BUILDING 700 OR HVAC RETROFIT

PROJECT: 612A4-13-301

HilliardArchitects.com
415 989-6400
1330 BROADWAY, SUITE 1111
Oakland, CA 94612

FINAL BID DOCUMENTS

SYMBOLS

- GRID LINE
- DEMOLISHED WALL
- ONE HOUR RATED WALL
- TWO HOUR RATED WALL
- NEW WALL
- CONSTRUCTION BARRIER
- 4' - 0" 2' - 0" DIMENSION LINES (TO FACE OF STUD U.O.N.)
- CENTERLINE OF COLUMN OR STUD, ETC.
- AREAS OF NO WORK
- ROOM NAME / C000 — ROOM NAME, ROOM NUMBER
- 0' 1' 2' 4' GRAPHIC SCALE

DETAIL INDICATOR

- 01 / 8-10 / 01 — DETAIL, REFERENCE DRAWING NUMBER

ELEVATION INDICATOR, EXTERIOR

- 01 / 5-10 — REFERENCE DRAWING NUMBER

ELEVATION INDICATOR, INTERIOR

- 01 / 02 / 03 / 04 / 5-10 — REFERENCE DRAWING NUMBER

BUILDING SECTION INDICATOR

- 01 / 3-10 — SECTION IDENTIFICATION, REFERENCE DRAWING NUMBER
- T.O. FEATURE X'-X" — ELEVATION MARKER
- NORTH — NORTH ARROW
- EXTERIOR ELEVATION IDENTIFICATION
- WORK POINT OR CONTROL POINT
- 1 — REVISION (AREA OF REVISION IN CLOUD)

MATERIALS

- BATT INSULATION
- RIGID INSULATION
- CONCRETE
- STAINLESS STEEL
- WOOD
- GYP. BOARD

DRAWING INDEX

GENERAL

.G0.00	GRAPHIC COVER SHEET
.G0.02	TITLE SHEET
.G0.03	ABBREVIATIONS

ARCHITECTURAL

AS1.52	NEW WORK PLAN
AS1.53	LEVEL 6 ROOF
AS2.11	EXTERIOR ELEVATIONS - NORTH
AS5.11	EXTERIOR WALL DETAILS
AS5.21	ROOF DETAILS

STRUCTURAL

S1.1	GENERAL NOTES
S2.1	ROOF FRAMING PLAN
S3.1	SECTIONS
S5.1	DETAILS

MECHANICAL

M-001	MECHANICAL HVAC LEGEND, SYMBOLS AND ABBREVIATIONS
MS-001	MECHANICAL HVAC OVERALL SITE PLAN
700-MD-106	MECHANICAL DEMOLITION PLAN - BLDG 700 - ROOF
700-MH-101	MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 1
700-MH-102	MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 2
700-MH-105	MECHANICAL HVAC NEW WORK PLAN - BLDG 700- LEVEL 5
700-MH-106	MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - ROOF
700-MP-106	MECHANICAL PIPING NEW WORK PLAN - BLDG - 700 ROOF
700-MH-601	MECHANICAL HVAC DIAGRAM - BLDG 700
700-MH-602	MECHANICAL PIPING DIAGRAM - BLDG 700
MH-311	MECHANICAL HVAC SECTIONS - BLDG 700
MI-411	MECHANICAL HVAC CONTROLS DIAGRAM - BLDG 700
MI-412	MECHANICAL HVAC POINTS LIST - BLDG 700
MH-510	MECHANICAL HVAC EQUIPMENT SCHEDULES
MH-511	MECHANICAL HVAC DETAILS - BLDG 700
MH-512	MECHANICAL HVAC DETAILS - BLDG 700
MH-513	MECHANICAL HVAC DETAILS - BLDG 707

ELECTRICAL

E-001	ELECTRICAL LEGENDS NOTES AND ABBREVIATIONS
700-ED-106	ELECTRICAL DEMOLITION PLAN - ROOF LEVEL
ED-501	ELECTRICAL POWER SINGLE LINE DIAGRAM - DEMOLITION
700-EP-106	ELECTRICAL POWER PLAN - ROOF LEVEL
E-501	ELECTRICAL POWER SINGLE LINE DIAGRAM
E-601	ELECTRICAL DETAILS

CONTACTS

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PROJECT DESCRIPTION

THE REPLACEMENT OF AIR HANDLING UNIT AHU-4 ON THE ROOF OF HOSPITAL BUILDING 700 WILL ADD MUCH NEEDED AIRFLOW CAPACITY TO BUILDING 700. IT WILL PROVIDE SPARE AIRFLOW CAPACITY TO ACCOMMODATE FUTURE CONVERSION OF OPERATING ROOM OR #3 INTO A HYBRID OR, AS WELL AS, AIRFLOW CAPACITY FOR FUTURE ADDITION OF TWO CATH LABS AND ASSOCIATED SUPPORT SPACES ON THE FIRST FLOOR. IT WILL CORRECT EXCESSIVELY HIGH STATIC PRESSURE LOSS PROBLEMS IN EXISTING SUPPLY DUCT RISERS SERVING THE SECOND FLOOR.

IT WILL REPLACE THE EXISTING CONSTANT AIR VOLUME 100% OUTSIDE AIR UNIT WITH A NEW 100% OUTSIDE AIR UNIT OF THE CORRECT SIZE AND CAPACITY WITH AIR-TO-AIR HEAT EXCHANGER TO RECOVER ENERGY FROM THE EXHAUST AIR STREAM OF THE CORRECT SIZE AND CAPACITY.

A MAJORITY OF WORK WILL BE PERFORMED ON THE ROOF/SIXTH FLOOR, WHERE THE EXISTING AHU4 WILL BE DEMOLISHED AND REPLACED WITH A LARGER AHU. THIS AHU WILL REQUIRE LARGER DUCT SIZES TO ACCOMMODATE THE INCREASED AIRFLOW. DUE TO LIMITED SPACE ON THE ROOF, ALL NEW DUCTWORK WILL BE ELEVATED ABOVE THE EXISTING ROOF EQUIPMENT VIA A NEW STRUCTURAL FRAMEWORK SYSTEM.

MAIN RISERS FOR SUPPLY AND EXHAUST AIR WILL BE INSTALLED ON THE NORTH EXTERIOR WALL, WITH TWO SUPPLY DUCTS TERMINATING AT THE EXTERIOR WALL OF THE SECOND FLOOR CEILING AND ONE PAIR OF SUPPLY & EXHAUST DUCTS TERMINATING AT THE FIRST FLOOR ROOF. OTHER PROJECTS CURRENTLY IN DESIGN WILL BE RESPONSIBLE FOR BRINGING THE DUCTWORK INTO THE INTERIOR OF THE BUILDING.

APPLICABLE CODES & STANDARDS

TYPE OF CONSTRUCTION:	TYPE II
OCCUPANCY CLASSIFICATION:	GROUP I AND B
BUILDING HEIGHT:	5 FLOORS AND MECH. PENTHOUSE
DATE OF CONSTRUCTION:	2000
SPRINKLERS:	FULLY SPRINKLERED

ALL CODE EDITIONS SHALL BE THE CURRENT CODE YEAR IN FORCE FOR THE STATE OF CALIFORNIA. WHERE CODES CONFLICT, THE MOST STRINGENT STANDARD WILL APPLY

VA DIRECTIVES, DESIGN MANUALS, MASTER SPECIFICATIONS, VA NATIONAL CAD STANDARD APPLICATION GUIDE, AND OTHER GUIDANCE ON THE TECHNICAL INFORMATION LIBRARY (TIL)

PHYSICAL SECURITY DESIGN MANUAL: MISSION CRITICAL FACILITIES

INTERNATIONAL BUILDING CODE 2015

NFPA 101 LIFE SAFETY CODE

NFPA NATIONAL FIRE CODES WITH THE EXCEPTION OF NFPA 5000 AND NFPA 900

OCCUPATIONAL, SAFETY AND HEALTH ADMINISTRATION STANDARDS (OSHA)

VA SEISMIC DESIGN REQUIREMENTS, H-18-8

NATIONAL ELECTRIC CODE 2011

NATIONAL STANDARD PLUMBING CODE

ASME BOILER AND PRESSURE VESSEL CODE

ASME CODE FOR PRESSURE PIPING

2010 ADA STANDARDS FOR ACCESSIBLE DESIGN, INCLUDING VA SUPPLIMENT, BARRIER FREE DESIGN GUIDE (VA PG 18-13), AND ARCHITECTURAL BARRIERS ACCESSIBILITY STANDARDS (ABAAS)

BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, AMERICAN CONCRETE INSTITUTE AND COMMENTARY (ACI 318)

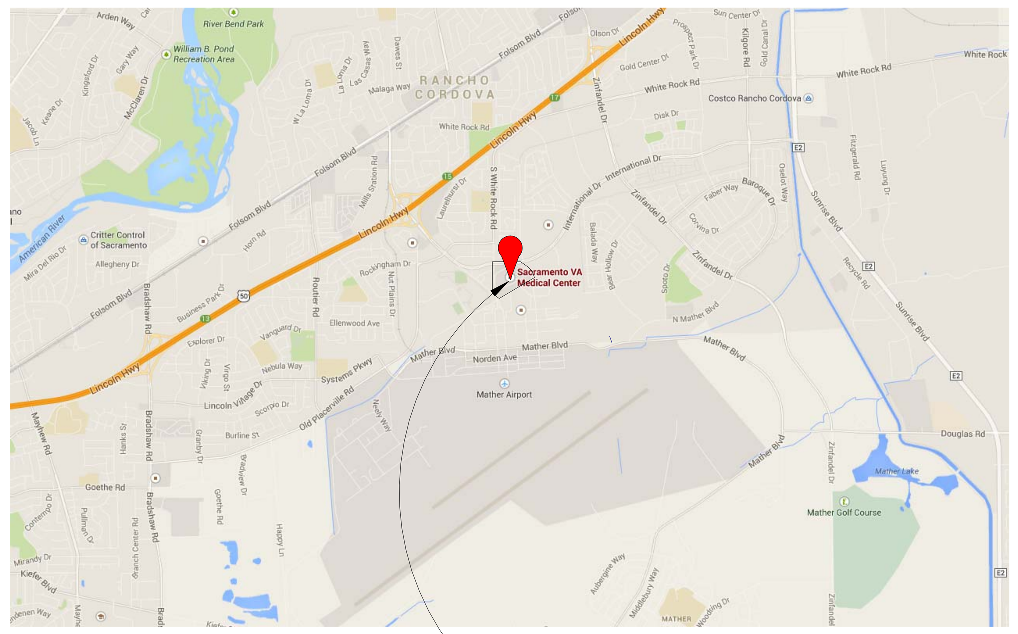
MANUAL OF STEEL CONSTRUCTION, LOAD AND RESISTANCE FACTOR DESIGN SPECIFICATIONS FOR STRUCTURAL STEEL BUILDING, AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

ENERGY POLICY ACT OF 2005 (EPAct)

FEDERAL LEADERSHIP IN HIGH PERFORMANCE AND SUSTAINABLE BUILDINGS: MEMORANDUM OF UNDERSTANDING (MOU)

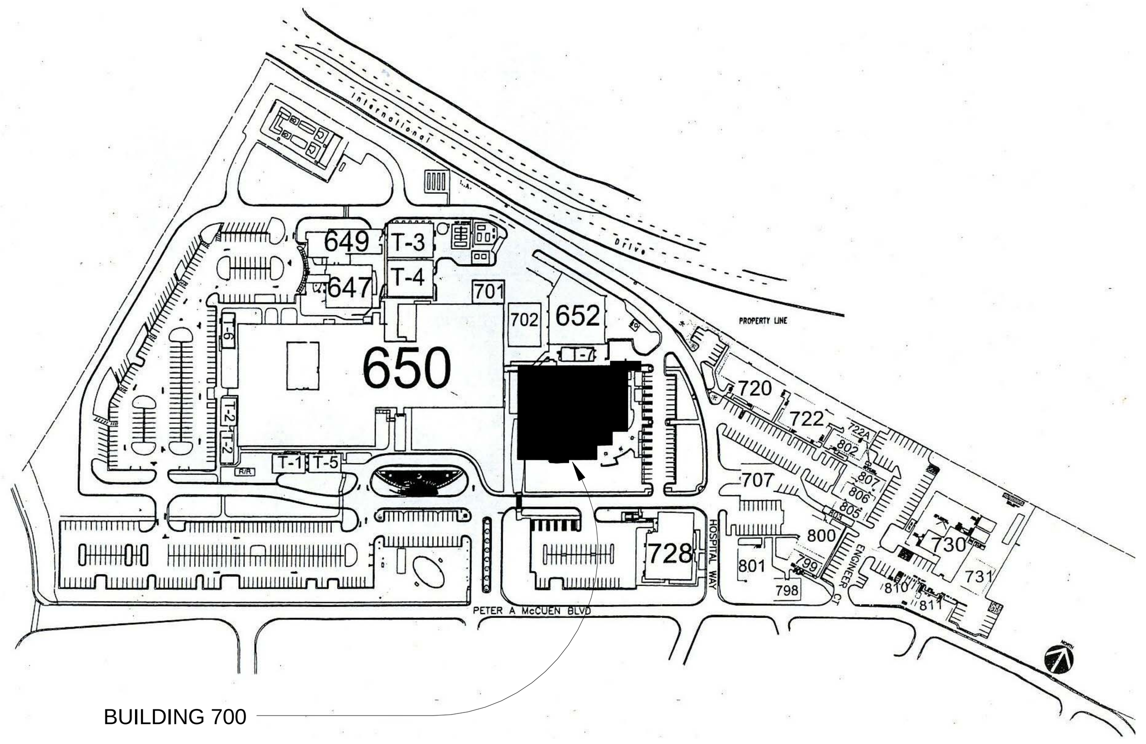
VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY - ASHRAE STANDARD 62.1 - 2013

SAFETY STANDARD FOR REFRIGERATION SYSTEMS - ASHRAE STANDARD 15 - 2013



VA NOTHERN CALIFORNIA HEALTHCARE SYSTEM
10535 HOSPITAL WAY
MATHER, CA 95655

VICINITY MAP



BUILDING 700

CAMPUS MAP

FINAL BID DOCUMENTS

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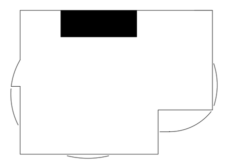

KEY PLAN

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Drawing Title	TITLE SHEET
Approved: Project Director	
Project Title	BUILDING 700 OR HVAC RETROFIT
Location	VA MATHER
Date	4/03/2015
Checked	KT
Drawn	PLP
Project Number	612A4-13-301
Building Number	700
Drawing Number	.G0.02
Dwg.	of

Office of Construction and Facilities Management

Department of Veterans Affairs

A

A — LABEL CLASS A DOOR
A/C — AIR CONDITION
A/C UNIT — AIR CONDITIONING UNIT
A/E — ARCHITECT/ENGINEER
AAMA — AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION
AB — ANCHOR BOLT
ABC — AGGREGATE BASE COURSE
ABV — ABOVE
AC — ASBESTOS CEMENT OR ASPHALTIC CONCRETE
ACI — AMERICAN CONCRETE INSTITUTE
ACOUS — ACOUSTICAL
ACS DR — ACCESS DOOR
ACS FLR — ACCESS FLOOR
ACS PNL — ACCESS PANEL
ACST — ACOUSTIC
ACT — ACOUSTIC CEILING TILE
ACT — ACOUSTICAL CEILING TILE
AD — AREA DRAIN
ADA — AMERICANS WITH DISABILITIES ACT
ADB — AUTOMATIC DOOR BOTTOM
ADC — AUTOMATIC DOOR CLOSER
ADDL — ADDITIONAL
ADDN — ADDITION
ADH — ADHESIVE
ADJ — ADJACENT, ADJOINING, OR ADJUSTABLE
ADMIN — ADMINISTRATION
AFC — ABOVE FINISHED COUNTER
AFF — ABOVE FINISHED FLOOR
AFG — ABOVE FINISHED GRADE
AFS — ABOVE FINISHED SLAB
AGA — AMERICAN GAS ASSOCIATION
AGC — ASSOCIATED GENERAL CONTRACTORS
AGGR — AGGREGATE
AHJ — AUTHORITY HAVING JURISDICTION
AHR — ANCHOR
AHU — AIR HANDLING UNIT
AI — ASQUISITION AND INSTALLATION
AIA — AMERICAN INSTITUTE OF ARCHITECTS
AISC — AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AL/ALUM — ALUMINUM
ALT — ALTERNATE
ALT NO — ALTERNATE NUMBER
AMP — AMPERE
AMT — AMOUNT
ANOD — ANODIZE
ANSI — AMERICAN NATIONAL STANDARDS INSTITUTE
ANT — ANTENNA
APA — AMERICAN PLYWOOD ASSOCIATION
APPD — APPROVED
APPROX — APPROXIMATE
APT — APARTMENT
AR — AS REQUIRED
ARCH — ARCHITECT(URAL)
ASB — ASBESTOS
ASI — ARCHITECT'S SUPPLEMENTAL INSTRUCTION
ASKLR — AUTOMATIC SPRINKLER
ASPH — ASPHALT
ASSN — ASSOCIATION
ASTM — AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATCH — ATTACHMENT
ATM — AUTOMATIC TELLER MACHINE
ATS — AUTOMATIC TRANSFER SWITCH
AUTO — AUTOMATIC
AUX — AUXILIARY
AV — AUDIO VISUAL
AVE — AVENUE
AVG — AVERAGE
AW — ACID WASTE
AWI — ARCHITECTURAL WOODWORKING INSTITUTE
AWPA — AMERICAN WOOD PRESERVERS' ASSOCIATION
AWS — AMERICAN WELDING SOCIETY
AWT — ACOUSTICAL WALL TREATMENT

B

B — LABEL CLASS B DOOR
B PL — BASE PLATE
BALC — BALCONY
BAT — BATTEN
BB — BULLETIN BOARD
BD — BOARD
BD FT — BOARD FEET (FOOT)
BEV — BEVEL
BHMA — BUILDER'S HARDWARE MANUFACTURER'S ASSOCIATION
BI FLD DR — BIFOLDING DOORS
BITUM — BITUMINOUS
BKG — BACKING
BLD — BUILD
BLDG — BUILDING
BLK. — BLOCK
BLKG — BLOCKING
BLKT — BLANKET
BLVD — BOULEVARD
BM — BENCH MARK
BM — BEAM OR BENCHMARK
BO — BOTTOM OF
BOT — BOTTOM
BR — BEDROOM
BRCG — BRACING
BRDG JST — BRIDGING JOIST
BRG — BEARING
BRG PL — BEARING PLATE
BRKT — BRACKET
BRZ — BRONZE
BSMT — BASEMENT
BTWN — BETWEEN
BU — BUSHEL
BUR — BUILT-UP ROOFING

C

C — CELSIUS OR CHANNEL
C — LABEL CLASS C DOOR
C CONC — CAST CONCRETE
C TO C — CENTER TO CENTER
CAB — CABINET
CAC — CEILING ATTENUATION CLASS
CANT — CANTILEVER
CB — CATCH BASIN OR CORNER BEAD
CBB — CEMENTITIOUS (BACKER) BOARD
CC — CONTRACTOR FURNISHED AND INSTALLED
CC — CUBIC CENTIMETER
CCTV — CLOSED CIRCUIT TELEVISION
CCW — COUNTERCLOCKWISE
CD — CONSTRUCTION DOCUMENTS OR CONTRACT DOCUMENTS
CEM — CEMENT(ITIOUS)
CEM PLAS — CEMENT PLASTER
CER — CERAMIC
CF — CONTRACTOR FURNISHED
CF/CI — CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CF/OI — CONTRACTOR FURNISHED/OWNER INSTALLED
CFLG — COUNTERFLASHING
CFM — CUBIC FEET PER MINUTE
CFMF — COLD-FORMED METAL FRAMING
CFS — CUBIC FEET PER SECOND
CG — CENTER OF GRAVITY OR CORNER GUARD
CGSFU — CERAMIC GLAZED STRUCTURAL FACING UNITS
CH BD — CHALKBOARD
CHEM — CHEMICAL
CHFR — CHAMFER
CHK — CHECK
CI — CAST IRON
CIP — CAST-IN-PLACE
CIR — CIRCLE
CIRC — CIRCULAR
CJ — CONSTRUCTION JOINT OR CONTROL JOINT
CL — CENTER LINE
CLDG — CLADDING
CLG — CEILING
CLG HT — CEILING HEIGHT
CLKG — CAULKING
CLO — CLOSET
CLR — CLEAR
CM — CONSTRUCTION MANAGEMENT
cm² — SQUARE CENTIMETER
cm³ — CUBIC CENTIMETER
CMU — CONCRETE MASONRY UNIT
CNR — CORNER
CNTR — COUNTER
CO — CARBON MONOXIDE, CERTIFICATE OF OCCUPANCY, CLEANOUT, CASED OPENING,OR COMPANY
CO2 — CARBON DIOXIDE
COL — COLUMN
COM — COMMON
COMB — COMBINATION, COMBINED
COMM — COMMUNICATION
COMP — COMPONENT
CONC — CONCRETE
CONC FLR — CONCRETE FLOOR
COND — CONDENSER OR CONDITION
CONF — CONFERENCE
CONN — CONNECT
CONSTR — CONSTRUCTION
CONT — CONTINUOUS
CONTR — CONTRACTOR
COORD — COORDINATE
CORR — CORRIDOR
CPM — CRITICAL PATH METHOD
CPRS — COMPRESSIBLE
CPT — CARPET
CRS — COLD ROLLED STEEL
CRSI — CONCRETE REINFORCING STEEL INSTITUTE
CSB — CONCRETE SPLASH BLOCK
CSG — CASING
CSI — CONSTRUCTION SPECIFICATIONS INSTITUTE
CSK — COUNTER SUNK
CSMT — CASEMENT
CSWK — CASEWORK
CT — CERAMIC TILE
CTB — CERAMIC TILE BASE
CTF — CERAMIC TILE FLOOR
CTG — COATING
CTR — CENTER
CTR — CENTER CONTOUR
CTRL — CONTROL
CTV — CABLE TELEVISION
CU — COPPER C
CU FT — CUBIC FEET
CU IN — CUBIC INCH
CUB YD — CUBIC YARD
CURT — CURTAIN
CYL — CYLINDER
CYL L — CYLINDER LOCK

D

D — DEPTH OR PENNY (NAIL)
D — LABEL CLASS D DOOR
DAT — DATUM
DB — DECIBEL
DBL — DOUBLE
DBL GLZ — DOUBLE GLAZE
DC — DIRECT CURRENT
DEG — DEGREE
DEL — DELETE
DEMO — DEMOLITION
DEPT — DEPARTMENT
DET — DETAIL
DF — DRINKING FOUNTAIN
DIA — DIAMETER
DIAG — DIAGONAL OR DIAGRAM
DIFF — DIFFERENCE OR DIFFUSER
DIM — DIMENSION
DIR — DIRECTION
DISP — DISPENSER
DIST — DISTANCE
DIV — DIVIDE OR DIVISION
DL — DEAD LOAD
DN — DOWN
DOC — DOCUMENT
DOUG FIR — DOUGLAS FIR
DOZ — DOZEN
DR — DOOR, DRAIN, DRESSING ROOM, OR DRIVE
DR CL — DOOR CLOSER
DR FR — DOOR FRAME
DR OPNG — DOOR OPENING
DS — DOWNSPOUT
DSGN — DESIGN
DSP — DRY DOWN SPOUT
DW — DISHWASHER
DWG — DRAWING
DWR — DRAWER
DWTR — DUMBWAITER

E

E — EAST
E — LABEL CLASS E DOOR
EA — EACH
EFF — EFFICIENCY
EFS — EXTERIOR FINISH SYSTEM
EIFS — EXTERIOR INSULATION AND FINISH SYSTEM
EJ — EXPANSION JOINT
EL — ELEVATION
ELAST — ELASTOMERIC
ELEC — ELECTRIC(AL)
ELEC DR OP — ELECTRIC DOOR OPENER
ELEV — ELEVATOR
EMER — EMERGENCY
EMER SHR — EMERGENCY SHOWER
ENCL — ENCLOSURE
ENGR — ENGINEER
ENVIR — ENVIRONMENT
EP — ELECTRICAL PANEL
EPA — ENVIRONMENTAL PROTECTION AGENCY
EPDM — ETHYLENE PROPYLENE DIENE MONOMER
EPO — EMERGENCY POWER OFF
EPS — EXPANDED POLYSTYRENE BOARD (INSULATION)
EQ — EQUAL
EQL SP — EQUALLY SPACED
EQUIP — EQUIPMENT
EQUIV — EQUIVALENT
ERD — EXISTING ROOF DRAIN
ESC — ESCAPE OR ESCUTCHEON
ESCAL — ESCALATOR
ESMT — EASEMENT
ESP — ESPECIALLY
EST — ESTIMATE
ETC — AND SO FORTH OR ET CETERA
EW — EACH WAY
EWC — ELECTRIC WATER COOLER
EWS — EYE WASH STATION
EXH — EXHAUST
EXIST — EXISTING
EXP — EXPANSION
EXP BT — EXPANSION BOLT
EXPO — EXPOSED
EXST GR — EXISTING GRADE
EXT — EXTERIOR, EXTERNAL, OR EXTINGUISHER
EXT GR — EXTERIOR GRADE

F

F — FAHRENHEIT OR FEMALE
FA — FIRE ALARM
FAB — FABRIC
FAC — FACTOR
FACIL — FACILITY
FAS — FASCIA
FAS BD — FASCIA BOARD
FB — FLAT BAR
FCO — FLOOR CLEANOUT
FCTY — FACTORY
FD — FLOOR DRAIN
FDC — FIRE DEPARTMENT CONNECTION
FDTN — FOUNDATION
FE — FIRE EXTINGUISHER
FEC — F.E. CLOSET
FEC — FIRE EXTINGUISHER CABINET
FEC FIRE — EXTINGUISHER CABINET
FF — FINISH FACE
FF EL — FINISH FLOOR ELEVATION
FF&E — FURNITURE, FIXTURE, AND EQUIPMENT
FH — FLAT HEAD
FH — FLAT HEAD OR FLAT HEAD SCREWS
FHC — FIRE HOSE CABINET
FHMS — FLAT HEAD MACHINE SCREW
FHP — FULL HEIGHT PARTITION
FHWS — FLAT HEAD WOOD SCREW
FHWS. — FLAT HEAD WOOD SCREW
FIG — FIGURE
FIL — FILLET
FIN — FINISH
FIN FLR — FINISH FLOOR
FIN GD — FINISH GRADE
FIN WD — FINISH WOOD
FIXT — FIXTURE
FL — FLOOR LINE
FLASH — FLASHING
FLDG — FOLDING
FLEX — FLEXIBLE
FLG — FLOORING
FLR — FLOOR
FLR FIN — FLOOR FINISH
FLR SK — FLOOR SINK
FLUOR — FLUORESCENT
FLUOR FIX — FLUORESCENT FIXTURE
FLUOR. — FLUORESCENT
FM — FACTORY MUTUAL
FM-G — FACTORY MUTUAL GLOBAL
FO — FACE OF
FO — FINISHED OPENING
FOC — FACE OF CONCRETE OR FACE OF CURB
FOF — FACE OF FINISH
FOF — FACE OF FINISH
FOM — FACE OF MASONRY
FOS — FACE OF STUD
FOS — FACE OF SLAB OR FACE OF STUD
FOUNT — FOUNTAIN
FOW — FACE OF WALL
FP — FIRE PROTECTION OR FIREPROOF
FPM — FEET PER MINUTE
FPRF. — FIREPROOF
FPS — FEET PER SECOND
FR — FIRE RATING, FIRE RESISTANT, OR FRAME
FR SNK — FLUSHING RIM SINK
FREQ — FREQUENCY
FRMG — FRAMING
FRP — FIBERGLASS REINFORCED PANEL
FRP — FIBER REINFORCED POLYESTER OR FIBERGLASS REINFORCED PLASTIC
FRZ — FREEZER
FS — FULL SIZE
FS — FEDERAL SPECIFICATION
FSTNR — FASTENER
FT — FEET OR FOOT
FTG — FOOTING
FURG — FURRING
FURN — FURNISH OR FURNITURE
FUT — FUTURE
FWC — FABRIC WALLCOVERING

G

G.F.I.C. — GROUND FAULT INTERRUPTER
G.L.B. — GLUE LAMINATED BEAM
GA — GAUGE
GA — GAGE OR GYPSUM ASSOCIATION
GAL — GALLON
GALV — GALVANIC OR GALVANIZED
GALV STL — GALVANIZED STEEL
GB — GRAB BAR
GC — GENERAL CONTRACTOR
GD — GUARD
GDR — GUARD RAIL
GEN — GENERAL OR GENERATOR
GFRC — GLASS-FIBER-REINFORCED CONCRETE
GFRG — GLASS-FIBER-REINFORCED GYPSUM
GFRP — GLASS-FIBER-REINFORCED PLASTIC
GI — GALVANIZED IRON
GL — GLASS
GL BLK — GLASS BLOCK
GLU LAM — GLUED LAMINATED WOOD
GND — GROUND
GR FL — GROUND FLOOR
GR. — GRADE
GRAN — GRANITE
GRTG — GRATING
GSB — GYPSUM SHEATHING BOARD
GSM — GALVANIZED SHEET METAL
GSU — GLAZED STRUCTURAL UNIT
GT — GROUT
GUAR — GUARANTEE
GUT — GUTTER
GYP — GYPSUM
GYP BD — GYPSUM BOARD
GYP PLAS — GYPSUM PLASTER

H

H — HIGH
H PLAM — HIGH PRESSURE PLASTIC LAMINATE
HAZ MAT — HAZARDOUS MATERIALS
HB — HOSE BIBB
HC — HOLLOW CORE
HCWD — HOLLOW CORE WOOD DOOR
HDBD — HARDBOARD
HDNR — HARDENER
HDO — HIGH DENSITY OVERLAY
HDR — HEADER
HDW — HARDWARE
HDWD — HARDWOOD
HEPA — HIGH EFFICIENCY PARTICULATE AIR (FILTER)
HEX — HEXAGON(AL)
HF — HIGH FREQUENCY
HNGR — HANGER
HIGH — STRENGTH
HM — HECTOMETER
HM — HOLLOW METAL
HMD — HOLLOW METAL DOOR
HMDF — HOLLOW METAL DOOR AND FRAME
HMF — HOLLOW METAL FRAME
HNDRL — HANDRAIL
HO — HOLD OPEN
HORIZ — HORIZONTAL
HOSP — HOSPITAL
HP — HIGH PRESSURE OR HORSEPOWER
HQ — HEADQUARTERS
HR. — HOUR
HS — HEAT-STRENGTHENED (GLASS) OR
HSE — HOUSE
HSKPG — HOUSEKEEPING
HST — HOIST
HT — HEIGHT
HVAC — HEATING, VENTILATING, AND AIR CONDITIONING
HVY — HEAVY
HW — HOT WATER
HYD — HYDRANT
HYDR — HYDRAULIC

I

I — INTERSTATE (HIGHWAY) OR MOMENT OF INERTIA
IAQ — INDOOR AIR QUALITY
IBC — INTERNATIONAL BUILDING CODE
ID — IDENTIFICATION, INSIDE DIAMETER, OR INTERIOR DESIGN
ID NO — IDENTIFICATION NUMBER
ILLUM — ILLUMINATION
INCL — INCLUDED
IND — INDEPENDENT OR INDUSTRIAL
INFO — INFORMATION
INSUL — INSULATION
INT — INTERIOR
INTERCOM — INTERCOMMUNICATION
INTL — INTERNATIONAL
IRMA — INVERTED ROOF MEMBRANE ASSEMBLY
ISO. JT. — ISOLATION JOINT
IWH — INSTANTANEOUS WATER HEATER

J

JAN — JANITOR
J-BOX — JUNCTION BOX
JT. — JOINT

K

KD — KILN DRIED OR KNOCKED DOWN
KIT — KITCHEN
KO — KNOCKOUT
KPL — KICKPLATE

L

L — ANGLE
L — LENGTH
L.B. — LAG BOLT
LAB — LABORATORY
LAD — LADDER
LAM — GL LAMINATED GLASS
LAM. — LAMINATE(D)
LAU — LAUNDRY
LAV — LAVATORY
LBR — LUMBER
LBS — POUND
LD BRG — LOAD-BEARING
LDR — LEADER
LED — LIGHT EMITTING DIODE
LF — LINEAR FEET (FOOT)
LH — LEFT HAND
LHR — LEFT HAND REVERSE
LHR — LEFT HAND REVERSE LATENT HEAT RATIO
LIB — LIBRARY
LIN — LINEAR
LINO — LINOLEUM
LIQ — LIQUID
LKR — LOCKER
LKR RM — LOCKER ROOM
LKWASH — LOCKWASHER
LL — LEAD LINED
LLH — LONG LEG HORIZONTAL
LLV — LONG LEG VERTICAL
LMST — LIMESTONE
LNDSCP — LANDSCAPE
LR — LIVING ROOM
LRG — LARGE
LRV — LOUVERED ROOF VENT
LS — LUMP SUM
LT — LIGHT
LT GA — LIGHT GAGE
LT WT — LIGHTWEIGHT
LTG — LIGHTING
LTNG — LIGHTNING
LVD — LOUVERED
LVR — LOUVER
LWC — LIGHTWEIGHT CONCRETE
LWIC — LIGHTWEIGHT INSULATING CONCRETE
LYR — LAYER

M

M.C. — MEDICINE CABINET
MACH — MACHINE
MACH RM — MACHINE ROOM
MAINT — MAINTENANCE
MAN — MANUAL
MATL — MATERIAL
MATV — MASTER ANTENNA TELEVISION SYSTEM
MAX — MAXIMUM
MB — MACHINE BOLT
MCB — METAL CORNER BEAD
MD — DECK
ME — MECHANICAL ENGINEER
MEAS — MEASURE
MECH — MECHANICAL
MECH RM — MECHANICAL ROOM
MED — MEDICAL MEDIUM
MED — MEDIUM MEDICAL
MEK — METHYL ETHYL KETONE
MEL — MELAMINE
MEMB — MEMBRANE
MEMO — MEMORANDUM
MEZZ — MEZZANINE
MF — MILL FINISH
MFD — MANUFACTURED
MFG — MANUFACTURING
MFR — MANUFACTURER
MFR REC — MANUFACTURER'S RECOMMENDATION
MGT — MANAGEMENT
MH — MANHOLE
MIC — MICROPHONE
MID — MIDDLE
MIL STD — MILITARY STANDARD
MIN — MINIMUM OR MINUTE
MIRR — MIRROR
MISC — MISCELLANEOUS
MIT — MITER
MKR — MARKER
ML — METAL LATH
MLDG — MOLDING (MOULDING)
MLWK — MILLWORK
mm — MILLIMETER
MO — MASONRY OPENING OR MOTOR OPERATED
MOD — MODEL, MODIFY OR MODULE
MOD BIT — MODIFIED BITUMEN
MON — MONITOR
MOPR — MOP RACK
MP — MIDPOINT
MR — MOISTURE RESISTANT
MS — MACHINE SCREW OR MOP SINK
MTD — MOUNTED
MTG — MOUNTING
MTL — METAL
MULL — MULLION
MW — MICROWAVE
MWP — MEMBRANE WATERPROOFING

N

N — NORTH
N.T.S. — NOT TO SCALE
NA — NOT APPLICABLE
NAAMM — NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS
NAT — NATURAL
NATL — NATIONAL
NC — NOISE CRITERIA
NCOMBL — NONCOMBUSTIBLE
NEC — NATIONAL ELECTRICAL CODE
NEG — NEGATIVE
NEMA — NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT — NEUTRAL
NFC — NATIONAL FIRE CODE
NFPA — NATIONAL FIRE PROTECTION ASSOCIATION
NIC — NOT IN CONTRACT
NLB — NON-LOAD BEARING
NO — NUMBER
NOM — NOMINAL
NR — NOISE REDUCTION
NRC — NOISE REDUCTION COEFFICIENT
NRCA — NATIONAL ROOFING CONTRACTORS ASSOCIATION
NRP — NONREMOVABLE
NS — NARROW STILE
NUM — NUMERAL

O

O — OXYGEN
O.A. — OVERALL
O.D. — OUTSIDE DIAMETER
O.F.C.I. — OWNER FURNISHED CONTRACTOR INSTALLED
O.H.S. — OVAL HEAD SCREW
O/O — OUT TO OUT
OA — UTSIDE AIR OR OVERALL
OBS. — OBSCURE
OC — ON CENTER
OCC — OCCUPY
OCC — OCCUPANCY
OCT — OCTAGON
OD — OUTSIDE DIAMETER OUTSIDE DIMENSION
OD — OUTSIDE DIMENSION OUTSIDE DIAMETER
OF/CI — OWNER FURNISHED/CONTRACTOR INSTALLED
OF/OI — OWNER FURNISHED/OWNER INSTALLED
OFD — OVERFLOW DRAIN
OFF — OFFICE
OH — OVERHANG
OH DR — OVERHEAD (COILING) DOOR
OPH — OPPOSITE HAND
OPNG — OPENING
OPP — OPPOSITE
OPR — OPERABLE
OPT — OPTIONAL
OR — OPERATING ROOM OR OUTSIDE RADIUS
ORD — ORDNANCE OR OVERFLOW ROOF DRAIN
ORG — ORGANIC
ORIG — ORIGINAL
ORN — ORNAMENTAL
OSHA — OCCUPATIONAL SAFETY AND HEALTH ADMINSTRATION
OUT — OUTLET
OZ — OUNCE

P

P.T.D/R — COMBO PAPER TOWEL DISPENSER/RECEPTACLE
P.T.R. — PAPER TOWEL RECEPTACLE
PAR — PARALLEL OR PARAPET
PARA — PARAGRAPH
PART — PARTIAL
PAT — PATTERN
PB — PUSHBUTTON
PBD — PARTICLEBOARD
PC — PIECE, POLYCARBONATE OR PORTLAND CEMENT
PCA — PORTLAND CEMENT ASSOCIATION
PCC — PRECAST CONCRETE
PCCP — CONCRETE PAVEMENT
PCD — PAPER CUP DISPENSER
PCF — POUNDS PER CUBIC FOOT
PCP — PORTLAND CEMENT PLASTER
PED — PEDESTAL
PEN — PENETRATE
PEND — PENDANT
PERF — PERFORATED
PERIM — PERIMETER
PERP — PERPENDICULAR
PGBD — PEGBOARD
PHAR — PHARMACY
PHOTO — PHOTOGRAPH
PHS — PHILLIPS HEAD SCREW
PKG — PACKAGE
PL — PROPERTY LINE
PL GL — PLATE GLASS
PL. — PLATE
PLA. — PLASTIC
PLAM — PLASTIC LAMINATE
PLAS — PLASTER OR PLASTIC
PLBG — PLUMBING
PLYWD — PLYWOOD
PMTL — PAINTED METAL
PNEU — PNEUMATIC
PNL — PANEL
PO — POST OFFICE PURCHASE ORDER
PO — PURCHASE ORDER POST OFFICE
POLY — POLYETHYLENE (PLASTIC)
PR — PAIR
PRCST — PRECAST
PREFAB — PREFABRICATE
PREFIN — PREFINISH
PRELIM — PRELIMINARY
PREP — PREPARATION
PRESS — PRESSURE
PREV — PREVIOUS
PRKG — PARKING
PRMLD — PREMOLDED
PROJ — PROJECT
PROP — PROPERTY
PSF — POUNDS PER SQUARE FOOT
PSI — POUNDS PER SQUARE INCH
PT — PAINT, PNEUMATIC TUBE, OR PRESSURE TREATED
PT. — PAINT
PTD — PAPER TOWEL DISPENSER
PTDF — PRESSURE TREATED DOUG FIR
PTN — PARTITION
PVC — POLYVINYL CHLORIDE (PLASTIC)
PVG — PAVING
PWR — POWER

Q

QA — QUALITY ASSURANCE
QC — QUALITY CONTROL
QRY — QUARRY
QT — QUARRY TILE
QTB — QUARRY TILE BASE
QTF — QUARRY TILE FLOOR
QTR — QUARTER
QTY — QUANTITY
QUAD — QUADRANT
QUAL — QUALITY

R

R — RADIUS OR RISER
R.D. — ROOF DRAIN
R.W.L. — RAIN WATER LEADER
RA — RETURN AIR
RAD — RADIATOR
RAD., R — RADIUS
RB — RESILIENT BASE OR RUBBER BASE
RB HK — ROBE HOOK
RBM — REINFORCED BRICK MASONRY
RBR — RUBBER
RCP — REFLECTED CEILING PLAN
RCVR — RECEIVER
RD — ROAD OR ROOF DRAIN
REC — RECESSED
RECD — RECEIVED
RECPT — RECEPTACLE
RECT — RECTANGLE
REF — REFERENCE OR REFRIGERATOR
REFR — REFRACTORY OR REFRIGERATION
REG — REGISTER
REINF — REINFORCE
REINF. — REINFORCEMENT
REP — REPAIR
REPL — REPLACE
REQ — REQUIRE
REQD. — REQUIRED
RESIL — RESILIENT
RET — RETURN
REV — REVISION
RF — RADIO FREQUENCY
RFG — ROOFING
RFI — REQUEST FOR INFORMATION
RFP — REQUEST FOR PROPOSAL
RH — RIGHT HAND
RHMS — ROUND HEAD MACHINE SCREW
RHR — RIGHT HAND REVERSE
RHWS — ROUND HEAD WOOD SCREW
RL — ROOF LEADER
RLG — RAILING
RM — ROOM
RND — ROUND
RO — ROUGH OPENING
ROW — RIGHT OF WAY
RPM — REVOLUTIONS PER MINUTE
RS — ROUGH SAWN
RT — RIGHT
RV — ROOF VENT
RVS — REVERSE
RWD — REDWOOD
RWD. — REDWOOD
RWL — RAIN WATER LEADER

S

S — SOUTH
S.A.F. — SELF-ADHERED FLASHING
S.C. — SOLID CORE
S.C.D. — SEAT COVER DISPENSER
S.D. — SOAP DISPENSER
S.M.S. — SHEET METAL SCREW
S.N.D. — SANITARY NAPKIN DISP.
S.N.R. — SANITARY NAPKIN RECEPTACLE
S.S.D. — SEE STRUCTURAL DRAWINGS
S.SK. — SERVICE SINK
SA — SUPPLY AIR
SALV — SALVAGE
SAMP — SAMPLE
SAN — SANITARY
SAT — SUSPENDED ACOUSTICAL TILE
SATC — SUSPENDED ACOUSTICAL TILE CEILING
SB — SPLASH BLOCK
SBS — STYRENE BUTADIEN STYRENE
SBSTR — SUBSTRATE
SC — SHADING COEFFICIENT OR SOLID CORE
SCH — SCHOOL
SCHED — SCHEDULE
SCHEM — SCHEMATIC
SCP — SCUPPER
SCRN — SCREEN
SCT — STRUCTURAL CLAY TILE
SCWD — SOLID CORE WOOD DOOR
SD — SHOP DRAWINGS, SMOKE DETECTOR, OR SOAP DISPENSER;
SDG — SIDING
SECT — SECTION
SEG — SEGMENT
SEL — SELECT
SEP — SEPARATE
SF — SQUARE FOOT (FEET)
SFTWD — SOFTWOOD
SGD — SLIDING GLASS DOOR
SGL — SINGLE
SH. — SHELF
SHR — SHOWER
SHR HD — SHOWER HEAD
SHRD — SHOWER DRAIN
SHT — MTL FLASH SHEET METAL (FLASHING)
SHT — SHEET
SHTHG — SHEATHING
SHV — SHELVING
SIM — SIMILAR
SIM. — SIMILAR
SJ — SCORED JOINT
SJI — STEEL JOIST INSTITUTE
SK — SKETCH
SKLT — SKYLIGHT
SLD — WDW HORIZONTAL SLIDING WINDOW
SLDG — SLIDING
SLNT — SEALANT
SM — SHEET METAL
SMK — SMOKE
SND — INS SOUND INSULATION
SND — SANITARY NAPKIN DISPENSER
SNDU — SANITARY NAPKIN DISPOSAL UNIT
SPEC — SPECIFICATION
SPKLR — SPRINKLER
SPKR — SPEAKER
SPLY — SUPPLY
SQ — SQUARE
SQ IN — SQUARE INCH
SQ YD — SQUARE YARD
SS — SANITARY SEWER OR SERVICE SINK
SST — STAINLESS STEEL
ST — STAIRS OR STREET
STA. — STATION
STC — SOUND TRANSMISSION CLASS
STD — STANDARD
STIF — STIFFENER
STL — JST STEEL JOIST
STL LNTL — STEEL LINTEL
STL PL — STEEL PLATE
STL RF DK — STEEL ROOF DECK
STL TB — STEEL TUBE
STL TR — STEEL TRUSS
STL. — STEEL
STNLS — STAINLESS
STOR — STORAGE
STR — STRINGERS
STRUCT — STRUCTURAL
STRUCT STL — STRUCTURAL STEEL
SUB — SUBSTITUTE
SURF — SURFACE
SUSP — SUSPEND(ED)
SUSP CLG — SUSPENDED CEILING
SV — SHEET VINYL
SW — SWITCH
SWDR — SWING DOOR
SYM — SYMBOL
SYM. — SYMMETRICAL
SYNTH — SYNTHETIC
SYS — SYSTEM

T

T — TREAD
T&B — TOP AND BOTTOM
T&G — TONGUE AND GROOVE
T&M — TIME AND MATERIALS
TB — TOWEL BAR
T.O.C./T.C. — TOP OF CURB
TOP/TP — TOP OF PAVEMENT
T.S. — TUBE STEEL
TB — THROUGH BOLT OR TOWEL BAR
TCA — TILE COUNCIL OF AMERICA
TCP — TELEPHONE CONTROL PANEL TEMPERATURE CONTROL PANEL; TRAFFIC CONTROL PLAN
TD — TOWEL DISPENSER
TECH — TECHNICAL
TEL — TELEPHONE
TEMP — TEMPERATURE OR TEMPORARY
TER — TERRAZZO
THD — THREAD
THERM — THERMAL
THK — THICKNESS
THK. — THICK
THRES — THRESHOLD
THRU — THROUGH
THRUOUT — THROUGHOUT
TK BD — TACKBOARD
TMPD — TEMPERED
TMPD GL — TEMPERED GLASS
TN — TRUE NORTH
TO_ — TOP OF ___
TO FDN — TOP OF FOUNDATION
TOB — TOP OF BEAM
TOM — TOP OF MASONRY
TOP — TOP OF PARAPET
TOS — TOP OF STEEL
TOW — TOP OF WALL
TPD — TOILET PAPER DISPENSER
TPH — TOILET PAPER HOLDER
TR — TOWEL RACK
TRANS — TRANSOM
TRANS WD FIN — TRANSPARENT WOOD FINISH
TRTD — TREATED
TS — TENSILE STRENGTH OR TUBE STEEL
TSTAT — THERMOSTAT
TV — TELEVISION
TYP — TYPICAL

U

U — HEAT TRANSFER COEFFICIENT
UC — UNDERCUT
UCD — UNDERCUT DOOR
UGND — UNDERGROUND
UL — UNDERWRITERS LABORATORIES
ULT — ULTIMATE
UNF. — UNFINISHED
UNFIN — UNFINISH
UON — UNLESS OTHERWISE NOTED
UPS — UNINTERRUPTIBLE POWER SUPPLY
UR — URINAL
UTIL — UTILITY
UV — ULTRAVIOLET

V

V — VOLT
V.G. — VERTICAL GRAIN
VAC — VACUUM
VAR — VARIES
VC — VA FURNISHED AND INSTALLED - MEDICAL CARE
VCT — VINYL COMPOSITION TILE VITRIFIED CLAY TILE
VEH — VEHICLE
VENT — VENTILATION
VERT — VERTICAL
VEST — VESTIBULE
VFAT — VINYL FACED ACOUSTICAL TILE
VIC — VICINITY
VID — VIDEO
VIF — VERIFY IN FIELD
VNR — VENEER
VOC — VOLATILE ORGANIC COMPOUND
VOL — VOLUME
VOLT — VOLTAGE
VP — VENEER PLASTER
VR — VAPOR RETARDER
VT. — VINYL TILE
VTF — VENT THROUGH ROOF
VV — VA FURNISHED AND INSTALLED-VHA APPROPRIATION.
VWC — VINYL WALL COVERING
VWF — VINYL WALL FABRIC

W

W — WEST
W — WIDE OR WEST
W.C. — WATER CLOSET
W.O. — WHERE OCCURS
W.P. — WORK POINT
W.W.M. — WELDED WIRE MESH
W/ — WITH
W/IN — WITHIN
W/O — WITHOUT
WARR — WARRANTY
WBL — WOOD BLOCKING
WC — WALL COVERING OR WATER CLOSET WALL COVERING OR WATER CLOSET
WCHR — WATER CHILLER
WCL WL MTD — WATER COOLER, WALL HUNG
WD — WOOD
WDW — WINDOW
WF — WIDE FLANGE
WFAB — WALL FABRIC
WFR — WOOD FRAME
WFS — BRACE CROSS BRACE
WH — WATER HEATER
WHSE — WAREHOUSE
WLD — WELDED
WM — WIRE MESH
WP — WATERPROOFING
WPD — WATER PRESSURE DROM
WPM — WATERPROOF MEMBRANE
WR — WEATHER RESISTANT
WRB — WEATHER-RESISTIVE BARRIER
WS — WEATHERSTRIP
WSCT — WAINSCOT
WT — WEIGHT
WTH — WIDTH
WWF — WELDED WIRE FABRIC

X

X — BRACE CROSS BRACE
XPS — EXTRUDED POLYSTYRENE BOARD (INSULATION)

Y

YD — YARD
YR — YEAR

& — AND
@ — AT
℄ OR CL — CENTERLINE
⌀ — DIAMETER
(E) — EXISTING
(N) — NEW
∥ — PARALLEL
⊥ — PERPENDICULAR
P — PLATE
+/- — PLUS OR MINUS
— POUND OR NUMBER

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Drawing Title: ABBREVIATIONS

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4/03/2015 | Checked: JP | Drawn: PLP

Project Number: 612A4-13-301

Building Number

Drawing Number: G0.03

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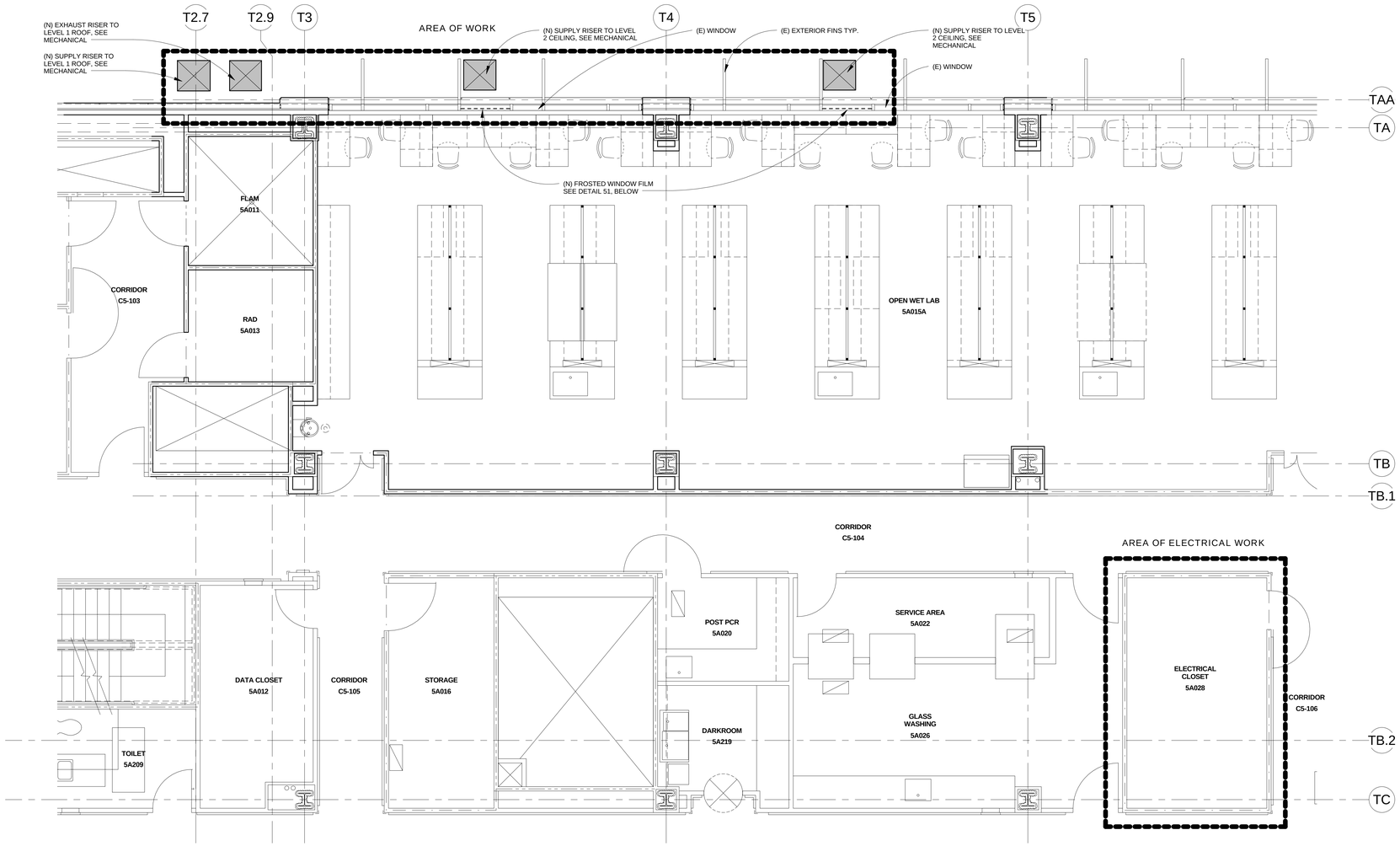
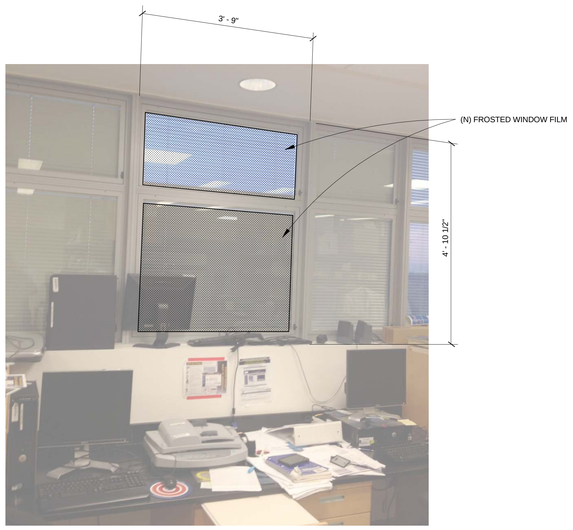
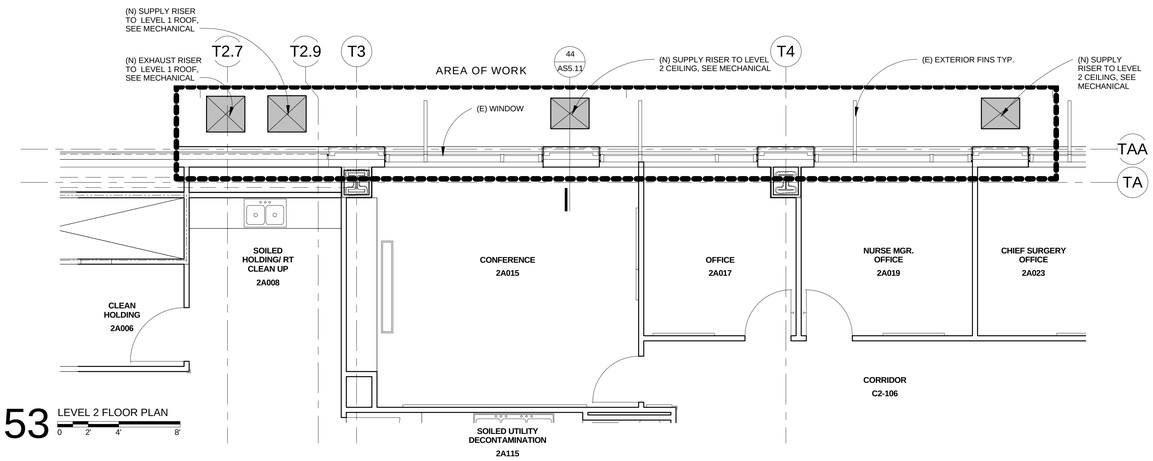


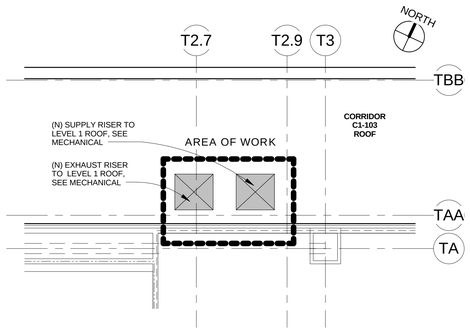
33 LEVEL 5 FLOOR PLAN
0 2' 4' 8'



51 WET LAB WINDOWS
0 1/2' 1' 2'



53 LEVEL 2 FLOOR PLAN
0 2' 4' 8'



57 LEVEL 1 ROOF PLAN
0 2' 4' 8'

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Drawing Title: NEW WORK PLAN

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4/03/2015 | Checked: KT | Drawn: PLP

Project Number: 612A4-13-301

Building Number: 700

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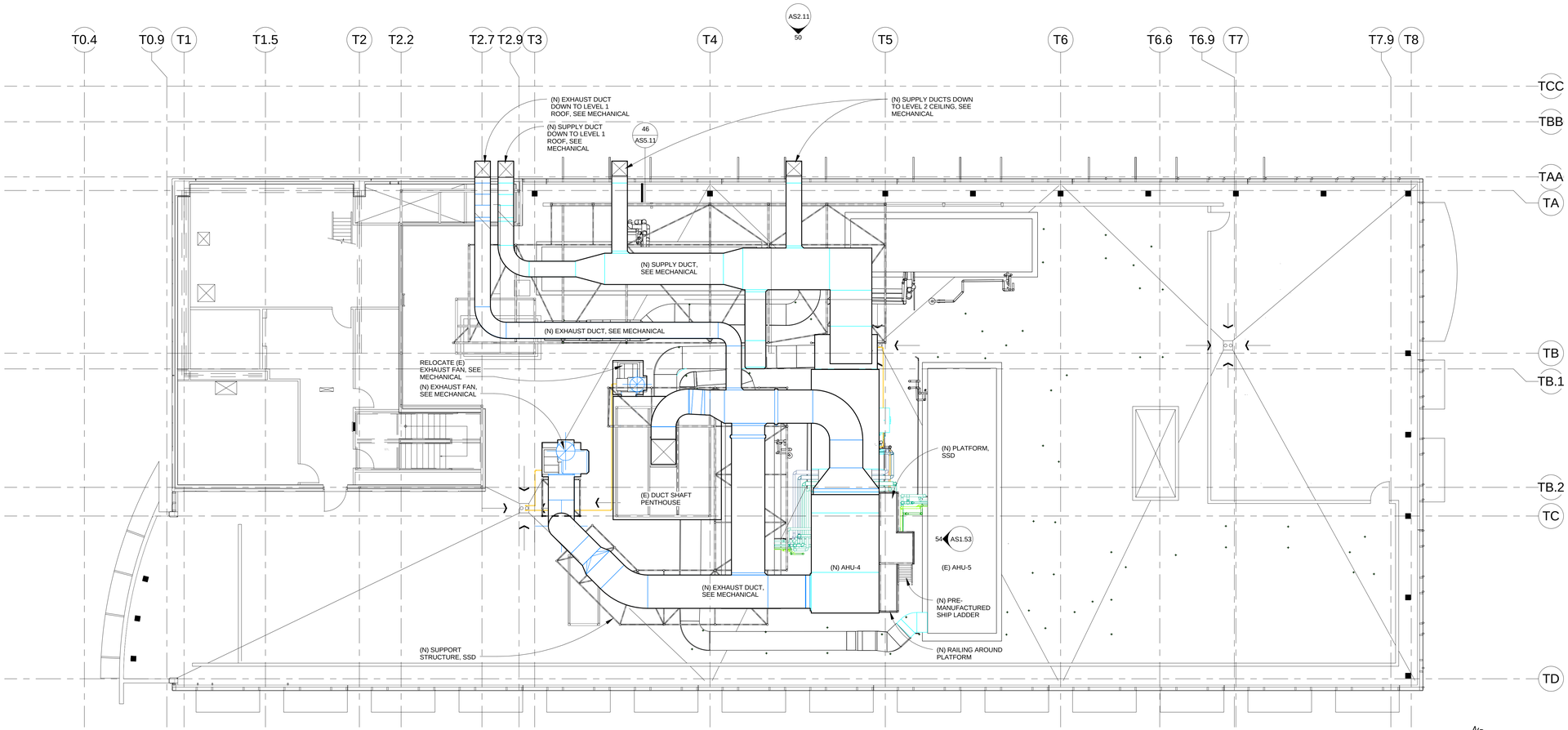
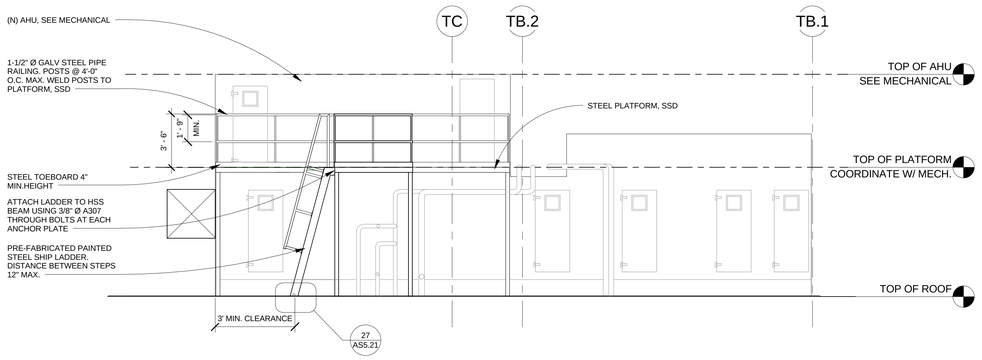


31 LEVEL 6 ROOF
0 4' 8' 16'



54 WEST ELEVATION - AHU 4
0 2' 4' 8'

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Drawing Title: LEVEL 6 ROOF

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4/03/2015 | Checked: KT | Drawn: PLP

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: AS1.53

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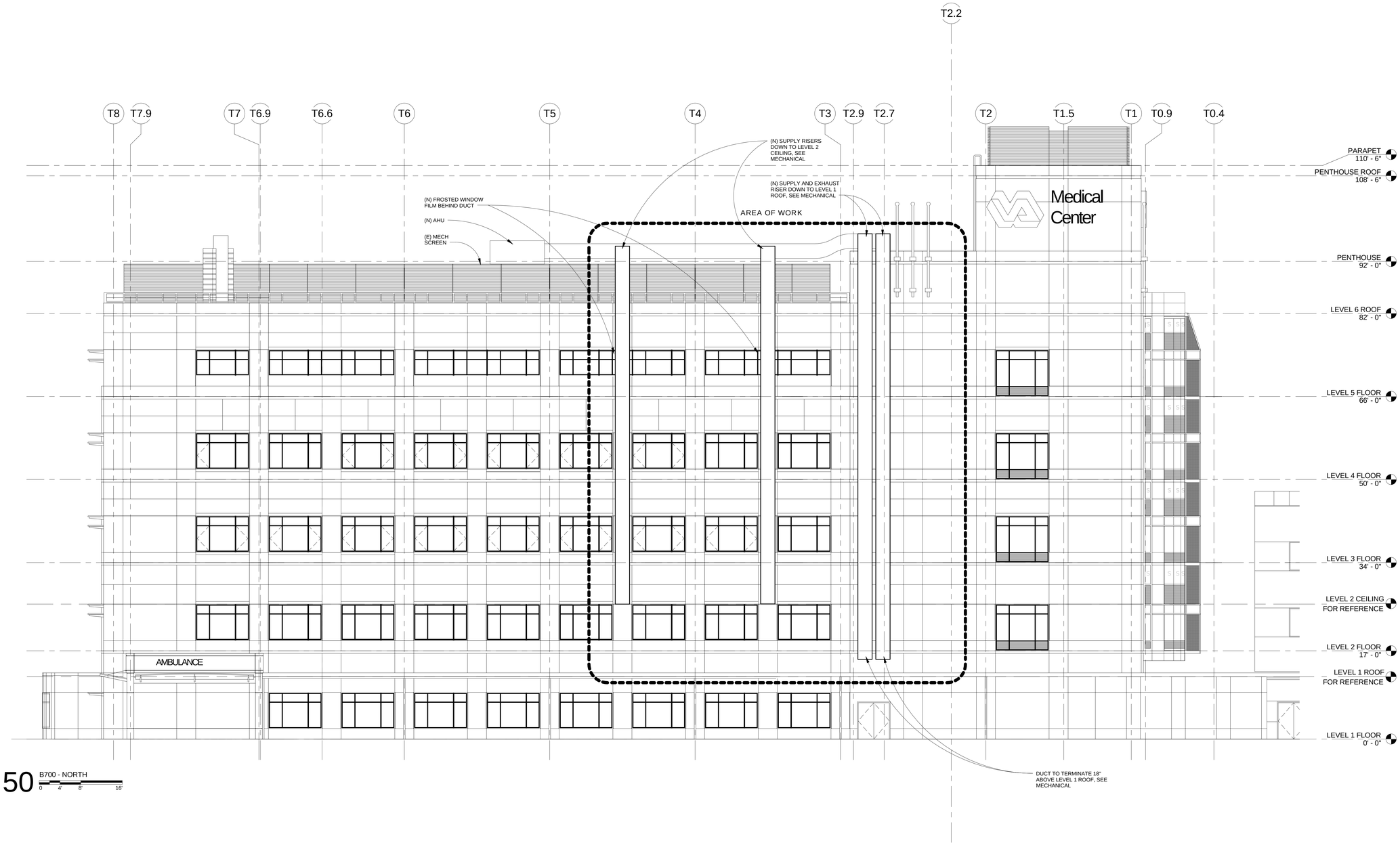

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Drawing Title: EXTERIOR ELEVATIONS - NORTH

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4/03/2015 | Checked: KT | Drawn: PLP

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: AS2.11

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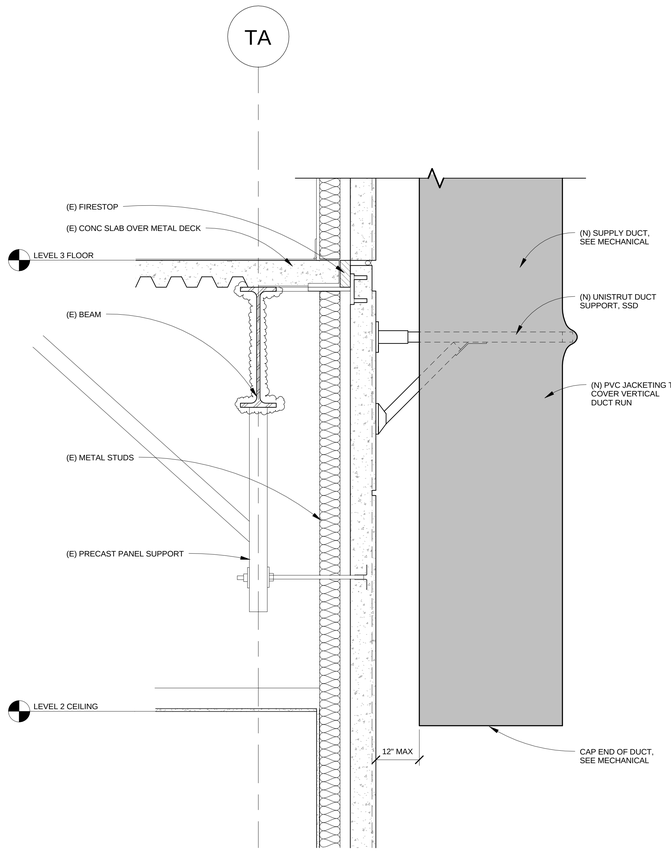
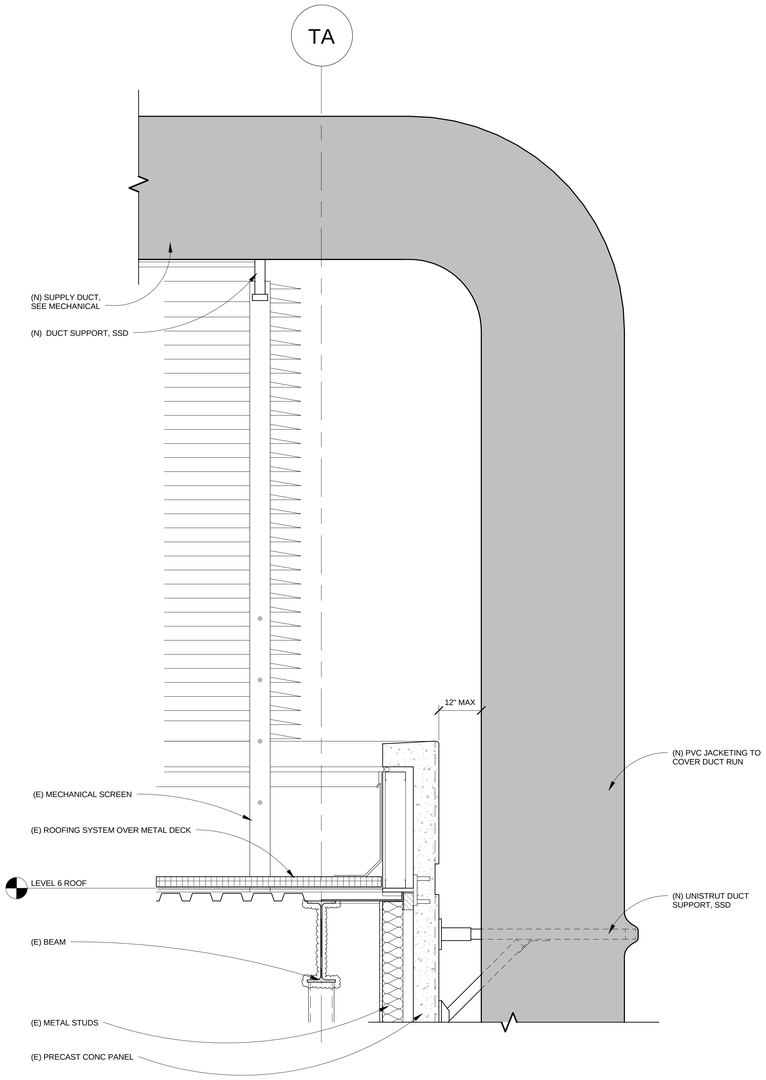


44 LEVEL 2 EXT. DETAIL
0 1/2" 1' 2'



46 LEVEL 6 ROOF EXT. DETAIL
0 1/2" 1' 2'

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Drawing Title: EXTERIOR WALL DETAILS

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4/03/2015 | Checked: KT | Drawn: PLP

Project Number: 612A4-13-301

Building Number:

Drawing Number: AS5.11

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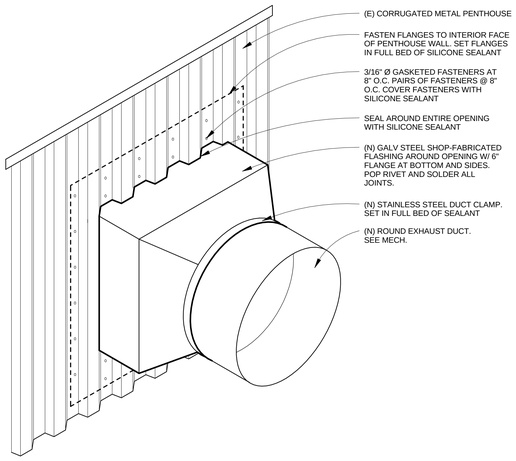
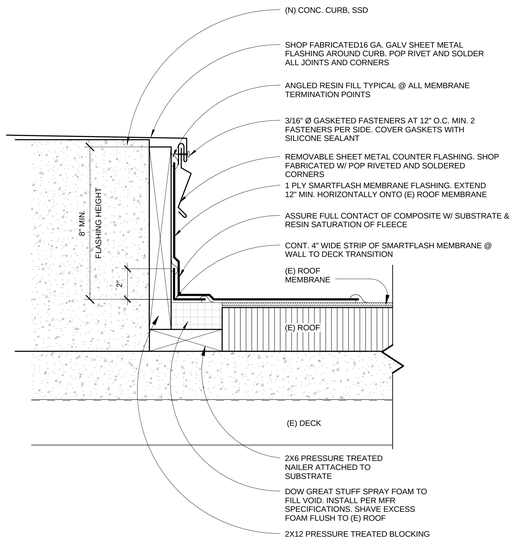
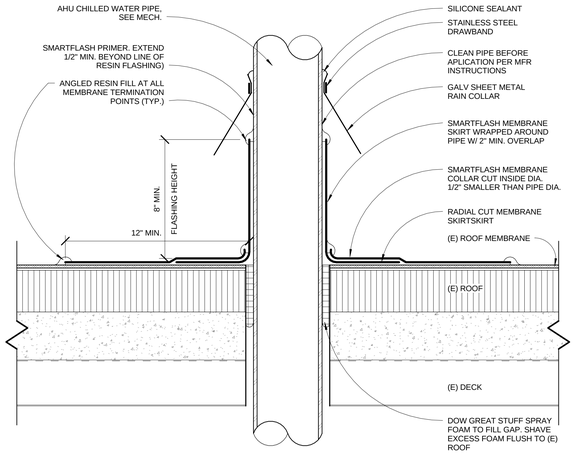


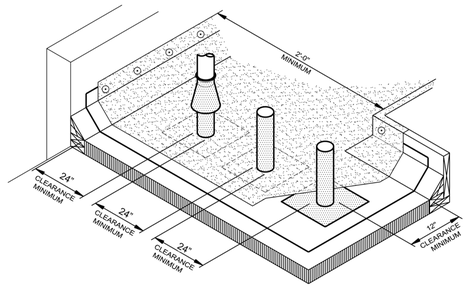
20 DUCT WALL PENETRATION AT PENTHOUSE
N.T.S.



23 FLASHING AT EXHAUST FAN CURB
0 2" 4" 8"

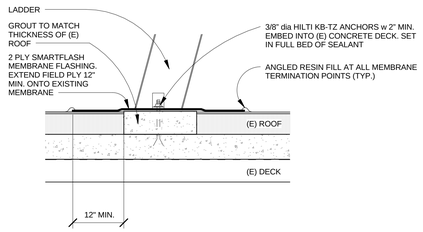


24 FLASHING AT AHU CHILLED WATER PIPE
0 2" 4" 8"

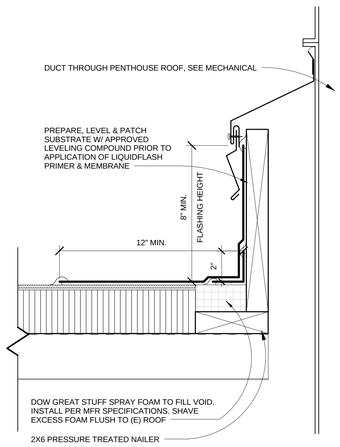


NOTE:
MAXIMUM OF 3 PENETRATIONS FOR ANY 10' X 10' AREA

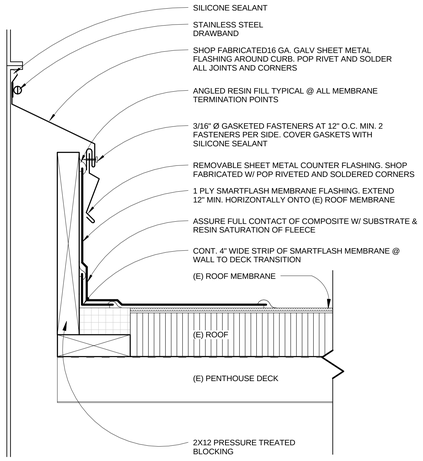
17 CLEARANCES FOR MULTIPLE PENETRATIONS (TYP.)
N.T.S.

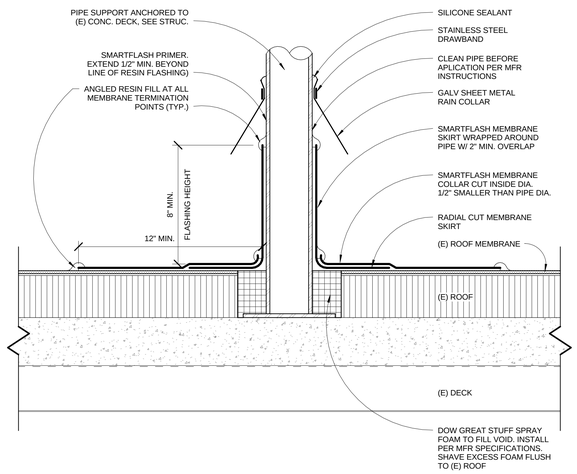


27 LADDER ATTACHMENT AT ROOF
0 1/2" 1' 2'

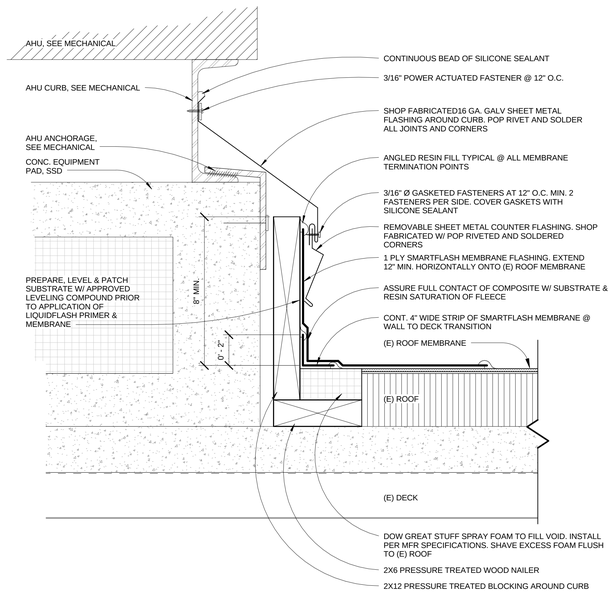


50 FLASHING AT DUCT PENETRATION
0 2" 4" 8"





54 FLASHING AT POST SUPPORT
0 2" 4" 8"



57 FLASHING AT AHU CURB
0 2" 4" 8"

FINAL BID DOCUMENTS

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8/13/2015 12:31:56 PM

Revisions:	Date

CONSULTANTS:

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Drawing Title: ROOF DETAILS	Project Title: BUILDING 700 OR HVAC RETROFIT		Project Number: 612A4-13-301
			Building Number:
Approved: Project Director	Location: VA MATHER		Drawing Number: AS5.21
	Date: 4/03/2015	Checked:	Drawn: PLP
			Dwg. of

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

GENERAL NOTES

APPLICABLE TO ALL DRAWINGS UNLESS NOTED OR SHOWN OTHERWISE

GENERAL NOTES
10009N001-1

1. INTERPRETATION OF DRAWINGS & SPECIFICATIONS
   A. WHERE SPECIFICATIONS HAVE BEEN PREPARED FOR THIS PROJECT, THEY ARE ARRANGED IN SEVERAL SECTIONS, BUT SUCH SEPARATION SHALL NOT BE CONSIDERED AS THE LIMITS OF THE WORK REQUIRED OF ANY SEPARATE TRADE. THE TERMS AND CONDITIONS OF SUCH LIMITATIONS ARE WHOLLY BETWEEN THE CONTRACTOR AND HIS SUBCONTRACTORS.
   B. IN GENERAL, THE WORKING DETAILS WILL INDICATE DIMENSIONS, POSITION AND KIND OF CONSTRUCTION, AND THE SPECIFICATIONS, QUALITIES AND METHODS. ANY WORK INDICATED ON THE WORKING DETAILS AND NOT MENTIONED IN THE SPECIFICATIONS, OR VICE VERSA, SHALL BE FURNISHED AS THOUGH FULLY SET FORTH IN BOTH. WORK NOT PARTICULARLY DETAILED, MARKED OR SPECIFIED, SHALL BE IDENTICAL OR SIMILAR TO LIKE CASES OF CONSTRUCTION THAT ARE DETAILED, MARKED OR SPECIFIED. IF CONFLICTS OCCUR ON DRAWINGS AND/OR SPECIFICATIONS, THE MOST EXPENSIVE MATERIALS OR METHODS WILL PREVAIL.
   C. SHOULD AN ERROR APPEAR IN THE WORKING DETAILS OR SPECIFICATIONS OR IN WORK DONE BY OTHERS AFFECTING THIS WORK, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AT ONCE AND IN WRITING. IF THE CONTRACTOR PROCEEDS WITH THE WORK SO AFFECTED WITHOUT HAVING GIVEN SUCH WRITTEN NOTICE AND WITHOUT RECEIVING THE NECESSARY APPROVAL, DECISION OR INSTRUCTIONS IN WRITING FROM THE OWNER, THEN HE SHALL HAVE NO VALID CLAIM AGAINST THE OWNER. FOR THE COST OF SO PROCEEDING AND SHALL MAKE GOOD ANY RESULTING DAMAGE OR DEFECT. NO VERBAL APPROVAL, DECISION, OR INSTRUCTION SHALL BE VALID OR BE THE BASIS FOR ANY CLAIM AGAINST THE OWNER, ITS OFFICERS, EMPLOYEES OR AGENTS. THE FOREGOING INCLUDES TYPICAL ERRORS IN THE SPECIFICATIONS OR NOTATIONAL ERRORS IN THE WORKING DETAILS WHERE THE INTERPRETATION IS DOUBTFUL OR WHERE THE ERROR IS SUFFICIENTLY APPARENT AS TO PLACE A REASONABLY PRUDENT CONTRACTOR ON NOTICE THAT, SHOULD HE ELECT TO PROCEED, HE IS DOING SO AT HIS OWN RISK.
2. CONSTRUCTION SHALL CONFORM TO ALL APPLICABLE CODES AND REGULATIONS.
3. SHOP DRAWING NOTE:
   A. WHEN NOT ADDRESSED BY DIVISION 1 OF THE SPECIFICATIONS, PAPER FORMAT STRUCTURAL SHOP DRAWINGS SHALL BE SUBMITTED IN THE FORM OF THREE COPIES MINIMUM OF EACH SHEET. WHERE SUBMITTALS ARE ELECTRONIC, FORMAT SHALL BE PDF.
   B. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE STRUCTURAL ENGINEER THAT HE UNDERSTANDS THE DESIGN CONCEPT BY INDICATING WHICH MATERIAL HE INTENDS TO FURNISH AND INSTALL, AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS HE INTENDS TO USE ON A STAND ALONE SET OF DOCUMENTS. DUPLICATION OF DESIGN DOCUMENTS FOR THE PURPOSE OF SHOP DRAWINGS IS NOT ACCEPTABLE.
   C. PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW BY THE STRUCTURAL ENGINEER. SHOP DRAWING SUBMITTALS SHALL INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, STRUCTURAL STEEL, REINFORCING STEEL, & GLUE-LAMINATED BEAMS.
   D. PRIOR TO SUBMISSION THE CONTRACTOR SHALL REVIEW ALL SUBMITTALS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS AND SHALL STAMP SUBMITTALS AS BEING "REVIEWED FOR CONFORMANCE".
   E. SHOP DRAWING SUBMITTALS PROCESSED BY THE STRUCTURAL ENGINEER ARE NOT CHANGE ORDERS.
   F. ANY DETAIL ON THE SHOP DRAWINGS THAT DEVIATES FROM THE CONTRACT DOCUMENTS SHALL CLEARLY BE MARKED WITH THE NOTE "THIS IS A CHANGE".
   G. SHOP DRAWINGS OR CALCULATIONS SUBMITTED FOR REVIEW THAT REQUIRE RESUBMITTAL FOR RE-REVIEW SHALL BE BILLED HOURLY FOR SUCH TIME TO THE GENERAL CONTRACTOR. RE-REVIEW WILL NOT PROCEED WITHOUT WRITTEN APPROVAL FROM THE GENERAL CONTRACTOR FOR ADDITIONAL ENGINEERING REVIEW SERVICES.
4. SAFETY NOTE:
   A. IT IS THE CONTRACTORS RESPONSIBILITY TO COMPLY WITH THE PERTINENT SECTIONS, AS THEY APPLY TO THIS PROJECT, OF THE "CONSTRUCTION SAFETY ORDERS" ISSUED BY THE STATE OF CALIFORNIA LATEST EDITION, AND ALL OSHA REQUIREMENTS.
   B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATE DESIGN AND CONSTRUCTION OF ALL FORMS AND SHORING REQUIRED. SHORING INDICATIONS (LOCATION, DIRECTION, DURATION, ETC.) ARE ONLY SHOWN ON THE STRUCTURAL DRWGS WHEN REQUIRED TO IMPLEMENT THE DESIGN INTENT OF THE FINAL WORK PRODUCT. DETERMINATION WHETHER SHORING IS REQUIRED FOR TEMPORARY OR INTERMEDIATE CONDITIONS DURING CONSTRUCTION IS WHOLLY THE RESPONSIBILITY OF THE CONTRACTOR.
   C. THE OWNER AND THE STRUCTURAL ENGINEER DO NOT ACCEPT ANY RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY WITH THESE REQUIREMENTS.
5. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER WHERE A CONFLICT OR DISCREPANCY OCCURS BETWEEN THE STRUCTURAL DRAWINGS AND ANY OTHER PORTION OF THE CONTRACT DOCUMENTS OR EXISTING FIELD CONDITIONS. SUCH NOTIFICATION SHALL BE GIVEN IN DUE TIME SO AS NOT TO AFFECT THE CONSTRUCTION SCHEDULE. IN CASE OF A CONFLICT BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS THE MORE RESTRICTIVE CONDITION SHALL TAKE PRECEDENCE UNLESS WRITTEN APPROVAL HAS BEEN GIVEN FOR THE LEAST RESTRICTIVE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS WITH ARCHITECTURAL PRIOR TO COMMENCING ANY WORK.
6. WHEN CONSTRUCTION ATTACHES TO OR IS WITHIN AN EXISTING BUILDING, A COMPLETE SET OF DRAWINGS OF THE EXISTING BUILDING SHALL BE KEPT ON THE JOB SITE. CONTRACTOR TO OBTAIN THESE DRAWINGS FROM THE OWNER (IF THEY ARE AVAILABLE).
7. CONTRACTOR SHALL PROVIDE AN ALLOWANCE EQUAL TO 2% OF THE BID FOR STRUCTURAL STEEL, MISC. IRON AND REINFORCING STEEL TO BE USED AT THE DISCRETION OF THE STRUCTURAL ENGINEER. UNUSED AMOUNT TO REVERT TO THE OWNER UPON COMPLETION OF THE JOB.
8. ANY SUBSTITUTIONS FOR STRUCTURAL MEMBERS, HARDWARE OR DETAILS SHALL BE REVIEWED BY THE ARCHITECT AND STRUCTURAL ENGINEER. SUCH REVIEW WILL BE BILLED ON A TIME AND MATERIALS BASIS TO THE GENERAL CONTRACTOR WITH NO GUARANTEE THAT THE SUBSTITUTION WILL BE ALLOWED.
9. DO NOT SCALE DRAWINGS. CONTACT THE ARCHITECT OR STRUCTURAL ENGINEER FOR ANY DIMENSIONS NOT SHOWN.
10. THESE DRAWINGS ARE NOT COMPLETE UNTIL REVIEWED AND ACCEPTED BY LOCAL BUILDING OFFICIALS AND THE OWNER AND SIGNED BY THE STRUCTURAL ENGINEER.

DESIGN CRITERIA
10009N002-1

1. CODES AND STANDARDS
   2013 CALIFORNIA BUILDING CODE (CBC)
   ASCE 7-10
   ACI 318-11
   AISC 360-10, 341-10, 358-10
2. VERTICAL LOADS
   ROOF LIVE LOAD = 20 PSF
   LIVE LOADS ARE REDUCED WHERE PERMITTED BY CODE.
4. LATERAL LOADS
   SEISMIC:
   SITE CLASS D
   S_S = 0.548; S_{DS} = 0.497
   S_1= 0.261; S_{D1} = 0.327
   I_e = 1.5 PER ASCE 7-10 SECT 13.1.3
   RISK CATEGORY: IV
   WIND:
   V_{ULT} = 115 MPH , V_{ASD} = 89 MPH
   RISK CATEGORY:
   EXPOSURE CATEGORY: C
   GCPI = ±0.18

ABBREVIATIONS
10009N003-1

AB	ANCHOR BOLT	MI	MALLEABLE IRON
ABV	ABOVE	MTL	METAL
BLW	BELOW	(N)	NEW
BOF	BOTTOM OF FOOTING	NIC	NOT IN CONTRACT
BRG	BEARING	NS	NEAR SIDE
BTWN	BETWEEN	NTS	NOT TO SCALE
CC	CENTER TO CENTER	NW	NORMAL WEIGHT
CJ	CONSTRUCTION JOINT	OH	OPPOSITE HAND
CLR	CLEAR	OSB	ORIENTED STRAND BOARD
CMU	CONCRETE MASONRY UNIT	PC	PIECE
CONT	CONTINUOUS	PJP	PARTIAL JOINT PENETRATION
CONTR	CONTRACTOR	PT	PRESSURE TREATED
CP	COMPLETE JOINT PENETRATION	REIN	REINFORCING
CSK	COUNTERSINK	RWD	REDWOOD
DF	DOUGLAS FIR	SC	SLIP CRITICAL
DL	DEAD LOAD	SHTG	SHEATHING
DO	DITTO	SIM	SIMILAR
DWG	DRAWING	SJ	SLAB CONTROL JOINT
(E)	EXISTING	SMS	SHEET METAL SCREW
EF	EACH FACE OR EDGE FASTENER	SP	STRUCTURAL PANEL
EJ	EXPANSION JOINT	STFNR	STIFFENER
ELEV	ELEVATION	STL	STEEL
EN	EDGE NAILING	STGRD	STAGGERED
EOS	EDGE OF SLAB	T&B	TOP & BOTTOM
EQ	EQUAL	T&G	TONGUE & GROOVE
EW	EACH WAY	THRD	THREADED
EWEF	EACH WAY EACH FACE	TN	TOE NAIL
FB	FACE OF BLOCK(OR BRICK) OR FLAT BAR	TO	TOP OF
		TOC	TOP OF CONCRETE (SLAB UNO)
FC	FACE OF CONCRETE OR FRAMING CLIP(SIMPSON A35 UNO)	TOF	TOP OF FOOTING OR TOP OF FRAMING
FF	FINISH FLOOR	TOS	TOP OF STEEL
FS	FACE OF STUD OR FAR SIDE	TOW	TOP OF WALL
FT	FIRE TREATED	UNO	UNLESS NOTED OTHERWISE
GA	GAUGE OR GAGE	VIF	VERIFY IN FIELD
GLB	GLUED LAMINATED BEAM	W/	WITH
HDG	HOT DIPPED GALVANIZED	W/O	WITHOUT
HDR	HEADER	WP	WORK POINT
HSB	HIGH STRENGTH BOLT	WS	WOOD SCREW
HSS	HOLLOW STRUCTURAL SECTION	WWF	WELDED WIRE FABRIC
HT	HEIGHT	CL	CENTERLINE
JH	JOIST HANGER	PL	PLATE
LL	LIVE LOAD	WF	WIDE FLANGE
LLH	LONG LEG HORIZONTAL	#	NUMBER OR POUNDS
LLV	LONG LEG VERTICAL	□	SQUARE
LS	LAG SCREW	Ø	ROUND OR DIAMETER
LW	LIGHT WEIGHT		CONT WOOD IN SECTION
LWIC	LIGHT WEIGHT INSULATING CONC		WOOD BLOCKING IN SECTION
MB	MACHINE BOLT	(A)	"MEMBER" ABOVE
MFR	MANUFACTURER	(B)	"MEMBER" BELOW

STATEMENT OF STRUCTURAL SPECIAL INSPECTIONS AND TESTING
10009N004-1

1. SPECIAL INSPECTIONS AND TESTING SHALL BE PROVIDED BY AN INSPECTION AGENCY, EMPLOYED BY THE OWNER, AND QUALIFIED BY THE BUILDING OFFICIAL TO INSPECT THE PARTICULAR TYPE OF CONSTRUCTION. TESTS AND INSPECTIONS, AS REQUIRED BY SECTIONS 110, 1704, 1705.10, 1705.11 AND 1705.12 OF THE 2013 CBC, SHALL BE PERFORMED DURING CONSTRUCTION ON THE TYPES OF WORK LISTED BELOW:

	INSPECTIONS/TESTING
☐ STRUCTURAL STEEL CONSTRUCTION	SECTION 1705.2.1
☐ STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL	SECTION 1705.2.2
☐ COLD-FORMED STEEL TRUSSES SPANNING ≥ 60 FT	SECTION 1705.2.2.2
☐ CONCRETE CONSTRUCTION	SECTION 1705.3
☐ MASONRY CONSTRUCTION-LEVEL A	SECTION 1705.4
☐ MASONRY CONSTRUCTION-LEVEL B	SECTION 1705.4
☐ MASONRY CONSTRUCTION-LEVEL C	SECTION 1705.4
☐ PREFABRICATED WOOD STRUCTURAL ELEMENTS	SECTION 1705.5
☐ HIGH LOAD DIAPHRAGM	SECTION 1705.5.1
☐ METAL-PLATE-CONNECTED WOOD TRUSSES SPANNING ≥ 60 FT	SECTION 1705.5.2
☐ SOILS	SECTION 1705.6
☐ DRIVEN DEEP FOUNDATIONS	SECTION 1705.7
☐ CAST-IN-PLACE DEEP FOUNDATIONS	SECTION 1705.8
☐ HELICAL PILE FOUNDATIONS	SECTION 1705.9
■ POST-INSTALLED ANCHORS	SEE DRILLED-IN ANCHOR NOTES

LATERAL FORCE-RESISTING SYSTEM:	INSPECTIONS/TESTING
☐ STRUCTURAL STEEL	SECTION 1705.11.1 & SECTION 1705.12
☐ STRUCTURAL WOOD	SECTION 1705.11.2
☐ COLD-FORMED STEEL LIGHT-FRAME CONSTRUCTION	SECTION 1705.11.3
☐ CONCRETE REINFORCEMENT	SECTION 1705.12.1

2. INSPECTIONS SHALL BE CONTINUOUS OR PERIODIC AS NOTED FOR THE INDIVIDUAL MATERIAL OR COMPONENT INSPECTION SECTIONS AND TABLES NOTED ABOVE.
3. THE SPECIAL INSPECTOR SHALL SUBMIT INSPECTION REPORTS TO THE BUILDING OFFICIAL AND THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. THE REPORTS SHALL INDICATE WHETHER WORK INSPECTED CONFORMED TO THE CONSTRUCTION DOCUMENTS. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF DISCREPANCIES ARE NOT CORRECTED, THEY SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.
4. ALL SPECIAL INSPECTION AGENCIES / INDIVIDUALS AND SHOP FABRICATORS SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO COMMENCEMENT OF WORK.
5. TESTING AND INSPECTION RECORDS SHALL BE RETAINED UNTIL COMPLETION OF CONSTRUCTION.
6. THE CONTRACTOR SHALL SUBMIT A WRITTEN STATEMENT TO THE BUILDING OFFICIAL ACKNOWLEDGING RESPONSIBILITY FOR CONSTRUCTION OF THE MAIN LATERAL-FORCE RESISTING SYSTEM PRIOR TO COMMENCEMENT OF THAT WORK AS REQUIRED BY SECTION 1704.4 OF THE 2013 CBC.
7. ALL SOILS AND FOUNDATION EXCAVATION INSPECTIONS SHALL BE BY THE GEOTECHNICAL ENGINEER OF RECORD.
8. FOR TESTING AND INSPECTION REQUIREMENTS FOR NON-STRUCTURAL MATERIALS AND COMPONENTS, SEE CONSTRUCTION DOCUMENTS AND COMPLY WITH CHAPTER 17 OF THE 2013 CBC.
9. SPECIAL INSPECTIONS AND TESTING OF THE LATERAL FORCE RESISTING SYSTEM SHALL BE PERFORMED AS NOTED ABOVE.

DRILLED-IN ANCHORS
30009D001-1

1. FOR CONCRETE CONSTRUCTION, EPOXY ANCHORS SHALL BE HILTI HIT-HY 200 PER ESR-3187, HILTI HIT-RE500-SD PER ESR-2322, SIMPSON SET-XP PER ESR-2508, OR POWERS PURE 110 PER ESR-3298 FOR THRD ROD & REBAR. EXPANSION ANCHORS SHALL BE HILTI KB-TZ PER ESR-1917, SIMPSON STRONG-BOLT 2 PER ESR-3037, OR POWERS POWER-STUD+ SD2 PER ESR-2502. SCREW ANCHORS SHALL BE HILTI KWIK HUS-EZ (KH-EZ) PER ESR-3027, SIMPSON TITEN HD PER ESR-2713, OR POWERS WEDGEBOLT+ PER ESR-2526.
2. FOR MASONRY CONSTRUCTION, EPOXY ANCHORS SHALL BE HILTI HIT-HY 70 PER ESR-2682, SIMPSON SET PER ESR-1772, OR POWERS T308+ PER ESR-3149 FOR THRD'D ROD & REBAR. EXPANSION ANCHORS SHALL BE HILTI KWIK BOLT 3 (KB3) PER ESR-1385, SIMPSON WEDGE-ALL PER ESR-1396, OR POWERS POWER-STUD+ PER ESR-2966. SCREW ANCHORS SHALL BE HILTI KWIK HUS-EZ (KH-EZ) PER ESR-3056, SIMPSON TITEN HD PER ESR-1056, OR POWERS WEDGEBOLT+ PER ESR-1678.
3. ANCHOR TYPE, SIZE & EMBEDMENT SHALL BE INDICATED IN DRAWINGS. POST-INSTALLED ANCHORS FOR REPAIR SHALL BE EVALUATED ON A CASE BY CASE BASIS. NOTIFY STRUCTURAL ENGINEER FOR REPAIRS.
4. ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS GIVEN IN THE ICC REPORT.
5. UNLESS NOTED OTHERWISE ANCHORS HAVE BEEN DESIGNED FOR SPECIAL INSPECTION. PROVIDE SPECIAL INSPECTION AS INDICATED IN THE ICC REPORT.
6. WHEN INSTALLING DRILLED-IN ANCHORS IN EXISTING CONCRETE OR MASONRY, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING EXISTING REINFORCING BARS. DO NOT INSTALL ANCHORS IN PRESTRESSED CONCRETE ELEMENTS.
7. ANCHORS INSTALLED FROM THE BOTTOM INTO METAL DECK WITH CONCRETE SHALL BE INSTALLED IN THE CENTER OF THE LOW FLUTE OF THE DECKING UNLESS NOTED OTHERWISE IN ICC REPORT. THE DECKING SHALL HAVE A MINIMUM THICKNESS OF 20 GAUGE. THE MINIMUM THICKNESS OF THE CONCRETE ABOVE THE HIGH FLUTE OF THE METAL DECK SHALL BE AS INDICATED IN THE ICC REPORT. SEE ICC REPORT FOR ADDITIONAL REQUIREMENTS, INCLUDING MINIMUM DIMENSIONS FOR FLUTE WIDTH AND DEPTH.
8. ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM AGE OF 21 DAYS AT THE TIME OF ANCHOR INSTALLATION PER ACI 318, APPENDIX D.
9. INSTALLER CERTIFICATION AND INSPECTION IS REQUIRED FOR HORIZONTAL AND UPWARDLY INCLINED ADHESIVE ANCHORS SUBJECTED TO SUSTAINED TENSION LOADING IN ACCORDANCE WITH ACI 318, APPENDIX D.
10. THE INSPECTION OF THE ANCHORS SHALL BE DONE BY A QUALIFIED INSPECTION AGENCY AND A REPORT OF THE INSPECTION RESULTS SHALL BE SUBMITTED TO THE GOVERNING AGENCY AND ARCHITECT/STRUCTURAL ENGINEER.

STRUCTURAL STEEL
30009D001-1

FABRICATION, ERECTION AND MATERIALS SHALL CONFORM WITH THE AISC SPECIFICATION FOR
1. STRUCTURAL STEEL BUILDINGS, THE AISC SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS, AND THE INTERNATIONAL BUILDING CODE, LATEST EDITIONS.
   STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL CONFORM WITH ASTM A992. ALL OTHER
2. STRUCTURAL STEEL ROLLED SHAPES (CHANNELS, ANGLES, ETC) AND PLATES SHALL CONFORM WITH ASTM A36, UNO.
   STEEL PIPE SHALL CONFORM TO ASTM A53, TYPES E OR S, GRADE B.
3. ALL HOLLOW STRUCTURAL SECTIONS (HSS) SHALL CONFORM TO ASTM A500, GRADE B.
4. ALL STRUCTURAL STEEL SHALL RECEIVE A MINIMUM OF ONE SHOP COAT OF RED PRIMER PAINT. DO
5. NOT PAINT AREAS TO BE FIELD WELDED, FIREPROOFED, GALVANIZED, TO RECEIVE SLIP-CRITICAL HIGH STRENGTH BH BOLTS, OR TO BE EMBEDDED IN CONCRETE. PROVIDE ADDITIONAL PAINTING AS NOTED IN THE SPECIFICATIONS.
   ALL STRUCTURAL STEEL SHALL BE ERECTED PLUMB AND TRUE TO LINE. TEMPORARY BRACING SHALL
6. BE INSTALLED AND SHALL BE LEFT IN PLACE UNTIL OTHER MEANS ARE PROVIDED TO ADEQUATELY BRACE THE STRUCTURE. CONTRACTOR RESPONSIBLE FOR REVIEWING ALL BASE PLATE AND SUPPORT CONDITIONS DURING ERECTION AND BRACING AS REQUIRED. SEE AISC AND OSHA REQUIREMENTS.
   PLACE NON-SHRINK GROUT UNDER ALL BASE PLATES BEFORE ADDING VERTICAL LOAD.
7. STRUCTURAL STEEL BELOW GRADE SHALL HAVE 3 INCHES MINIMUM OF CONCRETE COVER.
8. BOLTED CONNECTIONS:
9. A. BOLTED CONNECTIONS SHALL CONSIST OF UNFINISHED BOLTS CONFORMING TO ASTM A307 UNLESS NOTED OTHERWISE. WHERE HIGH STRENGTH BOLTS ARE INDICATED, BOLTS CONFORMING TO ASTM A325 OR ASTM A490 AS NEEDED SHALL BE PROVIDED. ANCHOR RODS CAST IN CONCRETE OR MASONRY SHALL BE HEADED BOLTS WITH CUT THREAD, FULL DIAMETER BODY STYLE CONFORMING TO ASTM F1554 GR. 36, 55 (WELDABLE PER S1 SUPPLEMENTARY REQUIREMENTS), OR 105 AS INDICATED ON DRAWINGS.
   B. ALL BOLTED CONNECTIONS AND BASE PLATES SHALL HAVE WASHERS CONFORMING TO ASTM F436 INLESS NOTED OTHERWISE. WASHERS MAY BE OMITTED AT SNUG-TIGHTENED STEEL-TO-STEEL CONNECTIONS, EXCEPT WHERE REQUIRED BY THE TCSC SPECIFICATION FOR STRUCTURAL JOINTS, LATEST EDITION. WASHERS FOR BASE PLATES SHALL CONFORM TO ASTM F844 UNLESS NOTED OTHERWISE, AND SHALL BE PLACED AT TOP AND BOTTOM OF PLATE.
10. "SLIP-CRITICAL" BOLTED CONNECTIONS:
    A. "SLIP-CRITICAL" CONNECTIONS (A325SC DESIGN VALUES WITH SPECIAL INSPECTION) ARE REQUIRED AT ALL BRACED FRAME CONNECTIONS, AT ALL CONNECTIONS ALONG CHORD LINES AND DRAG LINES (AS NOTED ON PLANS), AND UNO, AT ALL BOLTS IN OVERSIZED OR SLOTTED HOLES.
    B. THE SPECIAL INSPECTOR MUST BE PRESENT DURING INSTALLATION AND TIGHTENING OPERATION OF "SLIP-CRITICAL" CONNECTIONS.
    C. WASHERS MAY BE OMITTED AT "SLIP CRITICAL" CONECTIONS EXCEPT WHERE REQUIRED BY THE RCSC SPECIFICATION FOR STRUCURAL JOINTS, LATEST EDITION.
11. PROVIDE 1/2" DIAMETER STITCH BOLTS AND RING FILLS, SPACED AT NOT MORE THAN 2'-0" ON CENTER FOR ALL DOUBLE ANGLE MEMBERS.
12. AT WOOD TO STEEL PARALLEL CONTACT, BOLT WITH 1/2" DIAMETER BOLTS AT MAXIMUM 24"CC.
13. HOLES FOR UNFINISHED BOLTS SHALL BE OF THE SAME NOMINAL DIAMETER OF THE BOLT PLUS 1/16".
    USE STANDARD AISC GAGE AND PITCH FOR BOLTS EXCEPT AS NOTED OTHERWISE.
14. WELDING SHALL BE DONE BY THE ELECTRIC ARC PROCESS IN ACCORDANCE WITH AMERICAN WELDING SOCIETY STANDARDS. USING ONLY CERTIFIED WELDERS. ALL GROOVE WELDS SHALL HAVE COMPLETE PENETRATION UNLESS NOTED OTHERWISE. ALL EXPOSED WELDS SHALL BE GROUND SMOOTH. ALL ELECTRODES FOR WELDING SHALL COMPLY WITH AWS CODE, E70 SERIES MINIMUM.
15. WELD LENGTHS CALLED FOR ON PLANS ARE THE NET EFFECTIVE LENGTHS REQUIRED.
16. MINIMUM FILLET WELDS: 3/16" @ T < 1/2"
    1/4" @ T < 3/4"
    5/16" @ T > 3/4"
17. WELDING PROCEDURE SPECIFICATIONS (WPS) FOR SHOP AND FIELD PREQUALIFIED WELD JOINTS AND WELD JOINTS QUALIFIED BY TEST SHALL BE PREPARED FOR REVIEW PRIOR TO FABRICATION. ALL WELDING PROCEDURE ITEMS SUCH AS BASE METALS, WELDING PROCESSES, FILLER METALS AND JOINT DETAILS THAT MEET THE REQUIREMENTS OF AWS D1.1 SECTION 5.1 SHALL BE CONSIDERED AS PREQUALIFIED. ANY CHANGE OR SUBSTITUTION THAT IS BEYOND THE RANGE OR TOLERANCE OR REQUIREMENTS FOR PREQUALIFICATION SHALL BE QUALIFIED BY TEST PER AWS D1.1 SECTION 5 PART B. QUALIFICATION TESTING IS REQUIRED WHEN THE DEPTH OF A PARTIAL PENETRATION OR COMPLETE PENETRATION WELD IS 2" OR GREATER.
18. FOR NONDESTRUCTIVE TESTING OF WELDED CONNECTIONS EXCLUDING PRIMARY MEMBERS OF MOMENT RESISTING FRAMES:
    A. WELDED CONNECTIONS SHALL BE TESTED BY NONDESTRUCTIVE METHODS FOR COMPLIANCE WITH AISC .I2, AND JOB SPECIFICATIONS. ULTRASONIC TESTING SHALL BE IN ACCORDANCE WITH AWS D1.1, ASTM E164 AND ASME SECTION V. RADIOGRAPHY SHALL BE IN ACCORDANCE WITH AWS D1.1, ASTM E94 AND E99, AND ASME SECTION V. THIS TESTING SHALL BE PART OF THE SPECIAL INSPECTION REQUIREMENTS OF IBC SECTION 1704.3 PERFORMED BY AN APPROVED INDEPENDENT TESTING LABORATORY AS FOLLOWS:
       1. BASE METAL THICKER THAN 1 INCH WHEN SUBJECT TO THROUGH THICKNESS WELD SHRINKAGE STRAINS.
       2. ALL COMPLETE JOINT PENETRATION GROOVE OR BUTT WELDS.
       3. ALL PARTIAL JOINT PENETRATION GROOVE WELDS WHEN USED IN COLUMN SPLICES.
    B. ANY MATERIAL DISCONTINUITIES SHALL BE ACCEPTED OR REJECTED ON THE BASIS OF DEFECT RATING IN ACCORDANCE WITH THE (LARGER REFLECTOR) CRITERIA OF AISC .I2.

FINAL BID DOCUMENTS

Revisions:	Date

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Drawing Title: GENERAL NOTES	Project Title: BUILDING 700 OR HVAC RETROFIT		Project Number: 612A4-13-301
Approved: Project Director	Location: VA MATHER		Building Number: 700
	Date: 4/3/2015	Checked: GAM / Drawn: KCM	Drawing Number: S1.1
			Dwg. of

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

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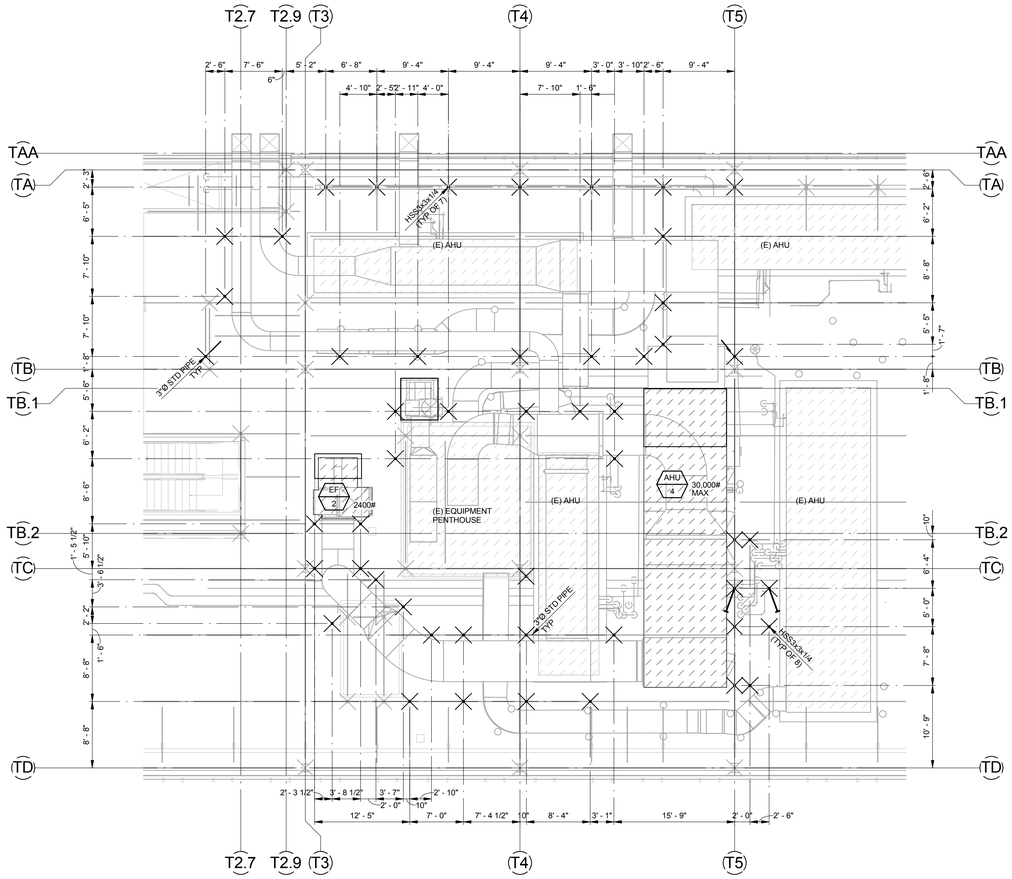
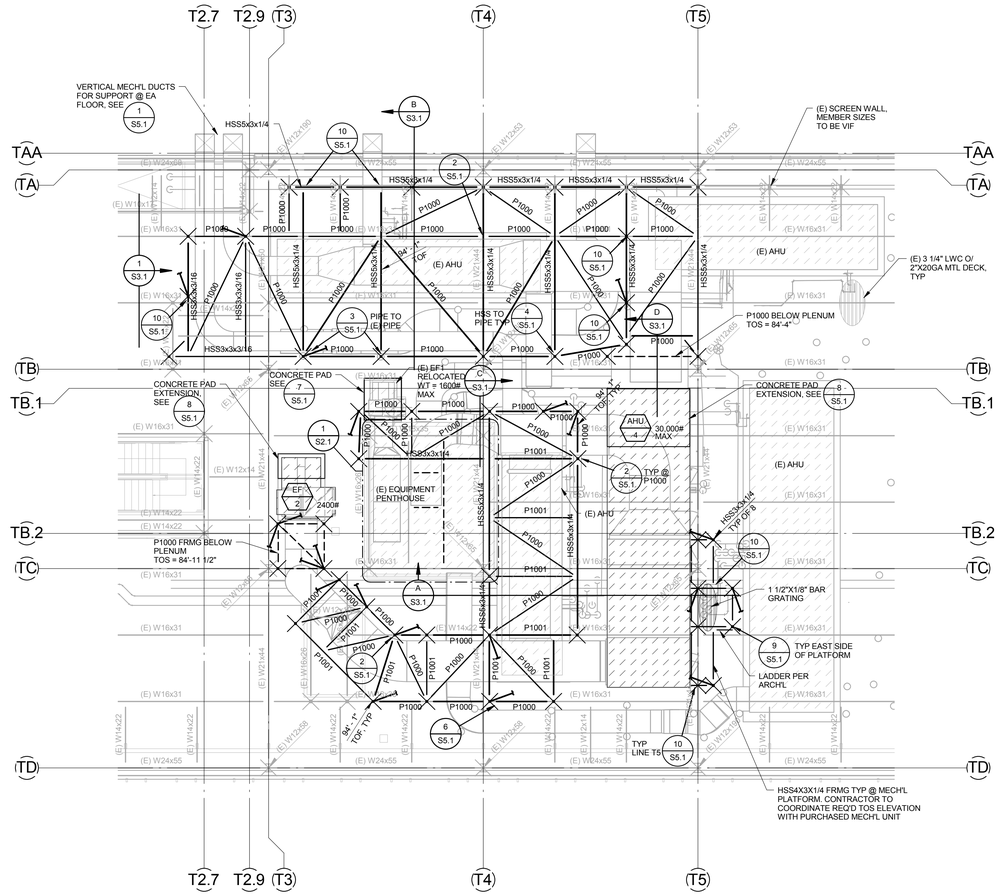
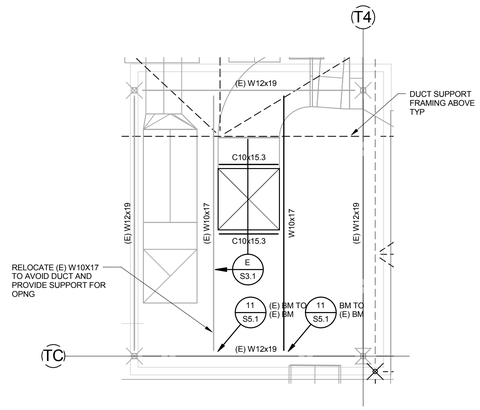


COLUMN DIMENSION PLAN — 1/8" = 1'-0"

TOC = +82'-0"



ROOF FRAMING PLAN — 1/8" = 1'-0"



PENTHOUSE ROOF FRAMING PLAN 1 / S2.1 — 1/4" = 1'-0"

ROOF FRAMING PLAN NOTES

1. INDICATES PIPE POST APPROXIMATE LOCATION. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR TO VIF AND NOTIFY ARCHITECT AND STRUCTURAL ENGINEER OF ANY DISCREPANCIES WITH THE PLANS PRIOR TO PROCEEDING WITH CONSTRUCTION. WHERE EXISTING POSTS MAY BE USED FOR SUPPORT, SEE 3 / S5.1
2. INDICATES UNISTRUT DIAGONAL BRACING APPROXIMATE LOCATIONS. CONTRACTOR TO VIF AND NOTIFY ARCHITECT AND STRUCTURAL ENGINEER OF ANY DISCREPANCIES WITH THE PLANS PRIOR TO PROCEEDING WITH CONSTRUCTION.
3. CONTRACTOR TO VIF LOCATIONS OF (E) DUCTS, (E) PIPE SUPPORTS AND OTHER (E)EQUIPMENT. NOTIFY ARCHITECT AND STRUTURAL ENGINEER OF ANY DISCREPANCIES WITH THE PLANS.
4. ALL STRUCTURAL STEEL AND UNISTRUT FRAMING MEMBERS, COMPONENTS, AND CONNECTIONS SHALL BE HOT-DIPPED GALVANIZED (HDG).

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Revisions:	Date

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Drawing Title	Project Title	Project Number
ROOF FRAMING PLAN	BUILDING 700 OR HVAC RETROFIT	612A4-13-301
Approved: Project Director	Location: VA MATHER	Building Number: 700
	Date: 4/3/2015 · Checked: GAM · Drawn: KM	Drawing Number: S2.1 · Dwg. of

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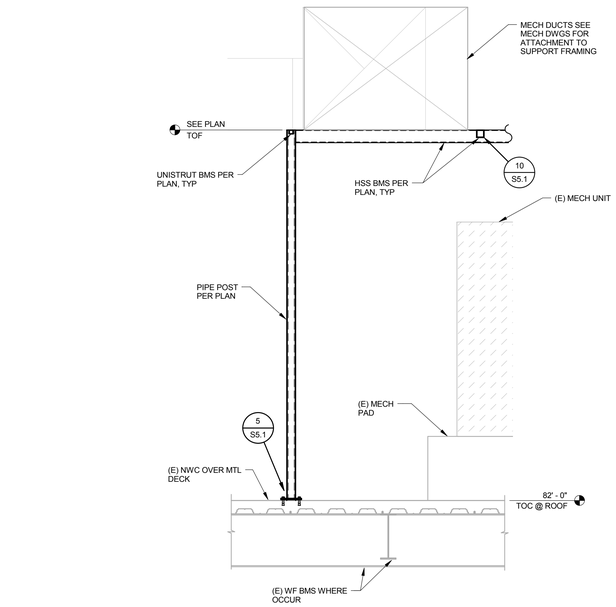
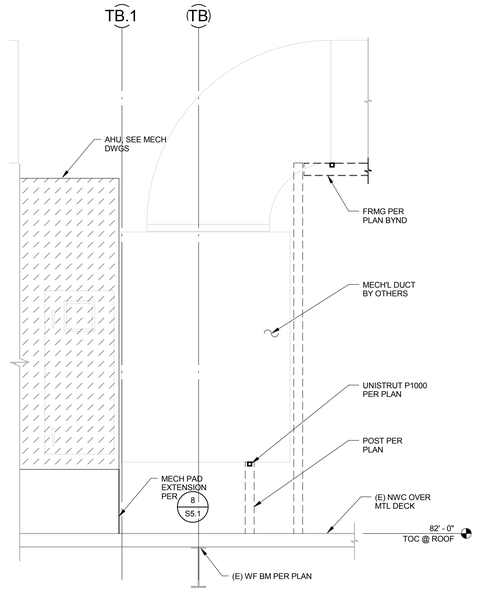
Department of Veterans Affairs

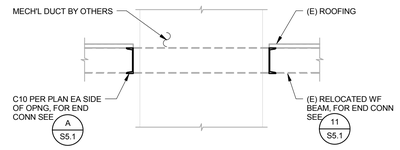
VA FORM 08-6231



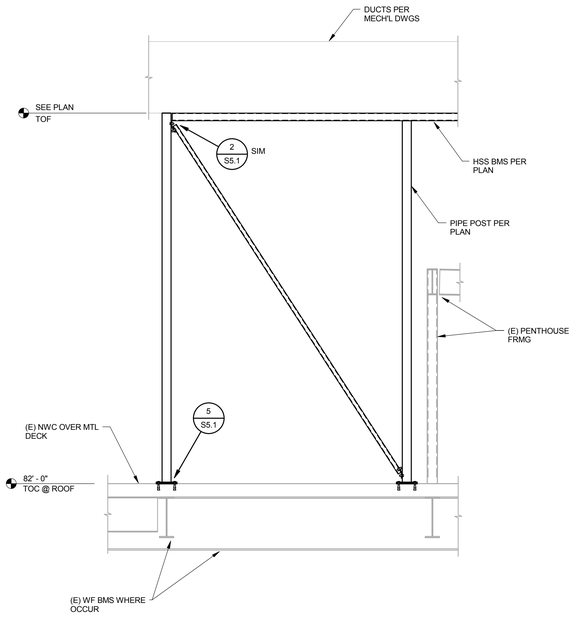
SECTION C S3.1 — 1/2" = 1'-0"



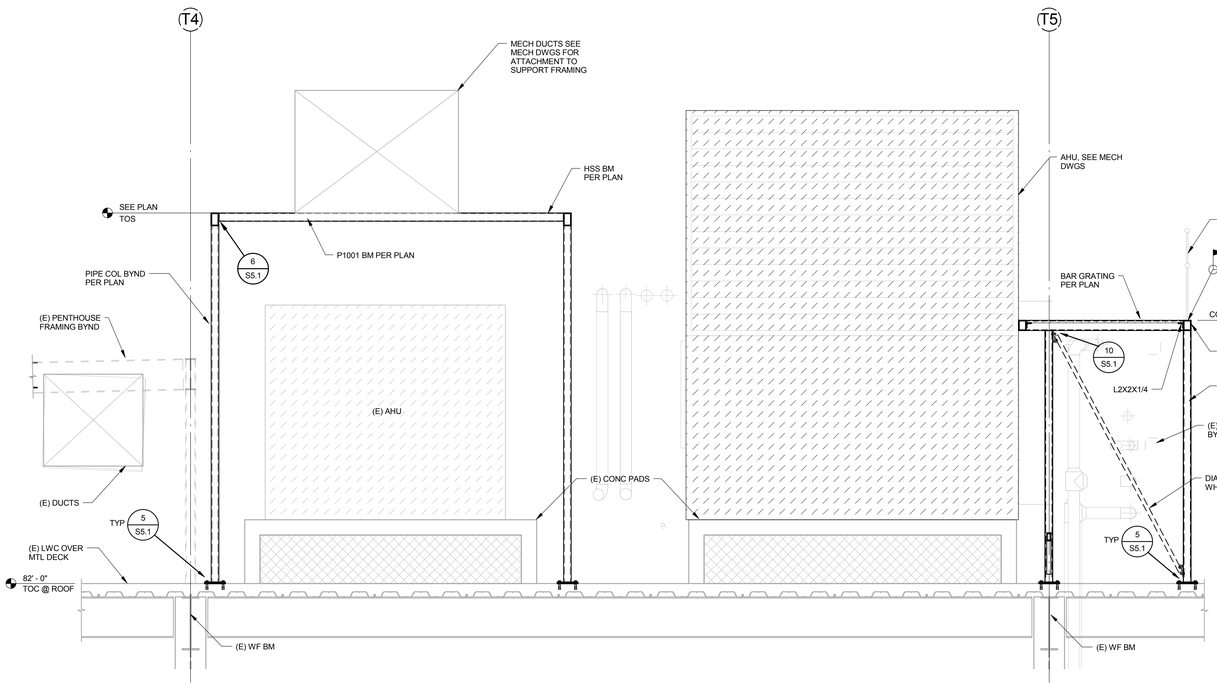
SECTION D S3.1 — 1/2" = 1'-0"



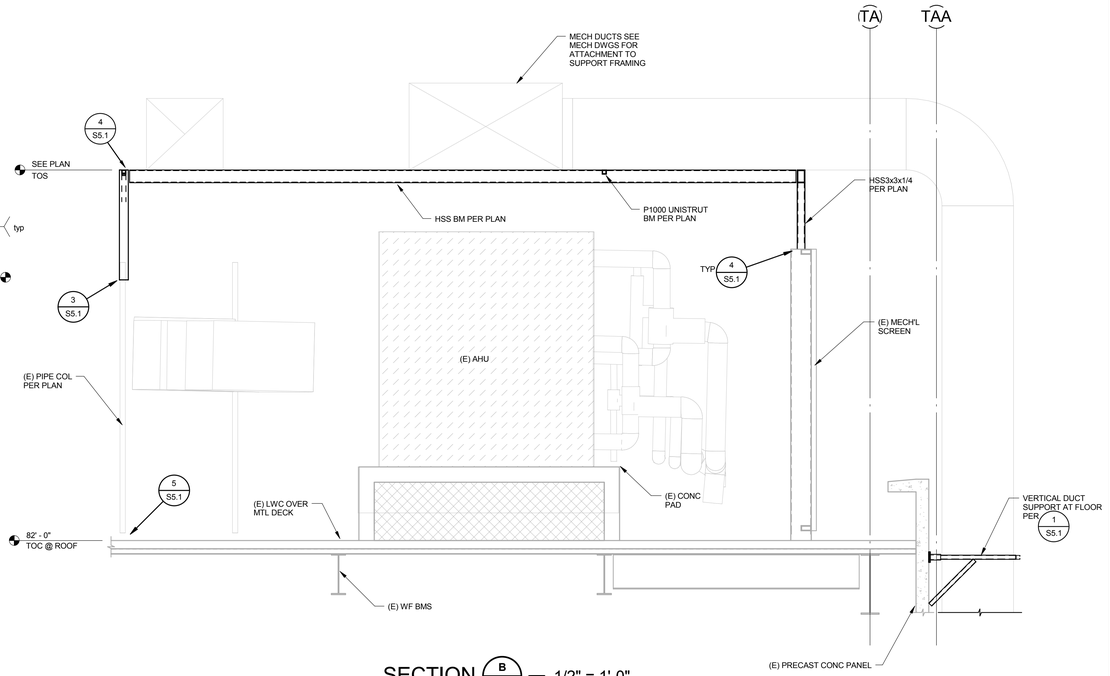
SECTION E S3.1 — 1/2" = 1'-0"



ELEVATION 1 S3.1 — 1/2" = 1'-0"



SECTION A S3.1 — 1/2" = 1'-0"



SECTION B S3.1 — 1/2" = 1'-0"

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Drawing Title: SECTIONS

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4/3/2015 | Checked: GAM | Drawn: KCM

Project Number: 612A4-13-301

Building Number: B700

Drawing Number: S3.1

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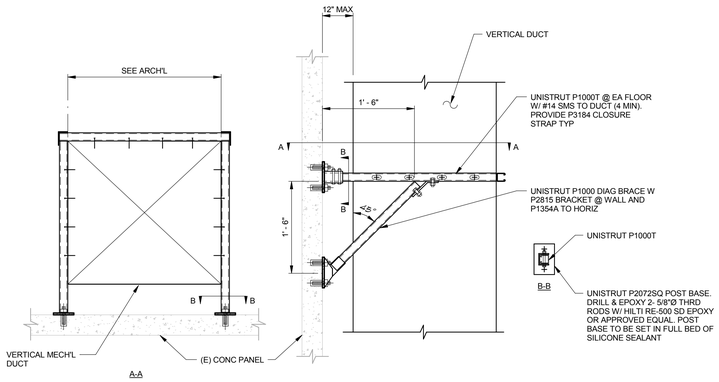
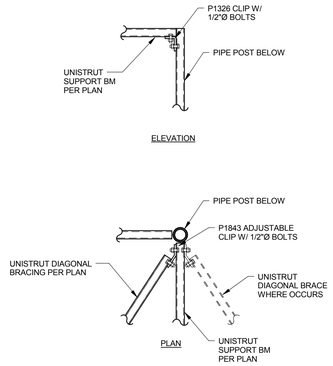
Office of Construction and Facilities Management

Department of Veterans Affairs

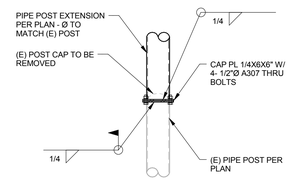
VA FORM 08-6231



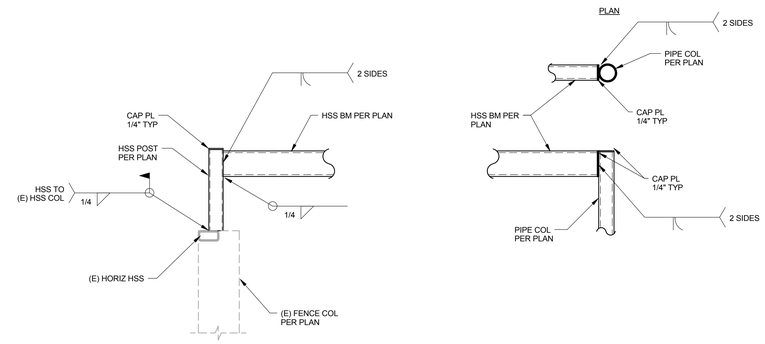
DETAIL 1/S5.1 — 1" = 1'-0"



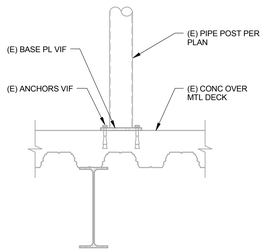
DETAIL 2/S5.1 — 1" = 1'-0"

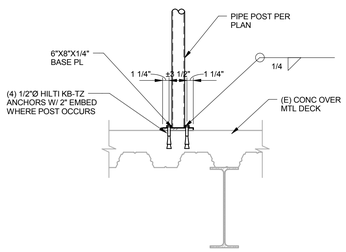


DETAIL 3/S5.1 — 1" = 1'-0"

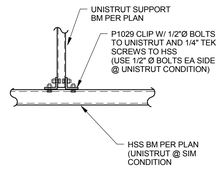


DETAIL 4/S5.1 — 1" = 1'-0"

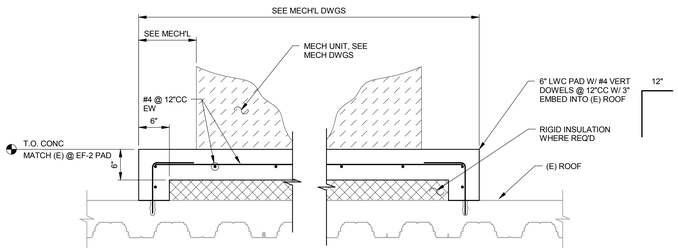




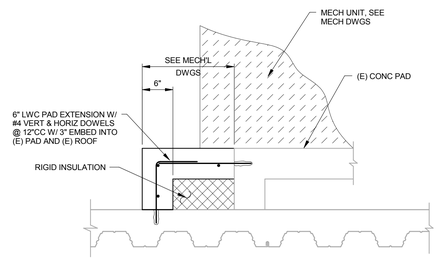
DETAIL 5/S5.1 — 1" = 1'-0"



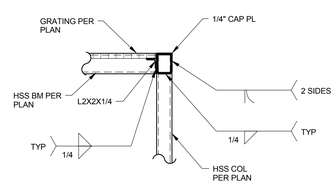
DETAIL 6/S5.1 — 1" = 1'-0"



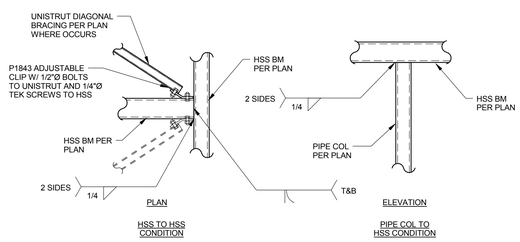
DETAIL 7/S5.1 — 1" = 1'-0"



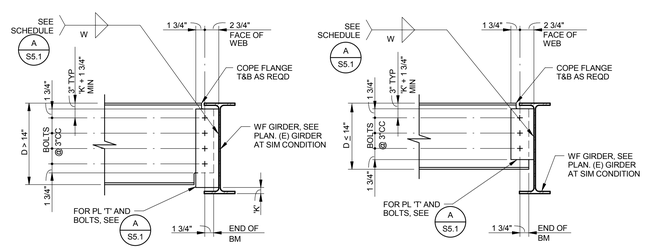
DETAIL 8/S5.1 — 1" = 1'-0"



DETAIL 9/S5.1 — 1" = 1'-0"



DETAIL 10/S5.1 — 1" = 1'-0"



NOTES:
CONTRACTOR MAY USE HORIZONTAL SHORT SLOTTED HOLES FOR THESE CONNECTIONS ONLY. THE SHORT SLOTTED HOLES SHALL BE IN THE SHEAR PL WITH HARDENED WASHERS PROVIDED OVER THE SLOTS. TYPE 'N' BEARING CONNECTIONS SHALL BE USED.

AT (E) WF BEAM TO BE RELOCATED, UNBOLT (E) BEAM AND CONNECT TO (E) GIRDER AT NEW LOCATION SHOWN ON PLAN. (E) SHEAR TAB MAY REMAIN IN PLACE.

DETAIL 11/S5.1
51350003-12
BEAM TO BEAM - ONE SIDE

A/S5.1 CONNECTION SCHEDULE
51350001-1

BEAM SIZE	NO. & DIA. A325-N BOLTS	SHR PL 'T'	W	MAX. LOAD CAPACITY 2
C8 & C10	2 - 7/8"Ø	1/4"	3/16"	26.1 K
W8 & W10	2 - 7/8"Ø	1/4"	3/16"	26.1 K
W12 & W14	3 - 7/8"Ø	1/4"	3/16"	39.2 K
W16	4 - 7/8"Ø	3/8"	1/4"	78.3 K
W18	5 - 7/8"Ø	3/8"	1/4"	97.9 K
W21	5 - 7/8"Ø	3/8"	1/4"	97.9 K

1. THIS SCHEDULE APPLIES TO NON-FRAME CONNECTIONS, TYPICAL.
2. LRFD LOAD CAPACITY PER AISC MANUAL 14TH ED., TABLE 10-10A.

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Revisions:	Date

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Drawing Title: DETAILS

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4/3/2015 | Checked: Checker | Drawn: Author

Project Number: 612A4-13-301

Building Number:

Drawing Number: S5.1

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Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231

MECHANICAL LEGEND, SYMBOLS AND ABBREVIATIONS

MECHANICAL ABBREVIATIONS

A/E	ARCHITECT / ENGINEER
AAV	AUTOMATIC AIR VENT
ACCH	AIR COOLED CHILLER
ACD	AUTOMATIC CONTROL DAMPER,MODULATING
ACD-TP	AUTOMATIC CONTROL DAMPER,TWO POSITION
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR-HANDLING UNIT
AMP	AMPERGE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
AS	AIR SEPARATOR
BDD	BACKDRAFT DAMPER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CENT	CENTRIFICAL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFT	CUBIC FEET
CFP	CHEMICAL FEED PUMP
CH	CHILLER
CHP	CHILLED WATER PUMP
PCHP	PRIMARY CHILLED WATER PUMP
SCHP	SECONDARY CHILLED WATER PUMP
CHW	CHILLER WATER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CI	CAST IRON
CM	CUBIC METER
CM/S	CUBIC METER PER SECOND
CO	CLEAN OUT
COP	COEFFICIENT OF PERFORMANCE
CT	COOLING TOWER
CW	COLD WATER (POTABLE)
CWCC	CHILLED WATER COOLING COIL
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN (TO COOLING TOWER)
CWS	CONDENSER WATER SUPPLY (FROM COOLING TOWER)
C	CENTIGRADE (CELCIUS)
CC	COOLING COIL
CCD	COOLING COIL CONDENSATE DRAIN
-	FEET
"	INOH
@	AT
Ø	DIAMETER
(SAD)	SEE ARCHITECTURAL DRAWINGS
(SED)	SEE ELECTRICAL DRAWINGS
(SCD)	SEE CIVIL DRAWINGS
(SPD)	SEE PLUMBING DRAWINGS
(SSD)	SEE STRUCTURAL DRAWINGS
E	EXISTING
EA	EXHAUST AIR
ECC	ENGINEERING CONTROL CENTER
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ENT	ENTERING
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
EX.	EXISTING
F	FAHRENHEIT
FD	FLOOR DRAIN
FD	FIRE DAMPER
FF	FINAL FILTER
FHX	FLUE GAS/FEEDWATER HEAT EXCHANGER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
GA	GAUGE
GAL	GALLONS
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GS	GALVANIZED STEEL
HB	HOSE BIBB
HD	HEAD
HOA	HAND/OFF/AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HVD	HOISTWAY VENT DAMPER
HX	HEAT EXCHANGER
HZ	HERTZ
N	NEW
W	WATTS
WCCH	WATER COOLED CHILLER
WCHP	WATER COOLED HEAT PUMPS
WF	WATER FILTER
WFCV	WATER FLOW CONTROL VALVE
WFM	WATER FLOWMETER
WFMD	WATER FLOW MEASURING DEVICE
WG	WATER GAGE
WPD	WATER SIDE PRESSURE DROP
YR	YEAR

CONTROLS SYMBOLS

XX / XXX — CONTROL POINT (SEE BELOW); DEVICE SERVED

TT XXX	TEMPERATURE TRANSMITTER
TE XXX	TEMPERATURE ELEMENT
PT XXX	PRESSURE TRANSMITTER
FT XXX	FLOW TRANSMITTER
IT XXX	CURRENT TRANSMITTER
CT XXX	CONDUCTIVITY TRANSMITTER
PDT XXX	PRESSURE DIFFERENTIAL TRANSMITTER
PDS XXX	PRESSURE DIFFERENTIAL SWITCH
HS XXX	HAND SWITCH (HAND-OFF-AUTO SWITCH)
TSL XXX	TEMPERATURE SWITCH, LOW (FREEZESTAT)
TSH XXX	TEMPERATURE SWITCH, HIGH (FREEZESTAT)
LC XXX	LEVEL CONTROLLER
KW XXX	POWER MONITORING
LT XXX	LEVEL TRANSMITTER
PSH XXX	PRESSURE SWITCH HIGH
PSL XXX	PRESSURE SWITCH LOW
EPT XXX	ELECTRONIC TO PNEUMATIC TRANSDUCER
FC XXX	FLOW CONTROLLER. SEE SEQUENCE OF OPERATION
FSH XXX	FLOW SWITCH HIGH
FSL XXX	FLOW SWITCH LOW
SIC XXX	SPEED INTERLOCK CONTROLLER. SEE SEQUENCE OF OPERATION
IS XXX	CURRENT SWITCH
TC XXX	TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
PC XXX	PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
ZC XXX	VALVE POSITION CONTROLLER
LTCP	LOCAL TEMPERATURE CONTROL PANEL
HVAC	HVAC CONTROL PANEL
VSMC	VARIABLE SPEED MOTOR CONTROLLER
ECC	INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
FM	FLOWMETER
T	TEMPERATURE WELL
	FLOW SWITCH
	EMERGENCY POWER OFF SWITCH
	HORN
	STROBE
DI	DIGITAL IN
DO	DIGITAL OUT
AI	ANALOG IN
AO	ANALOG OUT

VALVES

BUTTERFLY VALVE	DRAIN VALVE
GATE VALVE - THREADED/FLANGED	DRAIN VALVE WITH CAP
GLOBE VALVE- THREADED/FLANGED	REDUCED PRESSURE BACKFLOW PREVENTER (RPBP)
BALL VALVE	
SHUTOFF VALVE (BUTTERFLY VALVE FOR 3" AND LARGER, BALL VALVE FOR 2 1/2" AND SMALLER)	PRESSURE RELIEF VALVE(RV) OR SAFETY VALVE (SV)
GAUGE VALVE (BALL TYPE)	VACUUM RELIEF/VACUUM BREAKER
BALANCING VALVE	
SPRING CHECK VALVE	FLOAT OPERATED VALVE
SWING CHECK VALVE	
2-WAY SOLENOID VALVE (XX)	FCV — FLOW CONTROL VALVE
2-WAY CONTROL VALVE (VALVE BODY AS SPECIFIED) (XX)	
3-WAY MIXING VALVE WITH ARROW INDICATING FAIL POSITION	3-WAY DIVERTING VALVE WITH ARROW INDICATING FAIL POSITION

(XX) DEFINES FAIL POSITION OR NORMAL POSITION
FC = FAIL CLOSED (CONTROL VALVE OR DAMPER)
FO = FAIL OPEN (CONTROL VALVE OR DAMPER)
NC = NORMALLY CLOSED (CONTROL VALVE OR DAMPER)
NO = NORMALLY OPEN (CONTROL VALVE OR DAMPER)

PIPING SPECIALITIES

WATER SYSTEM PIPELINE STRAINER WITH 3/4" BRASS HOSE ADAPTOR AND PIPE	THERMOMETER
	PRESSURE GAUGE (WITH BALL VALVE)
WYE STRAINER (WITH BALL VALVE & HOSE CONNECTION	FLOW SENSOR
	FLOW SWITCH
SUCTION DIFFUSER WITH STRAINER AND DRAIN	AUTOMATIC AIR VENT (WITH BALL VALVE)
DUPLEX STRAINER	MANUAL AIR VENT
BASKET STRAINER	
FLANGE	TEST PLUG (PRESSURE/TEMP.)
UNION	CONCENTRIC OR ECCENTRIC REDUCER
2" AND SMALLER, CAP OR PLUG; 2 1/2" AND LARGER, BLIND FLANGE	CONCENTRIC REDUCER
PIPE FLEXIBLE CONNECTION	ECCENTRIC REDUCER
	DIRECTION OF PITCH (DOWN)
SHOCK SUPPRESSOR (WITH BALL VALVE)	DIRECTION OF FLOW
RISE OR DROP IN PIPE	FM — FLOW METER

ACTUATORS

MANUAL	S — SOLENOID
2-POSITION	M — ELECTRIC MOTOR DRIVEN
MODULATING	

PIPING

SINGLE	DOUBLE	
		ELBOW DOWN
		ELBOW UP
		BOTTOM CONNECTION (45° OR 90°)
		TOP CONNECTION (45° OR 90°)
		45° PIPE RISE(R) OR DROP(D)
	N/A	TEE (REFER TO SPECIFICATION FOR SIDE, TOP OR BOTTOM TEE)
		EXISTING PIPING TO REMAIN
		EXISTING PIPING TO BE REMOVED
		FLOW DIRECTION DESIGNATION
		LINE CONTINUATION BREAK

DUCTWORK SYMBOLS

VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING)	10x8 — NEW DUCT (INSIDE DIMENSIONS: WIDTH x DEPTH)
VANED ELBOW (SHORT RADIUS)	EXISTING DUCT TO REMAIN
STANDARD RADIUS ELBOW (LONG RADIUS)	EXISTING DUCT TO BE REMOVED
	LIMIT OF DEMOLITION
	DUCT DROP
	DUCT RISER

SPECIAL DESIGNATION

AHU 4 — EQUIPMENT (CHILLER INDICATED)	X — REVISION REFERENCE
A/158-6 OR 4/158-6 — DETAIL REFERENCE (TOP= DETAIL NO., BOTTOM=SHEET NO. IN DETAIL MANUAL)	X — GENERAL OR SPECIAL NOTES REFERENCE
PLAN CONTINUATION REFERENCE	ALTERNATE BOUNDARY
	MATCH LINE
	SCOPE OF WORK
X / XXX — DETAIL REFERENCE (TOP=DETAIL NO., BOTTOM=DRAWING NO. SHOWN ON)	PACKAGED EQUIPMENT

MISCELLANEOUS

POINT OF NEW CONNECTION TO EXISTING (POC)	VIBRATION ISOLATOR
POINT OF DISCONNECTION TO EXISTING (POD)	ELEVATION MARKER

PIPING SYSTEMS

CHS — CHILLED WATER SUPPLY	V — VENT
CHR — CHILLED WATER RETURN	C.W — COLD WATER
CHSR — CHILLED WATER SUPPLY/RETURN	
SGCHS — SURGERY CHILLED WATER SUPPLY	
SGCHR — SURGERY CHILLED WATER RETURN	
SGCHSR — SURGERY CHILLED WATER SUPPLY/RETURN	

PROJECT DESCRIPTION

REPLACE EXISTING 100% OUTSIDE AIR (OA) AIR HANDLING UNIT, AHU-4, SERVING EXISTING 2ND FLOOR SURGERY WING. NEW UNIT IS SIZED TO ACCOMMODATE THE FOLLOWING INCREASES IN AIRFLOW:
1. UPGRADE ALL AREAS TO CURRENT VA STANDARD AIR CHANGE RATE CRITERIA;
2. PROVISION FOR FUTURE CONVERSION OF OR #3, SUBSTERILE 2A236A AND ANGIO VIEWING 2A337 INTO A HYBRID OR WITH CONTROL ROOM, EQUIPMENT ROOM AND SUBSTERILE ROOM;
3. PROVISION FOR FUTURE FIRST FLOOR RENOVATION TO ADD TWO CATH LAB SUITES.

NEW AHU-4 WILL BE A 100% OA UNIT WITH AIR-TO-AIR HEAT EXCHANGER, UTILIZING EXHAUST AIR TO PRE-COOL OR PRE-HEAT OUTDOOR AIR. EXHAUST AIR THROUGH HEAT EXCHANGER WILL BE MODULATED - OR BYPASSED COMPLETELY - WHEN OUTDOOR CONDITIONS ARE IDEAL TO MAXIMIZE THE AMOUNT OF FREE COOLING AND INCREASE ENERGY EFFICIENCY.

ASSOCIATED EXHAUST FAN, EF-2, WILL ALSO BE REPLACED TO SERVE THE SAME AREAS AS THE NEW AHU-4.
EF-3 WILL BE REPLACED IN KIND AND MOVED TO A NEW LOCATION

NEW SUPPLY AND EXHAUST DUCTWORK ON THE ROOF WILL BE RECONFIGURED TO RECONNECT TO EXISTING INTERIOR RISERS, AS WELL AS SERVE NEW EXTERIOR DUCT RISERS ROUTED DOWN THE NORTH FACE OF THE HOSPITAL.

AFTER BUILD-OUT OF FIRST AND SECOND FLOORS (NOT IN SCOPE OF WORK) RE-BALANCING OF ALL SUPPLY AND EXHAUST RISER DUCTWORK SERVED BY AHU-4 WILL NEED TO OCCUR.

HVAC SYSTEM SHUTDOWN

TEMPORARY SERVICES FOR THIS PROJECT DURING SHUTDOWN WILL NOT BE AVAILABLE.

THIS PROJECT REQUIRES SHUTDOWN OF ALL HVAC SYSTEMS SERVING THE SECOND FLOOR SURGERY WING; IT IS IMPERATIVE THAT THE SHUTDOWN DURATION BE KEPT TO AN ABSOLUTE MINIMUM. TO REDUCE PROGRAMMING IMPACTS TO THE OPERATION OF THE HOSPITAL, SHUTDOWN SHALL BE SCHEDULED WITH THE VA MINIMUM FOUR (4) WEEKS IN ADVANCE TO ALLOW SUFFICIENT TIME FOR RESCHEDULING OF SURGERIES. SHUTDOWN SHALL OCCUR FOR NINE (9) DAYS STARTING **SATURDAY, 12/26/2015 THROUGH SUNDAY 1/3/2016.** CONTRACTOR IS EXPECTED TO MOBILIZE THEIR SUBCONTRACTORS TO WORK 2 TO 3 SHIFTS (AS NEEDED) DURING THIS PERIOD TO COMPLETE ALL WORK TO HAVE THE NEW AHU-4 AND NEW EF-1 AND NEW EF-2 FULLY OPERATIONAL, COMMISSIONED AND COMPLETELY AIR BALANCED BY **9 PM SATURDAY, 1/2/2016** .

SHUTDOWN TASKS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
1. COORDINATE WITH HOSPITAL OPERATIONS A MINIMUM OF FOUR (4) WEEKS PRIOR TO SHUTDOWN.
2. LIMIT SHUTDOWN TIME TO EXISTING AHU-5 AND AHU-6 WITH THE FOLLOWING PROCESS:
   2.1. CUT AND CAP EXISTING PIPING RUNNING OVER THE TOP OF EXISTING AHU-4 AND SERVING EXISTING AHU-5 AND 6. ADD TEMPORARY HOSE CONNECTIONS TO AHU-6 WHILE AHU-5 MAINTAINS THE USE OF ITS EXISTING PIPING CONNECTIONS. RESTART AND CONTINUE TO OPERATE AHU-5 AND AHU-6 DURING EXTENDED SHUTDOWN PERIOD FOR AHU-4 REPLACEMENT WORK.
3. TESTING, ADJUSTING AND BALANCING PROCEDURE DURING SHUTDOWN
   3.1. DRIVE ALL AIR TERMINAL BOXES TO THEIR MAXIMUM POSITION BEFORE ANY DEMOLITION WORK OCCURS.
   3.2. MEASURE TOTAL SUPPLY AIR AND EXHAUST STATIC PRESSURE AND AIR FLOW AT THE DISCHARGE OF AHU-4 AND INLET OF EF-2.
   3.3. DEMOLISH AND REPLACE EQUIPMENT PER PROJECT SCOPE.
   3.4. AFTER WORK IS COMPLETE, DRIVE ALL AIR TERMINAL BOXES TO THEIR MAXIMUM POSITION.
   3.5. SET DUCTWORK STATIC PRESSURE AND AIRFLOW FOR NEW AHU-4 AND EF-2 TO PREVIOUSLY MEASURED QUANTITIES.
   3.6. RE-BALANCE ALL SPACES BACK TO EXISTING CONDITIONS AS SHOWN ON ORIGINAL AS-BUILT DRAWINGS.

CAUTIONARY NOTE:
DO NOT BEGIN SHUTDOWN WORK UNTIL THE FOLLOWING PRE-DEMOLITION WORK IS COMPLETED:
1. COMPLETION OF ALL NEW AND ADDITIONAL EQUIPMENT PADS.
2. COMPLETION OF ALL NEW ELECTRICAL WORK NOT REQUIRED DURING SHUTDOWN.
3. COMPLETION OF ALL NEW PIPING/DUCTWORK NOT REQUIRED DURING SHUTDOWN.
4. CONTRACTOR TO MEASURE ALL EXISTING AIRFLOWS PRIOR TO DEMOLITION. AFTER WORK IS COMPLETE, RETURN AIRFLOW TO PREVIOUSLY MEASURED QUANTITIES.

CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALL DIMENSIONS ARE VERIFIED IN THE FIELD.

UN-CONNECTED NEW AND EXISTING DUCTWORK AND PIPING NOT IN OPERATION DURING SHUTDOWN SHALL BE COVERED AT OPEN ENDS TO PREVENT CONTAMINATION OF THE INTERIOR SURFACES UNTIL FINAL CONNECTIONS ARE MADE.

CONTRACTOR TO TAKE STEPS TO PREVENT CONDENSATION BUILD-UP ON INTERIOR SURFACES OF ALL UN-INSULATED DUCTWORK UNTIL FINAL CONNECTIONS ARE MADE AND DUCTWORK IS IN OPERATION. CLEAN ALL DUCTWORK PER SPECIFICATIONS PRIOR TO FINAL OPERATION.

GENERAL NOTES

1. THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS.
2. FOR TYPICAL WATER PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD EQUIPMENT DETAILS.
3. SEISMIC PROVISIONS REQUIRED - SEE SPECS.
4. ALL PRESSURES LISTED ARE GAGE PRESSURE UNLESS OTHERWISE NOTED
5. NOTES SHOWN ON INDIVIDUAL SHEETS ARE DESIGNATED WITH A DIAMOND SURROUNDING THE NOTE NUMBER (SHEET NOTE) OR WITHOUT THE DIAMOND (GENERAL NOTE). WITH THE DIAMOND, THE NOTE APPLIES TO A SPECIFIC LOCATION ON THE SHEET AND WITHOUT THE DIAMOND, THE NOTE APPLIES TO THE ENTIRE SHEET.
6. WORK SHOWN WITHIN THE MATCH LINES OF EACH SHEET PERTAINS TO THOSE PARTICULAR SHEETS, UNLESS OTHERWISE NOTED. FOR WORK SHOWN BEYOND THE MATCH LINES ON EACH SHEET, REFER TO OTHER SHEETS.
7. DARK LINEWORK INDICATES NEW CONSTRUCTION, LIGHTER LINEWORK INDICATES EXISTING WORK TO REMAIN.
8. ALL ELEVATIONS NOTED ARE RELATIVE TO FINISHED FLOOR ELEVATION.
9. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. PROVIDE TRANSITIONS FOR FINAL CONNECTION TO EQUIPMENT. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OF WORK.
10. PROVIDE 3/8" BLOW-OFF VALVE AND 1/2" TO HOSE THREAD ADAPTER ON ALL STRAINERS.
11. PROVIDE UNIONS OR FLANGES ON EACH SIDE OF CONTROL VALVES. EVERY PIPING ASSEMBLY SHALL BE MADE SO AS TO MAKE EVERY VALVE AND PIECE OF EQUIPMENT EASILY REMOVABLE.
12. PROVIDE 1" AIR GAP AT ALL DRAIN CONNECTIONS.
13. MAINTAIN EXISTING UTILITY SERVICES FOR MEDICAL CENTER, SUCH AS ELECTRICITY, HEATING WATER, AND CHILLED WATER AT ALL TIMES. PROVIDE TEMPORARY FACILITIES, LABOR, MATERIALS, EQUIPMENT, CONNECTIONS, AND UTILITIES TO ASSURE UNINTERRUPTED SERVICES. WHERE NECESSARY TO CUT EXISTING AIRFLOW, WATER, CONDUITS, WIRES, CABLES, ETC. OF UTILITY SERVICES, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES WHERE SHOWN. NO UTILITY SERVICE MAY BE INTERRUPTED WITHOUT PRIOR APPROVAL OF RESIDENT ENGINEER. CONTRACTOR SHALL SUBMIT A REQUEST TO INTERRUPT SERVICES TO RESIDENT ENGINEER, IN WRITING, MINIMUM 48 HOURS IN ADVANCE OF PROPOSED INTERRUPTION. REQUEST SHALL STATE REASON, DATE, EXACT TIME OF, AND APPROXIMATE DURATION OF SUCH INTERRUPTION. CONTRACTOR WILL BE ADVISED OF APPROVAL OF REQUEST, OR OF WHICH OTHER DATE AND/OR TIME SUCH INTERRUPTION WILL CAUSE LEAST INCONVENIENCE TO OPERATIONS OF MEDICAL CENTER. INTERRUPTION TIME APPROVED BY MEDICAL CENTER MAY OCCUR AT OTHER THAN CONTRACTOR'S NORMAL WORKING HOURS. MAJOR INTERRUPTIONS OF ANY SYSTEM MUST BE REQUESTED, IN WRITING, AT LEAST 15 CALENDAR DAYS PRIOR TO THE DESIRED TIME AND SHALL BE PERFORMED AS DIRECTED BY THE RESIDENT ENGINEER. IN ORDER TO MINIMIZE DISRUPTIONS TO SYSTEM, WORK SHALL BE PERFORMED DURING THE WEEK BETWEEN CHRISTMAS 2015 AND NEW YEAR'S DAY 2016, AS SHOWN ON THE DRAWINGS AND DESCRIBED BELOW:
14. CONTRACTOR TO VERIFY ALL ELECTRICAL SERVICES. REFER TO ELECTRICAL DRAWINGS FOR NEW WORK REQUIRED.
15. CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR AND INCLUDE IN THEIR SCOPE ANY POINTS SHOWN ON MI-411 OR MI-412, AND POINTS TO COMPLY WITH THE SEQUENCE OF OPERATION.

APPLICABLE CODES AND ORDINANCES

2013 CALIFORNIA BUILDING CODE-PART 2, TITLE 24, CCR
2013 CALIFORNIA MECHANICAL CODE-PART 4, TITLE 24, CCR
2013 CALIFORNIA ELECTRICAL CODE-PART 3, TITLE 24, CCR
2013 CALIFORNIA PLUMBING CODE-PART 5, TITLE 24, CCR
2013 CALIFORNIA FIRE CODE-PART 9, TITLE 24, CCR
US DEPARTMENT OF VETERANS AFFAIRS STANDARDS FOR CONSTRUCTION

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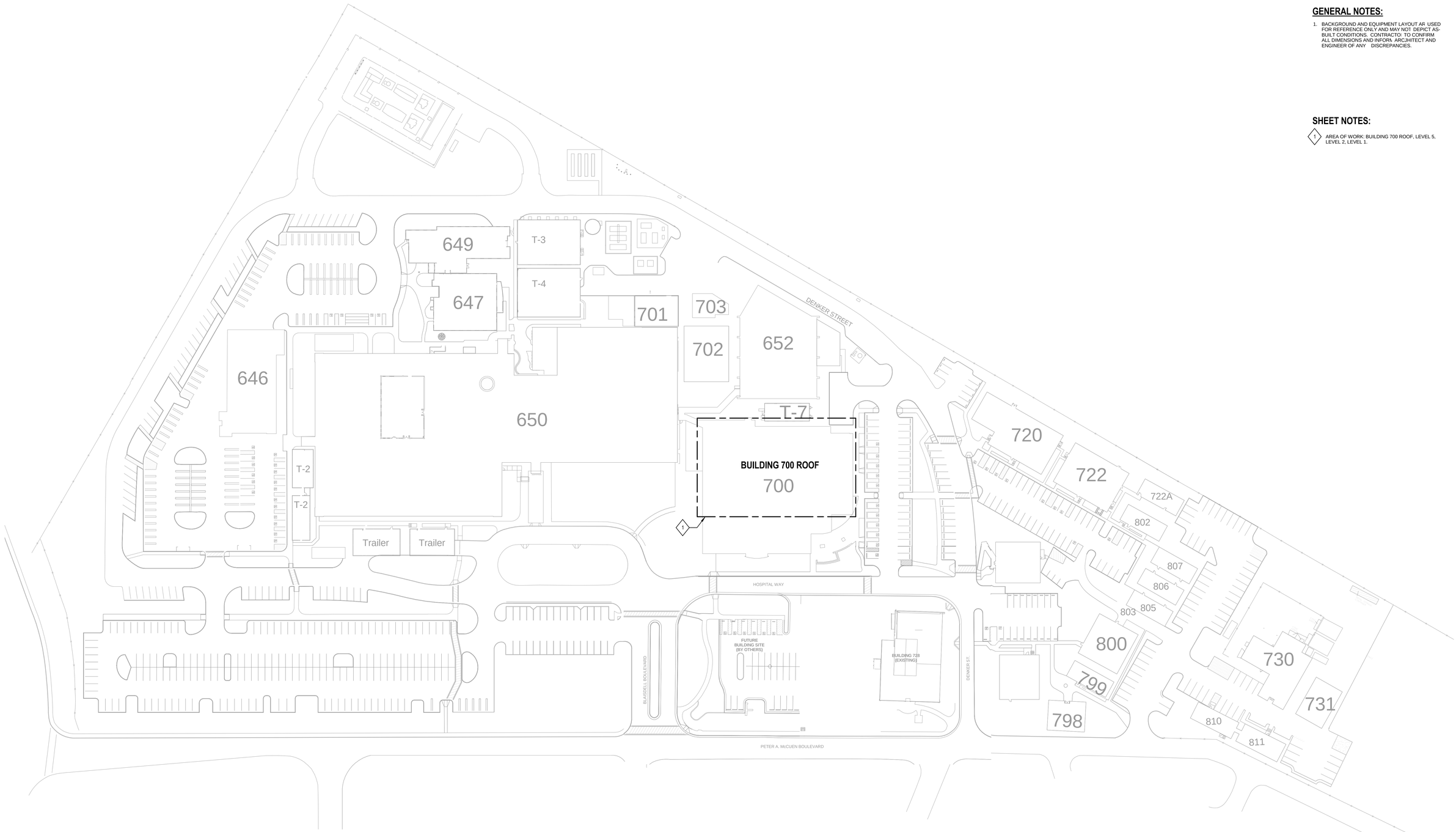
Drawing Title: MECHANICAL HVAC LEGEND, SYMBOLS AND ABBREVIATIONS	Project Title: BUILDING 700 OR HVAC RETROFIT	Project Number: 612A4-13-301	Office of Construction and Facilities Management
		Building Number: 700	
Approved: Project Director	Location: VA MATHER	Drawing Number: M-001	Department of Veterans Affairs
	Date: 4-3-2015 / Checked: BPT / Drawn: MJV	Dwg. of	



GENERAL NOTES:

1. BACKGROUND AND EQUIPMENT LAYOUT AR USED FOR REFERENCE ONLY AND MAY NOT DEPICT AS-BUILT CONDITIONS. CONTRACTO TO CONFIRM ALL DIMENSIONS AND INFORM ARCJHITECT AND ENGINEER OF ANY DISCREPANCIES.

SHEET NOTES:

1 AREA OF WORK: BUILDING 700 ROOF, LEVEL 5, LEVEL 2, LEVEL 1.

1 MECAHNICAL HVAC OVERALL SITE PLAN

1" = 50'-0"

NORTH

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Drawing Title	MECHANICAL HVAC OVERALL SITE PLAN
Approved: Project Director	
Project Title	BUILDING 700 OR HVAC RETROFIT
Location	VA MATHER
Date	4-3-2015
Checked	BPT
Drawn	MJV
Project Number	612A4-13-301
Building Number	700
Drawing Number	MS-001
Dwg. of	

Office of Construction and Facilities Management

Department of Veterans Affairs

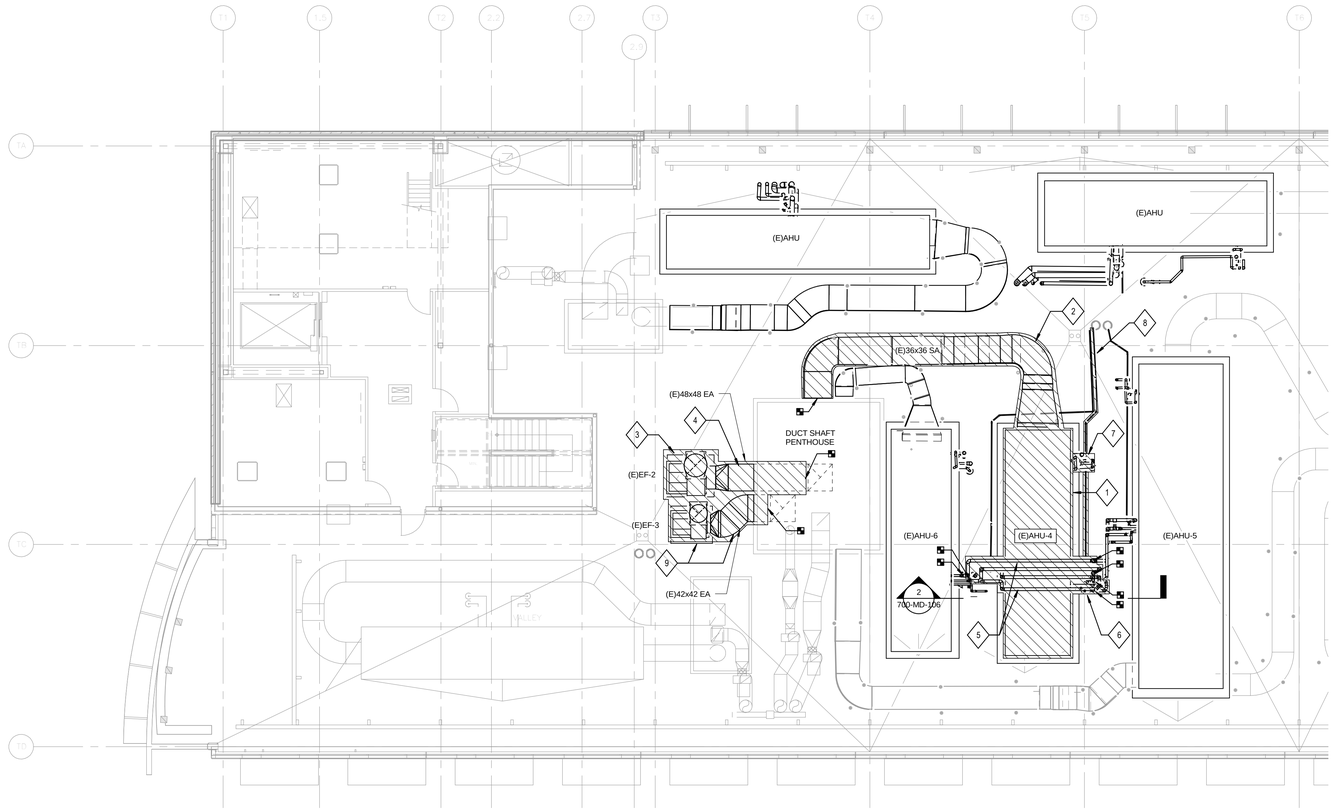
VA FORM 08-6231

GENERAL NOTES:

1. BACKGROUND AND EQUIPMENT LAYOUT ARE USED FOR REFERENCE ONLY AND MAY NOT DEPICT AS-BUILT CONDITIONS. CONTRACTOR TO CONFIRM ALL DIMENSIONS AND INFORM ARCHITECT AND ENGINEER OF ANY DISCREPANCIES.

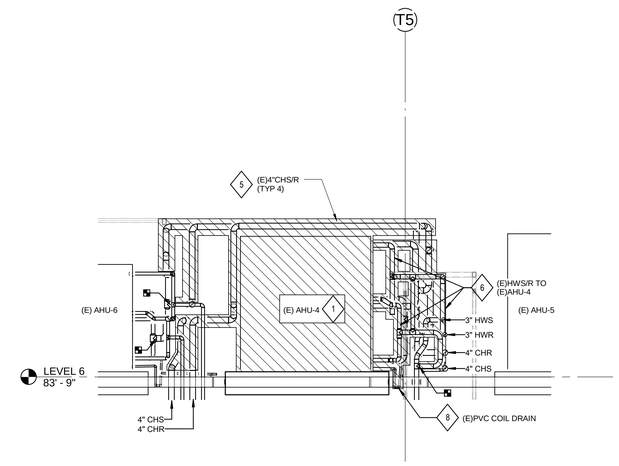
SHEET NOTES:

1. EMOLISH (E)AHU-4. ROOF CURB TO REMAIN.
2. DEMOLISH (E) SUPPLY DUCTWORK, AS SHOWN. (E) 36x36 SUPPLY DUCT DOWN TO LEVEL 2 TO REMAIN.
3. DEMOLISH (E)EF-2. (E) EQUIPMENT PAD TO REMAIN AND BE EXTENDED.
4. DEMOLISH (E) EXHAUST DUCTWORK, AS SHOWN. (E)48x48 EA RISER TO REMAIN IN SHAFT.
5. DEMOLISH FOUR (4) (E)4"CHWS/R PIPES GOING OVER TOP OF (E)AHU-4.
6. DEMOLISH (E)HWS/R PIPING TO (E) AHU-4 BACK TO TEE AND CAP.
7. DEMOLISH (E) STEAM AND CONDENSATE PIPING TO (E) HUMIDIFIER IN (E) AHU-4 BACK TO ROOF PENETRATIONS.
8. DEMOLISH (E) PVC COIL CONDENSATE DRAIN.
9. DEMOLISH (E)EF-3 AND (E) ASSOCIATED INLET DUCTWORK. (E)42x42 EA RISER TO REMAIN IN SHAFT. DEMOLISH (E) EF-3 EQUIPMENT PAD AND REPAIR ROOF. (E)EF-3 AND IT'S STACK TO BE RETURNED TO OWNER FOR FUTURE USE.



1 MECHANICAL DEMOLITION PLAN -BLDG 700 - ROOF

1/8" = 1'-0"



2 PIPING DEMOLITION AT (E)AHU-4

1/4" = 1'-0"

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Drawing Title	MECHANICAL HVAC DEMOLITION PLAN - BLDG 700 - ROOF
Approved: Project Director	
Project Title	BUILDING 700 OR HVAC RETROFIT
Location	VA MATHER
Date	4-3-2015
Checked	BPT
Drawn	MJV
Project Number	612A4-13-301
Building Number	700
Drawing Number	700-MD-106
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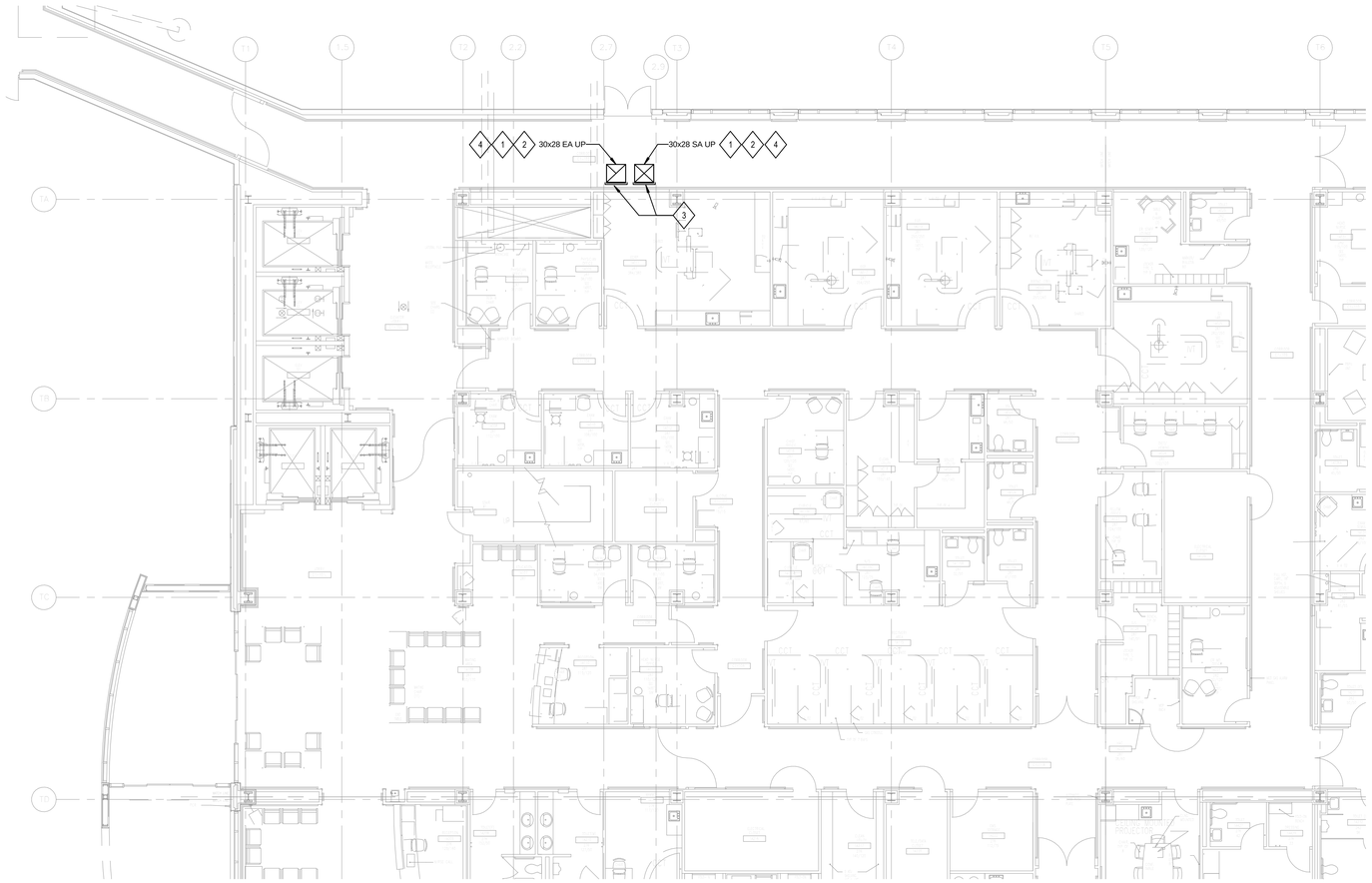
SHEET NOTES:

1. INSTALL (N)30x28 SA AND (N)30x28 EA DUCTWORK DOWN TO FIRST FLOOR. TERMINATE AND CAP ELBOW OUTSIDE EXTERIOR WALL. SEAL CAP AIR TIGHT. FUTURE DISTRIBUTION DUCTWORK WILL PENETRATE INTO LEVEL 1 ABOVE THE CEILING.
2. PROVIDE PVC COATING ON INSULATED DUCTWORK ROUTED DOWN EXTERIOR OF BUILDING, AS REQUIRED BY ARCHITECT.
3. MITERED ELBOWS WITH TURNING VANES. PROVIDE PERMANENT DUCT CAP AT OPENING OF ELBOW. SEAL CAP AIR TIGHT. CONTRACTOR TO CONFIRM EXACT LOCATION AND ELEVATION OF DUCTWORK TERMINATION TO ENSURE FUTURE DUCTWORK CONNECTIONS ARE COORDINATED WITH EXISTING STRUCTURAL ELEMENTS AND ALL OTHER DISCIPLINES.
4. PROVIDE PVC COATING ON THE TOTAL LENGTH OF INSULATED DUCTWORK ROUTED DOWN EXTERIOR OF BUILDING.



1 MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 1
1/8" = 1'-0"

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Drawing Title: MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 1

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: BPT | Drawn: MJV

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: 700-MH-101

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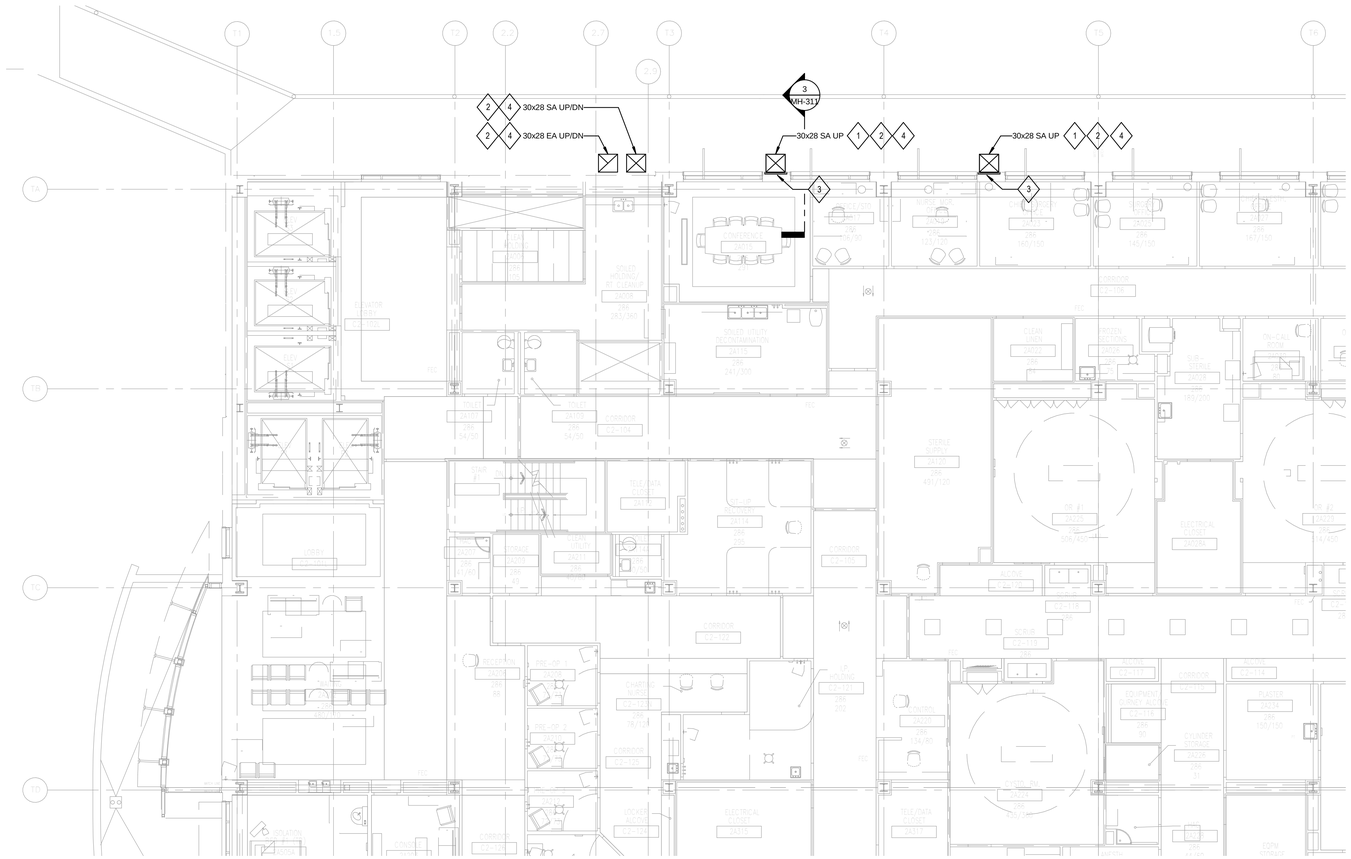

1 MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 2

1/8" = 1'-0"

GENERAL NOTES:

1. BACKGROUND AND EQUIPMENT LAYOUT ARE USED FOR REFERENCE ONLY AND MAY NOT DEPICT AS-BUILT CONDITIONS. CONTRACTOR TO CONFIRM ALL DIMENSIONS AND INFORM ARCHITECT AND ENGINEER OF ANY DISCREPANCIES.

SHEET NOTES:

1. INSTALL (N)30x28 SA AND (N)30x28 EA DUCTWORK DOWN TO SECOND FLOOR. TERMINATE AND CAP ELBOW OUTSIDE EXTERIOR WALL. SEAL CAP AIR TIGHT.
2. PROVIDE PVC COATING ON INSULATED DUCTWORK ROUTED DOWN EXTERIOR OF BUILDING, AS REQUIRED BY ARCHITECT.
3. MITERED ELBOWS WITH TURNING VANES. PROVIDE PERMANENT DUCT CAP AT OPENING OF ELBOW. SEAL CAP AIR TIGHT. CONTRACTOR TO CONFIRM EXACT LOCATION AND ELEVATION OF DUCTWORK TERMINATION TO ENSURE FUTURE DUCTWORK CONNECTIONS ARE COORDINATED WITH EXISTING STRUCTURAL ELEMENTS AND ALL OTHER DISCIPLINES.
4. PROVIDE PVC COATING ON THE TOTAL LENGTH OF INSULATED DUCTWORK ROUTED DOWN EXTERIOR OF BUILDING.

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Drawing Title: MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 2

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: BPT | Drawn: MJV

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: 700-MH-102

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GENERAL NOTES:

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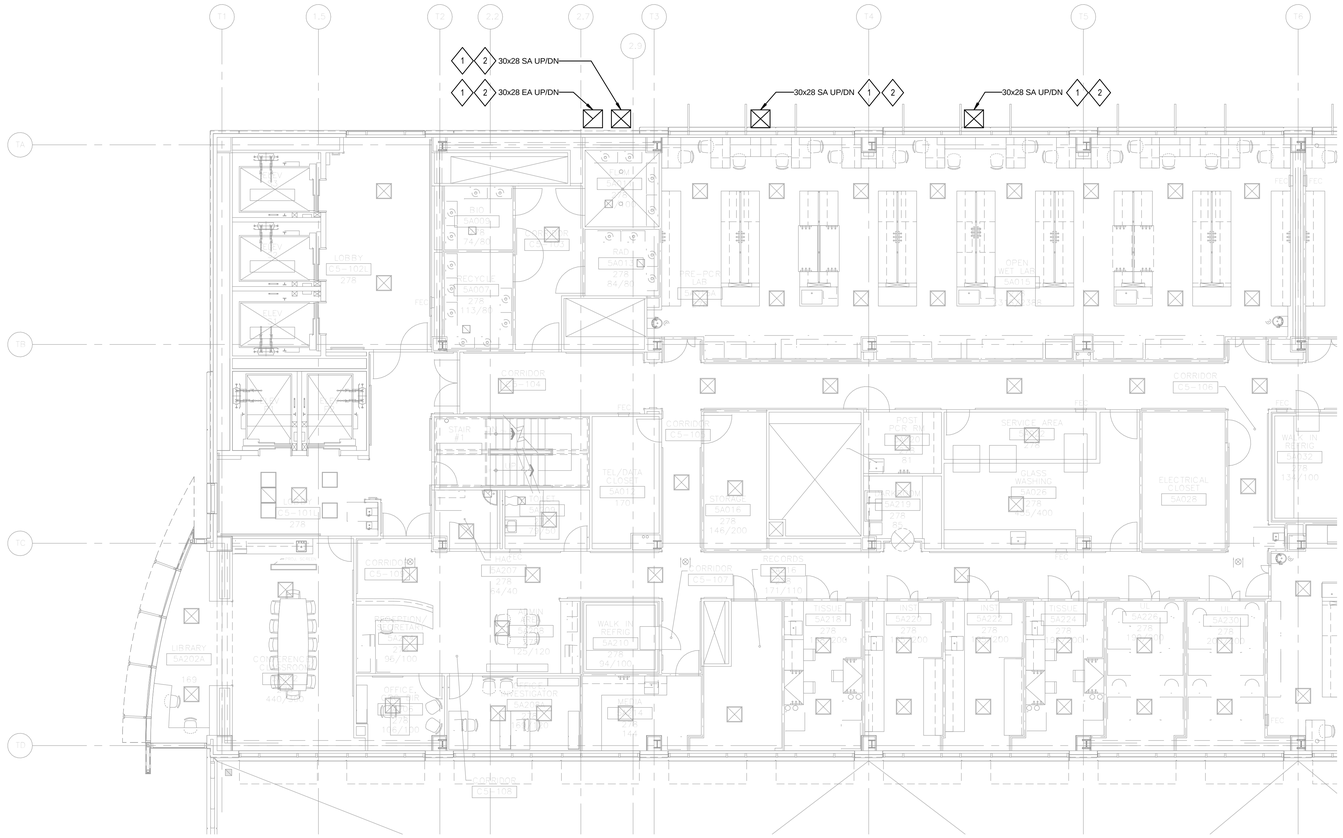
SHEET NOTES:

1. PROVIDE PVC COATING ON THE TOTAL LENGTH OF INSULATED DUCTWORK ROUTED DOWN THE EXTERIOR OF BUILDING AND ON HORIZONTAL PORTION OF DUCTWORK ON THE ROOF, AS REQUIRED BY ARCHITECT.

2. PROVIDE PVC COATING ON THE TOTAL LENGTH OF INSULATED DUCTWORK ROUTED DOWN EXTERIOR OF BUILDING.



1 MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 5
1/8" = 1'-0"

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Drawing Title: MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - LEVEL 5

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: BPT | Drawn: MJV

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: 700-MH-105

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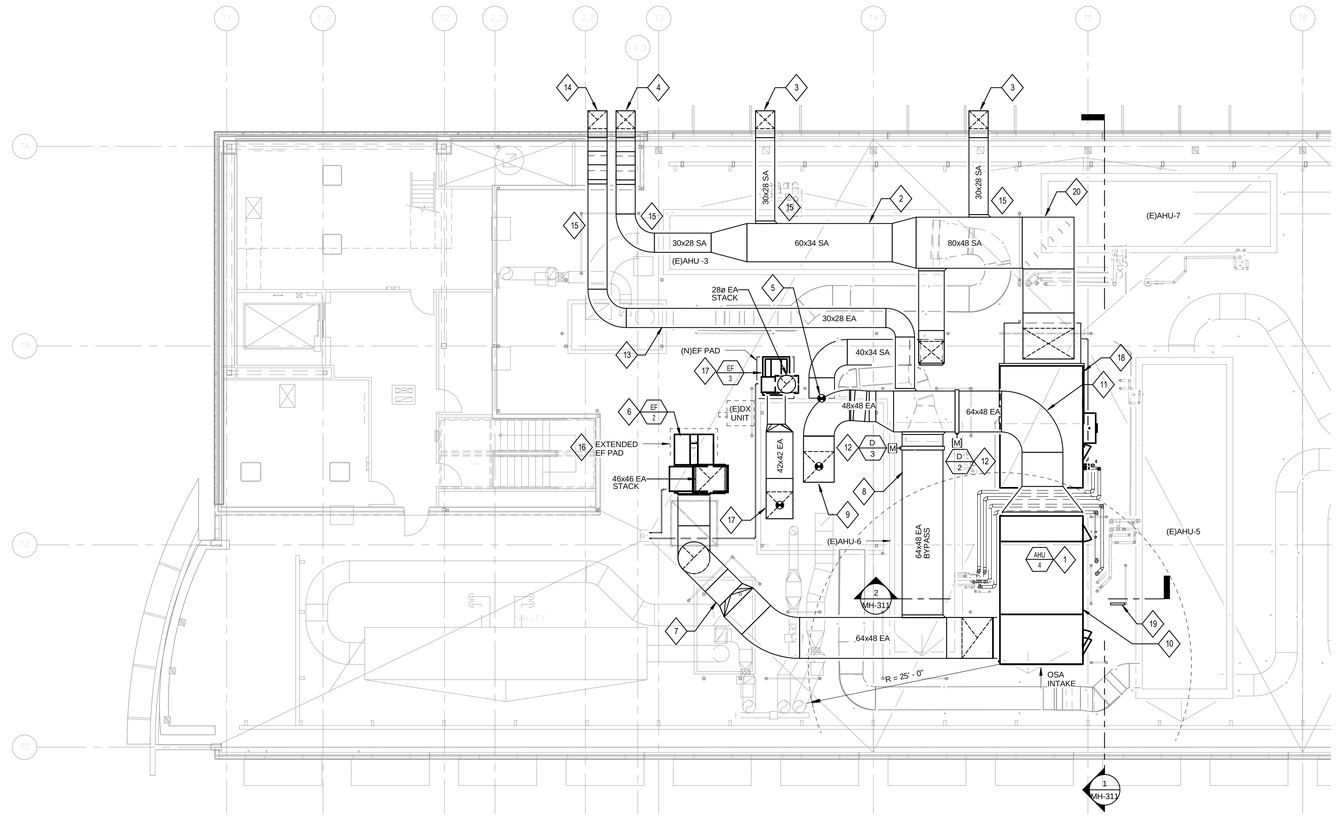

1 MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - ROOF

1/8" = 1'-0"

GENERAL NOTES:

1. BACKGROUND AND EQUIPMENT LAYOUT ARE USED FOR REFERENCE ONLY AND MAY NOT DEPICT AS-BUILT CONDITIONS. CONTRACTOR TO CONFIRM ALL DIMENSIONS AND INFORM ARCHITECT AND ENGINEER OF ANY DISCREPANCIES.
2. PROVIDE FLEXIBLE CONNECTIONS AT ALL DUCTWORK CONNECTIONS FOR NEW HVAC EQUIPMENT.
3. ALL HORIZONTAL DUCTWORK TO BE INSTALLED SUCH THAT BOTTOM OF DUCT ELEVATION IS 10'-0" ABOVE TOP OF AHU-4 EQUIPMENT PAD.

SHEET NOTES:

1. (N)AHU-4. 35,600 CFM @ 7.5" s.p. 75 HP VFD. 460V/3 PHASE CUSTOM AIR HANDLING UNIT 35'L x 13.5'W x 13.5'H, 30,000 LBS. SEE SCHEDULE.
2. (N)60x34 SA DUCT (22,600 CFM)
3. (2) (N)30x24 SA RISERS DOWN TO L2 SURGERY WING (6,800 CFM EACH)
4. (N)30x28 SA RISER DOWN TO L1 CATH LABS (9,000 CFM)
5. RE-USE (E)36" DIA. ROUND SA RISER DOWN TO L2 (13,000 CFM)
6. (N)EF-2. 34,300 CFM @ 3.5" s.p. 40 HP MOTOR, 460V/3PHASE BISW, 3,500 LBS.
7. (N) 64x48 EA DUCT
8. (N) 64x48 EA BYPASS DUCT
9. RE-USE (E)48x48 EA RISER DOWN TO L2 (26,300 CFM)
10. AIR TO AIR HEAT EXCHANGER PORTION OF (N)AHU-4.
11. (N)64x48 EA DUCT.
12. MODULATING BYPASS DAMPERS FOR SYSTEM OPTIMIZATION. PROVIDE 120V POWER CONNECTION FROM SPARE CIRCUIT IN PANELBOARD QL51A. PROVIDE (2)#10, 1#10G IN 3/4"C)
13. (N)30x28 EA DUCT SERVING L1 CATH LABS.
14. (N)30x28 EA RISER DOWN TO L1 CATH LABS. (8,000 CFM)
15. PROVIDE PVC COATING ON THE TOTAL LENGTH OF INSULATED DUCTWORK ROUTED DOWN EXTERIOR OF BUILDING AND ON HORIZONTAL PORTION ON THE ROOF TO A POINT 10 FEET FROM EDGE OF ROOF.
16. ENLARGED PAD FOR (N)EF-2.
17. (N) EF-3, 16,540 CFM @ 1.9" S.P. 10 HP MOTOR, 460V/3PHASE BISW, 1,500 LBS. TO REPLACE EXISTING.
18. ENLARGED PAD FOR (N)AHU-4.
19. SHIP LADDER TO ACCESS UPPER PLATFORM. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS.
20. MITERED ELBOW WITH TURNING VANES.

NORTH

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Revisions:	Date

CONSULTANTS:

Affiliated Engineers W, Inc.
123 Mission Street, 7th Floor
San Francisco, California 94105
415.764.3700

KEY PLAN

ARCHITECT/ENGINEERS:

Hilliard ARCHITECTS
251 Post Street, Suite 620
San Francisco, CA 94108-5017
Tel 415 989 6400, Fax 415 989 3056
www.HilliardArchitects.com

Drawing Title	MECHANICAL HVAC NEW WORK PLAN - BLDG 700 - ROOF
Approved: Project Director	
Project Title	BUILDING 700 OR HVAC RETROFIT
Location	VA MATHER
Date	4-3-2015
Checked	BPT
Drawn	MJV
Project Number	612A4-13-301
Building Number	700
Drawing Number	700-MH-106
Dwg. of	

Office of Construction and Facilities Management

Department of Veterans Affairs

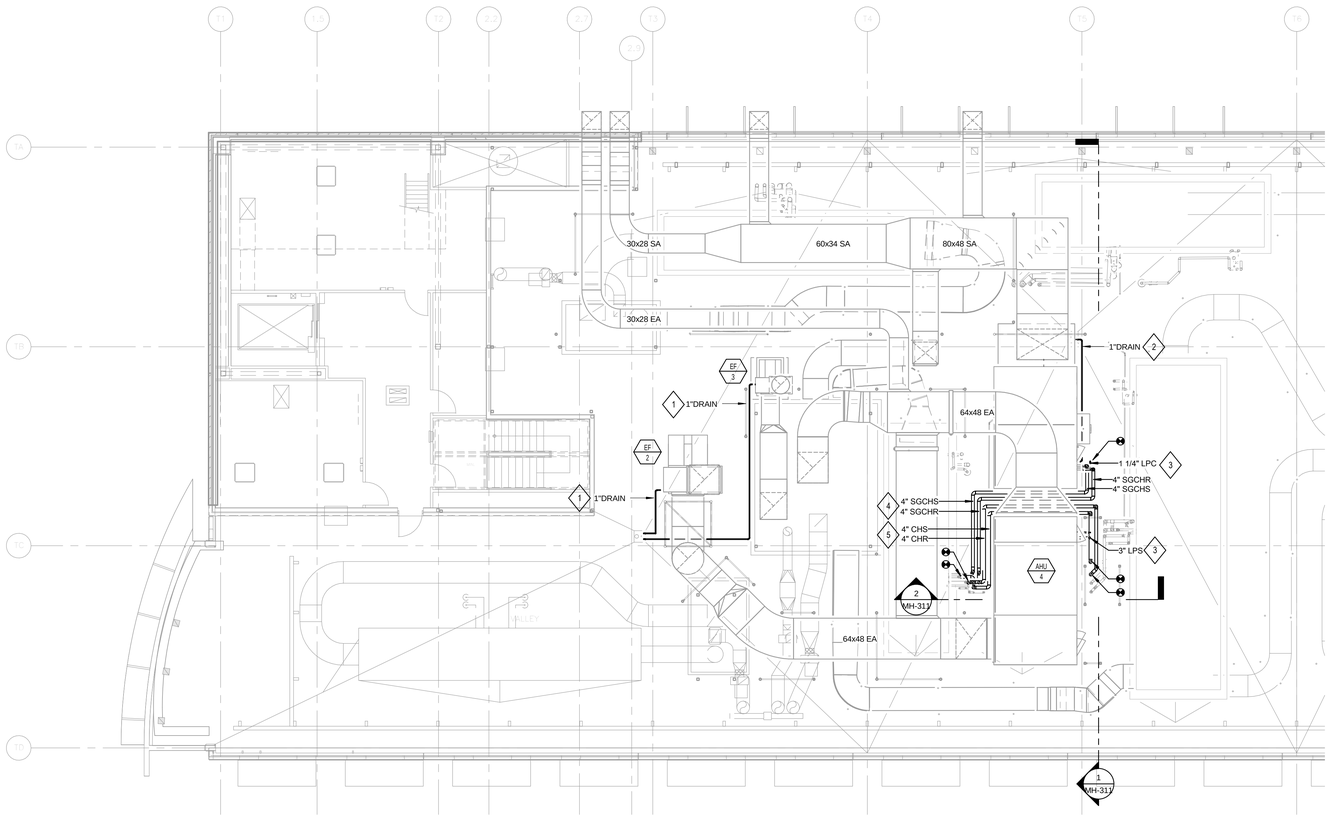
VA FORM 08-6231

GENERAL NOTES:

1. BACKGROUND AND EQUIPMENT LAYOUT ARE USED FOR REFERENCE ONLY AND MAY NOT DEPICT AS-BUILT CONDITIONS. CONTRACTOR TO CONFIRM ALL DIMENSIONS AND INFORM ARCHITECT AND ENGINEER OF ANY DISCREPANCIES.

SHEET NOTES:

1. PROVIDE 1"PVC EXHAUST FAN CASE DRAIN. ROUTE TO NEAREST ROOF DRAIN, AS SHOWN.
2. PROVIDE 1"PVC COIL CONDENSATE DRAIN. ROUTE TO NEAREST ROOF DRAIN, AS SHOWN.
3. CONNECT 3"LPS AND 1-1/4"LPC TO (N) HUMIDIFIER AT (N)AHU-4.
4. RECONNECT (N)4"SGCHS/R PIPING TO STUB-UPS AT ROOF AND RUN OVER (N)AHU-4 TO CONNECT TO COOLING COILS.
5. RECONNECT (N)4"CHS/R TO CAPPED TEES AND RUN OVER (N)AHU-4 TO RE-CONNECT WITH COOLING COILS AT (E)AHU-5.



1 MECHANICAL PIPING NEW WORK PLAN - BLDG 700 - ROOF

1/8" = 1'-0"

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Drawing Title: **MECHANICAL PIPING NEW WORK PLAN - BLDG 700 - ROOF**

Approved: Project Director

Project Title: **BUILDING 700 OR HVAC RETROFIT**

Location: **VA MATHER**

Date: **4-3-2015** | Checked: **BPT** | Drawn: **MJV**

Project Number: **612A4-13-301**

Building Number: **700**

Drawing Number: **700-MP-106**

Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs

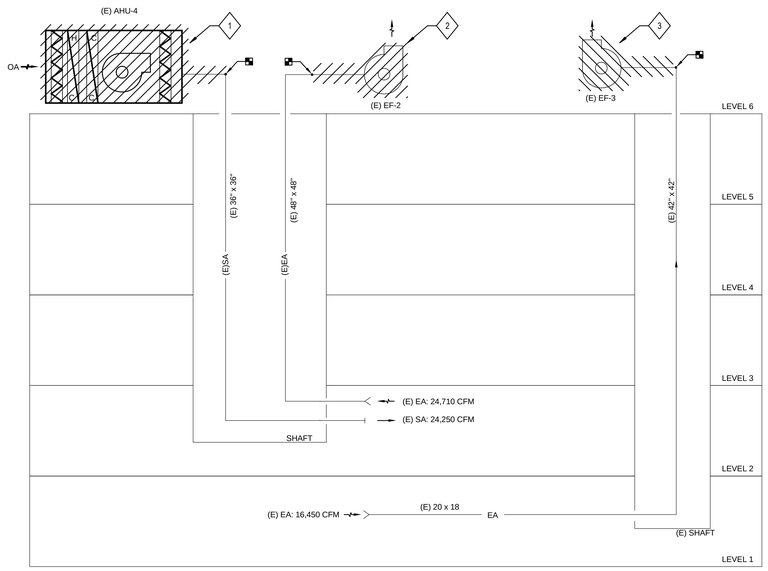
VA FORM 08-6231

GENERAL NOTES:

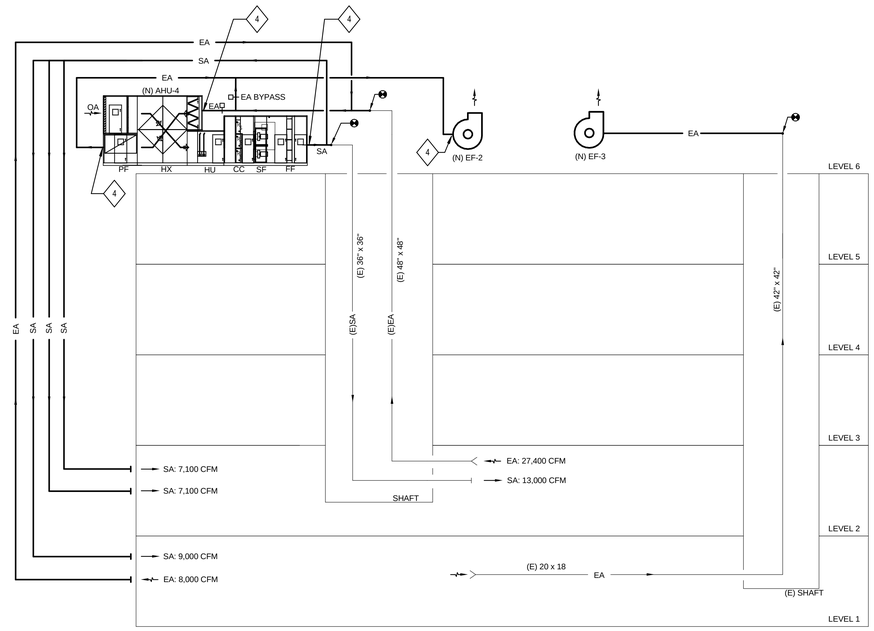
1. CONTRACTOR TO CONFIRM ALL CFM QUANTITIES OF EXISTING CONDITIONS BEFORE DEMOLITION WORK BEGINS.

SHEET NOTES:

1. DEMOLISH (E)AHU-4. EXISTING EQUIPMENT PAD TO REMAIN AND BE ENLARGED
2. DEMOLISH (E)EF-2. EXISTING EQUIPMENT PAD TO REMAIN AND BE ENLARGED.
3. DEMOLISH (E)EF-3, (E) ASSOCIATED INLET DUCTWORK AND (E)EQUIPMENT PAD. (E)EF-3 AND IT'S STACK TO BE RETURNED TO OWNER FOR FUTURE USE.
4. FLEX CONNECTION.



1 **MECHANICAL HVAC DEMOLITION DIAGRAM**
SCALE: NONE



2 **NEW MECHANICAL HVAC DIAGRAM**
SCALE: NONE

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Approved: Project Director	
Project Title	BUILDING 700 OR HVAC RETROFIT
Location	VA MATHER
Date	4-3-2015
Checked	BPT
Drawn	MJV
Project Number	612A4-13-301
Building Number	700
Drawing Number	700-MH-601
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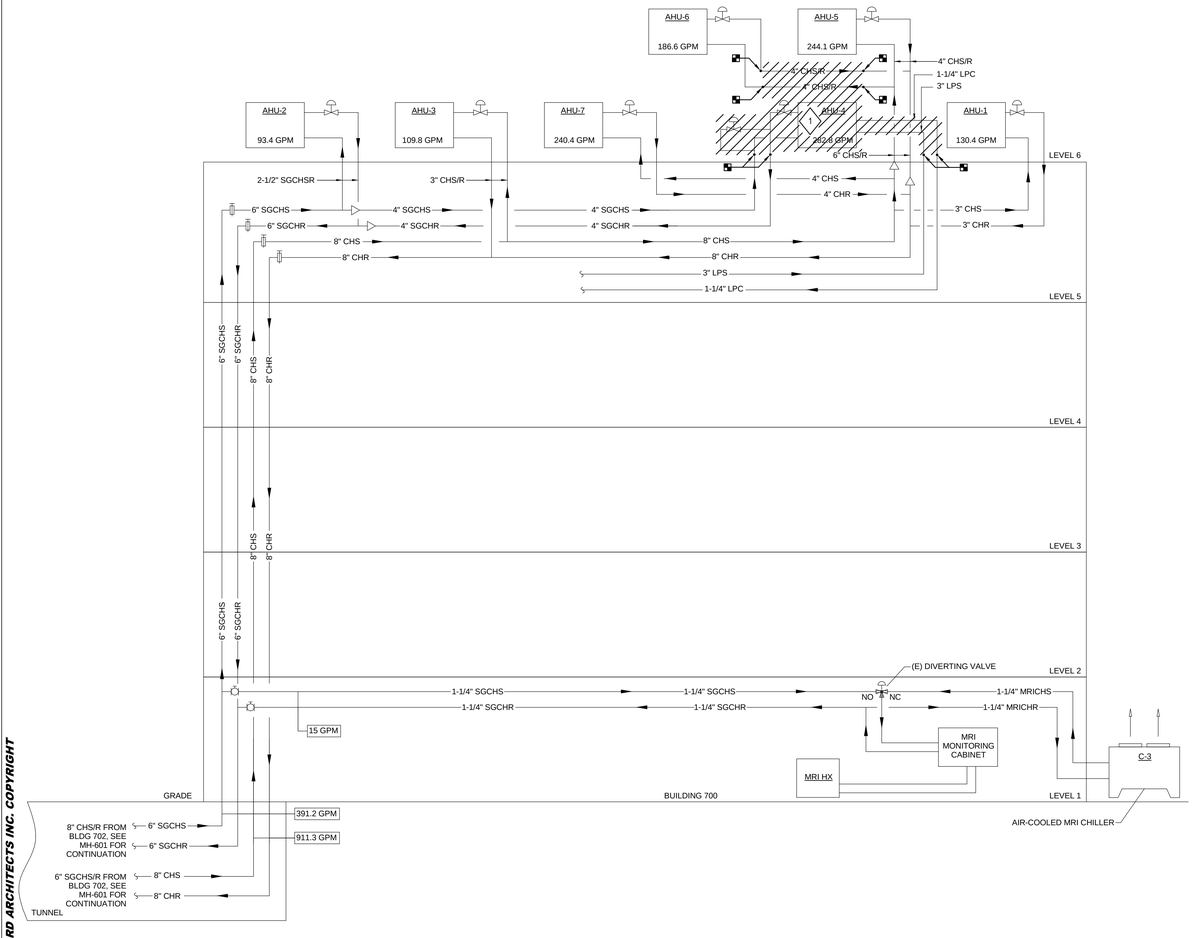
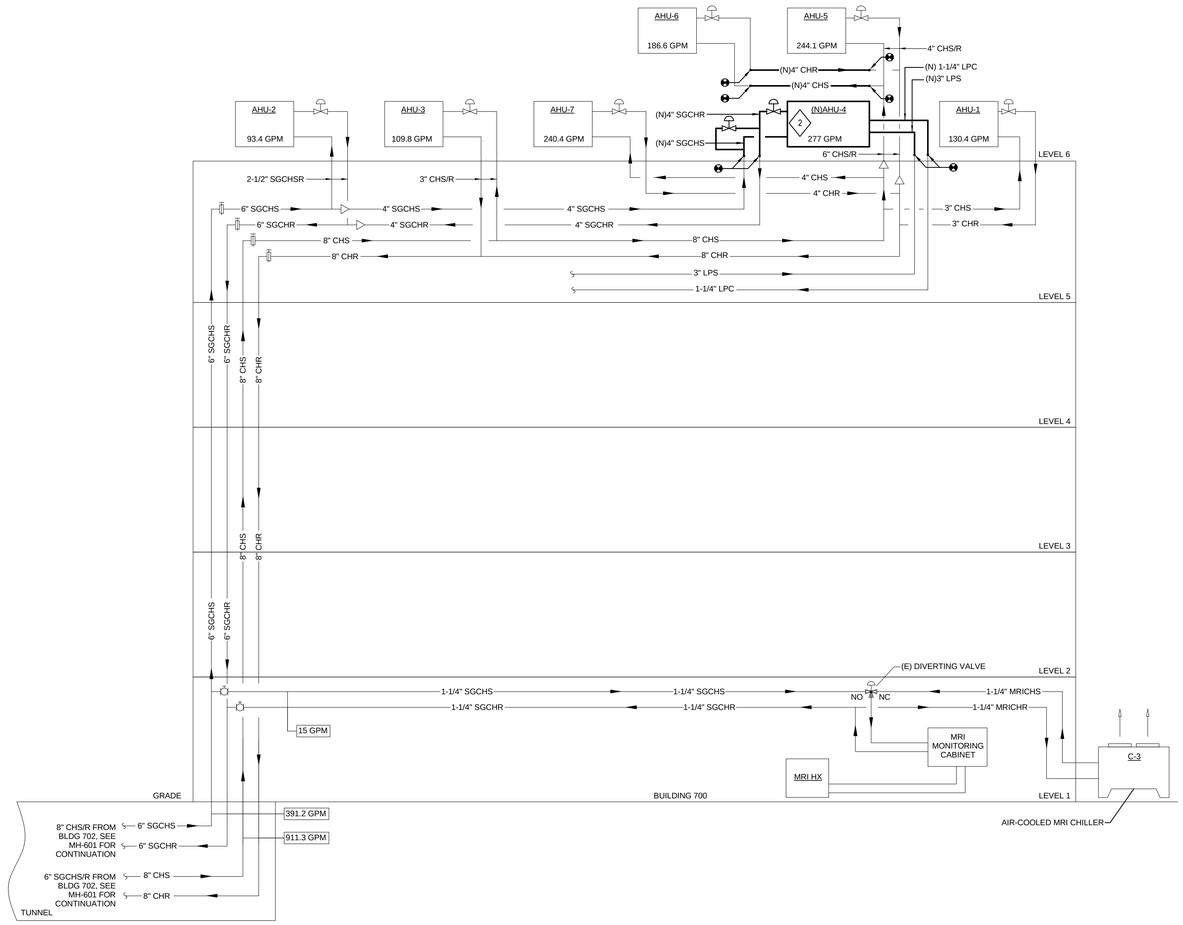
SHEET NOTES:

1. DEMOLISH (E)AHU-4 AND ASSOCIATED PIPING, AS INDICATED.
2. (N)AHU-4 AND ASSOCIATED PIPING.



1 **MECHANICAL PIPING DEMOLITION DIAGRAM**
SCALE: NONE



2 **NEW MECHANICAL PIPING DIAGRAM**
SCALE: NONE

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Drawing Title	MECHANICAL PIPING DIAGRAM - BLDG 700
Approved: Project Director	
Project Title	BUILDING 700 OR HVAC RETROFIT
Location	VA MATHER
Date	4-3-2015
Checked	BPT
Drawn	MJV
Project Number	612A4-13-301
Building Number	700
Drawing Number	700-MH-602
Dwg. of	

Office of Construction and Facilities Management
Department of Veterans Affairs

VA FORM 08-6231

GENERAL NOTES:

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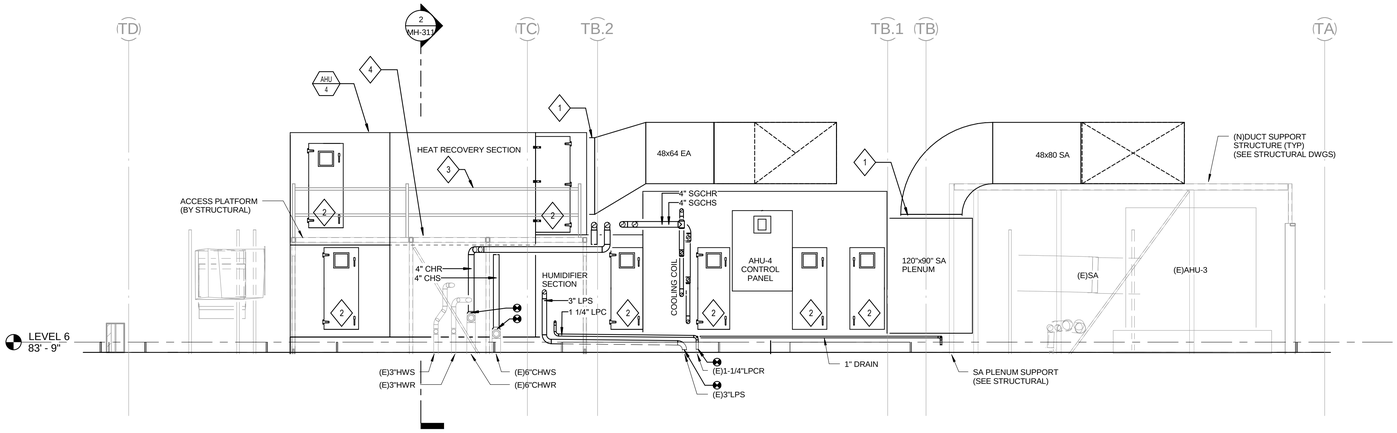
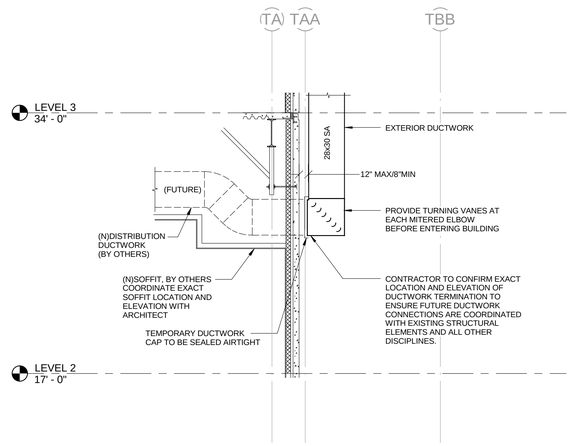
SHEET NOTES:

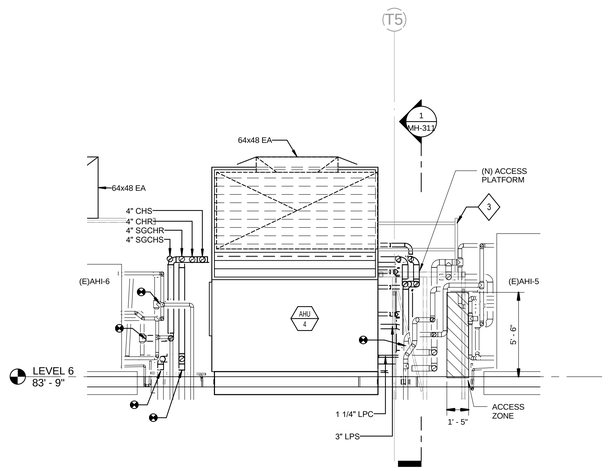
1. FLEX CONNECTION.
2. AHU ACCESS DOOR BOTTOMS TO BE LOCATED AS LOW AS POSSIBLE TO BASE OF UNIT SECTION FOR IMPROVED ACCESS TO UNIT.
3. SAFETY RAIL AT ACCESS PLATFORM. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS.
4. TOP OF PLATFORM SHALL BE AT AN APPROPRIATE ELEVATION TO ACCESS THE SECOND LEVEL OF (N) AHU-4 WITHOUT BLOCKING THE DOORS ON THE FIRST LEVEL OF (N) AHU-4.



1 MECHANICAL WEST ELEVATION - ROOF LEVEL
1/4" = 1'-0"



3 DUCT PENETRATION AT LEVEL 2
1/4" = 1'-0"



2 MECHANICAL NORTH ELEVATION - ROOF LEVEL
1/4" = 1'-0"

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Drawing Title	Project Title	Project Number
MECHANICAL HVAC SECTIONS - BLDG 700	BUILDING 700 OR HVAC RETROFIT	612A4-13-301
Approved: Project Director	Location: VA MATHER	Building Number: 700
	Date: 4-3-2015 / Checked: DW / Drawn: MJV	Drawing Number: MH-311
		Dwg. of

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Department of Veterans Affairs

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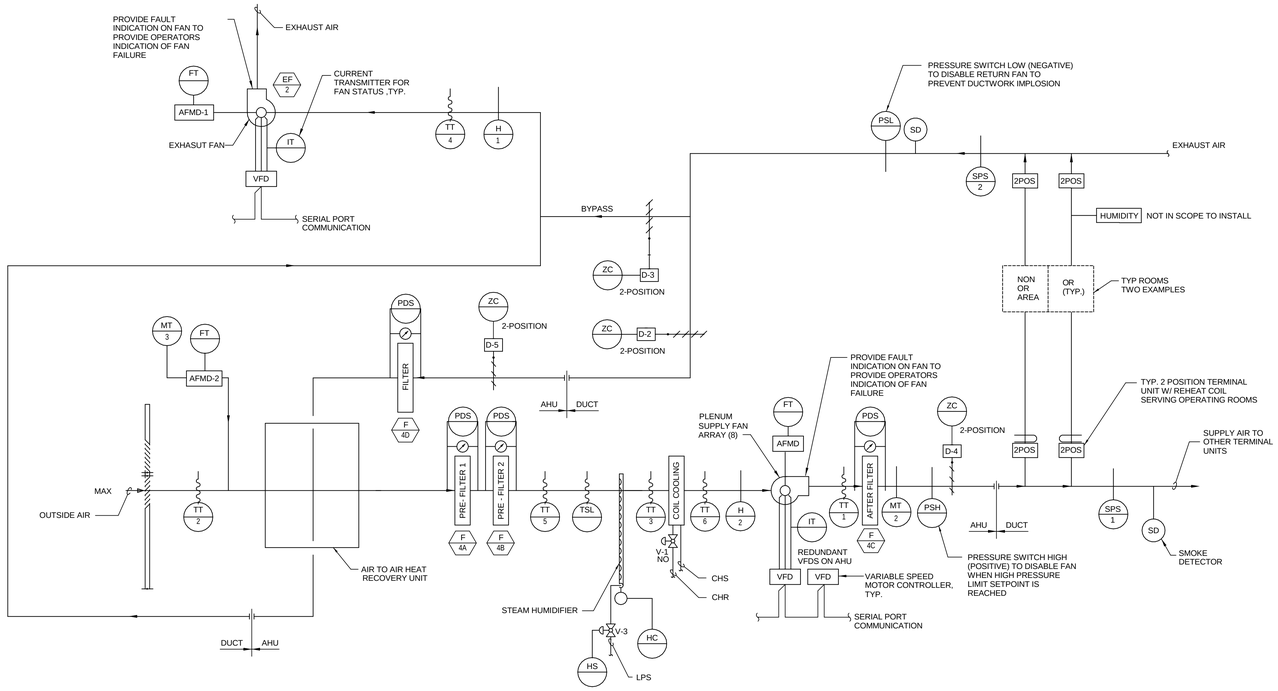
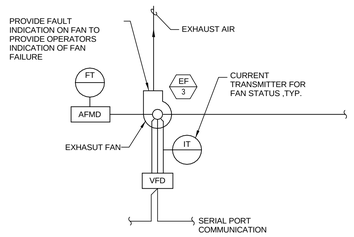


1 AIR HANDLING UNIT (AHU-4) AND EXHAUST FAN (EF-2) FOR SURGICAL SUITE

NTS



2 EXHAUST FAN (EF-3) FOR LEVEL 1

NTS

SEQUENCE OF OPERATION FOR AIR HANDLING UNIT AND EXHAUST FANS FOR SURGICAL SUITE AND LEVEL 1

1. GENERAL

1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. THE UNIT WILL NORMALLY OPERATE 24 HOUR/DAY. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-4, D-5 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-4, D-5 SHALL BE FULLY OPEN. EXHAUST FAN EF-2 SHALL BE INTERLOCKED WITH SUPPLY FAN THROUGH THE BUILDING MANAGEMENT SYSTEM. THE SYSTEM SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

2.1 SUPPLY AIR TEMPERATURE SETPOINT (AS SET BY ECC ADJUSTABLE), SENSED BY SENSOR TT-1, SHALL BE MAINTAINED BY SEQUENCING V-1 AND V-2. HEATING AND COOLING CONTROL VALVE SHALL BE MODULATED VIA PID CONTROL LOOP TO MAINTAIN THE SUPPLY AIR TEMP.

3. HX CONTROL

3.1 IF TT-2 IS LOWER THAN 51°F OR GREATER THAN 72°F, THEN D-2 IS 100% OPEN AND D-3 IS 100% CLOSED. THESE DAMPERS ARE 2-POSITION AND SHALL REMAIN INTERLOCKED. IF TT-2 IS BETWEEN 51°F AND 72°F, THEN D-3 IS OPEN AND D-2 IS CLOSED.

29°F ← USE HX | DO NOT USE HX 51°F–72°F | USE HX → 104°F

4. AIR FLOW CONTROL

4.1 THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN DUCT STATIC PRESSURE. THE EXHAUST AIR FLOW SHALL BE CONTROLLED BY MODULATING THE EXHAUST FAN VFD TO MAINTAIN DUCT STATIC PRESSURE.

4.2 USING HIGH PRESSURE SENSOR PSH LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 3" [75mm] OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT PSH DOES EXCEED 3" [75mm] THE SUPPLY AIR FAN SHALL STOP. PSH SHALL BE HARDWIRED TO THE SUPPLY FAN AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. PSH WILL REQUIRE MANUAL RESET AT THE DEVICE.

4.3 USING LOW PRESSURE SENSOR PSL LOCATE AT THE EXHAUST FAN INLET, SHALL PREVENT THE EXHAUST FAN FROM DEVELOPING OVER - 3" [75mm] OF NEGATIVE STATIC PRESSURE (FIELD ADJUSTABLE) IF STATIC PRESSURE AT PSL DOES EXCEED - 3" [75mm] THE EXHAUST AIR FAN SHALL STOP. PSL SHALL BE HARDWIRED TO THE EXHAUST FAN AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE, OR ON LEAD OR LAG VFD. PSL WILL REQUIRE MANUAL RESET.

5. HUMIDITY CONTROL

5.1 WHEN THE DIGITAL CONTROL PANEL IS NOT CALLING FOR HUMIDITY, SENSED BY EXHAUST AIR HUMIDITY SENSOR, 2-WAY CONTROL VALVE V-3 SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, V-3 SHALL MEET DEMAND.

5.2 EXHAUST AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 42° F [5.6° C] DEW POINT (ADJ) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE V-3 TO MAINTAIN THE DESIRED HUMIDITY. THE DRYBULB TRANSMITTER T-4 AND HUMIDITY TRANSMITTER H-1 IN EXHAUST AIR SHALL BE USED TO CALCULATE RETURN AIR DEW POINT TEMPERATURE. V-3 SHALL BE CLOSED WHENEVER THE EXHAUST AIR DEWPOINT IS > 45° F [7°C]. DCP SHALL CLOSE VALVE V-3 WHENEVER THE SUPPLY FAN IS OFF. VALVE V-3 SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE. H-2 SHALL LIMIT THE HUMIDIFIER TO 90% RH.

5.3 UPON DROP IN SPACE RELATIVE HUMIDITY BELOW 20%, AS MEASURED BY ANY SPACE RELATIVE HUMIDITY SENSOR, THE CENTRAL HUMIDIFIER SHALL BE ACTIVATED TO MAINTAIN THE SETPOINT.

5.4 UPON A CALL FOR HUMIDIFICATION FROM THE ROOM SENSOR OR THE RETURN/EXHAUST DUCT SENSOR, THE STEAM GRID HUMIDIFIER CONTROL VALVE SHALL BE MODULATED TO OPEN TO ADMIT MORE MOISTURE TO THE SYSTEM. THE SUPPLY DUCT RELATIVE HUMIDITY SENSOR SHALL PROVIDE A PROPORTIONAL HIGH LIMIT TO OVERRIDE THE CONTROL SIGNAL TO THE HUMIDIFIER CONTROL VALVE AS NEEDED TO ENSURE THAT THE DUCT RELATIVE HUMIDITY DOES NOT RISE ABOVE 80%. THE ECC CONTROLLER SHALL BE PROGRAMMED TO KEEP THE HUMIDIFIER CONTROL VALVE CLOSED WHEN THE AIR HANDLER SYSTEM SERVING THAT HUMIDIFIER IS NOT IN OPERATION.

6. LOSS OF COOLING PROTECTION

6.1 IF THE AIR TEMPERATURE AS SENSED BY TT-1 RAISES ABOVE 65°F [18°C], AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND ECC. IF THIS TEMPERATURE RAISES ABOVE 70°F [21°C], AS SENSED BY TT-1 THE SUPPLY AND EXHAUST FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND ECC.

7. AUTOMATIC SMOKE SHUTDOWN/RESTART

7.1 WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, SD, THE SUPPLY AND EXHAUST FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. D-4 AND D-5 SMOKE DAMPERS IN THE SUPPLY AND EXHAUST DUCTS SHALL CLOSE.

7.2 EXHAUST FANS SERVING OTHER AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND/OR SUITE EXHUAST FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

8. EMERGENCY CONSTANT SPEED OPERATION

8.1 UPON FAILURE OF THE VFD, THE EXHAUST FAN SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FAN SHALL THEN BE OPERATED AT CONSTANT SPEED. UPON FAILURE OF A VFD ON THE SUPPLY FAN, THE REDUNDANT VFD SHALL ENERGIZE.

9. DAMPER CONTROL

9.1 AHU VENDOR SHALL INTERLOCK D-4 WITH SUPPLY FAN VFDS AND PROVE INTERLOCK DURING FACTORY ACCEPTANCE TEST. SMOKE DETECTOR SHALL BE HARDWIRED TO DE-ENERGIZE BOTH VFDS. BMS CONTROLLER SHALL PROVIDE LEAD/LAG INTERFACE FOR VFDS.

9.2 D-5 SHALL BE INTERLOCKED WITH EF-2 VFD (IN BYPASS OR AUTO MODE). WHEN FAN ENERGIZES, D-5 SHALL OPEN. WHEN FAN DE-ENERGIZES, D-5 SHALL CLOSE.

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Revisions:	Date

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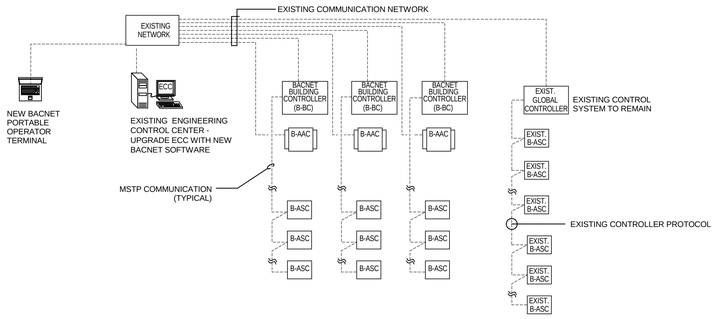
Drawing Title	MECAHNICAL HVAC CONTROLS DIAGRAM - BLDG 700
Approved: Project Director	
Project Title	BUILDING 700 OR HVAC RETROFIT
Location	VA MATHER
Date	4-3-2015
Checked	DW
Drawn	MJV
Project Number	612A4-13-301
Building Number	700
Drawing Number	MI-411
Dwg. of	

Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231



CONTROL SYSTEM CONFIGURATION
EXISTING ECC TO REMAIN, INSTALL NEW BACNET SOFTWARE ON EXISTING ECC. EXISTING CONTROL SYSTEM SOFTWARE TO CO-EXIST ON ECC. INSTALL NEW BACNET CONTROLS ON CURRENT PROJECT. EXISTING CONTROL SYSTEM TO REMAIN, RE-USE EXISTING COMMUNICATION NETWORK.

CONTROLS CONTRACTOR SHALL BE:
JOHNSON CONTROLS
ERIK BECK
103 WOODMERE RD
SUITE 110
FOLSOM, CA 95630
MAIN: (916) 294-8845
ALT: (916) 201-8319

NOTES:
1. INSTALL NEW BACNET SOFTWARE ON EXISTING ENGINEERING CONTROL CENTER (ECC.)
2. REUSE EXISTING JOHNSON CONTROLS METASYS COMMUNICATION NETWORK. CONTACT INFORMATION ON DRAWING M-001.
3. EXISTING CONTROLLERS TO REMAIN.
4. INSTALL MULTIPLE BUILDING CONTROLLERS AS REQUIRED.
5. INSTALL NEW CONTROLLERS (B-AAC, B-ASC) AS REQUIRED,
6. PROVIDE NEW PORTABLE OPERATORS TERMINAL.

2 BACNET SYSTEM ARCHITECTURE

NTS

JOB: BUILDING 700 OR HVAC REPLACEMENT
BUILDING: 700
PAGE:

SYSTEM: VAV AIR HANDLER

SYSTEM COMPONENT:	SYSTEM OUTPUTS: BINARY	SYSTEM OUTPUTS: ANALOG	SYSTEM INPUTS: BINARY	SYSTEM INPUTS: ANALOG	SYSTEM SOFTWARE/CONTROL: ALARM PROCESSING	SYSTEM SOFTWARE/CONTROL: APPLICATION/FUNCTION	REMARKS
Exhaust Air Temperature TT-4	o	o			o		
Exhaust Air Humidity H-1	o	o					
Exhaust Air Flow (cfm) AFMS-1	o	o					
Exhaust Static Pressure	o	o					
Cooiling Coil Temperature TT-6	o	o					
Discharge Air Temperature TT-1	o	o					
Discharge Static Pressure SPS-1	o	o					
Discharge Air Humidity H-2	o	o					
Supply Air Flow (cfm) AFMS-2	o	o					
OUTSIDE AIR TEMPERATURE TT-2	o	o					
EXHAUST LOW PRESSURE PSC	o	o					
STATIC PRESSURE HIGH LIMIT	o	o					
HUMIDITY HIGH LIMIT H-2	o	o					
SUPPLY FAN VSMC ALARM	o	o					
EXHAUST FAN VFD ALARM	o	o					
EXHAUST FAN VFD EF-2	o	o	o	o			FULL COMMUNICATION
EXHAUST FAN VFD EF-3	o	o	o	o			
SUPPLY FAN VFD (TYP 2)	o	o	o	o			FULL COMMUNICATION
EXHAUST AIR DAMPER D-2	o	o					
EXHAUST AIR DAMPER D-3 BYPASS	o	o					
COILING VALVE V-1	o	o					
STEAM HUMIDIFIER VALVE V-3	o	o					

1 POINTS LIST FOR VAV AIR HANDLING UNIT

NTS

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Revisions: Date

Drawing Title: MECHANICAL HVAC POINTS LIST - BLDG 700

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: DW | Drawn: MJV

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: MI-412

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Department of Veterans Affairs

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AIR HANDLING UNITS

MARK AHU	LOCATION	SERVICE	CFM DESIGN	CFM RATED	MIN. OA (%)	AIR HANDLING UNIT COMPONENTS - SEE INDIVIDUAL EQUIPMENT SCHEDULES FOR COMPONENT CHARACTERISTICS: SUPPLY FAN MARK	COOLING COIL MARK	SOUND ATTENUATING DEVICES	SUPPLY AIR PREFILTER MARK	SUPPLY AIR FILTER MARK	SUPPLY AIR AFTER FILTER MARK	VFD (1)	MOISTURE ELIMINATOR	HUMIDIFIER (2)	DISCHARGE DAMPER MARK	MAX. DISCHARGE SOUND POWER LEVELS: 63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ	UNIT WEIGHT	REMARKS
AHU-4	ROOF	OR	36,200	-	100	SF-4	CC-4	n/a	F-4A	F-4B	F-4C	VFD-1 & 2	ME-4	H-4	D-4	90	81	77	79	68	61	48	39	30,000	(1)(2)(3)(4)(5)(6)

(1) VFD PROVIDED WITH AIR HANDLING UNIT. PROVIDE REDUNDANT VFD.
(2) STAINLESS STEEL DRAIN PAN TO BE PROVIDED WITH HUMIDIFIERS
(3) AHU MANUFACTURER TO INCLUDE FACTORY ACCEPTANCE TEST (FAT) FOR THE AHU. TEST TO INLCUDE:
A. SMOKE DETECTOR SHUT DOWN OF BOTH VFDs.
B. VFD INTERCONNECTS WITH SUPPLY AIR DISCHARGE DAMPER; WHEN VFDs ENERGIZE, DAMPER OPENS FULLY. WHEN VFDs DE-ENERGIZE, DAMPER CLOSES.
C. AHU VENDOR TO SHOW LEAD/LAG CHANGEOVER OF VFDs DURING FAT.
(4) SINGLE POINT 460/3 PHASE CONNECTION.
(5) SINGLE POINT 120/1 PHASE CONNECTION.
(6) PROVIDE FACTORY INSTALLED UNISTRUT SUPPORTS AT CENTER TOP PORTION OF UNIT FOR PIPING SUPPORT. COORDIANTE WITH STRUCTURAL.

SUPPLY AND EXHAUST FANS

MARK SF/EF	LOCATION	SERVICE	CFM (BEFORE 2ND FLOOR BUILDOUT) (5)	CFM (AFTER 2ND FLOOR BUILDOUT)	SP ("WG)	FAN TYPE	DRIVE	WHEEL TYPE: TYPE	QTY.	MIN DIA. (IN)	MAXIMUM RPM	FAN CLASS	FAN ARRANGEMENT	FAN MOTOR LOCATION	FAN DISCHARGE AND ROTATION	DAMPER MARK	INTERLOCK	MAX. BARE FAN INLET/DISCHARGE SOUND POWER LEVELS (3): 63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ	MOTOR: HP	MOTOR TYPE	PH	VOLT	VFD	REMARKS
SF-4	AHU-4/ROOF	LEVEL 1 AND 2 OR	24,250	36,200	7.5	FANWALL	DIRECT	AF	8	18	3,567	II	2 ROW x 4 COLS	INTERNAL	PLENUM		SEE SPEC.	102/91	99/88	94/96	100/92	94/88	91/85	91/84	86/79	10 EA/80 TOTAL	PREMIUM EFFICIENCY TFEC	3	460	YES	(2), (4)
EF-2	ROOF	LEVEL 1 AND 2 OR	24,710	35,400	4.25	CENTRIFUGAL UPBLAST	BELT	BI	1	49	1725	II	10	EXTERNAL	UBCW		SEE SPEC.	99	104	93	88	87	83	79	75	40	PREMIUM EFFICIENCY TFEC	3	460	YES	(1), (2), (3)
EF-3	ROOF	LEVEL 4 AND 5	16,450	16,450	1.9	CENTRIFUGAL UPBLAST	BELT	BI	1	33	936	II	10	EXTERNAL	UBCW		SEE SPEC.	89/93	94/98	89/88	83/86	83/84	80/80	74/75	68/68	10	PREMIUM EFFICIENCY TFEC	3	460	YES	(1), (2), (3)

(1) PROVIDE WITH MOTOR ENCLOSURE.
(2) PROVIDE WITH RAIN WATER OUTLET IN FAN HOUSING.
(3) MAXIMUM DISCHARGE SOUND POWER LEVEL FOR SUPPLY FANS AND MAXIMUM INLET SOUND POWER LEVEL FOR EXHAUST FANS.
(4) UNIT TO BE SUPPLIED WITH REDUNDANT VFDS. VFDS TO BE LEAD/LAG THROUGH BMS INTERFACE. SMOKE DETECTOR TO BE WIRED TO VFD THROUGH A COMMON TERMINAL STRIP. SMOKE DAMPER TO BE WIRED TO VFDS THROUGH A COMMON TERMINAL STRIP.
(5) CONTRACTOR TO CONFIRM CFM BEFORE DEMOLITION WORK BEGINS.

VARIABLE FREQUENCY DRIVES

MARK VFD	SYSTEM	MAX. HORSEPOWER	INPUT ELECTRICAL CHARACTERISTICS: VOLT	FREQUENCY	PHASE	BYPASS: YES	NO	REMARKS (1) (2) (3) (4)
VFD-1	AHU-4	80	460	60	3		X	SUPPLIED BY AHU MANUFACTURER, CONNECTED BY ELECTRICAL
VFD-2	AHU-4	80	460	60	3		X	SUPPLIED BY AHU MANUFACTURER, CONNECTED BY ELECTRICAL
VFD-8	EF-3	10	460	60	3	X		SUPPLIED AND INSTALLED BY MECHANICAL, CONNECTED BY ELECTRICAL
VFD-9	EF-2	40	460	60	3	X		SUPPLIED AND INSTALLED BY MECHANICAL, CONNECTED BY ELECTRICAL

(1) ALL VFDs ON SITE SHALL BE SUPPLIED BY THE SAME MANUFACTURER.
(2) ALL VFDs SHALL INTERFACE WITH THE BUILDING MANAGEMENT SYSTEM THROUGH SERIAL PORT COMMUNICATION FOR FULL COMMUNICATION THROUGH THE VFD
(3) WHEN VFD IS LOCATED OUTSIDE, PROVIDE NEMA 3R ENCLOSURE.
(4) ALL VFDs SHALL BE LOCATED WITHIN 50 FEET OF MOTOR.

COOLING COILS IN CENTRAL STATIONS

MARK CC	LOCATION	AREA SERVED	SYSTEM	NO.	TOTAL CAP.: MBH	CFM	NOMINAL SIZE: FACE AREA (F²)	DIM (IN): H	L	AIR SIDE: MAX. FACE VEL.	MAX. PD ("WG)	EAT (°F): DB	WB	LAT (°F): DB	WB	WATER SIDE: GPM (TOTAL)	MAX. PD (FT)	EWT (°F)	LWT (°F)	REMARKS
CC-4	ROOF	LEVEL 1 AND 2	AHU-4	3	1389	36,200	77.1	31.5	117.50	469.5	0.66	83.5	64.6	51.2	50.7	276.5	9.37	45.0	55.0	(1), (2)

(1) PROVIDE COPPER FINS AND COPPER TUBES FOR ALL COILS.
(2) ALL COILS PROVIDED WITH STAINLESS STEEL DRAIN PAN

CONTROL DAMPERS

MARK D	SERVICE	BLADE TYPE: OPPOSED	PARALLEL	CONTROL TYPE: MOTORIZED 2 POSITION	BACKDRAFT	FAIL POSITION: FC	FO	LOW LEAK SEALS	PRESSURE RATING (INCHES WG)	ELECTRICAL (VOLTS)	REMARKS
D-2	ROOF	-	YES	YES	NO	YES	-	YES	12	120	(1), (2)
D-3	ROOF	-	YES	YES	NO	YES	-	YES	12	120	(1), (2)
D-4	AHU-4 / ROOF	-	YES	YES	NO	YES	-	YES	12	120	(1), (2), (3)
D-5	AHU-4 / ROOF	-	YES	YES	NO	YES	-	YES	12	120	(1), (2), (3)

(1) ISOLATION DAMPERS SHALL BE PROVIDE WITH STAINLESS STEEL SLEEVE BEARINGS, STAINLESS STEEL AXLES

(2) PROVIDE WITH END POSTION SWITCHES

(3) SMOKE DAMPER

AIR HANDLING UNIT FILTERS

MARK F	SYSTEM	LOCATION	TYPE	CFM	MAX. FACE VEL. (FPM)	MIN. FACE AREA (FT²)	PRESS. DROP ("WG): INITIAL	FINAL	MIN. EFF. (%)	MIN. MERV RATING	MEDIA LENGTH (IN)	REMARKS (1)
F-4A	AHU-4	ROOF	OR	36,200	600	60.3	0.23	0.5	-	8	4	PREFILTER 1
F-4B	AHU-4	ROOF	OR	36,200	600	60.3	0.22	0.5	-	11	6	PREFILTER 2
F-4C	AHU-4	ROOF	OR	36,200	600	60.3	0.29	0.5	-	17	12	AFTERFILTER
F-4D	AHU-4	ROOF	OR	36,200	600	60.3	0.23	0.5	-	8	4	HEAT RECOVERY FILTER

HUMIDIFIERS

MARK H	LOCATION	SYSTEM	TYPE	SOURCE	CFM	CAPACITY (LBS/HR)	STEAM PRESSURE AT INLET OF CONTROL VALVE (PSIG)	ENTERING AIR TEMPERATURE DB(°F)/WB(°F)	LEAVING AIR TEMPERATURE (°F)	CONTROL TYPE	TRAP TYPE	TRAP SIZE (IN)	MANIFOLD DIAMETER (IN)	ABSORPTION DISTANCE (IN)	REMARKS
H-4	ROOF	AHU-4	PRESSURIZED	STEAM	36,200	620	15	83.5/64.6	51.2	CLEAN STREAM GENERATOR	THERMOSTATIC	2	3	12	304 STAINLESS STEEL

AIR TO AIR HEAT EXCHANGER SCHEDULE

MARK	LOCATION	SYSTEM AND/OR SERVICE	MODE	SUPPLY AIR: SUPPLY AIR FLOW CFM	APD INCH	EAT Db °F	EAT Wb °F	LAT Db °F	LAT Wb °F	EXHAUST AIR: AIR FLOW CFM	APD INCH	EAT Db °F	EAT Wb °F	LAT Db °F	LAT Wb °F	REMARKS
AHU-4	B700 ROOF	AHU-4	SUMMER	36200	1.16	104	71	83.5	64.6	35,400	1.24	75	62.5	94.5	68.8	
			WINTER	36200	1.34	26.8	26.8	55	42.8	35,400	1.17	70	53	39.9	38	

FINAL BID DOCUMENTS

Revisions:	Date

VA FORM 08-6231

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Drawing Title: MECHANICAL HVAC EQUIPMENT SCHEDULES

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: DW | Drawn: MJV

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: MH-510

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Department of Veterans Affairs

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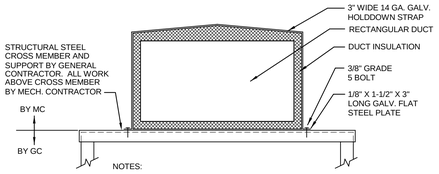

NOTES:
(1) PROVIDE SUFFICIENT PITCH AT TOP OF DUCT MAKING CENTER THE HIGHEST POINT TO PREVENT PUDDLING.

10 DUCT SUPPORT - RECTANGULAR DUCT ON ROOF

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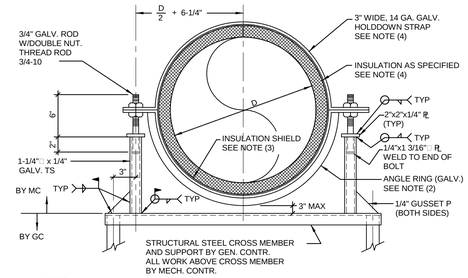


NOTES:

(1) PAINT ALL FIELD WELDED GALVANIZED COMPONENTS WITH ZINC PAINT AFTER WELDING.

(2) 1-1/2" x 1-1/2" x 1/4" FOR DUCTS SMALLER THAN 48" DIA., 2" x 2" x 1/4" FOR DUCTS 48"-60" DIA. AND 2-1/2" x 2-1/2" x 1/4" FOR DUCTS OVER 60" DIA.

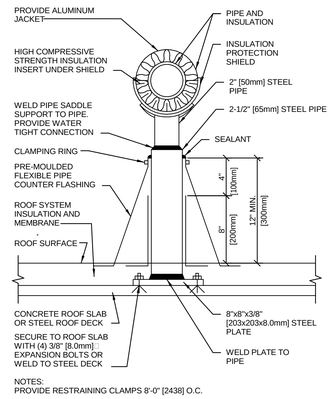
(3) INSULATION SHIELD FOR INSULATED DUCT TO BE GALV. STEEL WITH FOLLOWING WIDTH & THICKNESS: 12" WIDE 16 GA. FOR DUCTS SMALLER THAN 36" DIA., 18" WIDE 16 GA. FOR DUCTS 36"-50" DIA. AND 24" WIDE 16 GA. FOR DUCTS OVER 50" DIA. TOP HALF TO OVERLAP MINIMUM 3" OF BOTTOM HALF. SEAL OVERLAP WITH VAPOR BARRIER MASTIC AND MINIMUM TWO 3" WIDE BANDS. REFER TO SPECIFICATIONS FOR WEIGHT-SUPPORTING INSULATION AT SUPPORT POINTS.

(4) FOR UNINSULATED ROUND METAL DUCTWORK, USE 3" WIDE, 14 GA. HOLD DOWN STRAPS OF SAME MATERIAL AS DUCTWORK. FOR NON-METAL ROUND DUCTWORK, USE EITHER NON-METAL HOLD DOWN STRAP OF SIMILAR MATERIAL OR FITTED PIECE OF PROTECTIVE LINING USED ON METAL STRAP BETWEEN STRAP AND DUCT.

7 DUCT SUPPORT - ROUND DUCT ON ROOF

NTS

D=25" & ABOVE



NOTES:
PROVIDE RESTRAINING CLAMPS 8'-0" [2438] O.C.

4 DETAIL FOR SUPPORTING PIPE ON ROOF

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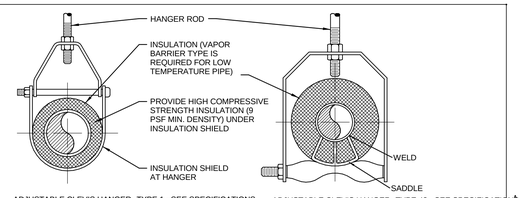
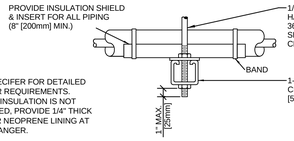


ADJUSTABLE CLEVIS HANGER TYPE 1 - SEE SPECIFICATIONS

ADJUSTABLE CLEVIS HANGER TYPE 43 - SEE SPECIFICATIONS



NOTES:
1. SEE SPECIFER FOR DETAILED HANGER REQUIREMENTS.
2. WHERE INSULATION IS NOT REQUIRED, PROVIDE 1/4" THICK FELT OR NEOPRENE LINING AT EACH HANGER.

SIDE VIEW TRAPEZE HANGER FOR UP TO 1000 LB. [453KG] UNIFORM LOAD

MAXIMUM PIPE/TUBING SUPPORT SPACING																					
NOM. SIZE	IN. [mm]	THRU 3/4 THRU [20]	1 [25]	1 1/4 [32]	1 1/2 [40]	2 [50]	2 1/2 [65]	3 [75]	4 [100]	5 [125]	6 [150]	8 [200]	10 [250]	12 [300]	14 [350]	16 [400]	18 [450]	20 [500]	24 [600]
PIPE	FT. [mm]	7 [2100]	7 [2100]	7 [2100]	9 [2700]	10 [3000]	11 [3400]	12 [3700]	14 [4100]	16 [4900]	17 [5200]	19 [5800]	22 [6700]	23 [7000]	25 [7600]	27 [8200]	28 [8500]	30 [9100]	32 [9600]
TUBING	FT. [mm]	5 FT [1500]	6 [1800]	7 [2100]	8 [2400]	8 [2400]	9 [2700]	10 [3000]	12 [3700]	13 [4000]	14 [4100]	16 [4900]	-	-	-	-	-	-	-
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.																			

1 PIPE HANGERS

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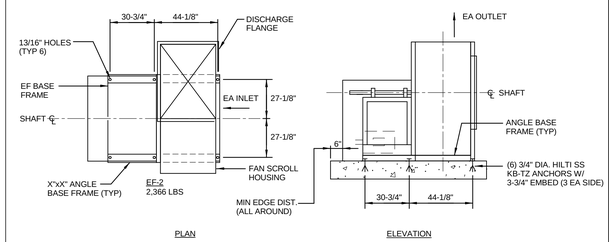

PLAN ELEVATION

12 (N) EF-2 ANCHORAGE DETAIL

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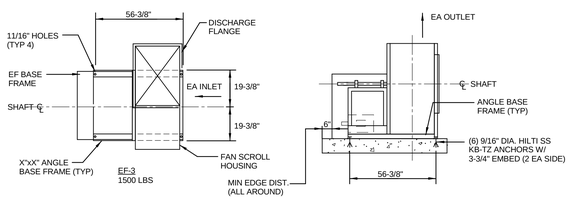

PLAN ELEVATION

8 (N) EF-3 ANCHORAGE DETAIL

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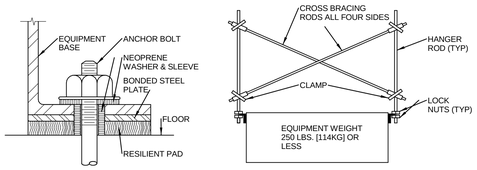


FLOOR MOUNT EQUIPMENT RESTRAINED BY RESILIENT PADS (TYPE DS)

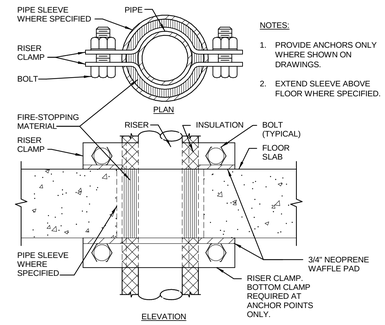
SEISMIC BRACING FOR LIGHT SUSPENDED EQUIPMENT

NOTE:
NOT REQUIRED FOR AIR TERMINAL UNITS.

NOTE:
1. NOT REQUIRED WHERE VIBRATION ISOLATION BASES ARE USED.

5 SEISMIC BRACING FOR EQUIPMENT

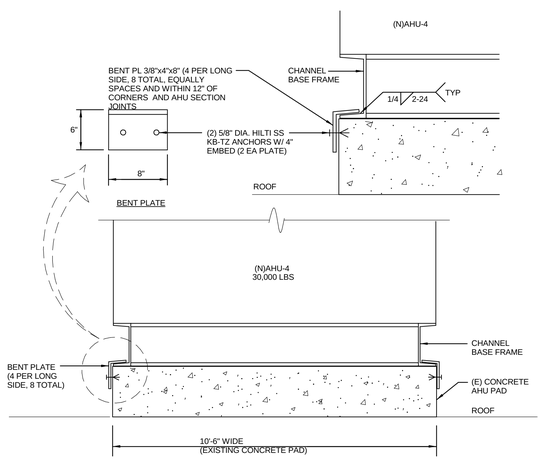
NTS



NOTES:
1. PROVIDE ANCHORS ONLY WHERE SHOWN ON DRAWINGS.
2. EXTEND SLEEVE ABOVE FLOOR WHERE SPECIFIED.

2 SUPPORT/ANCHOR FOR PIPE RISERS

NTS

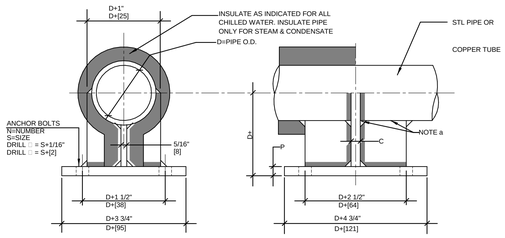


NOTE: (E) AHU PAD WIDTH IS ADEQUATE FOR NEW UNIT. THE PAD WILL NEED TO BE EXTENDED TO THE NORTH APPROXIMATELY 8'-6" TO ACCOMODATE LENGTH OF NEW UNIT.

13 (N) AHU-4 ANCHORAGE DETAIL

NTS

PIPE ANCHOR SCHEDULE											
D		P		C		N		S		BOLT PATTERN
IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	
4"	102	5/8"	16	3/4"	19	4"	102	3/4"	19	
3"	76	1/2"	13	1/2"	13	4"	102	5/8"	16	
2 1/2"	64	5/8"	10	3/8"	10	4"	102	5/8"	16	
2"	51	3/8"	10	3/8"	10	4"	102	5/8"	16	
1 1/2"	38	3/8"	10	1/4"	6	4"	102	1/2"	13	



NOTE:
a WHERE USED FOR COPPER TUBE OR PIPE, BRAZE TO FABRICATED STEEL ANCHOR

9 SMALL PIPE ANCHOR 1 $\frac{1}{2}$"- 4"

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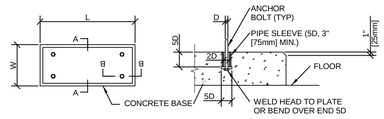

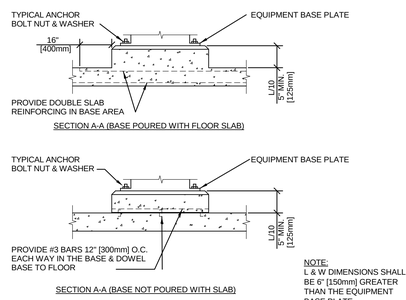

NOTE:
L & W DIMENSIONS SHALL BE 6" [150mm] GREATER THAN THE EQUIPMENT BASE PLATE.

6 CONCRETE EQUIPMENT BASES

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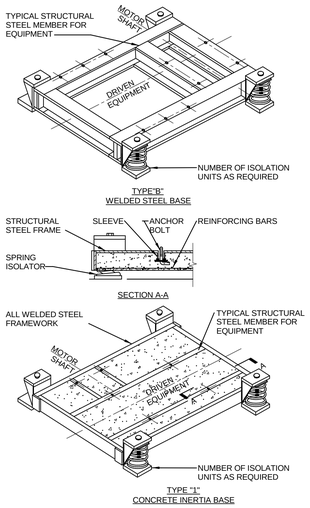

3 VIBRATION ISOLATION BASES

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Drawing Title	MECHANICAL HVAC DETAILS - BLDG 700
Project Title	BUILDING 700 OR HVAC RETROFIT
Project Number	612A4-13-301
Building Number	700
Approved: Project Director	
Location	VA MATHER
Date	4-3-2015
Checked	DW
Drawn	MJV
Drawing Number	MH-511
Dwg. of	

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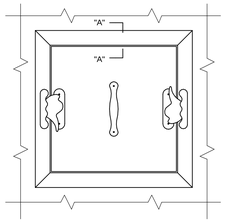
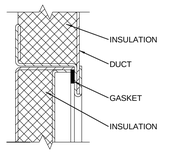
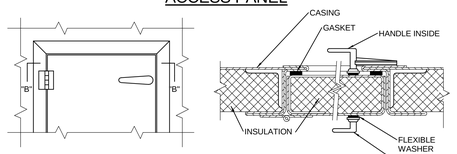




SECTION "A-A"

ACCESS PANEL



ACCESS DOOR

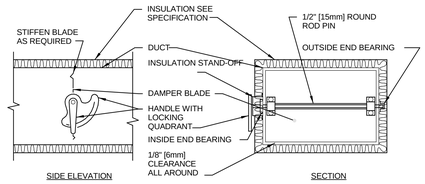
SECTION "B-B"

NOTES:

1. LATCHES SHALL BE OF THE WEDGE TYPE TO CLOSE DOORS TIGHTLY.
2. HINGES ON THE ACCESS DOORS SHALL HAVE NON-CORROSIVE PINS.
3. SEE SMACNA 2005, FIGURE 9-15

10 ACCESS PANEL AND DOOR DETAIL

NTS

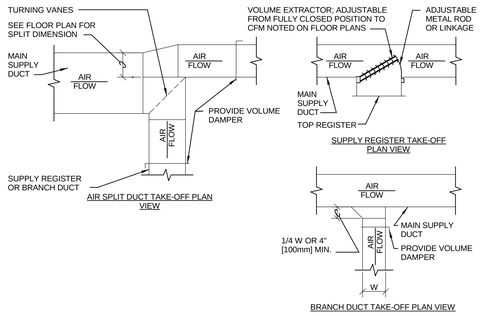


NOTE:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

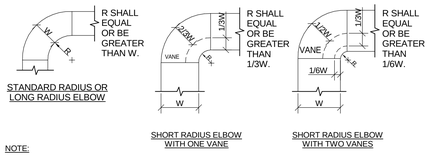
7 VOLUME DAMPER DETAIL

NTS



4 SUPPLY DUCTWORK TAKE-OFFS

NTS



NOTE:

1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS CAN BE SUBSTITUTED WITH SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

1 DUCTWORK RADIUS ELBOWS

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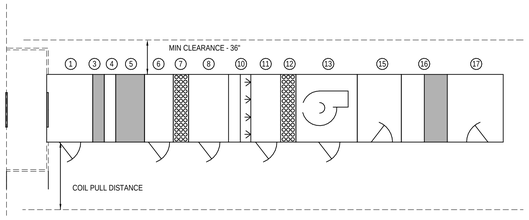


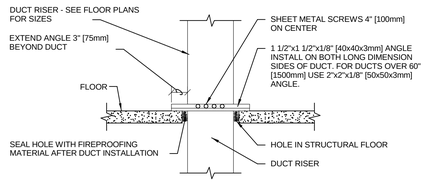
	AIR HANDLING UNIT	ITEM	MINIMUM OUTSIDE AIR TWO BEDS OF FILTERS VAV	MINIMUM OUTSIDE AIR THREE BEDS OF FILTERS CV	100% OUTSIDE AIR TWO BEDS OF FILTERS CV	100% OUTSIDE AIR THREE BEDS OF FILTERS CV
*	MIXING BOX	1	YES	YES	NO	NO
	PRE-FILTERS (SIDE ACCESS)	3	YES	YES	YES	YES
	INSPECTION SECTION, SMALL	4	YES	YES	YES	YES
	AFTER FILTER (SIDE ACCESS)	5	YES	YES	YES	YES
	ACCESS SECTION, MED-LARGE	6	YES	YES	YES	YES
*	HEAT RECOVERY COIL	7	NO	NO	YES	YES
*	ACCESS SECTION, MED-LARGE	8	NO	NO	YES	YES
*	INSPECTION SECTION,SMALL	10	YES	YES	YES	YES
	HUMIDIFIER	11	YES	YES	YES	YES
	COOLING COIL	12	YES	YES	YES	YES
	FAN	13	YES	YES	YES	YES
*	ACCESS SECTION,MED-LARGE	15	NO	NO	YES	YES
*	HEPA FILTER	16	NO	NO	NO	YES
*	DISCHARGE PLENUM (VERTICAL)	17	YES	YES	YES	YES
* AS REQUIRED						

NOTE:

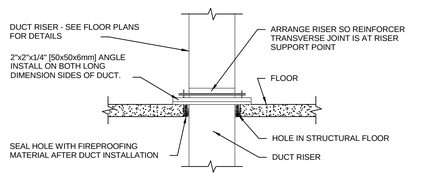
1. ACCESS DOORS SHALL BE GASKETED AND HINGED TO OPEN AGAINST FAN OPERATING PRESSURE TO PREVENT AIR LEAKAGE.
2. MINIMUM ACCESS DOOR WIDTH SHALL BE 24" [600mm].
3. ACCESS DOOR HEIGHT SHALL BE DETERMINED BY UNIT CASING BUT NOT TO EXCEED 6'-0" [1800mm].
4. ACCESS DOORS ON FAN SUCTION SHALL OPEN OUTWARD.
5. ACCESS DOORS ON FAN DISCHARGE SIZE SHALL OPEN INWARD.

11 ACCESS DOOR SWING DETAIL FOR AIR HANDLING UNITS

NTS



0.5 INCH WG [125Pa] TO 2 INCHES WG [500Pa] DUCT RISER SUPPORT



2 INCHES WG [500Pa] TO 4 INCHES WG [1000Pa] DUCT RISER SUPPORT

NOTE:
ALL DUCT WORK RISERS WHICH ARE RUN EXPOSED, SUCH AS THRU ATTIC FLOORS AND FAN ROOM FLOORS SHALL BE PROVIDED WITH A 3" [75mm] HIGH CONCRETE CURB AROUND OPENING FOR DUCT.

8 DUCT RISER SUPPORTS

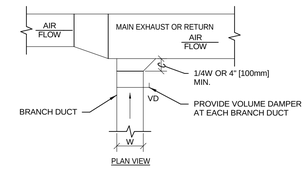
NTS

NOTE:

1. ALL VANE ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.
2. WHEN W1 DOES NOT EQUAL W2, VANE SHALL BE SINGLE THICKNESS VANE TYPE REGARDLESS OF W DIMENSION.
3. ALL SINGLE THICKNESS VANES SHALL HAVE A 2" [50mm] RADIUS, 1 1/2" [40mm] MAXIMUM SPACE BETWEEN VANES AND A 3/4" [20mm] TRAILING EDGE.
4. WHEN W EQUALS W2 AND W1 IS GREATER THAN 20" [500mm] VANES SHALL BE DOUBLE VANE TYPE.

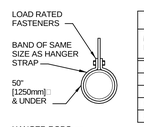
2 DUCTWORK SQUARE VANE ELBOWS

NTS

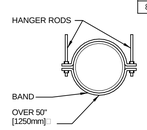


5 EXHAUST OR RETURN BRANCH DUCTWORK

NTS



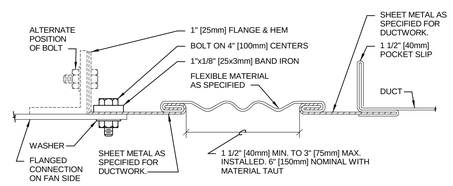
HANGER STRAPS OR RODS			
MAX. DUCT IN. [mm]	QUANTITY/SIZE IN. [mm]	MAX. LOAD LBS. [kg]	MAX. SPACING IN. [mm]
26 [650]	ONE 1 [25] x 22 GA STRAP	260 [119]	144 [3600]
36 [900]	ONE 1 [25] x 18 GA STRAP	420 [190]	144 [3600]
50 [1250]	ONE 1 [25] x 16 GA STRAP	700 [317]	144 [3600]
60 [1500]	TWO 3/8 [10] RODS	1320 [598]	144 [3600]
84 [2100]	TWO 1/2 [13] RODS	2500 [1133]	144 [3600]



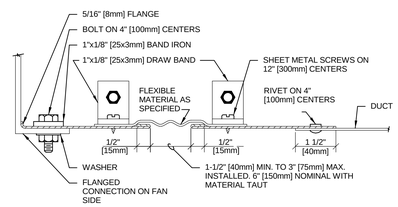
NOTE:
TABULATED DATA FROM SMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

9 ROUND DUCT HANGERS

NTS



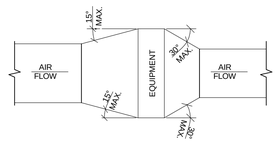
RECTANGULAR FLEXIBLE CONNECTION



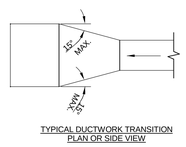
ROUND FLEXIBLE CONNECTION

6 FLEXIBLE DUCT CONNECTIONS

NTS



TYPICAL DUCTWORK TRANSITION WITH EQUIPMENT MOUNTED IN DUCT PLAN OR SIDE VIEW



TYPICAL DUCTWORK TRANSITION PLAN OR SIDE VIEW

NOTE:
UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

3 DUCTWORK TRANSITIONS (WITH EQUIPMENT MOUNTED IN DUCT)

NTS

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Revisions:	Date

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KEY PLAN

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Drawing Title: MECHANICAL HVAC DETAILS - BLDG 700

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: DW | Drawn: MJV

Project Number: 612A4-13-301

Building Number: 700

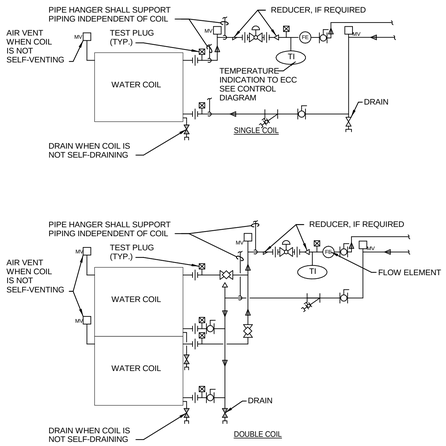
Drawing Number: MH-512

Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231

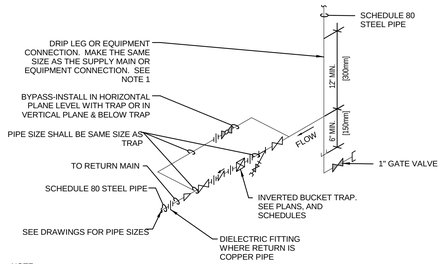


NOTE:

1. WHEN COIL IS INCLUDED IN CASING MOUNTED ON VIBRATION ISOLATORS THE FIRST 2 HANGERS FOR EACH PIPE SHALL BE SPRING & NEOPRENE TYPE. TYPE "H" FOR 4" [100mm] PIPE & SMALLER. TYPE "H-P" FOR 5" [125mm] PIPE & LARGER.
2. PIPING SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS; NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALES, OR EQUIPMENT.
3. THE FLOW ELEMENT MAY BE INSTALLED IN THE SUPPLY PIPING IF THE REQUIRED MINIMUM UPSTREAM AND DOWNSTREAM DIMENSIONS CANNOT BE OBTAINED IN THE RETURN PIPING.

12 WATER COILS - PIPING CONNECTIONS

NTS

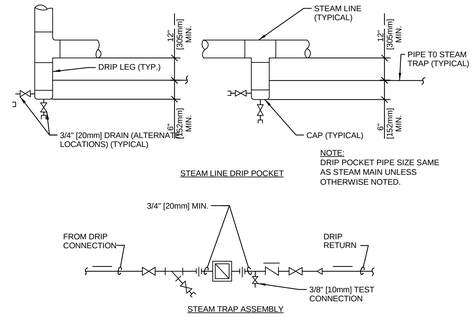


NOTE:

1. ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 6" SCALE POCKET BELOW TRAP INLET.
2. PROVIDE BYPASS PIPING.

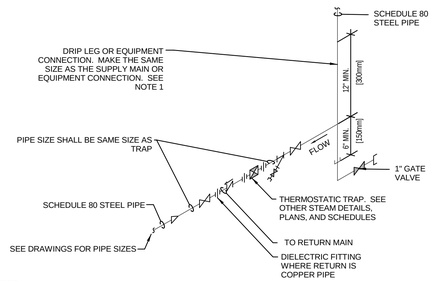
9 INVERTED BUCKET STEAM TRAP ASSEMBLY

NTS



5 STEAM LINE DRIP POCKET STEAM TRAP ASSEMBLY

NTS

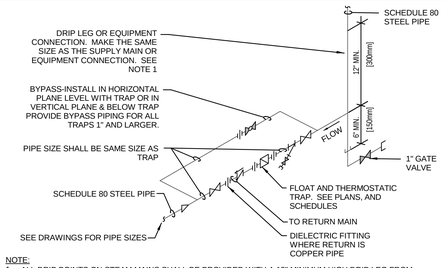


NOTE:

1. ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 6" SCALE POCKET BELOW TRAP INLET.

1 THERMOSTATIC STEAM TRAP ASSEMBLY

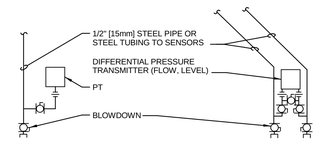
NTS



NOTE:
1. ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 6" SCALE POCKET BELOW TRAP INLET.

10 FLOAT AND THERMOSTATIC STEAM TRAP ASSEMBLY

NTS

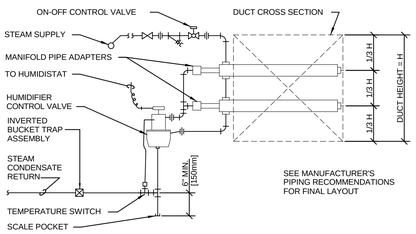


NOTES:

1. INSTALLATION OF SENSORS AND TRANSMITTERS SHALL CONFORM TO RECOMMENDATIONS OF MANUFACTURERS OF TRANSMITTERS.

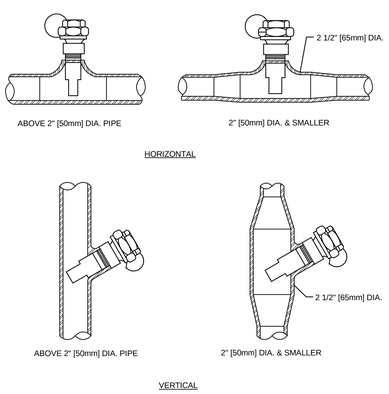
11 PRESSURE TRANSMITTER INSTALLATION

NTS



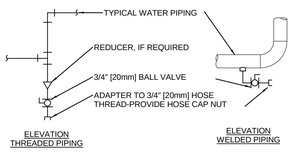
2 STEAM HUMIDIFIER - PIPING CONNECTIONS (MULTIPLE DISPERSION TUBES)

NTS



13 INSTALLATION OF THERMOMETER WELLS

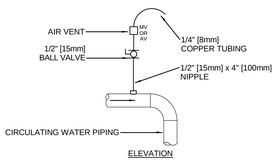
NTS



TYPICAL CHILLED AND HOT WATER PIPING DRAIN VALVE CONNECTIONS

NOTES:
1. DRAIN ALL LOW POINTS AS INDICATED ABOVE.

2. WHERE SCALE POCKETS ARE SHOWN ON PIPE RISER DIAGRAMS AND/OR PLANS LOCATE DRAIN AT BOTTOM OF SCALE POCKET.

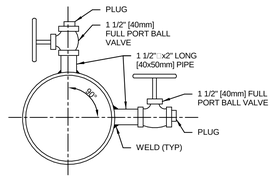


TYPICAL MANUAL AIR VENT

NOTES:
1. VENT ALL HIGH POINTS INDICATED ABOVE.
2. IF AUTOMATIC AIR VENTS ARE USED, PIPE DISCHARGE TO DRAIN.

11 DRAIN VALVE AND AIR VENT CONNECTIONS (HYDRONIC SYSTEMS)

NTS



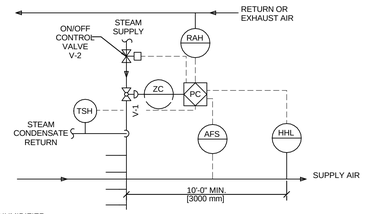
NOTE:

1. PROVIDE IN CHILLED WATER MAIN AND IN CONDENSER WATER MAIN.
2. LOCATE PILOT TUBE TAPS 20 PIPE DIAMETERS DOWNSTREAM AND 10 PIPE DIAMETERS UPSTREAM FROM THE NEAREST PIPE FITTING.

EITHER TOP OR SIDE LOCATION. BOTH ARE NOT REQUIRED AT SAME LOCATION.

7 PITOT TEST CONNECTIONS

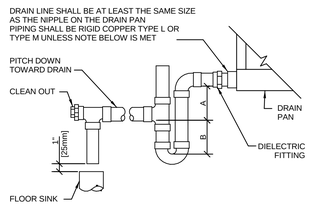
NTS



STEAM HUMIDIFIER
RETURN (OR EXHAUST) AIR HUMIDITY SHALL BE MONITORED. ON A CALL FOR HUMIDIFICATION, HUMIDIFIER VALVE V-1 SHALL MODULATE TO MAINTAIN THE RETURN (OR EXHAUST) AIR HUMIDITY SET POINT TO 30% (ADJUSTABLE). PRIOR TO ACTIVATION OF V-1, THE ON/OFF CONTROL VALVE V-2 SHALL BE ENABLED THROUGH ECC AND JACKET TEMPERATURE SENSED BY TSH SHALL BE WARM ENOUGH TO PREVENT CONDENSATION. THE HIGH LIMIT HUMIDITY SENSOR, LOCATED IN THE SUPPLY AIR DUCT 10 FEET AWAY FROM THE HUMIDIFIER SHALL DISABLE THE HUMIDIFIER AND GIVE AN ALARM SIGNAL TO THE ECC. IF THE SUPPLY AIR HUMIDITY EXCEEDS 90% RH aDJUSTABLE). THE AIRFLOW SWITCH SHALL PROVE AIRFLOW BEFORE HUMIDITY CONTROLS ARE ACTIVATED.

3 STEAM HUMIDIFIER CONTROLS

NTS



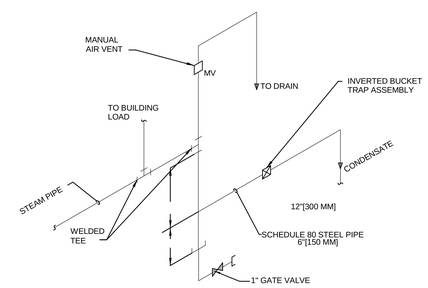
UNIT TYPE	A	B
DRAW THRU	2" [50mm] PLUS X	X
BLOW THRU	1" [25mm] MINIMUM	2X

WHERE X = STATIC PRESSURE IN PAN

NOTE: 1. CPVC PIPE MAY BE USED ONLY IF APPROVED BY LOCAL VA AND IS INDOORS AND DOES NOT PASS THROUGH RATED BARRIERS.
2. DIELECTRIC FITTING TO BE USED WHEN TWO DISSIMILAR METALS ARE TO BE CONNECTED.

8 AIR HANDLING UNIT DRAIN TRAP DETAIL

NTS



4 END OF STEAM LINE DRIP TRAP

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Revisions:	Date

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Tel 415 989 6400, Fax 415 989 3056
www.HilliardArchitects.com

Drawing Title: MECHANICAL HVAC DETAILS - BLDG 700

Approved: Project Director

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: DW | Drawn: MJV

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: MH-513

Dwg. of

Office of Construction and Facilities Management

Department of Veterans Affairs

VA FORM 08-6231

ELECTRICAL SYMBOLS AND ABBREVIATIONS

LIGHTING

TYPE
CIRCUIT/SWITCH

TYPE	DESCRIPTION	TYPE	DESCRIPTION
A	LINE VOLTAGE INCANDESCENT/HALOGEN	G	ELECTRODELESS INDUCTION FLUORESCENT
B	LOW VOLTAGE INCANDESCENT/HALOGEN	H	STANDARD HID
C	COMPACT FLUORESCENT	L	LIGHT PIPE/GUIDE/TUBE, FIBER OPTICS
D	DOUBLE ENDED/PIN, SINGLE ENDED COMPACT HID	N	NEON/COLD CATHODE
		S	SPECIAL PURPOSE
F	STANDARD LINEAR FLUORESCENT	T	TRACK
		X	EXIT LIGHT

SUFFIX	DESCRIPTION
E	BATTERY PACK/INVERTER

SURFACE MOUNTED LINEAR FLUORESCENT MOUNTING LOCATION: CEILING
SURFACE MOUNTED LINEAR FLUORESCENT MOUNTING LOCATION: WALL
PENDANT/SUSPENDED LINEAR FLUORESCENT
PENDANT/SUSPENDED FLUORESCENT
RECESSED GRID MOUNTED FLUORESCENT MOUNTING LOCATION: CEILING
RECESSED FLANGE MOUNTED FLUORESCENT MOUNTING LOCATION: CEILING
SURFACE MOUNTED FLUORESCENT MOUNTING LOCATION: CEILING
SURFACE MOUNTED EMERGENCY LINEAR FLUORESCENT MOUNTING LOCATION: CEILING
SURFACE MOUNTED EMERGENCY LINEAR FLUORESCENT MOUNTING LOCATION: WALL
PENDANT/SUSPENDED EMERGENCY LINEAR FLUORESCENT
PENDANT/SUSPENDED EMERGENCY FLUORESCENT
RECESSED GRID MOUNTED EMERGENCY FLUORESCENT MOUNTING LOCATION: CEILING
RECESSED FLANGE MOUNTED EMERGENCY FLUORESCENT. MOUNTING LOCATION: CEILING
SURFACE MOUNTED EMERGENCY FLUORESCENT MOUNTING LOCATION: CEILING
SURFACE MOUNTED CRITICAL LINEAR FLUORESCENT MOUNTING LOCATION: CEILING
SURFACE MOUNTED CRITICAL LINEAR FLUORESCENT MOUNTING LOCATION: WALL
PENDANT/SUSPENDED CRITICAL LINEAR FLUORESCENT
PENDANT/SUSPENDED CRITICAL FLUORESCENT
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SURFACE MOUNTED CRITICAL INCANDESCENT/COMPACT FLUORESCENT/HID MOUNTING LOCATION: WALL
PENDANT/SUSPENDED CRITICAL INCANDESCENT/COMPACT FLUORESCENT/HID
DIRECTIONAL INDICATOR ADDED TO FIXTURE SYMBOL TO DESIGNATE AIMING DIRECTION
EXIT DIRECTIONAL ARROW
SINGLE FACE EXIT FIXTURE MOUNTING LOCATION: CEILING
DOUBLE FACE EXIT FIXTURE MOUNTING LOCATION: CEILING
SINGLE FACE EXIT FIXTURE MOUNTING LOCATION: WALL
DOUBLE FACE EXIT FIXTURE MOUNTING LOCATION: WALL
SINGLE HEAD EMERGENCY FIXTURE WITH BATTERY PACK
DOUBLE HEAD EMERGENCY FIXTURE WITH BATTERY PACK
PILOT LIGHT MOUNTING LOCATION: AS NOTED
TRACK MOUNTING LOCATION: AS NOTED

SITE SYMBOLS

TYPE
CIRCUIT/SWITCH
POLE FIXTURE, ONE HEAD
POLE FIXTURE, TWO HEAD
POLE FIXTURE, FOUR HEAD
BOLLARD OR GROUND MOUNTED FIXTURE
EXTERIOR WALL MOUNTED FIXTURE
E — UG — E = ELECTRIC POWER
T = TELEPHONE
UG = UNDERGROUND
OH = OVERHEAD
D = DATA

EQUIPMENT AND WIRING

MOTOR
TRANSFORMER - ONE LINE DIAGRAM
ISOLATION TRANSFORMER - ONE LINE DIAGRAM
GROUND CONNECTION
TRANSFORMER
PANELBOARD - NORMAL SURFACE MOUNTED
PANELBOARD - NORMAL FLUSH MOUNTED
PANELBOARD - EMERGENCY/LIFE SAFETY SURFACE MOUNTED
PANELBOARD - EMERGENCY/LIFE SAFETY FLUSH MOUNTED
PANELBOARD - CRITICAL SURFACE MOUNTED
PANELBOARD - CRITICAL FLUSH MOUNTED
LOW VOLTAGE LIGHTING CONTROL PANEL - SURFACE MOUNTED
LOW VOLTAGE LIGHTING CONTROL PANEL - FLUSH MOUNTED
DISTRIBUTION PANELBOARD
MCC MOTOR CONTROL CENTER
CABLE TAP BOX
BUSWAY PLUG-IN UNIT
CURRENT TRANSFORMER
POTENTIAL TRANSFORMER
REVERSE POWER RELAY
NON FUSED DISCONNECT SWITCH
FUSED DISCONNECT SWITCH
BREAKER DISCONNECT SWITCH
MAGNETIC MOTOR STARTER
COMBINATION MOTOR STARTER
$M MANUAL STARTER W/OVERLOAD PROTECTION
$M MOTOR RATED SWITCH W/ THERMAL OVERLOAD PROTECTION
SURFACE JUNCTION BOX
SURFACE JUNCTION BOX - WALL
FLUSH JUNCTION BOX - CEILING
FLUSH JUNCTION BOX - WALL
FLUSH JUNCTION BOX - FLOOR
AUTOMATIC TRANSFER SWITCH
V VS VOLTMETER & SELECTOR SWITCH
A AS AMMETER, SELECTOR SWITCH, & CT'S
EGS ENGINE GENERATOR SET
GEN REMOTE GENERATOR ANNUNCIATOR
GI REMOTE GROUND INDICATOR
GR ROOM REFERENCE GROUND POINT
GROUND CONNECTION - PLUG-IN
LINE VOLTAGE THERMOSTAT
kWh REVENUE METER, kWh/D
M METER WITH CURRENT TRANSFORMER
MOLDED CASE CIRCUIT BREAKER
LOW VOLTAGE DRAW-OUT AIR CIRCUIT BREAKER
SWITCH - ONE LINE DIAGRAM
GROUNDED "Y" SYSTEM
H ELECTRIC HEATER
R RELAY - TYPE AS NOTED
TR TIMING RELAY
AIR TERMINAL
PUSH BUTTON
K KIRK KEY INTERLOCK
PM PHYSIOLOGICAL MONITOR OUTLET
PANEL DIVISION ARROW
PANEL DIVISION LINE
WIRING CONCEALED IN FLOOR
WIRING IN CEILING/WALLS
HOMERUN
INDICATES NUMBER OF CONDUCTORS
INDICATES NEUTRAL CONDUCTOR
PROVIDE GROUND IN EVERY CONDUIT WHERE NOT INDICATED, PROVIDE, HOT, NEUTRAL, AND GROUND
LP-A/1,3,5 - PANEL/CIRCUITS

SWITCHES

$a SINGLE POLE SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
a = SWITCH DESIGNATION
$3 THREE WAY SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$4 FOUR WAY SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$2 TWO POLE SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$K KEY SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$MC MOMENTARY CONTACT SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$D DOOR SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$P SWITCH WITH PILOT LIGHT
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$ LV-M LOW VOLTAGE "M"-MASTER SWITCH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
$DM REMOTE CONTROL FOR MOTORIZED DAMPER
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
LIGHTING CONTACTOR
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: AS NOTED
D DIMMER MOUNTING
LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
TS TIME SWITCH MOUNTING
LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
PC PHOTO CELL MOUNTING
LOCATION: WALL
MOUNTING HEIGHT: AS NOTED
S AL AMBIENT LIGHT SENSOR
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: AS NOTED
S AL AMBIENT LIGHT SENSOR
MOUNTING LOCATION: CEILING
S ??? OCCUPANCY SENSOR FOR LIGHTING CONTROL
PIR = PASSIVE INFRARED
2P = 2 POLE, DUAL RELAY
U = ULTRASONIC
DT = DUAL TECHNOLOGY
PIRA = PIR WITH AMBIENT LIGHT SENSOR
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 3'-6"
S ??? OCCUPANCY SENSOR FOR LIGHTING CONTROL
MOUNTING LOCATION: CEILING
FLOOR SWITCH
MOUNTING LOCATION: FLOOR

RECEPTACLES

DUPLEX RECEPTACLE
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
EMERGENCY DUPLEX RECEPTACLE
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
SINGLE RECEPTACLE
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
DOUBLE DUPLEX RECEPTACLE
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
EMERGENCY DOUBLE DUPLEX RECEPTACLE
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
DUPLEX RECEPTACLE - ABOVE CASEWORK OR 2" ABOVE COUNTERTOP BACKSPLASH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: FIELD VERIFY
EMERGENCY DUPLEX RECEPTACLE - ABOVE CASEWORK OR 2" ABOVE COUNTERTOP BACKSPLASH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: FIELD VERIFY
POWER OUTLET
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
POWER OUTLET, EMERGENCY CIRCUIT
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
FIXED EQUIPMENT CONNECTION - WALL
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
FIXED EQUIPMENT CONNECTION - WALL
EMERGENCY CIRCUIT
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
X = OUTLET TYPE
X D = DEDICATED OUTLET
G = GFCI OUTLET
L = TWISTLOCK OUTLET
T = TV OUTLET
W = WEATHERPROOF, GFCI OUTLET
#A = AMP RATING (OTHER THAN 20A)
DUPLEX RECEPTACLE LOCATED IN SURFACE MOUNTED RACEWAY
EMERGENCY DUPLEX RECEPTACLE LOCATED IN SURFACE MOUNTED RACEWAY
POWER OUTLET IN SURFACE MOUNTED RACEWAY VOLTAGE AND AMPERAGE AS INDICATED
EMERGENCY POWER OUTLET IN SURFACE MOUNTED RACEWAY VOLTAGE AND AMPERAGE AS INDICATED
DUPLEX RECEPTACLE, UPPER HALF SWITCHED, LOWER HALF HOT MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 1'-6"
DOUBLE DUPLEX RECEPTACLE - ABOVE CASEWORK OR 2" ABOVE COUNTERTOP BACKSPLASH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: FIELD VERIFY
EMERGENCY DOUBLE DUPLEX RECEPTACLE - ABOVE CASEWORK OR 2" ABOVE COUNTERTOP BACKSPLASH
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: FIELD VERIFY
DUPLEX RECEPTACLE - CEILING MOUNTED
MOUNTING LOCATION: CEILING
DUPLEX RECEPTACLE - FLOOR MOUNTED
MOUNTING LOCATION: FLOOR
FIXED EQUIPMENT CONNECTION MOUNTING LOCATION: COORDINATE W/ EQUIPMENT
CLOCK RECEPTACLE
MOUNTING LOCATION: WALL
MOUNTING HEIGHT: 8'-0"
OUTLETS INSTALLED IN SURFACE MOUNTED RACEWAY

RECEPTACLE MOUNTING HEIGHTS:
1. ALL RECEPTACLE MOUNTING HEIGHTS TO BE COORDINATED WITH ARCHITECT AND CASEWORK/ FURNITURE APPROVED SHOP DRAWINGS PRIOR TO ROUGH-IN. SOME RECEPTACLES TO BE MOUNTED INSIDE CASEWORK.

SHEET SYMBOLS

NOTE DESIGNATION
1 X0.0 DETAIL REFERENCE TOP DESIGNATES DETAIL NUMBER BOTTOM DESIGNATES ON WHICH SHEET DETAIL APPEARS
REFER X0.0 PLAN CONTINUATION DESIGNATION
1 X0.0 SECTION REFERENCE TOP DESIGNATES SECTION NUMBER BOTTOM DESIGNATES ON WHICH SHEET SECTION APPEARS
LINE CONTINUE BREAK
ELEVATION DESIGNATION
REVISION NUMBER DESIGNATION
NEW WORK CONNECTION TO EXISTING WORK DESIGNATION
EQUIPMENT DESIGNATION TOP DESIGNATES EQUIPMENT ABBREVIATION BOTTOM DESIGNATES EQUIPMENT NUMBER

ELECTRICAL ABBREVIATIONS

A	-	AMPERES
AC	-	ABOVE CEILING/ALTERNATING CURRENT
ADO	-	AUTOMATIC DOOR OPENER
AF	-	AMPERE FRAME
AFF	-	ABOVE FINISHED FLOOR
AIC	-	AMP INTERRUPTING CAPACITY
ALT	-	ALTERNATE
ARCH	-	ARCHITECTURAL
ASC	-	ABOVE SUSPENDED CEILING
AT	-	AMPERE TRIP
ATS	-	AUTOMATIC TRANSFER SWITCH
AUTO	-	AUTOMATIC
BATS	-	BYPASS AUTOMATIC TRANSFER SWITCH
BC	-	BARE COPPER
BFC	-	BELOW FINISH CEILING
BFL	-	BELOW FLOOR LEVEL
BLDG	-	BUILDING
BPIP	-	BOILER PLANT INSTRUMENTATION PANEL
BPS	-	BYPASS SWITCH
BRKR	-	BREAKER
C	-	CONDUIT
CB	-	CIRCUIT BREAKER
CCTV	-	CLOSED CIRCUIT TELEVISION
CCT	-	CIRCUIT
CCT BKR	-	CIRCUIT BREAKER
CFCI	-	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CLG	-	CEILING
CO	-	CONDUIT ONLY
CONTR	-	CONTRACTOR
CORR	-	CORRIDOR
CR	-	CONTROL RELAY
CT	-	CURRENT TRANSFORMER
DB	-	DIRECT BURIAL
DC	-	DIRECT CURRENT
DED	-	DEDICATED
DET	-	DETAIL
DIA	-	DIAMETER
DISC	-	DISCONNECT
DN	-	DOWN
DP	-	DISTRIBUTION PANEL
DS	-	DISCONNECT SWITCH
(E)	-	EXISTING
EC	-	EMPTY CONDUIT/ELECTRICAL CONTRACTOR
ECL	-	EMERGENCY CRITICAL LIGHTING
ECP	-	EMERGENCY CRITICAL POWER
EDB	-	ELECTRIC DUCT BANK
EG	-	EQUIPMENT GROUND
EGS	-	ENGINE GENERATOR SET
EJ	-	EXPANSION JOINT
ELEC	-	ELECTRICAL/ELECTRICAL
ELL	-	EMERGENCY LIFE SAFETY LIGHTING
ELP	-	EMERGENCY LIFE SAFETY POWER
EMER	-	EMERGENCY
EMI	-	ELECTROMAGNETIC INTERFERENCE
EMT	-	ELECTICAL METALLIC TUBING
EO	-	ELECTRICALLY OPERATED
EPO	-	EMERGENCY POWER OFF
EQUIP	-	EQUIPMENT
ESM	-	ELECTRIC STRIP MOLD
ETR	-	EXISTING TO REMAIN
EWC	-	ELECTRIC WATER COOLER
F/FC	-	FLUSH WITH FINISHED CEILING
F/FF	-	FLUSH WITH FINISHED FLOOR
F/FW	-	FLUSH WITH FINISHED WALL
FA	-	FIRE ALARM
FACP	-	FIRE ALARM CONTROL PANEL
FCU	-	FAN COIL UNIT
FDR	-	FEEDER
FDS	-	FUSED DISCONNECT SWITCH
FI	-	FILM ILLUMINATOR
FIXT	-	FIXTURE
FL	-	AT FLOOR LINE
FLA	-	FULL LOAD AMPERES
FLEX	-	FLEXIBLE
FLR	-	FLOOR
FLUOR	-	FLUORESCENT
FS	-	FLOW SWITCH
FSS	-	FUSED SAFETY SWITCH
FSCP	-	FLAME SAFEGUARD CONTROL PANEL
FVNR	-	FULL VOLTAGE NON-REVERSING
GC	-	GENERAL CONTRACTOR
GFCI	-	GROUND FAULT CIRCUIT INTERRUPTER
GFP	-	GROUND FAULT PROTECTION
GND	-	GROUND
GEN	-	GENERATOR
GFI	-	GROUND FAULT INTERRUPTER
GTB	-	GROUND TERMINAL BOX
HH	-	HANDHOLE
HOA	-	HAND OFF AUTOMATIC
HP	-	HORSEPOWER
HTRACE	-	HEAT TRACE
HV	-	HIGH VOLTAGE
IMC	-	INTERMEDIATE METAL CONDUIT
INCAND	-	INCANDESCENT
JB	-	JUNCTION BOX
KO	-	KNOCK-OUT
KV	-	KILOVOLT
KVA	-	KILOVOLT-AMPERES
KW	-	KILOWATTS
KWH	-	KILOWATT HOURS
LSIG/LSIA:		
L	-	LONG DELAY PROTECTION
S	-	SHORT DELAY PROTECTION
I	-	INSTANTANEOUS PROTECTION
A	-	GROUND FAULT ALARM
G	-	GROUND FAULT PROTECTION
LAN	-	LOCAL AREA NETWORK
LGT	-	LIGHT
LTCP	-	LOCAL TEMPERATURE CONTROL PANEL
LTG	-	LIGHTING
LTS	-	LIGHTS
LV	-	LOW VOLTAGE
MATV	-	MASTER ANTENNA TELEVISION
MC	-	MECHANICAL CONTRACTOR
MCB	-	MAIN CIRCUIT BREAKER
MCC	-	MOTOR CONTROL CENTER
MCP	-	MOTOR CIRCUIT PROTECTOR
MDP	-	MAIN DISTRIBUTION PANEL
MER	-	MECHANICAL EQUIPMENT ROOM
MLO	-	MAIN LUGS ONLY
MH	-	MANHOLE
MPTB	-	MUSIC & PAGE TERMINAL BOX
MTD	-	MOUNTED
MTG	-	MOUNTING
MTG HGT	-	MOUNTING HEIGHT
MTR	-	MOTOR/METER
NA	-	NOT APPLICABLE
NC	-	NEW CONNECTION/NORMALLY CLOSED
NEC	-	NATIONAL ELECTRICAL CODE
NFD	-	NON-FUSED DISCONNECT
NFSS	-	NON-FUSED SAFETY SWITCH
NIC	-	NOT IN CONTRACT
NO	-	NORMALLY OPEN
NTS	-	NOT TO SCALE
OC	-	ON CENTER
OFCI	-	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	-	OWNER FURNISHED OWNER INSTALLED
P	-	POLE
PA	-	PUBLIC ADDRESS
PB	-	PULL BOX/PUSHBUTTON
PBPU	-	PREFABRICATED BEDSIDE PATIENT POWER UNIT
PC	-	PLUMBING CONTRACTOR/PHOTOCELL
PDU	-	POWER DISTRIBUTION UNIT
PF	-	POWER FACTOR
PH	-	PHASE
PLBG	-	PLUMBING
PNL	-	PANEL
POD	-	POWER OPERATED DAMPER
PT	-	POTENTIAL TRANSFORMER
PTRV	-	POWER TYPE ROOF VENTILATOR
PWR	-	POWER
(R)	-	(RELOCATED)
REC	-	RECESSED
RECEP	-	RECEPTACLE
REL	-	RELOCATE
REQD	-	REQUIRED
RGIP	-	REMOTE GROUND INDICATOR PANEL
RMC	-	RIGID METAL CONDUIT
RVAT	-	REDUCED VOLTAGE AUTO TRANSFORMER
SHT	-	SHEET
SIG	-	SIGNAL
SIM	-	SIMILAR
SPEC	-	SPECIFICATION
SS	-	SAFETY SWITCH
STA	-	STATION
STR	-	STARTER
SW	-	SWITCH
SWBD	-	SWITCHBOARD
SWGR	-	SWITCHGEAR
TEL	-	TELEPHONE
TFA	-	TO FLOOR ABOVE
TFB	-	TO FLOOR BELOW
TS	-	TAMPER SWITCH/TIME SWITCH
TV	-	TELEVISION
TVSS	-	TRANSIENT VOLTAGE SURGE SUPPRESSION
TVTC	-	TELEVISION TERMINAL CABINET
UDC	-	UNDERCOUNTER
UG	-	UNDERGROUND
UH	-	UNIT HEATER
UNO	-	UNLESS NOTED OTHERWISE
UPS	-	UNINTERRUPTED POWER SUPPLY
V	-	VOLTAGE
VFD	-	VARIABLE FREQUENCY DRIVE
VP	-	VAPOR PROOF
W	-	WIRE
W/	-	WITH
WP	-	WEATHERPROOF
WS	-	WALL SURFACE
WT	-	WATER TIGHT
X	-	EXISTING
XFMR	-	TRANSFORMER
XP	-	EXPLOSION PROOF

GENERAL NOTES

1. ALL WORK TO COMPLY WITH 2014 NATIONAL ELECTRICAL CODE.
2. ALL EQUIPMENT TO BE INSTALLED OR PERMANENTLY CONNECTED (HARD WIRED) MUST BE LISTED, LABELED OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY.
3. SEAL ALL CONDUIT PENETRATIONS THROUGH FIRE RATED PARTITIONS WITH CSFM AND UL LISTED FIRE STOP SYSTEMS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATED PARTITION LOCATION.
4. PROVIDE A SEPARATE GREEN INSULATED GROUND CONDUCTOR FOR EACH CONDUIT. GROUND AT BOTH ENDS OF THE CONDUIT.
5. CONTRACTOR SHALL EXTEND WIRING FROM ALL JUNCTION BOXES, RECEPTACLES, SWITCHES, ETC. AND MAKE FINAL CONNECTION AS REQUIRED TO ALL BUILDING EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS.
6. FOR PURPOSES OF CLEARNESS AND LEGIBILITY, THE ELECTRICAL DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC. THE SIZE AND LOCATION OF EQUIPMENT IS SHOWN TO SCALE WHEREVER POSSIBLE. CONTRACTOR SHALL VERIFY ALL CONDITIONS, DATA INFORMATION AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION SECTION WHERE ELECTRICAL WORK INTERFACES WITH OTHER TRADES.
7. ALL DEVICES AND EQUIPMENT INSTALLED OUTSIDE OR IN WET OR DAMP LOCATIONS SHALL BE APPROVED WEATHERPROOF.
8. PROVIDE UPDATED CIRCUIT DIRECTORIES OF AFFECTED SWITCHBOARDS AND PANELBOARDS. USE THE SCHEDULES OF THE CONTRACT ELECTRICAL DRAWINGS AND UPDATE TO AS-BUILT CONDITION.
9. CUT, PATCH AND FINISH PAINT EXISTING GYPBOARD WALLS AND CEILINGS TO CONCEAL NEW CONDUITS.
10. UNLESS OTHERWISE NOTED, ALL CONDUIT AND CONDUCTORS SHOWN ON PLANS ARE #12THWN IN 3/4" CONDUIT.

DEMOLITION NOTES

1. THE ELECTRICAL DEMOLITION PLAN SHOWING EXISTING CONDITIONS HAS BEEN PREPARED BASED ON FIELD OBSERVATION AND RECORD DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST WHICH DO NOT SHOW, AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER SIMILAR TO THOSE ITEMS WHICH DO SHOW. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS.
2. ACCOMPLISH ALL WORK IN A NEAT WORKMANLIKE MANNER TO MINIMIZE ANY INTERFERENCE, ANNOYANCE OR INCONVENIENCE SUCH WORK MIGHT IMPOSE ON THE OWNER.
3. WHERE DEMOLITION WORK INTERFERES WITH THE OWNER'S USE OF THE PREMISES, SCHEDULE DEMOLITION WORK TO MINIMIZE INCONVENIENCE TO THE OWNER.
4. PROVIDE NEW CONDUITS AND WIRES TO MAINTAIN WIRING CONTINUITY OF EXISTING OUTLETS, LIGHT FIXTURES, FIRE ALARM, PAGING SYSTEM AND OTHER EXISTING WORK DISTURBED DUE TO DEMOLITION SCOPE SO AS TO MINIMIZE FACILITY DISRUPTION.

FINAL BID DOCUMENTS

Revisions:	Date

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Affiliated Engineers W, Inc.
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San Francisco, California 94105
415.764.3700

REGISTERED PROFESSIONAL ENGINEER MARK ROY VALENZUELA No. E19144 Exp. 06/30/2016 ELECTRICAL STATE OF CALIFORNIA

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Drawing Title: ELECTRICAL LEGEND, NOTES, AND ABBREVIATIONS
Approved:
Project Title: BUILDING 700 OR HVAC RETROFIT
Location: VA MATHER
Date: 4-3-2015 | Checked: MRP | Drawn: MRV
Project Number: 612A4- 13- 301
Building Number: 700
Drawing Number: E-001
Dwg. of

Office of Facilities Management
Department of Veterans Affairs

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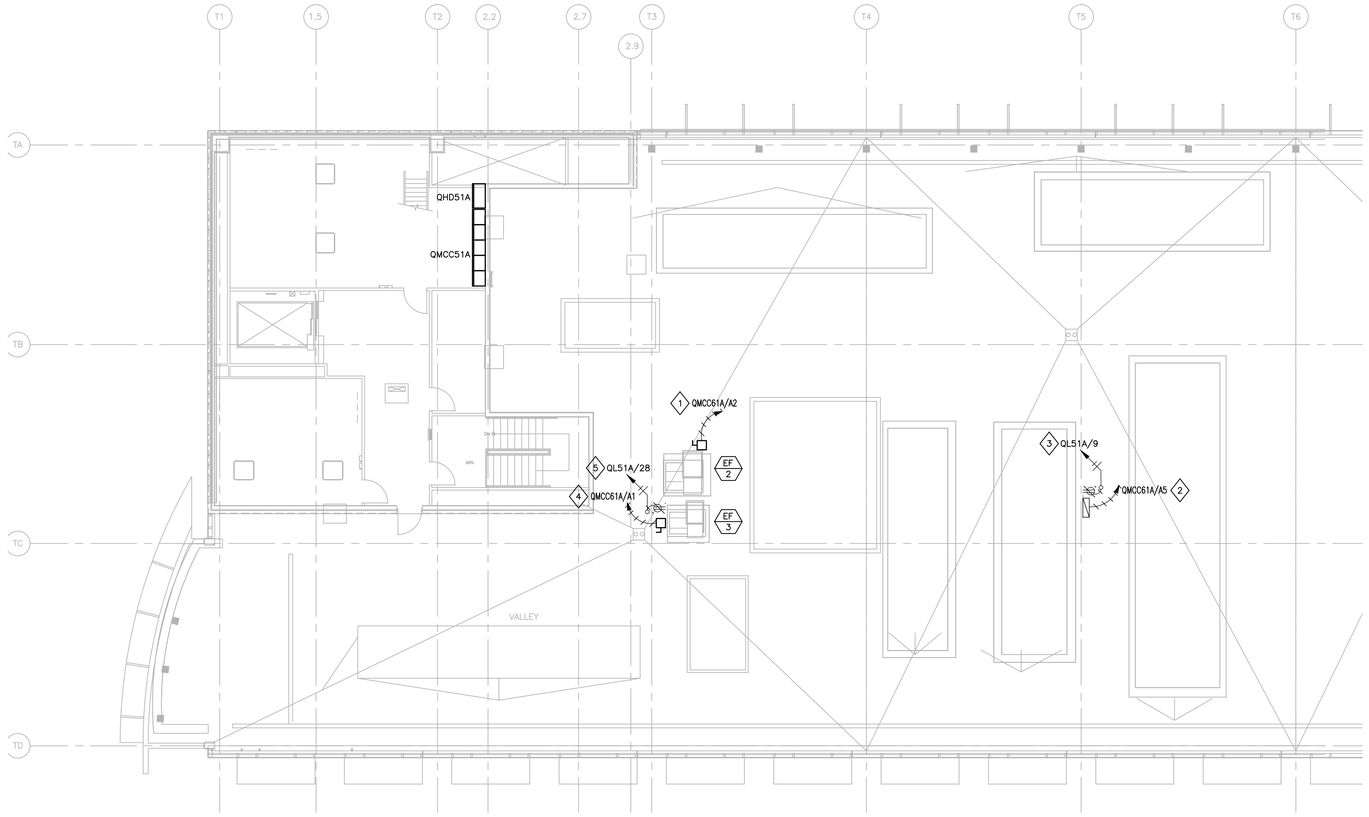

1 ELECTRICAL DEMOLITION PLAN - ROOF LEVEL
1/8" = 1'-0"

GENERAL NOTES

1. BACKGROUND AND EQUIPMENT LAYOUT ARE USED FOR REFERENCE ONLY AND MAY NOT DEPICT AS-BUILT CONDITIONS.

SHEET NOTES

1. DEMOLISH EXISTING POWER CONNECTION FROM EXHAUST FAN EF-2 BACK TO EXISTING MOTOR CONTROL CENTER QMCC61A. SEAL ROOF CONDUIT PENETRATION TO BE WATERPROOF AS NECESSARY.
2. DISCONNECT POWER CONNECTION AND DEMOLISH CONDUIT AND WIRING FROM AHU-4 BACK TO NEAREST JUNCTION BOX. RETAIN CONDUIT AND WIRING FOR FUTURE CONNECTION TO NEW AHU-4 SUPPLY FAN VFDS. REFER TO DRAWING 700-MH-106 FOR ADDITIONAL INFORMATION. SEAL ROOF CONDUIT PENETRATION TO BE WATERPROOF AS NECESSARY.
3. DISCONNECT AND REMOVE EXISTING SURFACE-MOUNT RECEPTACLE, AND ASSOCIATED WIRING BACK TO NEAREST JUNCTION BOX. DEMOLISH FLEXIBLE CONDUIT BACK TO ROOF CONDUIT STUB ADJACENT TO EXISTING AIR HANDLER UNIT AHU-4. CAP CONDUIT FOR REUSE FOR NEW POWER RECEPTACLE AT NEW AHU-4 UNIT.
4. DISCONNECT AND REMOVE POWER CONNECTION TO EXHAUST FAN EF-3 BACK TO NEAREST JUNCTION BOX LOCATED WITHIN 5TH FLOOR CEILING SPACE. DISCONNECT AND RELOCATE EXISTING 30A/3P NEMA-3R DISCONNECT SWITCH FOR REUSE AT NEW EXHAUST FAN EF-3 LOCATION.
5. DISCONNECT AND REMOVE EXISTING RECEPTACLE MOUNTED TO EF-3 DISCONNECT SWITCH SUPPORT FRAME. DEMOLISH FLEXIBLE CONDUIT BACK TO ROOF CONDUIT STUB ADJACENT TO EF-3. CAP CONDUIT FOR REUSE FOR NEW POWER RECEPTACLE AT NEW EXHAUST FAN EF-2 SUPPORT FRAME.

NORTH

FINAL BID DOCUMENTS

Revisions:	Date

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Drawing Title: **ELECTRICAL DEMOLITION PLAN - ROOF LEVEL**

Approved:

Project Title: **BUILDING 700 OR HVAC RETROFIT**

Location: VA MATHER

Date	Checked	Drawn
4-3-2015	MRP	MRV

Project Number: 612A4-13-301

Building Number: 700

Drawing Number: **700-ED-106**

Dwg. of

Office of Facilities Management

Department of Veterans Affairs

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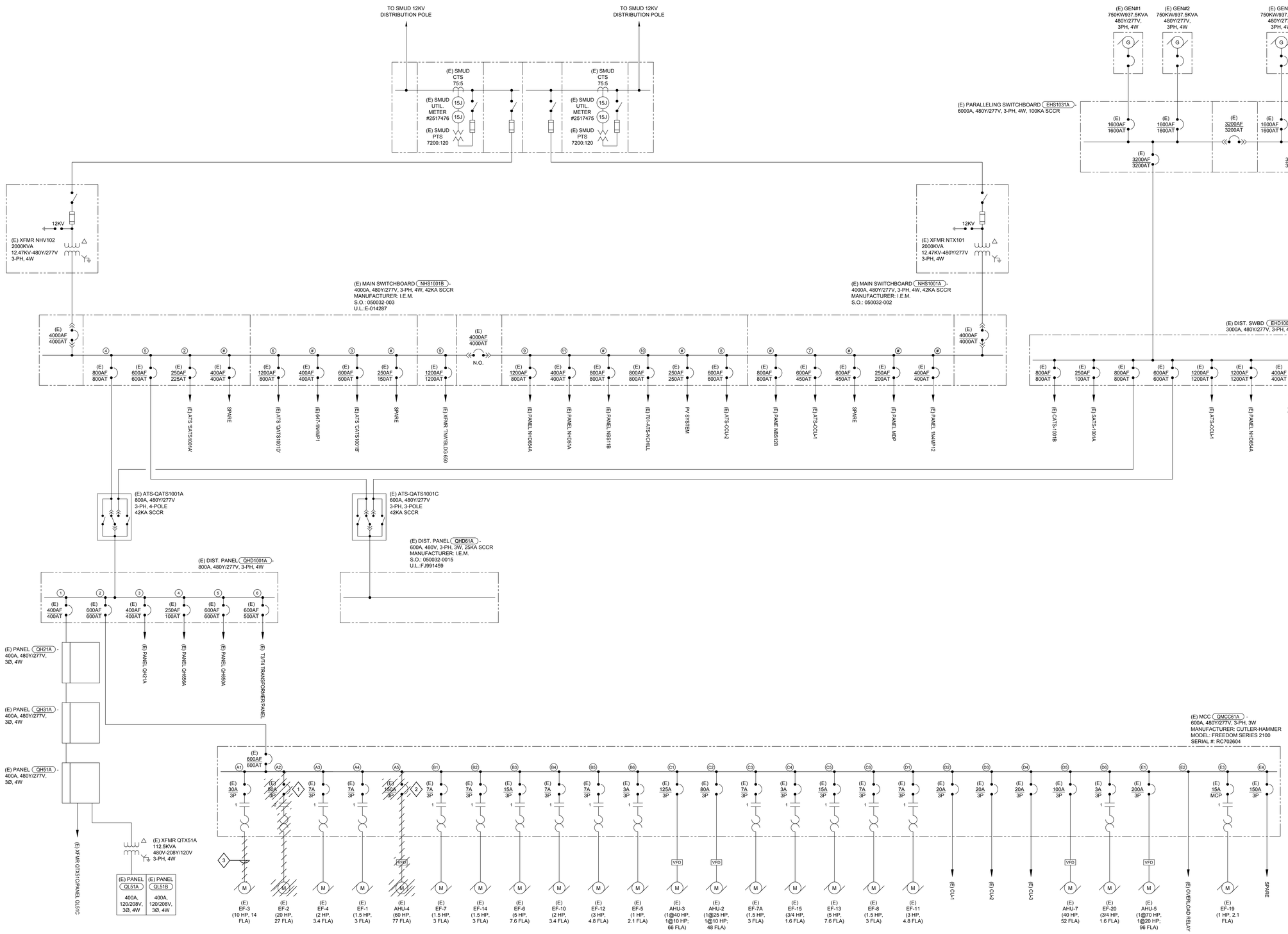

1 **ELECTRICAL POWER SINGLE LINE DIAGRAM - DEMOLITION**
SCALE: NONE

GENERAL NOTES:

1. ALL EQUIPMENT SHOWN ON DIAGRAM IS EXISTING UNLESS OTHERWISE NOTED.

SHEET NOTES:

1. DISCONNECT AND REMOVE EXISTING 50A MCP/NEMA SIZE 2 STARTER MCC BUCKET. RETURN MCC STARTER BUCKET TO OWNER FOR LATER REUSE.
2. DISCONNECT AND REMOVE EXISTING 150A/3P CIRCUIT BREAKER.
3. DISCONNECT AND REMOVE EXISTING WIRING (3#12, 1#12G). RETAIN EXISTING 1/2" CONDUIT FOR REUSE.

FINAL BID DOCUMENTS

Revisions:	Date

CONSULTANTS:

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Drawing Title: **ELECTRICAL POWER SINGLE LINE DIAGRAM - DEMOLITION**

Approved:

Project Title: **BUILDING 700 OR HVAC RETROFIT**

Location: **VA MATHER**

Date: **4-3-2015** | Checked: **MRP** | Drawn: **MRV**

Project Number: 612A4- 13- 301

Building Number: **700**

Drawing Number: **ED-501**

Dwg. of

Office of Facilities Management

Department of Veterans Affairs

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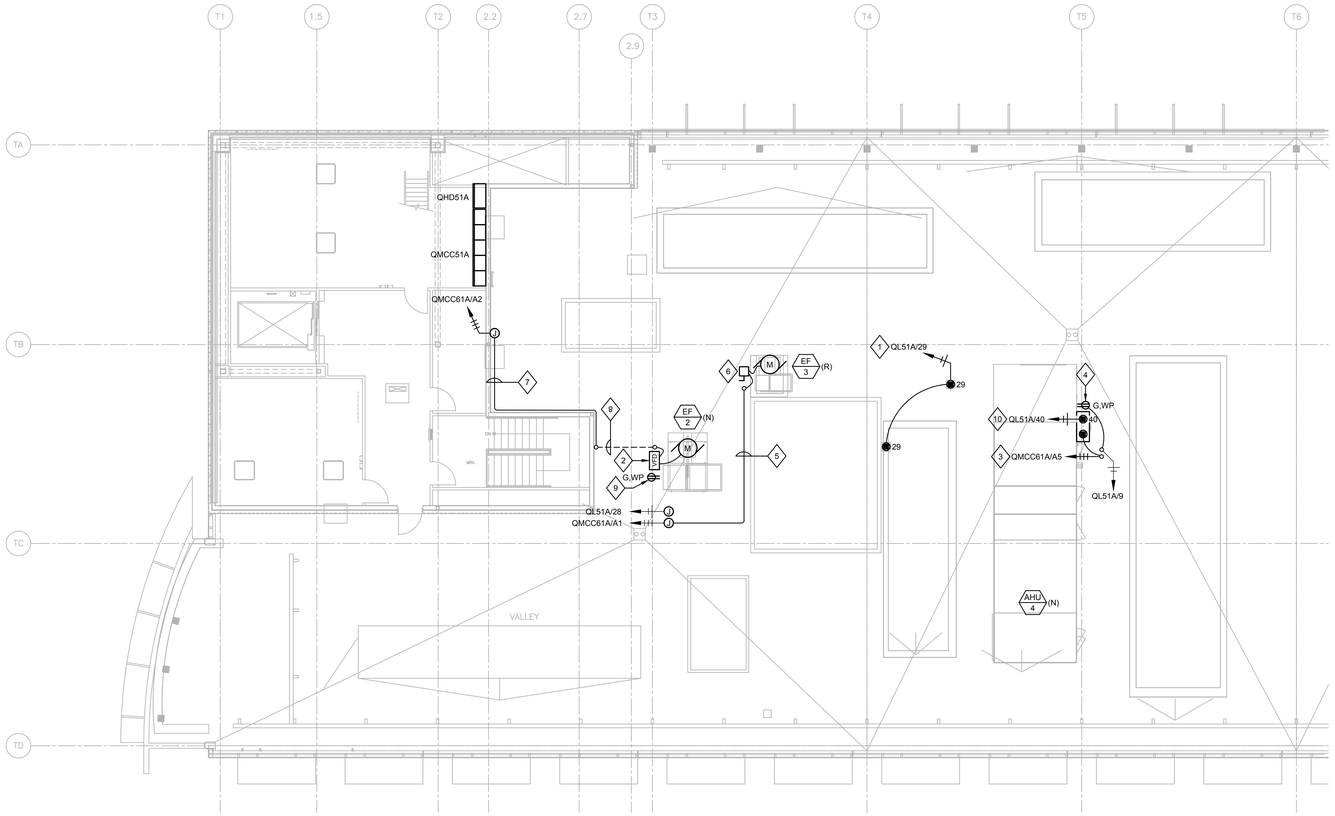
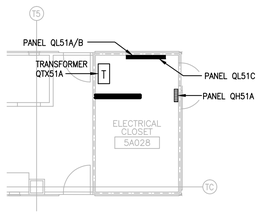
VA FORM 08-6231



1 ELECTRICAL POWER PLAN - ROOF LEVEL
1/8" = 1'-0"



2 ELECTRICAL ENLARGED POWER PLAN - LEVEL FIVE
1/8" = 1'-0"

VOLTAGE: 208Y 120V
PHASE / WIRE: 3P / 4W
MAIN BREAKER: 400
BUS AMPACITY: 400

(E) Panel QL51A

MOUNTING: SURFACE
SCCR RATING: 10,000

LOAD DESCRIPTION	NOTE	A	B	C	CB	CKT.	CKT.	CB	A	B	C	NOTE	LOAD DESCRIPTION
(E) WINDOW WASH RECEPTACLE	1				20/1	1	2	30/1				1	(E) WINDOW WASH RECEPTACLE
-	-				20/1	3	4	30/1				-	-
-	-				20/1	5	6	30/1				-	-
(E) AHU-1 & 5 LTG/RECEPTACLES					20/1	7	8	30/1				1	(E) CENTRIFUGE
(E) AHU-6, &7 LTG/RECEPTACLES					20/1	9	10	30/1				-	-
(E) AHU-2,3 PNTHS/LTG/RECEPTS					20/1	11	12	30/1				-	-
(E) REFRIGERATOR					20/1	13	14	20/1					(E) FREEZER
(E) REFRIGERATOR					20/1	15	16	20/1				1	(E) ULTRA LOW FREEZER
(E) REFRIGERATOR					20/1	17	18	20/1				-	-
(E) CENTRIFUGE	1				20/1	19	20	20/1				1	(E) CENTRIFUGE
-	-				20/1	21	22	20/1				-	-
-	-				20/1	23	24	20/1				-	-
(E) FREEZER					20/1	25	26	20/1					(E) FREEZER
(E) ROOM					20/1	27	28	20/1					(E) ROOF RECEPTACLES
(N) CONTROL DAMPERS				0.40	20/1	29	30	20/1					(E) HEAT PUMP HP-2
(E) REFRIGERATOR					20/1	31	32	20/1					(E) ELEVATOR MACHINE ROOM
(E) REFRIGERATOR					20/1	33	34	20/1					(E) JOHNSON CONTROL VAV POWER
(E) J.C ROOF A/R HANDLER CONTROLS					20/1	35	36	20/1					(E) JOHNSON CONTROL NCN-4
(E) WATER PUMP	1				20/1	37	38	20/1					(E) SA034 RECEPT
-	-				20/1	39	40	20/1		0.64			**(N) AHU-4 LIGHTS/REC/DAMPERS**
-	-				20/1	41	42	20/1					SPARE

LOAD SUMMARY	CONN. KVA	NEC FACTOR	NEC KVA
MOTOR LOADS	0.00	100%	0.00
ADD'L 25% OF LA RGEST MOTOR FOR DEMAND: 25% x 0		25%	0.00
LIGHTING / CONTINUOUS LOADS	0.00	125%	0.00
RECEPTACLES (FIRST 10KVA)	1.04	100%	1.04
RECEPTACLES (OVER 10KVA)	0.00	50%	0.00
EQUIPMENT LOADS	0.00	100%	0.00
TOTALS:	1.04		1.04

TOTAL CONNECTED			TOTAL NEC		
PHASE A:	0.00	KVA	PHASE A:	0.00	KVA
PHASE B:	0.64	KVA	PHASE B:	0.64	KVA
PHASE C:	0.40	KVA	PHASE C:	0.40	KVA
	2.9	AMPS		3.0	AMPS

Notes:
1. SINGLE POLE BREAKERS CONNECTED TOGETHER WITH BREAKER TIE

GENERAL NOTES

1. BACKGROUND AND EQUIPMENT LAYOUT ARE USED FOR REFERENCE ONLY AND MAY NOT DEPICT AS-BUILT CONDITIONS.

SHEET NOTES

1. PROVIDE 120V POWER CONNECTION TO MECHANICAL CONTROL DAMPERS FROM SPARE CIRCUIT IN PANELBOARD QL51A FOR. PROVIDE (2#10, 1#10G IN 3/4"C).
2. PROVIDE POWER CONNECTION FROM MOTOR CONTROL CENTER QMCC61A TO NEW EXHAUST FAN EF-2. PROVIDE CONNECTION TO 40 HP VFD IN NEMA-3R ENCLOSURE WITH INTEGRAL DISCONNECT, 30KAIC. PROVIDE UNISTRUT MOUNTING FRAME OR EQUIPMENT PAD AS NECESSARY.
3. PROVIDE POWER CONNECTION FROM EXISTING MOTOR CONTROL CENTER QMCC61A TO NEW AHU-4 SUPPLY FAN VFDS. ROUTE RIGID METAL CONDUIT THROUGH 5TH FLOOR CEILING SPACE AND STUB UP TO ROOF ADJACENT TO VFD CABINET. TRANSITION FROM RMC TO LIQUIDTIGHT FLEXIBLE CONDUIT FOR CONNECTION TO VFD CABINET. SEAL NEW ROOF CONDUIT PENETRATION TO BE WATERTIGHT.
4. PROVIDE NEW GFCI DUPLEX RECEPTACLE SURFACE-MOUNT TO NEW AIR HANDLER UNIT. EXTEND CONDUIT AND WIRING TO NEW RECEPTACLE.
5. EXTEND EXISTING CONDUIT FROM EXISTING JUNCTION BOX TO RELOCATED EXHAUST FAN EF-3. RUN CONDUIT AND WIRING ON ROOF TOP SUPPORTED BY SLEEPERS AND WALL-MOUNTED UNISTRUT SUPPORTS SPACED MAXIMUM 10'-0" ON CENTER.
6. RELOCATE AND REUSE EXISTING 30A/3P NEMA-3R DISCONNECT SWITCH. PROVIDE NEW UNISTRUT MOUNTING FRAME.
7. WALL-MOUNT EXHAUST EF-2 FEEDER ON BUILDING WALL VIA WALL-MOUNTED UNISTRUT SUPPORTS, SPACED MAXIMUM 14'-0" ON CENTER.
8. RUN EXHAUST FAN EF-2 FEEDER IN 5TH FLOOR CEILING SPACE. PENETRATE ROOF MEMBRANE ADJACENT TO STAIRWELL WALL AND ADJACENT TO NEW 40HP VFD UNIT.
9. PROVIDE NEW GFCI DUPLEX RECEPTACLE, AND MOUNT TO NEW VFD SUPPORT STRUCTURE. EXTEND CONDUIT AND WIRING TO NEW RECEPTACLE.
10. PROVIDE 120V POWER CONNECTION FOR AHU-4 LIGHTS, RECEPTACLES, AND DAMPERS

NORTH

FINAL BID DOCUMENTS

Revisions: Date

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REGISTERED PROFESSIONAL ENGINEER
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Exp. 06/30/2016
ELECTRICAL
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KEY PLAN

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Drawing Title: **ELECTRICAL POWER PLAN - ROOF LEVEL**

Approved:

Project Title: **BUILDING 700 OR HVAC RETROFIT**

Location: **VA MATHER**

Date: **4-3-2015** | Checked: **MRP** | Drawn: **MRV**

Project Number: 612A4-13-301
Building Number: **700**
Drawing Number: **700-EP-106**
Dwg. of

Office of Facilities Management
Department of Veterans Affairs

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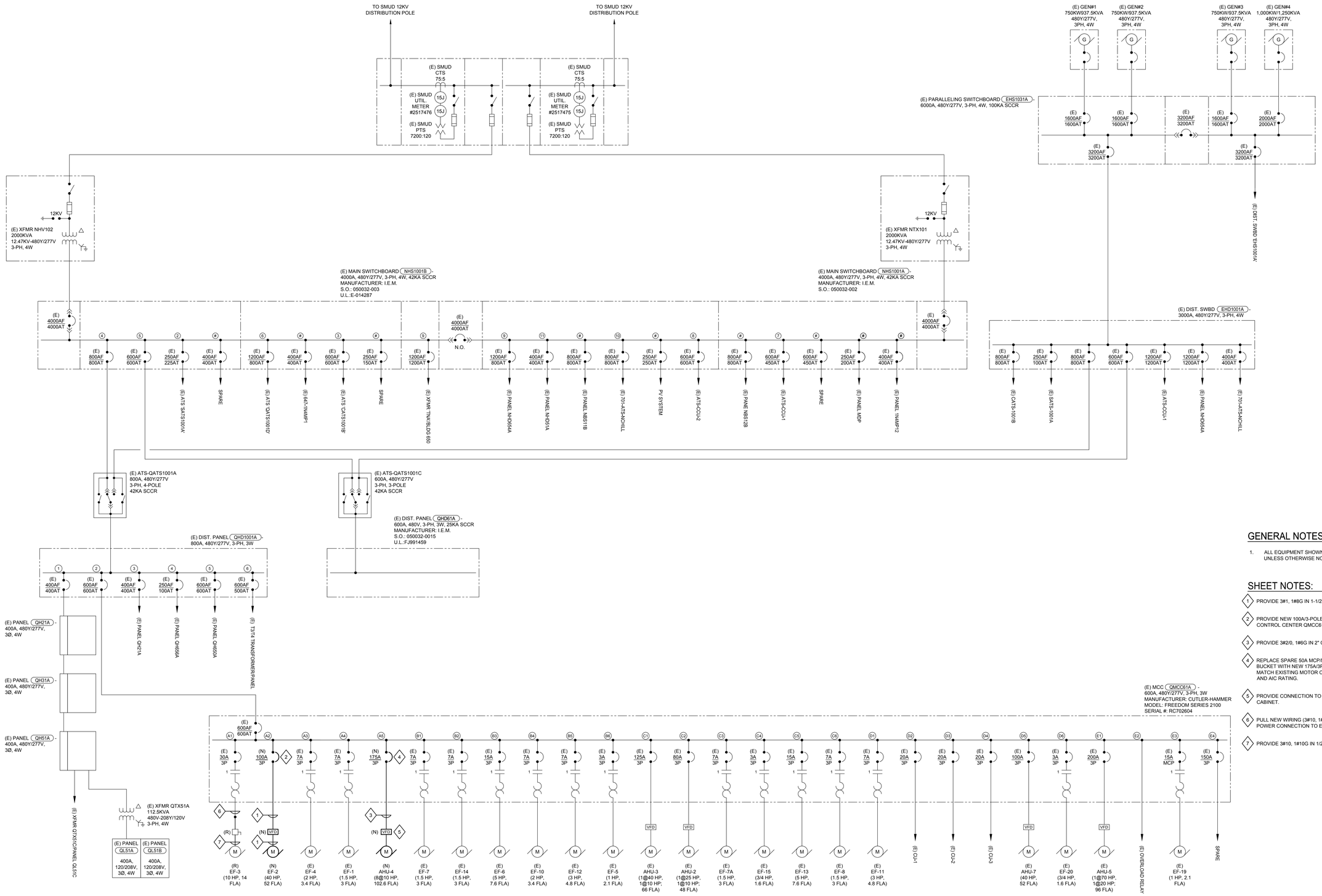

1 **ELECTRICAL POWER SINGLE LINE DIAGRAM**
SCALE: NONE

GENERAL NOTES:

1. ALL EQUIPMENT SHOWN ON DIAGRAM IS EXISTING UNLESS OTHERWISE NOTED.

SHEET NOTES:

1. PROVIDE 3#1, 1#8G IN 1-1/2" CONDUIT.
2. PROVIDE NEW 100A/3-POLE CIRCUIT BREAKER IN MOTOR CONTROL CENTER QMCC61A.
3. PROVIDE 3#2/0, 1#6G IN 2" CONDUIT.
4. REPLACE SPARE 50A MCP/NEMA SIZE 2 STARTER MCC BUCKET WITH NEW 175A/3P CIRCUIT BREAKER MCC BUCKET. MATCH EXISTING MOTOR CONTROL CENTER DEVICE TYPE AND A/C RATING.
5. PROVIDE CONNECTION TO AHU-4 INTEGRAL 75HP VFD DRIVE CABINET.
6. PULL NEW WIRING (3#10, 1#10G) THROUGH 1/2" CONDUIT FOR POWER CONNECTION TO EXHAUST FAN EF-3.
7. PROVIDE 3#10, 1#10G IN 1/2" CONDUIT.

FINAL BID DOCUMENTS

Revisions:	Date

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Drawing Title: **ELECTRICAL POWER SINGLE LINE DIAGRAM**

Approved:

Project Title: **BUILDING 700 OR HVAC RETROFIT**

Location: **VA MATHER**

Date: **4-3-2015** | Checked: **MRP** | Drawn: **MRV**

Project Number: 612A4- 13- 301

Building Number: **700**

Drawing Number: **E-501**

Dwg. of

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231

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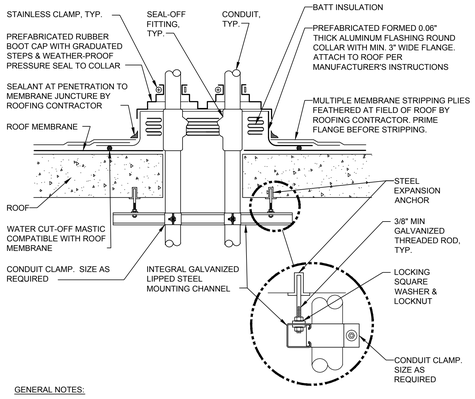
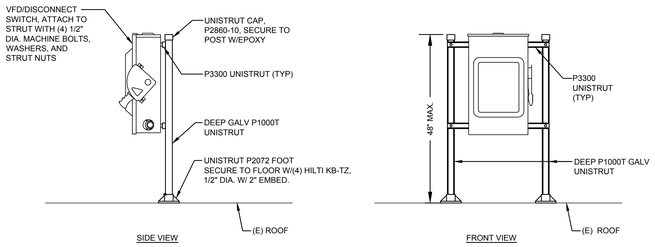


GENERAL NOTES:

1. MAINTAIN A MINIMUM CLEARANCE OF 12" [308mm] ON ALL SIDES OF ROOF PENETRATION FROM WALLS, CURBS, AND OTHER PROJECTIONS TO FACILITATE PROPER FLASHING.
2. FLANGES OF ADJACENT FLASHINGS SHALL NOT BE CUT OR OVERLAPPED.
3. VERIFY ROOF & STRUCTURAL SYSTEM WITH ARCHITECT.
4. COORDINATE FLASHING INSTALLATION WITH ROOFING CONTRACTOR TO ENSURE PROPER METHODS & MATERIALS ARE USED TO MAINTAIN ROOF WARRANTY.

1 ROOF PENETRATION DETAIL

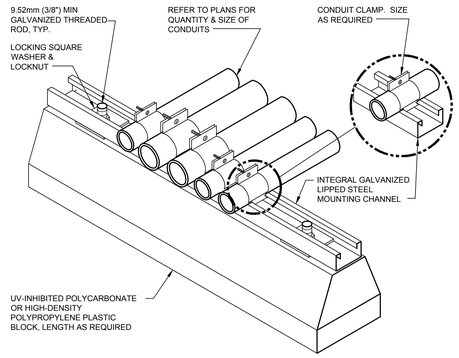
SCALE: NONE



2 VFD/DISCONNECT SUPPORT STAND DETAIL

MAX OPERATING WEIGHT: 150 LBS

SCALE: NONE



3 ROOF CONDUIT SUPPORT DETAIL

SCALE: NONE

FINAL BID DOCUMENTS

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Drawing Title: ELECTRICAL DETAILS

Approved:

Project Title: BUILDING 700 OR HVAC RETROFIT

Location: VA MATHER

Date: 4-3-2015 | Checked: MRP | Drawn: MRV

Project Number: 612A4- 13- 301

Building Number: 700

Drawing Number: E-601

Dwg. of

Office of Facilities Management

Department of Veterans Affairs

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