

# Flood Recovery House Design

**for the**

# West Virginia Army National Guard

# Charleston, West Virginia

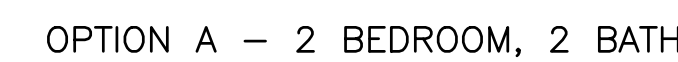
# July 26, 2018

**West Virginia Army  
National Guard  
Charleston, WV 25302**

# Construction Documents

## DRAWING INDEX

## BUILDING INFORMATION



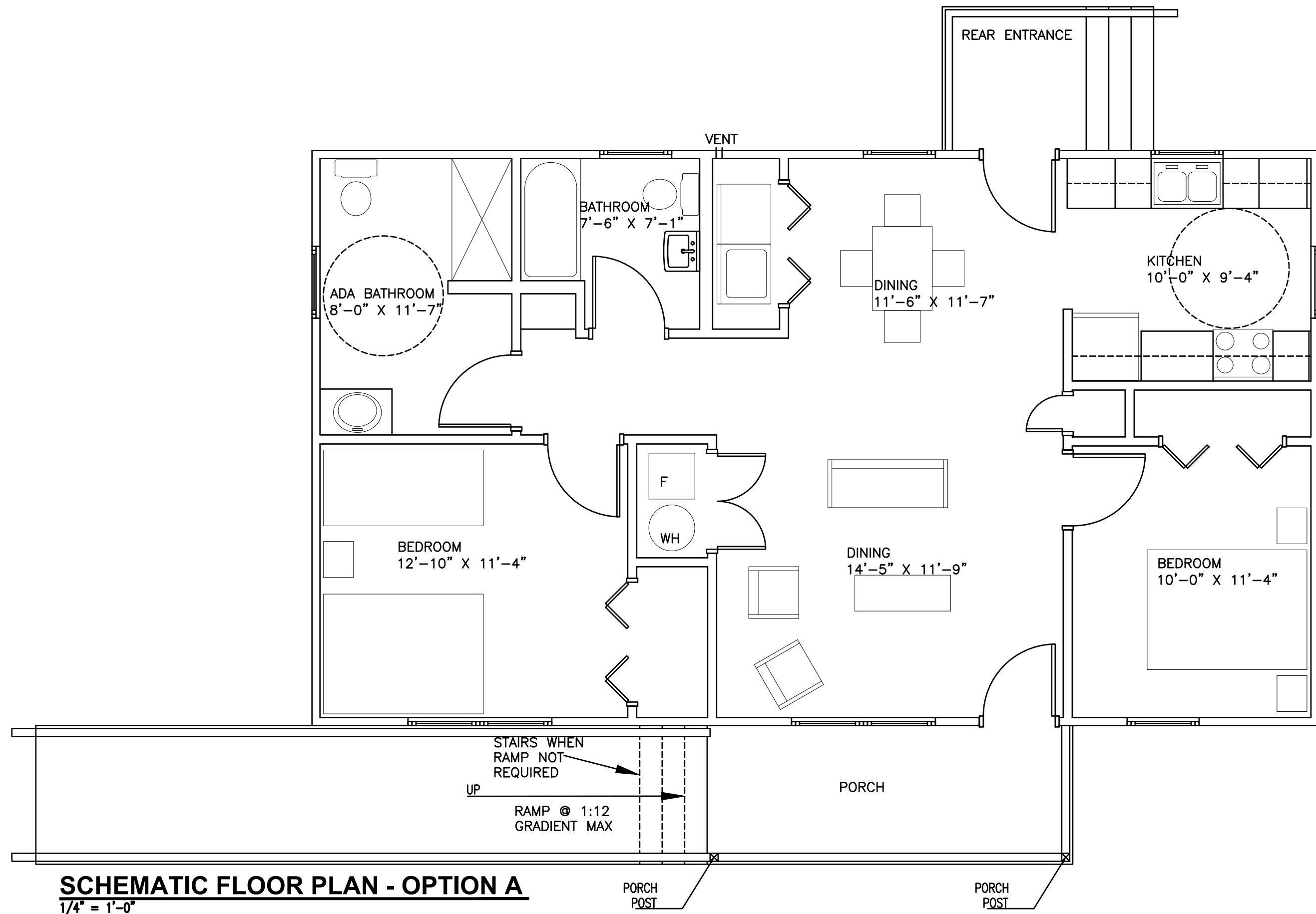
SHEET NO.	SHEET NAME	SHEET NO.	SHEET NAME	SHEET NO.	SHEET NAME
G000	COVER SHEET				
ARCHITECTURAL					
A131	FLOOR PLAN OPTION A				
A132	FLOOR PLAN OPTION B				
A151	ROOF & FOUNDATION PLANS OPTION A				
A152	ROOF & FOUNDATION PLANS OPTION B				
A221	FINISH FLOOR PLAN OPTION A				
A222	FINISH FLOOR PLAN OPTION B				
A270	KITCHEN ELEVATIONS OPTIONS A & B				
A311	ELEVATIONS OPTION A				
A312	ELEVATIONS OPTION B				
A560	SECTIONS & DETAILS				
PLUMBING					
P131	PLUMBING SEWER PLAN A & PLAN B				
P142	PLUMBING DOMESTIC WATER PLAN A & PLAN B				
P511	PLUMBING DETAILS, NOTES AND SCHEDULES				
P512	PLUMBING DETAILS, NOTES AND SCHEDULES				
MECHANICAL					
M131	MECHANICAL HVAC PLAN				
M511	MECHANICAL DETAILS, NOTES AND SCHEDULES				
M512	MECHANICAL DETAILS, NOTES AND SCHEDULES				
ELECTRICAL					
E131	ELECTRICAL PLAN A & PLAN B				
E511	ELECTRICAL DETAILS, NOTES AND SCHEDULES				
E512	ELECTRICAL DETAILS, NOTES AND SCHEDULES				
E513	ELECTRICAL DETAILS, NOTES AND SCHEDULES				

OCCUPANCY CLASSIFICATION - SINGLE FAMILY HOUSE  
(PER 2015 INTERNATIONAL RESIDENTIAL CODE)

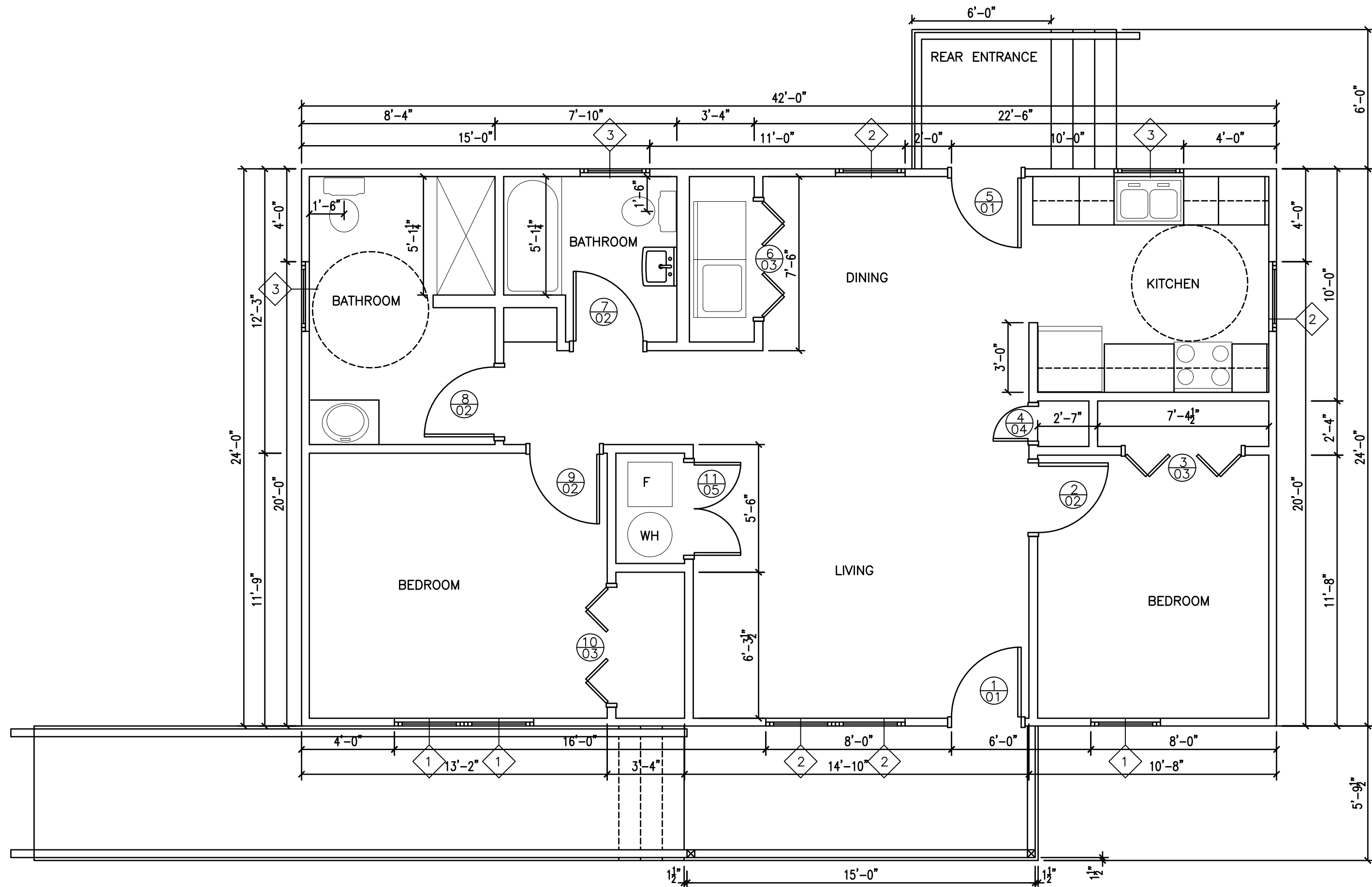
CONSTRUCTION TYPE : V  
NON-SPRINKLERED  
(PER 2015 INTERNATIONAL RESIDENTAL CODE)

OPTION A	1,008	SF
OPTION B	1,200	SF

(PER 2015 INTERNATIONAL RESIDENTIAL CODE)



SCHEMATIC FLOOR PLAN - OPTION A  
1/4" = 1'-0"



DIMENSIONED FLOOR PLAN - OPTION A  
1/4" = 1'-0"

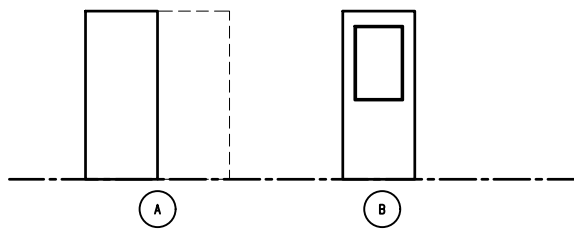
GENERAL NOTES

- 1. ALL INTERIOR DIMENSIONS ARE FROM FACE OF WALL TO FACE OF WALL UNLESS NOTED OTHERWISE.
- 2. ALL INTERIOR WALLS ARE 2x4 WOOD STUDS WITH 1/2" G.W.B. ON EACH SIDE.
- 3. PER ADA ALL THRESHOLDS SHALL NOT BE MORE THAN 1/2" IN HEIGHT VARIATION.

DOOR SCHEDULE - OPTION A

DOOR TYPE	SIZE	DOOR MAT'L	GLASS	ELEV	FRAME MAT'L	HARDWARE SET	FUNCTION
EXTERIOR	1 3'-0" x 6'-8" x 1 3/4"	FIBERG	FT	B	FIBERG	1	ENTRANCE
	2 3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
	3 5'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	3	BI-FOLD
	4 1'-6" x 6'-8" x 1 3/4"	WOOD		A	WOOD	4	PASSAGE
EXTERIOR	5 3'-0" x 6'-8" x 1 3/4"	FIBERG	FT	B	FIBERG	1	ENTRANCE
	6 5'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	3	BI-FOLD
	7 3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
	8 3'-0" x 7'-0" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
	9 3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
	10 5'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	3	BI-FOLD
	11 (2) 2'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	5	PASS. W/FLUSHBOLT

FT = FULLY TEMPERED GLASS



WINDOW SCHEDULE

WINDOW TYPE	FRAME MAT'L	WINDOW SIZE
1	FIBERGLASS	3'-0" x 5'-0"
2	FIBERGLASS	3'-0" x 4'-4"
3	FIBERGLASS	3'-0" x 3'-0"

NOTE: ALL WINDOWS SHALL COMPLY WITH 2009 IECC GLAZING REQUIREMENTS

WEST VIRGINIA ARMY NATIONAL GUARD  
FLOOD RECOVERY  
HOUSE DESIGN  
Charleston, WV

CONSTRUCTION DOCUMENTS

FLOOR PLAN  
OPTION A

DRAWN

JSB

CHECKED

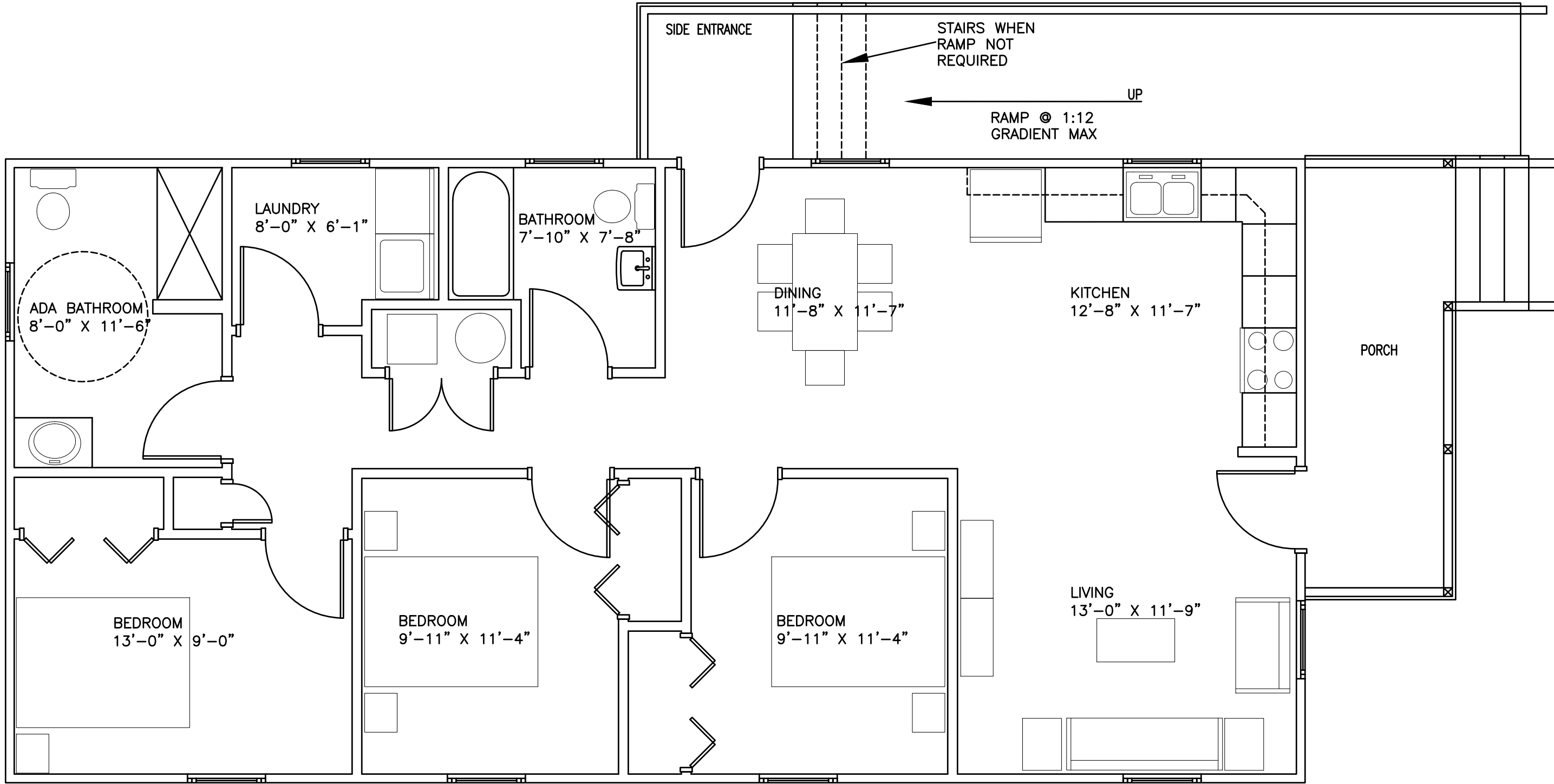
ARK

DATE

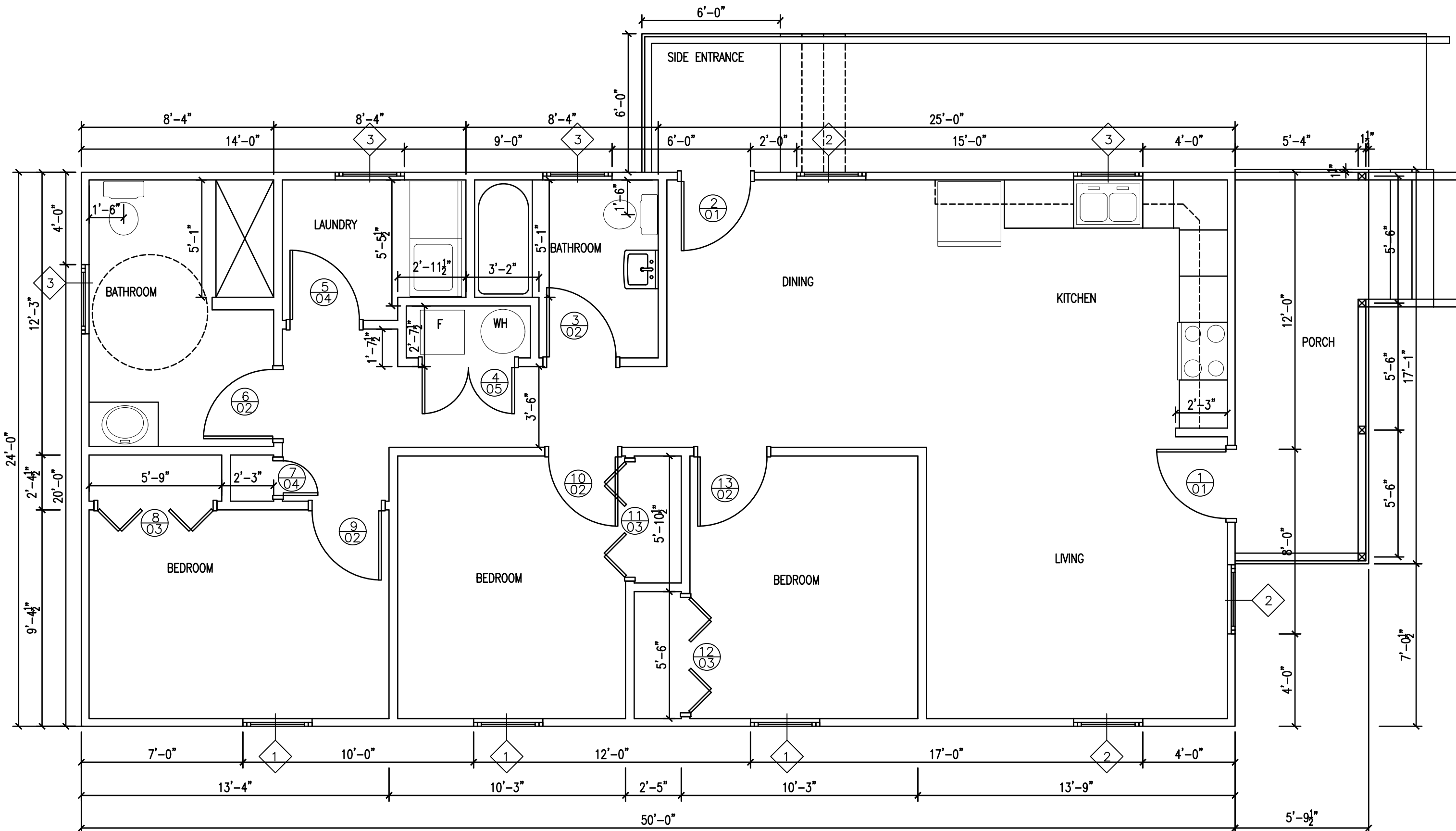
July 26, 2018

COMM. NO.

18065



**SCHEMATIC FLOOR PLAN - OPTION B**  
1/4" = 1'-0"



**DIMENSIONED FLOOR PLAN - OPTION B**  
1/4" = 1'-0"

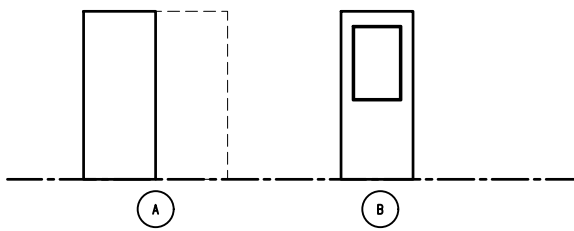
**GENERAL NOTES**

1. ALL INTERIOR DIMENSIONS ARE FROM FACE OF WALL TO FACE OF WALL UNLESS NOTED OTHERWISE.
2. ALL INTERIOR WALLS ARE 2x4 WOOD STUDS WITH 1/2" G.W.B. ON EACH SIDE.
3. PER ADA ALL THRESHOLDS SHALL NOT BE MORE THAN 1/2" IN HEIGHT VARIATION.

**DOOR SCHEDULE - OPTION B**

DOOR TYPE	SIZE	DOOR MAT'L	GLASS	ELEV	FRAME MAT'L	HARDWARE SET	FUNCTION
1	3'-0" x 6'-8" x 1 3/4"	FIBERG	FT	B	FIBERG	1	ENTRANCE
2	3'-0" x 6'-8" x 1 3/4"	FIBERG	FT	B	FIBERG	1	ENTRANCE
3	3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
4	(2) 2'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	5	PASS. W/FLUSHBOLT
5	3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	4	PASSAGE
6	5'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
7	1'-6" x 6'-8" x 1 3/4"	WOOD		A	WOOD	4	PASSAGE
8	5'-0" x 7'-0" x 1 3/4"	WOOD		A	WOOD	3	BI-FOLD
9	3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
10	3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY
11	5'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	3	BI-FOLD
12	5'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	3	BI-FOLD
13	3'-0" x 6'-8" x 1 3/4"	WOOD		A	WOOD	2	PRIVACY

FT = FULLY TEMPERED GLASS



WINDOW TYPE	FRAME MAT'L	WINDOW SIZE
1	FIBERGLASS	3'-0" x 5'-0"
2	FIBERGLASS	3'-0" x 4'-4"
3	FIBERGLASS	3'-0" x 3'-0"

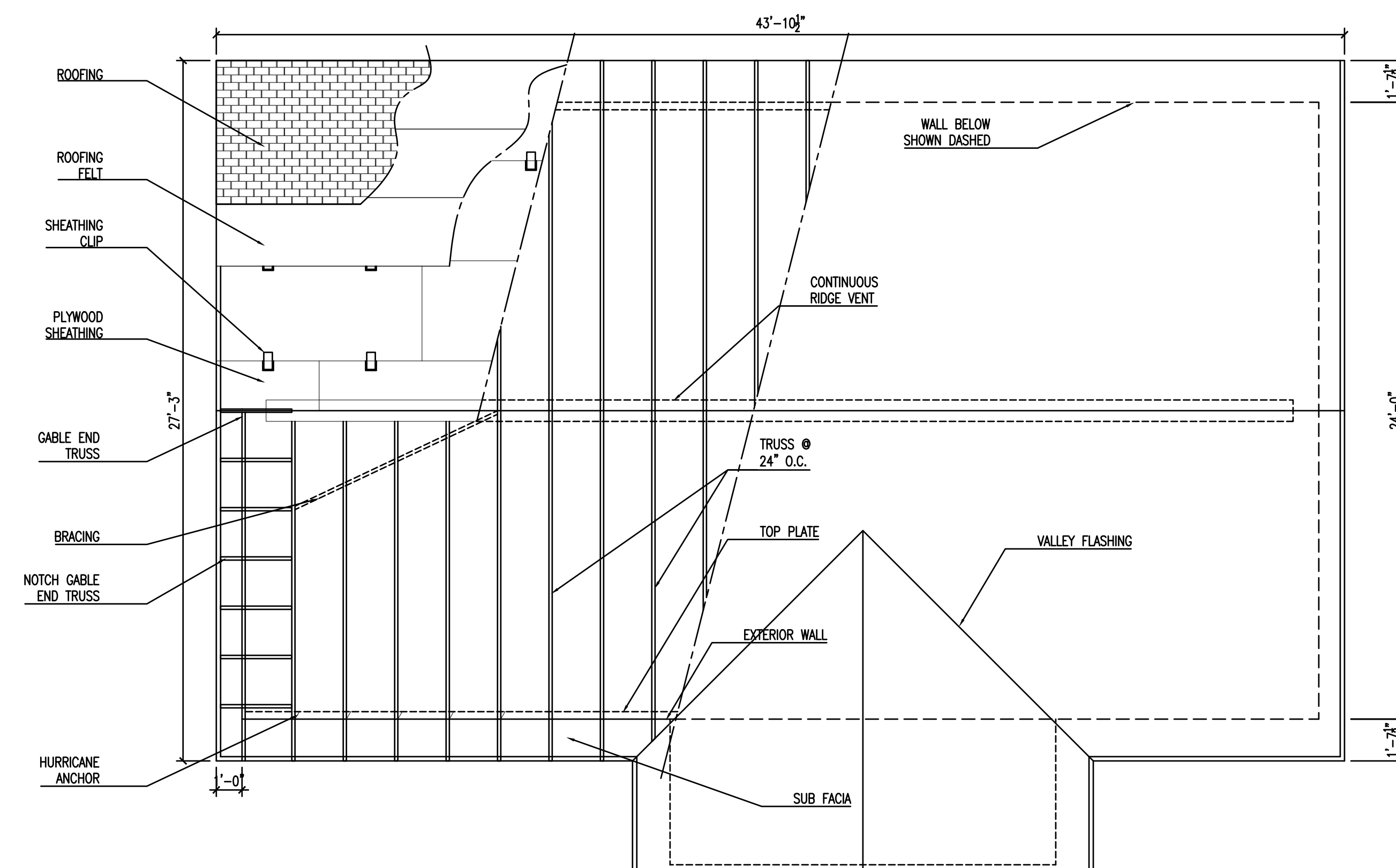
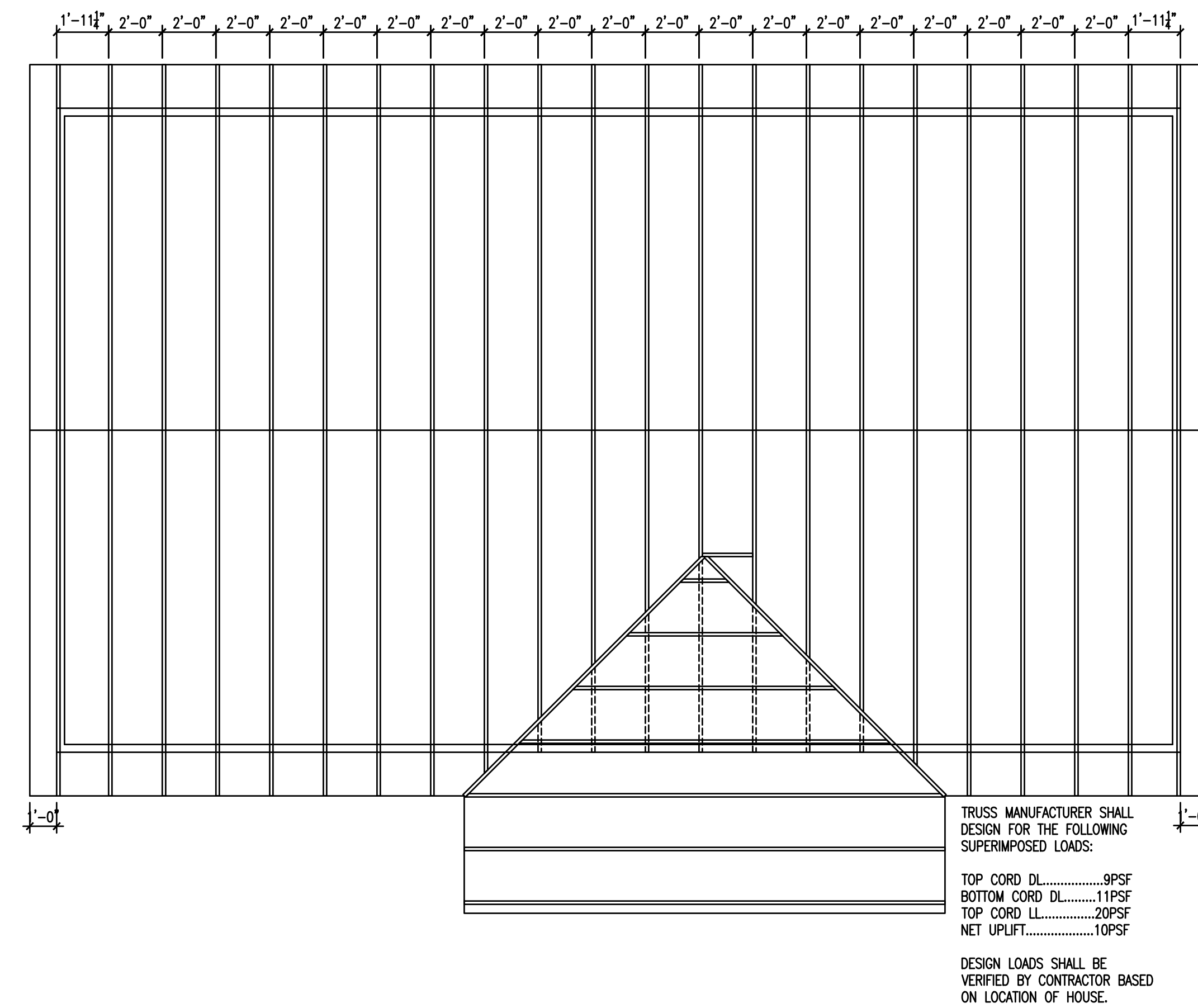
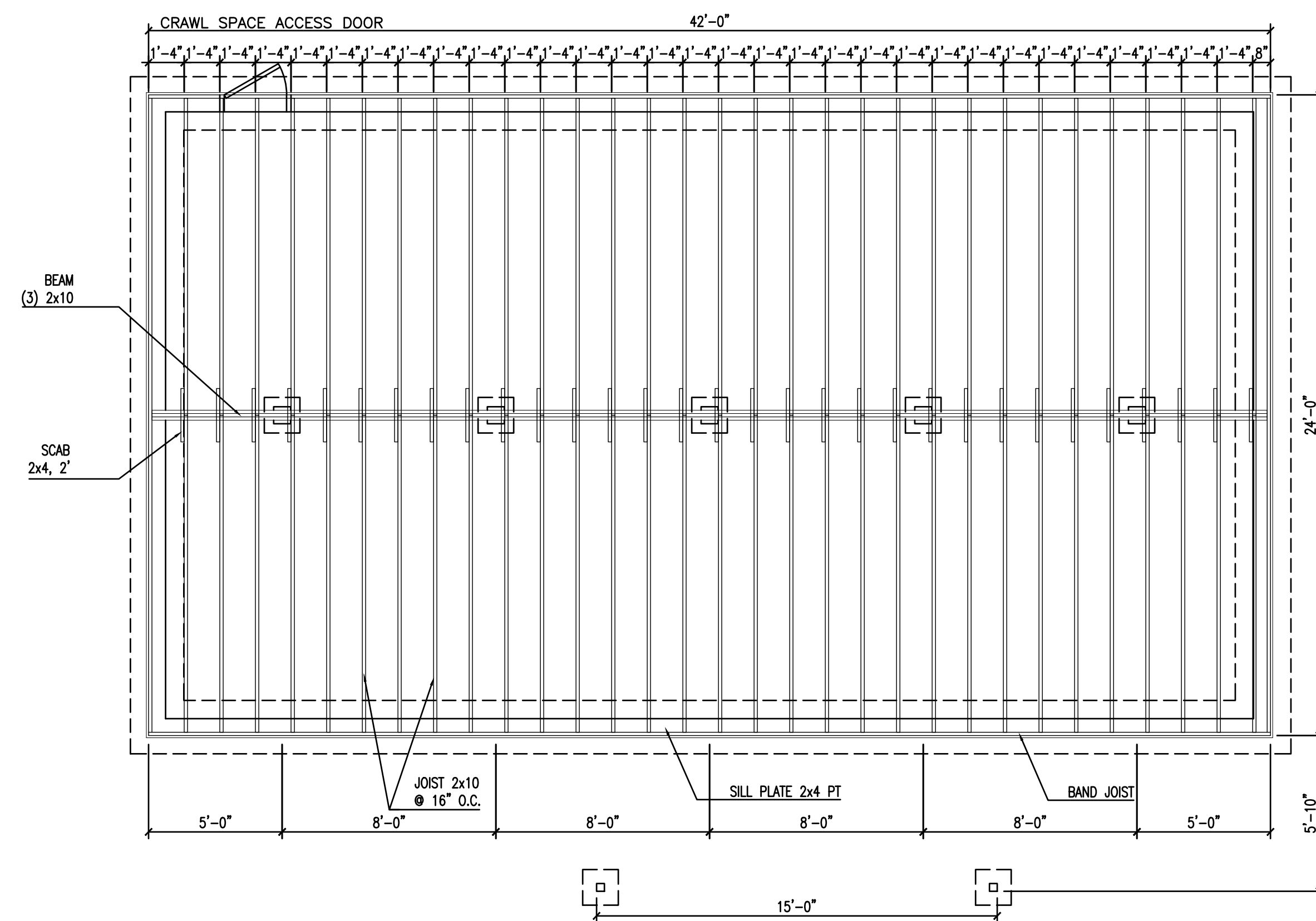
NOTE: ALL WINDOWS SHALL COMPLY WITH 2009 IECC GLAZING REQUIREMENTS

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**FLOOD RECOVERY**  
HOUSE DESIGN  
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CONSTRUCTION DOCUMENTS

**FLOOR PLAN  
OPTION B**

DRAWN JSB	CHECKED ARK
	DATE July 26, 2018
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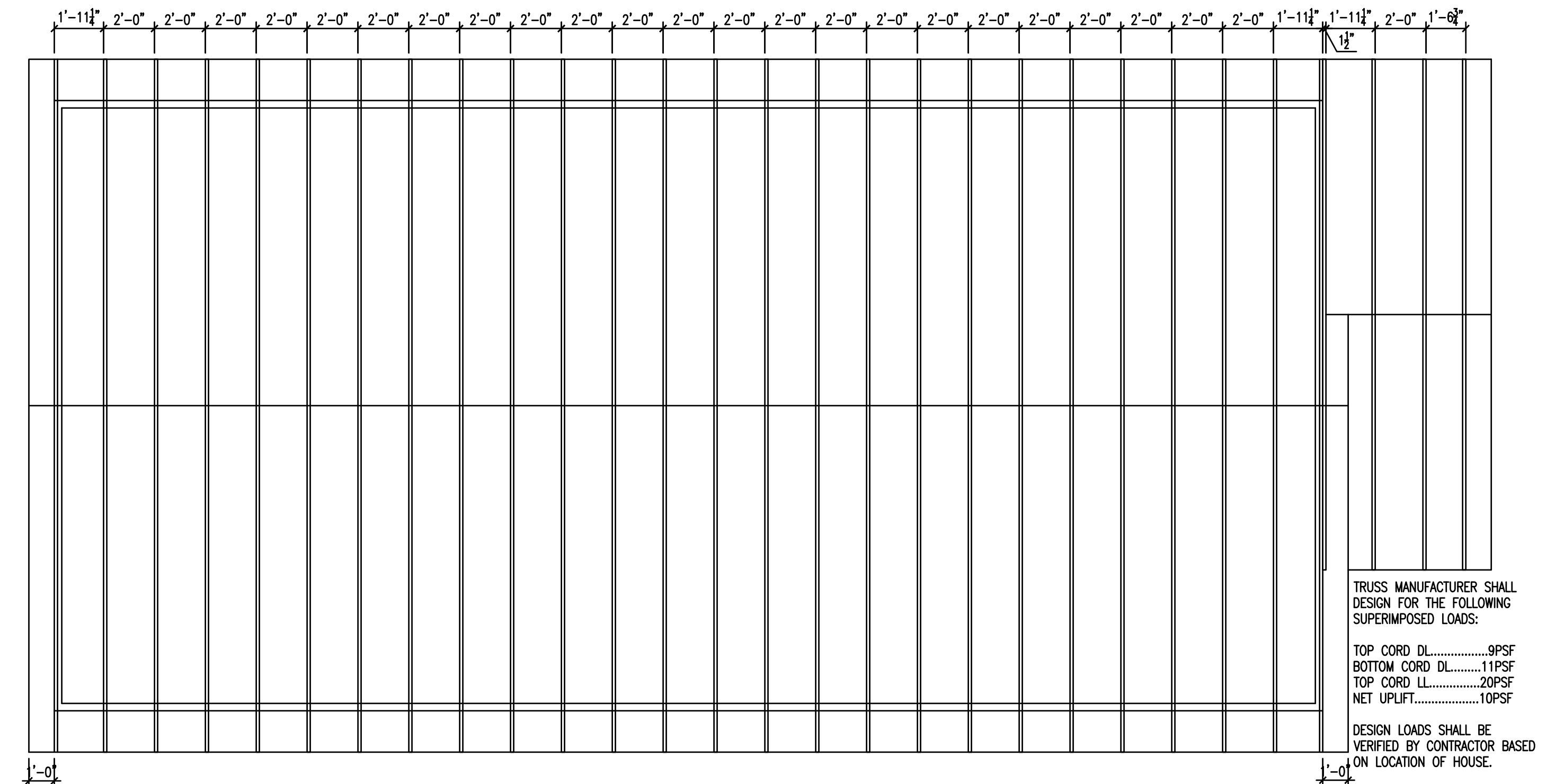
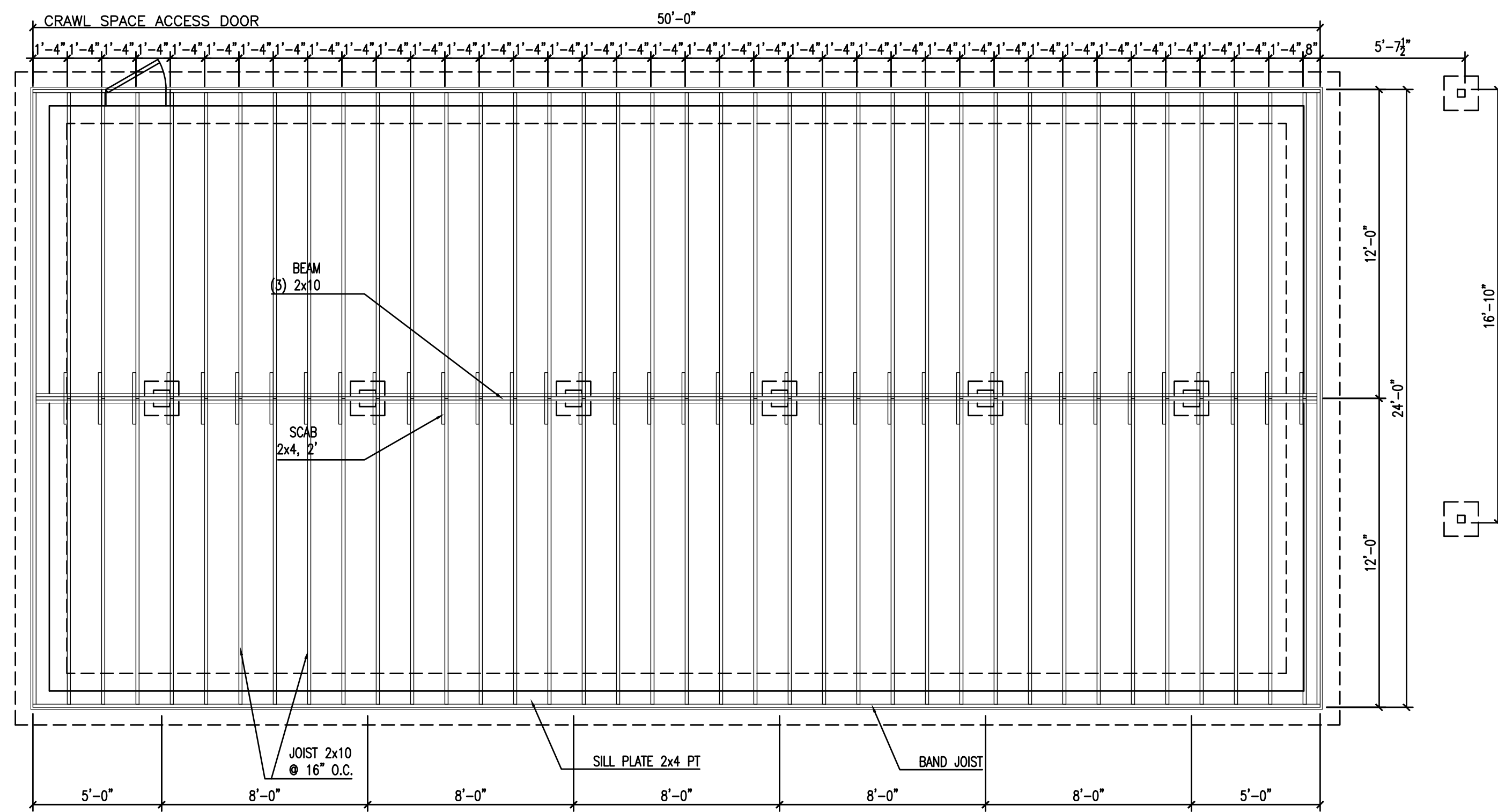
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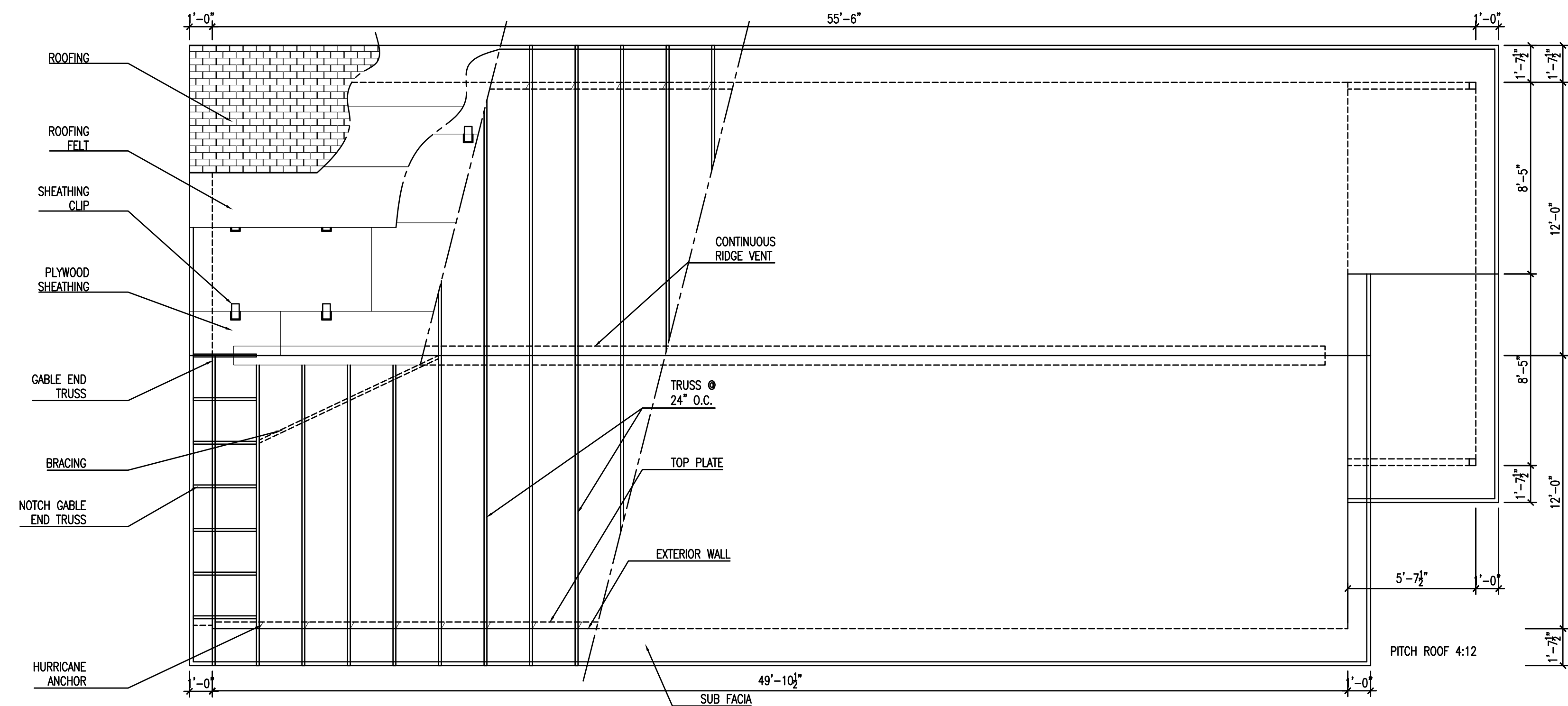
# ROOF & FOUNDATION PLANS OPTION A

DRAWN  <b>JSB</b>	CHECKED  <b>ARK</b>
	DATE  <b>July 26, 2018</b>
	COMM. NO.  <b>18065</b>



**CRAWL SPACE FOUNDATION PLAN - OPTION B**  
1/4" = 1'-0"

**ROOF FRAMING PLAN - OPTION B**  
1/4" = 1'-0"



**ROOF PLAN - OPTION B**  
1/4" = 1'-0"

[illegible]

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## ROOF & FOUNDATION PLANS OPTION B

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	DATE  July 26, 2018
	COMM. NO.  18065



ROOM FINISH SCHEDULE - OPTION A				
ROOM NUMBER	ROOM NAME	FLOOR	BASE	WALLS
101	LIVING	LP-1	WB-1	PT-1
102	BEDROOM	LP-1	WB-1	PT-2
103	CLOSET	LP-1	WB-1	PT-1
104	HALL CLOSET	LP-1	WB-1	PT-2
105	KITCHEN	LP-1	WB-1	PT-1
106	DINING	LP-1	WB-1	PT-1
107	LAUNDRY	LP-1	WB-1	PT-1
108	HALLWAY	LP-1	WB-1	PT-1
109	BATHROOM	LP-1	WB-1	PT-1
110	ALCOVE	LP-1	WB-1	PT-1
111	BATHROOM	LP-1	WB-1	PT-1
112	BEDROOM	LP-1	WB-1	PT-2
113	CLOSET	LP-1	WB-1	PT-1
114	MECHANICAL	LP-1	WB-1	PT-1

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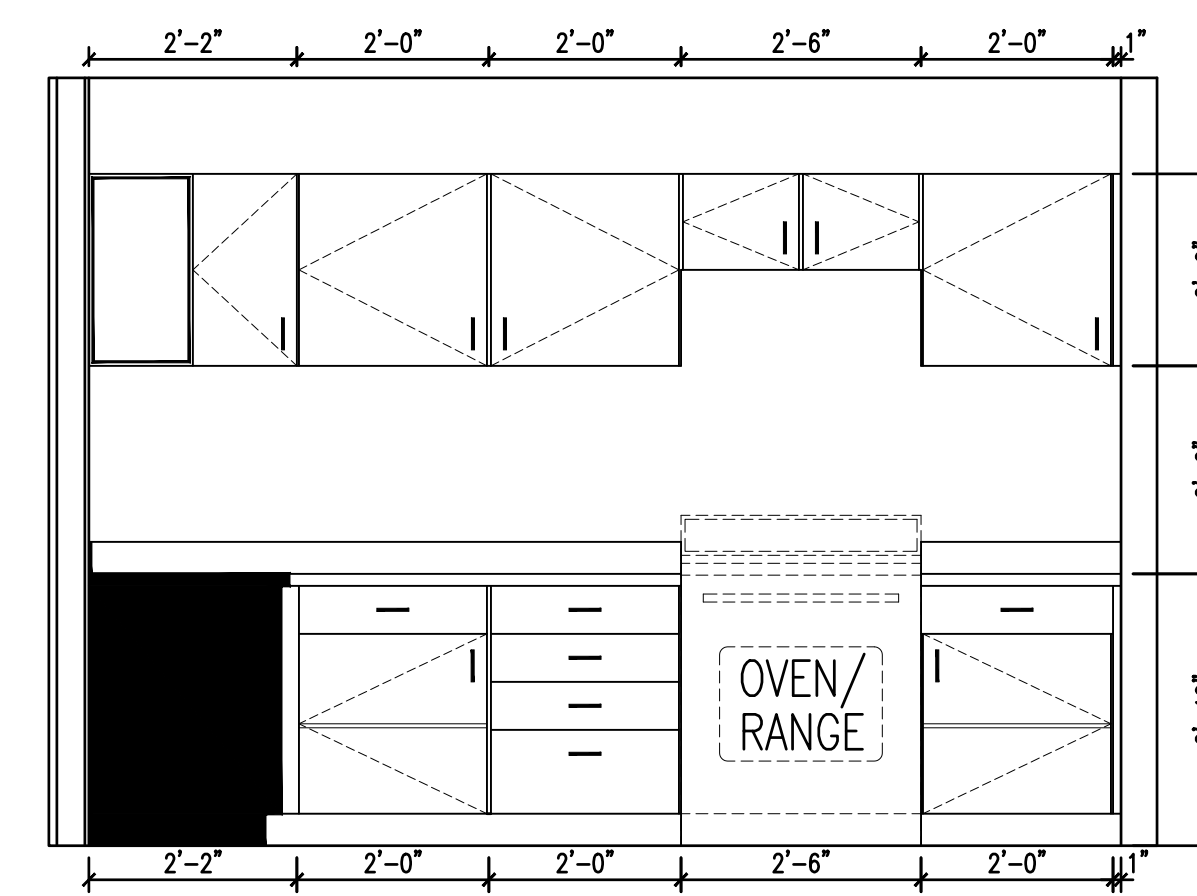
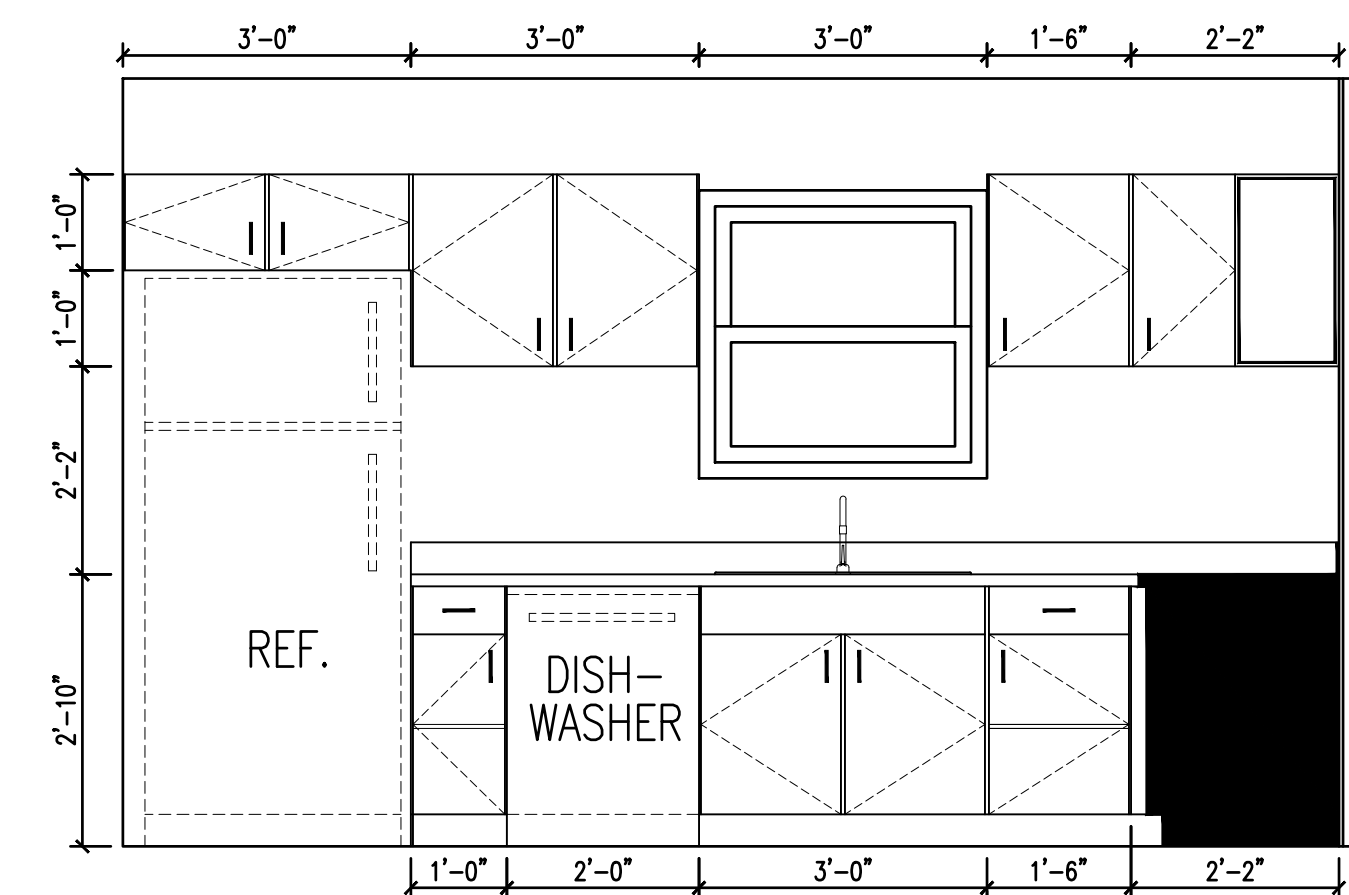
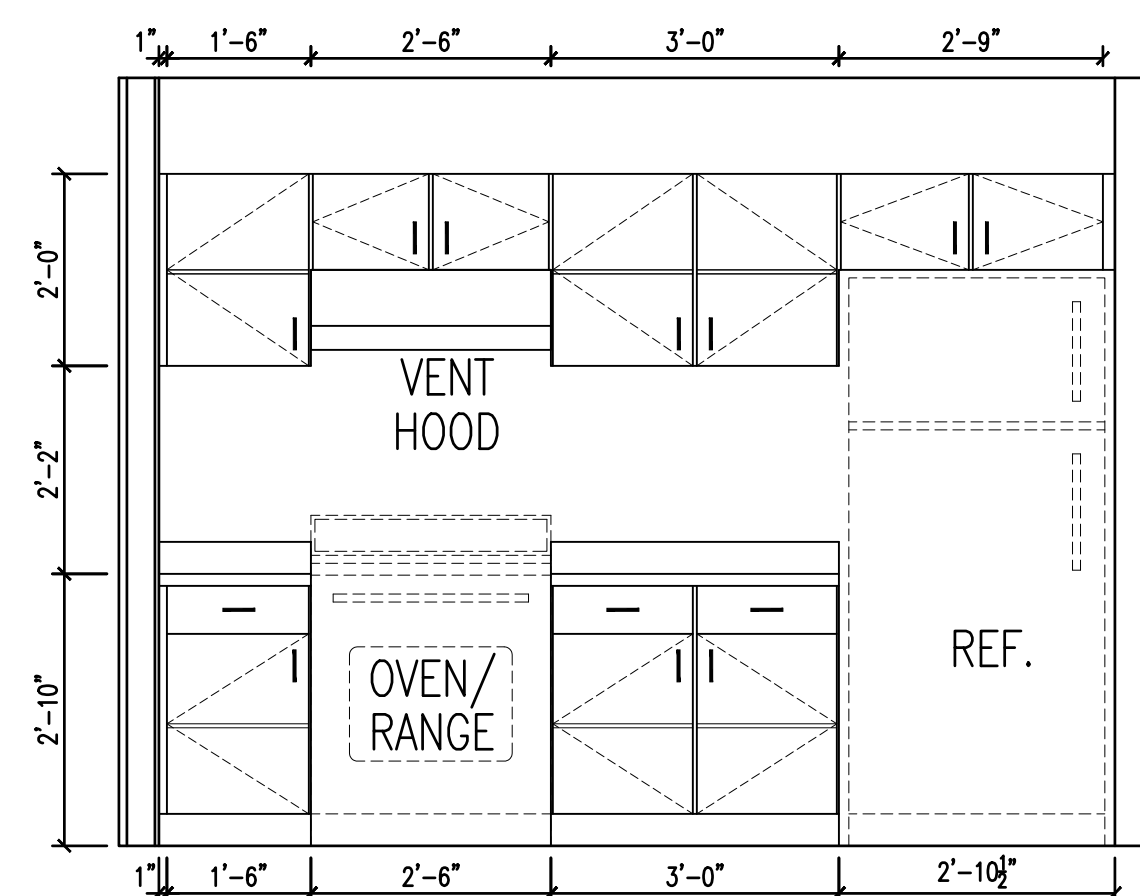
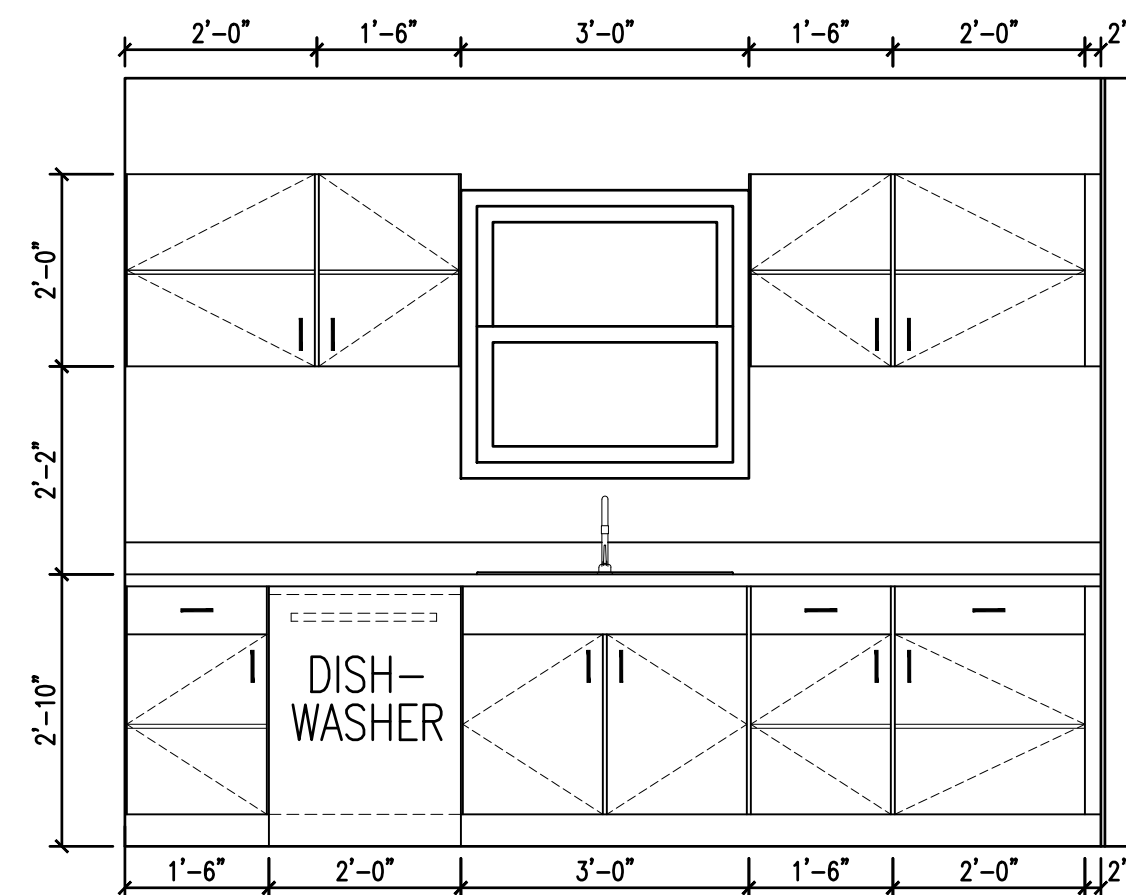
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CONSTRUCTION DOCUMENTS

## FINISH FLOOR PLAN OPTION A

RAWN CC	CHECKED ARK
	DATE July 26, 2018
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NOTE: BASE CABINET(S) HEIGHT CAN BE ADJUSTED TO 36" IF HOUSE IS TO NOT BE ADA COMPLIANT

[illegible]

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## CONSTRUCTION DOCUMENTS

# KITCHEN ELEVATIONS - OPTIONS A & B

DRAWN  <b>JSB</b>	CHECKED  <b>ARK</b>
	DATE <b>July 26, 2011</b>
	COMM. NO. <b>18065</b>

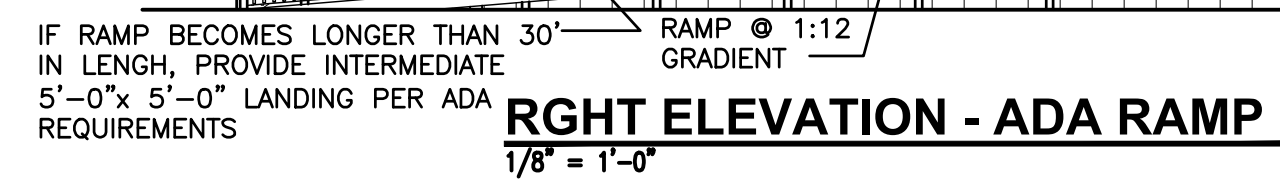
**A270**







**FRONT ELEVATION**  
1/8" = 1'-0"



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CONSTRUCTION DOCUMENTS

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# CONSTRUCTION DOCUMENTS

<h1 style="text-align: center;">PLUMBING SEWER</h1> <h2 style="text-align: center;">PLAN A &amp; PLAN B</h2>	
DRAWN  <b>MWE</b>	CHECKED  <b>MWE</b>
	DATE  <b>July 26, 2018</b>
	COMM. NO.  <b>18065</b>



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Charleston, WV

CONSTRUCTION DOCUMENTS

**P141**



PLUMBING SPECIALTIES				
MARK	MANUFACTURER	DESCRIPTION	MODEL	PIPE SIZE
BFP-1	WATTS REGULATOR	BACKFLOW PREVENTER	SERIES 909	3/4" - 2"
WHA	WATTS REGULATOR	WATER HAMMER ARRESTER	05	1/2"
HP	ZURN	FREEZE PROOF HOSE BIB	21320	3/4"

**BACKFLOW PREVENTER (BFP-1):**

- REDUCED PRESSURE ASSEMBLY CAPABLE OF PROTECTING POTABLE WATER FROM HEALTH HAZARD CROSS-CONNECTIONS.
- SUPPLY WITH RESILIENT SEATED SHUTOFFS
- WITH STRAINER - ALLOW ROOM FOR STRAINER REMOVAL.

**WATER HAMMER ARRESTOR (WHA):**

- MAY BE INSTALLED IN CONCEALED LOCATION WITH ACCESS PANELS
- FACTORY AIR-CHARGED, NOT RECHARGEABLE
- INSTALLED WITH STANDARD PIP TEE AT ANY ANGLE.
- TYPE & SIZE AS RECOMMENDED BY THE MANUFACTURER.

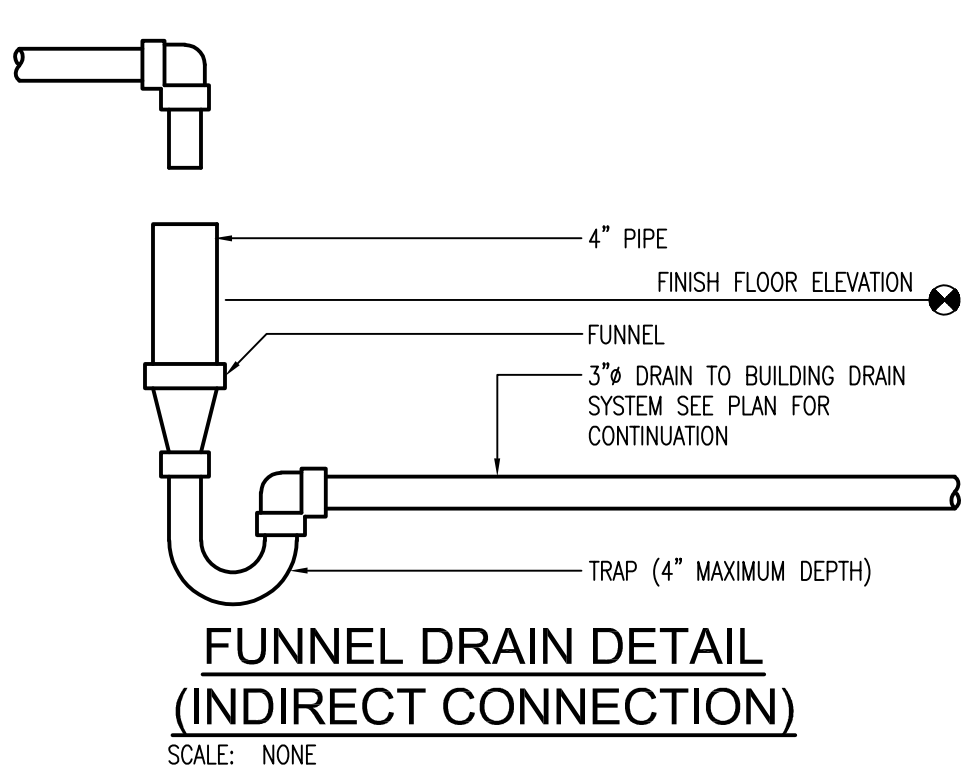
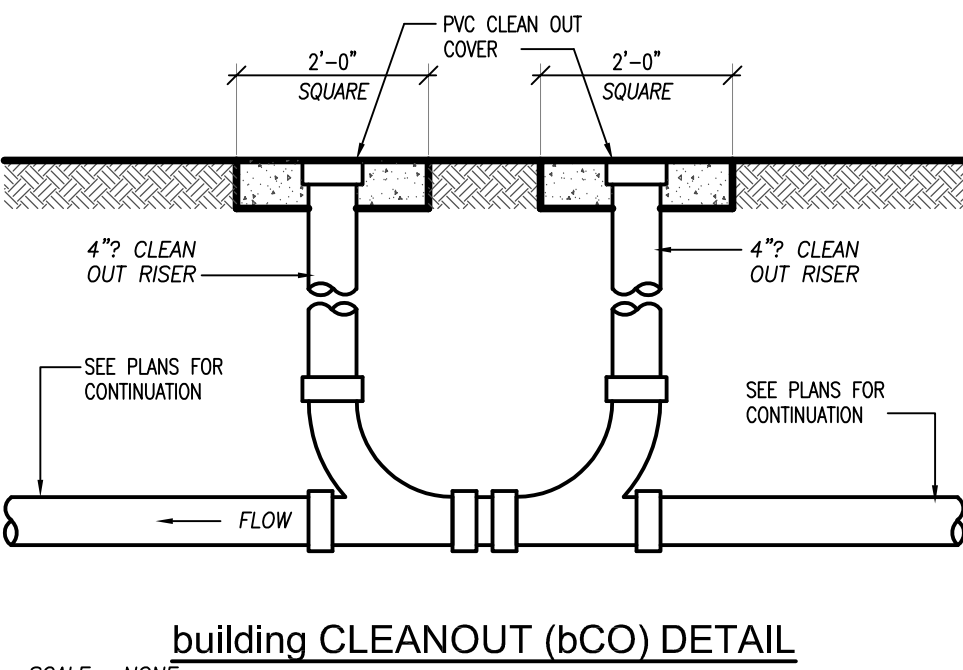
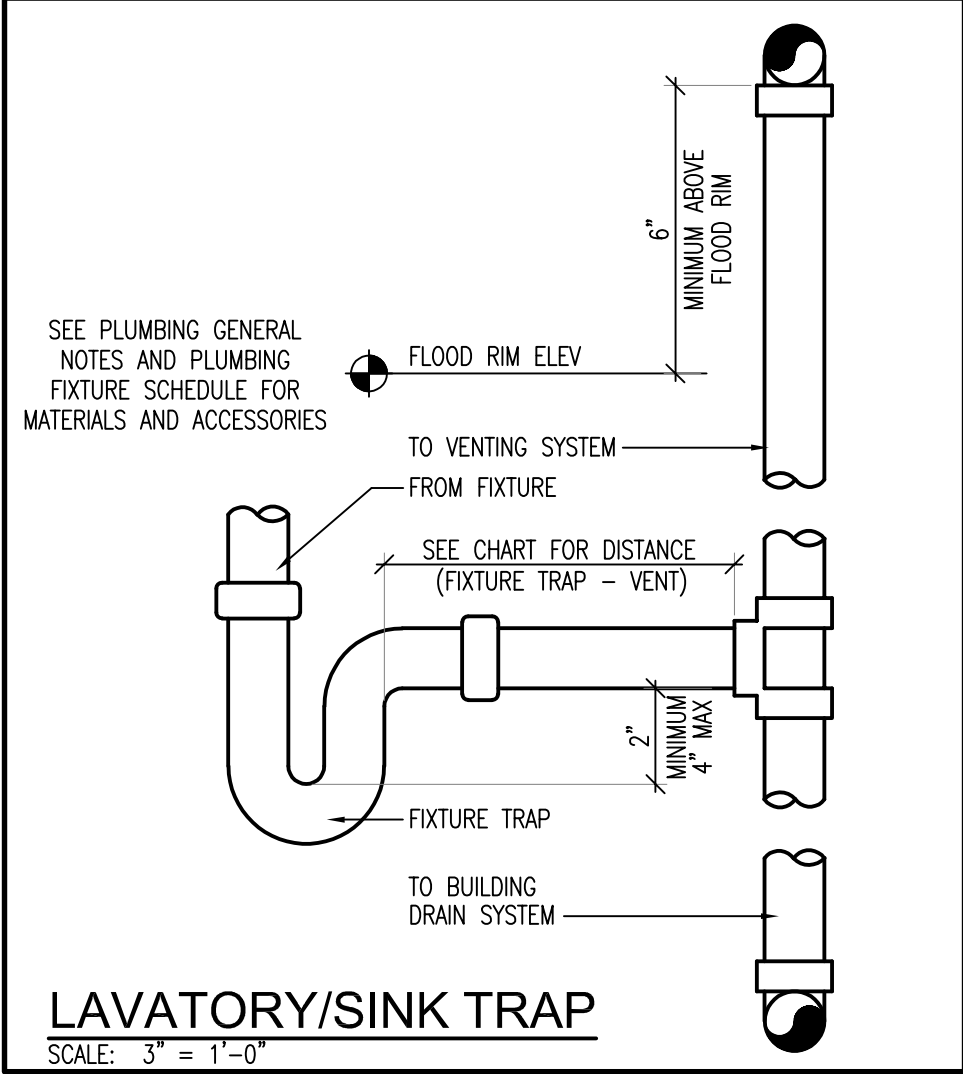
**WATER HYDRANT (HB):**

- INTEGRAL ANTI-SIPHON VACUUM BREAKER/BACKFLOW PREVENTER
- CERAMIC VALVE CARTRIDGE
- COPPER TUBING CASING
- 304 STAINLESS STEEL FACEPLATE WITH STAINLESS STEEL BOX AND HINGED COVER WITH AN OPERATING KEY LOCK AND WATER STAMPED ON THE COVER

DOMESTIC WATER PIPE SPECIFICATION: PEX	
PEX TUBE AND FITTINGS:	
1. PEX (CROSS LINKED POLYETHYLENE) DISTRIBUTION SYSTEM: ASTM F 877, SDR 9 TUBING	
FITTINGS:	
1. FITTINGS FOR PEX TUBE: ASTM F 1807, METAL-INSERT TYPE WITH COPPER OR STAINLESS-STEEL CRIMP RINGS AND MATCHING PEX TUBE DIMENSIONS	
JOINT CONSTRUCTION	
1. JOINTS FOR PEX PIPING: JOIN ACCORDING TO ASTM F 1807	
HANGAR AND SUPPORT INSTALLATION	
1. INSTALL VINYL-COATED HANGERS FOR PEX PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS	
a. NPS 1 AND SMALLER: 32 INCHES WITH 1/4-INCH ROD	
2. INSTALL HANGERS FOR VERTICAL PEX PIPING EVERY 48 INCHES	

MINIMUM CONNECTION SIZE		
FIXTURE TYPE	MIN SUPPLY SIZE	MIN WASTE SIZE
DRINKING FOUNTAIN	3/8"	1 1/4"
DISHWASHING MACHINE	1/2" (WITH BFP)	1 1/2"
KITCHEN SINK (DOMESTIC)	1/2"	2"
LAVATORY	3/8"	1 1/2"
SHOWER	1/2"	1 1/2"
SINK (SERVICE)	1/2"	2"
URINAL	3/4"	FIXTURE OUTLET SIZE
WATER CLOSET (FLUSH TANK)	3/8"	FIXTURE OUTLET SIZE
WATER CLOSET (FLUSH VALVE)	1 1/4"	FIXTURE OUTLET SIZE

FIXTURE TRAP - VENT DISTANCE				
TRAP SIZE (in)	FIXTURE DRAIN SIZE (in)	SLOPE (in/ft)	MAXIMUM DISTANCE FROM TRAP (ft)	MINIMUM DISTANCE FROM TRAP (ft)
1 1/4	1 1/4	1/4	3 1/2	8
1 1/4	1 1/2	1/4	5	8
1 1/4	1 1/2	1/4	5	8
1 1/4	2	1/4	6	8
1 1/4	2	1/4	6	8
1 1/2	3	1/8	10	8
2	4	1/8	12	8

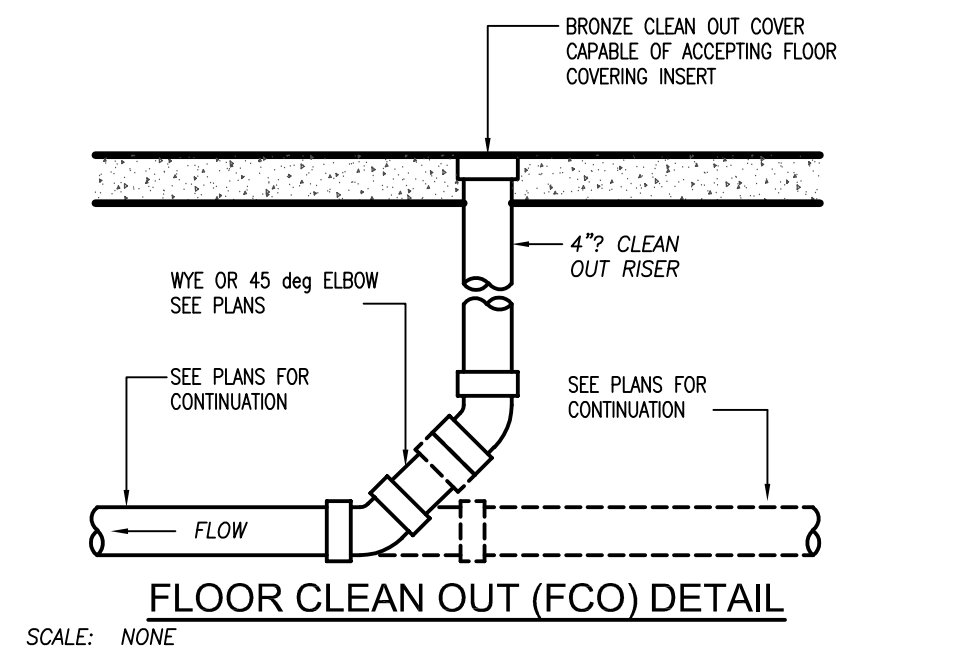


PIPING SYMBOLS LEGEND	
LINE TYPE	PIPE LABEL
---	NEW CONCEALED DOMESTIC COLD WATER PIPING - POT CW
---	NEW UNDERGROUND DOMESTIC COLD WATER PIPING - NA
---	EXISTING UNDERGROUND DOMESTIC COLD WATER PIPING
---	NEW CONCEALED DOMESTIC HOT WATER SUPPLY PIPING - POT HWS
---	NEW CONCEALED DOMESTIC HOT WATER RETURN PIPING - POT HWR
---	NEW CONCEALED STORM SEWER PIPING - STORM SEWER
---	NEW CONCEALED STORM SEWER PIPING UNDERSLAB - NA
---	EXISTING STORM SEWER PIPING - NA
---	NEW CONCEALED SANITARY SEWER PIPING - SANITARY SEWER
---	NEW UNDERGROUND SANITARY SEWER PIPING - NA
---	EXISTING SANITARY SEWER PIPING - NA
---	NEW SANITARY VENT PIPING WITHIN BUILDING - SANITARY VENT
---	NEW CONCEALED CHILLED WATER SUPPLY PIPING - CHWS
---	NEW CONCEALED CHILLED WATER RETURN PIPING - CHWR
---	NEW CONCEALED HOT WATER SUPPLY PIPING - HWS
---	NEW CONCEALED HOT WATER RETURN PIPING - HWR
---	NEW CONCEALED STEAM PIPING - STEAM
---	NEW CONCEALED STEAM CONDENSATE PIPING - STEAM CONDENSATE
---	NEW LOW PRESSURE GAS PIPING - LP NATURAL GAS
---	NEW MEDIUM PRESSURE GAS PIPING - MP NATURAL GAS
---	NEW COMPRESSED AIR PIPING - COMPRESSED AIR
---	ONE (1) HOUR RATED CONSTRUCTION
---	TWO (2) HOUR RATED CONSTRUCTION
---	FIRE PROTECTION PIPING
α	PIPE ELBOW TURNED UP
α	PIPE ELBOW TURNED DOWN
+	PIPE TEE
90°	90° PIPE ELBOW
45°	45° PIPE ELBOW
+	PLUG VALVE
+	BALL VALVE (NORMALLY OPEN) - SEE BELOW FOR SPECIFICATIONS
+	BALL VALVE (NORMALLY CLOSED) - SEE BELOW FOR SPECIFICATIONS
+	BALANCING VALVE - SEE BELOW FOR SPECIFICATIONS
+	CHECK VALVE - SEE BELOW FOR SPECIFICATION
+	AUTOMATIC AIR VENT
+	PRESSURE/TEMPERATURE RELIEF VALVE
+	PRESSURE REDUCING VALVE
+	WYE FITTING
+	FLOOR CLEANOUT
+	CLEAN OUT (CONCEALED & ACCESSIBLE SPACE)
+	CIRCULATION PUMP WITH DESIGNATION - SEE PUMP SCHEDULE
+	WATERHAMMER ARRESTOR WITH PID SIZE (AS RECOMMENDED BY MANUFACTURER)
+	REDUCED PRESSURE BACKFLOW PREVENTER (1/2" - 2")
+	REDUCED PRESSURE BACKFLOW PREVENTER (2 1/2" - 3")
+	FREEZE PROOF HOSE BIB
+	NEW CONNECTION
+	POINT OF DISCONNECTION
+	EMERGENCY GAS SHUT OFF BUTTON. OPERATES A NORMALLY CLOSED GAS VALVE. FAILS IN A CLOSED POSITION.

****	SPECIFICATIONS:
DOMESTIC WATER BALL VALVES (400 PSI): 1/2" - 2"	
1.	HANDLE NUT: ZINC PLATED STEEL
2.	HANDLE: ZINC PLATED STEEL CLEAR CHROMATE PLASTISOL COATED
3.	PACKING GLAND: BRASS ASTM B 16 ALLOY C36000
4.	PACKING: TFE
5.	STEM: SILICON BRONZE ASTM B 16 ALLOY C36000
6.	BALL: BRASS ASTM B 16 ALLOY C36000
7.	SEAT RINGS: TFE
8.	BODY & BODY END PIECE: BRONZE ASTM B 584 ALLOY C84400 OR BRASS ASTM B 124 ALLOY C37700
NATURAL GAS BALL VALVES (2,000# WOG): 1/2" - 2"	
1.	BODY: CARBON STEEL (A108)
2.	SEAT RETAINER: CARBON STEEL (A108)
3.	BALL: STAINLESS STEEL (A128 F304)
4.	SEAT: PTFE
5.	STEM: STAINLESS STEEL (A128 F304)
6.	PACKING & WASHER: PTFE
7.	LEVER & HANDLE NUT: STEEL (ZINC PLATED)
8.	BUSHING: STAINLESS STEEL (A276 304)
BALANCING VALVE (240 PSI): 3/4" - 2"	
STRAIGHT PATTERN GLOBE * NON-RISING STEM DESIGN * FITTED WITH TWO TEST POINTS FOR DIFFERENTIAL PRESSURE MEASUREMENT * INTEGRAL INTERNAL MEMORY STOP (NIBCO X1710 SERIES DZR BRASS CIRCUIT BALANCING VALVES OR EQUAL)	
1.	BODY: DZR METAL
2.	HANDWHEEL: POLYMER
3.	ISOLATING STEM: DZR METAL
4.	STEM SEALS: EPDM
5.	REGULATING STEM: DZR METAL
6.	BONNET: DZR METAL
7.	DISC NUT: DZR METAL
8.	DISK SEAT RING: DZR METAL
9.	DISK 'O' RING: EPDM
CHECK VALVE (200 PSI): 3/4" - 2"	
1.	BONNET, BODY, DISC HANGER, DISC HOLDER & SEAT DISC NUT: BRONZE ASTM B 62
2.	HINGE PIN: BRONZE STM B 140 ALLOY OR B 134 ALLOY C23000
3.	HANGER NUT: BRONZE ASTM B 16
4.	SEAT DISC: BRONZE ASTM (B) FKM (V) B 62 C83600
5.	HINGE PIN PLUG: BRONZE ASTM B 140 ALLOY C31400
6.	SEAT DISC WASHER: ASTM B 98 ALLOY C65500 OR ASTM B 103

## GENERAL SANITARY NOTES:

- COMPONENTS AND INSTALLATION SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING MINIMUM WORKING PRESSURE, UNLESS OTHERWISE INDICATED: SOIL, WASTE, AND VENT PIPING: 10-FOOT HEAD OF WATER.
- SUBMIT PRODUCT DATA: FOR PIPE, TUBE, FITTINGS, AND COUPLINGS, INDICATING LOCATION AND USE (ABOVE GROUND, UNDERGROUND, PLENUM AREA, ETC.).
- PIPING MATERIALS SHALL BEAR LABEL, STAMP, OR OTHER MARKINGS OF SPECIFIED TESTING AGENCY.
- HUBLESS CAST-IRON SOIL PIPE AND FITTINGS: ASTM A 888 OR CISPI 301.
- SHIELDED COUPLINGS: ASTM C 1277 ASSEMBLY OF METAL SHIELD OR HOUSING, CORROSION-RESISTANT FASTENERS, AND RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP. STANDARD, SHIELDED, STAINLESS-STEEL COUPLINGS: CISPI 310, WITH STAINLESS-STEEL CORRUGATED SHIELD; STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE.
- COPPER TUBE AND FITTINGS: COPPER DWV TUBE: ASTM B 306, DRAINAGE TUBE, DRAWN TEMPER. COPPER DRAINAGE FITTINGS: ASME B16.23, CAST COPPER OR ASME B16.29, WROUGHT COPPER, SOLDER-JOINT FITTINGS.
- UNDERGROUND BUILDING DRAINAGE, WASTE AND VENT PIPE (UPTO 6" ABOVE RIM) SHALL BE SCH 40 PVC.
- CANCEALED ABOVE GROUND, SOIL AND WASTE PIPING NPS 4 AND SMALLER SHALL BE ANY OF THE FOLLOWING:
  - HUBLESS CAST-IRON SOIL PIPE AND FITTINGS; STANDARD, SHIELDED, STAINLESS-STEEL COUPLINGS; AND HUBLESS-COUPLING JOINTS.
  - COPPER DWV TUBE, COPPER DRAINAGE FITTINGS, AND SOLDERED JOINTS.
  - COPPER DWV TUBE, COPPER DRAINAGE FITTINGS, AND SOLDERED JOINTS. SCHEDULE 40 PVC
- DISSIMILAR PIPE-MATERIAL COUPLINGS: RIGID, UNSHIELDED, NONPRESSURE PIPE COUPLINGS FOR JOINING DISSIMILAR PIPE MATERIALS WITH SMALL DIFFERENCE IN OD.
- ABOVEGROUND, VENT PIPING NPS 4 AND SMALLER (6" ABOVE FIXTURE RIM) SHALL BE ANY OF THE FOLLOWING:
  - SERVICE CLASS, CAST-IRON SOIL PIPE AND FITTINGS; GASKETS; AND GASKETED JOINTS.
  - HUBLESS CAST-IRON SOIL PIPE AND FITTINGS; STANDARD, SHIELDED, STAINLESS-STEEL COUPLINGS; AND HUBLESS-COUPLING JOINTS.
  - COPPER DWV TUBE, COPPER DRAINAGE FITTINGS, AND SOLDERED JOINTS. OPTION FOR VENT PIPING, NPS 2-1/2 AND NPS 3-1/2: HARD COPPER TUBE, TYPE M (TYPE C); COPPER PRESSURE FITTINGS; AND SOLDERED JOINTS. SCHEDULE 40 PVC
- MAKE CHANGES IN DIRECTION FOR SOIL AND WASTE DRAINAGE AND VENT PIPING USING APPROPRIATE BRANCHES, BENDS, AND LONG-SWEEP BENDS. SANITARY TEES AND SHORT-SWEEP 1/4 BENDS MAY BE USED ON VERTICAL STACKS IF CHANGE IN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL. USE LONG-TURN, DOUBLE Y-BRANCH AND 1/8-BEND FITTINGS IF 2 FIXTURES ARE INSTALLED BACK TO BACK OR SIDE BY SIDE WITH COMMON DRAIN PIPE. STRAIGHT TEES, ELBOWS, AND CROSSES MAY BE USED ON VENT LINES. DO NOT CHANGE DIRECTION OF FLOW MORE THAN 90 DEGREES. USE PROPER SIZE OF STANDARD INCREASERS AND REDUCERS IF PIPES OF DIFFERENT SIZES ARE CONNECTED. REDUCING SIZE OF DRAINAGE PIPING IN DIRECTION OF FLOW IS PROHIBITED.
- LAY BURIED BUILDING DRAINAGE PIPING BEGINNING AT LOW POINT OF EACH SYSTEM. INSTALL TRUE TO GRADES AND ALIGNMENT INDICATED, WITH UNBROKEN CONTINUITY OF INVERT. PLACE HUB ENDS OF PIPING UPSTREAM. INSTALL REQUIRED GASKETS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS FOR USE OF LUBRICANTS, CEMENTS, AND OTHER INSTALLATION REQUIREMENTS. MAINTAIN SWAB IN PIPING AND PULL PAST EACH JOINT AS COMPLETED. INSTALL SOIL AND WASTE DRAINAGE AND VENT PIPING AT THE FOLLOWING MINIMUM SLOPES, UNLESS OTHERWISE INDICATED:
  - BUILDING SANITARY DRAIN: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 3 AND SMALLER; 1 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 4 AND LARGER.
  - HORIZONTAL SANITARY DRAINAGE PIPING: 2% DOWNWARD IN DIRECTION OF FLOW.
  - VENT PIPING: 1% DOWN TOWARD VERTICAL FIXTURE VENT OR TOWARD VENT STACK.
- INSTALL PVC SOIL AND WASTE DRAINAGE AND VENT PIPING ACCORDING TO ASTM D 2665.
- DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT IS INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.
- JOIN HUBLESS CAST-IRON SOIL PIPING ACCORDING TO CISPI 310 AND CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" FOR HUBLESS-COUPLING JOINTS.
- SOLDERED JOINTS: USE ASTM B 813, WATER-FLUSHABLE, LEAD-FREE FLUX; ASTM B 32, LEAD-FREE-ALLOY SOLDER; AND ASTM B 828 PROCEDURE, UNLESS OTHERWISE INDICATED.
- PVC NONPRESSURE PIPING JOINTS: JOIN PIPING ACCORDING TO ASTM D 2665.
- BACKWATER VALVES: INSTALL BACKWATER VALVES IN PIPING SUBJECT TO SEWAGE BACKFLOW.
  - HORIZONTAL PIPING: HORIZONTAL BACKWATER VALVES. USE NORMALLY CLOSED TYPE, UNLESS OTHERWISE INDICATED.
  - FLOOR DRAINS: DRAIN OUTLET BACKWATER VALVES, UNLESS DRAIN HAS INTEGRAL BACKWATER VALVE.
  - INSTALL BACKWATER VALVES IN ACCESSIBLE LOCATIONS.
  - INSTALL BACKWATER VALVES ON THE INFLUENT OF THE GREASE INTERCEPTOR.
- INSTALL PIPE HANGARS AND SUPPORTS AS INDICED BELOW:
  - BASE OF VERTICAL PIPING: MSS TYPE 52, SPRING HANGERS.
  - SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR. ROD DIAMETER MAY BE REDUCED 1 SIZE FOR DOUBLE-ROD HANGERS, WITH 3/8-INCH MINIMUM RODS.
- INSTALL HANGERS FOR CAST-IRON SOIL PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
  - NPS 1-1/2 AND NPS 2: 60 INCHES WITH 3/8-INCH ROD.
  - NPS 3: 60 INCHES WITH 1/2-INCH ROD.
  - NPS 4 AND NPS 5: 60 INCHES WITH 5/8-INCH ROD.
  - NPS 6: 60 INCHES WITH 3/4-INCH ROD.
- INSTALL SUPPORTS FOR VERTICAL CAST-IRON SOIL PIPING EVERY 15 FEET.
- INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
  - NPS 1-1/4: 72 INCHES WITH 3/8-INCH ROD.
  - NPS 1-1/2 AND NPS 2: 96 INCHES WITH 3/8-INCH ROD.
  - NPS 2-1/2: 108 INCHES WITH 1/2-INCH ROD.
  - NPS 3 TO NPS 5: 10 FEET WITH 1/2-INCH ROD.
  - NPS 6: 10 FEET WITH 5/8-INCH ROD.
- INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET (3 M).
- SUPPORT PIPING AND TUBING NOT LISTED ABOVE ACCORDING TO MSS SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
- DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES. THE CONTRACTOR MUST COORDINATE ALL WORK WITH OTHER TRADES.
- CONNECT SOIL AND WASTE PIPING TO EXTERIOR SANITARY SEWERAGE PIPING. USE TRANSITION FITTING TO JOIN DISSIMILAR PIPING MATERIALS.
- CONNECT DRAINAGE AND VENT PIPING TO THE FOLLOWING:
  - PLUMBING FIXTURES: CONNECT DRAINAGE PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING CODE.
  - PLUMBING SPECIALTIES: CONNECT DRAINAGE AND VENT PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING CODE.
- EVERY CLEAN OUT SHALL BE INSTALLED TO OPEN TO ALLOW CLEANING IN THE DIRECTION OF THE FLOW OF THE DRAINAGE PIPE OR AT RIGHT ANGLES THERETO. CLEAN OUTS SHALL BE THE SAME NOMINAL SIZE AS THE PIPE THEY SERVE UP TO 4 INCHES NOMINAL SIZE, THE MINIMUM SIZE OF THE CLEAN OUT SHALL BE 4 INCHES WITH THE EXCEPTION OF:
  - "P" TRAP CONNECTIONS WITH SLIP JOINTS OR GROUND JOINT CONNECTIONS.
  - STACK CLEAN OUTS THAT ARE NOT MORE THAN ONE PIPE DIAMETER SMALLER THAN THE DRAIN SERVED.
- CLEAN OUTS ON 6" AND SMALLER PIPES SHALL BE PROVIDED WITH A CLEARANCE OF NOT LESS THAN 18 INCHES FOR RODDING. CLEAN OUTS ON 8" AND LARGER PIPES SHALL BE PROVIDED WITH A CLEARANCE OF NOT LESS THAN 36"
- DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST 24 HOURS BEFORE INSPECTION MUST BE MADE. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION. ROUGHING-IN INSPECTION:
  - ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGHING-IN AND BEFORE SETTING FIXTURES.
  - FINAL INSPECTION: ARRANGE FOR FINAL INSPECTION BY AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.
  - REINSPECTION: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TEST OR INSPECTION, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR REINSPECTION.
- REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION. TEST SANITARY DRAINAGE AND VENT PIPING ACCORDING TO PROCEDURES OF AUTHORITIES HAVING JURISDICTION OR, IN ABSENCE OF PUBLISHED PROCEDURES, AS FOLLOWS:
  - TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SECTIONS, SUBMIT SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
  - LEAVE UNCOVERED AND UNCONCEALED NEW, ALTERED, EXTENDED, OR REPLACED DRAINAGE AND VENT PIPING UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT WAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
  - ROUGHING-IN PLUMBING TEST PROCEDURE: TEST DRAINAGE AND VENT PIPING, EXCEPT OUTSIDE LEADERS, ON COMPLETION OF ROUGHING-IN. CLOSE OPENINGS IN PIPING SYSTEM AND FILL WITH WATER TO POINT OF OVERFLOW, BUT NOT LESS THAN 10-FOOT HEAD OF WATER. FROM 15 MINUTES BEFORE INSPECTION STARTS TO COMPLETION OF INSPECTION, WATER LEVEL MUST NOT DROP. INSPECT JOINTS FOR LEAKS.
  - FINISHED PLUMBING TEST PROCEDURE: AFTER PLUMBING FIXTURES HAVE BEEN SET AND TRAPS FILLED WITH WATER, TEST CONNECTIONS AND PROVE THEY ARE GAS TIGHT AND WATERTIGHT. PLUG VENT-STACK OPENINGS ON ROOF AND BUILDING DRAINS WHERE THEY LEAVE BUILDING. INTRODUCE AIR INTO PIPING SYSTEM EQUAL TO PRESSURE OF 1-INCH WG. USE U-TUBE OR MANOMETER INSERTED IN TRAP OF WATER CLOSET TO MEASURE THIS PRESSURE. AIR PRESSURE MUST REMAIN CONSTANT WITHOUT INTRODUCING ADDITIONAL AIR THROUGHOUT PERIOD OF INSPECTION. INSPECT PLUMBING FIXTURE CONNECTIONS FOR GAS AND WATER LEAKS.
- REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE OBTAINED. PREPARE REPORTS FOR TESTS AND REQUIRED CORRECTIVE ACTION.
- CLEAN INTERIOR OF PIPING. REMOVE DIRT AND DEBRIS AS WORK PROGRESSES. PROTECT DRAINS DURING REMAINDER OF CONSTRUCTION PERIOD TO AVOID CLOGGING WITH DIRT AND DEBRIS AND TO PREVENT DAMAGE FROM TRAFFIC AND CONSTRUCTION WORK. PLACE PLUGS IN ENDS OF UNCOMPLETED PIPING AT END OF DAY AND WHEN WORK STOPS.
- ALL CONDENSATE PIPING SHALL BE INSULATED.
- ALL SEWER PIPING INVERTS INDICATED ARE REFERENCED FROM THE FINISH FLOOR ELEVATION.



WEST VIRGINIA ARMY NATIONAL GUARD

FLOOD RECOVERY

HOUSE DESIGN

Charleston, WV

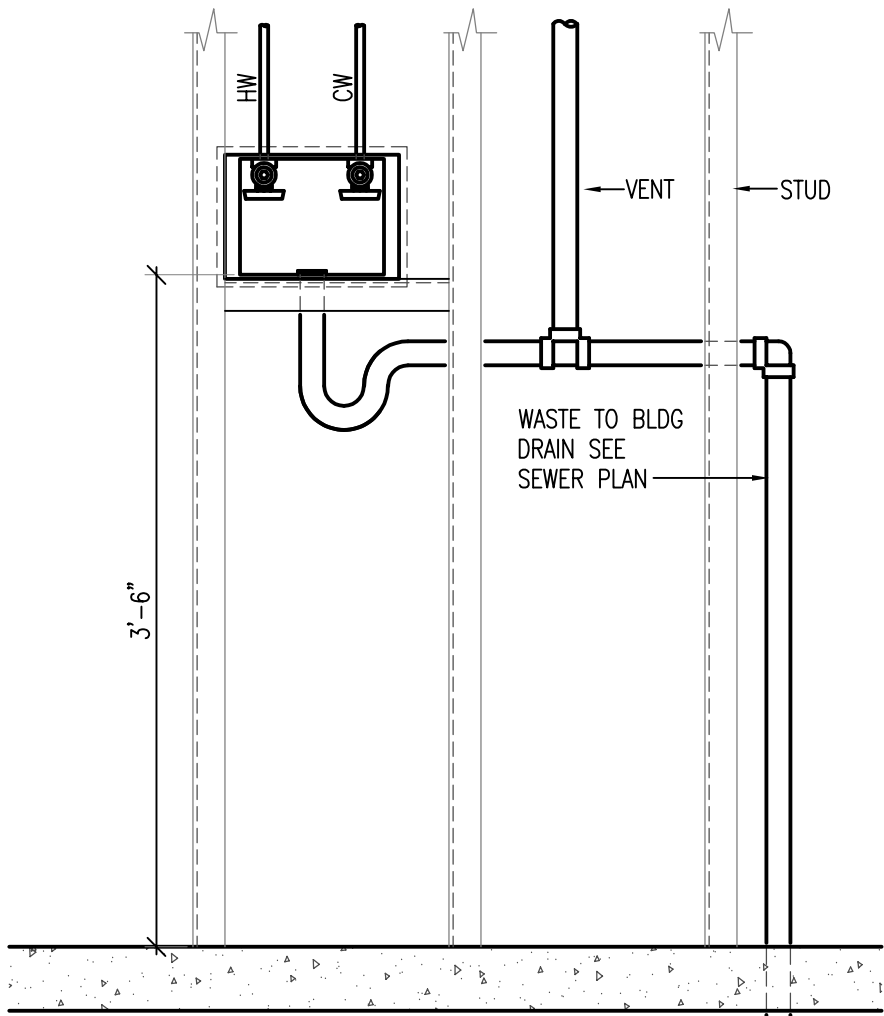
CONSTRUCTION DOCUMENTS

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## PLUMBING DETAILS, NOTES AND SCHEDULE

DRAWN	CHECKED
MWE	MWE
DATE	July 26, 2018
COMM. NO.	18065

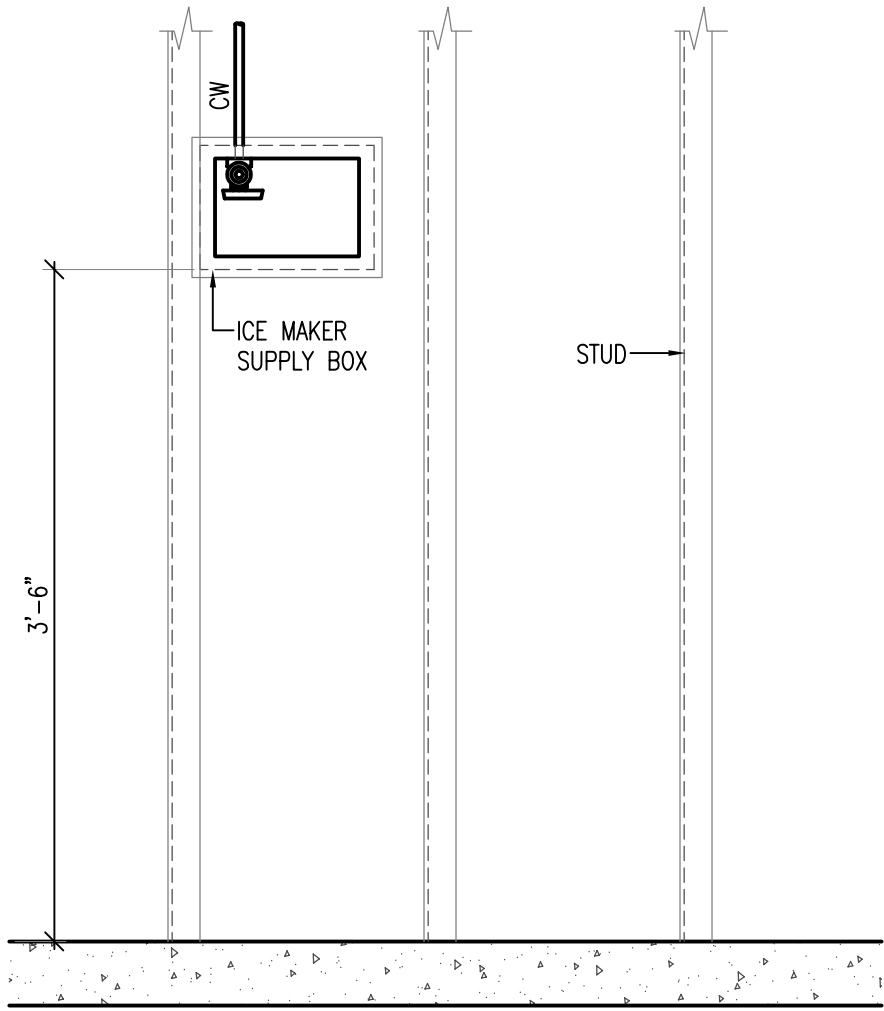
P511



- WASHING MACHINE SUPPLY BOX NOTES:
1. FURNISH AND INSTALL RECESSED 20 GAUGE BOX AND 18 GAUGE FACEPLATE EQUAL TO GUY GRAY WASHING MACHINE OUTLET BOX.
  2. WASHING MACHINE OUTLET BOX SHALL BE FURNISHED WITH TWO 1/2" SWEAT CONNECTION VALVES AND A 1.50" OR 2.0" THREADED DRAIN FITTING AND LOCKNUT.
  3. UNIT SHALL BE GUY GRAY B200TS AS MANUFACTURED BY IPS CORPORATION (PROVIDE B200 IN LIEU OF B200TS FOR WASHING MACHINE SUPPLY BOXES SUPPLYING DOMESTIC WATER FROM BELOW).

WASHING MACHINE SUPPLY BOX

SCALE: NONE



- REFRIGERATOR SUPPLY BOX NOTES:
1. FURNISH AND INSTALL RECESSED 20 GAUGE BOX AND 18 GAUGE FACEPLATE EQUAL TO GUY GRAY WASHING MACHINE OUTLET BOX.
  2. UNIT SHALL BE GUY GRAY BM875QTS AS MANUFACTURED BY IPS CORPORATION.

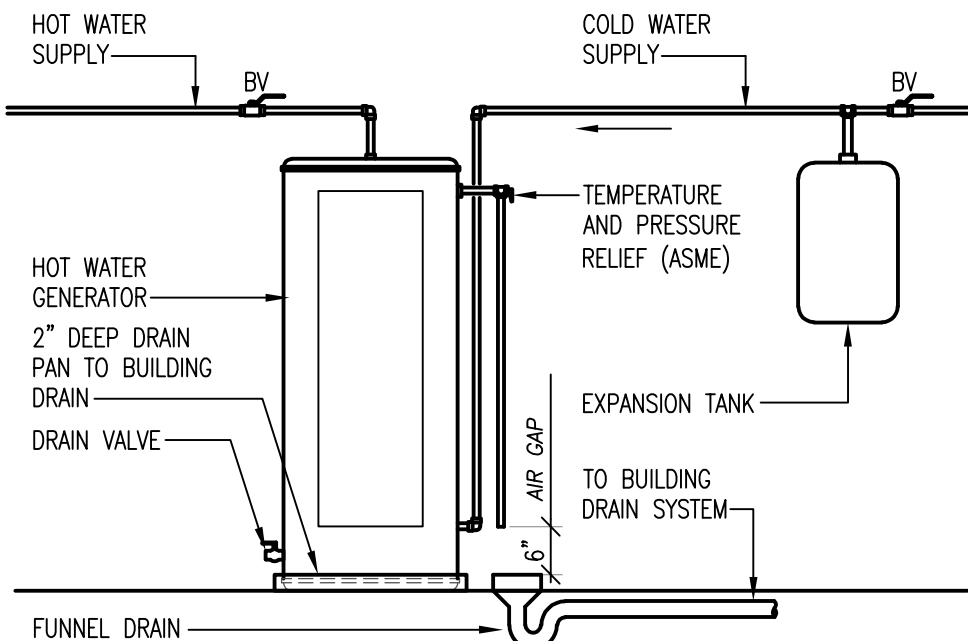
REFRIGERATOR SUPPLY BOX

SCALE: NONE

PLUMBING FIXTURE SCHEDULE					
MARK	DESCRIPTION	MOUNTING	MATERIAL	MARK	DESCRIPTION
LAV-1	LAVATORY (ADA) ONE LEVER FAUCET	WALL	VITREOUS CHINA	WC-1	WATER CLOSET (FLUSH TANK ADA)
LAV-2	LAVATORY	DROP-IN	VITREOUS CHINA	SH-1	SHOWER
SK-1	KITCHEN SINK	DROP-IN	STAINLESS STEEL	TUB-1	BATH TUB
SPECIFICATION:			SPECIFICATION:		
** LAV-1			** WC-1		
FIXTURE: ZURN Z5344 - 20"x18" WHEELCHAIR ADA CONCEALED CARRY ARM LAVATORY, 4" CENTERSET			FIXTURE: ZURN Z5560 - 1.6 GPF ADA HEIGHT, TWO-PIECE TOILET WITH PRESSURE ASSISTED TANK, SIPHON JET ELONGATED BOWL		
FAUCET: ZURN Z7440-WF - 4" CENTERSET SIERRA SERIES LAVATORY FAUCET, 5" INTEGRAL SPOUT, CERAMIC DISC CARTRIDGE, TEMPERATURE LIMIT STOP, LEVER CONTROL WITH TMV TYPICAL, SEE DETAIL.			SUP LINE: ZURN Z8800-CR - STANDARD STOP WITH FLEXIBLE CLOSET RISER SEAT: ZURN Z5985S-EL - ELONGATED, WHITE, CLOSED FRONT TOILET SEAT WITH COVER AND STAINLESS STEEL CHECK HINGE.		
DRAIN: ZURN - STOPPER			** SH-1		
P-TRAP: ZURN Z8700-PC - 1.25" CAST BRASS P-TRAP WITH CLEANOUT AND ADA COMBINATION OFFSET TRAP AND SUPPLY WRAP PROTECTOR KIT			FIXTURE: AQUATIC 1623BFSTD - ACRYLX (WHITE), BARRIER FREE, SMOOTH TILE WALL FINISH. UNIT SHALL BE INSTALLED WITH THE FOLLOWING OPTIONS: GRAB BARS, FOLD-UP SEAT, CURTAIN ROD. UNIT SHALL COMPLY WITH ADA AND HUD UM73g. INTERIOR DIMENSIONS: 60x30x74.875.		
SUP LINE: ZURN ZB855WLLK-PC - WHEELCHAIR LAVATORY SUPPLY KIT			FAUCET: HAND-HELD SHOWER ASSEMBLY WITH SLIDE BAR. ASME 1016 LISTED PRESSURE BALANCING VALVE		
CARRIER: ZURN Z1224 OR Z1231			DRAIN: CENTER		
** LAV-2			P-TRAP: INSTALL PVC P TRAP NOT TO EXCEED 4" DEEP		
FIXTURE: ZURN Z5124 - 19" ROUND, 4" CENTERSET COUTERTOP LAVATORY			** TUB-1		
FAUCET: ZURN Z811101 - 4" CENTERSET INTEGRAL SPOUT FAUCET, 2.50" LEVER HANDLES, WITH TMV SEE DETAIL			FIXTURE: AQUATIC 6030AS (WHITE)		
DRAIN: ZURN - STOPPER			FAUCET: MOEN ADLER THREE-HANDLE TUB/SHOWER VALVE MODEL 82663. DUAL CONTROL LEVEL HANDLES. FLOW RATES SHALL MEET ENERGY STAR REQUIREMENTS. CHROME PLATED METAL. 10 YEAR WARRANTY STOPPER TO MATCH FINISH ON FAUCET.		
P-TRAP: ZURN Z8700-PC - 1.25" CAST BRASS P-TRAP WITH CLEANOUT AND SUPPLY WRAP PROTECTOR KIT.			DRAIN: STOPPER TO MATCH FINISH ON FAUCET.		
SUP LINE: ZURN Z8804LR-PC - STANDARD STOP LAVATORY SUPPLY KIT (CONNECTIONS 0.50" NOM x 0.375" OD)					
CARRIER: NONE REQUIRED					
** SK-1					
FIXTURE: KOHLER TOCCATA - 33"x22"x7.50"4, 3 HOLE FAUCET PUNCHING, EQUAL-SIZED DOUBLE BASINS					
FAUCET: KOHLER CORALAIS - SINGLE-CONTROL KITCHEN SINK FAUCET WITH LOOP HANDLE, 10" SWING SPOUT AND SIDESPRAY IN POLISHED CHROME WITH TMV SEE DETAIL					
DRAIN: KOHLER - STAINLESS STEEL SINK STRAINER, EACH BASIN					
P-TRAP: KOHLER K-9000 - CAST BRASS ADJUSTABLE P-TRAP, TUBING OUTLET, 1.50"x1.50" WITH CLEANOUT PLUG					
SUP LINE: KOHLER - STANDARD ANGLE STOPS WITH FLEXIBLE HOSES					

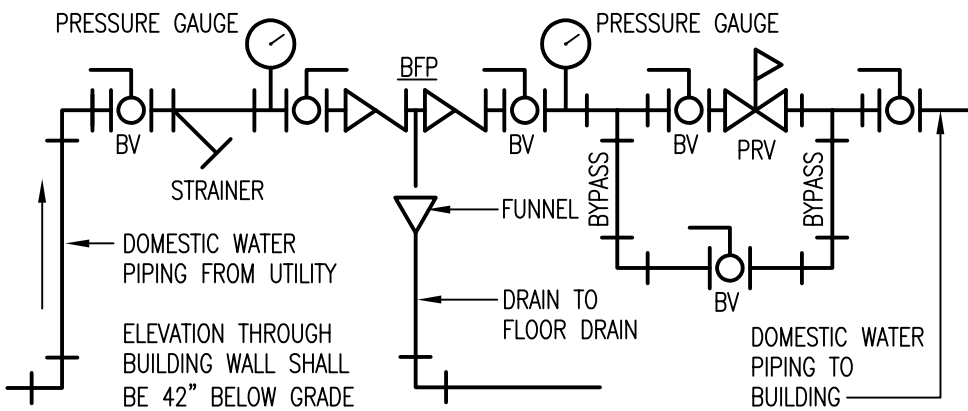
WATER HEATER SCHEDULE											
MARK	MAKE	MODEL	VOLUME	SOURCE	UNIFORM EF	RECOVERY RATE	V / PH	ELEMENT	MOCP	NOTES	
HWG-1	BRADFORD WHITE	RE2H50S10	50 GAL	HEAT PUMP	3.39	21 GPH @ 90°F	240-10	4.5 KW	25A	NON-SIMULTANEOUS OPERATION	
WATER HEATER SPECIFICATIONS:											
1. ENERGY STAR QUALIFIED.											
2. CONTROL PANEL: PROVIDES DETAILED DIAGNOSTIC INFORMATION INCLUDING WATER HEATER FAULT CODES, TANK CODES, NEED-TO-ASSESS CODES, AND HEAT PUMP ADDITIONAL FUNCTIONS ALLOW YOU TO MONITOR THE STATUS OF TEMPERATURE SENSING THERMISTORS AND HEATING COMPONENTS.											
3. OPERATING MODES:											
a. HEAT PUMP ONLY MODE											
b. HYBRID MODE											
c. ELECTRIC ONLY MODE											
d. VACATION MODE											
4. VITRAGLAS LING-AN EXCLUSIVELY ENGINEERED ENAMEL FORMULA THAT PROVIDES SUPERIOR TANK PROTECTION FROM THE HIGHLY CORROSIVE EFFECTS OF HOT WATER. THIS FORMULA (VITRAGLAS) IS FUSED TO THE STEEL SURFACE BY FIRING AT A TEMPERATURE OF OVER 1600°F (871°C).											
5. OPERATING SOUND LEVEL OF APPROXIMATELY 55 dBA											
6. OPERATING AIR TEMPERATURE RANGE: 35 - 120°F FOR THE HEAT PUMP											
7. BACKUP ELECTRIC HEATING ELEMENTS.											
8. DIRECT HEAT TRANSFER WITH IMMERSED ELEMENTS, TRANSFERS HEAT DIRECTLY TO THE WATER.											
9. INSULATION SYSTEM: 2" NON-CFC FOAM INSULATION COVERS THE SIDES AND TOP OF THE TANK.											
10. FACTOR INSTALLED HEAT TRAPS.											
11. MAGNESIUM ANODE ROD											
12. FACTORY INSTALLED ASME RATED T&P RELIEF VALVE											
13. 10 YEAR WARRANTY											

EXPANSION TANK SCHEDULE					
MARK	MAKE	MODEL	VOL. gal	ACCEPTANCE gal	REMARKS
XT-1	WATTS-REGULATOR	DETA 5	3.5	2.1	
NOTES:					
1. ASME SECTION VIII CONSTRUCTION & SUITABLE FOR POTABLE WATER					
2. FDA APPROVED FIXED BUTYL BLADDER					
3. STAINLESS STEEL CONNECTION					
4. PRE-CHARGED TO 40 psi					
5. CARBON STEEL SHEEL					
6. RATED FOR 150 psi @ 240 deg F					



WATER HEATER DETAIL

SCALE: NONE



WATER SERVICE ENTRANCE SCHEMATIC

SCALE: NONE

GENERAL DOMESTIC WATER NOTES:

1. WATER METERS WILL BE FURNISHED BY UTILITY COMPANY FOR INSTALLATION BY CONTRACTOR.
2. DEFINITIONS - PVC: POLYVINYL CHLORIDE PLASTIC.
3. PROVIDE COMPONENTS AND INSTALLATION CAPABLE OF PRODUCING DOMESTIC WATER PIPING SYSTEMS WITH 125 PSIG, UNLESS OTHERWISE INDICATED.
4. SUBMITTALS:
  - a. PRODUCT DATA: FOR PIPE, TUBE, FITTINGS AND COUPLINGS.
  - b. FIELD QUALITY-CONTROL TEST REPORTS.
5. PIPING MATERIALS SHALL BEAR LABEL, STAMP, OR OTHER MARKINGS OF SPECIFIED TESTING AGENCY.
6. TRANSITION COUPLINGS FOR ABOVEGROUND PRESSURE PIPING: COUPLING OR OTHER MANUFACTURED FITTING THE SAME SIZE AS, WITH PRESSURE RATING AT LEAST EQUAL TO AND ENDS COMPATIBLE WITH, PIPING TO BE JOINED.
7. COPPER TUBE AND FITTINGS:
  - a. HARD COPPER TUBE: ASTM B 88, TYPES L AND M (ASTM B 88M, TYPES B AND C), WATER TUBE, DRAIN TEMPER.
  - b. COPPER PRESSURE FITTINGS: ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT-COPPER, SOLDER-JOINT FITTINGS.
  - c. COPPER UNIONS: MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET,METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.
8. PVC PIPE AND FITTINGS (UNDERGROUND ONLY)
  - a. PVC SCHEDULE 40 PIPE: ASTM D 1785.
  - b. PVC SCHEDULE 40 FITTINGS: ASTM D 2466, SOCKET TYPE.
9. TRANSITION AND SPECIAL FITTINGS WITH PRESSURE RATINGS AT LEAST EQUAL TO PIPING RATING MAY BE USED IN APPLICATIONS BELOW, UNLESS OTHERWISE INDICATED. FLANGES MAY BE USED ON ABOVEGROUND PIPING, UNLESS OTHERWISE INDICATED.
10. DOMESTIC WATER PIPING ON SERVICE SIDE OF WATER METER INSIDE THE BUILDING: USE ANY OF THE FOLLOWING PIPING MATERIALS FOR EACH SIZE RANGE:
  - a. NPS 1 AND SMALLER: HARD COPPER TUBE, TYPE L, AND SOLDERED JOINTS.
  - b. NPS 1-1/4 AND NPS 1-1/2: HARD COPPER TUBE, TYPE M SOLDERED JOINTS.
  - c. NPS 2 : HARD COPPER TUBE, TYPE M; AND SOLDERED JOINTS.
  - d. NPS 2-1/2 TO NPS 3-1/2: HARD COPPER TUBE, TYPE M COOPER SOLDERED JOINTS
11. DRAWINGS INDICATE VALVE TYPES TO BE USED. WHERE SPECIFIC VALVE TYPES ARE NOT INDICATED, THE FOLLOWING REQUIREMENTS APPLY:
  - a. SHUTOFF DUTY: USE BRONZE BALL FOR PIPING NPS 2 AND SMALLER. USE CAST-IRON BUTTERFLY VALVES WITH FLANGED ENDS FOR PIPING NPS 2-1/2 AND LARGER.
  - b. THROTTLING DUTY: USE BRONZE BALL OR GLOBE VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE CAST-IRON BUTTERFLY VALVES WITH FLANGED ENDS FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.
  - c. HOT-WATER-PIPING, BALANCING DUTY: CALIBRATED BALANCING VALVES.
  - d. DRAIN DUTY: HOSE-END DRAIN VALVES.
12. INSTALL SHUTOFF VALVE CLOSE TO WATER MAIN ON EACH BRANCH AND RISER SERVING PLUMBING FIXTURES OR EQUIPMENT, ON EACH WATER SUPPLY TO EQUIPMENT, AND ON EACH WATER SUPPLY TO PLUMBING FIXTURES THAT DO NOT HAVE SUPPLY STOPS. USE BALL VALVES FOR PIPING NPS 2 AND SMALLER. USE BUTTERFLY VALVES FOR PIPING NPS 2-1/2 AND LARGER.
13. INSTALL DRAIN VALVES FOR EQUIPMENT AT BASE OF EACH WATER RISER, AT LOW POINTS IN HORIZONTAL PIPING, AND WHERE REQUIRED TO DRAIN WATER PIPING.
14. INSTALL HOSE-END DRAIN VALVES AT LOW POINTS IN WATER MAINS, RISERS, AND BRANCHES.
15. INSTALL STOP-AND-WASTE DRAIN VALVES WHERE INDICATED.
16. INSTALL CALIBRATED BALANCING VALVES IN EACH HOT-WATER CIRCULATION RETURN BRANCH AND DISCHARGE SIDE OF EACH PUMP AND CIRCULATOR. SET CALIBRATED BALANCING VALVES PARTLY OPEN TO RESTRICT BUT NOT STOP FLOW.
17. INSTALL UNDER-BUILDING-SLAB COPPER TUBING ACCORDING TO CDA'S "COPPER TUBE HANDBOOK."
18. INSTALL WALL PENETRATION SYSTEM AT EACH SERVICE PIPE PENETRATION THROUGH FOUNDATION WALL. MAKE INSTALLATION WATERTIGHT.
19. INSTALL DOMESTIC WATER PIPING LEVEL WITHOUT PITCH AND PLUMB.
20. ROUGH-IN DOMESTIC WATER PIPING FOR WATER-METER INSTALLATION ACCORDING TO UTILITY COMPANY'S REQUIREMENTS.
21. SOLDERED JOINTS: USE ASTM B 813, WATER-FLUSHABLE, LEAD-FREE FLUX; ASTM B 32, LEAD-FREE-ALLOY SOLDER; AND ASTM B 828 PROCEDURE, UNLESS OTHERWISE INDICATED.
22. SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR. ROD DIAMETER MAY BE REDUCED 1 SIZE FOR DOUBLE-ROD HANGERS, TO A MINIMUM OF 3/8 INCH.
23. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
  - a. NPS 3/4 AND SMALLER: 60 INCHES WITH 3/8-INCH ROD.
  - b. NPS 1 AND NPS 1-1/4: 72 INCHES WITH 3/8-INCH ROD.
  - c. NPS 1-1/2 AND NPS 2: 96 INCHES WITH 3/8-INCH ROD.
  - d. NPS 2-1/2: 108 INCHES WITH 1/2-INCH ROD.
  - e. NPS 3 TO NPS 5: 10 FEET WITH 1/2-INCH ROD.
24. INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET.
25. SUPPORT PIPING AND TUBING NOT LISTED ABOVE ACCORDING TO MSS SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
26. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES. INSTALL PIPING ADJACENT TO EQUIPMENT AND MACHINES TO ALLOW SERVICE AND MAINTENANCE. CONNECT DOMESTIC WATER PIPING TO EXTERIOR WATER-SERVICE PIPING. USE TRANSITION FITTING TO JOIN DISSIMILAR PIPING MATERIALS.
27. CONNECT DOMESTIC WATER PIPING TO WATER-SERVICE PIPING WITH SHUTOFF VALVE, AND EXTEND AND CONNECT TO THE FOLLOWING:
  - a. BOOSTER PUMPS: COLD-WATER SUCTION AND DISCHARGE PIPING.
  - b. WATER HEATERS: COLD-WATER SUPPLY AND HOT-WATER OUTLET PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN SIZES OF WATER HEATER CONNECTIONS.
  - c. PLUMBING FIXTURES: COLD- AND HOT-WATER SUPPLY PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING CODE.
  - d. EQUIPMENT: COLD- AND HOT-WATER SUPPLY PIPING AS INDICATED, BUT NOT SMALLER THAN EQUIPMENT CONNECTIONS. PROVIDE SHUTOFF VALVE AND UNION FOR EACH CONNECTION. USE FLANGES INSTEAD OF UNIONS FOR NPS 2-1/2 AND LARGER.
28. INSPECT DOMESTIC WATER PIPING AS FOLLOWS:
  - a. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT HAS BEEN INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.
  - b. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST 24 HOURS BEFORE INSPECTION MUST BE MADE. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION: ROUGHING-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGHING-IN AND BEFORE SETTING FIXTURES.
  - d. FINAL INSPECTION: ARRANGE FINAL INSPECTION FOR AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.
29. REINSPECTION: IF AUTHORITIES HAVING JURSDICTION FIND THAT PIPING WILL NOT PASS TEST OR INSPECTION, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR REINSPECTION.
  - a. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.
30. TEST DOMESTIC WATER PIPING AS FOLLOWS:
  - a. FILL DOMESTIC WATER PIPING. CHECK COMPONENTS TO DETERMINE THAT THEY ARE NOT AIR BOUND AND THAT PIPING IS FULL OF WATER.
  - b. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEGMENTS, SUBMIT SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
31. LEAVE NEW, ALTERED, EXTENDED, OR REPLACED DOMESTIC WATER PIPING UNCOVERED AND UNOCCUPIED UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT WAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
32. CAP AND SUBJECT PIPING TO STATIC WATER PRESSURE OF 50 PSIG (345 KPA) ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.
33. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED.
34. PERFORM THE FOLLOWING ADJUSTMENTS BEFORE OPERATION:
  - a. CLOSE DRAIN VALVES, HYDRANTS, AND HOSE BIBS.
  - b. OPEN SHUTOFF VALVES TO FULLY OPEN POSITION.
  - c. OPEN THROTTLING VALVES TO PROPER SETTING.
  - d. ADJUST CALIBRATED BALANCING VALVES TO FLOWS INDICATED.
  - e. REMOVE PLUGS USED DURING TESTING OF PIPING AND PLUGS USED FOR TEMPORARY SEALING OF PIPING DURING INSTALLATION.
  - f. REMOVE AND CLEAN STRAINER SCREENS. CLOSE DRAIN VALVES AND REPLACE DRAIN PLUGS.
  - g. REMOVE FILTER CARTRIDGES FROM HOUSINGS AND VERIFY THAT CARTRIDGES ARE AS SPECIFIED FOR APPLICATION WHERE USED AND ARE CLEAN AND READY FOR USE.
  - h. CHECK PLUMBING SPECIALTIES AND VERIFY PROPER SETTINGS, ADJUSTMENTS, AND OPERATION.
35. ALL DOMESTIC WATER PIPING SHALL BE INSTALLED WITHIN THE ENVELOPE OF THE BUILDING AND NOT FASTENED OR OTHERWISE COME IN CONTACT WITH EXTERIOR MEMBERS.
36. INSULATE ALL HOT AND COLD WATER LINES WITH INSULATION HAVING AN INSULATION VALUE EQUAL TO OR GREATER THAN THE REQUIREMENTS SET FORTH IN THE INTERNATIONAL ENERGY CODE.
37. NEW OR REPAIRED POTABLE WATER SYSTEMS ("ON SITE" OR "IN PLANT") SHALL BE PURGED OF DELETERIOUS MATTER AND DISINFECTED PRIOR TO UTILIZATION. THE METHOD TO BE FOLLOWED SHALL BE THAT PRESCRIBED BY THE HEALTH AUTHORITY OR WATER PURVEYOR HAVING JURISDICTION OR, IN THE ABSENCE OF A PRESCRIBED METHOD, THE PROCEDURE DESCRIBED IN EITHER AWWA C651 OR AWWA C652, OR AS DESCRIBED BELOW:
  - a. THE PIPE SYSTEM SHALL BE FLUSHED WITH CLEAN, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT AT THE POINTS OF OUTLET.
  - b. THE SYSTEM OR PART THEREOF SHALL BE FILLED WITH A WATER/CHLORINE SOLUTION CONTAINING AT LEAST 50 PARTS PER MILLION OF CHLORINE, AND THE SYSTEM OR PART THEREOF SHALL BE VALVED OFF AND ALLOWED TO STAND FOR 24 HOURS; OR THE SYSTEM OR PART THEREOF SHALL BE FILLED WITH A SOLUTION CONTAINING AT LEAST 200 PARTS PER MILLION OF CHLORINE AND ALLOWED TO STAND FOR THREE (3) HOURS.
  - c. THE PROCEDURE SHALL BE REPEATED WHERE SHOWN BY A BACTERIOLOGICAL EXAMINATION THAT THE CONTAMINATION REMAINS PRESENT IN THE SYSTEM.

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PLUMBING DETAILS, NOTES AND SCHEDULE

DRAWN	CHECKED
MWE	MWE
DATE	July 26, 2018
COMM. NO.	18065





- ## PLAN NOTES:
1. 5'x6 STD TOP TAP FOR 60 CFM; HART & COOLEY 212
  2. 12"x18 WIDE TAP FOR 60 GPM; HART & COOLEY 672 12"x18 STEEL STAMPED RETURN AIR GRILLE - FILTER SHALL BE INSTALLED AFTER RETURN AIR GRILLE AND AFTER OUTSIDE AIR CONNECTION. SEE AIR HANDLER DETAIL.
  3. 5'x6 OUTSIDE AIR DUCT WITH BALANCING DAMPER AND TAP INTO RETURN AIR DUCT. EXTEND DUCT UP THROUGH ROOF WITH FLASHING, STORM COLLAR AND CAP. BALANCE OUTSIDE AIR DUCT TO 60 CFM.
  4. 5'x6 DYERVENT VENT PIPE CONNECT TO THE OUTSIDE WALL TO DRYER AND TERMINATE WITH A WALL MOUNTED VENT PIPE TO THE OUTSIDE WALL. SEAL PIPE JOINTS. DO NOT USE SCREWS. VENT PIPE SHALL BE G60 GALVANIZED.
  5. CRAWL SPACE MECHANICAL VENTILATION EXHAUST FAN - SEE SCHEDULE.
  6. INSTALL EXHAUST FAN WITHIN CRAWL SPACE.
  7. 16"x6 ALUMINUM EQUAL TO GREENHECK BRICK VENT WITH INSECT SCREEN EQUAL TO BVE.
  8. RANGE HOOD - DUCT RANGE HOOD UP THROUGH ROOF WITH FLASHING, STORM COLLAR AND CAP. DUCT INSTALLATION SHALL COMPLY WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
  9. HEAT PUMP INSTALLED ON FACTORY SUPPLIED STANDS ON CONCRETE - SEE DETAIL.
  10. EXHAUST GRILLED MOUNTED WITHIN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
  11. SUPPLY AIR DUCT INSTALLED WITHIN THE CRAWL SPACE.
  12. 5'x6 STD TOP TAP FOR 60 CFM; HART & COOLEY 212
  13. INSTALL A REGISTER IN THE TOE KICK AS A SIDE WALL REGISTER TO DISCHARGE AT THE FLOOR LEVEL.

[illegible]

WEST VIRGINIA ARMY NATIONAL GUARD  
**FLOOD RECOVERY**  
HOUSE DESIGN  
Charleston, WV

# CONSTRUCTION DOCUMENTS



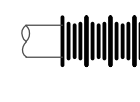
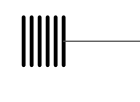

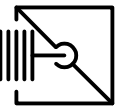
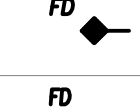





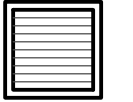
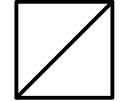
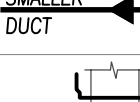
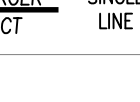
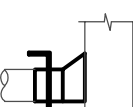
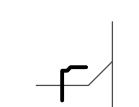
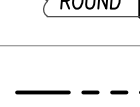
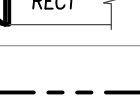
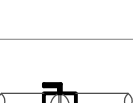

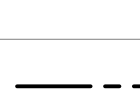
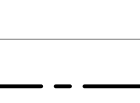
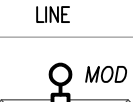
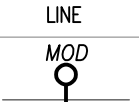

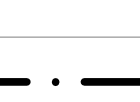




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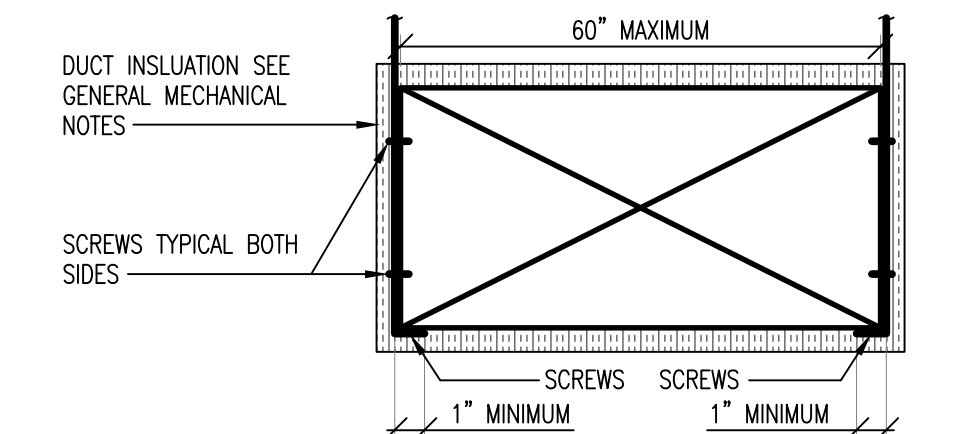
**MECHANICAL  
HVAC  
FLOOR PLAN A  
FLOOR PLAN B**

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	DATE <b>July 26, 2018</b>
	COMM. NO. <b>18065</b>

# M131



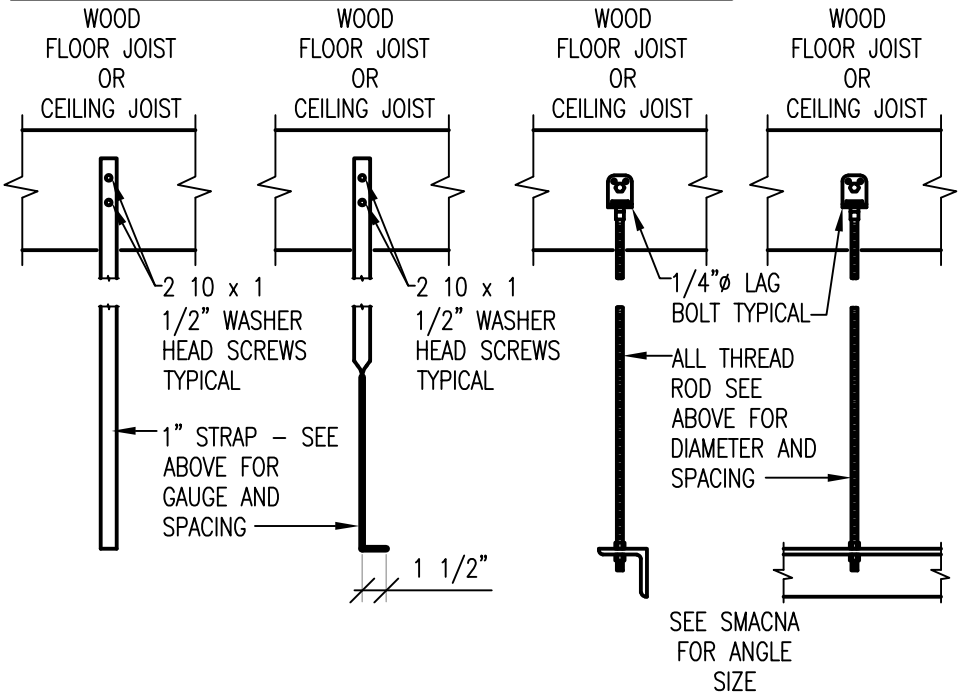
HVAC SYMBOLS LEGEND					
		SUPPLY AIR DIFFUSER (SEE SCHEDULE) WITH FLEXIBLE CONNECTION HAVING 1.5 TIMES DIAMETER OF DUCT FOR RADIUS TURNED DOWN			FLEXIBLE DUCT-- UL 181 LISTED INSULATED DUCT WITH FOIL FACE FASTENED WITH FLEXIBLE STRAPS (NO DUCT TAPE) SEE MECHANICAL NOTES FOR MAXIMUM LENGTH -- SIZE TO MATCH PLAN SHEET ROUND DUCT SIZE
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		RETURN AIR GRILLE (SEE SCHEDULE) WITH FLEXIBLE CONNECTION HAVING 1.5 TIMES DIAMETER OF DUCT FOR RADIUS TURNED DOWN			FIRE DAMPER -- HORIZONTAL POSITION WITH 170 deg F FUSIBLE LINK (WITH ACCESS DOOR)
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		EXHAUST AIR GRILLE (SEE SCHEDULE) WITH FLEXIBLE CONNECTION HAVING 1.5 TIMES DIAMETER OF DUCT FOR RADIUS TURNED DOWN			FIRE DAMPER -- VERTICAL POSITION WITH 170 deg F FUSIBLE LINK (WITH ACCESS DOOR)
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		RETURN AIR GRILLE (SEE SCHEDULE) FOR SYSTEM WITHOUT RETURN AIR DUCT (PLENUM RETURN)			FIRE & SMOKE DAMPER -- HORIZONTAL POSITION WITH 170 deg F FUSIBLE LINK AND ACCESS DOOR
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		STOD -- STICK ON TAKE OFF FOR ROUND DUCT WITH VOLUME DAMPER AND 1" EXTENDED BASE FASTENED WITH SCREWS FLEXMASTER OR EQUAL (SEE PLAN SHEETS FOR SIZE)			FIRE & SMOKE DAMPER -- VERTICAL POSITION WITH 170 deg F FUSIBLE LINK AND ACCESS DOOR
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		RETURN AIR GRILLE (SEE SCHEDULE) FOR SYSTEM WITHOUT RETURN AIR DUCT (PLENUM RETURN)			DUCT FITTING (REDUCER)
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		STOD -- STICK ON TAKE OFF FOR ROUND DUCT WITH VOLUME DAMPER AND 1" EXTENDED BASE FASTENED WITH SCREWS FLEXMASTER OR EQUAL (SEE PLAN SHEETS FOR SIZE)			DUCT FITTING (REDUCER)
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DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		STOD -- STICK ON TAKE OFF FOR ROUND DUCT WITH VOLUME DAMPER AND 1" EXTENDED BASE FASTENED WITH SCREWS FLEXMASTER OR EQUAL (SEE PLAN SHEETS FOR SIZE)			DUCT FITTING (REDUCER)
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
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DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
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DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
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DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
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DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
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DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		STOD -- STICK ON TAKE OFF FOR ROUND DUCT WITH VOLUME DAMPER AND 1" EXTENDED BASE FASTENED WITH SCREWS FLEXMASTER OR EQUAL (SEE PLAN SHEETS FOR SIZE)			DUCT FITTING (REDUCER)
DOUBLE LINE	SINGLE LINE		DOUBLE LINE	SINGLE LINE	
		STOD -- STICK ON TAKE OFF FOR ROUND DUCT WITH			



1/2" DUCT PERIMETER (P)		PAIR @ 10" SPACING		PAIR @ 8" SPACING		PAIR @ 5" SPACING		PAIR @ 5" SPACING	
STRAP (GA)	ROD	STRAP (GA)	ROD	STRAP (GA)	ROD	STRAP (GA)	ROD	STRAP (GA)	ROD
P/2 = 30"	1"x22	3/8"	1"x22	3/8"	1"x22	1/4"	1"x22	1/4"	1"x22
P/2 = 72"	1"x18	3/8"	1"x20	3/8"	1"x22	3/8"	1"x22	3/8"	1"x18
P/2 = 96"	1"x16	1/2"	1"x18	1/2"	1"x20	3/8"	1"x20	3/8"	1"x16
P/2 = 120"	1 1/2"x16	1/2"	1"x16	1/2"	1"x18	3/8"	1"x18	3/8"	1"x16
P/2 = 168"	1 1/2"x16	1/2"	1 1/2"x16	1/2"	1"x16	3/8"	1"x16	3/8"	1"x16
P/2 = 192"	NOT GIVEN	1/2"	1 1/2"x16	1/2"	1"x16	3/8"	1"x16	3/8"	1"x16
P/2 = 193" AND UP: SPECIAL ANALYSIS REQUIRED									

- NOTES:
- DIMENSIONS OTHER THAN GAGE ARE IN INCHES.
  - TABLE ALLOW FOR DUCT WEIGHT, 1 LB/SF INSULATION WEIGHT AND NORMAL REINFORCEMENT AND TRAPEZE WEIGHT, BUT NO EXTERNAL LOADS.
  - STRAPS ARE GALVANIZED STEEL; OTHER MATERIALS ARE UNCOATED STEEL.
  - ALLOWABLE LOADS FOR P/2 ASSUME THAT DUCTS ARE 16 GA MAXIMUM, EXCEPT THAT WHEN MAXIMUM DUCT DIMENSIONS (W) IS OVER 60 INCHES THEN P/2 MAXIMUM IS 1.25 W.
  - SEE DETAILS FOR UPPER ATTACHMENTS.
  - SEE DETAILS FOR LOWER ATTACHMENTS.
  - SEE THE LATEST EDITION OF SMACNA FOR OTHER CONFIGURATIONS.

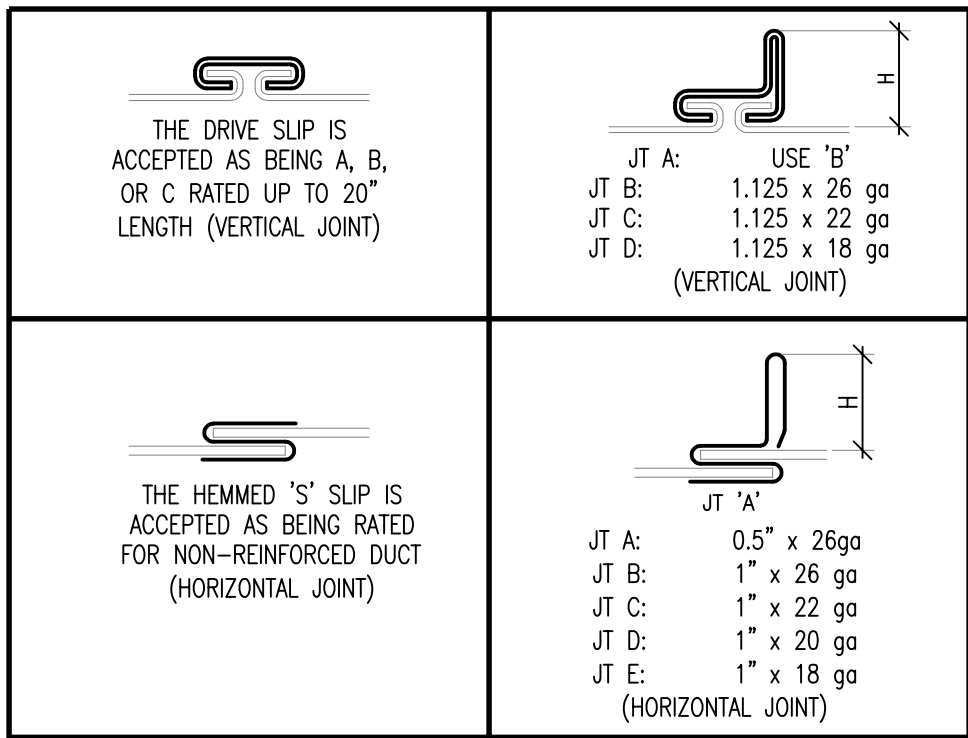
#### UPPER ATTACHMENT DETAIL



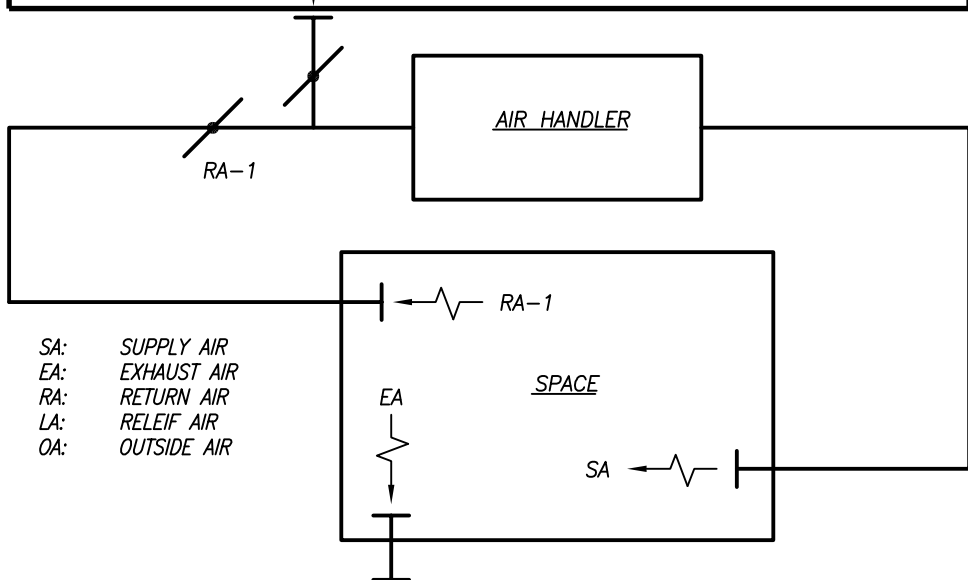
#### DUCT HANGER DETAIL AND LEGEND

SCALE: NONE

DUCT REINFORCEMENT SCHEDULE	
DUCT DIMENSION	NO REINFORCEMENT REQUIRED (GA)
8"	26
10"	26
12"	26
14"	24
16"	22
18"	22
20"	20
22"	18
24"	18
26"	18
28"	16
30"	16
32"-36"	F
38"-42"	G
44"-48"	H
50"-54"	H
56"-60"	H



- ALTERNATIVE DUCT CONSTRUCTION:
- DUCTMATE OR AN EQUAL PRODUCT MAY BE USED AS OPPOSED TO THE ABOVE CRITERIA.
  - SHOP FABRICATED JOINTS SUCH AS TDC AND TDF MAY BE USED AS OPPOSED TO THE ABOVE CRITERIA.
  - THE ABOVE INFORMATION IS FOR REFERENCE ONLY ANOTHER SMACNA COMBINATION OF METAL GA AND LOCKS MAY BE USED.
  - CONTRACTOR SHALL SUBMIT PROPOSED DUCT CONSTRUCTION PRIOR TO FABRICATION.



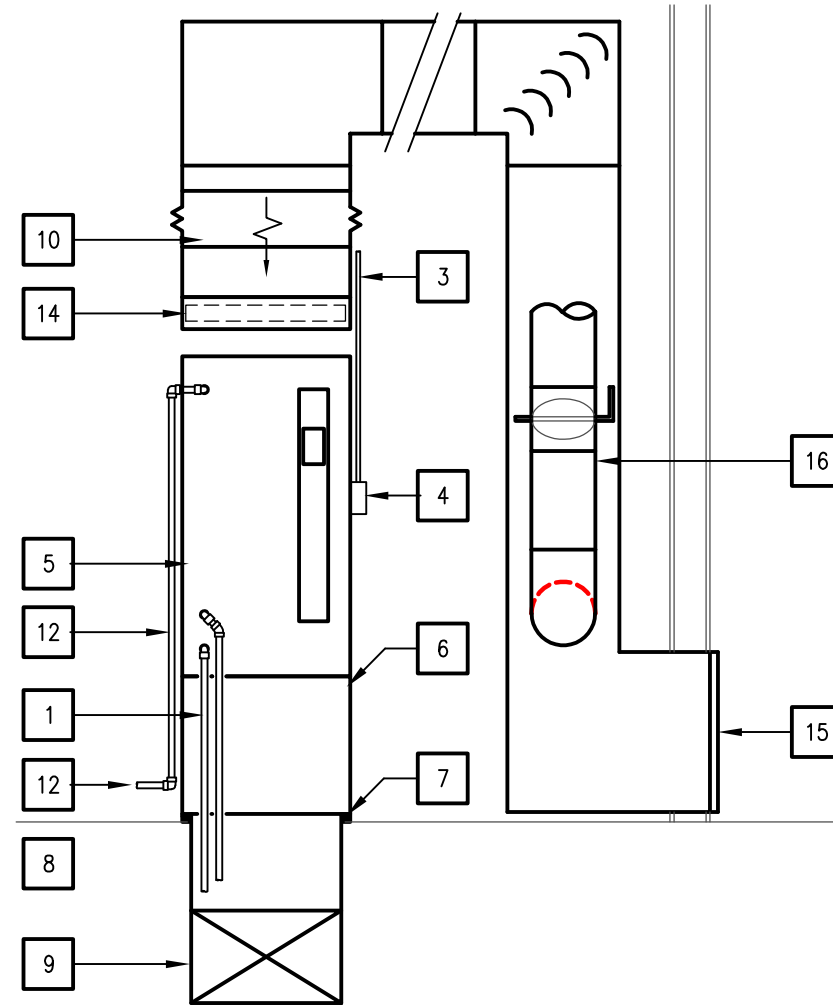
AIR HANDLER FLOW CHART			
AH-A NON-ECONOMIZER		AH-B NON-ECONOMIZER	
AIR cfm	ECONOMIZER AIR cfm	AIR cfm	ECONOMIZER AIR cfm
SA 600	SA 600	SA 600	SA 600
EA 60	EA 60	EA 60	EA 60
RA-1 540	RA-1 540	RA-1 540	RA-1 540
RA-2 0	RA-2 0	RA-2 0	RA-2 0
LA-1 0	LA-1 0	LA-1 0	LA-1 0
LA-2 0	LA-2 0	LA-2 0	LA-2 0
OA 60	OA 60	OA 60	OA 60

#### GENERAL MECHANICAL NOTES:

- DESIGN CONDITIONS ARE SET BY THE LOCAL WEATHER DATA (OUTDOOR CONDITIONS) AND THE ENERGY CODE (INDOOR SET POINTS: 75F - SUMMER AND 68F - WINTER)
- THE CONTRACTOR SHALL READ ALL SPECIFICATIONS ASSOCIATED WITH HIS PORTION OF THE WORK
- SUBMITTALS SHALL BE REVIEWED AND APPROVED BY ENGINEER PRIOR TO PAY APPLICATION APPROVAL FOR ANY INSTALLED EQUIPMENT.
- ALL EQUIPMENT SHALL BE STORED AND HANDLED TO COMPLY WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
- ALL EQUIPMENT SHALL BE ARRANGED TO AFFORD ACCESS FOR INSPECTION, MAINTENANCE, AND REPAIR. THE CONTRACTOR SHALL SUBMIT PROPOSED EQUIPMENT CUT-SHEETS AND INFORMATION SHOWING COMPLIANCE TO THE PLANS.
- COORDINATE ALL WORK WITH THE OTHER TRADES. SHOULD A SPATIAL CONFLICT ARISE THE CONTRACTOR SHALL GENERATE COORDINATION DRAWINGS AT TWICE THE CONSTRUCTION DOCUMENT SCALE (ie 3/8" = 1'-0" FOR 3/16" = 1'-0", 1/4" = 1'-0" FOR 1/8" = 1'-0" ETC) TO PLAN AND RESOLVE THE SPATIAL CONFLICT.
- ALL FIELD ADJUSTMENTS SHALL BE RECORDED ON A SET OF PLANS TO BE ISSUED WITH THE OPERATION AND MAINTENANCE MANUALS.
- OUTSIDE AIR INTAKES SHALL BE PROTECTED BY SCREENS OF CORROSION-RESISTANT MATERIAL NOT LARGER THAN 1/4" MESH, UNLESS OTHERWISE NOTED.
- AIR FILTERS SHALL BE RATED EITHER AS CLASS 1 OR CLASS 2 IN ACCORDANCE WITH UL900, STANDARD FOR SAFETY AIR FILTER UNITS HAVING A MERV RATING OF 8, UNLESS OTHERWISE NOTED.
- HVAC EQUIPMENT SHALL NOT BE OPERATED WITHOUT FILTERS IN PLACE.
- HVAC EQUIPMENT SHALL NOT BE UTILIZED PRIOR TO THE REMOVAL OF DRYWALL DUST AND AFTER THE FIRST COAT OF PAINT IS DRY. THE EQUIPMENT SHALL NOT BE UTILIZED PRIOR TO ANY POTENTIAL HAZARDS THAT WOULD VOID THE WARRANTY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT THE EQUIPMENT AGAINST AN EVENT THAT WOULD TERMINATE THE WARRANTY PRIOR TO MATURITY.
- MEASURES SHALL BE EMPLOYED TO REDUCE THE MIGRATION OF CONSTRUCTION-GENERATED CONTAMINANTS TO OCCUPIED AREAS.
- ALL HEATING AND COOLING EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE NFPA STANDARDS AND THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
- ALL DRAIN PANS SHALL BE FIELD TESTED DURING OPERATING CONDITIONS THAT ARE MOST RESTRICTIVE TO CONDENSATE FLOW TO DEMONSTRATE PROPER DRAINAGE.
- ALL SUPPLY, RETURN AND EXHAUST AIR DUCT SHALL BE SEALED HUNG AND FABRICATED MATCHING OR EXCEEDING THE SMACNA STANDARDS FOR:  
1" WG: LOW PRESSURE RECTANGULAR DUCT (CONSTANT VOLUME SYSTEM)
- ALL DUCT SHALL BE HUNG FROM BAR JOISTS OR CONCRETE FLOORS - NOT FROM ROOF DECKING OR FLOOR DECKING.
- INSTALL TURNING VANES WITH ALL SUPPLY AIR ELBOWS AND SUPPLY AIR TEES.
- ALL SUPPLY, RETURN AND EXHAUST AIR DUCT SHALL BE FABRICATED USING GALVANIZED SHEET METAL G90 OR BETTER HAVING A CLEAR PHYSICAL SIZE AS INDICATED WITHIN THE DRAWINGS AND HAVING A THICKNESS EQUAL TO OR GREATER THAN: 26 GA: RECTANGULAR DUCT AND 30 GA: ROUND DUCT
- ALL SUPPLY, RETURN AND EXHAUST AIR DUCT SHALL CONFORM TO THE SMACNA STANDARDS FOR AIR LEAKAGE, DUCT CONSTRUCTION, DUCT HANGERS, ETC. ALL SUPPLY, RETURN AND EXHAUST AIR DUCT SHALL BE FREE AND CLEAN FROM ALL DEBRIS.
- ALL DIMENSIONS INDICATED ON SUPPLY AIR DUCT, RETURN AIR DUCT, EXHAUST AIR DUCT AND OUTSIDE AIR DUCT ARE INSIDE CLEAR DIMENSIONS. IF DUCT LINER IS INSTALLED THE AIR DUCT SHALL BE INCREASED TO ACCOMMODATE THE DUCT LINER, SUCH THAT THE DIMENSIONS INDICATED SHALL BE INSIDE CLEAR.
- ALL INLETS AND OUTLETS OF EQUIPMENT CONVEYING AIR SHALL HAVE FLEXIBLE CONNECTORS (VIBRATION ISOLATION) CONFORMING TO THE REQUIREMENTS FOR CLASS 0 AND CLASS 1 CONNECTORS WHEN TESTED IN ACCORDANCE WITH UL 181. ALL FLEXIBLE DUCTS SHALL NOT EXCEED SEVEN FEET (7 ft).
- FLEXIBLE CONNECTORS AND VIBRATION ISOLATION CONNECTORS IN DUCT SYSTEMS SHALL BE MADE OF AN APPROVED FLAME-RETARDANT FABRIC OR SHALL CONSIST OF SLEEVE JOINTS WITH PACKING OF APPROVED MATERIAL, EACH HAVING A MAXIMUM FLAME SPREAD INDEX OF 25 AND A MAXIMUM SMOKE DEVELOPED INDEX OF 50. THE FLEXIBLE DUCT SHALL NOT PASS THROUGH WALLS OR FLOORS.
- AIR DUCT COVERINGS SHALL NOT BE INSTALLED SO AS TO CONCEAL OR PREVENT THE USE OF ANY SERVICE OPENING.
- AIR DUCT COVERINGS SHALL NOT EXTEND THROUGH WALLS OR FLOORS THAT ARE REQUIRED TO BE FIRE STOPPED OR REQUIRED TO HAVE A FIRE RESISTANCE RATING. WHERE AIR DUCTS PASS THROUGH WALLS, FLOORS OR PARTITIONS THAT ARE REQUIRED TO HAVE A FIRE RESISTANCE RATING AND WHERE FIRE DAMPERS ARE NOT REQUIRED, THE OPENING IN THE CONSTRUCTION AROUND THE AIR DUCT SHALL BE AS FOLLOWS:  
a. NOT EXCEED 1" AVERAGE CLEARANCE ON ALL SIDES.  
b. FILLED SOLID WITH AN APPROVED MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAME AND HOT GASES SUFFICIENT TO IGNITE COTTON WASTE WHEN SUBJECTED TO THE TIME-TEMPERATURE FIRE CONDITIONS REQUIRE FOR FIRE BARRIER PENETRATION AS SPECIFIED IN NFPA 251.
- A SERVICE OPENING SHALL BE PROVIDED (ACCESS DOOR) IN AIR DUCTS ADJACENT TO EACH FIRE DAMPER, SMOKE DAMPER, AND SMOKE DETECTOR. THE OPENINGS SHALL BE IDENTIFIED WITH LETTERS HAVING A MINIMUM HEIGHT OF 1/2" TO INDICATE THE LOCATION OF THE FIRE PROTECTION DEVICE(S) WITHIN. SAID OPENINGS SHALL BE ACCESSIBLE FOR MAINTENANCE AND INSPECTION.
- THE INSTALLATION OF AIR DUCTS, INCLUDING THE HANGERS, SHALL NOT REDUCE THE FIRE RESISTANCE RATING OF STRUCTURAL MEMBERS.
- ALL CUTTING AND PATCHING SHALL BE COORDINATED AND DONE BY THE MECHANICAL CONTRACTOR; OVER CUTTING SHALL BE REPAIRED AT THE DISCRETION OF THE OWNER OR OWNER'S REPRESENTATIVE.
- ALL ROOF PENETRATIONS SHALL BE COORDINATED AND DONE BY THE MECHANICAL CONTRACTOR.
- SHOULD AN ACCEPTABLE AND APPROVED EQUAL MANUFACTURER BE FURNISHED FOR ANY EQUIPMENT. ALL PHYSICAL DIMENSIONS, ELECTRICAL REQUIREMENTS, NATURAL GAS REQUIREMENTS SHALL BE VERIFIED AND APPROPRIATE MODIFICATIONS BE MADE AT THE DISCRETION OF THE ENGINEER. THE COST ASSOCIATED WITH THE REQUIRED MODIFICATIONS SHALL BE INCLUDED WITHIN THE BID AND THERE SHALL BE NO ADDITIONAL COST TO THE OWNER FOR SAID MODIFICATIONS.
- ALL SUPPLY AIR TAKE OFF'S SERVING ONLY ONE DIFFUSER SHALL HAVE A BALANCING DAMPER. ALL SUPPLY AIR TAKE OFF'S SERVING MORE THAN ONE DIFFUSER SHALL UTILIZE AN EXPANDED TAP (6" MIN 45 DEG OR MORE).
- EXAMINE AREAS WHERE DIFFUSERS, REGISTERS, AND GRILLES ARE TO BE INSTALLED FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF EQUIPMENT. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
- INSTALL DIFFUSERS, REGISTERS, AND GRILLES LEVEL AND PLUMB.
- CEILING-MOUNTED OUTLETS AND INLETS: DRAWINGS INDICATE GENERAL ARRANGEMENT OF DUCTS, FITTINGS, AND ACCESSORIES. AIR OUTLET AND INLET LOCATIONS HAVE BEEN INDICATED TO ACHIEVE DESIGN REQUIREMENTS FOR AIR VOLUME, NOISE CRITERIA, AIRFLOW PATTERN, THROW, AND PRESSURE DROP. MAKE FINAL LOCATIONS WHERE INDICATED, AS MUCH AS PRACTICAL. FOR UNITS INSTALLED IN LAY-IN CEILING PANELS, LOCATE UNITS IN THE CENTER OF PANEL WHERE ARCHITECTURAL FEATURES OR OTHER ITEMS CONFLICT WITH INSTALLATION, NOTIFY ARCHITECT FOR A DETERMINATION OF FINAL LOCATION.
- INSTALL DIFFUSERS, REGISTERS, AND GRILLES WITH AIRTIGHT CONNECTIONS TO DUCTS AND TO ALLOW SERVICE AND MAINTENANCE OF DAMPERS, AIR EXTRACTORS, AND FIRE DAMPERS.
- EVERY EFFORT SHALL BE TAKEN TO KEEP THE SUPPLY AIR DUCT AND OUTSIDE AIR DUCT CLEAN AND CLEAN OF DIRT AND DEBRIS. SUPPLY AIR DUCT AND OUTSIDE AIR DUCT SHALL BE CLEAN AND FREE OF DIRT AND DEBRIS.
- PRIOR TO OCCUPANCY, EACH AND EVERY VENTILATION SYSTEM SHALL BE TESTED AND RECORDED TO DEMONSTRATE THAT OUTDOOR AIR DAMPERS OPERATE IN ACCORDANCE WITH THE SYSTEM INTENT.
- ALL CONDENSATE PIPING SHALL BE INSULATED.

#### DETAIL NOTES:

- REFRIGERANT LINES TO OUTDOOR UNIT SEE PLAN DRAWINGS FOR OUTDOOR UNIT LOCATION(S).
- NOT USED
- EMT WITH CONDUCTORS AND EGC TO POWER PANEL SEE PLAN DRAWINGS
- FACTORY INSTALLED DISCONNECT - SINGLE POINT CONENTION
- AIR HANDLER SEE EQUIPMENT SCHEDULES
- 24 GAUGE G90 GALVANIZED STEEL PLENUM
- 1" CORK/NEOPRENE - RIBBED LAMINATED ISOLATION EQUIPMENT PAD
- FLEXIBLE CONNECTION
- SUPPLY AIR DUCT TRANSITION AS REQUIRED TO CONNECT TO SUPPLY AIR SYSTEM - INSULATE ALL NEW SUPPLY AIR DUCT SEE GENERAL MECHANICAL NOTES FOR SPECIFICATIONS
- RETURN AIR DUCT TRANSITION AS REQUIRED TO CONNECT TO RETURN AIR SYSTEM - SEE GENERAL MECHANICAL NOTES FOR INSULATION SPECIFICATIONS
- NOT USED
- CONDENSATE PIPING TO FUNNEL DRAIN - SEE PLUMBING DRAWINGS FOR CONTINUATION
- NOT USED
- FILTER AND FILTER RACK SEE GENERAL MECHANICAL NOTES FOR FILTER SPECIFICATIONS.
- RETURN AIR GRILLE WITH OPPOSED BLADE DAMPER - SEE AIR FLOW SCHEMATIC FOR FLOW RATE SETTINGS.
- 5" DIA OUTSIDE AIR DUCT AND MANUAL DAMPER - SEE AIR FLOW SCHEMATIC FOR FLOW RATE SETTINGS.



#### TYPICAL FLOOR MOUNTED DOWN FLOW AIR HANDLER SCHEMATIC

SCALE: NONE

WEST VIRGINIA ARMY NATIONAL GUARD

FLOOD RECOVERY

HOUSE DESIGN

Charleston, WV

CONSTRUCTION DOCUMENTS

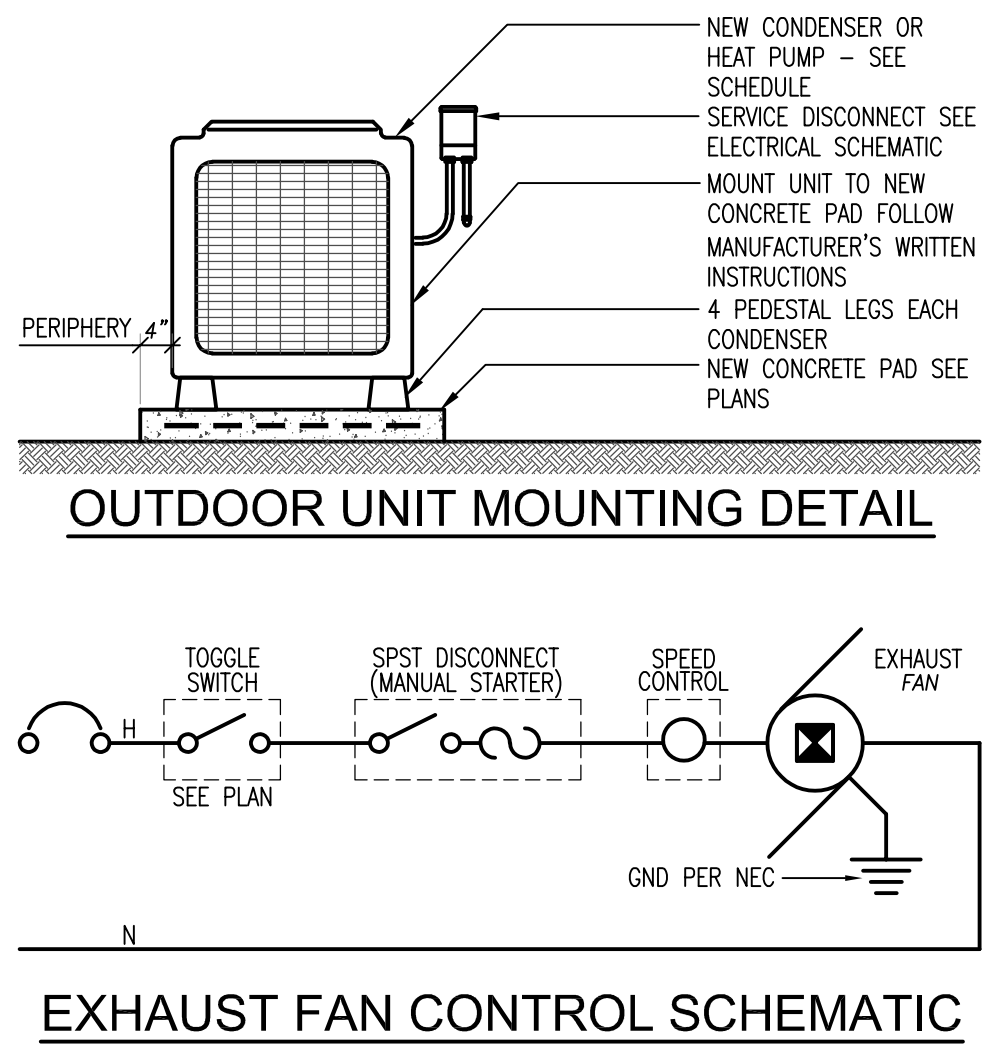
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#### MECHANICAL DETAILS, NOTES AND SCHEDULES

DRAWN	CHECKED
MWE	MWE
DATE	July 26, 2018
COMM. NO.	18065

M511





EXHAUST FAN SCHEDULE AND SPECIFICATIONS												
MARK	MAKE	MODEL	TYPE	CFM	ESP (in WC)	POWER	LOCATION	FAN RPM	SONES	DRIVE	REMARKS	
EF-A	COOK	GN-142		75	0.5	48	IN-LINE	1,340	2.7	DIRECT		
EF-B	COOK	GN-142		75	0.5	48	IN-LINE	1,340	2.7	DIRECT		

**PERFORMANCE REQUIREMENTS:**

- PROJECT ALTITUDE: BASE FAN-PERFORMANCE RATINGS ON ACTUAL PROJECT SITE ELEVATIONS.
- OPERATING LIMITS: CLASSIFY ACCORDING TO AMCA 99.

**SUBMITTALS:**

PRODUCT DATA:

- FOR EACH TYPE OF PRODUCT INDICATED, INCLUDE RATED CAPACITIES, OPERATING CHARACTERISTICS, AND FURNISHED SPECIALTIES AND ACCESSORIES. ALSO INCLUDE THE FOLLOWING:
- CERTIFIED FAN PERFORMANCE CURVES WITH SYSTEM OPERATING CONDITIONS INDICATED.
- CERTIFIED FAN SOUND-POWER RATINGS.
- MOTOR RATINGS AND ELECTRICAL CHARACTERISTICS, PLUS MOTOR AND ELECTRICAL ACCESSORIES.
- MATERIAL THICKNESS AND FINISHES, INCLUDING COLOR CHARTS.
- DAMPERS, INCLUDING HOUSINGS, LINKAGES, AND OPERATORS.
- ROOF CURBS.
- FAN SPEED CONTROLLERS.

**SHOP DRAWINGS:**

- INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
- DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.
- WIRING DIAGRAMS: FOR POWER, SIGNAL, AND CONTROL WIRING.
- FIELD QUALITY-CONTROL REPORTS.
- ROOF FRAMING AND SUPPORT MEMBERS RELATIVE TO DUCT PENETRATIONS.
- CEILING SUSPENSION ASSEMBLY MEMBERS.
- OPERATION AND MAINTENANCE DATA (AT PROJECT CLOSEOUT): FOR POWER VENTILATORS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS.

**MAINTENANCE MATERIAL SUBMITTALS:**

- FURNISH EXTRA MATERIALS THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS. BELTS: ONE SET FOR EACH BELT-DRIVEN UNIT.

**QUALITY ASSURANCE:**

- ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- AMCA COMPLIANCE: FANS SHALL HAVE AMCA-CERTIFIED PERFORMANCE RATINGS AND SHALL BEAR THE AMCA-CERTIFIED RATINGS SEAL.
- UL STANDARDS: POWER VENTILATORS SHALL COMPLY WITH UL 705. POWER VENTILATORS FOR USE FOR RESTAURANT KITCHEN EXHAUST SHALL ALSO COMPLY WITH UL 762.

**COORDINATION:**

- COORDINATE SIZE AND LOCATION OF STRUCTURAL-STEEL SUPPORT MEMBERS.
- COORDINATE SIZES AND LOCATIONS OF CONCRETE BASES WITH ACTUAL EQUIPMENT PROVIDED.
- COORDINATE SIZES AND LOCATIONS OF ROOF CURBS, EQUIPMENT SUPPORTS, AND ROOF PENETRATIONS WITH ACTUAL EQUIPMENT PROVIDED.

**MOTORS:**

COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS FOR MOTORS SPECIFIED.

- MOTOR SIZES: MINIMUM SIZE AS INDICATED. IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0.
- ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED.

**SOURCE QUALITY CONTROL:**

- CERTIFY SOUND-POWER LEVEL RATINGS ACCORDING TO AMCA 301, "METHODS FOR CALCULATING FAN SOUND RATINGS FROM LABORATORY TEST DATA." FACTORY TEST FANS ACCORDING TO AMCA 300, "REVERBERANT ROOM METHOD FOR SOUND TESTING OF FANS." LABEL FANS WITH THE AMCA-CERTIFIED RATINGS SEAL.
- CERTIFY FAN PERFORMANCE RATINGS, INCLUDING FLOW RATE, PRESSURE, POWER, AIR DENSITY, SPEED OF ROTATION, AND EFFICIENCY BY FACTORY TESTS ACCORDING TO AMCA 210, "LABORATORY METHODS OF TESTING FANS FOR AERODYNAMIC PERFORMANCE RATING." LABEL FANS WITH THE AMCA-CERTIFIED RATINGS SEAL.

**INSTALLATION:**

- INSTALL POWER VENTILATORS LEVEL AND PLUMB.
- SECURE ROOF-MOUNTED FANS TO ROOF CURBS WITH CADMIUM-PLATED HARDWARE.
- CEILING UNITS: SUSPEND UNITS FROM STRUCTURE; USE STEEL WIRE OR METAL STRAPS.
- SUPPORT SUSPENDED UNITS FROM STRUCTURE USING THREADED STEEL RODS AND SPRING HANGERS WITH VERTICAL-LIMIT STOPS HAVING A STATIC DEFLECTION OF 1 INCH (25 MM).
- INSTALL UNITS WITH CLEARANCES FOR SERVICE AND MAINTENANCE.
- LABEL UNITS WITH 2"x4" LAMINATED PLASTIC LABELS ACCORDING TO MECHANICAL DRAWING IDENTIFICATION SUBMIT SAMPLE OF LABEL WITH FAN SUBMITTAL.

**CONNECTIONS:**

- INSTALL DUCTS ADJACENT TO POWER VENTILATORS TO ALLOW SERVICE AND MAINTENANCE.
- GROUND EQUIPMENT AND CONNECT WIRING ACCORDING TO THE NATIONAL ELECTRICAL CODE LATEST ADOPTED EDITION, UNLESS OTHERWISE NOTED.

**TESTING:**

- VERIFY THAT SHIPPING, BLOCKING, AND BRACING ARE REMOVED.
- VERIFY THAT UNIT IS SECURE ON MOUNTINGS AND SUPPORTING DEVICES AND THAT CONNECTIONS TO DUCTS AND ELECTRICAL COMPONENTS ARE COMPLETE. VERIFY THAT PROPER THERMAL-OVERLOAD PROTECTION IS INSTALLED IN MOTORS, STARTERS, AND DISCONNECT SWITCHES.
- VERIFY THAT CLEANING AND ADJUSTING ARE COMPLETE.
- DISCONNECT FAN DRIVE FROM MOTOR. VERIFY PROPER MOTOR ROTATION DIRECTION, AND VERIFY FAN WHEEL FREE ROTATION AND SMOOTH BEARING OPERATION. RECONNECT FAN DRIVE SYSTEM, ALIGN AND ADJUST BELTS, AND INSTALL BELT GUARDS.
- ADJUST BELT TENSION.
- ADJUST DAMPER LINKAGES FOR PROPER DAMPER OPERATION.
- VERIFY LUBRICATION FOR BEARINGS AND OTHER MOVING PARTS.
- VERIFY THAT MANUAL AND AUTOMATIC VOLUME CONTROL AND FIRE AND SMOKE DAMPERS IN CONNECTED DUCTWORK SYSTEMS ARE IN FULLY OPEN POSITION.
- DISABLE AUTOMATIC TEMPERATURE-CONTROL OPERATORS, ENERGIZE MOTOR AND ADJUST FAN TO INDICATED RPM, AND MEASURE AND RECORD MOTOR VOLTAGE AND AMPERAGE.
- SHUT UNIT DOWN AND RECONNECT AUTOMATIC TEMPERATURE-CONTROL OPERATORS.
- REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

**ADJUSTING:**

- ADJUST DAMPER LINKAGES FOR PROPER DAMPER OPERATION.
- ADJUST BELT TENSION.
- COMPLY WITH TESTING, ADJUSTING & BALANCING REQUIREMENTS & PROCEDURES.
- REPLACE FAN AND MOTOR PULLEYS AS REQUIRED TO ACHIEVE DESIGN AIRFLOW.
- LUBRICATE BEARINGS.

**CEILING-MOUNTED VENTILATORS:**

BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT INDICATED ABOVE OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING: GREENHECK FAN CORPORATION, LORREN COOK COMPANY, PENNBARRY, QUIETAIRE INC.

HOUSING: STEEL, LINED WITH ACOUSTICAL INSULATION.

FAN WHEEL: CENTRIFUGAL WHEELS DIRECTLY MOUNTED ON MOTOR SHAFT. FAN SHROUDS, MOTOR, AND FAN WHEEL SHALL BE REMOVABLE FOR SERVICE.

GRILLE: PAINTED ALUMINUM, LOUVERED GRILLE WITH FLANGE ON INTAKE AND THUMBSCREW ATTACHMENT TO FAN HOUSING.

ELECTRICAL REQUIREMENTS: JUNCTION BOX FOR ELECTRICAL CONNECTION ON HOUSING AND RECEPTACLE FOR MOTOR PLUG-IN.

**ACCESSORIES:**

- VARIABLE-SPEED CONTROLLER: SOLID-STATE CONTROL TO REDUCE SPEED FROM 100 TO LESS THAN 50 PERCENT (SEE SCHEMATIC & DETAILS).
- MANUAL STARTER SWITCH: SINGLE-POLE ROCKER SWITCH ASSEMBLY WITH COVER AND PILOT LIGHT (SEE SCHEMATIC & DETAILS).
- ISOLATION: RUBBER-IN-SHEAR VIBRATION ISOLATORS.

**REMARKS:**

- 115V - 1Ø
- PROVIDE SUBMITTALS FOR ALL EXHAUST FANS.
- ACCEPTABLE MANUFACTURERS: GREENHECK, COOK, PENN & CAPTIVEAIRE
- PROVIDE BACK DRAFT DAMPER
- PROVIDE ISOLATION SPRINGS
- SEE SCHEMATIC FOR OPERATION
- PROVIDE AND INSTALL DISCONNECT
- THERMAL OVERLOAD PROTECTION
- PROVIDE AND INSTALL SPEED CONTROLLER
- PROVIDE AND INSTALL ALUMINUM GRILLE WITH FAN

AIR HANDLER SCHEDULE											
MARK	MAKE	MODEL	COOLING CAPACITY		HTG CAPACITY INPUT KW	HTG CAPACITY OUTPUT KW	FAN cfm	ELECTRICAL		TOTAL	
			TONS	MBH				VOLTS / PH	MCA	MOCP	FLOW
AH-A	TRANE	TEM440BS21SA	1.5	15.6	7.6	600	208-230/1Ø	42	45	45	UP 1 - 2
AH-B	TRANE	TEM440BS21SA	1.5	15.6	7.6	600	208-230/1Ø	42	45	45	UP 1 - 2

**GENERAL AIR HANDLER NOTES:**

- SYSTEM SHALL BE ENERGY STAR
- INSULATED BLOWER COMPARTMENT
- WARRANTIES: ENTIRE UNIT - 5 YEAR
- BLOWER ACCESS PANEL SWITCH - SHUTS DOWN ALL 115V POWER WHEN BLOWER ACCESS PANEL IS REMOVED
- PROVIDE WITH A CLEANABLE FILTER.
- ACCEPTABLE ALTERNATE MANUFACTURER'S SUBJECT TO THE REQUIREMENTS STATED HEREIN: CARRIER & YORK.
- AIR HANDLER SHALL HAVE A DEHUMIDIFICATION CYCLE CAPABILITY OF REDUCING HUMIDITY.
- COMPLETE WITH TRANE'S COMFORT R

**ACCESSORIES:**

- PROGRAMMABLE THERMOSTAT: EACH FURNACE SYSTEM SHALL HAVE A SOLID-STATE PROGRAMMABLE THERMOSTAT. THE THERMOSTAT SHALL HAVE THE CAPABILITY TO SET BACK OR SHUT DOWN THE SYSTEM BASE ON DAY OF THE WEEK AND TIME OF DAY, AND PROVIDE A READILY ACCESSIBLE MANUAL OVERRIDE THAT WILL RETURN TO THE PRESET BACK OR SHUTDOWN SCHEDULE WITHOUT REPROGRAMMING. SEE CONTROL SCHEMATIC FOR OPERATION OF AUXILIARY EQUIPMENT.
- PROVIDE A 2" DEEP DRAIN PAN FOR SECONDARY CONTAINMENT OF CONDENSATE (4" LARGER THAN UNIT-BOTH DIRECTION). PIPE AWAY FROM UNIT WITH CONDENSATE LINE FROM COIL TO THE BUILDING DRAINAGE SYSTEM WITH A TWO (2) INCH AIR GAP.

DUCT CONSTRUCTION SCHEDULE								
DUCT	PRESSURE CLASS SMACNA	DUCT SEAL CLASS SMACNA	DUCT INSULATION				NOTES	MARK
			R VALUE	DENSITY	THICKNESS	JACKET		
SUPPLY AIR DUCT								
INTERIOR CONCEALED	1" WG	A	4.2	0.75 pcf	1.50"	FACTORY APPLIED	NOTES	SA-1
INTERIOR EXPOSED RECTANGULAR	1" WG	A	4.2	0.75 pcf	1.50"	FACTORY APPLIED	NOTES	SA-2
INTERIOR EXPOSED ROUND	1" WG	A	4.2	0.75 pcf	1.50"	FACTORY APPLIED	NOTES	SA-3
EXTERIOR	1" WG	A	6.0	1.50 pcf	2.20"	FIELD APPLIED	NOTES	SA-4
RETURN AIR DUCT								
INTERIOR CONCEALED	1" WG	C	NR				NOTES	RA-1
INTERIOR EXPOSED RECTANGULAR	1" WG	C	NR				NOTES	RA-2
INTERIOR EXPOSED ROUND	1" WG	C	NR				NOTES	RA-3
EXTERIOR	1" WG	C	6.0	1.50 pcf	2.20"	FIELD APPLIED	NOTES	RA-4
OUTSIDE AIR DUCT								
INTERIOR CONCEALED	1" WG	A	4.2	0.75 pcf	1.50"	FACTORY APPLIED	NOTES	OA-1
INTERIOR EXPOSED RECTANGULAR	1" WG	A	4.2	0.75 pcf	1.50"	FACTORY APPLIED	NOTES	OA-2
INTERIOR EXPOSED ROUND	1" WG	A	4.2	0.75 pcf	1.50"	FACTORY APPLIED	NOTES	OA-3
EXTERIOR	1" WG	A	6.0	1.50 pcf	2.20"	FIELD APPLIED	NOTES	OA-4
EXHAUST AIR DUCT								
INTERIOR CONCEALED	1" WG	C	NR	NR	NR		NOTES	EA-1
INTERIOR EXPOSED RECTANGULAR	1" WG	C	NR	NR	NR		NOTES	EA-2
INTERIOR EXPOSED ROUND	1" WG	C	NR	NR	NR		NOTES	EA-3
EXTERIOR	1" WG	C	NR	NR	NR		NOTES	EA-4

**NOTES:**

1. NR = NOT REQUIRED.

2. DUCT PRESSURE CLASS -- SEE DUCT REINFORCEMENT SCHEDULE

3. DUCT SEAL CLASS REQUIREMENTS:

a. CLASS A -- ALL TRANSVERSE JOINTS, LONGITUDINAL SEAMS, AND DUCT WALL PENETRATIONS

b. CLASS B -- ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS ONLY

c. CLASS C -- TRANSVERSE JOINTS ONLY

3. R-VALUE:

a. RATED R VALUE 5.1 = INSTALLED R VALUE 4.2

b. RATED R VALUE 7.4 = INSTALLED R VALUE 6.0

c. WHERE R HAS THE UNITS: [(HR x ft<sup>2</sup> x °F) / BTU]

4. INSULATION DENSITY

a. DUCT WRAP: 0.75 pcf

b. DUCT BOARD: 1.50 pcf

5. INSULATION THICKNESS:

a. RATED THICKNESS 1.50" = INSTALLED THICKNESS 1.125"

b. RATED THICKNESS 2.20" = INSTALLED THICKNESS 1.625"

6. FACTORY APPLIED JACKET: SEE SPECIFICATIONS

7. FIELD APPLIED JACKET: SEE DETAIL

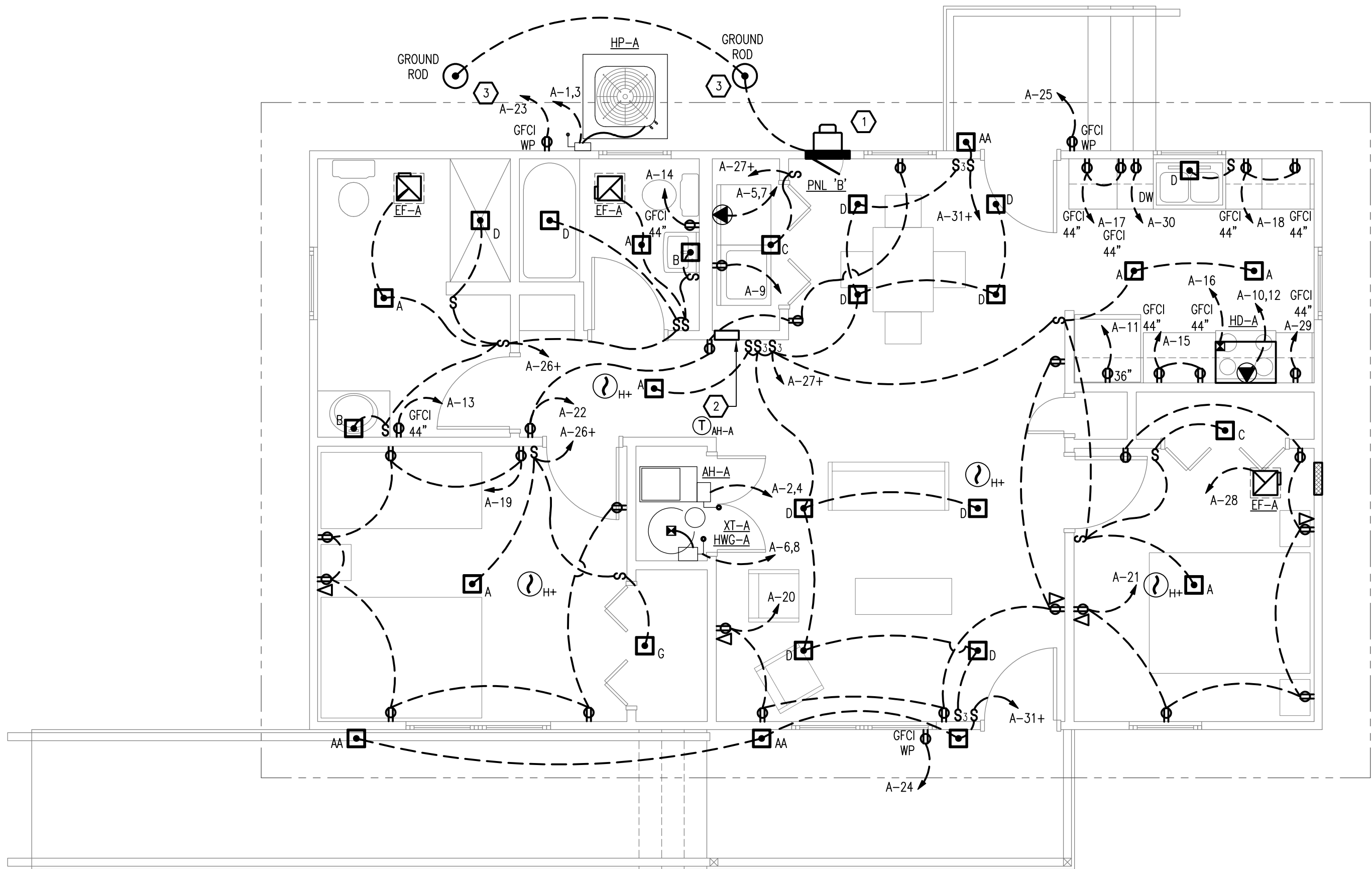
HEAT PUMP SCHEDULE											
MARK	MAKE	MODEL	CAPACITY (MBH)		SYSTEM ton	MIN AMB (deg F)	VOLTS/PH	MCA	MOCP	SEER	REMARKS
			85/67 MA & 95 OA	ton							
HP-A	TRANE	4TNR5018H1000A	15.0 TC & 17.4 SC	1.5	55	208-230/1Ø	12	20	14.0		ENERGY STAR COMPLIANT
HP-B	TRANE	4TNR5018H1000A	15.0 TC & 17.4 SC	1.5	55	208-230/1Ø	12	20	14.0		ENERGY STAR COMPLIANT

**HEAT PUMP SPECIFICATIONS:**

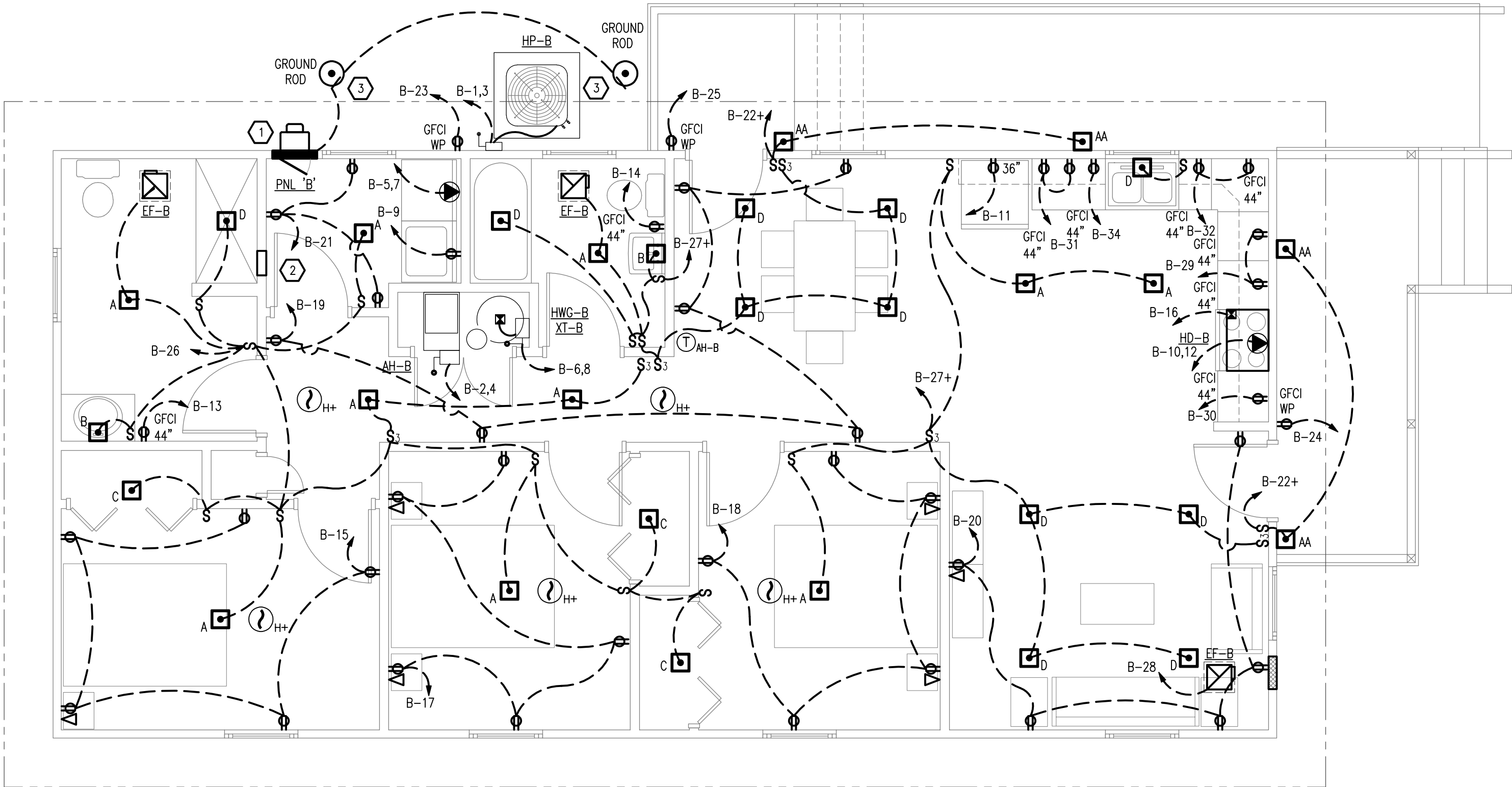
- PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED, INCLUDE PERFORMANCE DATA IN TERMS OF CAPACITIES, OUTLET VELOCITIES, STATIC PRESSURES, SOUND POWER CHARACTERISTICS, MOTOR REQUIREMENTS, AND ELECTRICAL CHARACTERISTICS. HEAT PUMP AND FAN COIL SHALL BE COMPATIBLE AND THE SEER RATING SHALL REFLECT THE COMBINATION OF THE FAN COIL AND THE HEAT PUMP.
- SHOP DRAWINGS: INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
- WIRING DIAGRAMS: FOR POWER, SIGNAL, AND CONTROL WIRING
- CLOSEOUT SUBMITTALS:
  - OPERATION AND MAINTENANCE DATA FOR HEAT PUMPS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS
- QUALITY ASSURANCE:
  - ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION
  - ASHRAE/IESNA COMPLIANCE: REQUIREMENTS IN ASHRAE/IESNA 90.1
- COORDINATE SIZES AND LOCATIONS OF CONCRETE BASES WITH ACTUAL EQUIPMENT PROVIDED. CAST ANCHOR-BOLT INSERTS INTO BASES.
- WARRANTY PERIOD:
  - FOR COMPRESSOR: FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
  - FOR PARTS: FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
  - FOR LABOR: ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION
- PROVIDE PRODUCT INDICATED ABOVE OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:
  - CARRIER CORPORATION
  - LENNOX INTERNATIONAL INC.
  - TRANE; A BUSINESS OF AMERICAN STANDARD COMPANIES
  - YORK; A JOHNSON CONTROLS COMPANY
- CASING: STEEL, FINISHED WITH BAKED ENAMEL IN STANDARD COLOR, WITH REMOVABLE PANELS FOR ACCESS TO CONTROLS, WEEP HOLES FOR WATER DRAINAGE, AND MOUNTING HOLES IN BASE. PROVIDE BRASS SERVICE VALVES, FITTINGS, AND GAGE PORTS ON EXTERIOR OF CASING.
- COMPRESSOR: HERMETICALLY SEALED WITH CRANKCASE HEATER AND MOUNTED ON VIBRATION ISOLATION DEVICE. COMPRESSOR MOTOR SHALL HAVE THERMAL- AND CURRENT-SENSITIVE OVERLOAD DEVICES, START CAPACITOR, RELAY, AND CONTACTOR
- COMPRESSOR TYPE: SCROLL
- MATCHED WITH AN AIR HANDLER TO UTILIZE TRANE'S COMFORT R SYSTEM. REFRIGERANT CHARGE: R-410A.
- REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINNS AND LIQUID SUBCOOLER. COMPLY WITH ARI 210/240.
- HEAT-PUMP COMPONENTS: REVERSING VALVE AND LOW-TEMPERATURE-AIR CUTOFF THERMOSTAT.
- FAN: ALUMINUM-PROPELLER TYPE, DIRECTLY CONNECTED TO MOTOR.
- MOTOR: PERMANENTLY LUBRICATED, WITH INTEGRAL THERMAL-OVERLOAD PROTECTION.
- LOW AMBIENT KIT: PERMITS OPERATION DOWN TO 45 DEG F.
- MOUNTING BASE: POLYETHYLENE UNLESS OTHERWISE INDICATED
- ACCESSORIES:
  - AUTOMATIC-RESET TIMER TO PREVENT RAPID CYCLING OF COMPRESSOR
  - FACTORY CLEANED, DRIED, PRESSURIZED SOFT-ANNEALED COPPER SUCTION AND LIQUID LINES, AND SEALED; FACTORY-INSULATED SUCTION LINE WITH FLARED FITTINGS AT BOTH ENDS
  - INSTALL AND CONNECT PRE-CHARGED REFRIGERANT TUBING TO COMPONENT'S QUICK-CONNECT FITTINGS. INSTALL TUBING TO ALLOW ACCESS TO UNIT
- FIELD QUALITY CONTROL: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS
- TEST AND INSPECTIONS:
  - AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS
  - REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST
- OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION
- TEST AND ADJUST CONTROLS AND SAFETIES
- REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT. PREPARE TEST AND INSPECTION REPORTS
- ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS
- TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN UNITS.
- SPLIT SYSTEM SHALL BE ENERGY STAR COMPLIANT AND BE INSTALLED WITH A DEHUMIDIFICATION CYCLE.

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July 26, 2018



ELECTRICAL - PLAN A  
SCALE: 1/4" = 1'-0"



ELECTRICAL - PLAN B  
SCALE: 1/4" = 1'-0"

**PLAN NOTES:**

1. METER BASE & METER - SEE ELECTRICAL RISER SCHEMATIC.
2. DEMARCATION FOR PHONE, INTERNET AND TELEVISION CABLE. PROVIDERS SHALL INSTALL CABLE TO DEMARCATION LOCATION
3. GROUND ROD - SEE GROUND ROD DETAIL.

WEST VIRGINIA ARMY NATIONAL GUARD

FLOOD RECOVERY

HOUSE DESIGN

Charleston, WV

CONSTRUCTION DOCUMENTS

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**ELECTRICAL  
PLAN A & PLAN B**

DRAWN

MWE

CHECKED

MWE

DATE

July 26, 2018

COMM. NO.

18065

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<p>*** COORDINATION WITH OTHER TRADES:</p> <ol style="list-style-type: none"><li>1. TAKE STEPS TO INSURE THAT DEVICES AND THEIR BOXES ARE PROTECTED. DO NOT PLASTER WALLS OVER DEVICES AND BOXES AND DO NOT CUT HOLES FOR BOXES WITH ROUTERS THAT ARE GUIDED BY RIDING AGAINST OUTSIDE OF THE BOXES.</li><li>2. KEEP OUTLET BOXES FREE OF PLASTER, DRYWALL JOINT COMPOUND, MORTAR, CEMENT, CONCRETE, DUST, PAINT, AND OTHER MATERIAL THAT MAY CONTAMINATE THE RACEWAY SYSTEM, CONDUCTORS, AND CABLES.</li><li>3. INSTALL DEVICE BOXES IN BRICK OR BLOCK WALLS SO THAT THE COVER PLATE DOES NOT CROSS A JOINT UNLESS THE JOINT IS TROWELED FLUSH WITH THE FACE OF THE WALL.</li><li>4. INSTALL WIRING DEVICES AFTER ALL WALL PREPARATION, INCLUDING PAINTING, IS COMPLETE.</li></ol>	<p>*** IDENTIFICATION:</p> <ol style="list-style-type: none"><li>1. RECEPTACLES: IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH SERVICE IS PROVIDED BY HOT, STAMPED OR ENGRAVED MACHINE PRINTING WITH BLACK-FILLED LETTERING ON FACE OF PLATE, AND DURABLE WIRE MARKERS OR TAGS INSIDE OUTLET BOXES.</li></ol>
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- RECEIVING, STORING AND PROTECTING MATERIALS
- MATERIALS AND EQUIPMENT SHALL BE CAREFULLY UNLOADED, OBSERVING ALL PACKING LABEL WARNINGS.
- PACKAGES WITH PACKING SLIPS AND/OR PURCHASE ORDERS SHALL BE INVENTORIED. BACK ORDERS SHALL BE DOCUMENTED AND NEW SHIPPING SCHEDULES VERIFIED. EXPEDITE OR OTHERWISE RESOLVE THE PRODUCT DELIVERY SCHEDULE PROBLEMS.
- LEAVING PROTECTIVE COVERINGS IN PLACE AS MUCH AS POSSIBLE, SHIPMENT SHALL BE OPENED AND INSPECTED COMPLETELY, AND, AS QUICKLY AS POSSIBLE, RECOVERY OF LOSS DUE TO SHIPPING DAMAGE SHALL BE INITIATED. UNDATED MATERIALS SHALL BE CAREFULLY REPAKED, UNLESS INTENDED FOR IMMEDIATE INSTALLATION.
- MATERIALS SHALL BE STORED IN A CLEAN, DRY AND SECURE LOCATION. AVOID SPACES WHERE WATER MIGHT ACCUMULATE OR WHERE SIGNIFICANT AIRBORNE DUST OR DEBRIS IS PRESENT. SHOULD SITE CONDITIONS PROHIBIT SUCH ACTIONS, MATERIALS SHALL BE STORED ON PALLETIS OR OTHER MEANS TO ELEVATE MATERIALS ABOVE FLOOR AND POTENTIAL HAZARDS.
- ALL WARNINGS AND STACKING INSTRUCTIONS ON PACKAGING OR SHIPPING MATERIALS, EQUIPMENT SHALL BE OBSERVED TO PREVENT DAMAGE.
- MATERIALS STORED ON SITE SHALL BE LOCATED IN SUCH A WAY THAT OTHER ITEMS CAN OPERATE WITHOUT DELAY.
- BOXES THAT ARE PARTIALLY CRUSHED SHALL NOT BE STACKED EVEN IF THE PRODUCTS ARE INTACT.
- SHOULD MATERIALS OR EQUIPMENT BECOME DAMAGED WHILE STORED OR AFTER INSTALLATION, SAID MATERIALS OR EQUIPMENT SHALL BE REPLACED.
- EQUIPMENT WITH MORE SENSITIVE MATERIALS SHALL BE STORED IN SUCH A MANNER AS TO ASSURE EQUIPMENT DOES NOT BECOME DAMAGED IN TOTAL OR IN PART.

- ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS  
 CERTIFIED IN NFPA 70A BY A QUALIFIED TESTING AGENCY, AND MARKED FOR  
 INTENDED LOCATION AND APPLICATION, COMPLY WITH UL 467 FOR GROUNDING  
 AND BONDING MATERIALS AND EQUIPMENT.  
 SUBMIT PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.  
 INFORMATIONAL SUBMITTALS: PLANS SHOWING DIMENSIONED AS-BUILT LOCATIONS  
 OF GROUNDING FEATURES SPECIFIED, INCLUDING THE FOLLOWING: GROUND RODS  
 AND BONDING ARRANGEMENTS AND CONNECTIONS FOR SEPARATELY DERIVED  
 SYSTEMS.  
 THE WORK HEREIN SPECIFIED SHALL BE FREE FROM DEFECTS IN WORKMANSHIP  
 AND MATERIAL UNDER NORMAL USE AND SERVICE. IF WITHIN TWELVE (12)  
 MONTHS FROM THE DATE OF SUBSTANTIAL COMPLETION AND OWNER ACCEPTANCE  
 OF WORK HEREIN DESCRIBED, ANY OF THE EQUIPMENT OR MATERIALS, OR THE  
 INSTALLATION THEREOF, IS FOUND TO BE DEFECTIVE IN WORKMANSHIP OR  
 MATERIAL, IT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S CHARGE.  
 ALL MATERIAL AND WORKMANSHIP SHALL COMPLY WITH ALL APPLICABLE CODES,  
 SPECIFICATIONS, LOCAL ORDINANCES, INDUSTRY STANDARDS AND UTILITY COMPANY  
 REGULATIONS.  
 EQUIPMENT SHALL BE INSTALLED LEVEL, PLUMB AND TRUE WITH THE STRUCTURE  
 AND OTHER EQUIPMENT. THE EQUIPMENT SHALL ALSO BE INSTALLED IN THE  
 CORRECT POSITION, HORIZONTAL OR VERTICAL AS INTENDED.  
 ALL MATERIALS SHALL BE FIRMLY SECURED IN PLACE, ADEQUATELY SUPPORTED,  
 AND PERMANENT.  
 ALL HARDWARE, FITTINGS, AND ACCESSORIES SHALL BE OF A TYPE DESIGNED,  
 INTENDED AND APPROPRIATE FOR USE AND COMPLEMENT THE ITEMS WITH WHICH  
 THEY ARE USED.  
 ALL MATERIALS AND EQUIPMENT INCLUDING HANGERS, SUPPORTS, FASTENERS OR  
 FITTING, AND ACCESSORIES SHALL HAVE CORROSION PROTECTION SUITABLE FOR  
 THE ATMOSPHERE IN WHICH THEY ARE INSTALLED (INSTALLED INDOORS OR  
 OUTDOORS). CARE SHALL BE TAKEN DURING THE INSTALLATION TO ASSURE THE  
 INTEGRITY OF THE CORROSION PROTECTION. DAMAGED CORROSION PROTECTION  
 SHALL BE REPAIRED DURING OR AFTER INSTALLATION.  
 ALL SCREWS, BOLTS, NUTS, CLAMPS, FITTINGS OR OTHER FASTENING DEVICES  
 SHALL BE MADE UP TIGHT IN ACCORDANCE WITH MANUFACTURERS' AND/OR  
 INSTALLATION INSTRUCTIONS.  
 COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE MECHANICAL CONTRACTOR.  
 SHOULD ALTERNATE BUT EQUAL HVAC EQUIPMENT BE CHOSEN AND APPROVED

ALL REQUIRED PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AND SHALL BE INCLUDED WITHIN THE BID. THE CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED INSPECTIONS PRIOR TO COVERING WORK IN QUESTION.

14. THE CONTRACTOR SHALL, AFTER COMPLETION OF THE ORIGINAL TEST OF THE INSTALLATION AND ACCEPTANCE BY THE OWNER, PROVIDE ANY SERVICE INCIDENTAL TO THE PROPER PERFORMANCE OF THE ELECTRICAL SYSTEMS UNDER GUARANTEES OUTLINED ABOVE FOR A PERIOD OF TWELVE (12) MONTHS.
15. IN CASE OF DIFFERENCES BETWEEN BUILDING CODES, SPECIFICATIONS, STATE LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS AND UTILITY COMPANY REGULATIONS AND THE CONTRACT DOCUMENTS, THE MOST STRINGENT SHALL GOVERN. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER IN WRITING OF ANY SUCH DIFFERENCE.
16. NONCOMPLIANCE: SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY WITH THE REQUIREMENTS OF APPLICABLE BUILDING CODES, STATE AND LOCAL ORDINANCES, INDUSTRY STANDARDS AND UTILITY COMPANY REGULATIONS, HE SHALL BEAR ALL COSTS ARISING IN CORRECTING THE DEFICIENCIES.
17. ALL REQUIRED FEES, PERMITS, AND INSPECTIONS SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR UNDER THE SECTION OF SPECIFICATIONS FOR WHICH THEY ARE REQUIRED.
18. ACCESS TO LOCATIONS SHOWN ON THE DRAWINGS, UNLESS PREVENTED BY PROJECT CONDITIONS.
19. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MARKING ALL SWITCHES, RECEPTACLES, AND FIXED EQUIPMENT WITH BRANCH CIRCUIT PANEL NAME AND NUMBER SERVING EACH DEVICE.
20. ALL ELECTRICAL EQUIPMENT, SUCH AS SWITCHES, CIRCUIT BREAKERS, ETC. SHALL BE OPERATED BY OPERATING THE DEVICE TO VERIFY THAT THE MECHANICAL PORTIONS OF THE DEVICE ARE FUNCTIONING PROPERLY.
21. IDENTIFY ALL BREAKERS FEEDING THE FIRE ALARM CONTROL UNIT(S) IN COMPLIANCE WITH THE NATIONAL FIRE ALARM CODE.

1. ALL ANCHORS AND FASTENERS SHALL BE OF A TYPE DESIGNED FOR THE PURPOSED AND RATED CAPABLE OF ADEQUATELY AND SAFELY SECURING THE ITEM ON THE BASE MATERIAL IN WHICH THE ANCHOR OR FASTENER IS USED.
2. CARE SHALL BE TAKEN TO USE MATERIALS TO PREVENT CORROSION THAT WOULD RESULT FROM DISSIMILAR METAL CONTACT IN DAMP OR WET LOCATIONS. DAMAGED CORROSION PROTECTION COATINGS SHALL BE REPAIRED.
3. ANCHORS OR FASTENERS USED SHALL BE A TYPE DESIGNED AND INTENDED FOR USE IN THE BASE MATERIAL TO WHICH THE MATERIAL OR SUPPORT IS TO BE ATTACHED.

1. HANGARS AND SUPPORTS SHALL BE USED TO PROPERLY AND FIRMLY SUPPORT ELECTRICAL MATERIALS OR EQUIPMENT IN A SAFE AND PERMANENT MANNER. THE SUPPORTS MAY BE STANDARD MANUFACTURED ITEMS OR FABRICATED.
2. HANGARS AND SUPPORTS SHALL BE OF A TYPE FOR THE PURPOSE, HAVE A NEAT AND FINISHED APPEARANCE AND COMPLEMENT THE INSTALLATION.

1. OUTLET BOXES SHALL BE OF A TYPE DESIGNED FOR THE USE AND LOCATION. OUTLET AND DEVICE BOXES SHALL BE SECURELY AND RIGIDLY ATTACHED TO SUPPORTED PLUMB, LEVEL, AND TRUE.
2. BOX SUPPORTS, HANGERS OR BRACKETS, SHALL BE OF A TYPE DESIGNED OR SUITABLE FOR THE TYPE OF BOX USED AND THE BUILDING STRUCTURAL MEMBER TO WHICH THEY ARE ATTACHED.
3. OUTLET AND DEVICE BOXES AND THEIR COVERS SHALL HAVE CORROSION PROTECTION SUITABLE FOR THE ATMOSPHERE IN WHICH THEY ARE INSTALLED.
4. INSTALLATION OF OUTLET AND DEVICE BOXES SHALL BE COORDINATED WITH OTHER TRADES.
5. OUTLET AND DEVICE BOXES SHALL BE PROTECTED TO PREVENT THE ENTRANCE OF FOREIGN MATTER, PLASTER AND DEBRIS SHALL BE THOROUGHLY CLEANED FROM THE BOX BEFORE CONDUCTORS ARE INSTALLED.
6. UNLESS OTHERWISE INDICATED, SINGLE-GANG OUTLET AND DEVICE BOXES FOR RECEPTABLES AND SWITCHES SHALL BE MOUNTED WITH THE LONG AXIS (DIMENSION) VERTICAL.
7. UNLESS OTHERWISE INDICATED, BOXES OF THREE OR MORE GANGES SHALL BE MOUNTED WITH THE LONG AXIS (DIMENSION) HORIZONTAL. THE BOX SHALL BE LOCATED SO THAT THE COVER FOR THE DEVICE SHALL NOT SPAN MORE THAN ONE WALL FINISH VERTICALLY OR HORIZONTALLY.
8. UNLESS OTHERWISE INDICATED, BOXES FOR SWITCHES NEAR DOORS SHALL BE LOCATED ON THE SIDE OPPOSITE THE HINGE AND CLOSE TO THE DOOR THRESHOLD.
9. PLASTIC COVER PLATES SHALL NOT BE USED FOR SURFACE MOUNTED OUTLET AND DEVICE BOXES.
10. THE ELECTRICAL CONTRACTOR SHALL ROUGH-IN ALL THERMOSTAT BOXES, SENSOR BOXES, VOICE BOXES, DATA BOXES, ETC. AND INSTALL CONDUIT WITH A LONG PAPER TERMINATED AT THE BOXES ABOVE.
11. ALL HVAC CONTROL WIRING AND SYSTEMS LESS THAN 100V SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR, UNLESS OTHERWISE NOTED.

- SHEATHED NON-METALLIC CABLE MAY BE INSTALLED FOR BRANCH CIRCUITS. ALL CONDUCTORS INSTALLED WITHIN RACEWAY ABOVE GRADE SHALL HAVE AN INSULATION SUITABLE FOR DRY AND DAMP LOCATIONS AT 90° C. THHN. ALL CONDUCTORS INSTALLED WITHIN CONDUIT BELOW GRADE SHALL HAVE AN INSULATION SUITABLE FOR DRY AND WET LOCATIONS AT 90° C. THHN-2. EACH CIRCUIT SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR. THE EQUIPMENT GROUND CONDUCTOR SHALL NOT BE LESS THAN #12 AWG OR AS INDICATED ON THE DRAWINGS. PROVIDE ELECTRICALLY CONTINUOUS, TIGHT GROUNDING CONNECTIONS FOR WIRING DEVICES, UNLESS OTHERWISE INDICATED. DEVICE GROUNDING CONNECTIONS SHALL BE MADE VIA A PIGTAIL FROM THE GROUND SCREW WITHIN THE DEVICE BACK BOX. INSTALL IN STRICT ACCORDANCE WITH NEC ARTICLES PERTAINING TO GROUNDING.

- GROUND RODS: COPPER-CLAD STEEL, SEE DETAIL FOR DIMENSIONS.  
INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED FOR 600 V  
UNLESS OTHERWISE REQUIRED BY APPLICABLE CODE OR AUTHORITIES HAVING  
JURISDICTION.  
BARE COPPER CONDUCTORS: SOLID CONDUCTORS: ASTM B 3. STRANDED  
CONDUCTORS: ASTM B 8. BONDING CABLE: 28 KCMIL, 14 STRANDS OF NO.  
17 AWG CONDUCTOR, 1/4 INCH IN DIAMETER.

- LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USED AND FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED. BOLTED CONNECTORS FOR CONDUCTORS AND PIPES. COPPER OR COPPER ALLOY, PRESSURE TYPE WITH AT LEAST TWO BOLTS. PIPE CONNECTORS: CLAMP TYPE, SIZED FOR PIPE. WELDED CONNECTORS: EXOTHERMIC-WELDING KITS OF TYPES RECOMMENDED BY KIT MANUFACTURER FOR MATERIALS BEING JOINED AND INSTALLATION CONDITIONS UNDERGROUND GROUNDING CONDUCTORS: INSTALL BARE COPPER CONDUCTOR, NO. 2/0 AWG MINIMUM UNLESS OTHERWISE INDICATED. BURY AT LEAST 24 INCHES BELOW GRADE. CONDUCTOR TERMINATIONS AND CONNECTIONS: PIPE AND EQUIPMENT GROUNDING CONDUCTOR TERMINATIONS AND CONNECTIONS: UNDERGROUND AND OVERGROUND CONNECTIONS: WELDED CONNECTIONS EXCEPT AT TEST WELLS AND AS OTHERWISE INDICATED. CONNECTIONS TO GROUND RODS AT TEST WELLS: BOLTED CONNECTIONS. CONNECTIONS TO STRUCTURAL STEEL: WELDED CONNECTIONS.

- INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH ALL FEEDERS AND BRANCH CIRCUITS.
- AIR DUCT EQUIPMENT CIRCUITS:** INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTOR TO DUCT MOUNTED ELECTRICAL DEVICES OPERATING AT 120 V AND MORE, INCLUDING AIR CLEANERS, HEATERS, DAMPERS, HUMIDIFIERS, AND OTHER DUCT ELECTRICAL EQUIPMENT. BOND CONDUCTOR TO EACH UNIT AND TO AIR DUCT AND CONNECTED METALLIC PIPING.
- WATER HEATER, HOT TRACING, AND ANTIFROST HEATING CABLES:** INSTALL A SEPARATE INSULATED EQUIPMENT GROUNDING CONDUCTOR TO EACH ELECTRICAL WATER HEATER AND HEAT TRACING CABLE. BOND CONDUCTOR TO HEATER UNITS PIPING, CONNECTED EQUIPMENT, AND COMPONENTS.
- SIGNAL AND COMMUNICATION EQUIPMENT:** IN ADDITION TO GROUNDING AND BONDING REQUIREMENTS FOR NETA 70, PROVIDE A SEPARATE GROUNDING SYSTEM COMPLYING WITH REQUIREMENTS IN TIA/EIA J-STD-607-A.
- a. FOR TELEPHONE, ALARM, VOICE AND DATA, AND OTHER COMMUNICATION EQUIPMENT, PROVIDE NO. 4 AWG MINIMUM INSULATED GROUNDING CONDUCTOR IN RACEWAY FROM GROUNDING ELECTRODE SYSTEM TO EACH SERVICE LOCATION, TERMINAL CABINET, WIRING CLOSET, AND CENTRAL EQUIPMENT LOCATION.**
- b. TERMINAL CABINETS:** TERMINATE GROUNDING CONDUCTOR ON CABINET GROUNDING TERMINAL.

[illegible]

WEST VIRGINIA ARMY NATIONAL GUARD

## FLOOD RECOVERY

# HOUSE DESIGN

# Charleston, WV

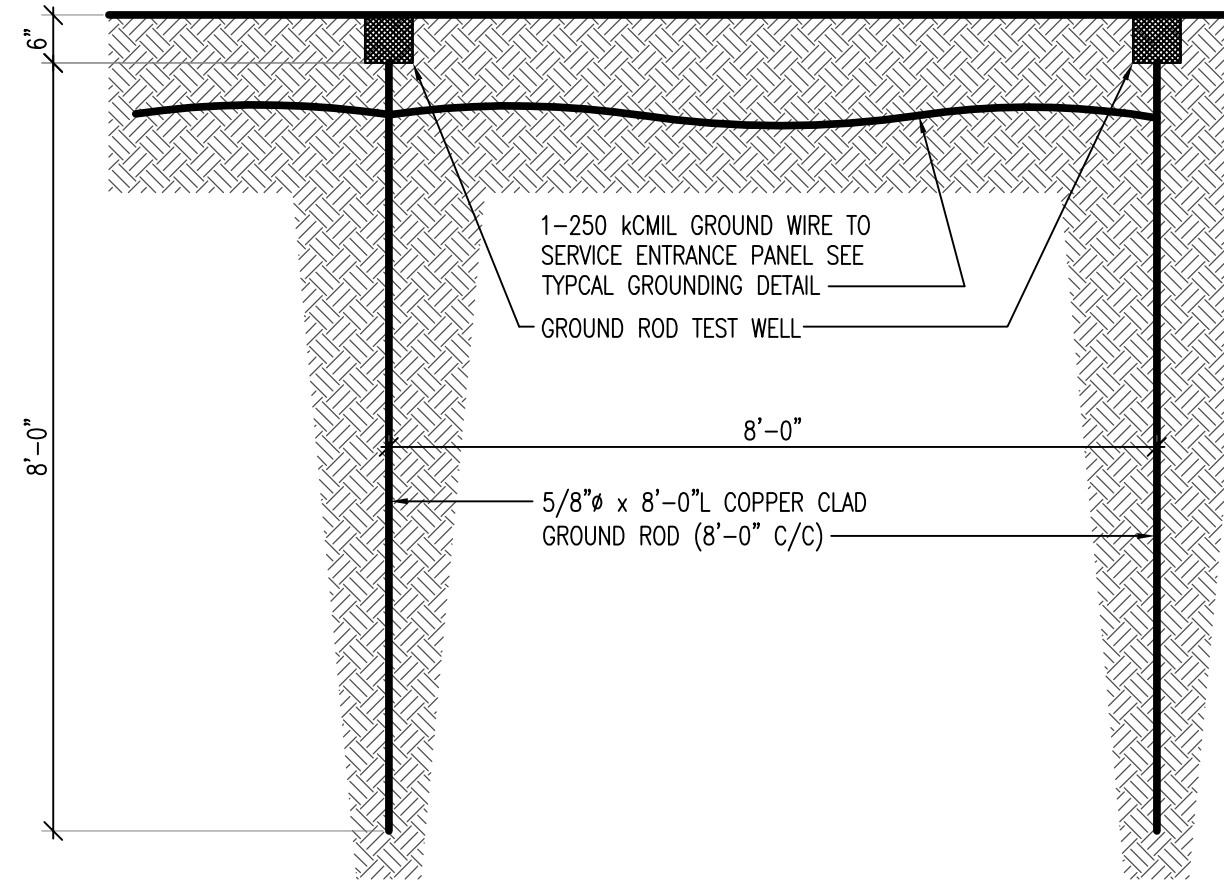
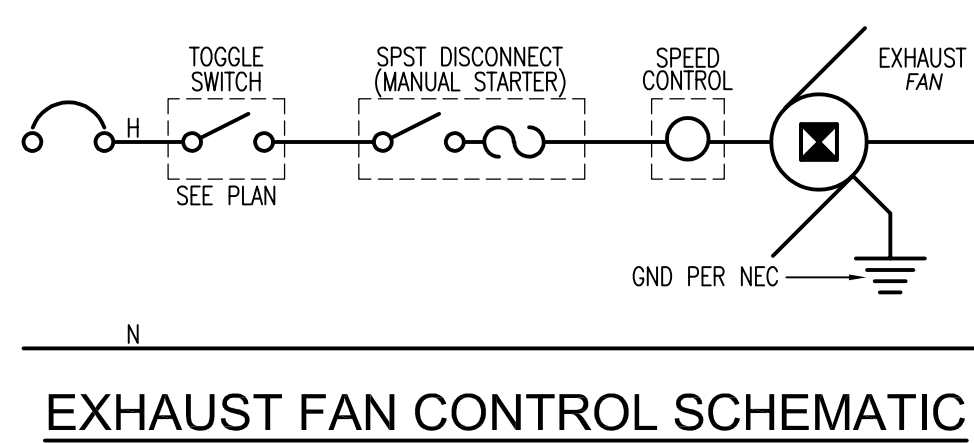
# CONSTRUCTION DOCUMENTS

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# ELECTRICAL DETAILS, NOTES AND SCHEDULES

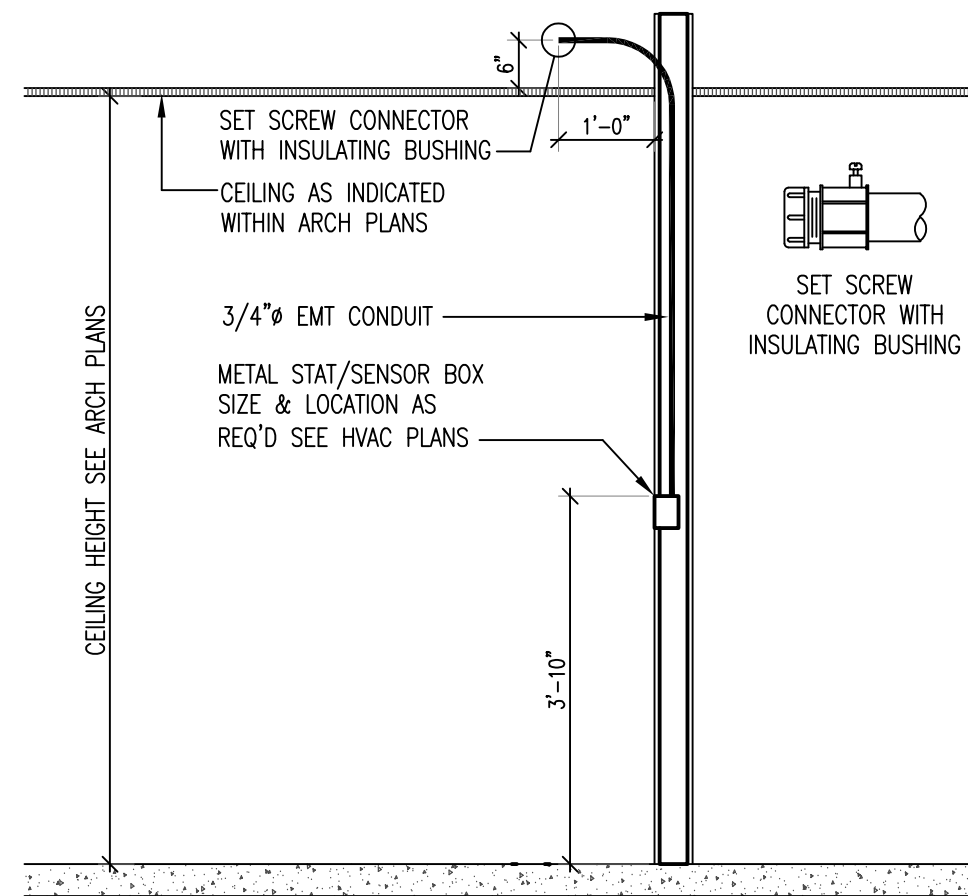
DRAWN  <b>MWE</b>	CHECKED  <b>MWE</b>
	DATE <b>July 26, 2018</b>
	COMM. NO. <b>18065</b>

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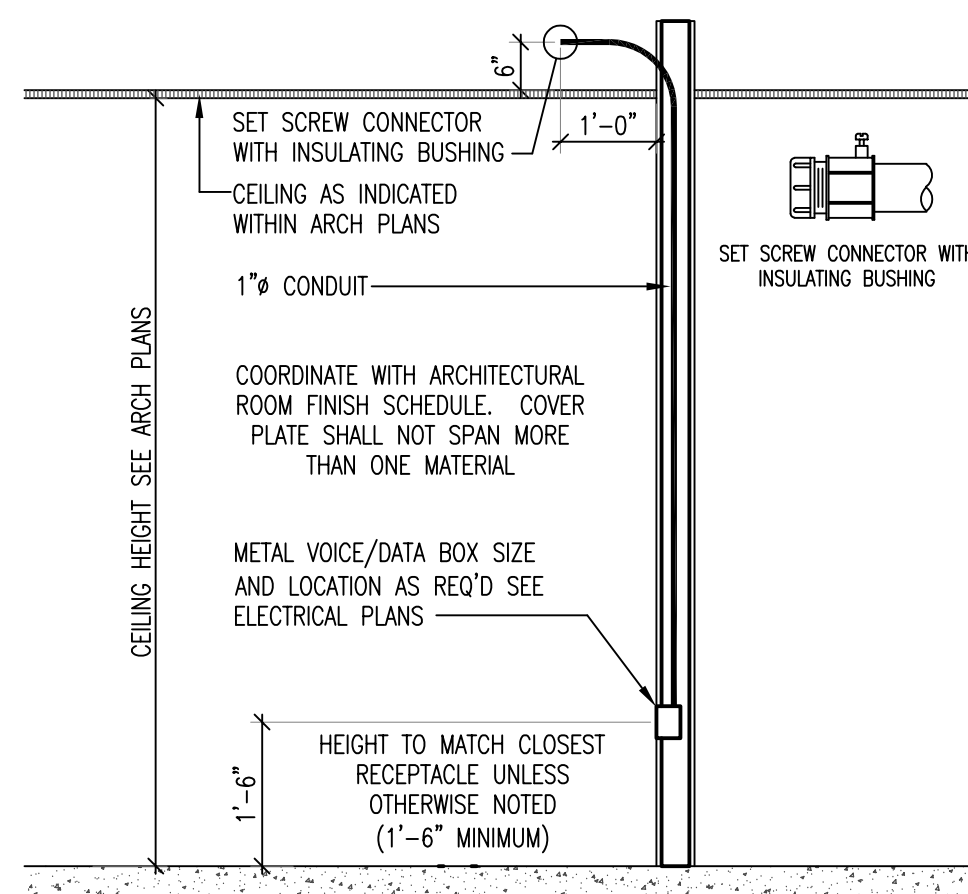


- ### GROUND TESTING NOTES:
1. PERFORM TESTS AND INSPECTIONS.
  2. AFTER INSTALLING GROUNDING SYSTEM BUT BEFORE PERMITTING ELECTRICAL CIRCUITS HAVE BEEN ENERGIZED, TEST FOR COMPLIANCE WITH REQUIREMENTS.
  3. INSPECT PHYSICAL AND MECHANICAL CONDITION. VERIFY TIGHTNESS OF ACCESSIBLE, BOLTED, ELECTRICAL CONNECTIONS WITH A CALIBRATED TORQUE WRENCH ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
  4. TEST COMPLETED GROUNDING SYSTEM AT EACH LOCATION WHERE A MAXIMUM GROUND RESISTANCE LEVEL IS SPECIFIED, AT SERVICE DISCONNECT, RESISTANCE GROUNDING TERMINAL, AND INDIVIDUAL GROUND RODS. MAKE TESTS AT GROUND RODS BEFORE ANY CONDUCTORS ARE CONNECTED.
    - a. MEASURE GROUND RESISTANCE NO FEWER THAN TWO FULL DAYS AFTER LAST TRACE OF PRECIPITATION AND WITHOUT SOIL BEING MOISTENED BY ANY MEANS OTHER THAN NATURAL DRAINAGE OR SEEPAGE AND WITHOUT CHEMICAL TREATMENT OR OTHER ARTIFICIAL MEANS OF REDUCING NATURAL RESISTANCE.
    - b. PERFORM TESTS BY FALL-OF-POTENTIAL METHOD ACCORDING TO IEEE 81.
  5. GROUNDING SYSTEM WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.
  6. PREPARE TEST AND INSPECTION REPORTS & REPORT MEASURED GROUND RESISTANCES THAT EXCEED THE FOLLOWING VALUES:
    - a. POWER AND LIGHTING EQUIPMENT OR SYSTEM WITH CAPACITY OF 500 KVA AND LESS: 10 OHMS.
    - b. POWER AND LIGHTING EQUIPMENT OR SYSTEM WITH CAPACITY OF 500 TO 1000 KVA: 5 OHMS.
    - c. POWER AND LIGHTING EQUIPMENT OR SYSTEM WITH CAPACITY MORE THAN 1000 KVA: 3 OHMS.
    - d. POWER DISTRIBUTION UNITS OR PANELBOARDS SERVING ELECTRONIC EQUIPMENT: 1 OHM.
    - e. PANELBOARDS: 10 OHMS.
    - f. EXCESSIVE GROUND RESISTANCE: IF RESISTANCE TO GROUND EXCEEDS SPECIFIED VALUES, NOTIFY ENGINEER PROMPTLY AND INCLUDE RECOMMENDATIONS TO REDUCE GROUND RESISTANCE.

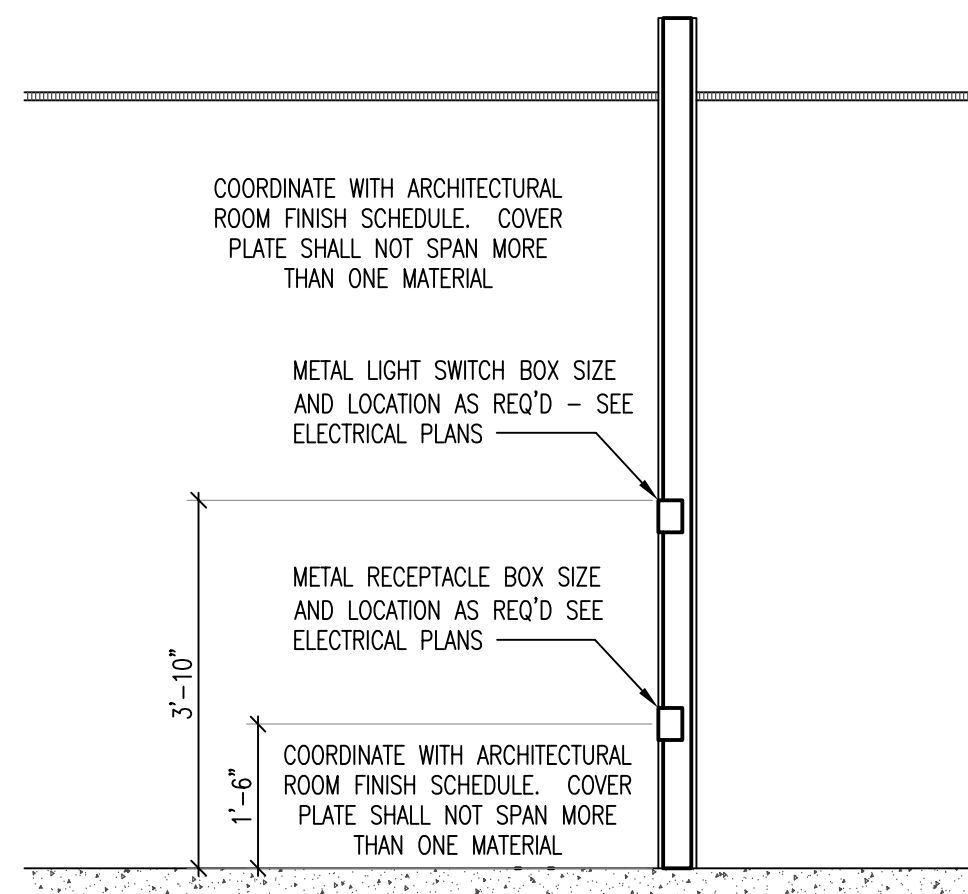
## GROUND ROD DETAIL



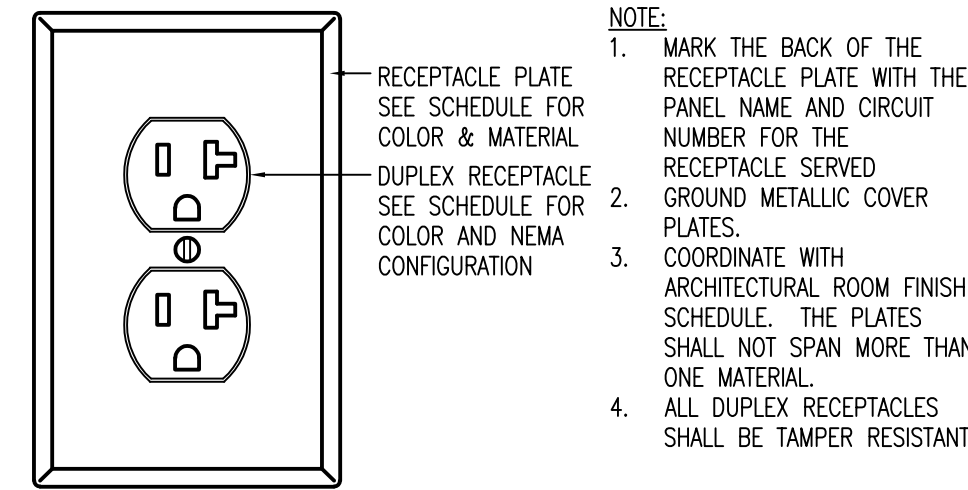
HVAC-CONTROL ROUGH-IN  
SCALE: 1/2" = 1'-0"



**VOICE/DATA ROUGH-IN DETAIL**  
SCALE: 1/2" = 1'-0"

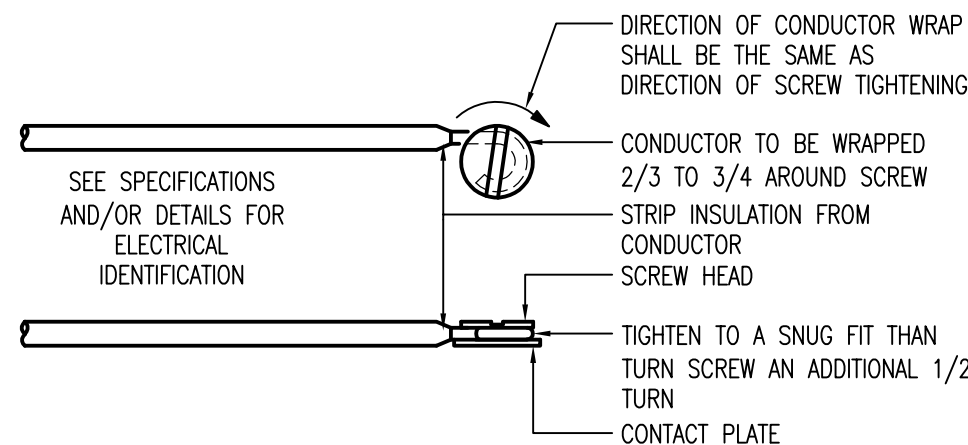


**WIRING DEVICE ROUGH-IN DETAIL**  
SCALE: 1/2" = 1'-0"

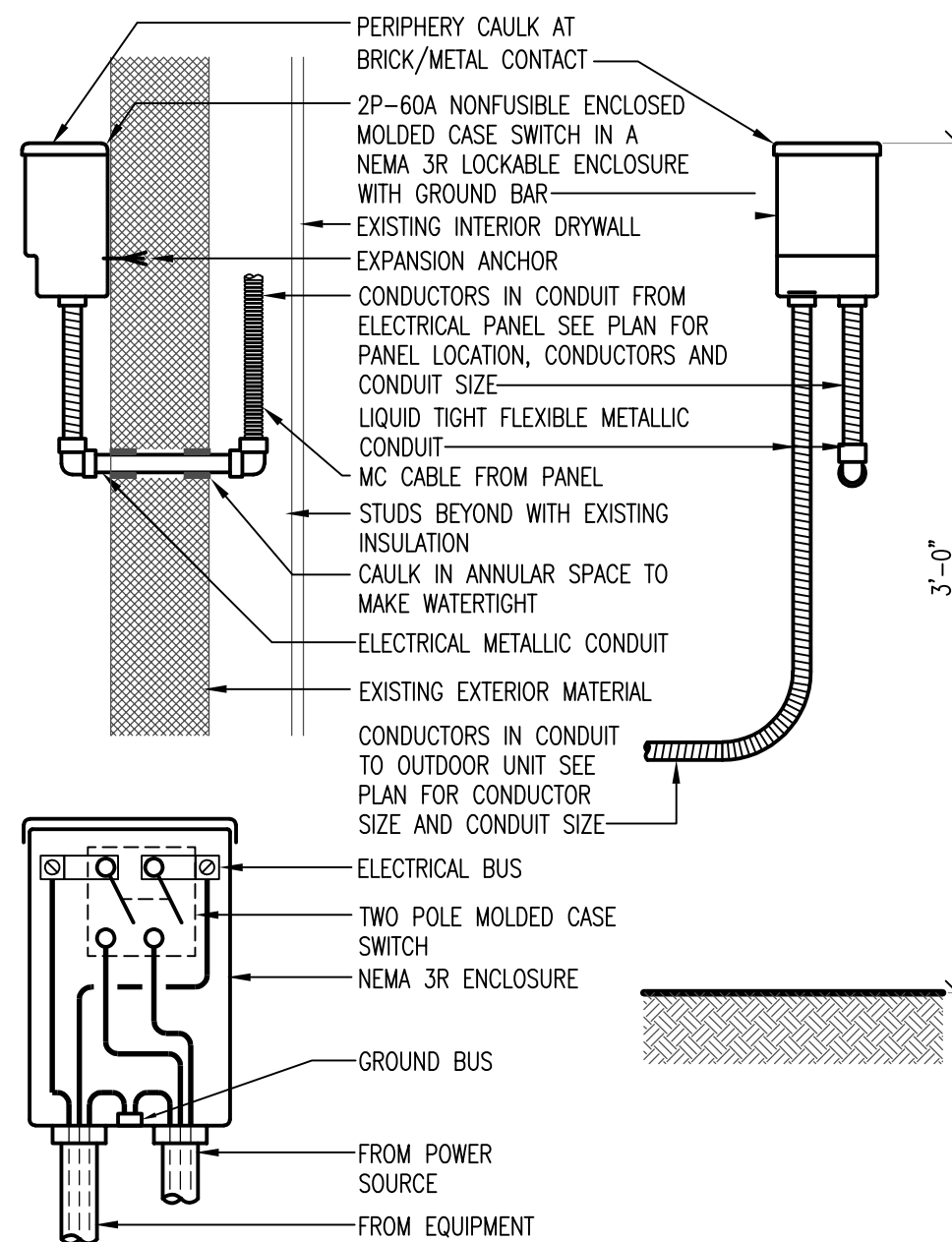


### **DUPLEX RECEPTACLE DETAIL**

SCALE: 1/2" = 1"





























### SMALL ELECTRICAL TERMINAL TERMINATION DETAIL



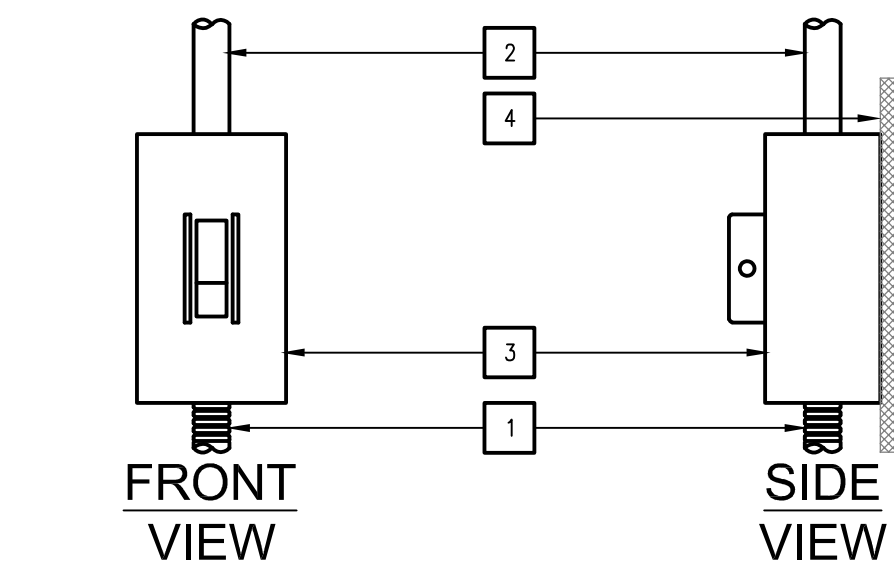
## OUTDOOR UNIT DISCONNECT

SCALE: NONE

### SCHEMATIC

FIRE ALARM SYMBOLS LEGEND	
SYMBOL	DEVICE
	FIRE ALARM CONTROL UNIT
	FIRE ALARM ANNUNCIATOR PANEL
 DC	FIRE ALARM SYSTEM CONTROL UNIT (DRY CHEMICAL)
	CONTROL PANEL FOR HVAC, EXHAUST, PRESSURIZATION, ETC.
	FIRE ALARM DOCUMENT CABINET
	FIRE ALARM MANUAL STATION
	FIRE ALARM HEAT DETECTOR
 F	FIRE ALARM HEAT DETECTOR (FIXED TEMPERATURE)
 R	FIRE ALARM HEAT DETECTOR (RATE OF RISE)
 R/F	FIRE ALARM HEAT DETECTOR (RATE OF RISE & FIXED TEMPERATURE)
 R/F	FIRE ALARM HEAT DETECTOR (RATE OF RISE & FIXED TEMPERATURE)
 H	SINGLE STATION HEAT ALARM WITH HEAT DETECTOR & AUDIBLE NOTIFICATION (HORN)
 HH	MULTIPLE STATION HEAT ALARM WITH HEAT DETECTOR & AUDIBLE NOTIFICATION (HORN)
	FIRE ALARM SMOKE DETECTOR
 H	SINGLE STATION SMOKE ALARM WITH SMOKED DETECTOR & AUDIBLE NOTIFICATION (HORN) – 120V WITH BATTERY BACKUP
 CO H	SINGLE STATION SMOKE ALARM / CARBON MONOXIDE WITH SMOKED DETECTOR & AUDIBLE NOTIFICATION (HORN) – 120V WITH BATTERY BACKUP
 HH	MULTIPLE STATION SMOKE ALARM WITH SMOKED DETECTOR & AUDIBLE NOTIFICATION (HORN) – 120V WITH BATTERY BACKUP
 CO HH	MULTIPLE STATION SMOKE ALARM / CARBON MONOXIDE WITH SMOKED DETECTOR & AUDIBLE NOTIFICATION (HORN) – 120V WITH BATTERY BACKUP
 CO	CARBON MONOXIDE DETECTOR
	FIRE ALARM DUCT SMOKE DETECTOR
	FIRE ALARM HORN
 15cd	FIRE ALARM HORN & STROBE WITH CANDELA RATINGS
 15cd	FIRE ALARM STROBE WITH CANDELA RATINGS
 TS	SPRINKLER VALVE TAMPER SWITCH
 FS	WATER FLOW SWITCH
 PS	LOW PRESSURE SWITCH

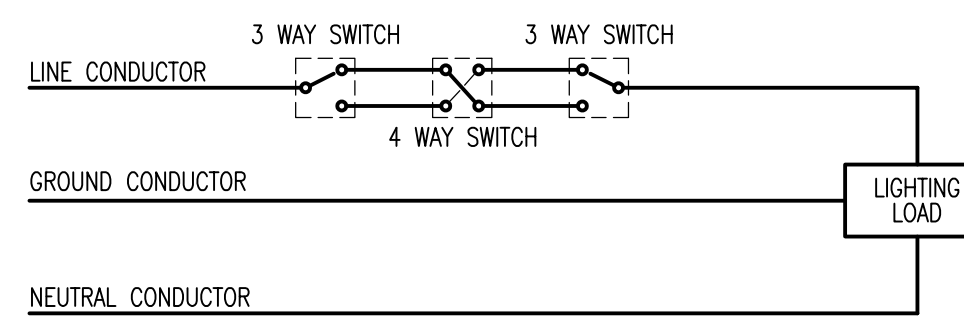
- NOTES:
1. THE FIRE ALARM INSTALLATION SHALL SATISFY THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
  2. APPROVAL FROM THE AUTHORITY HAVING JURISDICTION SHALL BE OBTAINED PRIOR TO INSTALLATION.



 DETAIL NOTES:

1. MC CABLE - SEE PANEL SCHEDULE FOR NUMBER OF CONDUCTORS AND MC SIZE
2. ELECTRICAL METALLIC TUBING - SEE PANEL SCHEDULE FOR NUMBER OF CONDUCTORS & EMT SIZE
3. 2P-40A - 600V MANUAL STARTER WITH NEMA 1 ENCLOSURE AND LOCKOUT WALL PLATE (EQUAL TO LEVITON MS402-BW, NEMA 1 ENCLOSURE AND LOCKOUT WALL PLATE)
4. WALL - SEE ARCHITECTURAL DRAWINGS FOR MATERIALS PROVIDE BLOCKING AS REQUIRED

HOT WATER GENERATOR  
DISCONNECT DETAIL  
(2P-6kW MAXIMUM)

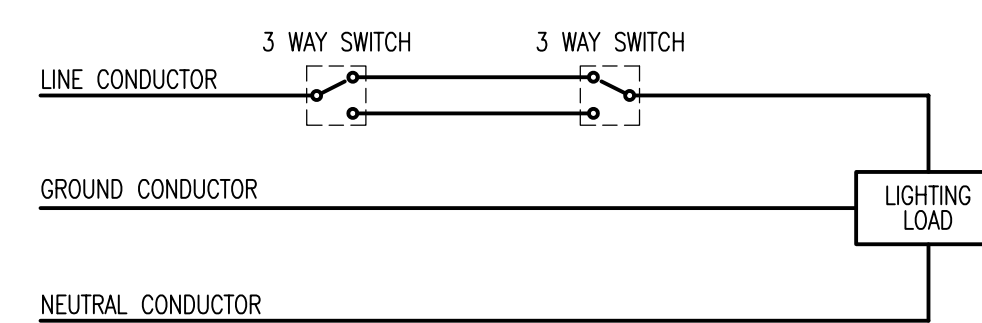


- NOTES:**
1. SEE PLAN SHEETS AND PANEL BOARD SCHEDULE FOR CONDUCTOR SIZES.
  2. SEE PLAN SHEETS AND WIRING DEVICE SCHEDULE FOR SWITCH LOCATION, SWITCH COLOR AND NEMA DESIGNATION.
  3. SEE PLAN SHEETS AND WIRING DEVICE SCHEDULE FOR PLATE COLOR AND PLATE MATERIAL.
  4. SEE PLAN SHEETS AND WIRING DEVICE SCHEDULE FOR MOUNTING HEIGHTS.

FOUR WAY SWITCH DETAIL

SCALE: NONE

ELECTRICAL SYMBOLS LEGEND	
	BREAKER
	SINGLE POLE SINGLE THROW SWITCH
	DISCONNECT SWITCH SEE PANEL SCHEDULE
	DIRECT CONNECTION
	SPECIAL CONNECTION - SEE PANEL SCHEDULE FOR RATINGS
	EGRESS LIGHT - SINGLE REMOTE HEAD
	EGRESS LIGHT - DOUBLE HEAD
	HOME RUN TO PANEL NAME 'A' AND CIRCUIT NUMBER '3'
	HOME RUN TO PANEL NAME 'A' AND CIRCUIT NUMBER '3' (NOTE: 'A' INDICATES THERE IS MORE ON CIRCUIT #3)
	CONDUIT AND CONDUCTORS CONCEALED BELOW FLOOR, WITHIN WALLS OR ABOVE CEILINGS
	EXPOSED ELECTRICAL METAL TUBING AND CONDUCTORS UNLESS OTHERWISE NOTED
	EXPOSED RACEWAY (WIRE MOLD) AND CONDUCTORS UNLESS OTHERWISE NOTED
	PLAIN OLD TELEPHONE SYSTEM CONDUIT
	OVERHEAD CONDUCTORS - NEW
	SERVICE ENTRANCE CONDUITS AND CONDUCTORS
	UNDERGROUND CONDUITS
	EXISTING UNDERGROUND CONDUITS
	OVERHEAD CONDUCTORS - EXISTING
	PLAN VIEW OF GROUND ROD WITH TEST WELL
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	FUSE
	ELECTRIC MOTOR
	OVERLOAD
	EMERGENCY STOP BUTTON
	PUSH BUTTON - START
	PUSH BUTTON - STOP
	NORMALLY OPEN FLOW SWITCH
	NORMALLY CLOSED FLOW SWITCH
	NORMALLY OPEN TEMPERATURE SWITCH
	NORMALLY CLOSED TEMPERATURE SWITCH
	COIL TO OPERATE CONTACTS
	HAND - OFF - AUTOMATIC CONTROL
	SURFACE MOUNTED ELECTRICAL PANEL - NEW
	RECESSED ELECTRICAL PANEL - NEW



- NOTES:**
1. SEE PLAN SHEETS AND PANEL BOARD SCHEDULE FOR CONDUCTOR SIZES.
  2. SEE PLAN SHEETS AND WIRING DEVICE SCHEDULE FOR SWITCH LOCATION, SWITCH COLOR AND NEMA DESIGNATION.
  3. SEE PLAN SHEETS AND WIRING DEVICE SCHEDULE FOR PLATE COLOR AND PLATE MATERIAL.
  4. SEE PLAN SHEETS AND WIRING DEVICE SCHEDULE FOR MOUNTING HEIGHTS.

### THREE WAY SWITCH DETAIL

[illegible]

WEST VIRGINIA ARMY NATIONAL GUARD  
**FLOOD RECOVERY**  
HOUSE DESIGN  
Charleston, WV

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# ELECTRICAL DETAILS, NOTES AND SCHEDULES

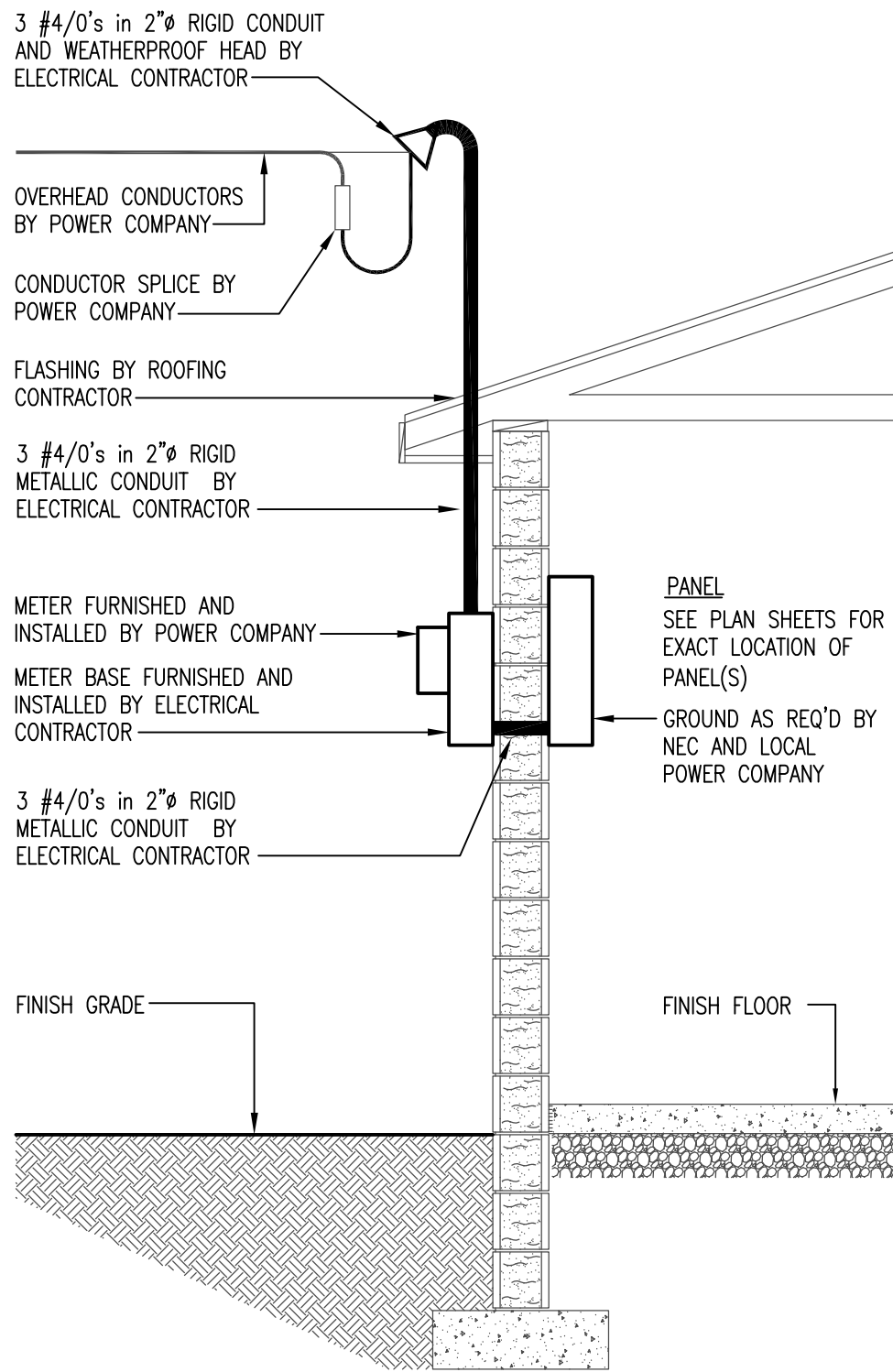
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**E512**



LUMINAIRE SCHEDULE									
MARK	MAKE	MODEL	LAMP	LAMP COLOR	VOLTAGE	MOUNTING	DIMENSIONS	ACCESSORIES / OPTIONS	
A	KICHLER	BRUSHED NICKEL FLUSH MOUNT LUMINAIRE	A BASE LED	4000 K	120 V	SURFACE MOUNTED ABOVE MIRROR	15.25"ø	ENERGY STAR CERTIFIED	
B	KICHLER	CRAFTSMAN 3-LIGHT SATIN NICKEL CONE LED VANITY LIGHT	A BASE LED	4000 K	120 V	SURFACE MOUNTED ABOVE MIRROR	21.73"	ENERGY STAR CERTIFIED	
C	KICHLER	BRUSHED NICKEL FLUSH MOUNT LUMINAIRE	A BASE LED	4000 K	120 V	SURFACE MOUNTED ABOVE MIRROR	13"ø	ENERGY STAR CERTIFIED	
D	HALO	WHITE INTEGRATED LED	LED	3000 K	120 V	RECESSED CAN LIGHT	5"ø	PROVIDE WITH HOUSING ENERGY STAR CERTIFIED	
AA	AMAX LTG	SL18 WALL PAK	2000 LUM LED	3000 K	120 V	WALL MTD		ENERGY STAR CERTIFIED	

LUMINAIRE SCHEDULE GENERAL NOTES:									
1. ALL LUMINAIRES SHALL HAVE A LOCAL DISCONNECT TO COMPLY WITH THE NATIONAL ELECTRICAL CODE.									
2. MANUFACTURERS ARE SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE PRODUCTS INDICATED ABOVE OR AN EQUAL PRODUCT BY A MANUFACTURER INDICATED: COOPER LIGHTING, HALO, DAYBRITE, HUBBELL, ACUITY BRANDS OR LITHONIA.									
3. LUMINAIRE PHOTOMETRIC DATA TESTING LABORATORY QUALIFICATIONS: PROVIDED BY MANUFACTURERS' LABORATORIES THAT ARE ACCREDITED UNDER THE NATIONAL VOLUNTEER LABORATORY ACCREDITATION PROGRAM FOR ALL LIGHTING PRODUCTS.									
4. COORDINATE LAYOUT AND INSTALLATION OF LIGHTING FIXTURES AND SUSPENSION SYSTEM WITH OTHER CONSTRUCTION THAT PENETRATES CEILINGS OR IS SUPPORTED BY THEM, INCLUDING HVAC EQUIPMENT, FIRE-SUPPRESSION SYSTEM, AND PARTITION ASSEMBLIES.									
5. UNIT EQUIPMENT AND BATTERY SYSTEMS FOR EMERGENCY LUMINAIRES SHALL BE LISTED TO ANSI/UL 924, STANDARD FOR EMERGENCY LIGHTING AND POWER EQUIPMENT.									
SUBMITTALS									
1. PRODUCT DATA: FOR EACH TYPE OF LIGHTING FIXTURE, ARRANGED IN ORDER OF FIXTURE DESIGNATION. INCLUDE DATA ON FEATURES, ACCESSORIES, FINISHES, AND THE FOLLOWING: A. PHYSICAL DESCRIPTION OF LIGHTING FIXTURE INCLUDING DIMENSIONS. B. EMERGENCY LIGHTING UNITS INCLUDING BATTERY AND CHARGER. C. ENERGY-EFFICIENCY DATA.									
2. OPERATION AND MAINTENANCE DATA: FOR LIGHTING EQUIPMENT AND FIXTURES TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS.									
3. PROVIDE A LIST OF ALL LAMP TYPES USED ON PROJECT, USE ANSI AND MANUFACTURERS' CODES.									



ELECTRICAL SERVICE ENTRANCE  
SCALE: 1/2" = 1'-0"

PANEL: SQUARE D LOAD CENTER ENCLOSURE: NEMA 1 COVER: HINGED & LOCKABLE WIRE: 3W MAIN BUS RATING: 200A - CONTINUOUS MAIN BREAKER: 200A									
PANEL 'A'									
N - G: YES - 100% NEUTRAL BUS PH, NEUT & GND BUS MATERIAL: TIN PLATED ALUMINUM MOUNTING: RECESSED SEE PLANS INCOMING MAINS LOCATION: SEE ELECTRICAL RISER SCHEMATIC FEED THROUGH LUGS: NO A/C: 22k AC									
SERVICE	DISC	BREAKER TYPE/POLE/AMPS	WIRE	EGG	C	240 VOLTS LOAD	A	1 PHASE C	DISC SERVICE
1 HP-A		2 2 20	3 #12's	12		1500	4000	2500	AH-A 2
3						1500		2500	4
5 CLOTHES DRYER		1 2 30	3 #10's	10		2880	5130	2250	HWC-A 6
7						2880		2250	8
9 CLOTHES WASHER		1 1 20	2 #12's	12		1600	6400	4800	STOVE 10
11 REFRIGERATOR		1 1 20	2 #12's	12		1600		4800	12
13 BATH RCPT		3 1 20	2 #12's	12		200	400	200	BATH RCPT 14
15 RECEPTACLES		3 1 20	2 #12's	12		400		400	RANGE HOOD 16
17 RECEPTACLES		3 1 20	2 #12's	12		400	800	400	RECEPTACLES 18
19 RECEPTACLES		3 1 20	2 #12's	12		1400		1000	RECEPTACLES 20
21 RECEPTACLES		3 1 20	2 #12's	12		1200	2000	800	RECEPTACLES 22
23 RECEPTACLES		3 1 20	2 #12's	12		800		800	RECEPTACLES 24
25 RECEPTACLES		3 1 20	2 #12's	12		800	2,000	1200	LIGHTS 26
27 LIGHTS		3 1 20	2 #12's	12		1200		1400	CRAWL SPACE EF-A 28
29 RECEPTACLES		3 1 20	2 #12's	12		800	1400	600	DISH WASHER 30
31 EXTERIOR LTS		3 1 20				800		0	SPARE 32
33 SPARE		1 1 20				0	0	0	SPARE 34
35 SPARE		1 1 20				0		0	SPARE 36
37 SPARE		1 1 20				0	0	0	SPARE 38
39 SPARE		1 1 20				0		0	SPARE 40
41 SPARE		1 1 20				0	0	0	SPARE 42
BREAKER TYPE: 1. THERMAL MAGNETIC TRIP 2. HEATING AIR CONDITIONING OR REFRIGERATION CIRCUIT BREAKER (HACR) 3. ARC FAULT CIRCUIT INTERRUPTER 4. SHUNT TRIP						19,960	22,130	22,530	24,700
								44,660 VA	
								186.1 AMPS	
						DISCONNECT (DISC) TYPE: SEE DISCONNECT SCHEDULE (UNLESS OTHER WISE NOTED) 1. LOCKABLE BREAKER 2. SUPPLIED BY MANUFACTURER 3. MANUAL STARTER 4. 2P-60A ENCLOSED MOLDED CASE SWITCH			

PANEL: SQUARE D LOAD CENTER ENCLOSURE: NEMA 1 COVER: HINGED & LOCKABLE WIRE: 3W MAIN BUS RATING: 200A - CONTINUOUS MAIN BREAKER: 200A									
PANEL 'B'									
N - G: YES - 100% NEUTRAL BUS PH, NEUT & GND BUS MATERIAL: TIN PLATED ALUMINUM MOUNTING: RECESSED SEE PLANS INCOMING MAINS LOCATION: SEE ELECTRICAL RISER SCHEMATIC FEED THROUGH LUGS: NO A/C: 22k AC									
SERVICE	DISC	BREAKER TYPE/POLE/AMPS	WIRE	EGG	C	240 VOLTS LOAD	A	1 PHASE C	DISC SERVICE
1 HP-B		2 2 20	3 #12's	12		1500	4000	2500	AH-B 2
3						1500		2500	4
5 CLOTHES DRYER		1 2 30	3 #10's	10		2880	5130	2250	HWC-B 6
7						2880		2250	8
9 CLOTHES WASHER		1 1 20	2 #12's	12		1600	6400	4800	STOVE 10
11 REFRIGERATOR		1 1 20	2 #12's	12		1600		4800	12
13 BATH RCPT		3 1 20	2 #12's	12		200	400	200	BATH RCPT 14
15 RECEPTACLES		3 1 20	2 #12's	12		1000		1400	RANGE HOOD 16
17 RECEPTACLES		3 1 20	2 #12's	12		1000	2000	1000	RECEPTACLES 18
19 RECEPTACLES		3 1 20	2 #12's	12		1200		2200	RECEPTACLES 20
21 RECEPTACLES		3 1 20	2 #12's	12		400	1200	800	EXTERIOR LTG 22
23 RECEPTACLES		3 1 20	2 #12's	12		800		800	RECEPTACLES 24
25 RECEPTACLES		3 1 20	2 #12's	12		800	2,600	1800	LIGHTS 26
27 LIGHTS		3 1 20	2 #12's	12		1800		2000	CRAWL SPACE EF-B 28
29 RECEPTACLES		3 1 20	2 #12's	12		200	600	400	RECEPTACLES 30
31 RECEPTACLES		3 1 20	2 #12's	12		400		800	RECEPTACLES 32
33 SPARE		3 1 20				0	600	600	DISH WASHER 34
35 SPARE		1 1 20				0		0	SPARE 36
37 SPARE		1 1 20				0	0	0	SPARE 38
39 SPARE		1 1 20				0		0	SPARE 40
41 SPARE		1 1 20				0	0	0	SPARE 42
BREAKER TYPE: 1. THERMAL MAGNETIC TRIP 2. HEATING AIR CONDITIONING OR REFRIGERATION CIRCUIT BREAKER (HACR) 3. ARC FAULT CIRCUIT INTERRUPTER 4. SHUNT TRIP						19,760	22,930	23,530	26,700
								46,460 VA	
								193.6 AMPS	
						DISCONNECT (DISC) TYPE: SEE DISCONNECT SCHEDULE (UNLESS OTHER WISE NOTED) 1. LOCKABLE BREAKER 2. SUPPLIED BY MANUFACTURER 3. MANUAL STARTER 4. 2P-60A ENCLOSED MOLDED CASE SWITCH			

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E513