FIRE PROTECTION LEGEND

SYMBOL	DESCRIPTION
	RISE IN PIPE
	DROP IN PIPE
	SPRINKLER MAIN
	UNDERGROUND PIPE
	OS&Y GATE VALVE W/ VALVE TAMPER SUPERVISORY SWITCH
	CHECK VALVE
	QUICK RESPONSE–CONCEALED TYPE W/ WHITE FINISH PLATE
	QUICK RESPONSE UPRIGHT W/ BRASS FINISH
	ONE–WAY FIRE DEPARTMENT CONNECTION – FREE STANDING
	TWO–WAY FIRE DEPARTMENT CONNECTION – WALL–MOUNT
	SPECIAL CABINET – TYPE AS NOTED
P	ADDRESSABLE FIRE ALARM MANUAL STATION – MOUNTING HEIGHT 4'–0"
WP VA 15,30, 75,110,185	GENERAL BUILDING FIRE ALARM COMBINATION AUDIO/VISUAL (HORN/STROBE) DEVICE – MOUNTING HEIGHT 6'–8" UNLESS NOTED OTHERWISE – SUBSCRIPT '15,30,75,110,185' DENOTES CANDELA RATING – SUPERSCRIPT 'WP' DENOTES WEATHERPROOF
VT	VALVE TAMPER SUPERVISORY SWITCH WITH MONITOR MODULE
WF	WATERFLOW SWITCH WITH MONITOR MODULE
S	SMOKE SENSOR – PHOTOELECTRIC TYPE WITH INTEGRATED SOUNDER BASE
C	CARBON MONOXIDE (CO) DETECTOR WITH INTEGRATED SOUNDER BASE
WP F	ELECTRIC SPRINKLER ALARM BELL – SUBSCRIPT 'WP' DENOTES WEATHERPROOF DEVICE
MM	JUNCTION BOX WITH ADDRESSABLE MONITOR MODULE
CM	JUNCTION BOX WITH ADDRESSABLE CONTROL MODULE
J	JUNCTION BOX – SIZE AS REQUIRED
IAM	INDIVIDUAL ADDRESSABLE MODULE
ZAM	ZONE ADAPTER MODULE
LPI	JUNCTION BOX WITH LINE POWERED ISOLATOR
TVSS	TRANSCIENT VOLTAGE SURGE SUPPRESSOR
	HOMERUN TO PANEL – NUMBER OF ARROWS INDICATE NUMBER OF CIRCUITS AND NUMBER OF CROSSLINES INDICATES NUMBER OF #12 CONDUCTORS – WHERE NO CROSSLINES APPEAR 2#12 PLUS 1#12 GRD CONDUCTORS ARE IMPLIED
	FIRE ALARM/SPRINKLER ZONE BOUNDARY
#	DRAWING NOTE NUMBER

CONVENTIONS

SECTION CUT

A
1 | 1

SECTION LAYER

SHEET NO. WHERE SECTION IS SHOWN

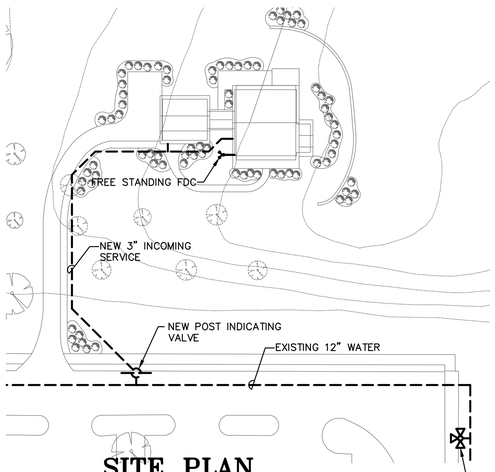
SHEET NO. WHERE SECTION IS CUT

DETAIL

1
1 | 1

DETAIL NO.

SHEET NO. WHERE DETAIL IS SHOWN



SITE PLAN

NO SCALE

NOTE:

1. ALL PIPING AND HYDRANT LOCATIONS DEPICTED ON THIS PLAN ARE SHOWN FOR THE PURPOSES OF HYDRAULIC CALCULATIONS AND FIRE DEPARTMENT CONNECTION POSITION. THIS SITE PLAN IS NOT INTENDED FOR INSTALLATION OF PIPING AND/OR HYDRANT LOCATIONS.

FIRE PROTECTION (FIRE SPRINKLER) GENERAL NOTES:

1. PROVIDE A COMPLETE AND OPERATIONAL FIRE SPRINKLER SYSTEM. THE SYSTEM SHALL BE DESIGNED, FABRICATED, INSTALLED, COORDINATED, TESTED AND PLACED INTO SERVICE IN ACCORDANCE WITH NFPA 13, NFPA 13D, NFPA 24, NFPA 25, NFPA 70, NFPA 72, NFPA 241, LOCAL AUTHORITY REQUIREMENTS, AND THE CONTRACT DOCUMENTS.
2. THE GENERAL SCOPE OF THE AUTOMATIC FIRE SPRINKLER SYSTEM SHALL CONSIST OF THE FOLLOWING FOR ALL AREAS OF THE BUILDING AS SHOWN:
   A. PROVIDE NFPA 13D WET PIPE SPRINKLER SYSTEM TO PROTECT ALL OCCUPIED AREAS OF THE NET ZERO ENERGY HOUSE AS INDICATED ON DRAWINGS.
   B. PROVIDE NFPA 13 WET PIPE SPRINKLER SYSTEM TO PROTECT THE GARAGE.
3. RESIDENTIAL SPRINKLER HEADS PROTECTING THE NET ZERO ENERGY HOUSE SHALL BE LISTED FOR 20' X 20' COVERAGE.
4. THE FIRE PROTECTION INSTALLER(S) SHALL SUBMIT COMPLETE LAYOUT SHOP DRAWINGS, CALCULATIONS, AND ANNOTATED MANUFACTURER'S DATA INFORMATION TO THE OWNER AND ENGINEER OF RECORD FOR REVIEW AND APPROVAL. APPROVALS SHALL BE OBTAINED BEFORE THE PURCHASE OR INSTALLATION OF EQUIPMENT.
5. THE FIRE PROTECTION INSTALLER(S) SHALL BE RESPONSIBLE FOR ALL APPLICABLE TRADE PERMITS, REQUESTS FOR INSPECTION, AND TESTING AS REQUIRED BY THE APPROVING AHJ.
6. THE FINAL DESIGN OF THE FIRE PROTECTION SYSTEM SHALL BE COORDINATED WITH FIELD CONDITIONS AND THE AVAILABLE WATER SUPPLY.
7. THE FIRE PROTECTION INSTALLER(S) SHALL COORDINATE ALL SYSTEM PIPING, DEVICES, CONDUIT, EQUIPMENT, AND RELATED APPURTENANCES WITH THE BUILDING STRUCTURAL, MECHANICAL AND ELECTRICAL ELEMENTS, INCLUDING BUT NOT LIMITED TO, STRUCTURAL MEMBERS AND SYSTEMS, AIR DUCTS AND OUTLETS, LIGHT FIXTURES, AND SIMILAR EQUIPMENT AND MATERIAL THAT MAY INTERFERE WITH THE PROPER INSTALLATION AND OPERATION OF THE SYSTEM. SUBMITTED LAYOUT SHOP DRAWINGS SHALL BE COORDINATED WITH ALL TRADES.
8. THE FIRE PROTECTION SYSTEM PIPING, DEVICES, HANGERS, CABINETS, EQUIPMENT AND RELATED APPURTENANCES SHALL BE INSTALLED NEAT AND IN A WORKMANLIKE MANNER. CONFORM TO THE LATEST TRADE PRACTICES. PIPING SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO BUILDING LINES AND PROPERLY MOUNTED/SECURED TO THE BUILDING STRUCTURE.
9. THE FIRE PROTECTION SYSTEM WORK SHALL BE COORDINATED WITH SPECIAL TRADES (ELEVATOR, ENERGY MANAGEMENT, COMPUTER DATA, ETC) AS APPLICABLE TO THE PROJECT.
10. THE TERM 'PROVIDE' MEANS TO FURNISH AND INSTALL COMPLETE AND READY FOR THE INTENDED USE.
11. THE FIRE PROTECTION INSTALLER SHALL PROVIDE ALL NECESSARY PARTS AND ACCESSORIES EVEN THOUGH THE PARTS AND ACCESSORIES ARE NOT SPECIFICALLY MENTIONED OR SHOWN WITHIN THE CONTRACT DOCUMENTS.
12. ALL FIRE SPRINKLER SYSTEM PIPING AND EQUIPMENT SHOWN ARE FOR SUGGESTIVE PURPOSES ONLY AND SHALL NOT BE SCALED.
13. ALL FIRE SPRINKLER VALVES SHALL BE SUPERVISED IN ACCORDANCE WITH NFPA 13 AND NFPA 72. ALL WIRING CONNECTIONS SHALL BE COORDINATED BY THE SPRINKLER INSTALLER AND MADE BY THE FIRE ALARM INSTALLER.
14. THE FIRE SPRINKLER PIPING SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE TEST IN ACCORDANCE WITH NFPA 13.
15. FIRE SPRINKLER PIPE HANGERS AND PIPE SUPPORTS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 13. ALL HANGER MATERIALS SHALL BE UL LISTED. PIPE STANDS SHALL BE SECURELY MOUNTED TO BOTH THE FLOOR AND THE PIPE WHICH IT SUPPORTS.
16. ALL FLOOR AND WALL PENETRATIONS SHALL BE CORE DRILLED AND COORDINATED WITH THE BUILDING STRUCTURAL SYSTEM. SLEEVES SHALL BE PROVIDED AT ALL FLOOR AND/OR WALL PENETRATIONS IN ACCORDANCE WITH NFPA 13, UNO.
17. PROVIDE FIRE SPRINKLER SYSTEM ACCESS PANELS FOR VALVES AND/OR EQUIPMENT CONCEALED ABOVE HARD CEILINGS OR BEHIND WALLS IN ACCORDANCE WITH NFPA 13 AND AS INDICATED.
18. 2–INCH MAIN DRAINS AND INSPECTOR'S TEST/DRAINS THAT DO NOT DISCHARGE TO THE EXTERIOR OF THE BUILDING SHALL BE PIPED TO APPROVED ENCLOSED FLOOR DRAINS AND/OR OTHERWISE ARRANGED TO PREVENT SPLASHING/BACKFLOW. THE LOCATION OF DRAINS INSIDE THE BUILDING SHALL BE APPROVED BY NIST.

ABBREVIATIONS

A	AMPERE
ACFM	ACTUAL CUBIC FEET PER MINUTE
ACT	ACOUSTICAL CEILING TILE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
ASSD	AIR SAMPLING SMOKE DETECTION
ATR	ALL THREAD ROD
BPA	BACKFLOW PREVENTION ASSEMBLY
C	CONDUIT
CRAH	COMPUTER ROOM AIR HANDLER
DACT	DIGITAL ALARM COMMUNICATOR TRANSMITTER
DN	DOWN
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FAPB	FIRE ALARM POWER BOOSTER PANEL
FAGAP	FIRE ALARM GRAPHIC ANNUNCIATOR PANEL
FDC	FIRE DEPARTMENT CONNECTION
GPM	GALLONS PER MINUTE
GRD	GROUND
HP	HORSEPOWER
MAX	MAXIMUM
MIN	MINIMUM
NFACP	NETWORK FIRE ALARM CONTROL PANEL
SF	SQUARE FEET
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
W	WIRE
W/	WITH

FIRE PROTECTION (FIRE ALARM) GENERAL NOTES:

1. THE GENERAL SCOPE OF THE FIRE ALARM PORTION OF THIS PROJECT SHALL CONSIST OF THE INSTALLATION OF A NEW SUPERVISED FIRE ALARM AND DETECTION SYSTEM FOR THE BUILDING AS INDICATED ON THE DRAWINGS. ALL WORK SHALL BE IN FULL ACCORDANCE WITH THE REQUIREMENTS AND APPENDIX OF NFPA 70, 72, 241, IBC, LOCAL AUTHORITY REQUIREMENTS, AND THE CONTRACT DOCUMENTS.
2. THE FIRE ALARM INSTALLER(S) SHALL SUBMIT COMPLETE LAYOUT SHOP DRAWINGS, CALCULATIONS, AND ANNOTATED MANUFACTURER'S DATA INFORMATION TO THE OWNER AND ENGINEER OF RECORD FOR REVIEW AND APPROVAL. APPROVALS SHALL BE OBTAINED BEFORE THE PURCHASE OR INSTALLATION OF EQUIPMENT.
3. THE FIRE ALARM INSTALLER(S) SHALL BE RESPONSIBLE FOR ALL APPLICABLE TRADE PERMITS, REQUESTS FOR INSPECTION, AND TESTING AS REQUIRED BY THE APPROVING AHJ.
4. SPACING OF SMOKE SENSORS SHALL BE IN ACCORDANCE WITH NFPA 72 AND AS INDICATED ON THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL CONFIRM AND IF NECESSARY, REDUCE SPACING AS APPLICABLE, BASED ON CEILING HEIGHT, CONSTRUCTION, AND/OR AIR CHANGE RATES, AT NO ADDITIONAL COST TO THE OWNER.
5. FIRE ALARM MANUAL PULL STATIONS AT DOOR OPENINGS SHALL BE WITHIN 5'–0" HORIZONTALLY OF THE DOOR OPENING.
6. DUCT SMOKE DETECTORS SHALL BE PROVIDED IN THE SUPPLY AND RETURN OF ALL HVAC UNITS WITH A CAPACITY GREATER THAN 2,000 CFM.
7. DUCT SMOKE DETECTORS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. EXTEND ALL ASSOCIATED FIRE ALARM WIRING AND CONDUIT FROM MONITOR MODULE AND CONNECT TO DUCT SMOKE DETECTOR.
8. CONDUCTORS FOR THE FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 70. THE CONDUCTORS SHALL NOT BE INSTALLED WITH CONDUCTORS OF LIGHTING OR POWER SYSTEMS. THE SUM OF THE CROSS–AREA OF INDIVIDUAL CONDUCTORS SHALL NOT EXCEED 40 PERCENT OF THE INTERIOR CROSS–SECTION OF THE CONDUIT. ALL FIRE ALARM SYSTEM CONDUIT SHALL NOT BE LESS THAN 3/4 INCH.
9. ALL DEVICES SHALL BE MOUNTED AND SECURED TO THE BUILDING STRUCTURE.
10. ALL FLOOR AND WALL PENETRATIONS SHALL BE CORE DRILLED AND SHALL BE COORDINATED WITH STRUCTURAL SYSTEMS.
11. THE TERM "PROVIDE" MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

FIRE PROTECTION DESIGN CRITERIA:

1. THE REQUIRED FIRE SPRINKLER SYSTEM SHALL ADHERE TO SPECIFIC HYDRAULIC DESIGN REQUIREMENTS. WHEN THE REQUIREMENTS OF NFPA 13, NFPA 13D, LOCAL OR STATE AUTHORITIES ARE MORE STRINGENT, THOSE REQUIREMENTS SHALL GOVERN. IF NOT, THE SYSTEM SHALL COMPLY WITH THE FOLLOWING:
   A. NET ZERO ENERGY HOUSE (NFPA 13D) – AREAS SHALL BE HYDRAULICALLY DESIGNED BASED ON A MINIMUM DISCHARGE OF 13 GPM TO ALL THE DESIGN SPRINKLERS SIMULTANEOUSLY AND A MINIMUM OF 18 GPM TO ANY SPRINKLER IN THEY SYSTEM. THE SYSTEM SHALL PROVIDE A MINIMUM DENSITY OF 0.05 GPM/SF TO THE DESIGN SPRINKLERS. THE NUMBER OF DESIGN SPRINKLERS SHALL BE ALL THE SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF TWO. THE MAXIMUM SPRINKLER HEAD SPACING SHALL BE PER THE MANUFACTURER'S LISTING.
   B. LIGHT HAZARD – AREAS SHALL BE HYDRAULICALLY DESIGNED BASED ON A DENSITY OF .10 GPM/SF OVER THE MOST REMOTE 1500 SF. THE MAXIMUM SPRINKLER HEAD SPACING SHALL BE 225 SF. THE HOSE STREAM ALLOWANCE SHALL BE 100 GPM.
   C. ORDINARY HAZARD, GROUP 1 – AREAS SHALL BE HYDRAULICALLY DESIGNED BASED ON A DENSITY OF .15 GPM/SF OVER THE MOST REMOTE 1500 SF. THE MAXIMUM SPRINKLER HEAD SPACING SHALL BE 130 SF. THE HOSE STREAM ALLOWANCE SHALL BE 250 GPM.
   D. ORDINARY HAZARD, GROUP 2 – AREAS SHALL BE HYDRAULICALLY DESIGNED BASED ON A DENSITY OF .20 GPM/SF OVER THE MOST REMOTE 1500 SF. THE MAXIMUM SPRINKLER HEAD SPACING SHALL BE 130 SF. THE HOSE STREAM ALLOWANCE SHALL BE 250 GPM.
2. ALL FIRE SPRINKLER SYSTEM PIPING SHALL ADHERE TO THE FOLLOWING REQUIREMENTS:
   A. 2–INCH AND SMALLER – THREADED BLACK STEEL SCHEDULE 40.
   B. 2 ½–INCH AND LARGER – ROLL GROOVED BLACK STEEL SCHEDULE 10, UNO.
   C. BRANCHLINE OUTLETS AT MAIN PIPING SHALL BE SHOP–WELDED.
   D. ALL PIPING SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 13.
   E. CONCEAL ABOVE SUSPENDED, PLASTER OR DRYWALL CEILINGS.
   F. CPVC PIPING IS PERMITTED FOR THE NET ZERO ENERGY HOUSE NFPA 13D SYSTEM ACCORDING TO THE MANUFACTURER'S LISTING.
3. FIRE SPRINKLER HEADS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 13 AND THE CONTRACT DOCUMENTS. SPRINKLER HEADS SHALL BE PROVIDED AS FOLLOWS;
   A. IN FINISHED CEILINGS – RESIDENTIAL QUICK RESPONSE, WHITE FINISH, PENDENT, FLUSH TYPE WITH MATCHING FINISH ESCUTCHEON.
   B. IN UNFINISHED CEILINGS – QUICK RESPONSE, BRASS FINISH, PENDENT OR UPRIGHT TYPE.

CODES AND STANDARDS REFERENCES:

ALL REFERENCES TO NFPA 13 SHALL MEAN THE 2002 EDITION.
ALL REFERENCES TO NFPA 13D SHALL MEAN THE 2002 EDITION
ALL REFERENCES TO NFPA 24 SHALL MEAN THE 2002 EDITION
ALL REFERENCES TO NFPA 25 SHALL MEAN THE 2002 EDITION.
ALL REFERENCES TO NFPA 70 SHALL MEAN THE 2005 EDITION.
ALL REFERENCES TO NFPA 72 SHALL MEAN THE 2002 EDITION.
ALL REFERENCES TO NFPA 90A SHALL MEAN THE 2002 EDITION.
ALL REFERENCES TO NFPA 241 SHALL MEAN THE 2004 EDITION.
ALL REFERENCES TO IBC SHALL MEAN THE 2006 EDITION.

WATERFLOW TEST INFO:

STATIC:	75 PSI
RESIDUAL:	42 PSI
FLOW:	3528 GPM
DATE:	9/09
BY:	NIST FIRE PROTECTION GROUP
LOCATION:	BUILDING 226 (FH 52)
ELEV.:	GRADE

NOTE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING UP–TO–DATE AND ACCURATE WATERFLOW INFORMATION PRIOR TO PREPARATION OF INSTALLATION SHOP DRAWINGS.

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LICENSE NO.: 18046 EXPIRATION DATE: 1–02–2012

PROJECT:

National Institute of Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD

Building America U.S. Department of Energy
Research Toward Zero Energy Homes

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

MARK	DATE	DESCRIPTION
	08/03/10	UPDATE
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 F–001
DRAWN BY:	---
CHECKED BY:	---

SHEET TITLE:

FIRE PROTECTION GENERAL NOTES, LEGEND AND ABBREVIATIONS

SCALE AS NOTED

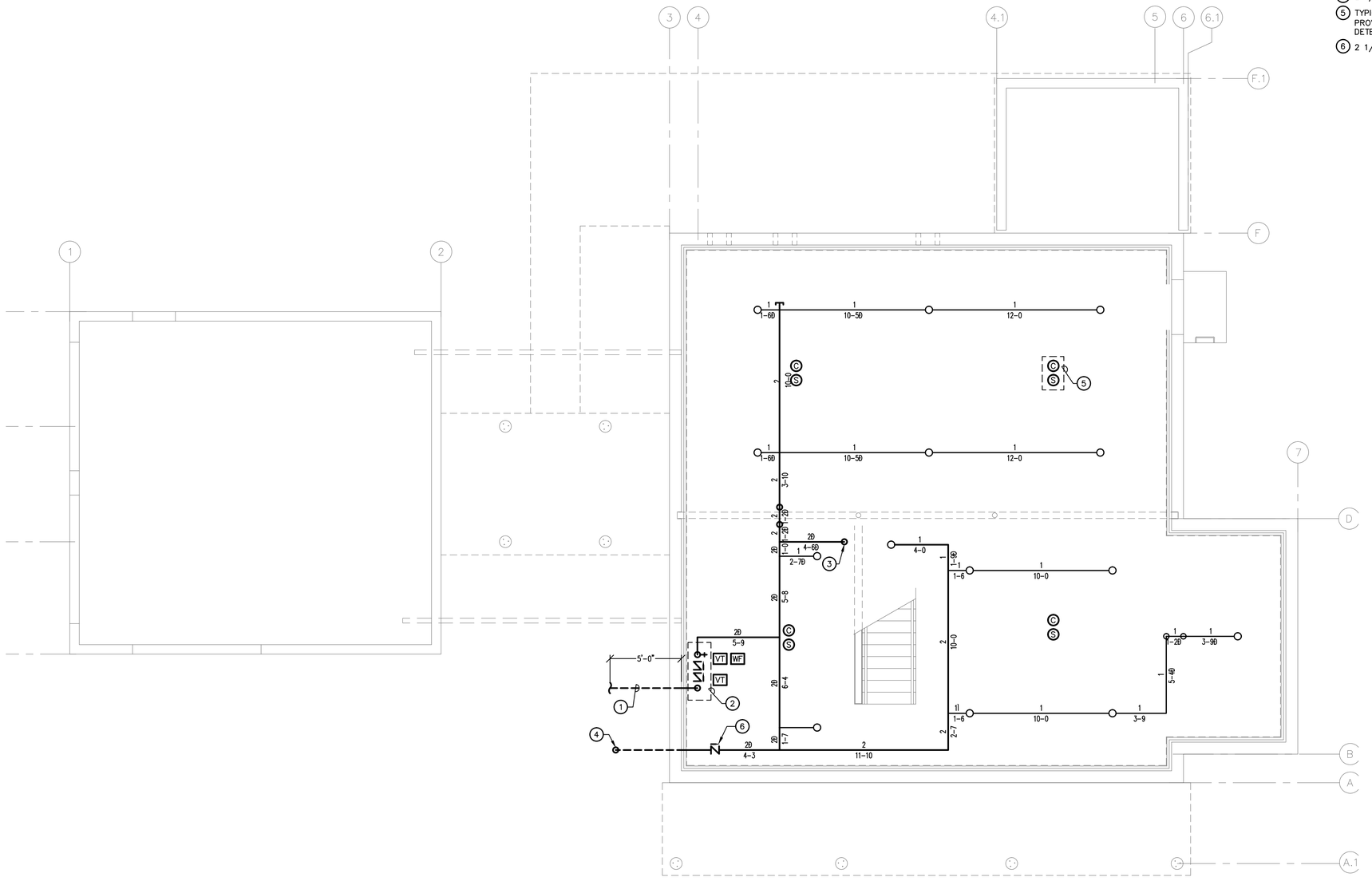
F–001

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. REFER TO F-001 FOR LEGEND, SYMBOLS, ABBREVIATIONS, AND DESIGN CRITERIA.
2. BASEMENT TO BE DESIGNED BASED PER NFPA 13D.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. 3" INCOMING UNDERGROUND COMBINATION DOMESTC/SPRINKLER. SEE CIVIL DRAWINGS FOR ALL WORK BEYOND 5FT OUTSIDE OF BUILDING.
2. FOR RISER DETAIL REFER TO F-601.
3. 2 1/2" UP TO FIRST FLOOR.
4. 2 1/2" UP TO FDC.
5. TYPICAL SMOKE SENSOR AND CARBON MONOXIDE DETECTOR LOCATIONS. PROVIDE INTEGRATED SOUNDER BASE(S). COMBINATION SMOKE/CO DETECTORS ARE ACCEPTABLE.
6. 2 1/2" SWING CHECK W/ BALL DRIP.



BASEMENT FLOOR PLAN

SCALE: 1/4" = 1'-0"

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

1/4"=1'-0"

0 2' 4' 8' 12'

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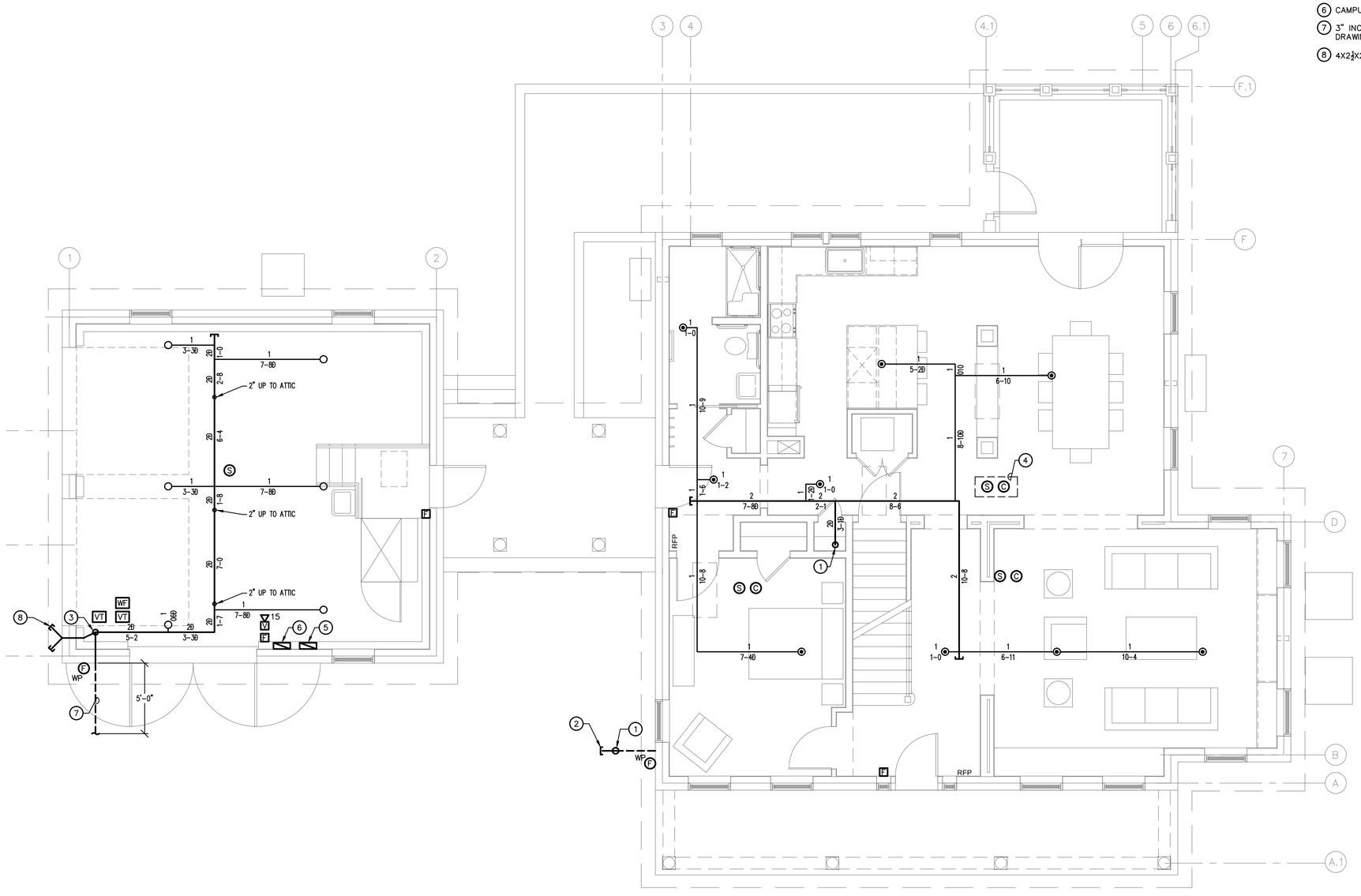
SHEET TITLE:

BASEMENT FLOOR PLAN

SCALE AS NOTED

F-101



FIRST FLOOR PLAN

SCALE: ¼" = 1'-0'

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. REFER TO F-001 FOR LEGEND, SYMBOLS, ABBREVIATIONS, AND DESIGN CRITERIA.
2. PIPING IN GARAGE TO BE RUN EXP.
3. GARAGE TO BE DESIGNED BASED ON ORDINARY HAZARD GROUP II PER NFPA 13.
4. NET ZERO ENERGY HOUSE TO BE DESIGNED PER NFPA 13D.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. 2 1/2" UP FROM BASEMENT FLOOR.
2. 2 1/2" FREE STANDING FDC. LOCATE 18" TO 36" ABOVE FINISH GRADE. PROVIDE MATCHING CAP AND CHAIN. LOCATE IN LANDSCAPED AREA NEXT TO PATH.
3. REFER TO F-601 FOR RISER DETAIL.
4. TYPICAL SMOKE SENSOR AND CARBON MONOXIDE DETECTOR LOCATIONS. PROVIDE INTEGRATED SOUNDER BASE(S). COMBINATION SMOKE/CO DETECTORS ARE ACCEPTABLE.
5. FIRE ALARM CONTROL PANEL LOCATION. SEE FIRE ALARM RISER DIAGRAM ON SHEET F-601 FOR ALARM MONITOR CONNECTIONS.
6. CAMPUS FIRE ALARM DEVICE CABINET. SEE SHEET F-601 FOR DETAIL.
7. 3" INCOMING UNDERGROUND COMBINATION DOMESTC/SPRINKLER. SEE CIVIL DRAWINGS FOR ALL WORK BEYOND 5FT OUTSIDE OF BUILDING.
8. 4X2½X2½ FDC MOUNTED ON THE WALL. LOCATE 18" TO 36" ABOVE GRADE.

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 2' 4' 8' 12' 1/4"=1'-0"

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PROJECT NO:	NIST NZERTF
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DRAWN BY:	---
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SHEET TITLE:

FIRST FLOOR PLAN

SCALE AS NOTED

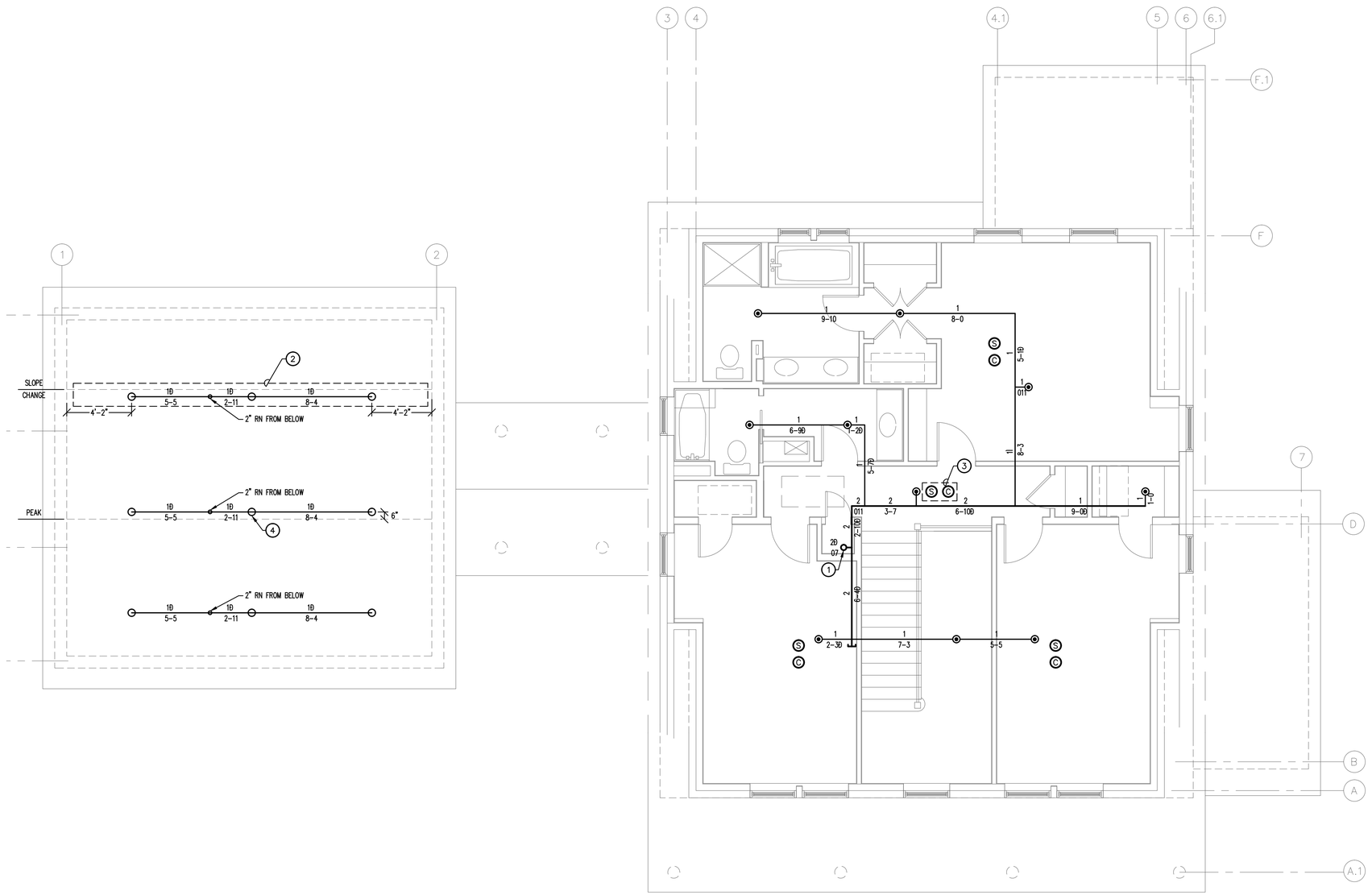
F-102

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. REFER TO F–001 FOR LEGEND, SYMBOLS, ABBREVIATIONS, AND DESIGN CRITERIA.
2. NET ZERO ENERGY HOUSE TO BE DESIGNED PER NFPA 13D.
3. NET ZERO ENERGY GARAGE ATTIC TO BE DESIGNED BASED ON LIGHT HAZARD PER NFPA 13.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. 2 1/2" UP FROM FIRST FLOOR.
2. RELOCATE SPRINKLER HEADS AT SLOPE CHANGE.
3. TYPICAL SMOKE SENSOR AND CARBON MONOXIDE DETECTOR LOCATIONS. PROVIDE INTEGRATED SOUNDER BASE(S). COMBINATION SMOKE/CO DETECTORS ARE ACCEPTABLE.
4. LOCATE UPRIGHT SPRINKLER HEAD MIN. 2'–0" FROM SIDE OF WOOD TRUSS PER NFPA 13, SECTION 8.6.4.1.3.3. MAX. DISTANCE FROM PEAK TO BE 3'–0" PER NFPA 13, SECTION 8.6.4.1.3.1.



SECOND FLOOR PLAN

SCALE: ¼" = 1'–0"

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 2' 4' 8' 12' 1/4"=1'–0"

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CAD DWG FILE:	09–247 F–103
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CHECKED BY:	---

SHEET TITLE:

SECOND FLOOR PLAN

SCALE AS NOTED

F–103

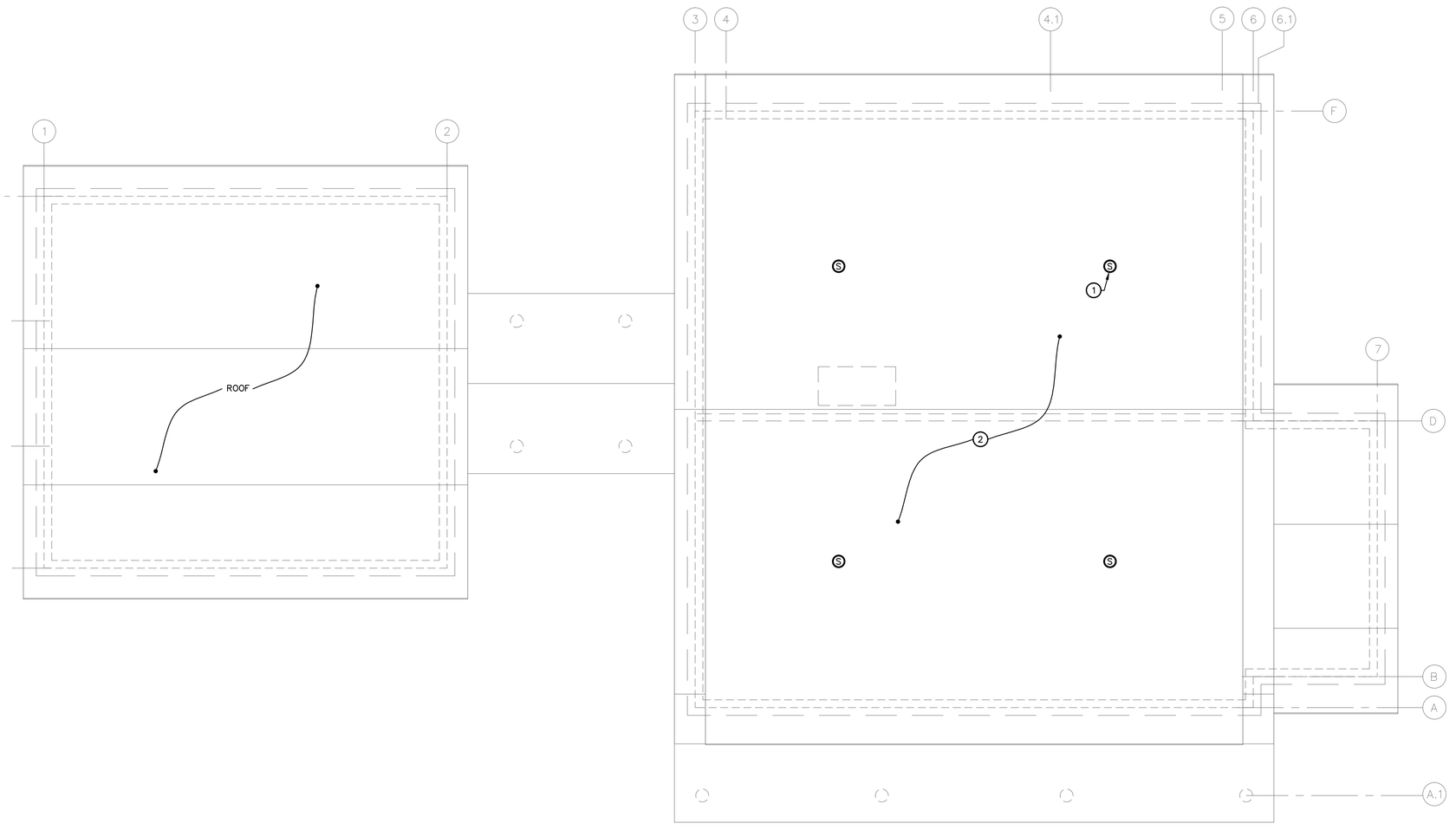
GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. REFER TO F-001 FOR LEGEND, SYMBOLS, ABBREVIATIONS, AND DESIGN CRITERIA.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

(1) TYPICAL SMOKE SENSOR. COORDINATE FINAL LOCATION W/ ATTIC EQUIPMENT AND CEILING SLOPE.

(2) NO SPRINKLERS IN THE ATTIC SPACE.



ATTIC FLOOR PLAN

SCALE: ¼" = 1'-0'

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 2' 4' 8' 12' 1/4"=1'-0"

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LICENSE NO.: 18046 EXPIRATION DATE: 1-02-2012

PROJECT:

National Institute of Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD

Building America U.S. Department of Energy
Research Toward Zero Energy Homes

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

MARK	DATE	DESCRIPTION
	08/03/10	UPDATE
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 F-104
DRAWN BY:	---
CHECKED BY:	---

SHEET TITLE:

ATTIC FLOOR PLAN

SCALE AS NOTED

F-104

FIRE ALARM EXPANSION NOTES:

1. FIRE ALARM SYSTEM IN THIS BUILDING IS REQUIRED TO BE CONNECTED TO CAMPUS WIDE FIRE ALARM SYSTEM. CONNECTION WILL BE MADE FROM EXISTING BUILDING 226. EQUIPMENT REQUIRED FOR NET ZERO ENERGY FACILITY IS SHOWN ON THE FIRE ALARM RISER DIAGRAM.
2. NEW EQUIPMENT REQUIRED FOR CONNECTION TO CAMPUS FIRE ALARM SYSTEM IS REQUIRED TO BE COMPATIBLE WITH SIMPLEX 4100U PANELS. SEE FOLLOWING NOTES CONCERNING COORDINATION/CONNECTION TO CAMPUS SYSTEM.

INSTALLATION NOTES:

3. CONTRACTOR SHALL MOUNT NEW CONTROL EQUIPMENT AS SHOWN ON DRAWINGS AND FIRE ALARM RISER.
4. CONTRACTOR SHALL PAINT CONDUITS WITH A RED STRIPE EVERY 10 FEET. PAINT ALL CONDUIT BODY COVERS AND JUNCTION BOX COVERS WITH RED PAINT.
5. DO NOT SPLICE EXISTING OR NEW MAPNET, IDNET, NOTIFICATION APPLIANCE CIRCUITS, OR 24VDC CIRCUITS. NO SPLICES OR "T-TAPS" SHALL BE PERMITTED UNDER ANY CIRCUMSTANCES.
6. SIGNALING LINE CIRCUITS (SLC) SHALL BE WEST PENN#D975 (18/2 TSP).
7. SPEAKER NOTIFICATION APPLIANCE CIRCUITS SHALL BE WEST PENN #991 (16/2 TSP RED & BLACK).
8. STROBE NOTIFICATION APPLIANCE CIRCUITS SHALL BE RED AND BLACK CONDUCTORS, MIN #12 AWG.
9. 24V POWER CIRCUITS SHALL BE BLUE AND WHITE CONDUCTORS.
10. MONITOR MODULE CIRCUITS SHALL BE BLUE AND WHITE CONDUCTORS, MIN #14 AWG.
11. MINIMUM CONDUIT SHALL BE 3/4" EMT.
12. CONNECTIONS TO WATER FLOW SWITCH AND TAMPER SWITCHES SHALL BE VIA LIQUID TIGHT FLEXIBLE CONDUIT.
13. CONSTRUCTION CONSTRAINTS REQUIRE THAT THE INSTALLING CONTRACTOR MUST COMPLY WITH THE FOLLOWING:
    A) ALL EXISTING DEVICES MUST REMAIN IN SERVICE WHEN THE NEW WORK IS BEING INSTALLED.
    B) ALL NEW CIRCUITS SHALL BE NFPA 72 "CLASS A" ("STYLE Z", "STYLE 6").
    C) PROVIDE COMPLETE AND ACCURATE AS-BUILT DRAWING IN AUTOCAD 2009 FORMAT.

TESTING NOTES:

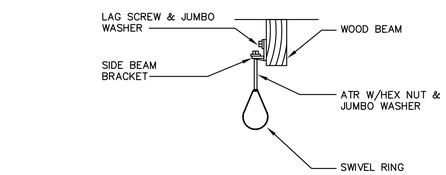
14. ALL TESTING SHALL BE PER MANUFACTURER'S INSTRUCTIONS AND NFPA 72. CONTRACTOR SHALL COMPLETE INTERNAL TESTING PRIOR TO REQUESTING AN OFFICIAL GOVERNMENT TEST. CONTRACTOR SHALL FLOW WATER TO CONFIRM ACTIVATION OF WATER FLOW SWITCH.
15. CONTRACTOR SHALL PERFORM THE FOLLOWING ACTIONS PRIOR TO AND DURING TESTING:
    A) ALL SPEAKER AND STROBE TESTING SHALL BE DONE ON A SATURDAY.
    B) ALL BATTERY TESTING SHALL BE DONE ON A SATURDAY.
    C) SIMPLEX GRINNELL PANEL DATABASE CHANGES MUST BE DONE ON A MONDAY OR TUESDAY, EXCEPT CAMPUS DOWNLOADS TO ADD NEW 4100U PANELS.
    D) ON A MONDAY OR TUESDAY, THE CONTRACTOR SHALL PROGRAM VIA A SIMPLEX GRINNELL AUTHORIZED PROGRAMMER (NIST COTR MUST APPROVE PROGRAMMER) THE NIST SIMPLEX GRAPHIC COMMAND CENTERS (TOTAL OF FIVE). ALL PROGRAMMING ON THE GCC(S) SHALL START BEFORE 11AM.
    E) THE CONTRACTOR SHALL TIE IN THE NEWLY PROGRAMMED DEVICES NO LATER THAN THE NEXT DAY AFTER PROGRAMMING.
    F) WITHIN TWO DAYS AFTER PROGRAMMING, AND IN ACCORDANCE WITH NFPA 72 (2007) EDITION, THE CONTRACTOR SHALL PROVIDE TWO REPRESENTATIVES FAMILIAR WITH SIMPLEX 4100U TO ASSIST WITH TESTING THE NEWLY INSTALLED DEVICES AND UP TO 50 INITIATING DEVICES NOT AFFECTED BY THE PROGRAMMING CHANGES. CONTRACTOR TESTING REPRESENTATIVES SHALL BE AVAILABLE FROM 7:45AM TO NOON, AND 1:15PM TO 5PM. FROM 9:15AM TO 9:45AM, NOON TO 1:15 PM, AND FROM 3:00PM TO 3:30PM NO TESTING WILL OCCUR. ALL TESTING WILL CONCLUDE AT 5:00PM. TESTING REPRESENTATIVES SHALL BE AT THE NDUCC AND IN THE FIELD TESTING DEVICES. IF THE TEST REVEALS THAT DEVICES ARE NOT REPORTING CORRECTLY EITHER TEXTUALLY OR GRAPHICALLY, THE CONTRACTOR SHALL CORRECT AND RETEST AS NOTED ABOVE, ANY ADDITIONAL TESTING MUST BE APPROVED AND SCHEDULED BY THE NIST COTR.

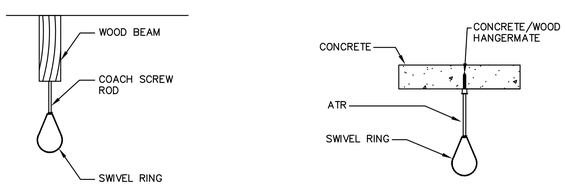
EQUIPMENT NOTES:

16. ALL EQUIPMENT MONITORED FROM CAMPUS FIRE ALARM SYSTEM SHALL BE CURRENT PRODUCTION MODELS MANUFACTURED BY SIMPLEX. ALL DEVICES SHALL BE COMPATIBLE WITH EXISTING INSTALLED CAMPUS FIRE ALARM CONTROL EQUIPMENT.

NEW 4100U PANEL TIE-IN'S & INTEGRATION:

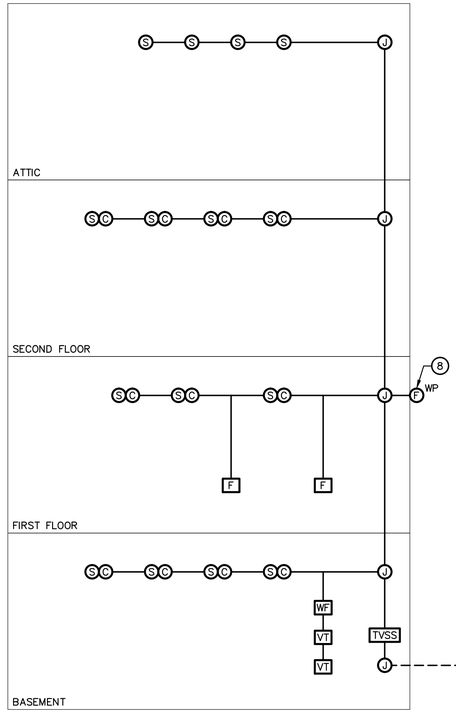
17. ALL FIBER OPTIC TIE-IN'S SHALL OCCUR ON A SATURDAY TO THE EXISTING CAMPUS FIRE ALARM NETWORK.
18. ALL PROGRAMMING TO INTEGRATE 4100U PANEL CONNECTIONS SHALL OCCUR ON A SATURDAY UNTIL COMPLETED. ALL FIVE SIMPLEX GRINNELL GSSS SHALL BE PROGRAMMED ALONG WITH ALL FIELD NODES ON THAT LOOP. PROVIDE 30 DAYS NOTICE FOR CAMPUS TIE-IN.





HANGER DETAILS

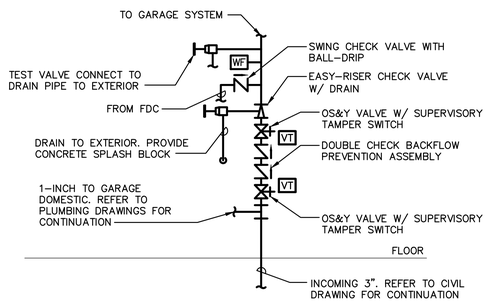
NO SCALE



FIRE ALARM RISER/DETAIL NOTES

NO SCALE

1. PROVIDE SIMPLEX 4090-9001 INDIVIDUAL ADDRESSABLE MODULE.
2. PROVIDE SIMPLEX 2190-9163 CONTROL RELAY ZONE ADAPTER MODULE.
3. PROVIDE SIMPLEX 2190-9169 LINE POWERED ISOLATOR.
4. PROVIDE CAMPUS FIRE ALARM DEVICE CABINET (FADC) MOUNTED ADJACENT TO FACP. MOUNT DEVICES ON DIN RAIL IN CABINET. SEE DETAIL THIS SHEET FOR INTERNAL DEVICES.
5. EXTEND SPARE CONDUCTORS FROM EXTERNAL HANDBOX AND CONNECT TO FADC AS SHOWN. SEE ELECTRICAL AND SITE DRAWINGS FOR UG CONDUIT LOCATIONS AND TERMINATIONS WITHIN GARAGE.
6. SEE ELECTRICAL DRAWINGS FOR UNDERGROUND FIRE ALARM WIRING FROM GARAGE TO HOUSE.
7. 120V FACP POWER SUPPLY. SEE ELECTRICAL DRAWING FOR CONTINUATION.
8. EXTERNAL ELECTRICAL SPRINKLER ALARM BELL.

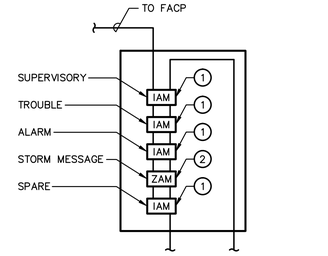


GARAGE FIRE SPRINKLER RISER DETAIL

NO SCALE

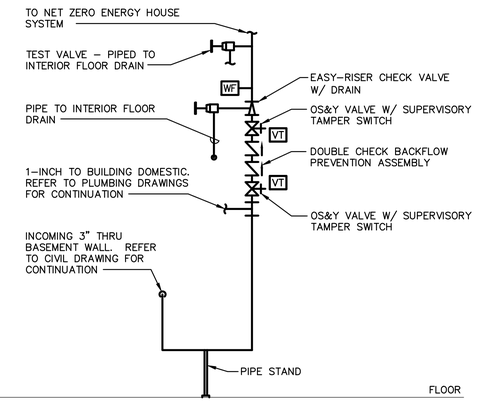
1 F-102 F-601

1. PROVIDE SPARE SPRINKLER CABINET AND NFPA REQUIRED SPRINKLERS AND WRENCH.



FIRE ALARM DEVICE CABINET (FADC) DETAIL

NO SCALE



BASEMENT FIRE SPRINKLER RISER DETAIL

NO SCALE

2 F-101 F-601

1. SECURE PIPE STAND TO FLOOR AND PIPE.
2. PROVIDE SPARE SPRINKLER CABINET AND NFPA REQUIRED SPRINKLERS AND WRENCH.

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PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 F-601
DRAWN BY:	---
CHECKED BY:	---

SHEET TITLE:

FIRE PROTECTION DETAILS AND MATRIX

SCALE AS NOTED

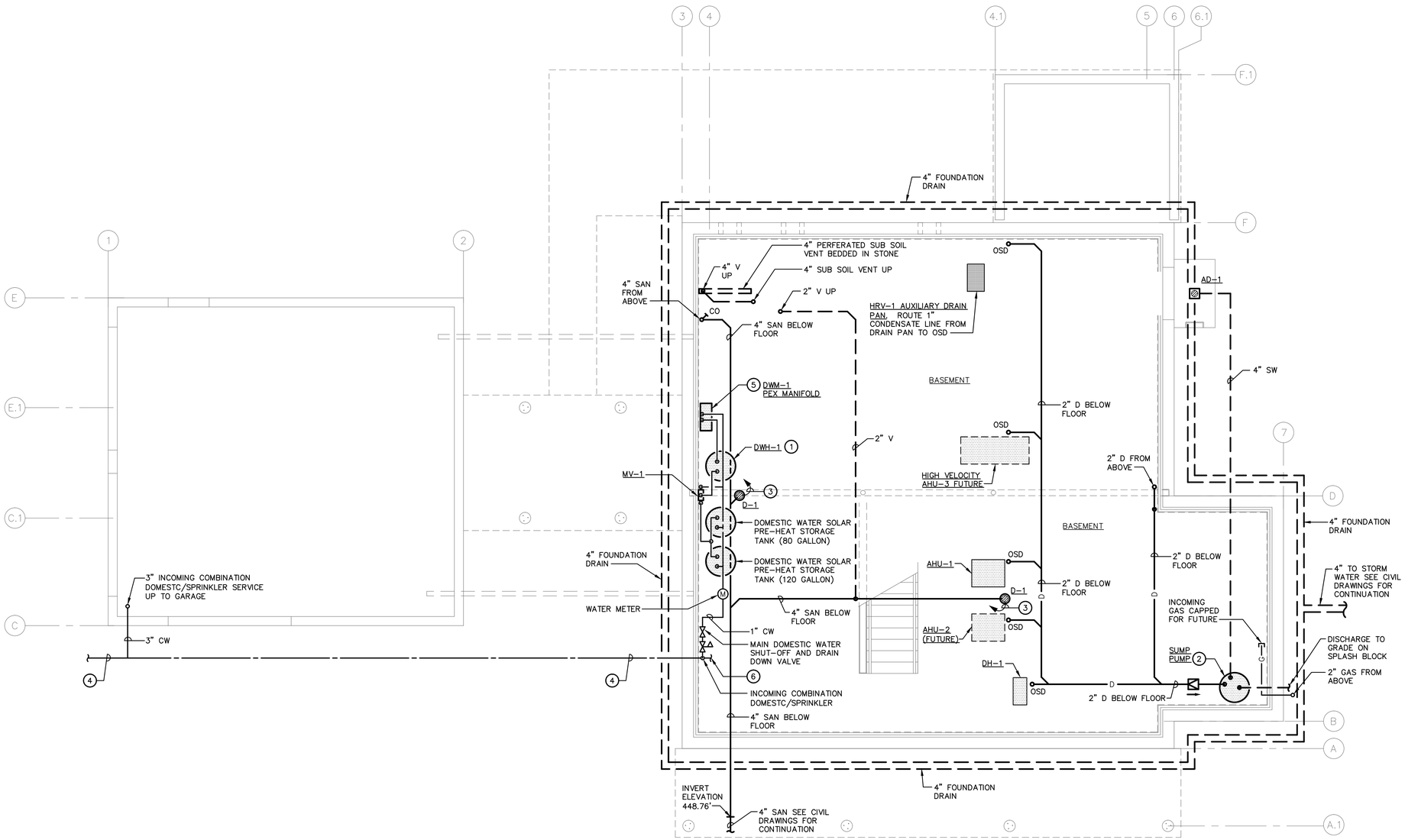
F-601

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.
2. ALL LAVATORY FAUCETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.5 GPM.
3. ALL SHOWERS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.75 GPM.
4. ALL TOILETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.1 GPM.
5. FOR PLUMBING LEGEND AND ABBREVIATIONS SEE MECHANICAL LEGEND AND ABBREVIATIONS ON SHEET M-001.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. 80 GALLON WATER HEATER WITH ATTACHED HEAT PUMP.
2. 30"ø x 36" DEEP CONDENSATE SUMP PIT W/ DUPLEX SUMP PUMPS. DISCHARGE TO GRADE ON SPLASH BLOCK.
3. PROVIDE TRAP PRIMER & CONNECT TO CW SYSTEM PER MANUFACTURERS RECOMMENDATIONS.
4. 3" UNDERGROUND COMBINATION DOMESTC/SPRINKLER. SEE CIVIL DRAWINGS FOR ALL WORK BEYOND 5 FEET OUTSIDE OF BUILDING.
5. PEX WATER MANIFOLD SYSTEM. MAIN FEED FROM WATER HEATER TO MANIFOLD SHALL BE LESS THEN OR EQUAL TO 6'-0". BRANCH LINES FROM MANIFOLD TO FIXTURES SHALL BE ⅜" PEX TUBING NOT EXCEEDING 58' IN DEVELOPED LENGTH PER INDIVIDUAL RUN.
6. TO HOUSE SPRINKLER SYSTEM – SEE FIRE PROTECTION DRAWINGS FOR CONTINUATION.



BASEMENT FLOOR PLAN – PLUMBING

SCALE: ¼" = 1'-0"

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

1/4"=1'-0"

0 2' 4' 8' 12'

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CAD DWG FILE:	09-247 P-101
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

BASEMENT FLOOR PLAN PLUMBING

SCALE AS NOTED

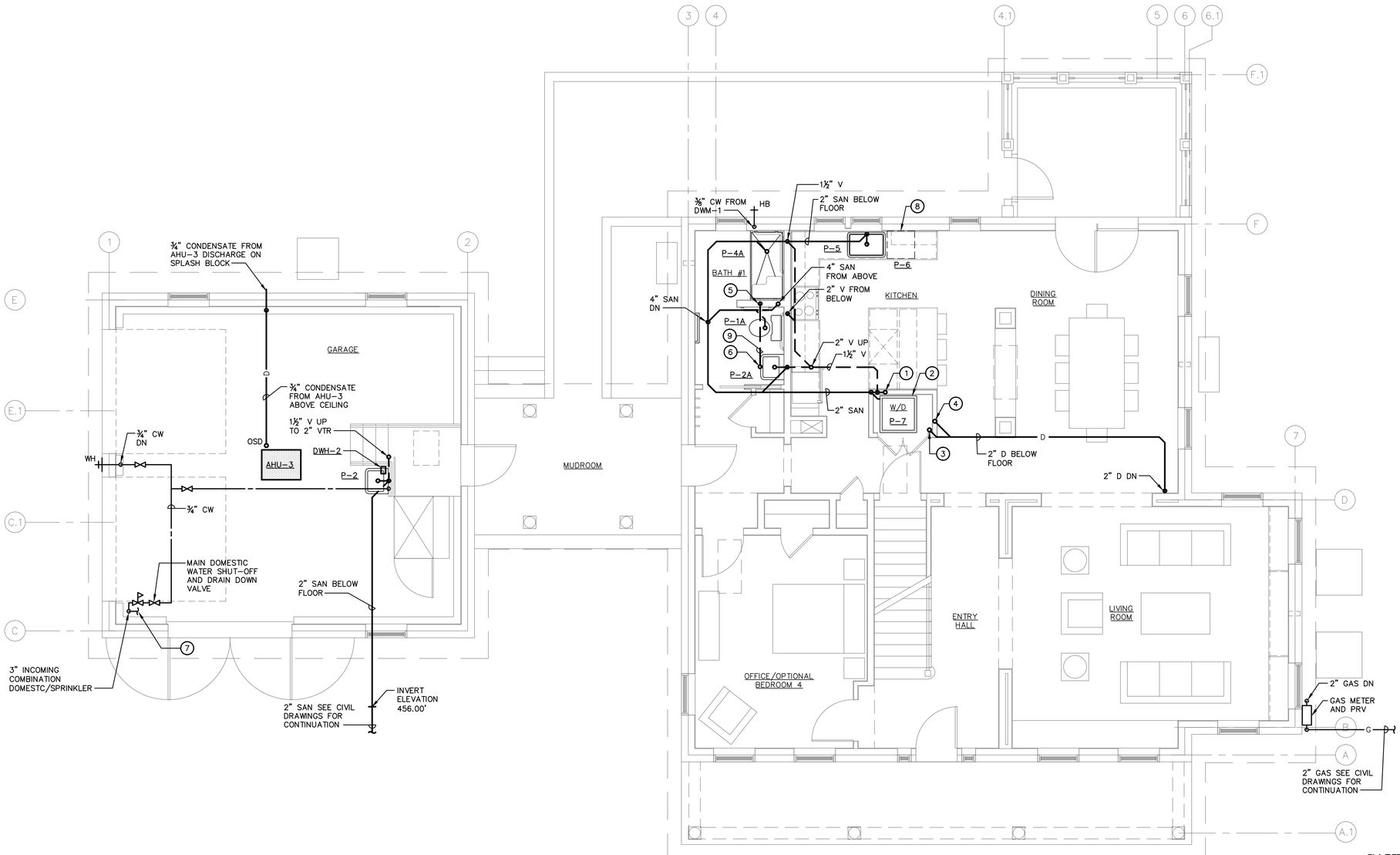
P-101

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.
2. ALL LAVATORY FAUCETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.5 GPM.
3. ALL SHOWERS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.75 GPM.
4. ALL TOILETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.1 GPM.
5. FOR PLUMBING LEGEND AND ABBREVIATIONS SEE MECHANICAL LEGEND AND ABBREVIATIONS ON SHEET M-001.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. 2" SAN UP TO WASHER BOX MOUNTED IN WALL.
2. WASHER AUXILIARY DRAIN PAN.
3. 2" CONDENSATE FROM FCU-2 OPEN SITE DRAIN AND EMERGENCY DRAIN PAIN LOCATED ABOVE WASHER AND DRYER.
4. 2" CONDENSATE FROM ABOVE.
5. 4" SUB SOIL VENT FROM BELOW.
6. 4" SUB SOIL VENT UP.
7. TO GARAGE SPRINKLER SYSTEM – SEE FIRE PROTECTION DRAWINGS FOR CONTINUATION.
8. CONNECT DISHWASHER DRAIN TO KITCHEN SINK ADJACENT TO DISHWASHER PER MANUFACTURERS RECOMMENDATIONS.
9. 4" SUB SOIL VENT ABOVE CEILING.



FIRST FLOOR PLAN – PLUMBING

SCALE: ¼" = 1'-0'

CAUTION:

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GRAPHIC SCALE

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CAD DWG FILE:	09-247 P-102
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

FIRST FLOOR PLAN PLUMBING

SCALE AS NOTED

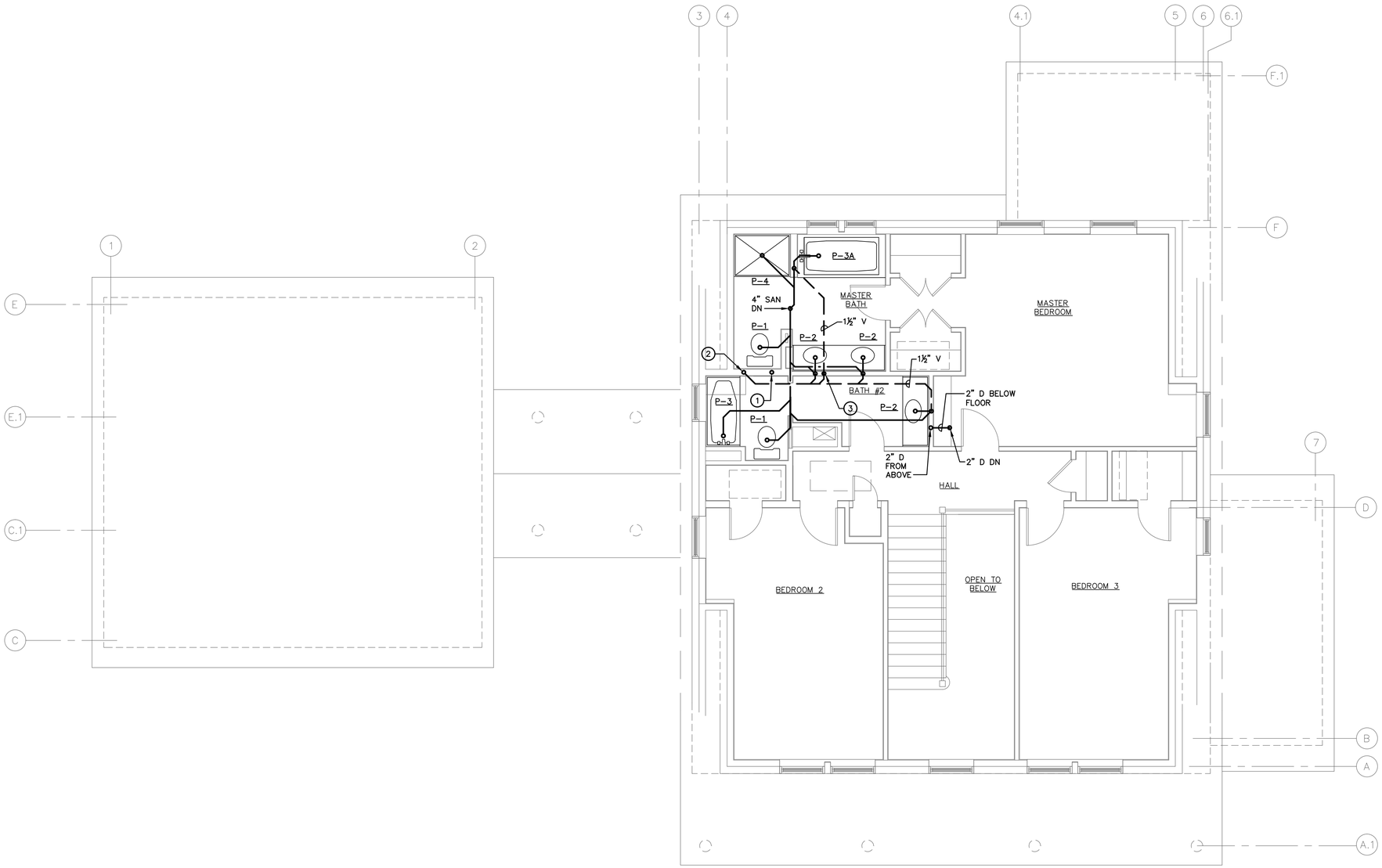
P-102

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.
2. ALL LAVATORY FAUCETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.5 GPM.
3. ALL SHOWERS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.75 GPM.
4. ALL TOILETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.1 GPM.
5. FOR PLUMBING LEGEND AND ABBREVIATIONS SEE MECHANICAL LEGEND AND ABBREVIATIONS ON SHEET M-001.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

(1) 4" SUB SOIL VENT UP & DN.
(2) 4" VENT UP TO 4" VTR.
(3) 2" VENT FROM BELOW.



SECOND FLOOR PLAN – PLUMBING

SCALE: ¼" = 1'-0'

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GRAPHIC SCALE

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0 2' 4' 8' 12'

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DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

SECOND FLOOR PLAN PLUMBING

SCALE AS NOTED

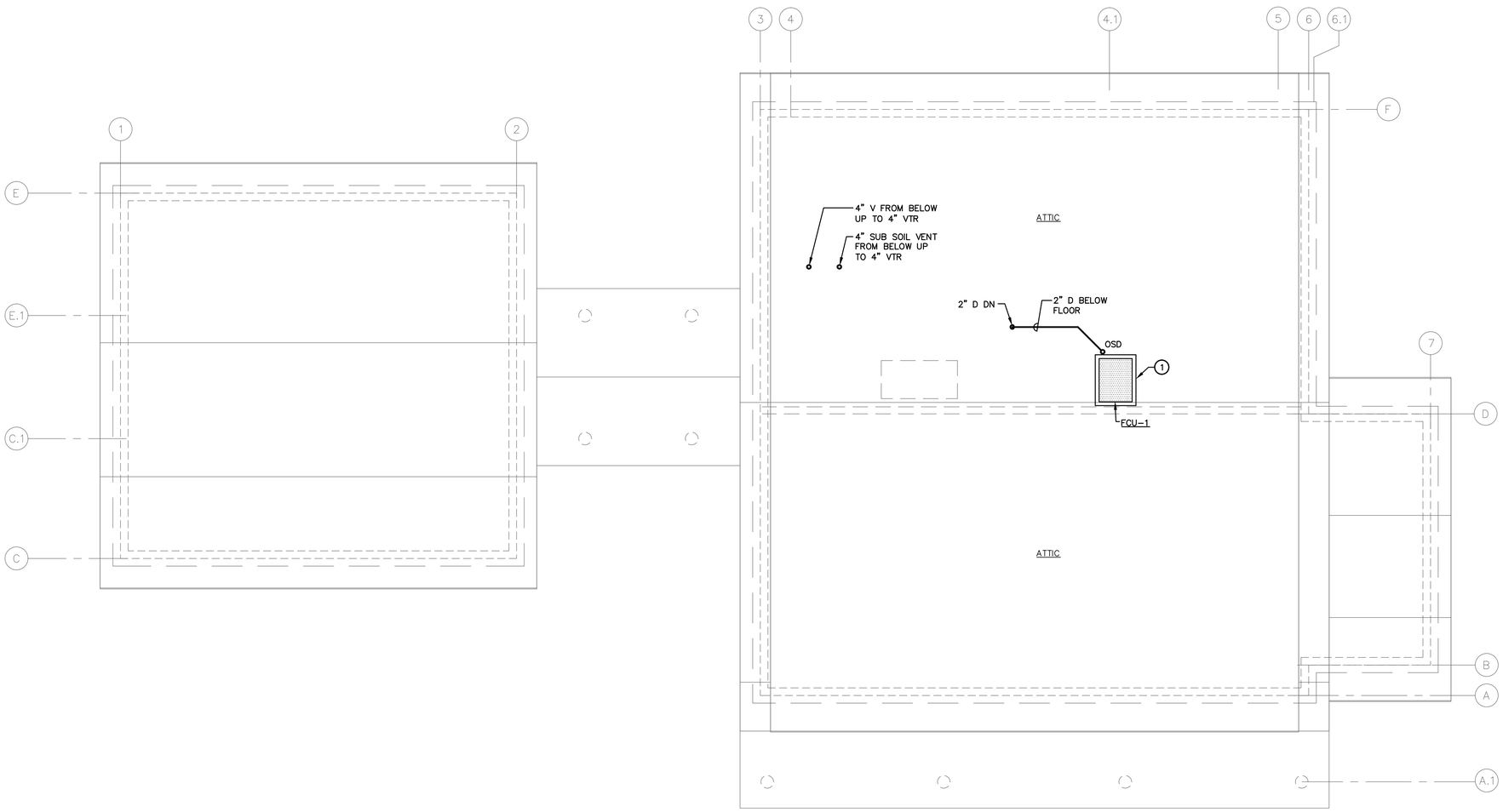
P-103

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.
2. ALL LAVATORY FAUCETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.5 GPM.
3. ALL SHOWERS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.75 GPM.
4. ALL TOILETS MUST HAVE AN AVERAGE FLOW RATE OF LESS THAN OR EQUAL TO 1.1 GPM.
5. FOR PLUMBING LEGEND AND ABBREVIATIONS SEE MECHANICAL LEGEND AND ABBREVIATIONS ON SHEET M-001.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

(1) FCU-1 AUXILIARY DRAIN PAN SEE DETAIL ON SHEET M-502 FOR MORE INFORMATION.



ATTIC FLOOR PLAN - PLUMBING

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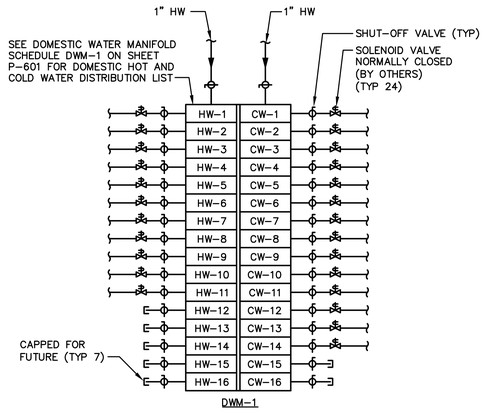
CHECKED BY:	EAH

SHEET TITLE:

ATTIC FLOOR PLAN PLUMBING

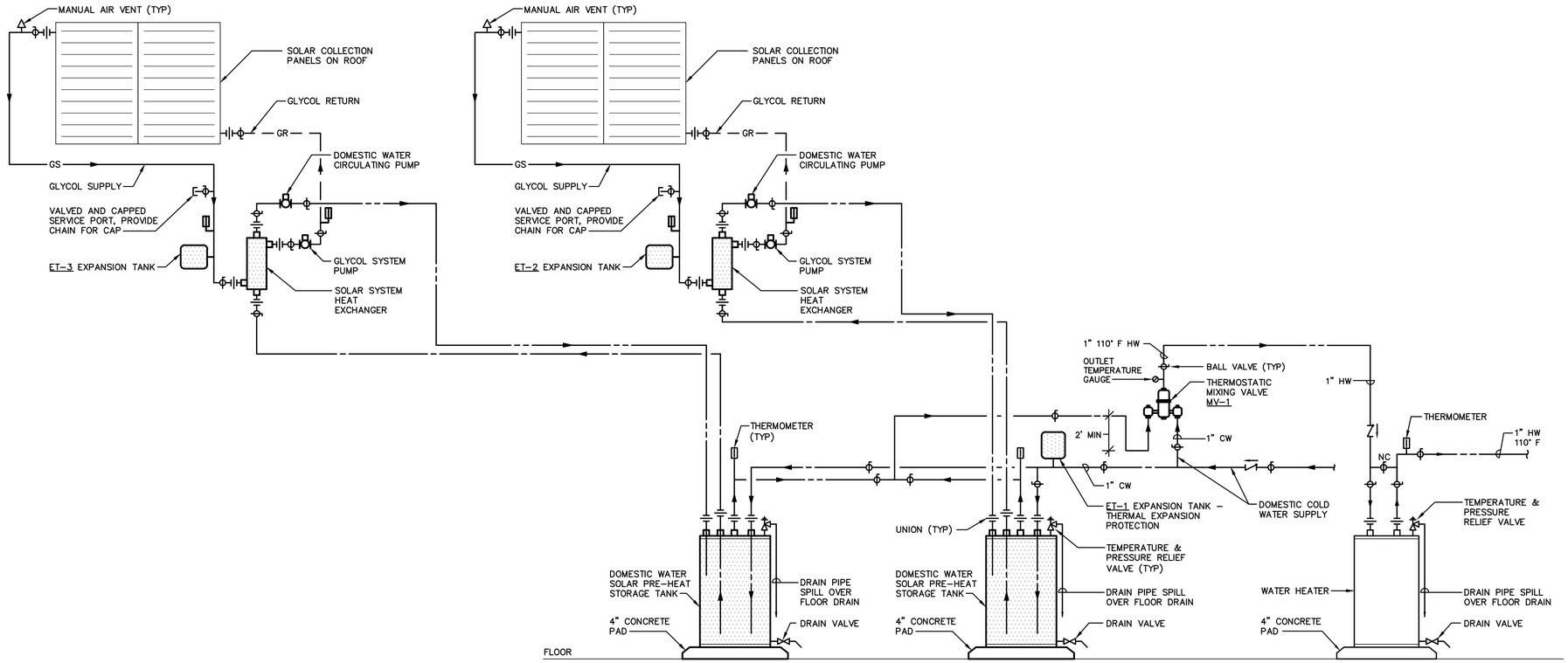
SCALE AS NOTED

P-104



DOMESTIC WATER MANIFOLD DETAIL

NO SCALE



NOTES:

1. CONTRACTOR TO FOLLOW THE MIXING VALVE MANUFACTURERS RECOMMENDED PIPING FOR COLD, HOT AND RECIRCULATING CONNECTIONS.
2. THE PIPE SIZE TO THE MIXING VALVE SHALL BE FED FULL LINE SIZE TO THE MIXING VALVE CONNECTIONS.
3. GLYCOL SYSTEM PIPE SIZING SHALL BE PERFORMED BY SOLAR WATER HEATING SYSTEM MANUFACTURER. FLUID VELOCITY SHALL NOT EXCEED 8 FT/SEC IN PIPING.

DOMESTIC WATER HEATING SYSTEM DETAIL

NO SCALE

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U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 P-501
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

PLUMBING DETAILS

SCALE AS NOTED

P-501

MIXING VALVE SCHEDULE

UNIT NO	CW CONN (IN)	HW CONN (IN)	DISCHARGE CONN (IN)	DISCHARGE TEMP (°F)	MAX GPM/MAX PRESSURE DROP (PSIG)	NOTES	MANUFACTURER & MODEL NO
MV-1	3/4"	3/4"	1"	110	0.5	1	POWERS 1432-RB

NOTES:
1. WALL MOUNTED

EXPANSION TANK SCHEDULE

UNIT NO	LOCATION	SERVICES	TYPE	SIZE DxL (IN)x(IN)	PRV PSIG	RV PSIG	SIZE		NOTES	MANUFACTURER & MODEL NO
							FILL (GAL)	SYSTEM (GAL)		
ET-1	BASEMENT	DOMESTIC WATER	WATER	8.5x11.5	15	30	2.1	80	–	FLEXCON WH-8
ET-2	BASEMENT	SOLAR SYSTEM	GLYCOL	12.5x19.2	15	30	8.5	80	–	FLEXCON WH-32
ET-3	BASEMENT	SOLAR SYSTEM	GLYCOL	12.5x19.2	15	30	8.5	120	–	FLEXCON WH-32

NOTES:

WATER HEATER SCHEDULE

UNIT NO	STORAGE CAPACITY GALLONS	INPUT KW	ELECTRIC V/PH/HZ	RECOVERY	NOTES	MANUFACTURER & MODEL NO
DWH-1	80	4.0	240/1/60	1ST HR RAITING 72 GPH	1, 2	–
DWH-2	N/A	3.4	240/1/60	0.5 GPM @ 45' RISE	3	–

NOTES:
1. ASME LISTED
2. UL LISTED
3. INSTANTANEOUS

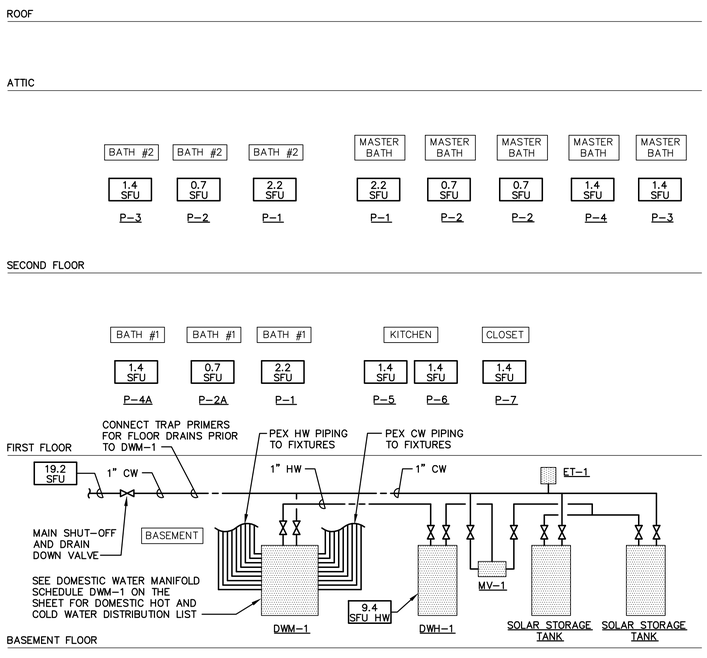
DOMESTIC WATER MANIFOLD-1 (DWM-1)

PORT SIZE	FIXTURE DESCRIPTION	FIXTURE LOCATION	PORT NUMBER & TYPE	PORT NUMBER & TYPE	FIXTURE DESCRIPTION	FIXTURE LOCATION	PORT SIZE
⅜"	LAVATORY	BATH #1	HW-1	CW-1	WATER CLOSET	BATH #1	⅜"
⅜"	SHOWER	BATH #1	HW-2	CW-2	LAVATORY	BATH #1	⅜"
⅜"	KITCHEN SINK	KITCHEN	HW-3	CW-3	SHOWER	BATH #1	⅜"
⅜"	DISHWASHER	KITCHEN	HW-4	CW-4	KITCHEN SINK	KITCHEN	⅜"
⅜"	CLOTHES WASHER	CLOSET	HW-5	CW-5	CLOTHES WASHER	CLOSET	⅜"
⅜"	LAVATORY	BATH #2	HW-6	CW-6	WATER CLOSET	BATH #2	⅜"
⅜"	TUB/SHOWER	BATH #2	HW-7	CW-7	LAVATORY	BATH #2	⅜"
⅜"	LAVATORY	MASTER BATH	HW-8	CW-8	TUB/SHOWER	BATH #2	⅜"
⅜"	LAVATORY	MASTER BATH	HW-9	CW-9	WATER CLOSET	MASTER BATH	⅜"
⅜"	TUB	MASTER BATH	HW-10	CW-10	LAVATORY	MASTER BATH	⅜"
⅜"	SHOWER	MASTER BATH	HW-11	CW-11	LAVATORY	MASTER BATH	⅜"
⅜"	–	–	HW-12	CW-12	TUB	MASTER BATH	⅜"
⅜"	–	–	HW-13	CW-13	SHOWER	MASTER BATH	⅜"
⅜"	–	–	HW-14	CW-14	HOSE BIBB	EAST SIDE	⅜"
⅜"	–	–	HW-15	CW-15	–	–	⅜"
⅜"	–	–	HW-16	CW-16	–	–	⅜"
–	–	–	–	–	–	–	–

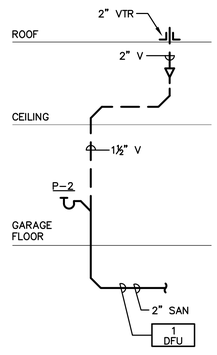
PLUMBING FIXTURE SCHEDULE

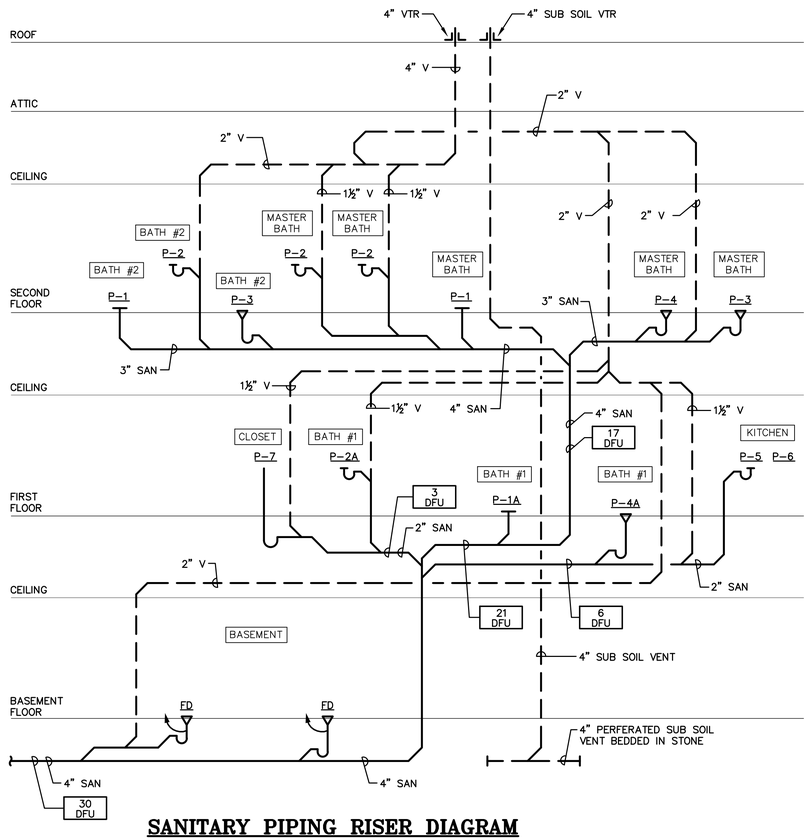
UNIT NO	FIXTURE	CW	HW	WASTE	VENT	NOTES	WSSC				MANUFACTURER & MODEL NO
							DFU'S	HW SFU'S	CW SFU'S	TOTAL SFU'S	
P-1	WATER CLOSET	½"	–	3"	2"	2	4	–	2.2	2.2	–
P-1A	WATER CLOSET	½"	–	3"	2"	1,2	4	–	2.2	2.2	–
P-2	LAVATORY	½"	½"	1½"	1½"	5	1	0.5	0.5	0.7	–
P-2A	LAVATORY	½"	½"	1½"	1½"	1,3	1	0.5	0.5	0.7	–
P-3	TUB	½"	½"	2"	1½"	2	2	1.0	1.0	1.4	–
P-3A	TUB	½"	½"	2"	1½"	2	2	1.0	1.0	1.4	–
P-4	SHOWER	½"	½"	2"	1½"	2	2	1.0	1.0	1.4	–
P-4A	SHOWER	½"	½"	2"	1½"	1,2	2	1.0	1.0	1.4	–
P-5	KITCHEN SINK	½"	½"	1½"	1½"	5	2	1.0	1.0	1.4	–
P-6	DISHWASHER	½"	½"	1½"	1½"	5	2	–	1.4	1.4	–
P-7	CLOTHES WASHER	½"	½"	2"	1½"	2	2	1.0	1.0	1.4	–

NOTES:
1. HANDICAP
2. FLOOR OUTLET
3. WALL MTD
4. CARRIER
5. COUNTERTOP
6. WALL OUTLET



DOMESTIC WATER RISER DIAGRAM
NO SCALE





SANITARY PIPING RISER DIAGRAM
NO SCALE

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CAD DWG FILE:	09-247 P-601
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

PLUMBING RISERS AND SCHEDULES

SCALE AS NOTED

P-601

GENERAL NOTES: (APPLY TO ALL DRAWINGS)

1. THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS SHOWN IN AN APPROXIMATE WAY ONLY. DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. REPAIR ALL DAMAGES OCCASIONED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDER GROUND UTILITIES.
2. RUN ALL SOIL, WASTE AND DRAIN PIPING WITH 2 PERCENT MINIMUM GRADE UNLESS OTHERWISE NOTED. HORIZONTAL VENT PIPING SHALL BE GRADED TO DRIP BACK TO THE SOIL OR WASTE PIPE BY GRAVITY.
3. ELEVATIONS NOTED ARE TO CENTERLINES OF PIPES FOR ALL PRESSURE LINES AND TO INVERT FOR ALL GRAVITY FLOW LINES.
4. MAINTAIN MINIMUM OF 3'–0" COVER OVER UNDERGROUND WATER MAINS AND MINIMUM OF 2'–6" COVER OVER UNDERGROUND SEWERS AND DRAINS.
5. PROVIDE AN AIR VENT AT THE TOP OF ALL RISERS AND AT THE HIGH POINT OF EACH DROP IN THE HEATING/CLOSED HEAT PUMP/GLYCOL/ AND CHILLED WATER SYSTEM.
6. UNLESS OTHERWISE NOTED, ALL PIPING AND DUCTWORK IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB, WITH SPACE FOR INSULATION IF REQUIRED.
7. INSTALL PIPING AND DUCTWORK SO THAT ALL VALVES AND DAMPERS ARE ACCESSIBLE.
8. COORDINATE ALL MECHANICAL WORK WITH ELECTRICAL WORK, ETC., SHOWN ON OTHER DRAWINGS.
9. EXCEPT AS OTHERWISE NOTED, LOCATE ALL ROOM THERMOSTATS 60 INCHES ABOVE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE ABOVE LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
10. CERTAIN ITEMS SUCH AS ACCESS DOORS, CLEANOUTS, RISE AND DROPS IN DUCTWORK AND PIPING, ETC., ARE INDICATED ON THE DRAWINGS FOR CLARITY OR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THESE ITEMS AS REQUIRED ELSEWHERE IN THE CONTRACT DOCUMENTS.
11. FLOW SCHEMATIC AND RISER DIAGRAMS INDICATE FLOW AND OPERATION CONCEPT AS WELL AS GENERAL ARRANGEMENT OF EQUIPMENT. VALVES, PRESSURE GAUGES, ETC. ARE INDICATED FOR THIS PURPOSE. ADDITIONAL VALVES, PRESSURE GAUGES, ETC. SHALL BE PROVIDED AS SHOWN ON VARIOUS EQUIPMENT DETAILS. SEE PLANS AND DETAILS FOR PIPE SIZES NOT INDICATED ON FLOW SCHEDULE AND RISER DIAGRAMS.
12. DUCTS ARE SIZED FOR COOLING TO ALLOW INSTALLATION OF CENTRAL COOLING IF SPECIFIED. SEE MECHANICAL SPECIFICATION FOR COOLING LOAD.
13. SIZES FOR BRANCH RUN–OUTS ARE GIVEN AS ROUND DUCT DIAMETER. WHERE OVAL SECTIONS ARE USED, THESE ARE TO BE SIZED EQUIVALENT TO THE GIVEN ROUND DUCT SIZES.
14. AIRFLOWS BELOW 20 CFM ARE NOT SUBJECT TO TAB BALANCING REQUIREMENTS.
15. ALL DUCTS TO BE SEALED WITH MASTIC AND LOCATED IN CONDITIONED SPACE.
16. ALL DUCTS TO BE ARRANGED AND INSTALLED IN SUCH MANNER AS TO OFFER MINIMUM AIRFLOW RESISTANCE.
17. ALL REGISTERS TO HAVE ADJUSTABLE TURNING VANES AND CLOSE–OFF DAMPER.
18. A MANUAL DAMPER TO BE LOCATED AT EACH TAKE–OFF / MAIN TRUNK JUNCTION TO CONTROL FLOW.
19. A NORMALLY OPEN MOTORIZED DAMPER TO BE LOCATED AT EACH TAKE–OFF /MAIN TRUNK JUNCTION TO ALLOW AUTOMATED CONTROL.
20. TRANSFER GRILLES TO BE PROVIDED FOR PRESSURE RELIEF / PRESSURE EQUALIZATION BETWEEN CLOSED ROOMS AND COMMON AREAS AND BETWEEN BEDROOM CLOSETS AND BEDROOMS.
21. DOORS TO BE UNDERCUT 3/4" BETWEEN TOP OF FINISH FLOOR AND UNDERSIDE OF DOOR.
22. AIR HANDLER TO BE LOCATED AND ACCESSED WITHIN INTERIOR CONDITIONED SPACE.
23. RETURN DUCT TO BE BUILT WITH TWO OFFSET BENDS TO REDUCE SOUND TRANSMISSION AND A VIBRATION ISOLATION SECTION.
24. A FILTER WITH A MERV 13 RATING TO BE INSTALLED AT THE AIR HANDLER.
25. HEAT RECOVERY VENTILATOR TO BE INSTALLED TO SUPPLY FRESH AIR TO INTERIOR.
26. ALL DUCTWORK TO BE SHEET METAL. SUPPLY TRUNKS IN BASEMENT TO BE INSULATED TO R–4.2.

HEAT RECOVERY VENTILATOR:

1. SUPPLY AND EXHAUST DUCTS BETWEEN HEAT RECOVERY VENTILATOR AND EXTERIOR TO BE INSULATED ALONG THE ENTIRE LENGTH TO CONTROL CONDENSATION.
2. SUPPLY AND EXHAUST DUCTS BETWEEN HEAT RECOVERY VENTILATOR AND EXTERIOR TO BE POSITIONED SO THAT THERE IS A FALL / SLOPE TOWARD THE OUTSIDE AIR INLET TO DRAIN ANY INCIDENT PRECIPITATION IN THE DUCT. SLOPE THE FIRST 4' OF DUCT RUN FROM THE EXTERIOR, OR THE ENTIRE FIRST SECTION IF SHORTER THAN 4'.
3. HEAT RECOVERY VENTILATOR TO BE PLACED ABOVE PLUMBED DRAIN PAN.

MECHANICAL LEGEND

SYMBOL	ABBREV	DESCRIPTION
	CW	COLD WATER; DOMESTIC
	HW	HOT WATER; DOMESTIC
	HWR	HOT WATER RECIRC; DOMESTIC
G	G	GAS
PD	PD	PUMPED DISCHARGE
	SAN	SANITARY
	V	VENT
D	D	(A/C) CONDENSATE DRAIN
	FDN	FOUNDATION DRAIN
	CO	CLEANOUT; LINE; FLOOR
	IW	INDIRECT WASTE
	D–1	FLOOR DRAIN
RG	RG	REFRIGERANT HOT GAS
RL	RL	REFRIGERANT LIQUID
	D–1	AREAWAY DRAIN
		DOOR LOUVER
		CENTERLINE
	UC	UNDERCUT
	PRV	PRESSURE REDUCING VALVE
		SOLENOID VALVE
		2–WAY CONTROL VALVE
		3–WAY CONTROL VALVE
		GAS COCK
T_A		THERMOSTAT AHU W/8 20 GAUGE SHIELDED WIRE CABLE TO ZONE CONTROLLER IN BASEMENT
T_B		THERMOSTAT FCU
T		THERMOSTAT BLANK W/8 20 GAUGE SHIELDED WIRE CABLE TO ZONE CONTROLLER IN BASEMENT
T		TEMPERATURE SENSOR
H		HUMIDISTAT
S		SENSOR
		VACUUM BREAKER
	SA	SHOCK ABSORBER
	MAV	MANUAL AIR VENT
HB	HB	HOSE BIBB WITH VACUUM BREAKER
F		FLOW SWITCH
		FLEXIBLE PIPE CONNECTOR
		BACKFLOW PREVENTER; DIRECTION OF FLOW INDICATED
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		PIPE GUIDE
		PIPE ANCHOR
		PIPE UNION
		THERMOMETER
		PRESSURE/TEMPERATURE TEST PLUG
		PRESSURE GAUGE WITH STOPCOCK
		GAUGE COCK
		SHUT OFF VALVE (SEE SPECIFICATION FOR TYPE)
		CHECK VALVE; DIRECTION OF FLOW INDICATED
		BALANCING VALVE
		BALL VALVE
		BUTTERFLY VALVE
	BWV	BACKWATER VALVE; DIRECTION OF FLOW INDICATED
		IN–LINE CIRCULATING PUMP
	CX	CONNECT TO EXISTING

MECHANICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ø OR DIA	DIAMETER
@	AT
ACH	AIR CHANGES PER HOUR
A/C	AIR CONDITIONING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
APG	AIR PRESSURE GAUGE
ATC	AUTOMATIC TEMPERATURE CONTROL
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BDD	BACK DRAFT DAMPER
BHP	BREAK HORSE POWER
BTUH	BRITISH THERMAL UNITS PER HOUR
BWV	BACK WATER VALVE
℄ OR CFM	CUBIC FEET PER MINUTE

MECHANICAL ABBREVIATIONS

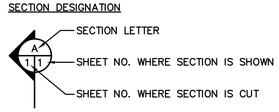
ABBREVIATION	DESCRIPTION
CUH	CABINET UNIT HEATER
CX	CONNECT TO EXISTING
D	DIFFUSER
DIA	DIAMETER
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DP	DIFFERENTIAL PRESSURE SWITCH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFT	ENTERING FLUID TEMPERATURE
EG	EXHAUST GRILLE
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EWT	ENTERING WATER TEMPERATURE
EX	EXISTING
F	FAHRENHEIT
FA	FACE AREA
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FLA	FULL LOAD AMPS
FOT	FLAT ON TOP
FOB	FLAT ON BOTTOM
FPM	FEET PER MINUTE
FV	FACE VELOCITY
G	GRILLE
GAL	GALLONS
GPM	GALLONS PER MINUTE
HD	HEAD
HP	HORSE POWER
HRV	HEAT RECOVERY VENTILATOR
HVD	HIGH VELOCITY DUCT
HVID	HIGH VELOCITY INDUCTION DIFFUSER
ID	INSIDE DIAMETER
INV	INVERT
IW	INDIRECT WASTE
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LRA	LOCKED ROTOR AMPS
LFT	LEAVING FLUID TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MBH	1000 BTU/HR
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
POD	POINT OF DISCONNECT
PRV	PRESSURE REDUCING VALVE
PSIG	POUNDS PER SQUARE INCH–GAGE
PSF	POUNDS PER SQUARE FOOT
R	REGISTER
RA	RETURN AIR
RD	ROOF DRAIN
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RLX	RELOCATE EXISTING
RPM	REVOLUTIONS PER MINUTE
RX	REMOVE EXISTING
SA	SUPPLY AIR
SCT	SATURATED CONDENSING TEMPERATURE
SD	SMOKE DAMPER
SENS/TOT	SENSIBLE/TOTAL
SP	STATIC PRESSURE
SST	SATURATED SUCTION TEMPERATURE
SV	SECTION VALVE
TEMP	TEMPORARY
TYP	TYPICAL
V	VENT
V/PH/HZ	VOLTS/PHASE/HERTZ
VD	VOLUME DAMPER
VTR	VENT THRU ROOF
W	WHITE/WATER/WEST
WG	WATER GAUGE
WB	WET BULB
WPD	WATER PRESSURE DROP
W/O	WITHOUT

DUCTWORK LEGEND

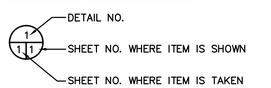
DOUBLE LINE	SINGLE LINE	DESCRIPTION
FC	FC	FLEXIBLE DUCT CONNECTION
		AIR FLOW MEASURING DEVICE
VD	VD	MANUAL VOLUME DAMPER
BDD	BDD	BACKDRAFT DAMPER
		FIRE DAMPER (1–1/2 HOUR UNLESS OTHERWISE NOTED)
S	S	SMOKE DETECTOR
MOD	MOD	MOTOR OPERATED DAMPER
DP	DP	DIFFERENTIAL PRESSURE SWITCH
S	S	SMOKE DAMPER
R	R	RISE IN DUCT (DIRECTION OF AIR FLOW)
D	D	DROP IN DUCT (DIRECTION OF AIR FLOW)
		ACCESS DOOR
		BRANCH WITH 45° TAP
VD	VD	PRE–FABRICATED ROUND BRANCH FITTING WITH VOLUME DAMPER
VD	VD	FLEXIBLE DUCTWORK BRANCH WITH VOLUME DAMPER FROM ROUND BRANCH FITTING
		TRANSITION
"A" "B" "C" "D"	"A" "B" "C" "D"	3 WAY SPLIT IN MAINS AREA "A" IS EQUAL TO SUM OF AREAS "B", "C" & "D"
"A" "B" "C"	"C"	2 WAY SPLIT IN MAINS AREA "A" IS EQUAL TO SUM OF AREAS "B" & "C" **ALL SQUARE ELBOWS SHALL HAVE TURNING VANES**
"A" "B" "C"	"A" "B" "C"	2 WAY SPLIT AT END OF MAIN, AREA "A" IS EQUAL TO SUM OF AREAS "B" & "C"
"A" "B" "C"	"A" "B" "C"	2 WAY OVER & UNDER SPLIT AT END OF MAIN, AREA "A" IS EQUAL TO SUM OF AREAS "B" & C"
VD	VD	FLEXIBLE DUCTWORK BRANCH WITH VOLUME DAMPER FROM SQUARE TO ROUND
		RADIUS ELBOW
		SUPPLY
		RETURN
		EXHAUST
		ROUND DUCT UP
		DIFFUSER (4 WAY UNLESS NOTED) NECK SIZE & CFM NOTED)
		RETURN REGISTER OR GRILLE SIZE & CFM NOTED
		EXHAUST REGISTER OR GRILLE SIZE & CFM NOTED
		DIFFUSER CONNECTED TO FLEX DUCT

MECHANICAL ABBREVIATIONS

SECTION DESIGNATION



PARTIAL PLAN/DETAIL DESIGNATION



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NET ZERO ENERGY RESIDENTIAL TEST FACILITY

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Building America U.S. Department of Energy
Research Toward Zero Energy Homes

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DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

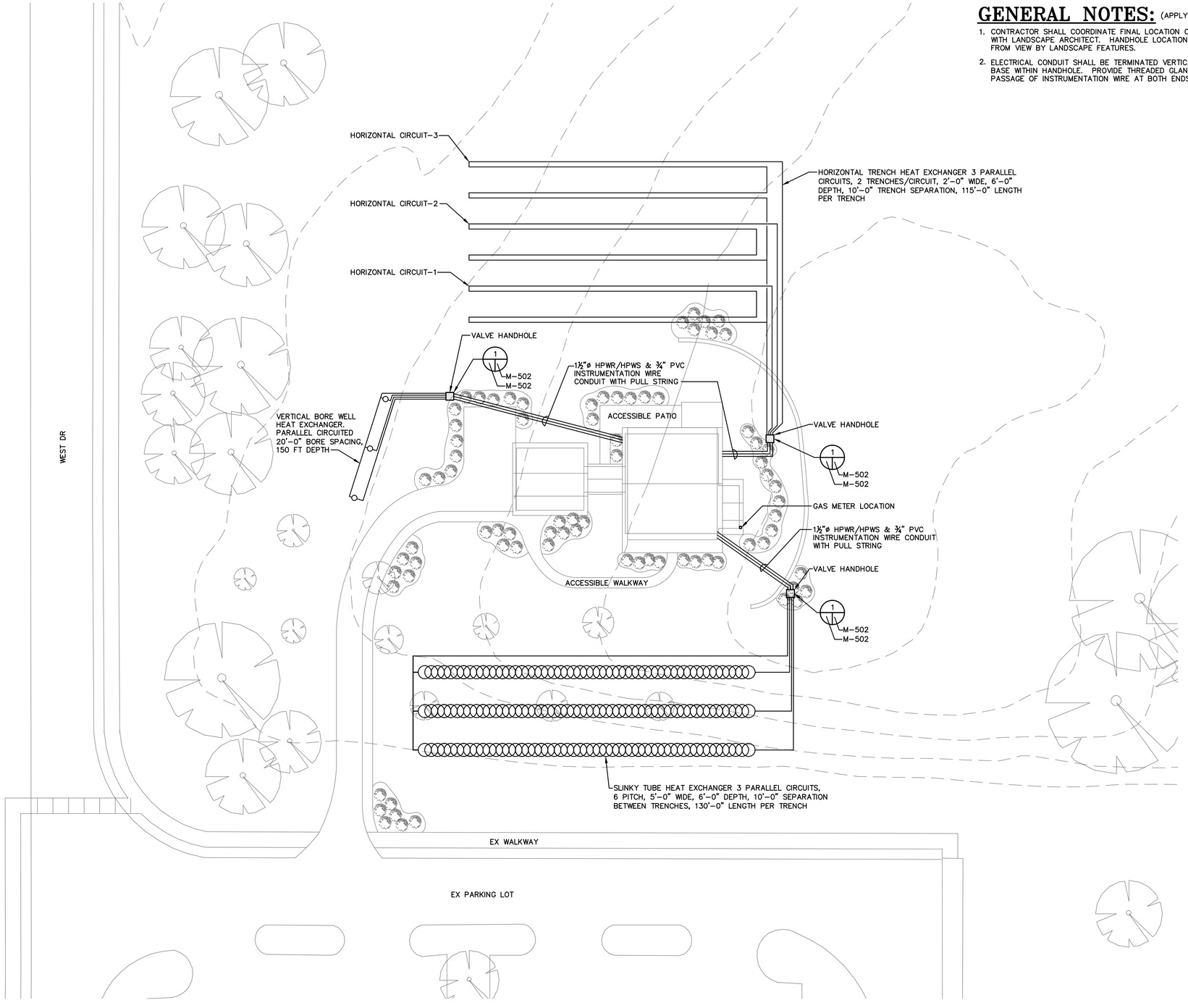
MECHANICAL LEGEND SCHEDULES & DETAILS

SCALE AS NOTED

M–001

GENERAL NOTES: (APPLY TO THIS DRAWING ONLY)

1. CONTRACTOR SHALL COORDINATE FINAL LOCATION OF VALVE HANDHOLES WITH LANDSCAPE ARCHITECT. HANDHOLE LOCATIONS SHALL BE OBSCURED FROM VIEW BY LANDSCAPE FEATURES.
2. ELECTRICAL CONDUIT SHALL BE TERMINATED VERTICAL, 1'–0" ABOVE GRAVEL BASE WITHIN HANDHOLE. PROVIDE THREADED GLAND SEAL TERMINATION FOR PASSAGE OF INSTRUMENTATION WIRE AT BOTH ENDS.



MECHANICAL – SITE PLAN

SCALE: 1" = 20'–0'

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

1"=20'–0"

0 10' 20' 30' 40' 60'

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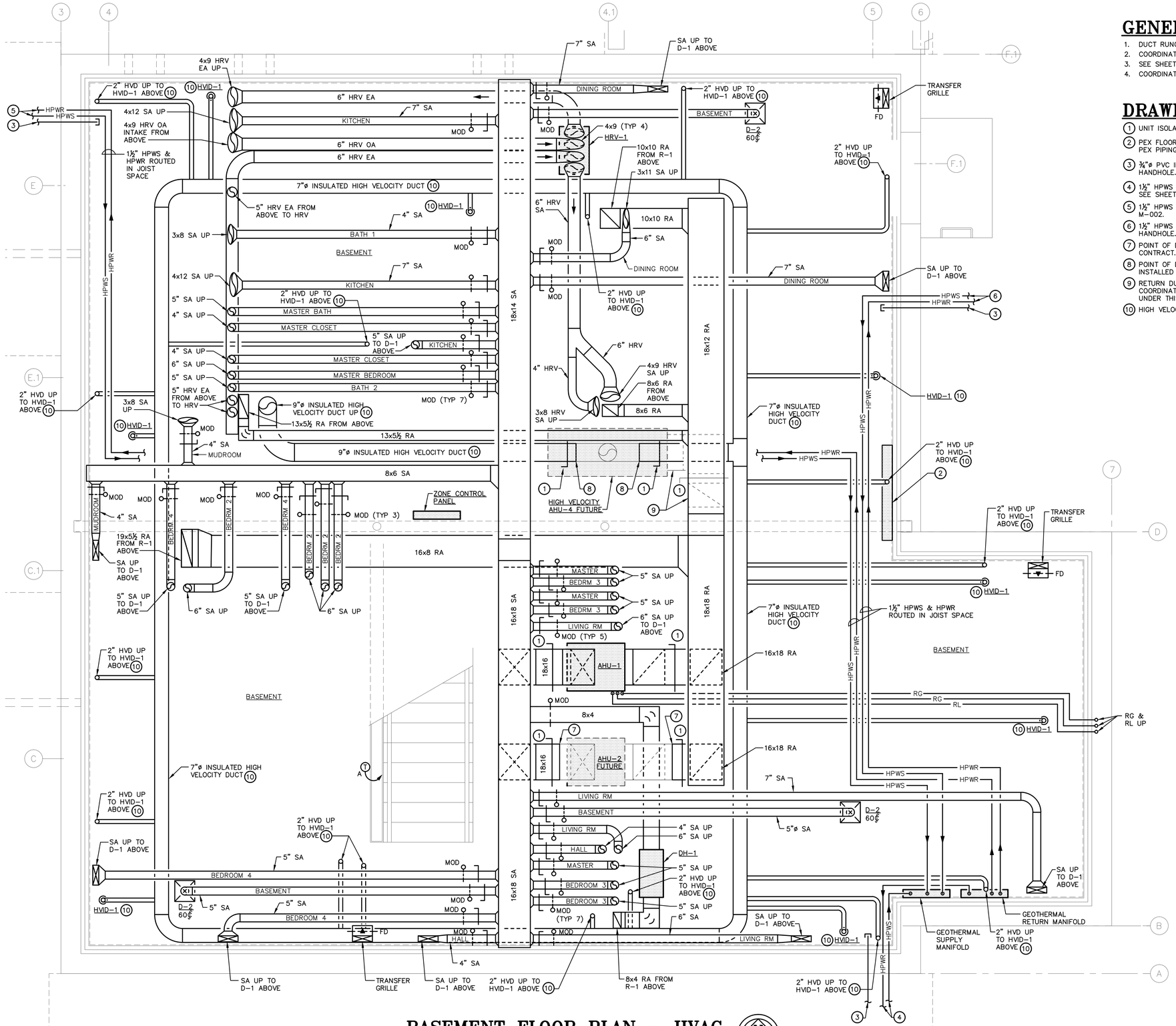
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 M–002
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

MECHANICAL SITE PLAN

SCALE AS NOTED

M–002



BASEMENT FLOOR PLAN – HVAC

SCALE: ½" = 1'-0"

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. DUCT RUNOUTS ARE LOCATED WITHIN JOIST BAY & PARALLEL TO JOISTS
2. COORDINATE WITH ELECTRICAL, PLUMBING & ARCHITECTURAL PLANS.
3. SEE SHEET M-501 FOR MECHANICAL DUCTWORK DETAILS.
4. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. UNIT ISOLATION OPPOSED BLADE DAMPER SEE SPECIFICATION.
2. PEX FLOOR HEAT MANIFOLD FOR FUTURE SYSTEM. SEE SHEET M-106 FOR PEX PIPING SYSTEM LAYOUT.
3. ¾"ø PVC INSTRUMENTATION CONDUIT W/PULLSTRING TO VALVE HANDHOLE. SEE SHEET M-002.
4. 1½" HPWS & HPWR TO SLINKY TUBE HEAT EXCHANGER VALVE HANDHOLE. SEE SHEET M-002.
5. 1½" HPWS & HPWR TO VERTICAL BORE VALVE HANDHOLE. SEE SHEET M-002.
6. 1½" HPWS & HPWR TO HORIZONTAL TRENCH HEAT EXCHANGER VALVE HANDHOLE. SEE SHEET M-002.
7. POINT OF DISCONNECT OF DUCTWORK FOR AHU-2 INSTALLED UNDER THIS CONTRACT.
8. POINT OF DISCONNECT FOR THE HIGH VELOCITY OPTION DUCTWORK INSTALLED UNDER THIS CONTRACT SERVING FUTURE AHU-4.
9. RETURN DUCTWORK SHOWN FOR HIGH VELOCITY UNIT AHU-4 IS FOR COORDINATION ONLY. RETURN DUCT TAP FOR AHU-4 NOT INSTALLED UNDER THIS CONTRACT.
10. HIGH VELOCITY OPTION.

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 1' 2' 4' 6' 1/2"=1'-0"

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LICENSE NO.: 17896 EXPIRATION DATE: 2-19-2012

PROJECT:

National Institute of Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD

Building America — U.S. Department of Energy — Research Toward Zero Energy Homes

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

MARK	DATE	DESCRIPTION
	07/27/10	HIGH VELOCITY OPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

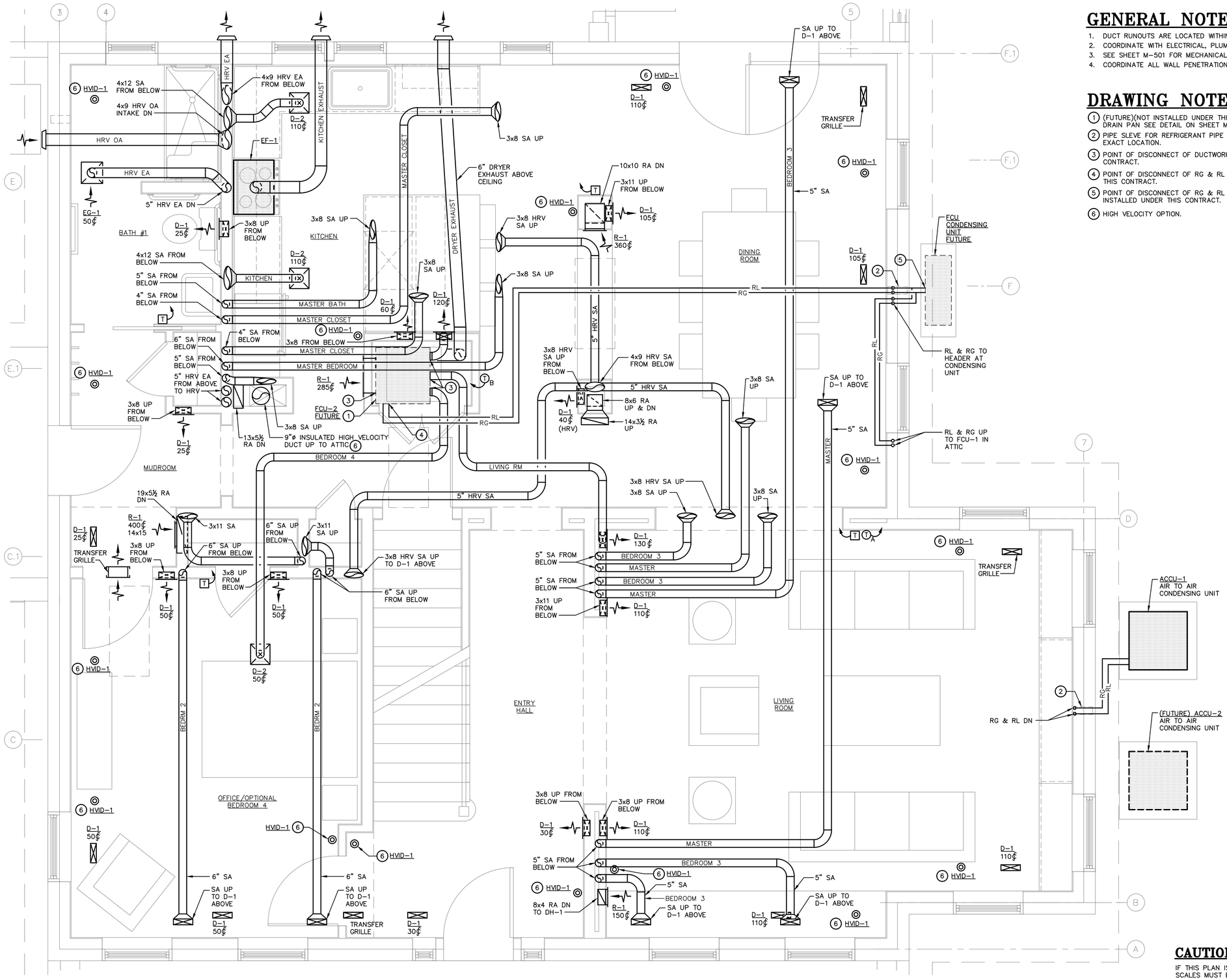
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-101-A1
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

BASEMENT FLOOR PLAN HVAC

SCALE AS NOTED

M-101



FIRST FLOOR PLAN - HVAC

SCALE: ½" = 1'-0'

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. DUCT RUNOUTS ARE LOCATED WITHIN JOIST BAY & PARALLEL TO JOISTS
2. COORDINATE WITH ELECTRICAL, PLUMBING & ARCHITECTURAL PLANS.
3. SEE SHEET M-501 FOR MECHANICAL DUCTWORK DETAILS.
4. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. (FUTURE)(NOT INSTALLED UNDER THIS CONTRACT) FCU-2 WITH AUXILIARY DRAIN PAN SEE DETAIL ON SHEET M-502 FOR MORE INFORMATION.
2. PIPE SLEVE FOR REFRIGERANT PIPE SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION.
3. POINT OF DISCONNECT OF DUCTWORK FOR FCU-2 INSTALLED UNDER THIS CONTRACT.
4. POINT OF DISCONNECT OF RG & RL LINES FOR FCU-2 INSTALLED UNDER THIS CONTRACT.
5. POINT OF DISCONNECT OF RG & RL LINES FOR FCU-1 AND FCU-2 INSTALLED UNDER THIS CONTRACT.
6. HIGH VELOCITY OPTION.

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 1' 2' 4' 6' 1/2"=1'-0"

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MARK	DATE	DESCRIPTION
	07/27/10	HIGH VELOCITY OPTION
	5/7/10	UPDATED
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-102-A1
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

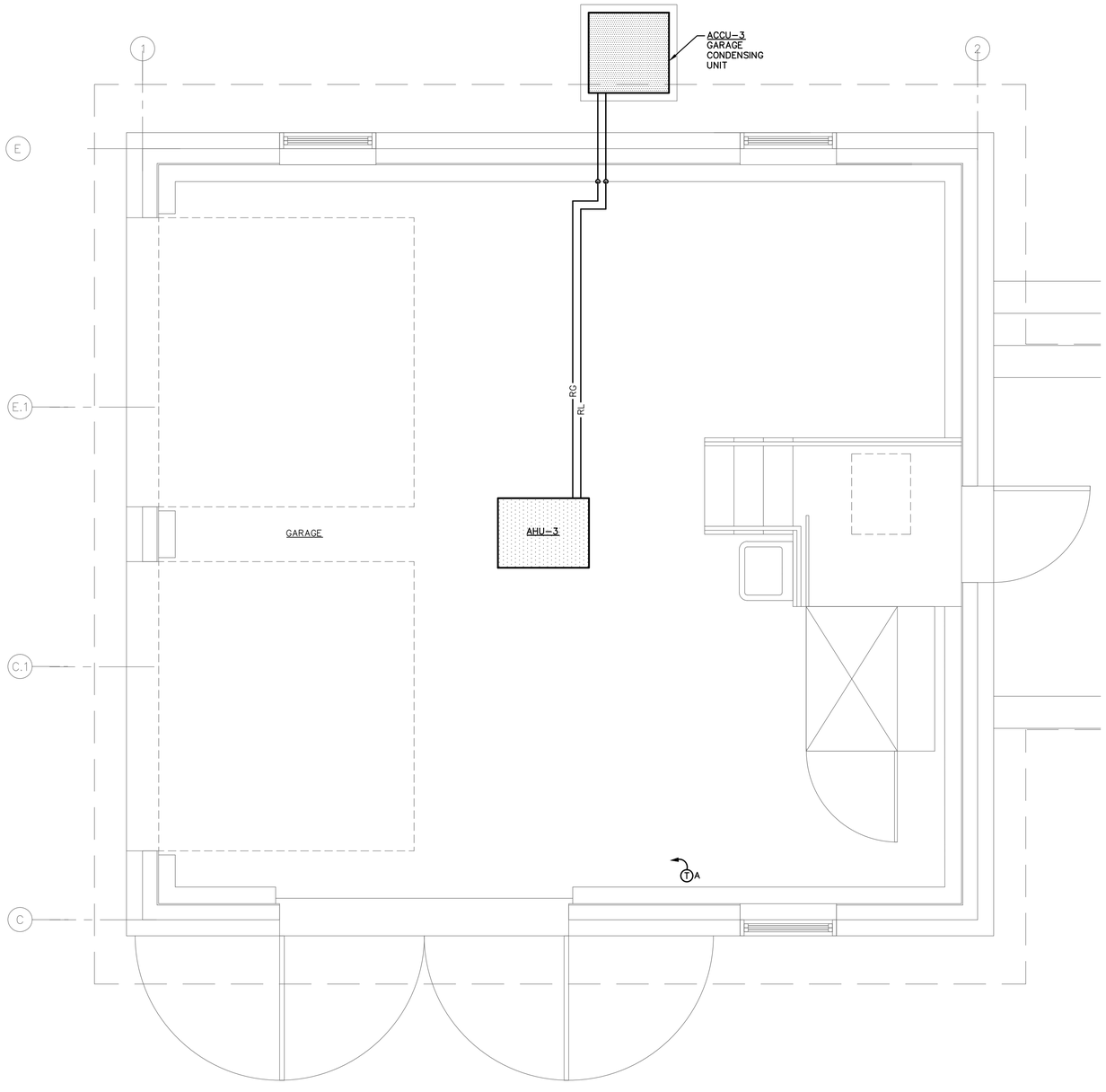
FIRST FLOOR PLAN HVAC

SCALE AS NOTED

M-102

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. DUCT RUNOUTS ARE LOCATED WITHIN JOIST BAY & PARALLEL TO JOISTS
2. COORDINATE WITH ELECTRICAL, PLUMBING & ARCHITECTURAL PLANS.
3. SEE SHEET M-501 FOR MECHANICAL DUCTWORK DETAILS.
4. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.



FIRST FLOOR PLAN GARAGE - HVAC

SCALE: ½" = 1'-0'

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 1' 2' 4' 6' 1/2"=1'-0"

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MARK	DATE	DESCRIPTION
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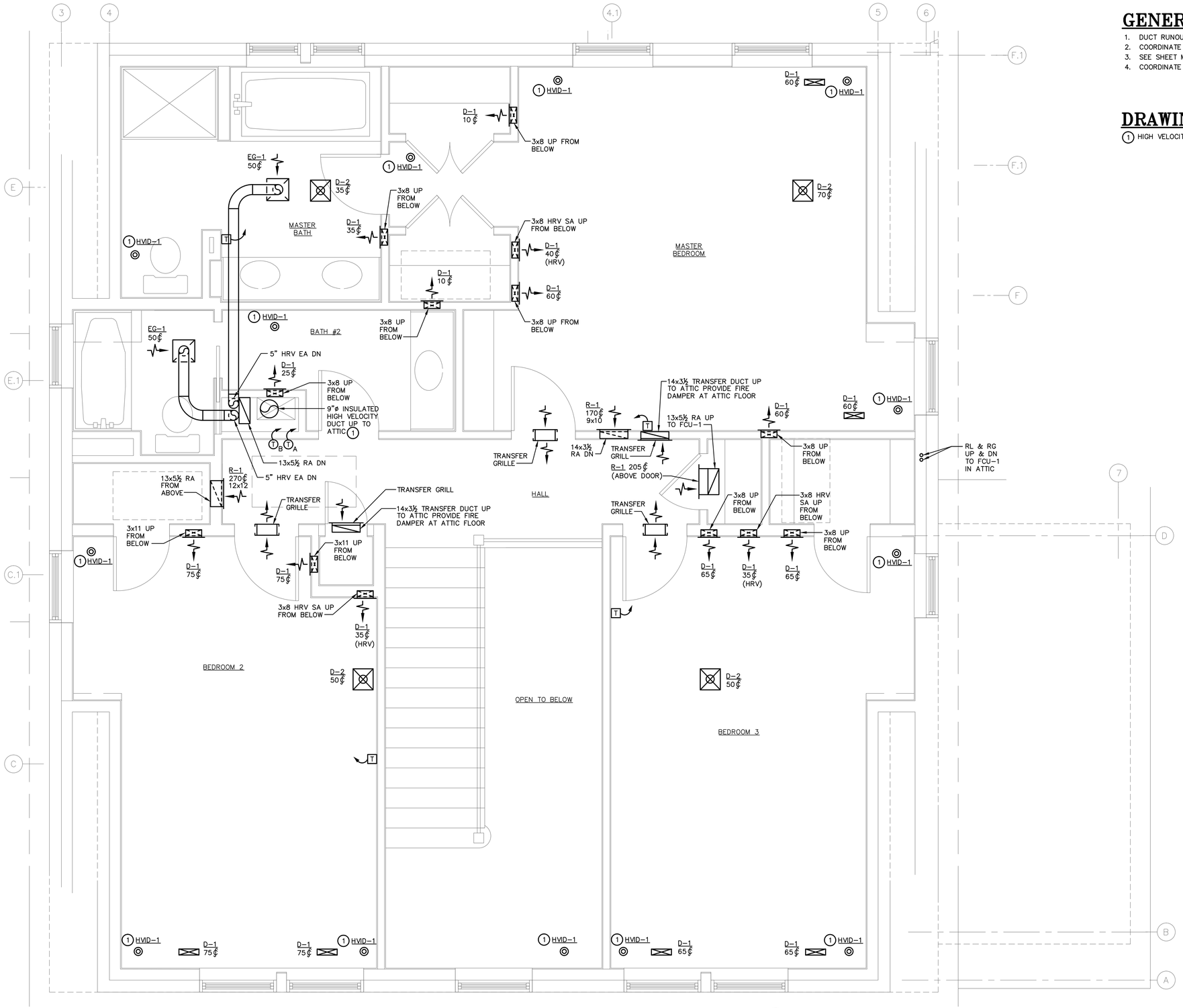
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-103
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

FIRST FLOOR PLAN
GARAGE HVAC

SCALE AS NOTED

M-103



SECOND FLOOR PLAN – HVAC

SCALE: ½" = 1'-0'

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. DUCT RUNOUTS ARE LOCATED WITHIN JOIST BAY & PARALLEL TO JOISTS
2. COORDINATE WITH ELECTRICAL, PLUMBING & ARCHITECTURAL PLANS.
3. SEE SHEET M-501 FOR MECHANICAL DUCTWORK DETAILS.
4. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

(1) HIGH VELOCITY OPTION.

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 1' 2' 4' 6' 1/2"=1'-0"

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LICENSE NO.: 17896 EXPIRATION DATE: 2-19-2012

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MARK	DATE	DESCRIPTION
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ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

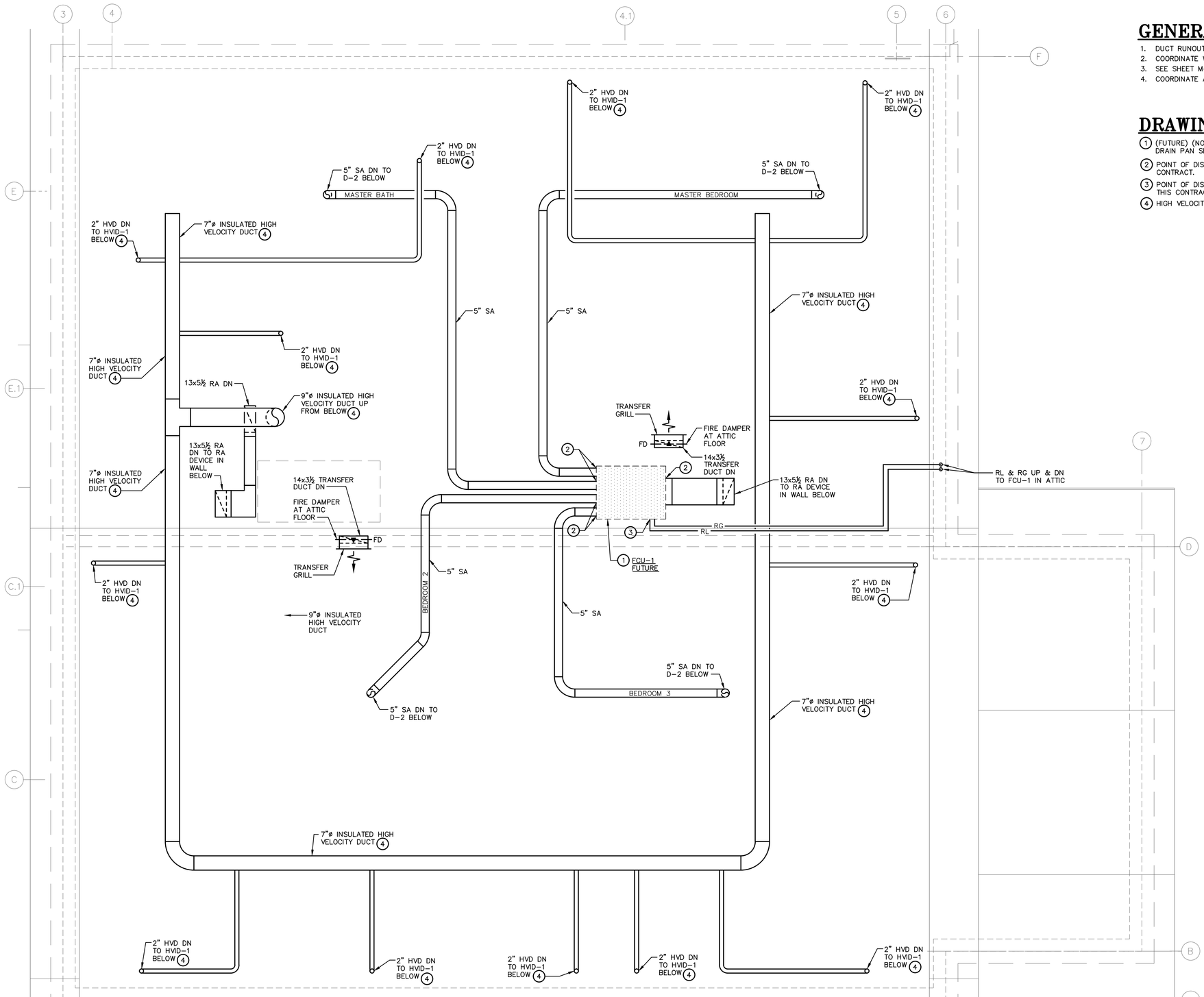
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-104-A1
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

SECOND FLOOR PLAN HVAC

SCALE AS NOTED

M-104



ATTIC FLOOR PLAN – HVAC

SCALE: ½" = 1'-0'

GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. DUCT RUNOUTS ARE LOCATED WITHIN JOIST BAY & PARALLEL TO JOISTS
2. COORDINATE WITH ELECTRICAL, PLUMBING & ARCHITECTURAL PLANS.
3. SEE SHEET M-501 FOR MECHANICAL DUCTWORK DETAILS.
4. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. (FUTURE) (NOT INSTALLED UNDER THIS CONTRACT) FCU-1 WITH AUXILIARY DRAIN PAN SEE DETAIL ON SHEET M-502 FOR MORE INFORMATION.
2. POINT OF DISCONNECT OF DUCTWORK FOR FCU-1 INSTALLED UNDER THIS CONTRACT.
3. POINT OF DISCONNECT OF RG & RL LINES FOR FCU-1 INSTALLED UNDER THIS CONTRACT.
4. HIGH VELOCITY OPTION.

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 1' 2' 4' 6' 1/2"=1'-0"

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MARK	DATE	DESCRIPTION
	07/27/10	HIGH VELOCITY OPTION
	5/7/10	UPDATED
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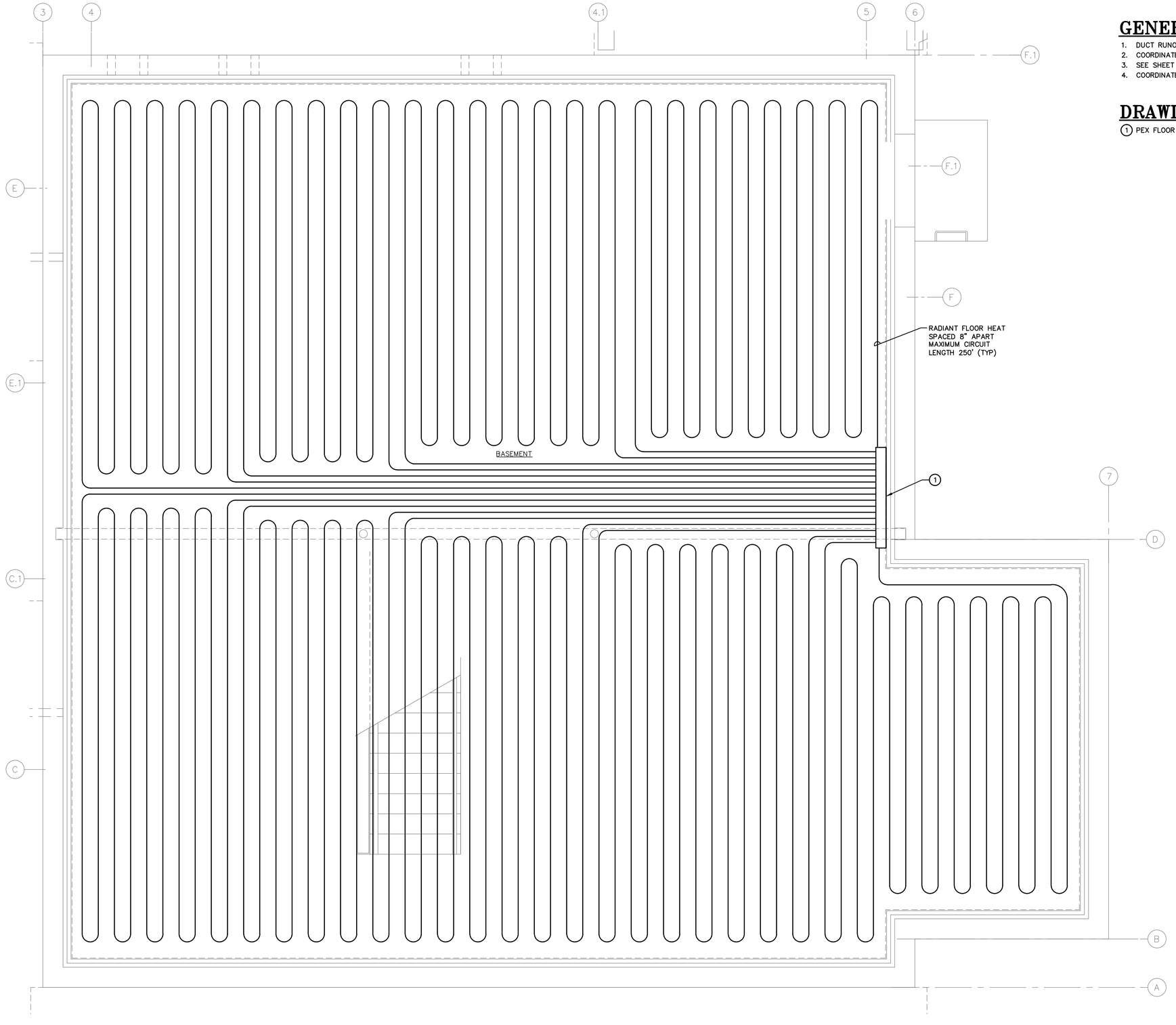
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-105-A1
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

ATTIC FLOOR PLAN HVAC

SCALE AS NOTED

M-105



GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

1. DUCT RUNOUTS ARE LOCATED WITHIN JOIST BAY & PARALLEL TO JOISTS
2. COORDINATE WITH ELECTRICAL, PLUMBING & ARCHITECTURAL PLANS.
3. SEE SHEET M-501 FOR MECHANICAL DUCTWORK DETAILS.
4. COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

(1) PEX FLOOR HEAT MANIFOLD.

BASEMENT FLOOR PLAN - RADIANT FLOOR HEAT

SCALE: ½" = 1'-0'

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 1' 2' 4' 6' 1/2"=1'-0"

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MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

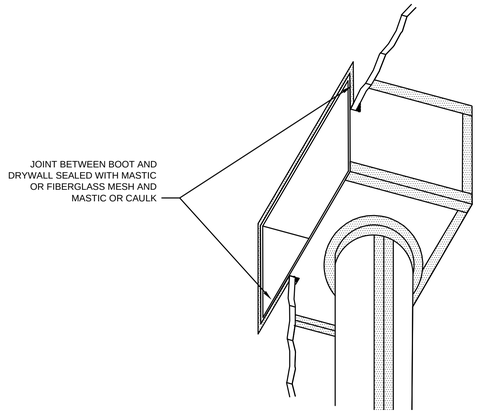
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-106
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

BASEMENT FLOOR PLAN RADIANT FLOOR HEAT

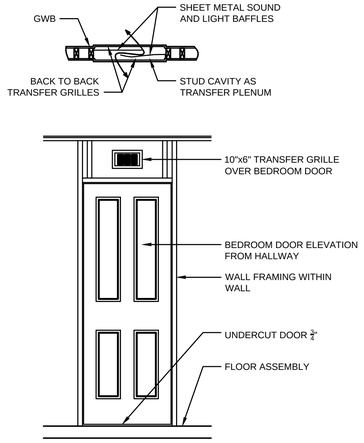
SCALE AS NOTED

M-106



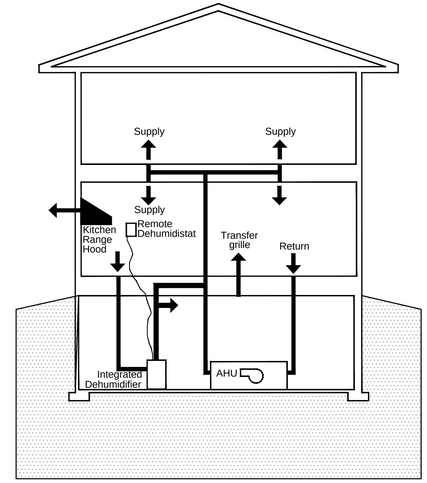
WALL REGISTER AIR SEALING DETAIL

NO SCALE



DOOR TRANSFER GRILLE DETAIL

SCALE: ½" = 1'–0"



DEHUMIDIFIER SCHEMATIC

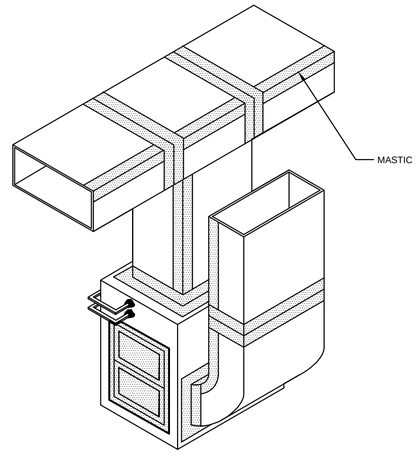
NO SCALE

BASEMENT TRANSFER GRILLE DETAIL

SCALE: ½" = 1'–0"

FLOOR BOOT AIR SEALING DETAIL

NO SCALE



AIR HANDLER AIR SEALING DETAIL

NO SCALE

CAUTION:
IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

1/2"=1'–0"

0 1' 2' 3' 4' 5' 6'

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MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

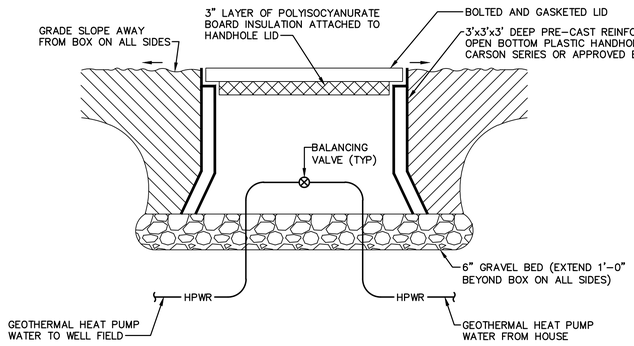
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 M–501
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

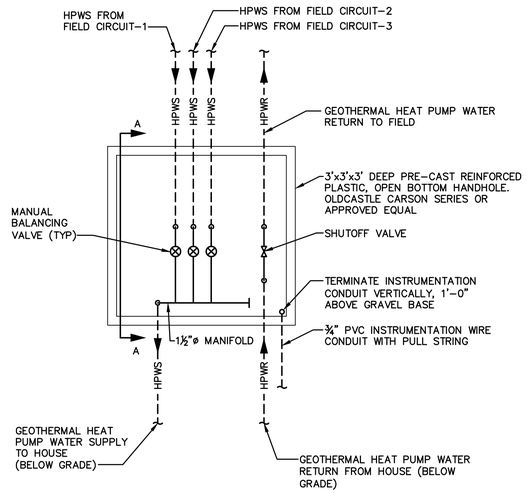
MECHANICAL DETAILS

SCALE AS NOTED

M–501



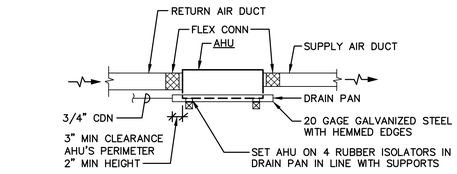
SECTION A-A



GEOTHERMAL SYSTEM VALVE HANDHOLE DETAIL

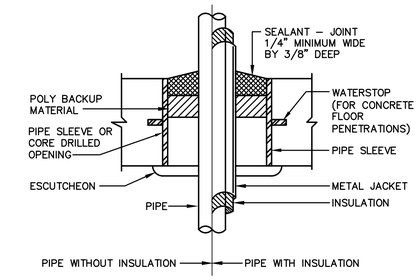
NO SCALE

1 M-002 M-502



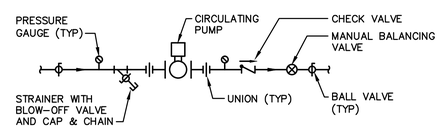
AUXILIARY CONDENSATE DRAIN PAN DETAIL

NO SCALE



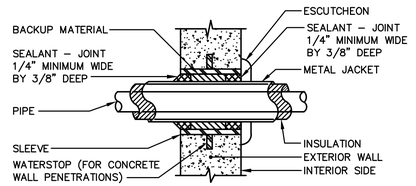
PIPE SLEEVE THRU FLOOR DETAIL

NO SCALE



IN-LINE PUMP DETAIL

NO SCALE



PIPE SLEEVE FOR INSULATED PIPE THRU WALL -ABOVE GRADE DETAIL

NO SCALE

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ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-502
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

MECHANICAL DETAILS

SCALE AS NOTED

M-502

SPLIT SYSTEM HEAT PUMP SCHEDULE

UNIT NO.	FAN					COOLING			HEATING			OUTDOOR UNIT					NOTES	MANUFACTURER & MODEL NO.
	CFM	O.A. CFM	ESP (IN WG)	RPM	HP-V/PH/HZ	TOT/SENS MBH	EAT DB/WB	SEER	MBH	HSPF	SUPP KW-V/PH/HZ	LOCATION	COMP. RLA	FAN FLA	MOCP	V/PH/HZ		
AHU-1	1200	–	0.75	–	240/1/60	36.6/27.9	80/67	14.8	25.6	8.5	7.5-240/1/60	GRADE	18.6	2.8	40	240/3/60	5	AAON F1-A-036-1-V-B
AHU-3	570	–	0.5	–	240/1/60	24.0/18.0	75/63	20.7	26.0	9.5	–	GRADE	12	0.75	30	230/1/60	1,2,3,4	CARRIER RAV-SP240UT-UL RAV-SP240AT2-UL
FCU-1	300	–	0.4	–	–	12.0/9.0	–	–	13.5	–	–	–	–	–	–	–	–	(FUTURE)
FCU-2	300	–	0.3	–	–	8.0/6.0	–	–	9.0	–	–							
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

NOTES:
1. COOLING BASED ON 95°F O.A. TEMPERATURE
2. HEATING BASED ON 68°F R.A. TEMPERATURE, 0°F O.A. TEMPERATURE
3. SUPPLEMENTAL HEATER W/1 STAGE
4. INDOOR UNIT (AHU) POWERED FROM OUTDOOR UNIT (HPU).
5. 15.6 MBH HOT GAS REHEAT.

WHOLE HOUSE DEHUMIDIFER:
ULTRA-AIRE 65H OR APPROVED EQUAL. 65 PINT PER DAY EXTRACTION, 4.3 PINTS/KWH EFFICIENCY INTEGRAL MERV 11 FILTER.

HEAT RECOVERY VENTILATOR:
VENMAR EKO 1.5 OR APPROVED EQUAL.

ZONE DAMPER SYSTEM:
HONEYWELL HZ 432 OR APPROVED EQUAL.

AIR DEVICES:

NOTES:
1. AIR DEVICES SHALL BE AS SPECIFIED OR APPROVED EQUAL.
2. AIR DEVICE COLOR SHALL BE SELECTED BY ARCHITECT.

FLOOR DIFFUSERS:

MANUFACTURER:	HART & COOLEY
MODEL:	411 DELUXE FLOOR DIFFUSER
FINISH:	STEEL – BRIGHT WHITE
SIZES:	4"x10" – 85 CFM OR LESS SUPPLY 4"x12" – 105 CFM OR LESS SUPPLY 4"x14" – 125 CFM OR LESS SUPPLY

WALL REGISTERS:

MANUFACTURER:	HART & COOLEY
MODEL:	A611MS REGISTER
FINISH:	ALUMINUM – BRIGHT WHITE
SIZES:	6"x10" – 100 CFM OR LESS SUPPLY 6"x12" – 120 CFM OR LESS SUPPLY 8"x10" – 130 CFM OR LESS SUPPLY

CEILING DIFFUSERS:

MANUFACTURER:	HART & COOLEY
MODEL:	A504MS SQUARE CEILING DIFFUSER
FINISH:	ALUMINUM – BRIGHT WHITE
SIZES:	8"x8" – 90 CFM OR LESS SUPPLY 10"x10" – 135 CFM OR LESS SUPPLY

RETURN GRILLES:

MANUFACTURER:	HART & COOLEY
MODEL:	650 RETURN AIR GRILLE
FINISH:	STEEL – BRIGHT WHITE
SIZES:	10"x20" – FIRST EAST 16"x14" – FIRST WEST 10"x10" – MASTER SUITE 12"x12" – SECOND HALL 10"x8" – DEHUMIDIFIER 16"x10" – FIRST FLOOR MULTI SPLIT 10"x10" – SECOND FLOOR MULTI SPLIT 6"x6" – HRV

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LICENSE NO. 17696 EXPIRATION DATE: 2-19-2012

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MARK	DATE	DESCRIPTION
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	4/16/10	UPDATED
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-601
DRAWN BY:	PJP
CHECKED BY:	EAH

SHEET TITLE:

MECHANICAL SCHEDULES

SCALE AS NOTED

M-601

LIGHTING FIXTURE SCHEDULE

TYPE	MOUNTING	VOLTS	LAMPS NUMBER & TYPE	MANUFACTURER & CAT.#	DESCRIPTION	NOTES
C1	SURFACE	120	LED MIN 180 LUMENS MAX 6 WATTS	ALBEO TECHNOLOGIES TALEA–HP	WHITE UNDER CABINET LED	–
F	SURFACE	120	–	MINKA AIRE F514–ORB	FAN IN LIVING ROOM – BRONZE	–
F/L	SURFACE	120	2–13W	MINKA AIRE F514–ORB	FAN AND LIGHT COMBINATION IN BEDROOMS – BRONZE	–
F/L	SURFACE	120	ENERGY STAR LIGHT KIT	GOSSAMER LIGHTHOUSE	FAN AND LIGHT ON PORCH WITH ENERGY STAR LIGHT KIT – GALVANIZED ALUMINUM	–
P1	PENDANT	120	5–13W	LITHONIA 11535 BZA	ANTIQUE BRONZE – FIVE LIGHT DINING ROOM AND ENTRY HALL PENDANT LIGHT. COORDINATE PENDANT TYPE AND MOUNTING HEIGHT WITH ARCHITECT	–
R1	RECESSED	120	LED MIN 650 LUMENS MAX 11 WATTS	CREE LED LIGHTING LR6	WHITE DIMMABLE 6" LIVING ROOM LIGHT LIGHTING QUALITY – CCT 2700'K, MIN. CRI 90	–
R2	RECESSED	120	LED MIN 650 LUMENS MAX 11 WATTS	CREE LED LIGHTING LR6	WHITE DIMMABLE 6" KITCHEN LIGHT WITH DAYLIGHT SENSOR LIGHTING QUALITY – CCT 2700'K, MIN OF CRI 90	–
R3	RECESSED	120	LED MIN 500 LUMENS MAX 11 WATTS	CREE LED LIGHTING LR4	WHITE 4" LED FIXTURE LIGHTING QUALITY – CCT 2700'K, MIN OF CRI 90	–
R4	RECESSED	120	LED MIN 650 LUMENS MAX 11 WATTS	CREE LED LIGHTING LR6	WHITE 6" LED FIXTURE LIGHTING QUALITY – CCT 2700'K, MIN OF CRI 90	–
RW	RECESSED	120	18–DDT	LITHONIA L7XF	WHITE BATHROOM 6" FIXTURE WITH WET LOCATION LENS	–
S1	SURFACE	120	23W–CF	LEVITON 8829–CW1	ATTIC PORCELAIN SOCKET, KEYLESS SINGLE CIRCUIT, WHITE OUTLET BOX MOUNT	–
S2	SURFACE	120	2–31W T8	LITHONIA 11235RE WH OR EQUAL	WHITE BASEMENT FIXTURE	–
S3	SURFACE	120	2–31W T8	LITHONIA 11235RE WH OR EQUAL	WHITE GARAGE FIXTURE	–
S4	SURFACE	120	15W–T8	LITHONIA CUC 15T8PHH 120 LP	WHITE CLOSET FIXTURE	–
W1	SURFACE	120	4–13W	LITHONIA 11534 BN	ANTIQUE BRONZE FOUR LIGHT MASTER BATH VANITY FIXTURE	–
W2	SURFACE	120	2–13W	LITHONIA 11532 BN	ANTIQUE BRONZE TWO LIGHT BATHROOM VANITY FIXTURE	–
W3	SURFACE	120	26W	PROGRESS P7047–20EBWB	ANTIQUE BRONZE WALL SCONCE	–
W4	SURFACE	120	1–18W	THOMAS LIGHTING PL9007–7	MATTE BLACK EXTERIOR LANTERN	–
W5	SURFACE	120	2–13W	PROGRESS P–7093–09EBWB	WHITE BASEMENT STAIR WALL SCONCE	–

REMARKS:

1. THIS IS A BRAND NAME OR APPROVED EQUAL SCHEDULE. SALIENT FEATURES OF THE SPECIFIED FIXTURE INCLUDE LAMP TYPE AND WATTAGE, ENERGY STAR, QUALITY, STYLE, AND FINISH.

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
ACU	AIR CONDITIONING UNIT
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AIC	AMPERES INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
C	CONDUIT
DH	DEHUMIDIFIER
DWH	DOMESTIC WATER HEATER
EF	EXHAUST FAN
EMT	ELECTRICAL METALLIC TUBING
EX	EXISTING
F	FUSED OR FUSIBLE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FCU	FAN COIL UNIT
FLA	FULL LOAD AMPERES
GFI	GROUND FAULT INTERRUPTER
HP	HORSEPOWER
HRU	HEAT RECOVERY UNIT
KVA	KILO–VOLTS–AMPERES
KW	KILOWATTS
KWH	KILOWATT HOURS
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MIN	MINIMUM
NFSS	NON–FUSED SAFETY SWITCH
P	POLE (1P., 2P., 3P.)
TV	TELEVISION
UL	UNDERWRITERS LABORATORIES
V	VOLTS
W	WATTS
WP	WEATHERPROOF
ø	PHASE

GENERAL NOTE:

1. PROVIDE A MAXIMUM OF TWO CONTROL DEVICES PER COVER PLATE. SEE ARCHITECTURAL DRAWINGS A–204/A–205/A–206 FOR INTERIOR ELEVATIONS.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
,	LIGHTING FIXTURE – FLUORESCENT – TYPE AS INDICATED
O, O, ◑	LIGHTING FIXTURE – CEILING, WALL MOUNTED, DIRECTIONAL – TYPE AS INDICATED
S, S_3, S_4, S_T, S_P	SWITCH – SINGLE POLE, THREE WAY, FOUR WAY, TIME DELAY, PILOT LIGHT – MOUNTING HEIGHT 4'–0" UNLESS NOTED OTHERWISE – SEE A–204/A–205/A–206 FOR SWITCH LOCATIONS ON INTERIOR ELEVATIONS – "P" SUBSCRIPT DENOTES A PILOT LIGHT
D	DIMMING SWITCH – MOUNTING HEIGHT 4'–0"
	DUPLEX RECEPTACLE – 20A., 125V. – MOUNTING HEIGHT 18" UNLESS NOTED OTHERWISE – SEE A–204/A–205/A–206 FOR RECEPTACLE LOCATIONS ON INTERIOR ELEVATIONS
	DOUBLE DUPLEX RECEPTACLE – 20A., 125V. – MOUNTING HEIGHT 18" UNLESS NOTED OTHERWISE – SEE A–204/A–205/A–206 FOR RECEPTACLE LOCATIONS ON INTERIOR ELEVATIONS
GFI	GFI RECEPTACLE – 20A., 125V. – MOUNTING HEIGHT 18" UNLESS NOTED OTHERWISE – SEE A–204/A–205/A–206 FOR RECEPTACLE LOCATIONS ON INTERIOR ELEVATIONS
	CEILING RECEPTACLE – 20A., 125V. – DUPLEX – FLUSH IN CEILING
J, J	JUNCTION BOX – CEILING, WALL MOUNTED – SIZE PER NEC OR AS INDICATED
	PANELBOARD – TYPE AS NOTED – MOUNTING HEIGHT 6'–6" TO TOP
	CONDUIT – IN OR ON CEILING OR WALLS
	CONDUIT – IN OR UNDER FLOOR
	HOMERUN TO PANEL – PROVIDE 2#12 AND #12, NEC TYPE 'NM' UNLESS OTHERWISE INDICATED
S_F	FAN CONTROLLER – FURNISHED BY FAN SUPPLIER. WIRED AND CONNECTED BY ELECTRICAL CONTRACTOR – MOUNTING HEIGHT 4'–0" AFF UNLESS NOTED OTHERWISE – SEE A–204/A–205/A–206 FOR SWITCH LOCATIONS ON INTERIOR ELEVATION – NUMBER OF WIRES AS REQUIRED
,	MAGNETIC STARTER, COMBINATION TYPE STARTER – TYPE AND RATING AS INDICATED
F,	DISCONNECT SWITCH, UNLESS NOTED OTHERWISE – FUSED, NON–FUSED – TYPE AND RATING AS INDICATED
M	MOTOR – HORSEPOWER AS NOTED
M	ELECTRIC METER SOCKET AND METER BY ELECTRICAL CONTRACTOR.
	SPECIAL RECEPTACLE. TYPE AND RATING AS INDICATED ON KITCHEN EQUIPMENT ELECTRICAL SCHEDULE. COORDINATE MOUNTING HEIGHT WITH EQUIPMENT BEING SERVED
30	SPECIAL PURPOSE RECEPTACLE – WALL MOUNTED – NEMA 14–30R FLUSH RECEPTACLE – PASS & SEYMOUR CATALOG# 3864 OR EQUIVALENT – 3#10 AND #10 GROUND
50	SPECIAL PURPOSE RECEPTACLE – WALL MOUNTED – NEMA 14–50R FLUSH RECEPTACLE – PASS & SEYMOUR CATALOG# 3894 OR EQUIVALENT – 3#6 AND #10 GROUND
	TELEPHONE/DATA OUTLET – WALL MOUNTED, PHONE AND DATA JACKS – MOUNTING HEIGHT 2'–0" – SEE DETAIL ON ELECTRICAL DRAWING E–502
	MOLDED CASE CIRCUIT BREAKER
F/L	FAN AND LIGHT COMBINATION (F/L) OR FAN ONLY (F)
TV	TV OUTLET – SEE DETAIL ON ELECTRICAL DRAWING E–502 – COMBINE WITH TELEPHONE/DATA WHERE LOCATED ADJACENT
WAP	JUNCTION BOX FOR OWNER FURNISHED WIRELESS ACCESS POINT
T	TRANSFORMER
P	PHOTO SENSOR – ADJUSTABLE TO TURN LIGHTS OFF AT USER DEFINED LEVEL – WORKS WITH RELAY PANEL SOFTWARE

CONVENTIONS

SECTION CUT

- SECTION LETTER
- SHEET NUMBER WHERE SECTION IS SHOWN
- SHEET NUMBER WHERE SECTION IS CUT

DETAIL

- DETAIL NUMBER
- SHEET NUMBER WHERE DETAIL IS SHOWN
- SHEET NUMBER WHERE DETAIL IS TAKEN

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LICENSE NO.: 13434 EXPIRATION DATE: 4–26–2011

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Building America U.S. Department of Energy
Research Toward Zero Energy Homes

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

MARK	DATE	DESCRIPTION
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PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 E–001
DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

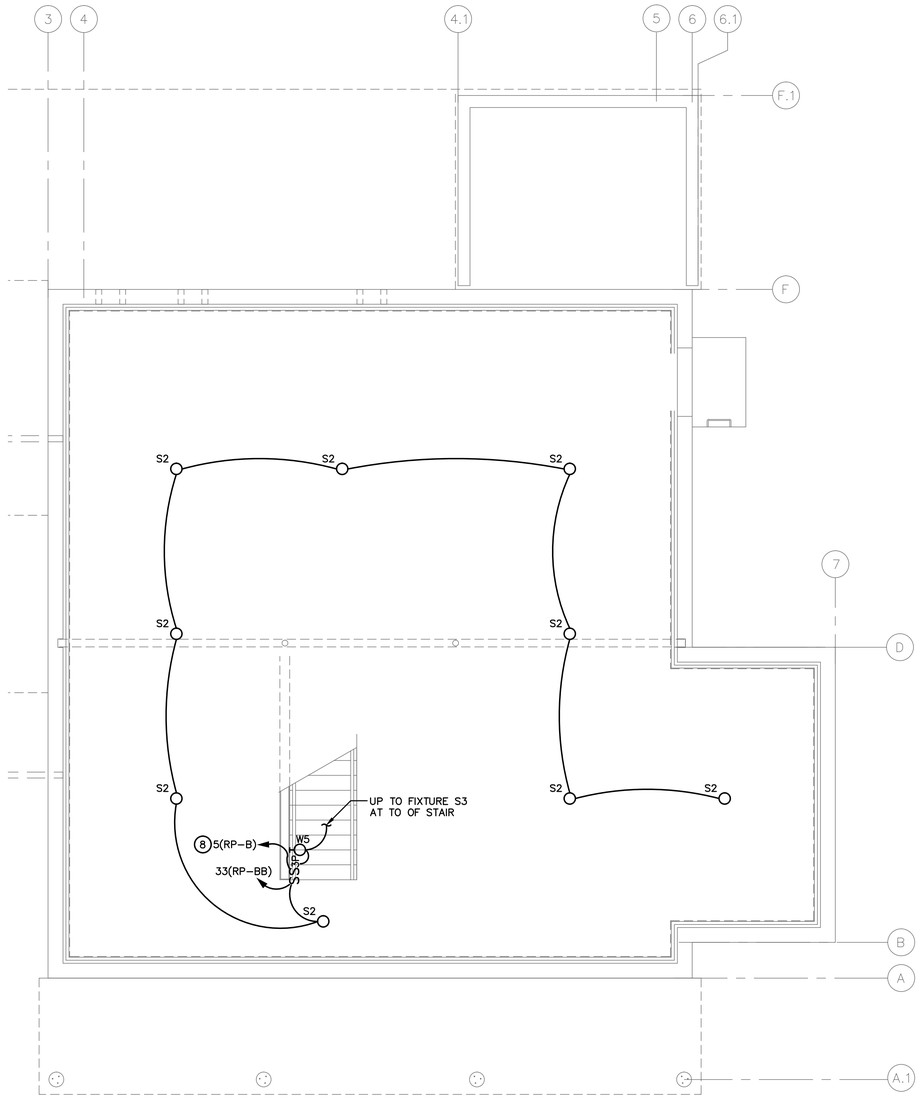
ELECTRICAL LEGEND, ABBREVIATIONS, SYMBOLS & LIGHTING FIXTURE SCHEDULE

SCALE AS NOTED

E–001

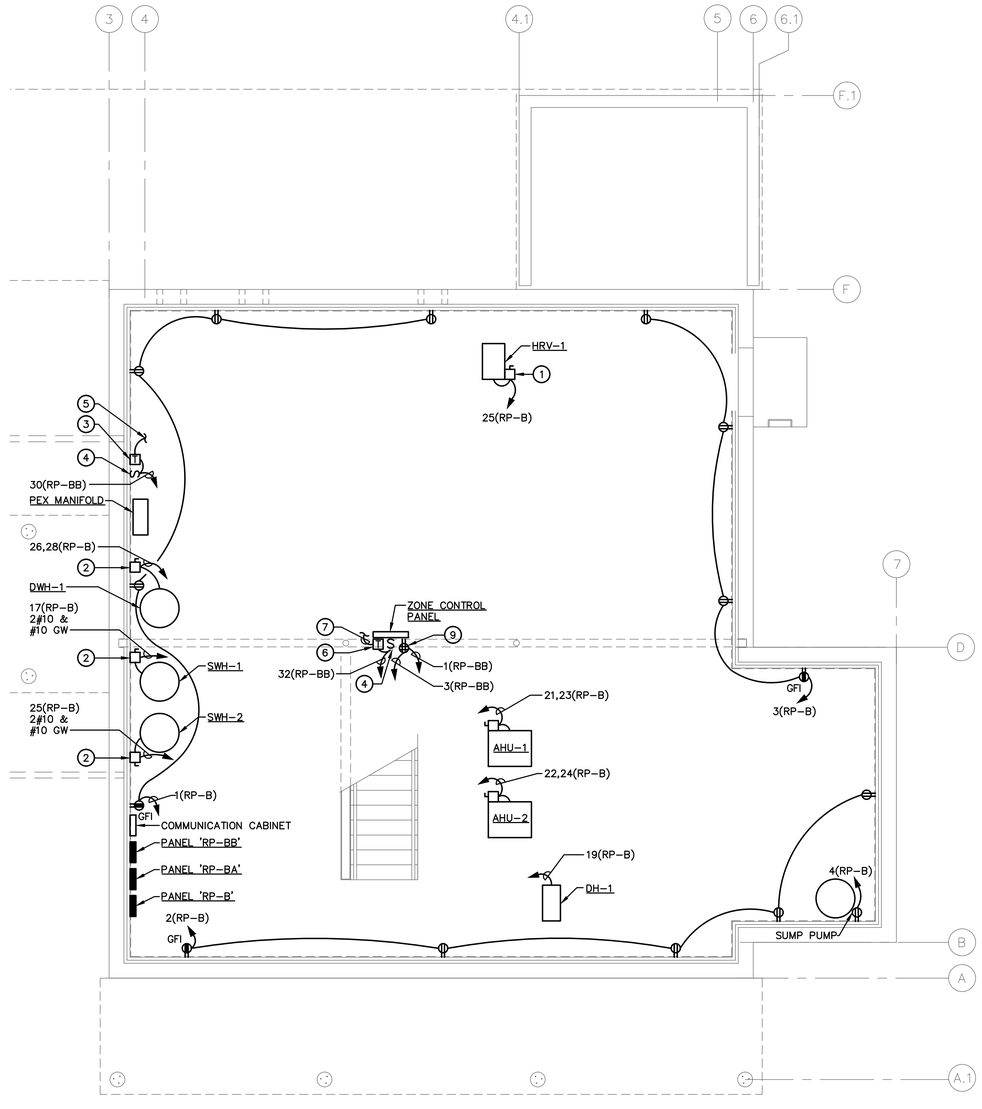
DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. 2P–30A NFSS IN NEMA 1 ENCLOSURE. MOUNT AT UNIT.
2. 2P–30A NFSS IN NEMA 1 ENCLOSURE.
3. CONTROL POWER TRANSFORMER – 1000VA, 120–24V, 1ø. MOUNT NEAR MANIFOLD WITH SOLENOIDS.
4. TOGGLE SWITCH DISCONNECT. MOUNT ADJACENT TO CONTROL POWER TRANSFORMER ON ZONE CONTROL PANEL SUPPORT RACK.
5. MAKE CONNECTION TO PLUMBING SOLENOIDS. SEE MECHANICAL PLANS FOR QUANTITY.
6. CONTROL POWER TRANSFORMER – 1000VA, 120–24V, 1ø. MOUNT ON ZONE CONTROL PANEL SUPPORT RACK.
7. MAKE CONTROL POWER CONNECTIONS AS DIRECTED BY GOVERNMENT.
8. PROVIDE THREE WIRES AND GROUND FOR EACH HOMERUN TO WIREWAY AT RELAY PANEL. CONNECT BRANCH CIRCUIT THROUGH RESPECTIVE RELAY AND THEN TO PANELBOARD. SEE RELAY SCHEDULE. TERMINATE THIRD WIRE AT EACH END FOR FUTURE USE. ALLOW SUFFICIENT SLACK IN WIREWAY FOR TERMINATING ON A RELAY. LABEL THE LOAD THAT IS SERVED BY THE WIRE. SEE DRAWING E–502, DETAIL 1.
9. MOUNT ON ZONE CONTROL PANEL SUPPORT RACK.



BASEMENT FLOOR PLAN – LIGHTING

SCALE: ¼" = 1'–0'



BASEMENT FLOOR PLAN – POWER

SCALE: ¼" = 1'–0'

CAUTION: IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE 1/4"=1'–0"

0 2' 4' 8' 12'

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PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 E–101
DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

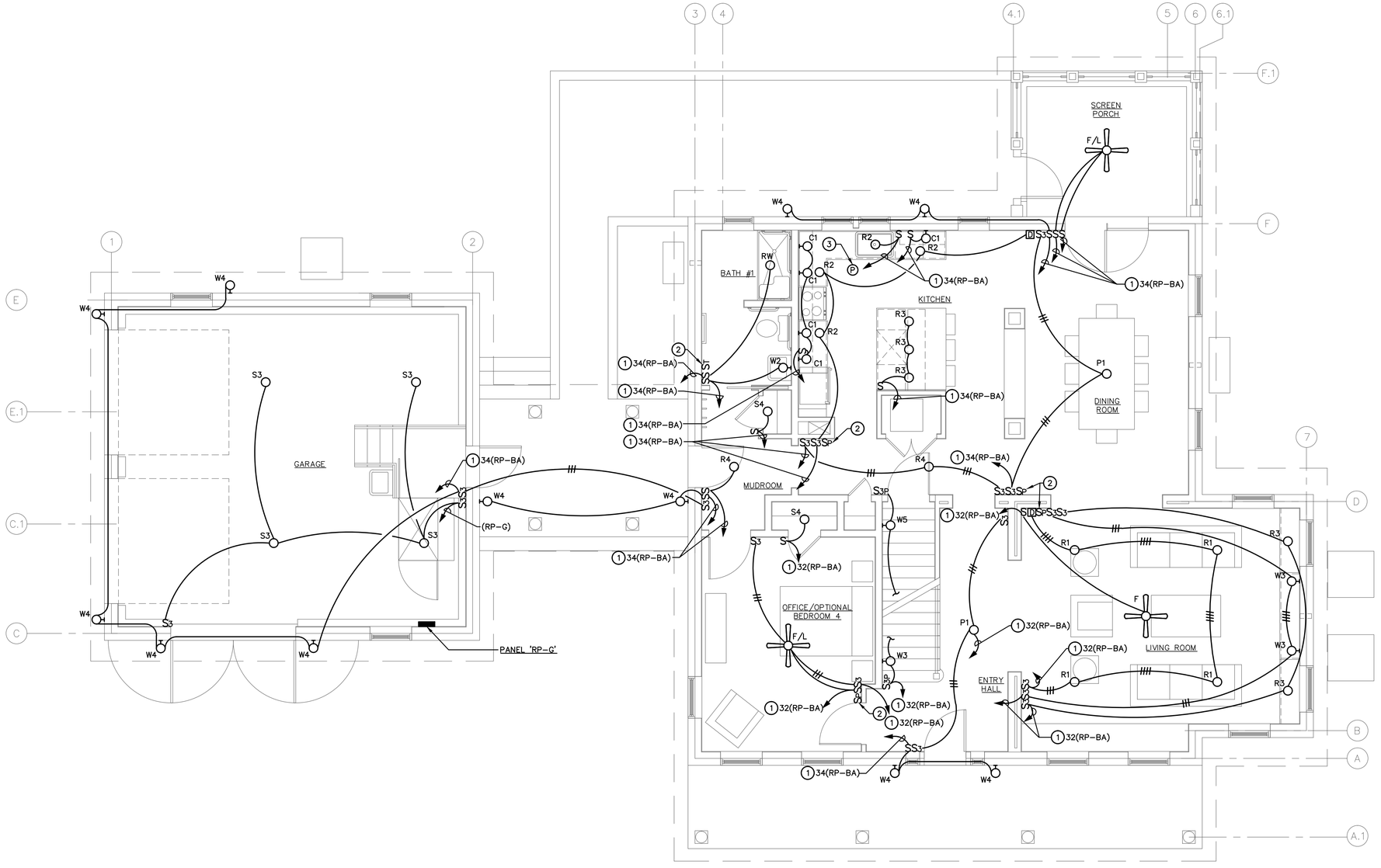
BASEMENT FLOOR PLAN – ELECTRICAL

SCALE AS NOTED

E–101

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. PROVIDE THREE WIRES AND GROUND FOR EACH HOMERUN TO WIREWAY AT RELAY PANEL, CONNECT BRANCH CIRCUIT THROUGH RESPECTIVE RELAY AND THEN TO PANELBOARD. SEE RELAY SCHEDULE. TERMINATE THIRD WIRE AT EACH END FOR FUTURE USE. ALLOW SUFFICIENT SLACK IN WIREWAY FOR TERMINATING ON A RELAY. LABEL THE LOAD THAT IS SERVED BY THE WIRE. SEE DRAWING E-502, DETAIL 1.
2. SWITCH FOR RECEPTACLE. SEE "FIRST FLOOR PLAN – POWER" ON DRAWING E-103 FOR CIRCUIT.
3. PROVIDE PHOTO SENSOR FOR RELAY INPUT FOR KITCHEN TYPE 'R2' LIGHTING FIXTURE CONTROL. TYPE 'R2' SHALL REMAIN OFF WHEN EXTERIOR LIGHT SATISFIES PHOTO SENSOR.



FIRST FLOOR PLAN – LIGHTING

SCALE: ¼" = 1'-0'

CAUTION:

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GRAPHIC SCALE

0 2' 4' 8' 12' 1/4"=1'-0"

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DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

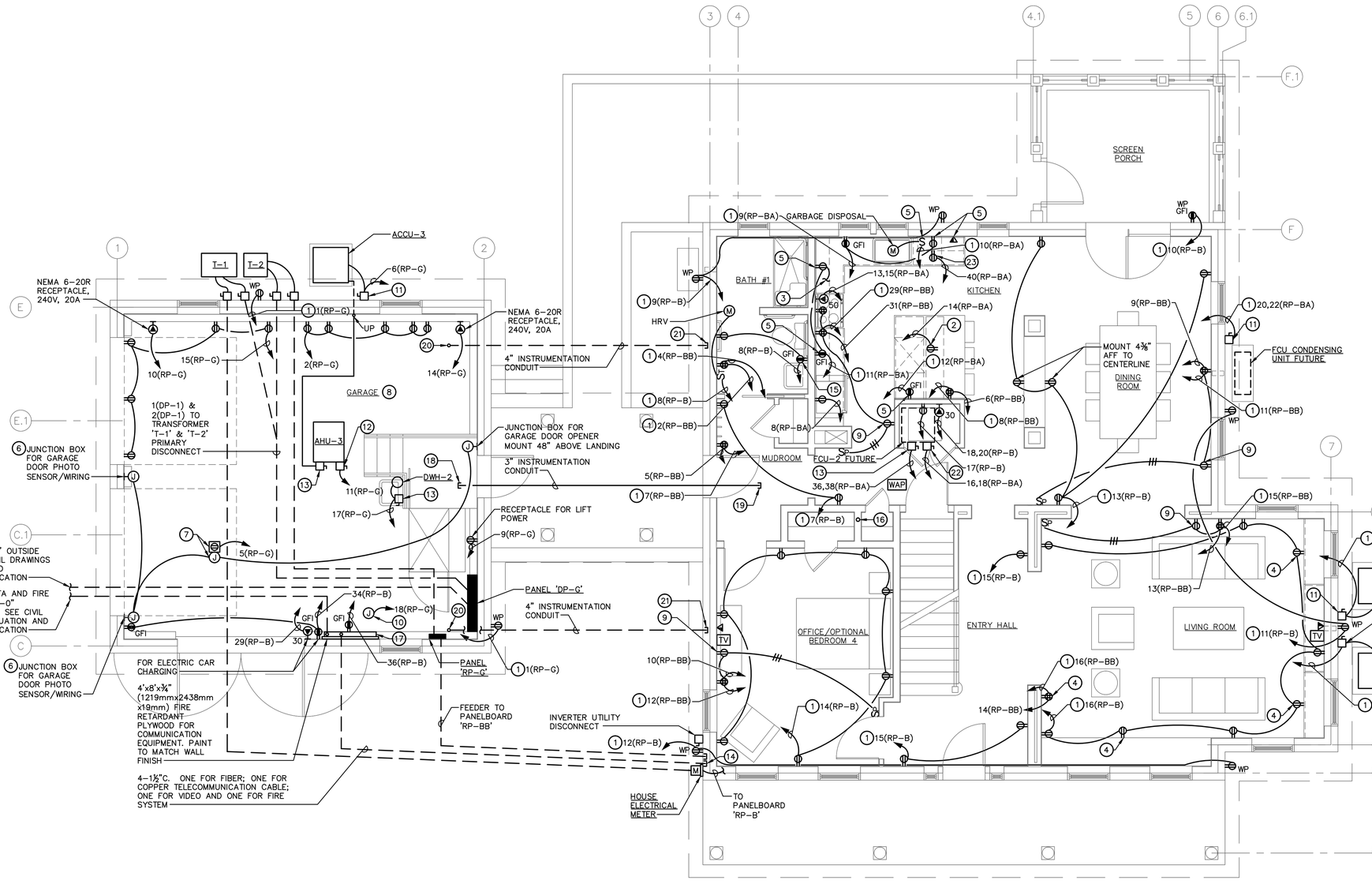
FIRST FLOOR PLAN – LIGHTING

SCALE AS NOTED

E-102

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. TO RELAY PANEL, CONNECT BRANCH CIRCUIT THROUGH RESPECTIVE RELAY AND THEN TO PANELBOARD. SEE RELAY SCHEDULE. LABEL THE LOAD THAT IS SERVED BY THE WIRE.
2. RECEPTACLE FOR MICROWAVE UNDER COUNTER. COORDINATE EXACT LOCATION WITH ARCHITECTURAL DRAWINGS.
3. MAKE CONNECTION TO RANGE HOOD.
4. MOUNT 2⅜" ABOVE FINISHED FLOOR TO CENTER LINE.
5. MOUNT 4'–¾" ABOVE FINISHED FLOOR. ALIGN WITH TOP OF TILE.
6. COORDINATE EXACT MOUNTING HEIGHT WITH MANUFACTURERS RECOMMENDATIONS.
7. COORDINATE EXACT LOCATION IN CEILING WITH GARAGE DOOR MOTOR.
8. MOUNT RECEPTACLE IN GARAGE 60" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
9. SEE DRAWING E–502; DETAIL–3 FOR INSTRUMENT POWER WIRING DIAGRAM.
10. JUNCTION BOX FOR FIRE ALARM CONTROL PANEL (FACP). EXTEND BRANCH CIRCUIT TO FACP.
11. 2P–60A NON–FUSED SAFETY SWITCH IN NEMA 3R ENCLOSURE. MOUNT AT EQUIPMENT.
12. 2P–100A NON–FUSED SAFETY SWITCH IN NEMA 1 ENCLOSURE. MOUNT AT EQUIPMENT.
13. 2P–30A NON–FUSED SAFETY SWITCH IN NEMA 1 ENCLOSURE. MOUNT AT EQUIPMENT.
14. TERMINATE COMMUNICATION CONDUITS WITH BUSHED END INSIDE BASEMENT.
15. MOUNT 48" ABOVE FINISHED FLOOR.
16. FEEDER FROM PANEL 'RP–A'.
17. WIREWAY FOR TERMINATING COMMUNICATION CONDUITS AND SEPARATING VOICE, DATA AND FIRE ALARM CABLE. PROVIDE 2–2"C BETWEEN WIREWAY AND FIRE ALARM CABINET. PROVIDE 2–3" BUSHED OPENINGS FOR VOICE AND DATA CABLE. SIZE WIREWAY AS REQUIRED.
18. TERMINATE WITH BUSHED END IN GARAGE ATTIC AT ACCESS HATCH.
19. TERMINATE WITH BUSHED END IN SECOND FLOOR FRAMING BELOW BEDROOM #2 FLOOR HATCH.
20. TERMINATE WITH BUSHED END AT GARAGE FLOOR.
21. TERMINATE CONDUIT APPROXIMATELY 36" ABOVE FINISHED FLOOR OF BASEMENT AND PROVIDE A BUSHED END. TERMINATE AT FOUNDATION WALL.
22. 2P–60A NON–FUSED SAFETY SWITCH IN A NEMA 1 ENCLOSURE. MOUNT AT EQUIPMENT.
23. MOUNT BEHIND DISHWASHER. FIELD COORDINATE EXACT LOCATION.



FIRST FLOOR PLAN – POWER

SCALE: ¼" = 1'–0'

CAUTION:

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GRAPHIC SCALE

0 2' 4' 8' 12' 1/4"=1'–0"

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ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 E–103
DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

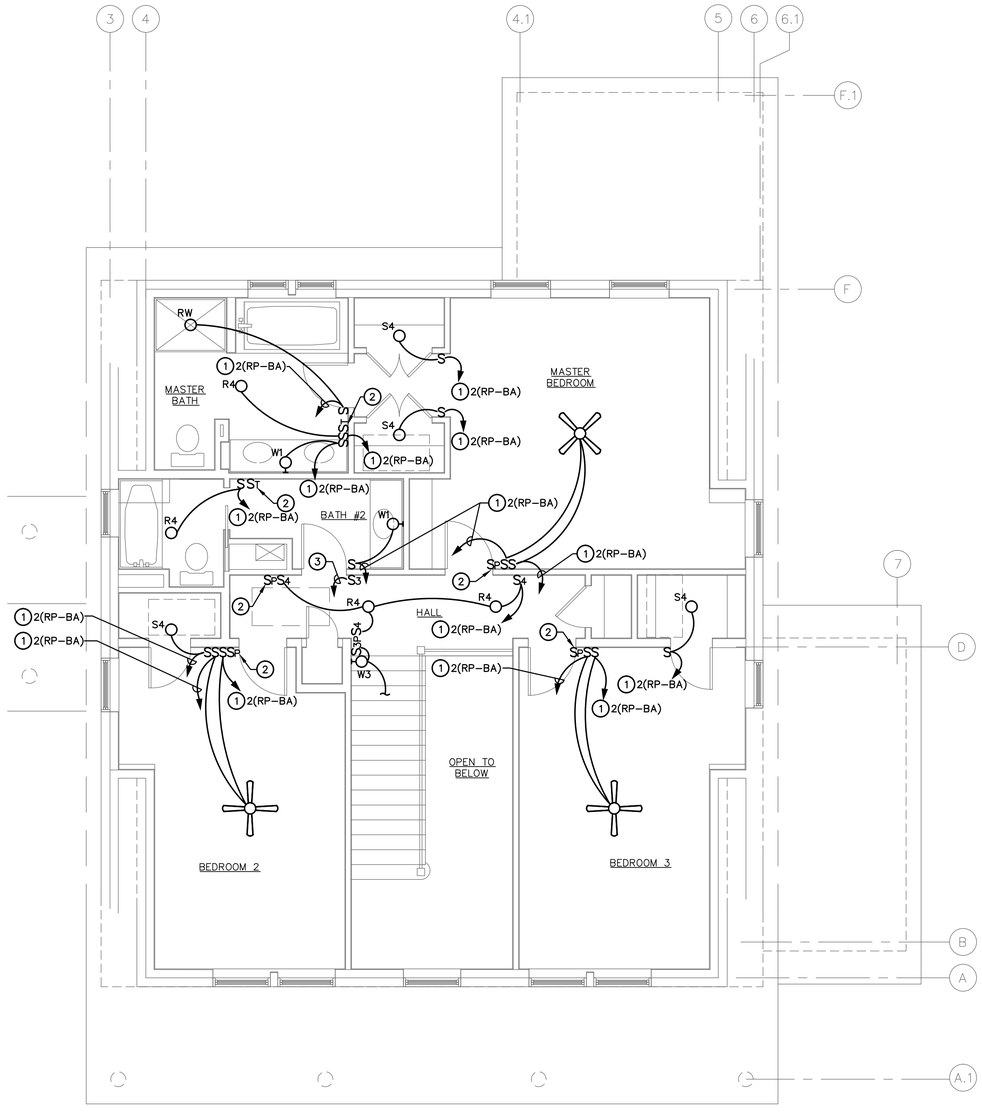
FIRST FLOOR PLAN – POWER

SCALE AS NOTED

E–103

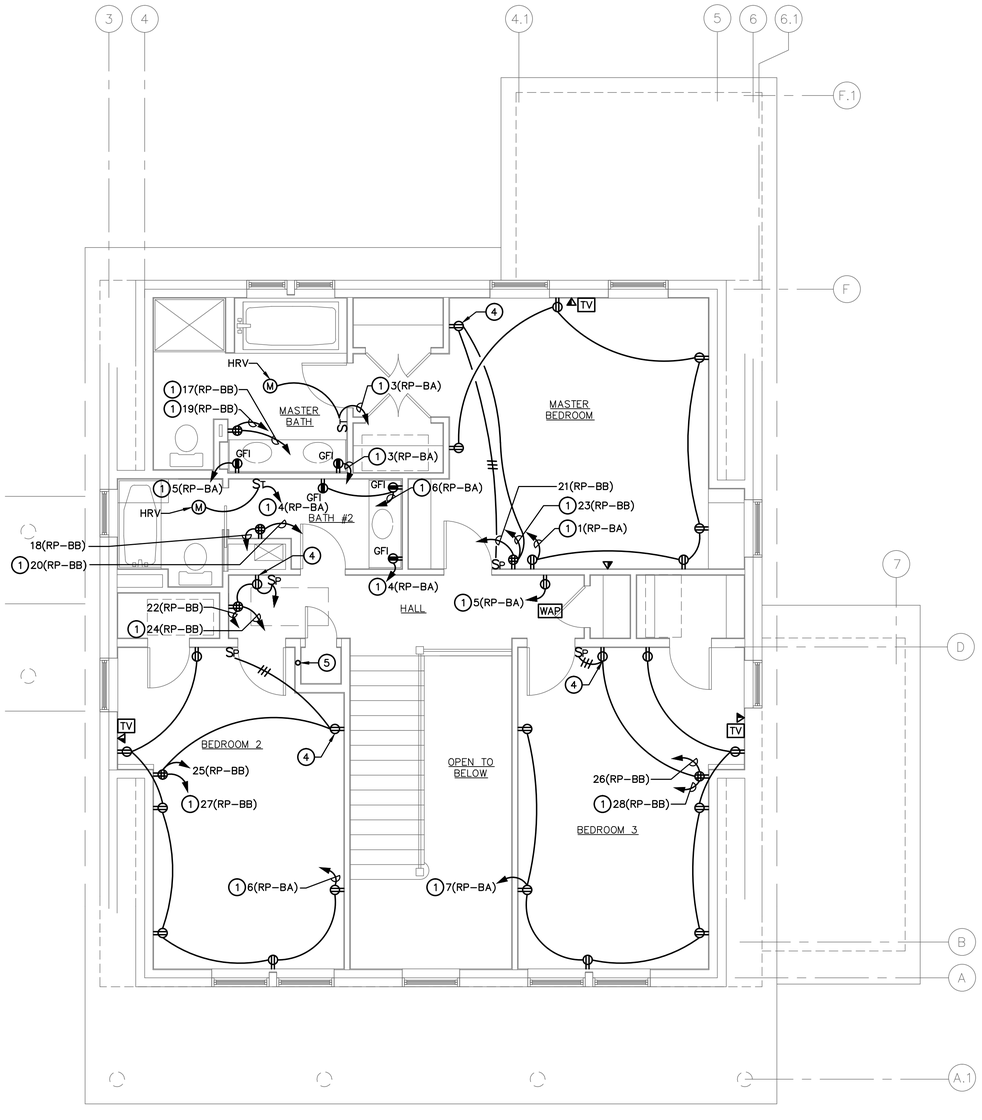
DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. TO RELAY PANEL, CONNECT BRANCH CIRCUIT THROUGH RESPECTIVE RELAY AND THEN TO PANELBOARD. SEE RELAY SCHEDULE. LABEL THE LOAD THAT IS SERVED BY THE WIRE.
2. SWITCH FOR RECEPTACLE. SEE "SECOND FLOOR PLAN – POWER" ON THIS SHEET FOR SWITCH CIRCUIT.
3. UP TO ATTIC LIGHTING FIXTURES.
4. SEE DRAWING E–502 FOR INSTRUMENT POWER WIRING DIAGRAM.
5. FEEDER FROM PANEL 'RP–A'.



SECOND FLOOR PLAN – LIGHTING

SCALE: ¼" = 1'–0'



SECOND FLOOR PLAN – POWER

SCALE: ¼" = 1'–0'

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 2' 4' 8' 12' 1/4"=1'–0"

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PROJECT:

National Institute of Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD

Building America — U.S. Department of Energy — Research Toward Zero Energy Homes

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 E–104
DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

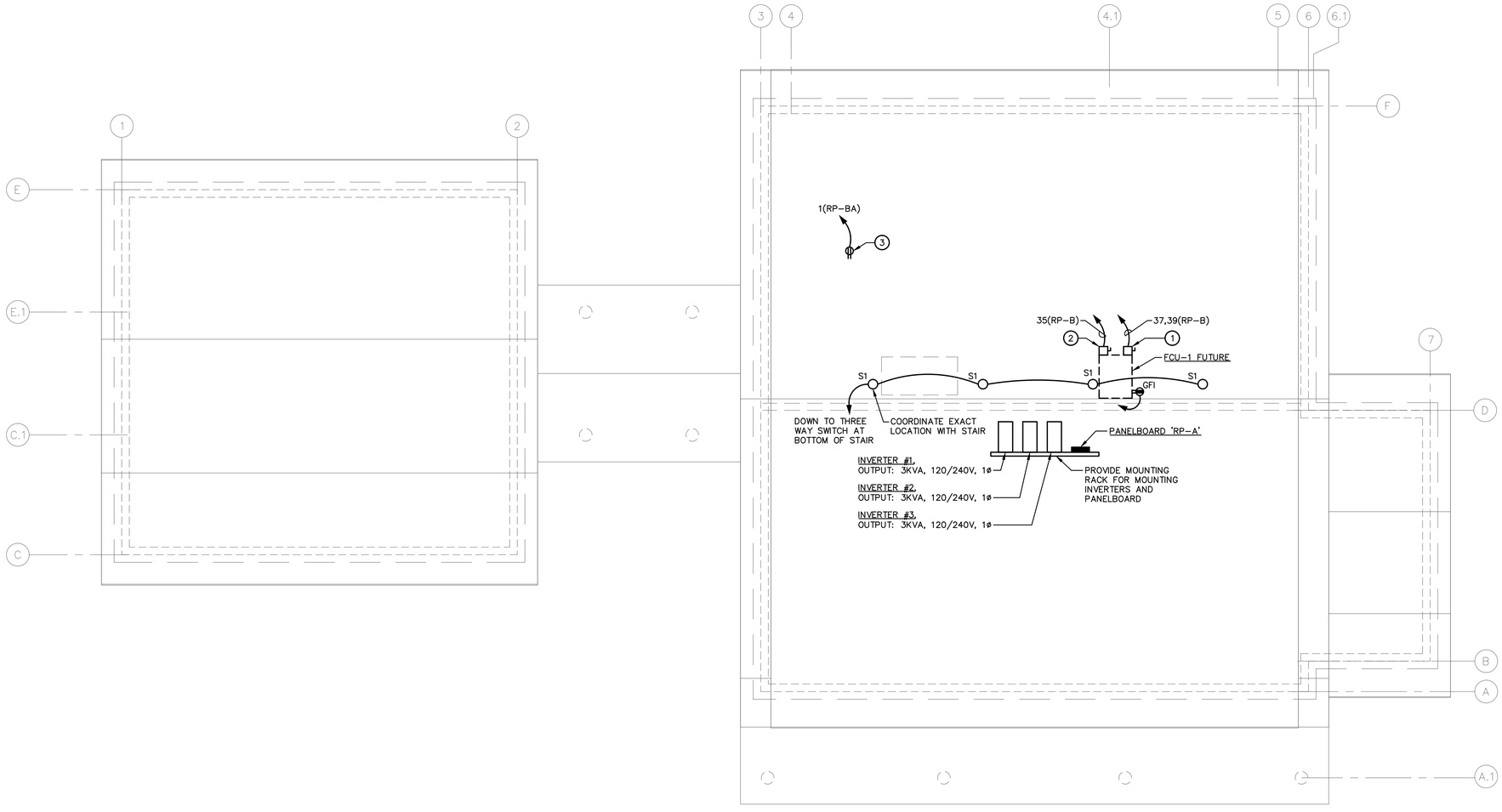
SECOND FLOOR PLAN – LIGHTING & POWER

SCALE AS NOTED

E–104

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. 2P–60A NON–FUSED SAFETY SWITCH IN NEMA 1 ENCLOSURE. MOUNT AT EQUIPMENT.
2. 2P–30A NON–FUSED SAFETY SWITCH IN NEMA 1 ENCLOSURE. MOUNT AT EQUIPMENT.
3. LOCATE RECEPTACLE ADJACENT TO RADON VENT. FIELD COORDINATE THE EXACT LOCATION.



ATTIC FLOOR PLAN – ELECTRICAL

SCALE: ¼" = 1'–0'

CAUTION:

IF THIS PLAN IS A REDUCTION, GRAPHIC SCALES MUST BE USED.

GRAPHIC SCALE

0 2' 4' 8' 12' 1/4"=1'–0"

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MARK	DATE	DESCRIPTION
	6/29/10	REVISIONS
	5/7/10	UPDATED
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 E–105
DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

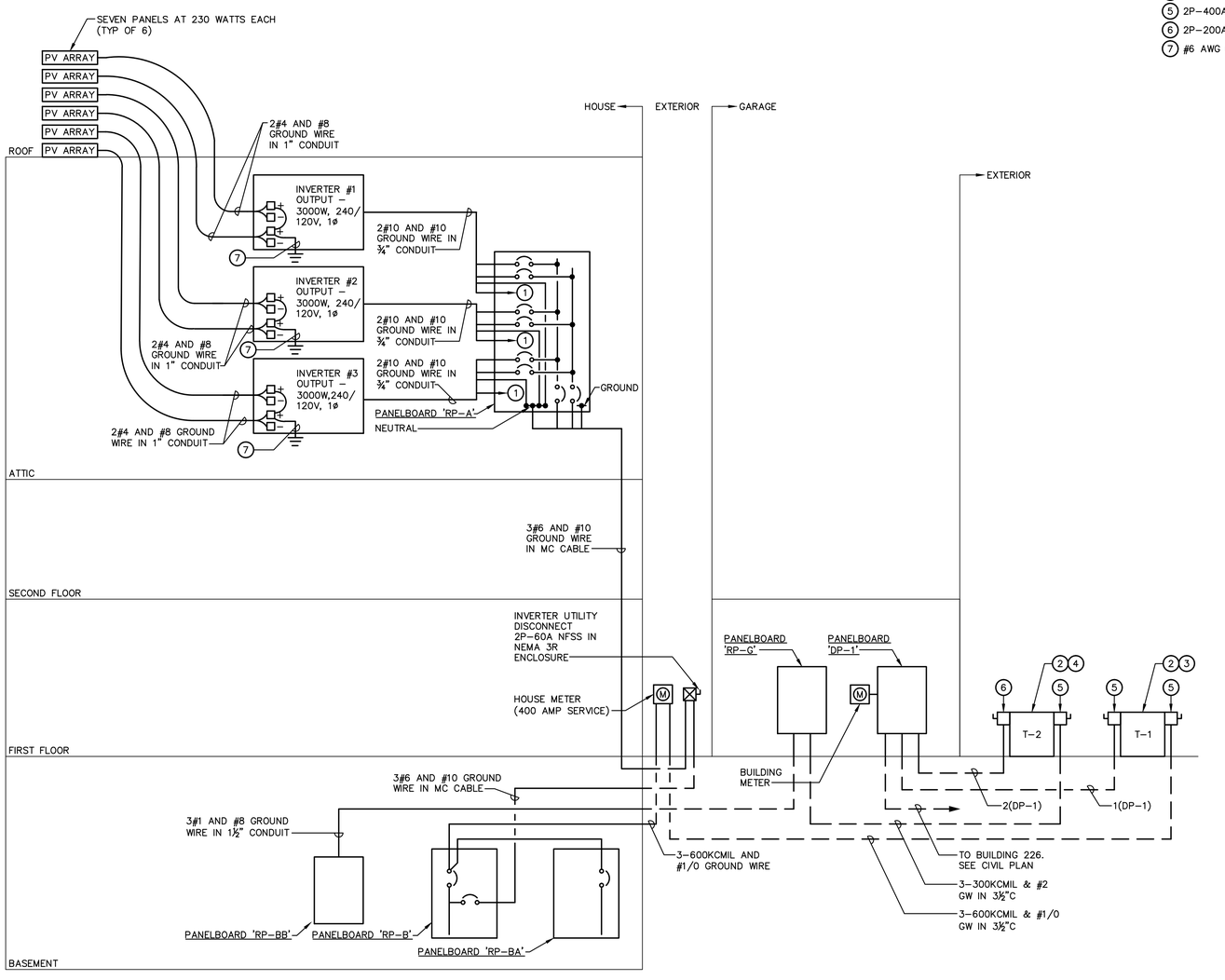
ATTIC FLOOR PLAN – ELECTRICAL

SCALE AS NOTED

E–105

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

1. TO GROUND BUS IN PANELBOARD.
2. PROVIDE WARNING LABEL: "CAUTION – EQUIPMENT IS BACKFED FROM A PHOTO VOLTAIC POWER SOURCE".
3. 75KVA – 480–120/240V, 1ø IN WEATHERPROOF ENCLOSURE.
4. 50KVA – 480–120/240V, 1ø IN WEATHERPROOF ENCLOSURE.
5. 2P–400A NFSS IN NEMA 3R ENCLOSURE. MOUNT AT TRANSFORMER.
6. 2P–200A NFSS IN NEMA 3R ENCLOSURE. MOUNT AT TRANSFORMER.
7. #6 AWG COPPER IN ¾" CONDUIT TO SERVICE ENTRANCE GROUND.



ELECTRICAL RISER DIAGRAM

NO SCALE

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MARK	DATE	DESCRIPTION
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ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

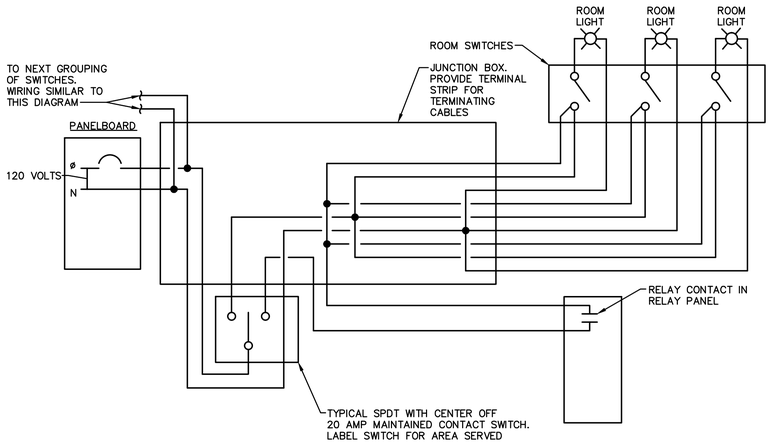
PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09–247 E–501
DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

ELECTRICAL RISER DIAGRAM

SCALE AS NOTED

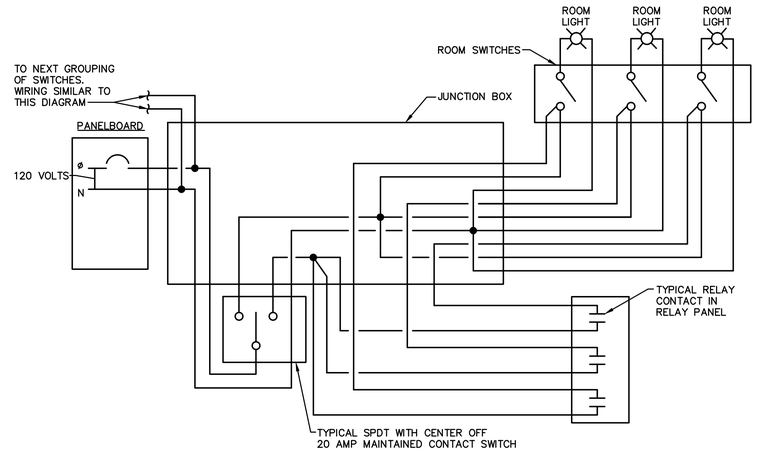
E–501



1 E-102, E-104 E-502

TYPICAL WIRING DIAGRAM FOR ROOM SWITCHES

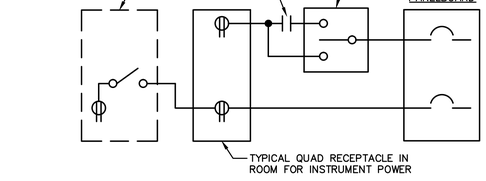
NO SCALE



2 E-102, E-104 E-502

TYPICAL FUTURE WIRING DIAGRAM FOR ROOM SWITCHES

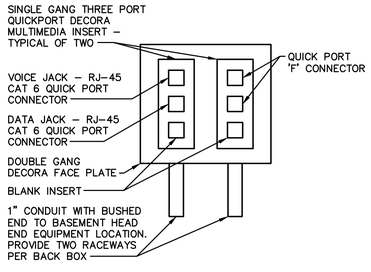
NO SCALE



3 E-102, E-104 E-502

TYPICAL ROOM INSTRUMENT POWER WIRING DIAGRAM

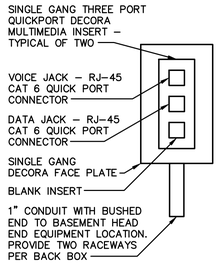
NO SCALE



4 E-502 E-502

VOICE, DATA AND VIDEO OUTLET

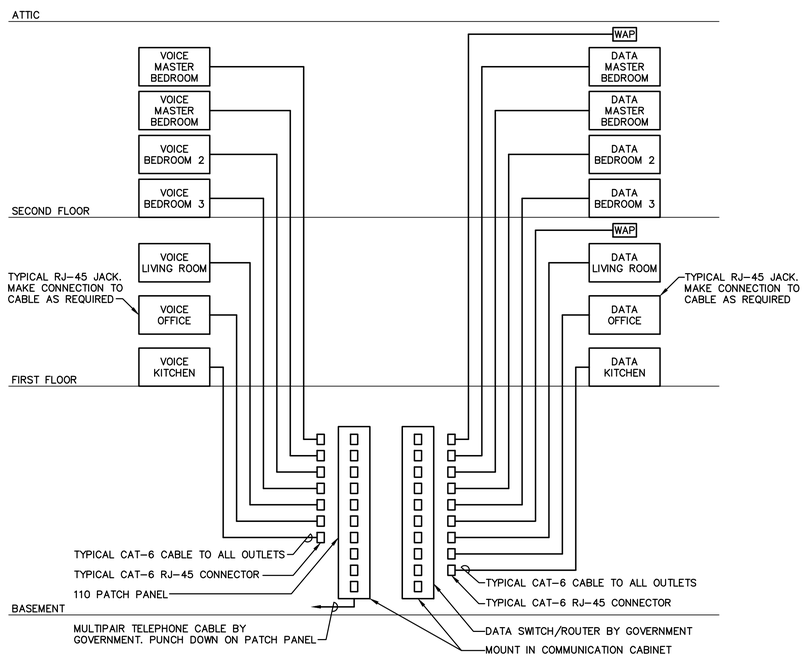
NO SCALE



5 E-502 E-502

VOICE AND DATA OUTLET

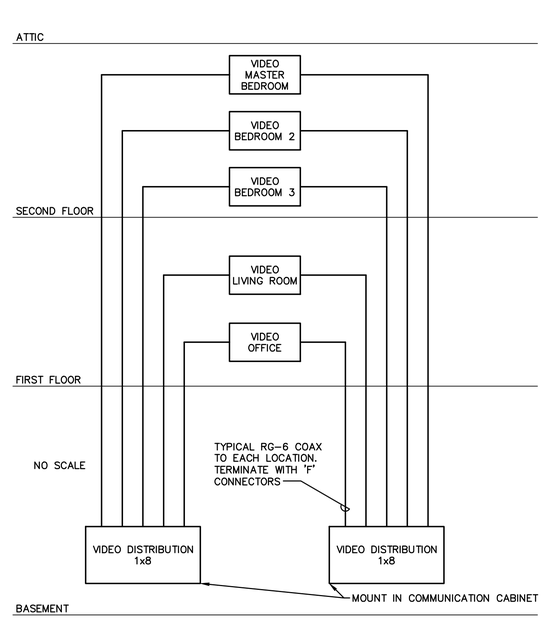
NO SCALE



6 E-502 E-502

VOICE/DATA RISER

NO SCALE



7 E-502 E-502

VIDEO RISER

NO SCALE

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CAD DWG FILE:	09-247 E-502
DRAWN BY:	JEM
CHECKED BY:	FJL

SHEET TITLE:

ELECTRICAL DETAILS

SCALE AS NOTED

E-502

PANEL SCHEDULE 'RP-A'

120/240 VOLTS – 1 PHASE – 3 WIRE – SURFACE MOUNTED

CIR	FOR	BREAKER POLE	BREAKER TRIP	AMPERES/PHASE A	AMPERES/PHASE A	AMPERES/PHASE B	AMPERES/PHASE B	CIR	FOR	BREAKER POLE	BREAKER TRIP
1	INVERTER NO. 1	2	20	12.5	12.5			2	INVERTER NO. 2	2	20
3	–	–	–			12.5	12.5	4	–	–	–
5	INVERTER NO. 3	2	20	12.5	0.0			6	SPACE	1	–
7	–	–	–			12.5	0.0	8	SPACE	1	–
9	SPACE	1	–	0.0	0.0			10	SPACE	1	–
11	SPACE	1	–			0.0	0.0	12	SPACE	1	–
				25.0	12.5	25.0	12.5				
			TOTALS	A=	37.5	B=	37.5				

MAIN BREAKER 2P,60A

MAIN LUGS ONLY — AMPERES–TOP/BOTTOM — CONNECTED LOAD 9.0 KVA

MINIMUM AIC RATING = 10,000 — AMPERES SYMMETRICAL

MAIN DISTRIBUTION PANEL SCHEDULE DP-1

480/277 VOLTS, 3 PHASE, 4 WIRE

CIR	LOAD	BREAKER FR	BREAKER POLE	BREAKER CAL	KVA	NUMBER OF CONDUIT	CONDUIT SIZE	CDT. SIZE	REMARKS
1	TRANSFORMER 'T–1'	400	2	250	75	1	3"	3–250KCMIL & #4GW	–
2	TRANSFORMER 'T–2'	225	2	175	50	1	3"	3#2/0 & #6GW	–
3	EQUIPPED SPACE ONLY	225	3	–	–	–	–	–	–
4	EQUIPPED SPACE ONLY	225	3	–	–	–	–	–	–

3P–400 AMP MAIN CIRCUIT BREAKER

RELAY PANEL SCHEDULE

RELAY NUMBER	BRANCH CIRCUIT	LOAD SERVED
1	34(RP–BA)	BATH #1 LIGHTS
2	34(RP–BA)	BATH #1 CLOSET LIGHTS
3	34(RP–BA)	KITCHEN LIGHTS WEST WALL
4	34(RP–BA)	KITCHEN LIGHTS NORTH WALL
5	34(RP–BA)	KITCHEN LIGHTS PENINSULA
6	34(RP–BA)	DINING ROOM LIGHTS NORTH WALL
7	34(RP–BA)	DINING ROOM LIGHTS NORTH WALL
8	32(RP–BA)	LIVING ROOM LIGHTS SOUTH WEST WALL
9	32(RP–BA)	ENTRY HALL LIGHTS SOUTH WALL
10	32(RP–BA)	OFFICE/OPTIONAL BEDROOM #4 LIGHTS/FAN SOUTH EAST WALL
11	34(RP–BA)	MUDROOM LIGHTS WEST WALL
12	32(RP–BA)	BASEMENT STAIRS LIGHTS
13	32(RP–BA)	FIRST FLOOR STAIRS LIGHTS
14	34(RP–BA)	GARAGE EXTERIOR LIGHTS
15	2(RP–BA)	MASTER BEDROOM LIGHTS/FAN SOUTH WALL
16	2(RP–BA)	MASTER BEDROOM CLOSET #1 LIGHTS
17	2(RP–BA)	MASTER BEDROOM CLOSET #2 LIGHTS
18	2(RP–BA)	MASTER BATH LIGHTS EAST WALL
19	2(RP–BA)	BEDROOM #2 LIGHTS/FAN NORTH WALL
20	2(RP–BA)	BEDROOM #3 LIGHTS/FAN NORTH WALL
21	2(RP–BA)	BEDROOM #3 CLOSET LIGHTS NORTH WALL
22	2(RP–BA)	HALL LIGHTS NORTH EAST WALL
23	23(RP–BB)	MASTER BEDROOM INSTRUMENT POWER
24	1(RP–BA)	MASTER BEDROOM RECEPTACLES
25	3(RP–BA)	MASTER BATH HRV
26	3(RP–BA)	MASTER BATH RECEPTACLES
27	5(RP–BA)	MASTER BATH RECEPTACLES
28	4(RP–BA)	BATH #2 RECEPTACLES
29	6(RP–BA)	BATH #2 RECEPTACLES
30	18(RP–BB)	BATH #2 INSTRUMENT POWER
31	4(RP–BA)	BATH #2 HRV
32	27(RP–BB)	BEDROOM #2 INSTRUMENT POWER
33	6(RP–BA)	BEDROOM #2 RECEPTACLES
34	7(RP–BA)	BEDROOM #3 RECEPTACLES
35	28(RP–BB)	BEDROOM #3 INSTRUMENT POWER
36	9(RP–B)	EXTERIOR RECEPTACLES NORTH WEST
37	10(RP–B)	SCREEN PORCH
38	11(RP–B)	EXTERIOR RECEPTACLES SOUTH EAST
39	12(RP–B)	EXTERIOR RECEPTACLES SOUTH
40	8(RP–B)	BATH #1 HRV
41	8(RP–B)	BATH #1 RECEPTACLES
42	4(RP–BB)	BATH #1 INSTRUMENT POWER
43	7(RP–BB)	MUDROOM INSTRUMENT POWER
44	7(RP–B)	CENTER HALL
45	11(RP–BA)	KITCHEN RECEPTACLES WEST WALL
46	9(RP–BA)	KITCHEN RECEPTACLES NORTH WALL
47	10(RP–BA)	GARAGE DISPOSAL NORTH WALL
48	12(RP–BA)	KITCHEN PENINSULA RECEPTACLES
49	8(RP–BB)	KITCHEN PENINSULA INSTRUMENT POWER
50	13(RP–B)	DINING ROOM RECEPTACLES
51	15(RP–B)	ENTRY HALL RECEPTACLES NORTH EAST
52	15(RP–B)	ENTRY HALL RECEPTACLES SOUTH
53	15(RP–BB)	LIVING ROOM INSTRUMENT POWER
54	16(RP–B)	LIVING ROOM RECEPTACLES
55	16(RP–BB)	LIVING ROOM INSTRUMENT POWER
56	12(RP–BB)	OFFICE/OPTIONAL BEDROOM INSTRUMENT POWER
57	14(RP–B)	OFFICE/OPTIONAL BEDROOM INSTRUMENT RECEPTACLES

NOTE: 1. PROVIDE ALL REQUIRED SUB FEED LUGS FOR ADDING FUTURE ADDITIONAL RELAY PANELS.

PANEL SCHEDULE 'RP-B'

120/240 VOLTS – 1 PHASE – 3 WIRE – SURFACE MOUNTED

CIR	FOR	BREAKER POLE	BREAKER TRIP	AMPERES/PHASE A	AMPERES/PHASE A	AMPERES/PHASE B	AMPERES/PHASE B	CIR	FOR	BREAKER POLE	BREAKER TRIP
1	RECEPT – BASEMENT	1	20	7.5	7.5			2	RECEPT – BASEMENT	1	20
3	RECEPT – BASEMENT	1	20			6.0	7.2	4	RECEPT – SUMP PUMP	1	20
5	SPARE	1	20	0.0	0.0			6	LIGHTS – FIRST FLOOR	1	20
7	SPARE	1	20			0.0	3.0	8	GFI RECEPT – BATH #1	1	20
9	RECEPT – OUTSIDE NORTH	1	20*	3.0	1.5			10	RECEPT – SCREEN PORCH	1	20
11	RECEPT – OUTSIDE EAST	1	20*			4.5	3.0	12	RECEPT – OUTSIDE SOUTH	1	20*
13	SPARE	1	20	6.0	10.5			14	RECEPT – OFFICE/BEDROOM 4	1	20
15	RECEPT – ENTRY HALL	1	20			4.5	9.0	16	SPARE	1	20
17	RECEPT – WASHER	1	20	10.0	21.0			18	RECEPT – DRYER	2	30
19	DEHUMIDIFIER DH–1	1	20			0.0	21.0	20	----------	–	–
21	AHU–1 – HEATER	2	80	60.0	0.0			22	AHU–2 – HEATER	2	80
23	----------	–	–			60.0	0.0	24	----------	–	–
25	HEAT RECOVERY UNIT HVR–1	1	15	1.2	22.0			26	WATER HEATER DWH–1	2	30
27	OUTSIDE LIGHTS	1	20			0.0	22.0	28	----------	–	–
29	VEHICLE CHARGER OUTLET	2	30	20.0	0.0			30	AHU–2 (ALTERNATE SYSTEM)	1	20
31	----------	–	–			20.0	10.0	32	AHU–1	1	20
33	INVERTER POWER	2	60	0.0	0.0			34	VEHICLE CHARGER OUTLET	1	20
35	FCU–1 (FUTURE)(ALT SYSTEM)	1	15			0.0	4.5	36	GARAGE RECEPTACLE	1	20
37	FCU–1 (FUTURE)(HEATER)	2	40	0.0	0.0			38	SPACE	1	–
39	(ALTERNATE SYSTEM)	–	–			0.0	0.0	40	SPACE	1	–
41	SPARE	1	20	0.0	0.0			42	SPACE	1	–
				107.7	62.5	95.0	79.7				
			TOTALS	A=	170.2	B=	174.7				

* GFCI BREAKER

– PROVIDE ARC FAULT BREAKERS AS REQUIRED
– PROVIDE WITH THRU FEED LUGS
– PROVIDE WITH BRANCH CIRCUIT MONITORING

MAIN BREAKER 2P, 400A

AMPERES–TOP/BOTTOM — CONNECTED LOAD 41.4 KVA

MINIMUM AIC RATING = 22,000 — AMPERES SYMMETRICAL

PANEL SCHEDULE 'RP-BA'

120/240 VOLTS – 1 PHASE – 3 WIRE – SURFACE MOUNTED

CIR	FOR	BREAKER POLE	BREAKER TRIP	AMPERES/PHASE A	AMPERES/PHASE A	AMPERES/PHASE B	AMPERES/PHASE B	CIR	FOR	BREAKER POLE	BREAKER TRIP
1	ATTIC RADON VENT MOTOR	1	20	10.5	8.4			2	LIGHTS – SECOND FLOOR	1	20
3	RECEPT – MASTER BATH	1	20			4.0	5.5	4	RECEPT – BATH #2	1	20
5	RECEPT – MASTER BATH	1	20	10.0	10.5			6	RECEPT – BATH #2	1	20
7	SPARE	1	20			9.0	10.0	8	RECEPT – REFRIGERATOR	1	20
9	RECEPT – KITCHEN COUNTER	1	20	3.0	5.8			10	RECEPT – GARBAGE DISPOSAL	1	20
11	RECEPT – KITCHEN COUNTER	1	20			3.0	1.5	12	RECEPT – KITCHEN ISLAND GFI	1	20
13	RECEPT – RANGE	2	50	40.0	12.0			14	RECEPT – MICROWAVE/FAN	1	20
15	----------	–	–			40.0	0.0	16	FCU–2 (FUTURE)(FIRST FLOOR)	2	40
17	SWH–1	2	25	19.0	0.0			18	(AH SYSTEM HTR)	–	–
19	----------	–	–			19.0	0.0	20	HPU–4 (11.45A, 230V)	2	25
21	AHU–3	2	–	0.0	0.0			22	(AH SYSTEM)	–	–
23	----------	–	–			0.0	25.6	24	HPU–1 (5 TON)	2	50
25	SWH–2	2	25	19.0	25.6			26	(FOR AHU–1)	–	–
27	----------	–	–			19.0	0.0	28	HPU–2	2	50
29	SPACE	1	–	1.5	0.0			30	(AH SYSTEM FOR AHU–2)	–	–
31	SPACE	1	–			0.0	5.0	32	LIGHTS 1ST FLOOR	1	20
33	SPACE	1	–	0.0	5.0			34	LIGHTS 1ST FLOOR	1	20
35	SPACE	1	–			0.0	0.0	36	FCU–2 (FUTURE)(ALT SYSTEM)	2	15
37	SPACE	1	–	0.0	0.0			38	----------	–	–
39	SPACE	1	–			0.0	15.0	40	DISHWASHER	1	20
41	SPACE	1	–	0.0	0.0			42	SPACE	1	–
				103.0	67.3	94.0	62.6				
			TOTALS	A=	170.3	B=	156.6				

– PROVIDE WITH BRANCH CIRCUIT MONITORING
– PROVIDE ARC FAULT BREAKERS AS REQUIRED

MAIN LUGS ONLY 400A — AMPERES–TOP/BOTTOM — CONNECTED LOAD 39.2 KVA

MINIMUM AIC RATING = 22,000 — AMPERES SYMMETRICAL

PANEL SCHEDULE 'RP-BB' (INSTRUMENTATION)

120/240 VOLTS – 1 PHASE – 3 WIRE – SURFACE MOUNTED

CIR	FOR	BREAKER POLE	BREAKER TRIP	AMPERES/PHASE A	AMPERES/PHASE A	AMPERES/PHASE B	AMPERES/PHASE B	CIR	FOR	BREAKER POLE	BREAKER TRIP
1	RECEPT – BASEMENT	1	20	1.5	1.5			2	RECEPT – BATH #1	1	20
3	RECEPT – BASEMENT	1	20			1.5	1.5	4	RECEPT – BATH #1	1	20
5	RECEPT – MUDROOM	1	20	1.5	1.5			6	RECEPT – KITCHEN	1	20
7	RECEPT – MUDROOM	1	20			1.5	1.5	8	RECEPT – KITCHEN	1	20
9	RECEPT – DINING ROOM	1	20	1.5	1.5			10	RECEPT – OFFICE/BEDROOM 4	1	20
11	RECEPT – DINING ROOM	1	20			1.5	1.5	12	RECEPT – OFFICE/BEDROOM 4	1	20
13	RECEPT – ENTRY HALL	1	20	1.5	1.5			14	RECEPT – LIVING ROOM	1	20
15	RECEPT – ENTRY HALL	1	20			1.5	1.5	16	RECEPT – LIVING ROOM	1	20
17	RECEPT – MASTER BATH	1	20	1.5	1.5			18	RECEPT – BATH #2	1	20
19	RECEPT – MASTER BATH	1	20			1.5	1.5	20	RECEPT – BATH #2	1	20
21	RECEPT – MATER BEDROOM	1	20	1.5	1.5			22	RECEPT – HALL	1	20
23	RECEPT – MATER BEDROOM	1	20			1.5	1.5	24	RECEPT – HALL	1	20
25	RECEPT – BEDROOM 2	1	20	1.5	1.5			26	RECEPT – BEDROOM 3	1	20
27	RECEPT – BEDROOM 2	1	20			1.5	1.5	28	RECEPT – BEDROOM 3	1	20
29	RECEPT – KITCHEN	1	20	1.5	10.0			30	CONTROL POWER FOR SOLENOID TRANSFORMER	1	15
31	RECEPT – KITCHEN	1	20			3.0	10.0	32	CONTROL POWER	1	15
33	BASEMENT LIGHTS	1	20	2.0	0.0			34	SPACE	1	–
35	SPACE	1	–			0.0	0.0	36	SPACE	1	–
37	SPACE	1	–	0.0	0.0			38	SPACE	1	–
39	SPACE	1	–			0.0	0.0	40	SPACE	1	–
41	SPACE	1	–	0.0	0.0			42	SPACE	1	–
				14.0	20.5	13.5	20.5				
			TOTALS	A=	34.5	B=	34.0				

– PROVIDE ARC FAULT BREAKERS AS REQUIRED

MAIN BREAKER 2P, 100A

AMPERES–TOP/BOTTOM — CONNECTED LOAD 8.2 KVA

MINIMUM AIC RATING = 22,000 — AMPERES SYMMETRICAL

PANEL SCHEDULE 'RP-G'

120/240 VOLTS – 1 PHASE – 3 WIRE – SURFACE MOUNTED

CIR	FOR	BREAKER POLE	BREAKER TRIP	AMPERES/PHASE A	AMPERES/PHASE A	AMPERES/PHASE B	AMPERES/PHASE B	CIR	FOR	BREAKER POLE	BREAKER TRIP
1	RECEPT – OUTSIDE	1	20*	3.0	4.5			2	RECEPT – NORTH WALL	1	20
3	RECEPT – GARAGE DOOR	1	20			9.8	0.0	4	SPARE	1	20
5	RECEPT – GARAGE DOOR	1	20	9.8	15.0			6	GARAGE (HPU–3)	2	25
7	SPARE	1	20			0.0	15.0	8	----------	–	–
9	LIFT	1	20	12.0	12.0			10	RECEPT – NORTH WALL	2	20
11	AHU–3 HEATER PKG	2	40			31.0	12.0	12	----------	–	–
13	----------	–	–	31.0	12.0			14	RECEPT – NORTH WALL	2	20
15	RECEPT – NORTH WALL	1	20			12.0	12.0	16	----------	–	–
17	DWH–2	2	20	14.6	10.0			18	FACP	1	20
19	----------	–	–			14.6	0.0	20	SPARE	1	20
21	SPACE	1	–	0.0	0.0			22	SPACE	1	–
23	SPACE	1	–			0.0	0.0	24	SPACE	1	–
25	SPACE	1	–	0.0	0.0			26	SPACE	1	–
27	SPACE	1	–			0.0	0.0	28	SPACE	1	–
29	SPACE	1	–	0.0	0.0			30	SPACE	1	–
31	SPACE	1	–			0.0	0.0	32	SPACE	1	–
33	SPACE	1	–	0.0	0.0			34	SPACE	1	–
35	SPACE	1	–			0.0	0.0	36	SPACE	1	–
37	SPACE	1	–	0.0	0.0			38	SPACE	1	–
39	PANEL RP–BB	2	100			21.0	0.0	40	SPACE	1	–
41	----------	–	–	21.0	0.0			42	SPACE	1	–
				91.4	53.5	88.4	39.0				
			TOTALS	A=	144.9	B=	127.4				

* GFCI BREAKER

MAIN BREAKER 2P, 250A

AMPERES–TOP/BOTTOM — CONNECTED LOAD 32.7 KVA

MINIMUM AIC RATING = 22,000 — AMPERES SYMMETRICAL

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LICENSE NO. 13434 EXPIRATION DATE: 4–26–2011

PROJECT:

National Institute of Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD

Building America — U.S. Department of Energy — Research Toward Zero Energy Homes

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

MARK	DATE	DESCRIPTION
	6/29/10	REVISIONS
	5/7/10	UPDATED
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

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CHECKED BY: FJL

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ELECTRICAL PANEL SCHEDULES

SCALE AS NOTED

E–601