

National Institute of Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD



PROJECT DESCRIPTION

These plans describe an energy efficient net zero single family home to be built in Gaithersburg, MD. The home has four bedrooms, three full baths and a full basement. The drawing set and specifications were developed by Building Science Corporation with support from the Department of Energy's Building America Program. The home will be registered under USGBC's LEED for Homes program and will target Platinum Certification. During project planning and construction, all efforts should be made to meet the goals of this project.

BUILDING CODE

These plans are submitted under the 2009 Edition of the International Residential Code For One-and Two-Family Dwellings.

SQUARE FOOTAGES - Area calculations according to ANSI Z765-2003

Basement	1,518 sq. ft.
First Floor	1,518 sq. ft.
Second Floor	1,191 sq. ft.

PROJECT TEAM

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CONSTRUCTION MANAGER

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DRAWING LIST

ARCHITECTURAL

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PLUMBING

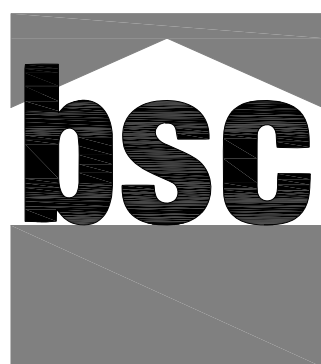
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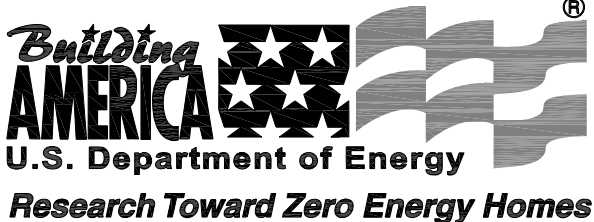
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CONSTRUCTION DOCUMENTS
31 MARCH 2010 ISSUED FOR CONSTRUCTION



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

GENERAL STRUCTURAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THESE PLANS AND THE INTERNATIONAL RESIDENTIAL CODE (IRC 2009), TRUSS MANUFACTURER SHOP DRAWINGS, AND THE MATERIAL MANUFACTURERS' INSTALLATION INSTRUCTIONS.
2. WHERE CONFLICTING INFORMATION EXISTS BETWEEN THESE PLANS AND OTHER REFERENCED REQUIREMENTS, THE MORE STRINGENT REQUIREMENT SHALL APPLY UNLESS OTHERWISE APPROVED BY THE DESIGN PROFESSIONAL RESPONSIBLE FOR THESE PLANS.
3. THE CONTRACTOR IS RESPONSIBLE TO IDENTIFY AND RESOLVE ALL CONFLICTS AND DISCREPANCIES PRIOR TO AND DURING CONSTRUCTION AND FACILITATE PROPER CONSTRUCTION AS INTENDED BY THESE PLANS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE STRUCTURAL SUPPORT OF CONSTRUCTION LOADS DURING ALL PHASES OF CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, FOUNDATION BACKFILL, BRACING OF WALL FRAMING TO RESIST CONSTRUCTION FLOOR LOADS AND LATERAL BUILDING LOADING, BRACING OF TRUSSES DURING INSTALLATION AND SUBSEQUENT CONSTRUCTION LOADING, AND OTHER CONDITIONS AS DICTATED BY THE CONTRACTOR'S CONSTRUCTION PRACTICE.
5. CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT CONSTRUCTION SAFETY REGULATIONS OF OSHA.
6. ALL CONSTRUCTION SHALL BE PERFORMED IN A GOOD, WORKMANLIKE MANNER FOLLOWING ACCEPTED CONSTRUCTION PRACTICES AND TOLERANCES. DEFECTIVE OR DAMAGED MATERIALS SHALL NOT BE USED AND SHALL BE REPLACED.

ENCLOSURE THERMAL ENVELOPE CRITERIA

COMPONENT	R-VALUE	U-VALUE
FRAMED WALLS	R-45	
ROOF	R-72	
WINDOWS		U-0.19
BASEMENT WALLS	R-23	
BASEMENT FLOOR	R-10	

DESIGN CRITERIA

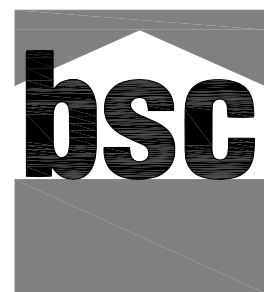
STRUCTURAL DESIGN CRITERIA

DESIGN ITEM	CRITERIA	CODE REFERENCE
GROUND SNOW LOAD	30 PSF – SEE NOTE 1	IRC 2009 FIG R301.2(5), ASCE 7 FIG 7-1
BASIC WIND SPEED	90 MPH (GUST)	IRC 2003, FIG R301.2(4) ASCE 7, FIG 6-1C
WIND EXPOSURE	C	IRC 2003, SEC R301.2.1.4 ASCE 7, Sect 6.5.6
WIND BORNE DEBRIS REGION	NO	IRC 2009 Sect. R301.2.1.2 ASCE 7, Sect. 6.5.9
MAPPED SEISMIC HAZARD	$S_s = 0.16g$ $S_1 = 0.05g$	ASCE 7, CH 11 & CH 22
SEISMIC SITE CLASS	D (firm soil assumed) ($F_a = 1.6$; $F_v = 2.4$)	ASCE 7, Sect. 11.4.2
SEISMIC DESIGN SPECTRAL ACCELERATION PARAMETERS	$SDS = 2/3(1.6)(0.16g) = 0.17g$ $SD_1 = 2/3(2.4)(0.05g) = 0.08g$	ASCE 7, Sect. 11.4
SEISMIC DESIGN CATEGORY	B (IRC DWELLINGS EXEMPT)	ASCE 7, Sect. 11.6
IRC 2009, FIG R301.2(2) LIVE LOADS		IRC 2009, TABLE R301.4 ASCE TABLE 4-1
FLOORS & DECKS	40 PSF	
FLOORS (BEDROOM AREAS)	30 PSF	
ATTIC WITH STORAGE	20 PSF	
ATTIC W/O STORAGE	10 PSF	
ROOF	20 PSF - SEE NOTE 2	
DEAD LOADS	Main house roof/ceiling dead load is 20 psf to account for solar panels and non-standard framing.	
FLOOR	10 PSF	
ROOF	15 PSF (20 PSF main house)	
WALL	8 PSF	
FROST DEPTH	30 INCHES	Based on local practice
AIR-FREEZING INDEX	350 deg. F-DAYS	ASCE 32-01, IRC FIG. R403.3(2)
SOIL BEARING VALUE (ASD)	3,000 PSF – SEE NOTE 3	Based on preliminary information for soils report provided by NIST consultant (otherwise use presumptive value per IRC Table 401.4.1)
LATERAL SOIL LOAD	45 PCF	Backfill Soil Class I or II required per IRC 2009 Table R404.1.2(4) and Table 405.1
CONVENTIONAL LIGHT-FRAME CONSTRUCTION REQUIREMENTS	SEE CODE REFERENCE	IRC 2009, CH 3, 4, 5, 6, 8 IBC 2009, CH 18 AND SEC 2308

ABBREVIATIONS

A.F.F.	ABOVE FINISHED FLOOR
B.O.	BOTTOM OF
BTW	BETWEEN
C/L	CENTER LINE
CLR.	CLEAR
EL.	ELEVATION
ELEV.	ELEVATION
EQ.	EQUAL
GWB	GYPSUM WALLBOARD
HRV	HEAT RECOVERY VENTILATOR
HVAC	HEATING VENTILATING AND AIR CONDITIONING
INSUL	INSULATION
LSL	LAMINATED STRAND LUMBER
MIN.	MINIMUM
O.C.	ON CENTER
PCF	POUNDS PER CUBIC FOOT
PV	PHOTOVOLTAIC
T & G	TONGUE & GROOVE
T.O.	TOP OF
TYP.	TYPICAL
W/	WITH
WD.	WOOD
W/O	WITHOUT

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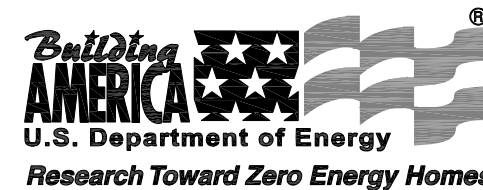
CONSULTANT: _____

PROJECT:

National Institute of
Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD



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

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	A-PLOT-SPEC-NZERTF
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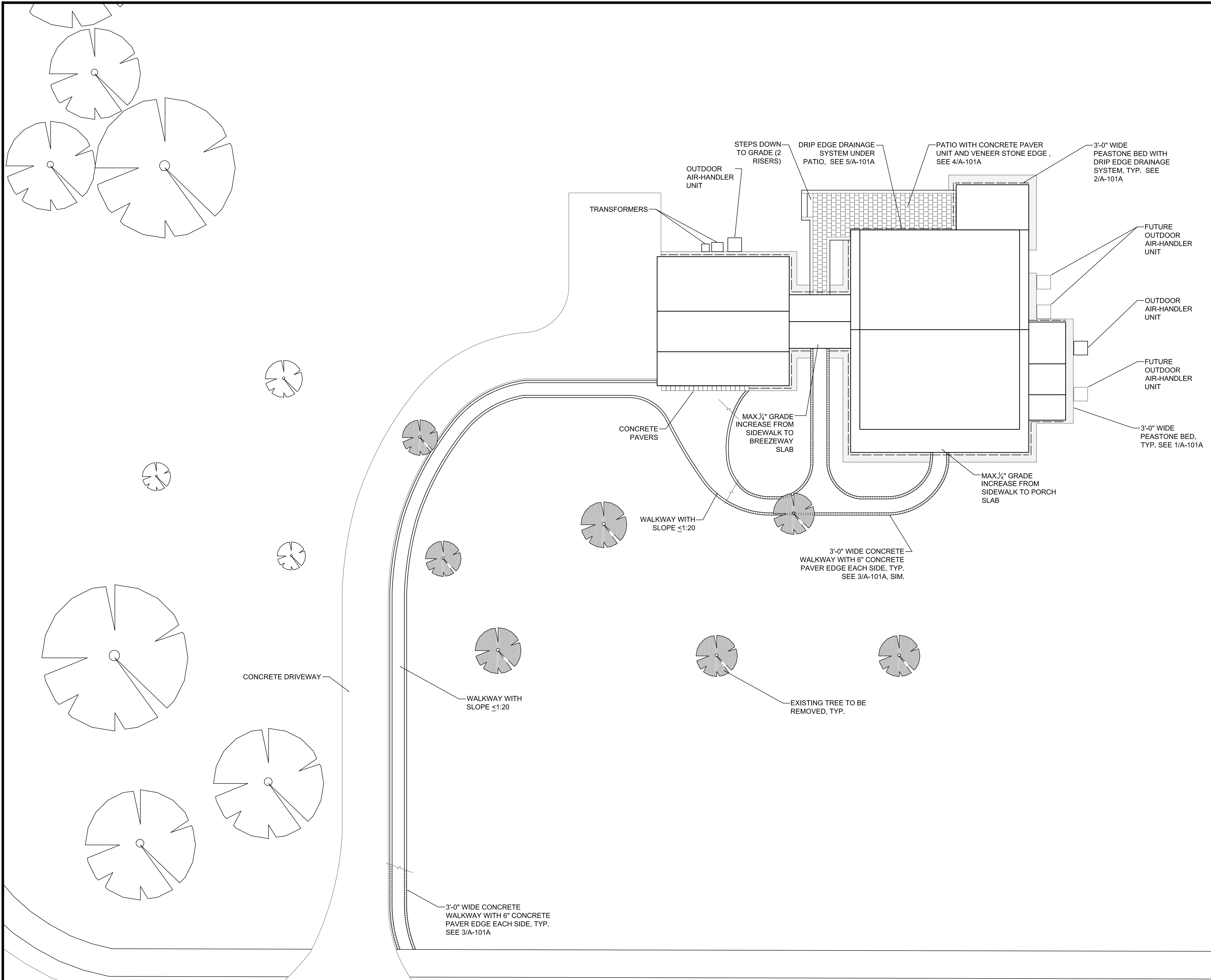
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DESIGN CRITERIA,
ABBREVIATIONS &
GEN. STRUCTURAL
NOTES

SCALE AS NOTED



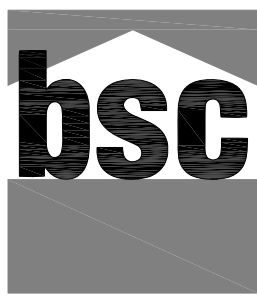
A-001



GENERAL SHEET NOTES

1. FOR PROPERTY LINE, LIMIT OF DISTURBANCE, GRADING CHANGES, LANDSCAPING, AND LOCATION OF BUILDING ON SITE, SEE SITE/CIVIL DRAWINGS.

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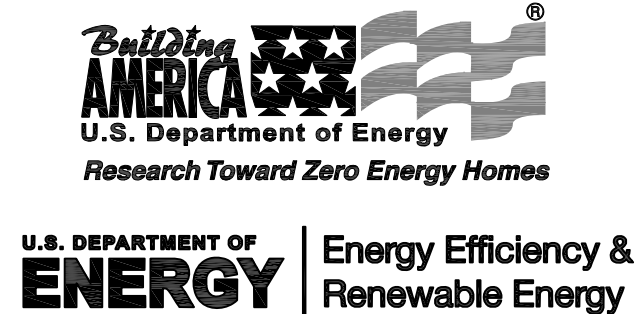
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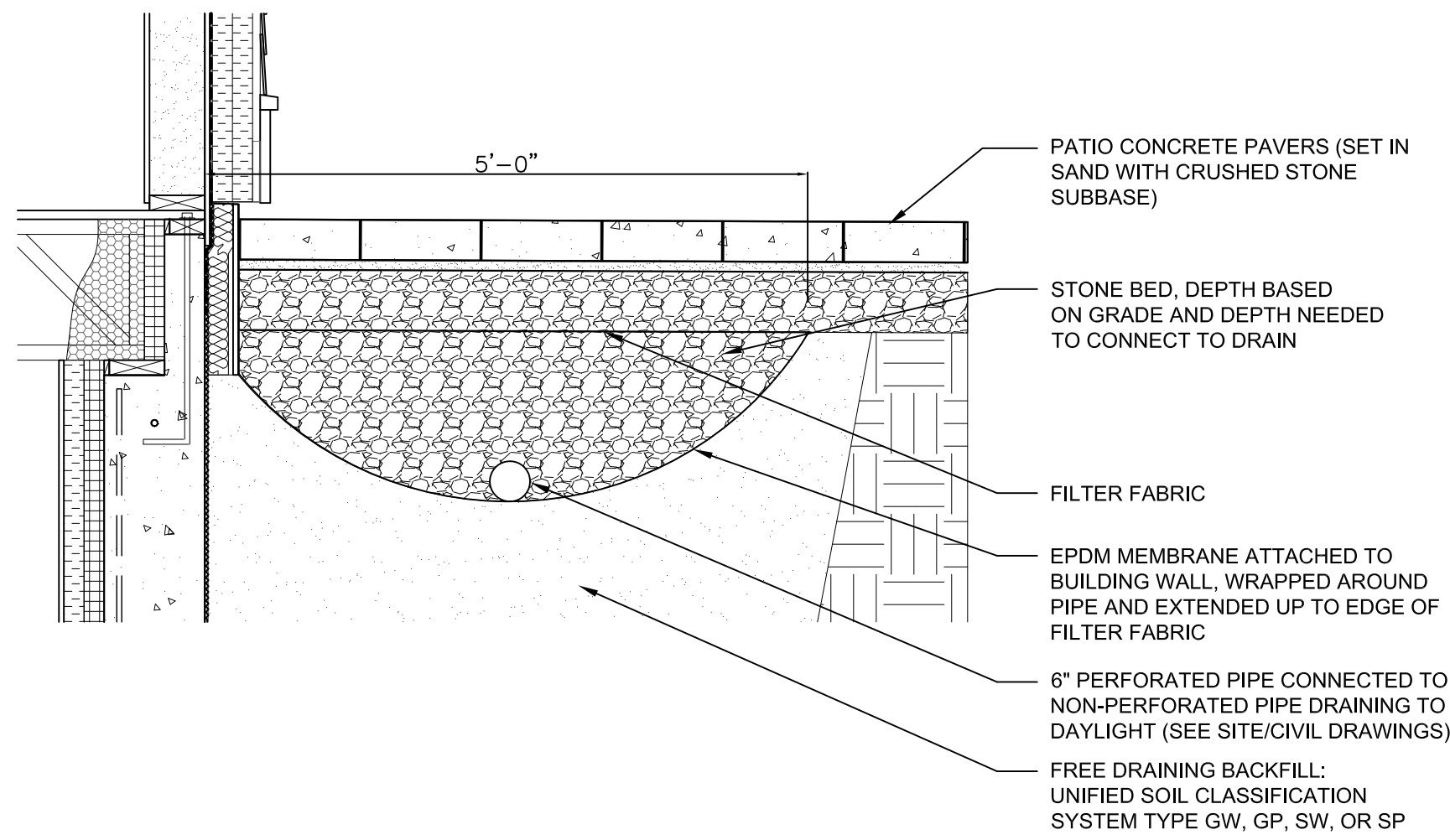
ARCHITECTURAL
SITE PLAN

SCALE AS NOTED



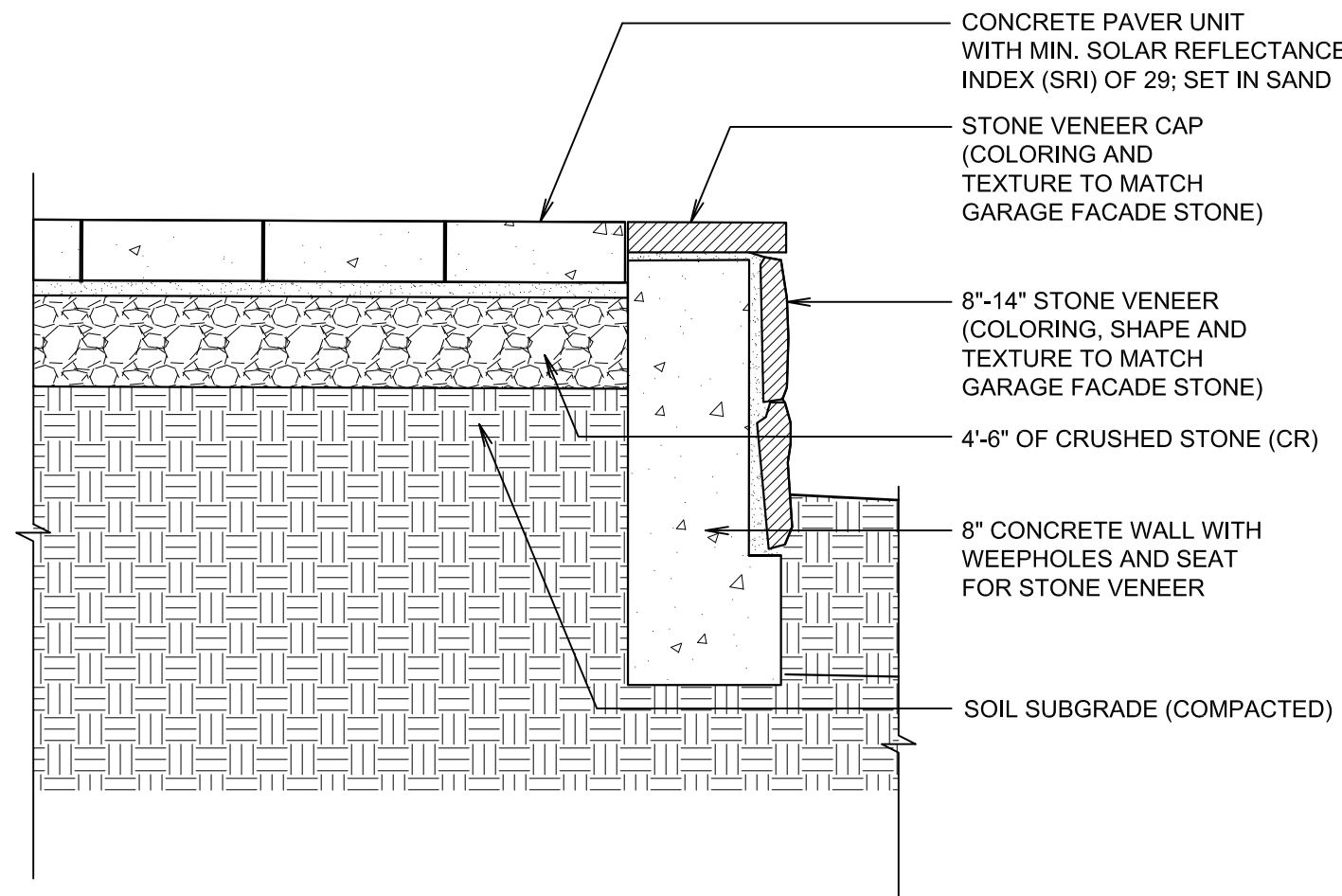
A-101

1 ARCHITECTURAL SITE PLAN
SCALE: 1:10



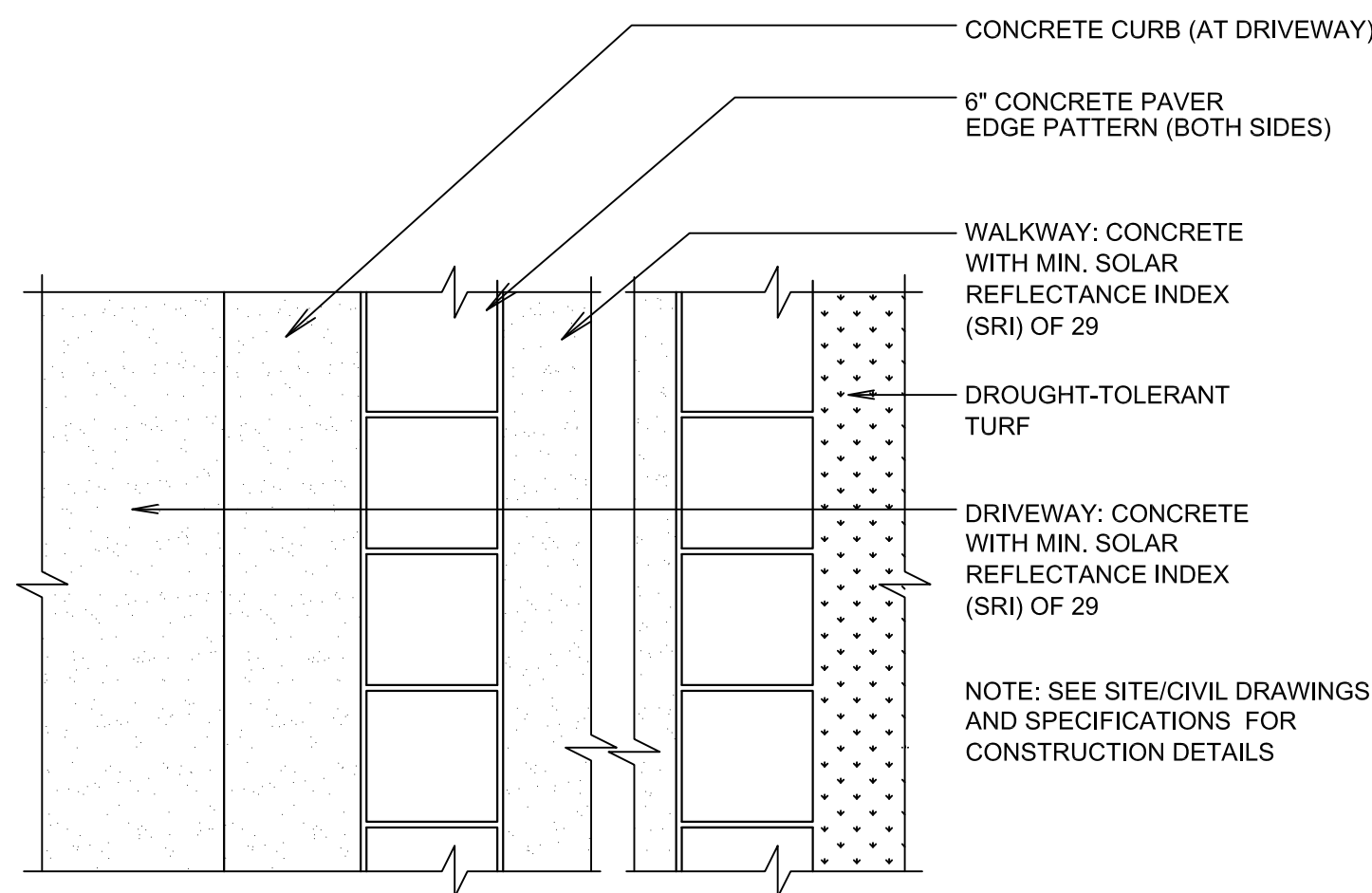
5 DRIP EDGE DRAINAGE UNDER PATIO

SCALE: 3/4" = 1'-0"



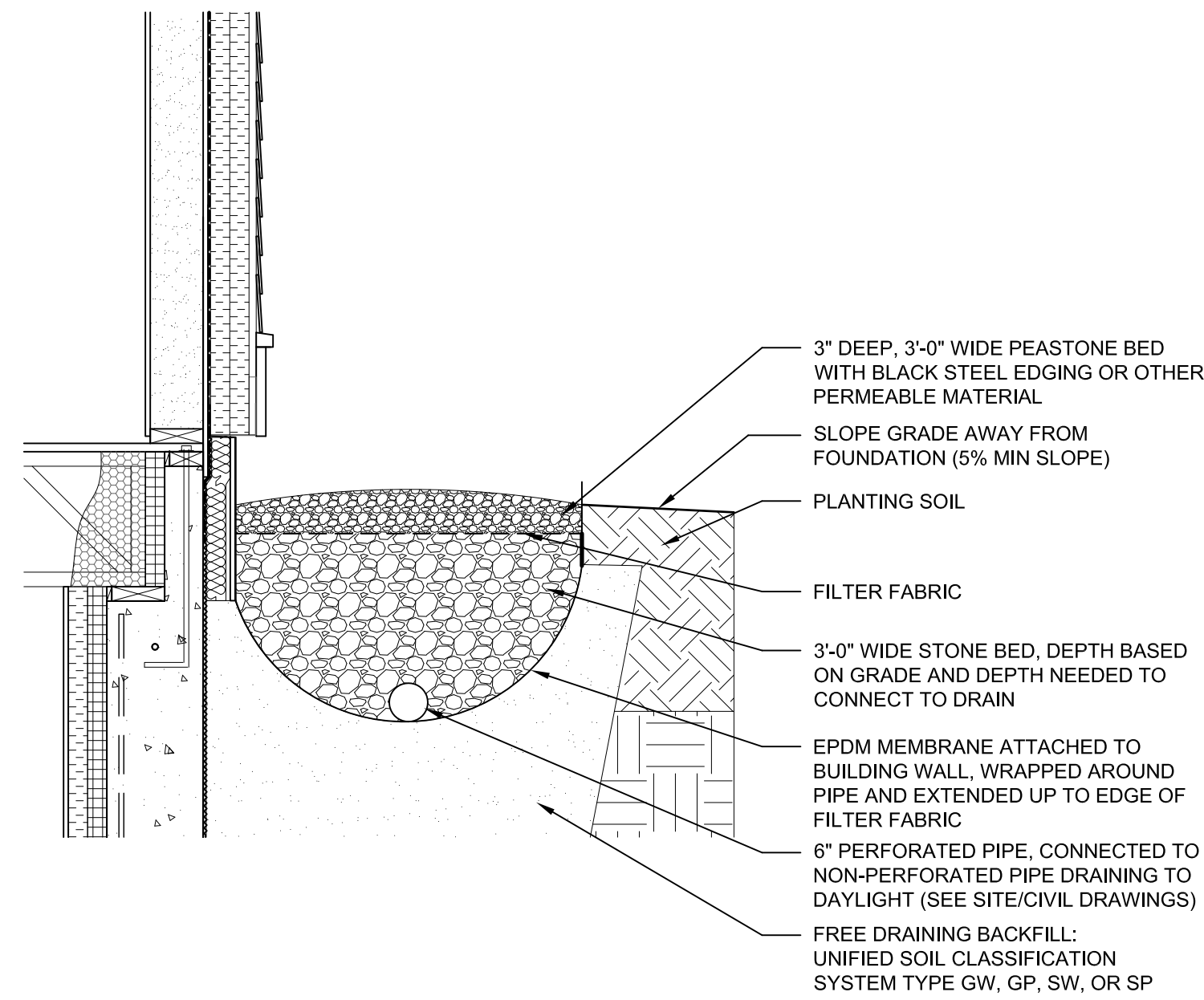
4 PATIO EDGE

SCALE: 1" = 1'-0"



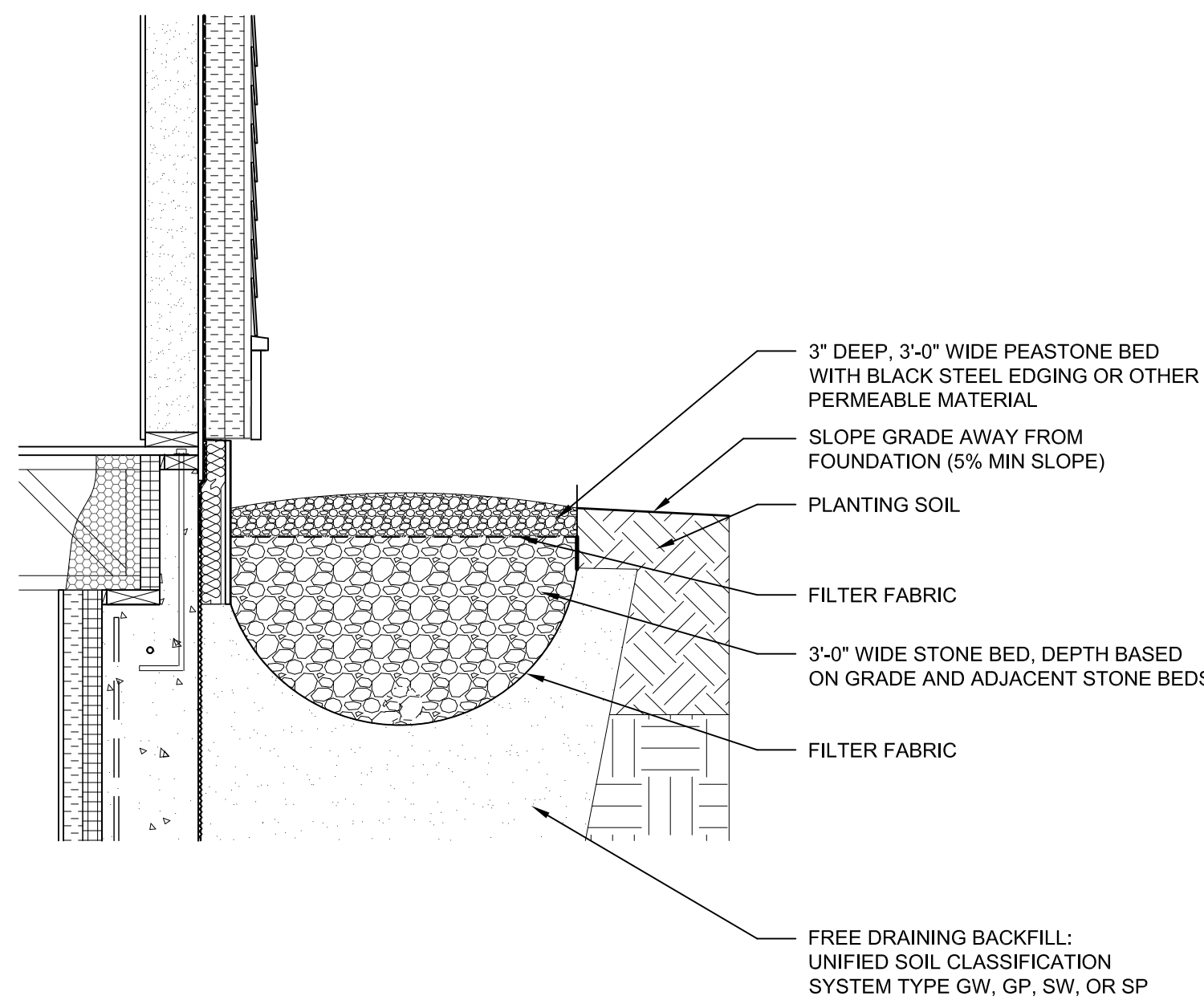
3 PAVING PLAN

SCALE: 1" = 1'-0"



2 PEASTONE BED WITH DRIP EDGE DRAINAGE

SCALE: 3/4" = 1'-0"



1 PEASTONE BED W/O DRIP EDGE DRAINAGE

SCALE: 3/4" = 1'-0"

GENERAL SHEET NOTES

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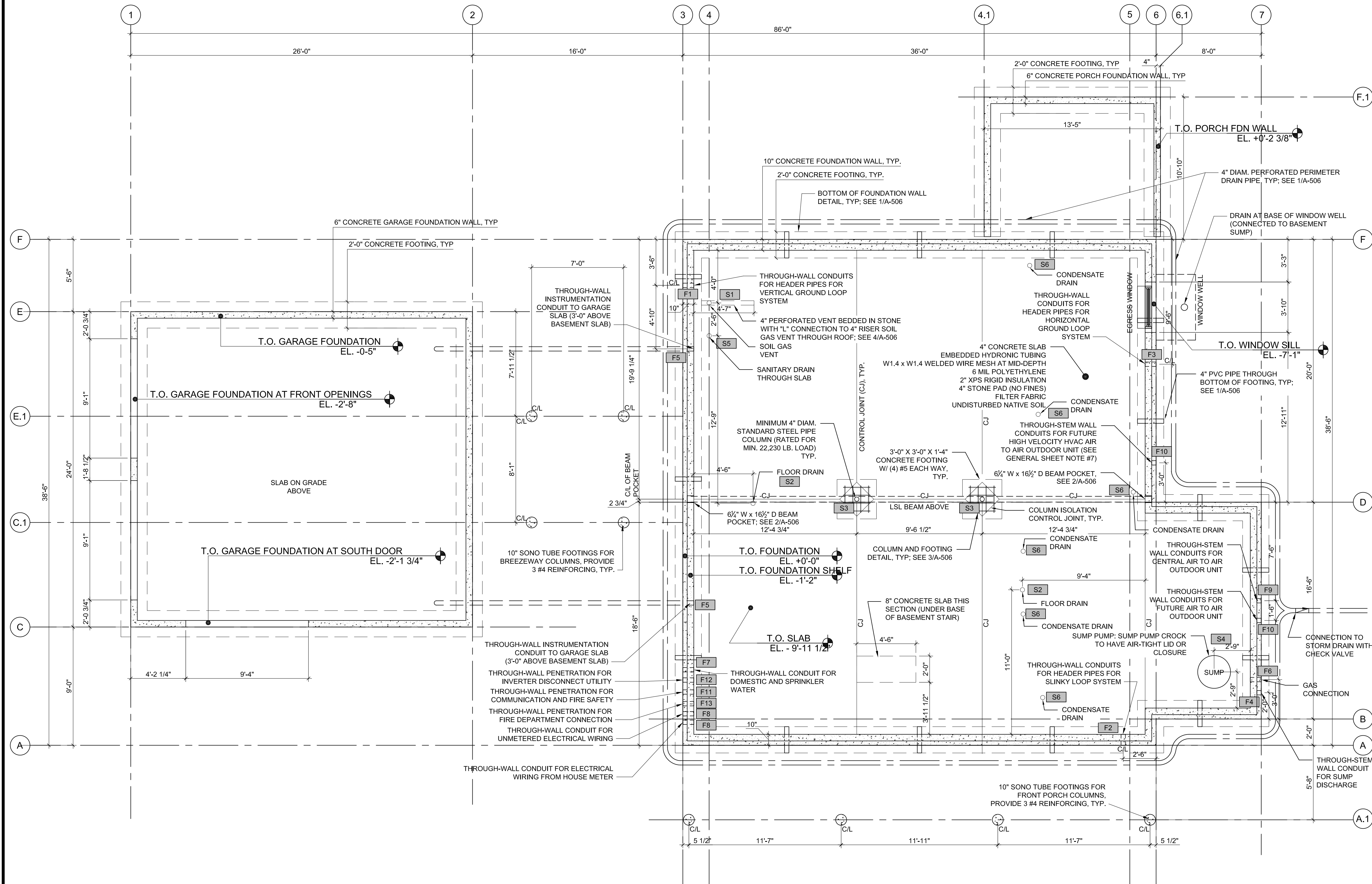
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**ARCHITECTURAL
SITE PLAN
DETAILS**

SCALE AS NOTED



A-101A



GENERAL SHEET NOTES

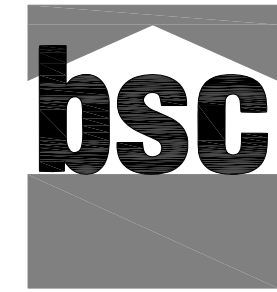
1. BASEMENT FOUNDATION WALL TO HAVE (1) #4 HORIZONTAL REINFORCEMENT W/ MATCHING CORNER BAR AT TOP AND (1) AT EACH MIDDLE THIRD, AND (1) #4 VERTICAL REINFORCEMENT AT 48" O.C. LOCATED WITH 1-1/4" CONCRETE COVER MEASURED FROM THE INSIDE FACE OF THE FOUNDATION WALL.
2. LOCATE 4" CONNECTION PIPE THROUGH BASE OF FOOTING WITHIN 5' OF EVERY CORNER AND EVERY 15' MAX ALONG LENGTH OF WALL SEGMENT WITH MIN OF 1 PER WALL SEGMENT.
3. LOCATE CONDENSATE DRAINS BASED ON LAYOUT OF MECHANICAL EQUIPMENT
4. SEE A-506 FOR FOUNDATION DETAILS.
5. SEE A-603 FOR PENETRATION SCHEDULE.
6. EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS
7. IF THE HIGH VELOCITY HVAC OPTION IS NOT AWARDED, THE PENETRATION FOR THE CONDUITS WILL NOT BE PROVIDED.

SHEET KEYNOTES

PENETRATION KEY

- S1. SOIL GAS VENT
- S2. FLOOR DRAIN
- S3. STEEL PIPE COLUMN
- S4. SUMP PUMP
- S5. SEWER CONNECTION
- S6. CONDENSATE DRAIN
- F1. VERTICAL GROUND LOOP SYSTEM
- F2. SLINKY LOOP SYSTEM
- F3. HORIZONTAL. GROUND. LOOP SYSTEM
- F4. SUMP PUMP OUTLET
- F5. INSTRUMENTATION CONDUIT
- F6. GAS CONNECTION
- F7. WATER CONNECTION
- F8. ELECTRICITY CONNECTION
- F9. AIR-TO-AIR OUTDOOR UNIT CONNECTION
- F10. FUTURE AIR-TO-AIR OUTDOOR UNIT CONNECTION
- F11. COMMUNICATION/FIRE SAFETY CONNECTION
- F12. INVERTER UTILITY DISCONNECT CONNECTION
- F13. FIRE DEPARTMENT CONNECTION

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SHEET TITLE:	

FOUNDATION PLAN

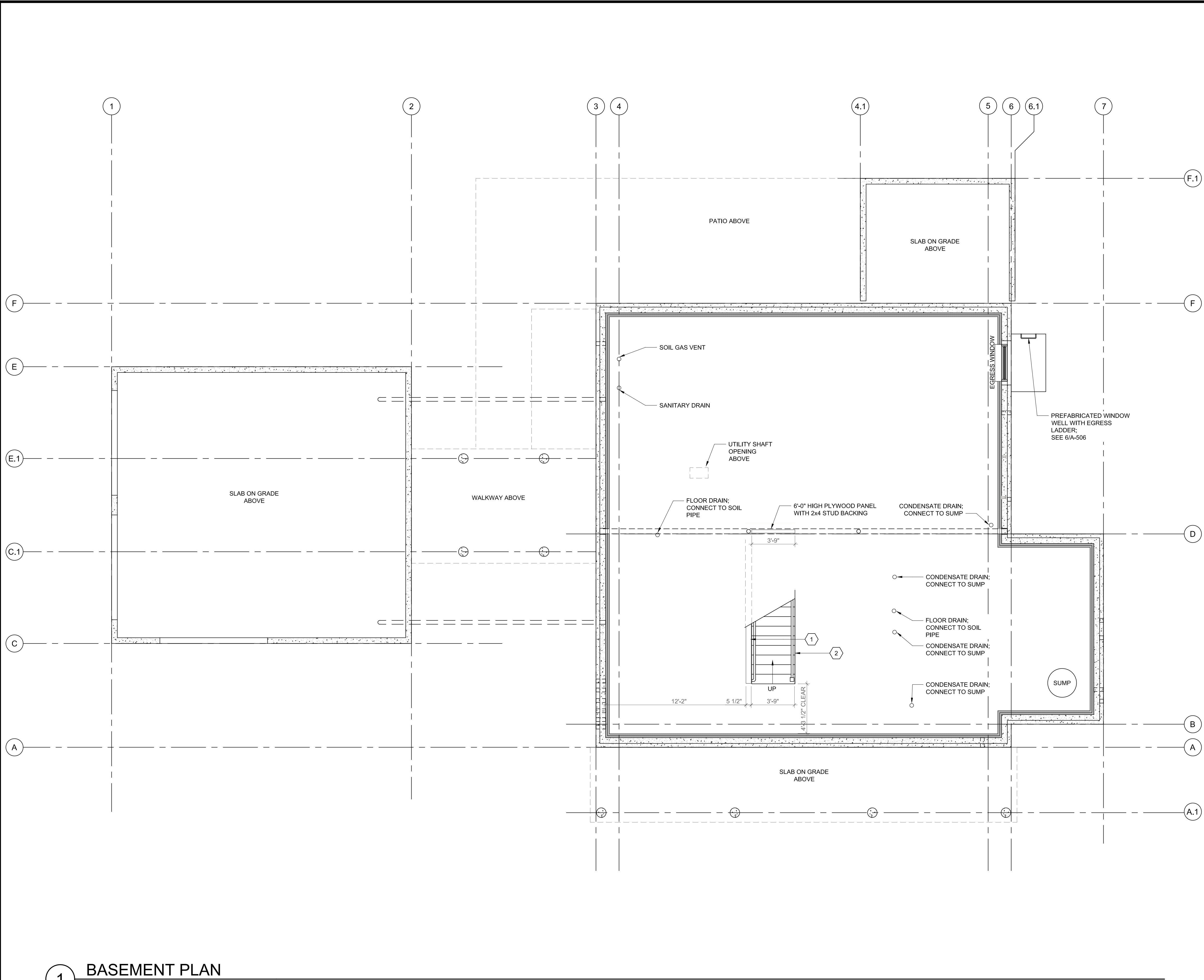
SCALE AS NOTED



A-102

1 FOUNDATION PLAN

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



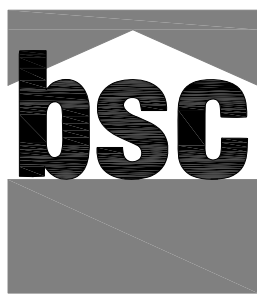
GENERAL SHEET NOTES

1. BASEMENT AREA TO OUTSIDE FACE OF FOUNDATION WALL: 1,518 SQ. FT.
2. SEE A-602 FOR FINISH SCHEDULE.

SHEET KEYNOTES

1. PROVIDE BLOCKING IN WALL TO SUPPORT FUTURE STAIR LIFT. BLOCKING SHOULD EXTEND UP TO A HEIGHT OF 3'-0" ABOVE STAIR TREADS.
2. STAIR FROM BASEMENT TO FIRST FLOOR TO HAVE 16 RISERS AT 6-2/3", 15 TREADS AT 10" WITH 1/2" NOSING.

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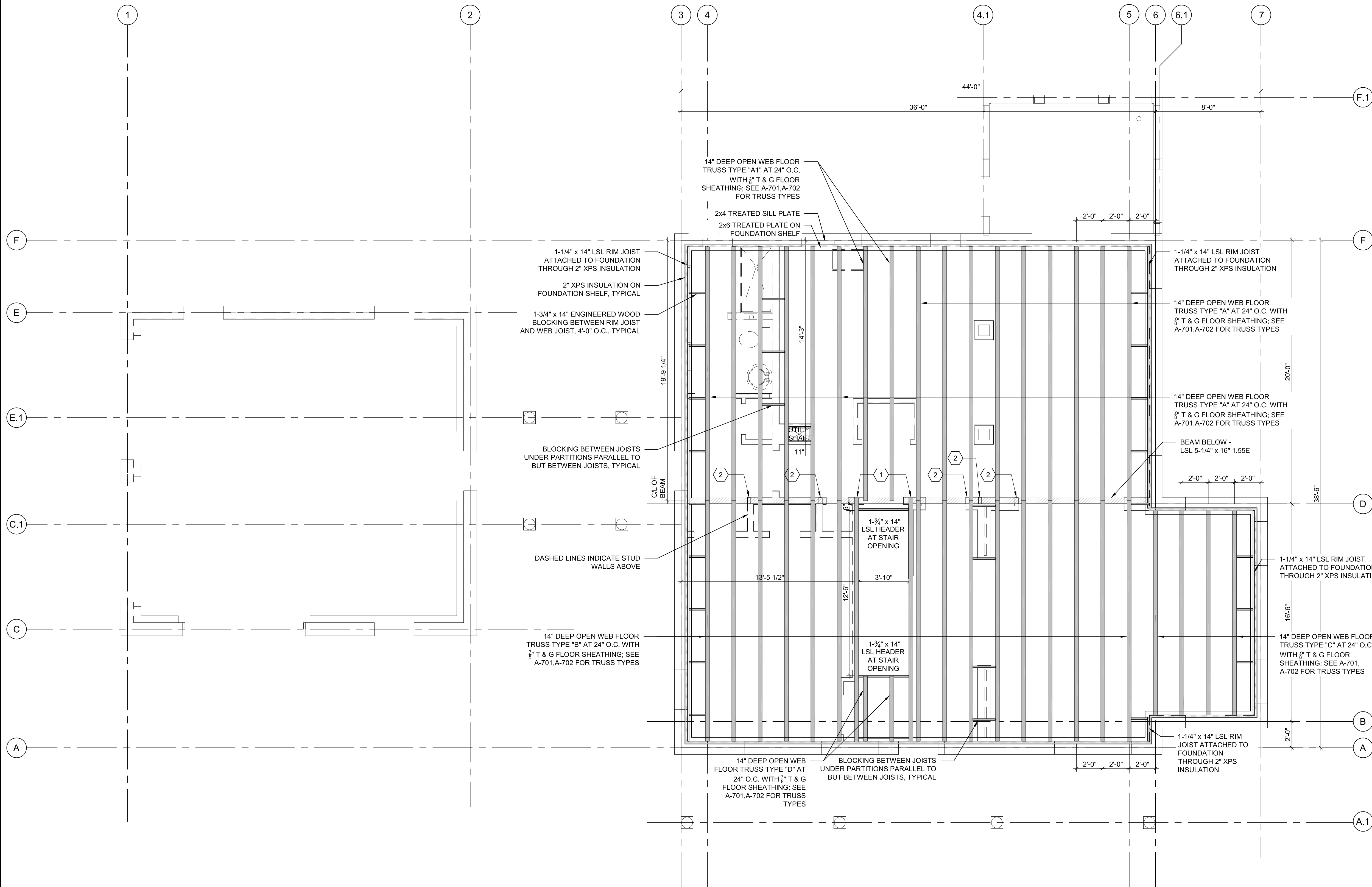
BASEMENT PLAN

SCALE AS NOTED



A-103

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



GENERAL SHEET NOTES

1. CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
2. EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
3. LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS.
4. PROVIDE ENGINEERED WOOD BLOCKING BETWEEN JOISTS UNDER PARTITIONS PARALLEL TO, BUT BETWEEN, JOISTS; COORDINATE LOCATION OF BLOCKING WITH MECHANICAL DUCTWORK.
5. SEE A-701 AND A-702 FOR OPEN WEB FLOOR JOIST TYPES; OPEN WEB FLOOR JOISTS TO BE CONSTRUCTED USING FSC-CERTIFIED WOOD; OPEN WEB FLOOR JOISTS TO BE ENGINEERED BY TRUSS SUPPLIER TO MEET LOCAL CODE.
6. GENERAL STRUCTURAL FRAMING CONNECTIONS:

LSL CEILING JOISTS TO FLOOR HEADERS: USP THD179 ENGINEERED WOOD JOIST HANGER;

DOUBLE LSL FLOOR HEADER TO TRIMMER: USP HD 410 DOUBLE HANGER.

STUD IN ATTIC BEARING WALL TO CEILING JOIST: USP LTW12 WITH 4 10d NAILS EACH END

CEILING JOIST TO STUD IN SECOND FLOOR BEARING WALL: USP RT10 WITH 4 8d NAILS EACH END (USE USP LTW12 AT CONNECTIONS TO WALL HEADERS)

STUD TO SOLE PLATE IN SECOND FLOOR BEARING WALL: (2) USP S01 CLIP ANCHORS

SOLE PLATE TO FLOOR DECK: (2) #8x3" WOOD SCREWS AT 12" O.C.

ATTIC FLUSH-FRAMED BEAM TO WALL STUDS AT ENDS OF BEAM: USP LTW12 WITH 6 10d NAILS EACH END OF STRAP; PROVIDE CONTINUOUS LOAD PATH DOWN TO BASEMENT BEAM USING SIMILAR SIZED STRAPS AT ALL FRAMING JOINTS.
7. STRUCTURAL FRAMING CONNECTIONS FOR CENTER BEARING WALL (TO RESIST ROOF UPLIFT):

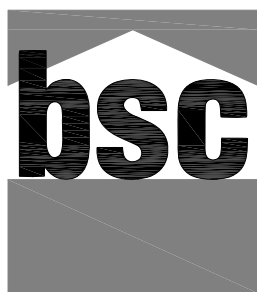
RAFTER TO RIDGE BOARD: USP AC7 ANGLE BRACKET WITH 4 10d NAILS EACH LEG

RAFTER TO STUD IN ATTIC BEARING WALL: USP LTW12 WITH R 10d NAILS EACH END

SHEET KEYNOTES

1. END OF FLOOR JOIST TO BE FULL BEARING ON BEAM BELOW.
2. 2-2x6 BLOCKS IN FLOOR BELOW JACK STUDS TO TRANSFER LOAD TO BEAM BELOW WHERE JACKS STUDS ARE NOT ALIGNED WITH FLOOR JOIST.

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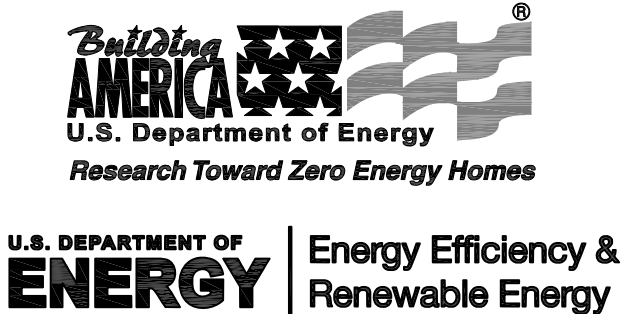
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SHEET TITLE:

FIRST FLOOR
FRAMING PLAN

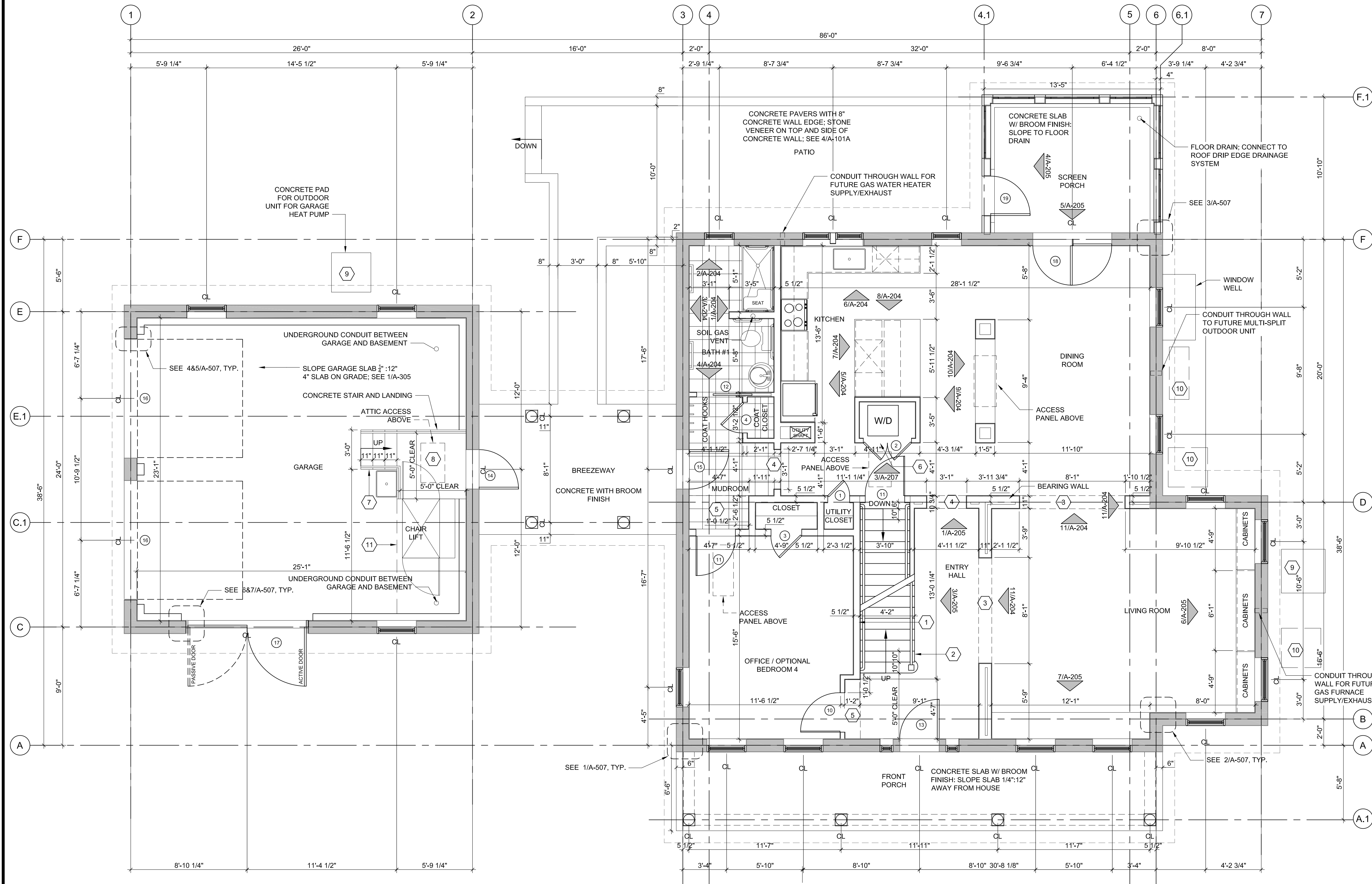
SCALE AS NOTED



A-104

1 FIRST FLOOR FRAMING PLAN

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



GENERAL SHEET NOTES

1. FIRST FLOOR AREA TO OUTSIDE FACE OF STUD WALL: 1,518 SQ. FT.
2. DIMENSIONS ARE TO FACE OF STUD UNLESS OTHERWISE NOTED.
3. INTERIOR PARTITIONS FRAMED WITH 2x4 WOOD STUDS UNLESS OTHERWISE NOTED.
4. INTERIOR BEARING WALLS FRAMED WITH 2x6 WOOD STUDS UNLESS OTHERWISE NOTED.
5. INTERIOR DOORS TO BE CENTERED BETWEEN THE NEAREST WALL PERPENDICULAR ON EACH SIDE OF THE DOOR UNLESS OTHERWISE NOTED.
6. SEE A-602 FOR FINISH SCHEDULE
7. REFER TO POCKET DOOR FRAME KIT INSTALLATION INSTRUCTIONS TO DETERMINE ROUGH OPENING OF POCKET DOOR.

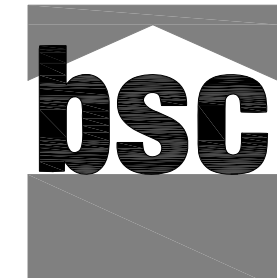
SHEET KEYNOTES

1. PROVIDE BLOCKING IN WALL TO SUPPORT FUTURE STAIR LIFT. BLOCKING SHOULD EXTEND UP TO A HEIGHT OF 3'-0" ABOVE STAIR TREADS.
2. STAIR FROM FIRST TO SECOND FLOOR TO HAVE 16 RISERS AT 7 1/4", 10" TREADS WITH 1/2" NOSING.
3. CASED OPENING, 7'-6" FINISHED HEIGHT
4. CASED OPENING, 6'-8" FINISHED HEIGHT
5. DROPPED CEILING, 7'-9" FINISHED HEIGHT
6. 18" x 18" ACCESS PANEL ABOVE DOOR FOR ACCESS TO FCU-2 UNIT.
7. CONCRETE GARAGE STAIR TO HAVE 4 RISERS AT 6 1/2", 11" TREADS.
8. GARAGE ATTIC ACCESS PANEL TO FIT WITHIN ROOF TRUSSES; SEE A-112 ROOF FRAMING PLAN FOR LOCATION AND SIZE. PANEL TO BE FASTENED FROM BELOW AND REMOVABLE WITHOUT REMOVING PANEL TRIM. ACCESS PANEL TO BE INSULATED. CELLULOSE ATTIC INSULATION SHALL BE HELD BACK FROM ACCESS OPENING.
9. SIZE OF CONCRETE PAD TO BE SPECIFIED BY MANUFACTURER OF AIR-TO-AIR OUTDOOR UNIT.
10. LOCATION OF FUTURE OUTDOOR AIR-TO-AIR UNIT.
11. DO NOT SLOPE SLAB IN THIS AREA; THICKEN SLAB UNDER CHAIR LIFT IF SPECIFIED BY MANUFACTURER OF LIFT.

DOOR KEY

1. 1'-8" x 6'-8" LH
2. (2) 1'-10" x 6'-8"
3. 2'-4" x 6'-8" LH
4. 2'-4" x 6'-8" RH
5. 2'-4" x 6'-8" POCKET
6. 2'-6" x 6'-8" RH
7. 2'-6" x 6'-8" LH
8. 2'-8" x 6'-8" LH
9. 2'-8" x 6'-8" RH
10. 3'-0" x 6'-8" LH
11. 3'-0" x 6'-8" RH
12. 3'-0" x 6'-8" POCKET
13. 3'-0" x 7'-0" RH W/ 12" SIDELITES
14. 3'-0" x 7'-0" LH
15. 3'-0" x 7'-0" RH
16. 9'-0" x 8'-0" OVERHEAD
17. (2) 4'-6" x 8'-0"
18. 6'-0" x 6'-8" (1) LH PANEL, (1) FIXED PANEL
19. 3'-0" x 6'-8" RH

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	06/29/10	UPDATED
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

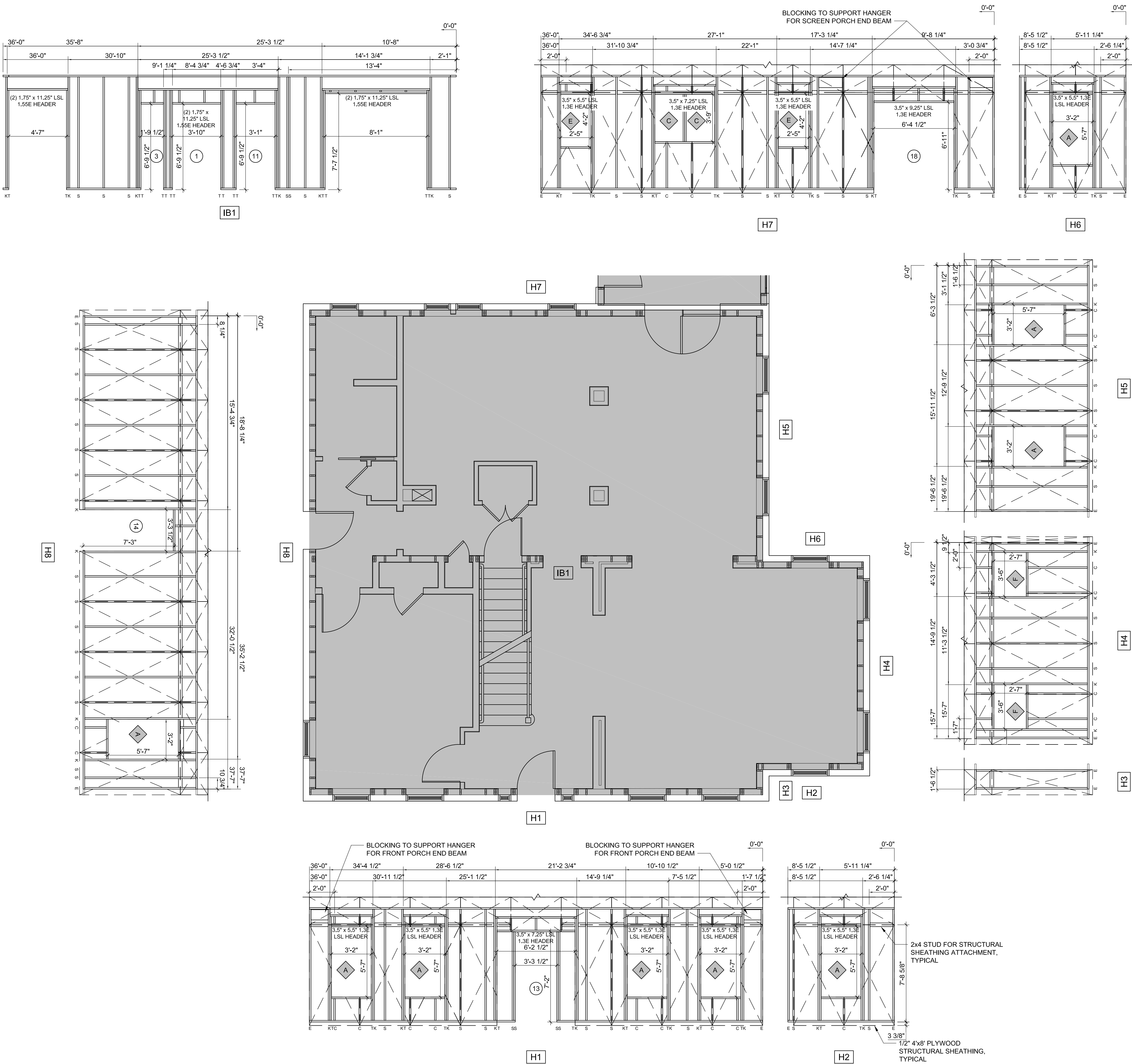
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SHEET TITLE:	

FIRST FLOOR PLAN

SCALE AS NOTED

A-105

1 FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"

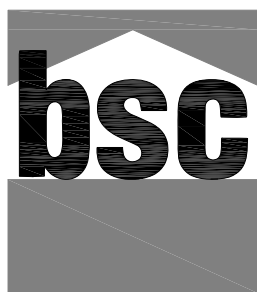


GENERAL SHEET NOTES

1. REAR WALL FRAMING ELEVATIONS DRAWN AS SEEN FROM INTERIOR; INTERIOR BEARING WALL FRAMING ELEVATION DRAWN AS SEEN FROM THE FRONT; ALL OTHER ELEVATIONS DRAWN AS SEEN FROM EXTERIOR
2. TYPICAL WALL HEIGHT = 9'-1".
3. TYPICAL FIRST FLOOR WINDOW FRAMING HEAD HEIGHT = 7'-6 3/4".
4. WINDOW AND EXTERIOR DOOR FRAMING OPENING DIMENSIONS TO BE ADJUSTED PER MANUFACTURER SELECTION AS FOLLOWS:
 - A. FRAMING WIDTH FOR DOORS AND WINDOWS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING WIDTH BY ADDING 1/2" TO EACH SIDE.
 - B. FRAMING HEIGHT FOR WINDOWS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING HEIGHT BY ADDING 1/2" TO THE TOP AND 1" TO THE BOTTOM.
 - C. FRAMING HEIGHT FOR DOORS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING HEIGHT BY ADDING 1/2" TO THE TOP.
5. FRAMING STUDS TO BE FSC-CERTIFIED LUMBER.
6. LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS.
7. STRUCTURAL SHEATHING CONNECTIONS (TO RESIST ROOF UPLIFT):
 - LAP SHEATHING ON RAFTER RIM BOARD: MINIMUM 8d NAILS AT 3" O.C.
 - HORIZONTAL SHEATHING EDGES AT BLOCKING OR FRAMING: MINIMUM 8d NAILS AT 3" O.C.
 - HORIZONTAL SHEATHING EDGES BELOW SECOND FLOOR: MINIMUM 8d NAILS AT 6" O.C.

SHEET KEYNOTES

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SHEET TITLE:

**FIRST FLOOR KEY
PLAN & WALL
FRAMING
ELEVATIONS**

SCALE AS NOTED



A-106

1 FIRST FLOOR KEY PLAN & WALL FRAMING ELEVATIONS

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

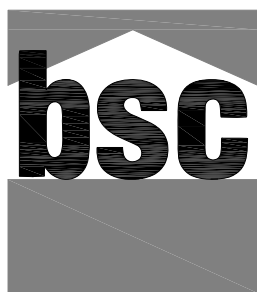
GENERAL SHEET NOTES

1. REAR WALL FRAMING ELEVATIONS DRAWN AS SEEN FROM INTERIOR; ALL OTHER ELEVATIONS DRAWN AS SEEN FROM EXTERIOR
2. TYPICAL GARAGE WALL HEIGHT = 9'-4".
3. TYPICAL GARAGE WINDOW FRAMING HEAD HEIGHT = 6'-10 1/2" ABOVE TOP OF GARAGE FOUNDATION WALL.
4. WINDOW AND EXTERIOR DOOR FRAMING OPENING DIMENSIONS TO BE ADJUSTED PER MANUFACTURER SELECTION AS FOLLOWS:
 - A. FRAMING WIDTH FOR DOORS AND WINDOWS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING BY ADDING 1/2" TO EACH SIDE.
 - B. FRAMING HEIGHT FOR WINDOWS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING HEIGHT BY ADDING 1/2" TO THE TOP AND 1" TO THE BOTTOM.
 - C. FRAMING HEIGHT FOR DOORS: INCREASE THE MANUFACTURER'S ROUGH OPENING HEIGHT BY ADDING 1/2" TO THE TOP.
5. FRAMING STUDS TO BE FSC-CERTIFIED LUMBER.
6. LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS.
7. STRUCTURAL SHEATHING CONNECTIONS ON GARAGE (FOR BRACING):

FASTEN PLYWOOD SHEATHING ON WEST WALL WITH MINIMUM 8d NAILS AT 3" O.C.

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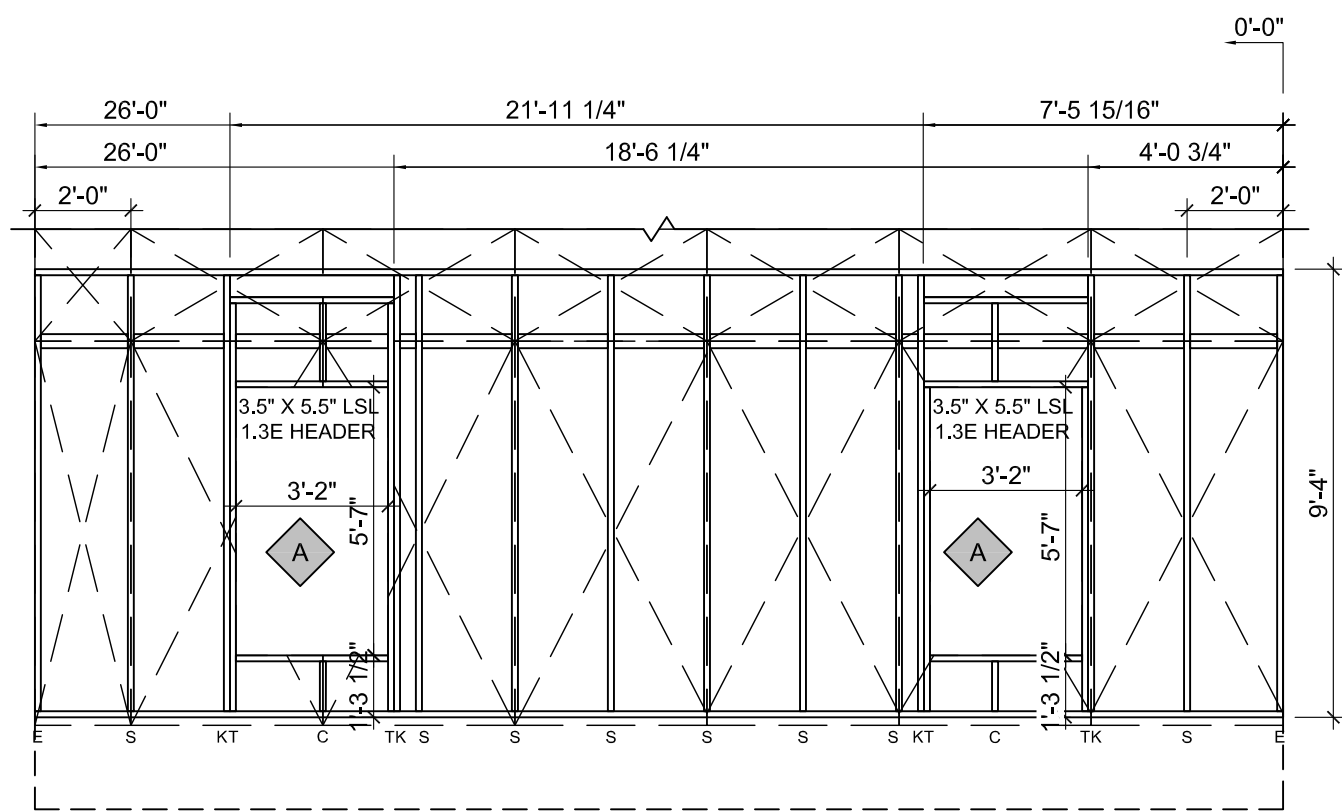
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SHEET TITLE:

SCREEN PORCH &
GARAGE KEY
PLANS & WALL
FRAMING ELEVATIONS.

SCALE AS NOTED

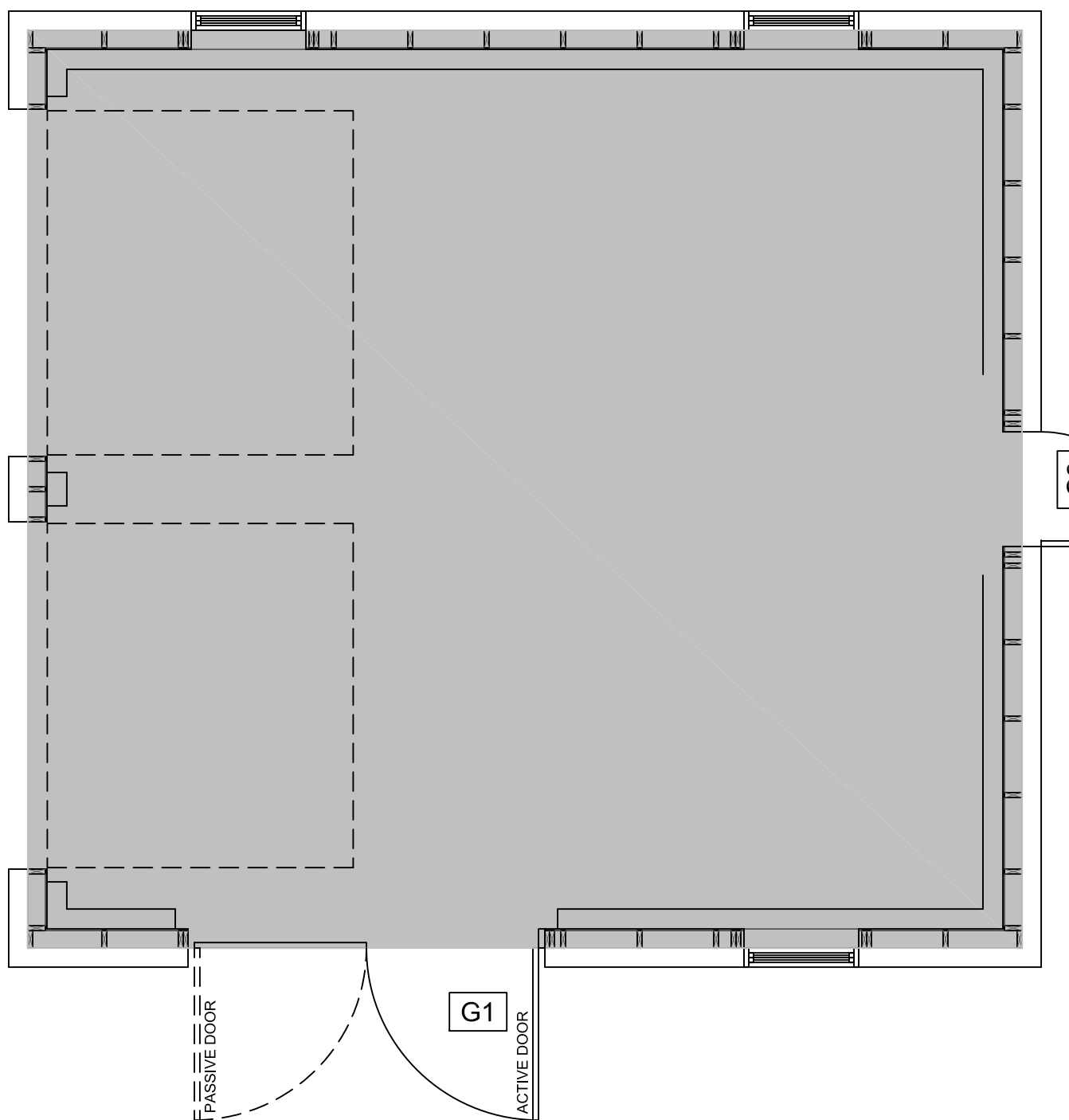
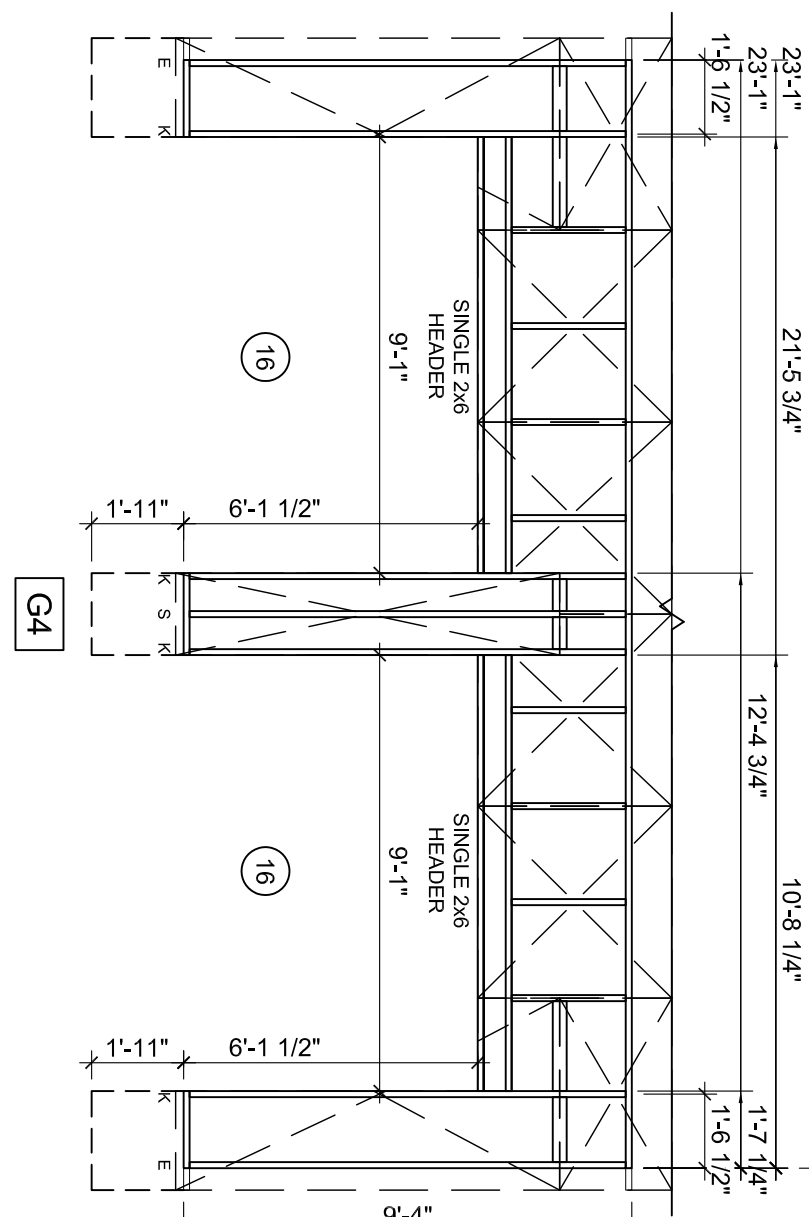


A-107



G3

G3

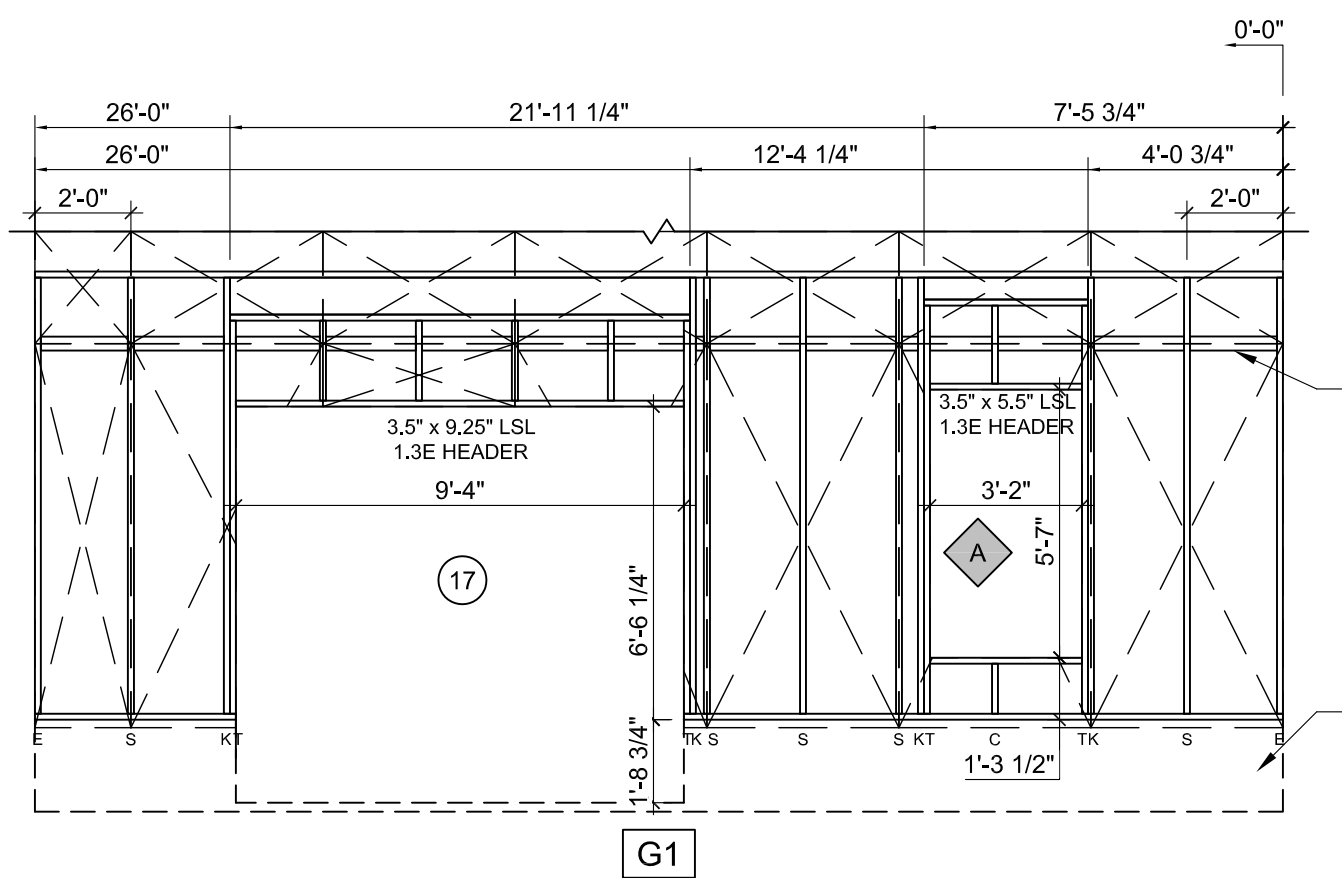


G1

G2

G3

G4

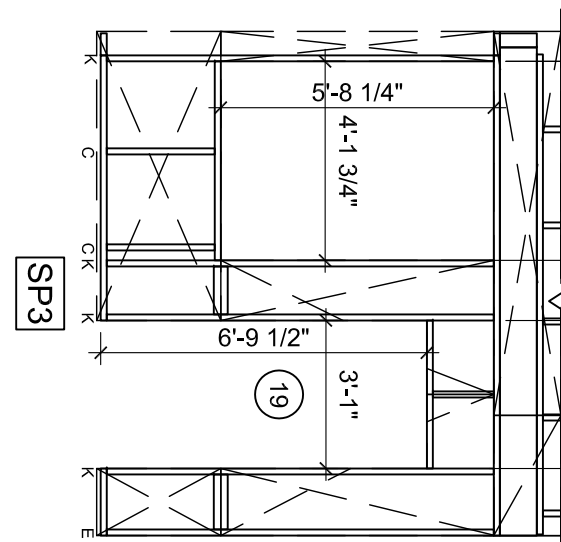


G1

G2

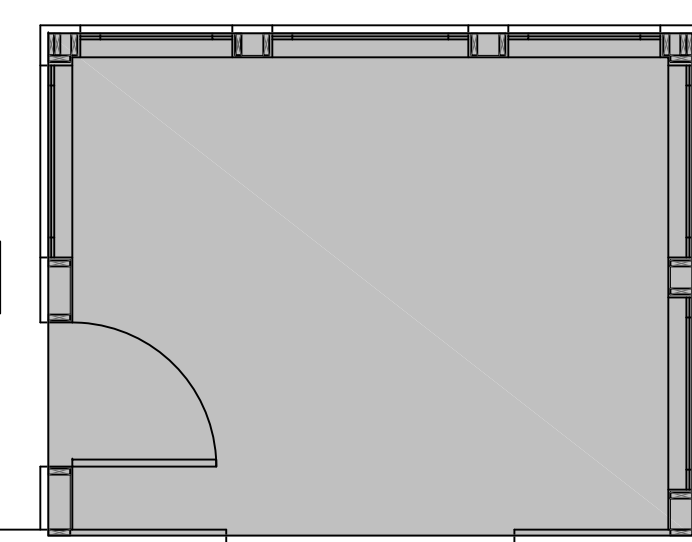
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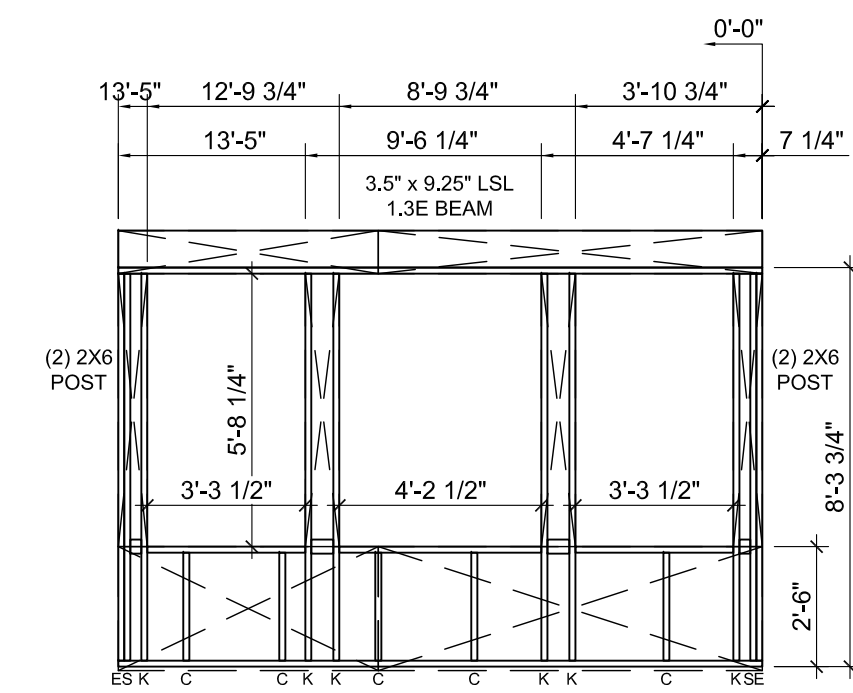
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SP3



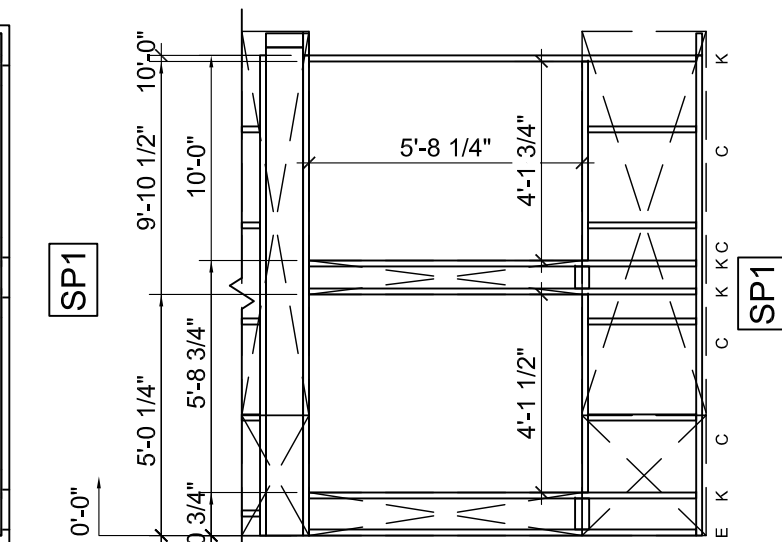
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SP2



SP2

SP2



SP1

SP1

SP1

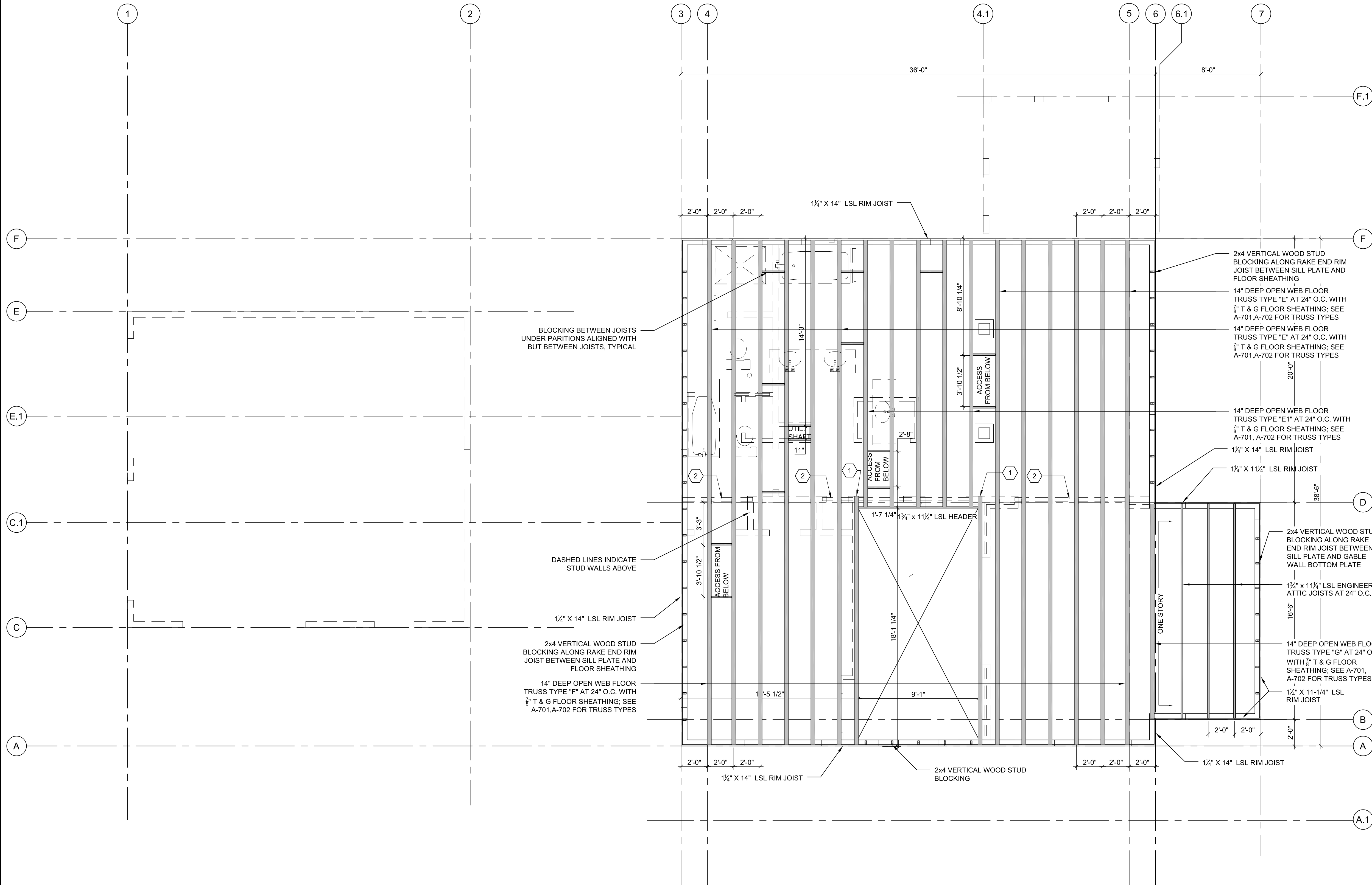
SP1

2 GARAGE KEY PLAN & WALL FRAMING ELEVATIONS

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

1 SCREEN PORCH KEY PLAN & WALL FRAMING ELEVATIONS

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



GENERAL SHEET NOTES

1. CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
2. EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
3. LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS.
4. PROVIDE ENGINEERED WOOD BLOCKING BETWEEN JOISTS UNDER PARTITIONS PARALLEL TO, BUT BETWEEN, JOISTS; COORDINATE LOCATION OF BLOCKING WITH MECHANICAL DUCTWORK.
5. SEE A-701 AND A-702 FOR OPEN WEB FLOOR JOIST TYPES; OPEN WEB FLOOR JOISTS TO BE CONSTRUCTED USING FSC-CERTIFIED WOOD; OPEN WEB FLOOR JOISTS TO BE ENGINEERED BY TRUSS SUPPLIER TO MEET LOCAL CODE.
6. GENERAL STRUCTURAL FRAMING CONNECTIONS:

LSL CEILING JOISTS TO FLOOR HEADERS: USP THD179 ENGINEERED WOOD JOIST HANGER;

DOUBLE LSL FLOOR HEADER TO TRIMMER: USP HD 410 DOUBLE HANGER.

7. STRUCTURAL FRAMING CONNECTIONS FOR CENTER BEARING WALL (TO RESIST ROOF UPLIFT):

RAFTER TO RIDGE BOARD: USP AC7 ANGLE BRACKET WITH 4 10d NAILS EACH LEG

RAFTER TO STUD IN ATTIC BEARING WALL: USP LTW12 WITH R 10d NAILS EACH END

STUD IN ATTIC BEARING WALL TO CEILING JOIST: USP LTW12 WITH 4 10d NAILS EACH END

CEILING JOIST TO STUD IN SECOND FLOOR BEARING WALL: USP RT10 WITH 4 8d NAILS EACH END (USE USP LTW12 AT CONNECTIONS TO WALL HEADERS)

STUD TO SOLE PLATE IN SECOND FLOOR BEARING WALL: (2) USP S01 CLIP ANCHORS

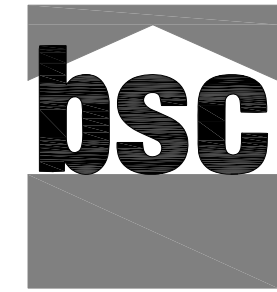
SOLE PLATE TO FLOOR DECK: (2) #8x3" WOOD SCREWS AT 12" O.C.

ATTIC FLUSH-FRAMED BEAM TO WALL STUDS AT ENDS OF BEAM: USP LTW12 WITH 8 10d NAILS EACH END OF STRAP; PROVIDE CONTINUOUS LOAD PATH DOWN TO BASEMENT BEAM USING SIMILAR SIZED STRAPS AT ALL FRAMING JOINTS.

SHEET KEYNOTES

1. END OF FLOOR JOIST TO BE FULL BEARING ON BEARING WALL BELOW.
2. FOR SIZE AND LOCATION OF HEADERS IN THE BEARING WALL BELOW, SEE A-108, WALL 1B1.

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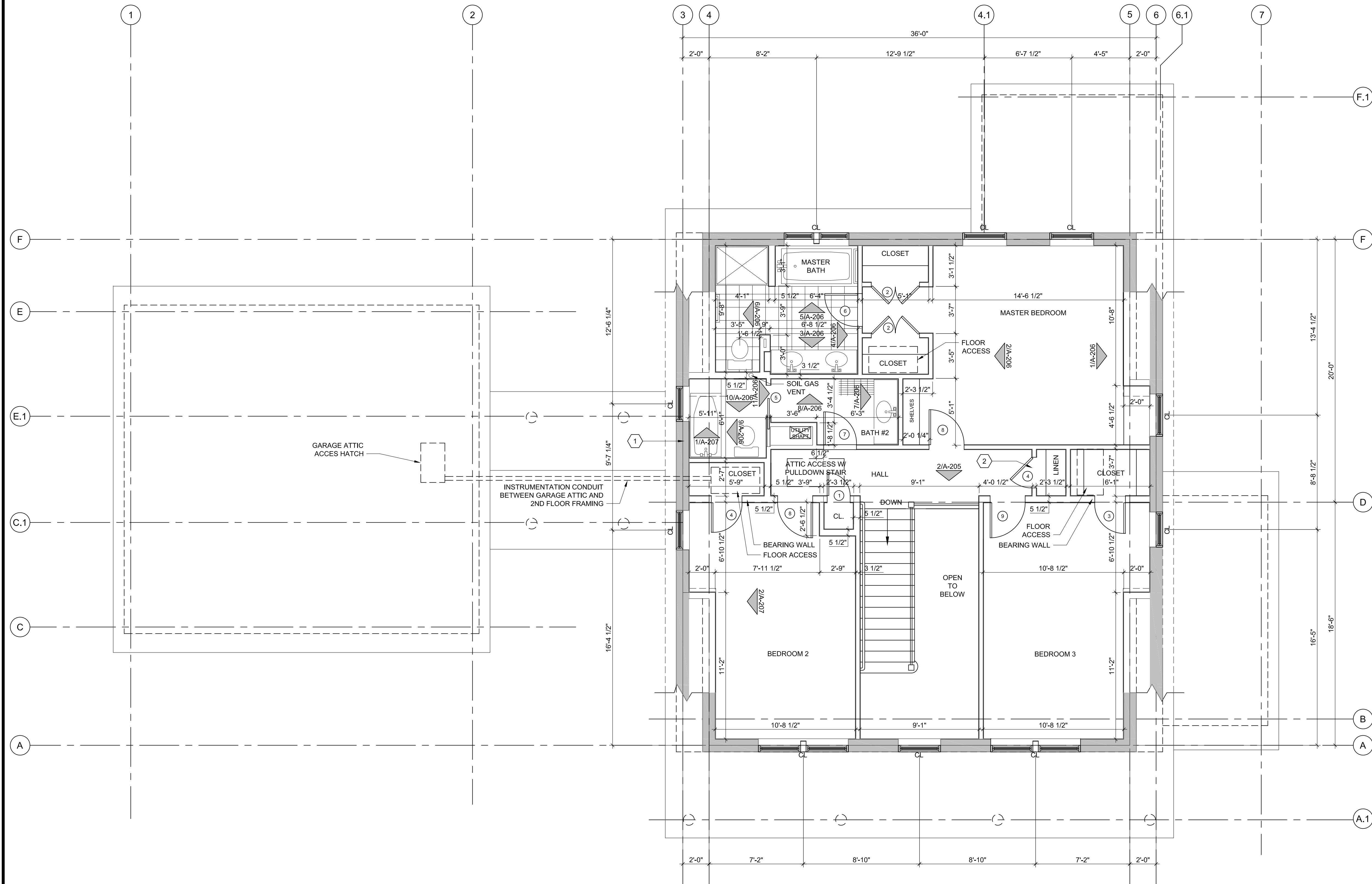
SECOND FLOOR &
LOWER ATTIC
FRAMING PLAN

SCALE AS NOTED



A-108

1 SECOND FLOOR & LOWER ATTIC FRAMING PLAN
SCALE: 1/4" = 1'-0"



GENERAL SHEET NOTES

1. SECOND FLOOR AREA TO OUTSIDE FACE OF STUD WALL: 1,191 SQ. FT.
2. DIMENSIONS ARE TO FACE OF STUD UNLESS OTHERWISE NOTED.
3. INTERIOR PARTITIONS FRAMED WITH 2x4 WOOD STUDS UNLESS OTHERWISE NOTED.
4. INTERIOR BEARING WALLS FRAMED WITH 2x6 WOOD STUDS UNLESS OTHERWISE NOTED.
5. INTERIOR DOORS TO BE CENTERED BETWEEN THE NEAREST WALL PERPENDICULAR ON EACH SIDE OF THE DOOR UNLESS OTHERWISE NOTED.
6. FLOOR ACCESS PANELS FIT WITHIN FRAMING MEMBERS; SEE FRAMING PLAN. PANELS TO BE COVERED WITH FINISH FLOORING. SEE 8/A-508.
7. SEE A-602 FOR FINISH SCHEDULE.
8. REFER TO POCKET DOOR FRAME KIT INSTALLATION INSTRUCTIONS TO DETERMINE ROUGH OPENING FOR POCKET DOOR.

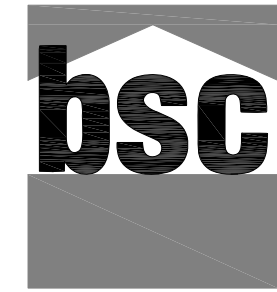
SHEET KEYNOTES

1. INSTRUMENTATION CONDUIT FROM GARAGE ATTIC (THROUGH BREEZEWAY) TO ENTER WALL THROUGH RIM JOIST (IN 2ND FLOOR FRAMING). PENETRATION "E10", SEE A-603 FOR PENETRATION SCHEDULE.
2. AIR RETURN FOR FCU-1 LOCATED IN WALL ABOVE DOOR

DOOR KEY

1. 1'-8" x 6'-8" LH
2. (2) 1'-10" x 6'-8"
3. 2'-4" x 6'-8" LH
4. 2'-4" x 6'-8" RH
5. 2'-4" x 6'-8" POCKET
6. 2'-6" x 6'-8" RH
7. 2'-6" x 6'-8" LH
8. 2'-8" x 6'-8" LH
9. 2'-8" x 6'-8" RH
10. 3'-0" x 6'-8" LH
11. 3'-0" x 6'-8" RH
12. 3'-0" x 6'-8" POCKET
13. 3'-0" x 7'-0" RH W/ 12" SIDELITES
14. 3'-0" x 7'-0" LH
15. 3'-0" x 7'-0" RH
16. 9'-0" x 8'-0" OVERHEAD
17. (2) 4'-6" x 8'-0"
18. 6'-0" x 6'-8" (1) LH PANEL, (1) FIXED PANEL
19. 3'-0" x 6'-8" RH

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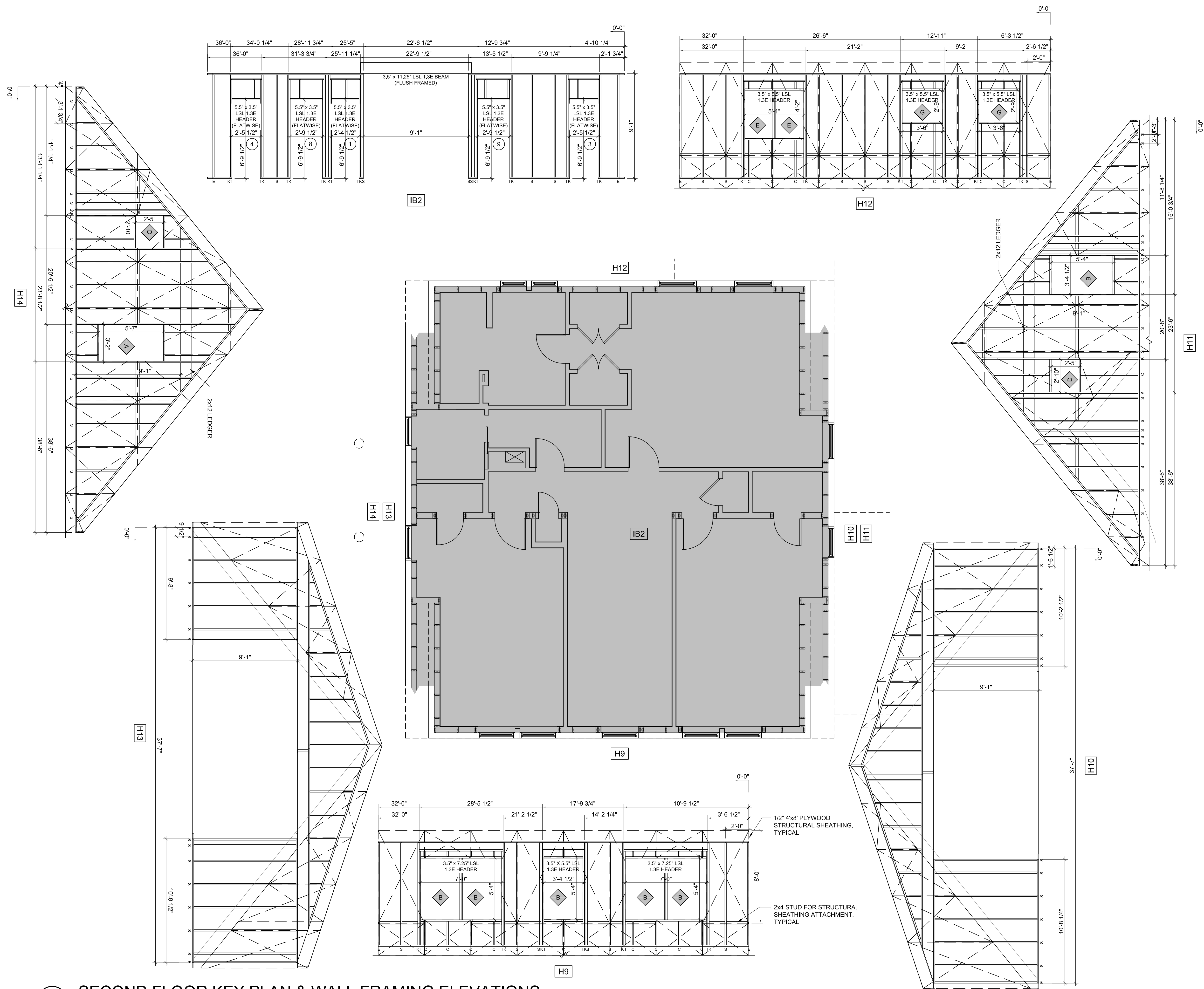
SECOND FLOOR
PLAN

SCALE AS NOTED



A-109

1 SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0"



GENERAL SHEET NOTES

1. REAR WALL FRAMING ELEVATIONS DRAWN AS SEEN FROM INTERIOR; INTERIOR BEARING WALL FRAMING ELEVATION DRAWN AS SEEN FROM THE FRONT; ALL OTHER ELEVATIONS DRAWN AS SEEN FROM EXTERIOR
2. TYPICAL WALL HEIGHT = 9'-1".
3. TYPICAL SECOND FLOOR WINDOW FRAMING HEAD HEIGHT = 7'-7 1/2".
4. WINDOW AND EXTERIOR DOOR FRAMING OPENING DIMENSIONS TO BE ADJUSTED PER MANUFACTURER SELECTION AS FOLLOWS:
 - A. FRAMING WIDTH FOR DOORS AND WINDOWS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING WIDTH BY ADDING 1/2" TO EACH SIDE.
 - B. FRAMING HEIGHT FOR WINDOWS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING HEIGHT BY ADDING 1/2" TO THE TOP AND 1" TO THE BOTTOM.
 - C. FRAMING HEIGHT FOR DOORS: INCREASE THE MANUFACTURER'S SPECIFIED ROUGH OPENING HEIGHT BY ADDING 1/2" TO THE TOP.
5. FRAMING STUDS TO BE FSC-CERTIFIED LUMBER.
6. LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS.
7. STRUCTURAL SHEATHING CONNECTIONS (TO RESIST ROOF UPLIFT):

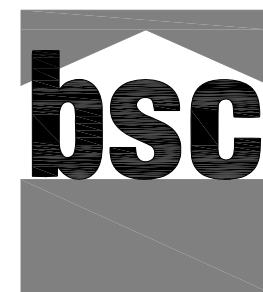
LAP SHEATHING ON RAFTER RIM BOARD: MINIMUM 8d NAILS AT 3" O.C.

HORIZONTAL SHEATHING EDGES AT BLOCKING OR FRAMING: MINIMUM 8d NAILS AT 3" O.C.

HORIZONTAL SHEATHING EDGES BELOW SECOND FLOOR: MINIMUM 8d NAILS AT 6" O.C.

SHEET KEYNOTES

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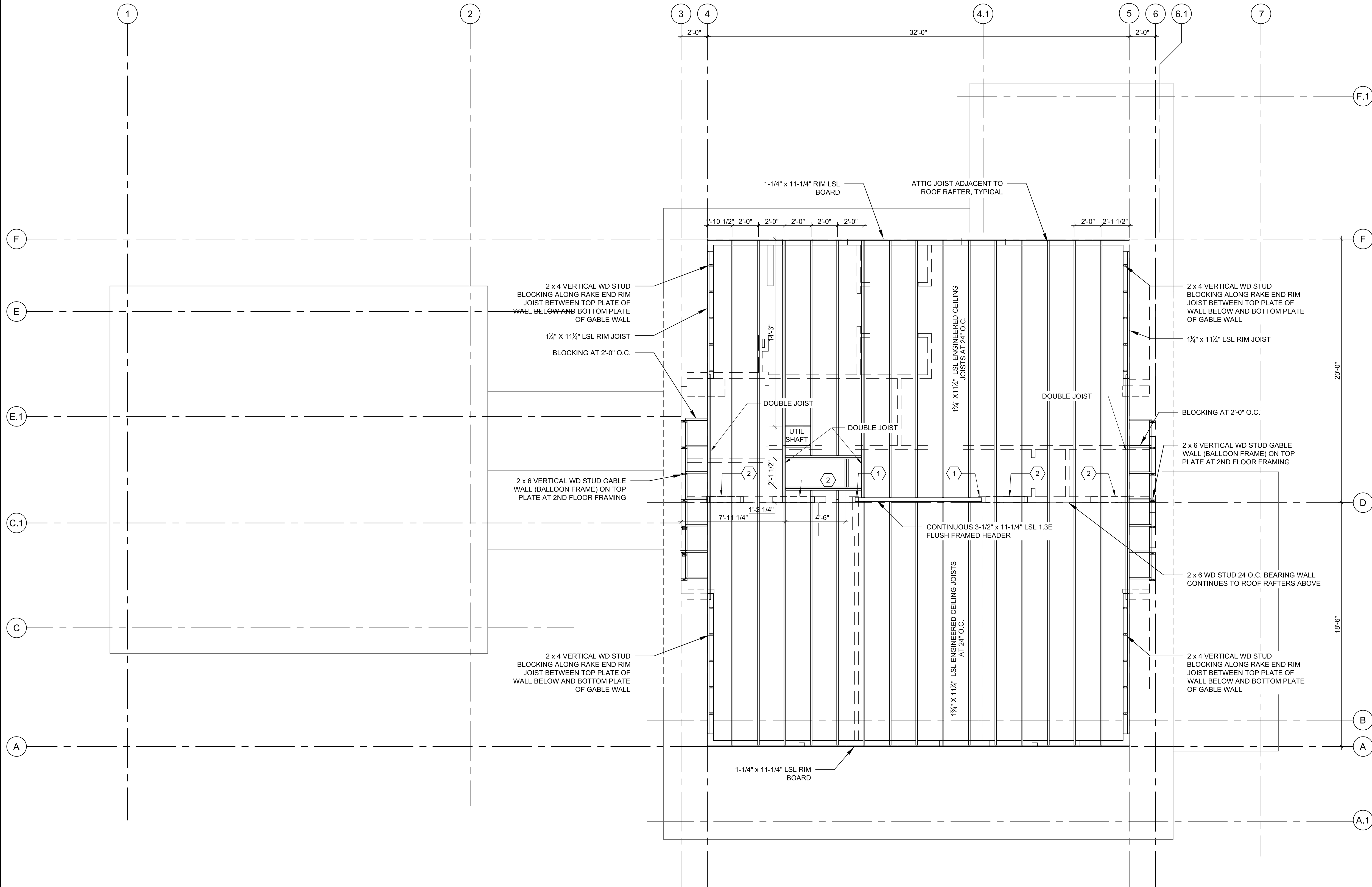
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SHEET TITLE:

**SECOND FLOOR
KEY PLAN & WALL
FRAMING
ELEVATIONS**

SCALE AS NOTED



A-110



GENERAL SHEET NOTES

- CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
- EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
- LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS.
- GENERAL STRUCTURAL FRAMING CONNECTIONS:

LSL CEILING JOISTS TO FLOOR HEADERS: USP THD179 ENGINEERED WOOD JOIST HANGER;

DOUBLE LSL FLOOR HEADER TO TRIMMER: USP HD 410 DOUBLE HANGER.
- STRUCTURAL FRAMING CONNECTIONS FOR CENTER BEARING WALL (TO RESIST ROOF UPLIFT):

RAFTER TO RIDGE BOARD: USP AC7 ANGLE BRACKET WITH 4 10d NAILS EACH LEG

RAFTER TO STUD IN ATTIC BEARING WALL: USP LTW12 WITH R 10d NAILS EACH END

STUD IN ATTIC BEARING WALL TO CEILING JOIST: USP LTW12 WITH 4 10d NAILS EACH END

CEILING JOIST TO STUD IN SECOND FLOOR BEARING WALL: USP RT10 WITH 4 8d NAILS EACH END (USE USP LTW12 AT CONNECTIONS TO WALL HEADERS)

STUD TO SOLE PLATE IN SECOND FLOOR BEARING WALL: (2) USP S01 CLIP ANCHORS

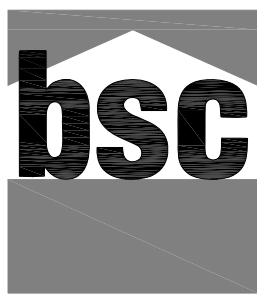
SOLE PLATE TO FLOOR DECK: (2) #8x3" WOOD SCREWS AT 12" O.C.

ATTIC FLUSH-FRAMED BEAM TO WALL STUDS AT ENDS OF BEAM: USP LTW12 WITH 8 10d NAILS EACH END OF STRAP; PROVIDE CONTINUOUS LOAD PATH DOWN TO BASEMENT BEAM USING SIMILAR SIZED STRAPS AT ALL FRAMING JOINTS.

SHEET KEYNOTES

- FOR LOCATION OF FLUSH FRAMED HEADER AND SUPPORT, SEE A-110, WALL IB2
- FOR SIZE AND LOCATION OF HEADERS IN THE BEARING WALL BELOW SEE A-110, WALL IB2.

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SHEET TITLE:

ATTIC FRAMING
PLAN

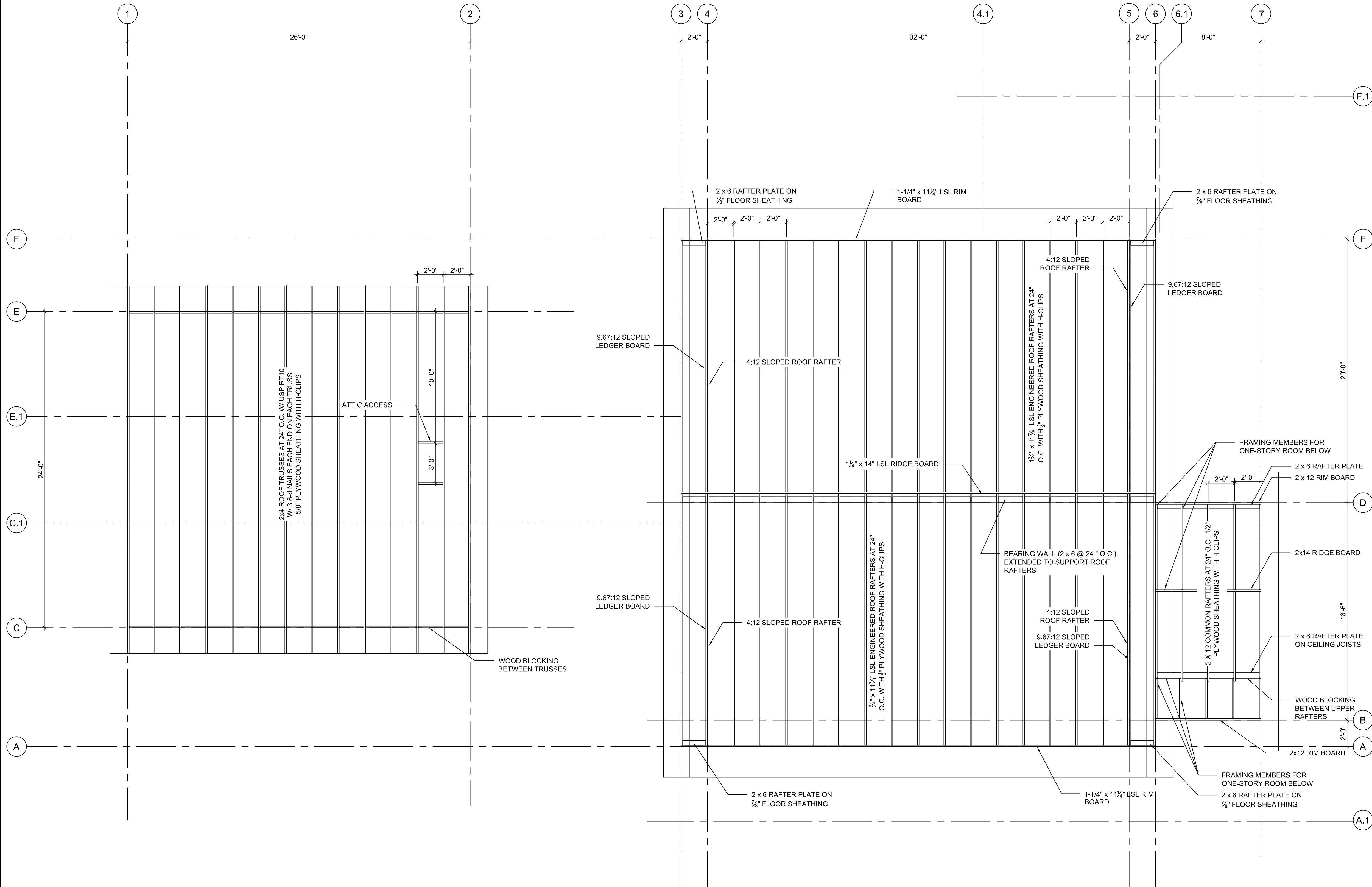
SCALE AS NOTED



A-111

1 ATTIC FRAMING PLAN

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

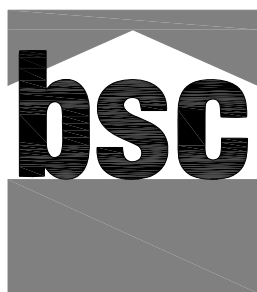


GENERAL SHEET NOTES

- CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
- EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
- LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS.
- SAWN LUMBER RAFTERS AND BLOCKING TO BE FSC CERTIFIED.
- GENERAL STRUCTURAL FRAMING CONNECTIONS:
 - LSL CEILING JOISTS TO FLOOR HEADERS: USP THD179 ENGINEERED WOOD JOIST HANGER;
 - DOUBLE LSL FLOOR HEADER TO TRIMMER: USP HD 410 DOUBLE HANGER.
- SEE A-305 FOR GARAGE ROOF TRUSS TYPES; TRUSSES TO BE CONSTRUCTED USING FSC-CERTIFIED WOOD; ROOF TRUSSES TO BE ENGINEERED BY TRUSS SUPPLIER TO MEET LOCAL CODE.
- STRUCTURAL FRAMING CONNECTIONS FOR CENTER BEARING WALL (TO RESIST ROOF UPLIFT):
 - RAFTER TO RIDGE BOARD: USP AC7 ANGLE BRACKET WITH 4 10d NAILS EACH LEG
 - RAFTER TO STUD IN ATTIC BEARING WALL: USP LTW12 WITH R 10d NAILS EACH END
 - STUD IN ATTIC BEARING WALL TO CEILING JOIST: USP LTW12 WITH 4 10d NAILS EACH END
 - CEILING JOIST TO STUD IN SECOND FLOOR BEARING WALL: USP RT10 WITH 4 8d NAILS EACH END (USE USP LTW12 AT CONNECTIONS TO WALL HEADERS)
 - STUD TO SOLE PLATE IN SECOND FLOOR BEARING WALL: (2) USP S01 CLIP ANCHORS
 - SOLE PLATE TO FLOOR DECK: (2) #8x3" WOOD SCREWS AT 12" O.C.
 - ATTIC FLUSH-FRAMED BEAM TO WALL STUDS AT ENDS OF BEAM: USP LTW12 WITH 6 10d NAILS EACH END OF STRAP; PROVIDE CONTINUOUS LOAD PATH DOWN TO BASEMENT BEAM USING SIMILAR SIZED STRAPS AT ALL FRAMING JOINTS.

SHEET KEYNOTES

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SHEET TITLE:

ROOF FRAMING PLAN

SCALE AS NOTED

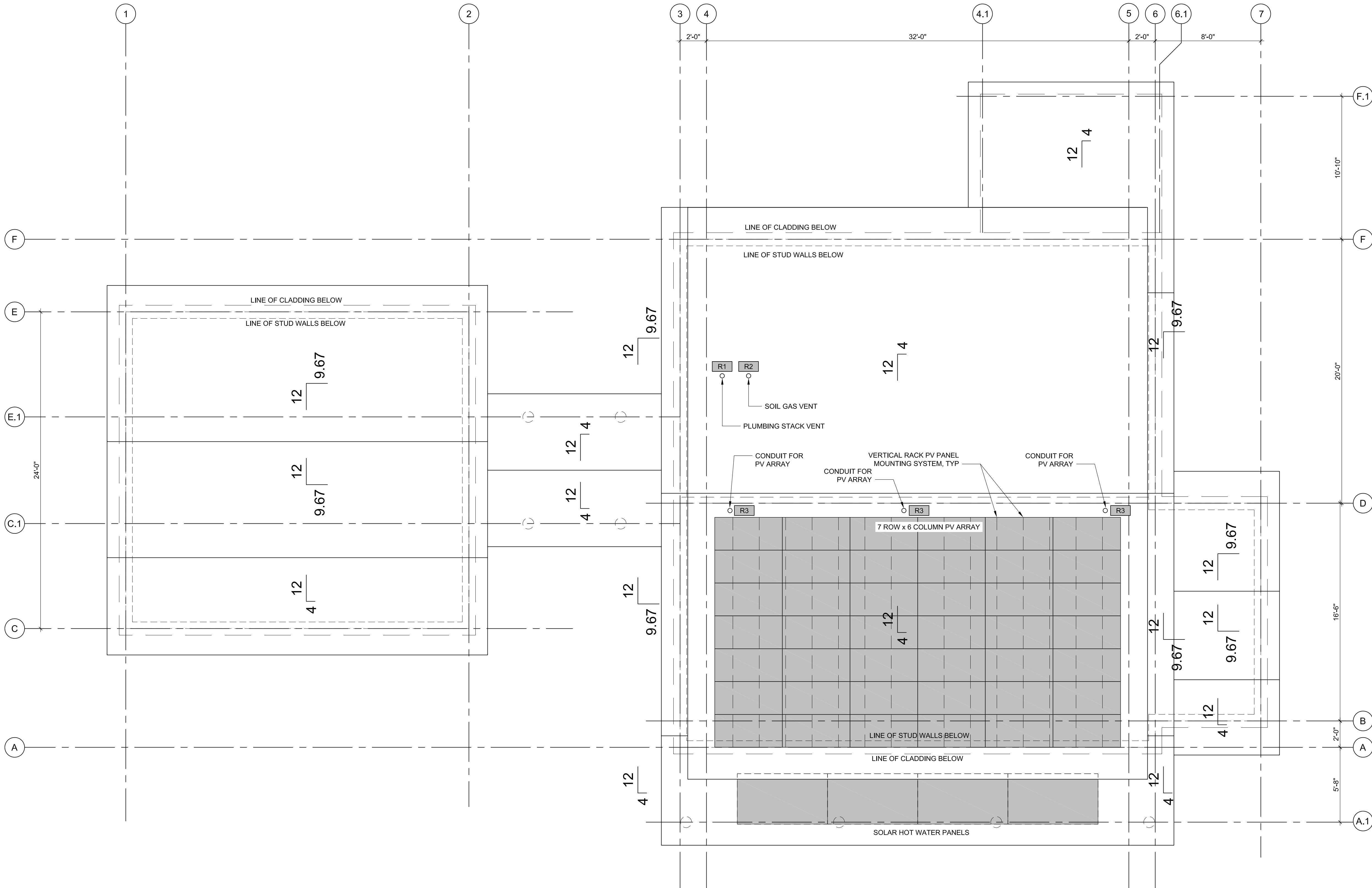


A-112

1

ROOF FRAMING PLAN

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



GENERAL SHEET NOTES

1. ROOF PENETRATIONS TO BE LOCATED SO AS TO AVOID POSSIBILITY OF SHADING PHOTOVOLTAIC ARRAY.
2. AT HOUSE, CONTINUOUS FULLY-ADHERED PEEL AND STICK ROOFING MEMBRANE TO BE APPLIED SHINGLE STYLE OVER ENTIRE ROOF INCLUDING OVERHANGS AT EAVES AND RAKES AND OVER PORCHES AND BREEZEWAY.
3. AT HOUSE, CONTINUOUS FULLY-ADHERED PEEL AND STICK ROOFING MEMBRANE TO BE EXTENDED MIN. 12" UP PLYWOOD WALL SHEATHING AT ALL ROOF-WALL INTERSECTIONS EXCEPT WHERE PORCH OR BREEZEWAY ROOF MEETS WALL.
4. AT HOUSE, ADDITIONAL STRIP OF FULLY-ADHERED PEEL AND STICK ROOFING MEMBRANE TO BE APPLIED AT ALL ROOF-WALL INTERSECTIONS EXTENDING MIN. 12" OVER ROOF MEMBRANE AND 12" UP FACE OF WALL INSULATING SHEATHING.
5. AT GARAGE, CONTINUOUS FULLY-ADHERED PEEL AND STICK ROOFING MEMBRANE TO BE APPLIED TO 4:12 SECTION OF ROOF AND AT EAVE OF 9.67:12 SLOPE EXTENDING A MIN. OF 36" FROM THE EXTERIOR WALL TOWARDS THE RIDGE.
6. SEE A-603 FOR PENETRATION SCHEDULE.

SHEET KEYNOTES

PENETRATION KEY

- R1. PLUMBING STACK VENT
R2. SOIL GAS VENT
R3. PV CONDUIT

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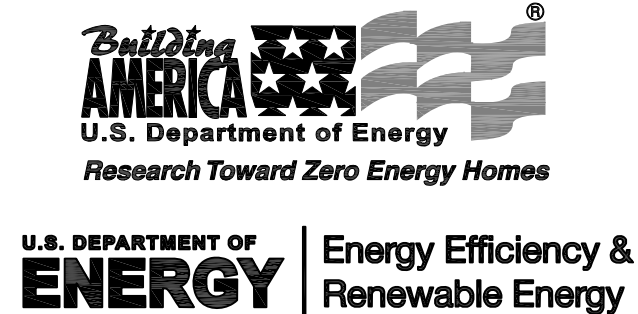
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SHEET TITLE:

ROOF PLAN

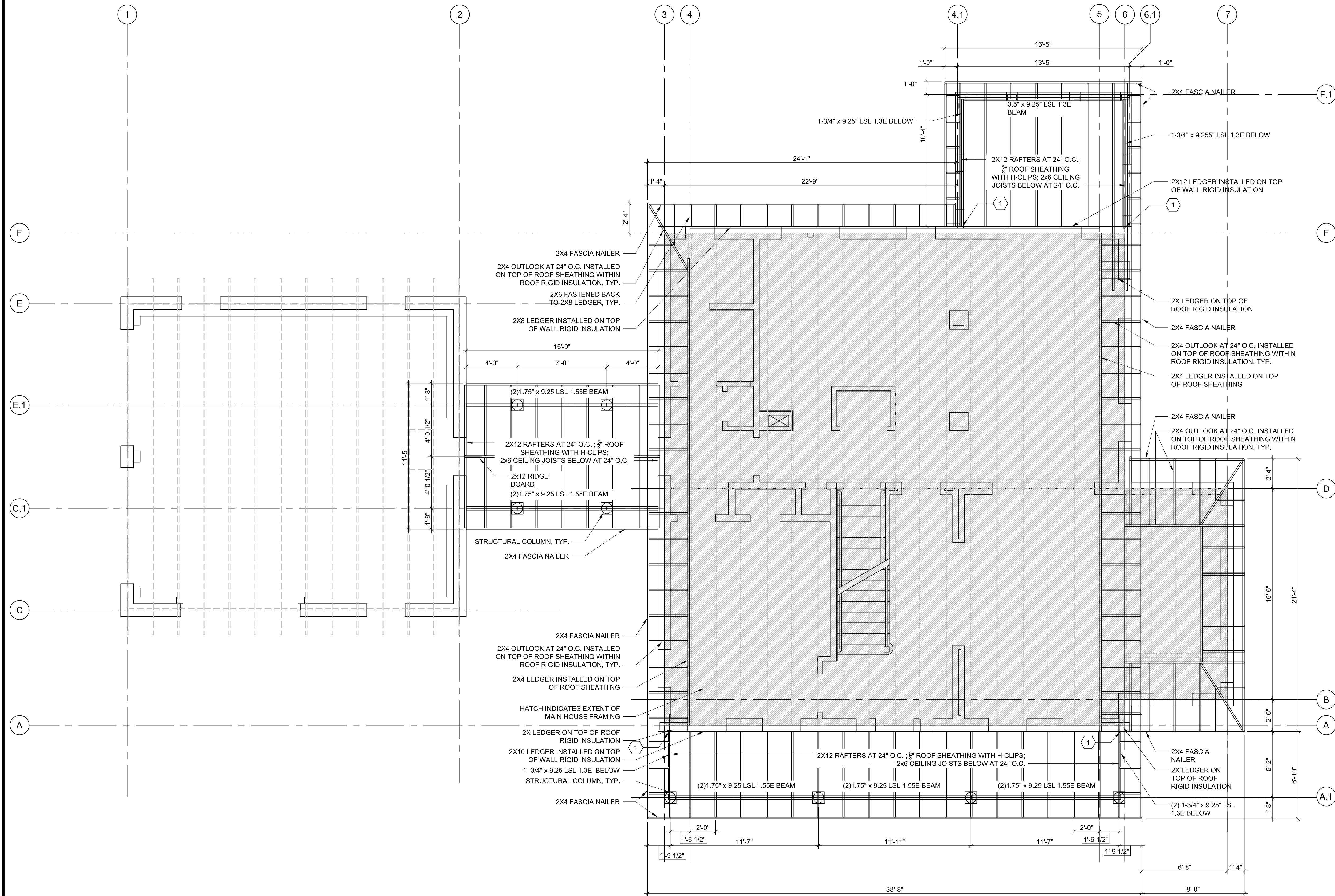
SCALE AS NOTED



A-113

1 ROOF PLAN

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



GENERAL SHEET NOTES

1. LIMIT THE OVERALL ESTIMATED WASTE FACTOR ON THE FRAMING ORDER TO 10% OR LESS
2. STRUCTURAL FRAMING CONNECTIONS FOR 2x4 ROOF OVERHANG OUTRIGGERS (TO RESIST WIND UPLIFT):

(1) #10 x 5" WOOD SCREW THROUGH 2x4 INTO RAFTER RIM BOARD;

(1) #10 x 5" WOOD SCREW THROUGH 2x4 INTO RAFTER, 4" FROM END OF 2x4.
3. STRUCTURAL FRAMING CONNECTIONS FOR FRONT PORCH ROOF TO RESIST WIND UPLIFT:

RAFTER LEDGER TO WALL STUDS: (2) 3/8" LAG SCREWS AT 24" O.C. (MINIMUM PENETRATION INTO STUD OF 2");

CEILING JOIST LEDGER TO WALL STUDS: (1) 3/8" LAG SCREW AT 24" O.C. (MINIMUM PENETRATION INTO STUD OF 2");

RAFTER TO LEDGER: USP A37 ANGLE BRACKET;

CEILING JOIST TO LEDGER: 4 16d TOE-NAILS OR USE USP A3 ANGLE BRACKET.
4. STRUCTURAL FRAMING CONNECTIONS FOR BREEZEWAY:

USE TIE STRAP AT EACH RAFTER TO TIE RAFTERS TO CEILING JOISTS.
5. STRUCTURAL FRAMING CONNECTIONS FOR FRONT PORCH AND BREEZEWAY COLUMNS (TO RESIST WIND UPLIFT):

BEAM TO STRUCTURAL COLUMN AND COLUMN BASE TO SONOTUBE CONNECTION TO FOLLOW COLUMN SUPPLIER'S INSTRUCTIONS; UPLIFT LOAD IS 800 LBS NOMINAL.
6. STRUCTURAL FRAMING CONNECTIONS FOR SCREEN PORCH ROOF (TO RESIST WIND UPLIFT AND FOR BRACING):

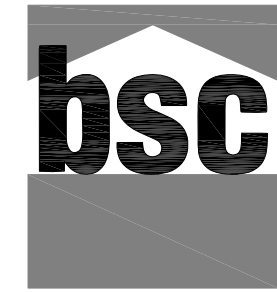
FASTEN 2x LEDGER AT SLOPE-CUT ENDS OF RAFTERS TO WALL STUDS AT 24" O.C. USING (2) 3/8" LAG SCREWS, TOP AND BOTTOM, PENETRATING MINIMUM 2-1/2" INTO STUDS ALONG LENGTH OF LEDGER;

FASTEN PORCH ROOF SHEATHING TO LEDGER USING 8d COMMON NAILS AT 3" O.C.
7. 2x FRAMING MEMBERS TO BE FSC-CERTIFIED.

SHEET KEYNOTES

1. CONCEALED HANGER SCREWED THROUGH INSULATION TO BLOCKING IN HOUSE WALL

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SHEET TITLE:

LOWER ROOF OVERHANG FRAMING PLAN

SCALE AS NOTED



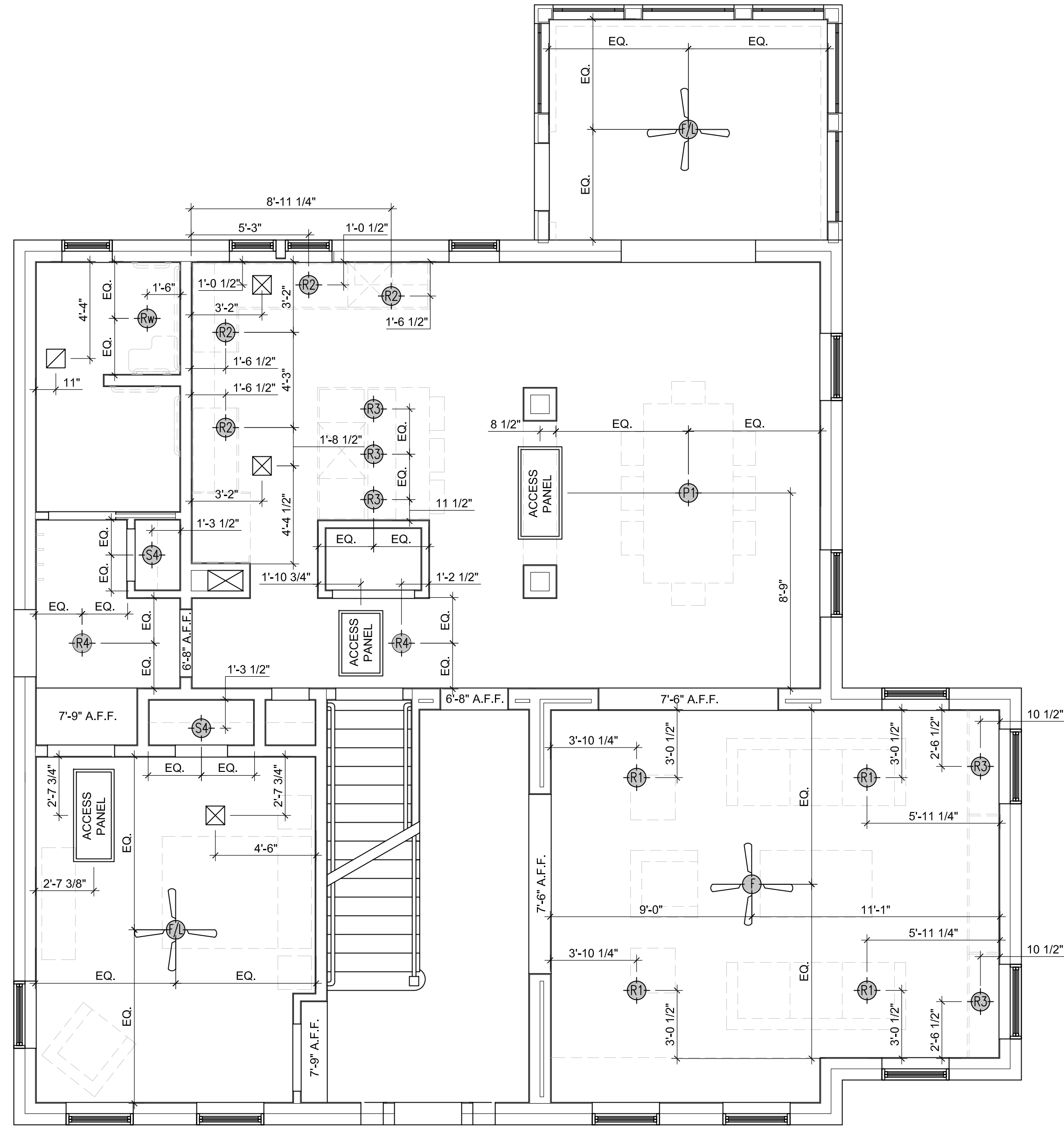
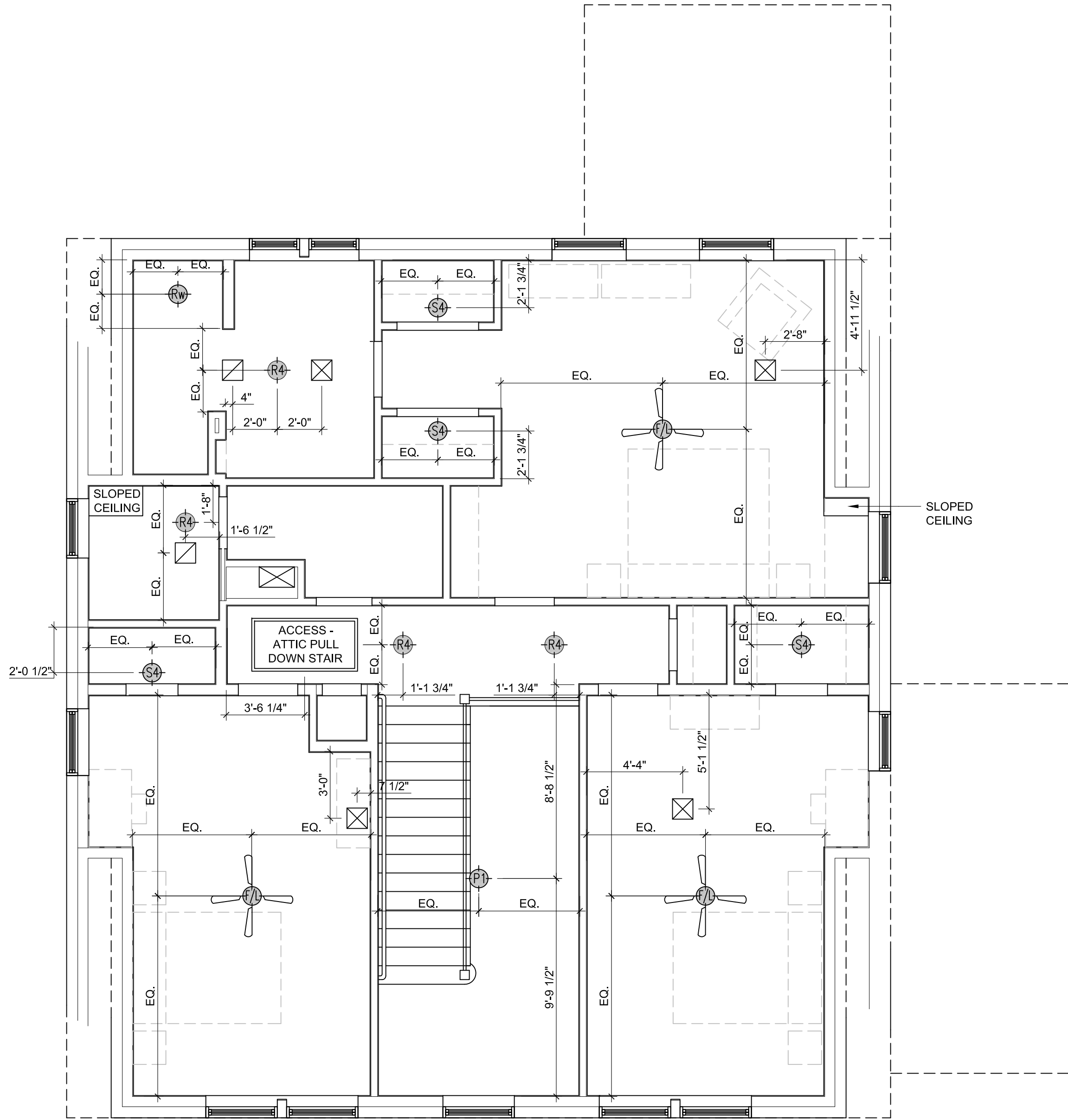
A-114

1 LOWER ROOF OVERHANG FRAMING PLAN

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



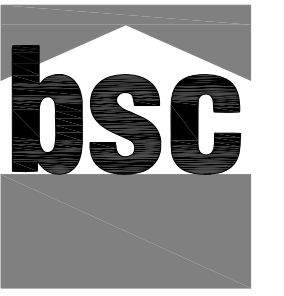
- SHEET KEYNOTES



GENERAL SHEET NOTES

1. CEILING ELEMENTS SHOWN FOR LOCATION ONLY; SEE E-001 FOR LIGHT FIXTURE SCHEDULE; SEE M-001 FOR DUCTWORK LEGEND. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR FIXTURE AND GRILLE SPECIFICATIONS.
2. ALL CEILING HEIGHTS AT 9'-0" A.F.F., UNLESS OTHERWISE NOTED.
3. SEE SPRINKLER PLAN FOR SPRINKLER HEAD LOCATIONS.
4. DIMENSIONS ARE TO FACE OF STUD AND CENTER OF CEILING ELEMENT.
5. SITE-BUILT ACCESS PANELS FIT WITHIN FRAMING MEMBERS ABOVE. SEE FRAMING PLANS FOR SIZE AND LOCATION. APPLY 1-1/2" x 3/4" FLAT TRIM AROUND EDGE OF PANEL. PANEL TO BE FASTENED AND REMOVABLE FROM BELOW WITHOUT REMOVING THE TRIM. PANEL FINISH TO MATCH CEILING FINISH. SEE 7/A-508.
6. CROWN MOULDING EXTENDS 5" FROM GWB, SEE INTERIOR ELEVATIONS FOR EXTENT OF CROWN MOULDING.

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SHEET TITLE:

**FIRST & SECOND
FLOOR REFLECTED
CEILING PLANS**

SCALE AS NOTED



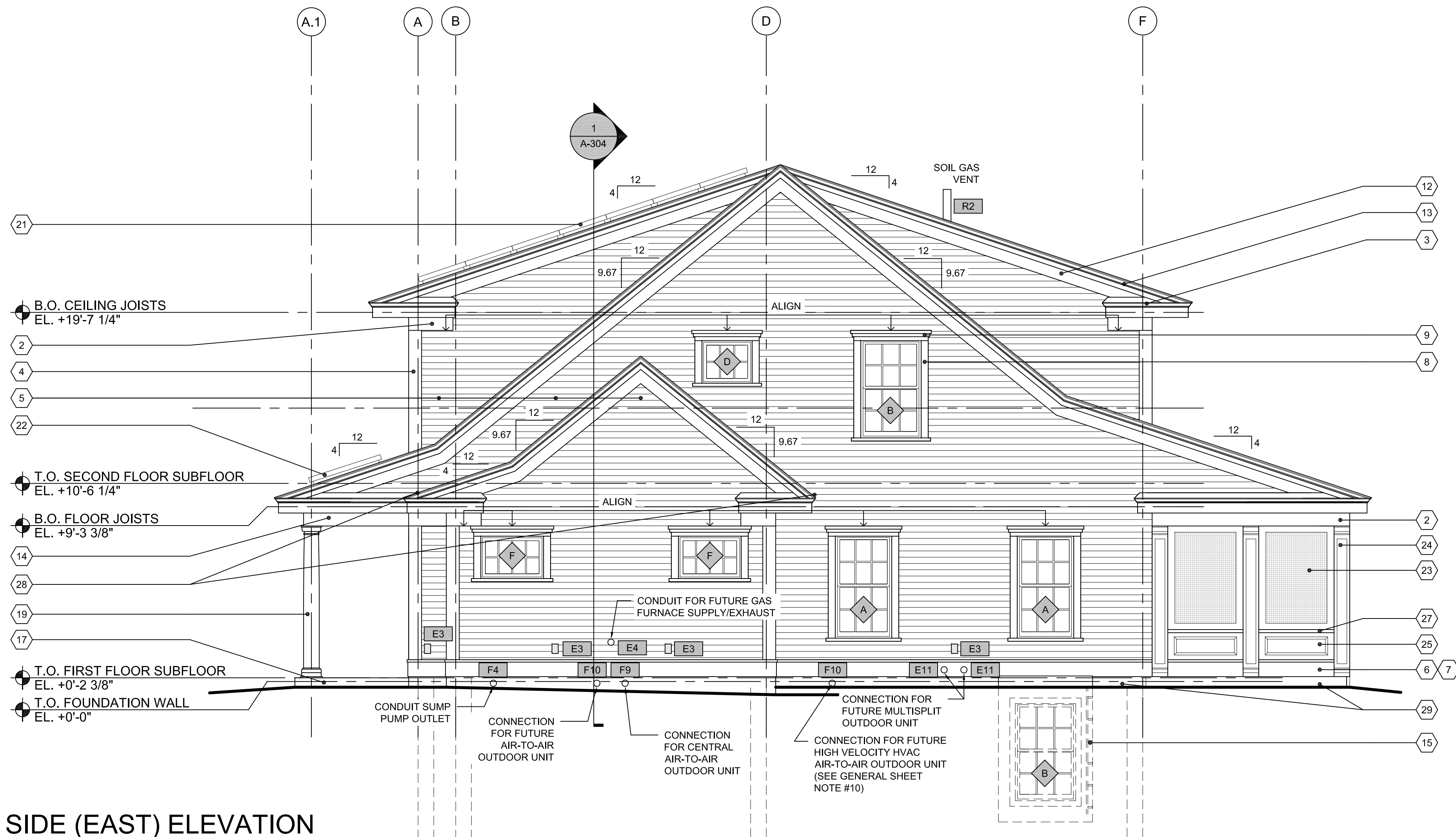
A-121

2 SECOND FLOOR REFLECTED CEILING PLAN

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

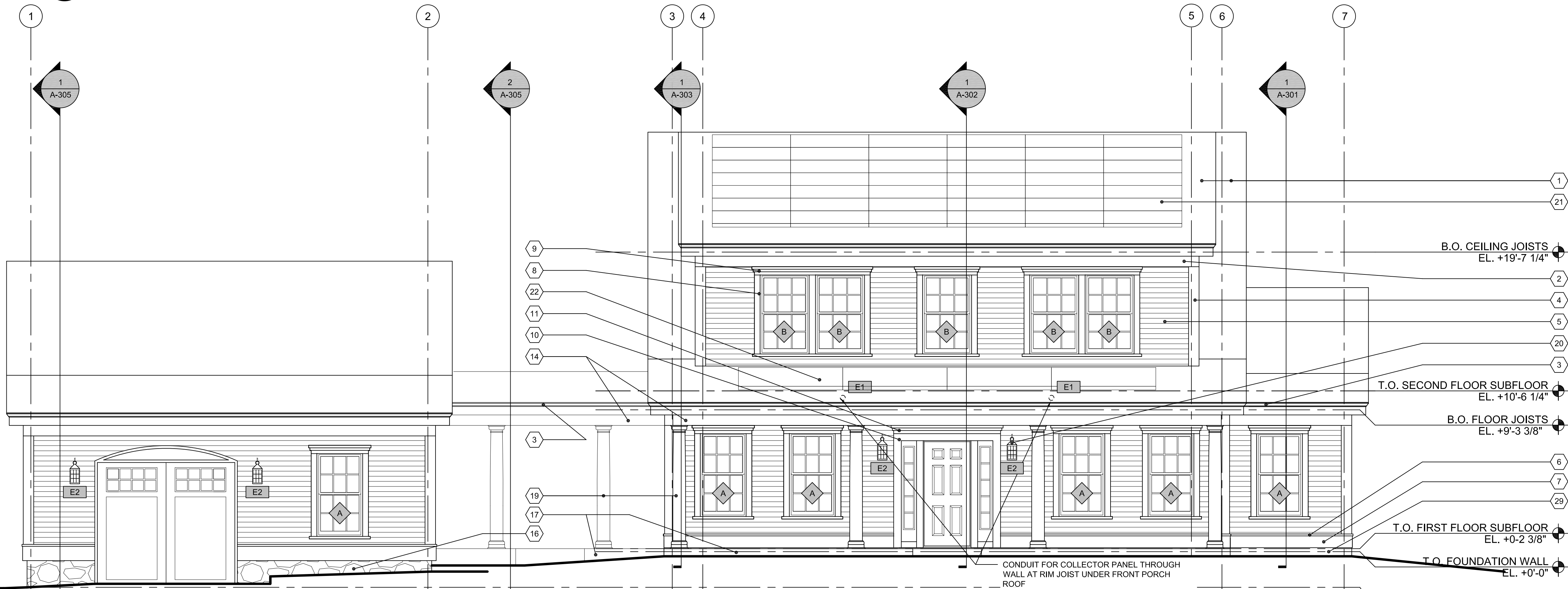
1 FIRST FLOOR REFLECTED CEILING PLAN

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



2 RIGHT SIDE (EAST) ELEVATION

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



1 FRONT (SOUTH) ELEVATION

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

GENERAL SHEET NOTES

- FIRST FLOOR SOFFITS AND SECOND FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE.
- SEE A-601 FOR WINDOW SCHEDULE.
- SEE A-603 FOR PENETRATION SCHEDULE.
- SIDING TO BE PAINTED P-12.
- ALL TRIM AND SOFFITS TO BE PAINTED P-13.
- ALL DOORS TO BE PAINTED P-14.
- CEILINGS OF PORCHES AND BREEZEWAY TO BE PAINTED P-15.
- FRONT PORCH AND BREEZEWAY COLUMNS TO BE PAINTED P-13.
- EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS.
- IF THE HIGH VELOCITY HVAC OPTION IS NOT AWARDED, THE PENETRATION FOR THE CONNECTION WILL NOT BE PROVIDED.

SHEET KEYNOTES

- ASPHALT ROOF SHINGLES
- 1" x 8" FRIEZE BOARD TRIM MOULDING
- 5/8" x 8" TRIM WITH 3" CROWN MOULDING
- 1" x 8 1/2" TRIM
- FIBER CEMENT SIDING, 4" EXPOSURE
- 2 x 2 TRIM
- 5/8" x 10" TRIM
- 1" x 4 1/2" WINDOW TRIM
- BUILT-UP WINDOW CROWN
- 1" x 6" DOOR TRIM
- BUILT-UP DOOR CROWN
- 5/4 x 8" TRIM
- 5/8" x 6" RAKE EDGE TRIM WITH 3" CROWN MOULDING
- 1" x 8 3/8" BEAM TRIM
- EGRESS WINDOW WELL AND LADDER
- STONE VENEER AT GARAGE FOUNDATION WALL
- CONCRETE DECK
- CONCRETE WALL WITH STONE VENEER EDGES
- LOAD-BEARING COLUMN
- EXTERIOR LANTERN
- PV ARRAY
- SOLAR COLLECTOR (HOT WATER SYSTEM)
- SCREEN PANEL
- PREFABRICATED PILASTER
- FIBER CEMENT PANEL
- FIBER CEMENT TRIM
- 2" SILL
- KICK-OUT FLASHING
- ALUMINUM COIL STOCK COVERING

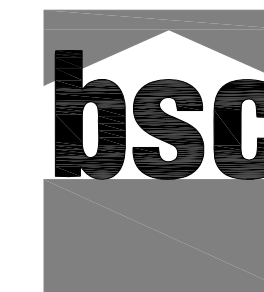
WINDOW KEY

- A. 3'-0" x 5'-5" DH
B. 3'-2 1/2" x 5'-2" DH
C. 2'-1" x 3'-7" DH
D. 2'-8" x 2'-3" AWN
E. 2'-3" x 4'-0" DH
F. 3'-4" x 2'-3" AWN
G. 3'-4" x 2'-7" AWN

PENETRATION KEY

- E1. COLLECTOR PANEL CONDUIT
E2. EXTERIOR LANTERN
E3. WEATHER PROTECTED OUTLET
E4. CONDUIT FOR FUTURE GAS FURNACE
E5. DRYER VENT
E6. RANGE HOOD VENT
E7. HRV EXHAUST
E8. HRV INLET
E9. INSTRUMENTATION CONDUIT
E10. CONDUIT FOR FUTURE GAS WATER HEATER
E11. FUTURE MULTI-SPLIT OUTDOOR UNIT CONNECTION
E12. HOSE BIBB
F4. SUMP PUMP OUTLET
F9. AIR-TO-AIR OUTDOOR UNIT CONNECTION
F10. FUTURE AIR-TO-AIR OUTDOOR UNIT CONNECTION
R1. PLUMBING STACK VENT
R2. SOIL GAS VENT

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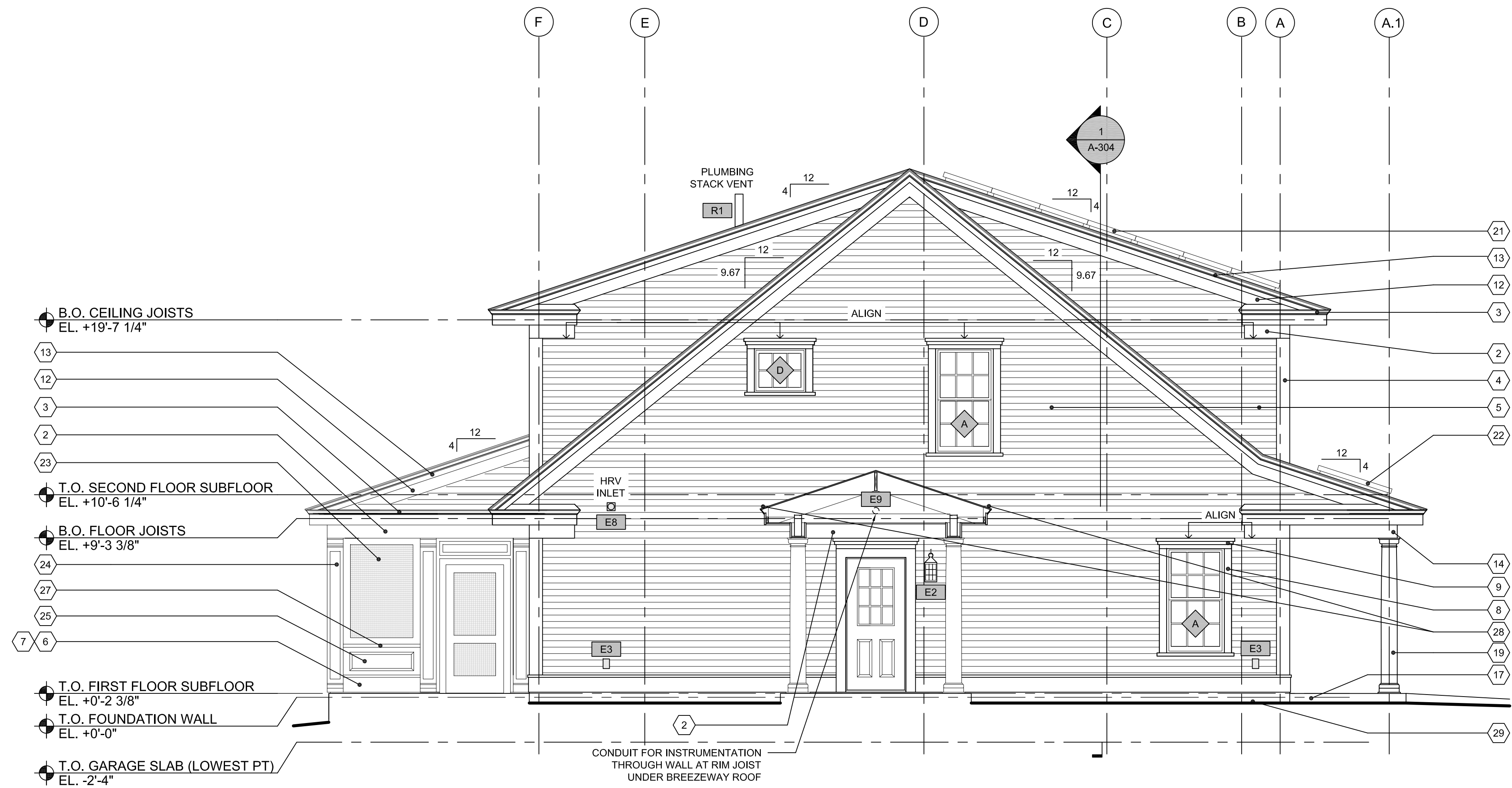
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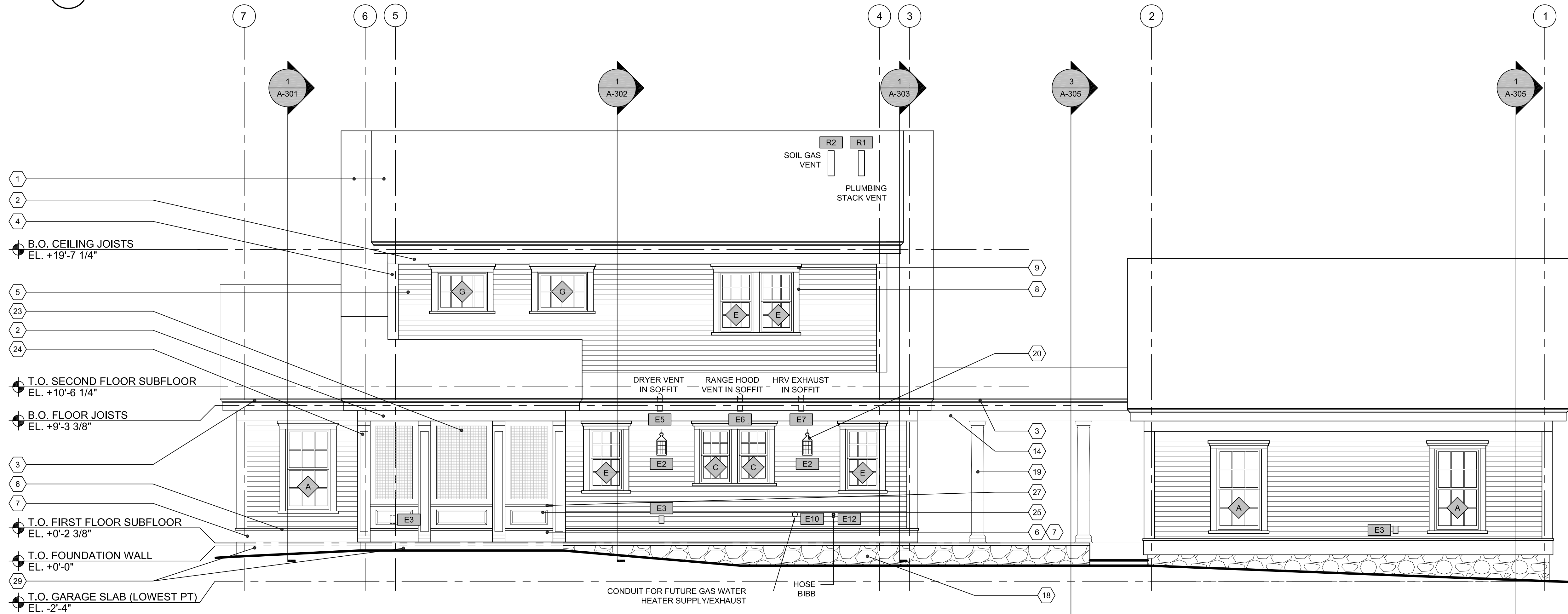
EXTERIOR ELEVATIONS

SCALE AS NOTED

A-201



2 LEFT SIDE (WEST) ELEVATION
SCALE: 1/4" = 1'-0"



1 REAR (NORTH) ELEVATION
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

- FIRST FLOOR SOFFITS AND SECOND FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE.
- SEE A-601 FOR WINDOW SCHEDULE.
- SEE A-603 FOR PENETRATION SCHEDULE.
- SIDING TO BE PAINTED P-12.
- ALL TRIM AND SOFFITS TO BE PAINTED P-13.
- ALL DOORS TO BE PAINTED P-14.
- CEILINGS OF PORCHES AND BREEZEWAY TO BE PAINTED P-15.
- FRONT PORCH AND BREEZEWAY COLUMNS TO BE PAINTED P-13.
- EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS.

SHEET KEYNOTES

- ASPHALT ROOF SHINGLES
- 1" x 8^{3/4}" FRIEZE BOARD TRIM MOULDING
- 3/4" x 8 TRIM WITH 3" CROWN MOULDING
- 1" x 8^{3/4}" TRIM
- FIBER CEMENT SIDING, 4" EXPOSURE
- 2 x 2 TRIM
- 3/4" x 10 TRIM
- 1" x 4 1/2" WINDOW TRIM
- BUILT-UP WINDOW CROWN
- 1" x 6" DOOR TRIM
- BUILT-UP DOOR CROWN
- 5/4 x 8 TRIM
- 3/4" x 6 RAKE EDGE TRIM WITH 3" CROWN MOULDING
- 1" x 8 3/4" BEAM TRIM
- EGRESS WINDOW WELL AND LADDER
- STONE VENEER AT GARAGE FOUNDATION WALL
- CONCRETE DECK
- CONCRETE WALL WITH STONE VENEER EDGES
- LOAD-BEARING COLUMN
- EXTERIOR LANTERN
- PV ARRAY
- SOLAR COLLECTOR (HOT WATER SYSTEM)
- SCREEN PANEL
- PREFABRICATED PILASTER
- FIBER CEMENT PANEL
- FIBER CEMENT TRIM
- 2" SILL
- KICK-OUT FLASHING
- ALUMINUM COIL STOCK COVERING

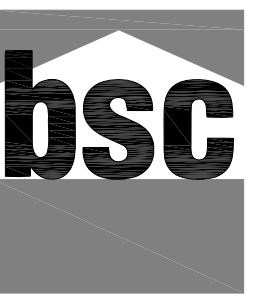
WINDOW KEY

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B. 3'-2 1/2" x 5'-2" DH
C. 2'-1" x 3'-7" DH
D. 2'-8" x 2'-3" AWN
E. 2'-3" x 4'-0" DH
F. 3'-4" x 2'-3" AWN
G. 3'-4" x 2'-7" AWN

PENETRATION KEY

- E1. COLLECTOR PANEL CONDUIT
E2. EXTERIOR LANTERN
E3. WEATHER PROTECTED OUTLET
E4. CONDUIT FOR FUTURE GAS FURNACE
E5. DRYER VENT
E6. RANGE HOOD VENT
E7. HRV EXHAUST
E8. HRV INLET
E9. INSTRUMENTATION CONDUIT
E10. CONDUIT FOR FUTURE GAS WATER HEATER
E11. FUTURE MULTI-SPLIT OUTDOOR UNIT CONNECTION
E12. HOSE BIBB
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R1. PLUMBING STACK VENT
R2. SOIL GAS VENT

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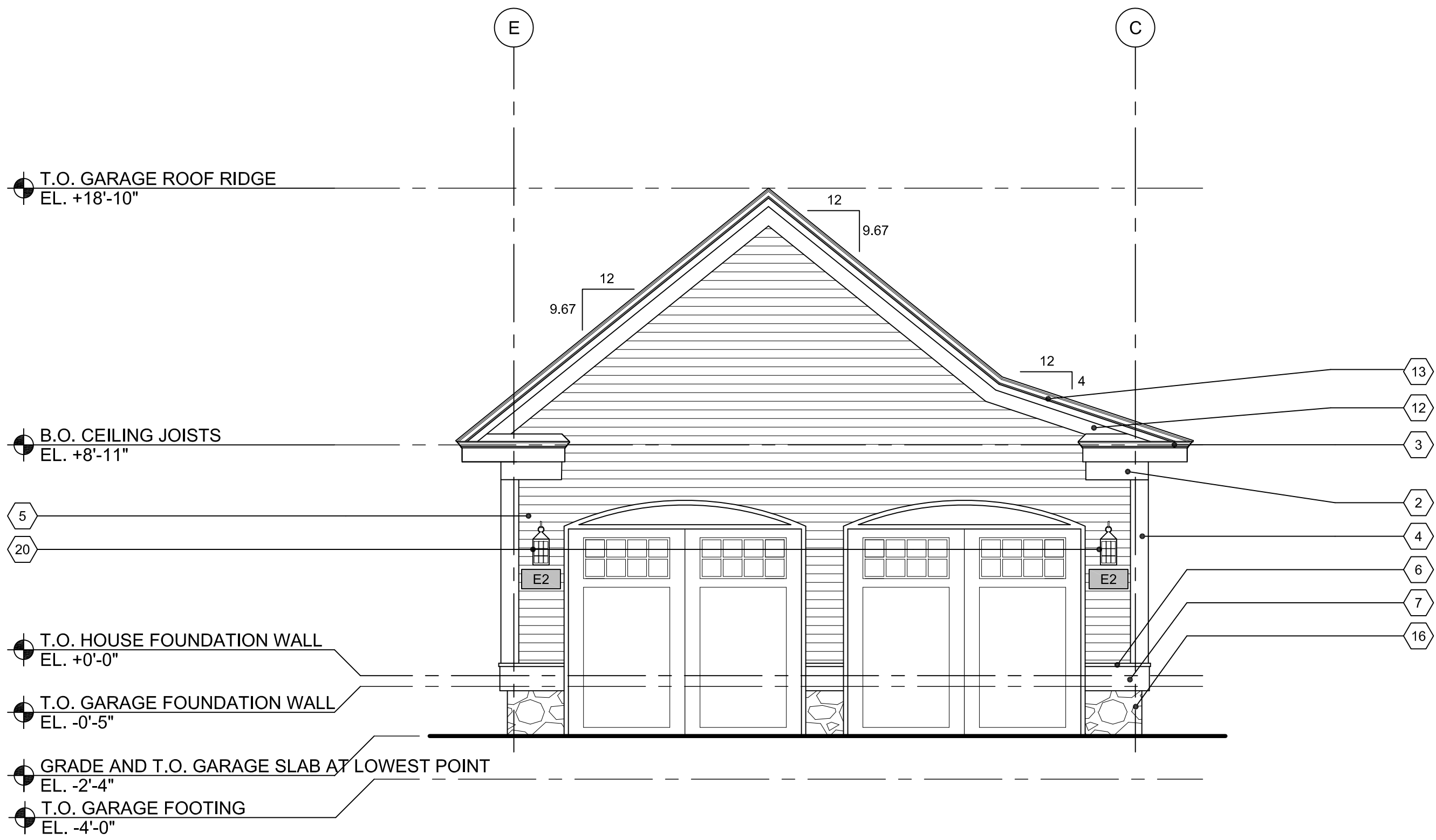
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**EXTERIOR
ELEVATIONS**

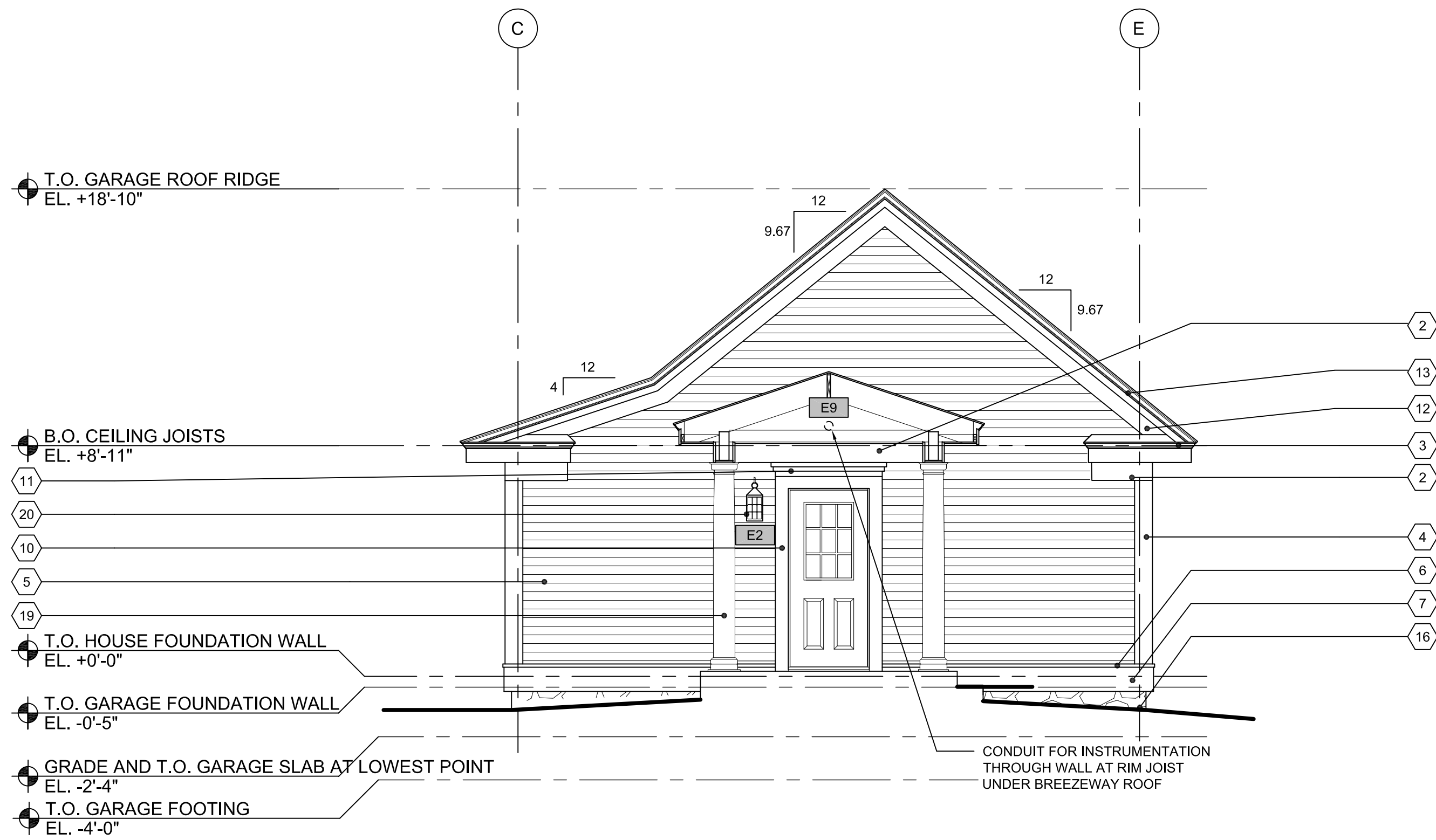
SCALE AS NOTED



A-202



2 LEFT SIDE (WEST) GARAGE ELEVATION
SCALE: 1/4" = 1'-0"



1 RIGHT SIDE (EAST) GARAGE ELEVATION
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

1. FIRST FLOOR SOFFITS AND SECOND FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE.
2. SEE A-601 FOR WINDOW SCHEDULE.
3. SEE A-603 FOR PENETRATION SCHEDULE.
4. SIDING TO BE PAINTED P-12.
5. ALL TRIM AND SOFFITS TO BE PAINTED P-13.
6. ALL DOORS TO BE PAINTED P-14.
7. CEILINGS OF PORCHES AND BREEZEWAY TO BE PAINTED P-15.
8. FRONT PORCH AND BREEZEWAY COLUMNS TO BE PAINTED P-13.
9. EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS.

SHEET KEYNOTES

1. ASPHALT ROOF SHINGLES
2. 1" x 8 1/2" FRIEZE BOARD TRIM MOULDING
3. 1/2" x 8 TRIM WITH 3" CROWN MOULDING
4. 1" x 8 1/2" TRIM
5. FIBER CEMENT SIDING, 4" EXPOSURE
6. 2 x 2 TRIM
7. 1/2" x 10 TRIM
8. 1" x 4 1/2" WINDOW TRIM
9. BUILT-UP WINDOW CROWN
10. 1" x 6" DOOR TRIM
11. BUILT-UP DOOR CROWN
12. 5/4 x 8 TRIM
13. 1/2" x 6 RAKE EDGE TRIM WITH 3" CROWN MOULDING
14. 1" x 8 1/2" BEAM TRIM
15. EGRESS WINDOW WELL AND LADDER
16. STONE VENEER AT GARAGE FOUNDATION WALL
17. CONCRETE DECK
18. CONCRETE WALL WITH STONE VENEER EDGES
19. LOAD-BEARING COLUMN
20. EXTERIOR LANTERN
21. PV ARRAY
22. SOLAR COLLECTOR (HOT WATER SYSTEM)
23. SCREEN PANEL
24. PREFABRICATED PILASTER
25. FIBER CEMENT PANEL
26. FIBER CEMENT TRIM
27. 2" SILL
28. KICK-OUT FLASHING
29. ALUMINUM COIL STOCK COVERING

WINDOW KEY

- A. 3'-0" x 5'-5" DH
- B. 3'-2 1/2" x 5'-2" DH
- C. 2'-1" x 3'-7" DH
- D. 2'-8" x 2'-3" AWN
- E. 2'-3" x 4'-0" DH
- F. 3'-4" x 2'-3" AWN
- G. 3'-4" x 2'-7" AWN

PENETRATION KEY

- E1. COLLECTOR PANEL CONDUIT
- E2. EXTERIOR LANTERN
- E3. WEATHER PROTECTED OUTLET
- E4. CONDUIT FOR FUTURE GAS FURNACE
- E5. DRYER VENT
- E6. RANGE HOOD VENT
- E7. HRV EXHAUST
- E8. HRV INLET
- E9. INSTRUMENTATION CONDUIT
- E10. CONDUIT FOR FUTURE GAS WATER HEATER
- E11. FUTURE MULTI-SPLIT OUTDOOR UNIT CONNECTION
- E12. HOSE BIBB
- F4. SUMP PUMP OUTLET
- F9. AIR-TO-AIR OUTDOOR UNIT CONNECTION
- F10. FUTURE AIR-TO-AIR OUTDOOR UNIT CONNECTION
- R1. PLUMBING STACK VENT
- R2. SOIL GAS VENT

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	08/03/10	UPDATED
	07/27/10	UPDATED
	06/29/10	UPDATED
MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO: NIST NZERTF
 CAD DWG FILE: A-PLOT-ELEV-NZERTF
 DRAWN BY: CG
 CHECKED BY: BP

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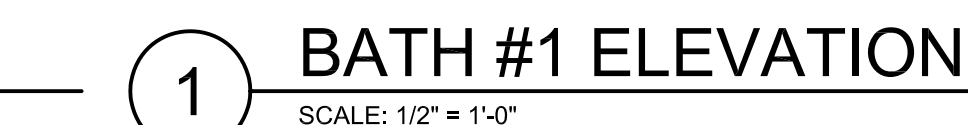
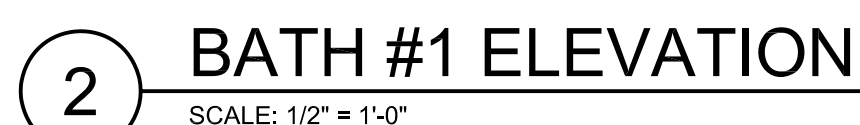
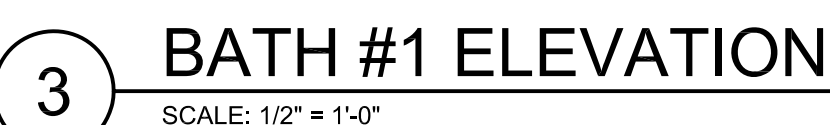
SHEET TITLE:

EXTERIOR
ELEVATIONS

SCALE AS NOTED



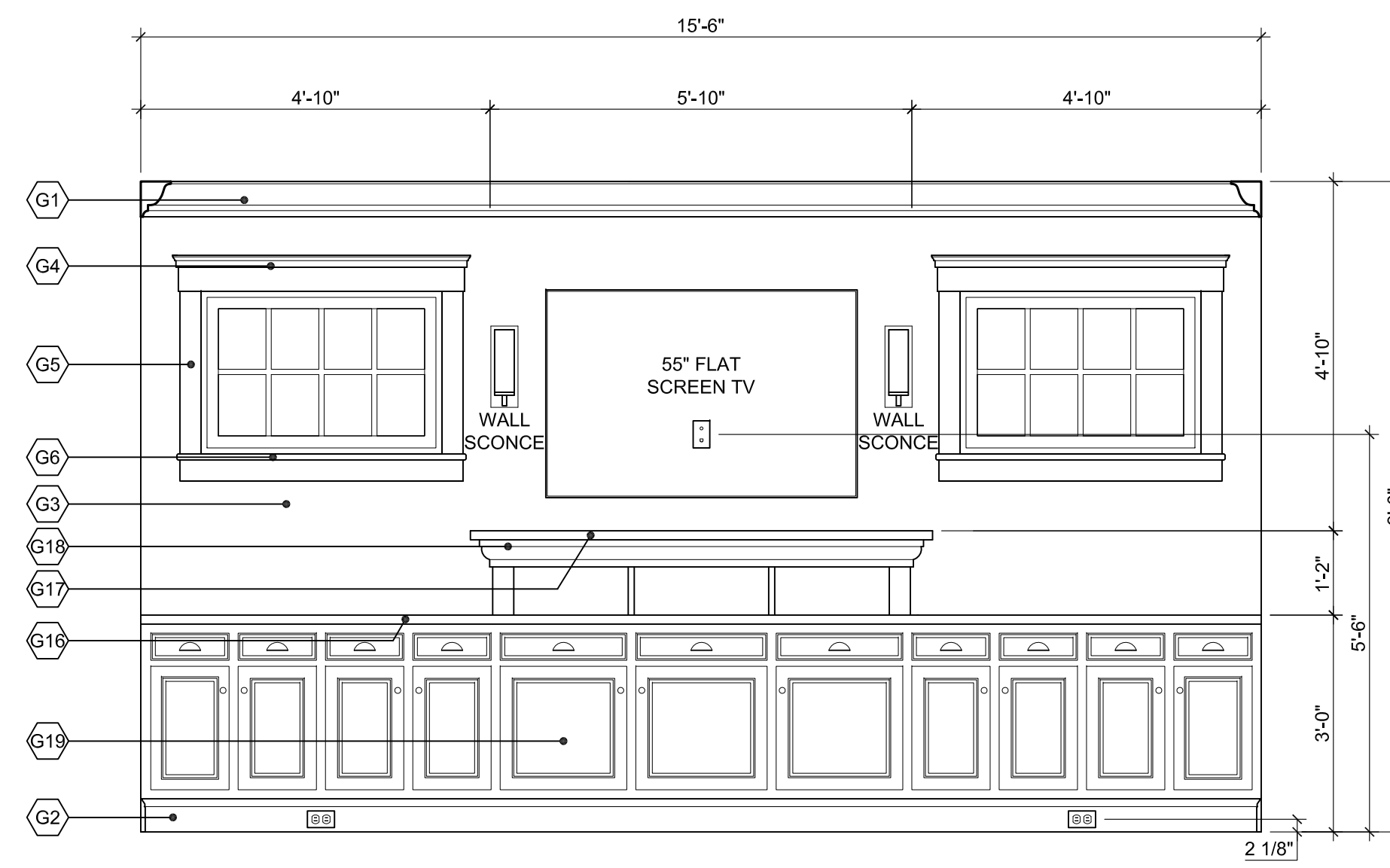
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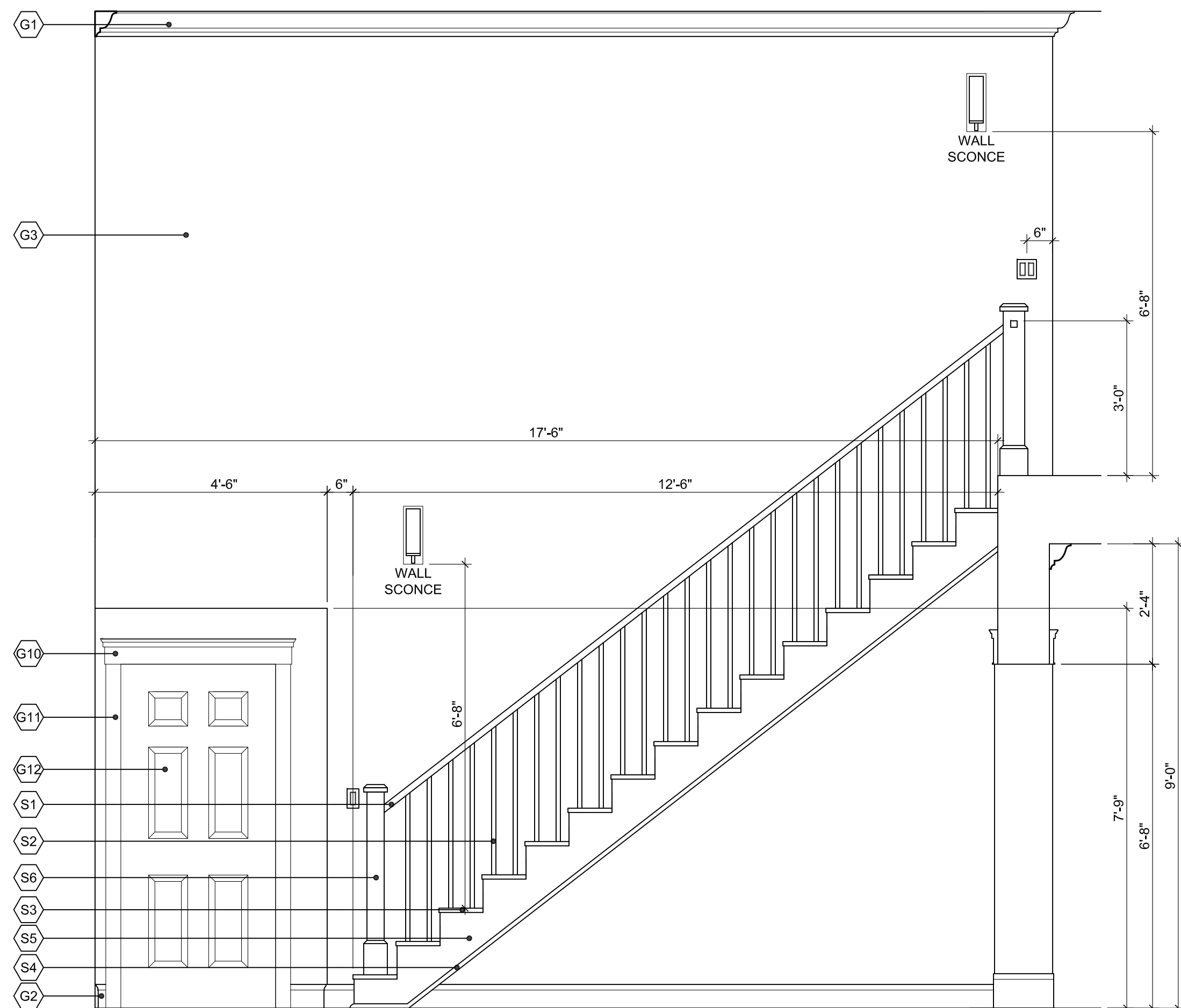
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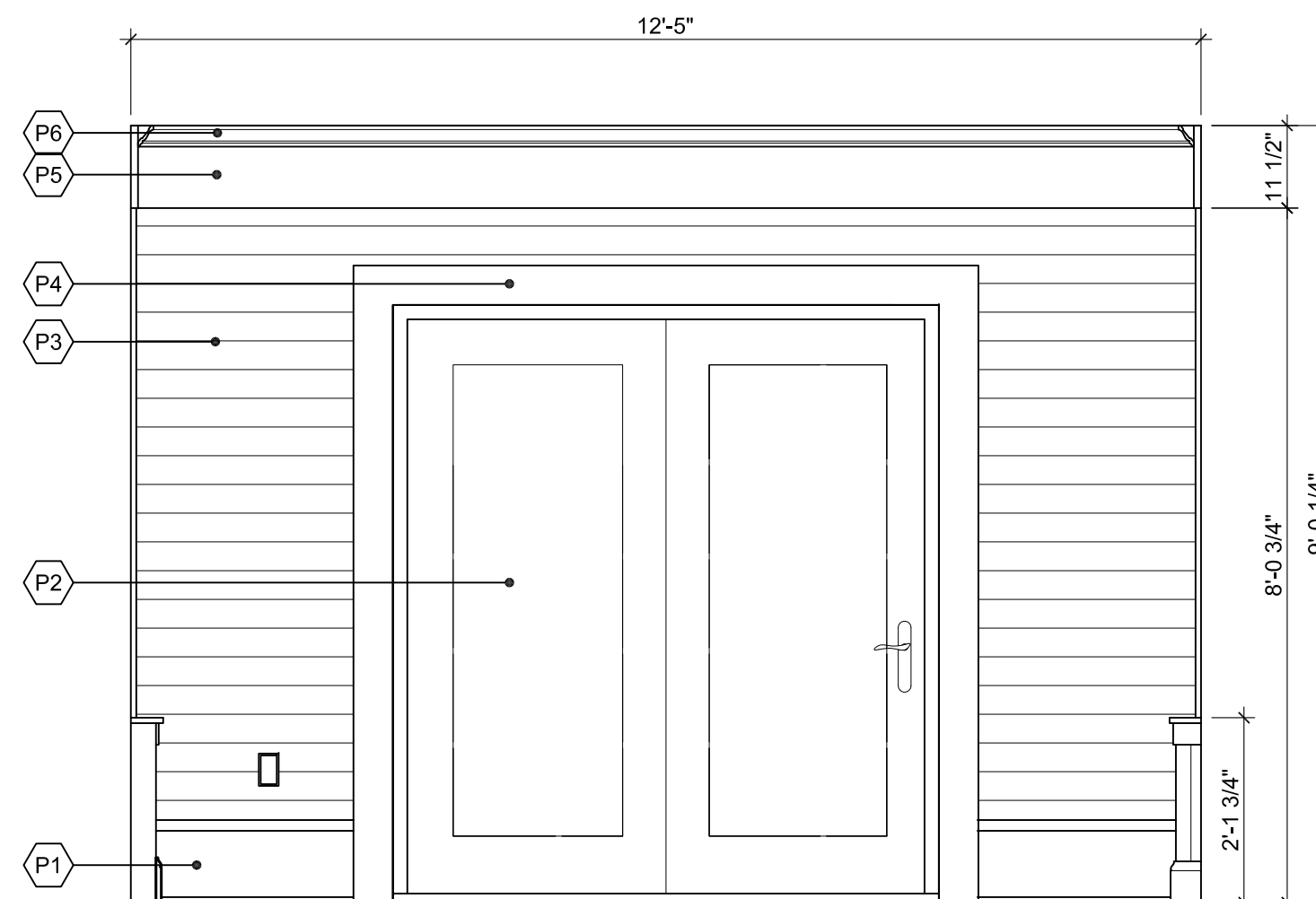
7 LIVING ROOM ELEVATION
SCALE: 1/2" = 1'-0"



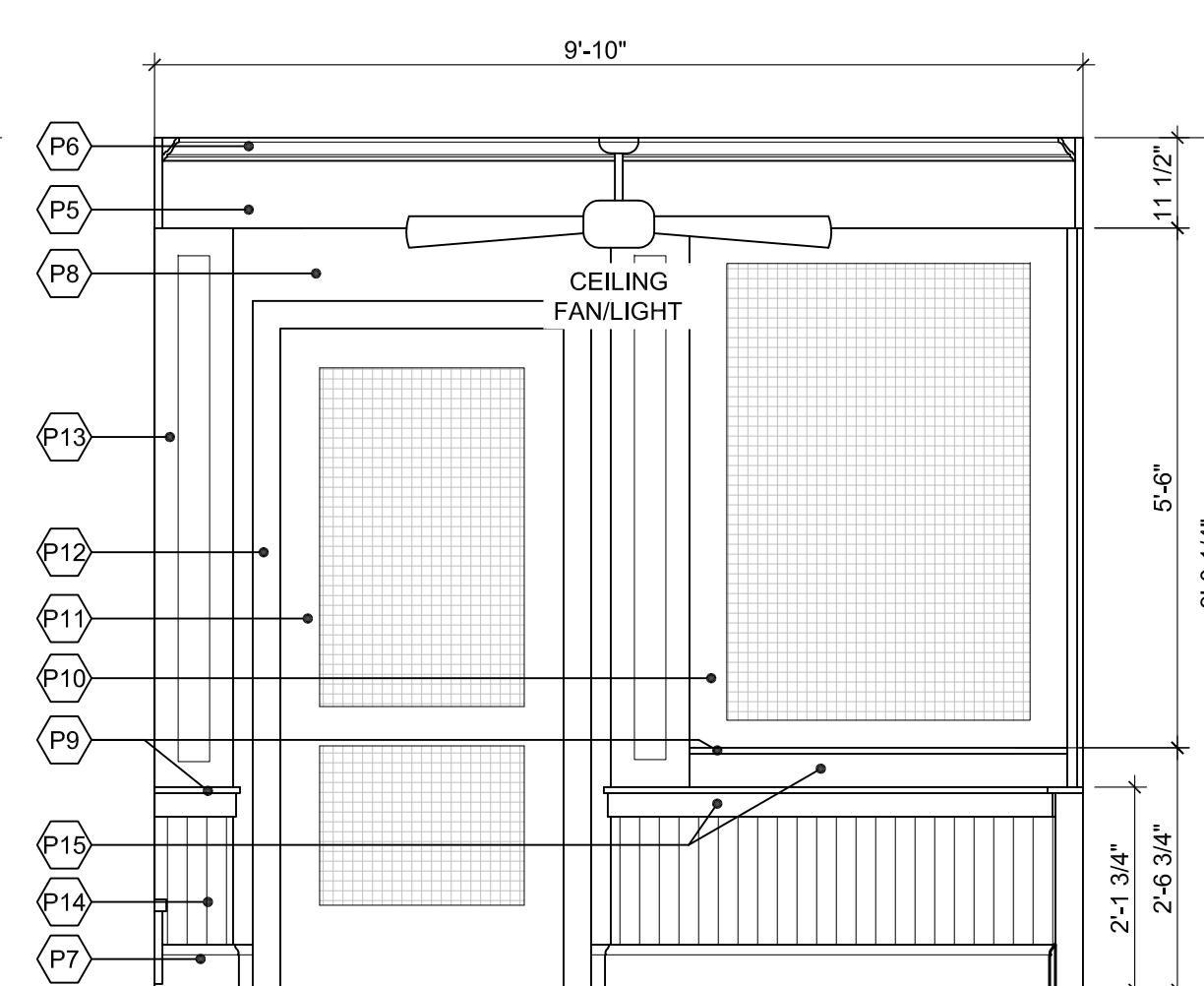
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SCALE: 1/2" = 1'-0"



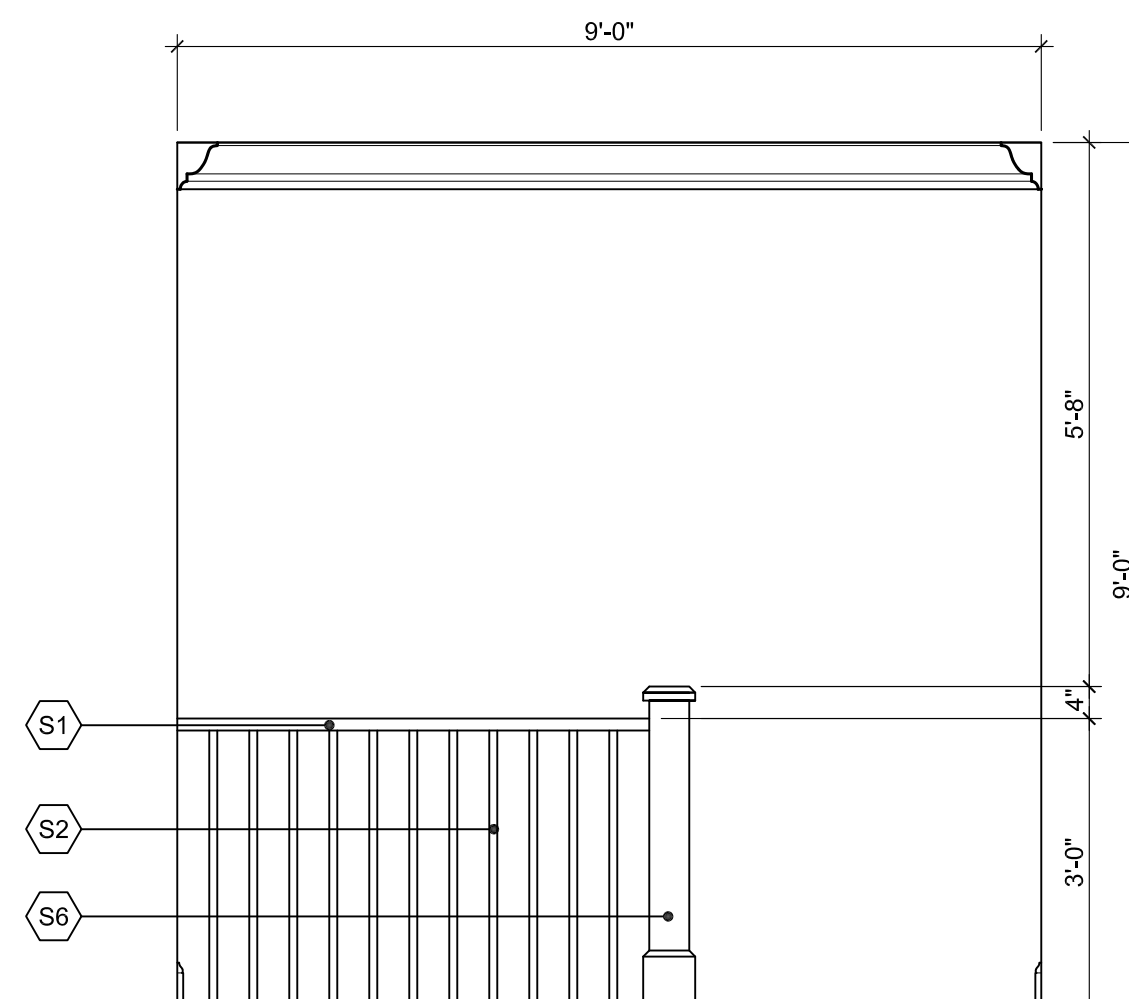
3 STAIR ELEVATION
SCALE: 1/2" = 1'-0"



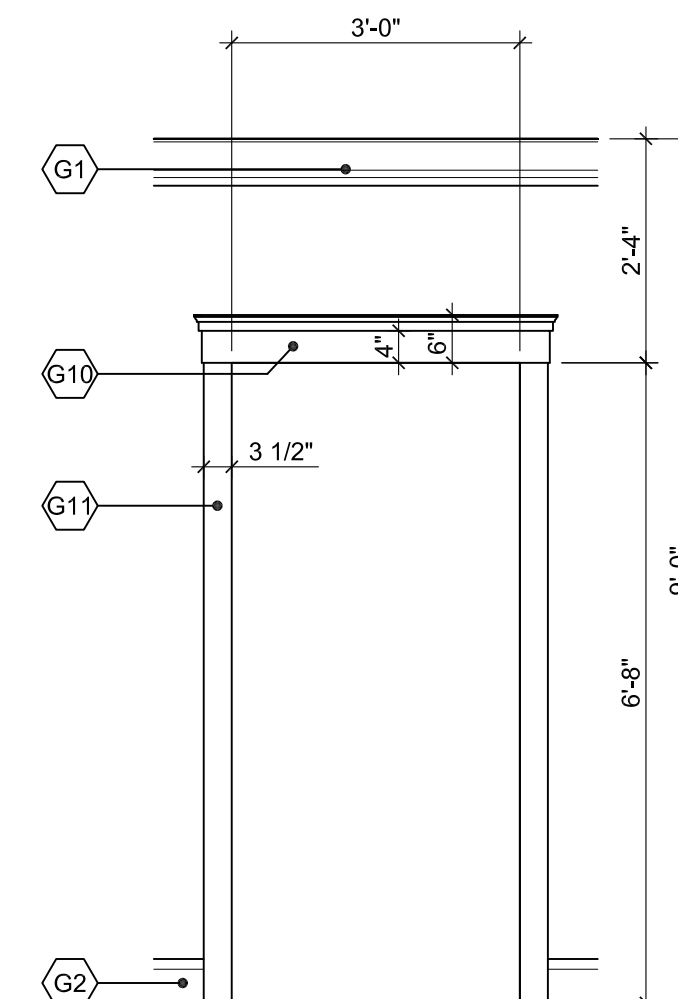
5 SCREEN PORCH ELEVATION
SCALE: 1/2" = 1'-0"



4 SCREEN PORCH ELEVATION
SCALE: 1/2" = 1'-0"



2 BALCONY ELEVATION
SCALE: 1/2" = 1'-0"



1 OPENING ELEVATION
SCALE: 1/2" = 1'-0"

GENERAL SHEET NOTES

- ALL TROPICAL WOOD, IF USED, MUST BE FSC-CERTIFIED.
- SEE A-602 FOR FINISH SCHEDULE.
- ALIGN SWITCH AND RECEPTACLE PLATES WITH TOP OF TILE IN KITCHENS AND BATHROOMS.

SHEET KEYNOTES

GENERAL:

- G1. CROWN MOULDING
- G2. BASE MOULDING
- G3. PAINTED WALL
- G4. WINDOW HEAD TRIM
- G5. 1x4 WINDOW JAMB TRIM
- G6. WINDOW SILL TRIM
- G7. CASED OPENING HEAD TRIM
- G8. 1x6 CASED OPENING JAMB TRIM
- G9. CASED OPENING BASE TRIM
- G10. DOOR HEAD TRIM
- G11. 1x4 DOOR JAMB TRIM
- G12. INTERIOR DOOR
- G13. BUILT-UP COLUMN
- G14. COLUMN BASE TRIM
- G15. WOOD PANEL
- G16. WOOD CAP
- G17. MANTLE
- G18. MANTLE TRIM
- G19. BASE CABINET
- G20. WOOD SHELF
- G21. 1"x4" DOOR HEAD TRIM

BATH:

- B1. TILE
- B2. HAND HELD SHOWER
- B3. SHOWER SEAT
- B4. GRAB BAR
- B5. TOWEL BAR
- B6. TOWEL RING
- B7. TOILET PAPER HOLDER
- B8. MIRROR
- B9. FRAMELESS MIRROR
- B10. ACCESSIBLE LAVATORY
- B11. ACCESSIBLE TOILET
- B12. TOILET
- B13. BATHTUB
- B14. VANITY BASE CABINET
- B15. SOLID SURFACE BACKSPASH
- B16. SOLID SURFACE COUNTERTOP
- B17. FRAMELESS GLASS SHOWER DOOR, TEMPERED
- B18. SOLID SURFACE BATHTUB DECK
- B19. 6" DEEP NICHE

KITCHEN:

- K1. WALL CABINET
- K2. BASE CABINET
- K3. END PANEL
- K4. SUPPORT BRACKET
- K5. RANGE HOOD EXHAUST DUCT
- K6. TILE BACKSPASH
- K7. SOLID SURFACE BACKSPASH
- K8. SOLID SURFACE COUNTERTOP

STAIR:

- S1. WOOD HANDRAIL
- S2. WOOD BALUSTER
- S3. WOOD TREAD
- S4. WOOD TRIM
- S5. WOOD STRINGER
- S6. WOOD POST

SCREEN PORCH:

- P1. EXTERIOR WATER TABLE
- P2. PORCH DOOR
- P3. EXTERIOR FIBER CEMENT LAP SIDING
- P4. 3/4" x 6" DOOR TRIM
- P5. 3/4" TRIM BOARD
- P6. 3" CROWN
- P7. 5 1/2" BASE
- P8. FIBER CEMENT PANEL BOARD
- P9. 3/4" WALL CAP
- P10. SCREEN PANEL
- P11. SCREEN DOOR
- P12. 3 1/2" TRIM
- P13. 10" TRIM BOARD W/ INSET PANEL
- P14. 2 1/2" BEADBOARD
- P15. TRIM BOARD

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

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	A-PLOT-ELEV-NZERTF
DRAWN BY:	KG, HW
CHECKED BY:	BP

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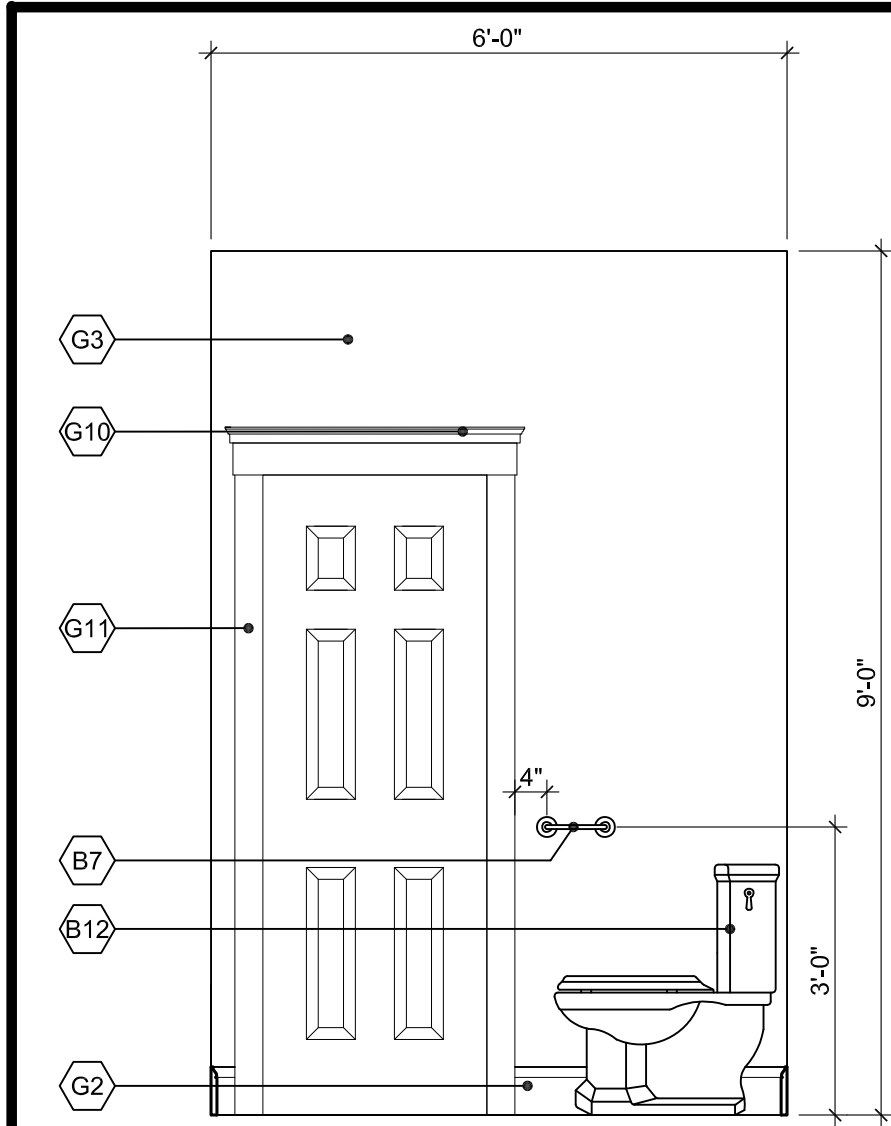
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**INTERIOR
ELEVATIONS**

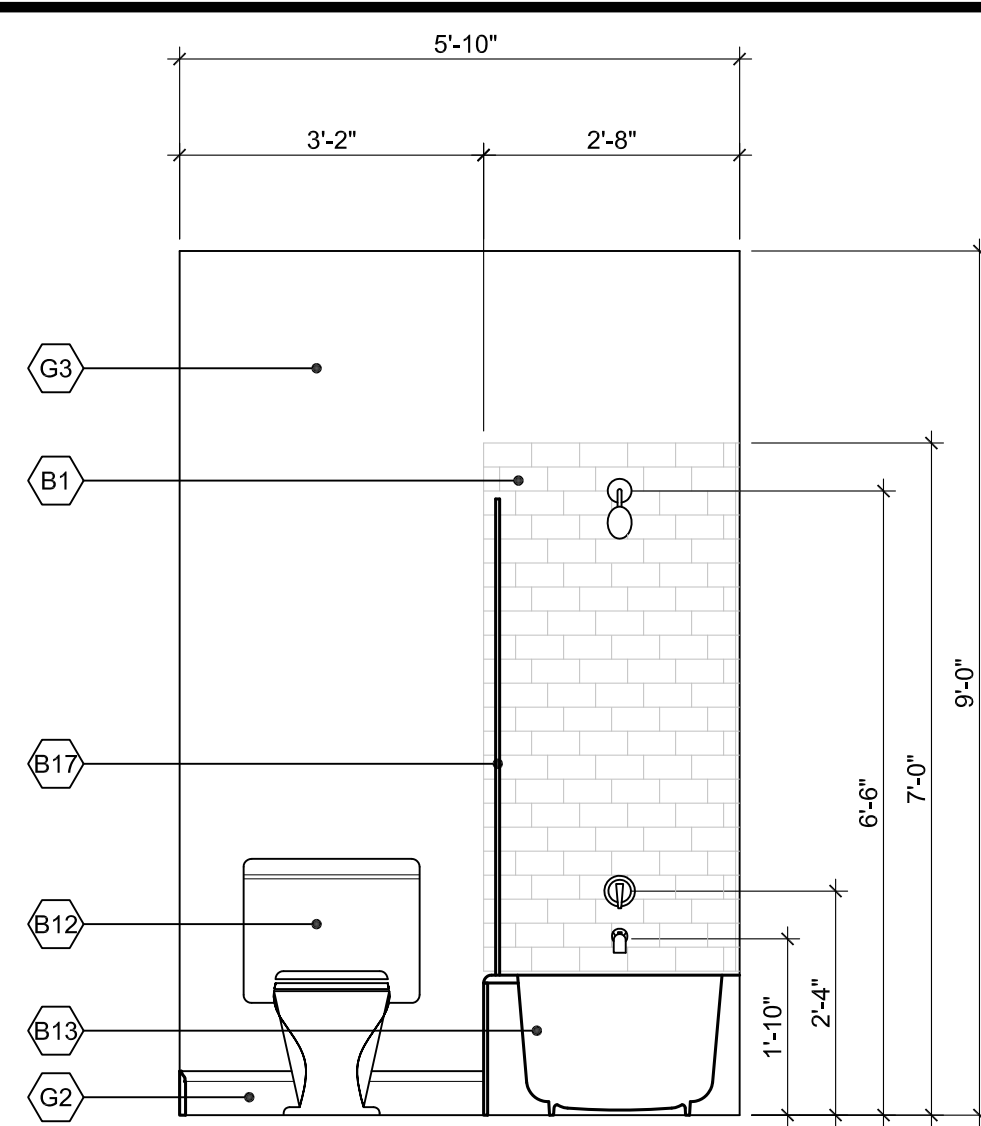
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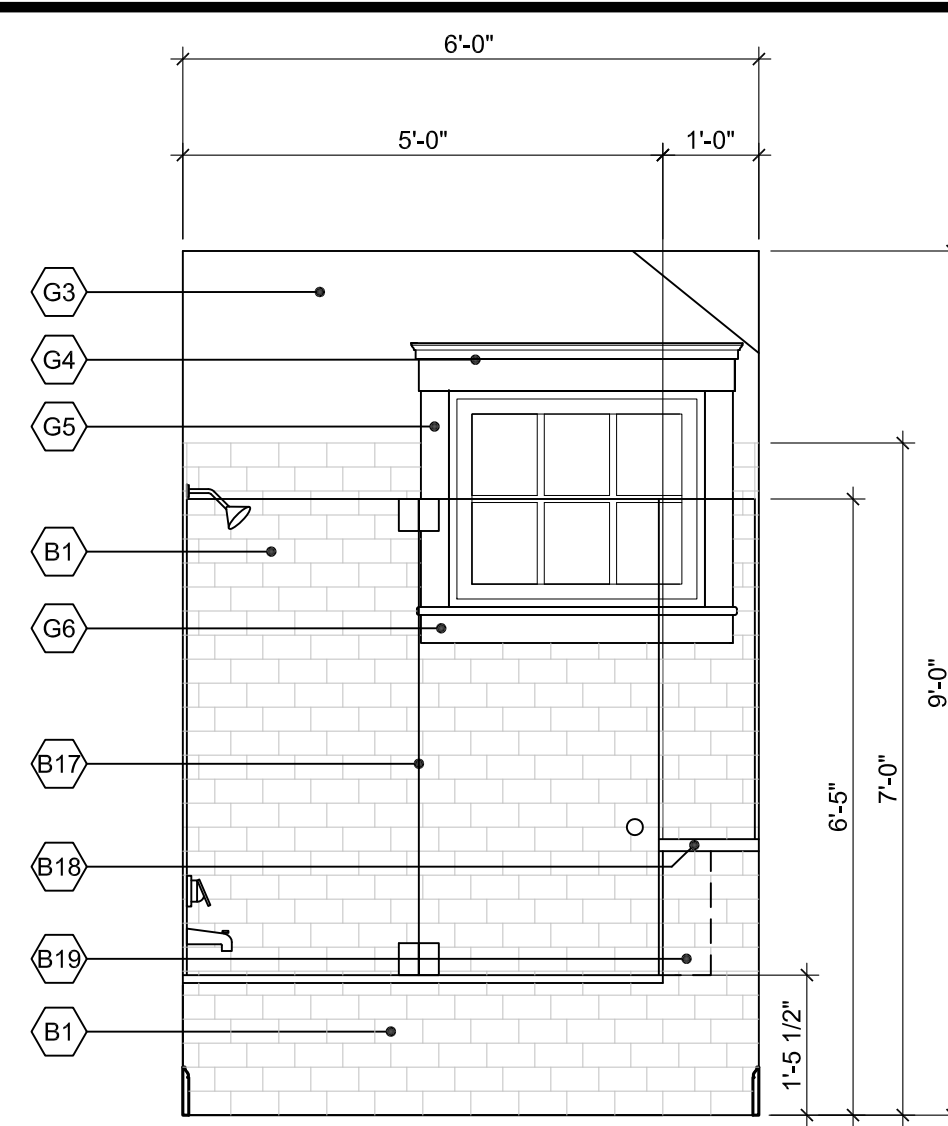
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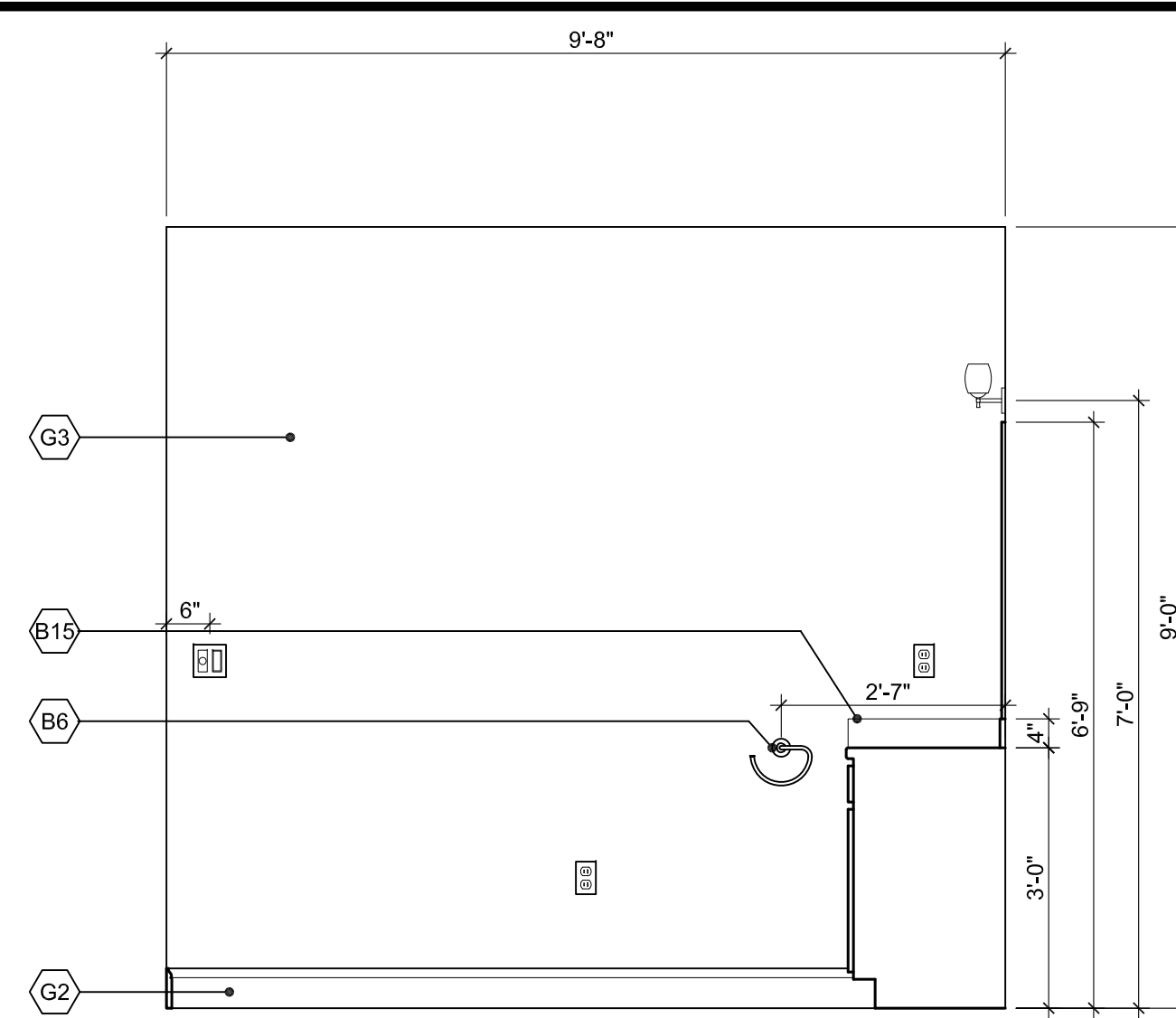
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SCALE: 1/2" = 1'-0"



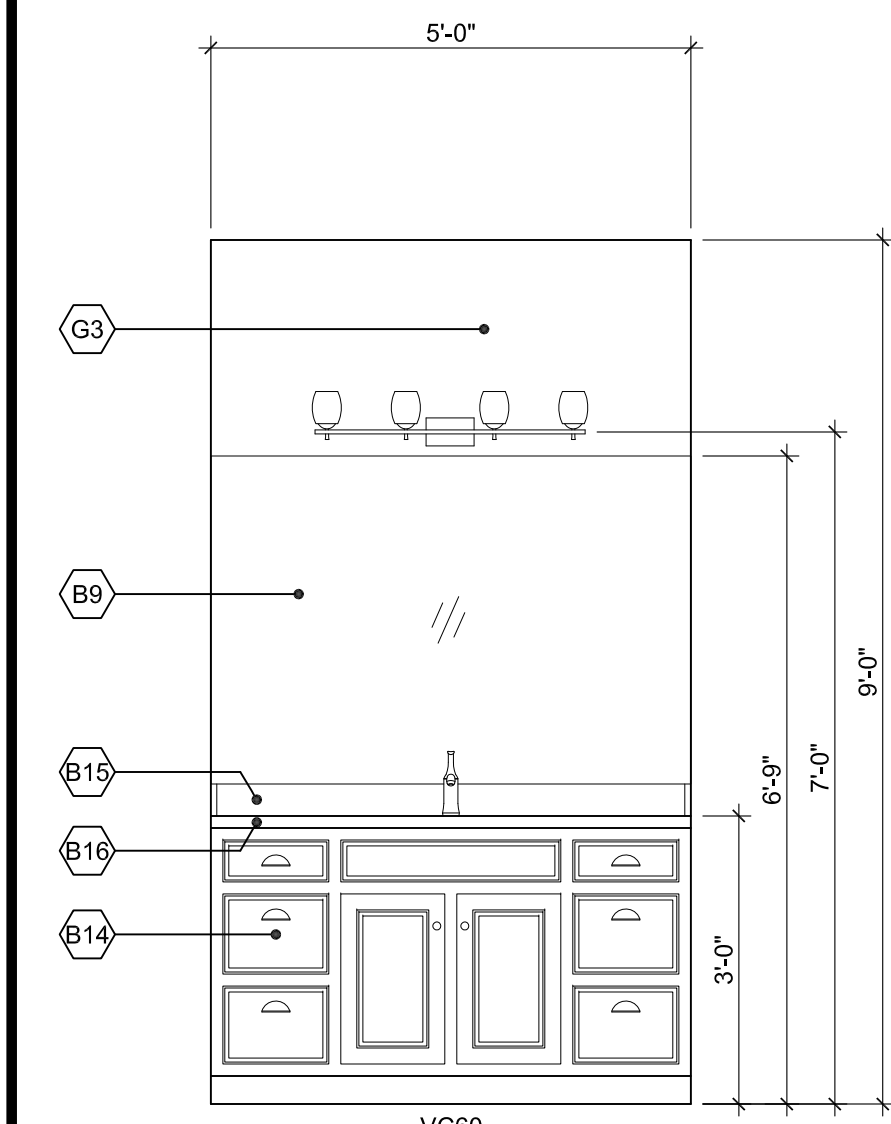
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SCALE: 1/2" = 1'-0"



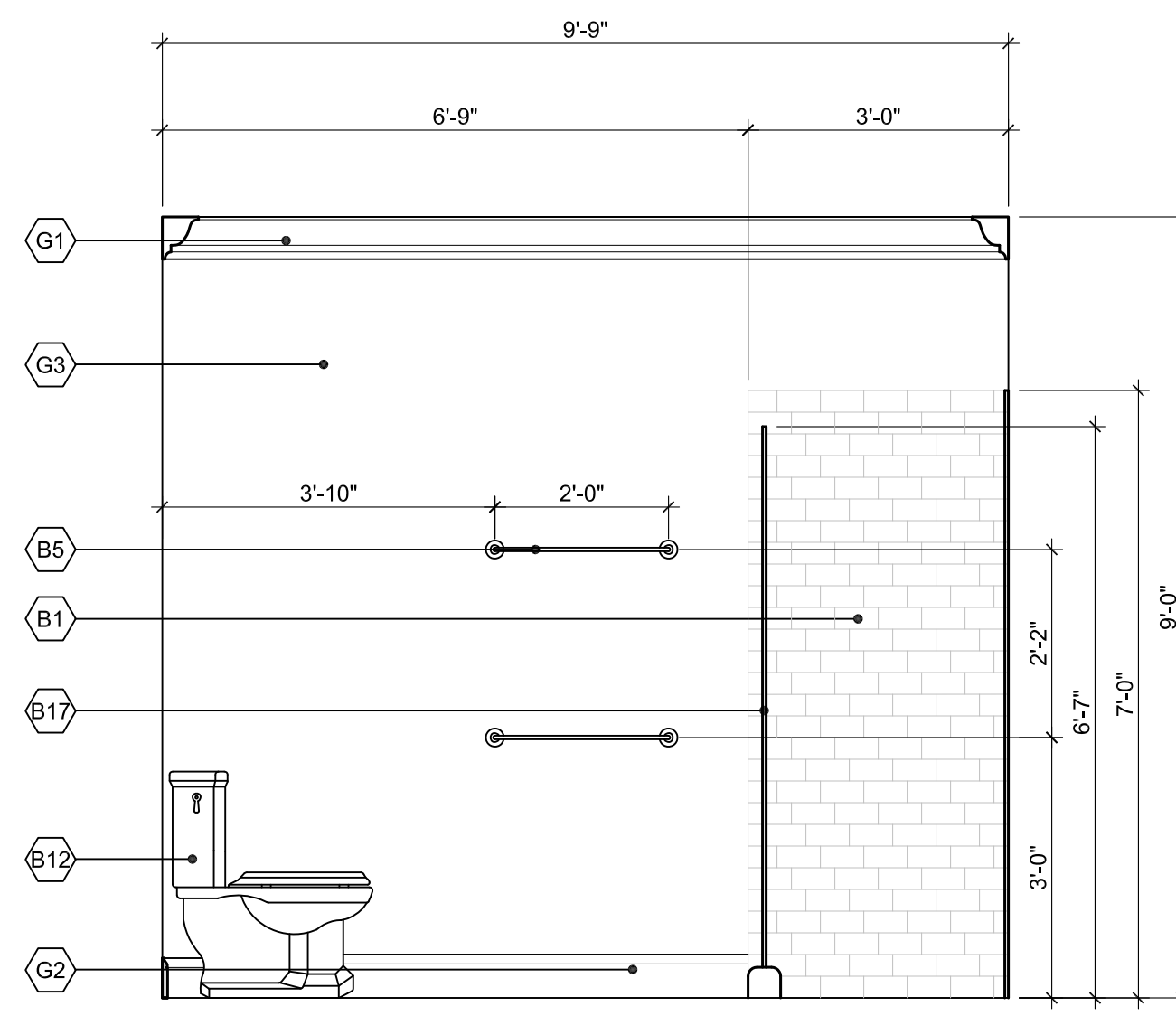
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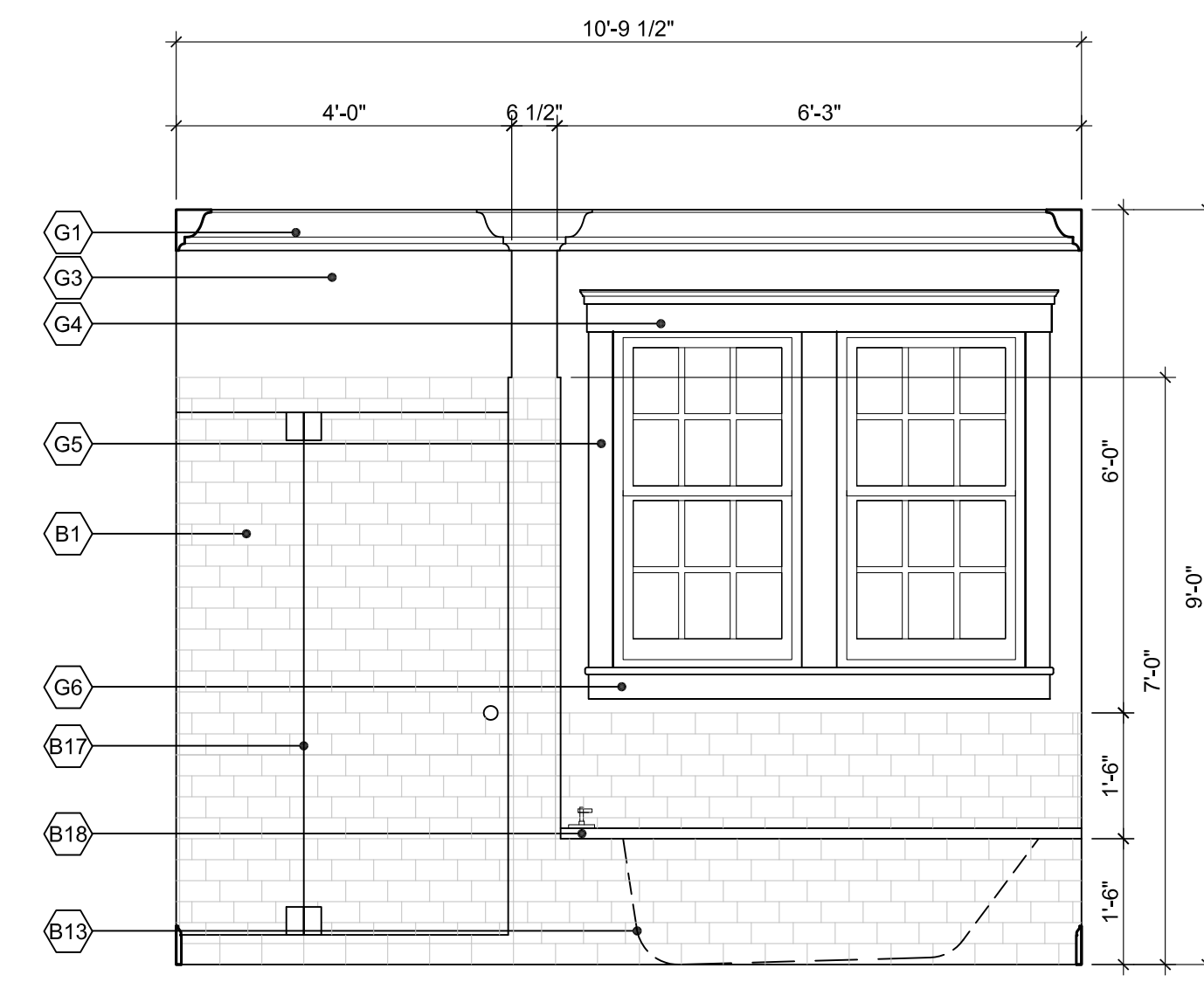
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SCALE: 1/2" = 1'-0"



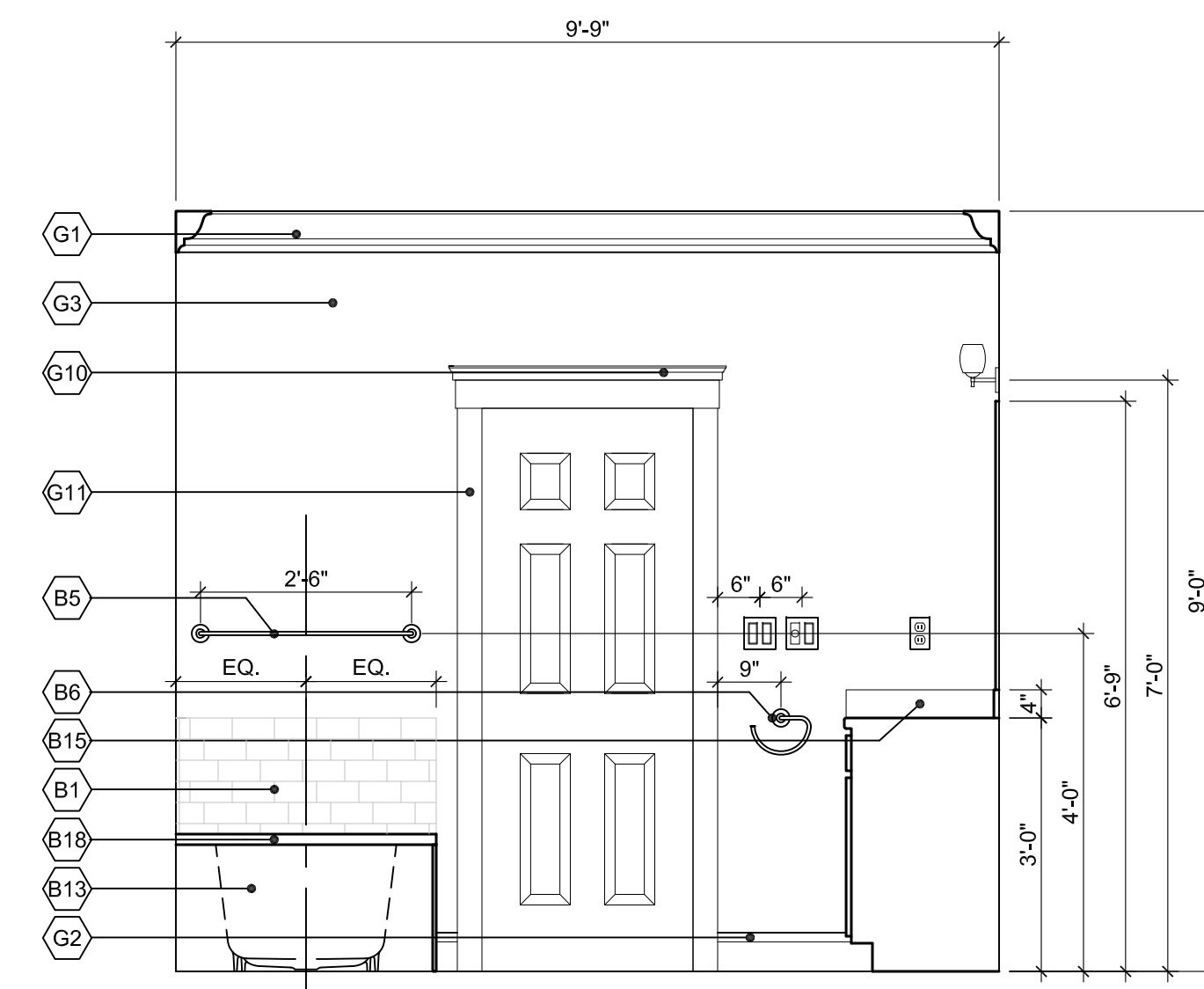
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SCALE: 1/2" = 1'-0"



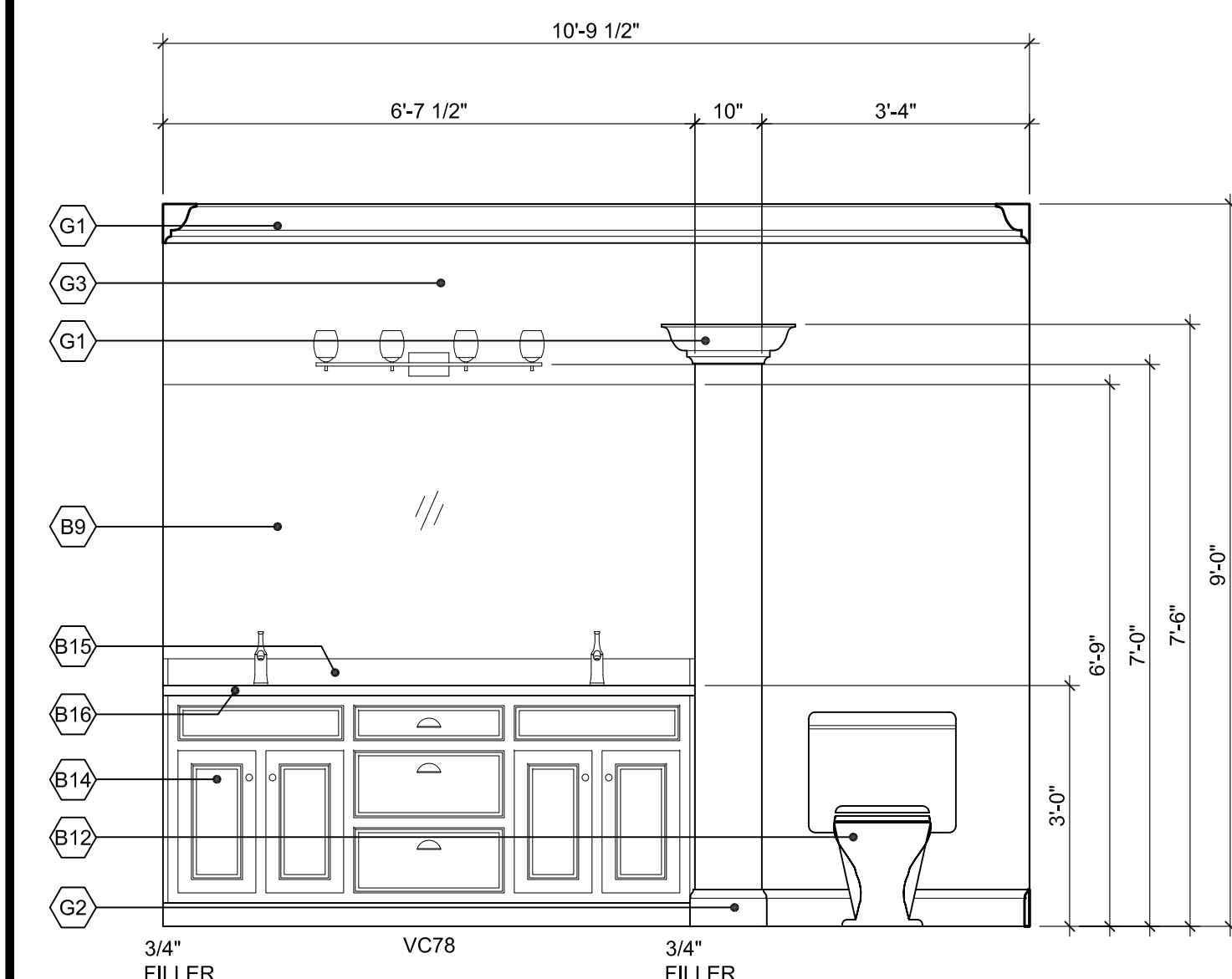
6 MASTER BATH ELEVATION
SCALE: 1/2" = 1'-0"



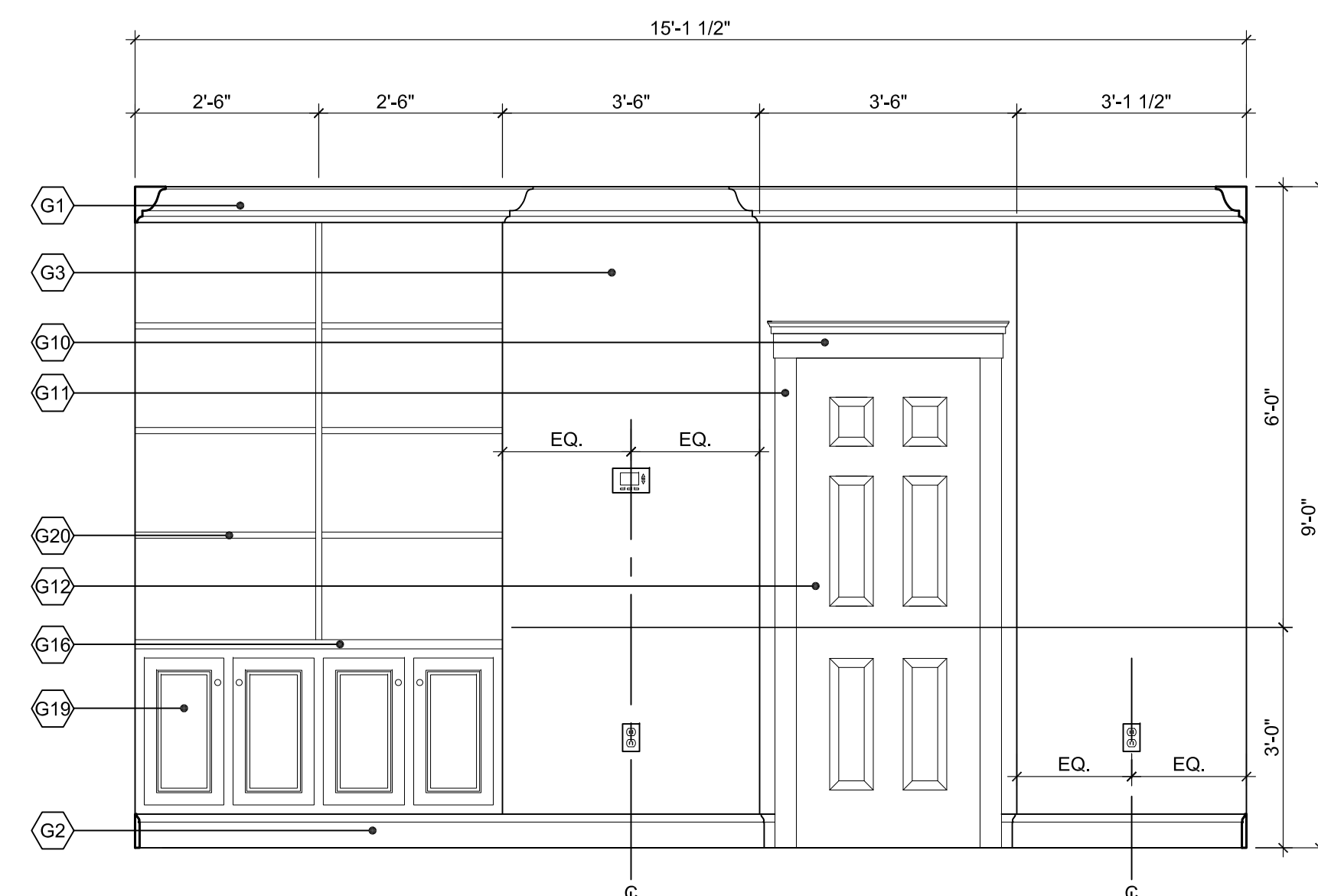
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SCALE: 1/2" = 1'-0"



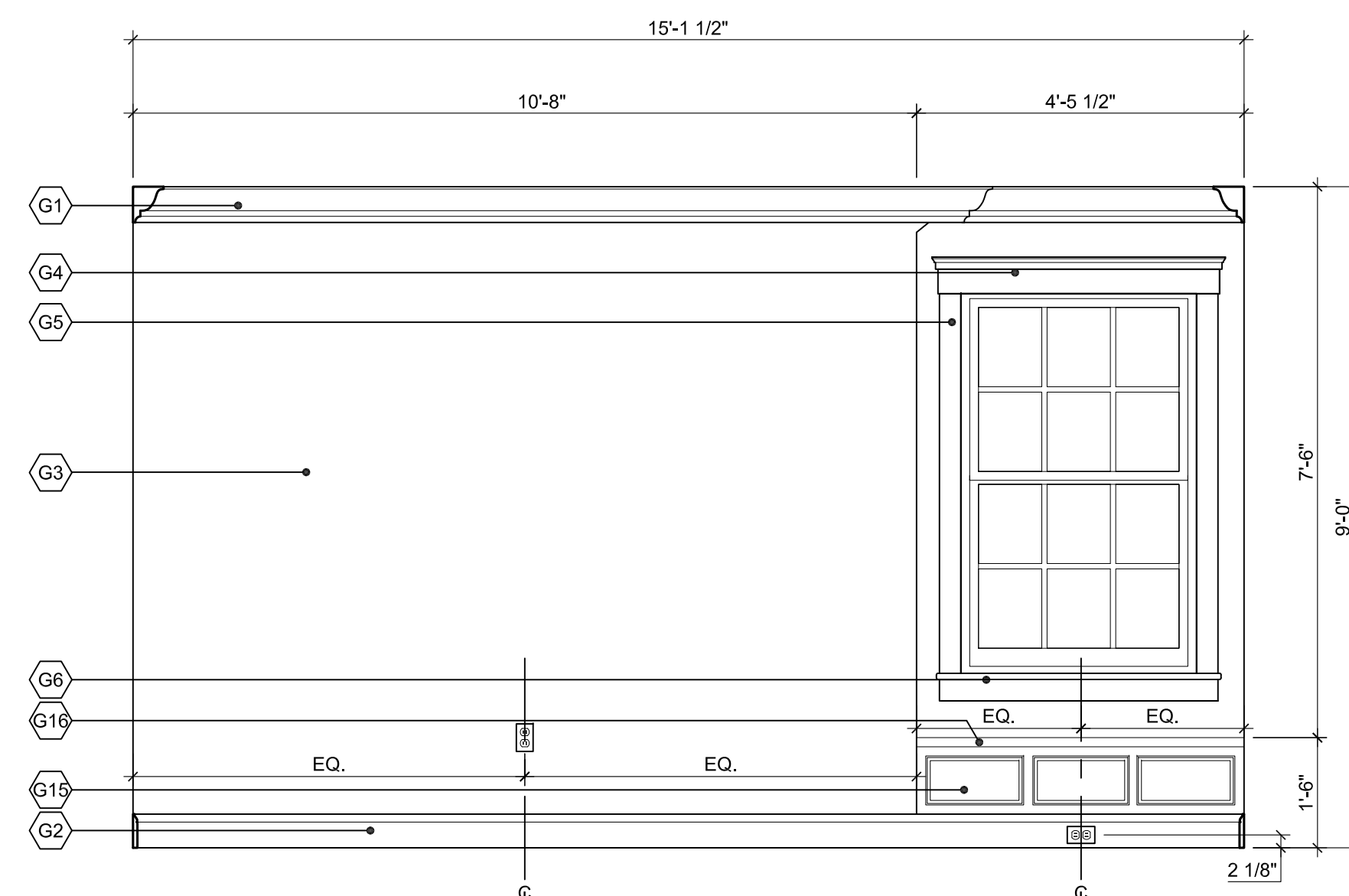
4 MASTER BATH ELEVATION
SCALE: 1/2" = 1'-0"



3 MASTER BATH ELEVATION
SCALE: 1/2" = 1'-0"



2 MASTER BEDROOM ELEVATION
SCALE: 1/2" = 1'-0"



1 MASTER BEDROOM ELEVATION
SCALE: 1/2" = 1'-0"

GENERAL SHEET NOTES

- ALL TROPICAL WOOD, IF USED, MUST BE FSC-CERTIFIED.
- SEE A-602 FOR FINISH SCHEDULE.
- ALIGN SWITCH AND RECEPTACLE PLATES WITH TOP OF TILE IN KITCHENS AND BATHROOMS.

SHEET KEYNOTES

- GENERAL:
- G1. CROWN MOULDING
 - G2. BASE MOULDING
 - G3. PAINTED WALL
 - G4. WINDOW HEAD TRIM
 - G5. 1x4 WINDOW JAMB TRIM
 - G6. WINDOW SILL TRIM
 - G7. CASED OPENING HEAD TRIM
 - G8. 1x6 CASED OPENING JAMB TRIM
 - G9. CASED OPENING BASE TRIM
 - G10. DOOR HEAD TRIM
 - G11. 1x4 DOOR JAMB TRIM
 - G12. INTERIOR DOOR
 - G13. BUILT-UP COLUMN
 - G14. COLUMN BASE TRIM
 - G15. WOOD PANEL
 - G16. WOOD CAP
 - G17. MANTLE
 - G18. MANTLE TRIM
 - G19. BASE CABINET
 - G20. WOOD SHELF
 - G21. 1"x4" DOOR HEAD TRIM

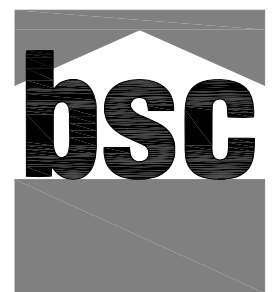
- BATH:
- B1. TILE
 - B2. HAND HELD SHOWER
 - B3. SHOWER SEAT
 - B4. GRAB BAR
 - B5. TOWEL BAR
 - B6. TOWEL RING
 - B7. TOILET PAPER HOLDER
 - B8. MIRROR
 - B9. FRAMELESS MIRROR
 - B10. ACCESSIBLE LAVATORY
 - B11. ACCESSIBLE TOILET
 - B12. TOILET
 - B13. BATHTUB
 - B14. VANITY BASE CABINET
 - B15. SOLID SURFACE BACKSPLASH
 - B16. SOLID SURFACE COUNTERTOP
 - B17. FRAMELESS GLASS SHOWER DOOR, TEMPERED
 - B18. SOLID SURFACE BATHTUB DECK
 - B19. 6" DEEP NICHE

- KITCHEN:
- K1. WALL CABINET
 - K2. BASE CABINET
 - K3. END PANEL
 - K4. SUPPORT BRACKET
 - K5. RANGE HOOD EXHAUST DUCT
 - K6. TILE BACKSPLASH
 - K7. SOLID SURFACE BACKSPLASH
 - K8. SOLID SURFACE COUNTERTOP

- STAIR:
- S1. WOOD HANDRAIL
 - S2. WOOD BALUSTER
 - S3. WOOD TREAD
 - S4. WOOD TRIM
 - S5. WOOD STRINGER
 - S6. WOOD POST

- SCREEN PORCH:
- P1. EXTERIOR WATER TABLE
 - P2. PORCH DOOR
 - P3. EXTERIOR FIBER CEMENT LAP SIDING
 - P4. 3/4 x 6 DOOR TRIM
 - P5. 3/4 TRIM BOARD
 - P6. 3" CROWN
 - P7. 5 1/2" BASE
 - P8. FIBER CEMENT PANEL BOARD
 - P9. 3/4" WALL CAP
 - P10. SCREEN PANEL
 - P11. SCREEN DOOR
 - P12. 3 1/2" TRIM
 - P13. 10" TRIM BOARD W/ INSET PANEL
 - P14. 2 1/2" BEADBOARD
 - P15. TRIM BOARD

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

PROJECT NO: NIST NZERTF
CAD DWG FILE: A-PLOT-ELEV-NZERTF
DRAWN BY: KG, HW
CHECKED BY: BP

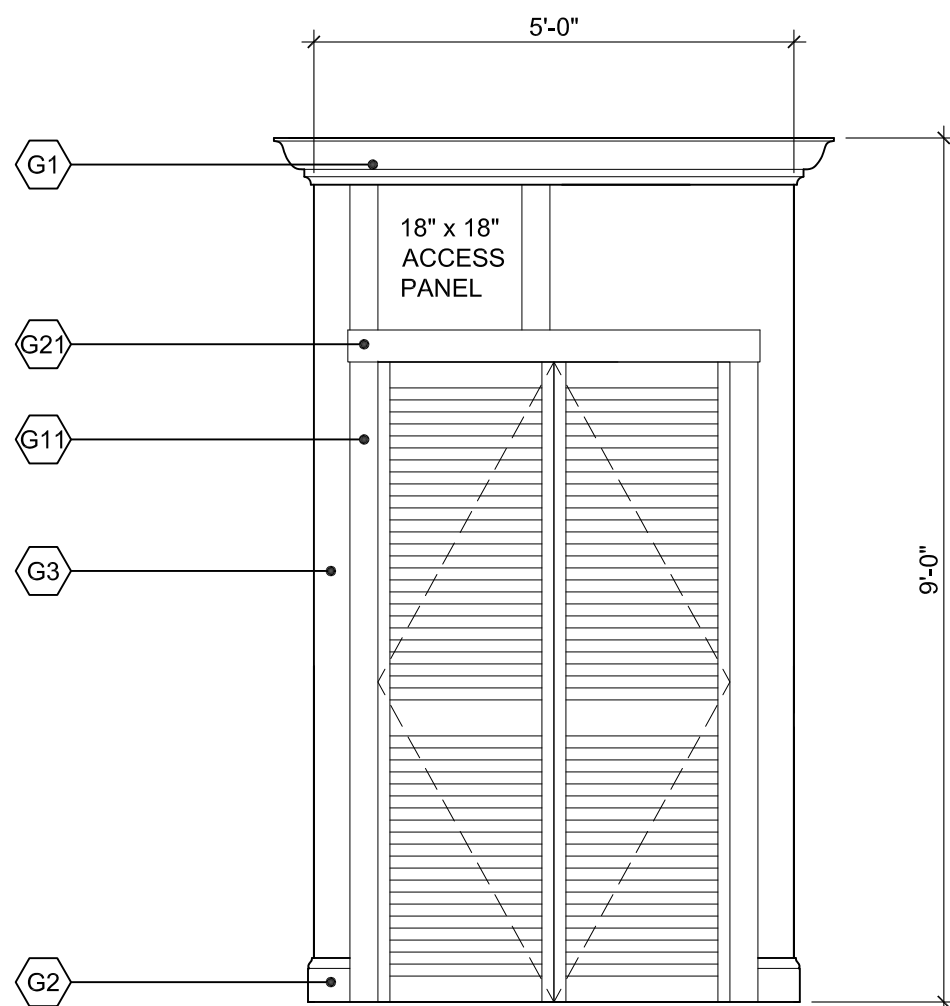
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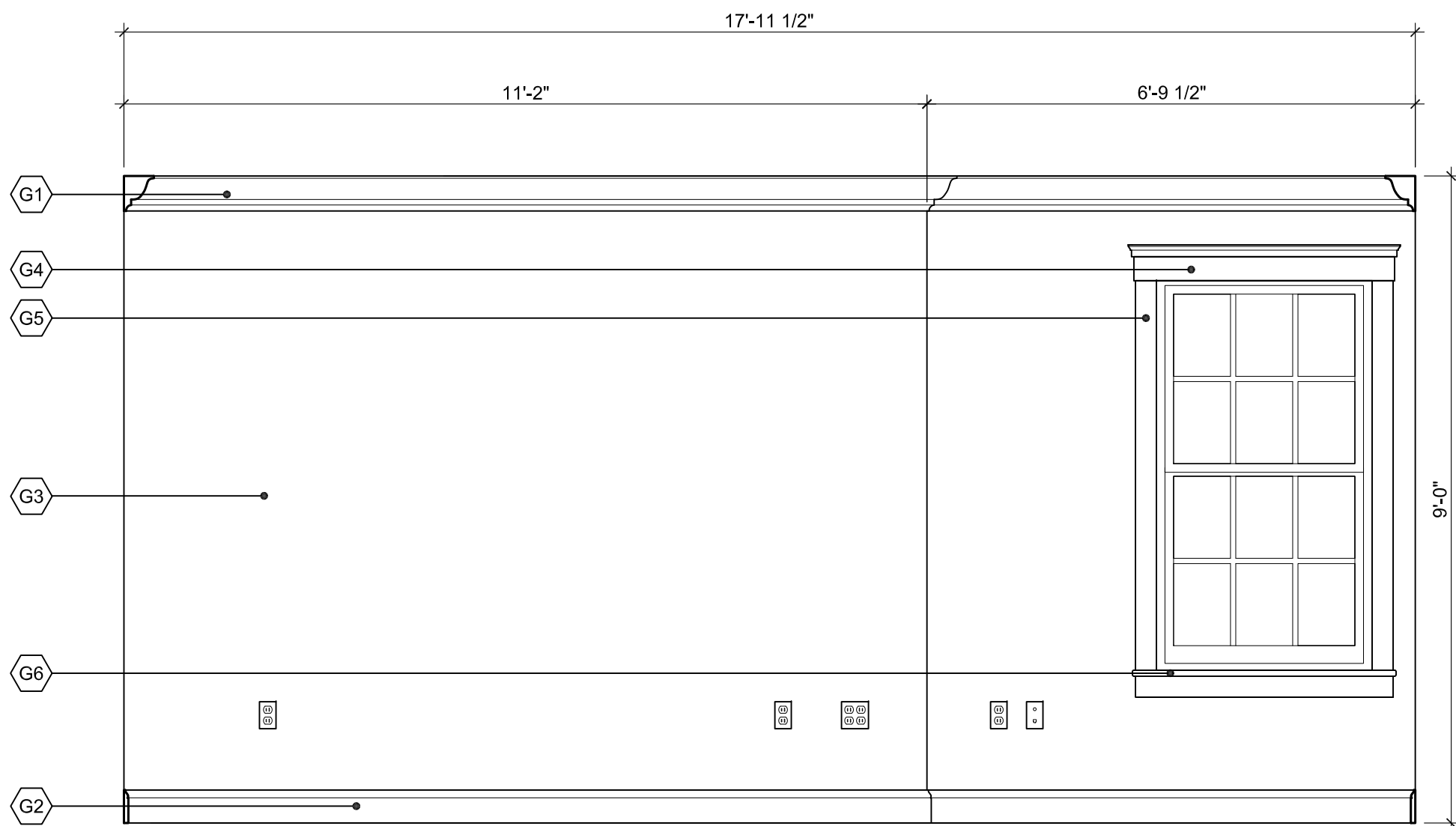
**INTERIOR
ELEVATIONS**

SCALE AS NOTED

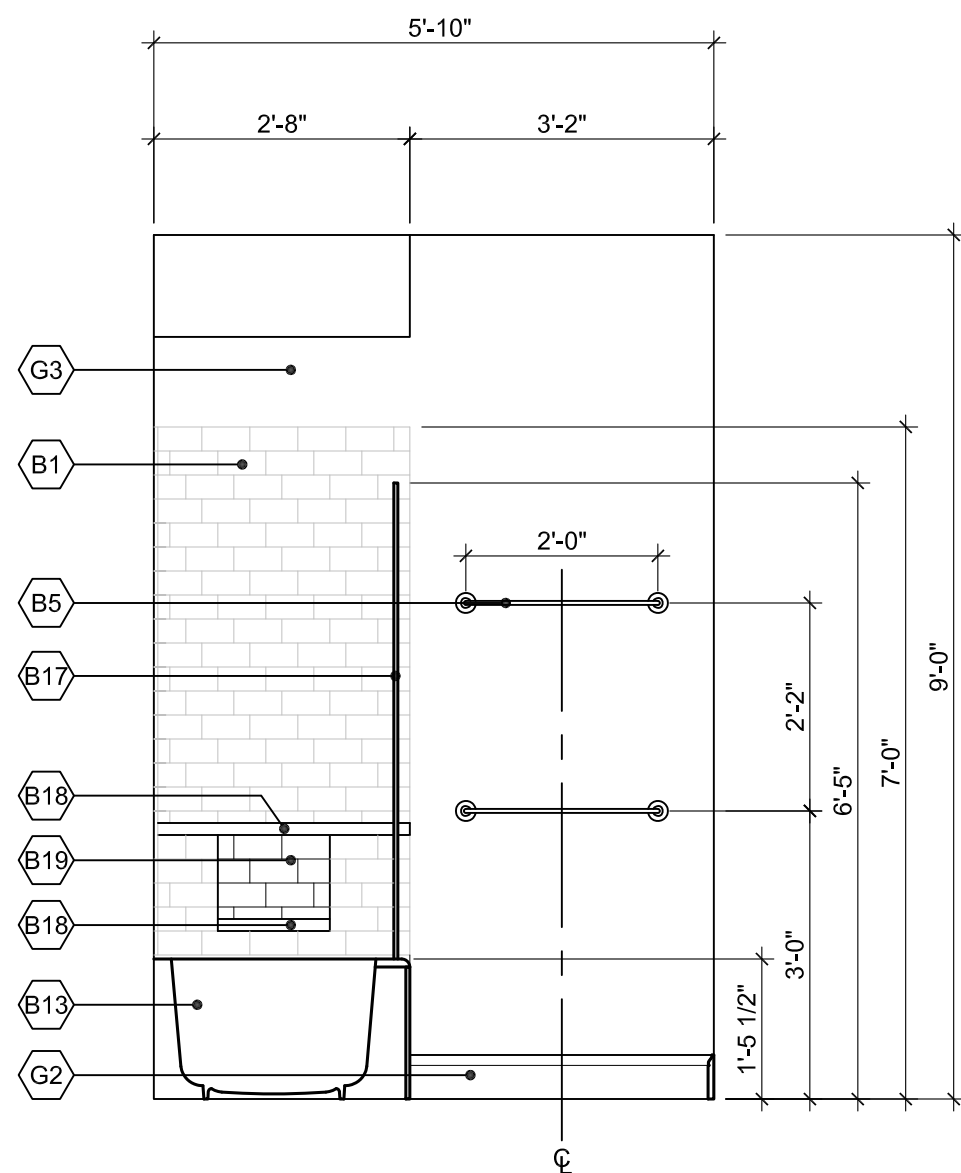
A-206



3 1ST FLOOR HALL ELEVATION
SCALE: 1/2" = 1'-0"



2 BEDROOM 2 ELEVATION (BEDROOM 3 SIMILAR)
SCALE: 1/2" = 1'-0"



1 BATH #2 ELEVATION
SCALE: 1/2" = 1'-0"

GENERAL SHEET NOTES

- ALL TROPICAL WOOD, IF USED, MUST BE FSC-CERTIFIED.
- SEE A-602 FOR FINISH SCHEDULE.
- ALIGN SWITCH AND RECEPTACLE PLATES WITH TOP OF TILE IN KITCHENS AND BATHROOMS.

SHEET KEYNOTES

- GENERAL:
- G1. CROWN MOULDING
 - G2. BASE MOULDING
 - G3. PAINTED WALL
 - G4. WINDOW HEAD TRIM
 - G5. 1x4 WINDOW JAMB TRIM
 - G6. WINDOW SILL TRIM
 - G7. CASED OPENING HEAD TRIM
 - G8. 1X6 CASED OPENING JAMB TRIM
 - G9. CASED OPENING BASE TRIM
 - G10. DOOR HEAD TRIM
 - G11. 1X4 DOOR JAMB TRIM
 - G12. INTERIOR DOOR
 - G13. BUILT-UP COLUMN
 - G14. COLUMN BASE TRIM
 - G15. WOOD PANEL
 - G16. WOOD CAP
 - G17. MANTLE
 - G18. MANTLE TRIM
 - G19. BASE CABINET
 - G20. WOOD SHELF
 - G21. 1" x 4" DOOR HEAD TRIM

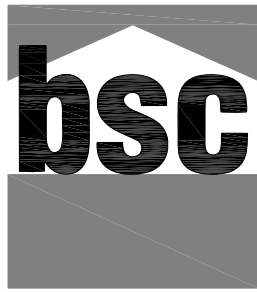
- BATH:
- B1. TILE
 - B2. HAND HELD SHOWER
 - B3. SHOWER SEAT
 - B4. GRAB BAR
 - B5. TOWEL BAR
 - B6. TOWEL RING
 - B7. TOILET PAPER HOLDER
 - B8. MIRROR
 - B9. FRAMELESS MIRROR
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 - B16. SOLID SURFACE COUNTERTOP
 - B17. FRAMELESS GLASS SHOWER DOOR, TEMPERED
 - B18. SOLID SURFACE BATHTUB DECK
 - B19. 6" DEEP NICHE

- KITCHEN:
- K1. WALL CABINET
 - K2. BASE CABINET
 - K3. END PANEL
 - K4. SUPPORT BRACKET
 - K5. RANGE HOOD EXHAUST DUCT
 - K6. TILE BACKSPLASH
 - K7. SOLID SURFACE BACKSPLASH
 - K8. SOLID SURFACE COUNTERTOP

- STAIR:
- S1. WOOD HANDRAIL
 - S2. WOOD BALUSTER
 - S3. WOOD TREAD
 - S4. WOOD TRIM
 - S5. WOOD STRINGER
 - S6. WOOD POST

- SCREEN PORCH:
- P1. EXTERIOR WATER TABLE
 - P2. PORCH DOOR
 - P3. EXTERIOR FIBER CEMENT LAP SIDING
 - P4. 3/4 x 6 DOOR TRIM
 - P5. 3/4 TRIM BOARD
 - P6. 3" CROWN
 - P7. 5 1/2" BASE
 - P8. FIBER CEMENT PANEL BOARD
 - P9. 3/4" WALL CAP
 - P10. SCREEN PANEL
 - P11. SCREEN DOOR
 - P12. 3 1/2" TRIM
 - P13. 10" TRIM BOARD W/ INSET PANEL
 - P14. 2 1/2" BEADBOARD
 - P15. TRIM BOARD

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DRAWN BY:	KG, HW
CHECKED BY:	BP

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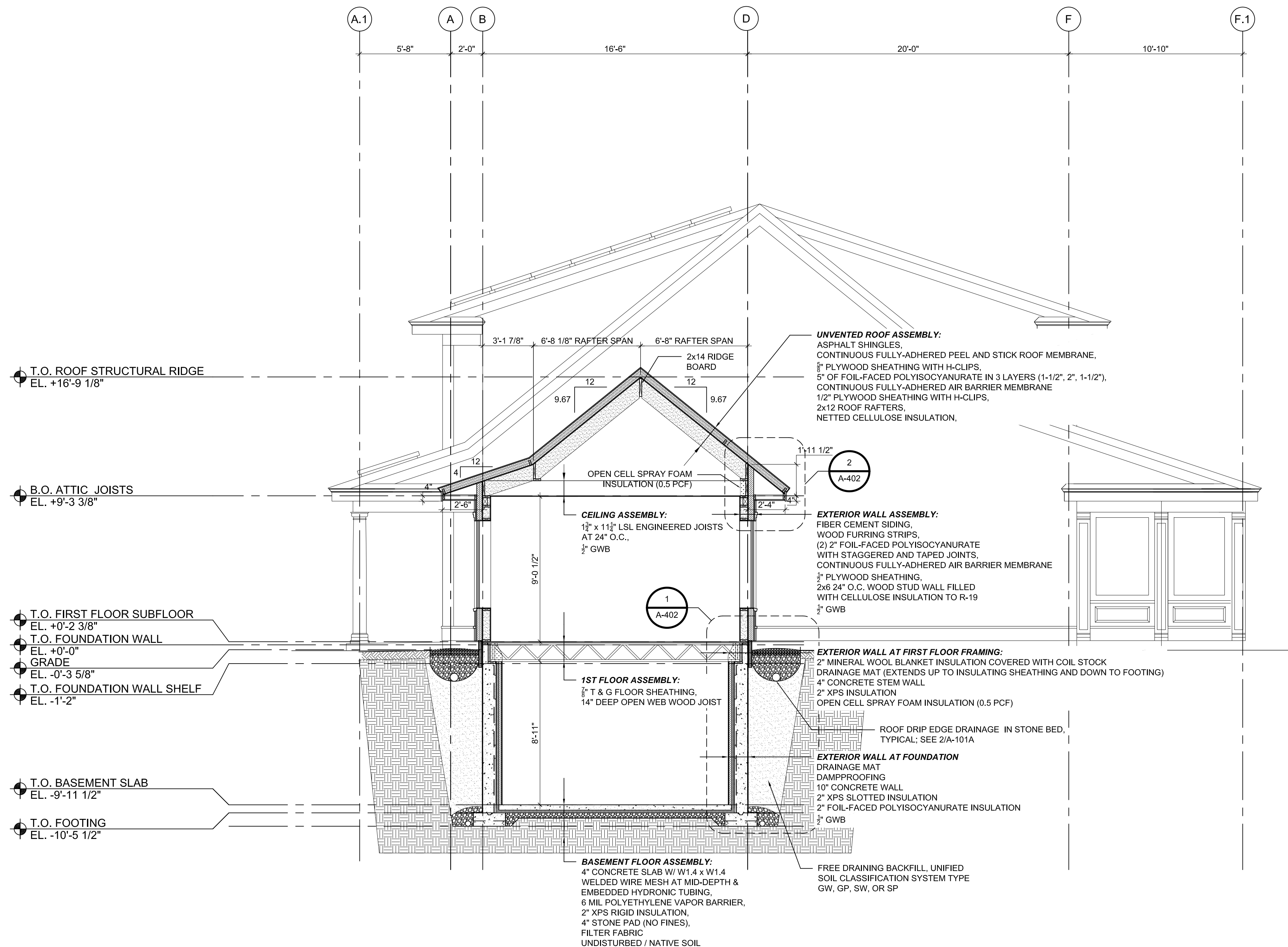
SHEET TITLE:

INTERIOR
ELEVATIONS

SCALE AS NOTED



A-207



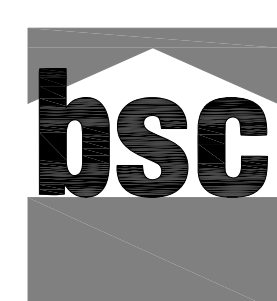
1 BUILDING SECTION
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

1. CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
2. EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
3. FIRST AND SECOND FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE, PORCHES AND BREEZEWAY.
4. EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS.
5. EL. +0'-2 3/8" (T.O. FIRST FLOOR SUBFLOOR) IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.5' IN THE SITE/CIVIL DRAWINGS.
6. EL. -9'-11 1/2" (T.O. BASEMENT SLAB) IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 451.34 IN THE SITE/CIVIL DRAWINGS.

SHEET KEYNOTES

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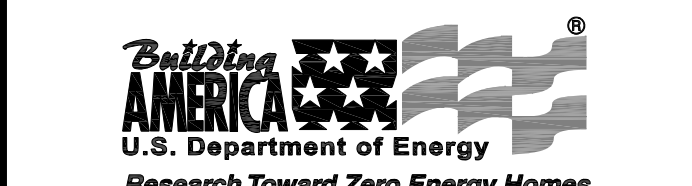
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CHECKED BY:	BP

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SHEET TITLE:

BUILDING SECTION

SCALE AS NOTED

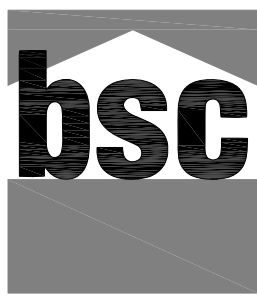
A-301

GENERAL SHEET NOTES

1. CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
2. EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
3. FIRST AND SECOND FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE, PORCHES, AND BREEZEWAY.
4. EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS.
5. EL. +0'-2 1/2" (T.O. FIRST FLOOR SUBFLOOR) IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.5' IN THE SITE/CIVIL DRAWINGS.
6. EL. -9'-11 1/2" (T.O. BASEMENT SLAB) IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 451.34' IN THE SITE/CIVIL DRAWINGS.

SHEET KEYNOTES

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DRAWN BY: CG
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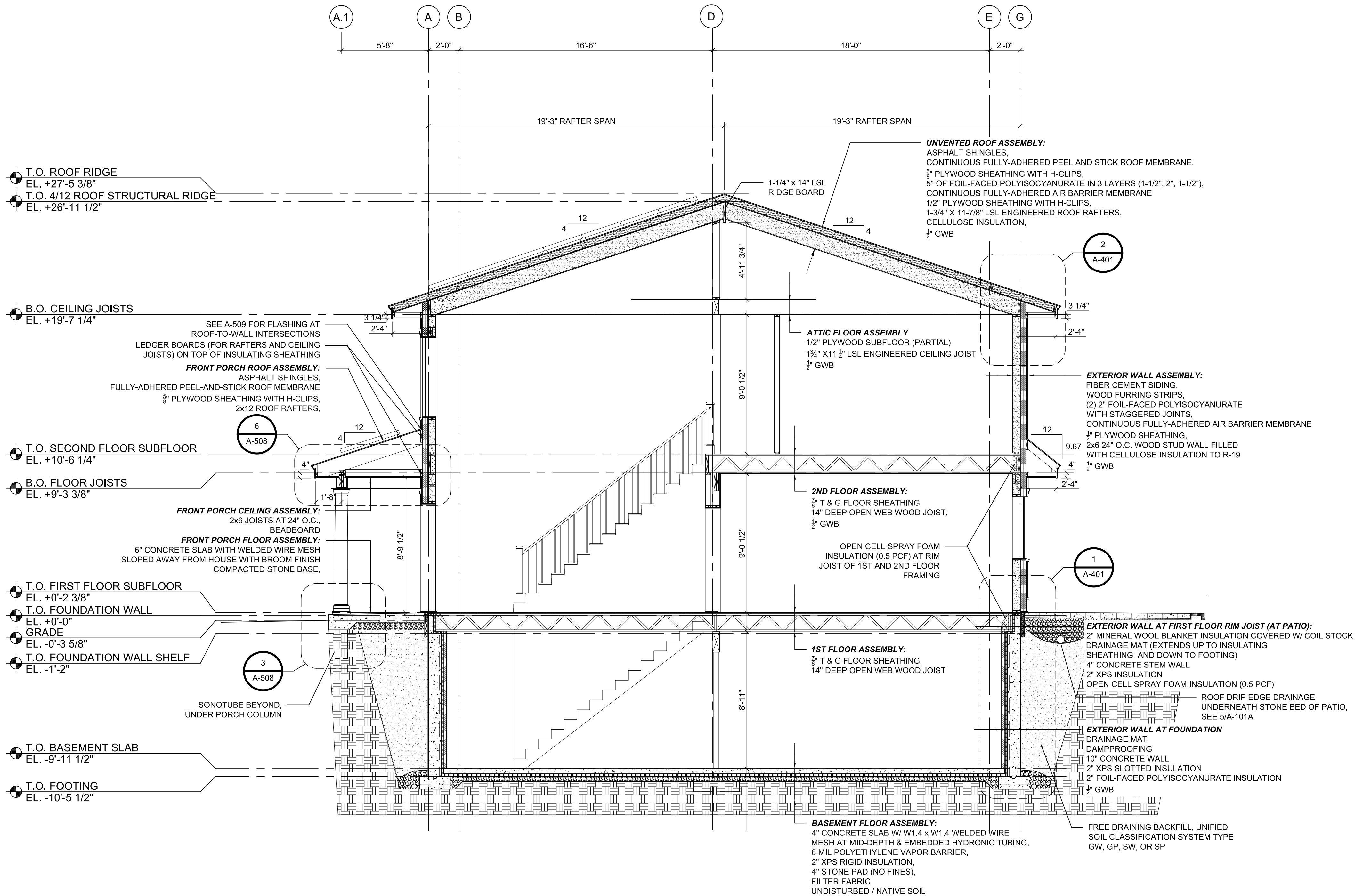
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BUILDING SECTION

SCALE AS NOTED

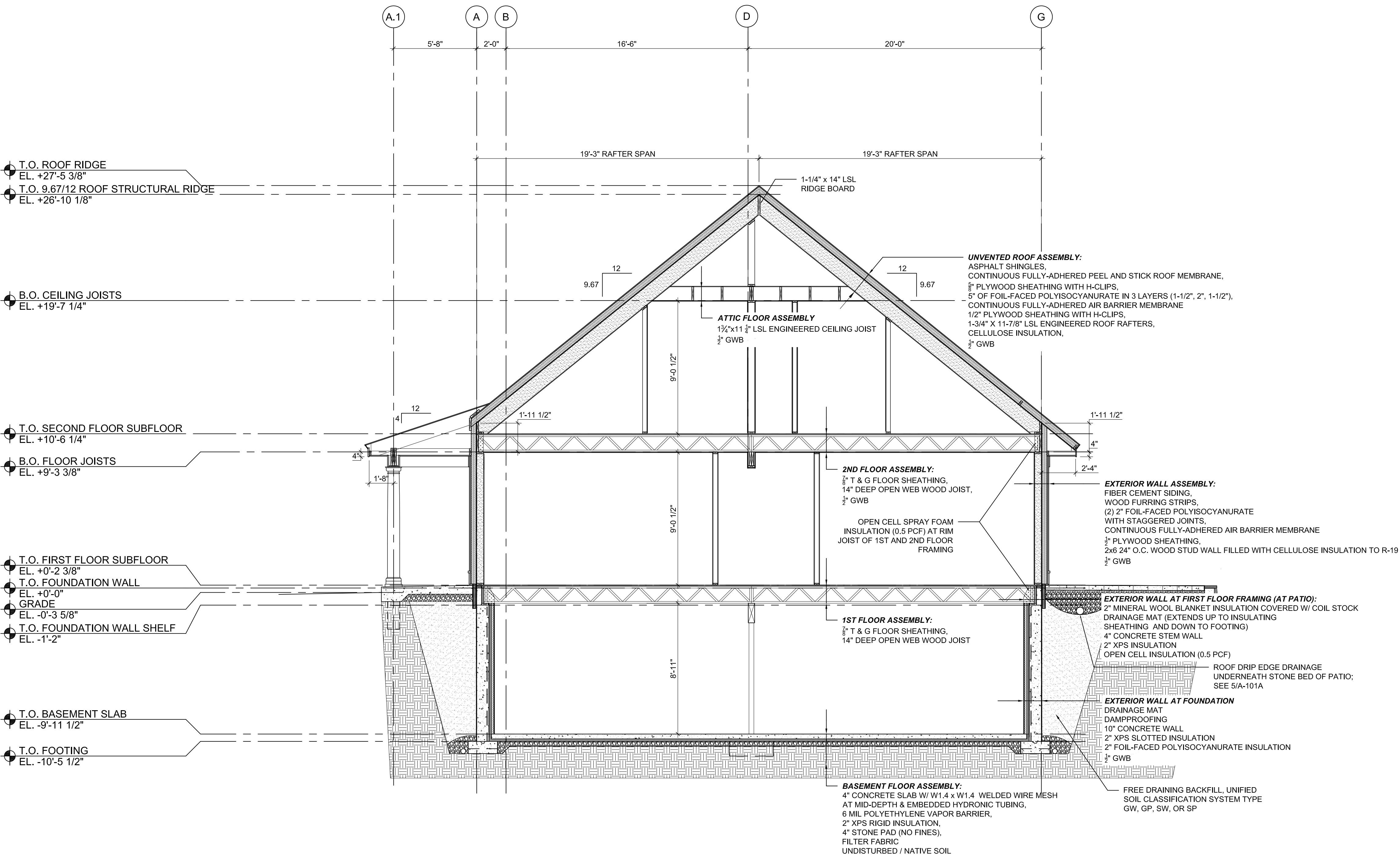


A-302



1 BUILDING SECTION

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



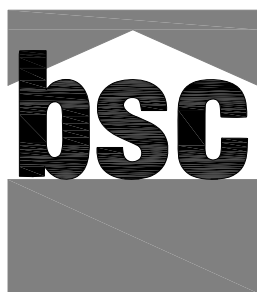
1 BUILDING SECTION
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

1. CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
2. EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
3. FIRST AND SECOND FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE, PORCHES AND BREEZEWAY.
4. EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS.
5. EL. +0'-2 3/8" (T.O. FIRST FLOOR SUBFLOOR) IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.5' IN THE SITE/CIVIL DRAWINGS.
6. EL. -9'-11 1/2" (T.O. BASEMENT SLAB) IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 451.34' IN THE SITE/CIVIL DRAWINGS.

SHEET KEYNOTES

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PROJECT:

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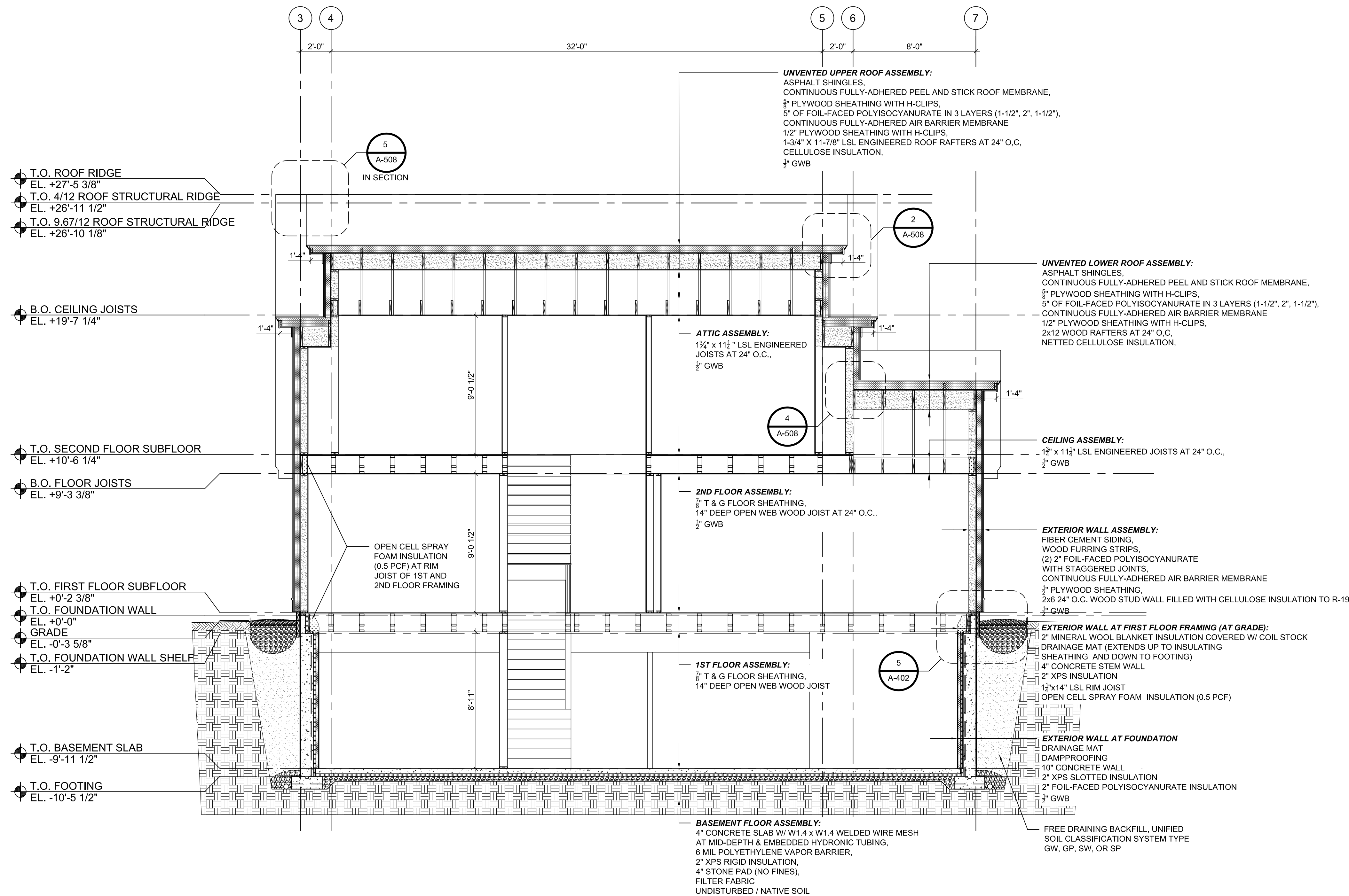
	05/07/10	UPDATED
MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

BUILDING SECTION

SCALE AS NOTED



A-303

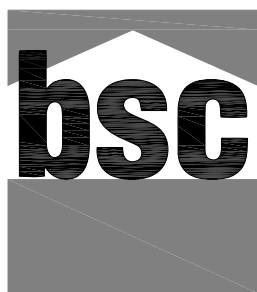


GENERAL SHEET NOTES

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2. EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
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6. EL. -9'-11 1/2" (T.O. BASEMENT SLAB) IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 451.34 IN THE SITE/CIVIL DRAWINGS.

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ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	A-PLOT-SECT-NZERTF
DRAWN BY:	CG
CHECKED BY:	BP

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SHEET TITLE:

BUILDING SECTION

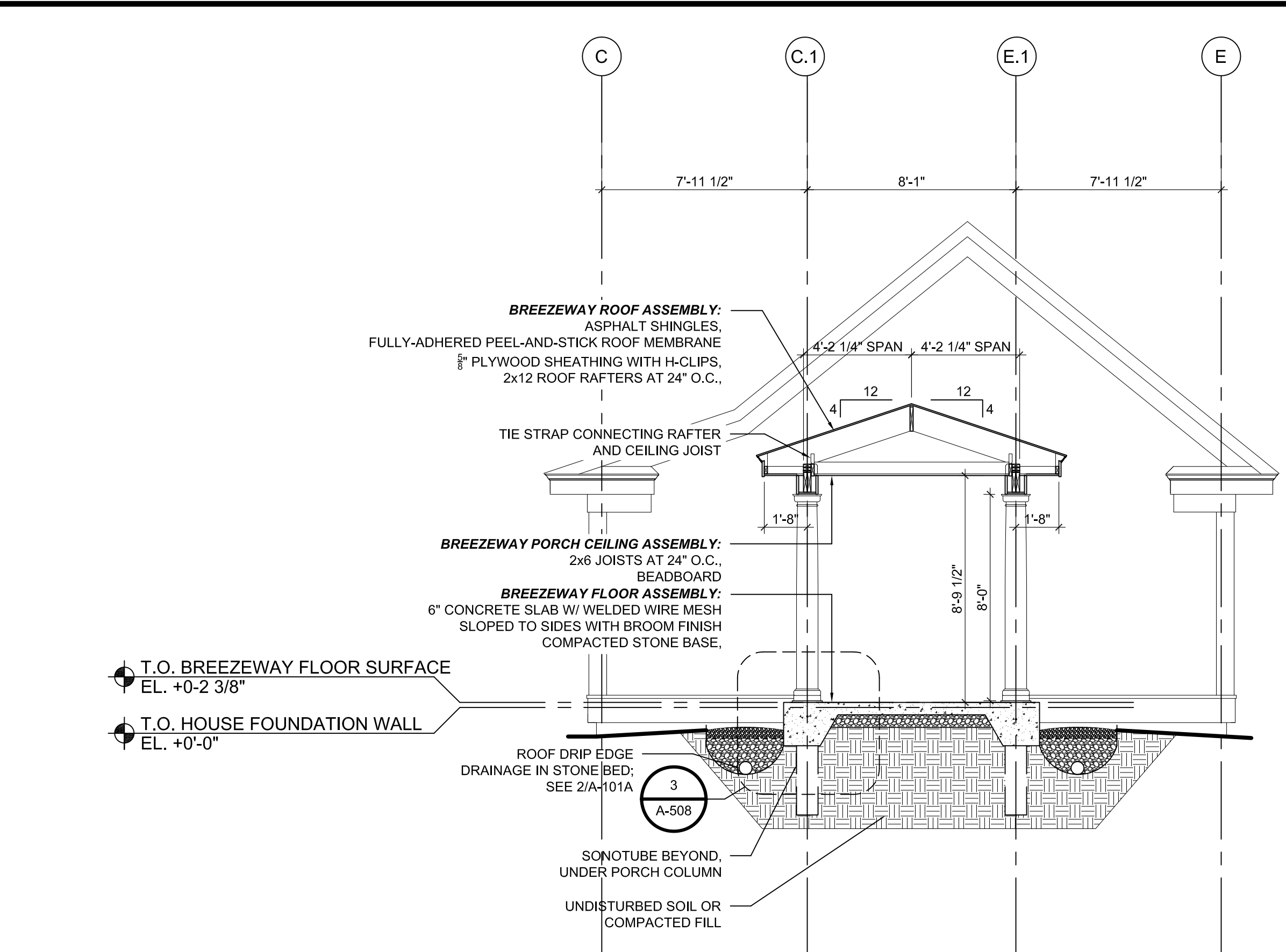
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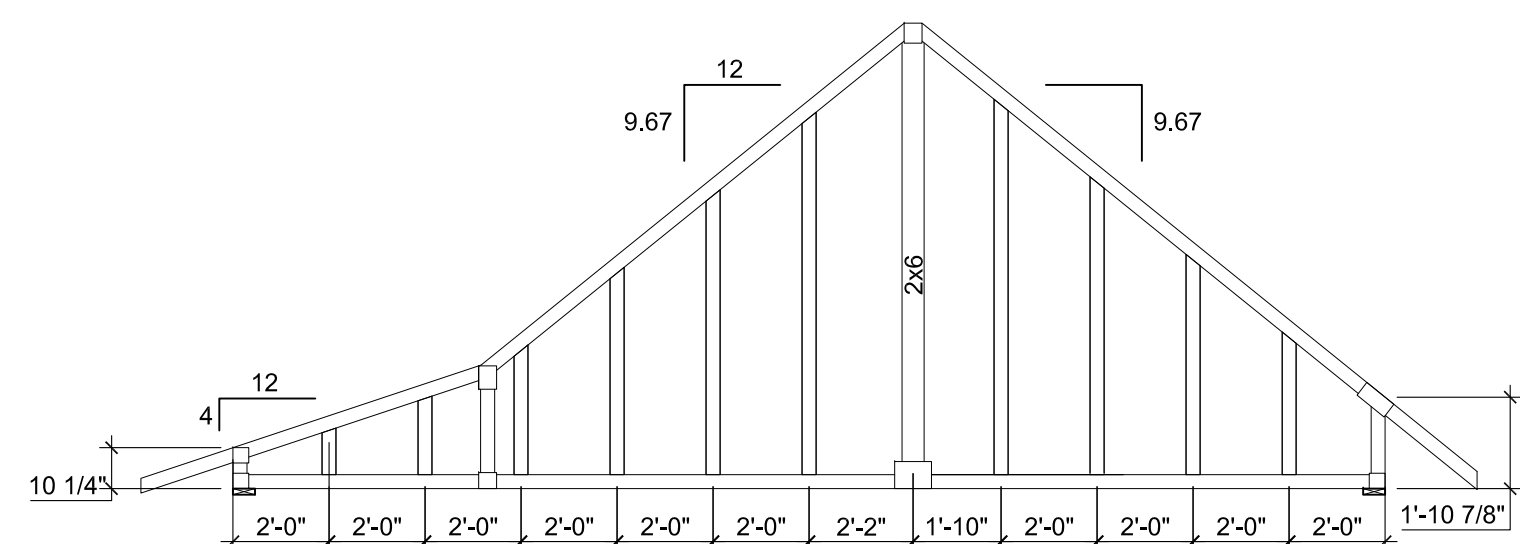
A-304

1 BUILDING SECTION

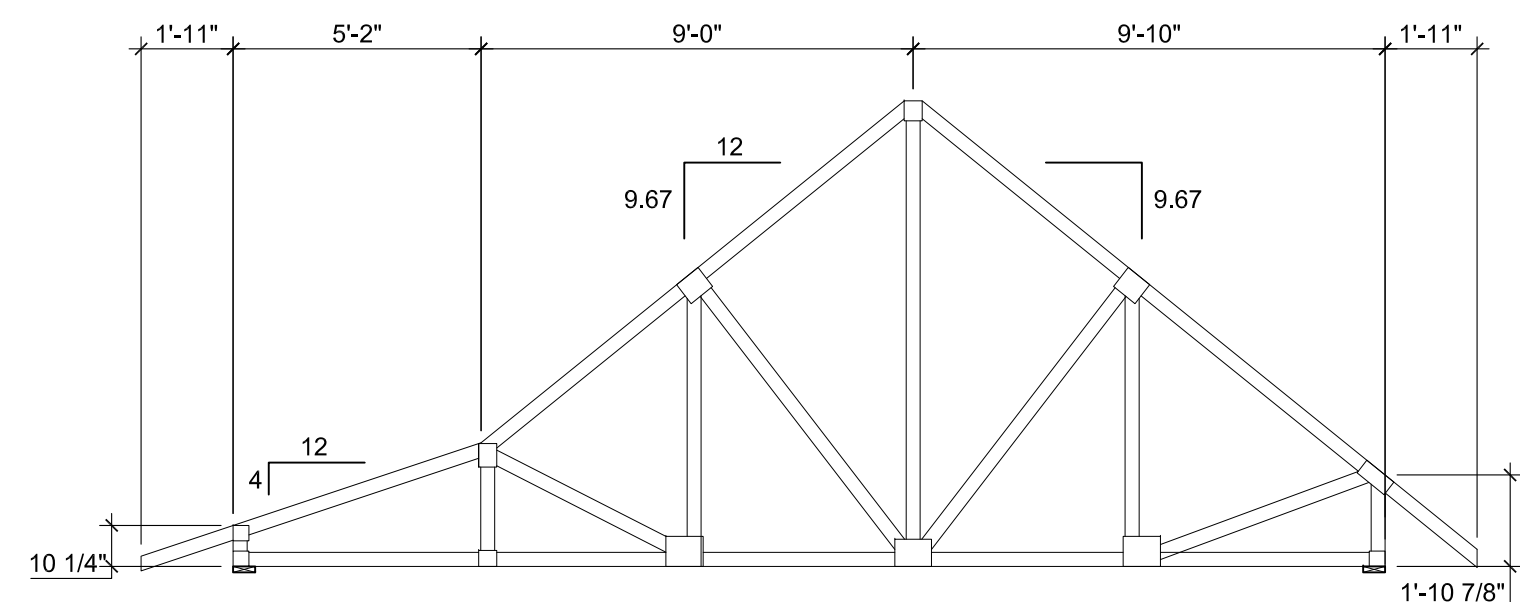
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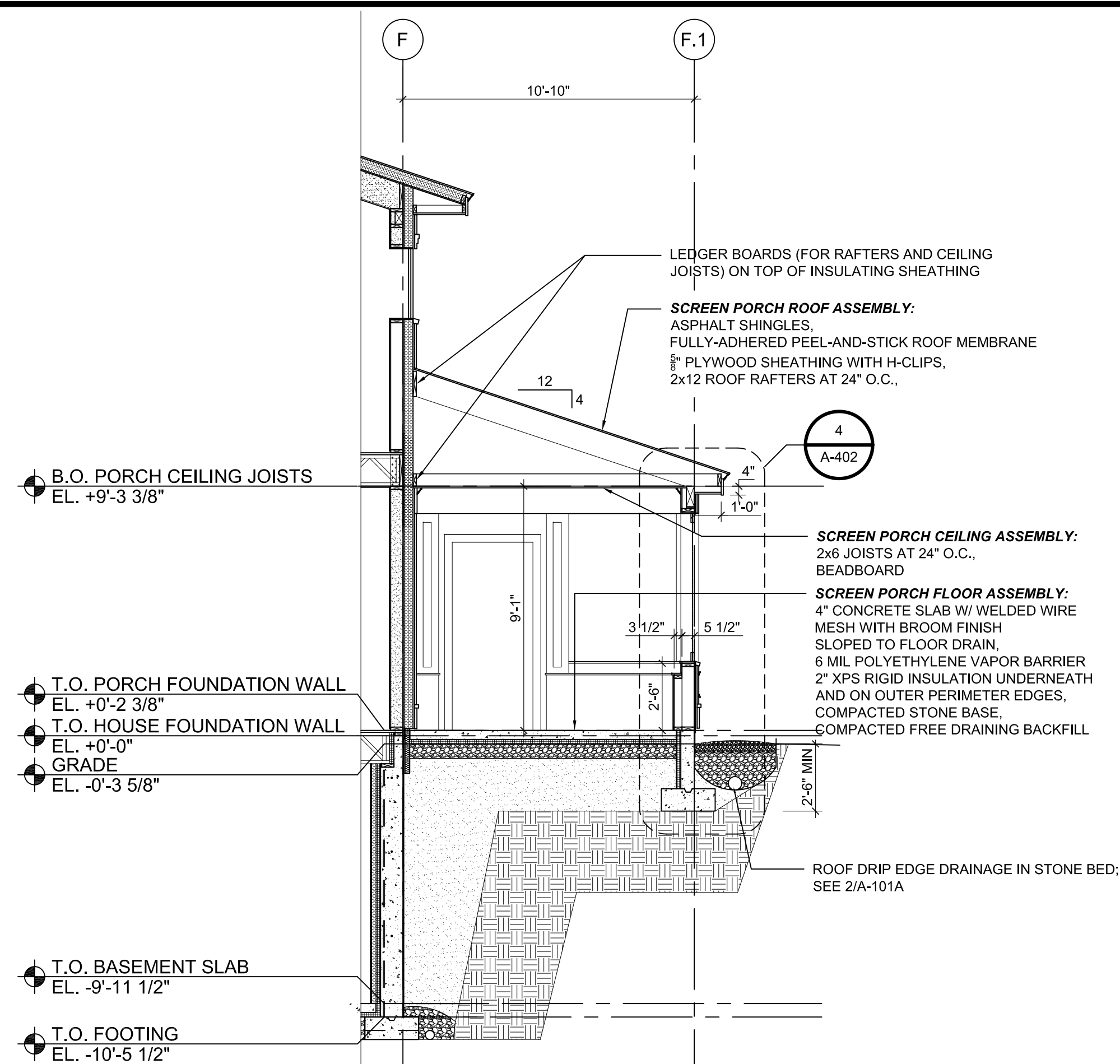
3 BREEZEWAY SECTION
SCALE: 1/4" = 1'-0"



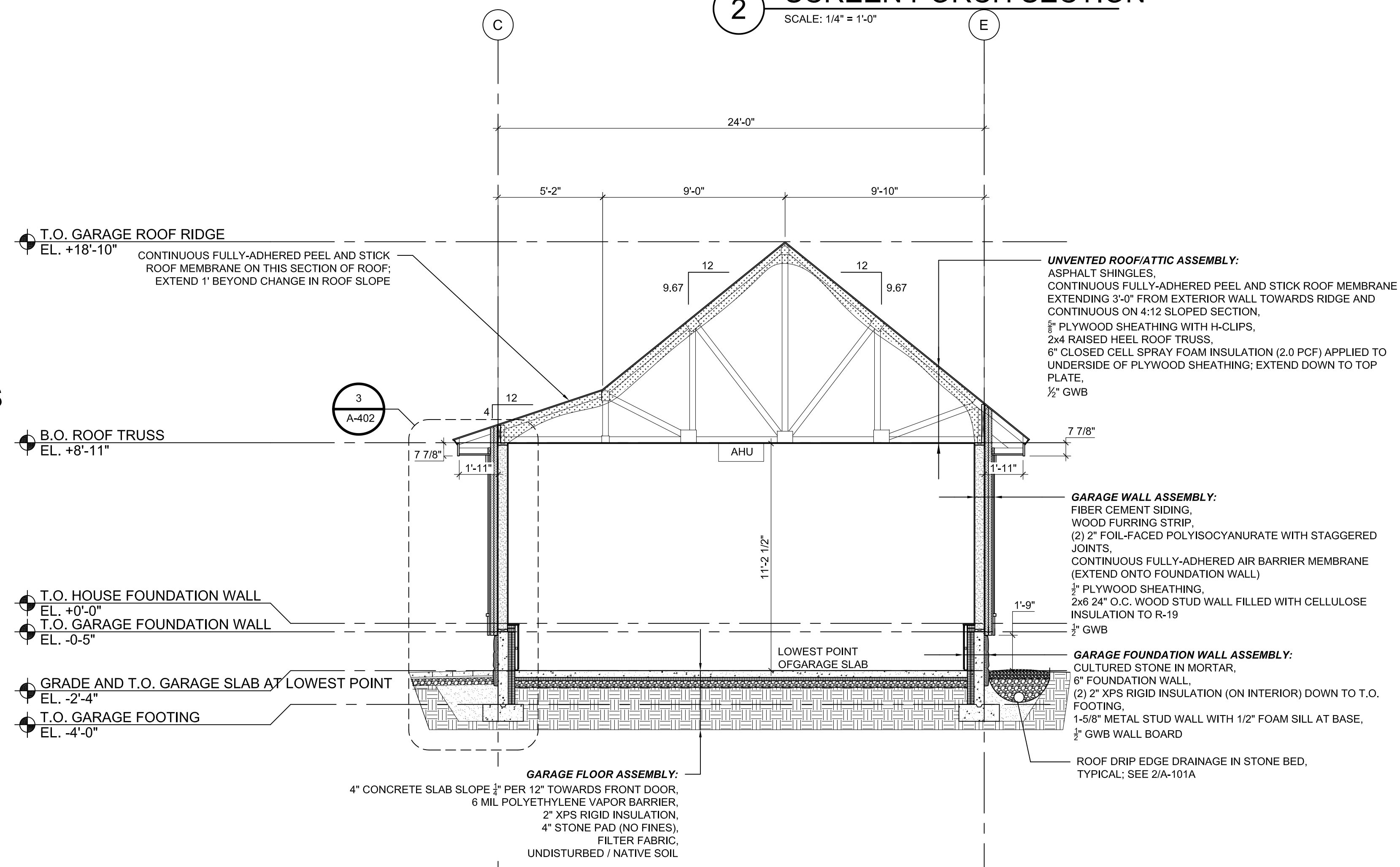
1B TYPICAL GARAGE ROOF END WALL TRUSS
SCALE: 1/4" = 1'-0"



1A TYPICAL GARAGE ROOF TRUSS
SCALE: 1/4" = 1'-0"



2 SCREEN PORCH SECTION
SCALE: 1/4" = 1'-0"



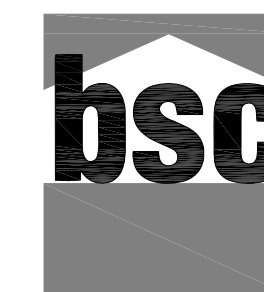
1 GARAGE SECTION
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

1. CONTRACTOR TO VERIFY ENGINEERED WOOD PRODUCT (EWP) MEMBER SIZES WITH EWP SUPPLIER.
2. EWP CONNECTIONS TO FOLLOW EWP SUPPLIER INSTRUCTIONS.
3. FIRST FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE, PORCHES AND BREEZEWAY
4. EL. +0'-0" IN THE ARCHITECTURAL DRAWINGS CORRESPONDS TO 461.30' IN THE SITE/CIVIL DRAWINGS.

SHEET KEYNOTES

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	06/29/10	UPDATED
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO: NIST NZERTF
CAD DWG FILE: A-PLOT-SECT-NZERTF
DRAWN BY: CG
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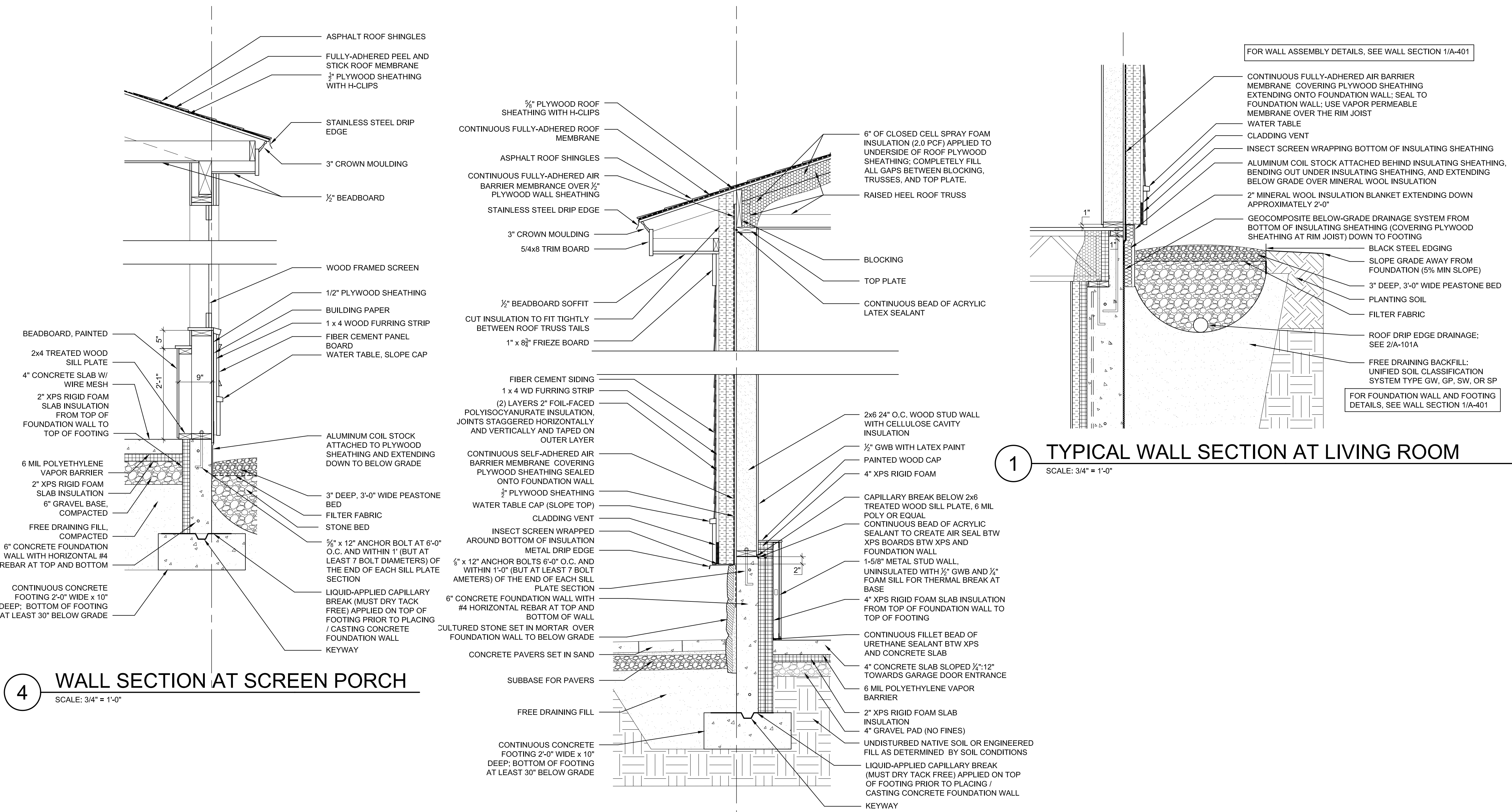
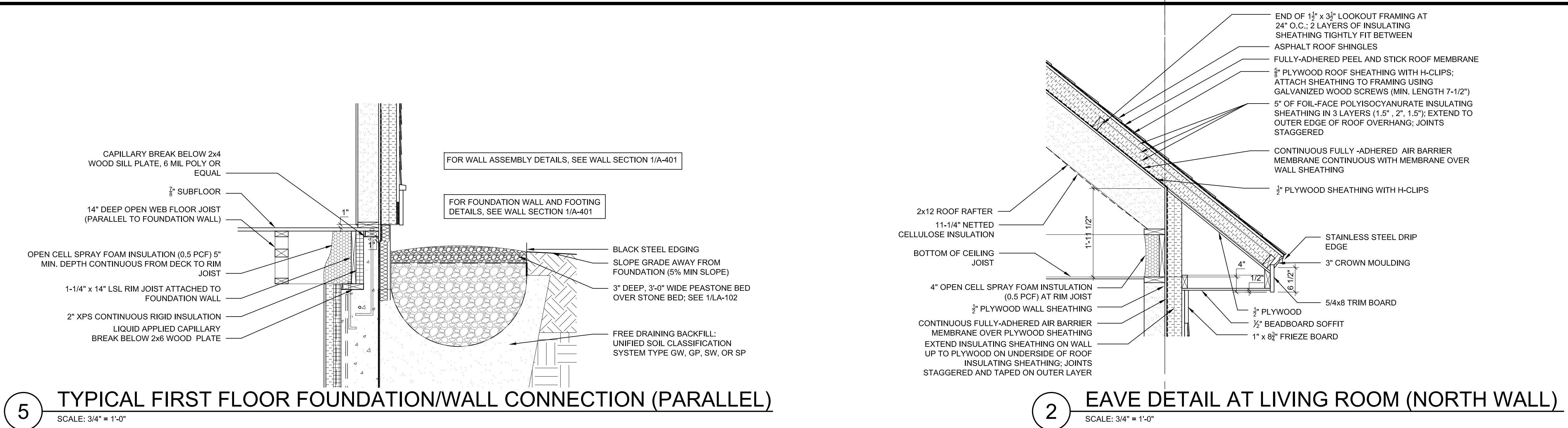
**GARAGE,
BREEZEWAY &
SCREEN PORCH
SECTIONS**

SCALE AS NOTED

A-305



A-401

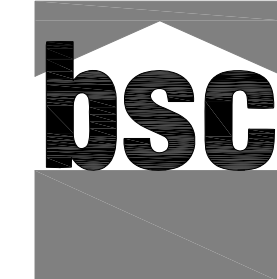


GENERAL SHEET NOTES

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3. FIRST AND SECOND FLOOR SOFFITS TO ALIGN AROUND PERIMETER OF HOUSE, PORCHES AND BREEZEWAY.

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CAD DWG FILE: A-PLOT-WSEC-NZERTF
DRAWN BY: CG
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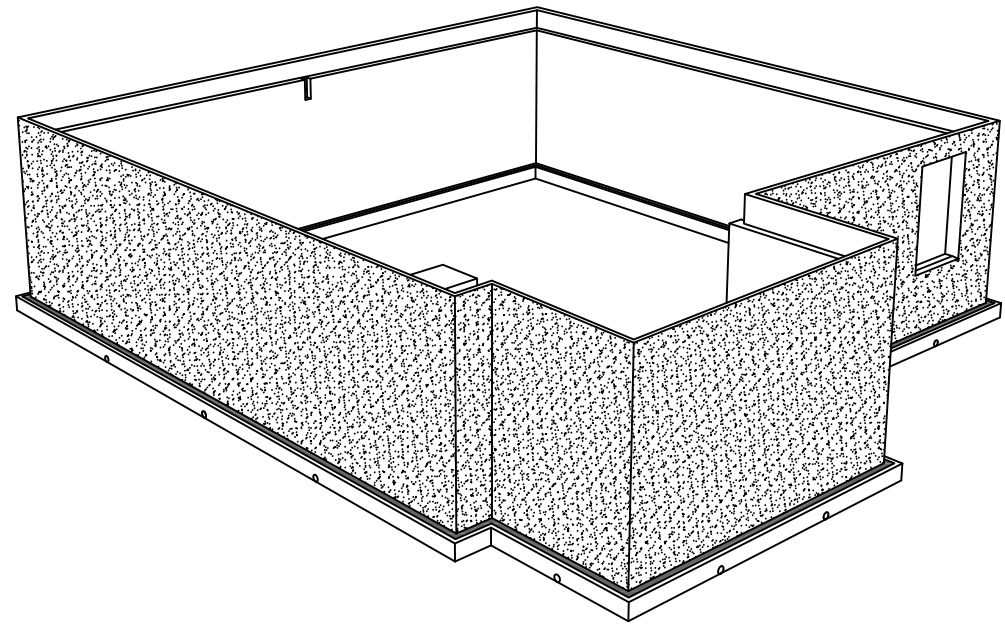
WALL SECTIONS

SCALE AS NOTED

A-402

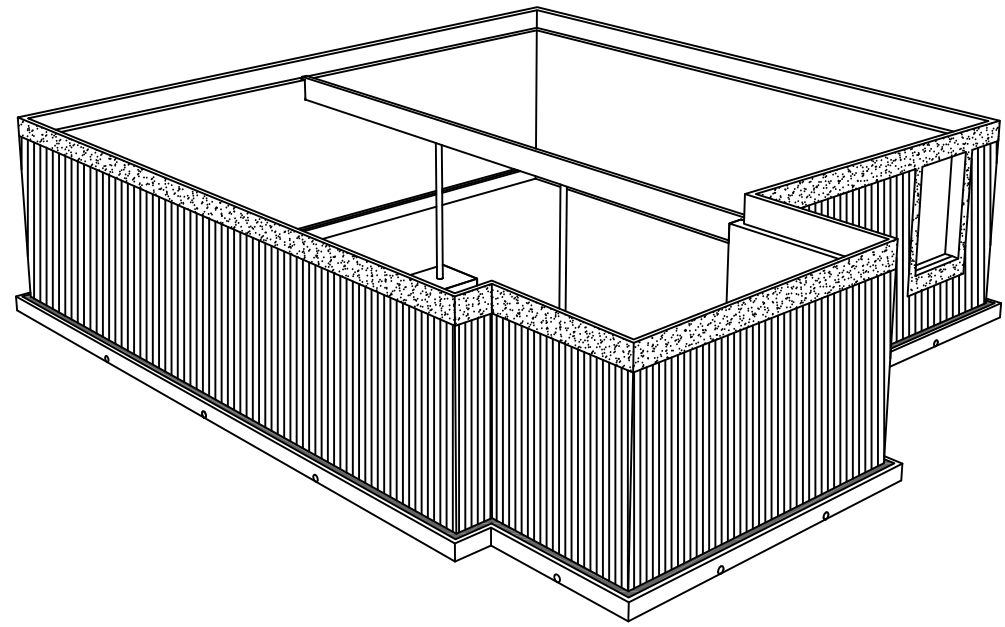
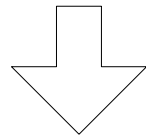
SEQUENCE NOTES

1. THE FOLLOWING CONSTRUCTION SEQUENCE LISTS THE REQUIRED ORDER OF STEPS TO BE COMPLETED TO ACHIEVE THE WATER MANAGEMENT AND AIRTIGHTNESS GOALS OF THIS PROJECT. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO COORDINATE AND SCHEDULE ALL CONSTRUCTION ACTIVITIES TO ACCOMMODATE THIS CONSTRUCTION SEQUENCE.
2. GARAGE AND BREEZEWAY CONSTRUCTION TO FOLLOW THIS CONSTRUCTION SEQUENCE AS APPLICABLE. HOWEVER, GARAGE AND BREEZEWAY ARE PERMITTED TO BE CONSTRUCTED AFTER HOUSE CONSTRUCTION HAS BEGUN AS LONG AS THE FOLLOWING STEPS ARE COMPLETED: 1) BREEZEWAY CONCRETE SLAB AT HOUSE TO BE INSTALLED AT STEP 15 ALONG WITH PORCH CONCRETE SLABS OR LATER, AND 2) BREEZEWAY ROOF LEDGER FRAMING TO BE INSTALLED AT STEP 16, ON TOP OF INSULATING SHEATHING AND BEFORE FURRING STRIPS. NOTE: AIRTIGHTNESS PERFORMANCE TESTS NOT PERFORMED ON GARAGE.
3. ALL CONCRETE SLAB AND CONCRETE FOUNDATION WALL PENETRATIONS MUST BE CAST INTO THE CONCRETE. PENETRATIONS SHALL NOT BE CREATED AFTER THE CONCRETE HAS BEEN PLACED. SEE A-603 FOR PENETRATION SCHEDULE.
4. ALL EXTERIOR WALL AND ROOF PENETRATIONS MUST BE INSTALLED DIRECTLY AFTER THE AIR BARRIER MEMBRANE HAS BEEN INSTALLED. PENETRATIONS SHALL NOT BE INSTALLED AFTER THE INSULATING SHEATHING HAS BEEN INSTALLED. SEE A-603 FOR PENETRATION SCHEDULE.



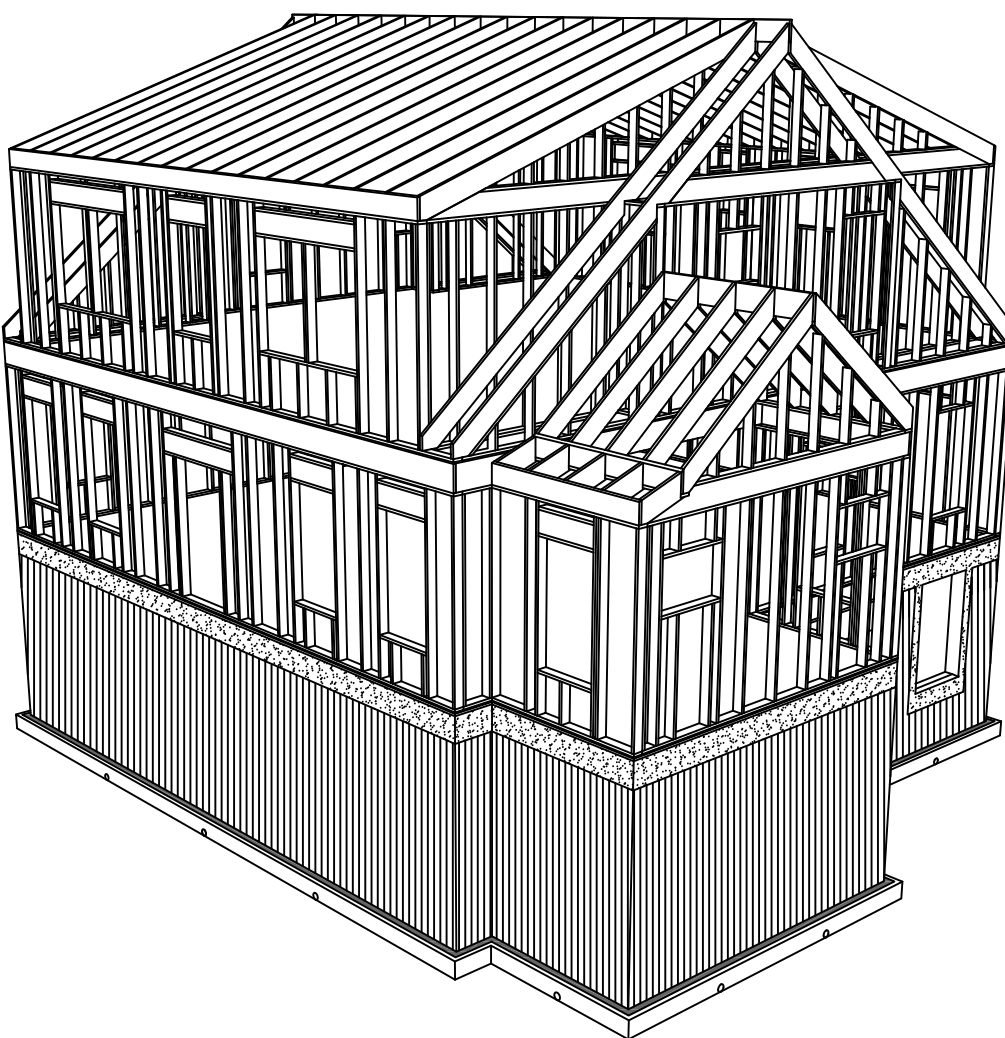
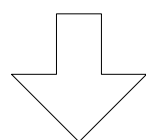
STEP 1

1. CAST PVC DRAIN PIPE INTO BOTTOM OF CONCRETE FOOTING. CONCRETE COLUMN FOOTINGS TO BE PLACED AT SAME TIME AS FOUNDATION WALL FOOTINGS.
- NOTE: FOOTING PENETRATIONS SHOWN AS EXAMPLE ONLY. NOT ALL SHOWN. SEE A-102 FOR PIPE LOCATIONS.
2. APPLY CAPILLARY BREAK ON TOP OF FOOTING.
 3. CAST PENETRATIONS, OPENINGS AND BEAM POCKETS INTO CONCRETE FOUNDATION WALL (SEE A-603 FOR PENETRATION SCHEDULE). (NOT SHOWN IN GRAPHIC). SEE A-506 FOR FOUNDATION PENETRATION DETAILS.
 4. SEAL FOUNDATION WALL PENETRATIONS TO CONCRETE ON BOTH INTERIOR AND EXTERIOR FACE OF WALL. (NOT SHOWN IN GRAPHIC). SEE A-506 FOR FOUNDATION DETAILS.
 5. APPLY DAMPROOFING TO CONCRETE FOUNDATION WALL.



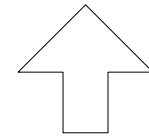
STEP 2

1. INSTALL GEOCOMPOSITE DRAINAGE SYSTEM FROM TOP OF FOOTING TO APPROX. 1'-6" BELOW TOP OF FOUNDATION WALL.
2. INSTALL PERIMETER DRAIN SYSTEM:
 - a. POSITION FILTER FABRIC AT BASE OF FOOTING AROUND PERIMETER OF FOUNDATION. (NOT SHOWN IN GRAPHIC)
 - b. INSTALL PERIMETER DRAINAGE SYSTEM. (NOT SHOWN IN GRAPHIC)
 - c. PLACE GRAVEL DRAINAGE BED AROUND PERIMETER PIPES. (NOT SHOWN IN GRAPHIC)
 - d. WRAP FILTER FABRIC AROUND GRAVEL DRAINAGE BED. (NOT SHOWN IN GRAPHIC)
6. BACKFILL FROM TOP OF FOOTING TO 3'-0" BELOW TOP OF FOUNDATION WALL USING FREE-DRAINING BACKFILL AS SPECIFIED. (NOT SHOWN IN GRAPHIC)

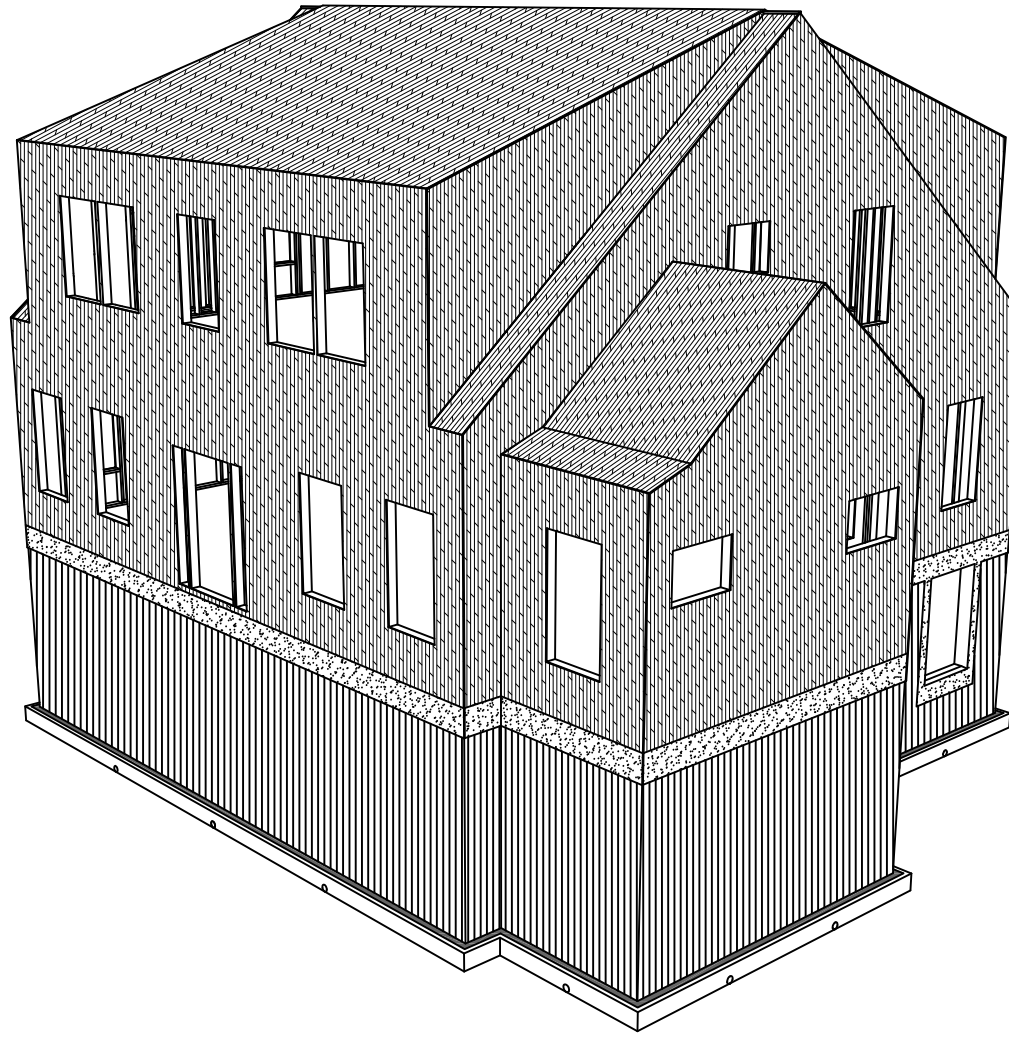


STEP 3

1. FRAME HOUSE ACCORDING TO FRAMING PLANS AND WALL FRAMING ELEVATIONS.
- NOTE: FRAMING IN GRAPHIC SHOWN FOR SEQUENCE PURPOSES ONLY. SEE FRAMING PLANS AND WALL FRAMING ELEVATIONS FOR FRAMING LAYOUT.
2. CAST ALL PENETRATIONS (SEE A-603 FOR PENETRATION SCHEDULE) INTO BASEMENT CONCRETE SLAB AND SEAL TO CONCRETE WITH URETHANE SEALANT. (NOT SHOWN IN GRAPHIC). SEE A-506 FOR FOUNDATION DETAILS.
 3. SEAL BASEMENT CONCRETE SLAB TO PERIMETER XPS INSULATING SHEATHING WITH URETHANE SEALANT. SEAL TOP OF PERIMETER XPS INSULATING SHEATHING TO CONCRETE FOUNDATION WALL WITH URETHANE SEALANT. (NOT SHOWN IN GRAPHIC)

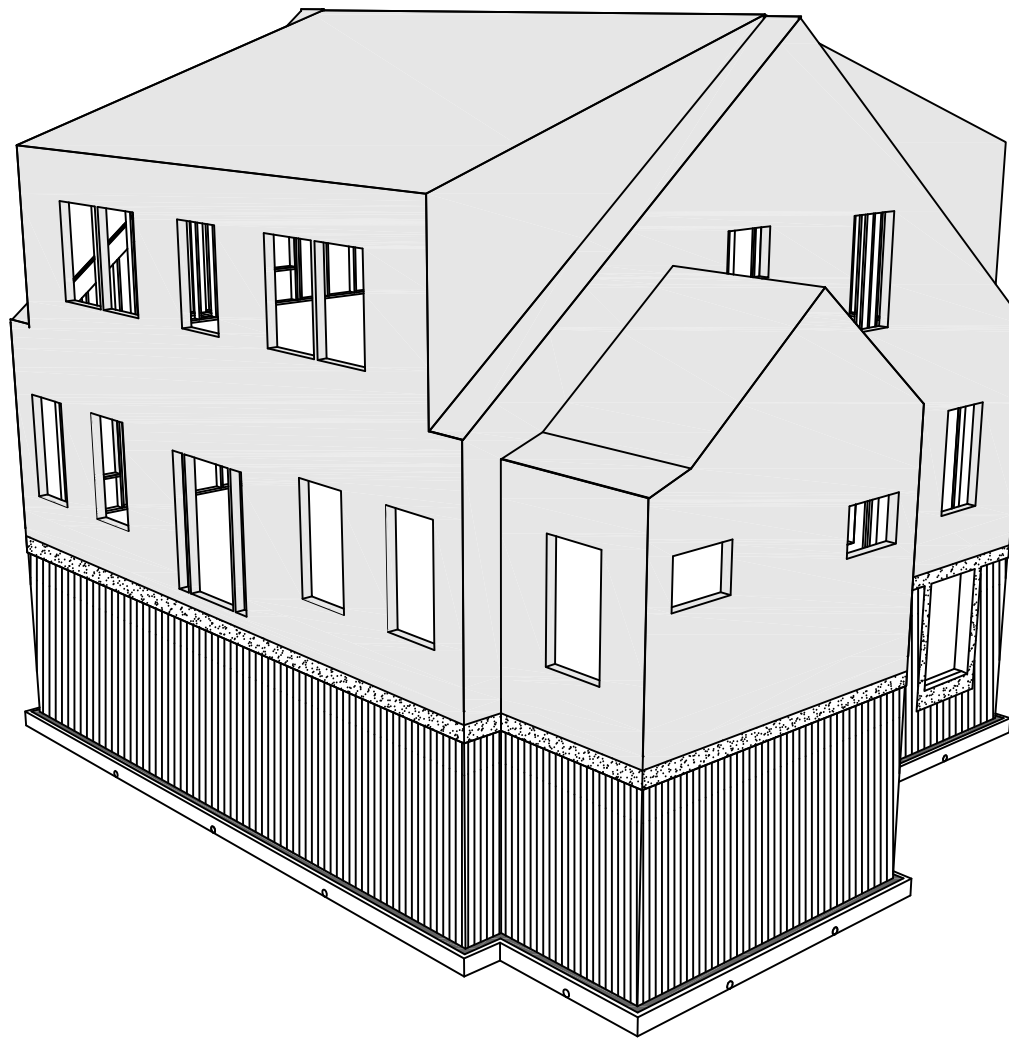
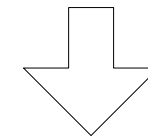


PROCEED TO
STEP 4 ABOVE



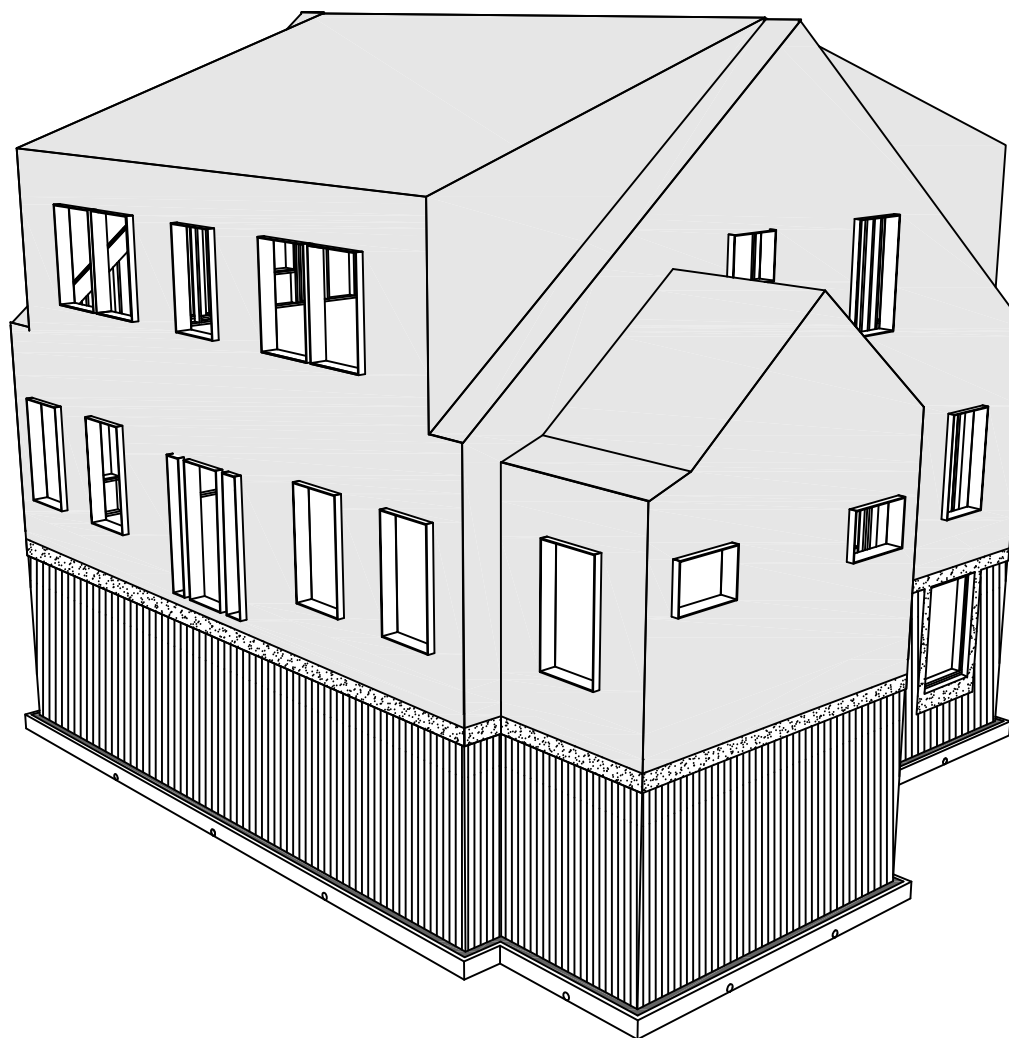
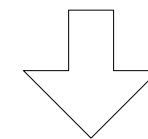
STEP 4

1. INSTALL 1/2" PLYWOOD SHEATHING ON EXTERIOR WALLS.
 2. INSTALL 1/2" PLYWOOD SHEATHING WITH H-CLIPS ON ROOF.
- NOTE: DO NOT EXTEND PLYWOOD SHEATHING BEYOND ROOF PLANE AT ROOF-TO-WALL INTERSECTIONS.



STEP 5

1. INSTALL CONTINUOUS FULLY-ADHERED AIR BARRIER MEMBRANE OVER 1/2" PLYWOOD SHEATHING ON WALLS AND ROOF. OVERLAP MEMBRANE ON ROOF OVER MEMBRANE ON WALL TO ENSURE AIRTIGHT CONNECTION. EXTEND MEMBRANE APPROX. 6" PAST BOTTOM OF PLYWOOD SHEATHING ON WALL ONTO CONCRETE FOUNDATION WALL. EXTEND 5 1/2" INTO WINDOW AND DOOR ROUGH OPENINGS.
2. SEAL 4 CORNERS OF WOOD FRAMED ROUGH OPENINGS FOR ALL WINDOWS AND DOORS WITH URETHANE SEALANT.

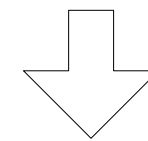


STEP 6

1. INSTALL PRE-ASSEMBLED 1/2" PLYWOOD EXTENSION BOX AT ALL WINDOW AND DOOR ROUGH OPENINGS. COAT ALL SURFACES OF PLYWOOD BOX WITH LIQUID-APPLIED VAPOR PERMEABLE WATERPROOFING COATING PRIOR TO BOX CONSTRUCTION AND INSTALLATION. SEAL INTERIOR CORNERS WITH URETHANE SEALANT ONCE INSTALLED. INSTALL BASEMENT WINDOW WOOD BUCKS AND SEAL TO CONCRETE. (SEE WINDOW AND DOOR DETAILS AND INSTALLATION SEQUENCES ON A-503, A-504, AND A-506.)
2. SEAL ALL PLYWOOD BOXES TO AIR BARRIER MEMBRANE ON EXTERIOR OF HOUSE WITH URETHANE SEALANT AT PERIMETER OF PLYWOOD BOX.
3. SEAL ALL PLYWOOD BOXES TO WOOD FRAMING ON INTERIOR OF HOUSE WITH ACRYLIC LATEX SEALANT AT PERIMETER OF PLYWOOD BOX.
4. INSTALL ALL EXTERIOR WALL AND ROOF PENETRATIONS (SEE A-603 FOR PENETRATION SCHEDULE). SEAL PENETRATIONS TO AIR BARRIER MEMBRANE WITH CLOSED CELL FOAM BACKER ROD AND URETHANE SEALANT ON EXTERIOR AND INTERIOR OF HOUSE. SEE A-505 AND A-509 FOR PENETRATION DETAILS.

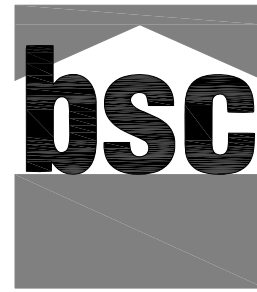


SEAL PLASTIC SHEET TO INTERIOR SIDE OF PLYWOOD EXTENSION BOX AT ALL WINDOWS AND DOORS, TO INTERIOR SIDE OF ALL FOUNDATION WALL, SLAB, EXTERIOR WALL AND ROOF PENETRATIONS. PERFORM BLOWER DOOR TEST AND AIR SEAL AS REQUIRED TO ACHIEVE AIRTIGHTNESS SPECIFIED IN PERFORMANCE TESTING SECTION OF THE SPECIFICATION.



PROCEED TO
STEP 7 ON A-501B

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CAD DWG FILE:	A-PLOT-DETL-NZERTF
DRAWN BY:	HW
CHECKED BY:	BP

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SHEET TITLE:

REQUIRED
CONSTRUCTION
SEQUENCE -
PART A

SCALE AS NOTED



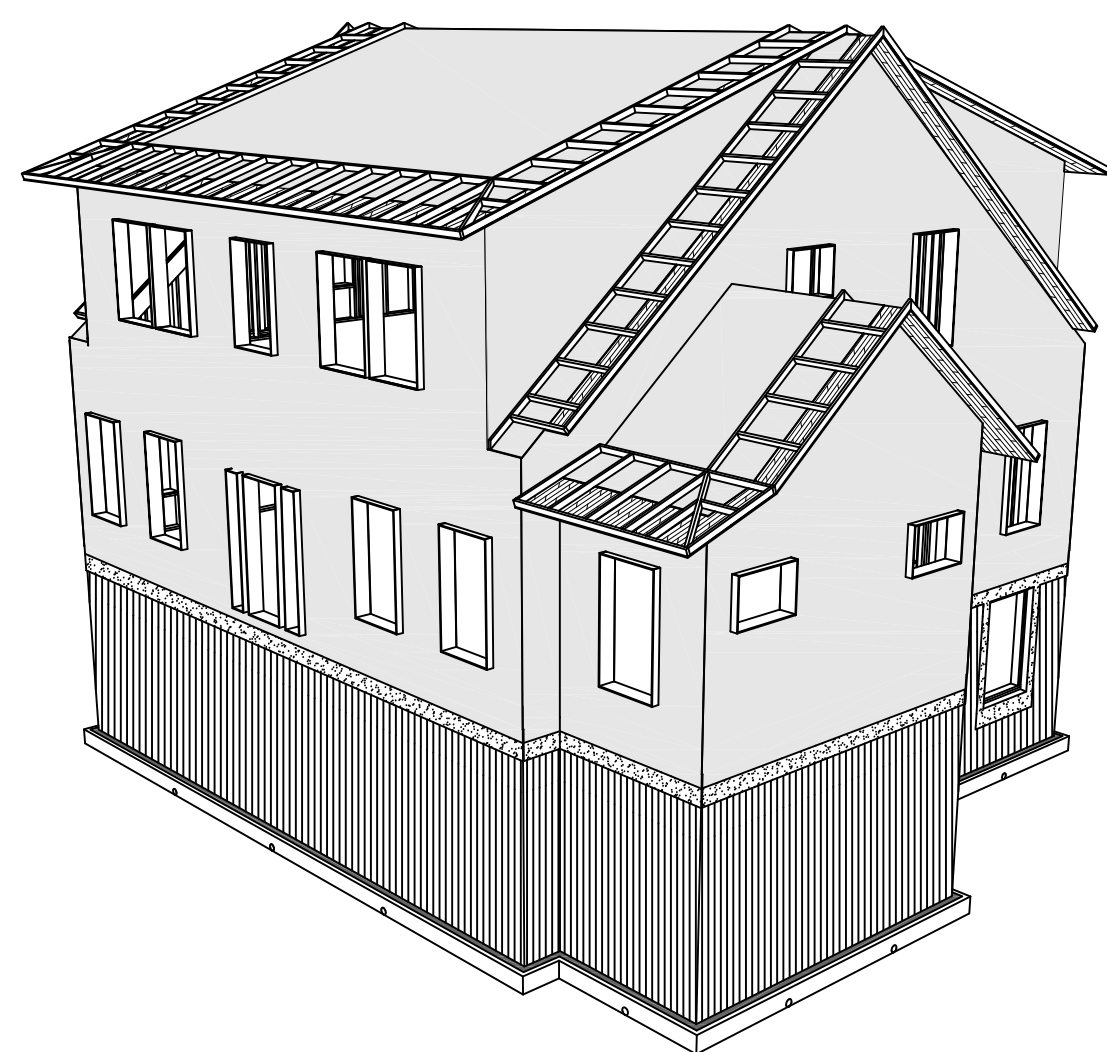
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REQUIRED CONSTRUCTION SEQUENCE - PART A

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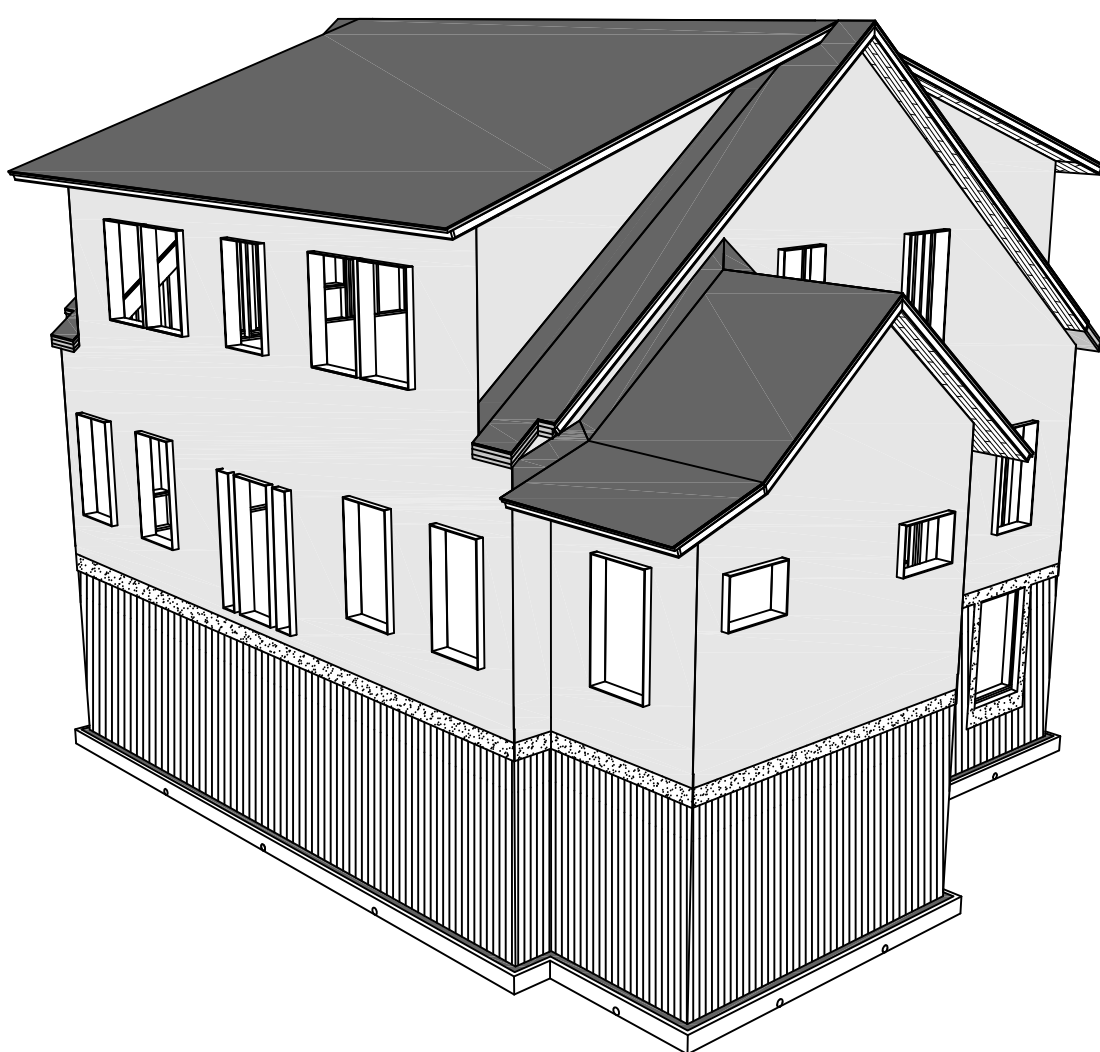
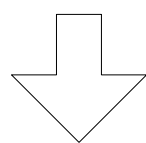
SEE A-501A FOR "SEQUENCE NOTES" AND STEPS 1-6.



STEP 7

1. INSTALL 2x4 ROOF OVERHANG FRAMING ON TOP OF AIR BARRIER MEMBRANE.
2. INSTALL $\frac{3}{4}$ " PLYWOOD SOFFIT UNDER OVERHANG FRAMING.

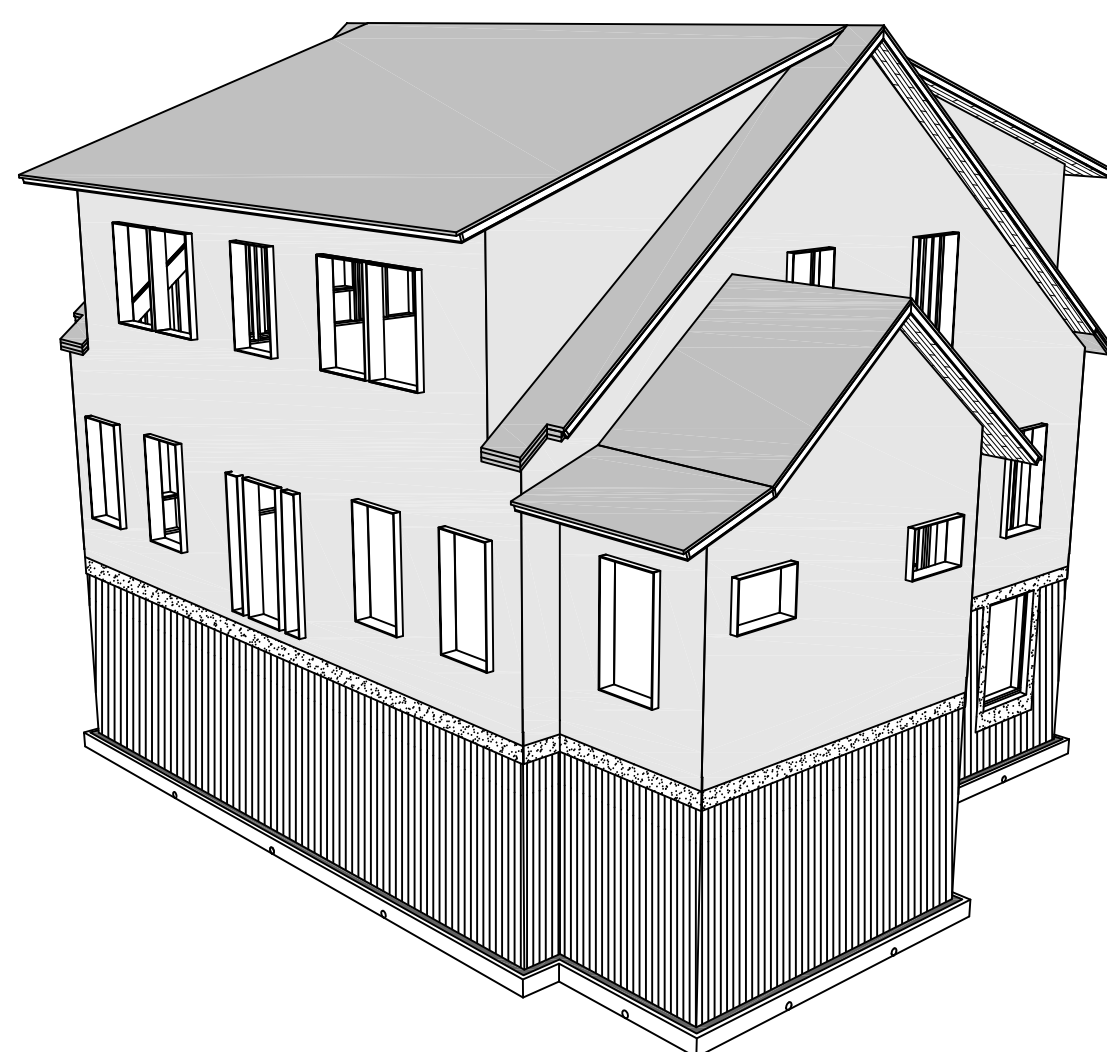
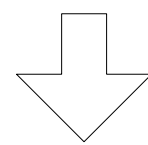
NOTE: FRAMING IN GRAPHIC SHOWN FOR SEQUENCE PURPOSES ONLY, SEE LOWER AND UPPER ROOF FRAMING PLANS FOR FRAMING LAYOUT.



STEP 10

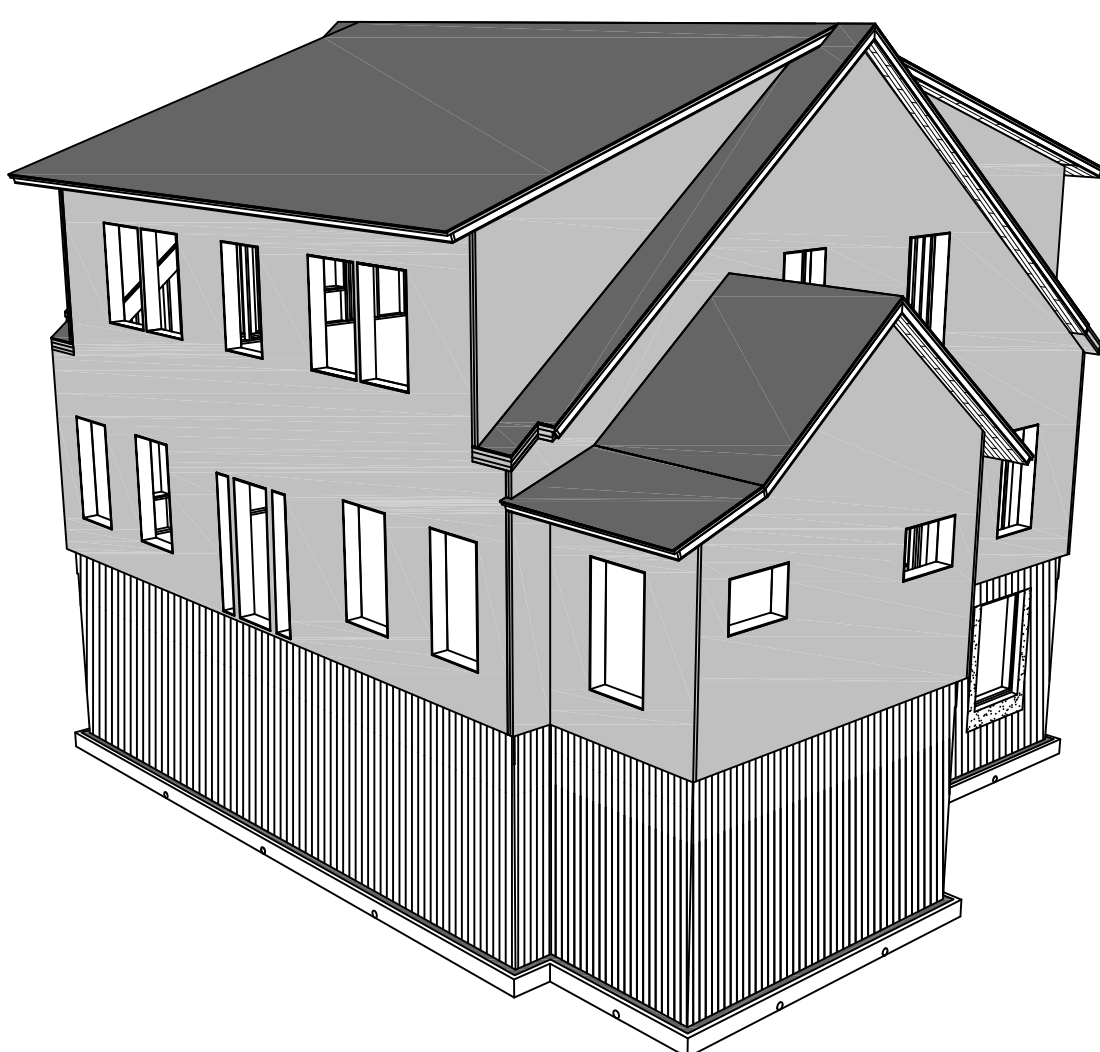
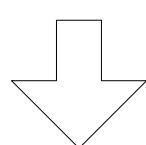
1. INSTALL CONTINUOUS FULLY-ADHERED PEEL AND STICK ROOF MEMBRANE (INSTALL MEMBRANE IN 2 STEPS ALONG WITH MEMBRANE FLASHING COLLAR AT ROOF PENETRATIONS - SEE A-509). TURN MEMBRANE UP WALL 12" MIN. AT ROOF TO WALL INTERSECTIONS. TAPE TOP EDGE OF MEMBRANE TO AIR BARRIER MEMBRANE ON WALL.

2. INSTALL MEMBRANE FLASHING COLLAR AT ROOF PENETRATIONS. SEE A-603 FOR PENETRATION SCHEDULE AND A-509 FOR ROOF PENETRATION DETAILS.



STEP 8

1. INSTALL 5" OF FOIL-FACED POLYISOCYANURATE INSULATING SHEATHING IN 3 LAYERS ($1\frac{1}{2}$ ", 2", $1\frac{1}{2}$ ") ON ROOF ONLY. STAGGER JOINTS OF INSULATING SHEATHING.
2. SEAL ROOF PENETRATIONS (SEE A-603 FOR PENETRATION SCHEDULE AND A-509 FOR ROOF PENETRATION DETAILS) TO INSULATING SHEATHING WITH CLOSED CELL FOAM BACKER ROD AND URETHANE SEALANT. (NOT SHOWN IN GRAPHIC)

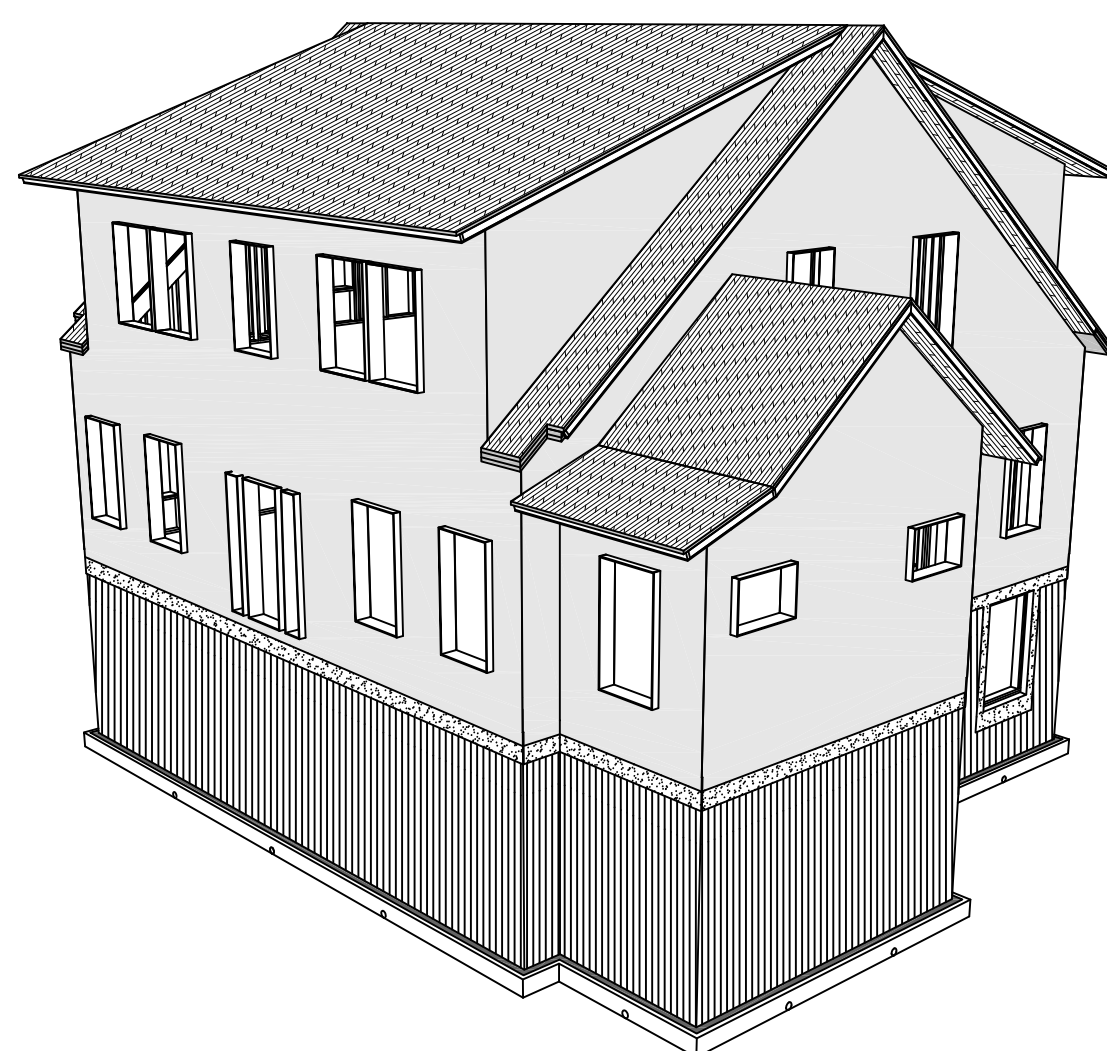
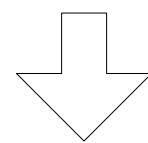


STEP 11

1. INSTALL (2) LAYERS OF 2" FOIL-FACED POLYISOCYANURATE INSULATING SHEATHING ON EXTERIOR WALLS. INSTALL INSULATING SHEATHING WITH TEMPORARY FASTENERS (NOT FURRING STRIPS AT THIS STEP) TO ALLOW FOR COMPLETE TAPING OF INSULATING SHEATHING JOINTS. FURRING STRIPS TO BE INSTALLED AFTER WINDOWS AND DOORS HAVE BEEN INSTALLED. STAGGER AND TAPE JOINTS OF INSULATING SHEATHING. OUTER LAYER OF INSULATING SHEATHING IS THE DRAINAGE PLANE. NOTE: FOUNDATION FLASHING (ALUMINUM COIL STOCK) MUST BE ATTACHED BEFORE INSULATING SHEATHING IS INSTALLED AT THE BASE OF THE EXTERIOR WALL (NOT SHOWN IN GRAPHIC).

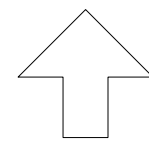
2. SEAL WALL PENETRATIONS (SEE A-603 FOR PENETRATION SCHEDULE) TO INSULATING SHEATHING WITH CLOSED CELL FOAM BACKER ROD AND URETHANE SEALANT. (NOT SHOWN IN GRAPHIC). SEE A-505 FOR WALL PENETRATION SEALING DETAILS.

3. COMPLETE THE INSTALLATION OF THE GEOCOMPOSITE DRAINAGE SYSTEM, OVERLAPPING FIRST LAYER OF SYSTEM 6" MIN. AND EXTENDING UP TO THE BOTTOM OF INSULATING SHEATHING (BUT UNDER FOUNDATION FLASHING). SEE 3/A-401 FOR TOP OF FOUNDATION DETAIL.

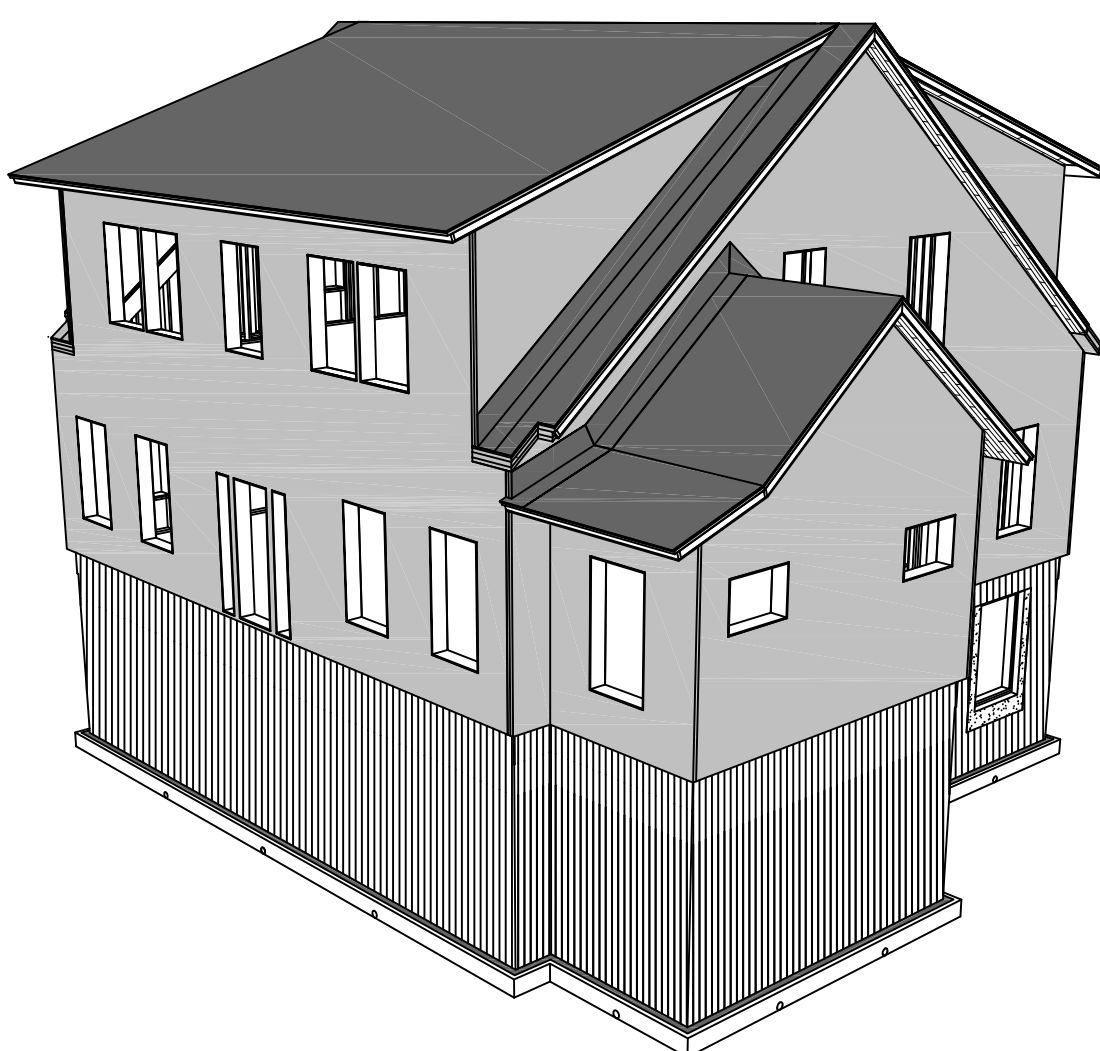


STEP 9

1. INSTALL $\frac{5}{8}$ " PLYWOOD SHEATHING WITH H-CLIPS ON ROOF.

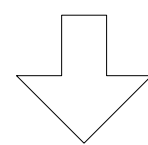


PROCEED TO
STEP 10 ABOVE



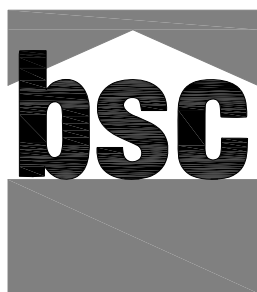
STEP 12

1. INSTALL A STRIP OF PEEL-AND-STICK ROOF MEMBRANE AT ROOF-TO-WALL INTERSECTIONS. TURN MEMBRANE UP WALL 12" MIN. AND EXTEND 12" MIN. ACROSS ROOF. TAPE TOP EDGE OF MEMBRANE TO INSULATING SHEATHING ON WALL.



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STEP 13 ON A-501C

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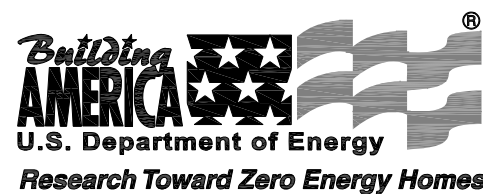
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PROJECT:

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PART B

SCALE AS NOTED



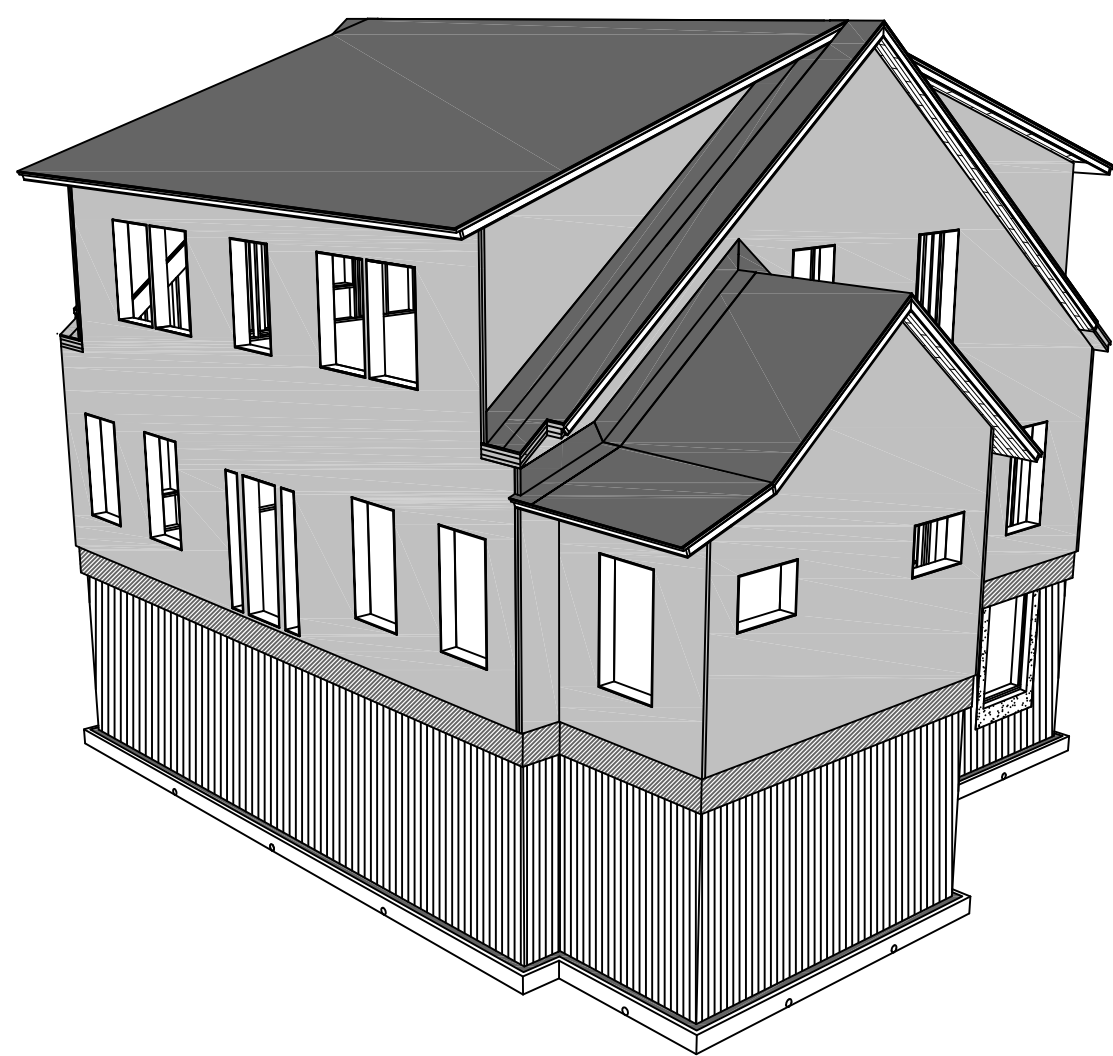
A-501B

1

REQUIRED CONSTRUCTION SEQUENCE - PART B

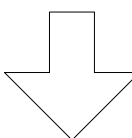
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SEE A-501A FOR "SEQUENCE NOTES" AND STEPS 1-6, AND A-501B FOR STEPS 7-12.



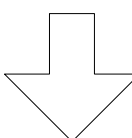
STEP 13

1. INSTALL MINERAL WOOL INSULATION COVERED WITH CEMENTITIOUS BOARD AROUND HOUSE PERIMETER AT TOP OF FOUNDATION WALL - FROM INSULATING SHEATHING DOWN 2'-0". NOTE: DOOR SILL FLASHING AND THRESHOLD BLOCKING NEED TO BE INSTALLED BEFORE THIS STEP (SEE A-504 FOR DOOR INSTALLATION SEQUENCE.)
2. INSTALL WINDOW WELL AT BASEMENT WINDOW. (NOT SHOWN IN GRAPHIC). SEE A-506 FOR WINDOW WELL DETAIL.
3. INSTALL REMAINING BACKFILL. (NOT SHOWN IN GRAPHIC)



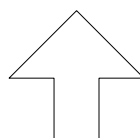
STEP 14

1. INSTALL ALL WINDOWS AND DOORS. SEE A-503 AND A-504 FOR WINDOW AND DOOR OPENING WATERPROOFING DETAILS AND INSTALLATION SEQUENCES.

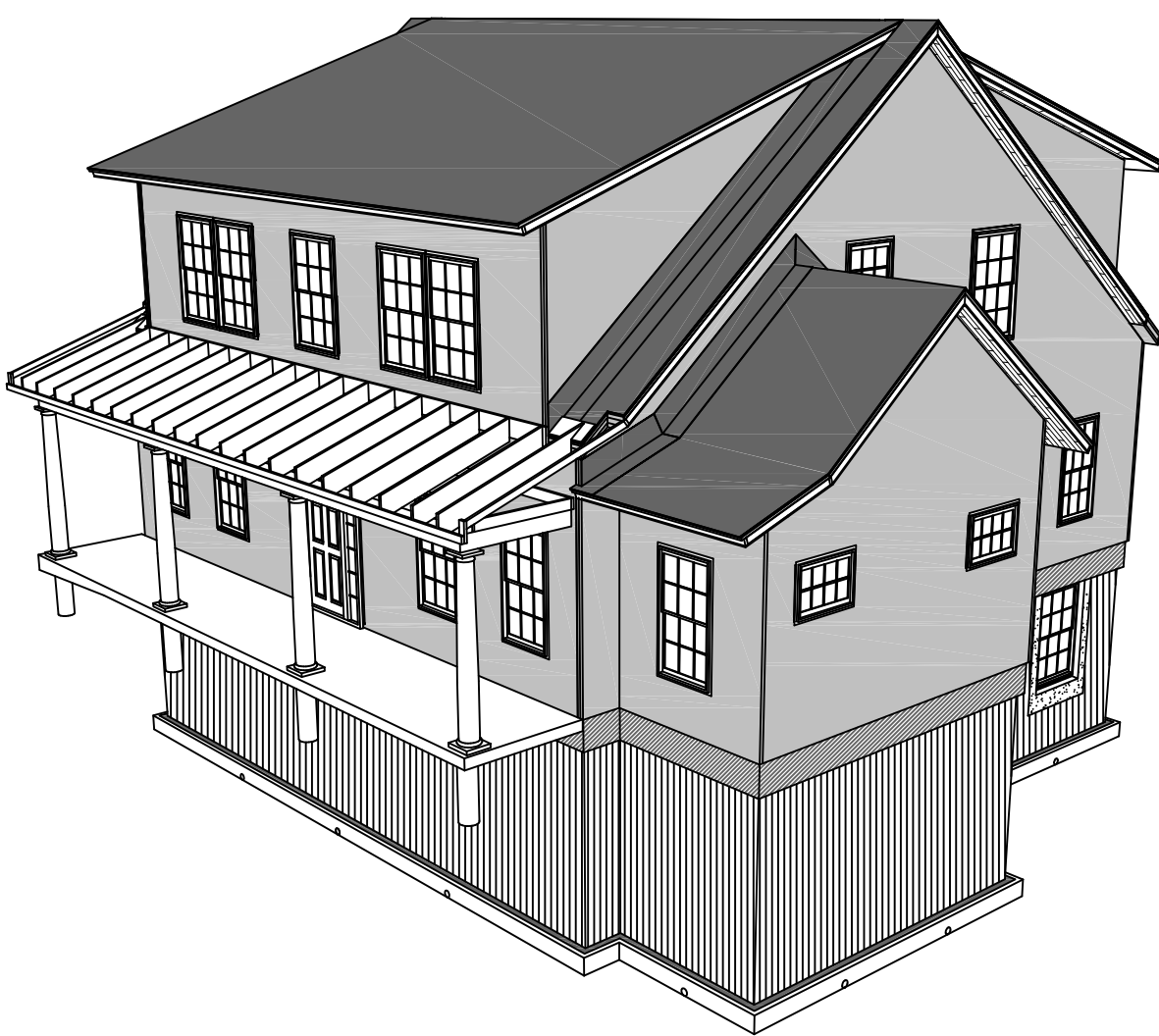


STEP 15

1. INSTALL FOUNDATION SYSTEMS FOR FRONT PORCH AND SCREEN PORCH. (SCREEN PORCH NOT SHOWN IN GRAPHIC)
2. INSTALL CONCRETE SLAB FOR FRONT PORCH AND SCREEN PORCH OVER COMPACTED SUBGRADE AND STONE. (SCREEN PORCH NOT SHOWN IN GRAPHIC)

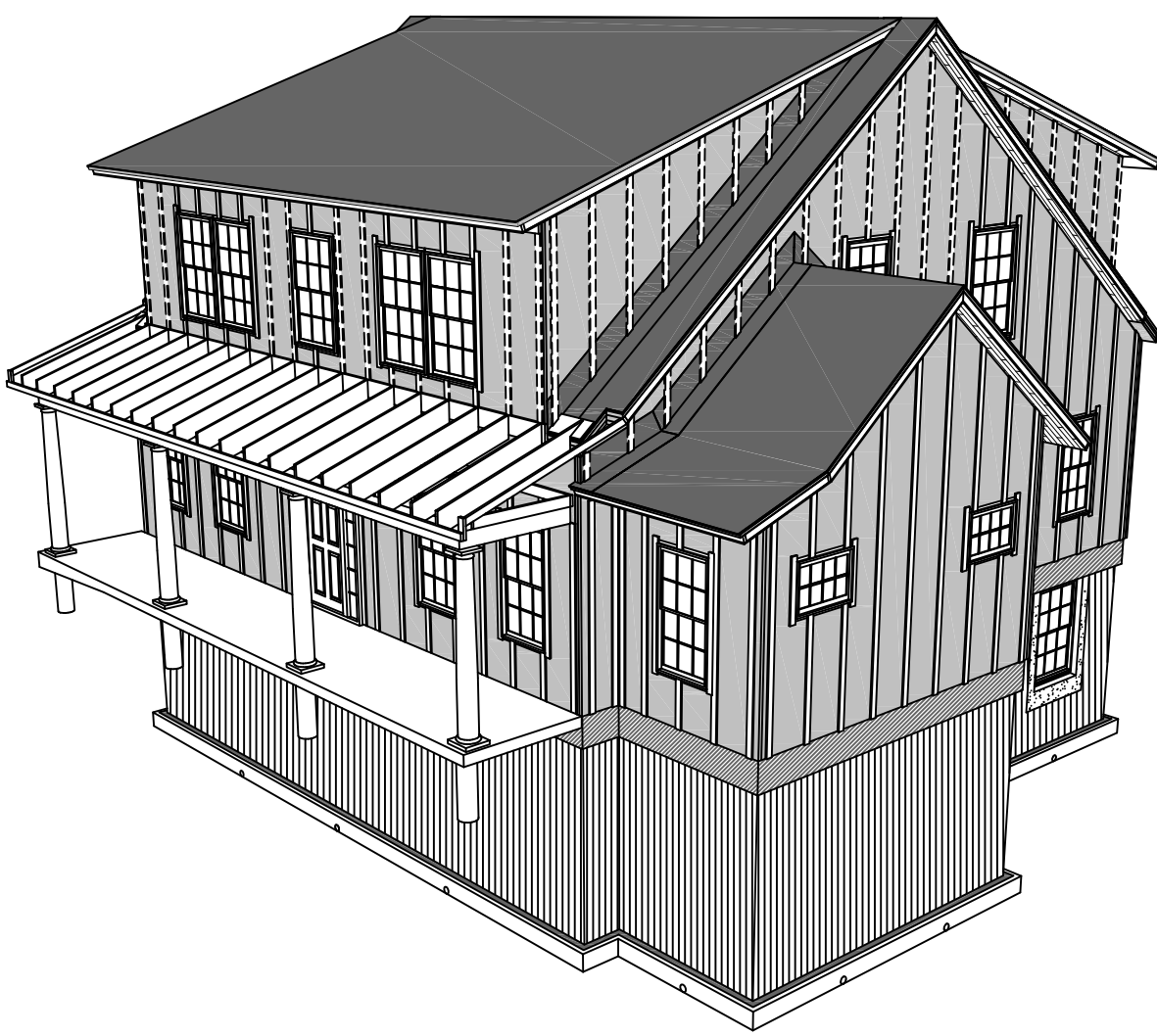
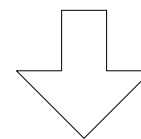


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STEP 16 ABOVE



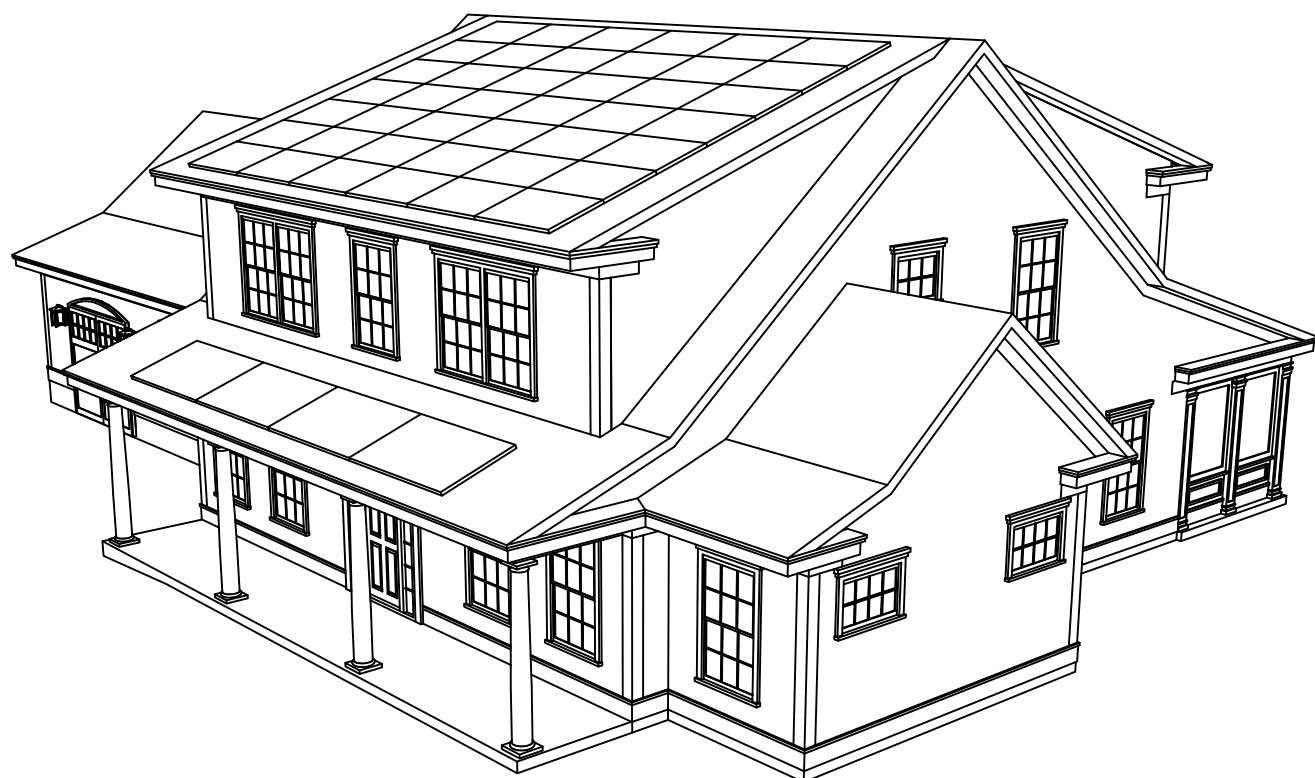
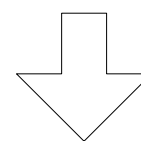
STEP 16

1. INSTALL BOTH FRONT PORCH AND REAR SCREEN PORCH FRAMING. (REAR SCREEN PORCH NOT SHOWN IN GRAPHIC)
 2. INTEGRATE PORCH ROOF AND WALL FULLY-ADHERED MEMBRANE WITH HOUSE ROOF AND WALL FULLY-ADHERED MEMBRANE. PORCH ROOF SHEATHING, WALL SHEATHING AND FULLY-ADHERED MEMBRANES NOT SHOWN IN GRAPHIC.
- NOTE: FRAMING IN GRAPHIC SHOWN FOR SEQUENCE PURPOSES ONLY. SEE PORCH FRAMING PLANS FOR FRAMING LAYOUT.



STEP 17

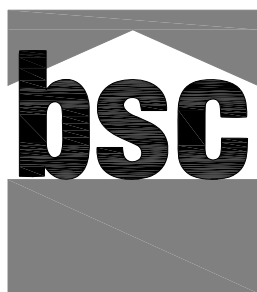
1. REMOVE TEMPORARY INSULATING SHEATHING FASTENERS AND INSTALL 1X4 WOOD FURRING STRIPS. SEE A-503 AND A-504 FOR FURRING STRIP INSTALLATION AROUND WINDOWS AND DOORS.
- NOTE: DO NOT INSTALL FURRING STRIPS AT ROOF-TO-WALL INTERSECTIONS (SHOWN AS DASHED LINES) UNTIL FLASHING, TAPE AND SHINGLES HAVE BEEN INSTALLED AT ROOF-TO-WALL LOCATIONS. SEE 4/A-508 AND 4/A-509 FOR DETAILS.



STEP 18

1. INSTALL FIBER CEMENT SIDING, TRIM AND ROOFING. SEE A-505 AND A-509 FOR PENETRATION DETAILS.
- NOTE: FINAL IMAGE SHOWN WITH GARAGE STRUCTURE, REAR SCREEN PORCH AND SOLAR THERMAL AND PV PANELS.

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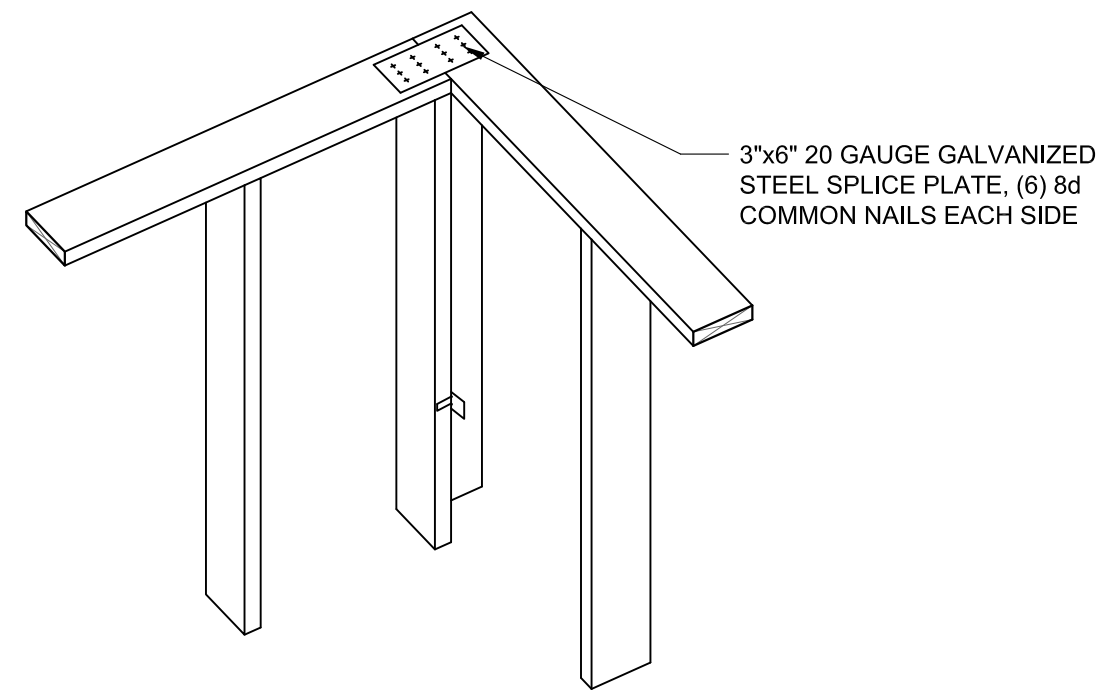
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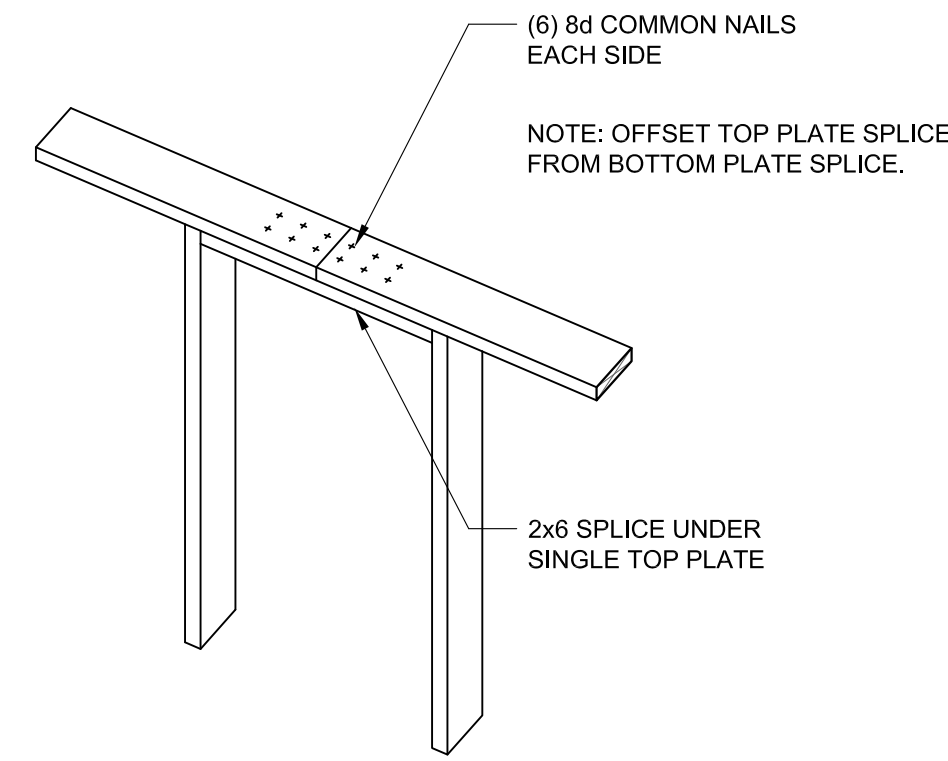
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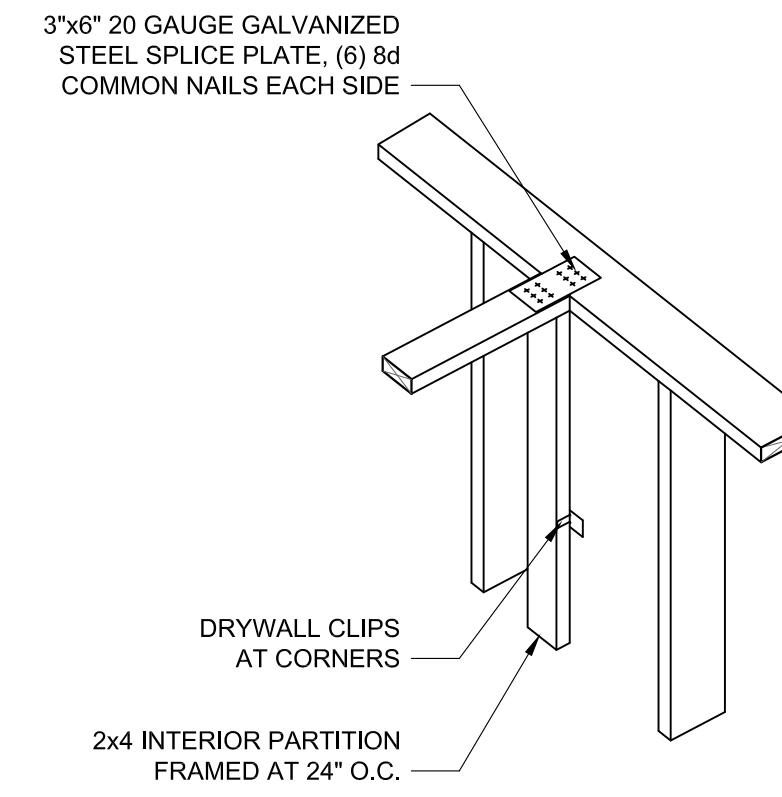
A-501C



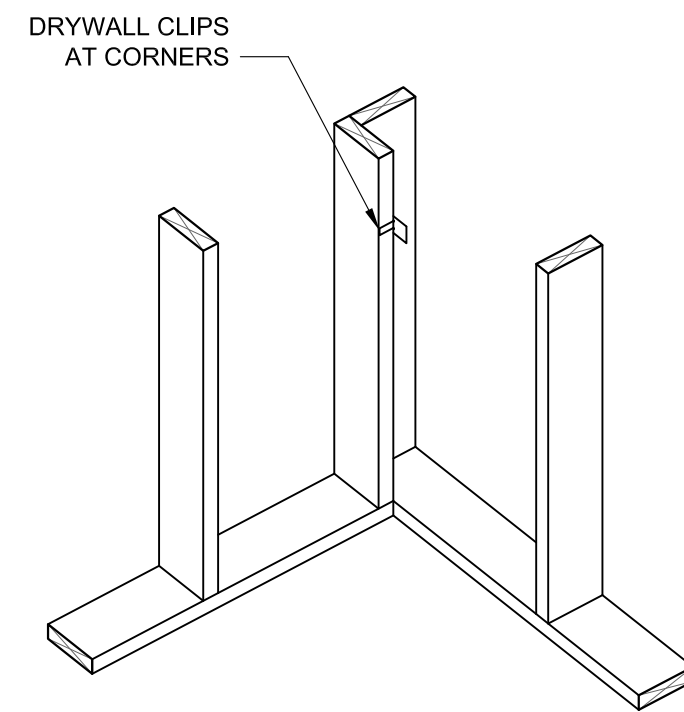
9 TWO-STUD CORNER - TOP
SCALE: N.T.S.



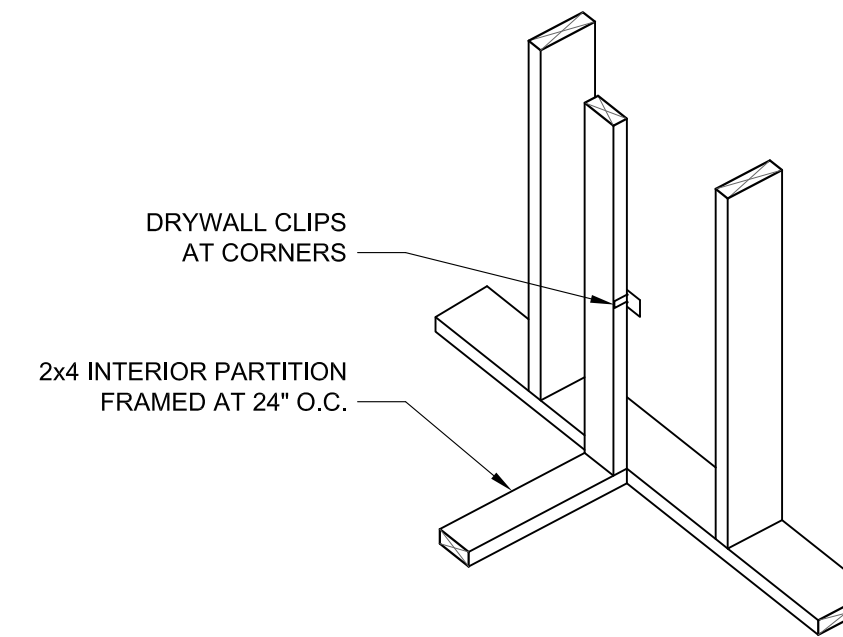
6 SINGLE TOP PLATE SPLICE
SCALE: N.T.S.



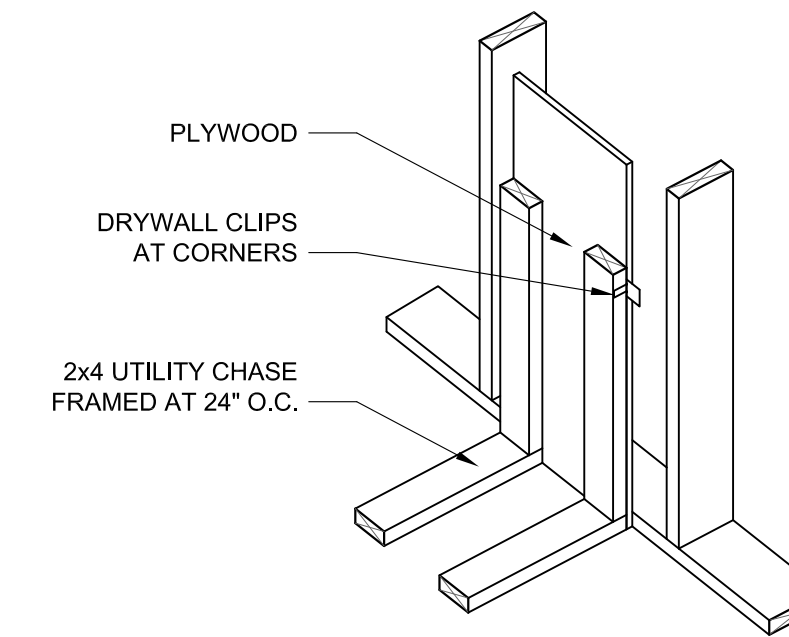
3 SINGLE TOP PLATE AT PARTITION
SCALE: N.T.S.



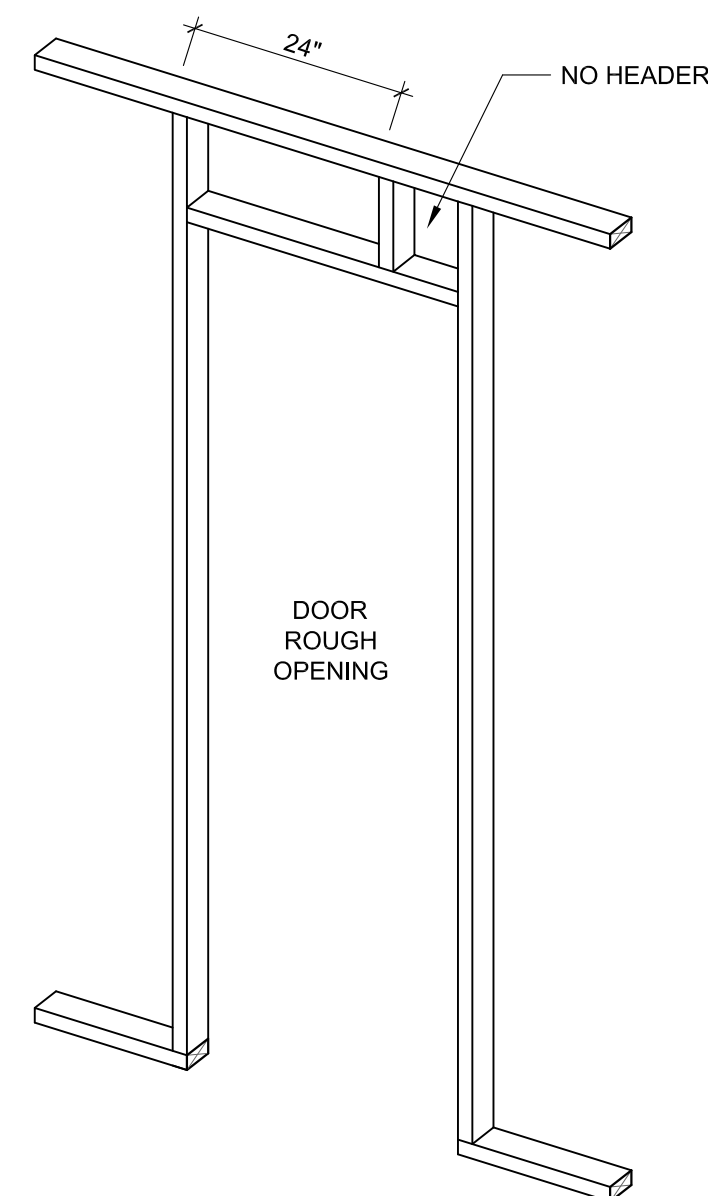
8 TWO-STUD CORNER - BOTTOM
SCALE: N.T.S.



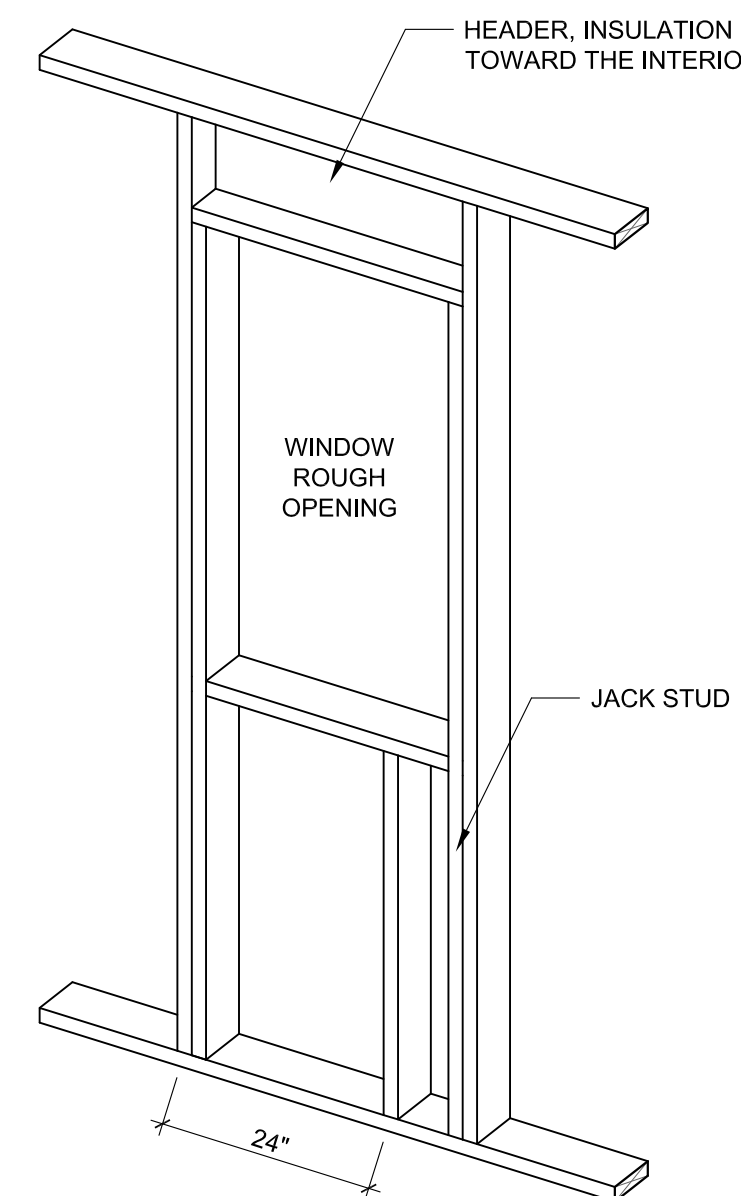
5 BOTTOM PLATE AT PARTITION
SCALE: N.T.S.



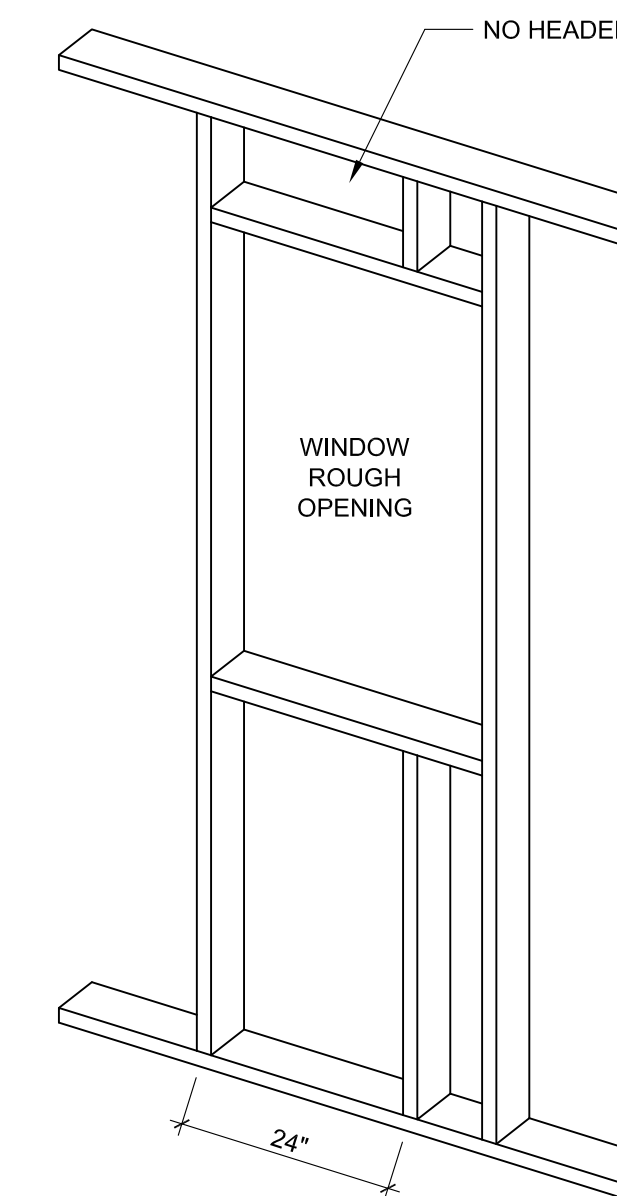
2 CHASE AT EXTERIOR WALL
SCALE: N.T.S.



7 NON-LOAD BEARING INTERIOR WALL
SCALE: N.T.S.



4 LOAD BEARING WALL
SCALE: N.T.S.



1 NON-LOAD BEARING WALL
SCALE: N.T.S.

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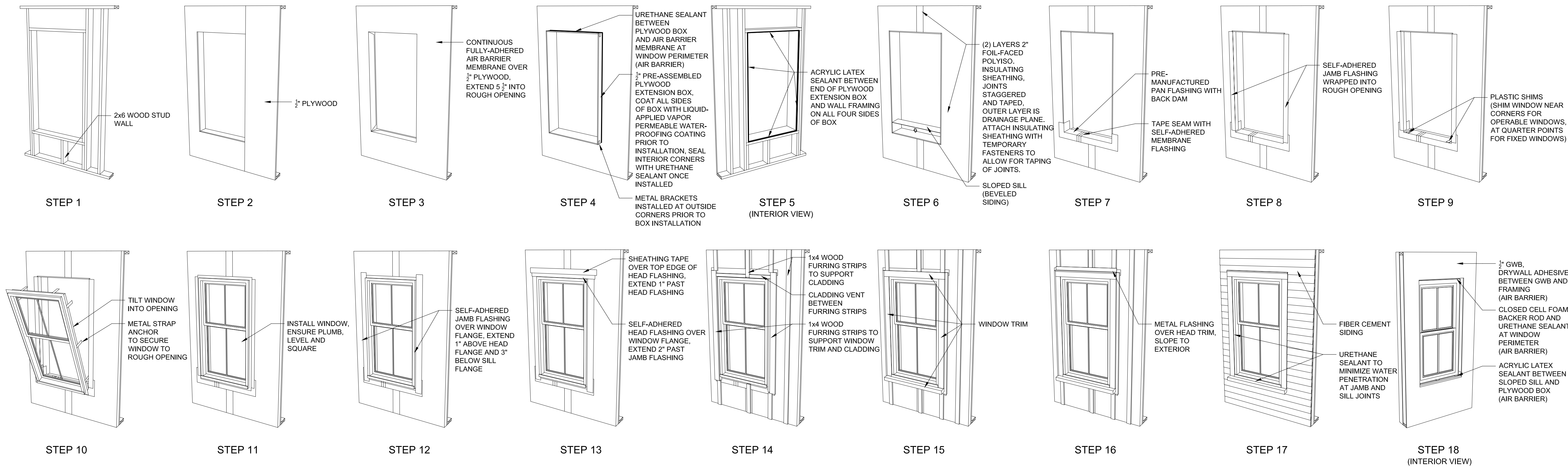
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**ADVANCED
FRAMING DETAILS**

SCALE AS NOTED

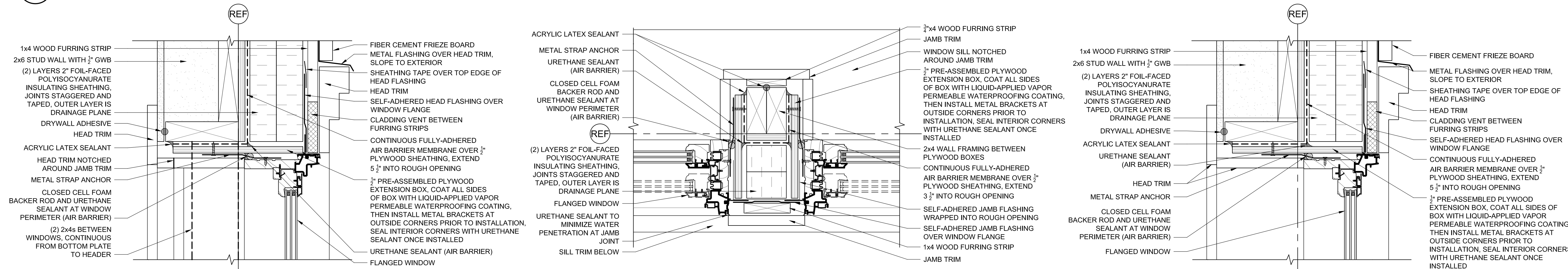


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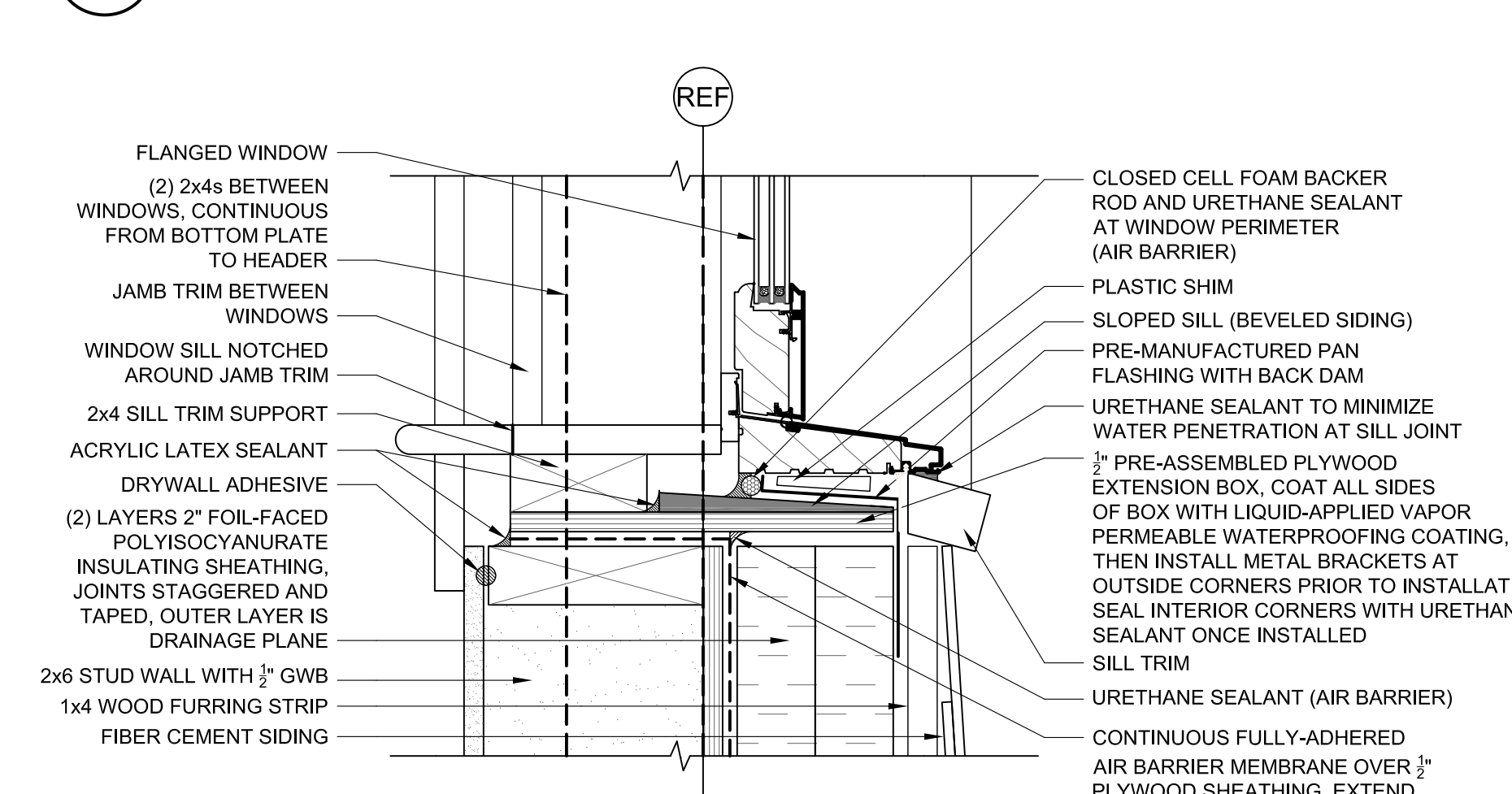
7 WINDOW INSTALLATION SEQUENCE

SCALE: N.T.S.



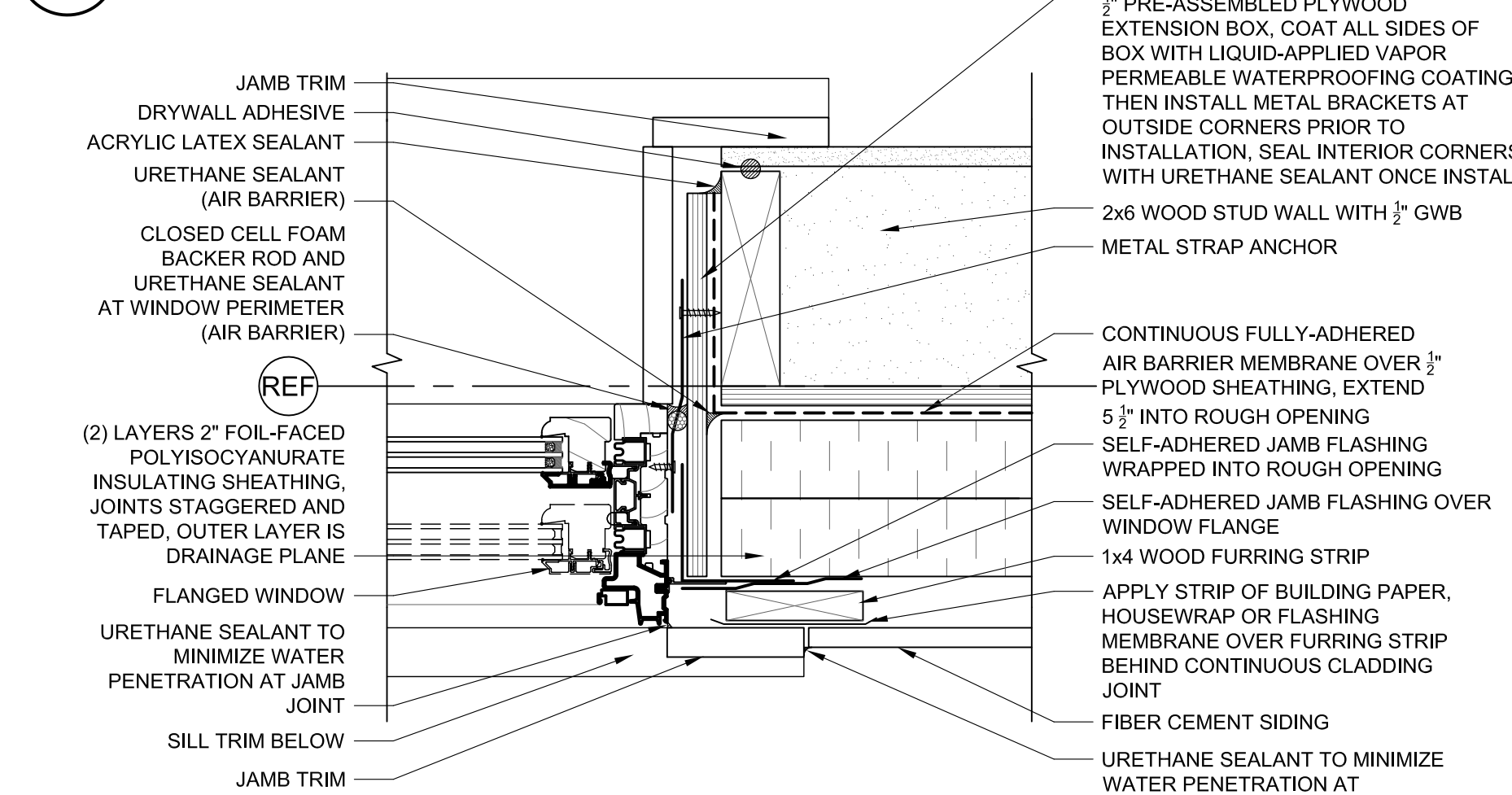
6 GANGED WINDOW HEAD DETAIL

SCALE: 3" = 1'-0"



4 GANGED WINDOW JAMB DETAIL

SCALE: 3" = 1'-0"



5 GANGED WINDOW SILL DETAIL

SCALE: 3" = 1'-0"



3 WINDOW JAMB DETAIL

SCALE: 3" = 1'-0"



1 WINDOW SILL DETAIL

SCALE: 3" = 1'-0"



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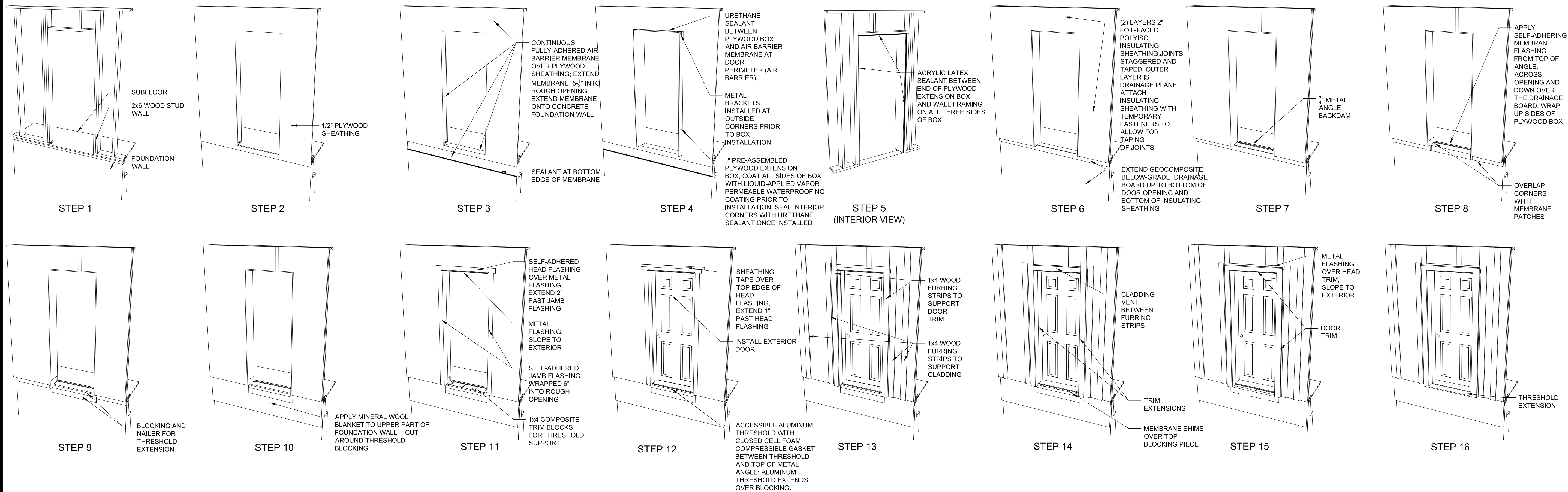
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SHEET TITLE:

WINDOW DETAILS & INSTALLATION SEQUENCE

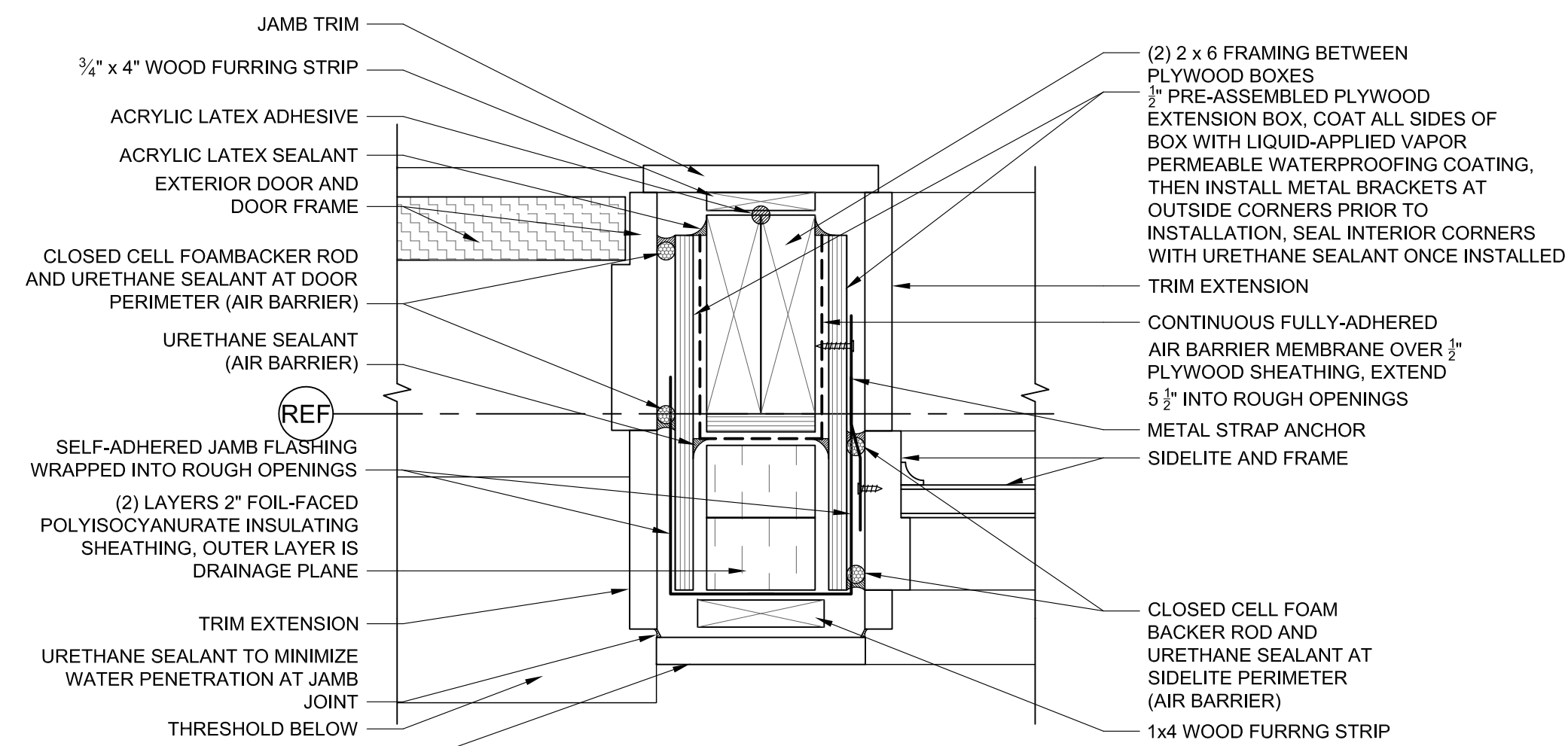
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A-503



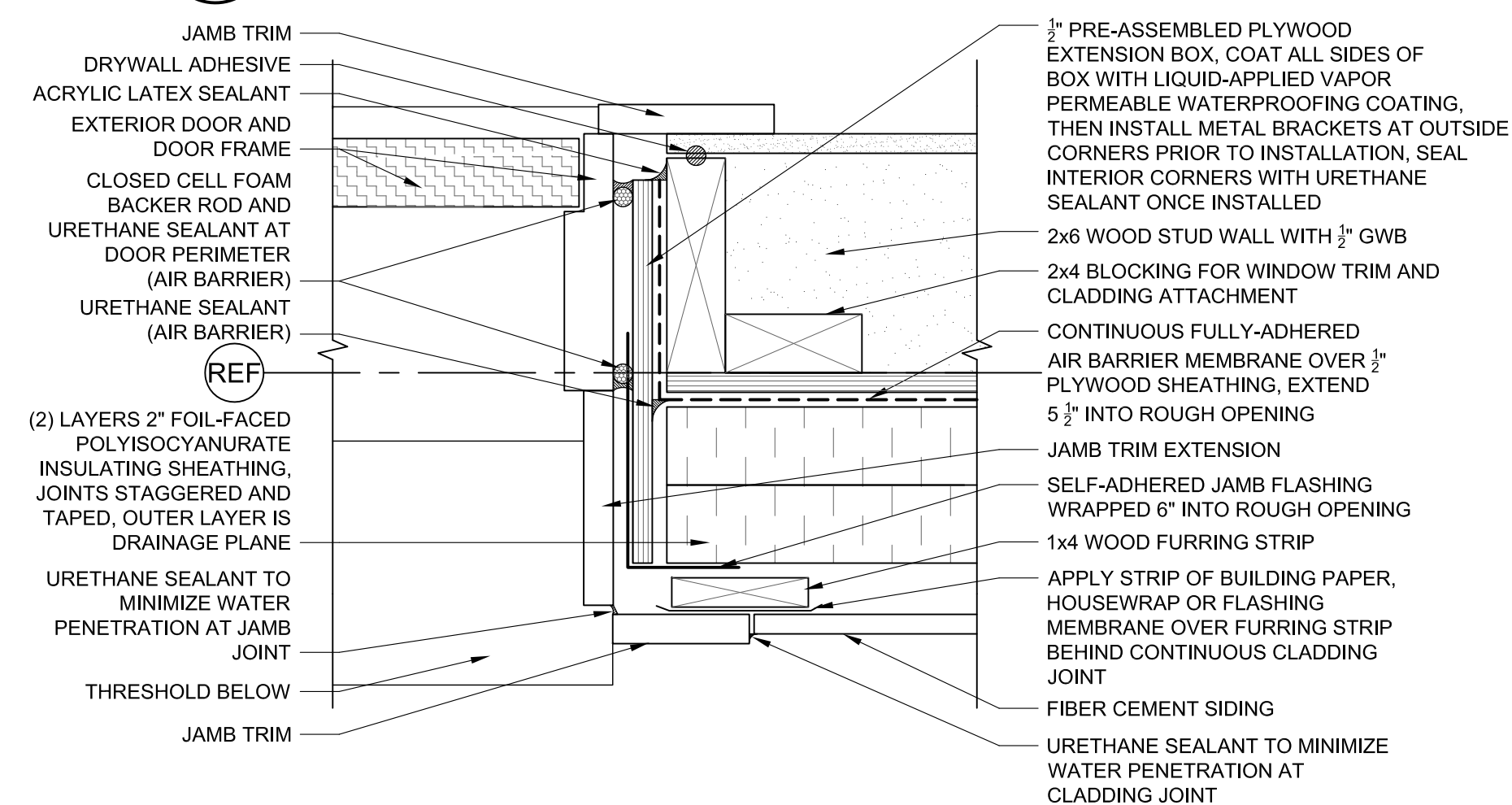
5 DOOR INSTALLATION SEQUENCE

SCALE: N.T.S.



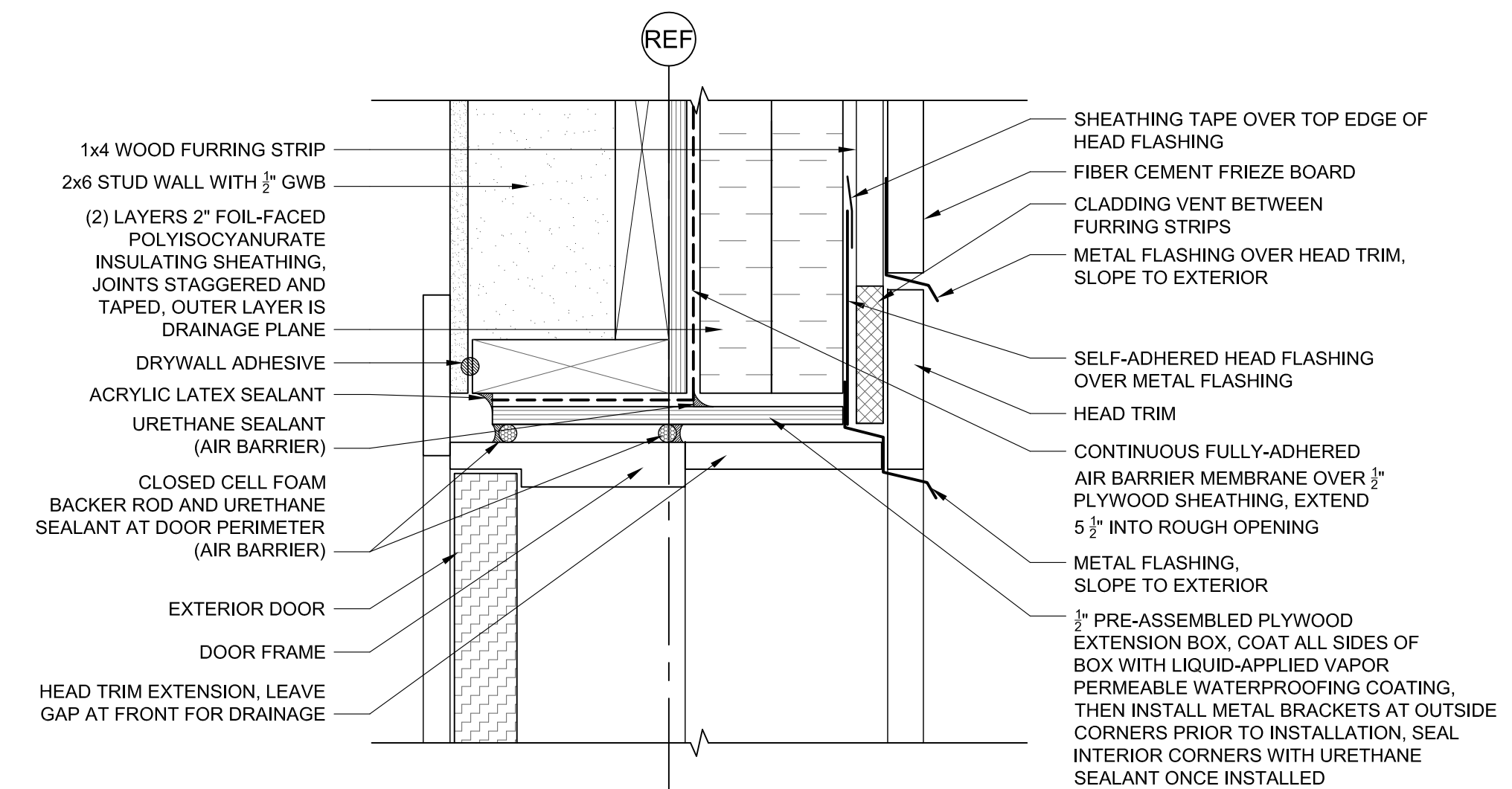
4 DOOR/SIDELITE JAMB DETAIL

SCALE: 3" = 1'-0"



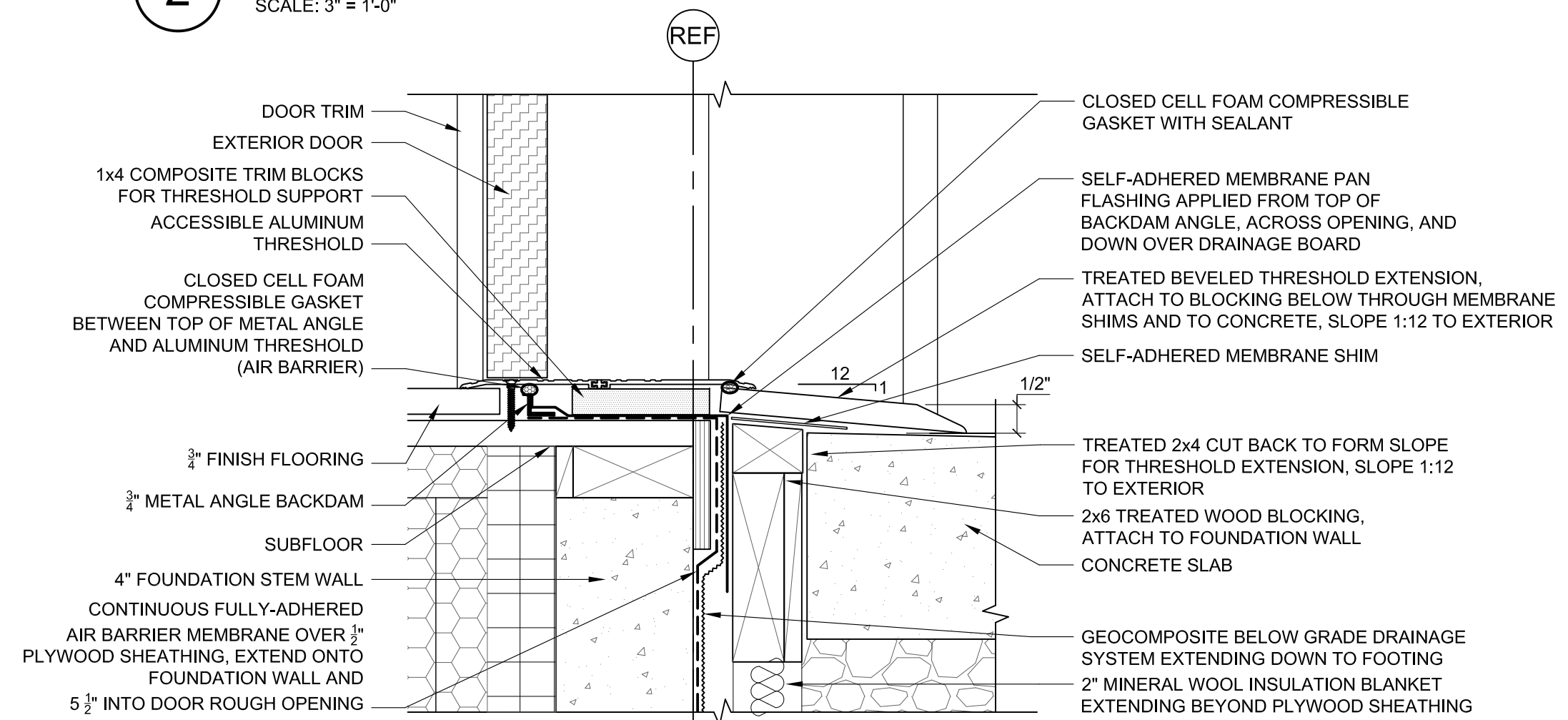
3 DOOR JAMB DETAIL

SCALE: 3" = 1'-0"



2 DOOR HEAD DETAIL

SCALE: 3" = 1'-0"



1 DOOR SILL DETAIL

SCALE: 3" = 1'-0"

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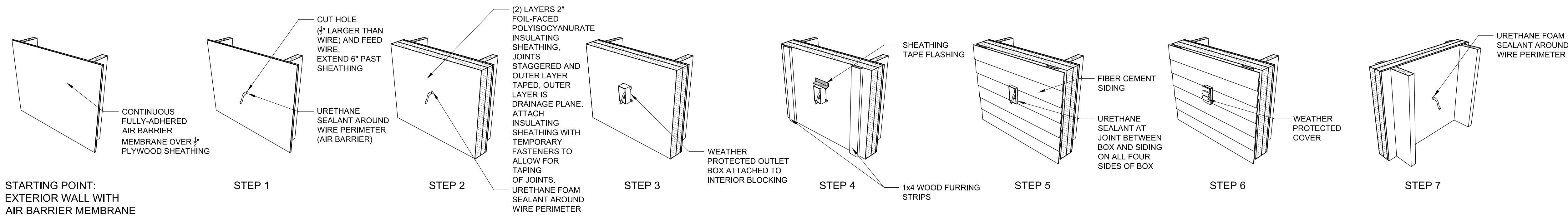
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DOOR DETAILS & INSTALLATION SEQUENCE

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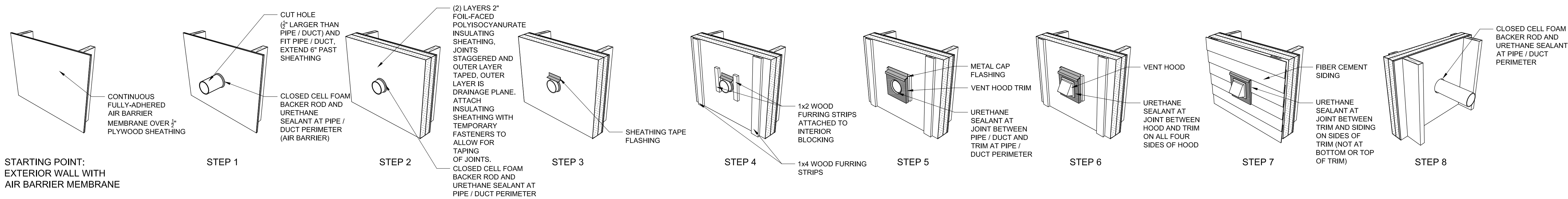


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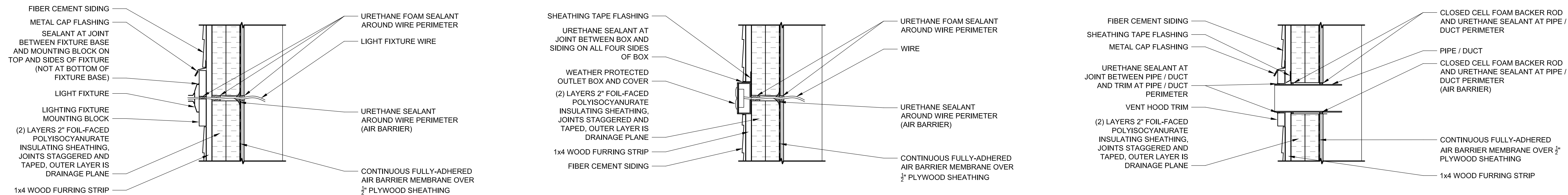
8 EXTERIOR ELECTRICAL BOX INSTALLATION SEQUENCE

SCALE: N.T.S.



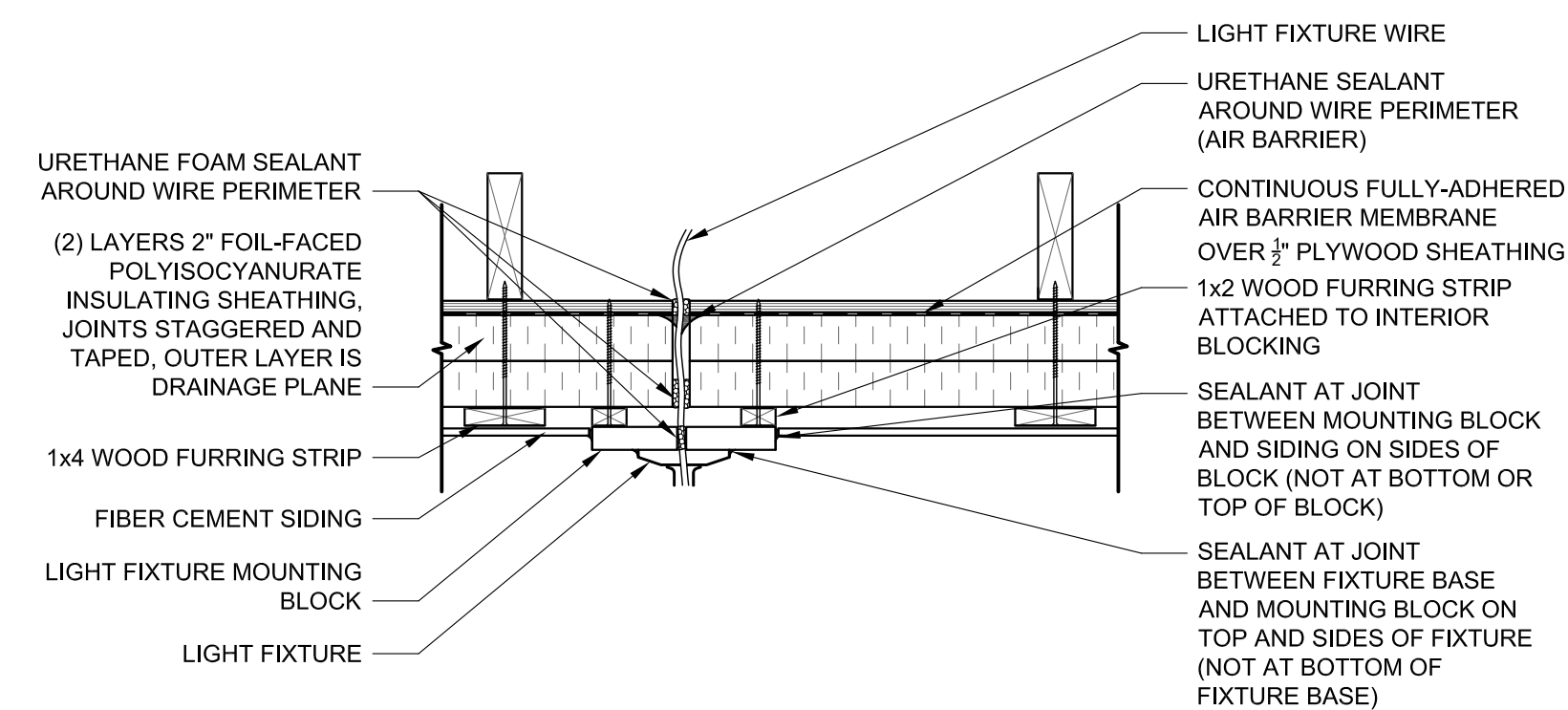
7 PIPE / DUCT INSTALLATION SEQUENCE (EXTERIOR LIGHT FIXTURE SEQUENCE SIMILAR)

SCALE: N.T.S.



6 EXTERIOR LIGHT FIXTURE SECTION DETAIL

SCALE: 1 1/2" = 1'-0"

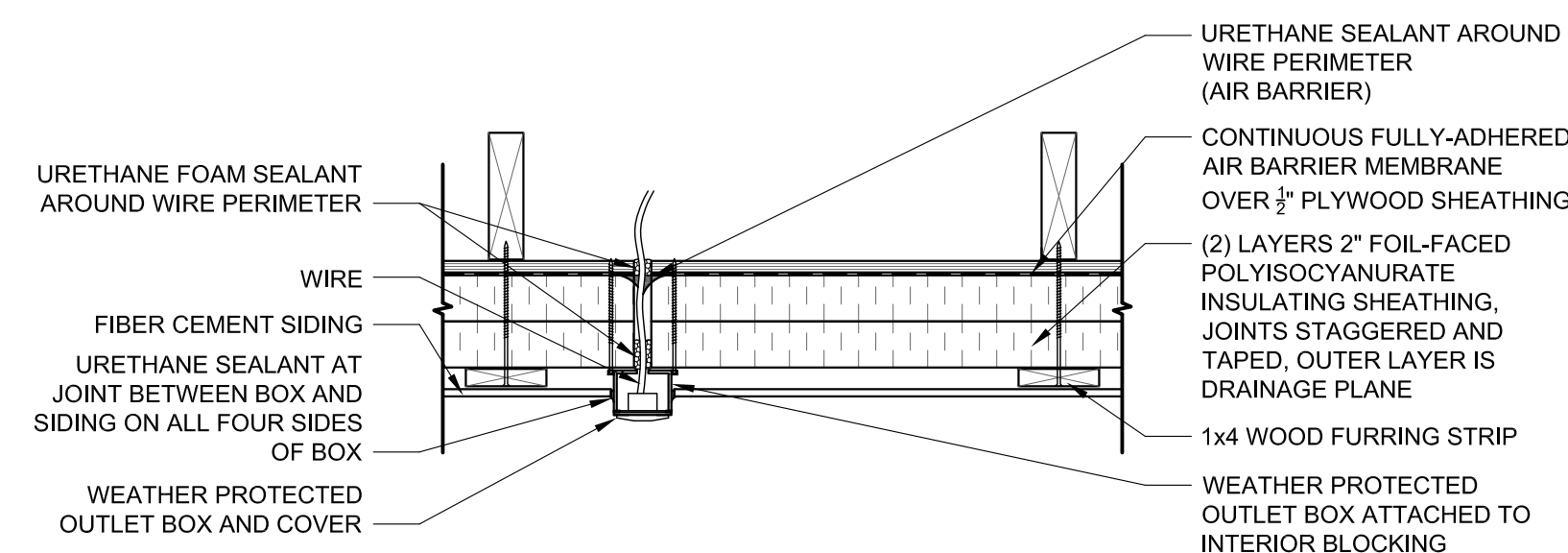


5 EXTERIOR LIGHT FIXTURE PLAN DETAIL

SCALE: 1 1/2" = 1'-0"

4 EXTERIOR ELECTRICAL BOX SECTION DETAIL

SCALE: 1 1/2" = 1'-0"

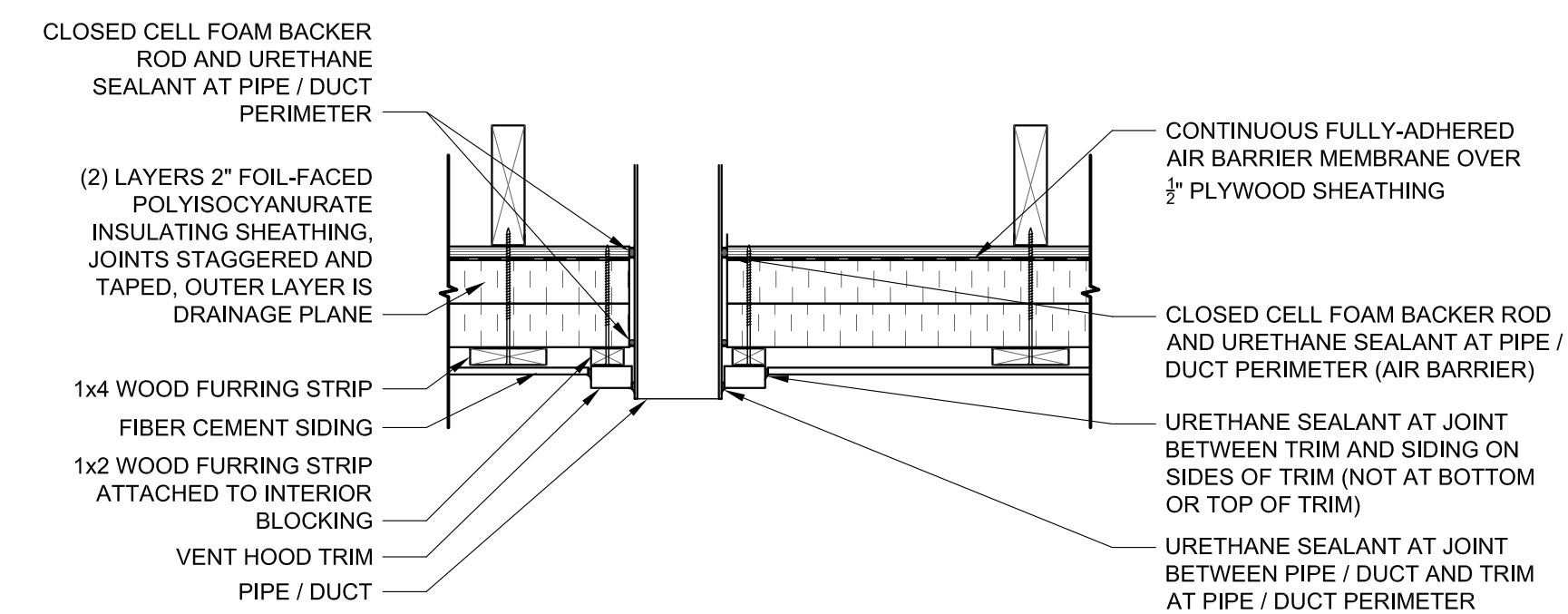


3 EXTERIOR ELECTRICAL BOX PLAN DETAIL

SCALE: 1 1/2" = 1'-0"

2 PIPE / DUCT SECTION DETAIL

SCALE: 1 1/2" = 1'-0"



1 PIPE / DUCT PLAN DETAIL

SCALE: 1 1/2" = 1'-0"

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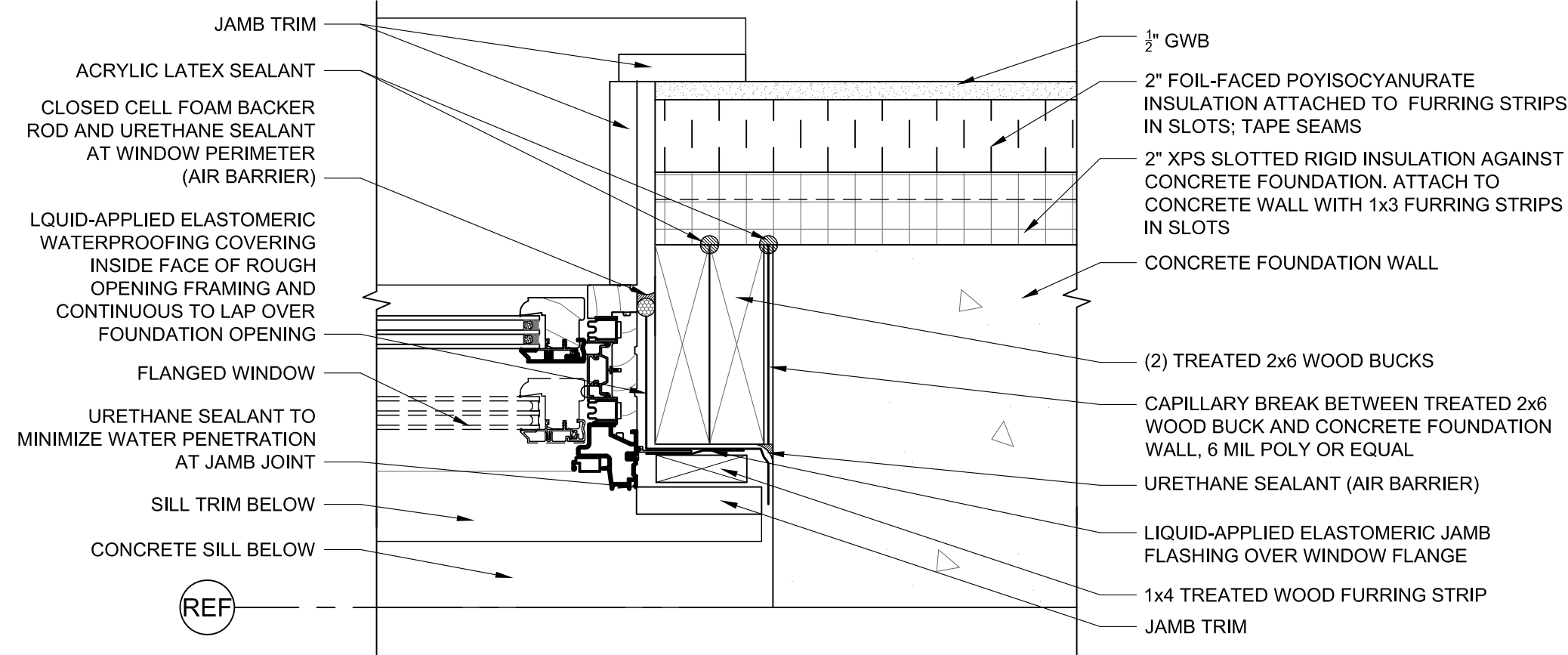
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DETAILS &
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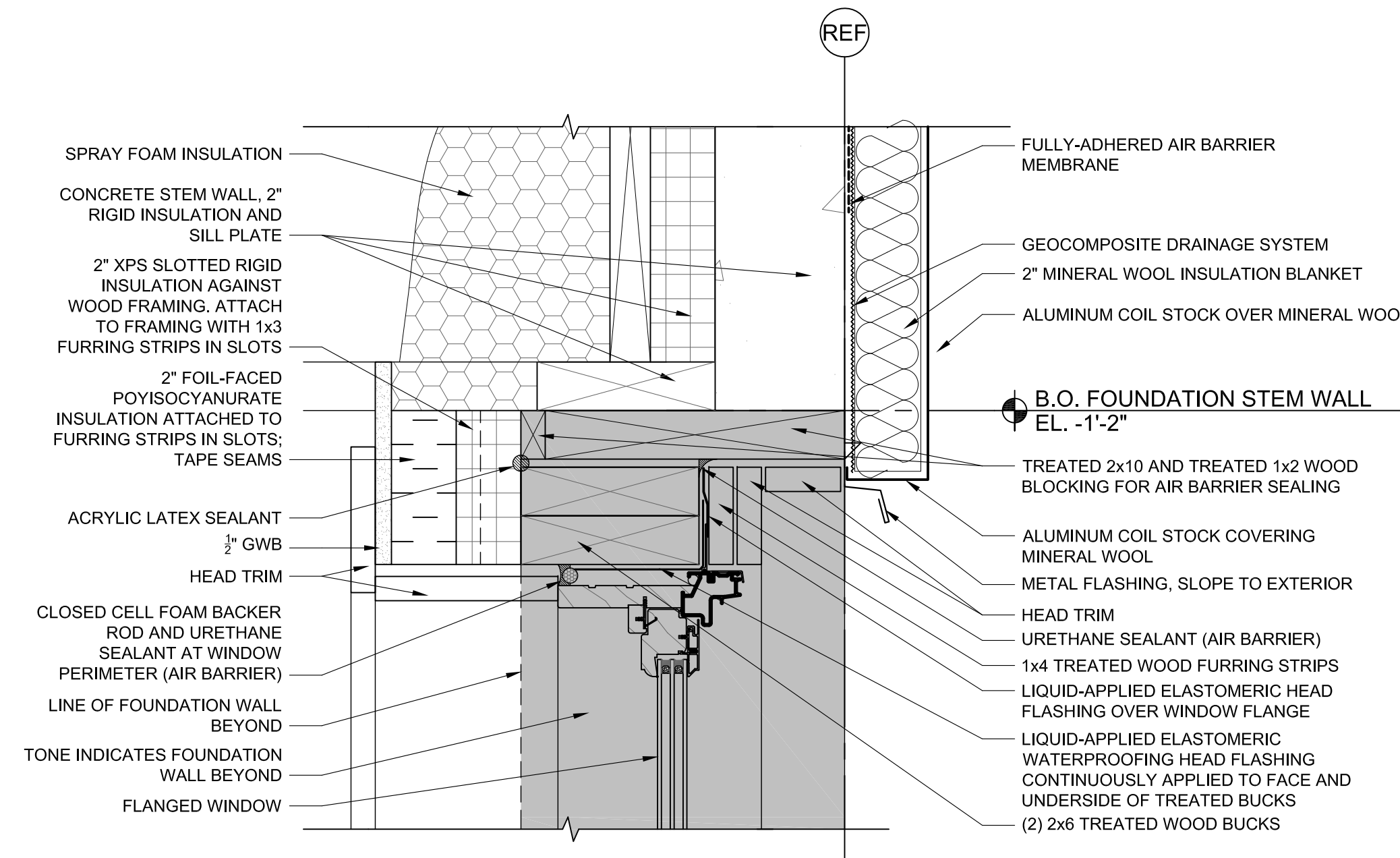
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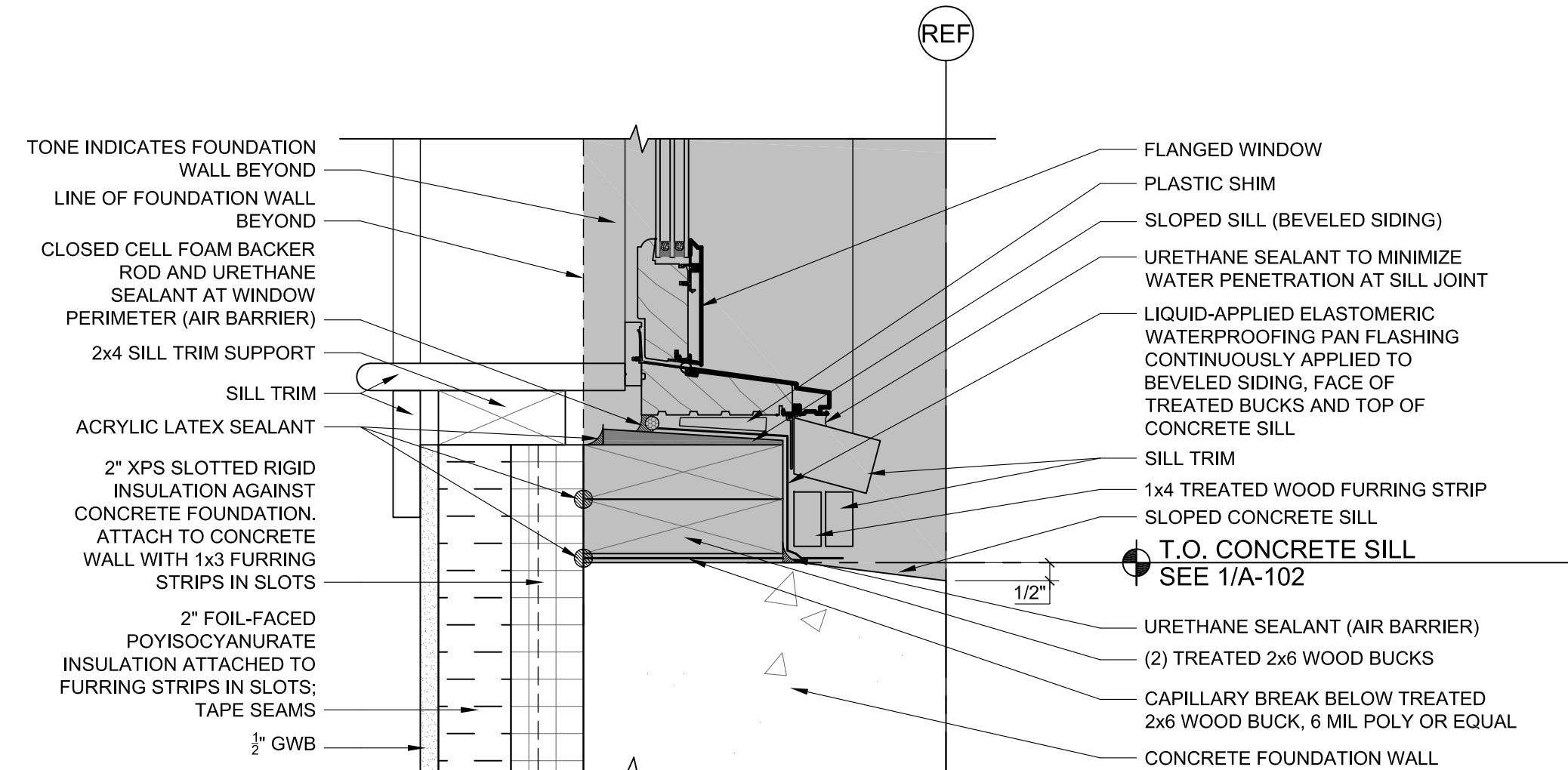
A-505



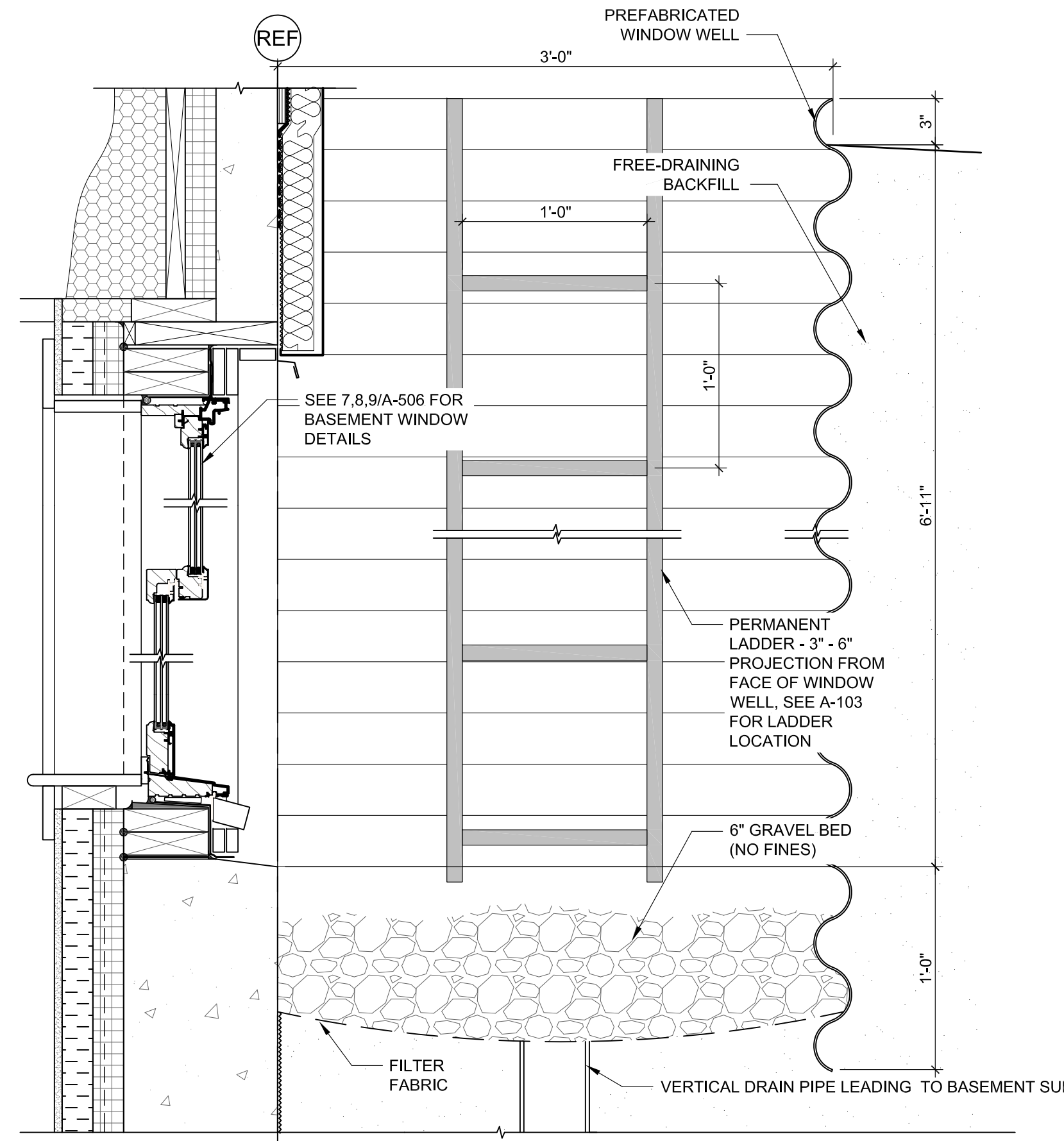
9 BASEMENT WINDOW JAMB DETAIL
SCALE: 3" = 1'-0"



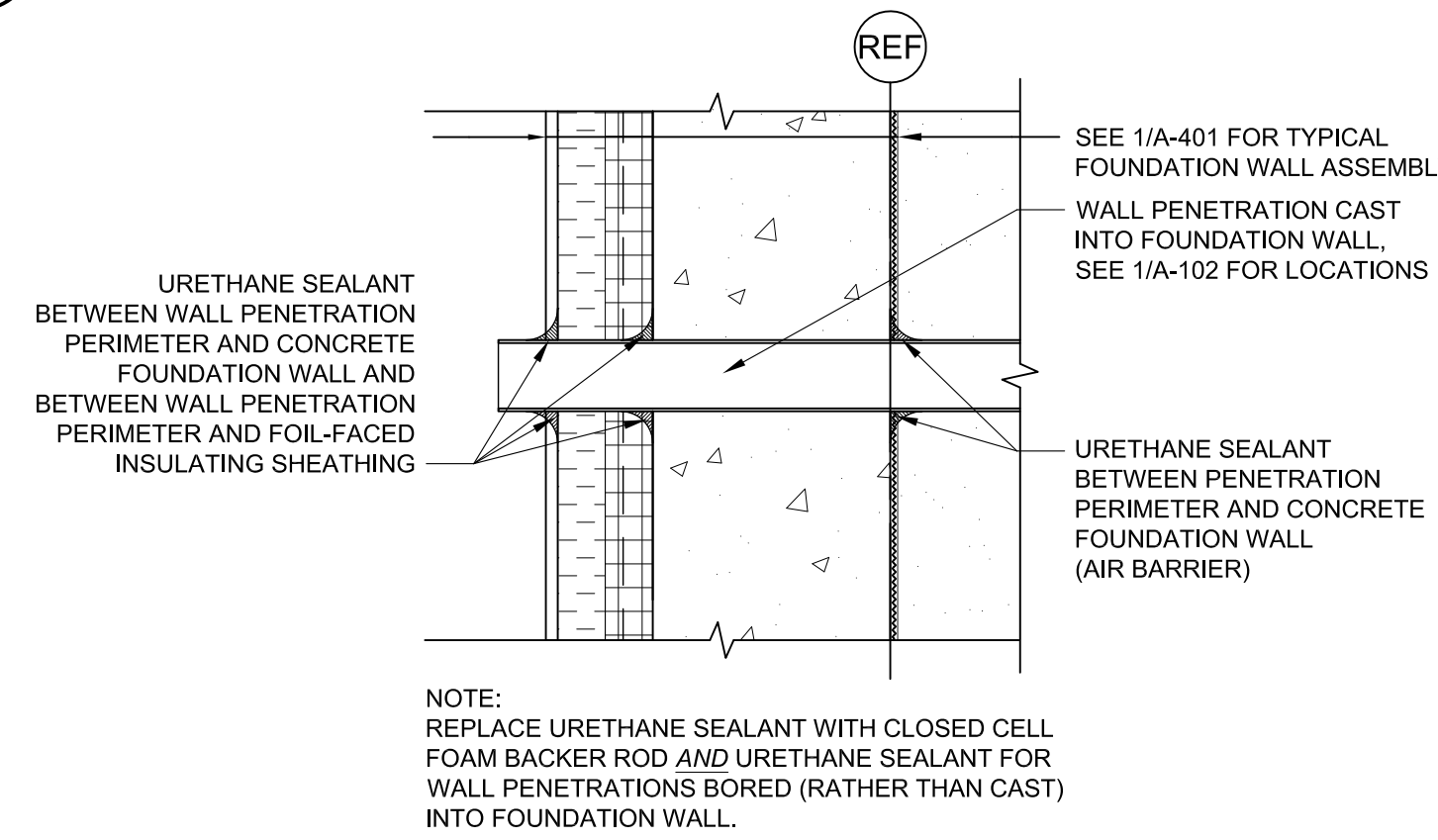
8 BASEMENT WINDOW HEAD DETAIL
SCALE: 3" = 1'-0"



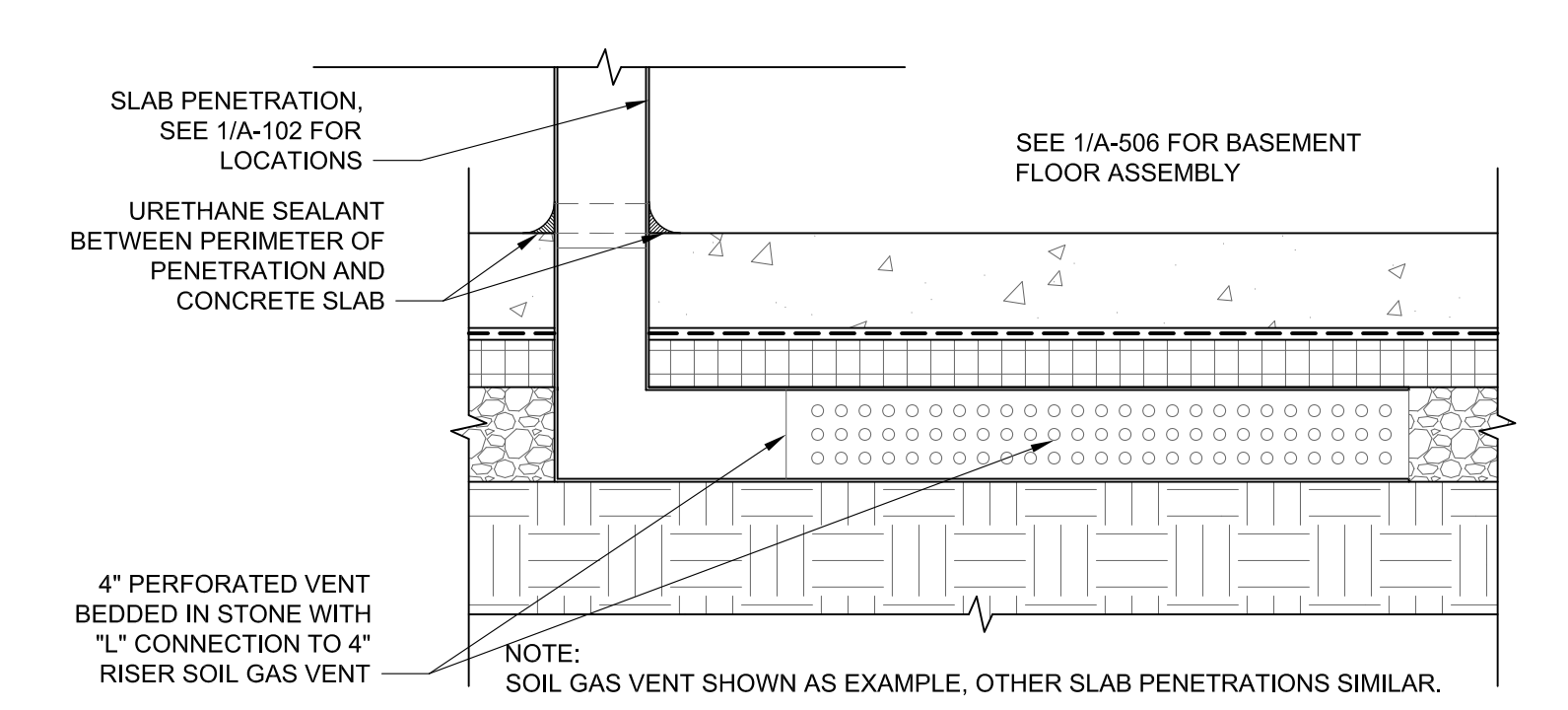
7 BASEMENT WINDOW SILL DETAIL
SCALE: 3" = 1'-0"



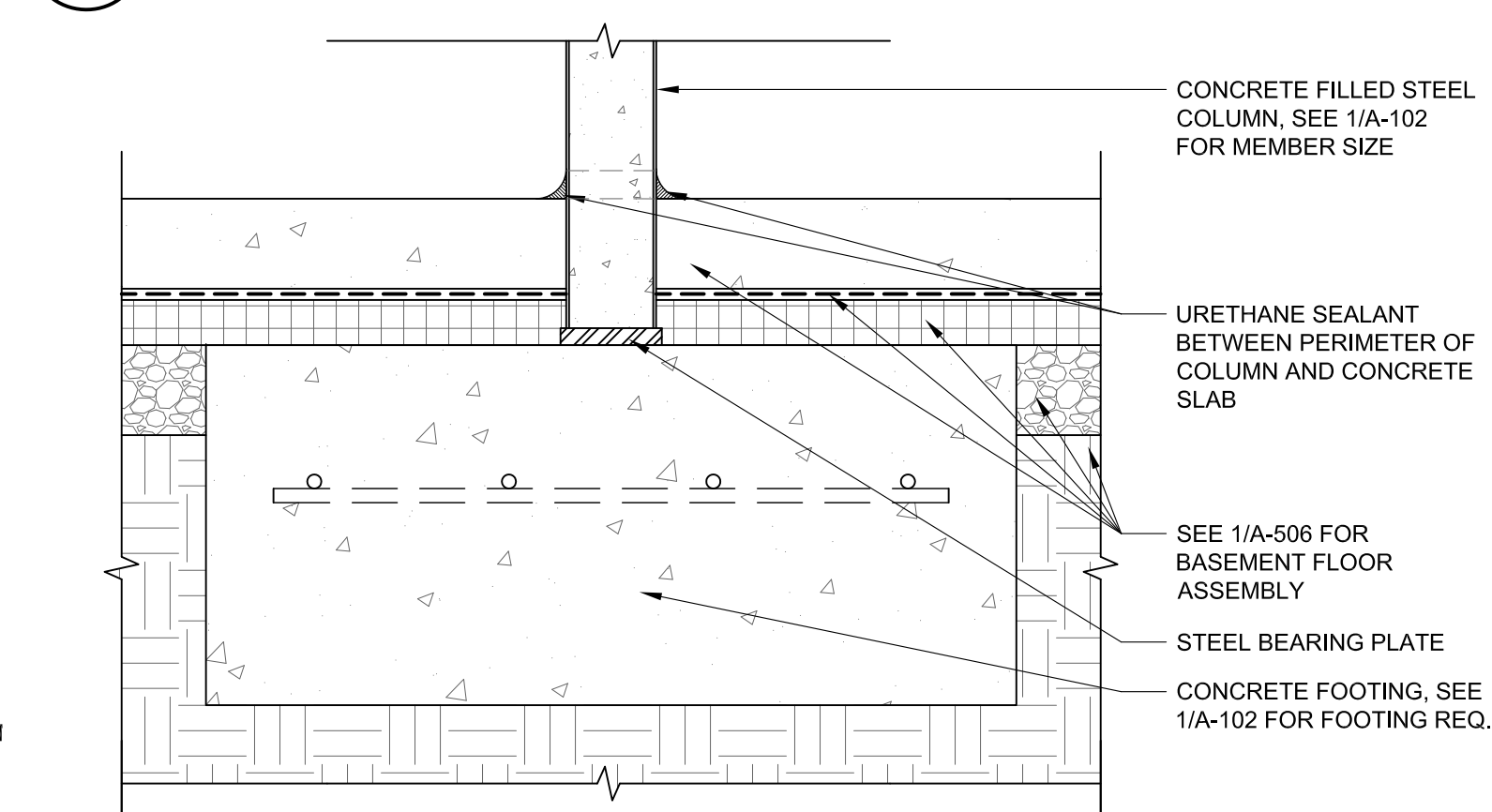
6 WINDOW WELL DETAIL
SCALE: 1 1/2" = 1'-0"



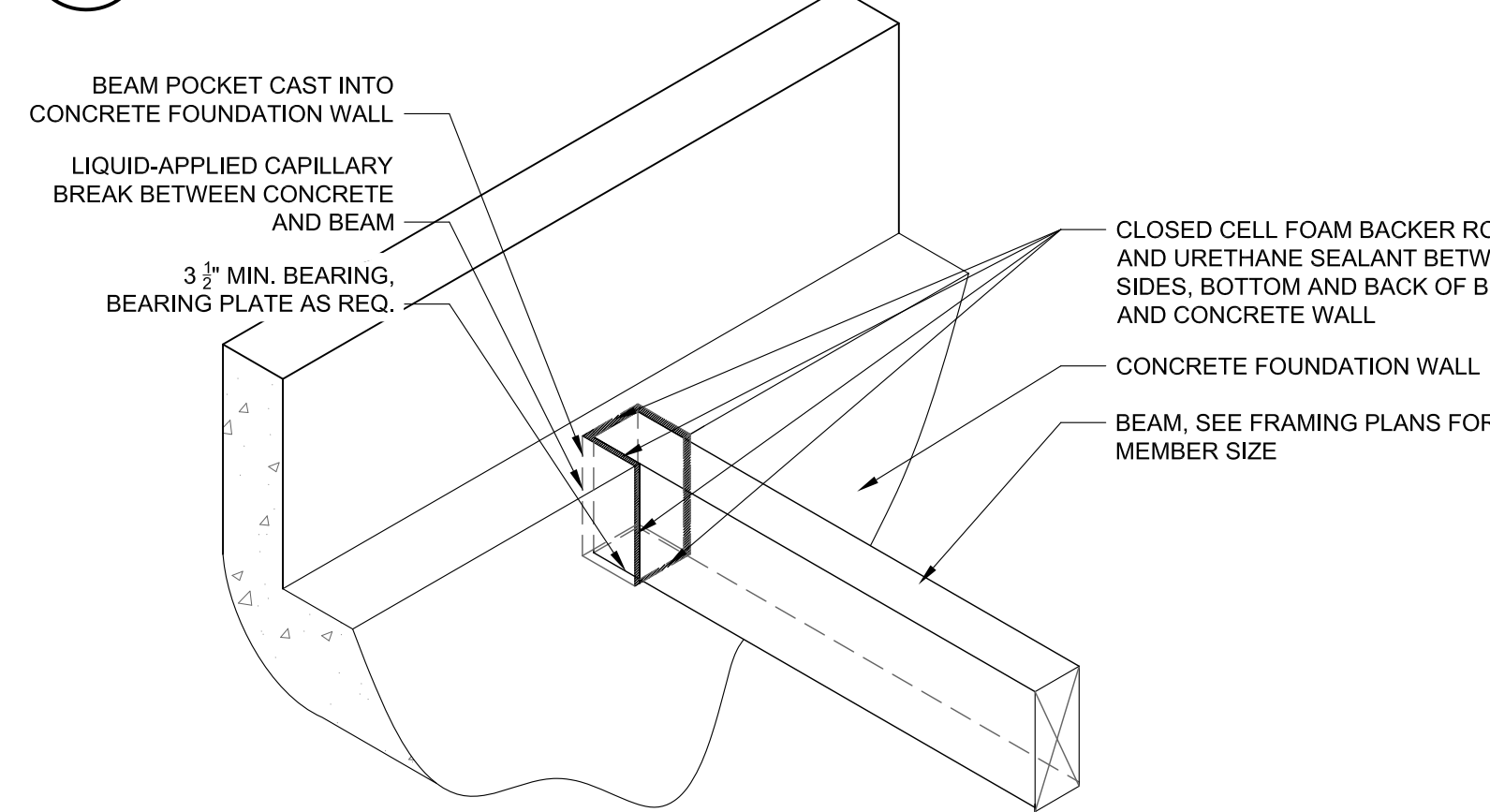
5 WALL PENETRATION DETAIL
SCALE: 1 1/2" = 1'-0"



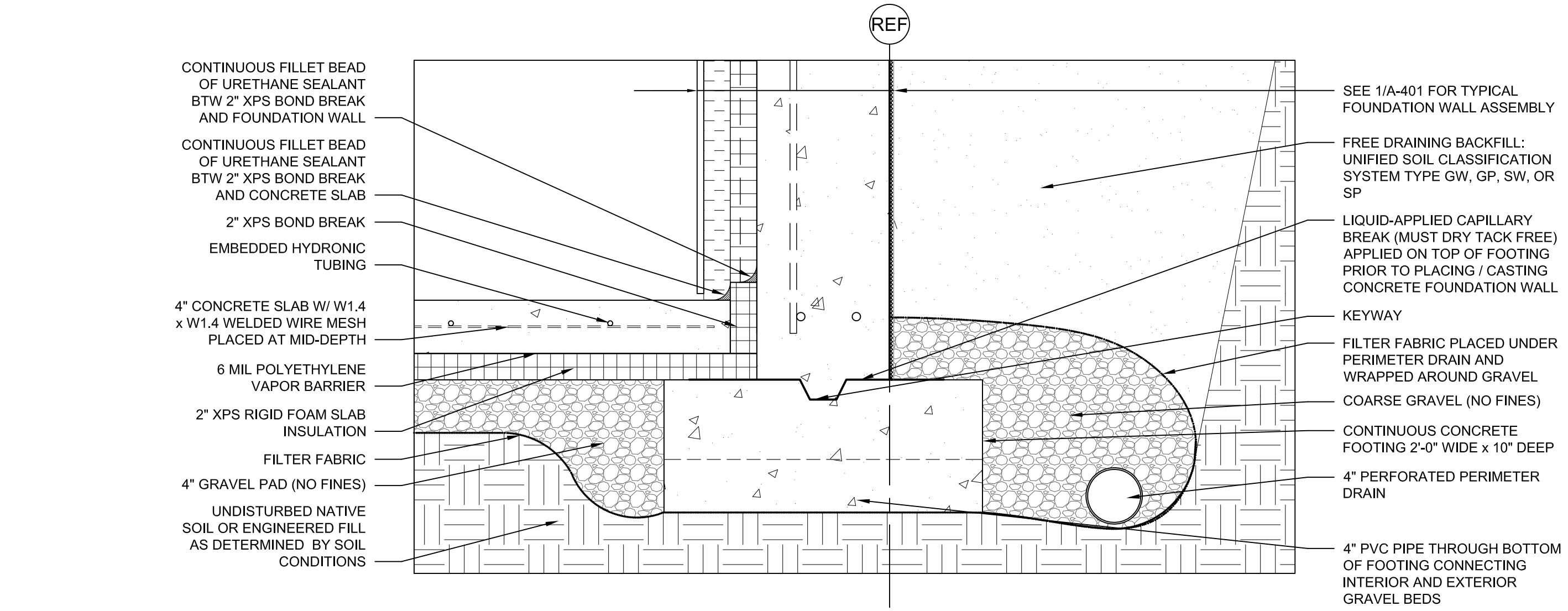
4 SLAB PENETRATION DETAIL
SCALE: 1 1/2" = 1'-0"



3 COLUMN & FOOTING DETAIL
SCALE: 1 1/2" = 1'-0"



2 BEAM POCKET DETAIL
SCALE: N.T.S.



1 BOTTOM OF FOUNDATION WALL DETAIL
SCALE: 1 1/2" = 1'-0"

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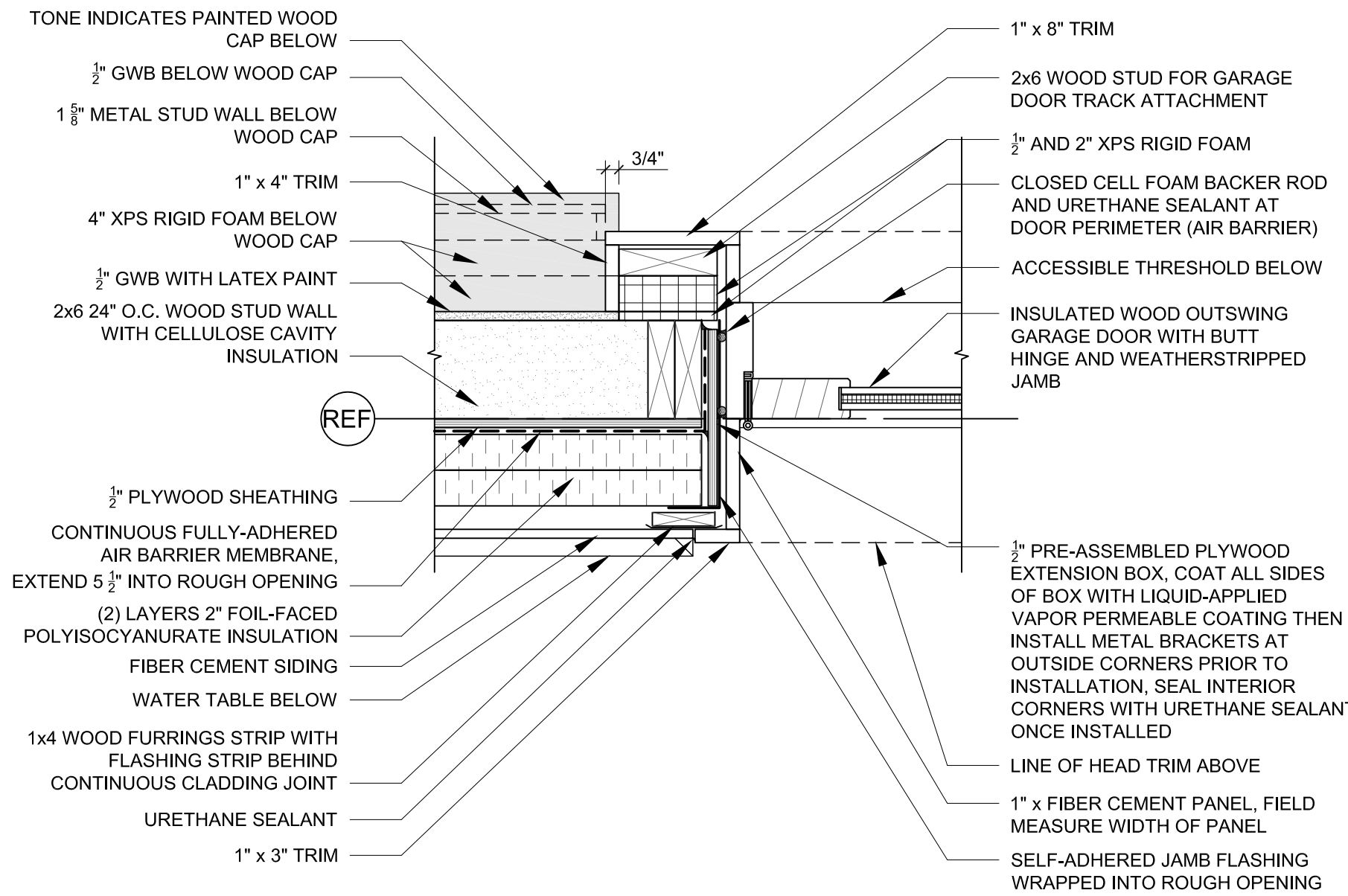
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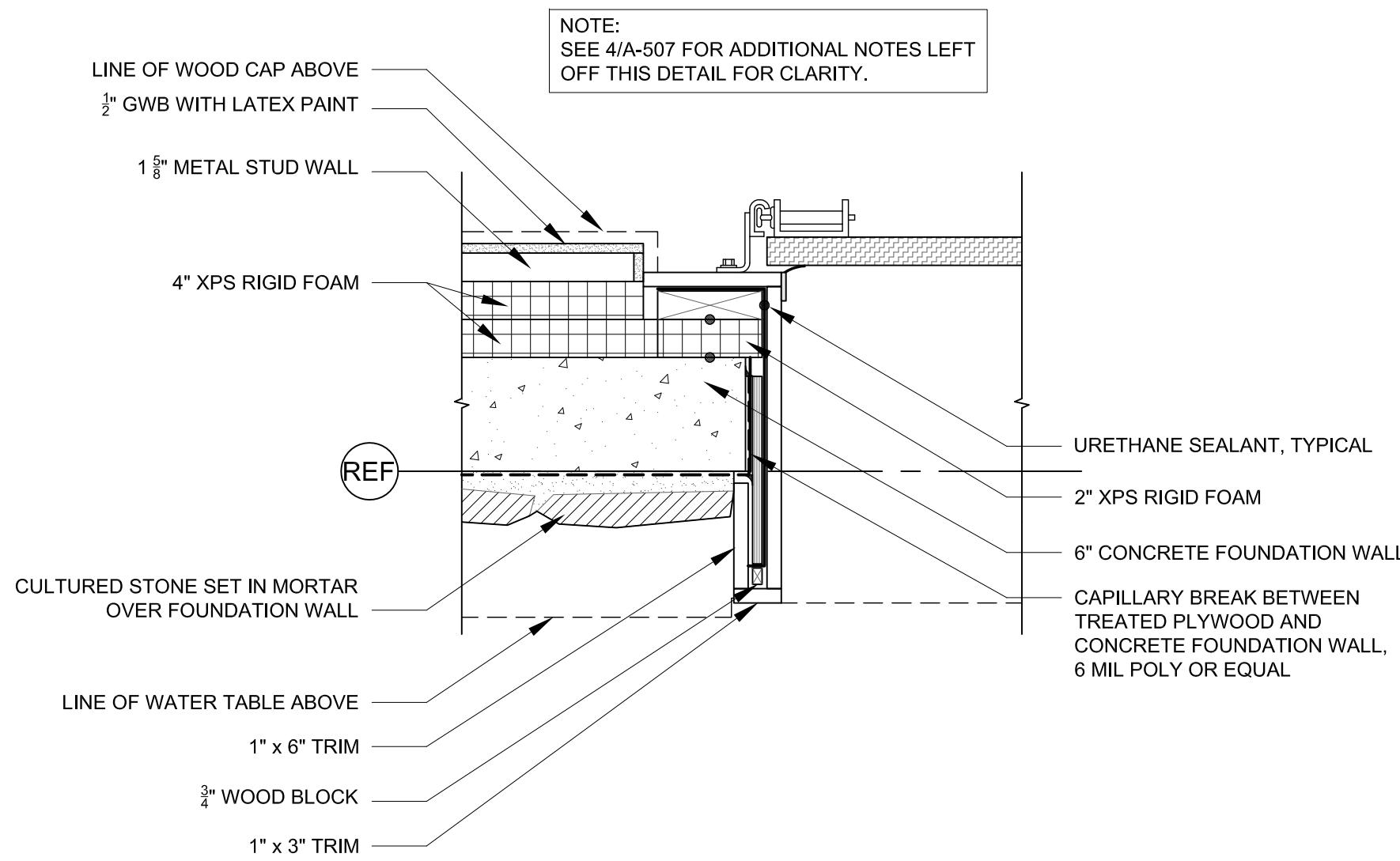
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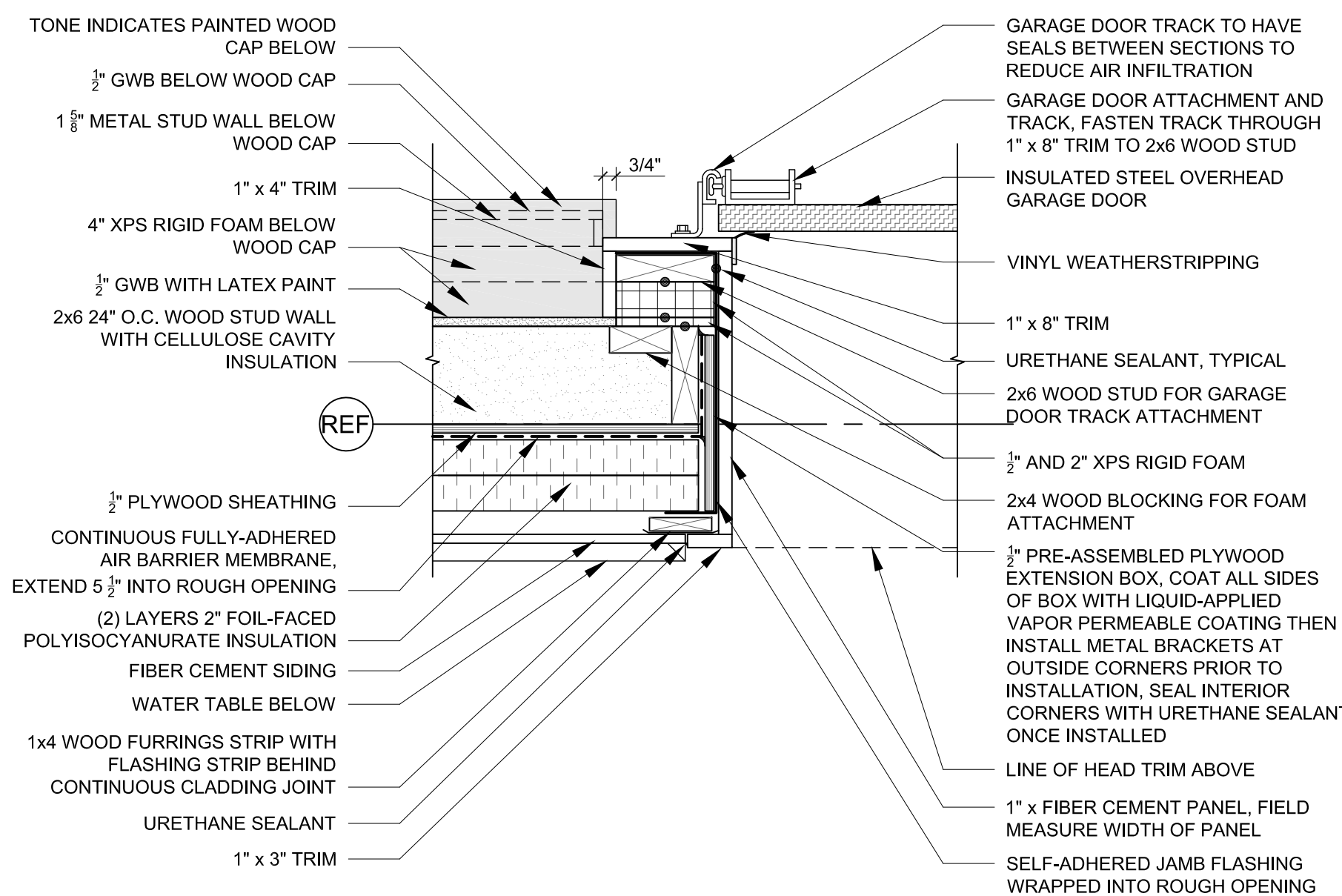
A-506



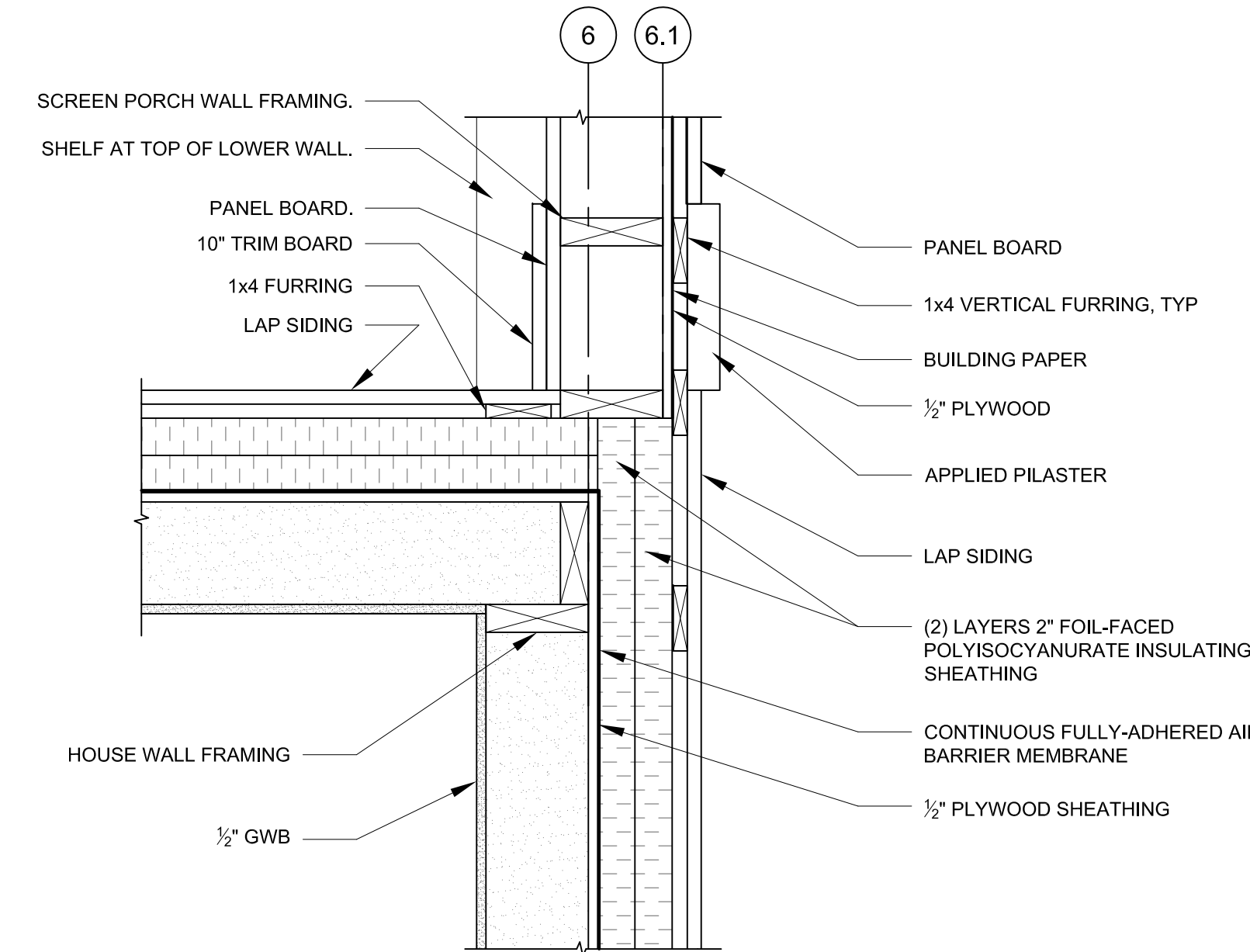
6 OUTSWING GARAGE DR. JAMB DETAIL AT SIDING
SCALE: 1 1/2" = 1'-0"



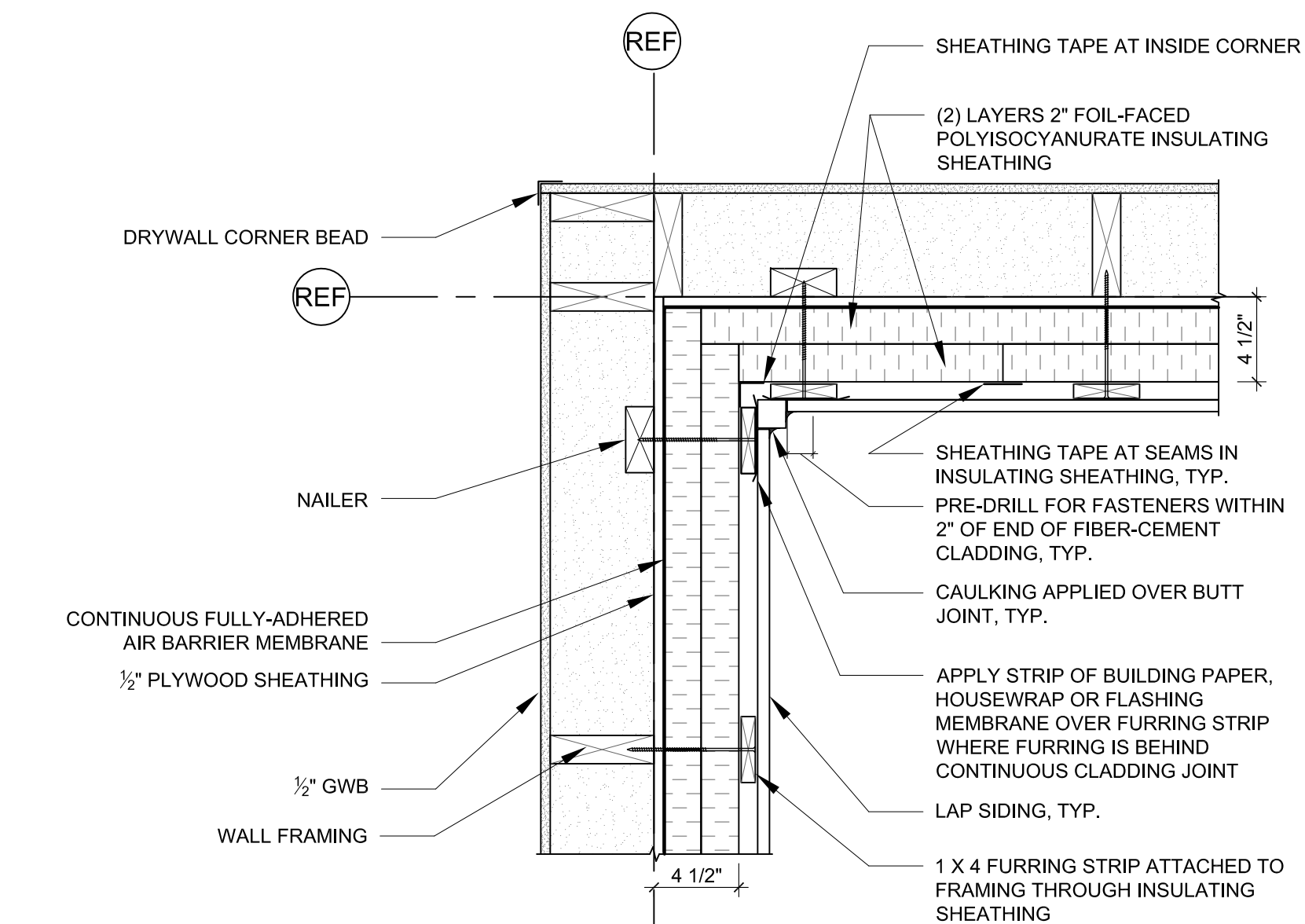
5 OVERHEAD GARAGE DR. JAMB DETAIL AT STONE
SCALE: 1 1/2" = 1'-0"



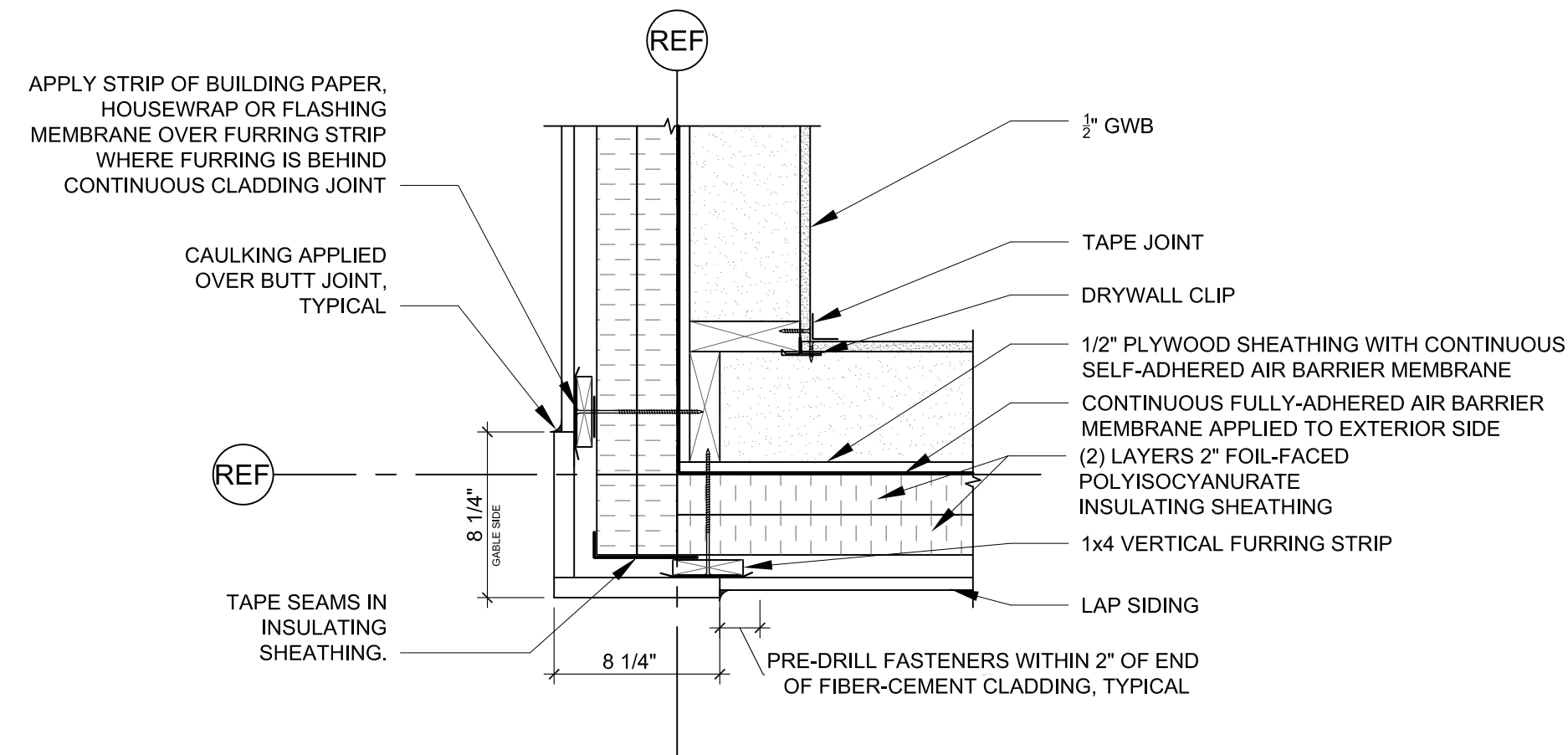
4 OVERHEAD GARAGE DR. JAMB DETAIL AT SIDING
SCALE: 1 1/2" = 1'-0"



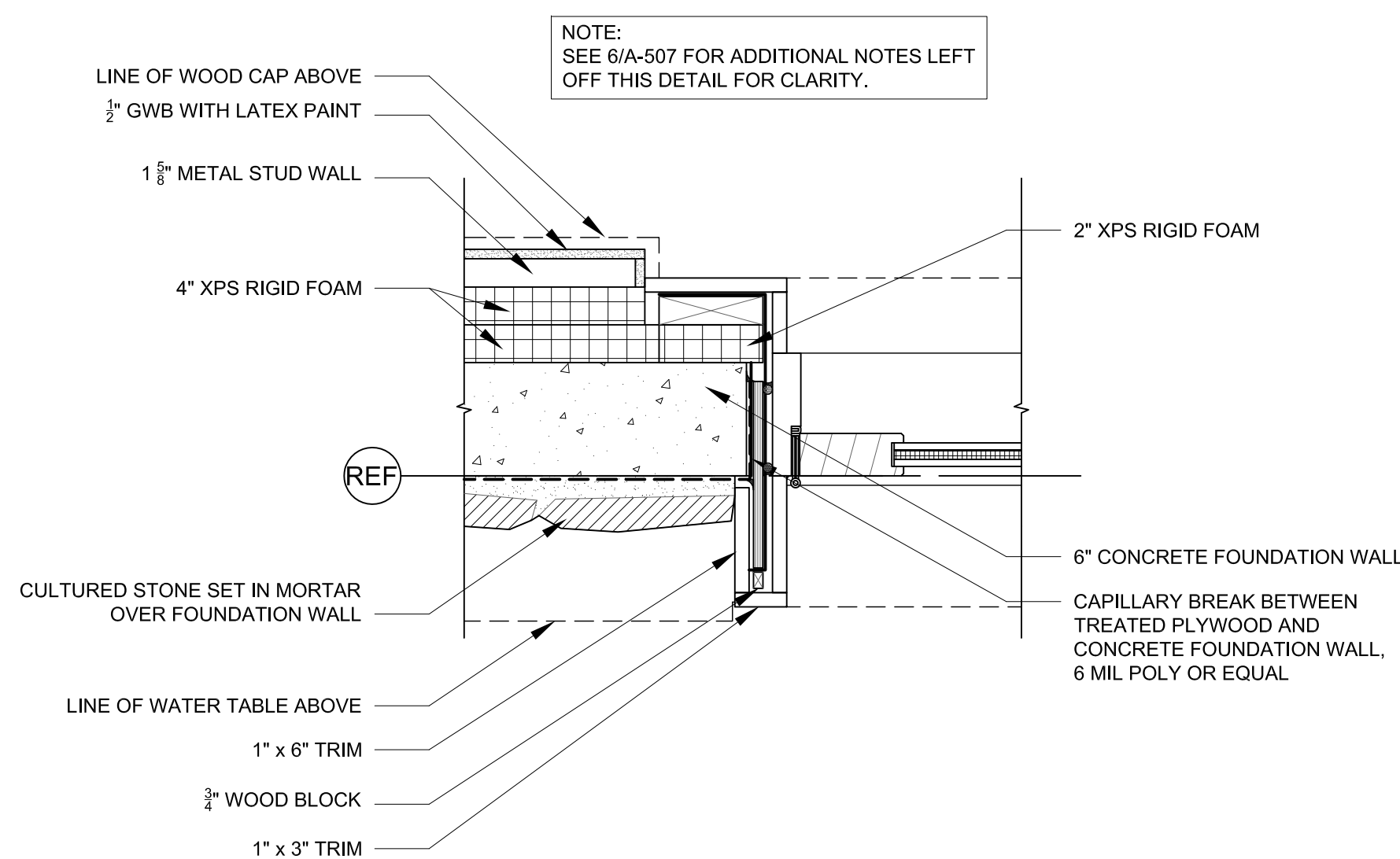
3 OUTSIDE CORNER DETAIL AT SCREEN PORCH
SCALE: 1 1/2" = 1'-0"



2 INSIDE CORNER DETAIL
SCALE: 1 1/2" = 1'-0"

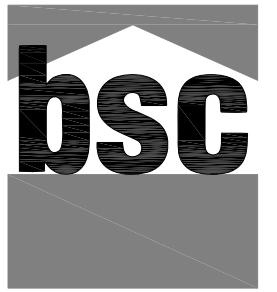


1 OUTSIDE CORNER DETAIL
SCALE: 1 1/2" = 1'-0"



7 OUTSWING GARAGE DR. JAMB DETAIL AT STONE
SCALE: 1 1/2" = 1'-0"

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PROJECT:

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PROJECT NO: NIST NZERTF
CAD DWG FILE: A-PLOT-DET1-NZERTF
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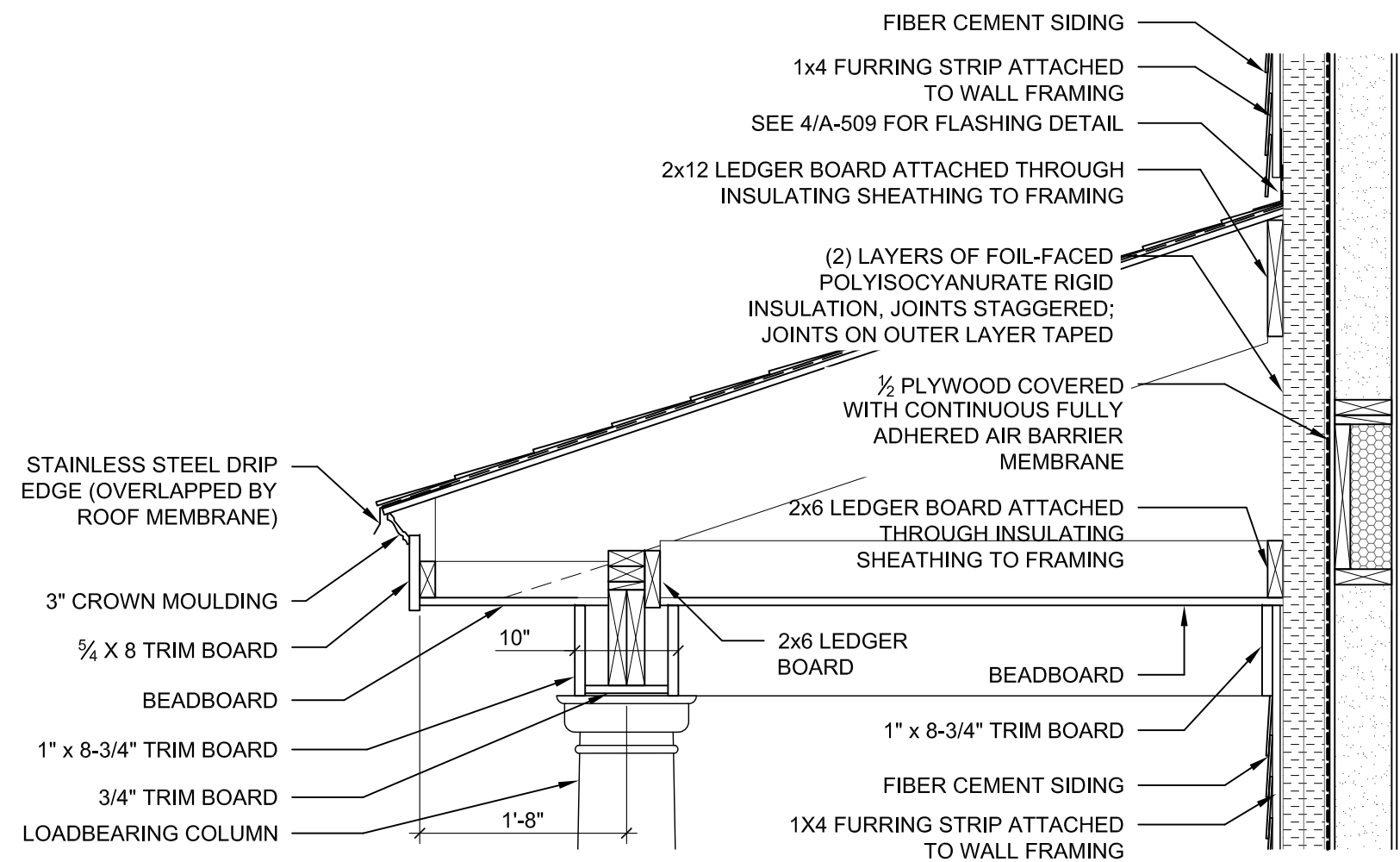
SHEET TITLE:

**HORIZONTAL
DETAILS**

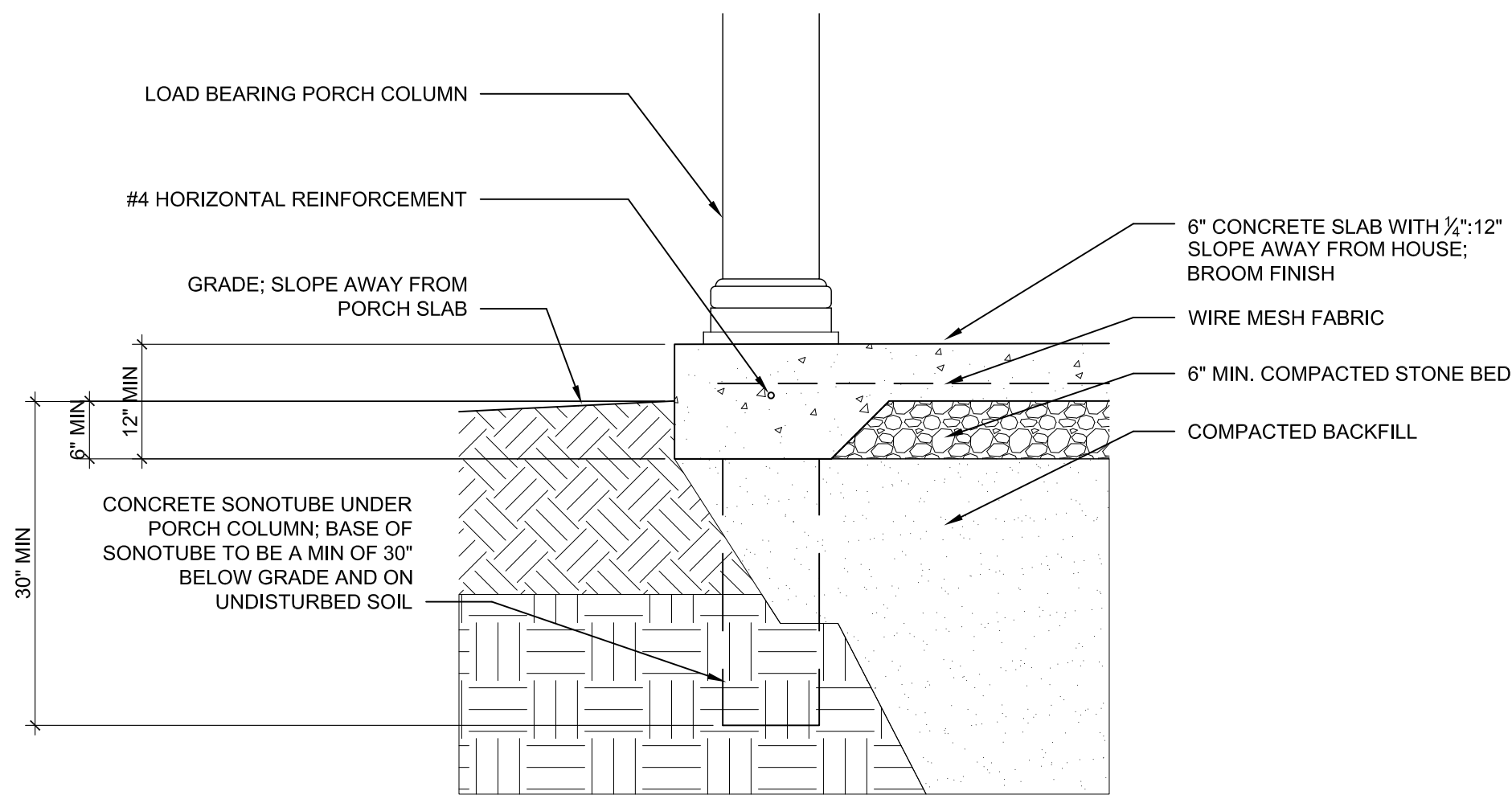
SCALE AS NOTED



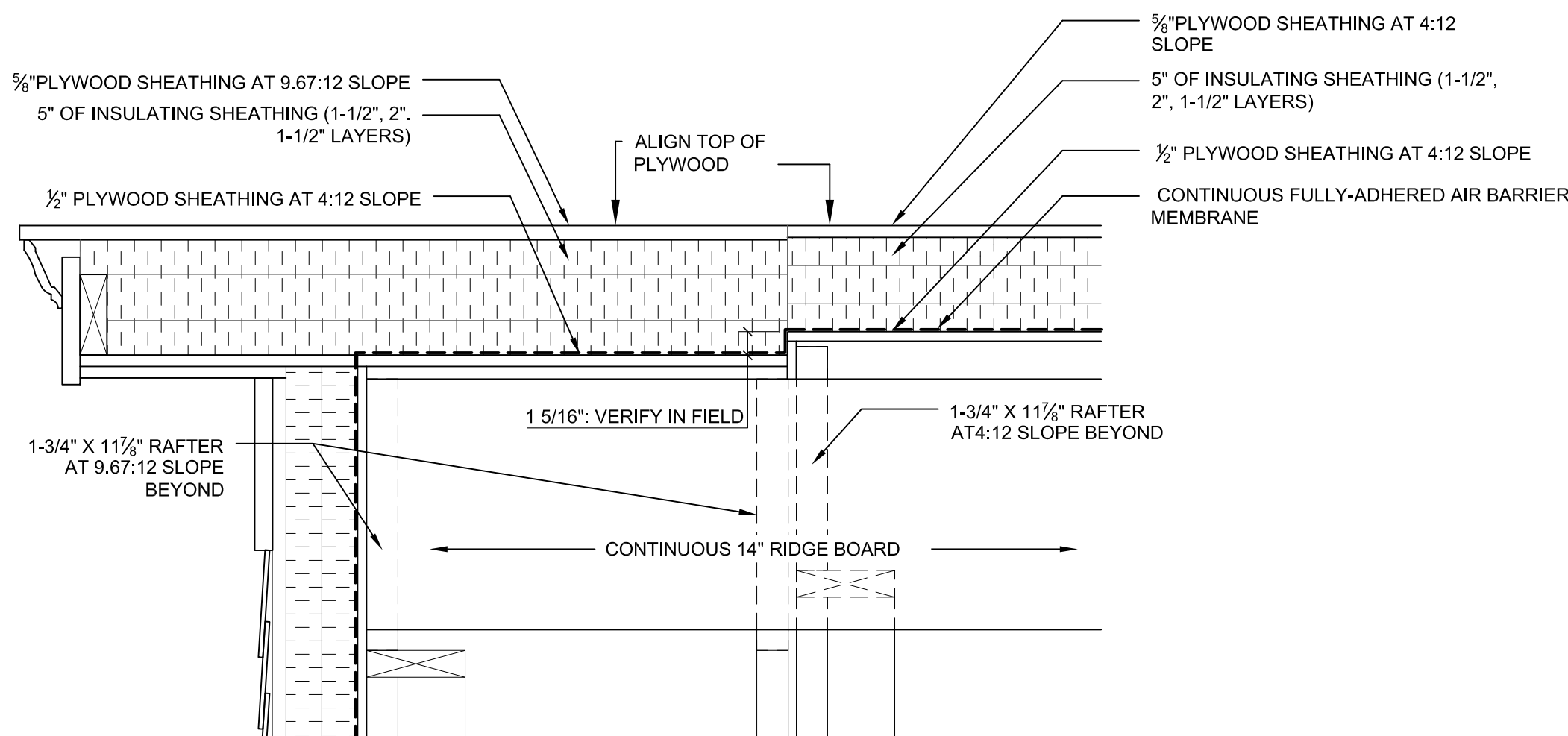
A-507



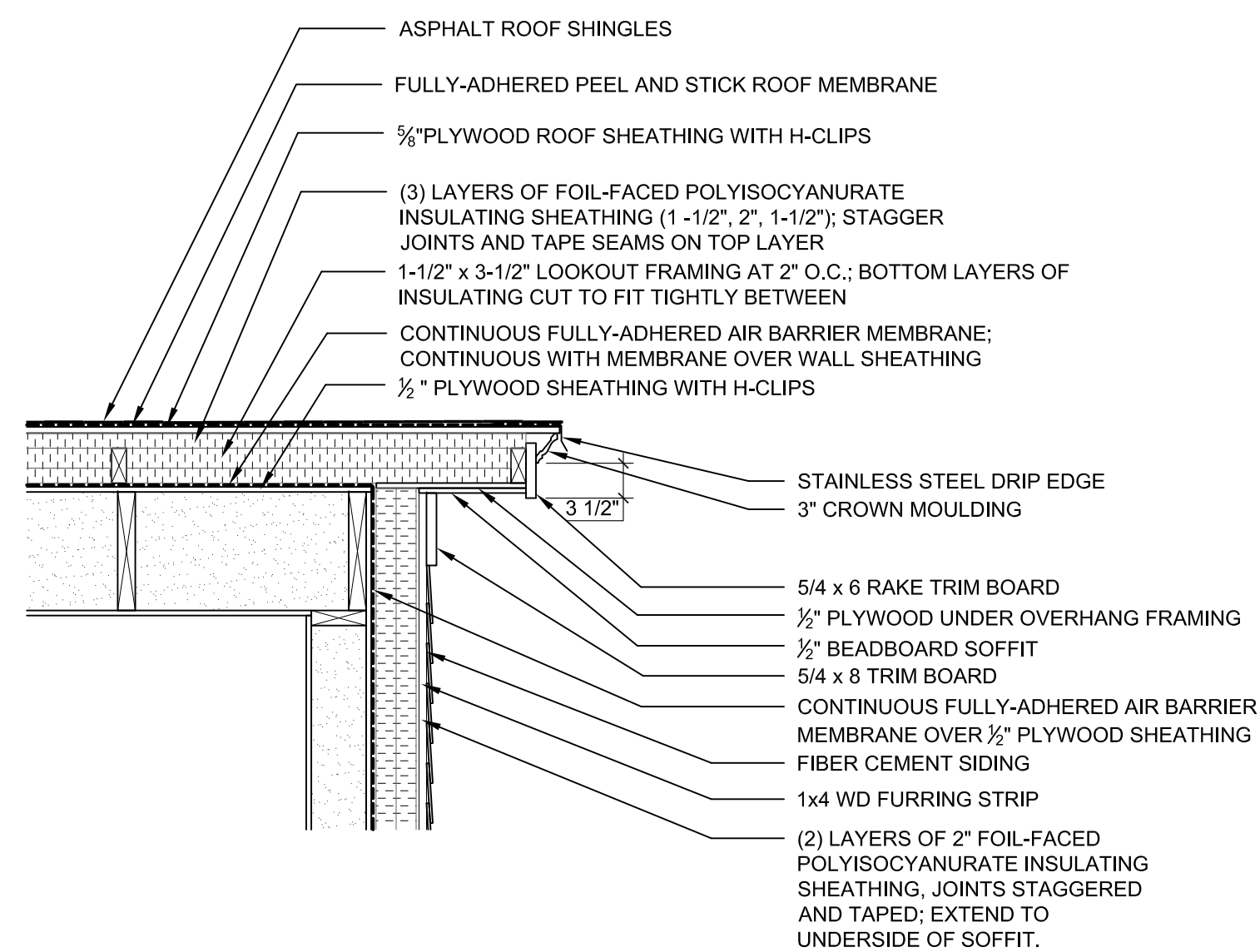
6 FRONT PORCH ROOF DETAIL
SCALE: 3/4" = 1'-0"



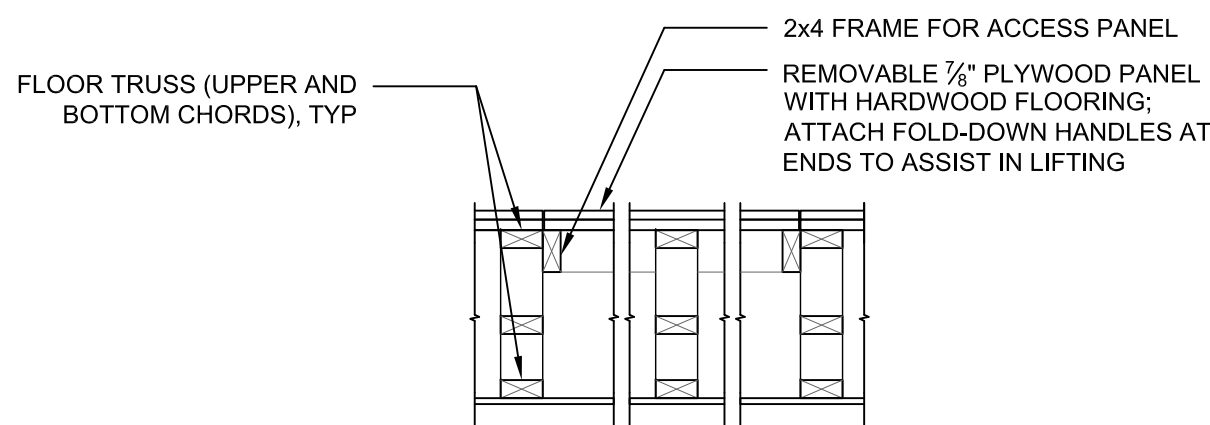
3 FRONT PORCH/BREEZEWAY FOUNDATION DETAIL
SCALE: 3/4" = 1'-0"



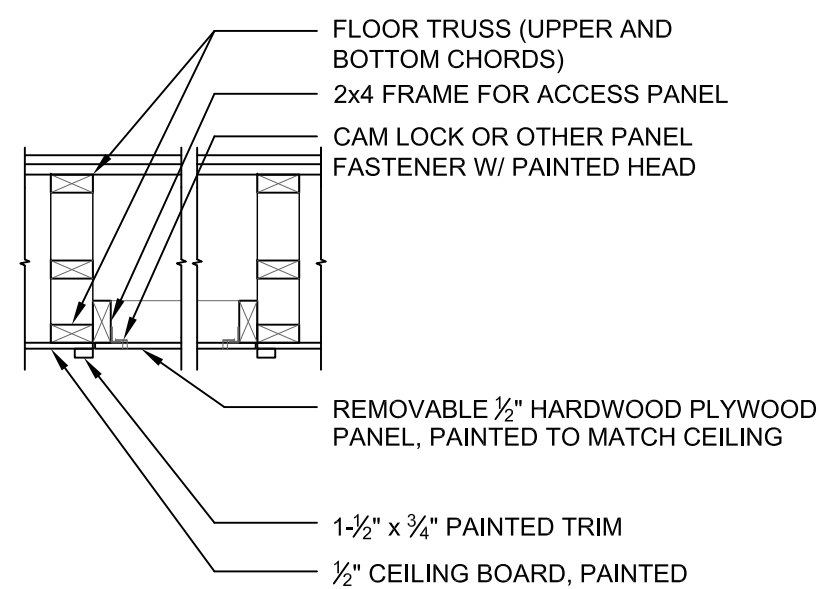
5 SECTION AT RIDGE OF HOUSE
SCALE: 1 1/2" = 1'-0"



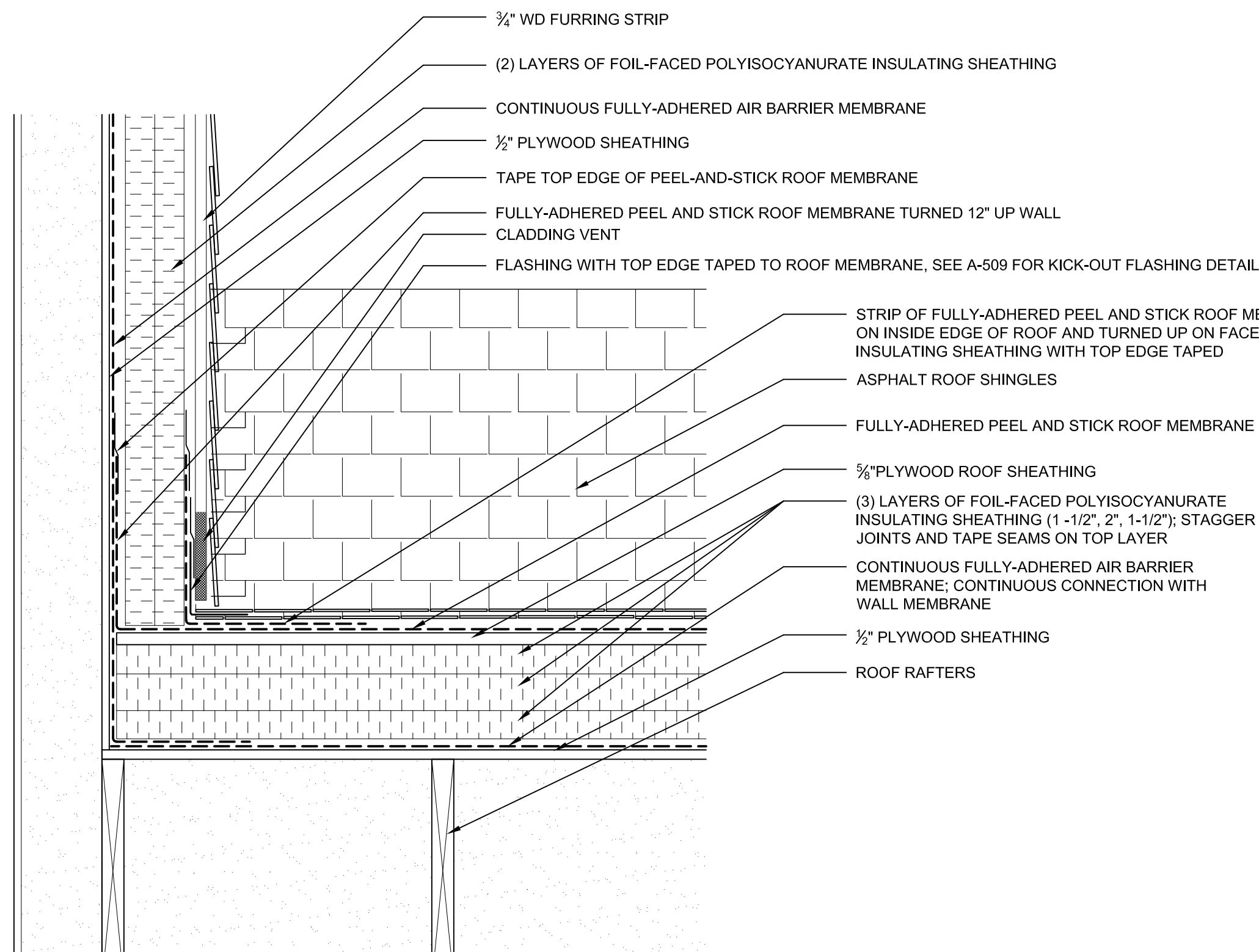
2 TYPICAL DETAIL AT RAKE
SCALE: 3/4" = 1'-0"



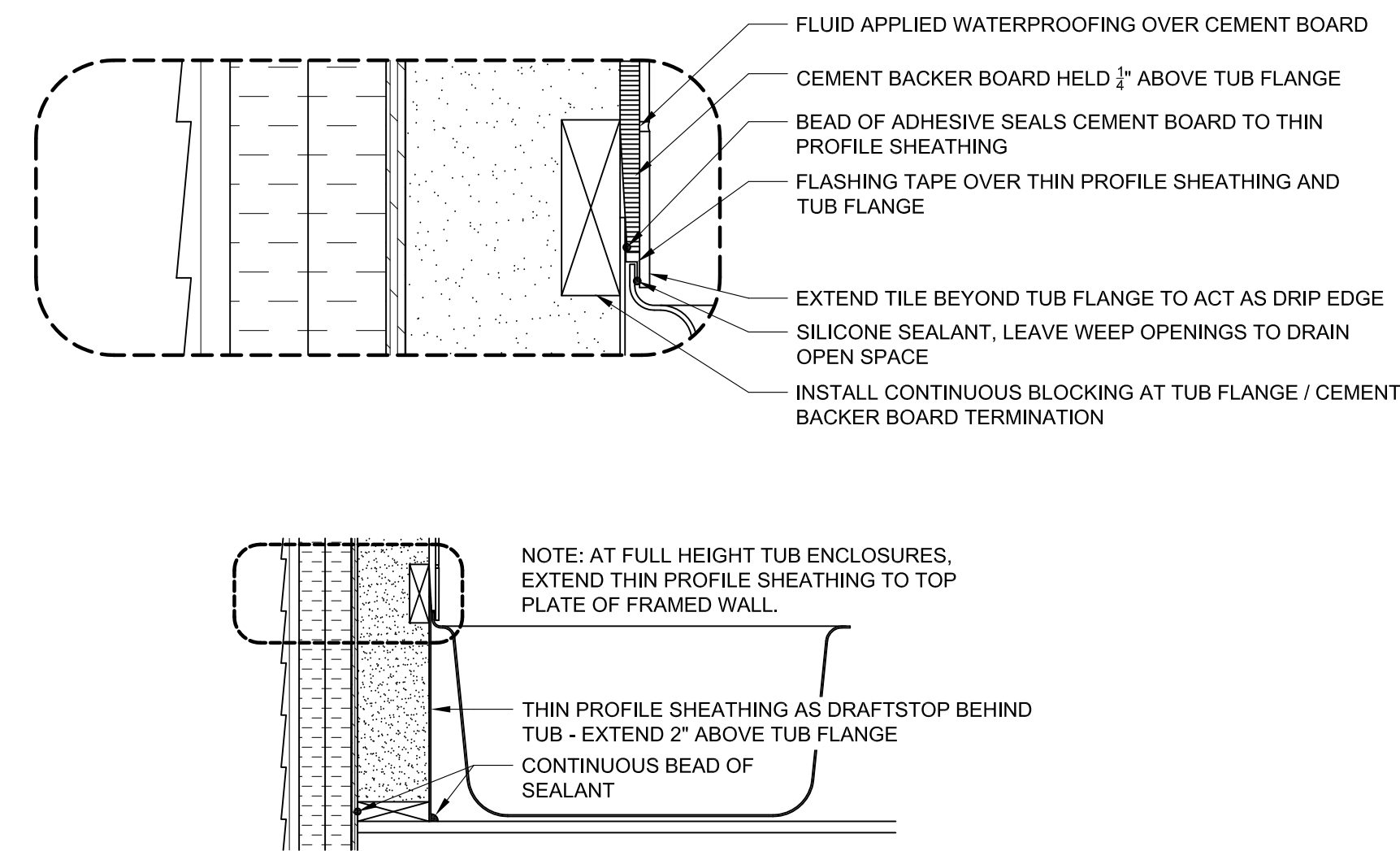
8 TYP. DETAIL AT FLOOR ACCESS PANEL
SCALE: 3/4" = 1'-0"



7 TYP. DETAIL AT CEILING ACCESS PANEL
SCALE: 3/4" = 1'-0"

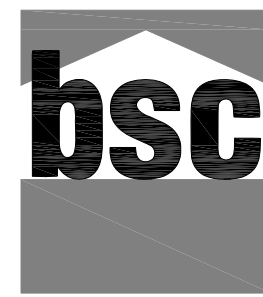


4 SECTION AT ROOF (PARALLEL) TO WALL CONNECTION
SCALE: 1 1/2" = 1'-0"



1 BATHTUB & SHOWER AT EXTERIOR WALL DETAIL
SCALE: 1" = 1'-0" BOTTOM, 3" = 1'-0" TOP

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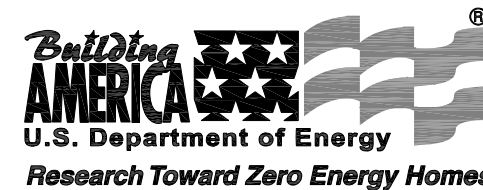
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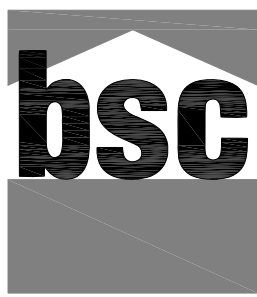
SHEET TITLE:

**VERTICAL
DETAILS**

SCALE AS NOTED



A-508



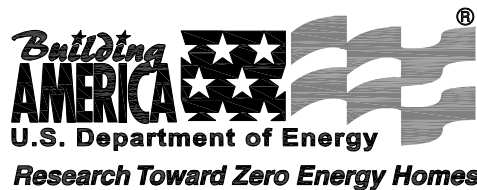
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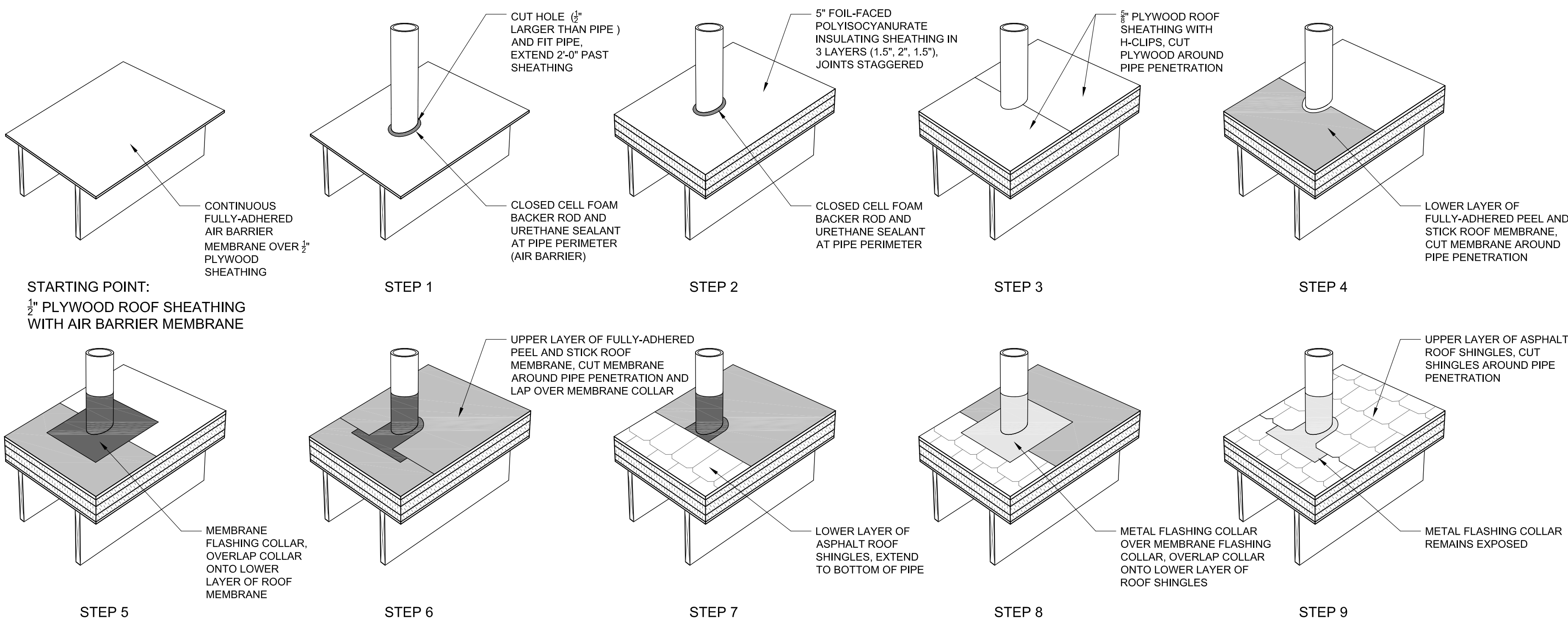
SHEET TITLE:

ROOF DETAILS

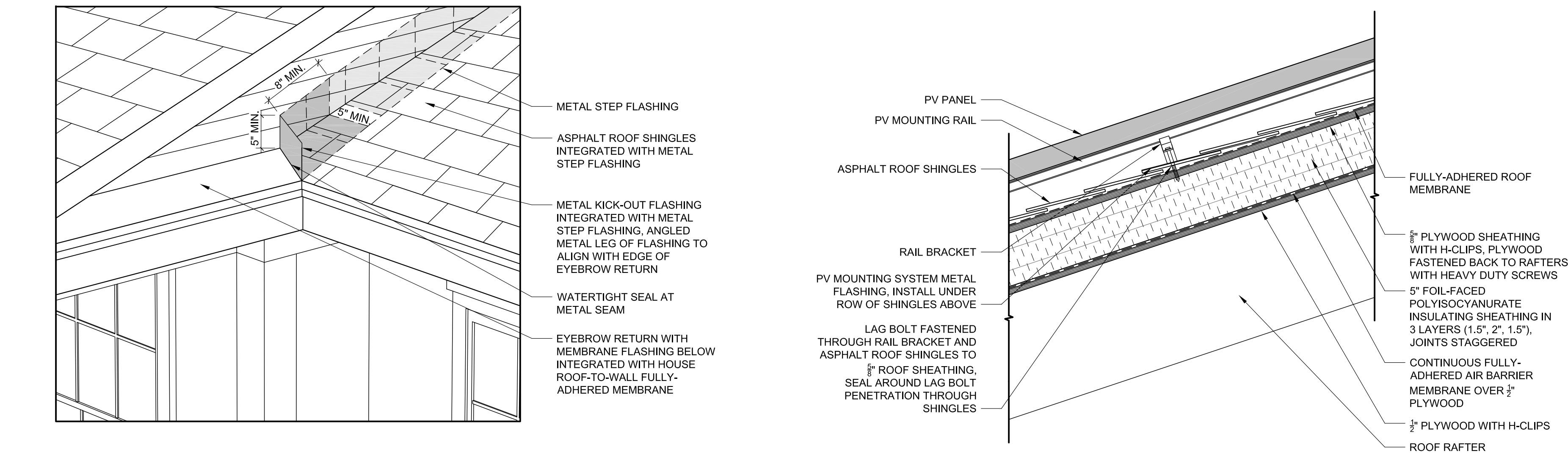
SCALE AS NOTED



A-509

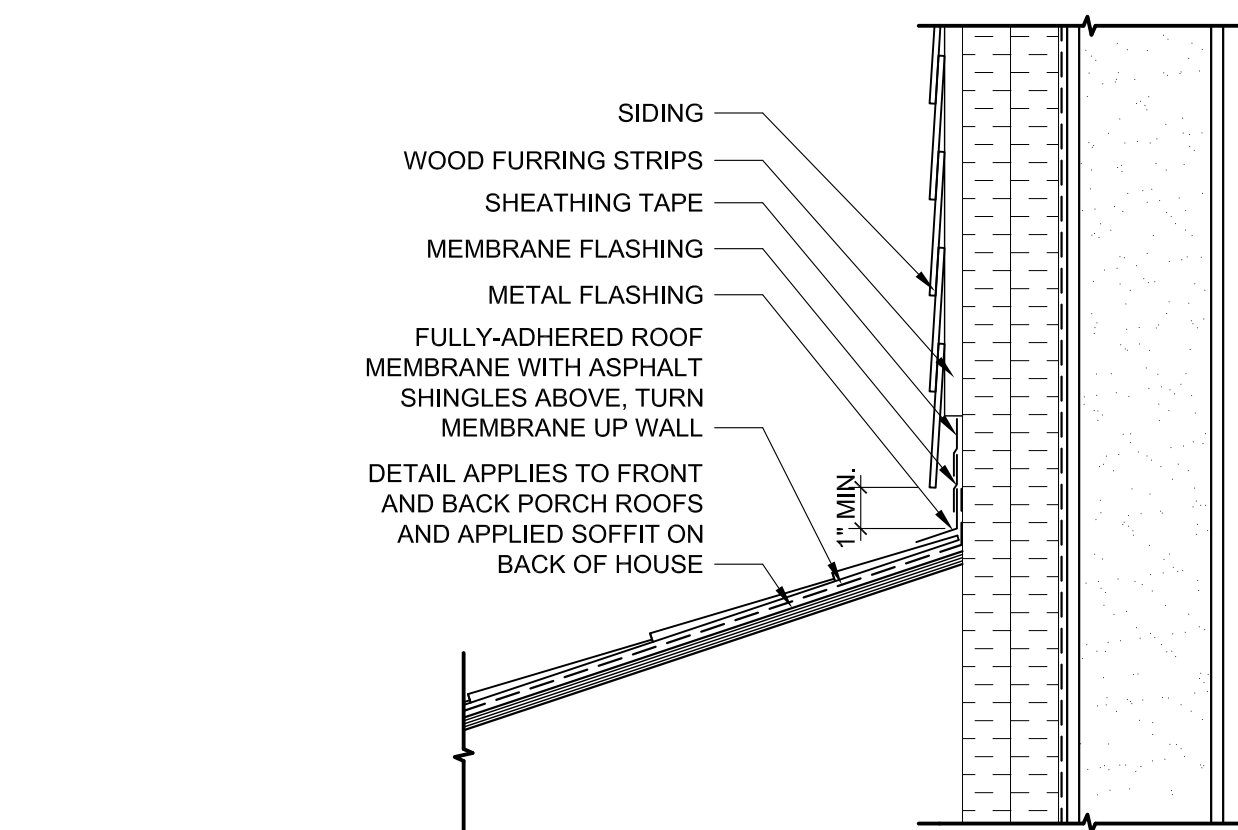


5 ROOF PENETRATION INSTALLATION SEQUENCE
SCALE: N.T.S.

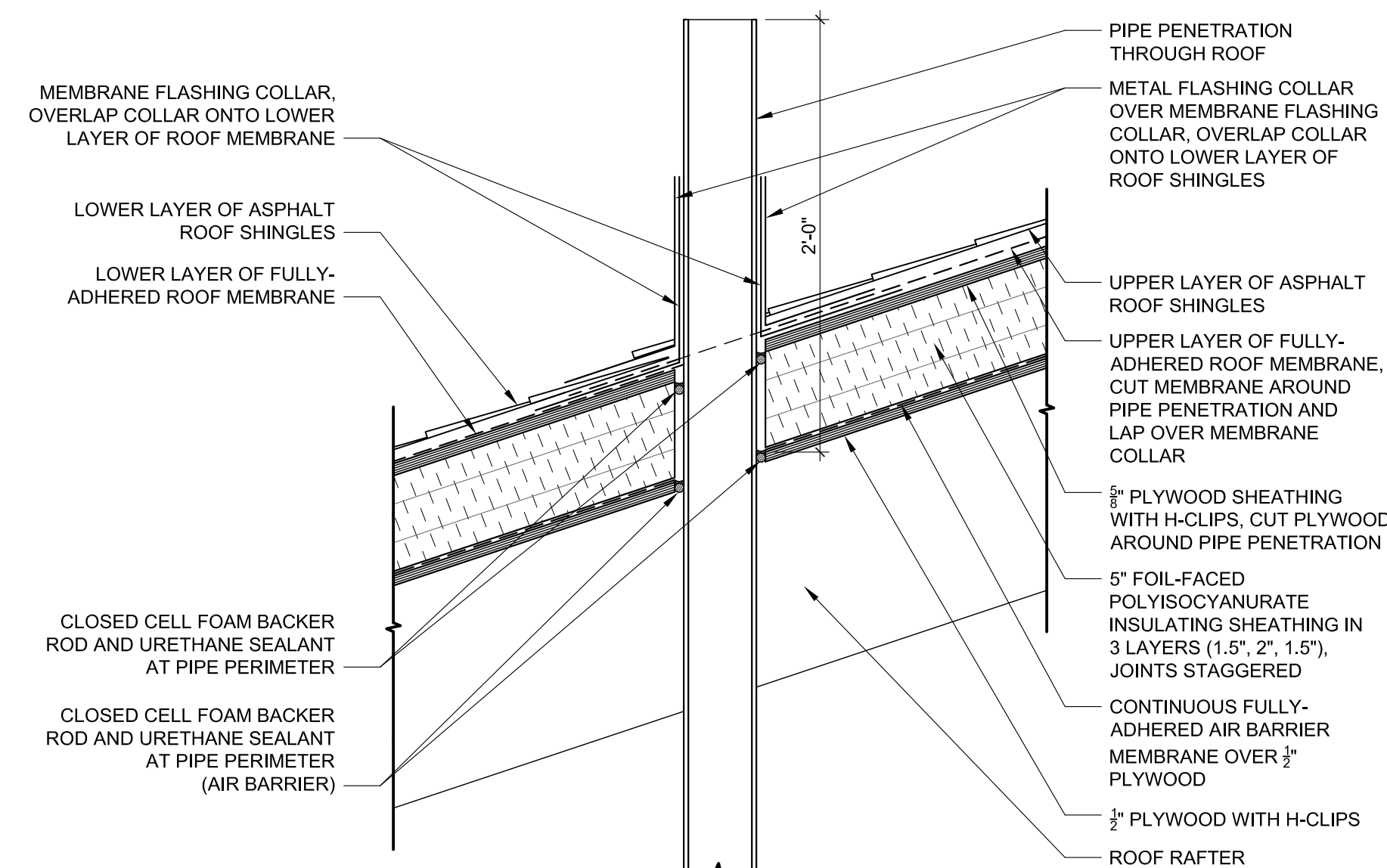


3 KICK-OUT FLASHING DETAIL
SCALE: N.T.S.

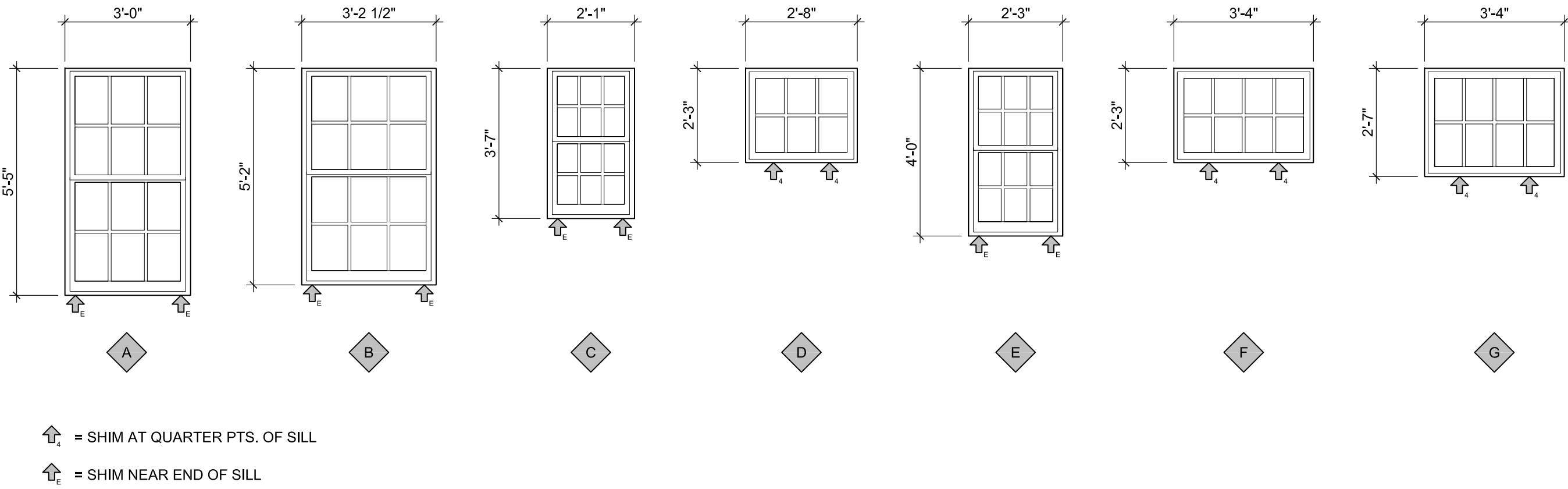
2 PV MOUNTING SYSTEM DETAIL
SCALE: 1 1/2" = 1'-0"



4 SLOPED ROOF-TO-WALL FLASHING DETAIL
SCALE: 1 1/2" = 1'-0"



1 ROOF PENETRATION SECTION DETAIL
SCALE: 1 1/2" = 1'-0"

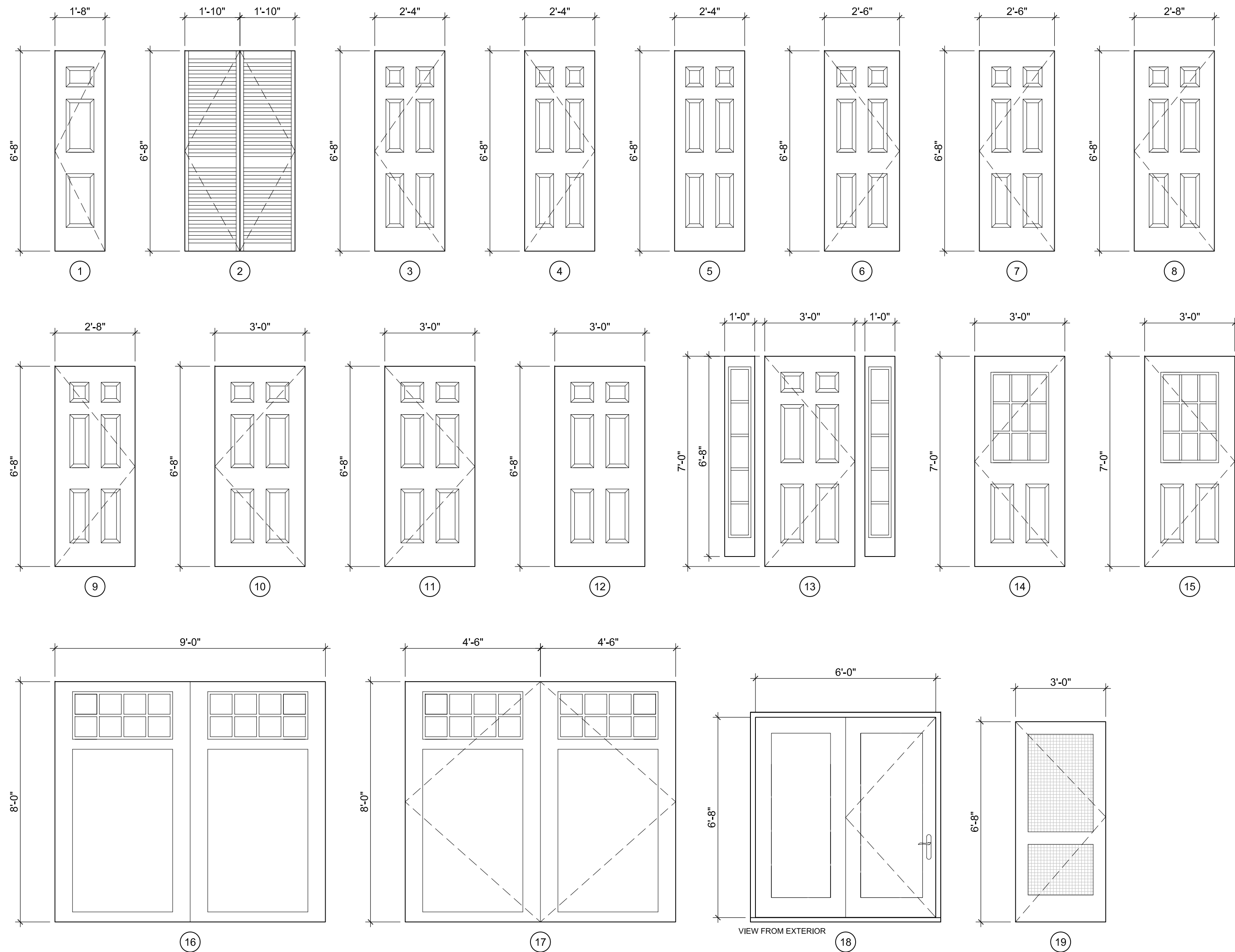


SHIM AT QUARTER PTS. OF SILL
SHIM NEAR END OF SILL

2

WINDOW TYPES

SCALE: 3/8" = 1'-0"



1

DOOR TYPES

SCALE: 3/8" = 1'-0"

WINDOW SCHEDULE *

TYPE	FRAME SIZE	TYPE	MATERIAL	GLAZING	MEETS EGRESS REQ.	QTY	NOTES
A	3'-0" x 5'-5"	DOUBLE HUNG	FIBERGLASS	SUPER-INSUL CLR LOW E	YES	13	1, 4, 5, 7, 8
B	3'-2 1/2" x 5'-2"	DOUBLE HUNG	FIBERGLASS	SUPER-INSUL CLR LOW E	YES	7	1, 3, 6, 7, 8
C	2'-1" x 3'-7"	DOUBLE HUNG	FIBERGLASS	SUPER-INSUL CLR LOW E	NO	2	1, 8
D	2'-8" x 2'-3"	AWNING	FIBERGLASS	SUPER-INSUL CLR LOW E	NO	2	1, 8
E	2'-3" x 4'-0"	DOUBLE HUNG	FIBERGLASS	SUPER-INSUL CLR LOW E	NO	4	1, 2, 8
F	3'-4" x 2'-3"	AWNING	FIBERGLASS	SUPER-INSUL CLR LOW E	NO	2	1, 8
G	3'-4" x 2'-7"	AWNING	FIBERGLASS	SUPER-INSUL CLR LOW E	NO	2	1, 8

NOTES:

- SIMULATED DIVIDED LITE.
- BATH #1 AND MASTER BATH WINDOWS TO HAVE TEMPERED GLASS.
- BASEMENT WINDOW TO HAVE TEMPERED GLASS.
- WINDOW IN BEDROOM 4 (SOUTHEAST CORNER) TO HAVE TEMPERED GLASS.
- WINDOW TYPE "A" TO MEET 2009 IRC SECTION R310 REQUIREMENTS FOR EMERGENCY ESCAPE AND RESCUE OPENINGS FOR GRADE FLOOR ONLY. BEDROOM 4 TO HAVE (1) WINDOW MEETING THESE REQUIREMENTS.
- WINDOW TYPE "B" TO MEET 2009 IRC SECTION R310 REQUIREMENTS FOR EMERGENCY ESCAPE AND RESCUE OPENINGS. BASEMENT WINDOW, BEDROOM 2, BEDROOM 3 AND MASTER BEDROOM ALL TO HAVE (1) WINDOW MEETING THESE REQUIREMENTS.
- SPECIFIED WINDOWS MEET EGRESS REQUIREMENTS.
- SEE SPECIFICATIONS FOR WINDOW MANUFACTURER, WINDOW TYPE AND WINDOW AND GLAZING PERFORMANCE SPECIFICATIONS.

* SEE 7/A-503 FOR WINDOW INSTALLATION SEQUENCE.

DOOR SCHEDULE ** ***

TYPE	SIZE	LOCATION	TYPE	MATERIAL	HINGE	QTY	NOTES
1	1'-8" x 6'-8"	INTERIOR	SWING	SOLID CORE	LH	2	1, 12, 16
2	(2) 1'-10" x 6'-8"	INTERIOR	DOUBLE SWING	SOLID CORE	-	3	1, 12, 16
3	2'-4" x 6'-8"	INTERIOR	SWING	SOLID CORE	LH	2	1, 12, 16
4	2'-4" x 6'-8"	INTERIOR	SWING	SOLID CORE	RH	3	1, 12, 16
5	2'-4" x 6'-8"	INTERIOR	POCKET	SOLID CORE	-	1	1, 12, 17
6	2'-6" x 6'-8"	INTERIOR	SWING	SOLID CORE	RH	1	1, 6, 12
7	2'-6" x 6'-8"	INTERIOR	SWING	SOLID CORE	LH	1	1, 6, 12
8	2'-8" x 6'-8"	INTERIOR	SWING	SOLID CORE	LH	2	1, 12, 15
9	2'-8" x 6'-8"	INTERIOR	SWING	SOLID CORE	RH	1	1, 12, 15
10	3'-0" x 6'-8"	INTERIOR	SWING	SOLID CORE	LH	1	1, 12, 15
11	3'-0" x 6'-8"	INTERIOR	SWING	SOLID CORE	RH	2	1, 12, 15
12	3'-0" x 6'-8"	INTERIOR	POCKET	SOLID CORE	-	1	1, 3, 12
13	3'-0" x 7'-0"	EXTERIOR	SWING	INSULATED FIBERGLASS	RH	1	1,2,4,7,9,10,11,13
14	3'-0" x 7'-0"	EXTERIOR	SWING	INSULATED FIBERGLASS	LH	1	1, 2,7,9,10,11,13
15	3'-0" x 7'-0"	EXTERIOR	SWING	INSULATED FIBERGLASS	RH	1	1,2,5,7,9,10,11,13
16	9'-0" x 8'-0"	EXTERIOR	OVERHEAD	INSULATED STEEL	-	2	1, 2, 5, 10, 13
17	(2) 4'-6" x 8'-0"	EXTERIOR	DOUBLE SWING	INSULATED WOOD	-	1	1, 2, 5, 7, 10, 11, 13
18	6'-0" x 6'-8"	EXTERIOR	1 FIXED / 1 SWING	INSULATED FIBERGLASS	LH	1	1,2,7,10,11,13
19	3'-0" x 6'-8"	SCREEN PORCH	SWING	FIBERGLASS	RH	1	1, 7, 8, 14

NOTES:

- SEE SPECIFICATIONS FOR DOOR MANUFACTURER, DOOR TYPE AND DOOR AND GLAZING PERFORMANCE SPECIFICATIONS.
- LITES IN DOORS, SIDELITES AND FIXED PANELS TO BE TEMPERED.
- POCKET DOOR IN ITS OPEN POSITION TO HAVE 32" CLEAR OPENING WITH PUSH/PULL HANDLE EXPOSED AND POCKET DOOR LOCK.
- FRONT ENTRY DOOR TO HAVE 12" SIDELITES ON EACH SIDE WHICH ARE FRAMED SEPARATELY FROM THE DOOR.
- DOOR IN GARAGE.
- BATHROOM DOOR TO HAVE PRIVACY LOCK.
- THRESHOLD TO BE BEVELED WITH SLOPE NOT TO EXCEED 1:2 AND HEIGHT NOT TO EXCEED 1/4".
- SCREEN PORCH DOOR TO BE FIBERGLASS FRAME WITH SCREEN INSERTS.
- SIMULATED DIVIDED LITES IN DOORS, SIDELITES AND FIXED PANELS.
- DOOR TO HAVE WEATHERSTRIPPING.
- EXTERIOR DOOR TO HAVE KEYED ENTRANCE LOCK.
- INTERIOR DOOR PAINTED P-11.
- EXTERIOR DOOR PAINTED P-14 (EXTERIOR), P-11 (INTERIOR).
- SCREEN PORCH DOOR PAINTED P-13.
- BEDROOM DOOR TO HAVE PASSAGE LOCK.
- CLOSET DOOR TO HAVE DUMMY HARDWARE.
- POCKET DOOR TO HAVE POCKET DOOR LOCK.

** SEE 4/A-504 FOR EXTERIOR DOOR INSTALLATION SEQUENCE.

*** ALL TROPICAL WOOD, IF USED, MUST BE FSC-CERTIFIED.

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SHEET TITLE:

**WINDOW & DOOR
SCHEDULES &
TYPES**

SCALE AS NOTED

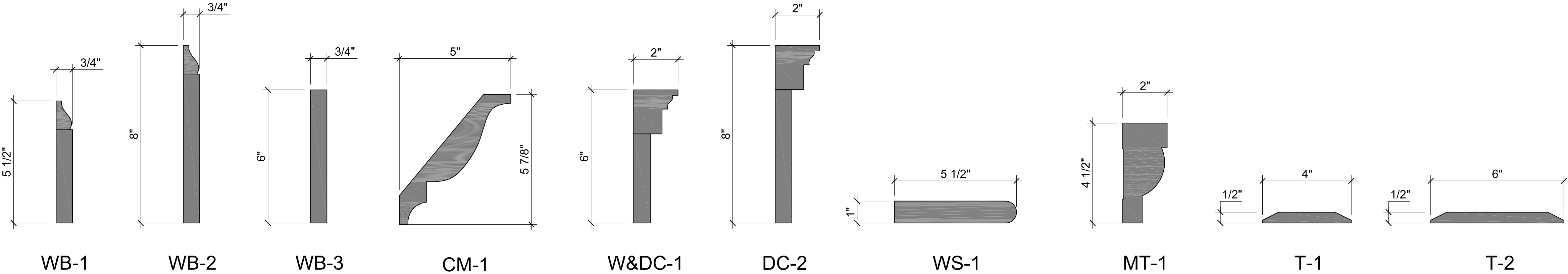


A-601

INTERIOR FINISH SCHEDULE									
	ROOM NAME	FLOOR	BASE	CROWN	WALLS		CEILING		NOTES
					MATL	COLOR	MATL	COLOR	
BASEMENT	BASEMENT	CONC	-	-	GWB	P-1	-	-	
	STAIR	WF-1	-	-	GWB	P-1	GWB	P-10	
FIRST FLOOR	GARAGE	CONC	-	-	GWB	P-1	GWB	P-10	
	MUDROOM	CT-1	WB-1	CM-1	GWB	P-1	GWB	P-10	
	COAT CLOSET	CT-1	WB-1	-	GWB	P-1	GWB	P-10	
	BATH #1	CT-1	WB-3	CM-1	GWB/CT-4	P-7	GWB	P-10	CT-3A SHOWER FLR.
	UTILITY CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	W/D CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	KITCHEN	WF-1	WB-1/WB-2	CM-1	GWB/CT-5	P-3	GWB	P-10	C-1
	DINING ROOM	WF-1	WB-1/WB-2	CM-1	GWB	P-3	GWB	P-10	
	SCREEN PORCH	CONC	TRIM W/CAP	3" EXT.	BEAD BD	P-13	BEAD BD	P-15	EXT. PVC PRODUCTS
	LIVING ROOM	WF-1	WB-1/WB-2	CM-1	GWB	P-4	GWB	P-10	
	ENTRY HALL	WF-1	WB-1/WB-2	CM-1	GWB	P-1	GWB	P-10	
	OFFICE/OPT. BR. 4	WF-1	WB-1	CM-1	GWB	P-4	GWB	P-10	
SECOND FLOOR	OFFICE CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	STAIR	WF-1	WB-1	-	-	-	-	-	
	HALL	WF-1	WB-1	CM-1	GWB	P-1	GWB	P-10	
	HALL CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	LINEN CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	BEDROOM 2	WF-1	WB-1	CM-1	GWB	P-5	GWB	P-10	
	BEDROOM 2 CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	BEDROOM 3	WF-1	WB-1	CM-1	GWB	P-6	GWB	P-10	
	BEDROOM 3 CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	BATH #2	CT-2	WB-1	-	GWB/CT-6	P-2	GWB	P-10	C-2
	MASTER BEDROOM	WF-1	WB-1	CM-1	GWB	P-8	GWB	P-10	
	MASTER BATH	CT-3	WB-1	CM-1	GWB/CT-7	P-9	GWB	P-10	C-3, CT-3A SHWR FLR.
	MASTER CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	
	MASTER CLOSET	WF-1	WB-1	-	GWB	P-1	GWB	P-10	

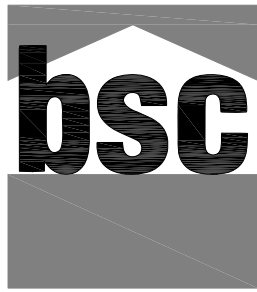
FINISH SCHEDULE KEY			
MARK	DESCRIPTION	MARK	DESCRIPTION
GWB	GYPSUM WALL BOARD	P-7	WALL PAINT COLOR
CONC	CONCRETE	P-8	WALL PAINT COLOR
CT-1	CERAMIC TILE 1	P-9	WALL PAINT COLOR
CT-2	CERAMIC TILE 2	P-10	CEILING PAINT COLOR
CT-3	CERAMIC TILE 3	P-11	INTERIOR TRIM PAINT COLOR
CT-3A	CERAMIC TILE 3A	P-12	SIDING PAINT COLOR
CT-4	CERAMIC TILE 4	P-13	EXTERIOR TRIM PAINT COLOR
CT-5	CERAMIC TILE 5	P-14	EXTERIOR DOOR PAINT COLOR
CT-6	CERAMIC TILE 6	P-15	CEILING PAINT COLOR
CT-7	CERAMIC TILE 7	WB-1	WOOD BASE 1
WF-1	WOOD FLOOR 1 - CLEAR FINISH	WB-2	WOOD BASE 2
P-1	WALL PAINT COLOR	WB-3	WOOD BASE 3
P-2	WALL PAINT COLOR	CM-1	CROWN MOULDING 1
P-3	WALL PAINT COLOR	C-1	COUNTERTOP 1
P-4	WALL PAINT COLOR	C-2	COUNTERTOP 2
P-5	WALL PAINT COLOR	C-3	COUNTERTOP 3
P-6	WALL PAINT COLOR		

NOTES:
1. SEE SPECIFICATIONS FOR PRODUCT INFORMATION.
2. SEE INTERIOR ELEVATIONS FOR BACKSPLASH EXTENT.



1 BASE & CROWN MOULDING, WINDOW & DOOR CROWNS, WINDOW STOOL, MANTLE TRIM AND THRESHOLD PROFILES
SCALE: 3" = 1'-0"

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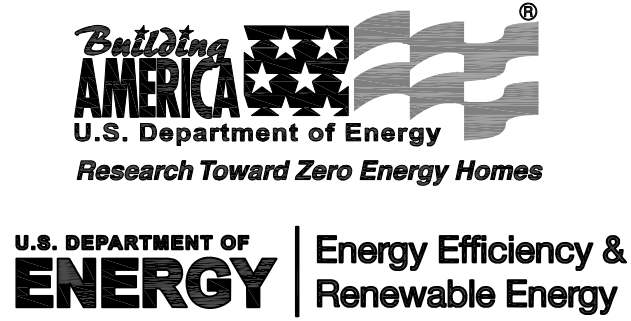
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INTERIOR FINISH
SCHEDULE

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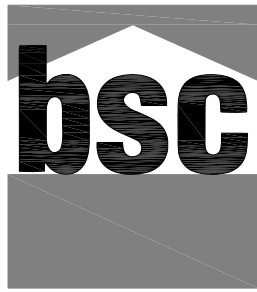


A-602

PENETRATION SCHEDULE						
	MARK	TYPE	LOCATION	QTY.	SHEET REFERENCE	NOTES
SLAB	S1	SOIL GAS VENT	BASEMENT SLAB	1	A-102, P-101	
	S2	FLOOR DRAIN	BASEMENT SLAB	2	A-102, P-101	
	S3	STEEL PIPE COLUMN	BASEMENT SLAB	2	A-102	
	S4	SUMP PUMP	BASEMENT SLAB	1	A-102, P-101	
	S5	SEWER CONNECTION	BASEMENT SLAB	1	A-102, P-101	
	S6	CONDENSATE DRAIN	BASEMENT SLAB	6	A-102, P-101	
FOUNDATION WALL	F1	VERT. GROUND LOOP SYSTEM	FOUNDATION WALL	1	A-102, M-101	2
	F2	SLINKY LOOP SYSTEM	FOUNDATION WALL	1	A-102, M-101	2
	F3	HORZ. GROUND LOOP SYSTEM	FOUNDATION WALL	1	A-102, M-101	2
	F4	SUMP PUMP OUTLET	FOUNDATION STEM WALL	1	A-102,A-201	
	F5	INSTRUMENTATION CONDUIT	FOUNDATION WALL	2	A-102, E-103	1,7
	F6	GAS CONNECTION	FOUNDATION WALL	1	A-102, P-101	
	F7	WATER CONNECTION	FOUNDATION WALL	1	A-102, F-101, P-101	8
	F8	ELECTRICITY CONNECTION	FOUNDATION WALL	2	A-102, E-103	
	F9	AIR-TO-AIR OUTDR. UNIT CONDUIT	FOUNDATION STEM WALL	1	A-102, A-201, M-102	1, 4
	F10	AIR-TO-AIR OUTDR UNIT CONDUIT	FOUNDATION WALL	1	A-102, A-201	3,5,13
	F11	COMMUNICATION/FIRE SAFETY	FOUNDATION WALL	1	A-102, E-101	9
	F12	INVERTER UTILITY CUTOFF	FOUNDATION WALL	1	A-102, E-101	10
	F13	FIRE DEPARTMENT CONNECTION	FOUNDATION WALL	1	A-102, F-101	11
EXTERIOR WALL	E1	COLLECTOR PANEL CONDUIT	SECOND FLOOR RIM JOIST	2	A-201	6
	E2	EXTERIOR LANTERN	EXTERIOR WALL	4	A-201, A-202	1
	E3	WEATHER PROTECTED OUTLET	EXTERIOR WALL	8	A-201, A-202	1
	E4	CONDUIT FOR GAS FURNACE	EXTERIOR WALL	1	A-201	3
	E5	DRYER VENT	SECOND FLOOR RIM JOIST	1	A-202, M-102	
	E6	RANGE HOOD VENT	SECOND FLOOR RIM JOIST	1	A-202, M-102	
	E7	HRV EXHAUST	SECOND FLOOR RIM JOIST	1	A-202, M-102	
	E8	HRV INLET	SECOND FLOOR RIM JOIST	1	A-202, M-102	
	E9	INSTRUMENTATION CONDUIT	SECOND FLOOR RIM JOIST	1	A-202, E-103	1,12
	E10	CONDUIT FOR GAS WTR. HEATER	EXTERIOR WALL	1	A-202	3
	E11	MULTISPLIT OUTDR. UNIT CONDUIT	EXTERIOR WALL	2	A-201, M-102	5
	E12	HOSE BIBB	EXTERIOR WALL	1	A-202, P-102	
ROOF	R1	PLUMBING STACK VENT	NORTH FACING ROOF	1	A-113, A-202, P-104	
	R2	SOIL GAS VENT	NORTH FACING ROOF	1	A-113, A-202, P-104	
	R3	PV ARRAY CONDUIT	SOUTH FACING ROOF	3	A-113, E-501	

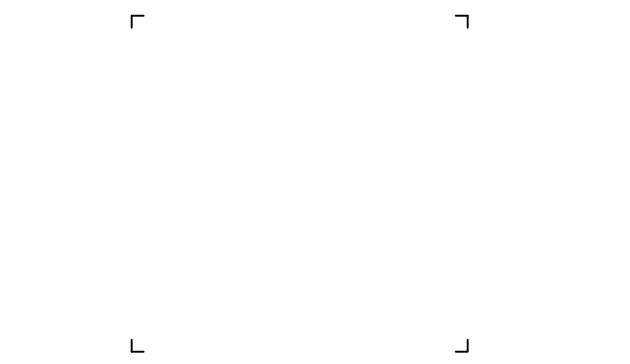
- NOTES:
1. QUANTITY INDICATED FOR HOUSE ONLY (NOT GARAGE).
 2. CONSISTS OF 3 CONDUITS: (1) 2" HPWS PIPE, (1) 2" HPWR PIPE AND (1)1-1/2" PVC WIRE CONDUIT.
 3. CONDUIT PROVIDED FOR EQUIPMENT TO BE INSTALLED IN THE FUTURE
 4. CONSISTS OF 4 CONDUITS: (3) 2" CONDUITS FOR REFRIGERANT LINES AND (1) 1-1/2" PVC WIRE CONDUIT.
 5. CONSISTS OF 3 CONDUITS: (2) 2" CONDUITS FOR REFRIGERANT LINES AND (1) 1-1/2" PVC WIRE CONDUIT.
 6. CONDUIT TO INCLUDE BOTH SUPPLY AND RETURN LINES
 7. 4" PVC CONDUIT
 8. 3" COMBINATION DOMESTIC/SPRINKLER
 9. CONSISTS OF (4) 1-1/2" CONDUITS: 1) FIBER, 2) COPPER TELECOMMUNICATION CABLE,3) VIDEO, 4) FIRE SYSTEM
 10. CONSISTS OF (2) CONDUITS: ONE FOR INPUT, ONE FOR OUTPUT
 11. 2-1/2" CONNECTION TO FREE-STANDING FIRE DEPARTMENT CONNECTION
 12. 3" PVC CONDUIT
 13. ADD 1 TO QUANTITY IF THE HIGH VELOCITY HVAC OPTION IS AWARDED

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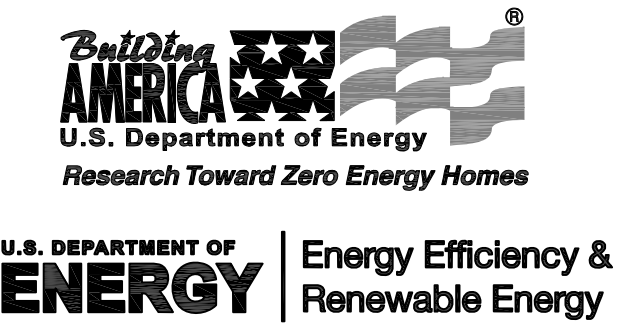


PROJECT:

National Institute of Standards and Technology

NET ZERO ENERGY
RESIDENTIAL TEST
FACILITY

NIST Campus
Gaithersburg, MD



	07/27/10	UPDATED
	06/29/10	UPDATED
MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	A-PLOT-SCHD-NZERTF
DRAWN BY:	CG
CHECKED BY:	BP

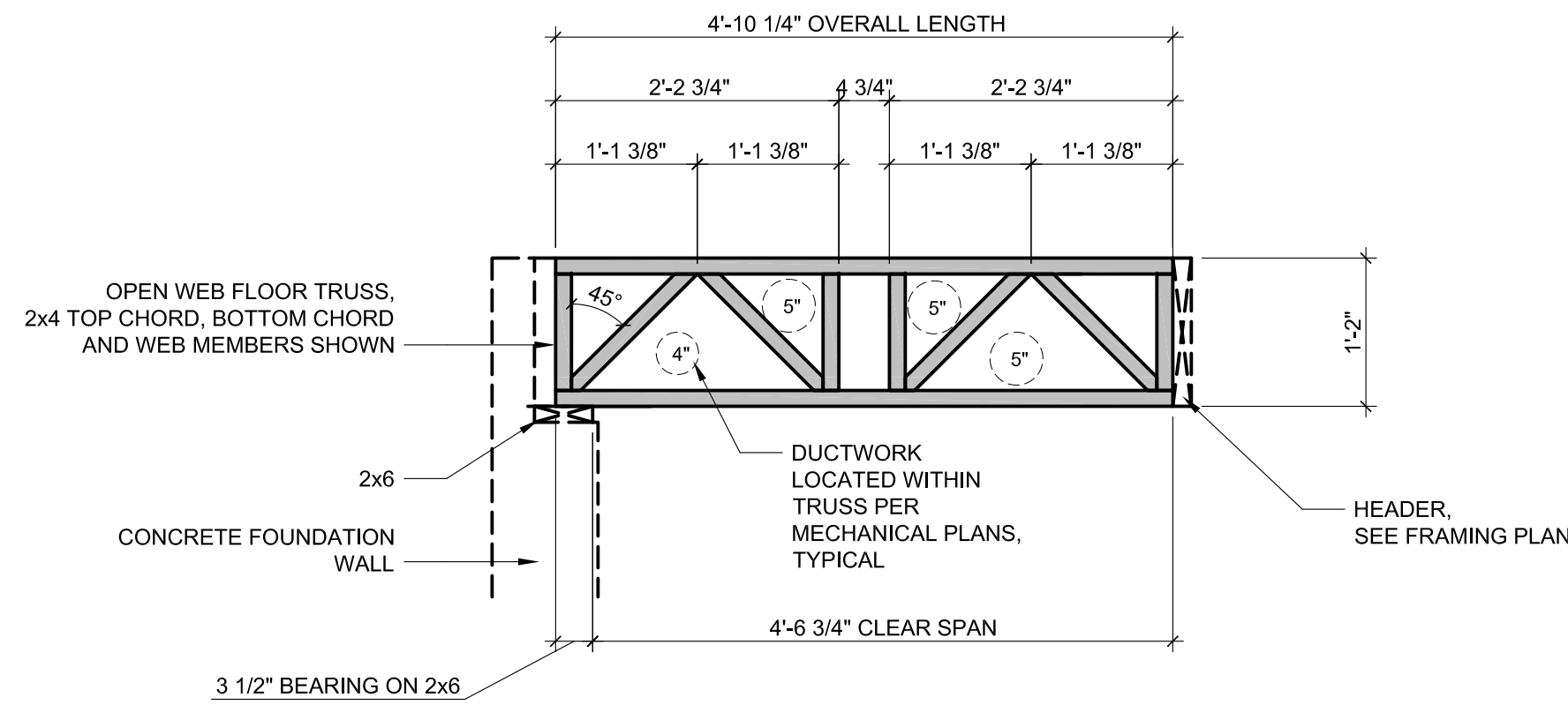
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SHEET TITLE:

PENETRATION SCHEDULE

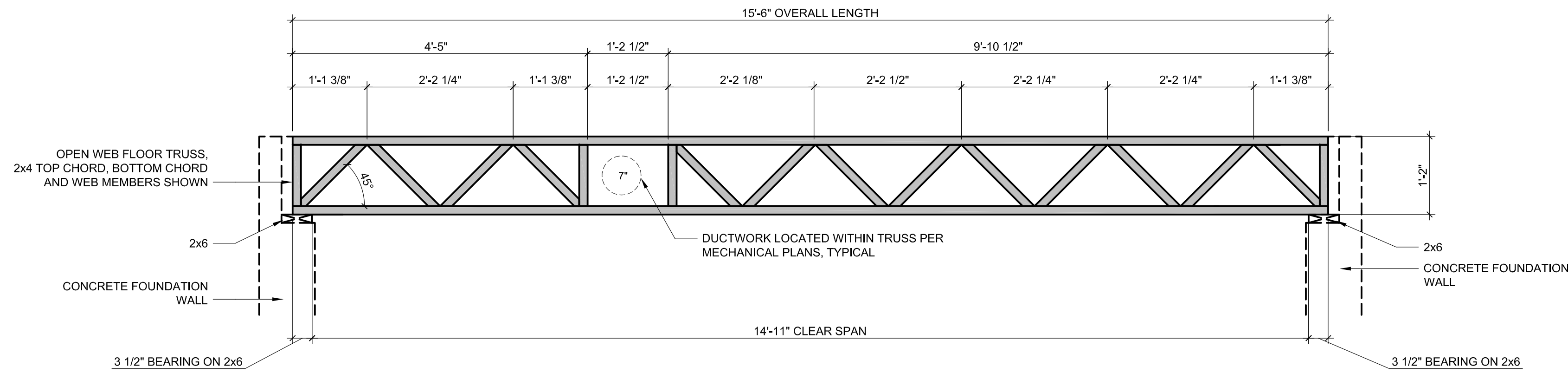
SCALE AS NOTED



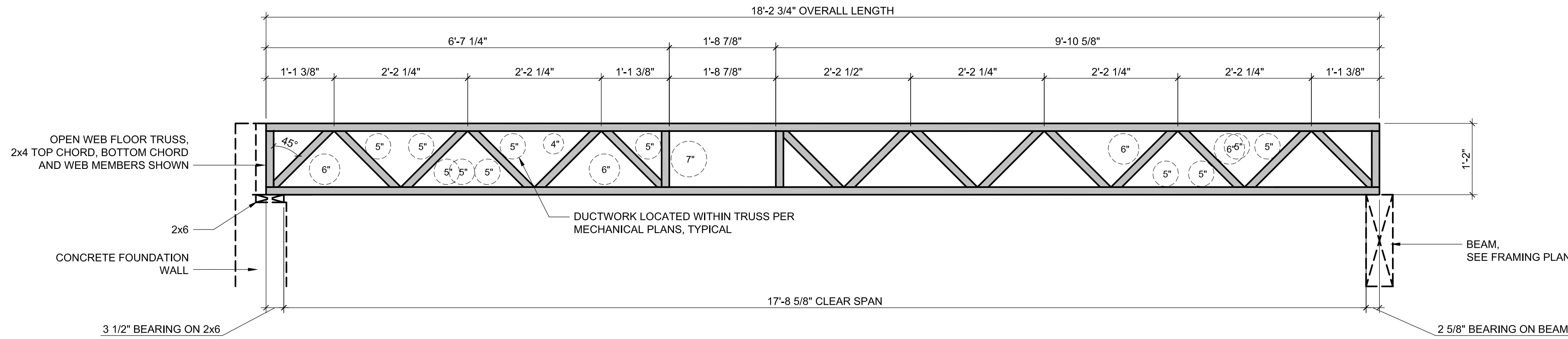
A-603



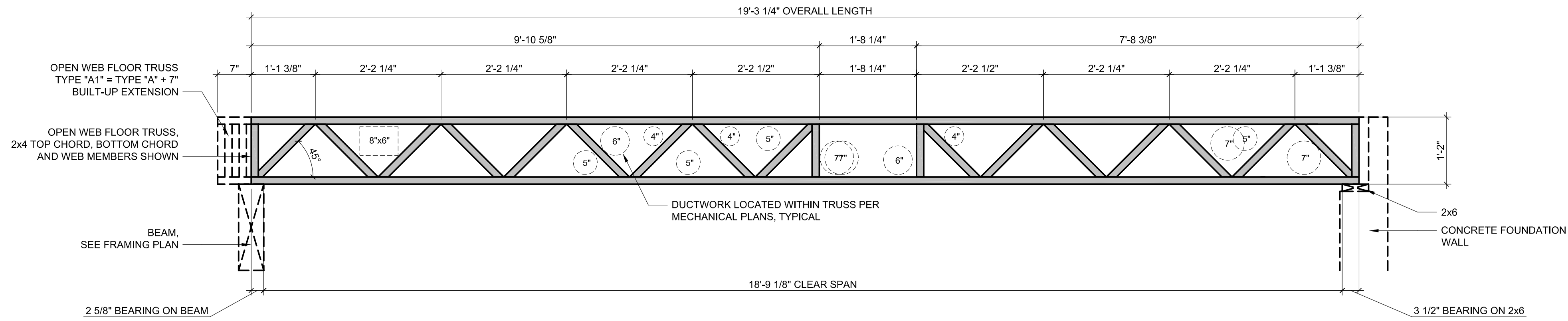
4 14" DEEP OPEN WEB FLOOR TRUSS - TYPE "D" ELEVATION
SCALE: 3/4" = 1'-0"



3 14" DEEP OPEN WEB FLOOR TRUSS - TYPE "C" ELEVATION
SCALE: 3/4" = 1'-0"



2 14" DEEP OPEN WEB FLOOR TRUSS - TYPE "B" ELEVATION
SCALE: 3/4" = 1'-0"

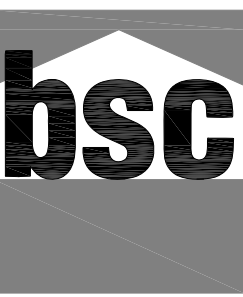


1 14" DEEP OPEN WEB FLOOR TRUSS - TYPE "A" AND "A1" ELEVATION
SCALE: 3/4" = 1'-0"

GENERAL SHEET NOTES

1. OPEN WEB FLOOR TRUSSES SHOWN FOR DESIGN INTENT AND COORDINATION WITH DUCT LAYOUTS ONLY.
2. SEE M-101a AND M-104a FOR FLOOR FRAMING AND DUCT LAYOUT PLANS.
3. SEE A-104 AND A-108 FOR FRAMING PLANS AND OPEN WEB FLOOR TRUSS TYPE DESIGNATIONS.

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MARK	DATE	DESCRIPTION
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PROJECT NO:	NIST NZERTF
CAD DWG FILE:	A-PLOT-SCHD-NZERTF
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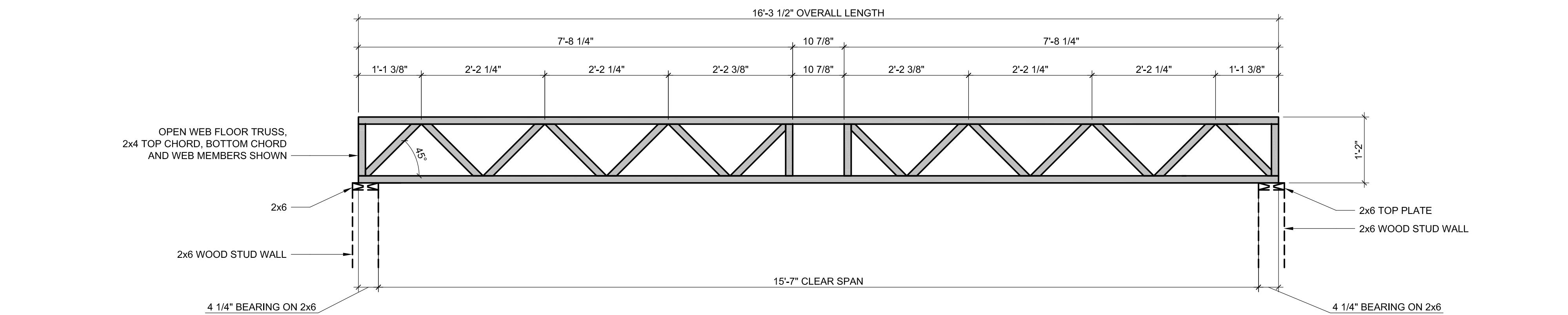
SHEET TITLE:

FIRST FLOOR
OPEN WEB FLOOR
TRUSS TYPE
ELEVATIONS

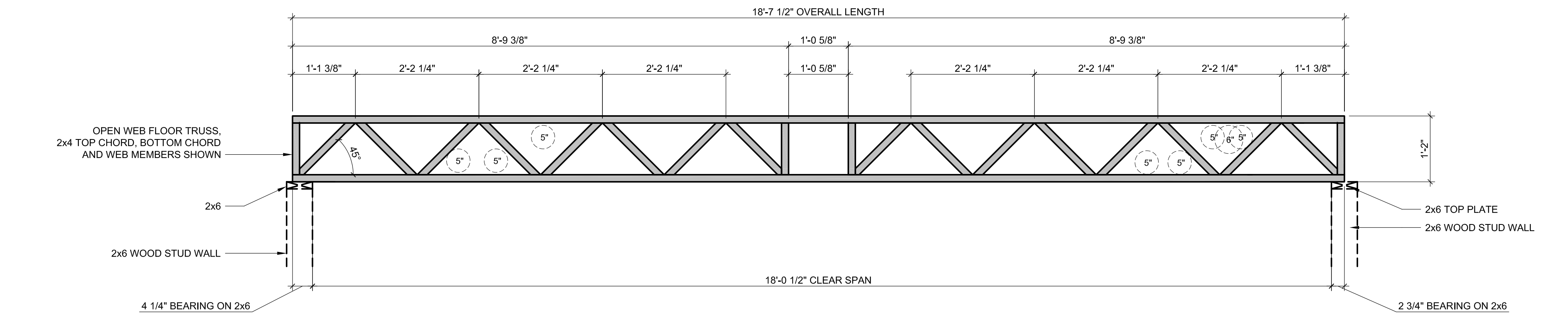
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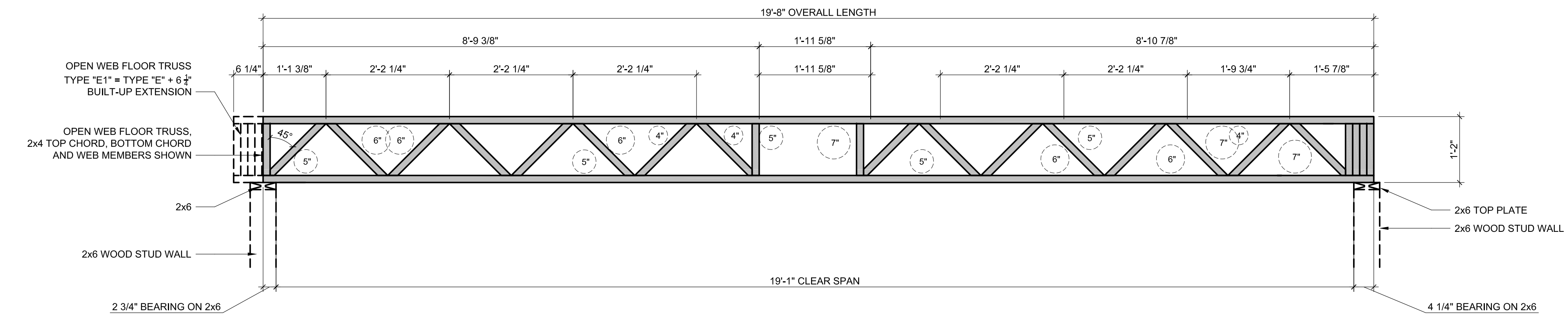
A-701



3 14" DEEP OPEN WEB FLOOR TRUSS - TYPE "G" ELEVATION
SCALE: 3/4" = 1'-0"



2 14" DEEP OPEN WEB FLOOR TRUSS - TYPE "F" ELEVATION
SCALE: 3/4" = 1'-0"

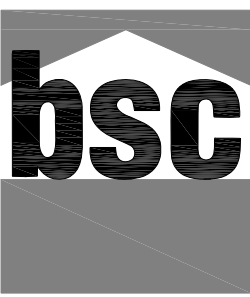


1 14" DEEP OPEN WEB FLOOR TRUSS - TYPE "E" AND E1" ELEVATION
SCALE: 3/4" = 1'-0"

GENERAL SHEET NOTES

1. OPEN WEB FLOOR TRUSSES SHOWN FOR DESIGN INTENT AND COORDINATION WITH DUCT LAYOUTS ONLY.
2. SEE M-101a AND M-104a FOR FLOOR FRAMING AND DUCT LAYOUT PLANS.
3. SEE A-104 AND A-108 FOR FRAMING PLANS AND OPEN WEB FLOOR TRUSS TYPE DESIGNATIONS.

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SHEET TITLE:

SECOND FLOOR
OPEN WEB FLOOR
TRUSS TYPE
ELEVATIONS

SCALE AS NOTED




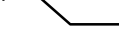



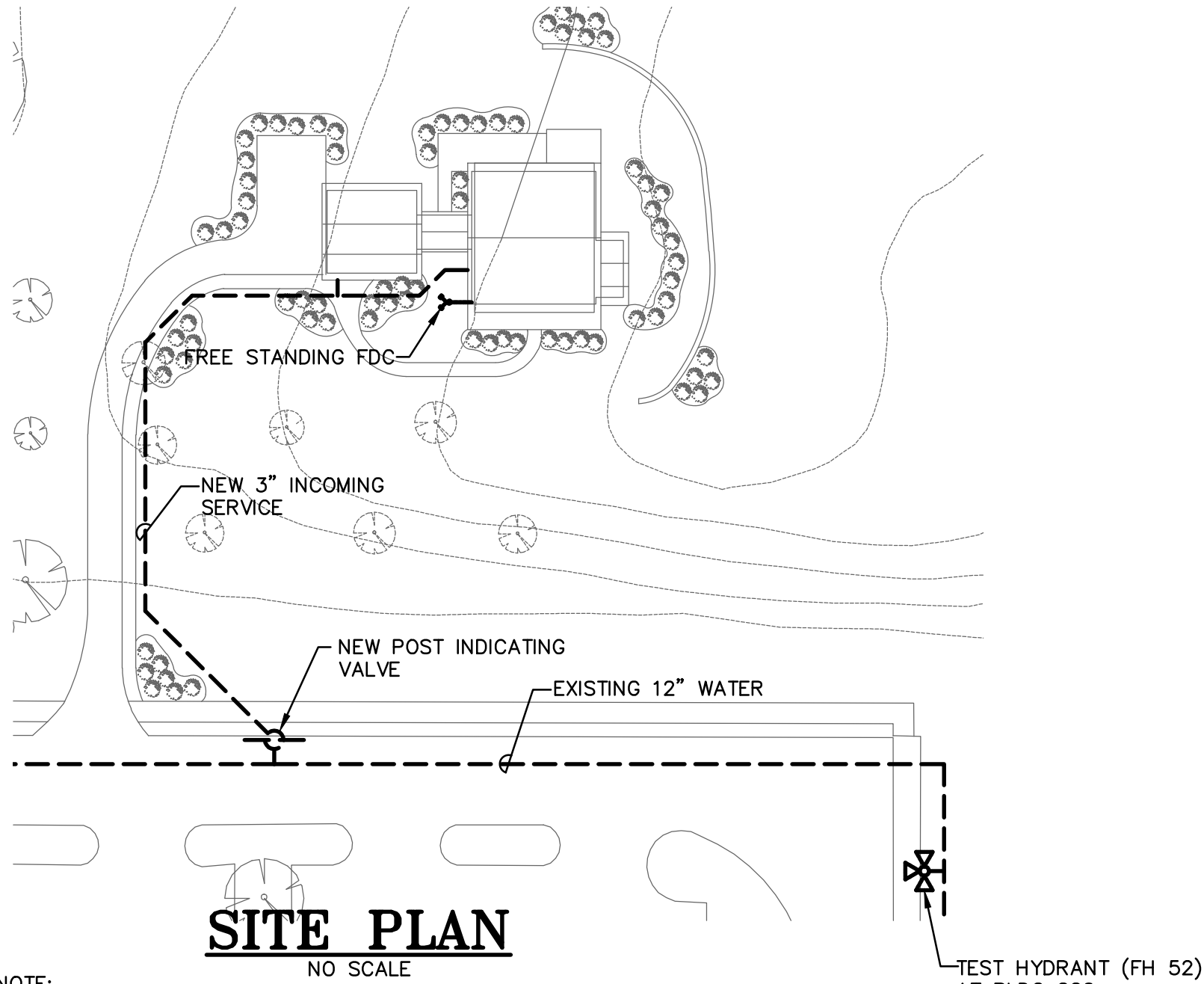
A-702

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
	ADDRESSABLE FIRE ALARM MANUAL STATION -- MOUNTING HEIGHT 4'-0"
	GENERAL BUILDING FIRE ALARM COMBINATION AUDIO/VSUAL (HORN/STROBE) DEVICE -- MOUNTING HEIGHT 6'-8" UNLESS NOTED OTHERWISE -- SUBSCRIPT '15,30,75,110,185' DENOTES CANDELA RATING -- SUPERScript 'WP' DENOTES WEATHERPROOF
	VALVE TAMPER SUPERVISORY SWITCH WITH MONITOR MODULE
	WATERFLOW SWITCH WITH MONITOR MODULE
	SMOKE SENSOR -- PHOTOELECTRIC TYPE WITH INTEGRATED SOUNDER BASE
	CARBON MONOXIDE (CO) DETECTOR WITH INTEGRATED SOUNDER BASE
	ELECTRIC SPRINKLER ALARM BELL -- SUBSCRIPT 'WP' DENOTES WEATHERPROOF DEVICE
	JUNCTION BOX WITH ADDRESSABLE MONITOR MODULE
	JUNCTION BOX WITH ADDRESSABLE CONTROL MODULE
	JUNCTION BOX -- SIZE AS REQUIRED
	INDIVIDUAL ADDRESSABLE MODULE
	ZONE ADAPTER MODULE
	JUNCTION BOX WITH LINE POWERED ISOLATOR
	TRANSIENT 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

<u>SECTION CUT</u>	
	SECTION LAYER
	SHEET NO. WHERE SECTION IS SHOWN
	SHEET NO. WHERE SECTION IS CUT
<u>DETAIL</u>	
	DETAIL NO.
	SHEET NO. WHERE DETAIL IS SHOWN



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 1/2-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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e-mail ebl@eblengineers.com

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 185446 EXPIRATION DATE: 1--31--2012

PROJECT:

National Institute of
Standards and Technology

Net Zero Energy
Residential Test
Facility

NIST Campus
Gaithersburg, MD



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

PROJECT NO: NIST NZERTF
CAD DWG FILE: 09--247 F--001

DRAWN BY: ---
CHECKED BY: ---

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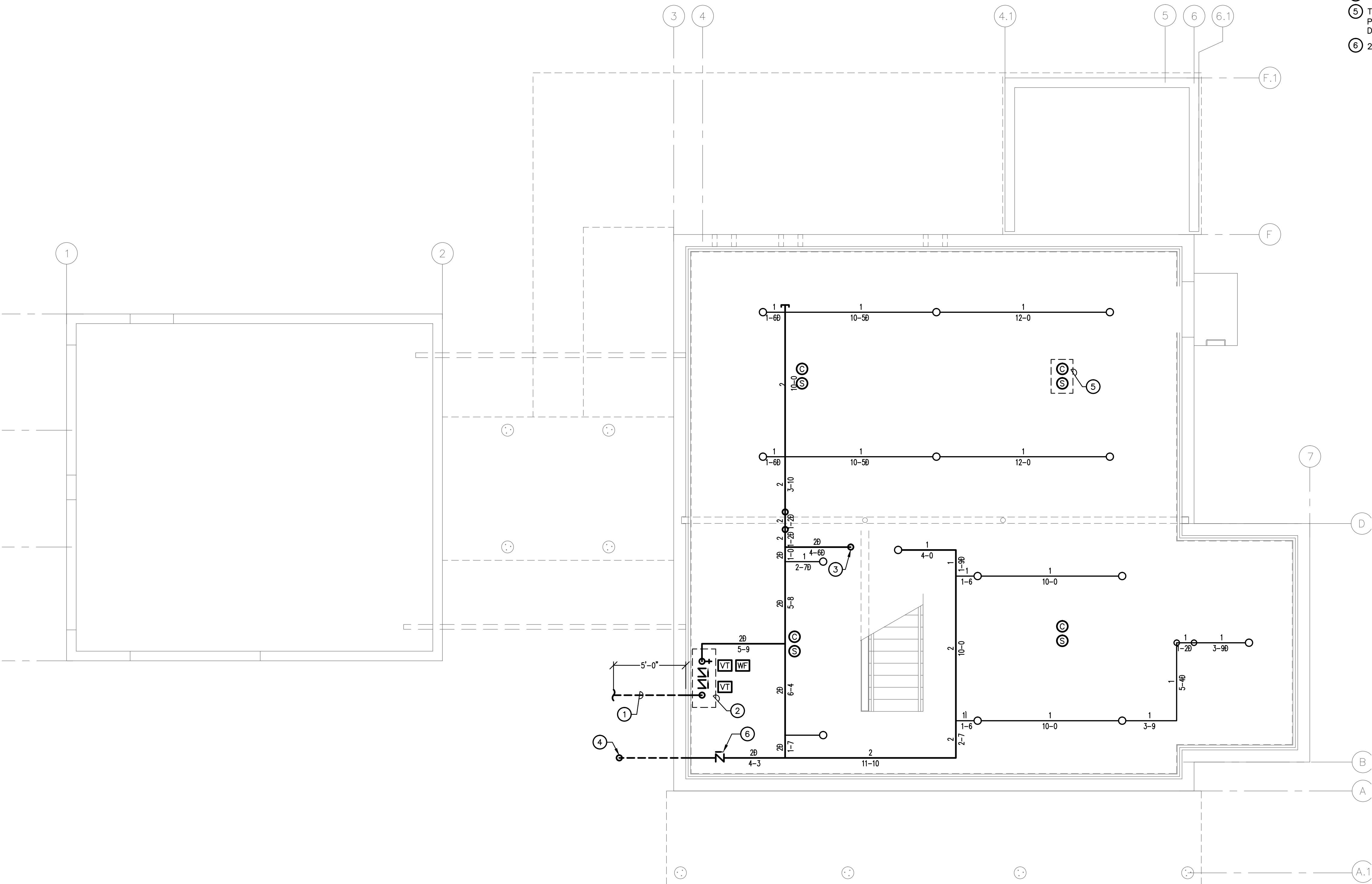
FIRE PROTECTION
GENERAL NOTES,
LEGEND AND
ABBREVIATIONS

SCALE AS NOTED



F--001

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BASEMENT FLOOR PLAN
SCALE: 1/4" = 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"

- 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 DOMESTIC/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.

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e-mail eb@eblengineers.com

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LICENSE NO. 18546 EXPIRATION DATE: 1-02-2012

PROJECT:

National Institute of
Standards and Technology

**NET ZERO ENERGY
RESIDENTIAL TEST
FACILITY**

NIST Campus
Gaithersburg, MD



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

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

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 F-101
DRAWN BY:	---
CHECKED BY:	---

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SHEET TITLE:

**BASEMENT FLOOR
PLAN**

SCALE AS NOTED



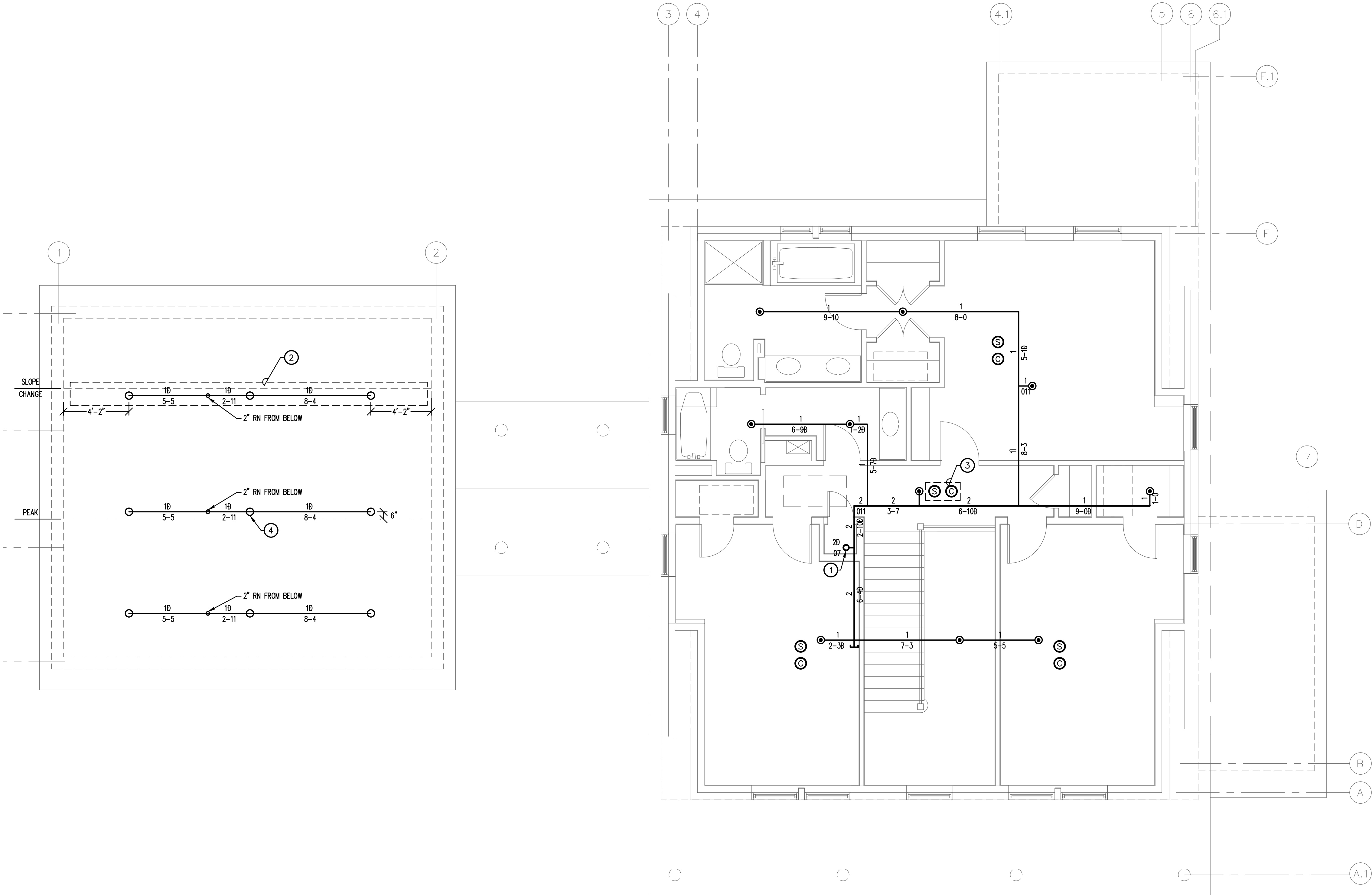
F-101

SCALE: $\frac{1}{4}" = 1'-0"$

1/4"=1'-0"

F-102

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SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0"

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.

CAUTION:

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GRAPHIC SCALE



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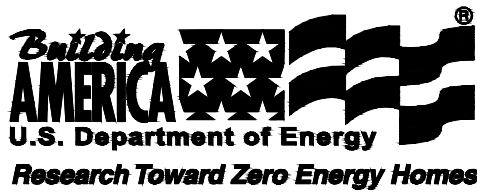
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SECOND FLOOR PLAN

SCALE AS NOTED

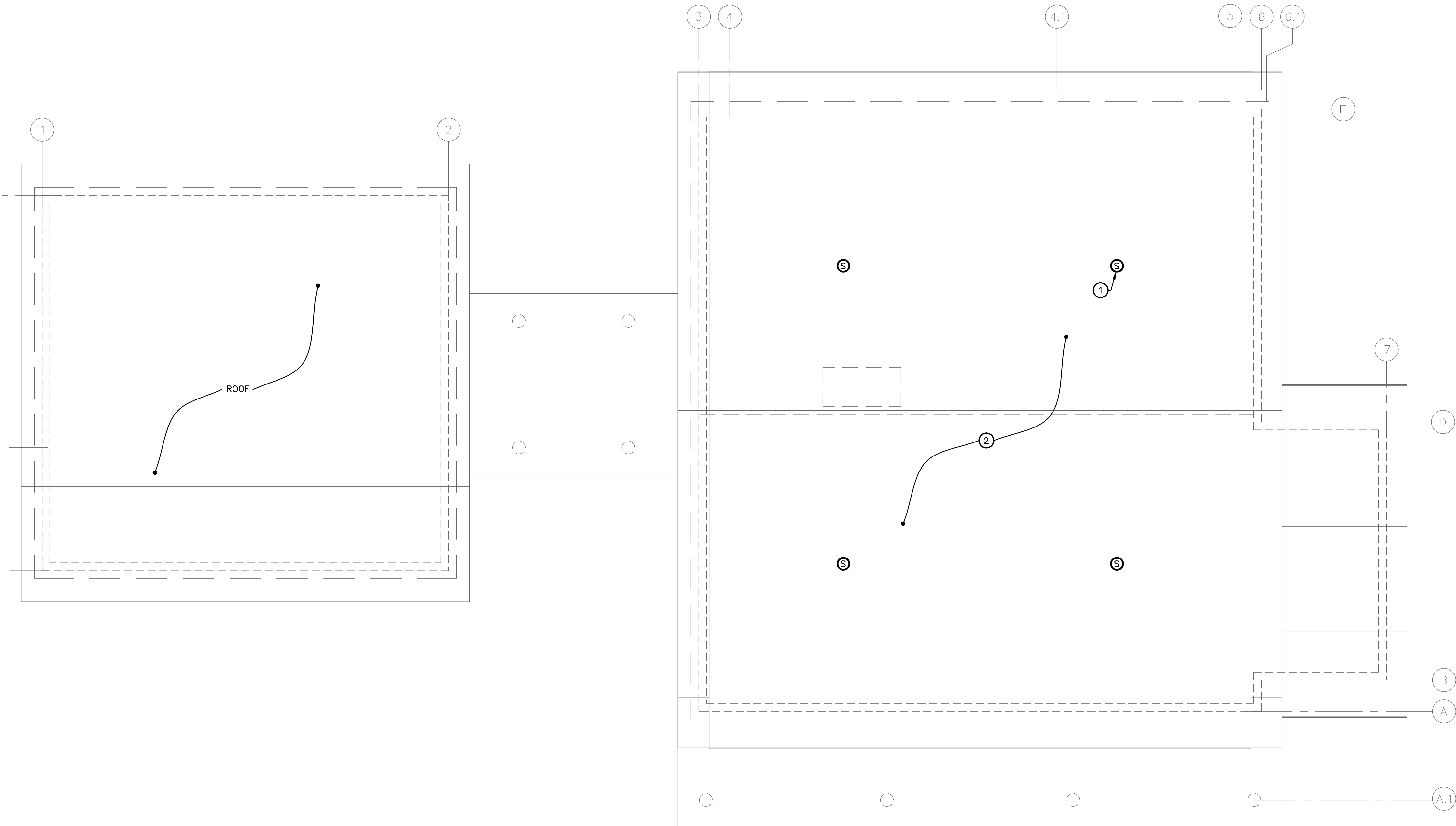


F-103

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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: 1/8" = 1'-0"

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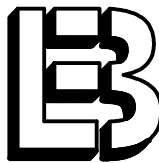
0 2' 4' 8' 12' 1/4"=1'-0"

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ATTIC FLOOR PLAN

SCALE AS NOTED



F-104

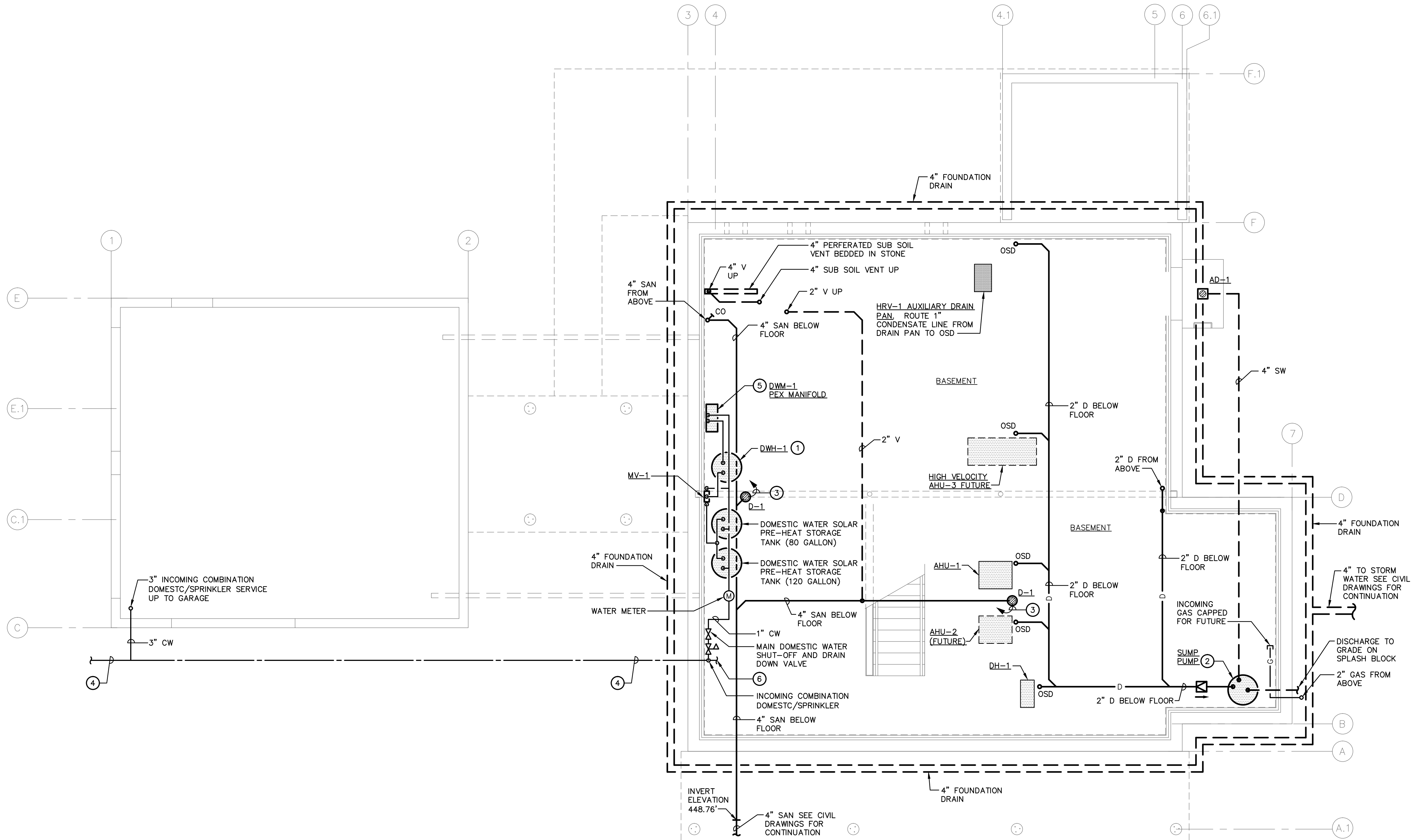
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GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

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

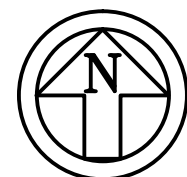
DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

- 80 GALLON WATER HEATER WITH ATTACHED HEAT PUMP.
- 30"x36" DEEP CONDENSATE SUMP PIT W/ DUPLEX SUMP PUMPS. DISCHARGE TO GRADE ON SPLASH BLOCK.
- PROVIDE TRAP PRIMER & CONNECT TO CW SYSTEM PER MANUFACTURERS RECOMMENDATIONS.
- 3" UNDERGROUND COMBINATION DOMESTIC/SPRINKLER. SEE CIVIL DRAWINGS FOR ALL WORK BEYOND 5 FEET OUTSIDE OF BUILDING.
- 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 3/8" PEX TUBING NOT EXCEEDING 58' IN DEVELOPED LENGTH PER INDIVIDUAL RUN.
- TO HOUSE SPRINKLER SYSTEM - SEE FIRE PROTECTION DRAWINGS FOR CONTINUATION.



BASEMENT FLOOR PLAN - PLUMBING

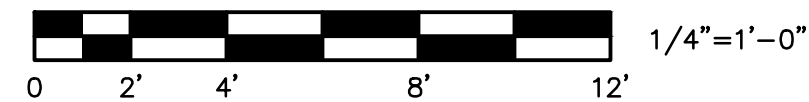
SCALE: 1/4" = 1'-0"



CAUTION:

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GRAPHIC SCALE

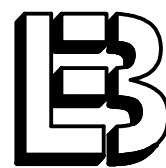


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CHECKED BY: EAH

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SHEET TITLE:

**BASEMENT FLOOR
PLAN PLUMBING**

SCALE AS NOTED



P-101

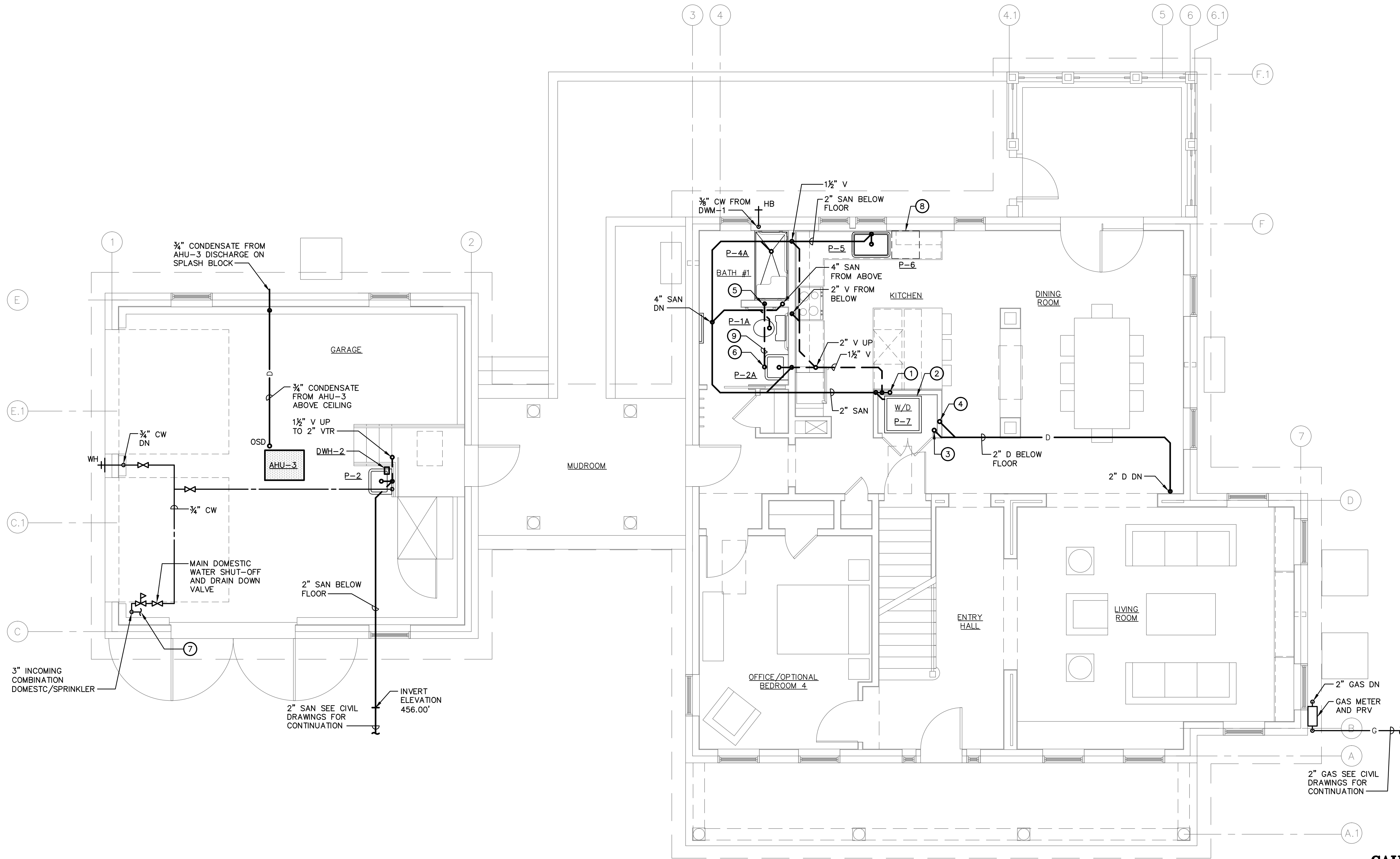
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GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

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.

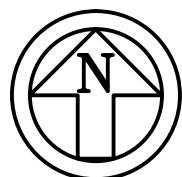
DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

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



CAUTION:

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

GRAPHIC SCALE

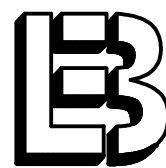


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SHEET TITLE:

**FIRST FLOOR PLAN
PLUMBING**

SCALE AS NOTED



P-102

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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.

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CHECKED BY:	EAH

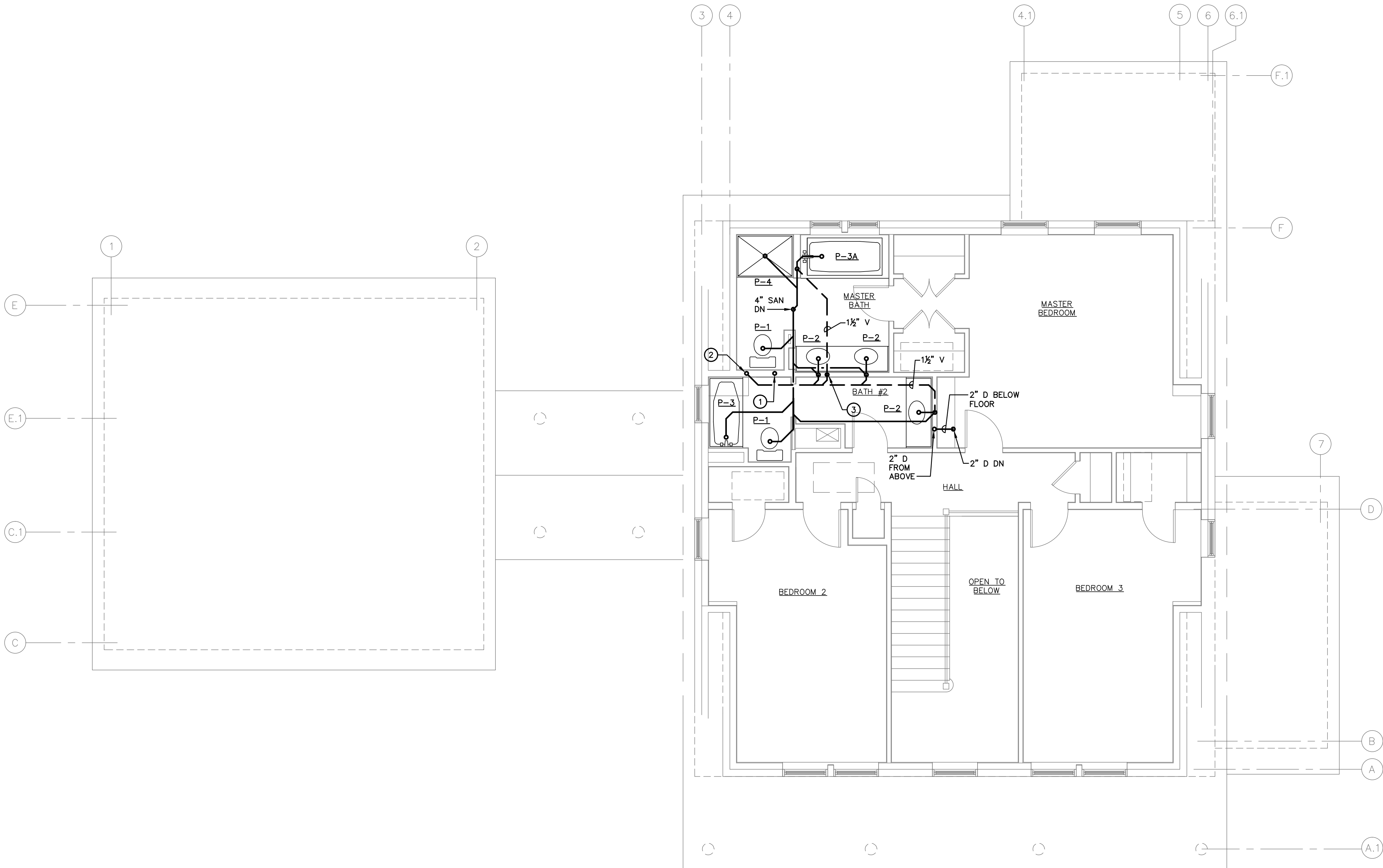
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**SECOND FLOOR PLAN
PLUMBING**

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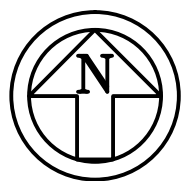


P-103



SECOND FLOOR PLAN - PLUMBING

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



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GRAPHIC SCALE



1/4"=1'-0"

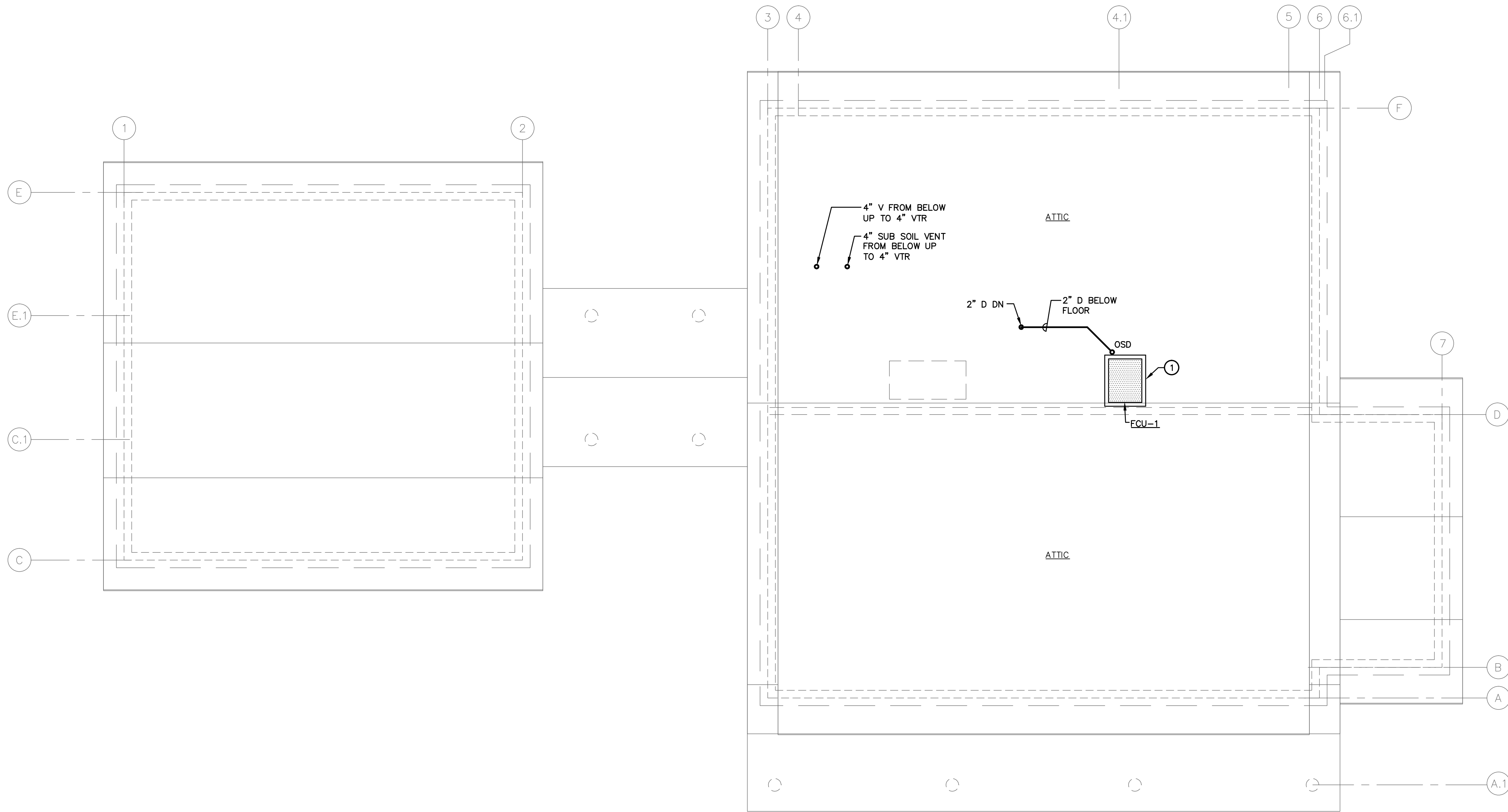
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GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

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.

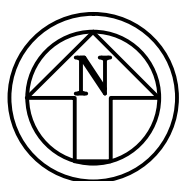
DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

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



ATTIC FLOOR PLAN - PLUMBING

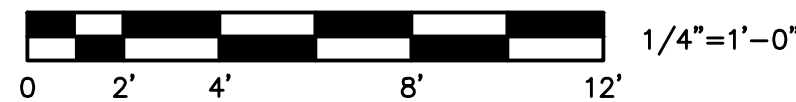
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GRAPHIC SCALE



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CHECKED BY:	EAH

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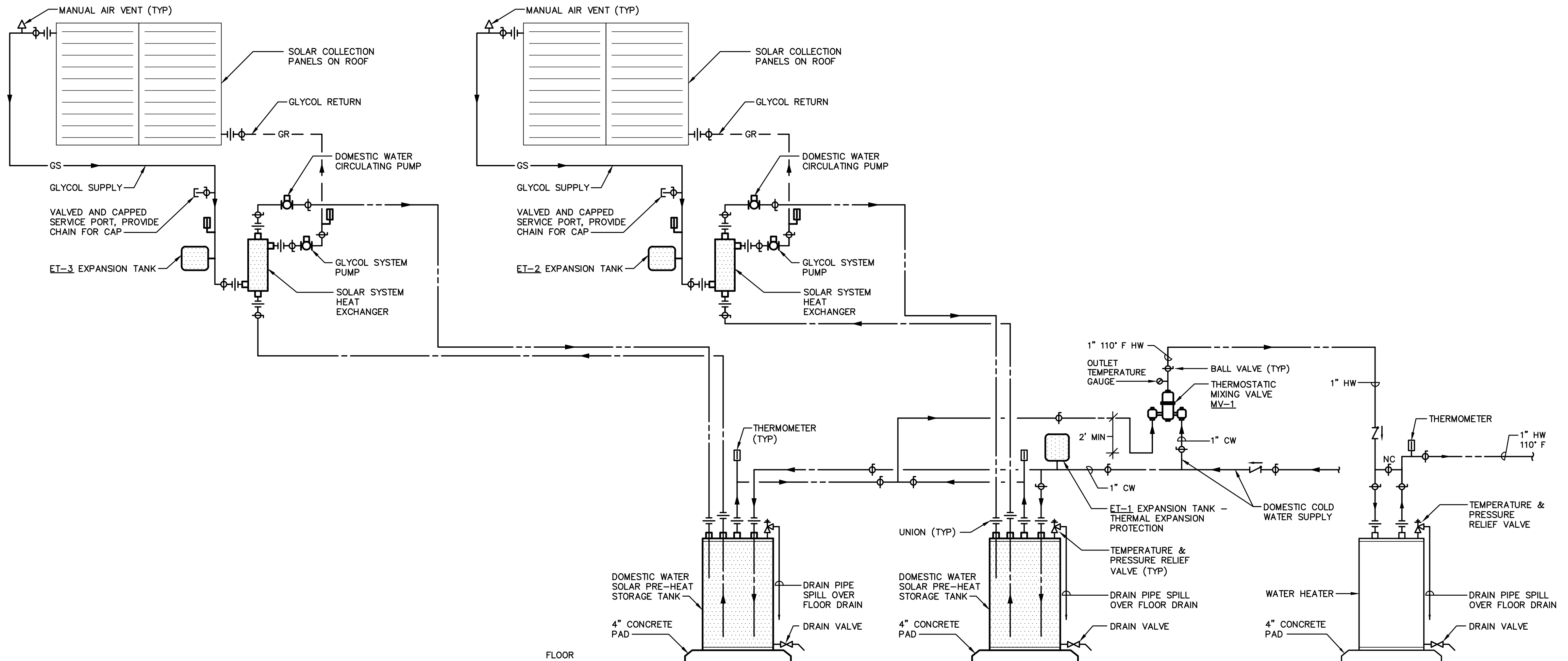
**ATTIC FLOOR PLAN
PLUMBING**

SCALE AS NOTED



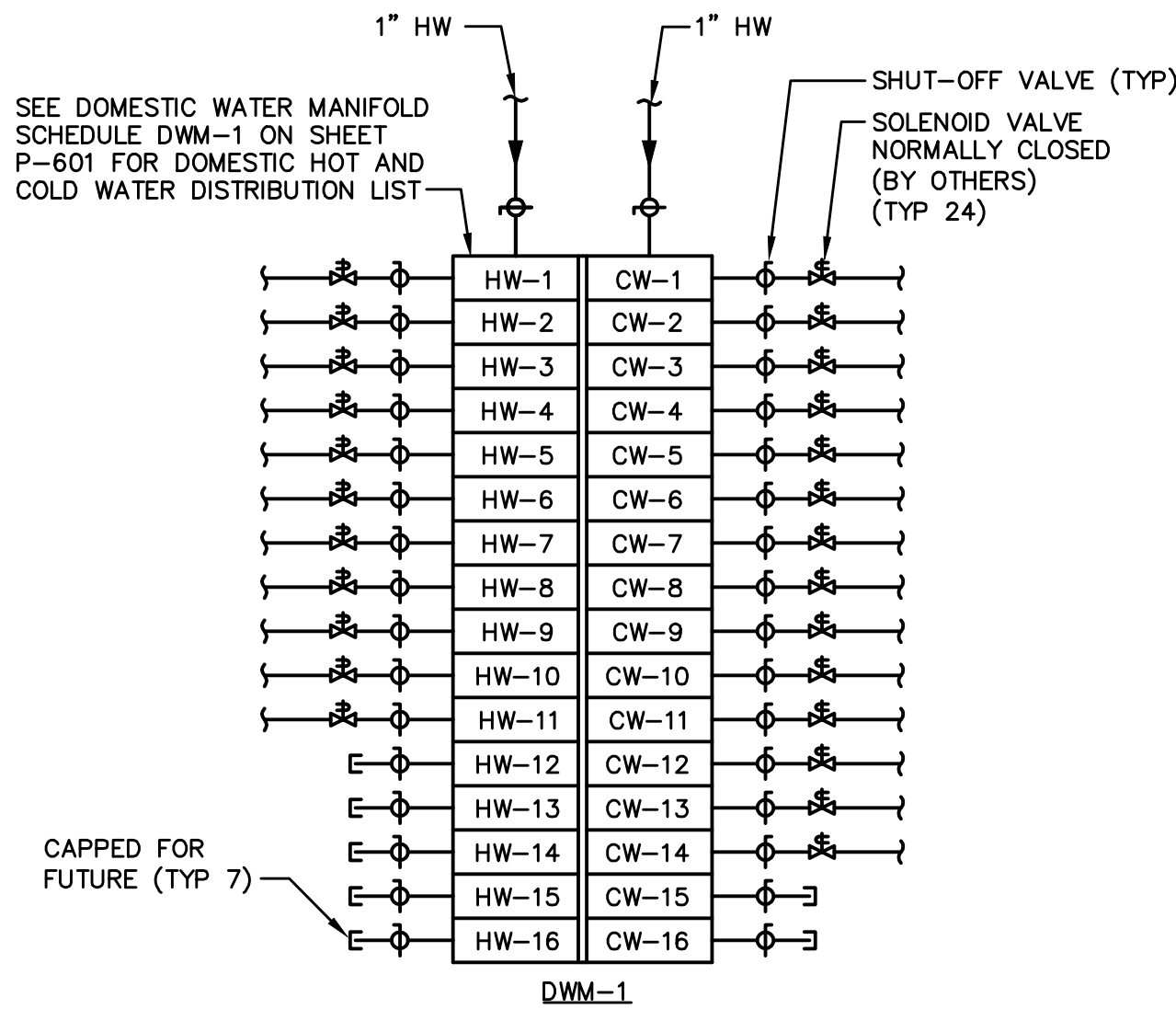
P-104

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- 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



DOMESTIC WATER MANIFOLD DETAIL
NO SCALE

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**PLUMBING
DETAILS**

SCALE AS NOTED



P-501

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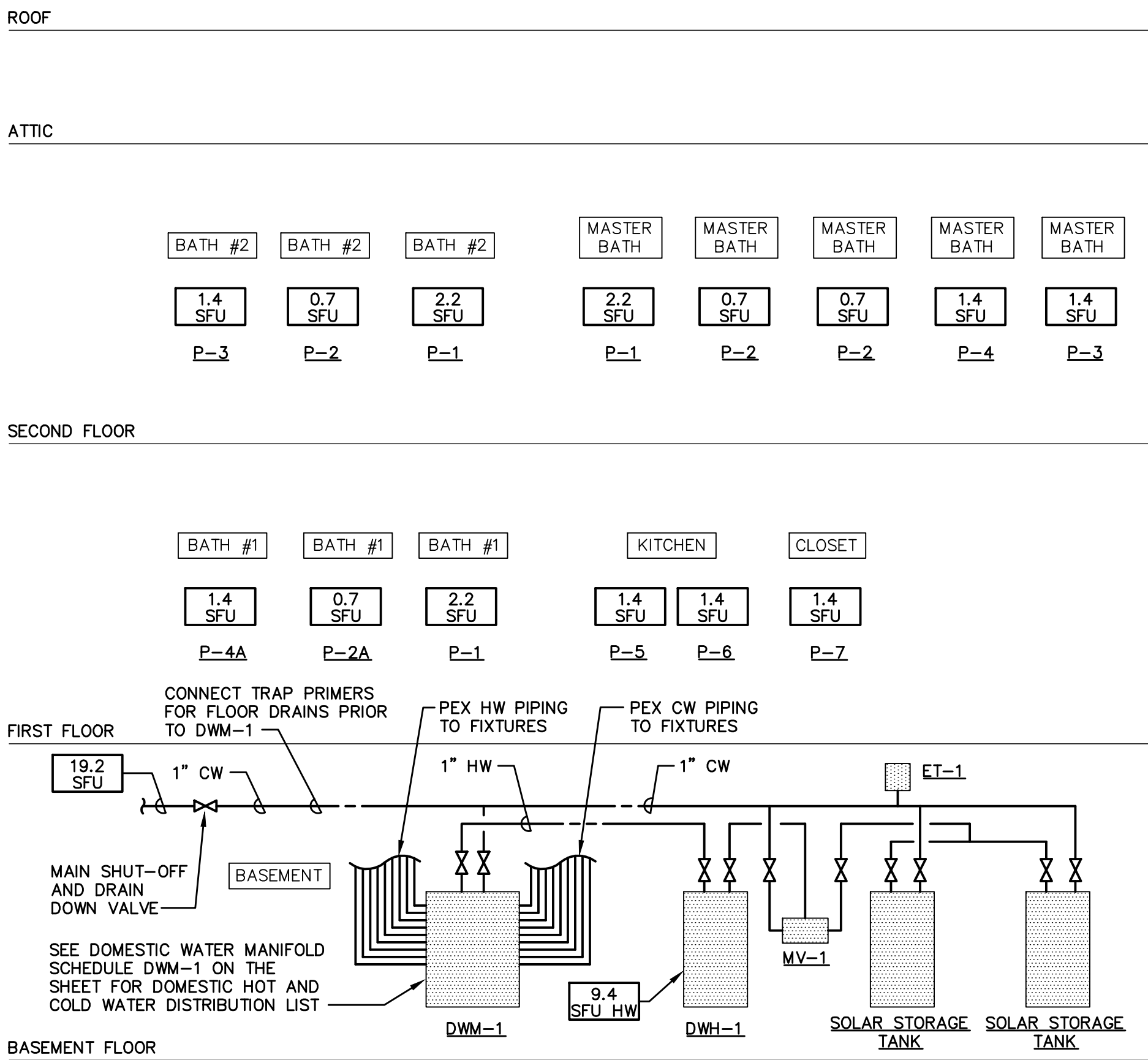
MIXING VALVE SCHEDULE							
UNIT NO	CW CONN (IN)	HW CONN (IN)	DISCHARGE CONN (IN)	DISCHARGE TEMP (°F)	MAX GPM/MAX PRESSURE DROP (PSIG)	NOTES	MANUFACTURER & MODEL NO
MV-1	3/4"	3/4"	1"	110	0.5	1	POWERS 1432-RB
NOTES: 1. WALL MOUNTED							

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:										

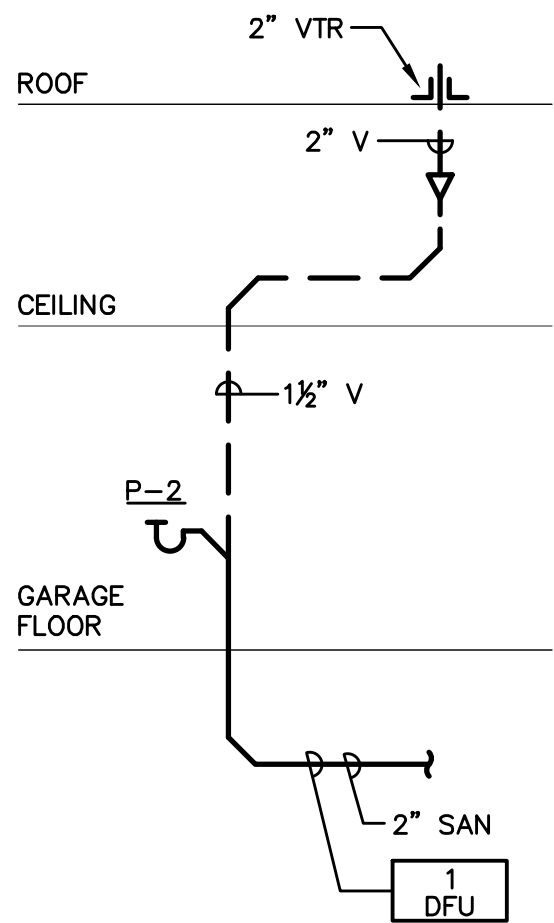
WATER HEATER SCHEDULE						
UNIT NO	STORAGE CAPACITY GALLONS	INPUT KW	ELECTRIC V/PH/Hz	RECOVERY	NOTES	MANUFACTURER & MODEL NO
DWH-1	80	4.0	240/1/60	1ST HR RAITING 72 GPH	1, 2	-
DWH-2	N/A	3.4	240/1/60	0.5 GPM @ 48" RISE	3	-
NOTES: 1. ASME LISTED 2. UL LISTED 3. INSTANTANEOUS						

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

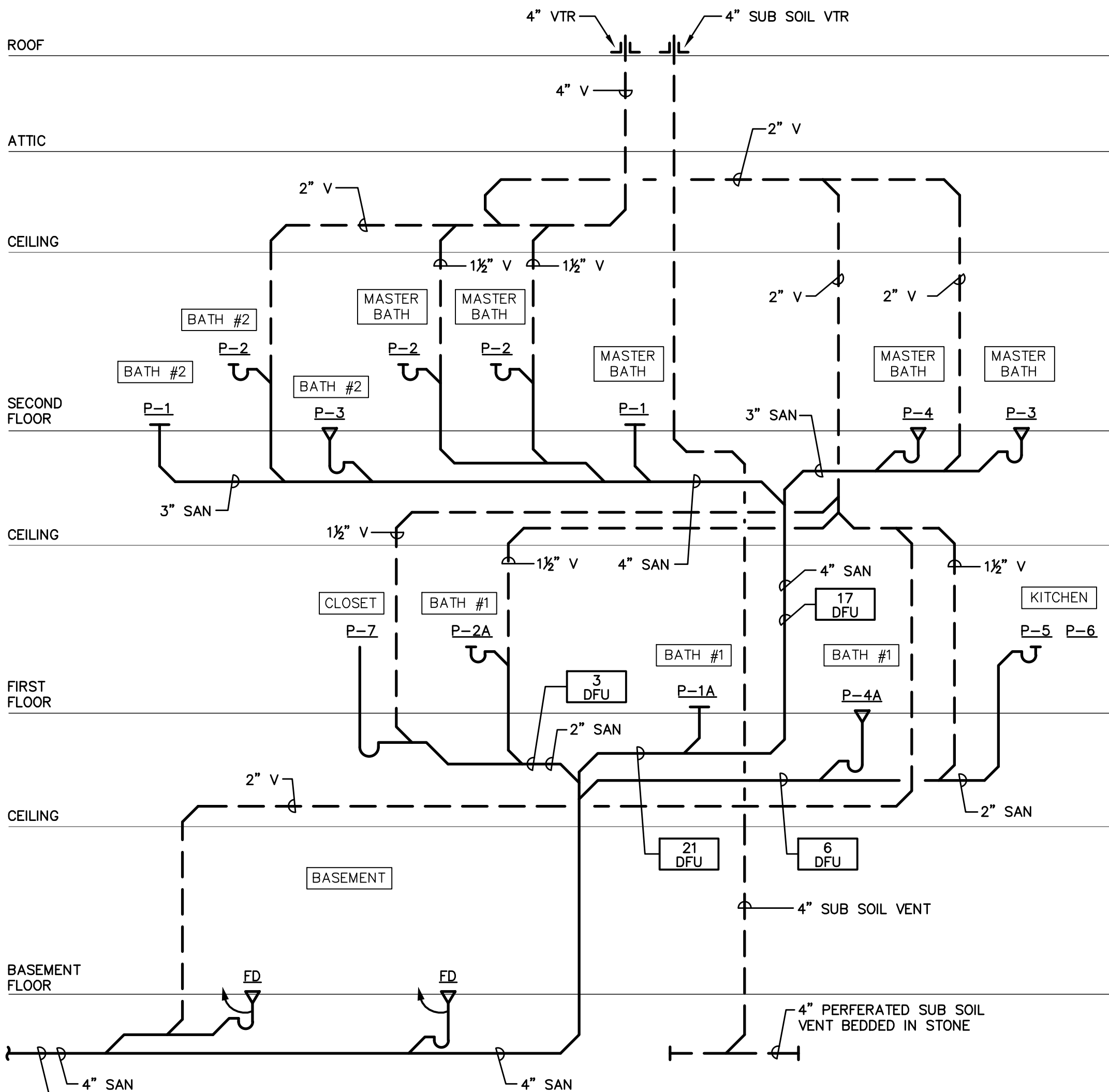
PLUMBING FIXTURE SCHEDULE											
UNIT NO	FIXTURE	CW	HW	WASTE	VENT	NOTES	WSSC				MANUFACTURER & MODEL NO
							DFU'S	HW SFU'S	CW SFU'S	TOTAL SFU'S	
P-1	WATER CLOSET	1/2"	-	3"	2"	2	4	-	2.2	2.2	-
P-1A	WATER CLOSET	1/2"	-	3"	2"	1,2	4	-	2.2	2.2	-
P-2	LAVATORY	1/2"	1/2"	1 1/2"	1 1/2"	5	1	0.5	0.5	0.7	-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

National Institute of
Standards and Technology

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD



U.S. DEPARTMENT OF
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PROJECT NO: NIST NZERTF

CAD DWG FILE: 09-247 P-601

DRAWN BY: PJP

CHECKED BY: EAH

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SHEET TITLE:

PLUMBING RISERS AND SCHEDULES

SCALE AS NOTED



P-601

GENERAL NOTES: (APPLY TO ALL DRAWINGS)

- 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.
- 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.
- ELEVATIONS NOTED ARE TO CENTERLINES OF PIPES FOR ALL PRESSURE LINES AND TO INVERT FOR ALL GRAVITY FLOW LINES.
- MAINTAIN MINIMUM OF 3'-0" COVER OVER UNDERGROUND WATER MAINS AND MINIMUM OF 2'-6" COVER OVER UNDERGROUND SEWERS AND DRAINS.
- 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.
- UNLESS OTHERWISE NOTED, ALL PIPING AND DUCTWORK IS OVERHEAD, TIGHT TO UNDERSIDE OF SLAB, WITH SPACE FOR INSULATION IF REQUIRED.
- INSTALL PIPING AND DUCTWORK SO THAT ALL VALVES AND DAMPERS ARE ACCESSIBLE.
- COORDINATE ALL MECHANICAL WORK WITH ELECTRICAL WORK, ETC., SHOWN ON OTHER DRAWINGS.
- 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.
- 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.
- 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.
- DUCTS ARE SIZED FOR COOLING TO ALLOW INSTALLATION OF CENTRAL COOLING IF SPECIFIED. SEE MECHANICAL SPECIFICATION FOR COOLING LOAD.
- 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.
- AIRFLOWS BELOW 20 CFM ARE NOT SUBJECT TO TAB BALANCING REQUIREMENTS.
- ALL DUCTS TO BE SEALED WITH MASTIC AND LOCATED IN CONDITIONED SPACE.
- ALL DUCTS TO BE ARRANGED AND INSTALLED IN SUCH MANNER AS TO OFFER MINIMUM AIRFLOW RESISTANCE.
- ALL REGISTERS TO HAVE ADJUSTABLE TURNING VANES AND CLOSE-OFF DAMPER.
- A MANUAL DAMPER TO BE LOCATED AT EACH TAKE-OFF / MAIN TRUNK JUNCTION TO CONTROL FLOW.
- A NORMALLY OPEN MOTORIZED DAMPER TO BE LOCATED AT EACH TAKE-OFF /MAIN TRUNK JUNCTION TO ALLOW AUTOMATED CONTROL.
- TRANSFER GRILLES TO BE PROVIDED FOR PRESSURE RELIEF / PRESSURE EQUALIZATION BETWEEN CLOSED ROOMS AND COMMON AREAS AND BETWEEN BEDROOM CLOSETS AND BEDROOMS.
- DOORS TO BE UNDERCUT 3/4" BETWEEN TOP OF FINISH FLOOR AND UNDERSIDE OF DOOR.
- AIR HANDLER TO BE LOCATED AND ACCESSED WITHIN INTERIOR CONDITIONED SPACE.
- RETURN DUCT TO BE BUILT WITH TWO OFFSET BENDS TO REDUCE SOUND TRANSMISSION AND A VIBRATION ISOLATION SECTION.
- A FILTER WITH A MERV 13 RATING TO BE INSTALLED AT THE AIR HANDLER.
- HEAT RECOVERY VENTILATOR TO BE INSTALLED TO SUPPLY FRESH AIR TO INTERIOR.
- ALL DUCTWORK TO BE SHEET METAL. SUPPLY TRUNKS IN BASEMENT TO BE INSULATED TO R-4.2.

HEAT RECOVERY VENTILATOR:

- SUPPLY AND EXHAUST DUCTS BETWEEN HEAT RECOVERY VENTILATOR AND EXTERIOR TO BE INSULATED ALONG THE ENTIRE LENGTH TO CONTROL CONDENSATION.
- 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'.
- 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—	V	VENT
—D—	D	(A/C) CONDENSATE DRAIN
===	FDN	FOUNDATION DRAIN
—•—	CO	CLEANOUT; LINE; FLOOR
---	IW	INDIRECT WASTE
—D-1—	D-1	FLOOR DRAIN
—RG—	RG	REFRIGERANT HOT GAS
—RL—	RL	REFRIGERANT LIQUID
—D-1—	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
—		THERMOSTAT AHU W/8 20 GAUGE SHIELDED WIRE CABLE TO ZONE CONTROLLER IN BASEMENT
—		THERMOSTAT FCU
—		THERMOSTAT BLANK W/8 20 GAUGE SHIELDED WIRE CABLE TO ZONE CONTROLLER IN BASEMENT
—		TEMPERATURE SENSOR
—		HUMIDISTAT
—		SENSOR
—		VACUUM BREAKER
—	SA	SHOCK ABSORBER
—	MAV	MANUAL AIR VENT
—	HB	HOSE BIBB WITH VACUUM BREAKER
—		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




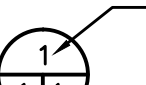


MECHANICAL ABBREVIATIONS

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
		FLEXIBLE DUCT CONNECTION
		AIR FLOW MEASURING DEVICE
		MANUAL VOLUME DAMPER
		BACKDRAFT DAMPER
		FIRE DAMPER (1-1/2 HOUR UNLESS OTHERWISE NOTED)
		SMOKE DETECTOR
		MOTOR OPERATED DAMPER
		DIFFERENTIAL PRESSURE SWITCH
		SMOKE DAMPER
		RISE IN DUCT (DIRECTION OF AIR FLOW)
		DROP IN DUCT (DIRECTION OF AIR FLOW)
		ACCESS DOOR
		BRANCH WITH 45° TAP
		PRE-FABRICATED ROUND BRANCH FITTING WITH VOLUME DAMPER
		FLEXIBLE DUCTWORK BRANCH WITH VOLUME DAMPER FROM ROUND BRANCH FITTING
		TRANSITION
		3 WAY SPLIT IN MAINS AREA "A" IS EQUAL TO SUM OF AREAS "B", "C" & "D"
		2 WAY SPLIT IN MAINS AREA "A" IS EQUAL TO SUM OF AREAS "B" & "C" ALL SQUARE ELBOWS SHALL HAVE TURNING VANES
		2 WAY SPLIT AT END OF MAIN, AREA "A" IS EQUAL TO SUM OF AREAS "B" & "C"
		2 WAY OVER & UNDER SPLIT AT END OF MAIN, AREA "A" IS EQUAL TO SUM OF AREAS "B" & "C"
		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

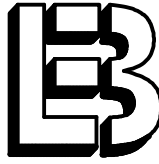
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	SECTION LETTER
	SHEET NO. WHERE SECTION IS SHOWN
	SHEET NO. WHERE SECTION IS CUT
<u>PARTIAL PLAN/DETAIL DESIGNATION</u>	
	DETAIL NO.
	SHEET NO. WHERE ITEM IS SHOWN
	SHEET NO. WHERE ITEM IS TAKEN

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**NET ZERO ENERGY
RESIDENTIAL TEST
FACILITY**

NIST Campus
Gaithersburg, MD



U.S. DEPARTMENT OF
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MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 M-001
DRAWN BY:	PJP
CHECKED BY:	EAH

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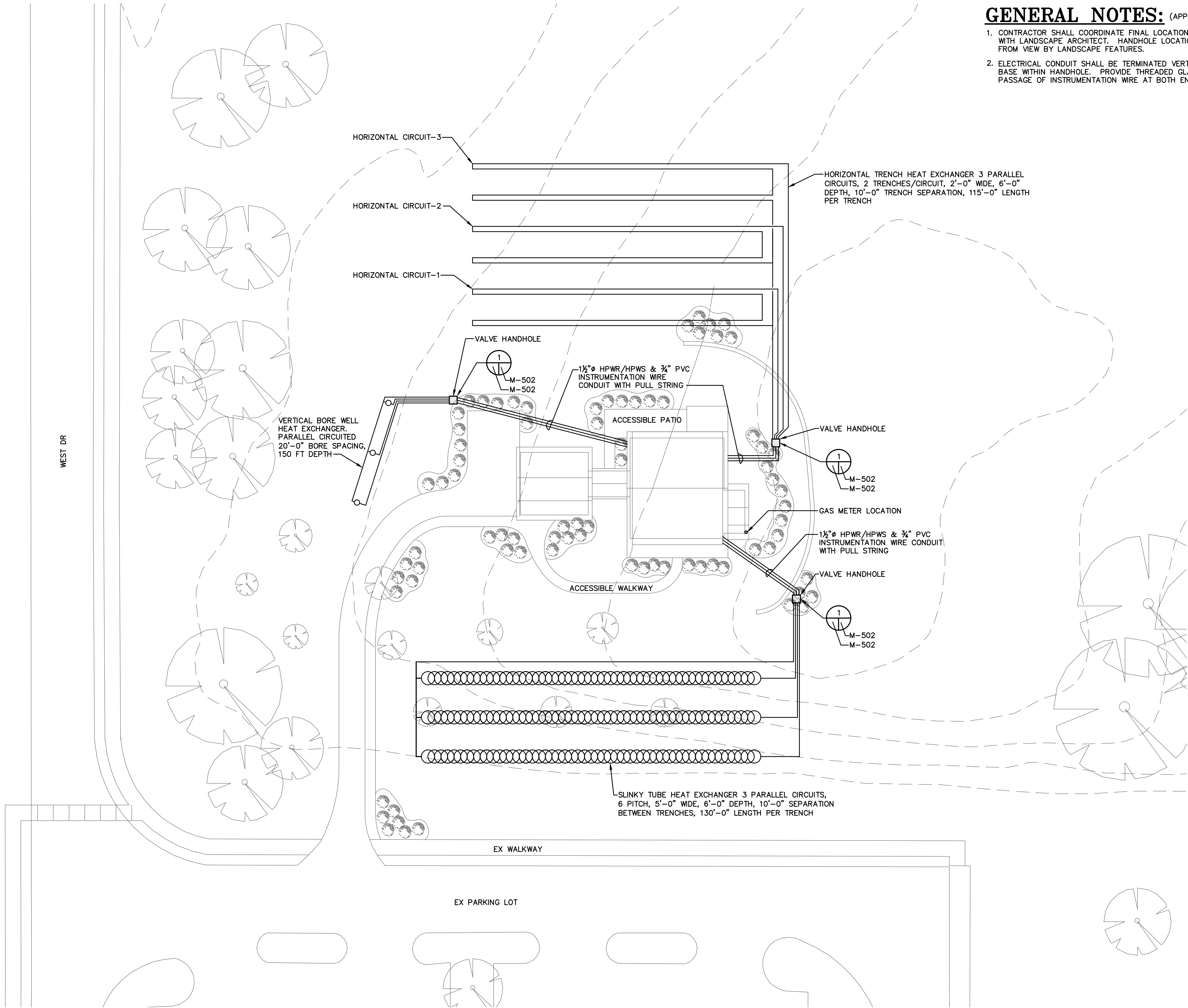
MECHANICAL LEGEND
SCHEDULES &
DETAILS

SCALE AS NOTED



M-001

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- 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.

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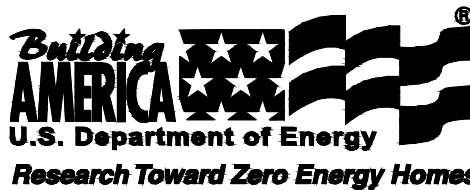
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CAD DWG FILE:	09-247 M-002
DRAWN BY:	PJP
CHECKED BY:	EAH

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SHEET TITLE:

**MECHANICAL
SITE PLAN**

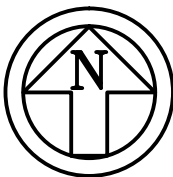
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M-002

MECHANICAL - SITE PLAN

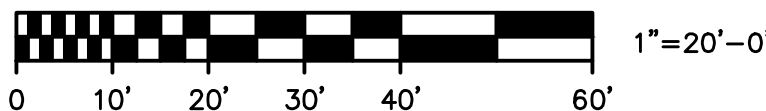
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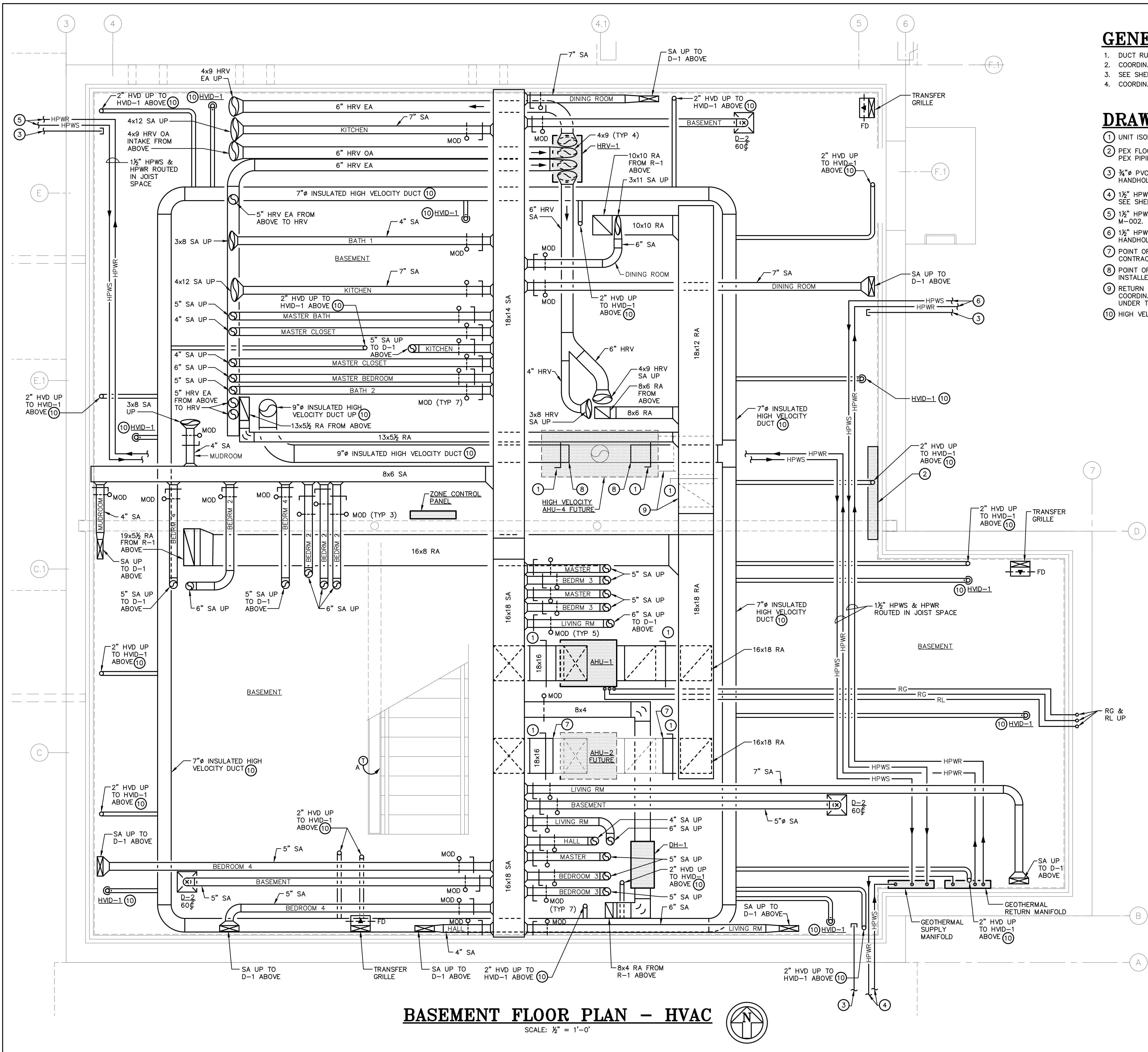
CAUTION:

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

GRAPHIC SCALE

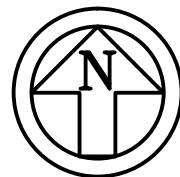


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BASEMENT FLOOR PLAN - HVAC

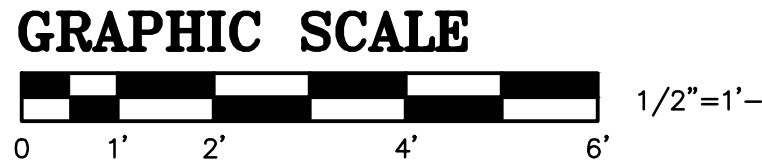
SCALE: 1/2" = 1'-0"



- GENERAL NOTES:** (APPLY TO THIS SHEET ONLY)
- DUCT RUNOUTS ARE LOCATED WITHIN JOIST BAY & PARALLEL TO JOISTS
 - COORDINATE WITH ELECTRICAL, PLUMBING & ARCHITECTURAL PLANS.
 - SEE SHEET M-501 FOR MECHANICAL DUCTWORK DETAILS.
 - COORDINATE ALL WALL PENETRATIONS WITH ARCHITECTURAL PLANS.

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

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

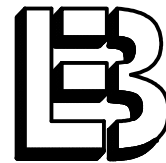


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PROJECT:
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U.S. DEPARTMENT OF
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MARK	DATE	DESCRIPTION
	07/27/10	HIGH VELOCITY OPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

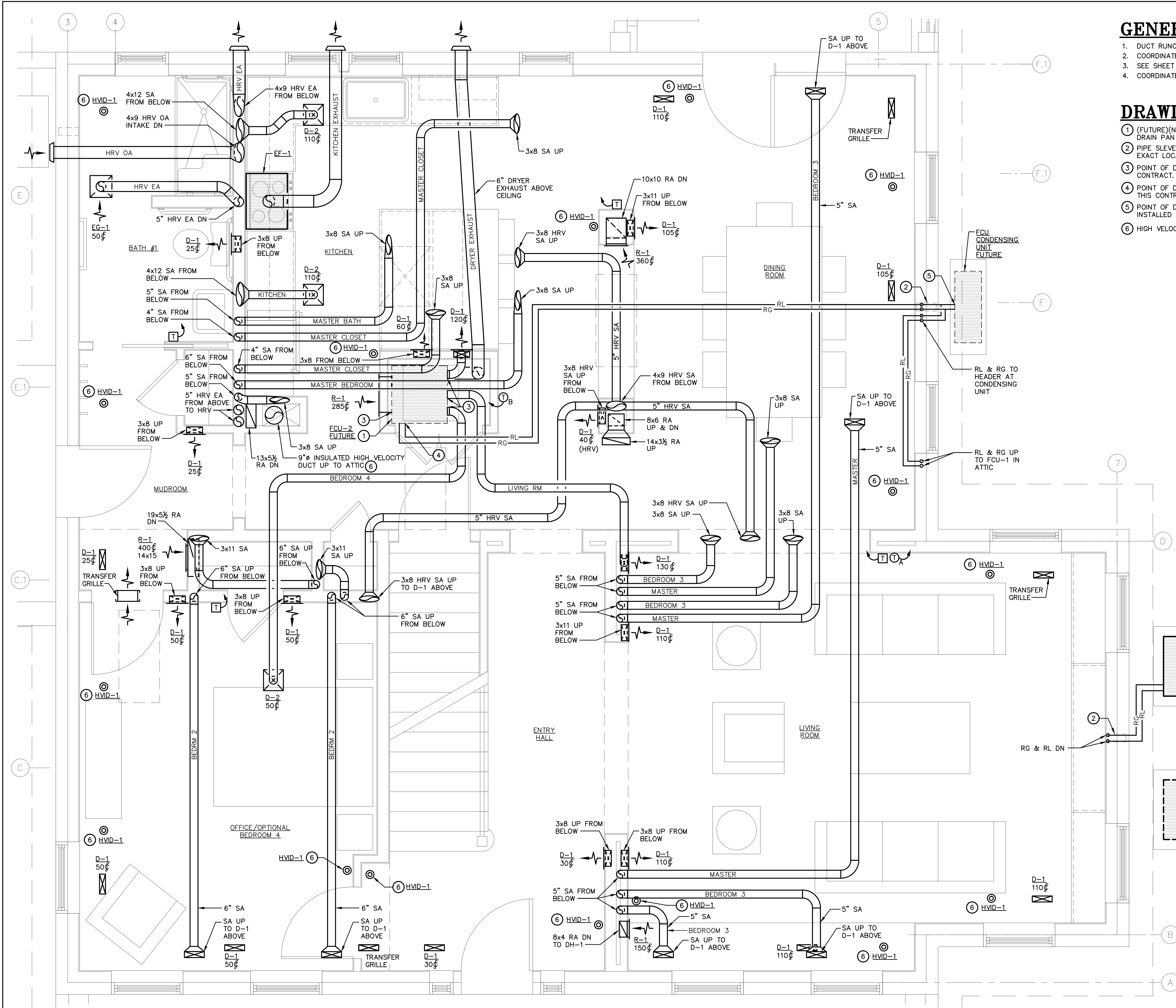
PROJECT NO: NIST NZERTF
CAD DWG FILE: 09-247 M-101-A1
DRAWN BY: PJP
CHECKED BY: EAH

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SHEET TITLE:

**BASEMENT FLOOR
PLAN HVAC**

SCALE AS NOTED

M-101



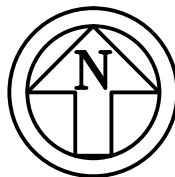
GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

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 SLEEVE 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.

FIRST FLOOR PLAN - HVAC
SCALE: 1/2" = 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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Building America
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Research Toward Zero Energy Homes

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CAD DWG FILE:	09-247 M-102-A1
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SHEET TITLE:	

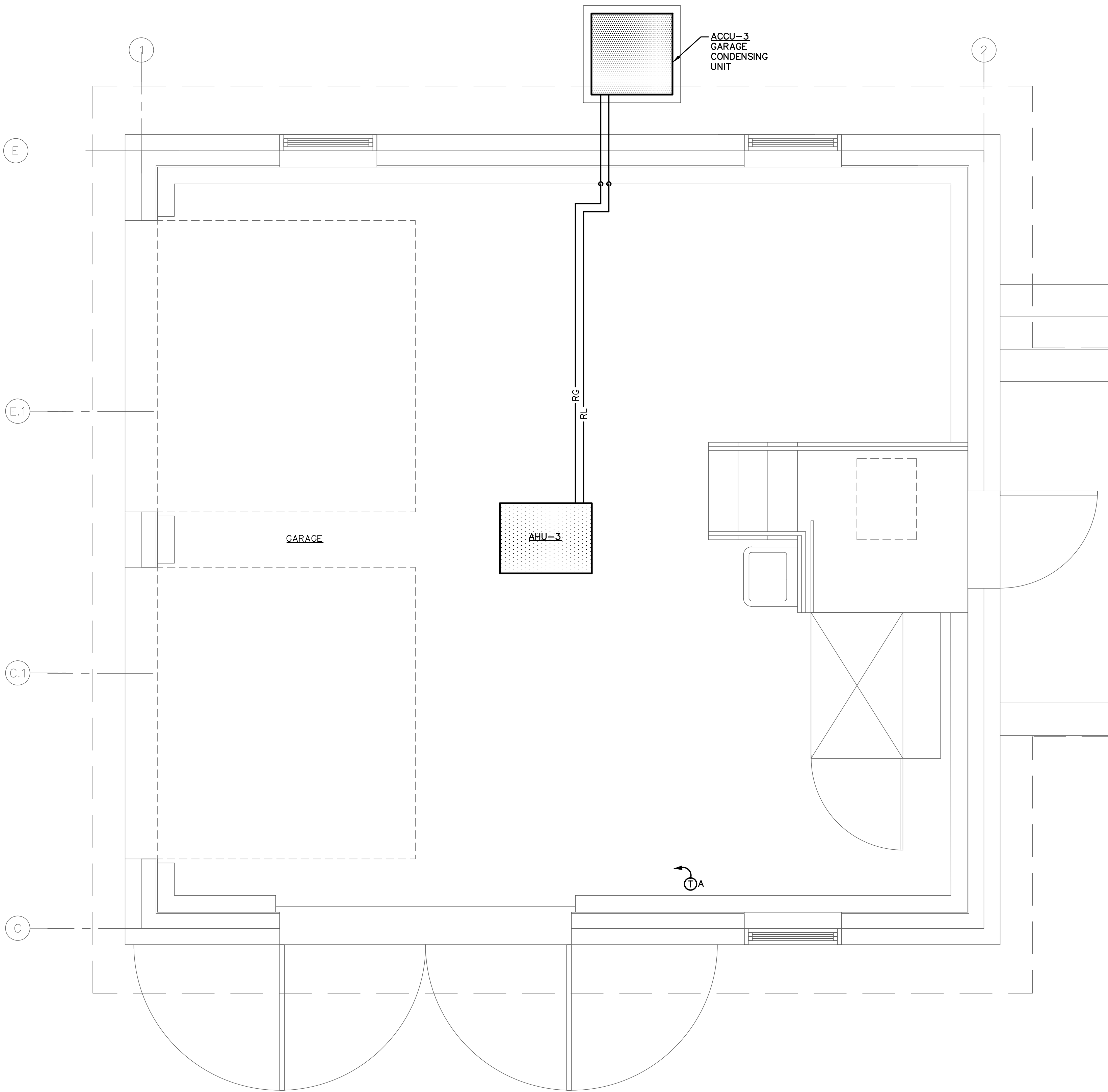
FIRST FLOOR PLAN HVAC

SCALE AS NOTED

M-102

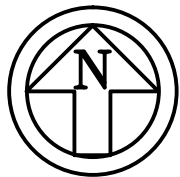
GENERAL NOTES: (APPLY TO THIS SHEET ONLY)

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: 1/2" = 1'-0"



CAUTION:

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

GRAPHIC SCALE



1/2"=1'-0"

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CAD DWG FILE:	09-247 M-103
DRAWN BY:	PJP
CHECKED BY:	EAH

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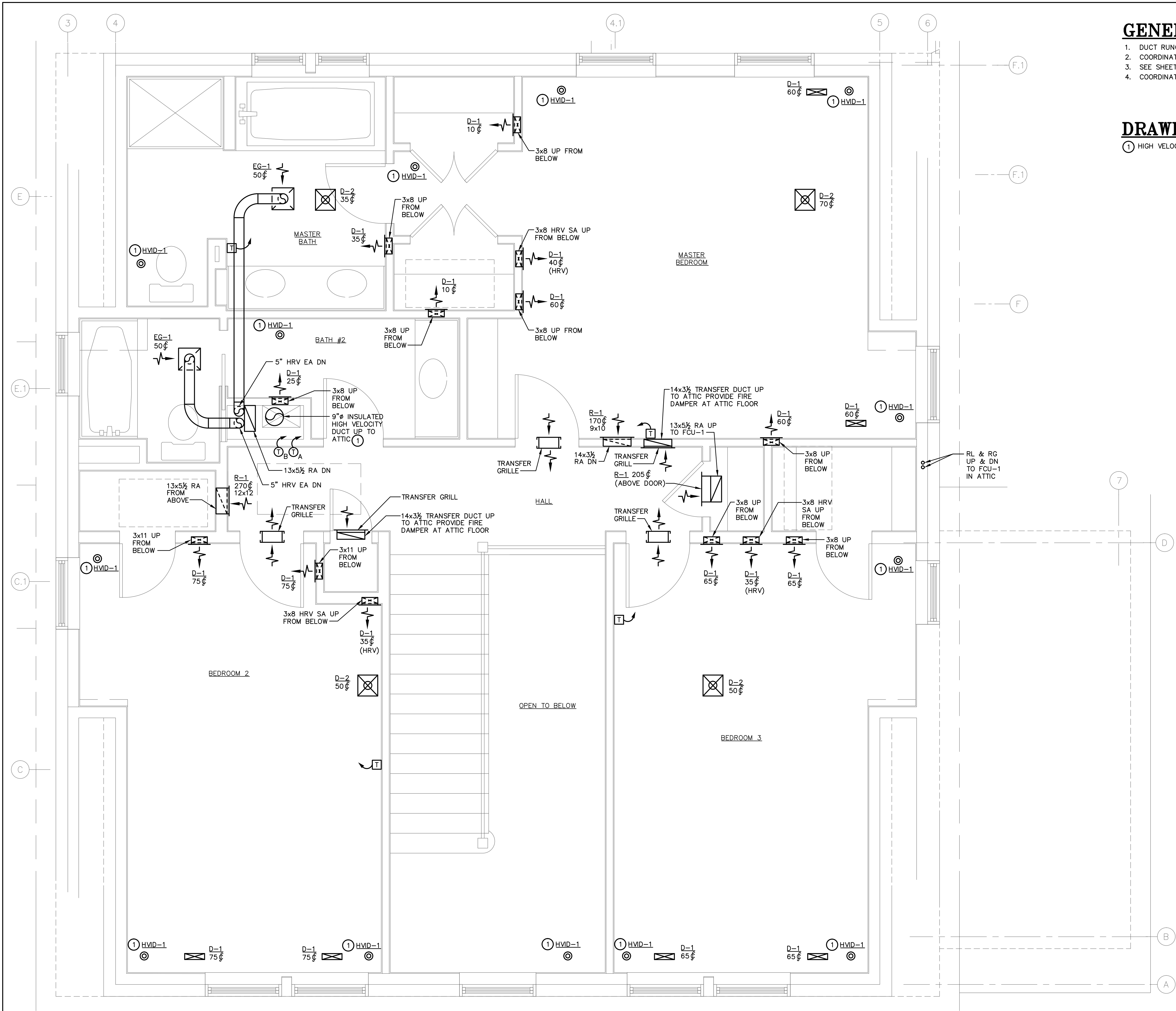
FIRST FLOOR PLAN
GARAGE HVAC

SCALE AS NOTED

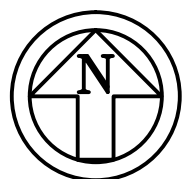


M-103

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SECOND FLOOR PLAN - HVAC
SCALE: 1/2" = 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.

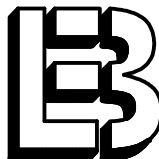
GRAPHIC SCALE
0 1' 2' 4' 6' 1/2"=1'-0"

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CAD DWG FILE: 09-247 M-104-A1
DRAWN BY: PJP
CHECKED BY: EAH

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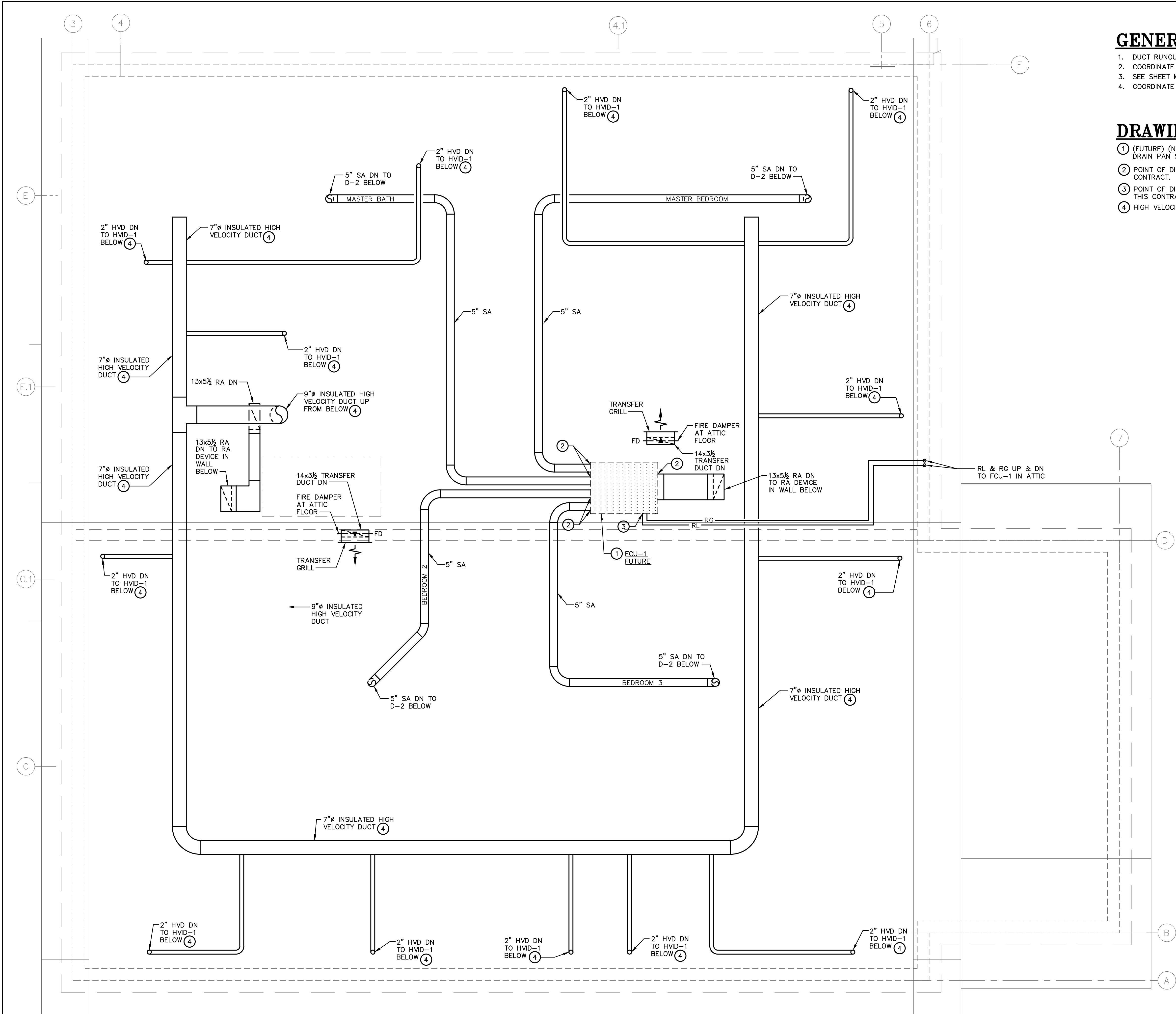
SECOND FLOOR PLAN
HVAC

SCALE AS NOTED



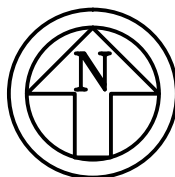
M-104

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ATTIC FLOOR PLAN - HVAC

SCALE: 1/2" = 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.

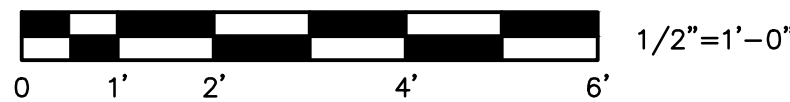
DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

- 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

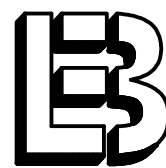


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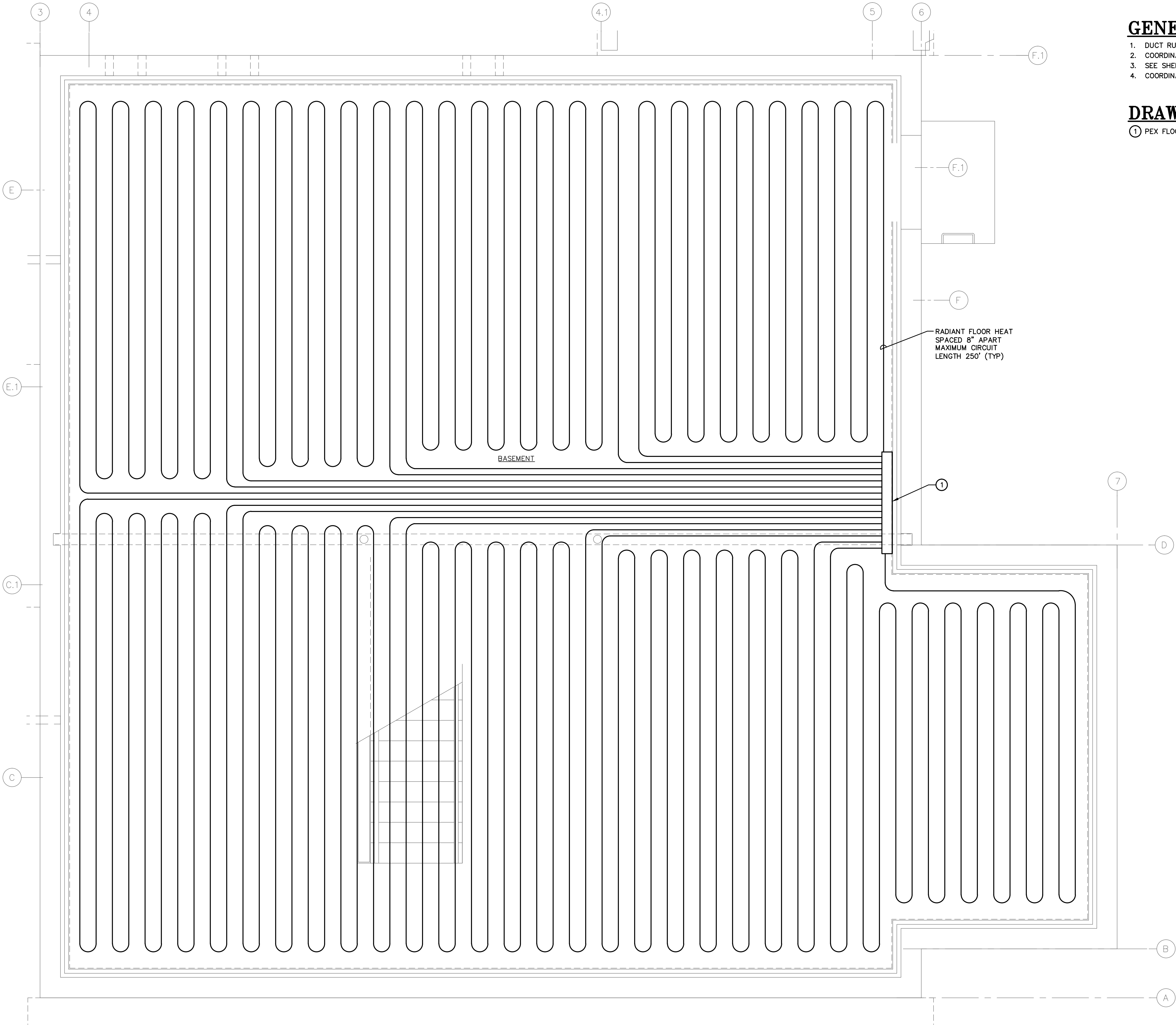
ATTIC FLOOR PLAN
HVAC

SCALE AS NOTED



M-105

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- 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.

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CAD DWG FILE: 09-247 M-106

DRAWN BY: PJP

CHECKED BY: EAH

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SHEET TITLE:

**BASEMENT FLOOR
PLAN RADIANT
FLOOR HEAT**

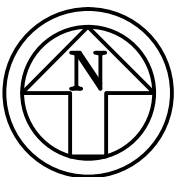
SCALE AS NOTED



M-106

BASEMENT FLOOR PLAN – RADIANT FLOOR HEAT

SCALE: 1/2" = 1'-0"



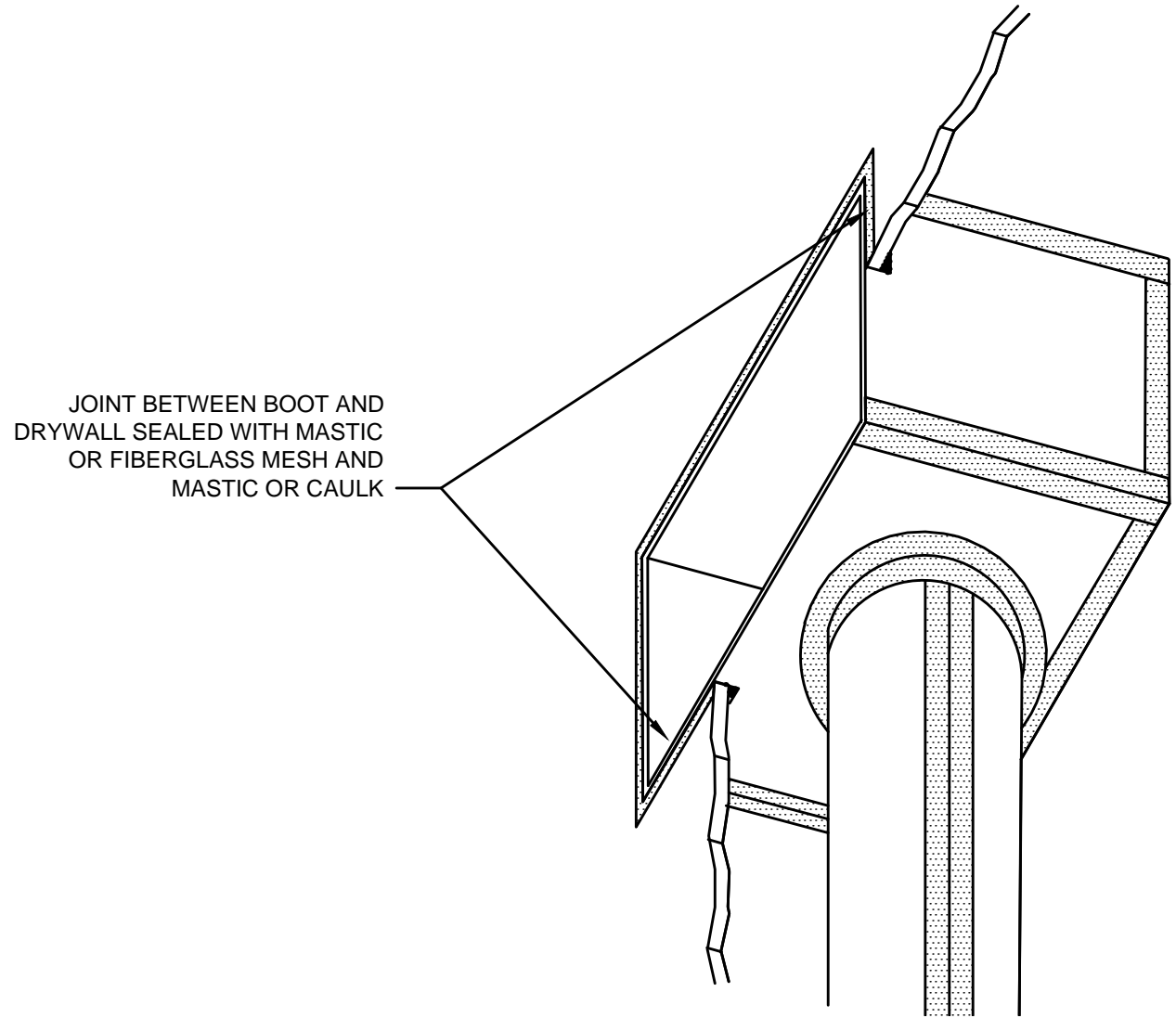
CAUTION:

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SCALES MUST BE USED.

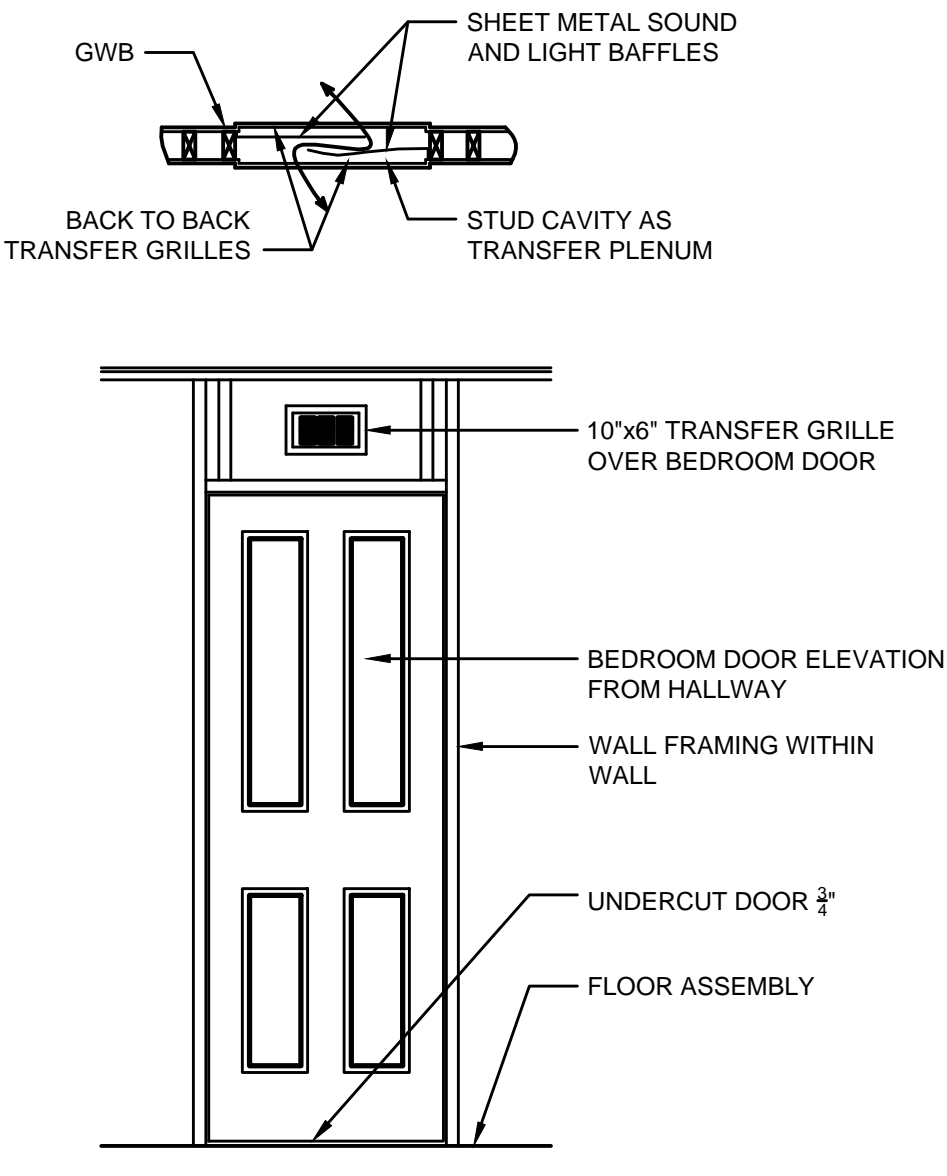
GRAPHIC SCALE



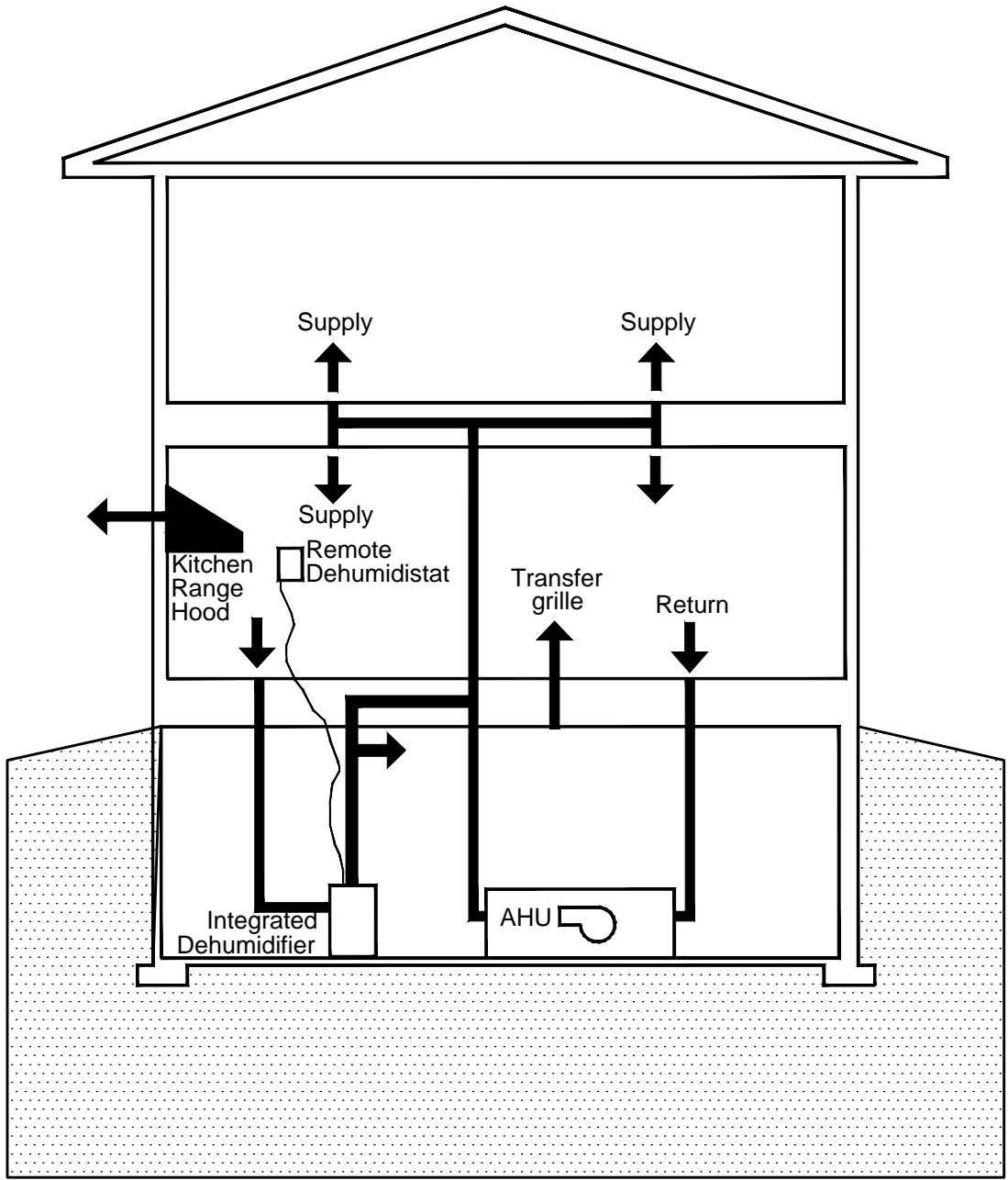
1/2"=1'-0"



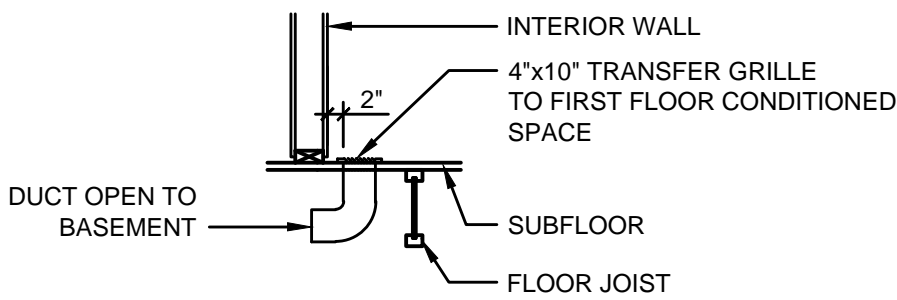
WALL REGISTER AIR SEALING DETAIL
NO SCALE



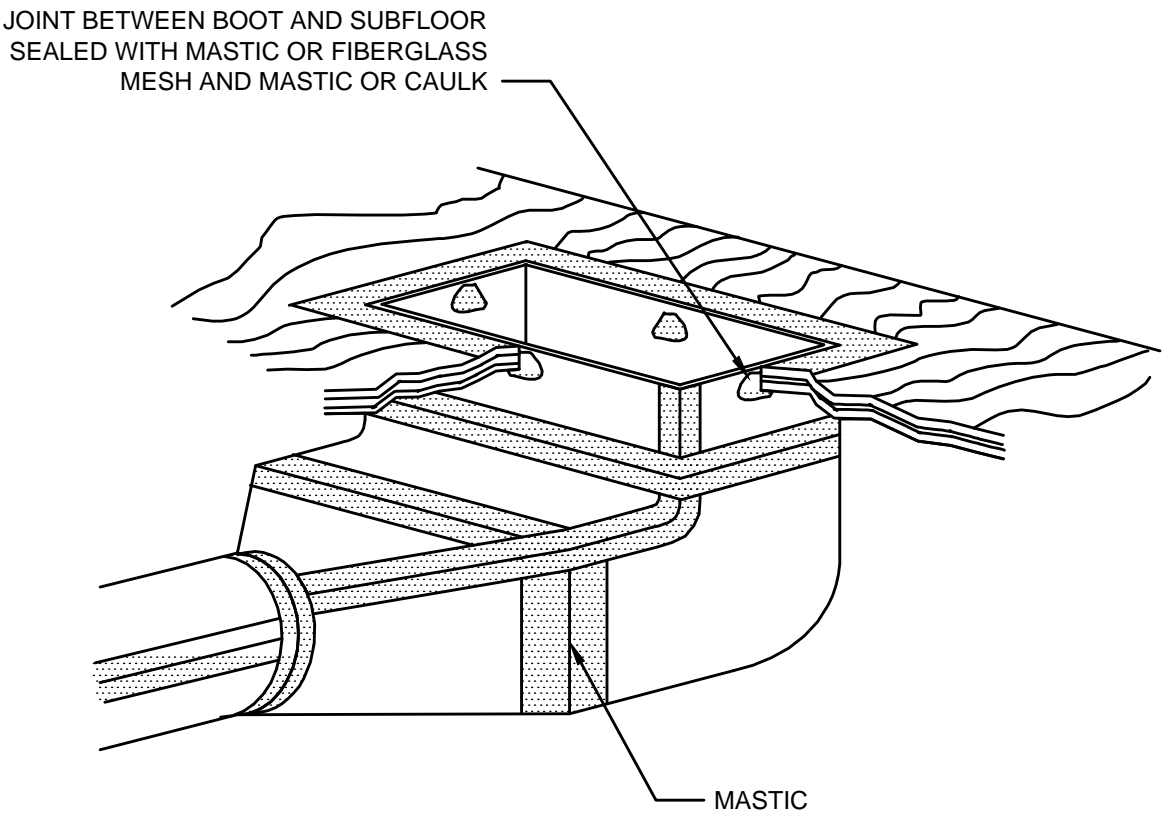
DOOR TRANSFER GRILLE DETAIL
SCALE: 1/2" = 1'-0"



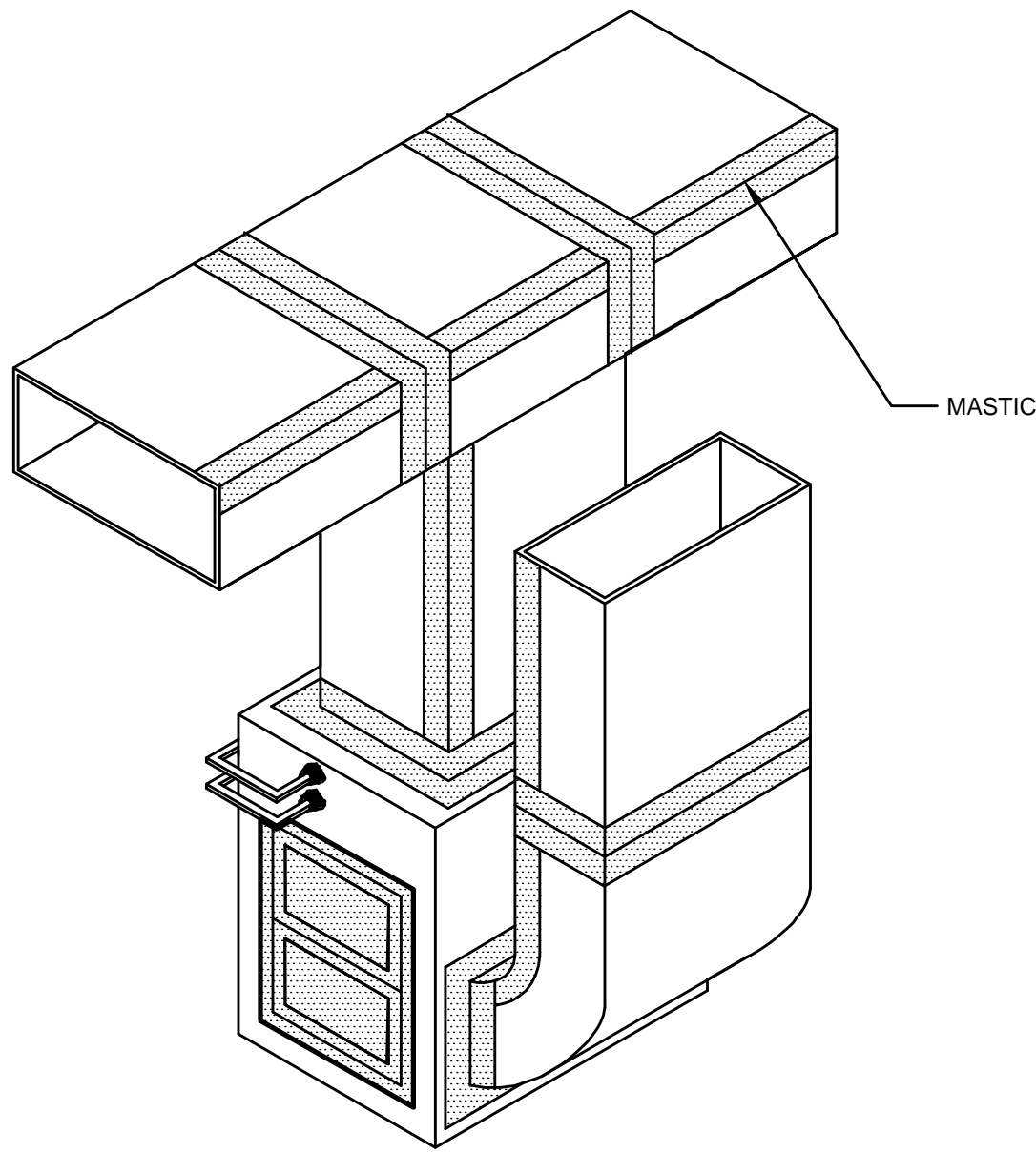
DEHUMIDIFIER SCHEMATIC
NO SCALE



BASEMENT TRANSFER GRILLE DETAIL
SCALE: 1/2" = 1'-0"



FLOOR BOOT AIR SEALING DETAIL
NO SCALE



AIR HANDLER AIR SEALING DETAIL
NO SCALE

CAUTION:
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GRAPHIC SCALE

0 1' 2' 3' 4' 5' 6' 1/2"=1'-0"

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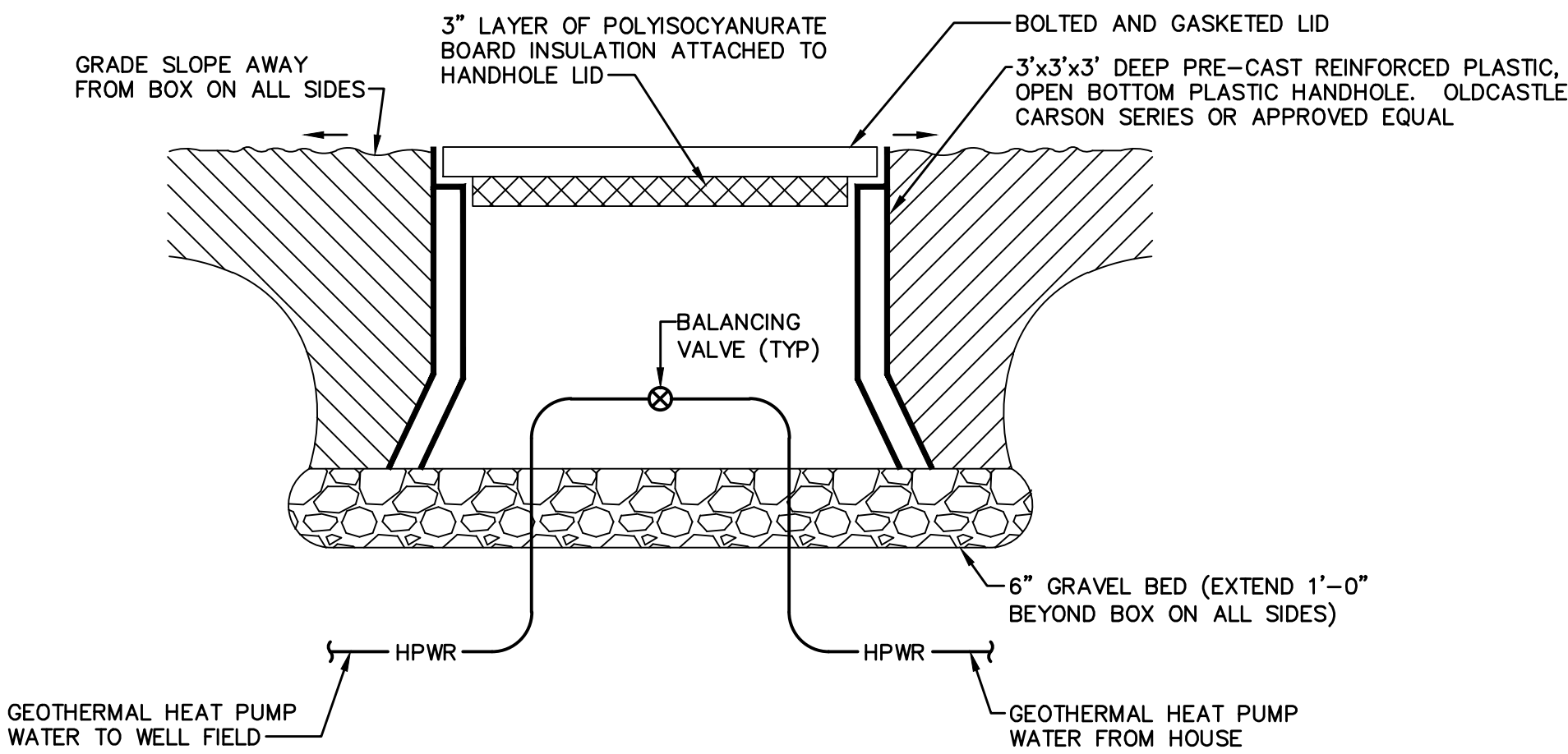
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**MECHANICAL
DETAILS**

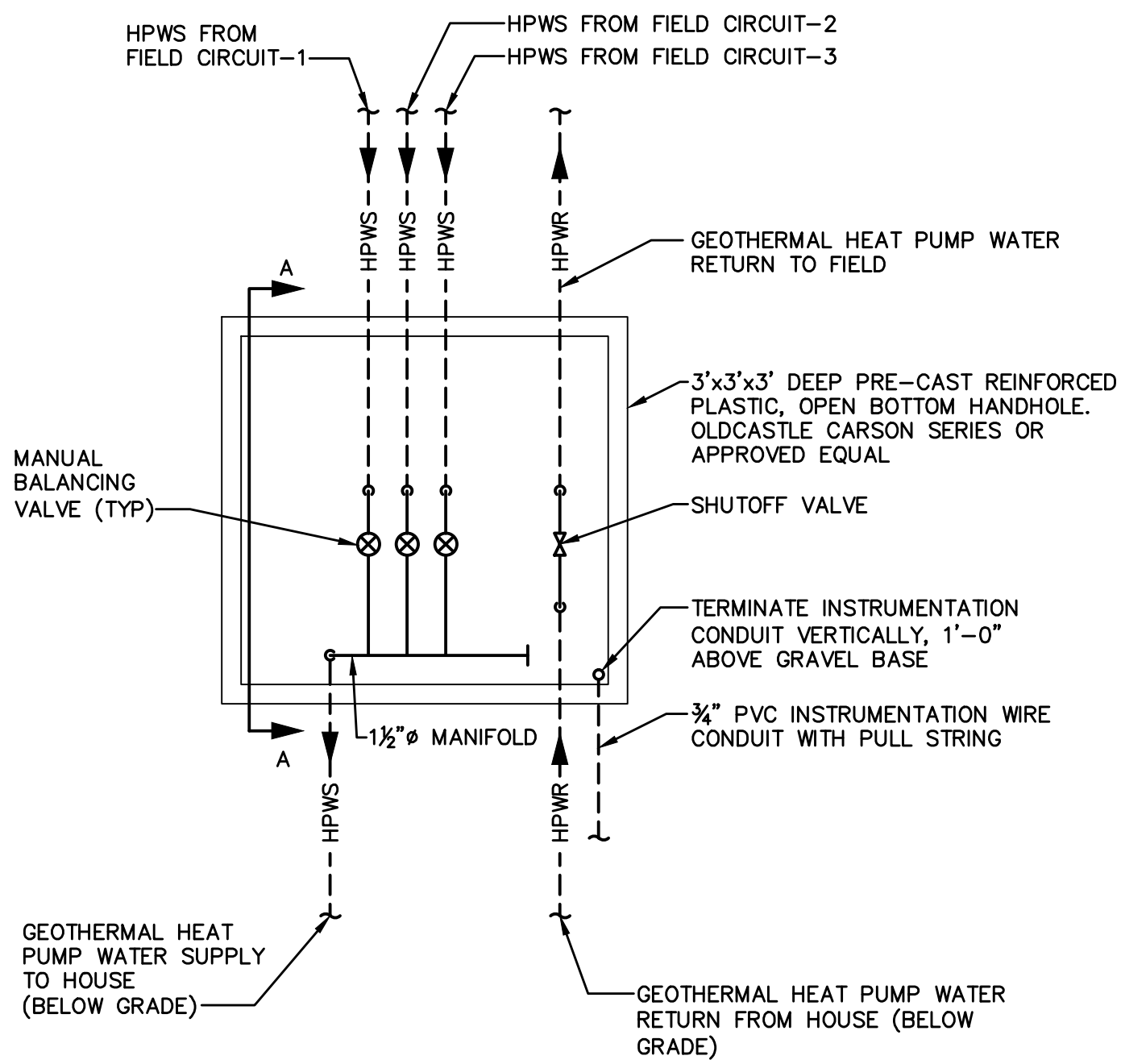
SCALE AS NOTED



M-501

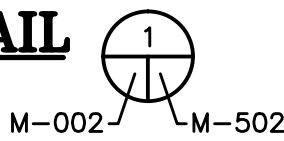


SECTION A-A

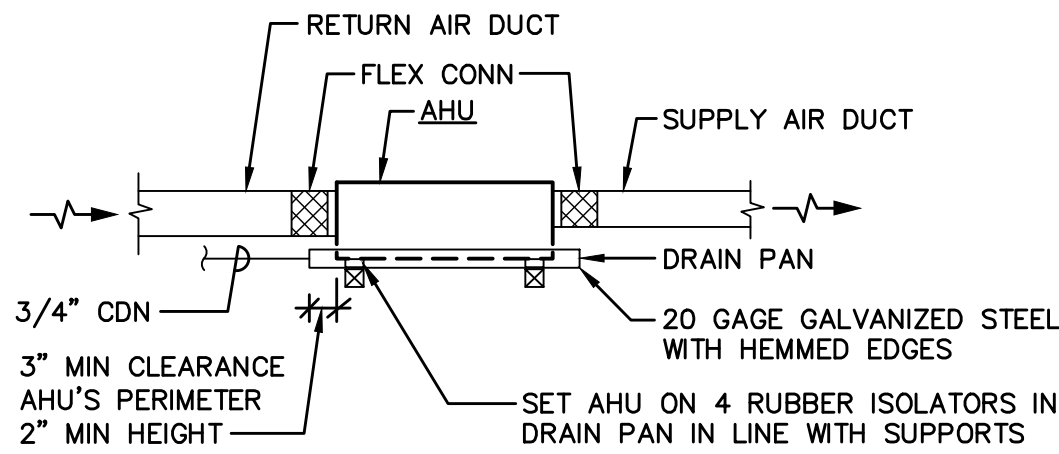


GEOTHERMAL SYSTEM VALVE HANDHOLE DETAIL

NO SCALE

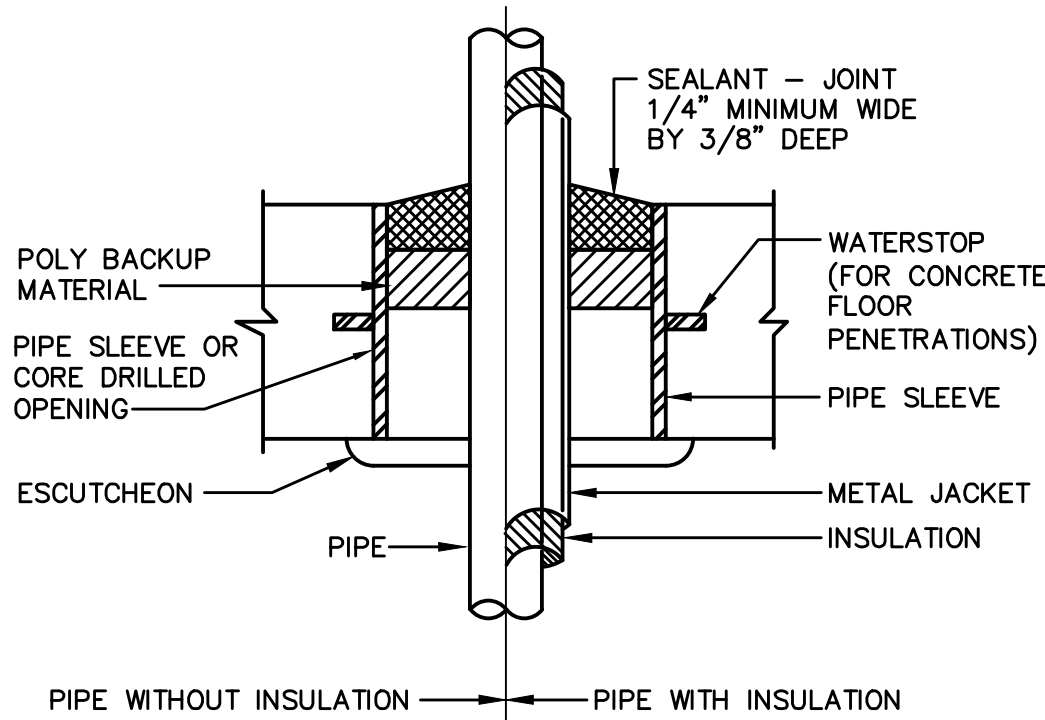


M-002 M-502



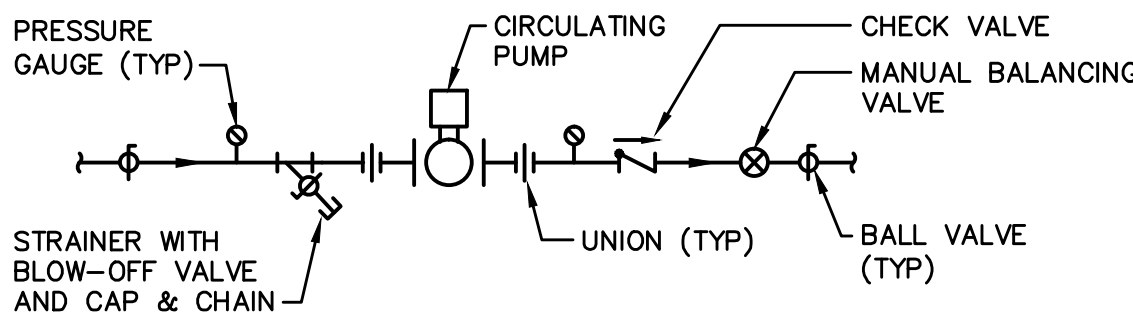
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NO SCALE



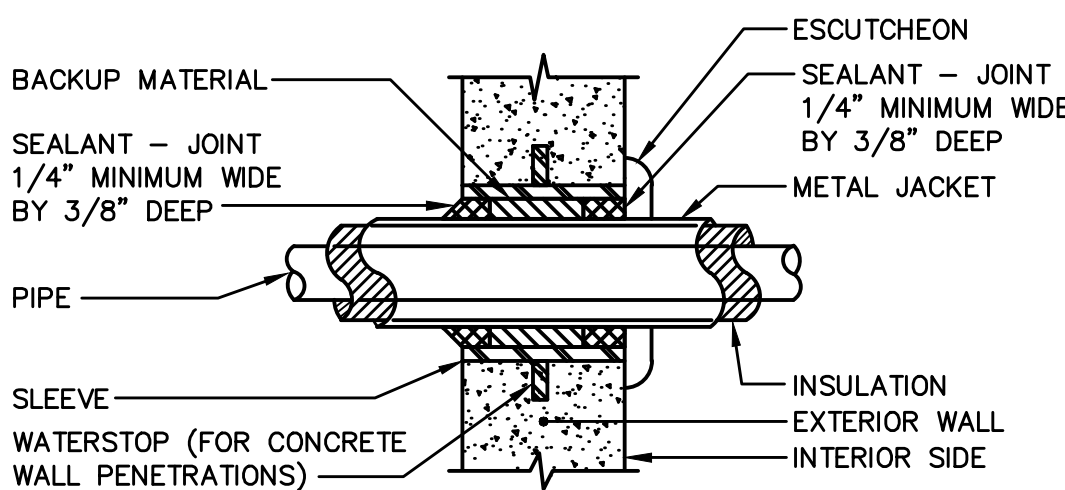
PIPE SLEEVE THRU FLOOR DETAIL

NO SCALE



IN-LINE PUMP DETAIL

NO SCALE



PIPE SLEEVE FOR INSULATED PIPE THRU WALL -ABOVE GRADE DETAIL

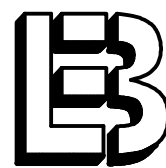
NO SCALE

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CHECKED BY:	EAH

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SHEET TITLE:

MECHANICAL
DETAILS

SCALE AS NOTED



M-502

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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	MOCF	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
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
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 DEHUMIDIFIER:
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:

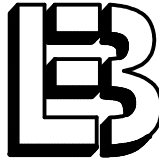
MANUFACTURER: HART & COOLEY
MODEL: 650 RETURN AIR GRILLE
FINISH: STEEL - BRIGHT WHITE
SIZES: 10"x20" - FIRST EAST
16"x14" - FIRST WEST
10"x10" - MASTER SUITE
12"x12" - SECOND HALL
10"x8" - DEHUMIDIFIER
16"x10" - FIRST FLOOR MULTI SPLIT
10"x10" - SECOND FLOOR MULTI SPLIT
6"x6" - HRV

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National Institute of Standards and Technology

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NIST Campus
Gaithersburg, MD



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

	5/7/10	UPDATED
	4/16/10	UPDATED
MARK	DATE	DESCRIPTION
ISSUE:	03/31/10	ISSUED FOR CONSTRUCTION

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

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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 2700K, 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 2700K, 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 2700K, 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 2700K, 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 15T8PPH 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
	LIGHTING FIXTURE - CEILING, WALL MOUNTED, DIRECTIONAL - TYPE AS INDICATED
	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
	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 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
	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
	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
	DISCONNECT SWITCH, UNLESS NOTED OTHERWISE - FUSED, NON-FUSED - TYPE AND RATING AS INDICATED
	MOTOR - HORSEPOWER AS NOTED
	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
	SPECIAL PURPOSE RECEPTACLE - WALL MOUNTED - NEMA 14-30R FLUSH RECEPTACLE - PASS & SEYMOUR CATALOG# 3864 OR EQUIVALENT - 3#10 AND #10 GROUND
	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
	FAN AND LIGHT COMBINATION (F/L) OR FAN ONLY (F)
	TV OUTLET - SEE DETAIL ON ELECTRICAL DRAWING E-502 - COMBINE WITH TELEPHONE/DATA WHERE LOCATED ADJACENT
	JUNCTION BOX FOR OWNER FURNISHED WIRELESS ACCESS POINT
	TRANSFORMER
	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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PROJECT:

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NET ZERO ENERGY RESIDENTIAL TEST FACILITY

NIST Campus
Gaithersburg, MD



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-001
DRAWN BY:	JEM
CHECKED BY:	FJL

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SHEET TITLE:

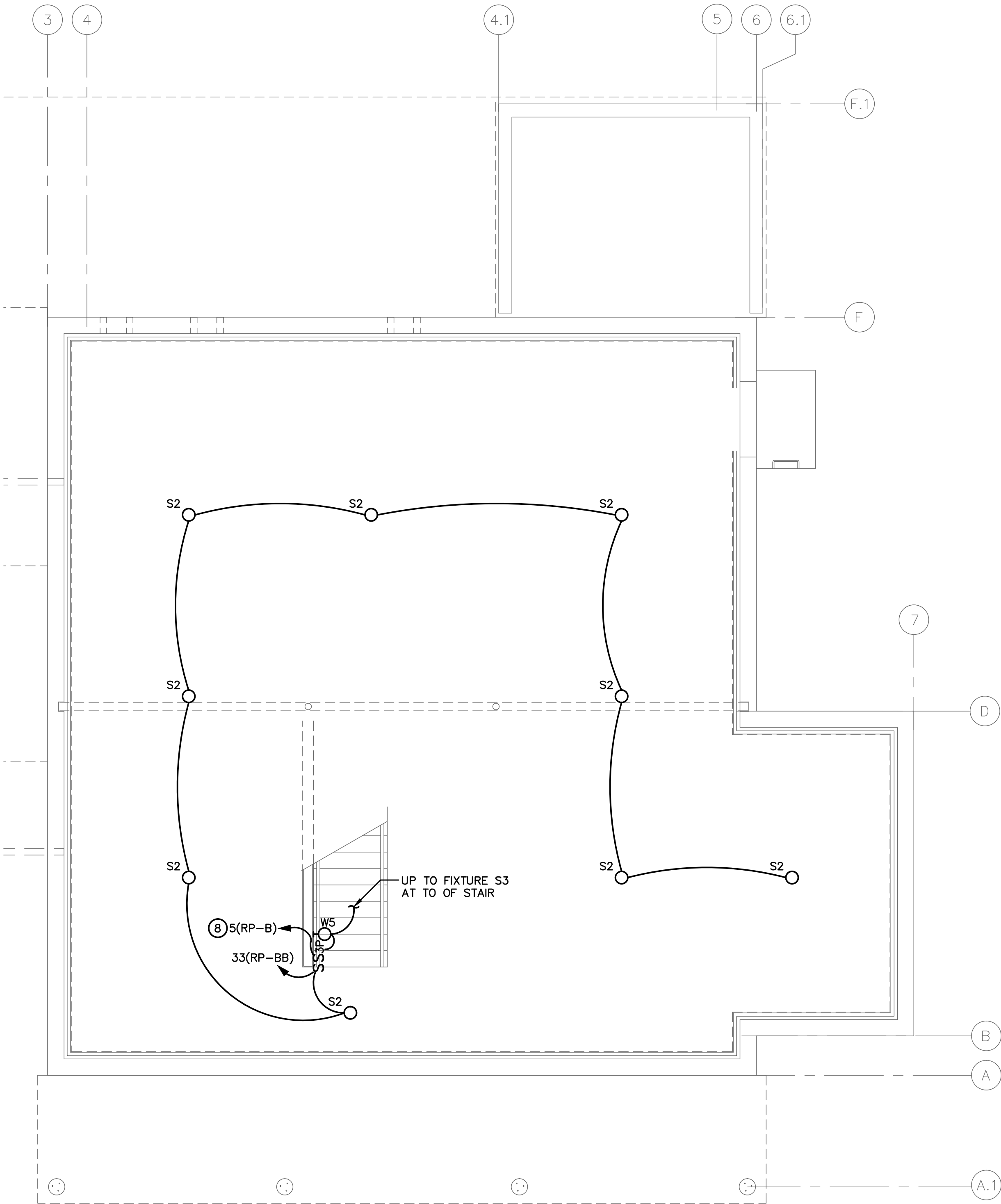
ELECTRICAL LEGEND, ABBREVIATIONS, SYMBOLS & LIGHTING FIXTURE SCHEDULE

SCALE AS NOTED

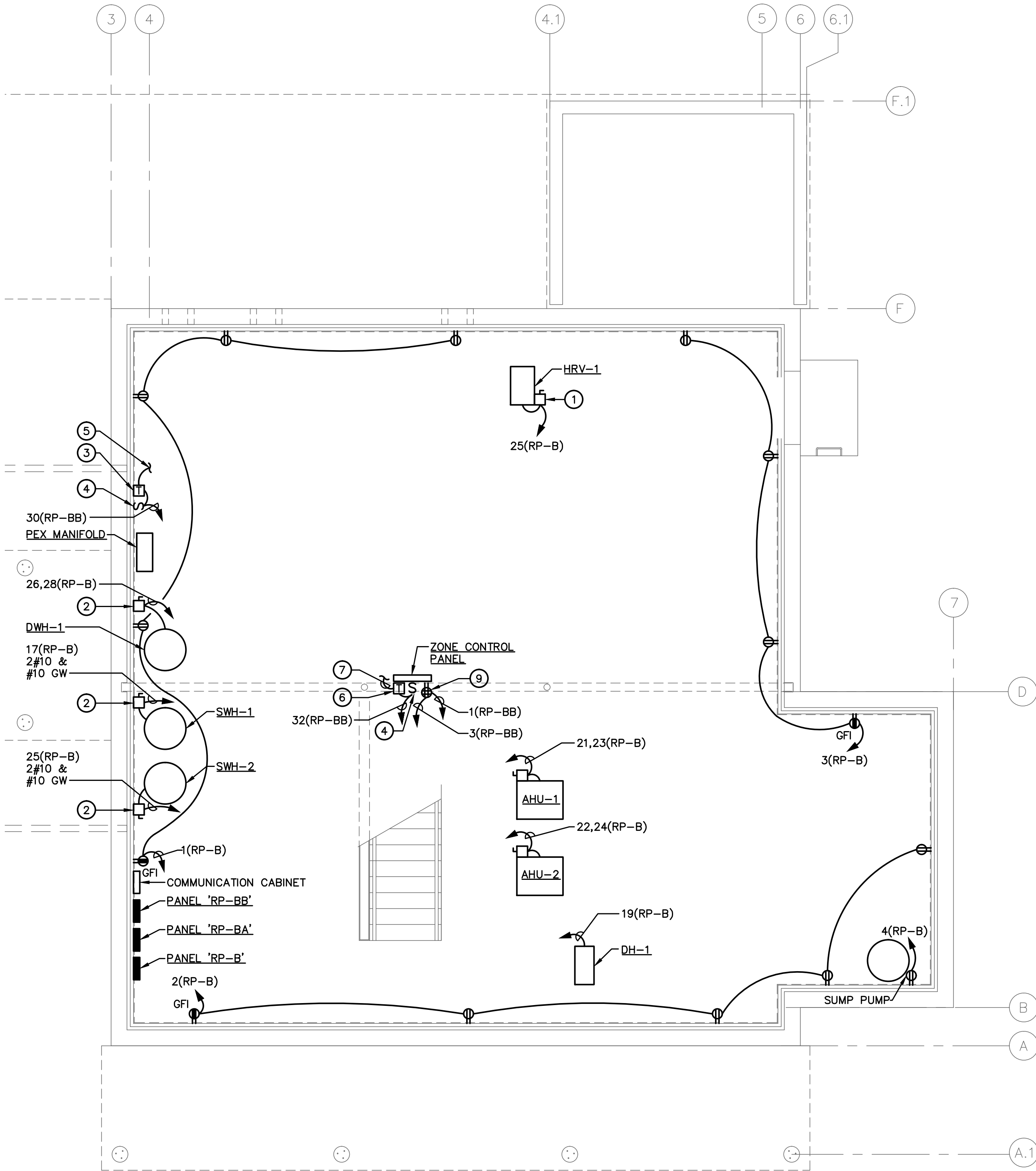


E-001

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BASEMENT FLOOR PLAN - LIGHTING
SCALE: 1/4" = 1'-0"



BASEMENT FLOOR PLAN - POWER
SCALE: 1/4" = 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"

- DRAWING NOTES:** (APPLY TO THIS SHEET ONLY)
- 2P-30A NFSS IN NEMA 1 ENCLOSURE. MOUNT AT UNIT.
 - 2P-30A NFSS IN NEMA 1 ENCLOSURE.
 - CONTROL POWER TRANSFORMER - 1000VA, 120-24V, 1Ø. MOUNT NEAR MANIFOLD WITH SOLENOIDS.
 - TOGGLE SWITCH DISCONNECT. MOUNT ADJACENT TO CONTROL POWER TRANSFORMER ON ZONE CONTROL PANEL SUPPORT RACK.
 - MAKE CONNECTION TO PLUMBING SOLENOIDS. SEE MECHANICAL PLANS FOR QUANTITY.
 - CONTROL POWER TRANSFORMER - 1000VA, 120-24V, 1Ø. MOUNT ON ZONE CONTROL PANEL SUPPORT RACK.
 - MAKE CONTROL POWER CONNECTIONS AS DIRECTED BY GOVERNMENT.
 - 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.
 - MOUNT ON ZONE CONTROL PANEL SUPPORT RACK.

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National Institute of
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RESIDENTIAL TEST
FACILITY**

NIST Campus
Gaithersburg, MD

**Building
AMERICA**
U.S. Department of Energy
Research Toward Zero Energy Homes

U.S. DEPARTMENT OF
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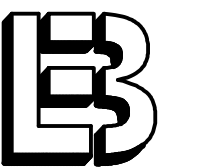
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**BASEMENT FLOOR
PLAN - ELECTRICAL**

SCALE AS NOTED

E-101

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SHEET TITLE:

**FIRST FLOOR PLAN –
LIGHTING**

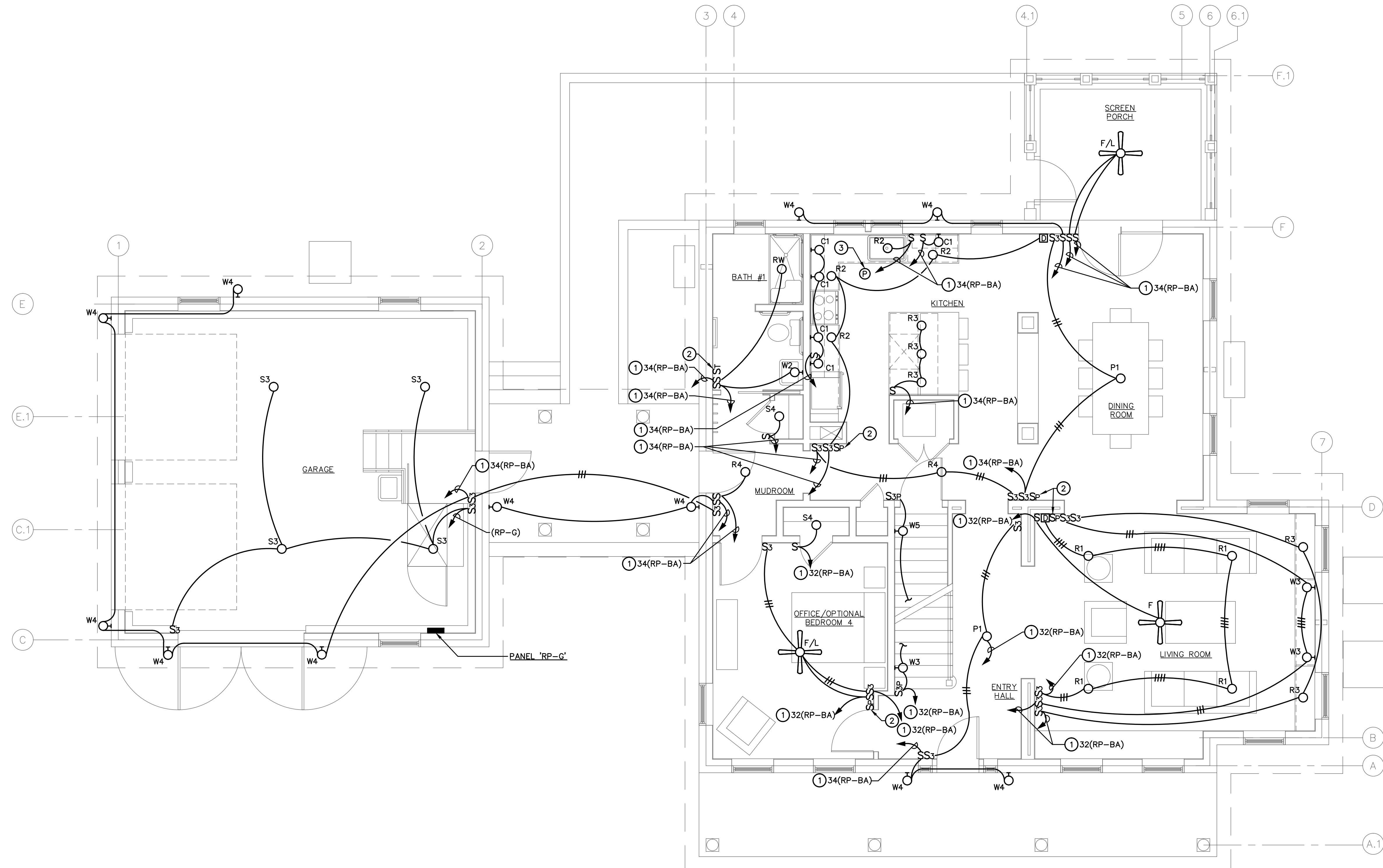
SCALE AS NOTED



E-102

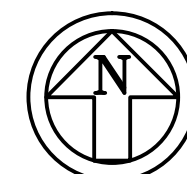
DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

- 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: $\frac{1}{4}" = 1'-0"$



CAUTION:

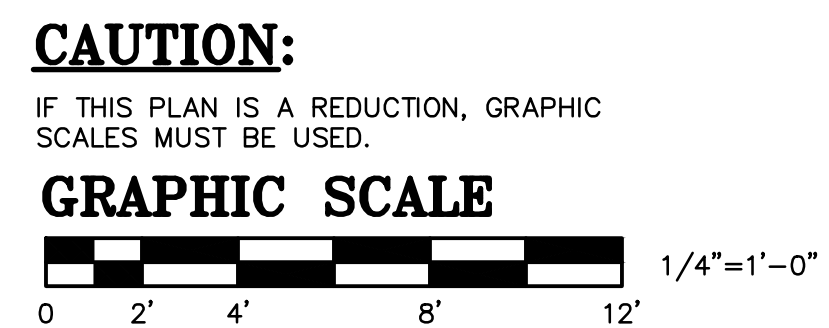
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SCALES MUST BE USED.

GRAPHIC SCALE



- 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 2 $\frac{3}{8}$ " ABOVE FINISHED FLOOR TO CENTER LINE.
- ⑤ MOUNT 4'- $\frac{3}{4}$ " ABOVE FINISHED FLOOR. ALIGN WITH TOP OF TILE.
- ⑥ COORDINATE EXACT MOUNTING HEIGHT WITH MANUFACTURER'S 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" 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.



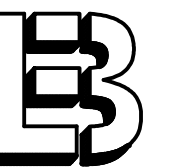
SCALE: $\frac{1}{4}" = 1'-0"$

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0 2' 4' 8' 12' $\frac{1}{4}" = 1'-0"$



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PROJECT:

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

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

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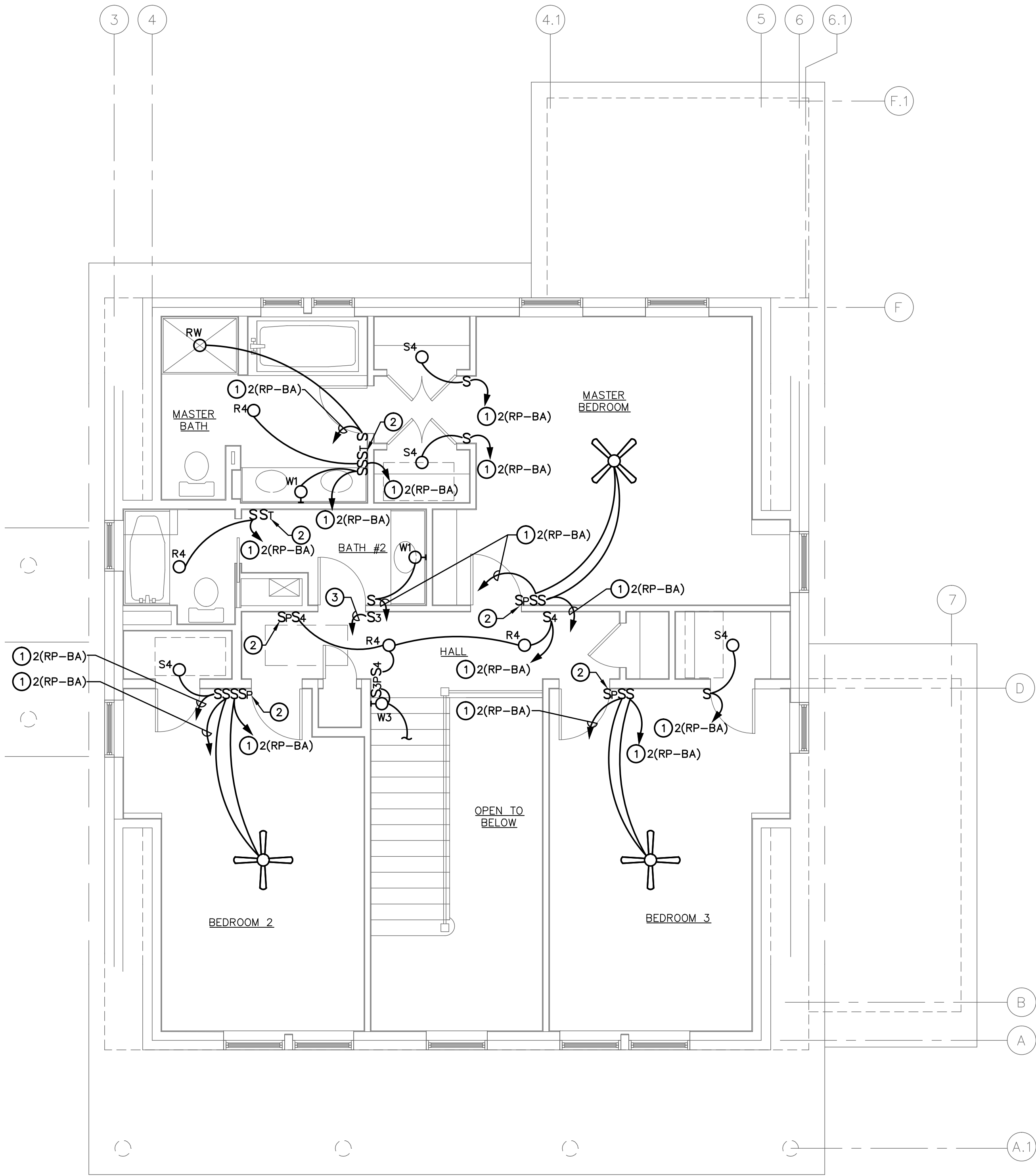
FIRST FLOOR PLAN -
POWER

SCALE AS NOTED



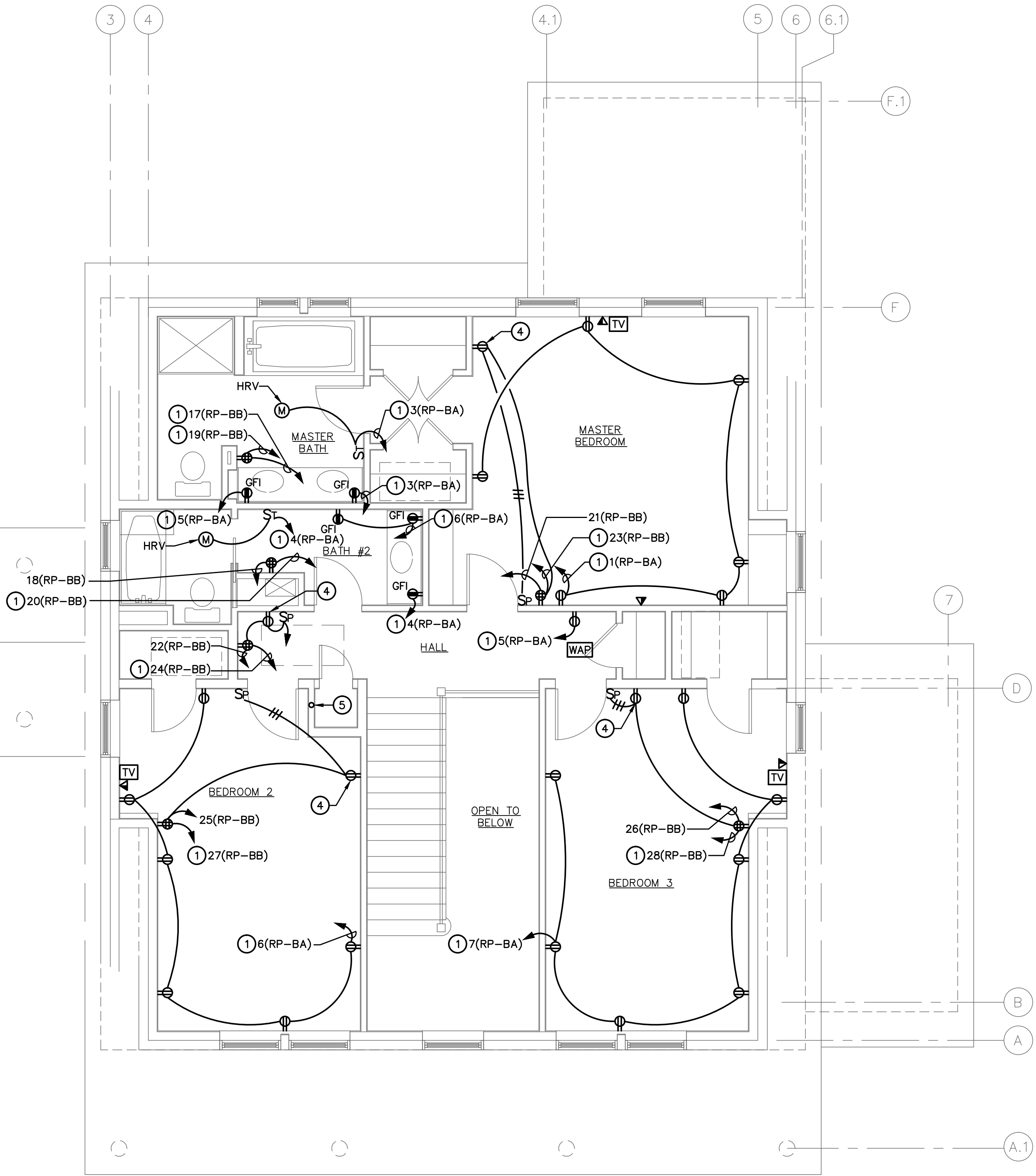
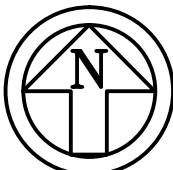
E-103

- 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'.



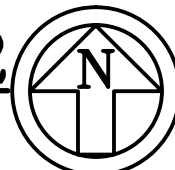
SECOND FLOOR PLAN - LIGHTING

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



SECOND FLOOR PLAN - POWER

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



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

GRAPHIC SCALE

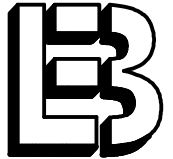
0 2' 4' 8' 12' 1/4"=1'-0"

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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-104
DRAWN BY:	JEM
CHECKED BY:	FJL

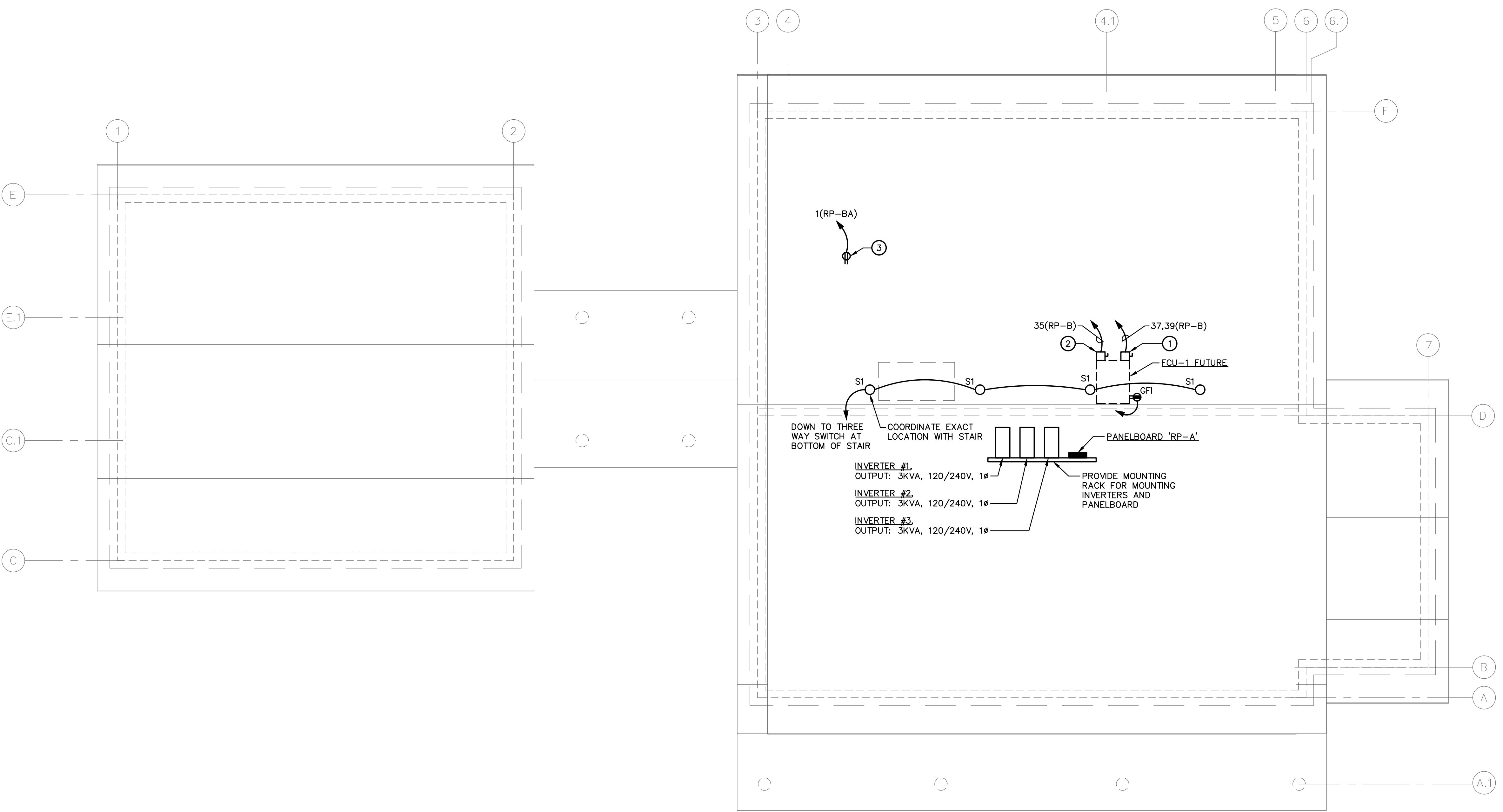
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SHEET TITLE:

SECOND FLOOR PLAN - LIGHTING & POWER

SCALE AS NOTED



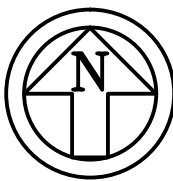
E-104



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



CAUTION:

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

GRAPHIC SCALE



1/4"=1'-0"

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

PROJECT NO:	NIST NZERTF
CAD DWG FILE:	09-247 E-105
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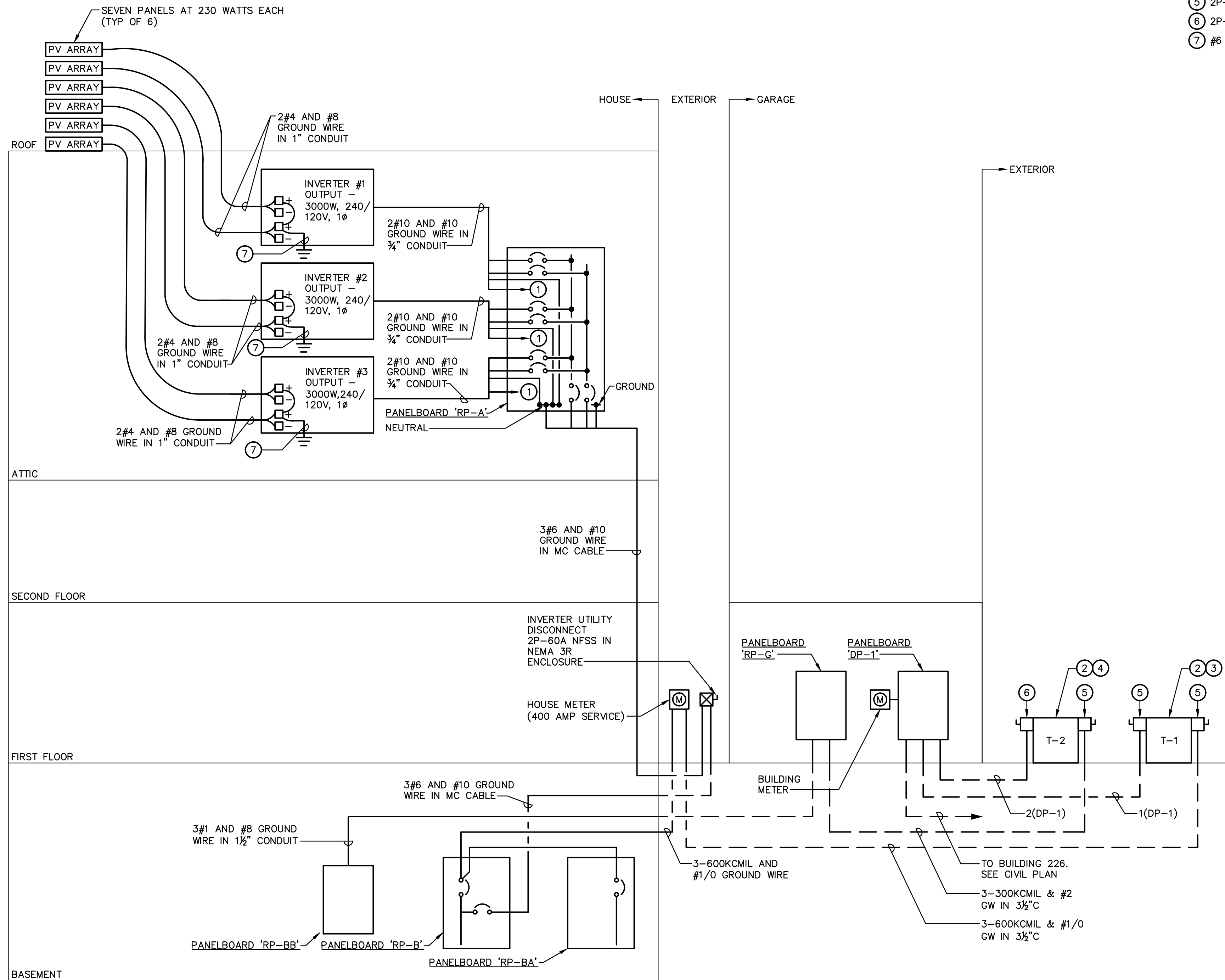
SHEET TITLE:

**ATTIC FLOOR PLAN
– ELECTRICAL**

SCALE AS NOTED



E-105



ELECTRICAL RISER DIAGRAM

NO SCALE

DRAWING NOTES: (APPLY TO THIS SHEET ONLY)

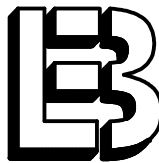
- ① TO GROUND BUS IN PANELBOARD.
- ② PROVIDE WARNING LABEL: "CAUTION - EQUIPMENT IS BACKFED FROM A PHOTO VOLTAIC POWER SOURCE".
- ③ 75KVA - 480-120/240V, 1Ø IN WEATHERPROOF ENCLOSURE.
- ④ 50KVA - 480-120/240V, 1Ø IN WEATHERPROOF ENCLOSURE.
- ⑤ 2P-400A NFSS IN NEMA 3R ENCLOSURE. MOUNT AT TRANSFORMER.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

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CAD DWG FILE: 09-247 E-501
DRAWN BY: JEM
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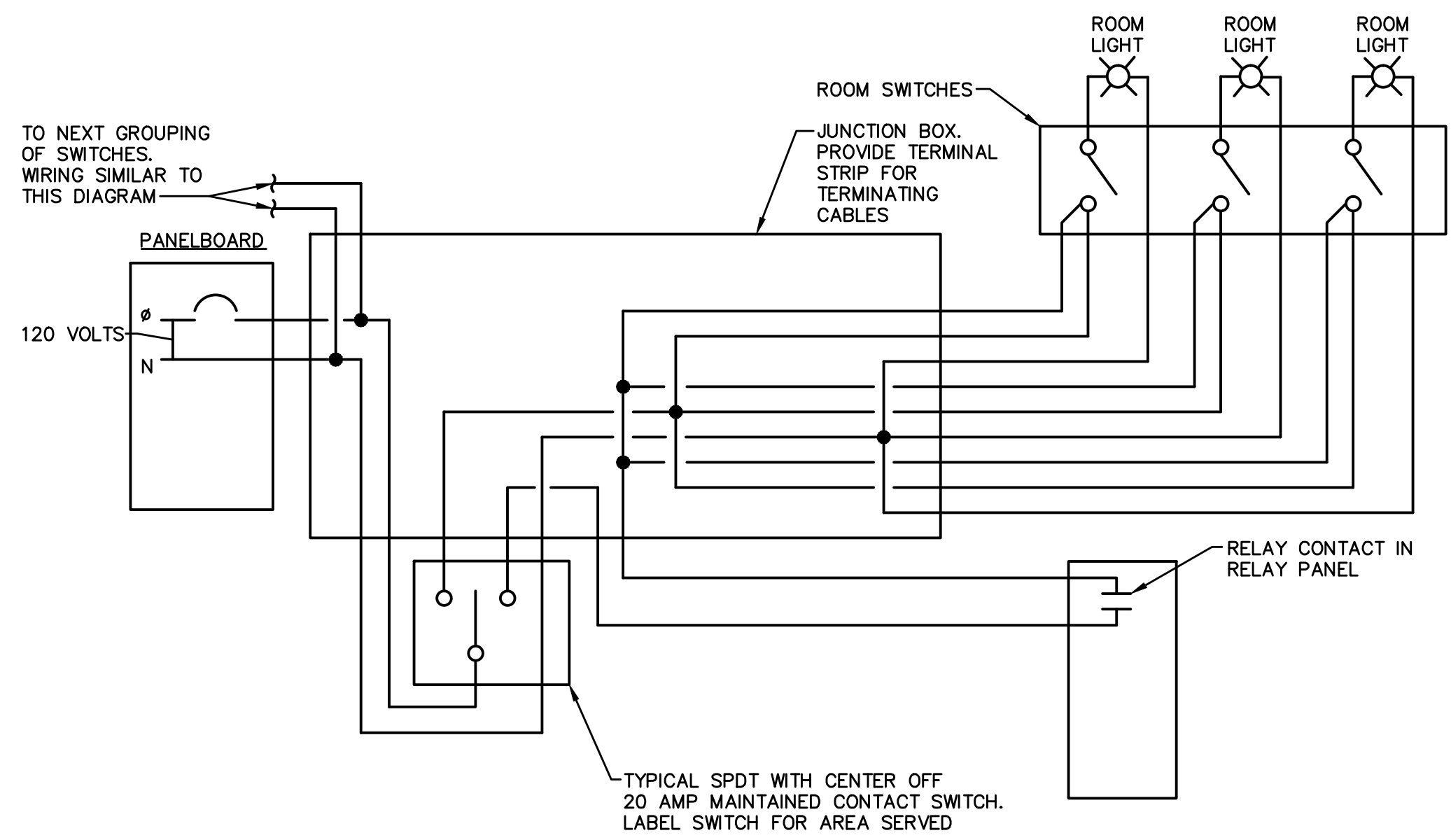
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SHEET TITLE:

**ELECTRICAL
RISER DIAGRAM**

SCALE AS NOTED

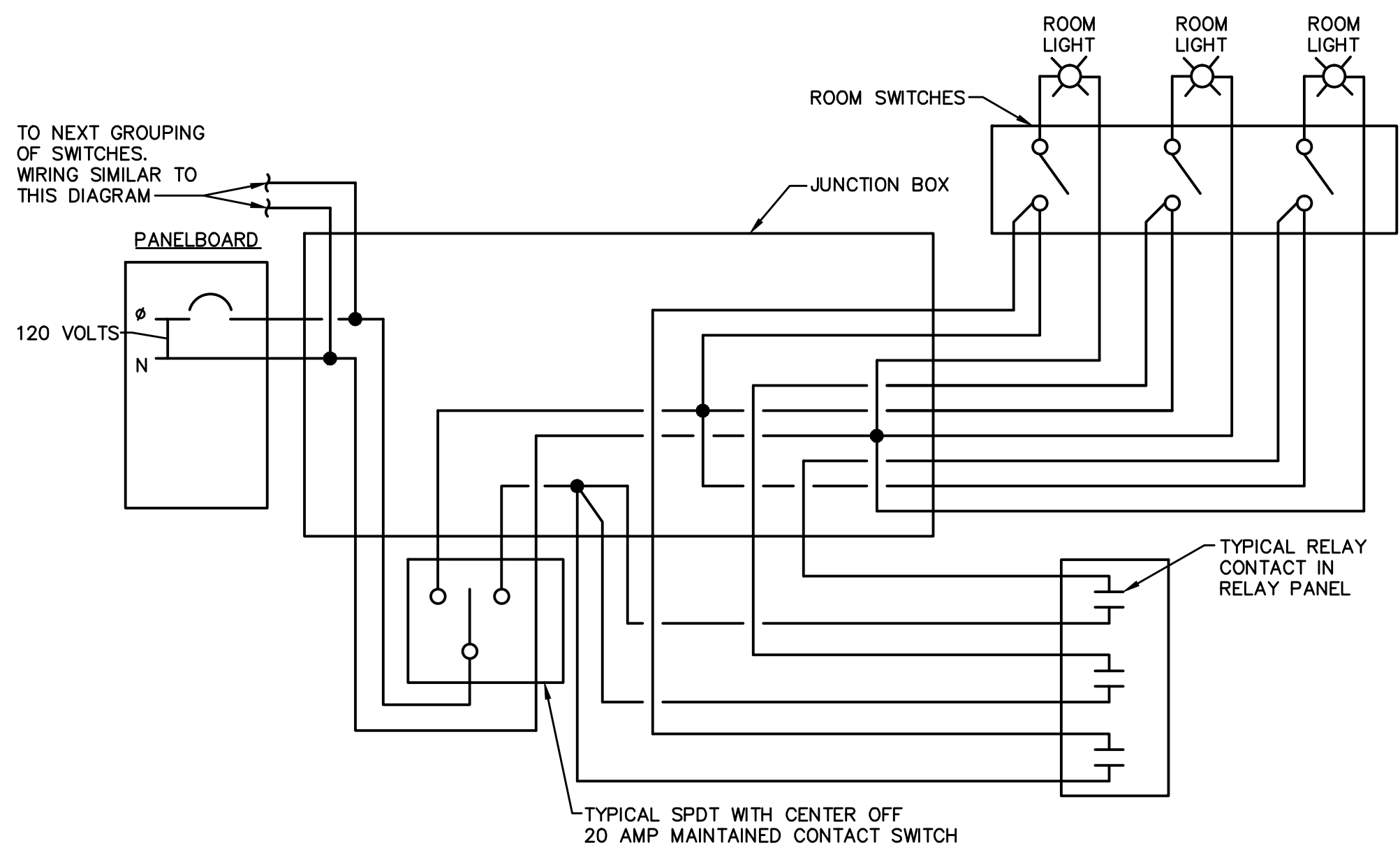


E-501



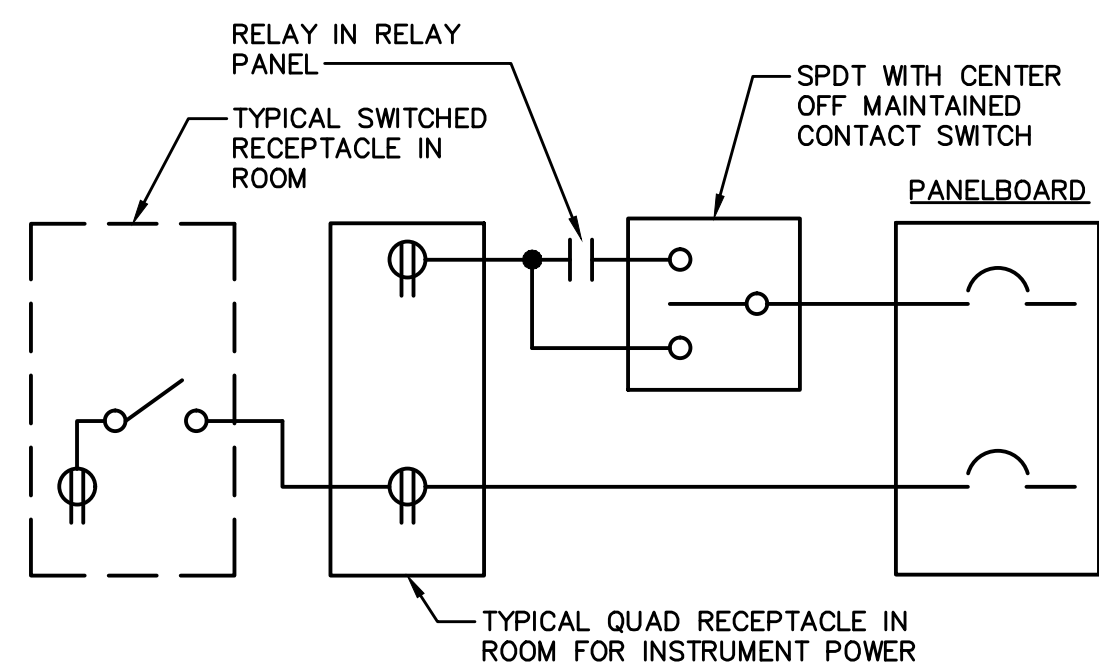
1
TYPICAL WIRING DIAGRAM FOR ROOM SWITCHES

E-102.
E-104
E-502



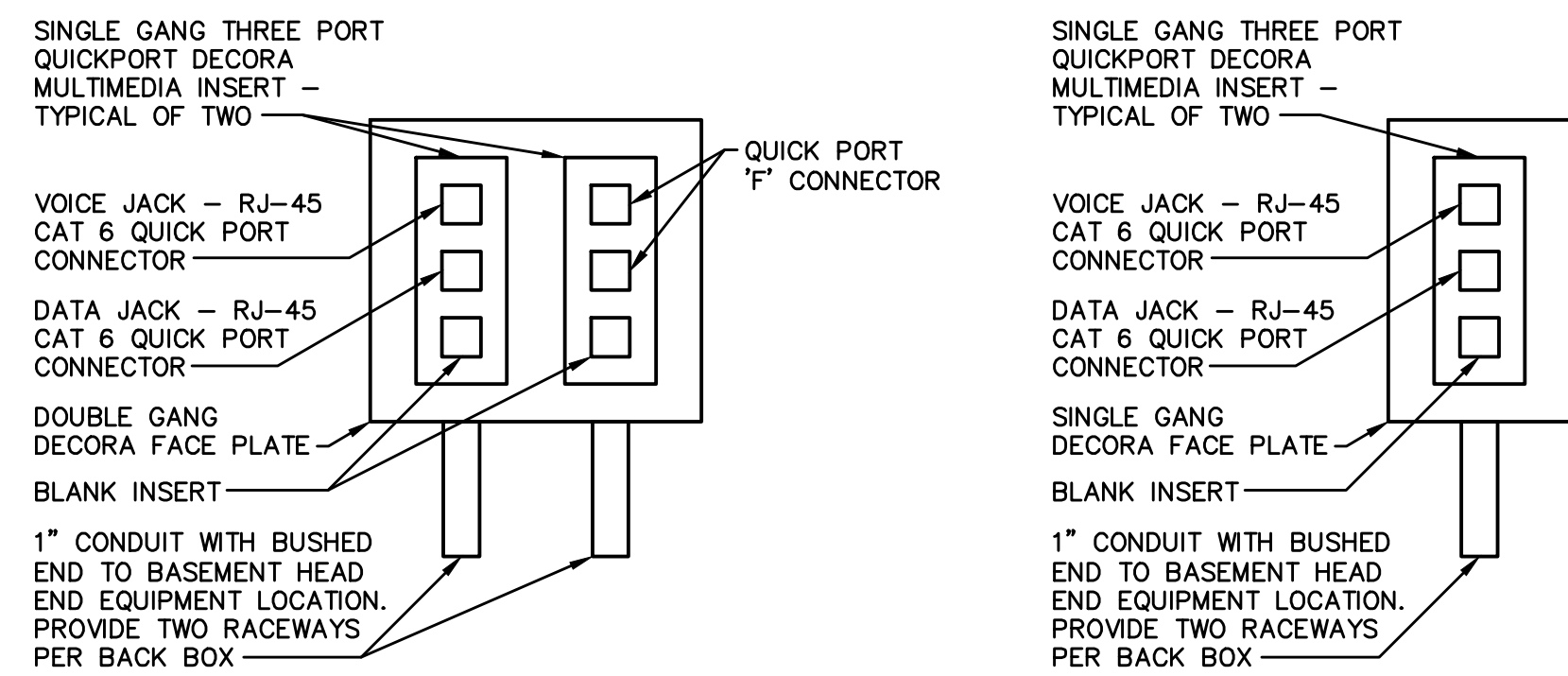
2
TYPICAL FUTURE WIRING DIAGRAM FOR ROOM SWITCHES

E-102.
E-104
E-502



3
TYPICAL ROOM INSTRUMENT POWER WIRING DIAGRAM

E-102.
E-104
E-502

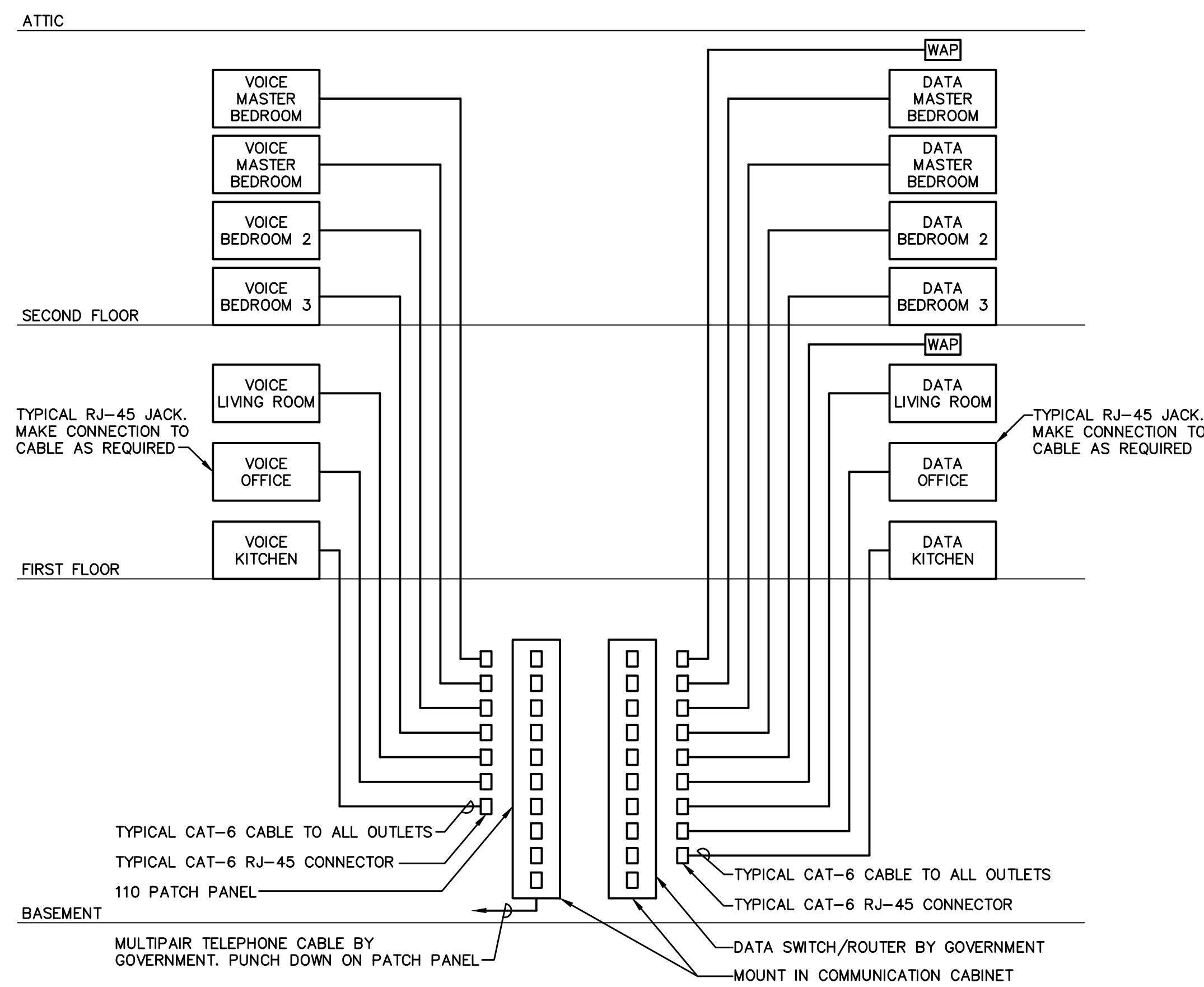


4
VOICE, DATA AND VIDEO OUTLET

E-502
E-502

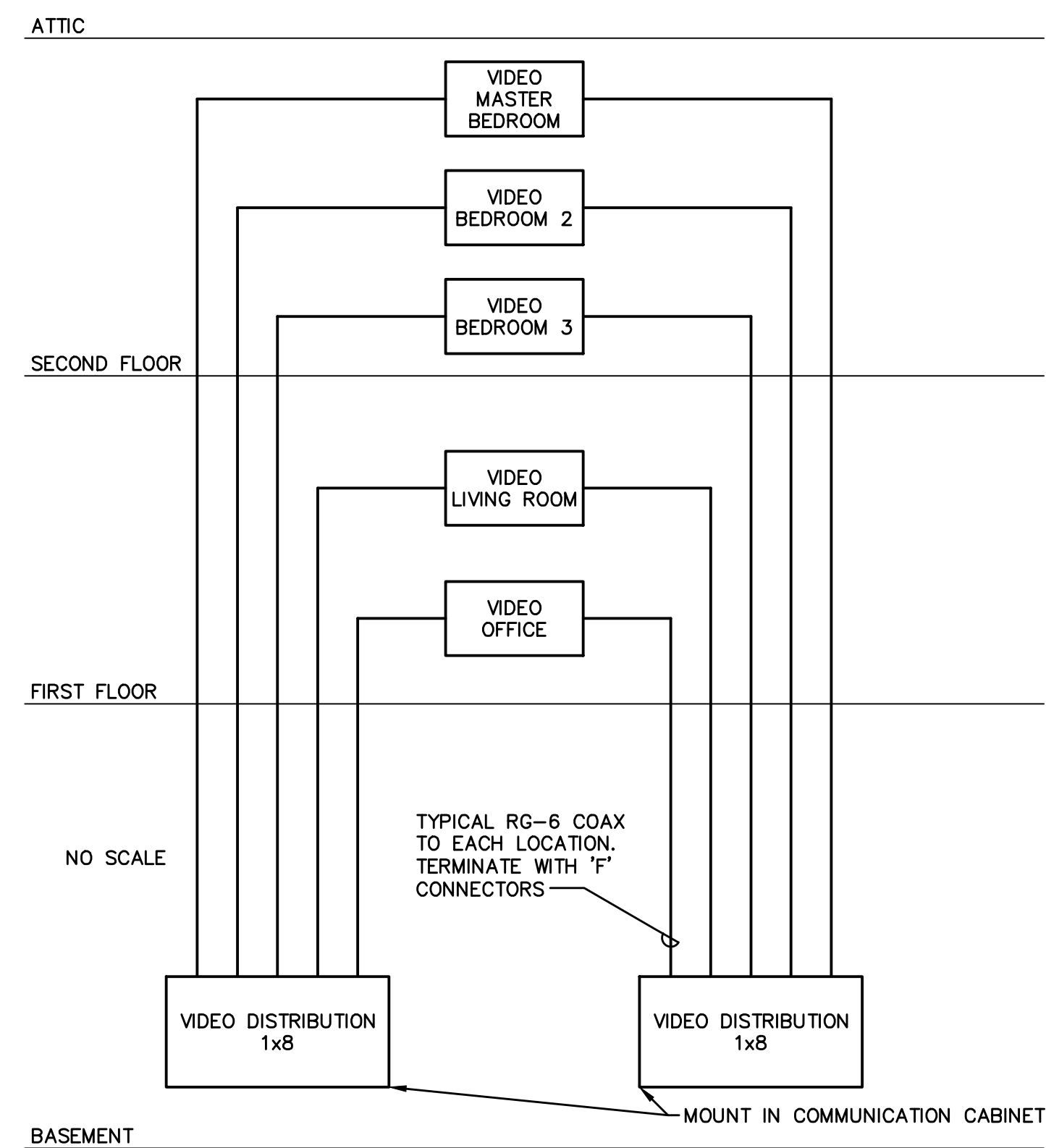
5
VOICE AND DATA OUTLET

E-502
E-502



6
VOICE/DATA RISER

E-502
E-502



7
VIDEO RISER

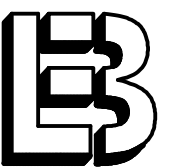
E-502
E-502

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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		AMPERES/PHASE				CIR	FOR	BREAKER		
		POLE	TRIP	A		B				POLE	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	–	
TOTALS				25.0	12.5	25.0	12.5					
				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								

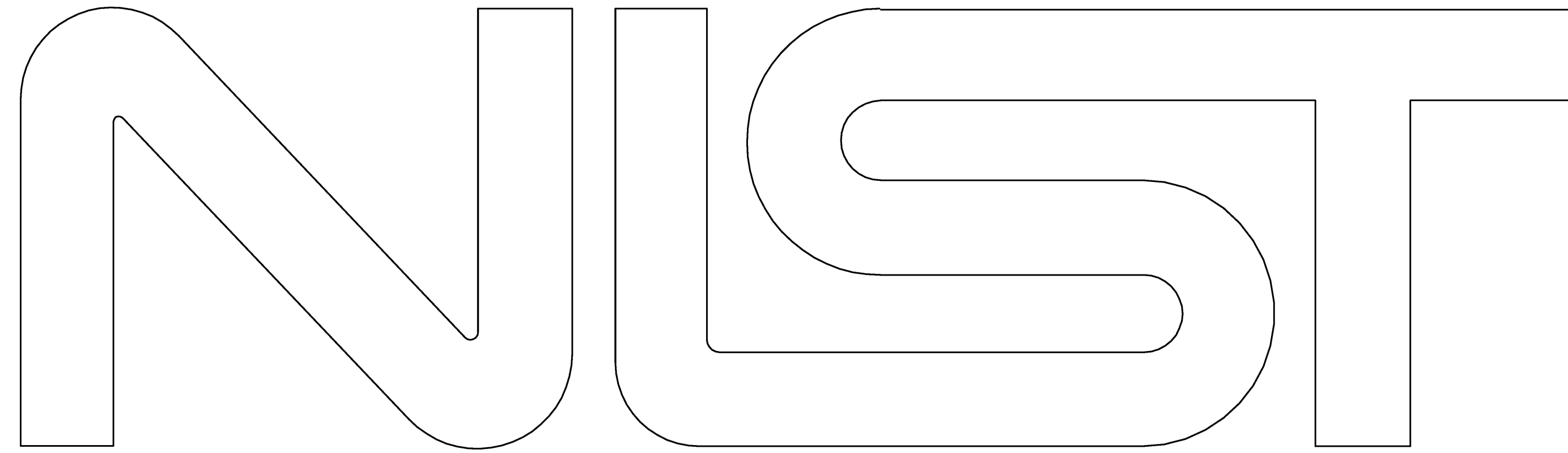
MAIN DISTRIBUTION PANEL SCHEDULE DP-1									
480/277 VOLTS, 3 PHASE, 4 WIRE									
CIR	LOAD	BREAKER FR	POLE	TRIP	KVA	NUMBER OF CONDUIT	CONDUIT SIZE	CDT. SIZE	REMARKS
1	TRANSFORMER 'T-1'	400	2	250	75	1	3"	3-250KCMIL & #4GW	-
2	TRANSFORMER 'T-2'	225	2	175	50	1	3"	3#2"O & #6GW	-
3	EQUIPPED SPACE ONLY	225	3	-	-	-	-	-	-
4	EQUIPPED SPACE ONLY	225	3	-	-	-	-	-	-
3P-400 AMP MAIN CIRCUIT BREAKER									

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		AMPERES/PHASE				CIR	FOR	BREAKER					
		POLE	TRIP	A		B				POLE	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	-				
* GFCI BREAKER TOTALS				107.7	62.5	95.0	79.7	- PROVIDE ARC FAULT BREAKERS AS REQUIRED - PROVIDE WITH THRU FEED LUGS - PROVIDE WITH BRANCH CIRCUIT MONITORING							
				A=	170.2	B=	174.7								
MAIN BREAKER 2P, 400A				AMPERES-TOP/BOTTOM								CONNECTED LOAD 41.4 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		AMPERES/PHASE				CIR	FOR	BREAKER		
		POLE	TRIP	A		B				POLE	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	—	
TOTALS				14.0	20.5	13.5	20.5	— PROVIDE ARC FAULT BREAKERS AS REQUIRED				
				A= 34.5		B= 34.0						
MAIN BREAKER 2P, 100A				AMPERES—TOP/BOTTOM								
MINIMUM AIC RATING = 22,000				AMPERES SYMMETRICAL								

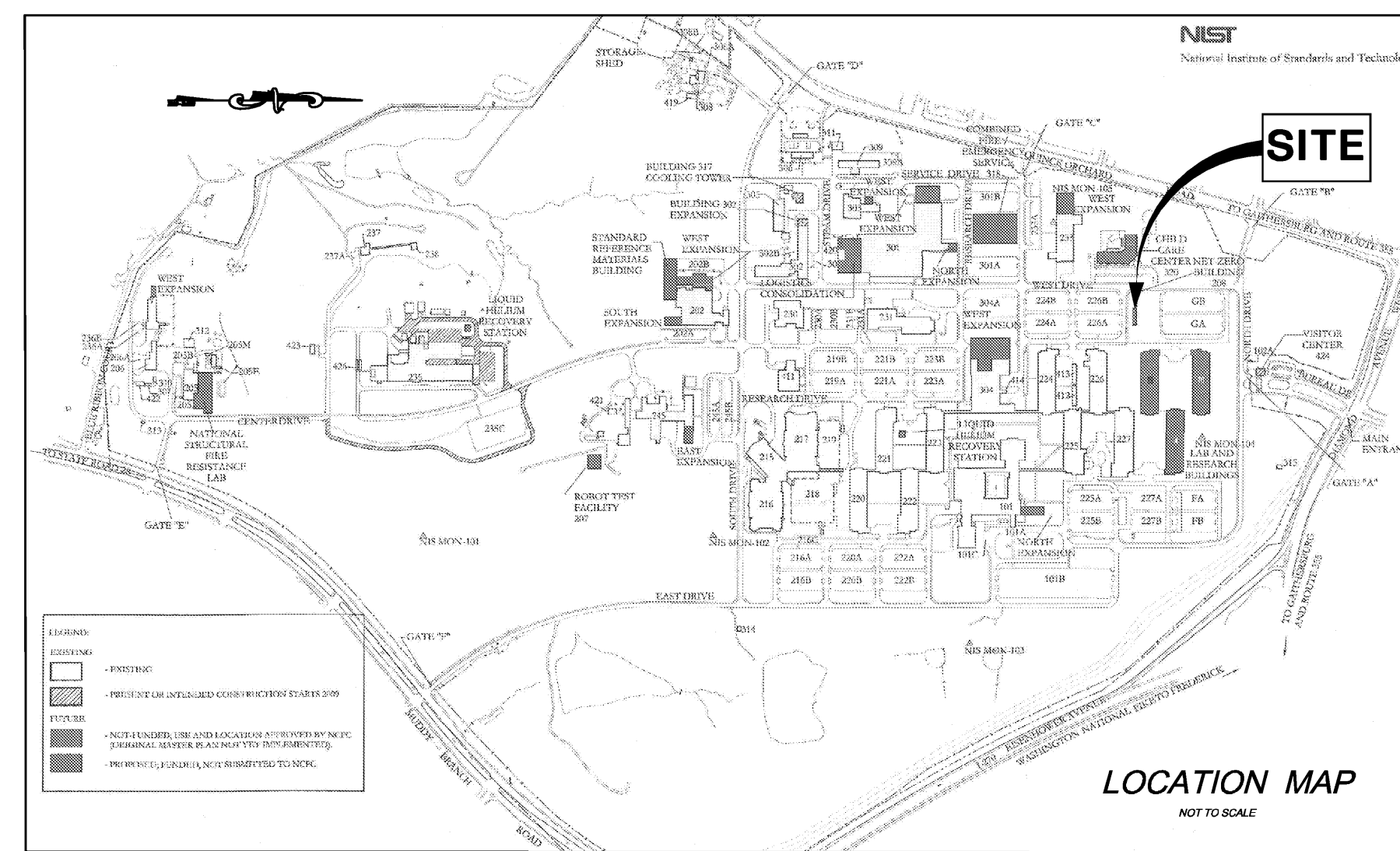
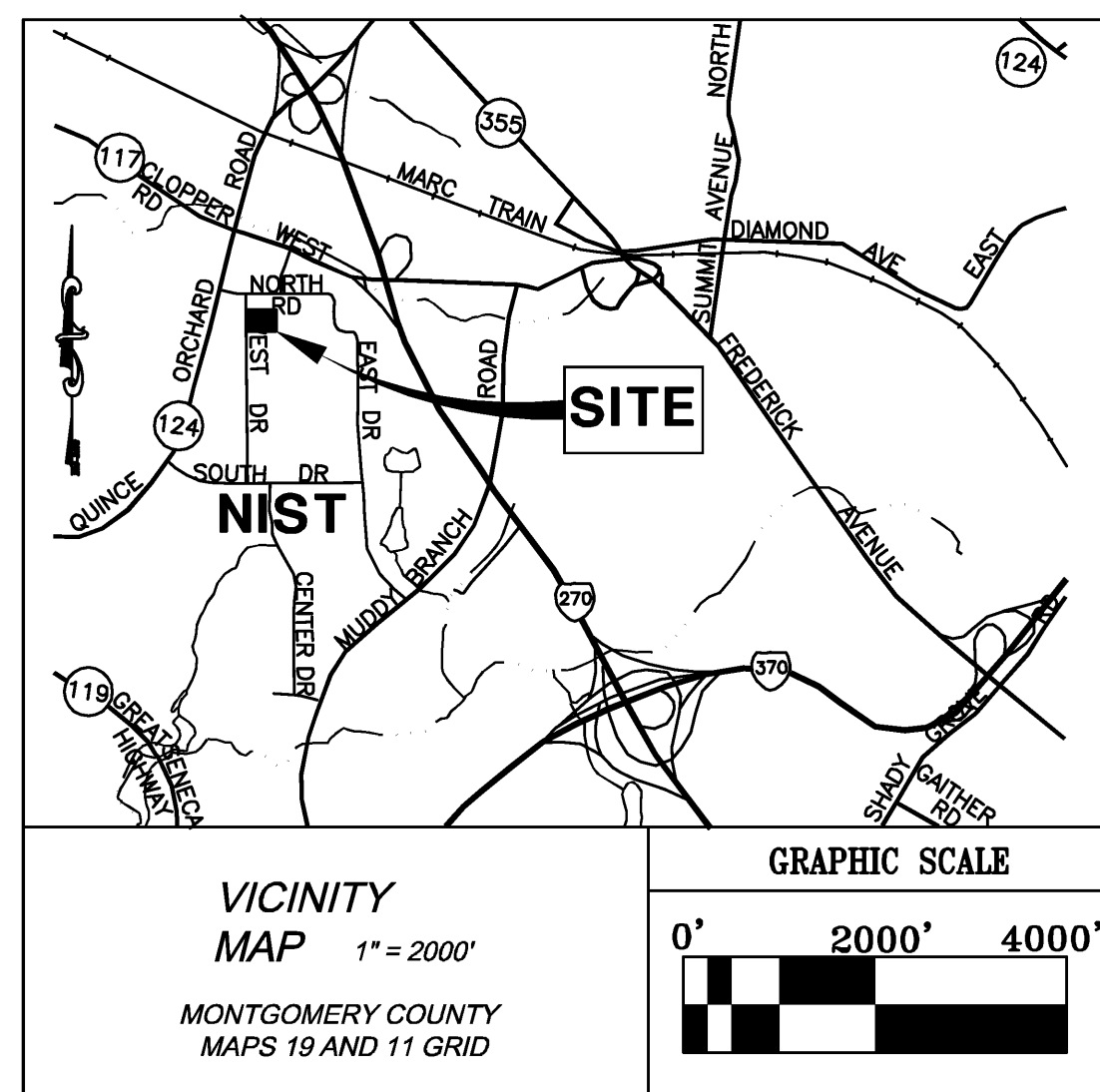
PANEL SCHEDULE 'RP-BA'												
120/240 VOLTS – 1 PHASE – 3 WIRE – SURFACE MOUNTED												
CIR	FOR	BREAKER		AMPERES/PHASE				CIR	FOR	BREAKER		
		POLE	TRIP	A		B				POLE	TRIP	
1	ATTIC RADON VENT MOTOR	1	20	10.5	8.4			2	LIGHTS – SECOND FLOOR	1	20	
3	RECEPT – MASTER BATH	1	20			4.0	5.5	4	RECEPT – 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	–	
TOTALS				103.0	67.3	94.0	62.6	– PROVIDE WITH BRANCH CIRCUIT MONITORING – PROVIDE ARC FAULT BREAKERS AS REQUIRED				
				A=	170.3	B=	156.6					
MAIN LUGS ONLY 400A MINIMUM AIC RATING = 22,000				AMPERES–TOP/BOTTOM AMPERES SYMMETRICAL				CONNECTED LOAD 39.2 KVA				



UTILITY AND SITE DESIGN
MARCH 2010

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

UNITED STATES DEPARTMENT OF COMMERCE
THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
GAITHERSBURG, MARYLAND



INDEX OF DRAWINGS

- C-001 COVER SHEET
- C-101 EXISTING CONDITIONS / DEMOLITION PLAN
- C-201 SITE / GRADING PLAN
- C-202 SITE DETAILS
- C-203 SITE DETAILS
- C-301 UTILITY PROFILES
- C-401 EROSION AND SEDIMENT CONTROL PLAN
- C-402 EROSION AND SEDIMENT CONTROL DETAILS
- C-403 EROSION AND SEDIMENT CONTROL NOTES
- C-404 EROSION AND SEDIMENT CONTROL NOTES
- C-501 PLANTING PLAN
- C-502 PLANTING PLAN NOTES AND DETAILS

PROPERTY ADDRESS
NIST CAMPUS
WEST STREET
GAITHERSBURG, MARYLAND

PROPERTY OWNER/APPLICANT
UNITED STATES DEPARTMENTS OF COMMERCE
THE NATIONAL INSTITUTE OF STANDARDS
AND TECHNOLOGY
GAITHERSBURG, MARYLAND
(301) 975-8339
CONTACT PERSON: SILVIO BARUZZI

REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/29/10
	100% CD SET		02/24/10
	ISSUED FOR CONSTRUCTION		03/31/10

PROFESSIONAL CERTIFICATION

"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12564, EXPIRATION DATE 08/10/2011."

KH KEAST & HOOD CO.
Structural Engineers
1850 M Street NW Washington, DC 20036
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PLANT DIVISION

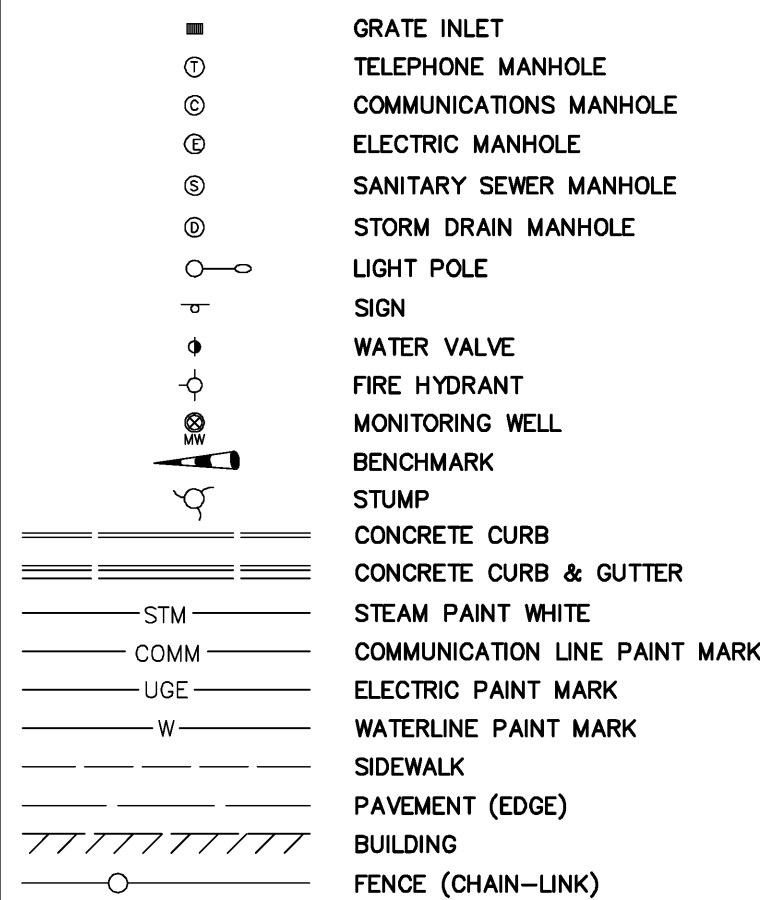
NET ZERO ENERGY RESIDENTIAL TEST FACILITY

COVER SHEET

SH.NO. ____ OF ____ DWG. C-001

APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF	DATE	FIRE PROTECTION SYS	DATE	S.H. & E. DIV	DATE	FACILITIES ENGR. OFF	DATE	PROJECT LEADER	DATE	KS/DN	02/01/10	SB134109CQ0026/69931	
														DRAWN BY	DATE	PROJECT W.O.	DESIGN PROJ. #

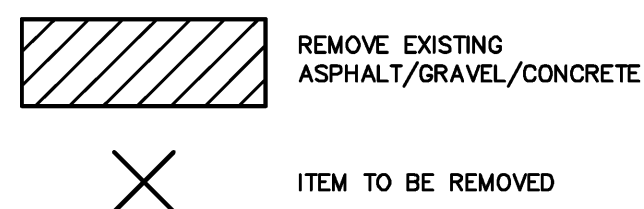
LEGEND



DEMOLITION NOTES:

- 1 SAWCUT & REMOVE EXISTING SIDEWALK.
- 2 REMOVE EXISTING CONCRETE CURB.
- 3 SAWCUT & REMOVE EXISTING ASPHALT PAVING.
- 4 REMOVE EXISTING TREES.

DEMOLITION LEGEND:



STORM DRAIN DATA

1. CURB INLET
TOP=453.30
INV. IN=439.02
INV. OUT=438.92
2. CURB INLET
TOP=453.22
INV. IN=439.25
INV. OUT=439.15
3. MANHOLE
TOP=452.93
(E) INV. IN=439.28
(S) INV. IN=444.53
INV. OUT=439.18
4. CURB INLET
TOP=450.97
INV. OUT=447.17
5. CURB INLET
TOP=450.02
INV. OUT=443.72
6. CURB INLET
TOP=450.25
(SW) INV. IN=442.80
(SE) INV. IN=441.55
(E) INV. IN=440.65
(W) INV. OUT=440.55
7. CURB INLET
TOP=450.30
INV. OUT=442.10
8. GRATE INLET
TOP=450.61
(SW) INV. IN=445.96
(SE) INV. IN=445.96
(E) INV. IN=443.61
(W) INV. OUT=443.21
9. GRATE INLET
TOP=450.65
(SW) INV. IN=446.65
(SE) INV. IN=446.65
(E) INV. IN=443.61
(W) INV. OUT=444.55

SANITARY SEWER DATA

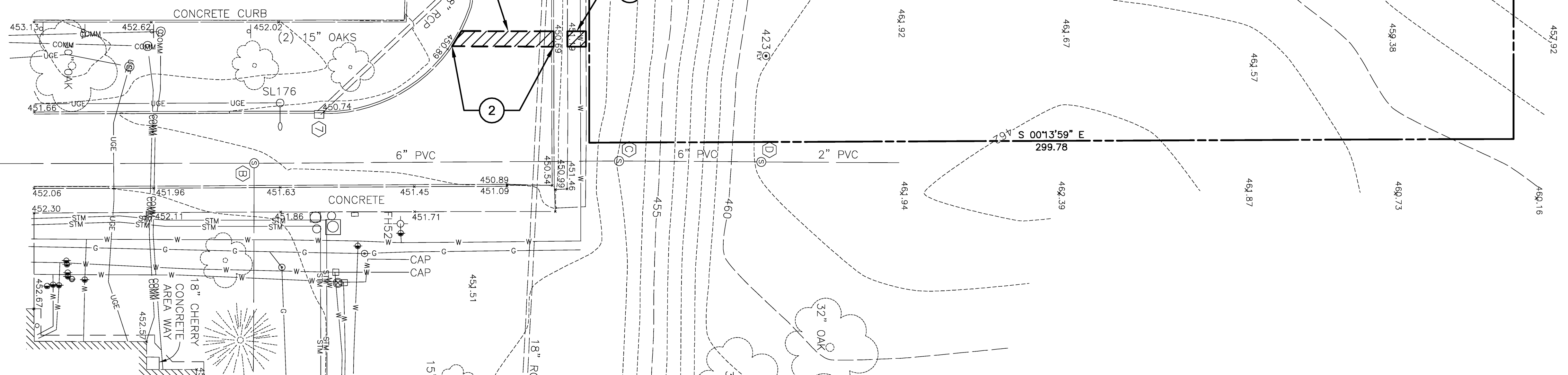
- A MANHOLE
TOP=452.05
(N) INV. IN=428.40
(E) INV. IN=428.85
(S) INV. OUT=428.40
- B MANHOLE
TOP=451.17
(N) INV. IN=444.99
(E) INV. IN=429.75
(S) INV. OUT=429.22
- C MANHOLE
TOP=453.11
(N) INV. IN=448.59
(S) INV. OUT=445.89
- D MANHOLE
TOP=461.08
(N) INV. IN=455.53
(S) INV. OUT=454.98
- E MANHOLE
TOP=452.80
(S) INV. IN=448.55
(E) INV. IN=447.60
(W) INV. OUT=446.65
- F MANHOLE
TOP=452.90
(S) INV. IN=448.18
(E) INV. IN=448.10
(W) INV. OUT=447.90

SURVEY CONTROL DATA

TRAVERSE	NORTHING	EASTING	ELEV.
203	90749.986	-59932.294	452.24
204	90345.238	-59933.965	452.71

GENERAL NOTES

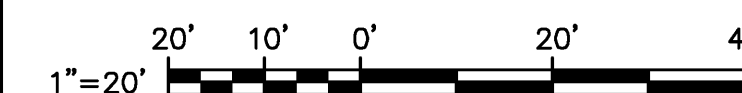
1. HORIZONTAL DATUM: NIST COORDINATES BASED FROM MONUMENTS NBS-104 AND NBS-105
VERTICAL DATUM: NIST ELEVATIONS BASED FROM MONUMENTS NBS-104 AND NBS-105
2. SEE ADDITIONAL SPOT SHOTS ON FROZEN -HIDN LAYERS
3. NO BOUNDARY WORK WAS PERFORMED WITH THIS SURVEY.



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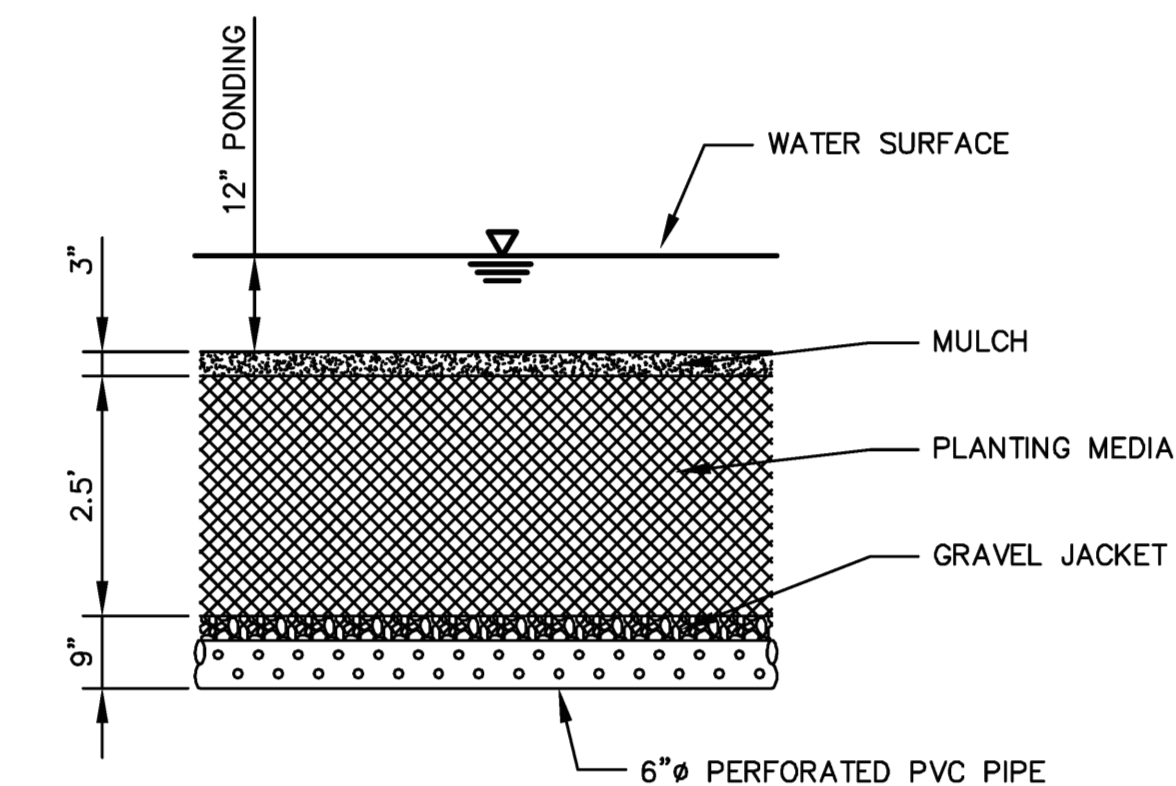
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NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
PLANT DIVISION

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

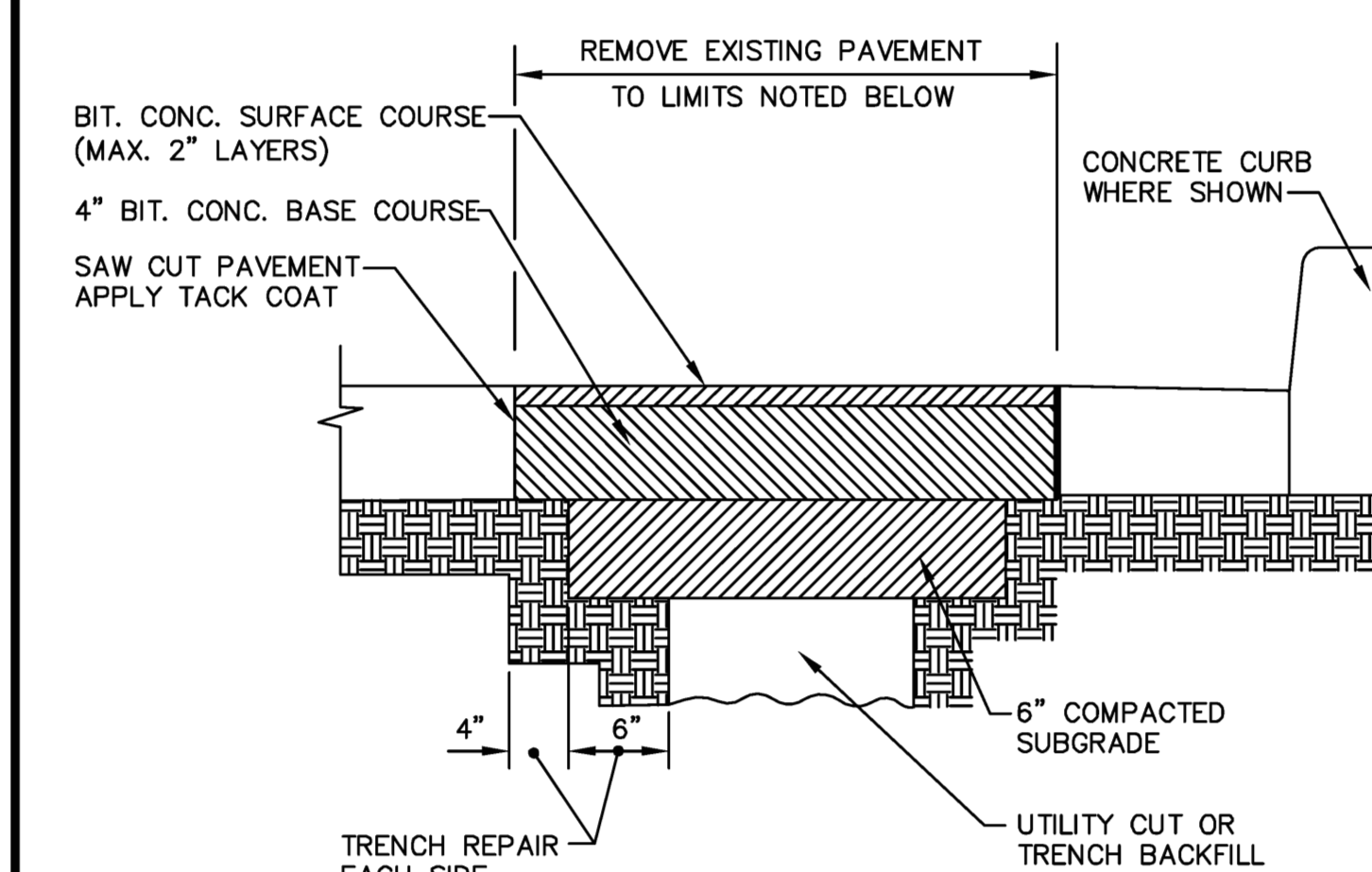
EXISTING CONDITIONS/DEMOLITION PLAN

SH.NO. ____ OF ____ **DWG. C-101**

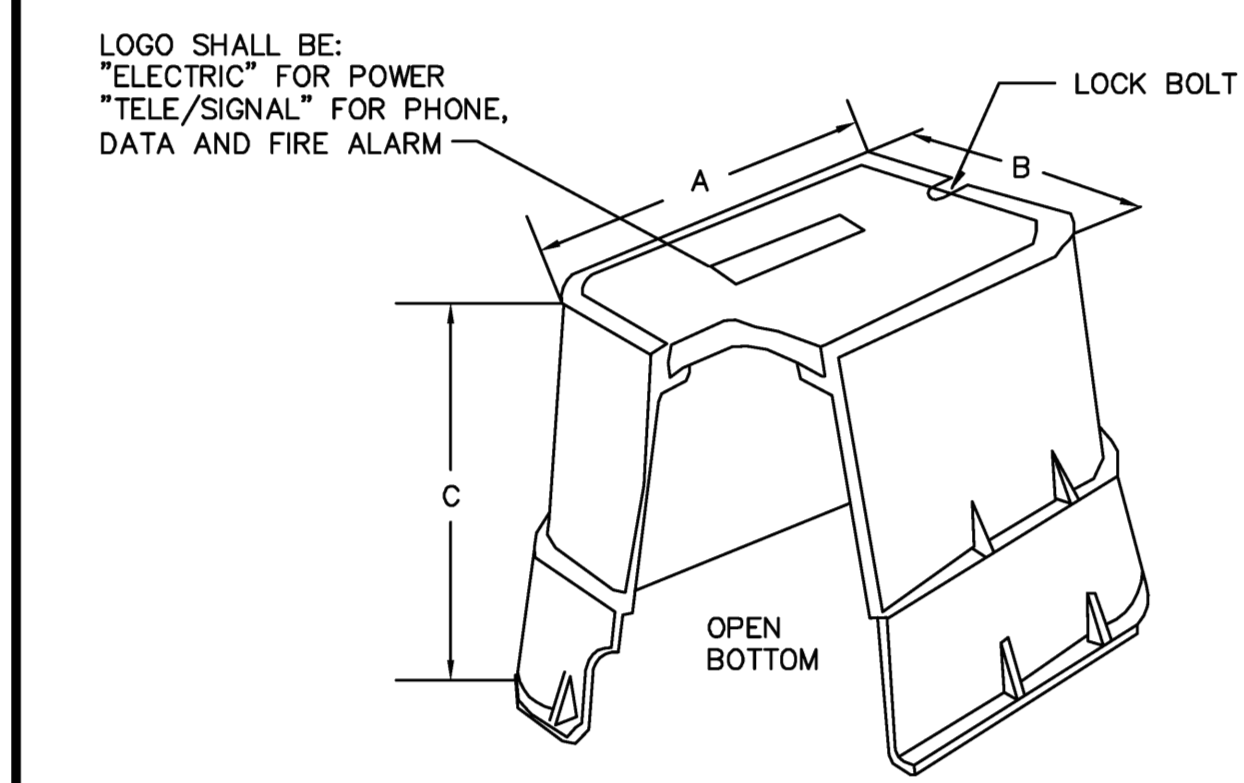
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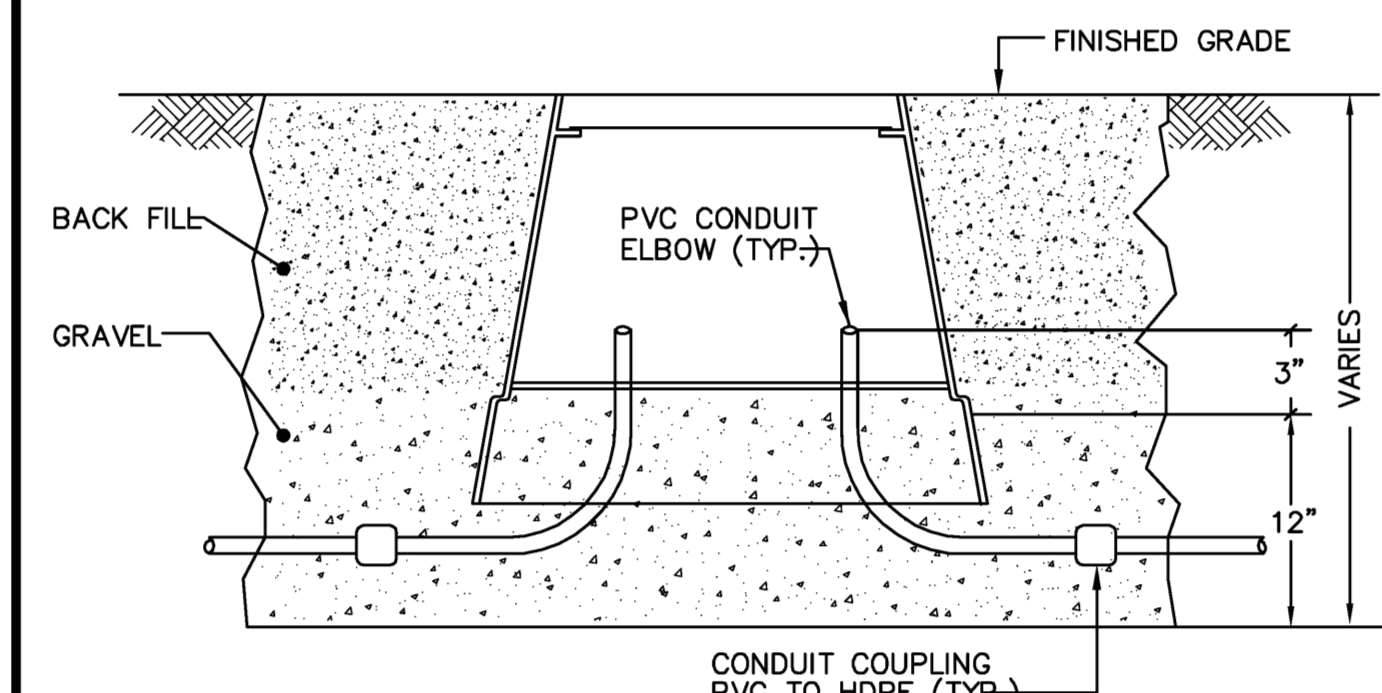
1 MICRO BIORETENTION TYPICAL SECTION
NOT TO SCALE



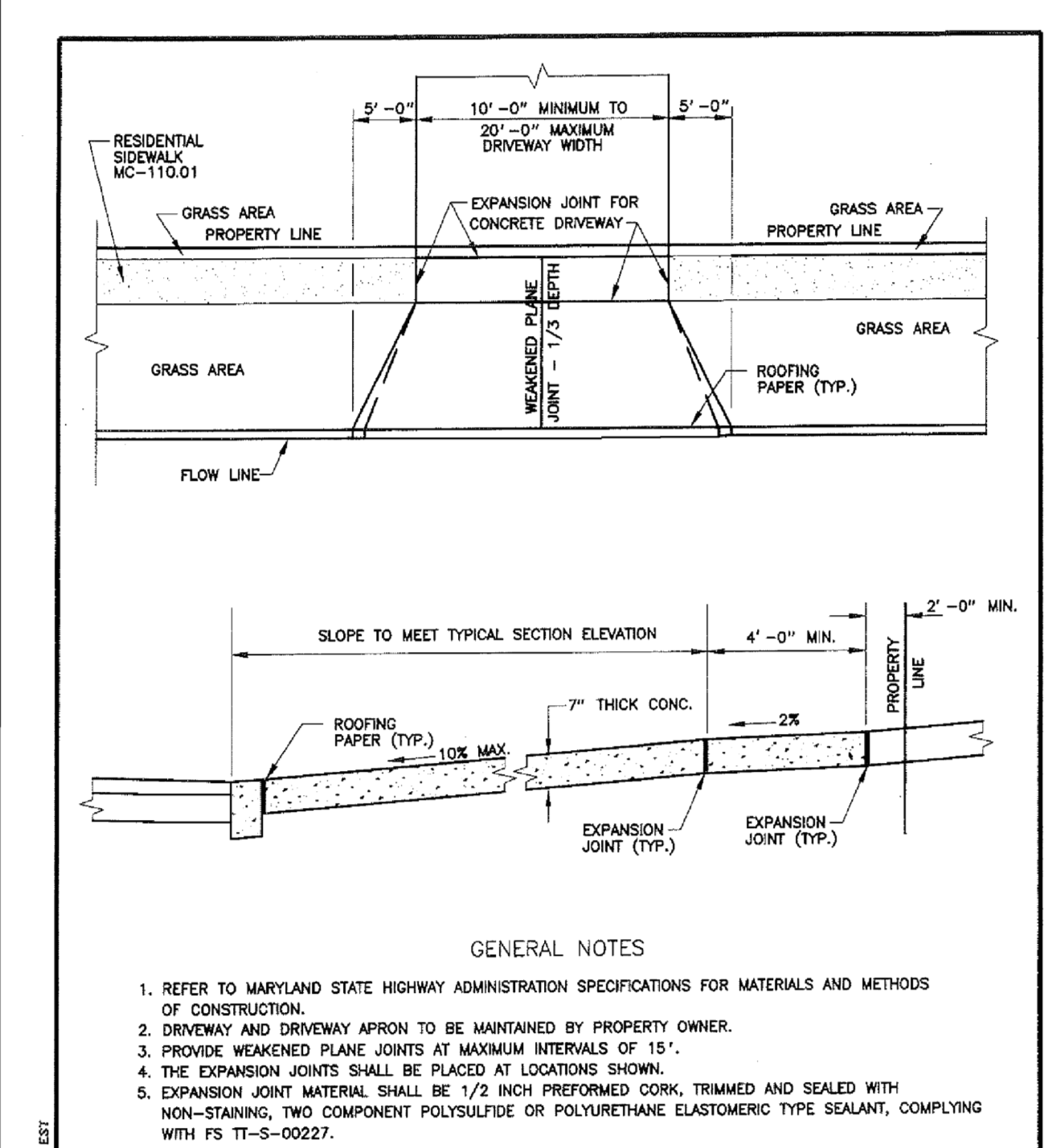
2 FULL-DEPTH ASPHALT PATCH
NOT TO SCALE



3 CONCRETE SIDEWALK
SCALE: NOT TO SCALE



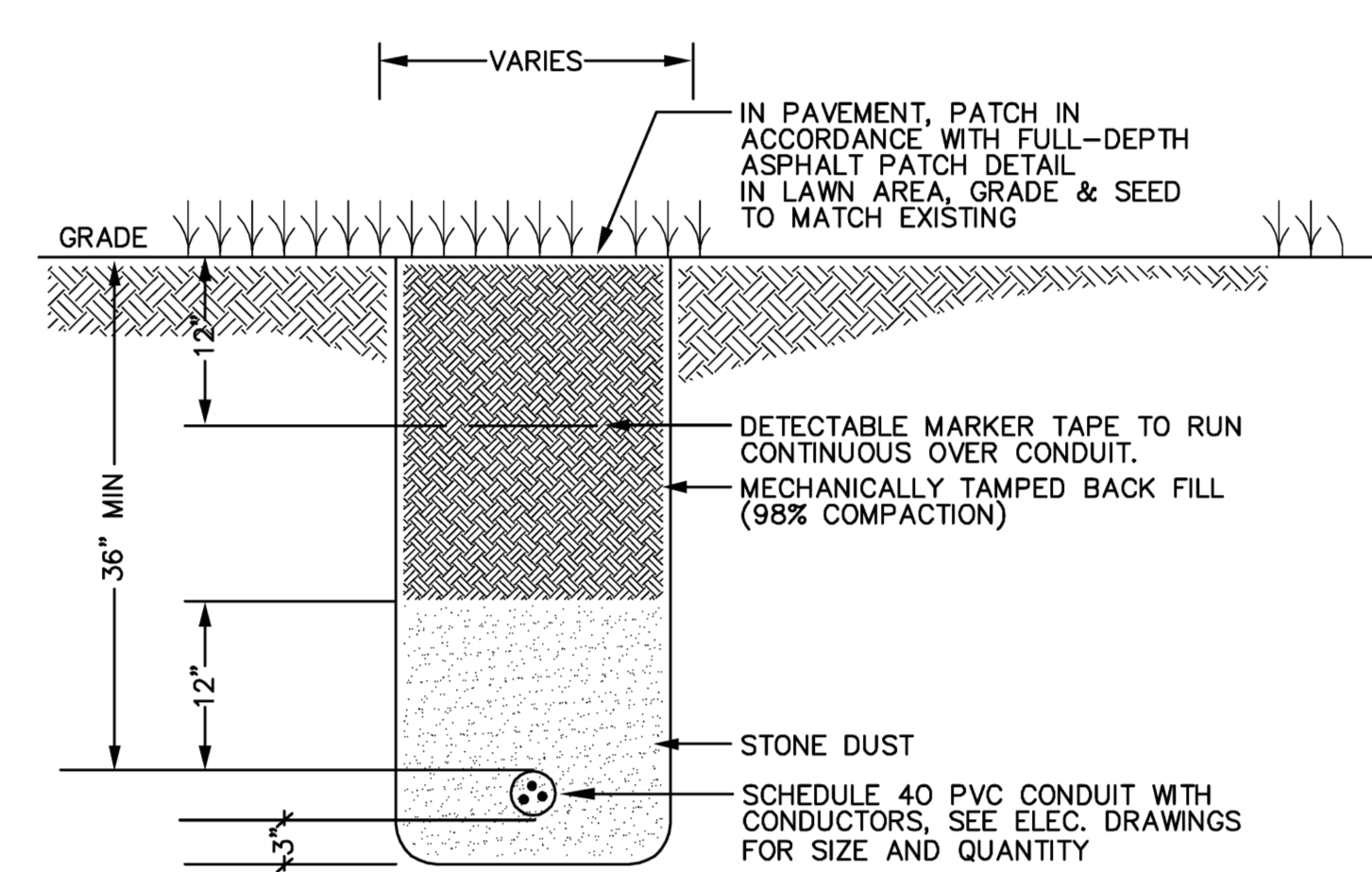
4 CONCRETE CURB
SCALE: NOT TO SCALE



5 MC DPW&T STANDARD NO. MC-301.01 (MODIFIED)
NOT TO SCALE

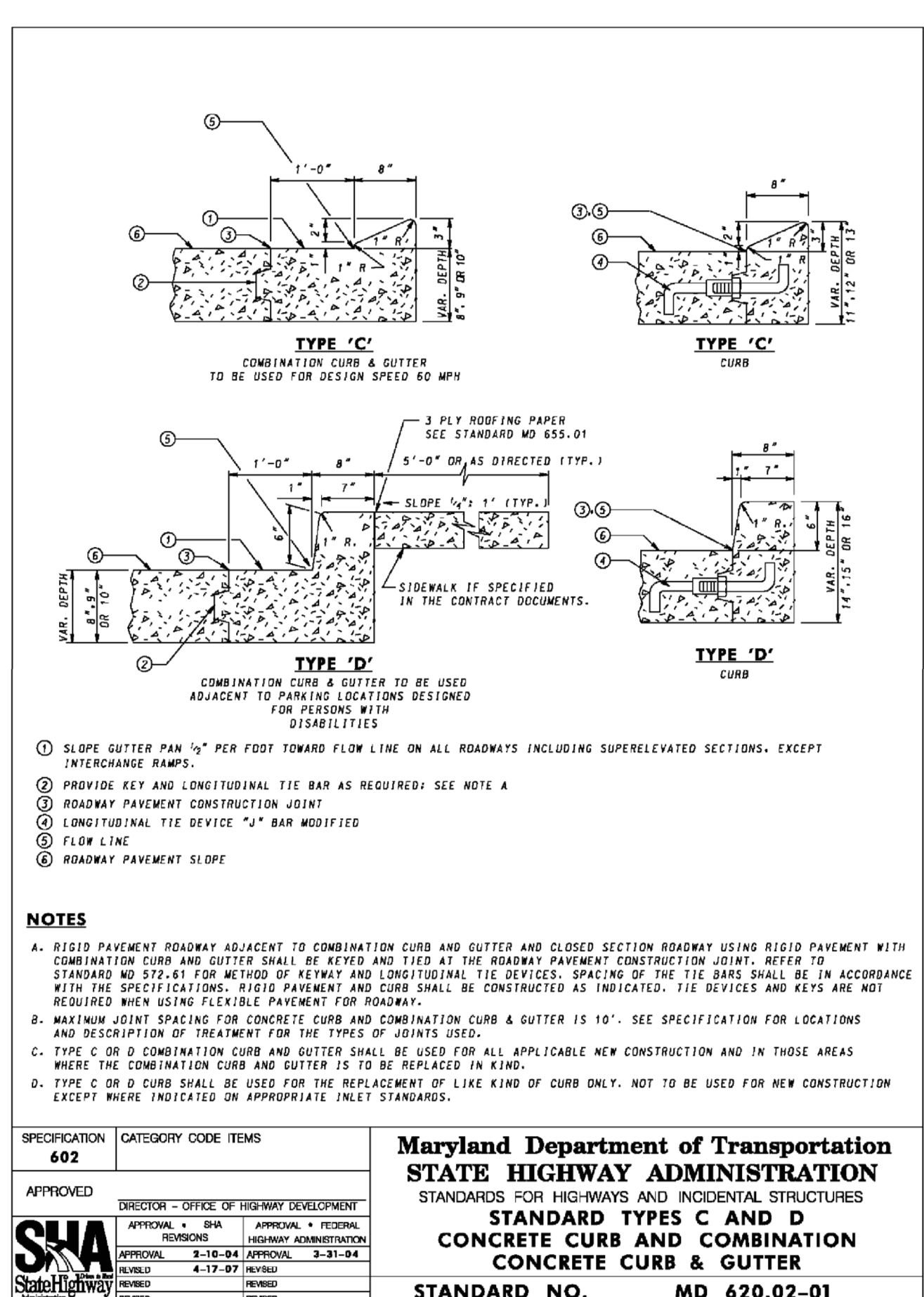


6 HANDBOX DETAIL
NOT TO SCALE

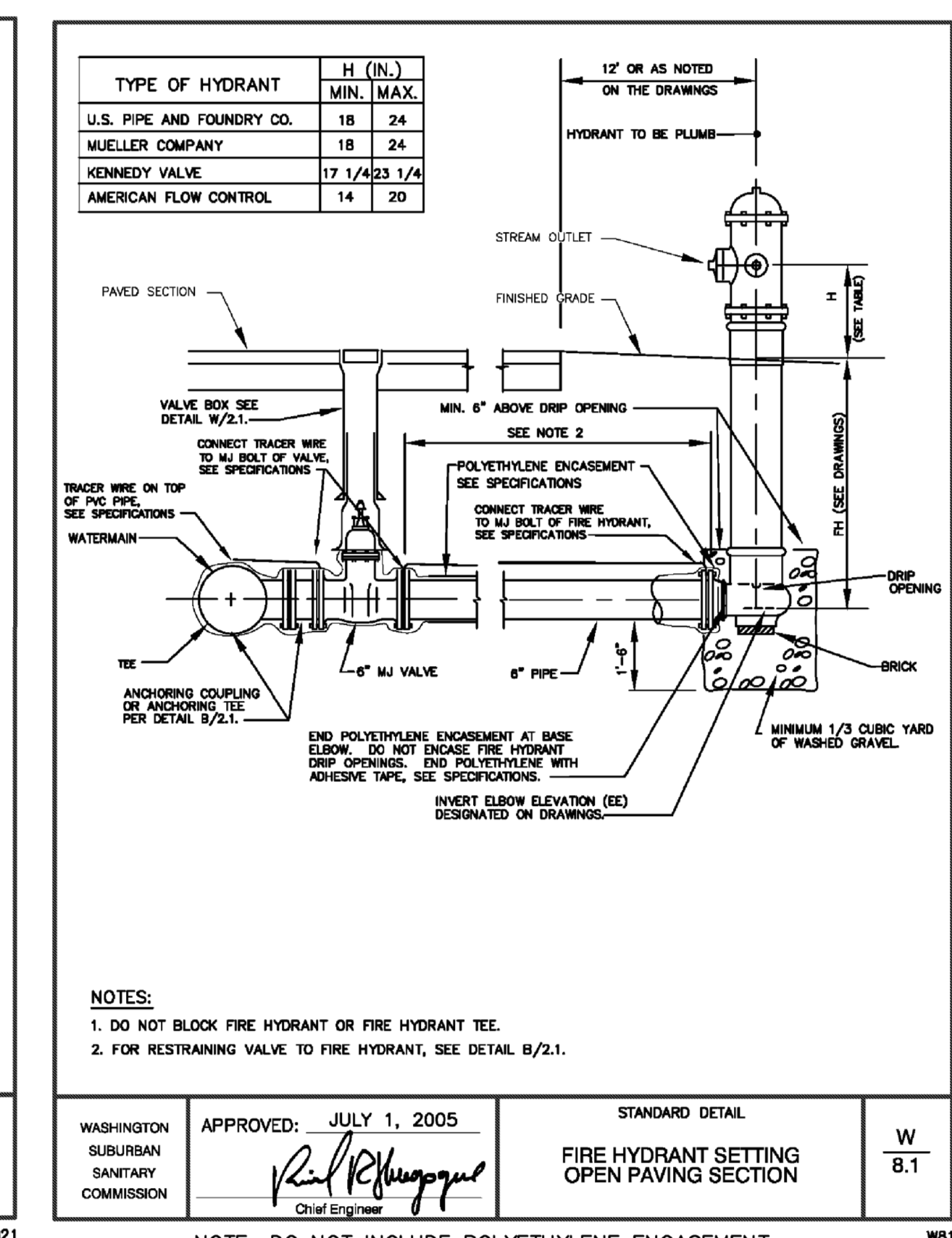


7 DIRECT BURIAL CONDUIT DETAIL
NOT TO SCALE

HANDBOX SCHEDULE				
TYPE	DIMENSIONS			BASIS OF DESIGN
	A	B	C	
A	49 5/8"	32 1/8"	36"	QUAZITE STYLE PG, 30"x48", CAT. NO. PG3048BA36 WITH ANSI 22 LOAD RATING AND EXTRA HEAVY DUTY COVER WITH BOLTS. COLOR IS GREY.
B	37 5/8"	26"	30"	QUAZITE STYLE PG, 24"x36", CAT. NO. PG2436BA30 WITH ANSI 22 LOAD RATING AND HEAVY DUTY COVER WITH BOLTS. COLOR IS GREY.



8 WSSC STANDARD DETAIL B2.1
NOT TO SCALE



9 WSSC STANDARD DETAIL W8.1
NOT TO SCALE

REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/29/10
	100% CD SET		02/24/10
	ISSUED FOR CONSTRUCTION		03/31/10

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APPROVED	JAN 5/96	DATE	REVISED	MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION
				RESIDENTIAL DRIVEWAY
				STANDARD NO. MC-301.01

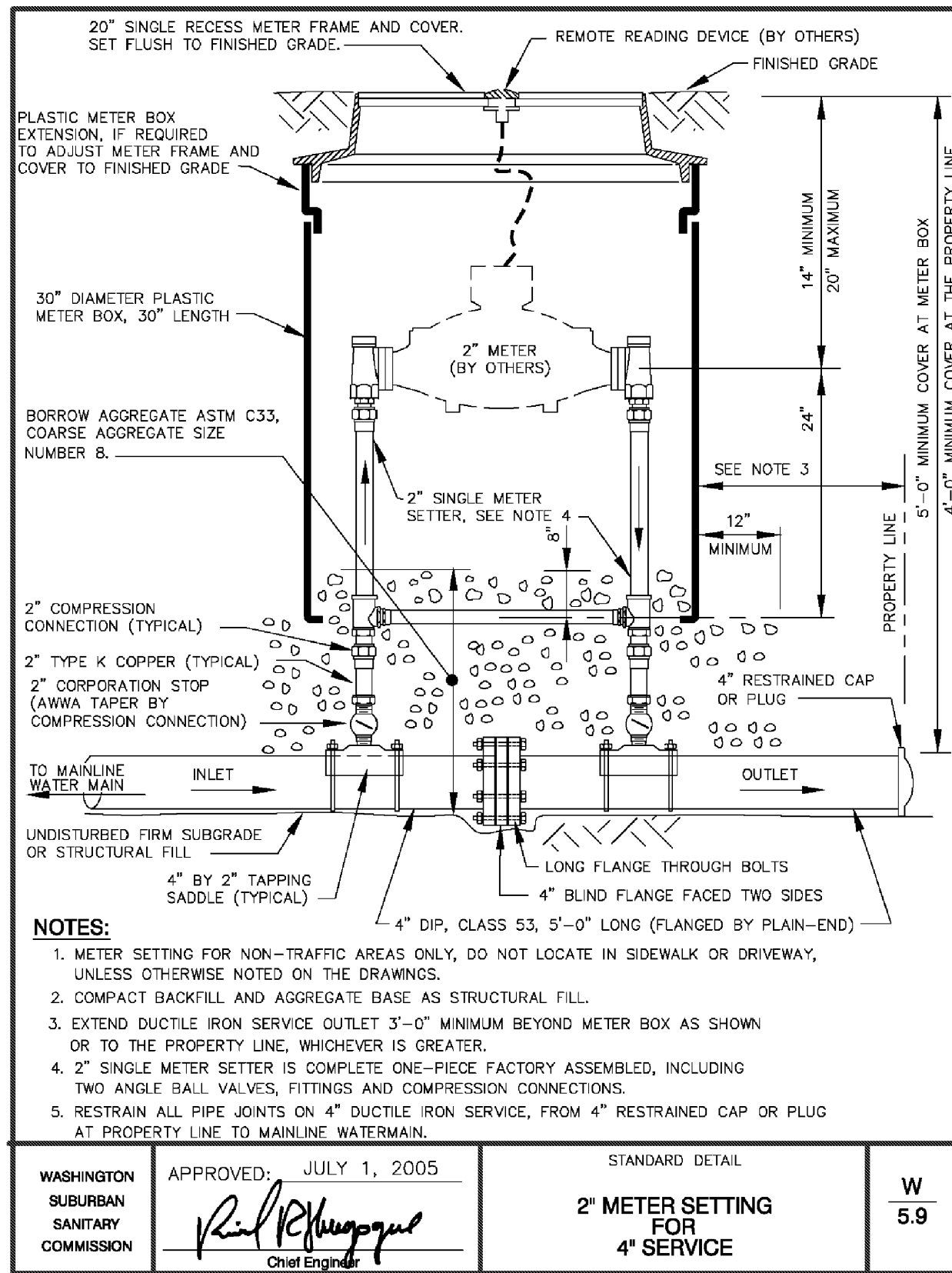
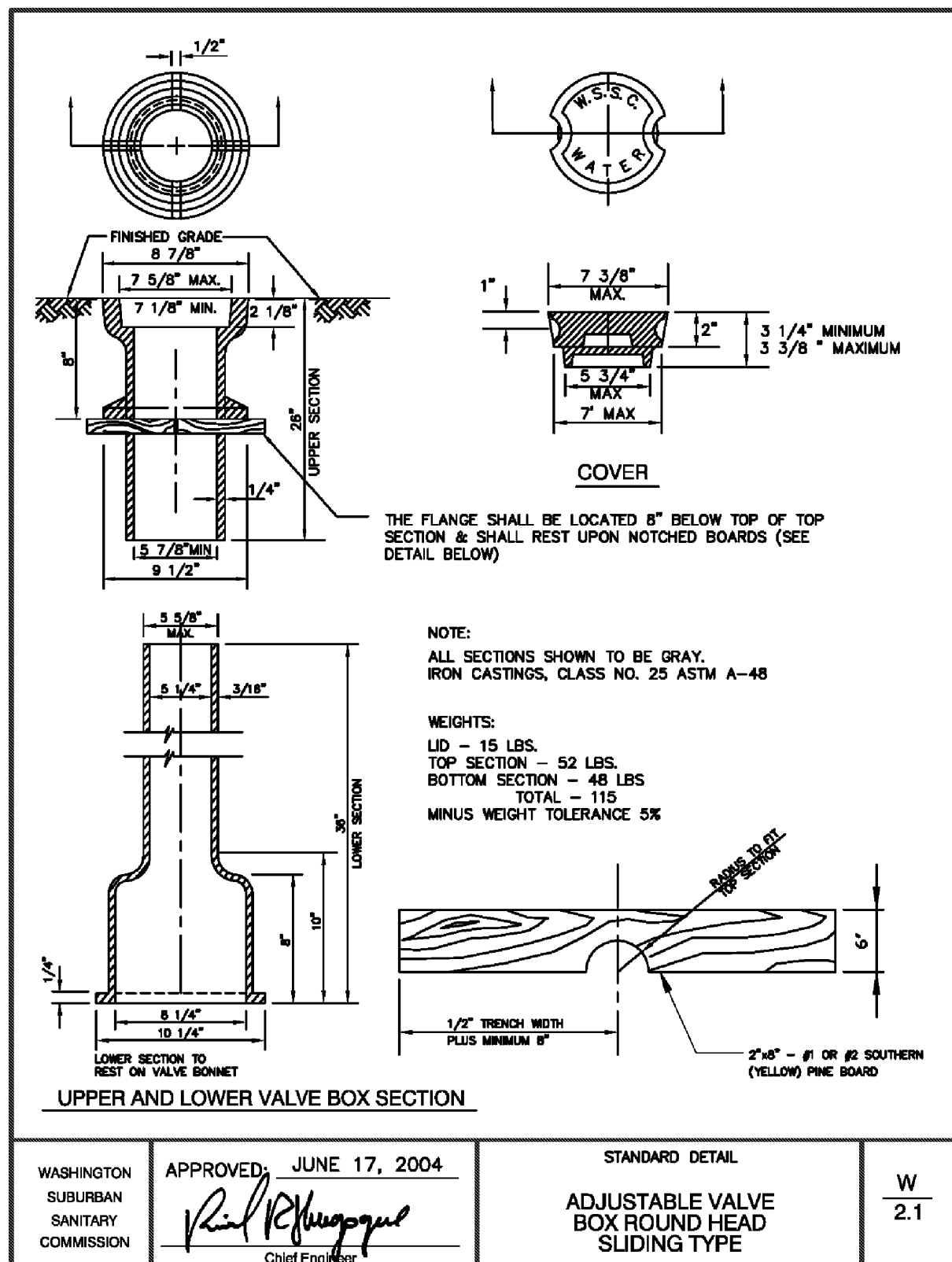
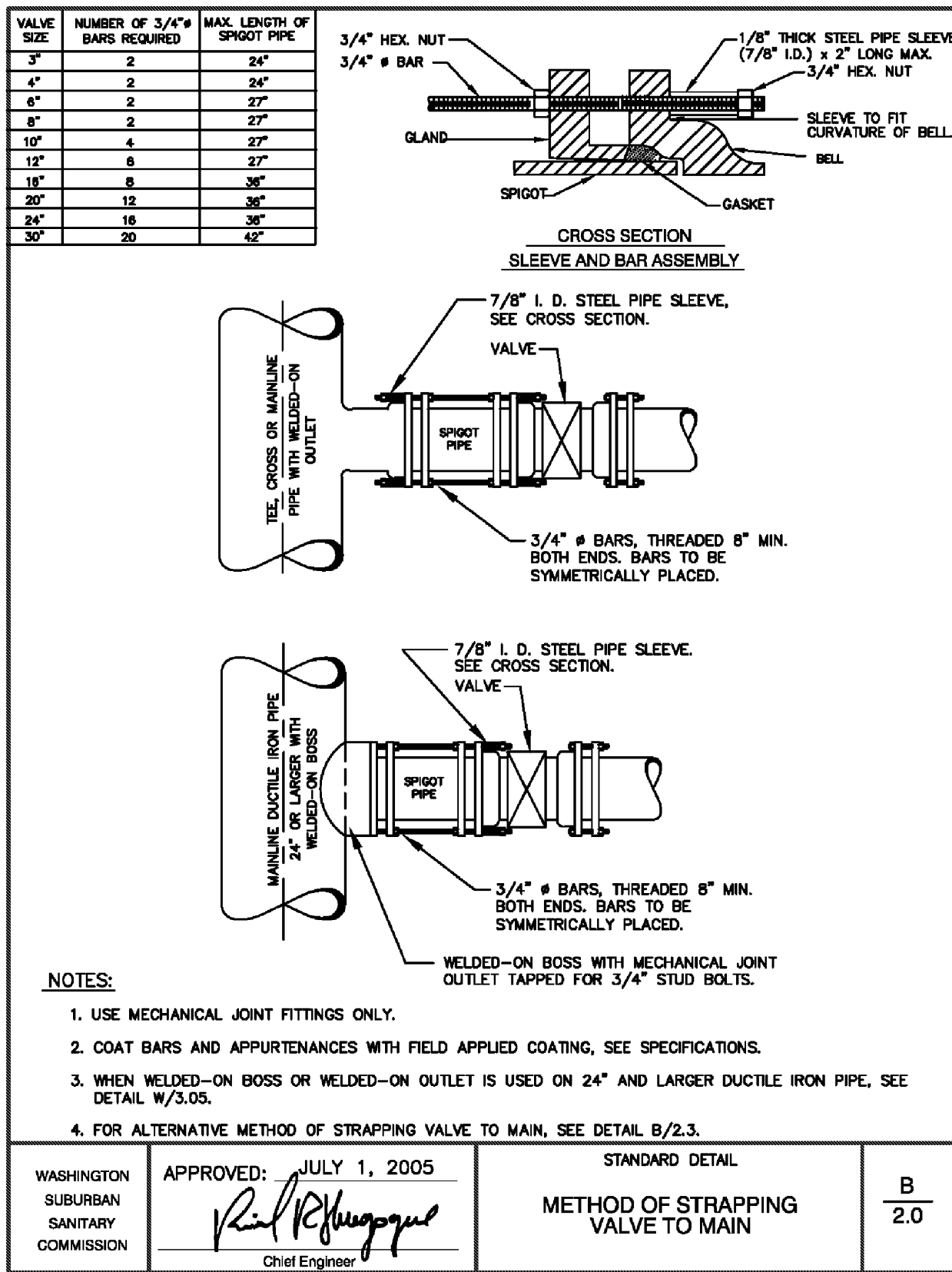
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EMAIL: AMT@AMTENGINEERING.COM

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NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
PLANT DIVISION
NET ZERO ENERGY RESIDENTIAL TEST FACILITY
SITE DETAILS
SH. NO. ____ OF ____ **DWG. C-202**

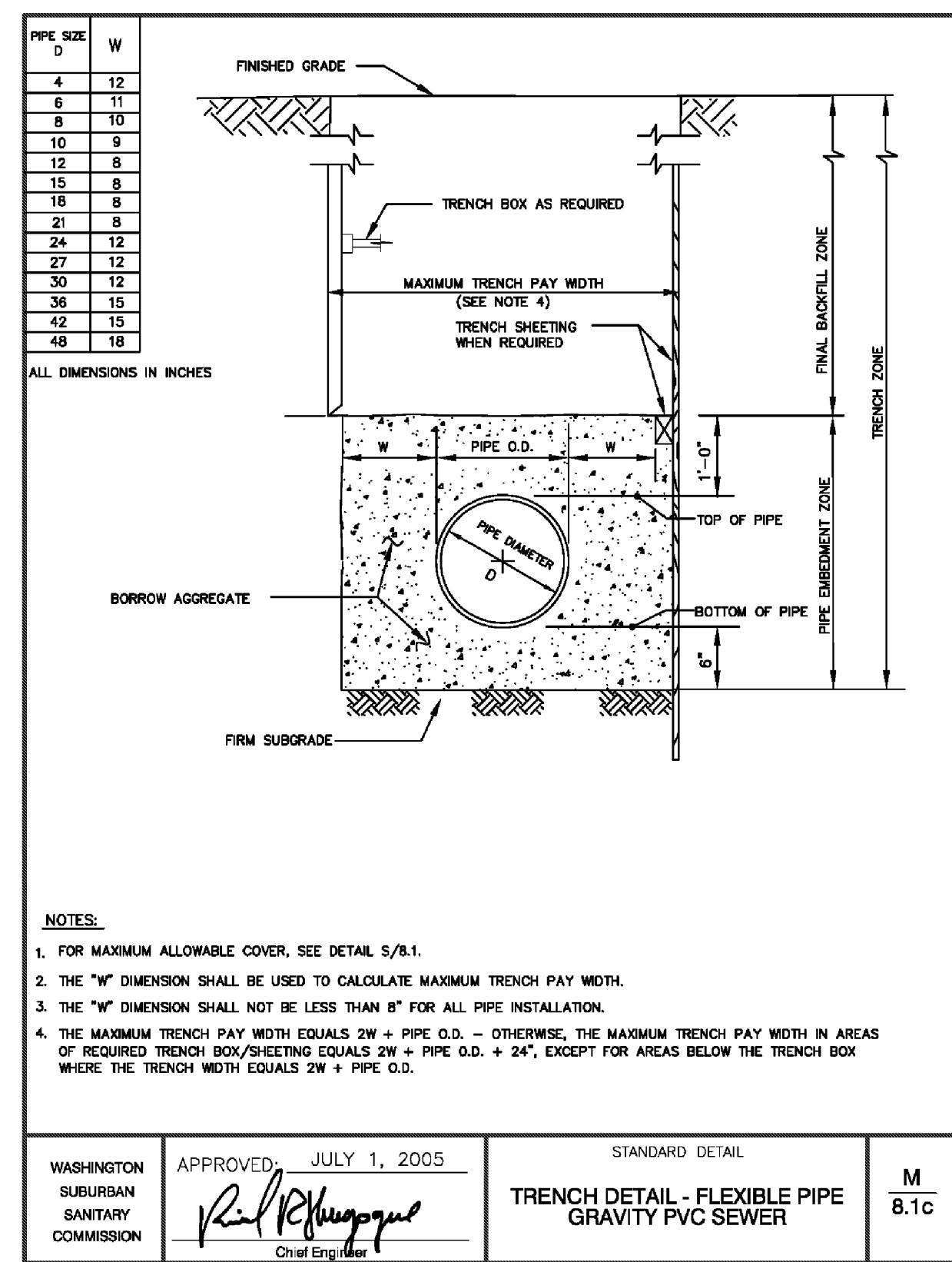
APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF	DATE	FIRE PROTECTION SYS	DATE	S.H. & E. DIV.	DATE	FACILITIES ENGR. OFF	DATE	PROJECT LEADER	DATE	KS/DN	02/01/10	SB134109CQ0026/89331	DESIGN PROJ. #
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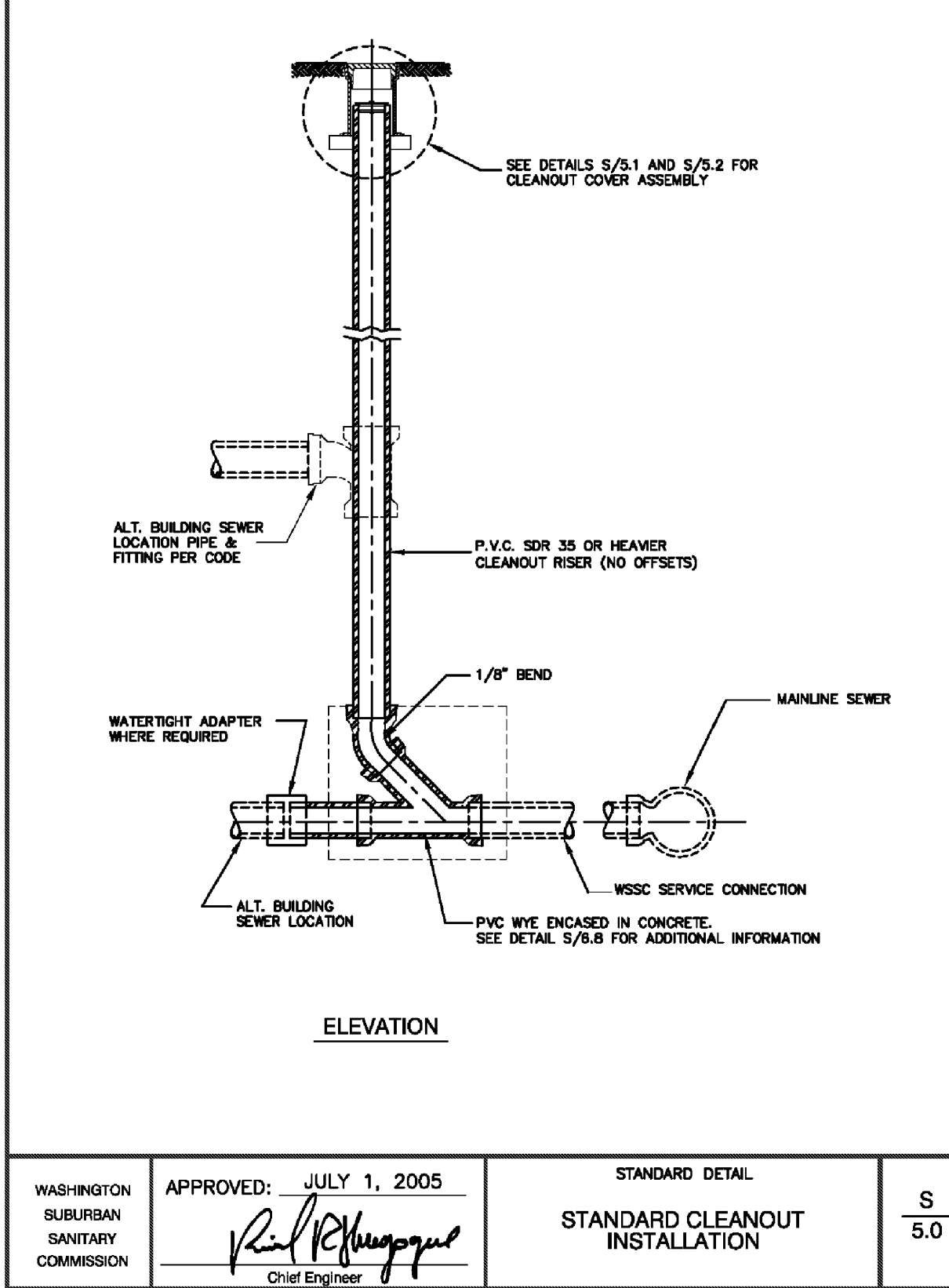
10 WSSC STANDARD DETAIL S5.0
201203 NOT TO SCALE

11 WSSC STANDARD DETAIL S5.0
201203 NOT TO SCALE

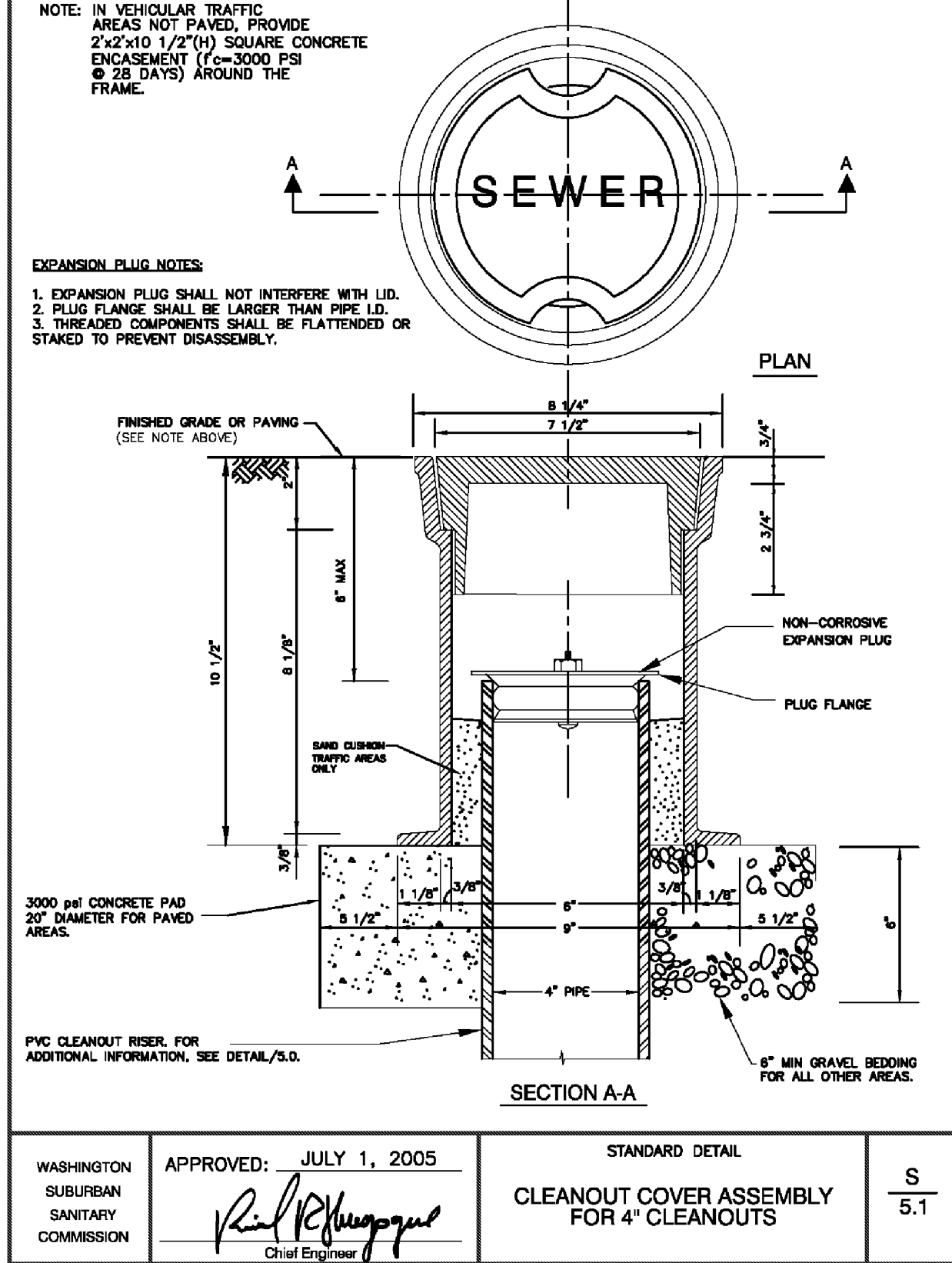
16 WSSC STANDARD DETAIL W5.9
201203 NOT TO SCALE



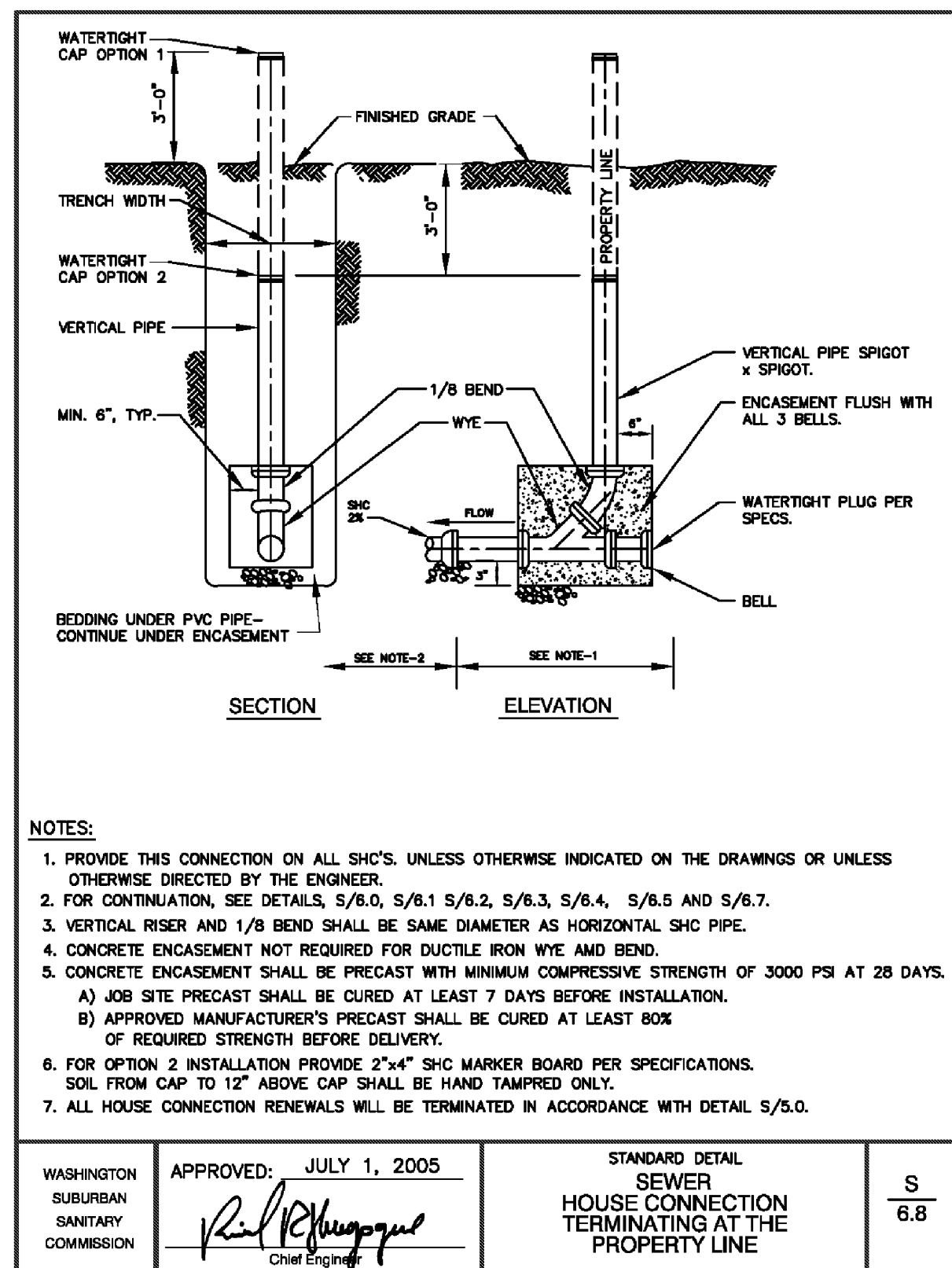
12 WSSC STANDARD DETAIL S5.0
201203 NOT TO SCALE



13 WSSC STANDARD DETAIL S5.0
201203 NOT TO SCALE



14 WSSC STANDARD DETAIL S5.0
201203 NOT TO SCALE



15 WSSC STANDARD DETAIL S5.0
201203 NOT TO SCALE

REVISION	DESCRIPTION	BY	DATE
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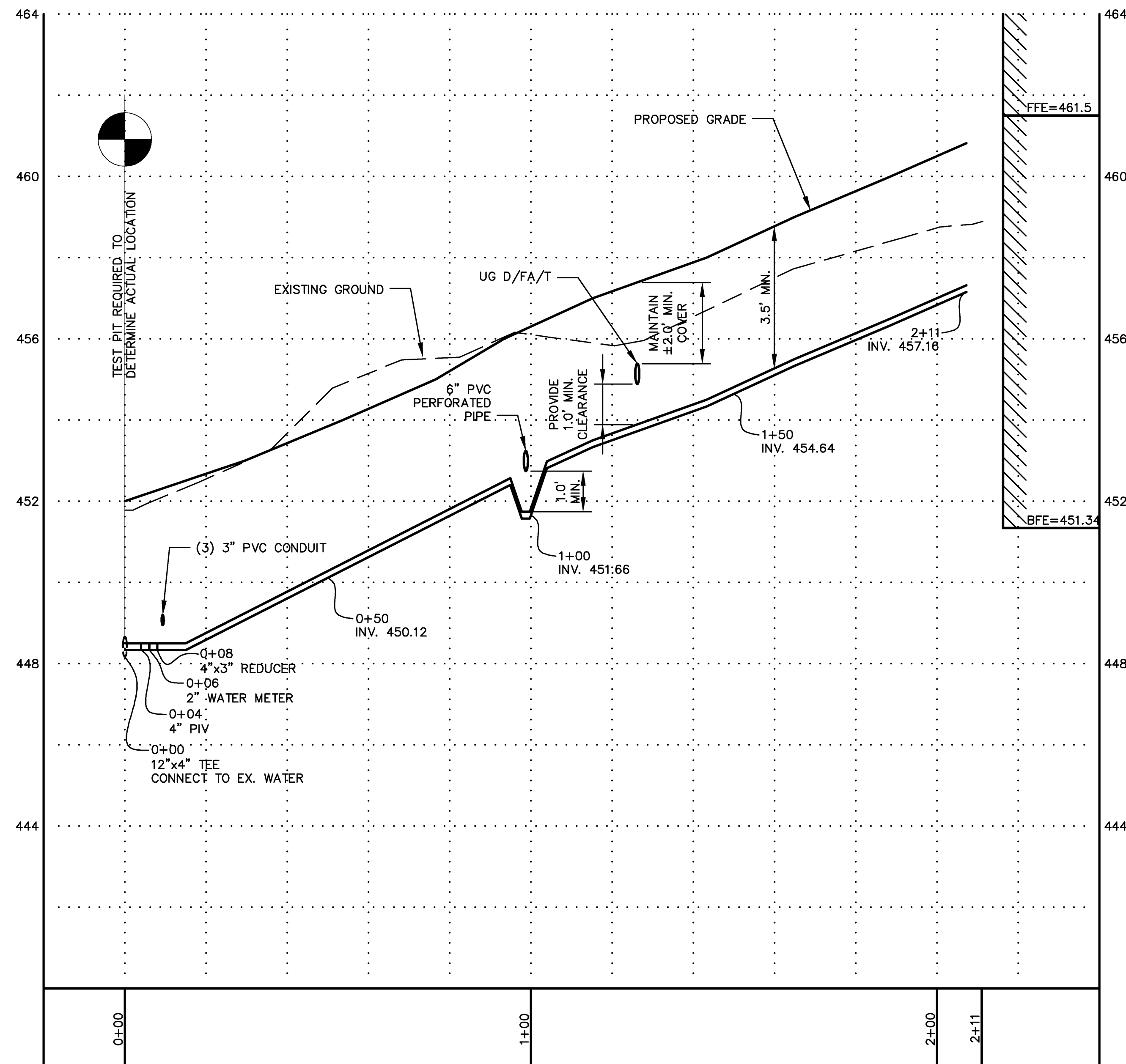
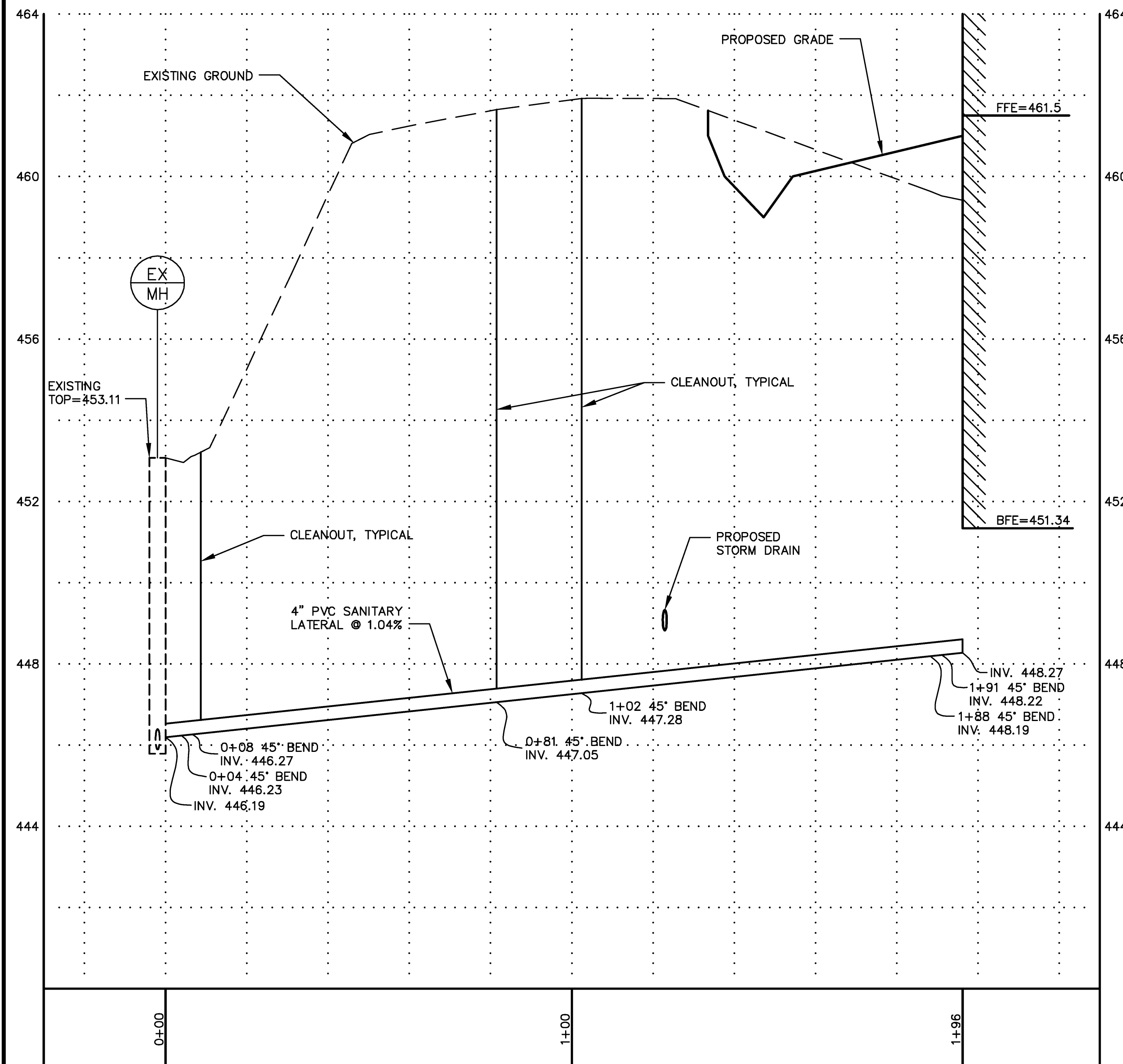
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PLANT DIVISION

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

SITE DETAILS

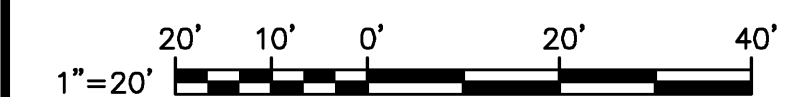
SH.NO. ____ OF ____ DWG. C-203




REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/28/10
	100% CD SET		02/24/10
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PLANT DIVISION

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

UTILITY PROFILES

SH.NO. ____ OF ____	DWG. C-301
---------------------	------------

[illegible]

LEGEND

LOD	LIMIT OF DISTURBANCE
SF	SILT FENCE
SSF	SUPER SILT FENCE
SCE	STABILIZED CONSTRUCTION ENTRANCE
[]	CURB INLET PROTECTION

STANDARD STABILIZATION NOTE

"Following initial soil disturbance or redistribution, permanent or temporary stabilization shall be completed within (7) days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes greater than 3 horizontal to 1 vertical (3:1) and fourteen days (14) as to all other disturbed or graded areas on the project site.

OWNER'S/DEVELOPER'S CERTIFICATION

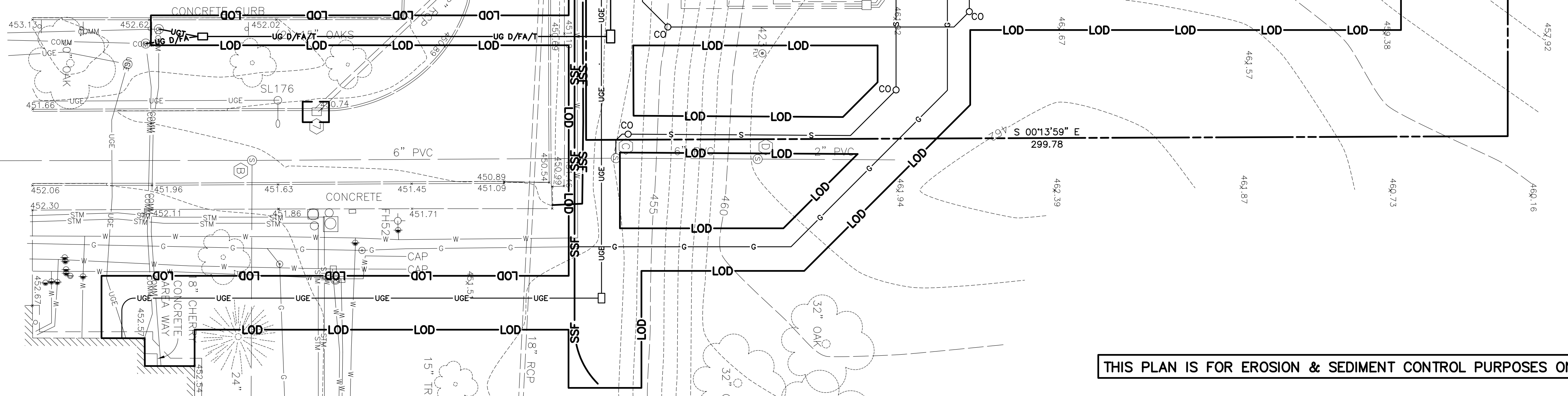
I/WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION, AND OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ONSITE EVALUATION BY THE STATE OF MARYLAND, DEPARTMENT OF THE ENVIRONMENT, COMPLIANCE INSPECTORS."

SIGNATURE	DATE
PRINTED NAME AND TITLE	REGISTRATION NUMBER

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE "1994 STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL, THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT STORMWATER MANAGEMENT REGULATIONS.

DESIGN ENGINEER SIGNATURE	DATE
PRINTED NAME	REGISTRATION NUMBER

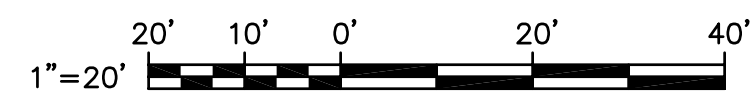


WEST DRIVE
ASPHALT PAVEMENT

REVISION	DESCRIPTION	BY	DATE
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PLANT DIVISION

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

EROSION & SEDIMENT CONTROL PLAN

SH.NO. ____ OF ____ DWG. C-401

THIS PLAN IS FOR EROSION & SEDIMENT CONTROL PURPOSES ONLY.

APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF	DATE	FIRE PROTECTION SVS	DATE	S.H. & E. DIV	DATE	FACILITIES ENGR. OFF	DATE	PROJECT LEADER	DATE	KS/DN	02/01/10	SB194109CQ0026/89331	DESIGN PROJ. #
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10' MAXIMUM CENTER TO CENTER

36" MINIMUM LENGTH FENCE POST, DRIVEN A MINIMUM OF 16" INTO GROUND

16" MINIMUM HEIGHT OF GEOTEXTILE CLASS F A

8" MINIMUM DEPTH IN GROUND

FLOW

FLOW

PERSPECTIVE VIEW

36" MINIMUM FENCE POST LENGTH

FLOW

FILTER CLOTH

FENCE POST SECTION MINIMUM 20" ABOVE GROUND

UNDISTURBED

MINIMUM OF 8" VERTICALLY INTO THE GROUND

MINIMUM OF 16" INTO THE GROUND

TOP VIEW

EMBED GEOTEXTILE CLASS F A

POSTS

SECTION A

SECTION B

STAPLE

CROSS SECTION

STANDARD SYMBOL

5'

- | | | |
|-------------------------------------------------------------|--------------------|-----------------------------------------------------------------------|
| U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE | PAGE
E - 15 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION |
|-------------------------------------------------------------|--------------------|-----------------------------------------------------------------------|

FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER
 10' MAXIMUM
 34" MINIMUM
 36" MINIMUM
 6" MINIMUM
 GROUND SURFACE
 FLOW
 2 1/2" DIAMETER GALVANIZED OR ALUMINUM POSTS
 CHAIN LINK FENCE WITH 1 LAYER OF FILTER CLOTH
 FLOW
 CHAIN LINK FENCING
 FILTER CLOTH
 34" MINIMUM
 16" MIN. 1ST LAYER OF FILTER CLOTH *
 EMBED FILTER CLOTH 6" MINIMUM INTO GROUND
 * IF MULTIPLE LAYERS ARE REQUIRED TO ATTAIN 42"

CONSTRUCTION SPECIFICATIONS

STANDARD SYMBOL
 SSF

- | | | |
|-------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------|
| Tensile Strength | 50 lbs/in (min.) | Test: MSMT 509 |
| Tensile | 20 lbs/in (min.) | Test: MSMT 509 |
| Modulus | 0.3 gal/ft ² /minute (max.) | Test: MSMT 322 |
| Filtration Efficiency | 75% (min.) | Test: MSMT 322 |
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<u>SLOPE STEEPNESS</u>	<u>(MAXIMUM) SLOPE LENGTH</u>	<u>(MAXIMUM) SILT FENCE LENGTH</u>
FLATTER THAN 50:1	UNLIMITED	UNLIMITED
50:1 TO 10:1	125 FEET	1,000 FEET
10:1 TO 5:1	100 FEET	750 FEET
5:1 TO 3:1	60 FEET	500 FEET
3:1 TO 2:1	40 FEET	250 FEET
2:1 AND STEEPER	20 FEET	125 FEET

NOTE: IN AREAS OF LESS THAN 2% SLOPE AND SANDY SOILS (USDA GENERAL CLASSIFICATION SYSTEM, SOIL CLASS A) MAXIMUM SLOPE LENGTH AND SILT FENCE LENGTH WILL BE UNLIMITED. IN THESE AREAS A SILT FENCE MAY BE THE ONLY PERIMETER CONTROL REQUIRED.

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DESIGN CRITERIA			
SLOPE	SLOPE STEEPNESS	SLOPE LENGTH (MAXIMUM)	SILT FENCE LENGTH (MAXIMUM)
0 - 10%	0 - 10:1	UNLIMITED	UNLIMITED
10 - 20%	10:1 - 5:1	200 FEET	1,500 FEET
20 - 33%	5:1 - 3:1	100 FEET	1,000 FEET
33 - 50%	3:1 - 2:1	100 FEET	500 FEET
50% +	2:1 +	50 FEET	250 FEET

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SHRUBS **SNOW FENCE**

NOTE: ALL PROTECTIVE FENCING SHALL EXTEND BEYOND THE TREE DRIFLINE

TEMPORARY MEASURES

NOTE: TEMPORARY MEASURES SHALL EXTEND BEYOND THE TREE DRIFLINE

TEMPORARY AND PERMANENT MEASURES

ORIGINAL GRADE

CUT AREAS

FINAL GRADE

ORIGINAL GROUND SURFACE

FILL AREAS

CUT

FILL

EXCESSIVE CUT AND FILL WILL KILL THIS TREE

IMPROPER PROCEDURE

PROPER

DRY WELL

CUT

FILL

RETAINING WALL

- | | | |
|-------------------------------------------------------------|--------------------|-----------------------------------------------------------------------|
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"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12564, EXPIRATION DATE 08/10/2011."

REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/29/10
	100% CD SET		02/24/10
	ISSUED FOR CONSTRUCTION		03/31/10

EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED.

APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF.	DATE	FIRE PROTECTION SYS.	DATE	S.H. & E. DIV.	DATE	FACILITIES ENG. OFF.	DATE	PROJECT LEADER	DATE	KS / DN	02/01/10	SHI34109CQ0028/69331	SH. NO. ____ OF ____	DWG. C-402
														DESIGN BY	PROJECT / E.G.	DESIGN PROJ. #		

SH.NO. ____ OF ____ DWG. C-402

NLST 

FOR OFFICIAL USE ONLY

U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
PLANT DIVISION

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

EROSION & SEDIMENT CONTROL DETAILS

SH.NO. ____ OF ____ DWG. C-402

SH.NO. ____ OF ____ DWG. C-402

STANDARD EROSION AND SEDIMENT CONTROL NOTES

THE WATER MANAGEMENT ADMINISTRATION REQUIRES THAT THESE NOTES, IN THEIR ENTIRETY, BE INCLUDED ON THE EROSION AND SEDIMENT CONTROL PLAN. IT IS RECOGNIZED THAT EVERY NOTE MAY NOT APPLY TO ALL PROJECTS. THE REQUIREMENT OF ANY INDIVIDUAL NOTE NOT APPLICABLE TO THE SUBJECT PROJECT IS NOT BINDING UPON THE APPLICANT OR THE APPLICANT'S CONTRACTOR.

1. THE CONTRACTOR SHALL NOTIFY THE ADMINISTRATION (WMA) AT (410) 537-3510 SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY AND, UNLESS WAIVED BY THE ADMINISTRATION, SHALL BE REQUIRED TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND A REPRESENTATIVE OF WMA.
2. THE CONTRACTOR MUST NOTIFY WMA IN WRITING AND BY TELEPHONE AT THE FOLLOWING POINTS:

A. THE REQUIRED PRE-CONSTRUCTION MEETING.

B. FOLLOWING INSTALLATION OF SEDIMENT CONTROL MEASURES.

C. DURING THE INSTALLATION OF SEDIMENT BASINS (TO BE CONVERTED INTO PERMANENT STORMWATER MANAGEMENT STRUCTURES) AT THE REQUIRED INSPECTION POINTS (SEE INSPECTION CHECKLIST ON PLAN), NOTIFICATION PRIOR TO COMMENCING CONSTRUCTION OF EACH STEP IS MANDATORY.

D. PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE(S).

E. PRIOR TO REMOVAL OF ALL SEDIMENT CONTROL DEVICES.

F. PRIOR TO FINAL ACCEPTANCE.
3. THE CONTRACTOR SHALL CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES PER THE APPROVED PLAN AND CONSTRUCTION SEQUENCE AND SHALL HAVE THEM INSPECTED AND APPROVED BY THE AGENCY INSPECTOR OR WMA INSPECTOR PRIOR TO BEGINNING ANY OTHER LAND DISTURBANCES. MINOR SEDIMENT CONTROL DEVICE LOCATION ADJUSTMENTS MAY BE MADE IN THE FIELD WITH THE APPROVAL OF THE WMA INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT ALL RUNOFF FROM DISTURBED AREAS IS DIRECTED TO THE SEDIMENT CONTROL DEVICES AND SHALL NOT REMOVE ANY EROSION OR SEDIMENT CONTROL MEASURE WITHOUT PRIOR PERMISSION FROM WMA INSPECTOR AND AGENCY INSPECTOR. THE CONTRACTOR MUST OBTAIN PRIOR AGENCY AND WMA APPROVAL FOR CHANGES TO THE SEDIMENT CONTROL PLAN AND / OR SEQUENCE OF CONSTRUCTION.
4. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO PUBLIC ROADS. ALL MATERIALS DEPOSITED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
5. THE CONTRACTOR SHALL INSPECT DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL SUCH TIMES AS THEY ARE REMOVED WITH PRIOR PERMISSION FROM WMA INSPECTOR AND AGENCY INSPECTOR.
6. ALL SEDIMENT BASINS, TRAP EMBANKMENTS, PERIMETER DIKES, SWALES AND ALL DISTURBED SLOPES STEEPER OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SOD OR SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES, AS SOON AS POSSIBLE BUT NO LATER THAN SEVEN (7) CALENDAR DAYS AFTER ESTABLISHMENT. ALL AREAS DISTURBED OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST BE MINIMIZED. MAINTENANCE MUST BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT FOR STABILIZATION MAY BE REDUCED TO THREE (3) DAYS FOR SENSITIVE AREAS.)
7. THE CONTRACTOR SHALL APPLY SOD OR SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES TO ALL DISTURBED AREAS AND STOCKPILES WITHIN FOURTEEN (14) CALENDAR DAYS AFTER STRIPPING AND GRADING ACTIVITIES HAVE CEASED IN THE AREA. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. (REQUIREMENT MAY BE REDUCED TO SEVEN (7) DAYS FOR SENSITIVE AREAS.)
8. PRIOR TO REMOVAL OF SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL STABILIZE AND HAVE ESTABLISHED PERMANENT STABILIZATION FOR ALL CONTRIBUTORY DISTURBED AREAS USING SOD OR AN APPROVED PERMANENT SEED MIXTURE WITH REQUIRED SOIL AMENDMENTS AND AN APPROVED ANCHORED MULCH. WOOD FIBER MULCH MAY ONLY BE USED IN SEEDING SEASON WHERE THE SLOPE DOES NOT EXCEED 10% AND GRADING HAS BEEN DONE TO PROMOTE SHEET FLOW DRAINAGE. AREAS BROUGHT TO FINISHED GRADE DURING THE SEEDING SEASON SHALL BE PERMANENTLY STABILIZED AS SOON AS POSSIBLE, BUT NOT LATER THAN FOURTEEN (14) CALENDAR DAYS AFTER ESTABLISHMENT. WHEN PROPERTY IS BROUGHT TO FINISHED GRADE DURING THE MONTHS OF NOVEMBER THROUGH FEBRUARY, AND PERMANENT STABILIZATION IS FOUND TO BE IMPRACTICAL, TEMPORARY SEED AND ANCHORED STRAW MULCH SHALL BE APPLIED TO DISTURBED AREAS. THE FINAL PERMANENT STABILIZATION OF SUCH PROPERTY SHALL BE APPLIED BY MARCH 15 OR EARLIER IF GROUND AND WEATHER CONDITIONS ALLOW.
9. THE SITE'S APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, DAILY LOG BOOKS, AND TEST REPORTS SHALL BE AVAILABLE AT THE SITE FOR INSPECTION BY DULY AUTHORIZED OFFICIALS OF WMA AND THE AGENCY RESPONSIBLE FOR PROJECT.
10. SURFACE DRAINAGE FLOWS OVER UNSTABILIZED CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER PREVENTING DRAINAGE FLOWS FROM TRAVERSING THE SLOPES OR BY INSTALLING PROTECTIVE DEVICES TO LOWER THE WATER DOWNSLOPE WITHOUT CAUSING EROSION. DIKES SHALL BE INSTALLED AND MAINTAINED AT THE TOP OF A CUT OR FILL SLOPE UNTIL THE SLOPE AND DRAINAGE AREA TO IT ARE FULLY STABILIZED, AT WHICH TIME THEY MUST BE REMOVED AND FINAL GRADING DONE TO PROMOTE SHEET FLOW DRAINAGE. PROTECTIVE METHODS MUST BE PROVIDED AT POINTS OF CONCENTRATED FLOW WHERE EROSION IS LIKELY TO OCCUR.
11. PERMANENT SWALES OR OTHER POINTS OF CONCENTRATED WATER FLOW SHALL BE STABILIZED WITH SOD OR SEED WITH AN APPROVED EROSION CONTROL MATTING, RIP-RAP, OR BY OTHER APPROVED STABILIZATION MEASURES.
12. TEMPORARY SEDIMENT CONTROL DEVICES MAY BE REMOVED, WITH PERMISSION OF WMA INSPECTOR AND AGENCY INSPECTORS, WITHIN THIRTY (30) CALENDAR DAYS FOLLOWING ESTABLISHMENT OF PERMANENT STABILIZATION IN ALL CONTRIBUTORY DRAINAGE AREAS. STORMWATER MANAGEMENT STRUCTURES USED TEMPORARILY FOR SEDIMENT CONTROL SHALL BE CONVERTED TO THE PERMANENT CONFIGURATION WITHIN THIS TIME PERIOD AS WELL.
13. NO PERMANENT CUT OR FILL SLOPE WITH A GRADIENT STEEPER THAN 3:1 WILL BE PERMITTED IN LAWN MAINTENANCE AREAS. A SLOPE GRADIENT OF UP TO 2:1 WILL BE PERMITTED IN NONMAINTENANCE AREAS PROVIDED THAT THOSE AREAS ARE INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN WITH A LOW-MAINTENANCE GROUND COVER SPECIFIED FOR PERMANENT STABILIZATION. SLOPE GRADIENT STEEPER THAN 2:1 WILL NOT BE PERMITTED WITH VEGETATIVE STABILIZATION.
14. FOR FINISHED GRADING, THE CONTRACTOR SHALL PROVIDE ADEQUATE GRADIENTS TO PREVENT WATER FROM PONDING FOR MORE THAN TWENTY FOUR (24) HOURS AFTER THE END OF A RAINFALL EVENT. DRAINAGE COURSES AND SWALE FLOW AREAS MAY TAKE AS LONG AS FORTY-EIGHT (48) HOURS AFTER THE END OF A RAINFALL EVENT TO DRAIN. AREAS DESIGNED TO HAVE STANDING WATER SHALL NOT BE REQUIRED TO MEET THIS REQUIREMENT.
15. SEDIMENT TRAPS OR BASINS ARE NOT PERMITTED WITHIN 20 FEET OF A FOUNDATION THAT EXISTS OR IS UNDER CONSTRUCTION. NO STRUCTURE MAY BE CONSTRUCTED WITHIN 20 FEET OF AN ACTIVE SEDIMENT TRAP OR BASIN.
16. THE WMA INSPECTOR HAS THE OPTION OF REQUIRING ADDITIONAL SAFETY OR SEDIMENT CONTROL MEASURES, IF DEEMED NECESSARY.
17. ALL TRAP DEPTH DIMENSIONS ARE RELATIVE TO THE OUTLET ELEVATION. ALL TRAPS MUST HAVE A STABLE OUTFALL. ALL TRAPS AND BASINS SHALL HAVE STABLE INFLOW POINTS.
18. VEGETATIVE STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. REFER TO APPROPRIATE SPECIFICATIONS FOR TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SODDING, AND GROUND COVERS.
19. SEDIMENT SHALL BE REMOVED AND THE TRAP OR BASIN RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE QUARTER OF THE TOTAL DEPTH OF THE TRAP OR BASIN. TOTAL DEPTH SHALL BE MEASURED FROM THE TRAP OR BASIN BOTTOM TO THE CREST OF THE OUTLET.
20. SEDIMENT REMOVED FROM TRAPS (AND BASINS) SHALL BE PLACED AND STABILIZED IN APPROVED AREAS, BUT NOT WITHIN A FLOODPLAIN, WETLAND OR TREE-SAVE AREA. WHEN PUMPING SEDIMENT LADEN WATER, THE DISCHARGE MUST BE DIRECTED TO A SEDIMENT TRAPPING DEVICE PRIOR TO RELEASE FROM THE SITE. A SUMP PIT MAY BE USED IF SEDIMENT TRAPS THEMSELVES ARE BEING PUMPED OUT.
21. ALL WATER REMOVED FROM EXCAVATED AREAS SHALL BE PASSED THROUGH A WMA APPROVED DEWATERING PRACTICE OR PUMPED TO A SEDIMENT TRAP OR BASIN PRIOR TO DISCHARGE TO A FUNCTIONAL STORM DRAIN SYSTEM OR TO STABLE GROUND SURFACE.
22. SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNED CONTROLS OR AS DIRECTED BY ENGINEER OR WMA INSPECTOR:

A. CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK.

B. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.

C. TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED, AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THAT SAME DAY, UNLESS;

D. TEMPORARY SILT FENCE SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE DAY.
23. WHERE DEEMED APPROPRIATE BY THE ENGINEER OR INSPECTOR, SEDIMENT BASINS AND TRAPS MAY NEED TO BE SURROUNDED WITH AN APPROVED SAFETY FENCE. THE FENCE MUST CONFORM TO LOCAL ORDINANCES AND REGULATIONS. THE DEVELOPER OR OWNER SHALL CHECK WITH LOCAL BUILDING OFFICIALS ON APPLICABLE SAFETY REQUIREMENTS. WHERE SAFETY FENCE IS DEEMED APPROPRIATE AND LOCAL ORDINANCES DO NOT SPECIFY FENCING SIZES AND TYPES, THE FOLLOWING SHALL BE USED AS A MINIMUM STANDARD: THE SAFETY FENCE MUST BE MADE OF WELDED WIRE AND AT LEAST 42 INCHES HIGH, HAVE POSTS SPACED NO FARTHER APART THAN 8 FEET, HAVE MESH OPENINGS NO GREATER THAN 2 INCHES IN WIDTH AND 4 INCHES IN HEIGHT WITH A MINIMUM OF 14 GAUGE WIRE. SAFETY FENCE MUST BE MAINTAINED AND IN GOOD CONDITION AT ALL TIMES.
24. OFF-SITE SPOIL OR BORROW AREAS ON STATE OR FEDERAL PROPERTY MUST HAVE PRIOR APPROVAL BY WMA AND OTHER APPLICABLE STATE, FEDERAL, AND LOCAL AGENCIES; OTHERWISE APPROVAL MUST BE GRANTED BY THE LOCAL AUTHORITIES. ALL WASTE AND BORROW AREAS OFF-SITE MUST BE PROTECTED BY SEDIMENT CONTROL MEASURES AND STABILIZED.
25. SITES WHERE INFILTRATION DEVICES ARE USED FOR THE CONTROL OF STORMWATER, EXTREME CARE MUST BE TAKEN TO PREVENT RUNOFF FROM UNSTABILIZED AREAS FROM ENTERING THE STRUCTURE DURING CONSTRUCTION. SEDIMENT CONTROL DEVICES PLACED IN INFILTRATION AREAS MUST HAVE BOTTOM ELEVATIONS AT LEAST TWO (2) FEET HIGHER THAN THE FINISH GRADE BOTTOM ELEVATION OF THE INFILTRATION PRACTICE. WHEN CONVERTING A SEDIMENT TRAP TO AN INFILTRATION DEVICE, ALL ACCUMULATED SEDIMENT MUST BE REMOVED AND DISPOSED OF PRIOR TO FINAL GRADING OF INFILTRATION DEVICE.
26. WHEN A STORM DRAIN SYSTEM OUTFALL IS DIRECTED TO A SEDIMENT TRAP OR SEDIMENT BASIN AND THE SYSTEM IS TO BE USED FOR TEMPORARILY CONVEYING SEDIMENT LADEN WATER, ALL STORM DRAIN INLETS IN NON-SUMP AREAS SHALL HAVE TEMPORARY ASPHALT BERMS CONSTRUCTED AT THE TIME OF BASE PAVING TO DIRECT GUTTER FLOW INTO THE INLETS TO AVOID SURCHARGING AND OVERFLOW OF INLETS IN SUMP AREAS.
27. SITE INFORMATION:

A. TOTAL AREA OF FACILITY (BASE, CAMPUS, PARK, ETC.) 578± ACRES

B. TOTAL AREA OF PROJECT SITE 578 ACRES

C. AREA DISTURBED 1.5 ACRES

D. AREA TO BE ROOFED OR PAVED 16 ACRES (SOLAR PANELS)

E. TOTAL CUT 2,000 CUBIC YARDS

F. TOTAL FILL 2,000 CUBIC YARDS

G. OFF-SITE WASTE / BORROW AREA LOCATION TO BE DETERMINED BY CONTRACTOR

NOTE:
1. EARTHWORK QUANTITIES SHOWN HERE ON ARE APPROXIMATE AND ARE FOR THE REVIEWING AGENCY USE ONLY. THE CONTRACTOR MUST MAKE HIS OWN DETERMINATION OF EARTHWORK QUANTITIES.

NOTE:
THE ABOVE SITE INFORMATION HAS BEEN PROVIDED SOLELY FOR USE BY MDE IN REVIEWING SEDIMENT CONTROL AND IS NOT TO BE RELIED UPON BY ANY CONTRACTOR IN PREPARING BIDS. THE CONTRACTOR SHALL MAKE ITS OWN DETERMINATION OF QUANTITIES, VOLUMES AND/OR AREAS USED IN ESTABLISHING ITS BIDS.

STANDARD STABILIZATION NOTE

"Following initial soil disturbance or redistribution, permanent or temporary stabilization shall be completed within (7) days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes greater than 3 horizontal to 1 vertical (3:1) and fourteen days (14) as to all other disturbed or graded areas on the project site.

STANDARDS AND SPECIFICATIONS FOR DUST CONTROL

1. THE CONTRACTOR SHALL CONDUCT OPERATIONS AND MAINTAIN THE PROJECT SITE AS TO MINIMIZE THE CREATION AND DISPERSION OF DUST. DUST CONTROL SHALL BE USED THROUGHOUT THE WORK AT THE SITE.
2. THE CONTRACTOR MUST PROVIDE CLEAN WATER, FREE FROM SALT, OIL AND OTHER DELETERIOUS MATERIAL TO BE USED FOR ON-SITE DUST CONTROL.
3. THE CONTRACTOR SHALL SUPPLY WATER SPRAYING EQUIPMENT CAPABLE OF ACCESSING ALL WORK AREAS.
4. THE CONTRACTOR SHALL IMPLEMENT STRICT DUST CONTROL MEASURES DURING ACTIVE CONSTRUCTION PERIODS ON-SITE. THESE CONTROL MEASURES WILL GENERALLY CONSIST OF WATER APPLICATIONS THAT SHALL BE APPLIED A MINIMUM OF ONCE PER DAY DURING DRY WEATHER OR MORE OFTEN AS REQUIRED TO PREVENT DUST EMISSIONS.
5. FOR WATER APPLICATION TO UNDISTURBED SOIL SURFACES, THE CONTRACTOR SHALL:

A. APPLY WATER WITH EQUIPMENT CONSISTING OF A TANK, SPRAY BAR, PUMP WITH DISCHARGE PRESSURE GAUGE;

B. ARRANGE SPRAY BAR HEIGHT, NOZZLE SPACING AND SPRAY PATTERN TO PROVIDE COMPLETE COVERAGE OF GROUND WITH WATER;

C. DISPERSE WATER THROUGH NOZZLES ON SPRAY BAR AT 20 PSI MINIMUM. KEEP AREAS DAMP WITHOUT CREATING NUISANCE CONDITIONS SUCH AS PONDING.
6. FOR WATER APPLICATION TO SOIL SURFACES DURING DEMOLITION AND/OR EXCAVATION, THE CONTRACTOR SHALL:

A. APPLY WATER WITH EQUIPMENT CONSISTING OF A TANK, PUMP WITH DISCHARGE GAUGE, HOSES AND MIST NOZZLES.

B. LOCATE TANK AND SPRAYING EQUIPMENT SO THAT THE ENTIRE EXCAVATION AREA CAN BE MISTED WITHOUT INTERFERING WITH DEMOLITION AND/OR EXCAVATION EQUIPMENT OR OPERATIONS. KEEP AREAS DAMP WITHOUT CREATING NUISANCE CONDITIONS SUCH AS PONDING.

C. APPLY WATER SPRAY IN A MANNER TO PREVENT MOVEMENT OF SPRAY BEYOND THE SITE BOUNDARIES.

SECTION I – VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. SITE PREPARATION

- I. INSTALL EROSION AND SEDIMENT CONTROL STRUCTURES (EITHER TEMPORARY OR PERMANENT) SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BERMS, WATERWAYS, OR SEDIMENT CONTROL BASINS.
- II. PERFORM ALL GRADING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. FINAL GRADING AND SHAPING IS NOT USUALLY NECESSARY FOR TEMPORARY SEEDING.
- III. SCHEDULE REQUIRED SOIL TESTS TO DETERMINE SOIL AMENDMENT COMPOSITION AND APPLICATION RATES FOR SITES HAVING DISTURBED AREA OVER 5 ACRES.
- B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
- I. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OVER 5 ACRES. SOIL ANALYSIS MAY BE PERFORMED BY THE UNIVERSITY OF MARYLAND OR A RECOGNIZED COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS.
- II. FERTILIZERS SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING, AND SUITABLE FOR ACCURATE APPLICATION BY APPROVED EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS SHALL BE DELIVERED TO THE SITE, FULLY LABELED ACCORDING TO APPLICABLE STATE FERTILIZER LAWS AND SHALL BEAR THE NAME, TRADE NAME OR TRADEMARK, AND WARRANTY OF THE PRODUCER.
- III. LIME MATERIALS SHALL BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED) WHICH CONTAINS AT LEAST 50% TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE SHALL BE GROUND TO SUCH FINENESS THAT AT LEAST 50% WILL PASS THROUGH A #100 MESH SIEVE, AND 98 TO 100% WILL PASS THROUGH A #20 MESH SIEVE.
- IV. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 – 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

C. SEEDBED PREPARATION

- I. TEMPORARY SEEDING

a. SEEDBED PREPARATION SHALL CONSIST OF LOOSENING SOIL TO A DEPTH OF 3" TO 5" BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS, CHISEL PLOWS, OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENEED, IT SHOULD NOT BE ROLLED OR DRAGGED SMOOTH, BUT LEFT IN THE ROUGHENED CONDITION. SLOPED AREAS (GREATER THAN 3:1) SHOULD BE TRACKED LEAVING THE SURFACE IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.

b. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.

c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3" TO 5" OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
- II. PERMANENT SEEDING

a. MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT:

1. SOIL PH SHALL BE BETWEEN 6.0 AND 7.0.

2. SOLUBLE SALTS SHALL BE LESS THAN 500 PARTS PER MILLION (PPM).

3. THE SOIL SHALL CONTAIN LESS THAN 40% CLAY, BUT ENOUGH FINE GRAINED MATERIAL (>30% SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION IS IF LOVEGRASS OR SERCEA LESPEDEZA IS TO BE PLANTED, THEN A SANDY SOIL (<30% SILT PLUS CLAY) WOULD BE ACCEPTABLE.

4. SOIL SHALL CONTAIN 1.5% MINIMUM ORGANIC MATTER BY WEIGHT.

5. SOIL MUST CONTAIN SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.

6. IF THESE CONDITIONS CANNOT BE MET BY SOILS ON SITE, ADDING TOPSOIL IS REQUIRED IN ACCORDANCE WITH SECTION 21 "STANDARD AND SPECIFICATION FOR TOPSOIL" OF THE 1994 MD STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.

b. AREAS PREVIOUSLY GRADED IN CONFORMANCE WITH THE DRAWINGS SHALL BE MAINTAINED IN A TRUE AND EVEN GRADE, THEN SCARIFIED OR OTHERWISE LOOSENEED TO A DEPTH OF 3 TO 5 INCHES TO PERMIT BONDING OF THE TOPSOIL TO THE SURFACE AREA AND TO CREATE HORIZONTAL EROSION CHECK SLOTS TO PREVENT TOPSOIL FROM SLIDING DOWN A SLOPE.

c. APPLY SOIL AMENDMENTS AS PER SOIL TEST OR AS INCLUDED IN THE CONTRACT DOCUMENTS.

d. MIX SOIL AMENDMENTS INTO THE TOP 3 – 5 INCHES OF TOPSOIL BY DISKING OR OTHER SUITABLE MEANS. LAWN AREAS SHOULD BE RAKED TO SMOOTH THE SURFACE; REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION, LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE. STEEP SLOPES (STEEPER THAN 3:1) SHOULD BE TRACKED BY A DOZER LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. THE TOP 1 – 3 INCHES OF SOIL SHOULD BE LOOSE AND FRIABLE. SEEDBED LOOSENING MAY NOT BE NECESSARY ON NEWLY DISTURBED AREAS.

D. SEED SPECIFICATIONS

- I. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED SHALL BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED SHALL HAVE BEEN TESTED WITHIN 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON THIS JOB.
- NOTE: SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY TYPE AND RATE OF SEED USED.
- II. INOCULANTS – THE INOCULANTS FOR TREATING LEGUME SEED IN THE SEED MIXTURES SHALL BE A PURE CULTURE OF NITROGEN-FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS SHALL NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING.
- NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANTS AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 – 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE INOCULANTS LESS EFFECTIVE.

SECTION I – VEGETATIVE STABILIZATION METHODS AND MATERIALS

E. METHODS OF SEEDING

- I. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER), BROADCAST OR DROP SEEDER, OR CULTIPACKER SEEDER.
- a. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES AMOUNTS WILL NOT EXCEED THE FOLLOWING: NITROGEN – MAXIMUM OF 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P205 (PHOSPHOROUS): 200 POUNDS/ACRE; K20 (POTASSIUM): 200 POUNDS/ACRE.
- b. LIME – USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
- c. SEED AND FERTILIZER SHALL BE MIXED ON SITE, AND SEEDING SHALL BE DONE IMMEDIATELY WITHOUT INTERRUPTION.
- II. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
- a. SEED SPREAD SHALL BE INCORPORATED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON THE TEMPORARY OR PERMANENT SEEDING SUMMARIES OR TABLES 25 OR 26. THE SEEDED AREA SHALL THEN BE ROLLED WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
- b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
- III. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
- a. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
- b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
- F. MULCH SPECIFICATIONS (IN ORDER OF PREFERENCE)
- I. STRAW SHALL CONSIST OF THOROUGHLY THRESHED WHEAT, RYE OR OAT STRAW, REASONABLY BRIGHT IN COLOR, AND SHALL NOT BE MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY, AND SHALL BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW.
- II. WOOD CELLULOSE FIBER MULCH (WCFM)
- a. WCFM SHALL CONSIST OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
- b. WCFM SHALL BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
- c. WCFM, INCLUDING DYE, SHALL CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
- d. WCFM SHALL BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER, AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL SHALL FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND SHALL COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDINGS.
- e. WCFM SHALL CONTAIN NO ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
- f. WOOD CELLULOSE FIBER MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH TO APPROXIMATELY 10 mm., DIAMETER APPROXIMATELY 1 mm., pH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6% MAXIMUM, AND WATER HOLDING CAPACITY OF 90% MINIMUM.
- NOTE: ONLY STERILE STRAW MULCH SHOULD BE USED IN AREAS WHERE A STAND OF ONE SPECIES OF GRASS IS DESIRED.

- G. MULCHING SEEDED AREAS – MULCH SHALL BE APPLIED TO ALL SEEDDED AREAS IMMEDIATELY AFTER SEEDING
- I. IF GRADING IS COMPLETED OUTSIDE OF THE SEEDING SEASON, MULCH ALONE SHALL BE APPLIED AS PRESCRIBED IN THIS SECTION AND MAINTAINED UNTIL THE SEEDING SEASON RETURNS AND SEEDING CAN BE PERFORMED IN ACCORDANCE WITH THESE SPECIFICATIONS.
- II. WHEN STRAW MULCH IS USED, IT SHALL BE SPREAD OVER ALL SEEDDED AREAS AT THE RATE OF 2 TONS/ACRE. MULCH SHALL BE APPLIED TO A UNIFORM LOOSE DEPTH OF BETWEEN 1 AND 2 INCHES. MULCH APPLIED SHALL ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. IF A MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHOULD BE INCREASED TO 2.5 TONS/ACRE.
- III. WOOD CELLULOSE FIBER USED AS A MULCH SHALL BE APPLIED AT A NET DRY WEIGHT OF 1,500 LBS. PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LBS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
- H. SECURING STRAW MULCH (MULCH ANCHORING)
- I. MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON SIZE OF AREA AND EROSION HAZARD:
- I. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS IS THE MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD BE USED ON THE CONTOUR, IF POSSIBLE.
- II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. THE FIBER BINDER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 LBS./ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LBS. OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
- III. APPLICATIONS OF LIQUID BINDERS SHOULD BE APPLIED HEAVIER AT EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. THE REMAINDER OF AREA SHOULD BE UNIFORM AFTER BINDER APPLICATION. SYNTHETIC BINDERS – SUCH AS ACRYLIC DRL (AGRO-TACK), DCA-70, PETROSET, TERRA TACK II, TERRA TACK AR, OR OTHER APPROVED EQUAL MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH.
- IV. LIGHTWEIGHT: PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/29/10
	100% CD SET		02/24/10
	ISSUED FOR CONSTRUCTION		03/31/10

PROFESSIONAL CERTIFICATION

"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12564, EXPIRATION DATE 08/10/2011."

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NIST 

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U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
PLANT DIVISION

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

EROSION & SEDIMENT CONTROL NOTES

SH.NO. ____ OF ____ DWG. C-403

APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF	DATE	FIRE PROTECTION SYS	DATE	S.H. & E. DIV	DATE	FACILITIES ENGR. OFF	DATE	PROJECT LEADER	DATE	KS/DN	02/01/10	SB134109CQ0026/69331
														DRAWN BY	DATE	PROJECT / W.O.

BIORETENTION CONSTRUCTION SPECIFICATIONS			
MATERIAL	SPECIFICATION/ TEST METHOD	SIZE	NOTES
PLANTING SOIL (2.5' TO 4' DEEP)	SAND 30–60% SILT 30–55% CLAY 10–25%	N/A	USDA SOIL TYPES LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDDED HARDWOOD		AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAGM AND CURTAIN DRAIN	PEA GRAVEL: ASTM D–448 ORNAMENTAL STONE: WASHED COBBLES	PEA GRAVEL: NO. 6 STONE: 2" TO 5"	
SAND	CLEAN AASHTO–M–6 OR ASTM–C–33 CONCRETE SAND	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
UNDERDRAIN GRAVEL	AASHTO–M–43	0.25" TO 0.75"	UNDERDRAIN GRAVEL SHALL BE CLEAN WASHED.
UNDERDRAIN PIPING	F758, TYPE PS 28 OR AASHTO–M–278	6" RIGID SCHEDULE 40 PVC OR SDR35	3/8" PERF. Ⓢ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES.
GEOTEXTILE FABRIC	CLASS "C", APPARENT OPENING SIZE (ASTM D–4751), GRAB TENSILE STRENGTH (ASTM D–4632), PUNCTURE RESISTANCE (ASTM D–4833)	N/A	FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY.
POURED IN PLACE CONCRETE (IF REQUIRED)	MSHA MIX NO. 3, F'c=3500 PSI AT 28 DAYS, NORMAL WEIGHT, AIR ENTRAINED, REINFORCING TO MEET ASTM 615–60	N/A	ON–SITE TESTING OF POURED IN PLACE CONCRETE REQUIRED. 28–DAY AND STRENGTH AND SLUMP TEST; ALL CONCRETE DESIGN (CAST–IN–PLACE OR PRECAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND – DESIGN TO INCLUDE MEETING ACI CODE 350.R/89; VERTICAL LOADING [H–10 OR H–20]; ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING.

MAINTENANCE SCHEDULE FOR BIORETENTION			
DESCRIPTION	METHOD	FREQUENCY	TIME OF YEAR
SOIL			
INSPECT AND REPAIR EROSION	VISUAL	MONTHLY	MONTHLY
ORGANIC LAYER			
REMULCH ANY VOID AREAS	BY HAND	WHENEVER NEEDED	WHENEVER NEEDED
REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER (OPTIONAL)	BY HAND	ONCE EVERY TWO TO THREE YEARS	SPRING
ANY ADDITIONAL MULCH ADDED (OPTIONAL)	BY HAND	ONCE A YEAR	SPRING
PLANTS			
REMOVAL AND REPLACEMENT OF ALL DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT	SEE PLANTING SPECIFICATIONS	TWICE A YEAR	3/15 TO 4/30 AND 10/1 TO 11/30
TREAT ALL DISEASED TREES AND SHRUBS	MECHANICAL OR BY HAND	N/A	VARIES, DEPENDS ON INSECT OR DISEASE INFESTATION
WATERING OF PLANT MATERIAL SHALL TAKE PLACE AT THE END OF EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER PLANTING HAS BEEN COMPLETED	BY HAND	IMMEDIATELY AFTER PROJECT COMPLETION	N/A
WATERING OF PLANT MATERIAL SHALL TAKE PLACE AT THE END OF EACH DAY FOR FOURTEEN CONSECUTIVE DAYS AFTER PLANTING HAS BEEN COMPLETED	BY HAND	IMMEDIATELY AFTER PROJECT COMPLETION	N/A
REPLACE STAKES AFTER ONE YEAR	BY HAND	ONCE A YEAR	ONLY REMOVE STAKES IN THE SPRING
REPLACE ANY DEFICIENT STAKES OR WIRES	BY HAND	N/A	WHENEVER NEEDED

SPECIFICATIONS FOR BIORETENTION

1. MATERIAL SPECIFICATIONS
THE ALLOWABLE MATERIALS TO BE USED IN BIORETENTION AREA ARE DETAILED IN TABLE B.3.2 OF THE 2000 MARYLAND STORMWATER DESIGN MANUAL.

2. PLANTING SOIL
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

PH RANGE 5.2 – 7.0
ORGANIC MATTER 1.5 – 4% (BY WEIGHT)
MAGNESIUM 35 LB./AC
PHOSPHORUS (PHOSPHATE – P205) 75 LB./AC
POTASSIUM (POTASH – K2O) 85 LB./AC
SOLUBLE SALTS NOT TO EXCEED 500 PPM

ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, PHOSPHORUS, AND POTASSIUM AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOP SOIL WAS EXCAVATED. SINCE DIFFERENT LABS CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY. SHOULD THE PH FALL OUT OF THE ACCEPTABLE RANGE, IT MAY BE MODIFIED (HIGHER) WITH LIME OR (LOWER) WITH IRON SULFATE PLUS SULFUR.

3. COMPACTION
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF BIORETENTION APPENDIX B.3. CONSTRUCTION SPECIFICATIONS FOR SAND FILTERS, BIORETENTION AND OPEN CHANNELS AREAS ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE. COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT. ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE REQUIRED SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE. WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE. WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL
RECOMMENDED PLANT MATERIAL FOR BIORETENTION AREAS CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION
MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE. ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON–SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL. APPENDIX B.3. CONSTRUCTION SPECIFICATIONS FOR SAND FILTERS, BIORETENTION AND OPEN CHANNELS GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON–GRASS GROUND COVER PLANTING SPECIFICATIONS.

AB–BUILT DATA FOR FILTERS		
* TO BE COMPLETED BY THE CERTIFYING ENGINEER		
TYPE OF FACILITY:	BIORETENTION	DESIGN
*AS-BUILT		
FILTER BED AREA (LxW)/ SURFACE AREA (SF)	327 SF	
FILTER BED WATER SURFACE ELEVATION	274.43	
FILTER INLET PIPE SIZE / ELEVATION	8"/ 275.00	
OUTLET PIPE (UNDERDRAIN) SIZE / ELEVATION	6"/ 270.50	
BIORETENTION VOLUME	325 CF	
MULCH THICKNESS	3"	
PLANTING MEDIA THICKNESS	30"	
PEA GRAVEL THICKNESS	3"	
UNDERDRAIN GRAVEL THICKNESS	8"	
GRAVEL THICKNESS BELOW UNDERDRAIN	6"	
PROVIDE COMPOSITION CERTIFICATION OF FILTER MEDIA	–	
VERIFY GEOTEXTILE FABRIC INSTALLATION (SIDES ONLY)	–	
VERIFY PLANTING (SPECIES, NUMBER AND HEALTH)	–	
VERIFY PLANTING (SPECIES, NUMBER AND HEALTH)		
DATE AS–BUILT ACCEPTED BY MDE:		

AS–BUILT CERTIFICATION REQUIREMENTS:

ONCE CONSTRUCTION IS COMPLETE, AS–BUILT PLAN CERTIFICATION SHALL BE SUBMITTED TO THE ADMINISTRATION BY EITHER A PROFESSIONAL ENGINEER OR PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF MARYLAND TO ENSURE THAT CONSTRUCTED STORMWATER MANAGEMENT PRACTICES AND CONVEYANCE SYSTEMS COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE APPROVED PLANS. AT A MINIMUM, AS–BUILT CERTIFICATION SHALL INCLUDE A SET OF DRAWINGS COMPARING THE APPROVED STORMWATER MANAGEMENT PLAN WITH WHAT WAS CONSTRUCTED. THE ADMINISTRATION MAY REQUIRE ADDITIONAL INFORMATION.

AT A MINIMUM, REGULAR INSPECTIONS SHALL BE MADE AND DOCUMENTED AT THE FOLLOWING SPECIFIED STAGES OF CONSTRUCTION:

FILTERING SYSTEMS:

- (A) DURING EXCAVATION TO SUBGRADE;
- (B) DURING PLACEMENT AND BACKFILL OF UNDERDRAIN SYSTEMS;
- (C) DURING PLACEMENT OF GEOTEXTILES AND ALL FILTER MEDIA;
- (D) DURING CONSTRUCTION OF APPURTENANT CONVEYANCE SYSTEMS SUCH AS FLOW DIVERSION STRUCTURES, PRE–FILTERS AND FILTERS, INLETS, OUTLETS, ORIFICES, AND FLOW DISTRIBUTION STRUCTURES; AND
- (E) UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY, ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS
UNDERDRAINS ARE TO BE PLACED ON A 3'–0" WIDE SECTION OF FILTER CLOTH. PIPE IS PLACED NEXT, FOLLOWED BY THE GRAVEL BEDDING. THE ENDS OF UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL SHALL BE CAPPED. THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN–OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS
THE BIORETENTION FACILITY MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

AS BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE STORMWATER MANAGEMENT FACILITY SHOWN ON THE PLANS HAS (HAVE) BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, EXCEPT AS NOTED IN RED ON THE "AS BUILT" DRAWINGS.

	SIGNATURE
NAME	
MARYLAND REGISTRATION NUMBER	DATE
MDE # ---SF-----	BIORETENTION
MDE No.	FACILITY IDENTIFICATION (NUMBER AND/OR TYPE)

"CERTIFY" MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION.

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN BEEN DESIGNED IN ACCORDANCE WITH THE 1994 STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL, THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT STORMWATER MANAGEMENT REGULATIONS.

	SIGNATURE
NAME	
MARYLAND REGISTRATION NUMBER	
P.E., R.L.S. OR R.L.A. (CIRCLE)	DATE

REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/29/10
	100% CD SET		02/24/10
	ISSUED FOR CONSTRUCTION		03/31/10

PROFESSIONAL CERTIFICATION

"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12564, EXPIRATION DATE 08/10/2011."

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EROSION & SEDIMENT CONTROL NOTES	
SH.NO. ____ OF ____	DWG. C–404

EROSION AND SEDIMENT CONTROL SHALL BE STRICTLY ENFORCED.

THIS PLAN IS FOR EROSION & SEDIMENT CONTROL PURPOSES ONLY.

MDE # 10-SF-0096

APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF	DATE	FIRE PROTECTION SYS.	DATE	S.H. & E. DIV.	DATE	FACILITIES ENGR. OFF	DATE	PROJECT LEADER	DATE	KS/DN	02/01/10	SB134108CQ0026/69331	
														DRAWN BY	DATE	PROJECT / W.O.	DESIGN PROJ. #

LEGEND

---	PROPERTY LINE
---	PROPOSED CONTOUR MAJOR
---	PROPOSED CONTOUR MINOR
---	PROPOSED GEOTHERMAL
---	PROPOSED WATER
---	PROPOSED SANITARY SEWER
---	PROPOSED UNDER GROUND ELECTRIC
---	PROPOSED UNDER GROUND DATA/FIRE ALARM/TELEPHONE
---	PROPOSED UNDER GROUND DATA/FIRE ALARM
---	PROPOSED UNDER GROUND TELECOMMUNICATIONS
---	PROPOSED GAS
---	HANDBOX
---	LIMIT OF NEW ASPHALT
---	PLANTING BED EDGE

PLANT SCHEDULE

TREES	BOTANICAL/COMMON	CONT	CAL	SIZE	QTY
AG	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE' / 'AUTUMN BRILLIANCE' SERVICEBERRY	B & B	6'-8" H	7	
IA	ILEX OPACA / AMERICAN HOLLY	B & B	6'-8" H	6	
OA	OXYDENDRUM ARBOREUM / SOURWOOD TREE	B & B	2" CAL	3	
QA	QUERCUS ALBA / WHITE OAK	B & B	2" CAL	1	
QR	QUERCUS RUBRA / RED OAK	B & B	2" CAL	1	
TD	TAXODIUM DISTICHUM / BALD CYPRESS	B & B	6'-8" H	3	
SHRUBS	BOTANICAL/COMMON	CONT	CAL	SIZE	QTY
CB	CALLICARPA AMERICANA / AMERICAN BEAUTYBERRY	3 GAL			95
CA	CLETHRA ALNIFOLIA / SUMMERSWEET CLETHRA	3 GAL			42
CS	CORNUS SERICEA 'CARDINAL' / 'CARDINAL' RED-TWIG DOGWOOD	3 GAL			29
MA	MAHONIA AQUIFOLIUM / OREGON GRAPE	3 GAL			30
VA	VIBURNUM DENTATUM / ARROWWOOD VIBURNUM	3 GAL			21
SHRUB AREAS	BOTANICAL/COMMON	CONT	CAL	SIZE	QTY
RG	RHUS AROMATICA 'GRO-LOW' / GRO-LOW FRAGRANT SUMAC	3 GAL @ 48" OC			105
GROUND COVERS	BOTANICAL/COMMON	CONT	CAL	SIZE	QTY
BN	BIORETENTION NATIVE MIX / SEE PLANTING LIST THIS SHEET	4" POT @ 18" OC			2,189
EK	ECHINACEA PURPUREA 'KIM'S KNEE HIGH' TM / PURPLE CONEFLOWER	4" POT @ 18" OC			105
LK	LIATRIS SPICATA 'KOBOLD' / KOBOLD BLAZING STAR	4" POT @ 12" OC			304
RH	RUDBECKIA HIRTA / BLACK-EYED SUSAN	4" POT @ 18" OC			142
UN	UPLAND NATIVE MIX / SEE PLANTING LIST THIS SHEET	SEED			6,525 SF

BIORETENTION NATIVE MIX

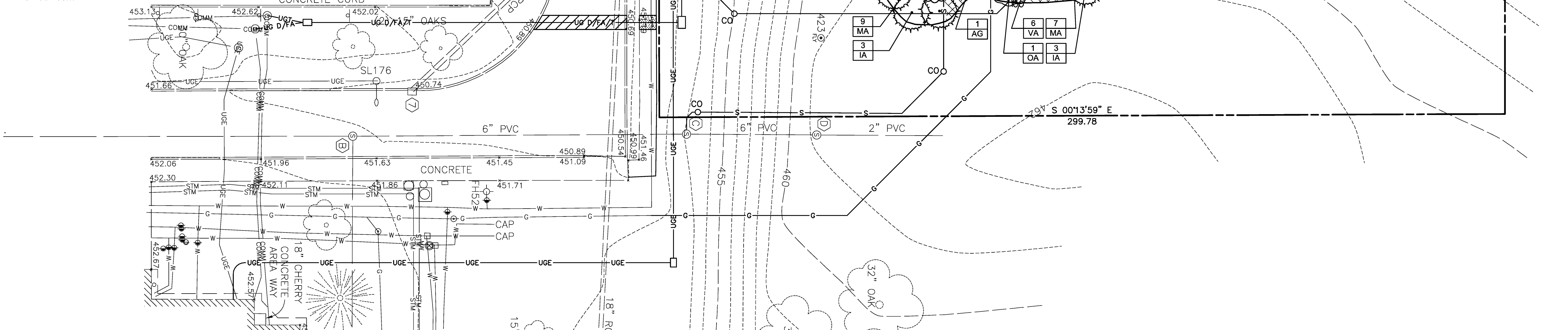
15%	Coreopsis lanceolata	Lance-Leaf Coreopsis
10%	Helopsis helianthoides	Oxeye Sunflower
15%	Iris versicolor	Blue Flag Iris
5%	Lupinus perennis	Wild Blue Lupine
5%	Monarda fistulosa	Wild Bergamot
5%	Monarda punctata	Spotted Beebalm
5%	Parthenium integrifolium	Wild Quinine
10%	Rudbeckia hirta	Black-Eyed Susan
20%	Schizanthus scoparium	Little Bluestem
10%	Sorghastrum nutans	Tomahawk Indian Grass
100%	TOTAL	

UPLAND NATIVE MIX

15%	Andropogon gerardii	Big Bluestem
10%	Asclepias tuberosa	Butterfly Milkweed
10%	Echinacea purpurea	Purple Coneflower
10%	Liatis spicata	Blazing Star
15%	Panicum virgatum	Switchgrass
10%	Rudbeckia hirta	Black-Eyed Susan
15%	Schizanthus scoparium	Little Bluestem
15%	Sorghastrum nutans	Indian Grass
100%	TOTAL	TO BE PLANTED AT 25 LBS/PLS** PER ACRE

* Overseed entire area with 10 LBS per acre of Lolium multiflorum Annual Ryegrass in addition to those species listed above

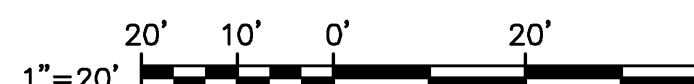
** PLS = Pure Live Seed



REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/29/10
	100% CD SET		02/24/10
	ISSUED FOR CONSTRUCTION		03/31/10

PROFESSIONAL CERTIFICATION

"I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12564, EXPIRATION DATE 08/10/2011."



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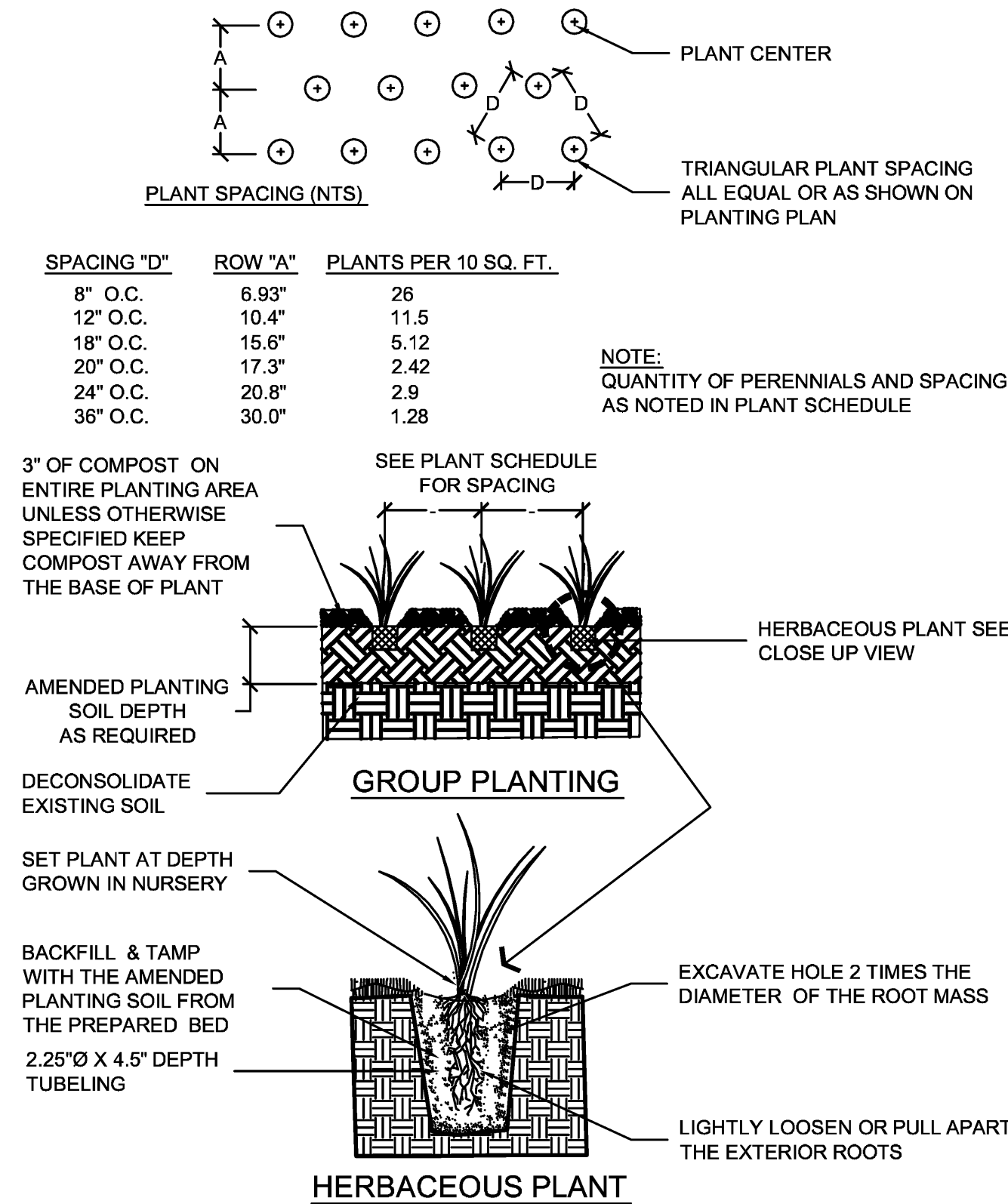
U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
PLANT DIVISION

NET ZERO ENERGY RESIDENTIAL TEST FACILITY

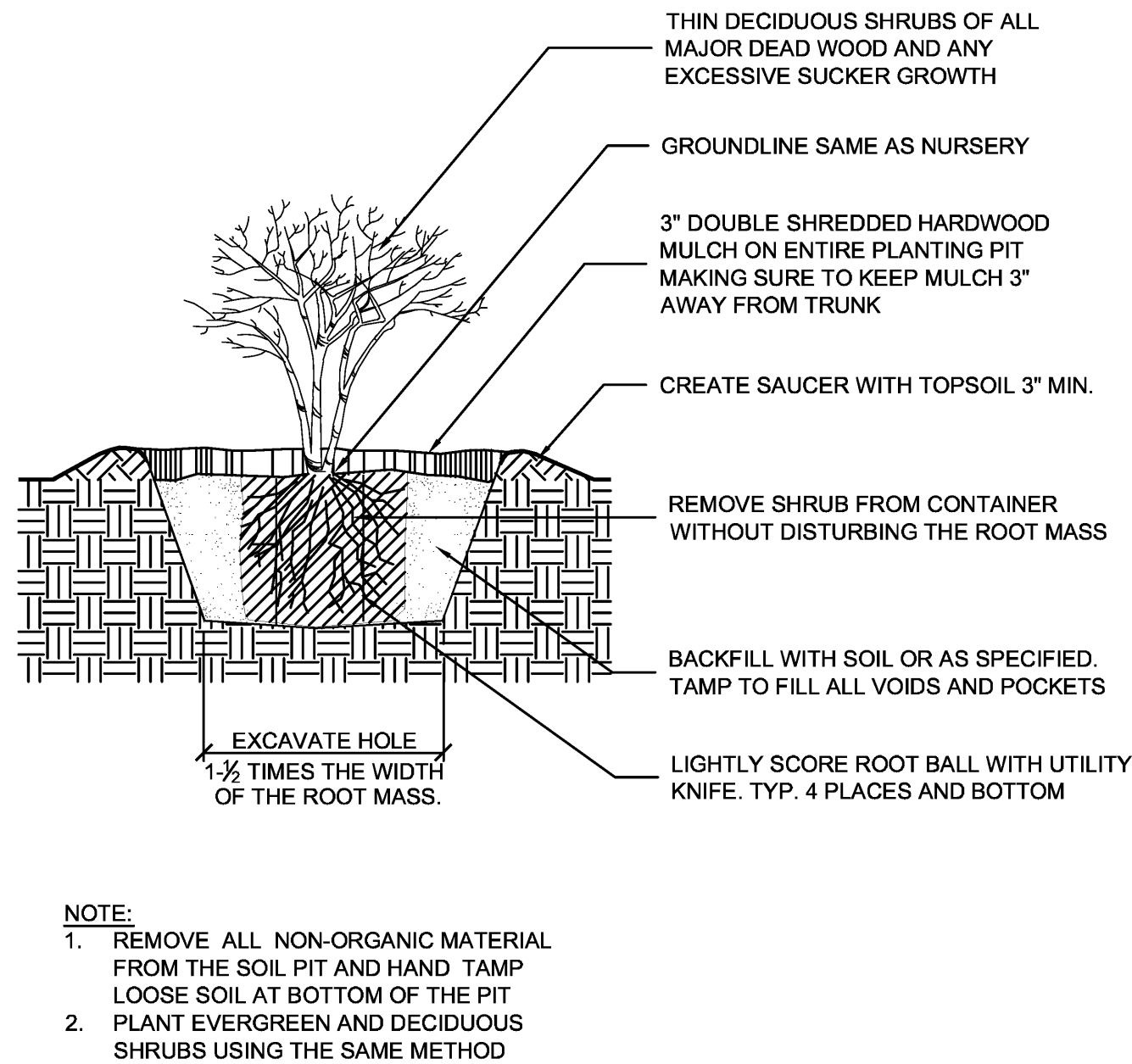
PLANTING PLAN

SH.NO. ____ OF ____ DWG. C-501

APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF	DATE	FIRE PROTECTION SYS	DATE	S.H. & E. DIV	DATE	FACILITIES ENGR. OFF	DATE	PROJECT LEADER	DATE	KS/DN	02/01/10	SB134109CQ0026/69331	DESIGN PROJ. #
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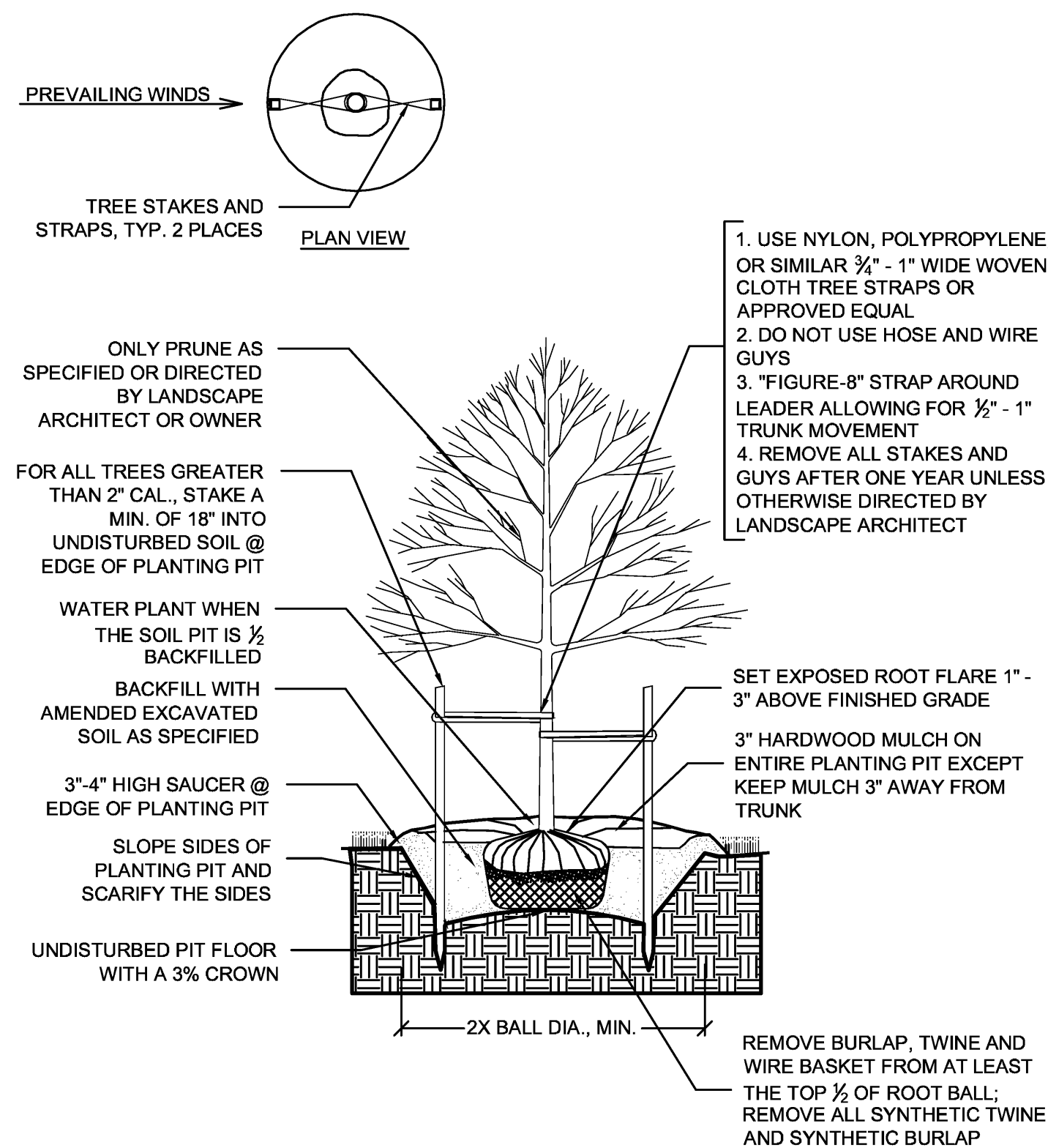
1 HERBACEOUS TUBELING/ PLUG PLANTING DETAIL
NOT TO SCALE



2 CONTAINERIZED SHRUB PLANTING
NOT TO SCALE

GENERAL PLANTING NOTES:

- THIS PLAN IS FOR PLANTING PURPOSES ONLY, AND ANY OTHER INFORMATION SHOWN IS FOR REFERENCE ONLY. SEE SITE PLAN FOR INFORMATION ABOUT ALL LAYOUT, GRADING AND OTHER SITE IMPROVEMENTS.
- CALL MISS UTILITY AT 811 OR 1-800-257-7777 TO MARK UTILITIES AT LEAST 48 HOURS BEFORE DIGGING.
- All materials and planting procedures except as otherwise noted shall conform to the latest edition of "LANDSCAPE SPECIFICATION GUIDELINES" by the Landscape Contractors Association MD-DC-VA.
- Plants shall conform to the current edition of the American Standard for Nursery Stock. (ANSI Z60.1)
- Plant names shall be those given in the latest edition of Standard Plant Names, American Committee on Horticultural Nomenclature.
- Topsoil shall meet specifications as per the 1994 MD Standards and Specifications for Soil Erosion and Sediment Control.
- The Contractor shall submit representative soil samples from both in-situ soils and soils brought in from off-site to a state licensed testing laboratory. The Contractor shall incorporate or apply soil amendments and fertilization based upon results of the soil tests and recommendations by the test lab.
- The Contractor shall apply grass according to the 1994 MD Standard and Specifications for Soil Erosion and Sediment Control. Do not use Kentucky 31 tall fescue.
- The Contractor shall stake out all planting beds and tree locations for approval by the Landscape Architect or Owner's representative before digging. It is the Contractor's responsibility to locate and coordinate plantings with all existing utilities. If discrepancies occur because of utility locations or other existing conditions the Contractor shall notify the Landscape Architect and Owner's representative immediately to coordinate any necessary adjustments.
- All plant material shall be labeled by the nursery and delivered with labels in place for inspection. Substitutions in plant species or size will not be permitted except with the approval of the Landscape Architect and Owner. Do not prune until plant material has been planted but as soon thereafter as is advisable under standard horticultural practices. For tree pruning and care methods please refer to ANSI A-300, latest edition.
- It is of utmost importance that all plant material be set slightly higher in relation to grade than it was grown in the nursery and with good earth to root contact. Any materials or work may be rejected by the Landscape Architect if it does not meet this or any other requirement of the specifications. Rejected materials shall be removed from the site by the Contractor at Contractor's expense.
- The Contractor shall mulch and water all plants well on the day they are planted. Individual planting shall be mulched. Acceptable mulch shall be hardwood only. Mulch must be wellaged, uniform in color, and free of foreign material including plant material. Well aged mulch is defined as mulch that has been stockpiled or stored for at least twelve (12) months. The Contractor shall apply the mulch uniformly to a 2 to 3 inch depth. Bark shall be kept 3 to 4 inches away from all trunks and woody stems.
- In case of discrepancies between quantities on the plant list and the plan, the plan shall govern.
- Seed or sod bare areas as directed by Owner for all disturbed areas to be stabilized that are not landscaped or covered.



3 STANDARD DECIDUOUS TREE PLANTING
NOT TO SCALE

Channel Installation Instructions

- Step 1 - Site Preparation**
Prepare site to design profile and grade. Remove debris, rocks, clods, etc. Ground surface should be smooth prior to installation to ensure blanket remains in contact with slope.
- Step 2 - Seeding**
Seeding of site should be conducted to design requirements or to follow local or state seeding requirements as necessary.
- Step 3 - Staple Selection**
At a minimum, 6" long by 1" crown, biodegradable staples are to be used to secure the blanket to the ground surface. Installation in rocky, sandy or other loose soil may require longer staples.
- Step 4 - Excavate Anchor Trench and Secure Blanket**
Excavate a trench along the top of the channel side slopes and the upstream terminal end of the channel to secure the edges of the blanket. The trench should run along the length and width of the installation, be 6" wide and 6" deep. Staple blanket along bottom of trench, fill with compacted soil, overlap blanket towards toe of slope and secure with row of staples (shown in Figures A, E and F).
- Step 5 - Secure Body of Blanket**
Roll blanket down slope from anchor trench. Staple body of blanket following the pattern shown in Figure D. Leave end of blanket unstapled to allow for overlap shown in Figure B. Place downstream blanket underneath upstream blanket to form shingle pattern. Staple seam as shown in Figure E. Secure downstream blanket with stapling pattern shown in Figure D. Stapling pattern shown in Figure D reflects minimum staples to be used. More staples may be required to ensure blanket is sufficiently secured to resist mowers and foot traffic and to ensure blanket is in contact with soil surface over the entire area of blanket. Further, critical points require additional staples. Critical points are identified in Figure G.
- Step 6 - Continue Along Slope - Complete Installation**
Overlap adjacent blankets as shown in Figure G and repeat Step 5. Secure toe of slope using stapling pattern shown in Figure E. Secure edges of installation by stapling at 1.0' intervals along the terminal edge.

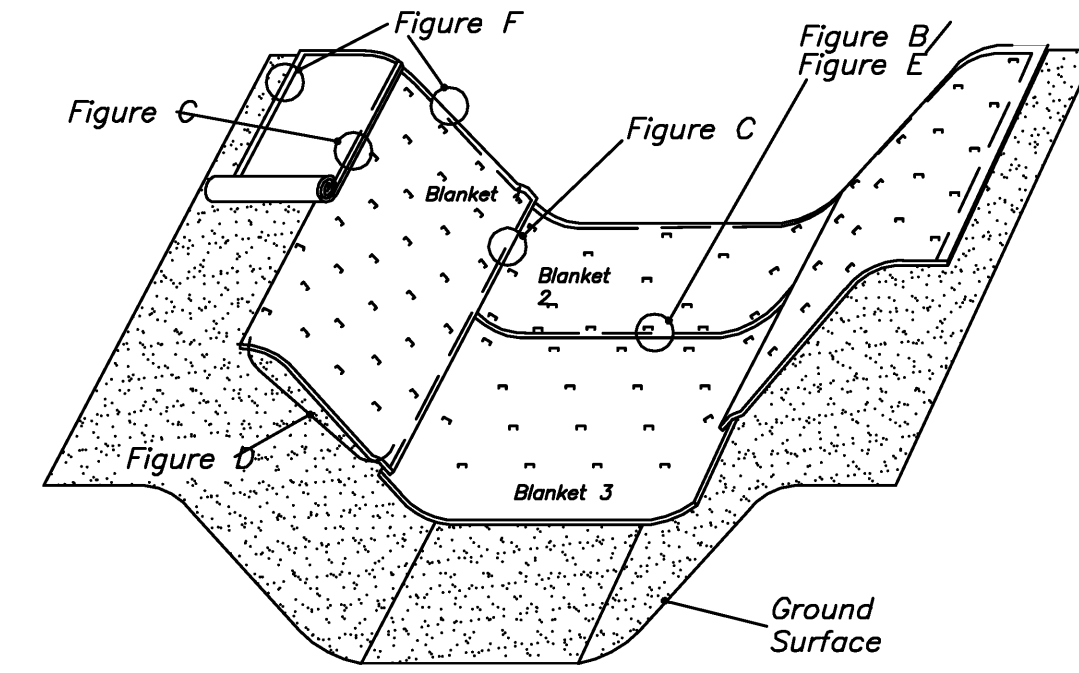


Figure A

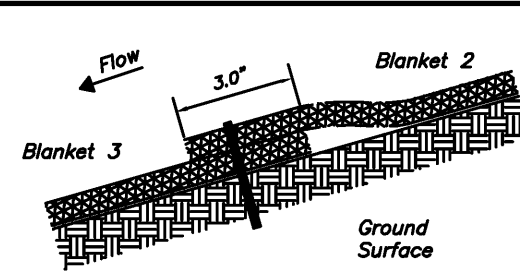


Figure B - Profile View

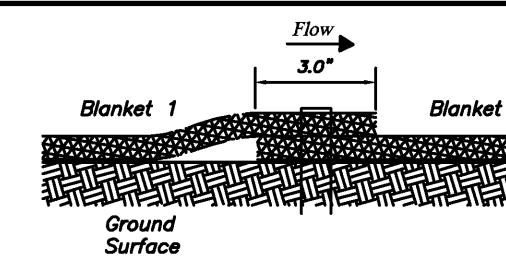


Figure C - Cross Section View

Product Application/Equivalency Specifications

Excelsior mat consists of a rapid degradable Rolled Erosion Control Product (RECP) comprised of an excelsior matrix mechanically (stitch) bound to a single, rapid photodegradable synthetic net (top). The expected longevity of the mat shall be approximately 45 - 90 days (actual longevity dependent on field and climatic conditions). The mat shall be manufactured to include physical properties sufficient to provide the intended longevity and performance to include:

- Verified Values:**
- Tensile strength: 5.0 md, 4.0 td lbs/in
 - Elongation: 20 md, 25 td percent
 - Mass per unit area: 11.5 oz/sq. yd
 - Light penetration: 50 percent open
 - Water absorption: 375 percent

- NETTING:**
- Top net: Synthetic rapid photo-degradable
 - Top net opening: 1.00 in x 0.75 in nominal

GENERAL

- Consist of machine produced, weed and debris free excelsior bound to a single, synthetic, rapidly degrading photo-degradable net.
- Sufficient tensile strength, thickness and coverage to maintain integrity during installation and ensure material performance.
- Meet ECTC specification for category 1C products.

4 EXCELSIOR MAT FOR NATIVE SEEDING AREAS
NOT TO SCALE

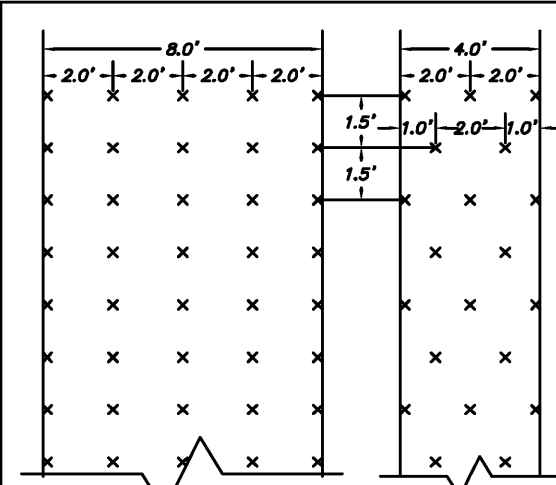


Figure D - Plan View

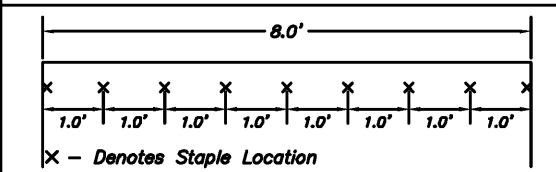


Figure E - Plan View

*Approximately 300 Staples per Roll (3" or 4" width) Required - Drawings Not to Scale
8" Wide Blanket Shown

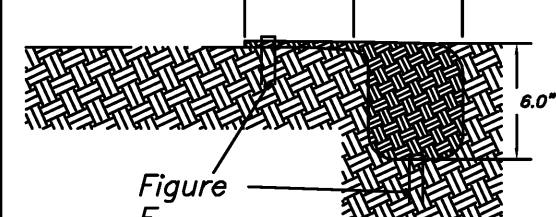


Figure F - Profile View

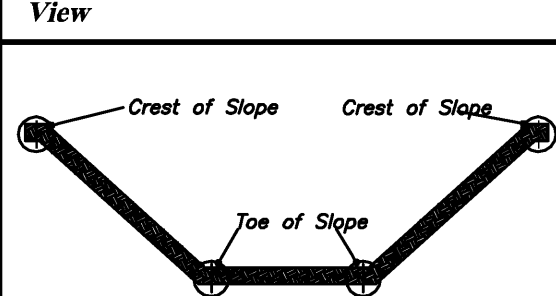


Figure G - Critical Points

REVISION	DESCRIPTION	BY	DATE
	95% CD SET		01/29/10
	100% CD SET		02/24/10
	ISSUED FOR CONSTRUCTION		03/31/10

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1" = 20'

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PLANT DIVISION

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PLANTING PLAN NOTES & DETAILS

SH. NO. ____ OF ____ **DWG. C-502**

APPROVED BY	DATE	SPONSOR	DATE	MAINTENANCE ENG. OFF	DATE	FIRE PROTECTION SYS	DATE	S.H. & E. DIV.	DATE	FACILITIES ENGR. OFF	DATE	PROJECT LEADER	DATE	KS/DN	02/01/10	SB134108CQ0026/69331	DRAWN BY	PROJECT W.O.	DESIGN PROJ. #
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