
2	Wall Stop	L02101 CONVEX
4	Kick Plate	J102
1	Set Self-Adhesive Seals	R0E154

INTERIOR SINGLE SECURITY DOORS

HW-SH-3

Each Door to Have:		RATED/NON-RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Storeroom Lock	F07
1	Electric Strike	ANSI/BHMA GRADE 1, UL1034 & UL10C, US32D,
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Set Self-Adhesive Seals	R0E154
1	Alarm Contact	

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-SH-4

Each [AC, EL, REX, DPS] Integrated Door to Have:		RATED
1	Offset Pivot Set	Type to operate with door & closer
1	Exit Device	CRL PA100 x Type L pull x 630, less bottom rod – CR Laurence or equal
1	Electric Strike	ANSI/BHMA GRADE 1, UL1034 & UL10C, US32D, FAIL SECURE, mount in head to operate device top rod, coordinate with Exit Device
1	Power Supply	REGULATED, FILTERED, 24VDC, AMPERAGE AS REQUIRED
1	Key Cylinder	TYPE AS REQUIRED
1	Concealed in head Door Closer	ANSI Standard A156.4, grade 1
1	Alarm Contact	

BALANCE OF HARDWARE BY SECTION 08 41 26, ALL-GLASS DOOR ENTRANCES

HW-SH-6

1	Continuous Transfer Hinge	x EPT Prep
1	Electric Power Transfer	10 Wire, Misc Accessory GVUX
1	Electrified Rated Delayed Egress Exit Device	TYPE 1 F08 LEVER
2	Key Cylinders	TYPE AS REQUIRED
1	Power Supply	TYPE REQUIRED BY PANIC MANUFACTURER
1	Closer	C02011/C02021
1	Wall Stop	L02101 CONVEX
1	Kick Plate	J102 (@ STORAGE ROOMS ONLY)
1	Set Self-Adhesive Seals	R0Y154
1	Alarm Contact	

POWER TRANSFER **SHARED BY ELECTRIC PANIC AND** RE-ACTIVATION SENSOR WIRING (RE-ACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

HW-SH-9

Each [AC, EL, REX, DPS] Pair to Have:		RATED
	Hinges	QUANTITY & TYPE AS REQUIRED
1	Electric Power Transfer	10 Wire, Misc Accessory GVUX
1	Set Auto Flush Bolts	TYPE 25
1	Dust Proof Strike	L04021
1	Storeroom Lock	F07
1	Electric Strike	ANSI/BHMA GRADE 1, UL1034 & UL10C, US32D
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0E634 x R0Y154 x THRU-BOLTS
2	Closers	C02011/C02021
2	Kick Plates	J102 (@ STORAGE ROOMS ONLY)
2	Wall Stops	L02101 CONVEX
1	Set Self-Adhesive Seals	R0E154
2	Alarm Contacts	

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28. COORDINATE ASTRAGAL WITH ELECTRIC STRIKE

- - - E N D - - -

BUILDING 2, ELEVATOR P-15

SECTION 14 24 10
HYDRAULIC ELEVATORS

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section of the specification is intended to cover the complete furnishing of labor, materials, engineering and components on elevator P-15 located in Building 2 Engineering Service.

B. Passenger Elevator No. P-15, shall be oil hydraulic type with microprocessor based control, ~~**two stop automatic operation,**~~ single car selective collective automatic operation and power-operated two-speed side opening car and hoistway doors with front and rear openings. Elevators shall have Class “A” loading.

1.2 SCOPE OF WORK

A. Remove existing cab, platform, hoistway leveling unit, jack and piston, oil lines, buffers, pit channel all machine room equipment including shunt trip disconnect, controller and tank unit, buffers, pit channel Hall push buttons, hall position indicators. The only equipment left should be the main rails, steel jack casing, hoistway door sills. Door jambs, door headers and steel strut angles. Install a new 3 stop, front and rear opening hydraulic elevator that meets this specification.

1.3 RELATED WORK

A. Section 01 33 23 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.

B. Section 07 84 00, FIRESTOPPING: Sealing around penetrations to maintain the integrity of fire-rated construction.

C. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS: Requirements for seismic restraint of non-structural components.

D. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements that are common to more than one section.

E. Section 26 05 19, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low Voltage power and lighting wiring.

F. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.

G. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits for cables and wiring.

H. Section 26 05 73, OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY: Requirements for installing the over-current protective devices to ensure proper equipment and personnel protection.

I. Section 26 24 16, PANELBOARDS: Low voltage panelboards.

J. Section 26 51 00, INTERIOR LIGHTING: Fixture and ballast type for interior lighting.

K. VA Barrier Free Design Handbook (H-18-13)

1.4 QUALIFICATIONS

A. Approval by the Contracting Officer is required for products or services of proposed manufacturers, suppliers and installers and shall be contingent upon submission by Contractor of a certificate stating the following:

1. Elevator contractor is currently and regularly engaged in the installation of elevator equipment as one of his principal products.
2. Elevator contractor shall have three years of successful experience, trained supervisory personnel, and facilities to install elevator equipment specified herein.
3. The installers shall be Certified Elevator Mechanics with technical qualifications of at least five years of successful experience and Apprentices actively pursuing certified mechanic status.
   a. Certificates are required for all workers employed in this capacity.
4. Elevator contractor shall submit a list of two or more prior hospital installations where all the elevator equipment he proposes to furnish for this project functioned satisfactorily to serve varying hospital traffic and material handling demands. Provide a list of hospitals that have the equipment in operation for two years preceding the date of this specification. Provide the names and addresses of the Medical Centers and the names and telephone numbers of the Medical Center Administrators.

B. Approval of Elevator Contractor’s equipment will be contingent upon their identifying an elevator maintenance service provider that shall render services within two hours of receipt of notification, together with certification that the quantity and quality of replacement parts

stock is sufficient to warranty continued operation of the elevator installation.

C. Approval will not be given to elevator contractors and manufacturers who have established on prior projects, either government, municipal, or commercial, a record for unsatisfactory elevator installations, have failed to complete awarded contracts within the contract period, and does not have the requisite record of satisfactorily performing elevator installations of similar type and magnitude.

D. The Contractor shall provide and install only those types of safety devices that have been subjected to tests witnessed and certified by an independent professional testing laboratory that is not a subsidiary of the firm that manufactures supplies or installs the equipment.

E. Welding at the project site shall be made by welders and welding operators who have previously qualified by test as prescribed in American Welding Society Publications AWS Dl.1 to perform the type of work required. VAMC shall require welding certificates be submitted for all workers employed in this capacity. A welding or hot work permit is required for each day and shall be obtained from the **COR** ~~**COTR**~~ of safety department. Request permit one day in advance.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification. Elevator installation shall meet the requirements of the latest editions published and adopted by the United States Department of Veterans Affairs on the date contract is signed.

B. Federal Specifications (Fed. Spec.):

J-C-30B.....Cable and Wire, Electrical (Power, Fixed Installation)

W-C-596F.....Connector, Plug, Electrical; Connector, Receptacle, Electrical

W-F-406E.....Fittings for Cable, Power, Electrical and Conduit, Metal, Flexible

HH-I-558C.....Insulation, Blankets, Thermal (Mineral Fiber, Industrial Type)

W-F-408E.....Fittings for Conduit, Metal, Rigid (Thick- Wall and Thin-wall (EMT) Type)

RR-W-410.....Wire Rope and Strand

TT-E-489J.....Enamel, Alkyd, Gloss, Low VOC Content

QQ-S-766 .....Steel, Stainless and Heat Resisting, Alloys, Plate, Sheet and Strip

C. International Building Code (IBC)

D. American Society of Mechanical Engineers (ASME):

A17.1 2010.....Safety Code for Elevators and Escalators

A17.2 2010.....Inspectors Manual for Electric Elevators and Escalators

E. National Fire Protection Association:

NFPA 13.....Standard for the Installation of Sprinkler Systems

NFPA 70.....National Electrical Code (NEC), Latest Addition.

NFPA 72.....National Fire Alarm and Signaling Code

NFPA 101.....Life Safety Code

NFPA 252.....Fire Test of Door Assemblies

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

A1008/A1008M-09.....Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High Strength Low-Alloy with Improved Farability

E1042-02.....Acoustically Absorptive Materials Applied by Trowel or Spray

G. Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS):

SP-58.....Pipe Hangers and Supports

H. Society of Automotive Engineers, Inc. (SAE)

J517-91.....Hydraulic Hose, Standard

I. Gages:

For Sheet and Plate: U.S. Standard (USS)

For Wires: American Wire Gauge (AWG)

J. American Welding Society (AWS):

D1.1.....Structured Welding Code – Steel

K. National Electrical Manufacturers Association (NEMA):

LD-3.....High-Pressure Decorative Laminates

L. Underwriter's Laboratories (UL):

486A.....Safety Wire Connectors for Copper Conductors

797.....Safety Electrical Metallic Tubing

M. Institute of Electrical and Electronic Engineers (IEEE)

N. Regulatory Standards:

Uniform Federal Accessibility Standards

Americans with Disabilities Act

1.6 SUBMITTALS

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

B. Before execution of work, furnish information to evidence full compliance with contract requirements for proposed items. Such information shall include, as required: Manufacturer's Name, Trade Names, Model or Catalog Number, Nameplate Data (size, capacity, and rating) and corresponding specification reference (Federal or project specification number and paragraph). All submitted drawings and related elevator material shall be forwarded to the Manhattan VAMC Chief Engineer, William Horton.

C. Shop Drawings:

1. Complete scaled and dimensioned layout in plan and section view showing the arrangement of equipment and all details of elevator unit specified including:
   a. Complete layout showing location of storage tank/pump assembly, controller, piping layout, outside diameter of cylinder/plunger assembly, size of car platform, car frame members, and support assembly.
   b. Weights of principal parts.
   c. Top and bottom clearances and over travel of the car.
   d. Location of shunt trip circuit breaker, switchboard panel, light switch, and feeder extension points in the machine room.

D. Samples:

1. One each of stainless steel, 75 mm x 125 mm (3 inch x 5 inch).
2. One each of color vinyl floor tile.
3. Cab laminate panel.
4. No other samples of materials specified shall be submitted unless specifically requested after submission of manufacturer's name. If additional samples are furnished pursuant to request, adjustment in contract price and time will be made as provided in Section 00 72 00, GENERAL CONDITIONS.

E. Name of manufacturer, type or style designation, and applicable data of the following equipment shall be shown on the elevator layouts:

1. Storage tank/pump assembly.

2. Pump and motor, HP and RPM rating, Voltage, Starting and Full Load Ampere, Number of phases, and Gallons per minute.
3. Controller
4. Starters and Overload Current Protection Devices.
5. Car Safety Device; Rupture Valve and Manual Shut Off Valves.
6. Hoistway Door Interlocks.
7. Car buffers; Maximum and minimum rated load, maximum rated striking speed and stroke. Pit channel.
8. Cab Ventilation Unit; HP rating and CFM rating.

F. Complete construction drawings of elevator car enclosure, showing dimensioned details of construction, fastenings to platform, car lighting, ventilation, ceiling framing, top exit, and location of car equipment.

G. Dimensioned drawings showing details of:
1. All signal and operating fixtures.
2. Hoistway door tracks and hangers.
3. Infrared curtain units.

H. Cuts or drawings showing details of controllers and supervisory panels.

I. Furnish certificates as required under: Paragraph "QUALIFICATIONS".

1.7 WIRING DIAGRAMS

A. Provide three complete sets of field wiring and straight line wiring diagrams showing all electrical circuits in the hoistway, machine room and fixtures. Install one set coated with an approved plastic sealer and mounted in the elevator machine room as directed by the Project Engineer.

B. In the event field modifications are necessary during installation, diagrams shall be revised to include all corrections made prior to and during the final inspection. Corrected diagrams shall be delivered to the Project Engineer within 30 days of final acceptance.

C. Provide the following information relating to the specific type of microprocessor controls installed:
1. Owner's information manual, containing job specific data on major components, maintenance, and adjustment.
2. System logic description.
3. Complete wiring diagrams needed for field troubleshooting, adjustment, repair and replacement of components. Diagrams shall be

base diagrams, containing all changes and additions made to the equipment during the design and construction period.

4. Changes made during the warranty period shall be noted on the drawings in adequate time to have the finalized drawings reproduced for mounting in the machine room no later than six months prior to the expiration of the warranty period.

1.8 ADDITIONAL EQUIPMENT

A. Additional equipment required to operate the specified equipment manufactured and supplied for this installation shall be furnished and installed by the contractor. The cost of the equipment shall be included in the base bid.

B. Special equipment not required by specification, which would improve the operation, may be installed in conjunction with the specified equipment by the contractor at his option at no additional cost to the Government, provided prior approval is obtained from the Contracting Officer’s Representative.

1.9 TOOL CABINET

A. Provide a metal parts/tool cabinet, having two shelves and hinged doors. Cabinet size shall be 1220 mm (48 inch) high, 762 mm (30 inch) wide, and 457 mm (18 inch) deep.

1.10 PERFORMANCE STANDARDS

A. The elevator shall be capable of meeting the highest standards of the industry and specifically the following:

1. Contract speed is high speed in either direction of travel with rated capacity load in the elevator. Speed variation under all load conditions, regardless of direction of travel, shall not vary more than five (5) percent.
2. The controlled rate of change of acceleration and retardation of the car shall not exceed 0.1G per second and the maximum acceleration and retardation shall not exceed 0.2G per second.
3. Starting, stopping, and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration.

B. The door operator shall open the car door and hoistway door simultaneously at 2.5-feet per second and close at 1-foot per second.

C. Pressure: Fluid system components shall be designed and factory tested for 500 psi operating pressure.

D. Floor level stopping accuracy shall be within 3 mm (1/8 inch) above or below the floor, regardless of load condition.

E. Noise and Vibration Isolation: All elevator equipment including their supports and fastenings to the building, shall be mechanically and electrically isolated from the building structure to minimize objectionable noise and vibration transmission to car, building structure, or adjacent occupied areas of building.

F. Sound Isolation: Noise level relating to elevator equipment operation in machine room shall not exceed 80 dBA. All dBA readings shall be taken three (3) feet off the floor and three (3) feet from equipment.

G. Airborne Noise: Measured noise level of elevator equipment during operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.

1.11 WARRANTY

A. Submit all labor and materials furnished in connection with elevator system and installation to terms of "Warranty of Construction" articles of FAR clause 52.246-21. The one year Warranty shall commence after final inspection, completion of performance test, and upon full acceptance of the installation and shall concur with the guarantee period of service.

B. During warranty period if a device is not functioning properly or in accordance with specification requirements, or if in the opinion of the Contracting Officer’s Representative, excessive maintenance and attention must be employed to keep device operational, device shall be removed and a new device meeting all requirements shall be installed as part of work until satisfactory operation of installation is obtained. Period of warranty shall start anew for such parts from date of completion of each new installation performed, in accordance with foregoing requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Where stainless steel is specified, it shall be corrosion resisting steel complying with Fed. Spec. QQ-S-766, Class 302 or 304, Condition A with Number 4 finish on exposed surfaces. Stainless steel shall have the grain of belting in the direction of the longest dimension and

surfaces shall be smooth and without waves. During installation all stainless steel surfaces shall be protected with a suitable material.

B. Where cold rolled steel is specified, it shall be low-carbon steel rolled to stretcher leveled standard flatness, complying with ASTM A109.

2.2 MANUFACTURED PRODUCTS

A. Materials, devices and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items. Items not meeting this requirement, but meet technical specifications which can be established through reliable test reports or physical examination of representative samples, will be considered.

B. When two or more devices of the same class of materials or equipment are required, these units shall be products of one manufacturer.

C. Manufacturers of equipment assemblies which include components made by others shall assume complete responsibility for the final assembled unit.

1. Individual components of assembled units shall be products of the same manufacturers.
2. Parts which are alike shall be the product of a single manufacturer.
3. Components shall be compatible with each other and with the total assembly for the intended service.

D. Motor nameplates shall state manufacturers' name, rated horsepower, speed, volts, amperes and other characteristics required by NEMA Standards and shall be securely attached to the item of equipment in a conspicuous location.

E. The elevator equipment, including controller, and supervisory system shall be non-proprietary, the product of manufacturers of established reputation, provided such items are capably engineered and produced under coordinated specifications to ensure compatibility with the total operating system. Mixing of manufactures related to a single system or group of components shall be identified in the submittals.

F. Where key operated switches are furnished in conjunction with any component of this elevator installation, furnish four (4) keys for each individual switch or lock. Keys and key switches shall match Building 1, Elevator P-16 .Provide different key tumblers for different switch and lock functions. Each and every key shall have a tag bearing a

stamped or etched legend identifying its purpose. Barrel key switches are not acceptable, except where required by code.

G. If the elevator equipment to be installed is not known to the Project Engineer, the Contractor shall submit drawings in triplicate for approval to the Project Engineer and VA CFM Elevator Engineer showing all details and demonstrate that the equipment to be installed is in strict accordance with the specifications.

2.3 CAPACITY, SIZE, SPEED, AND TRAVEL

A. Each direct-plunger elevator shall have the capacity to lift the live load, including the weight of entire car and plunger, at the speed specified in the following schedule:

ELEVATOR SCHEDULE	
Elevator Number	P-15
Overall Platform Size	72 inches W X 68 inches (front to rear)
Rated Load - kg(lb)	**3000** ~~**2000**~~lbs.
Contract Speed - m/s(fpm)	125fpm
Total Travel - m/s(fpm)	22ft 4in.
Number of Stops	3
Number of Openings	3 (GR,1 2)
Entrance Type & Size	EXISTING

2.4 POWER SUPPLY

A. For power supply in each machine room see Specification 260521, ELECTRICAL SPECIFICATION and Electrical drawings.

B. It shall be the electrical contractor's responsibility to supply the labor and materials for the installation of the following:

l. Feeders from the power source indicated on the drawings to elevator controller.

2. Shunt Trip Circuit Breaker for controller shall be located inside machine room at the strike side of the machine room door and lockable in the “Off” position.

C. Power for auxiliary operation of elevator as specified shall be (“Rescuevator”) battery lowing device.

2.5 CONDUIT AND WIREWAY

A. Unless otherwise specified or approved, install electrical conductors, except traveling cable connections to the car, in rigid zinc-coated steel or aluminum conduit, electrical metallic tubing or metal wireways. Rigid conduit smaller than 3/4 inch or electrical metallic tubing smaller than 1/2 inch electrical trade size shall not be used. All raceways completely embedded in concrete slabs, walls, or floor fill shall be rigid steel conduit. New wireway (duct) shall be used in the hoistway and to the controller and between similar apparatus in the elevator machine room. Fully protect self-supporting connections, where approved, from abrasion or other mechanical injury. Flexible metal conduit not less than 3/8 inch electrical trade size may be used, not exceeding 18 inches in length unsupported, for short connections between risers and limit switches, interlocks, and for other applications permitted by NEC.

B. All conduit terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushings. Install a steel lock nut under the bushings if they are constructed completely of insulating materials. Protect the conductors at ends of conduits not terminating in steel cabinets or boxes by terminal fittings having an insulated opening for the conductors.

C. Rigid conduit and EMT fittings using set screws or indentations as a means of attachment shall not be used. All fittings shall be steel or malleable iron.

D. Connect motors or other items subject to movement, vibration or removal to the conduit or EMT systems with flexible, steel conduits.

2.6 CONDUCTORS; NEW

A. Unless otherwise specified, conductors, excluding the traveling cables, shall be stranded or solid coated annealed copper in accordance with Federal Specification J-C-30B for Type RHW or THW. Where 16 and 18 AWG are permitted by NEC, single conductors or multiple conductor cables in accordance with Federal Specification J-C-580 for Type TF may be used provided the insulation of single conductor cable and outer jacket of multiple conductor cable is flame retardant and moisture resistant. Multiple conductor cable shall have color or number coding for each conductor. Conductors for control boards shall be in accordance with

NEC. Joints or splices are not permitted in wiring except at outlets. Tap connectors may be used in wireways provided they meet all UL requirements.

B. Provide all necessary conduit and wiring between machine room and hoistway.

C. All wiring must test free from short circuits or ground faults. Insulation resistance between individual external conductors and between conductors and ground shall be a minimum of one megohm.

D. Where size of conductors is not given, voltage and amperes shall not exceed limits prescribed by NEC.

E. Provide equipment grounding. Ground the conduits, supports, controller enclosure, motor, platform and car frame, and all other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be copper, green insulated and sized as required by NEC. Bond the grounding wires to all junction boxes, cabinets, and wire raceways.

F. Terminal connections for all conductors used for external wiring between various items of elevator equipment shall be solderless pressure wire connectors in accordance with Federal Specification W-S-610. The Elevator Contractor may, at his option, make these terminal connections on 10 gauge or smaller conductors with approved terminal eyelets set on the conductor with a special setting tool, or with an approved pressure type terminal block. Terminal blocks using pierce-through serrated washers are not acceptable.

2.7 TRAVELING CABLES; NEW

A. All conductors to the car shall consist of flexible traveling cables conforming to the requirements of NEC. Traveling cables shall run from the junction box on the car directly to the controller. Junction boxes on the car shall be equipped with terminal blocks. Terminal blocks having pressure wire connectors of the clamp type that meet UL 486A requirements for stranded wire may be used in lieu of terminal eyelet connections. Terminal blocks shall have permanent indelible identifying numbers for each connection. Cables shall be securely anchored to avoid strain on individual terminal connections. Flame and moisture resistant outer covering must remain intact between junction boxes. Abrupt bending, twisting and distortion of the cables shall not be permitted.

B. Provide spare conductors equal to 10 percent of the total number of conductors furnished, but not less than 5 spare conductors in each traveling cable.

C. Provide shielded wires for the auto dial telephone system within the traveling cable. Add 5 pair shielded wires for card reader, 2 RG-6/U coaxial CCTV cables, and 2 pair 14 gauge wires for CCTV power as needed.

D. If traveling cables come into contact with the hoistway or elevator due to sway or change in position, provide shields or pads to the elevator and hoistway to prevent damage to the traveling cables.

E. Hardware cloth wide may be installed from the hoistway suspension point downward to the elevator pit to prevent traveling cables from rubbing or chafing. Hardware cloth shall be securely fastened and tensioned to prevent buckling. Hardware cloth is not required when traveling cable is hung against a flat wall.

2.8 CONTROLLER AND SUPERVISORY PANEL; NEW

A. UL/CSA Labeled Controller: Mount all assemblies, power supplies, chassis switches, and relays on a self-supporting steel frame. Completely enclose the equipment and provide a mean to control the temperature. Solid state components shall be designed to operate between 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.

B. All controller switches and relays shall have contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear, and shall provide a wiping action to prevent sticking due to fusion. Switches carrying highly inductive currents shall be provided with arc shields or suppressors.

C. Where time delay relays are used in the circuits, they shall be of acceptable design, adjustable, reliable, and consistent such as condenser timing or electronic timing circuits.

D. Properly identify each device on all panels by name, letter, or standard symbol which shall be neatly stencil painted or decaled in an indelible and legible manner. Identification markings shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders. All spare

conductors to controller and supervisory panel shall be neatly formed, laced, and identified.

2.9 MICROPROCESSOR CONTROL SYSTEM; NEW

A. Provide a microprocessor based system (MCE 2000 Controller) with absolute position/speed feedback encoded tape and electronic motor starter to control the pump motor and signal functions in accordance with these specifications. Across the line and wye-delta starters are not acceptable. Complete details of the components and printed circuit boards, together with a complete operational description, shall be submitted for approval.

1. Controller shall be non-proprietary.
2. Proprietary tools shall not be necessary for adjusting, maintenance, repair, and testing of equipment.
3. Controller manufacturer shall provide engineering and technical support, including all manuals and wiring diagrams to the VA Medical Center’s designated Elevator Maintenance Service Provider.
4. Replacement parts shall be shipped overnight within 48 hours of an order being received.

B. All controller assemblies shall provide smooth, step-less acceleration and deceleration of the elevator, automatically and irrespective of the load in the car. All control equipment shall be enclosed in a metal cabinet with lockable, hinged door(s) and shall be provided with a means of ventilation. All non-conducting metal parts in the machine room shall be grounded in accordance with NEC. Cabinet shall be securely attached to the building structure.

C. Circuit boards for the control of elevator system; dispatching, signals, door operation and special operation shall be installed in a NEMA Type 1 General Purpose Enclosure. Circuit boards shall be moisture resistant, non-corrosive, non-conductive, fabricated of non-combustible material and adequate thickness to support the components mounted thereon. Mounting racks shall be spaced to prevent accidental contact between individual circuit boards and modules.

D. Modules shall be of the type that plug into pre-wired mounting racks. Field wiring or alteration shall not be necessary in order to replace defective modules.

E. Each device, module and fuse (with volt and ampere rating) shall be identified by name, letter or standard symbol in an approved indelible

and legible manner on the device or panel. Coordinate identification markings with identical markings on wiring diagrams.

F. The electrical connections between the printed circuit boards (modules) and the circuit connectors incorporated in the mounting racks shall be made through individual tabs which shall be an integral part of each module. The tabs shall be nickel-gold plated or other approved metal of equal electrical characteristics. Modules shall be keyed or notched to prevent insertion of the modules in the inverted position.

G. Light emitting diodes (LED) shall be for visual monitoring of individual modules.

H. Components shall have interlocking circuits to assure fail-safe operation and to prevent elevator movement should a component malfunction.

I. Method of wire wrapping from point to point with connections on the mounting racks shall be submitted for approval.

J. Field wiring changes required during construction shall be made only to the mounting rack connection points and not to the individual module circuitry or components. If it is necessary to alter individual modules they shall be returned to the factory where design changes shall be made and module design records changed so correct replacement units will be available.

K. All logic symbols and circuitry designations shall be in accordance with ASME and NEC Standards.

L. Solid state components shall be designed to operate within a temperature range of 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.

M. Wiring connections for operating circuits and for external control circuits shall be brought to terminal blocks mounted in an accessible location within the controller cabinet. Terminal blocks using pierce through serrated washers shall not be used.

2.10 EMERGENCY RESCUE OPERATION; (BATTERY LOWERING SYSTEM)

A. Provide a power source to send the elevator to the lowest landing by activating the down valves. After the elevator has leveled at the lowest landing, provide power to open the car and hoistway doors automatically. After a predetermined time the car and hoistway doors shall close. Power shall stay applied to the door open button so the doors can be opened from the inside of the elevator. The elevator shall

remain shut down at the bottom landing until normal power is restored. Install a sign on the controller indicating that the power is applied to the down valve and door operator during loss of normal power.

2.11 SINGLE CAR SELECTIVE COLLECTIVE AUTOMATIC OPERATION

A. Provide single car selective collective automatic operation for passenger elevator **P-15**.

B. Operate car without attendant from push buttons inside the car and located at each floor adjacent to the elevator entrance. When car is available, automatically start car and dispatch it to the floor corresponding to registered car or hall call. Once car starts, it shall respond to registered calls in direction of travel in the order floors are reached. Do not reverse car directions until all car calls have been answered or until all hall calls ahead of car and corresponding to direction of car travel have been answered. Slow car and stop automatically at floors corresponding to registered calls, in the order in which they are approached in either direction of travel. As slowdown is initiated, automatically cancel the hall call and car call. Hold car at arrival floor an adjustable time interval to allow passenger transfer. Illuminate appropriate push button to indicate call registration. Extinguish light when call is answered.

C. When all calls in the system have been satisfied, the elevator shall shut down at the last landing served with the car and hoistway doors closed. Registration of a call at the landing where the car is parked shall automatically open the car and hoistway doors. Provide a predetermined time delay to permit passengers entering the parked car to register the call of their choice and establish direction of travel before the system can respond to landing calls registered to the same time above or below the parked car.

D. Auxiliary Landing Call Operation: In the event of corridor call button circuit failure, elevators are to service each floor in both directions in a predetermined pattern without registration of a call within the elevator. Provide an illuminated signal in the controller to indicate that emergency dispatch operation is in effect. Restoration of the landing call button system shall cause normal operation to resume.

E. Car lights and fan in the elevator shall not shut off when elevator is idle. Arrange circuits so that power to lights and outlets on top and bottom of car shall not be interrupted.

2.12 FIREFIGHTERS SERVICE;

A. May reuse existing smoke detectors at floors G, **1** **and** 2 ~~**and 3**~~, and machine room~~**, if operable**~~. ~~**May reuse existing "zams".**~~ If not operable, provide new **smoke** **detectors** **and** **system** **devices** **as** **needed** ~~**"zams" for all smoke detectors**~~.

B. Provide Firefighters' Service as per ASME A17.1 Section 2.27.

C. Smoke Detectors:

1. Smoke detection devices that are designated for actuation of Elevator Phase I "FIRE SERVICE" response in each elevator lobby and machine room shall be provided by others.
   a. Elevator lobby smoke detectors shall activate only the elevators sharing the corresponding or common lobby.
   b. Machine room smoke detector shall activate fire recall for elevator with equipment located in that machine room.

2.13 HEAT DETECTORS, SHUNT TRIP CIRCUIT BREAKERS:

A. Provide new shunt trip circuit breaker in elevator machine room.

B. Reuse existing sprinkler head in machine room.

C. The heat detector shall be independent of the fire service system.

D. The heat detector shall be connected to the fire alarm control panel for alarm only. The fire alarm control shall send a supervised signal to the elevator machine room in the form of a 110 volt relay with a set of "C" contacts for elevator. The relay shall be located in the machine room. Power shall be removed from elevator controller by activating an independently controlled shunt trip circuit breaker when the temperature in the machine room exceeds the setting of the heat detector. Provide all necessary conduit, wiring, etc. Shunt trip circuit breaker to trip off when heat detector is activated.

2.14 PUMP UNIT ASSEMBLY

A. Completely integrate the pump unit for the control of the elevator and self-contain in a unit fabricated of structural steel. The unit shall consist of a hydraulic fluid pump driven by an induction motor together with oil control valves, piping, etc. Enclose unit on four open sides of the power unit frame with not less than 16 gauge steel removable panel sections. Provide a minimum 50 mm (2 inch) air space between the top of the panels and bottom of tank. Line panels on the interior side with one-inch rigid acoustical insulation board.

B. Control valves shall be electronically controlled. Hydraulic fluid flow shall be controlled to insure speed variation of not more than five (5) percent under all load conditions.

C. Hydraulic system working pressure shall not exceed 500 psi under any load condition.

D. Pump shall be positive displacement, rotary screw type, specifically designed for hydraulic elevator service, having a steady discharge without pulsation to give smooth and quiet operation. Pump output shall be capable of lifting elevator car with rated capacity, with a speed variation of no more than five (5) percent between no load and full load. Pump shall operate under flooded suction in an accurately machined case with the clearance required to assure maximum efficiency. Hydraulic fluid by-pass shall discharge directly into storage tank.

E. Motor shall be squirrel-cage, drip proof, ball bearing, and induction type, with a synchronous speed not in excess of 1800 RPM. Design motor specifically for elevator service, not to exceed nameplate full load current by more than 10% and be continuously rated 120 starts per hour without exceeding a rise of 40 degrees C. Include closed transition SCR soft start.

F. Connect motor and pump with multiple V-belt. Size belts and sheaves for duty involved and design to prevent any metallic contact between motor and pump shaft. Provide isolation units of rubber in shear to prevent transmission of pump and motor vibration to the building. Install expanded metal sheave guard that can be easily removed for servicing and inspection.

2.15 HYDRAULIC SYSTEM

A. Construct the storage tank of sheet steel, welded construction, and a steel cover with suitable means for filling, a minimum one-inch protected vent opening, an overflow connection, and a valve drain connection. Tank shall act as a storage tank only, and sized to pass through machine room door as shown on drawings. Provide marked gauge to monitor hydraulic fluid level. Tank shall be of capacity to hold volume of hydraulic fluid required to lift elevator to top terminal landing, plus a reserve of not less than ten gallons. Provide a baffle in the bottom of the tank to prevent entry of any sediment or foreign particles into hydraulic system. Baffle shall also minimize aeration of hydraulic fluid. Permissible minimum hydraulic fluid level shall be

clearly indicated. Hydraulic fluid shall be of good grade to assure free flow when cool, and have minimum flash point of 400 degrees F. Provide initial supply of hydraulic fluid for operation of elevator.

1. Provide a data plate on the tank framing indicating the characteristics of the hydraulic fluid used.

B. Furnish and install connections between the storage tank, pump, muffler, operating valves, and cylinder complete with necessary valves, pipe supports, and fittings. All connections between the discharge side of the pump, check valve, muffler, cylinder, lowering valves shall be of schedule 40 steel with threaded, flanged, or welded mechanical couplings. Size of pipe and couplings between cylinder and pumping unit shall be such that fluid pressure loss is limited to 10 percent.

C. Do not subject valves, piping, and fittings to working pressure greater than those recommended by the manufacturer.

D. Support all horizontal piping. Place hangers or supports within 305 mm (12 inch) on each side of every change of direction of pipe line and space supports not over 3.0 meters (10 feet) apart. Secure vertical runs properly with iron clamps at sufficiently close intervals to carry weight of pipe and contents. Provide supports under pipe to floor.

1. Provide all new oil line piping from machine room to hoistway, including necessary supports or hangers.

E. Install pipe sleeves where pipes pass through walls or floors. Set sleeves during construction. After installation of piping, equip the sleeves with snug fitting inner liner of either glass or mineral wool insulation.

F. Install blowout-proof, non-hammering, oil-hydraulic muffler in the hydraulic fluid supply pressure line near power unit in machine room. Design muffler to reduce to a minimum any pulsation or noises that may be transmitted through the hydraulic fluid into the hoistway.

G. Arrange control valves to operate so hydraulic fluid flow will be controlled in positive and gradual manner to insure smooth starting and stopping of elevator.

H. Provide safety check valve between cylinder and pump connection which will hold elevator with specified load at any point when pump stops or pressure drops below minimum operating levels.

I. Provide an automatic shut-off valve in the oil supply line at the cylinder inlet. Weld pipe protruding from cylinder at inlet and thread

to receive shut-off valve. Activate the automatic shut-off valve when there is more than a ten percent increase in high speed in the down direction. When activated, this device shall immediately stop the descent of the elevator, and hold the elevator until it is lowered by use of the manual lowering feature of the valve. Arrange the manual lowering feature of the automatic shut-off valve to limit the maximum descending speed of the elevator to 15 fpm. The exposed adjustments of the automatic shut-off valve shall have their means of adjustment sealed after being set to their correct position.

J. Provide external tank shut-off valve to isolate hydraulic fluid during maintenance operations.

K. Provide all pump relief and other auxiliary valves to comply with the requirements of the ASME A17.1 Section 3.19 and to insure smooth, safe, and satisfactory operation of elevator.

L. Furnish and adjust by-pass and relief valve in accordance with ASME A17.1 Rule 3.19.4.2.

M. Install check valve to hold the elevator car with rated load at any point when the pump stops.

N. Provide shut-off valves in the pit near the cylinder and in the machine room capable of withstanding 150 percent of design operating pressure. Each manual valve shall have an attached handle.

O. Conveniently locate the manual lowering valve, easily accessible, and properly identified with a red arrow and not concealed within the storage tank. Mark the operating handle in red.

P. Provide a low oil control feature which shall shut off the motor and pump and return the elevator to the lowest landing. Upon reaching the lowest landing, doors will open automatically allowing passengers to leave the car. Then doors shall close. All control buttons, except the door open button, shall be made ineffective.

Q. Provide oil-tight drip pan for assembled pumping unit, including storage tank. Pan shall be not less than 16 gauge sheet steel, with one-inch sides.

R. The entire hydraulic system, including muffler, shall be tested to withstand a pressure equal to twice the calculated working pressure.
   1. Submit certification that test has been performed.

2.16 HYDRAULIC PLUNGER ASSEMBLY

A. Design cylinder and plunger in accordance with ASME A17.1. It shall be of sufficient size to lift gross load the height specified Factory test at a pressure equal to twice the calculated working pressure, for strength and to insure freedom from leakage. Provide bottom of cylinder head with internal guide bearing and top of cylinder head with removable packing gland. Packing gland shall permit ready replacement of packing. Victaulic type packing gland head will not be permitted.
   1. Provide a bleeder valve located below the cylinder flange to release air or other gases from the system.
   2. Equip cylinder with drip ring below the packing gland to collect leakage of hydraulic fluid.
   3. Bolt the cylinder mounting brackets to continuous footing channels that also support the rails and buffers.

B. Install a flexible tubing scavenger line with an electrically operated pump between the piston drip ring and oil storage tank. Scavenger line, pump and strainers shall operate independently of hydraulic fluid pressure. Equip scavenger pump with a water float designed to prevent operation of the pump should the pit flood and designed to be manually reset. Strap the pump and reservoir to the pit channels.

C. Plunger shall be heavy seamless steel tubing, turned smooth and true to within plus or minus 0.38 mm (0.015 inch) tolerance and no diameter change greater than 0.07 mm (0.003 inch) per-inch of length. Grind the plunger surface to a fine polish finish, 12 micro-inches or finer. Where plunger is multi-piece construction, machine the joints to assure perfectly matching surfaces. No tool marks shall be visible.
   1. Secure plunger to underside of platform supporting beams with fastenings capable of supporting four times the weight of the plunger. The platen plate shall incorporate piston car vibration isolator as herein specified.
   2. Provide a stop ring welded or screwed to the bottom of plunger that shall prevent the plunger from leaving its cylinder.
   3. Isolate plunger head from the platen plate to prevent corrosion or electrolysis.
   4. Carefully protect plunger and replace if gouged, nicked or scored.

5. If conditions beneath the pit floor are not adequate to support the total loading of the elevator, install reinforcing members in the pit floor.

D. Before installation, clean entire cylinder wall of all traces of oil, grease, moisture, dirt and scale.

2.17 HYDRAULIC CYLINDER CASING

A. Reuse the existing steel casing in pit. Clean out old oil and debris in casing. If not done already, close the bottom with a minimum of 15.2 mm (6 inch) of concrete.

B. Provide PVC casing liner to fit inside steel casing. Fabricate from schedule **40** ~~**80**~~ PVC pipe with watertight bottom and a top flange gasket to seal plunger flange and form a complete, watertight, electrically non-conductive encasement of the entire unit.

2.18 CAR BUFFERS; NEW

A. Provide a minimum of two spring buffers for elevator that meets the requirements of ASME A17.1 Section 3.22. Securely fasten buffers and supports to the new pit channel and in the alignment with striker plates on elevator. Ever installed buffer shall have a permanently attached metal plate indicating its stroke and load rating.

B. Design and install buffers to provide minimum car runby required by ASME A17.1 Rule 3.4.2.

C. Furnish pipe stanchions and struts as required to properly support the buffer.

D. Install new pit channel for buffers.

2.19 CAR GUIDES

A. Guide Shoes: Reuse existing top and bottom guide shoes. Clean and repaint.

1. Provide each shoe with new inserts made of renewable non-metallic insert of durable material having low coefficient of friction and long-wearing qualities, when operated on guide rails receiving infrequent, light applications of rail lubricant. Gibs containing graphite or other solid lubricants are not acceptable.

2.20 GUIDE RAILS, SUPPORTS, AND FASTENINGS

A. Reuse existing main guide rail.

B. Existing bottom guide rails shall be sanded to remove all rust. Guide rails shall be clean and free of any signs of rust, grease, or abrasion before final inspection.

2.21 NORMAL AND FINAL TERMINAL STOPPING DEVICES; NEW

A. Normal and final terminal stopping devices shall conform to ASME A17.1 Section 2.25.

B. Mount terminal slowdown switches and direction limit switches on the elevator or in hoistway to reduce speed and bring car to an automatic stop at the terminal landings.

1. Switches shall function with any load up to and including 100 percent of rated elevator capacity at any speed obtained in normal operation.
2. Switches, when opened, shall permit operation of elevator in reverse direction of travel.

C. Mount final terminal stopping switches in the hoistway.

1. Switches shall be positively opened should the car travel beyond the terminal direction limit switches.
2. Switches shall be independent of other stopping devices.
3. Switches, when opened, shall remove power from pump motor and control valves preventing operation of car in either direction.

D. After final stopping switches have been adjusted, through bolt switches to guide rail.

2.22 CROSSHEAD DATA PLATE AND CODE DATA PLATE

A. Reuse existing non-corrosive metal Data Plate that is attached to car crosshead. Data plate shall bear information required by ASME A17.1 Section 2.16.3 and 2.20.2.1.

B. Permanently attach a Code Data Plate, in plain view, to the controller, ASME A17.1 Section 8.9.

2.23 WORKMAN'S LIGHTS AND OUTLETS; NEW

A. Provide duplex GFCI protected type receptacles and lamp, with wire guards on top of elevator car and beneath platform.

B. The receptacles shall be in accordance with Fed. Spec. W-C-596 for Type D7, 2-pole, 3-wire grounded type rated for 15 amperes and 125 volts.

2.24 TOP-OF-CAR OPERATING DEVICE; NEW

A. Provide a new car top operating device that meets the requirements of ASME A17.1 Section 2.26.

B. The device shall be activated by a toggle switch mounted in the device. The switch shall be clearly marked "INSPECTION" and "NORMAL" on the faceplate, with 6 mm (1/4 inch) letters.

C. Movement of the elevator shall be accomplished by the continuous pressure on a direction button and a safety button.

D. Provide an emergency stop toggle type switch.

E. Provide permanent identification for the operation of all components in the device.

F. The device shall be permanently attached to the elevator crosshead on the side of the elevator nearest to the hoistway doors used for accessing the top of the car.

2.25 CAR LEVELING DEVICE; NEW

A. Car shall be equipped with a two-way leveling device to automatically bring the car to within 3 mm (1/8 inch) of exact level with the landing for which a stop is initiated regardless of load in car or direction.

B. If the car stops short or travels beyond the floor, the leveling device, within its zone shall automatically correct this condition and maintain the car within 3 mm (1/8 inch) of level with the floor landing regardless of the load carried.

C. Provide encoded steel tape, **or** steel tape with magnets ~~**or steel vanes with magnetic switches**~~. Submit design for approval.

2.26 EMERGENCY STOP SWITCHES; NEW

A. Provide an emergency stop switch for each top-of-car device, pit, machine spaces, service panel and firefighters' control panel inside the elevator. Mount stop switches in the pit at top of the pit ladder 1220 mm (48 inch) above the bottom landing sill and 1220 mm (48 inch) above the pit floor adjacent to the pit ladder.

B. Each stop switch shall be red in color and shall have "STOP" and "RUN" positions legibly and indelibly identified.

2.27 MAIN CAR OPERATING PANEL; NEW

A. Locate the main car operating panel in the car enclosure on the front return panel for passenger elevator. The top floor car call push button shall not be more than 1220 mm (48 inch) above the finished floor. Car call push buttons and indicator lights shall be round with a minimum diameter of 25 mm (1 inch), LED white light illuminated. NO VANDAL PROOF BUTTONS.

B. One piece front faceplate, with edges beveled 15 degrees, shall have the firefighters' service panel recessed into the upper section and the service operation panel recessed into the lower section, fitted with hinged doors. Doors shall have concealed hinges, be in the same front

plane as the faceplate and fitted with cylinder type key operated locks. Secure the faceplate with stainless steel tamperproof screws.

C. All terminology on the main car operating panel shall be raised or engraved. Use 6 mm (1/4 inch) letters to identify all devices in upper section of the main car operating panel. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 inch) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

D. The upper section shall contain the following items in order listed from top to bottom:

1. Engrave elevator number, 25 mm (1 inch) high with black paint for contrast.
2. Engrave capacity plate information with black paint for contrast with freight loading class and number of passengers allowed.
3. Emergency car lighting system consisting of a rechargeable battery, charger, controls, and LED illuminated light fixture. The system shall automatically provide emergency light in the car upon failure or interruption of the normal car lighting service, and function irrespective of the position of the light control switch in the car. The system shall be capable of maintaining a minimum illumination of 1.0 foot-candle when measured 1220 mm (48 inch)above the car floor and approximately 305 mm (12 inch) in front of the car operating panel, for not less than four (4) hours.
4. LED illuminated digital car position indicator with direction arrows. Digital display floor numbers and direction arrows shall be a minimum of 50mm (2 inch) high.
5. Firefighters’ Emergency Operation Panel shall conform to the requirements of ASME A17.1 Section 2.27. Firefighters’ Panel shall be 1676 mm (66 inch) minimum to 1830 mm (72 inch) maximum to the top of the panel above finished floor.
6. Firefighters’ Emergency Indicator Light shall be round with a minimum diameter of 25 mm (1 inch).
7. Independent Service switch, see Section 2.29 for detailed description.
8. Complete set of round car call push buttons, minimum diameter of 25 mm (1 inch), and LED white light illuminated, corresponding to the

floors served. (GR, 1 and 2 floors) Car call buttons shall be legibly and indelibly identified by a floor number and/or letter not less than 12mm (1/2 inch) high in the face of the call button.

9. Door Open and Door Close buttons shall be located below the car call buttons. They shall have “OPEN” and “CLOSE” legibly and indelibly identified by letters in the face of the respective button. The Door Open button shall be located closest to the door jamb as required by ADA.
   a. Rear Door Open and Rear Door Close buttons shall be located below the Front Door Open and Front Door Close buttons. They shall have “REAR OPEN” and “REAR CLOSE” legibly and indelibly identified by letters in the face of the respective button.
10. Red Emergency Alarm button that shall be located below the car operating buttons. Mount the emergency alarm button not lower than 890 mm (35 inch) above the finished floor. It shall be connected to audible signaling devices as required by A17.1 Rule 2.27.1.2. Provide audible signaling devices including the necessary wiring.
11. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.1 Rule 2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button “HELP” in the face of the button with 12 mm (1/2 inch) high letters.
13. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 inch) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

E. The service operation panel, in the lower section shall contain the following items:
   1. Light switch (toggle) labeled “LIGHTS” for controlling interior car lighting with its two positions marked “ON” and “OFF”.
   2. Inspection switch (toggle) that will disconnect normal operation and activate hoistway access switches at terminal landings. Switch shall be labeled “INSPECTION” with its two positions marked “ON” and “OFF”.

3. Three position (toggle) switch labeled “FAN” with its positions marked “HIGH”, “LOW” and “OFF” for controlling car ventilating blower.
4. Two position, spring return, toggle switch or push button to test the emergency light and alarm device. It shall be labeled “TEST EMERGENCY LIGHT AND ALARM”.
5. Two position emergency stop switch, when operated, shall interrupt power supply and stop the elevator independently of regular operating devices. Emergency stop switch shall be marked “PULL TO STOP” and “PUSH TO RUN”.

2.28 AUXILIARY CAR OPERATING PANEL

A. Provide an auxiliary car operating panel in the rear return panel. The auxiliary car operating panel shall contain only those controls essential to passenger (public) operation. The auxiliary car operating panel faceplate shall match the main car operating panel faceplate in material and general design. Secure the faceplate with stainless steel tamperproof screws.

1. Mount door "OPEN" and door "CLOSE" buttons closest the door jamb and mount the red alarm button no lower than 875 mm (35 inch) above the finished floor. The Door Open button shall be located closest to the door jamb as required by ADA.
2. Complete set of round car call push buttons, minimum diameter 25 mm (1 inch), and LED white light illuminated, corresponding to the floors served. Car call button shall be legibly and indelibly identified by a floor number and/or letter not less than 12 mm (1/2 inch) high in the face of the call button corresponding to the numbers of the main car operating buttons. No vandal proof buttons.
3. Cross-connect all buttons in the auxiliary car operating panel to their corresponding buttons in the main car operating panel. Registration of a car call shall cause the corresponding button to illuminate in the main and auxiliary car operating panel.
4. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.1 Rule 2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button “HELP” in the face of the button with 12 mm (1/2 inch) high letters.

5. Install emergency telephone system in the auxiliary car operating panel.
6. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 inch) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

2.29 INDEPENDENT SERVICE

A. Provide a legibly and indelibly labeled "INDEPENDENT SERVICE", two-position key operated switch on the face of the main car operating panel that shall have its positions marked "ON" and "OFF". When the switch is in the "ON" position, the car shall respond only to calls registered on its car dispatch buttons and shall bypass all calls registered on landing push buttons. The car shall start when a car call is registered, car call button or door close button is pressed, car and hoistway doors are closed, and interlock circuits are made. When switch is returned to "OFF" position, normal service shall be resumed.

2.30 CAR POSITION INDICATOR

A. Provide an alpha-numeric digital car position indicator in the main car operating panel, consisting of numerals and arrows not less than 50 mm (2 inches) high, to indicate position of car and direction of car travel. Locate position indicator at the top of the main car operating panel, illuminated by light emitting diodes.

2.31 AUDIO VOICE SYSTEM

A. Provide digitized audio voice system activated by stopping at a floor. Audio voice shall announce floor designations, direction of travel, and special announcements. The voice announcement system shall be a natural sounding human voice that receives messages and shall comply with ADA requirements for audible car position indicators. The voice announcer shall have two separate volume controls, one for the floor designations and direction of travel, and another for special announcements. The voice announcer shall have a full range loud speaker, located on top of the cab. The audio voice unit shall contain the number of ports necessary to accommodate the number of floors, direction messages, and special announcements. Install voice announcer per manufacturer’s recommendations and instructions. The voice announcer units shall be

the product of a manufacturer of established reputation. Provide manufacturer literature and list of voice messages.

1. Fire Service Message.
2. “Please do not block doors.”
3. Provide special messages as directed by Project Engineer.

2.32 AUTO DIAL TELEPHONE SYSTEM

A. Furnish and install a complete ADA compliant intercommunication system.

B. Provide a two-way communication device in the car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic rollover capability with minimum two numbers.

C. “HELP” button shall illuminate and flash when call is acknowledged. Button shall match floor push button design.

D. Provide “HELP” button tactile symbol engraved signage and Braille adjacent to button mounted integral with car operating panels.

E. The auto dial system shall be located in the auxiliary car operating panel. The speaker and unit shall be mounted on the backside of the perforated stainless steel plate cover.

F. Elevator shall have an individual phone number.

G. If the operator ends the call, the phone shall be able to redial immediately.

2.33 CORRIDOR OPERATING DEVICE FACEPLATES; NEW

A. Fabricate faceplates for elevator operating and signal devices from not less than 3 mm (1/8 inch) thick flat stainless steel with all edges beveled 15 degrees. Install all faceplates flush with surface on which they are mounted.

B. Corridor push button faceplates shall be at least 127 mm (5 inch) wide by 305 mm (12 inch) high or larger to cover existing hole. The centerline of the landing push buttons shall be 1067 mm (42 inch) above the corridor floor.

C. Elevator Corridor Call Station Pictograph shall be engraved in the faceplate.

D. Fasten all car and corridor operating device and signal device faceplates with stainless steel tamperproof screws.

E. Design corridor push button faceplates so that pressure on push buttons shall be independent of pressure on push button contacts.

F. Engraved legends in faceplates shall have lettering 6 mm (1/4 inch) high filled with black paint.

G. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 inch) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

2.34 CORRIDOR OPERATING DEVICES

A. Provide one risers of landing call buttons located on front wall by strike jamb side of door opening in existing boxes.

B. Fixtures for terminal landings shall contain a single "UP" or "DOWN" button and up and down button for intermediate floor.

C. Each button shall contain an integral registration LED white light which shall illuminate upon registration of a call and shall extinguish when that call is answered. NO VANDAL PROOF BUTTONS.

D. The direction of each button shall be legibly and indelibly identified by arrows not less than 12 mm (1/2 inch) high in the face of each button.

E. Landing push buttons shall not re-open the doors while the car and hoistway doors are closing at that floor. Calls registered shall be canceled if closing doors are re-opened by means of "DOOR OPEN" button or infrared curtain unit.

2.35 CORRIDOR POSITION INDICATOR

A. Remove existing hall lantern/hall position indicators. Provide car with combination corridor lantern/position indicator digital display mounted over the hoistway entrances at each and every floor. Provide each terminal landing with "UP" or "DOWN", minimum 64 mm (2-1/2 inch) high digital arrow lanterns. Each lens shall be LED illuminated of proper intensity, so shielded to illuminate individual lens only. The lenses in each lantern shall be illuminated white to indicate "UP" travel and red to indicate "DOWN" travel. Lanterns shall signal in advance of car arrival at the landing indicating the direction of travel whether or not corridor button has been operated at that floor. Hall calls shall receive immediate assignment to elevator and hall lantern shall sound and illuminate. Corridor lanterns shall not be illuminated when a car passes a floor without stopping. Each lantern shall be equipped with a clearly audible electronic chime which shall sound once for "UPWARD"

bound car and twice for "DOWNWARD" bound car. Provide adjustable sound level on audible signal. Car riding lanterns are not acceptable.

B. Provide alpha-numeric digital position indicators directly over hoistway landing entranceways between the arrival lanterns at each and every floor. Indicator faceplate shall be stainless steel. Face plates shall cover any existing hall lantern or hall position hole in wall. Numerals shall be not less than 50 mm (2 inch) high with direction arrows. Cover plates shall be readily removable for re-lamping. The appropriate direction arrow shall be illuminated during entire travel of car in corresponding direction.

C. Provide LED illumination in each compartment to indicate the position and direction the car is traveling by illuminating the proper alpha-numeric symbol. When the car is standing at a landing without direction established, arrows shall not be illuminated.

2.36 HOISTWAY ACCESS SWITCHES

A. Provide hoistway access switches for elevator at top terminal landing to permit access to top of car, and at bottom terminal landing to permit access to pit. May reuse existing hall access switch box for new switches. Elevator with side slide doors, mount the access key switch 1830 mm (6 ft) above the corridor floor in the wall next to the strike jamb. Exposed portions of each access switch or its faceplate shall have legible, indelible legends to indicate "UP", "DOWN", and "OFF" positions. Submit design and location of access switches for approval. Each access switch shall be a constant pressure cylinder type lock having not less than five pins or five stainless steel disc combination with key removable only when switch is in the "OFF" position. Lock shall not be operable by any other key which will operate any other lock or device used for any other purpose in the VA Medical Center. When the car is moved down from the top terminal landing, limit the zone of travel to a distance not greater than the top of the crosshead level with the top floor.

B. Provide emergency access for all hoistway entrances, keyways for elevator.

2.37 HOISTWAY ENTRANCES

A. Reuse existing entrances frames. Clean, sand and repaint existing door frames covering both side of door frame and header entrances.

B. Reuse existing hoistway door sills, door entrance frames, door strut angles and door header. Replace door header tracks (new GAL), rubber bumpers and new stainless steel hoistway doors.

C. Reuse existing sheet steel fascia plates in hoistway that extend vertically from head of hanger support housing to sill above and from floor GR to hoistway ceiling.

D. Provide hoistway entrance with flush two speed side slide hoistway doors. Door panels shall be not less than 16-gauge stainless steel, flush type construction, and not less than 32 mm (1-1/4 inch) thick. Wrap stainless steel around the leading and trailing edges of the door panel. Top and bottom of door panels shall have continuous stiffener channels welded in place. Reinforcement of the door panels shall be approximately 1.0 mm (0.04 inch) in thickness and of the hat section type. At bottom of each and every panel, provide two removable laminated phenolic gibs or other approved material guides and a separate fire gib. Reinforce each door panel for hangers, interlock mechanism, drive assembly, and closer. One door panel for each entrance shall bear a BOCA label, Underwriters' label, or in lieu of this, labels from other accredited test laboratories may be furnished provided they are based on fire test reports and factory inspection procedures acceptable to the COTR. Fasten sight guard of 14-gauge stainless steel, extending full height of panel, to leading edge of fast speed panel of two-speed doors.

E. Provide hangers for hoistway door panels and provide relating devices to transmit motion from one door panel to the other. Fasten the hangers to the door sections. Provide reinforcements at the point of attachment. The hanger shall have provisions for vertical and lateral adjustments. Hang doors on two-point suspension hangers having sealed ball-bearing sheaves not less than 76 mm (3 inch) in diameter, with rubber or non-metallic sound-reducing tires mounted on malleable iron or steel brackets. The hanger sheaves shall operate at a relatively low rotational speed, and shall roll on a high-carbon, cold-rolled or drawn steel track shaped to permit free movement of sheaves without regard to vertical adjustment of sheave, bracket or housing. Beneath the track and each hanger sheave, provide a hardened steel up-thrust roller capable of withstanding a vertical thrust equal to the carrying capacity of adjacent upper sheave. The up-thrust shall have fine

vertical adjustments, and the face of the roller shaped so as to permit free movement of the hanger sheave. The up-thrust roller shall have ball or roller bearings. Provide the hanger sheaves with steel fire stops to prevent disengagement from tracks.

F. Do not use hangers that are constructed integrally with the door panels.

G. Provide raised numerals on cast, rear mounted plates for all openings. Numerals shall be a minimum of 50 mm (2 inch) high, located on each side of entrance frame, with centerline of 1524 mm (5 feet) above the landing sill. The number plates shall contain Braille.

H. Provide unique car number on every elevator entrance at designated main fire service floor level, minimum 76 mm (3 inch) in height.

2.38 ELECTRIC INTERLOCKS; NEW

A. Equip each hoistway door with an interlock, functioning as hoistway unit system, to prevent operation of car until all hoistway doors are locked in closed position. Hoistway door interlocks shall not be accepted unless they meet the requirements of ASME A17.1 Section 2.12.

B. Equip car doors with electric contact that prevents operation of car until doors are closed unless car is operating in leveling zone or hoistway access switch is used. Locate door contact to prevent its being tampered with from inside of car. Car door contact shall not be accepted unless it meets the requirements of ASME A17.1 Section 2.12.

C. Wiring installed from the hoistway riser to each door interlock shall be NEC type SF-2, or equivalent.

1. Type SF-2 cable terminations in the interlock housing shall be sleeved with glass braid fillers or equivalent.

D. Provide devices, either mechanical or electrical, that shall prevent operation of the elevator in event of damaged or defective door equipment that has permitted an independent car or hoistway door panel to remain in the "unclosed" and "unlocked" position.

2.39 CAR FRAME: REUSE EXISTING

A. Car frame shall conform to the requirements of ASME A17.1 Section 2.15, constructed of steel plates and structural shapes securely riveted, bolted, or welded together. Iron casting shall not be permitted. The entire assembly shall be rugged construction, and amply braced to withstand unequal loading of platform. Car frame members shall be constructed to relieve the car enclosure of all strains. Balance car

front to back and side to side. Provide balancing weights and frames, properly located, to achieve the required true balance.

B. Provide a bonding wire between frame and plunger.

2.40 CAR PLATFORM: NEW

A. Construct the car platform to comply with all the requirements of ASME A17.1 Section 2.15.5. The platform shall be designed to withstand the forces developed under the loading conditions specified. Provide car entrances with extruded aluminum sill or better with machined or extruded guide grooves. Cover underside and all exposed edges of wood filled platform with sheet metal of not less than 27-gauge, with all exposed joints and edges folded under. Fire resistant paint is not acceptable. Platform shall have flexible composition flooring not less than 3 mm (1/8 inch) thick. For color of tile, VAMC Project manager **shall** ~~**to**~~ choose color. Adhesive material shall be type recommended by manufacturer of flooring. Lay flooring flush with threshold plate and base.

B. Provide a platform guard (toe guard) that meets the requirements of ASME A17.1 Section 2.15.9, of not less than 12-guage sheet-steel on the entrance side, extend 76 mm (3 inch) beyond each side of entrance jamb. Securely brace platform guard to car platform, and bevel bottom edge at a 60-75 degree angle from horizontal. Install platform in the hoistway, so that the clearance between front edge and landing threshold shall not exceed 32 mm (1-1/4 inch).

C. Isolate the platform from the car frame by approved rubber pads or other equally effective means.

D. Provide adjustable diagonal brace rods to hold platform firmly within car suspension frame.

2.41 CAR ENCLOSURE: NEW

A. Car enclosure shall have a dome height inside the cab of 2440 mm (8 feet).

B. Securely fasten car enclosure to platform by through bolts located at intervals of not more than 457 mm (18 inch) running through an angle at the base of panels to underside of platform. Provide 6 mm (1/4 inch) bolts with nuts and lock washers.

C. Car enclosure base shall be of 14-gauge stainless steel, 152 mm (6 inch) high. Provide straight type base at front return sides. Vertical face of base at sides and rear shall be flush with, or recessed behind

the wainscot directly above the base. There shall be no exposed fastenings in base. Provide natural ventilation openings divided equally between the bottom and top of the car enclosure that shall provide a minimum 3.5 percent of the inside car floor area.

D. Construct canopy of not less than 12-gauge steel. Paint inside cab dome bright white.

E. Car top railings shall meet the requirements of ASME A17.1 Rules 2.14.1.7 and 2.10.2.

F. Front and rear return wall panel, entrance columns, rear corner columns, entrance head-jamb and transom shall be 14-gauge stainless steel full height of car. Side walls from top of base to top of panel shall be constructed of 14-gauge cold rolled steel. Side walls up to 1220 mm (48 inch) above finished floor shall be covered with stainless steel. Side walls from 1220 (48 inch) to the ceiling shall be covered with high pressure plastic laminate. Apply to 13 mm (1/2 inch) plywood/particle board that meets requirements of ASTM E 84, UL 723, or CAN/ULC-S102.2, whichever is applicable. Submit a method of fastening plywood/particle board to steel walls. It shall be flush with the face of the bottom section of the stainless steel. Plastic laminate shall comply with Federal Specification L-P-508, Style Type 1, and Class 1. Color to be determined by Resident Engineer. Interior shall be flush panel construction with angles welded on exterior to insure adequate rigidity. Coat exterior of panels with mastic sound insulation material approximately 2.5 mm (3/32 inch) thick followed by a prime coat of paint. Mastic material shall conform to ASTM E1042.

   1. Smooth and flush all joints with no ragged or broken edges. Plastic laminate shall comply with NEMA LD-3, textured finish, general purpose type, grade designation GP 50, and 0.050 inch thickness, except with a minimum wear resistance of 1200 cycles, and backer sheet, grade designation BK 20, and 0.020 inch thickness.

G. Provide a hinged top emergency exit cover. Exit shall be unobstructed when open and shall have mechanical stops on the cover. Provide a code approved exit switch to prevent operation of the elevator when the emergency exit is open.

H. Provide duplex, GFCI protected type receptacle in car. Locate flush-mounted receptacle on the centerline of the main car operating panel, 150 mm (6 inches) above the car floor.

I. Lighting for passenger elevators:
   1. Provide aluminum hanging ceiling frame. Construct frame of 1/8 in x 1-1/2 inch x 1-1/2 inch “T” and “L” sections, divide ceiling into four panels.
   2. Provide fluorescent (T-8) or LED illuminated car light fixtures above the ceiling panels. Provide 4 sets (2 lights each set), 4 feet long with ballast.

J. Provide a blower unit arranged to exhaust through an opening in the canopy. Provide a stainless or chrome plated fan grill around the opening. Provide 2-speed fan, capable of rated free delivery air displacement of approximately 380 and 700 cfm at respective speeds. Mount fan on top of car with rubber isolation to prevent transmission of vibration to car structure. Provide screening over intake and exhaust end of blower. Provide a 3-position switch to control the unit in service panel.

K. Provide car enclosure with two sets of stainless steel handrails.
   1. 75 mm (3 inch) wide x 9 mm (3/8 inch) thick flatstock located with centerlines 750 mm and 1050 mm (30 inch and 42 inch) above the car floor.
   2. Locate handrails approximately 38 mm (1-1/2 inch) from cab wall. Install handrails on two sides. Curve ends of handrails to walls. Conceal all handrail fastenings. Handrails shall be removable from inside the car enclosure.

L. Provide front and rear car entrance with two-speed side opening horizontal sliding car doors, of same type as hoistway doors. Construct door panels to be flush hollow metal construction, not less than 32 mm (1-1/4 inch) thick, consisting of one continuous piece 16-gauge stainless steel on car side face, leading and trailing edges. Separate two plates by a sound-deadening material, and reinforce by steel shapes welded to the plates at frequent intervals. Reinforce panels as required for installation of hangers, power-operating and door-opening devices. Hang doors on two-point suspension hangers having sealed ball-bearing sheaves not less than 76 mm (3 inch) in diameter, with rubber or non-metallic sound-reducing tires. Equip hangers with adjustable ball-bearing rollers to take upward thrust of panels. Upthrust rollers shall be capable of being locked in position after adjustment to a maximum of 0.38 mm (1/64 inch) clearance. Provide two laminated

phenolic gibs on each door panel. Gibs shall be replaceable without removal of door panel. Provide door drive assembly, restrictor, gate switch, header, track, arms, and all related door hardware.

2.42 POWER DOOR OPERATORS: REUSE EXISTING

A. Reuse existing front and rear door operators to automatically open the car and hoistway doors simultaneously when the car is level with the floor, and automatically close the doors simultaneously at the expiration of the door-open time. The door operator shall be capable of opening a car door and hoistway door simultaneously, at a speed of 0.762 m (2.5 feet) per second. The closing speed of the doors shall be .3 m (1 ft) per second. A reversal of direction of the doors from the closing to opening operation, whether initiated by obstruction of the infrared curtain or the door "OPEN" button, shall be accomplished within 38 mm (1.5 inch) maximum of door movement. Emphasis is placed on obtaining quiet interlock and door operation; smooth, fast, dynamic braking for door reversals, stopping of the door reversal, and stopping of the doors at extremes of travel.

B. The door operator in case of interruption or failure of the electric power from any cause, it shall permit emergency manual operation of the car door and hoistway door from within the car, only in the door zone. Out of door zone, doors are restricted to 100 mm (4 inch) opening.

1. It shall not be possible for the doors to open by power unless the elevator is within the leveling zone.
2. Provide new infrared curtain unit. The device shall cause the car and hoistway doors to reverse automatically to the fully-open position should the unit be actuated while the doors are closing. Unit shall function at all times when the doors are not closed, irrespective of all other operating features. The leading edge of the unit shall have an approved black finish.

C. Should the doors be prevented from closing for more than a predetermined adjustable interval of 20 to 60 seconds by operation of the curtain unit, the doors shall stay open, the audio voice message and a buzzer located on the car shall sound only on automatic operation. **Do not provide door nudging.**

1. If an obstruction of the doors should not activate the photo-electric door control device and prevent the doors from closing for more than a predetermined adjustable interval of 15 to 30 seconds,

the doors shall reverse to the fully open position and remain open until the “Door Close” button re-establishes the closing cycle.

D. Provide door "OPEN" and "CLOSE" buttons. When the door "OPEN" button is pressed and held, the doors, if in the open position, shall remain open and if the doors are closing, they shall stop, reverse and re-open. Momentary pressure of the door "CLOSE" button shall initiate the closing of the doors prior to the expiration of the normal door open time.

PART 3 – EXECUTION

3.1 PREPARATION

A. Examine work of other trades on which the work of this Section depends. Report defects to the Project Engineer in writing which may affect the work of this trade or equipment operation dimensions from site for preparation of shop drawings.

B. Ensure that shafts and openings for moving equipment are plumb, level and in line, and that pit is to proper depth, waterproofed and drained with necessary access doors, ladder and guard.

C. Ensure that machine room is properly illuminated, heated and ventilated, and equipment, foundations, beams correctly located complete with floor and access stairs and door.

D. Before fabrication, take necessary job site measurements, and verify where work is governed by other trades. Check measurement of space for equipment, and means of access for installation and operation. Obtain dimensions from site for preparation of shop drawings.

E. Ensure the following preparatory work, provided under other sections of the specification has been provided. Where applicable, locate controller near and visible to its respective hydraulic pump unit. Work required prior to the completion of the elevator installation by **GENERAL CONTRACTOR.**

1. Supply of electric feeder wires to the terminals of the elevator control panel, including circuit breaker.
2. Provide light and GFCI outlets in the elevator pit and machine room.
3. Furnish electric power for testing and adjusting elevator equipment.
4. Furnish circuit breaker panel in machine room for car and hoistway lights and receptacles.

5. Supply power for cab lighting and ventilation from an emergency power panel specified in Division 26, ELECTRICAL.
6. Machine room enclosed and protected from moisture, with self closing, self locking door and access stairs.
7. Provide fire extinguisher in machine room.

3.2 SPACE CONDITIONS

A. Attention is called to overhead clearance, pit clearances, overall space in machine room, and construction conditions at building site in connection with elevator work. Addition or revision of space requirements, or construction changes that may be required for the complete installation of the elevator must be arranged for and obtained by the Contractor, subject to approval by Project Engineer. Include cost of changes in bid that become a part of the contract. Provide proper, code legal installation of equipment, including all construction, accessories and devices in connecting with elevator, mechanical and electrical work specified.

B. GENERAL CONTRACTOR. Where concrete beams, floor slabs or other building construction protrude more than 100 mm (4 inch) into hoistway; bevel all top surfaces of projections to an angle of 75 degrees with the horizontal.

3.3 INSTALLATION

A. Perform work with competent Certified Elevator Mechanics and Apprentices skilled in this work and under the direct supervision of the Elevator Contractor’s experienced foreman.

B. Install machinery, guides, controls, car and all equipment and accessories in accordance with manufacturer's instructions, applicable codes and standards.

C. Isolate and dampen machine vibration with properly sized sound-reducing anti-vibration pads.

3.4 ARRANGEMENT OF EQUIPMENT

A. Clearance around elevator, mechanical and electrical equipment shall comply with applicable provisions of NEC. Arrange equipment in machine room so that major equipment components can be removed for repair or replacement without dismantling or removing other equipment in the same machine room. Locate controller near and visible to its respective hydraulic pump unit.

3.5 WORKMANSHIP AND PROTECTION

A. Installations shall be performed by Certified Elevator Mechanics and Apprentices to best possible industry standards. Details of the installation shall be mechanically and electrically correct. Materials and equipment shall be new and without imperfections.

B. Recesses, cutouts, slots, holes, patching, grouting, refinishing to accommodate installation of equipment shall be included in the Contractor's work. All new holes in concrete shall be core drilled.

C. Structural members shall not be cut or altered. Work in place that is damaged or defaced shall be restored equal to original condition.

D. Finished work shall be straight, plumb, level, and square with smooth surfaces and lines. All machinery and equipment shall be protected against dirt, water, or mechanical injury. At final completion, all work shall be thoroughly cleaned and delivered in perfect unblemished condition.

E. Sleeves for conduit and other small holes shall project 50 mm (2 inch) above concrete slabs.

F. Exposed gears, sprockets, and sheaves shall be guarded from accidental contact in accordance with ASME A17.1 Section 2.10.

3.6 CLEANING

A. Clean machine room and equipment.

B. Perform hoistway clean down.

C. Prior to final acceptance, remove protective covering from finished or ornamental surfaces. Clean and polish surfaces with regard to type of material.

3.7 PAINTING AND FINISHING

A. Hydraulic pump assembly shall be factory painted with manufacturer's standard finish and color.

B. Controllers, car frames and platforms, beams, rails and buffers, except their machined surfaces, cams, brackets and all other uncoated ferrous metal items shall be painted one factory priming coat or approved equal.

C. Upon completion of installation and prior to final inspection, all equipment shall be thoroughly cleaned of grease, oil, cement, plaster and other debris. All equipment, except that otherwise specified as to architectural finish, shall then be given two coats of paint of approved color, conforming to manufacturer's standard.

D. Stencil or apply decal floor designations not less than 100 mm (4 inch) high on hoistway doors, fascias or walls within door restrictor areas as required by ASME A17.1 Rule 2.29.2. The color of paint used shall contrast with the color of the surfaces to which it is applied.

E. Elevator pump units, controllers, main line shunt trip circuit breakers, bolster channels, and cross heads of cars shall be identified by 100 mm (4 inch) high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be stenciled or decaled.

F. Hoistway Entrances of Passenger Elevators:
   1. Door panels shall be parkerized or given equivalent rust resistant treatment and a factory finish of one coat of baked-on primer and one factory finish coat of baked-on enamel.
   2. Fascia plates, top and bottom shear guards, dust covers, hanger covers, and other metalwork, including built-in or hidden work and structural metal, shall be given one approved prime coat in the shop, and one field coat of paint of approved color.

G. Elevator Cabs for Passenger Elevators:
   1. Interior and exterior steel surfaces shall be parkerized or given equivalent rust resistant treatment before finish is applied.
   2. Interior steel surfaces shall be factory finished with one coat of baked on enamel or proxylin lacquer. Color to be determined by Resident Engineer.
   3. Give exterior faces of car doors one finish coat of paint of medium gray color.

3.8 PRE-TESTS AND TESTS

A. Pre-test the elevators and related equipment in the presence of the Project Engineer or his authorized representative for proper operation before requesting final inspection. Conduct final inspection at other than normal working hours, if required by Project Engineer.
   1. Procedure outlined in the Inspectors Manual for Hydraulic Elevators, ASME A17.2 shall apply.
      a. Final test shall be conducted in the presence of and witnessed by an ASME QEI-1 Certified Elevator Inspector.
      b. Government shall furnish electric power including necessary current for starting, testing, and operating machinery of each elevator.

2. Contractor shall furnish the following test instruments and materials on-site and at the designated time of inspection: properly marked test weights, oil pressure gauge, voltmeter, amp probe, thermometers, direct reading tachometer, megohm meter, vibration meter, sound meter, light meter, stop watch, and a means of two-way communication.
3. If during the inspection process the Inspector determines the need, the following instruments shall be available within a four-hour period: Megohm meter, vibration meter, sound meter, and a light meter.

B. Inspection of workmanship, equipment furnished, and installation for compliance with specification.

C. Full-Load Run Test: Elevators shall be tested for a period of one hour continuous run with full contract load in the car. The test run shall consist of the elevator stopping at all floors, in either direction of travel, for not less than five or more than ten seconds per floor.

D. Speed Test: The actual speed of the elevator shall be determined in both directions of travel with full contract load and no load in the elevator. Speed shall be determined by certified tachometer. The actual measured speed of the elevator with all loads in either direction shall be within five (5) percent of specified rated speed. Full speed runs shall be quiet and free from vibration and sway.

E. Temperature Rise Test: The temperature rise of the pump motor shall be determined during the full load test run. Temperatures shall be measured by the use of thermometers. Under these conditions, the temperature rise of the equipment shall not exceed 50 degrees Centigrade above ambient temperature. Test shall start when all machine room equipment is within 5 degrees Centigrade of the ambient temperature. Other tests for heat runs on motors shall be performed as prescribed by the Institute of Electrical and Electronic Engineers.

F. Car Leveling Test: Elevator car leveling devices shall be tested for accuracy of leveling at all floors with no load in car and with contract load in car in both directions of travel. Accuracy of floor level shall be within plus or minus 3 mm (1/8 inch) of level with any landing floor for which the stop has been initiated regardless of load in car or direction of travel. The car leveling device shall automatically correct over travel as well as under travel and shall

maintain the car floor within plus or minus 3 mm (1/8 inch) of level with the landing floor regardless of change in load.

G. The amp readings of the car in the up direction with full load shall not exceed the amp readings on the elevator motor.

H. Insulation Resistance Test: The elevator's complete wiring system shall be free from short circuits and ground faults and the insulation resistance of the system shall be determined by use of megohm meter, at the discretion of the Elevator Inspector conducting the test.

I. Safety Devices Tests: Safety devices shall be tested as required by ASME A17.1 Section 8.10.

J. Overload Devices: Test all overload current protection devices in the system at final inspection.

K. Limit Stops:

1. The position of the car when stopped by each of the normal limit stops with no load and with contract load in the car shall be accurately measured.
2. Final position of the elevator relative to the terminal landings shall be determined when the elevator has been stopped by the final limits. The lower limit stop shall be made with contract load in the elevator. Elevator shall be operated at inspection speed for both tests. Normal limit stopping devices shall be inoperative for the tests.

L. Working Pressure: Verify working pressure of the hydraulic system by pressure gauge placed in the system line. Take readings with no load and full load in car.

M. Setting of Car Door Contacts: The position of the car door at which the elevator may be started shall be measured. The distance from full closure shall not exceed that required by ASME A17.1. The test shall be made with the hoistway doors closed or the hoistway door contact inoperative.

N. Setting of Interlocks: The position of the hoistway door at which the elevator may be started shall be measured and shall not exceed ASME A17.1 requirements.

O. Operating and Signal System: The elevator shall be operated by the operating devices provided and the operation signals and automatic floor leveling shall function in accordance with requirements

specified. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration or deceleration.

P. Performance of the Elevator supervisory system shall be witnessed and approved by the representative of the Project Engineer.

Q. Evidence of malfunction in any tested system or parts of equipment that occurs during the testing shall be corrected, repaired, or replaced at no additional cost to the Government, and the test repeated.

R. If equipment fails test requirements and a re-inspection is required, the Contractor shall be responsible for the cost of re-inspection; salaries, transportation expenses, and per-diem expenses incurred by the representative of the Project Engineer.

3.9 INSTRUCTION OF VA PERSONNEL

A. Provide competent instruction to VA personnel regarding the operation of equipment and accessories installed under this contract, for a period of 4 hours. Instruction shall commence after completion of all work and at the time and place directed by the Project Engineer.

B. Written instructions in triplicate relative to care, adjustments and operation of all equipment and accessories shall be furnished and delivered to the Project Engineer in independently bound folders. DVD recordings will also be acceptable. Written instructions shall include correct and legible wiring diagrams, nomenclature sheet of all electrical apparatus including location of each device, complete and comprehensive sequence of operation, complete replacement parts list with descriptive literature, and identification and diagrammatic cuts of equipment and parts. Information shall also include electrical operation characteristics of all circuits, relays, timers, and electronic devices, as well as R.P.M. values and related characteristics for all rotating equipment.

C. Provide supplementary instruction for any new equipment that may become necessary because of changes, modifications or replacement of equipment or operation under requirements of paragraph entitled "Warranty of Construction".

3.10 INSPECTIONS AND SERVICE: GUARANTEE PERIOD OF SERVICE

A. Furnish complete inspection and maintenance service on entire elevator installation for a period of one (1) year after completion and acceptance of all the elevators in this project by the Project Engineer. This maintenance service shall run concurrently with the

warranty. Maintenance work shall be performed by Certified Elevator Mechanic and Apprentices employed and supervised by the company that is providing guaranteed period of service on the elevator equipment specified herein.

B. This contract will cover full maintenance including emergency call back service, inspections and servicing the elevators listed in the schedule of elevator. The Elevator Contractor shall be required to perform the following:
   1. Bi-weekly systematic examination of equipment.
   2. During each maintenance visit the Elevator Contractor shall clean, lubricate, adjust, repair and replace all parts as necessary to keep the equipment in first class condition and proper working order.
   3. Furnishing all lubricant, cleaning materials, parts and tools necessary to perform the work required. Lubricants shall be only those products recommended by the manufacturer of the equipment.
   4. As required, motor, controller, selector, leveling device, operating devices, switches on cars and in hoistway, hoistway doors and car doors or gate operating device, interlock contacts, guide shoes, guide rails, car door sills, hangers for doors, car doors or gates, and signal system shall be cleaned, lubricated and adjusted.
   5. Guide rails and bottom of platforms shall be cleaned every three months. Car top and machine room floors shall be cleaned monthly. Accumulated rubbish shall be removed from the pit monthly. A general cleaning of the entire installation including all machine room equipment and hoistway equipment shall be accomplished quarterly. Cleaning supplies and vacuum cleaner shall be furnished by the Contractor.
   6. Maintain the performance standards set forth in this specification.
   7. The operational system shall be maintained to the standards specified hereinafter including any changes or adjustments required to meet varying conditions of hospital occupancy.
   8. Maintain smooth starting and stopping and accurate leveling at all times.

C. Maintenance service shall not include the performance of work required as a result of improper use, accidents, and negligence for which the Elevator Contractor is not directly responsible.

D. Provide 24 hour emergency call-back service that shall consist of promptly responding to calls within two hours for emergency service should a shutdown or emergency develop between regular examinations. One hour for trap call. Overtime emergency call-back service shall be limited to minor adjustments and repairs required to protect the immediate safety of the equipment and persons in and about the elevator.

E. Service and emergency personnel shall report to the Project Engineer or his authorized representative upon arrival at the hospital and again upon completion of the required work. A copy of the work ticket containing a complete description of the work performed shall be given to the Project Engineer.

F. The Elevator Contractor shall maintain a log book in the machine room. The log shall list the date and time of all bi-weekly examinations and all trouble calls. Each trouble call shall be fully described including the nature of the call, necessary correction performed or parts replaced.

G. Written “Maintenance Control Program” shall be in place to maintain the equipment in compliance with ASME A17.1 Section 8.6.

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