PLUMBING DRAWING LIST

PLUMBING FIXTURE SCHEDULE

ITEM NO.	FIXTURE TYPE	WASTE CONN.	VENT CONN.	CW CONN.	HW CONN.	REMARKS
P-1	WATER CLOSET	3"	-	1 1/2"	-	
P-1A	WATER CLOSET (ADA)	3"	-	1 1/2"	-	
P-2	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	
P-2A	LAVATORY (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3	TUB/SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3A	TUB/SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3B	SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3C	SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-4	KITCHEN SINK	1 1/2"	1 1/2"	1/2"	1/2"	
P-4A	KITCHEN SINK (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	

PLUMBING LEGEND

SYMBOL	DESCRIPTION
W	SANITARY PIPING WASTE (ABOVE GRADE)
W	SANITARY PIPING WASTE (BELOW FLOOR)
GW	GREASE WASTE (BELOW FLOOR)
V	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWR	HOT WATER RECIRCULATION PIPING
	PIPE TURNING UP/DOWN
	FULL OPEN PORT GATE VALVE
	FLOOR DRAIN
	FLOOR CLEANOUT
	CLEANOUT
	1 HR RATED WALLS
	2 HR RATED WALLS
WHA	WATER HAMMER ARRESTOR
P-1	FIXTURE TYPE
	MIXING VALVE
	AIR ADMITTANCE VALVE
	BACKFLOW PREVENTOR

PLUMBING GENERAL NOTES

APPLICABLE CODES:
INTERNATIONAL PLUMBING CODE (IPC) 2015
INTERNATIONAL BUILDING CODE (IBC) 2015
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI A117.1-2009)
UNIFORM STATEWIDE BUILDING CODE OF ALABAMA 2015

PLUMBING SYSTEMS:
PROVIDE ALL PLUMBING FIXTURES AND TRIM AS INDICATED ON THE DRAWINGS AND AS SPECIFIED ELSEWHERE HEREIN. ALL FIXTURES SHALL BE CONNECTED TO THE PLUMBING SYSTEMS AS INDICATED AND REQUIRED FOR PROPER OPERATION. PIPING MATERIALS, ACCESSORIES AND EQUIPMENT SHALL BE SPECIFIED ELSEWHERE WITHIN THIS SPECIFICATION.

SANITARY WASTE AND VENT SYSTEMS:
PROVIDE A COMPLETE SANITARY, WASTE AND VENT SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING REQUIRING CONNECTIONS. ALL WASTE FROM THE BUILDING SHALL DISCHARGE BY GRAVITY OUT THE BUILDING TO BE PICKED UP BY CIVIL AND EXTENDED TO THE SEWER SYSTEM. SANITARY PIPING TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE OTHERWISE NOTED.

WATER SUPPLY SYSTEM:
PROVIDE A COMPLETE WATER SUPPLY SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING INCLUDING DOMESTIC WATER HEATERS. PROVIDE APPROVED GATE OR COMPRESSION STOPS AT EVERY CONNECTION TO FIXTURES AND EQUIPMENT.

STORM DRAINAGE SYSTEM:
REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND SIZING.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND FIXTURES. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGARS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.

PERMIT, FEES AND NOTICES:
COMPLY WITH THE GENERAL CONDITIONS AND PROVIDE ALL PERMITS AS REQUIRED FOR THE INSTALLATION OF ALL INDICATED PLUMBING SYSTEMS.

FIRE RATINGS:
SEPARATIONS BETWEEN R-2 TENANTS ARE 1-HR RATED.
CEILINGS ARE 1-HR RATED.
STAIRWELLS AND ELEVATOR ARE 2-HR RATED..

FULLY SPRINKLERED PER NFPA 13

USE GROUP: R-2
CONSTRUCTION: 5-A

PLUMBING SPECIFICATIONS

A. PIPE AND PIPE FITTINGS: 1. DOMESTIC (POTABLE) WATER (CW/HW) PIPING: SYSTEM DESIGN PRESSURE = 80 PSIG. PIPING 1" AND SMALLER SHALL BE PEX TUBING. BETWEEN 1-1/4" AND 2" SHALL BE SDR 11 CPVC TUBING. FOR PIPING GREATER THAN 2" PROVIDE SCHEDULE 80 CPVC TUBING.

2. SANITARY (W) AND VENT (V) PIPING: ALL SANITARY AND VENT PIPING SHALL BE SCHEDULE 40 PVC.

3. CONDENSATE DRAIN (D) PIPING: SYSTEM DESIGN PRESSURE = 10 PSIG. PROVIDE SCHEDULE 40 PVC.

4. STORM WATER (SW) PIPING: PROVIDE SCHEDULE 40 PVC.

B. VALVES:
1. GATE VALVES: POTABLE WATER SERVICE SIZES 1/2" - 2-1/2" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC PIPING SYSTEMS. ALL SHUT OFF VALVES SHALL BE FULL OPEN PORT TYPE VALVES.

2. DRAIN VALVES: POTABLE WATER SERVICE SIZES 1/2" AND 3/4" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC SYSTEMS.

3. BACKFLOW PREVENTER: SPECIFICATIONS ARE BASED ON WATTS LF909 LARGE SERIES WITH 909AG-F AIR GAP. PROVIDE AT LOCATIONS IN WHICH THE PUBLIC WATER SUPPLY SYSTEM MUST BE PROTECTED. MATERIALS OF CONSTRUCTION - EPOXY COATED CAST IRON BODY AND STRAINER, LEAD FREE COPPER SILICONE ALLOY TEST COCKS, STAINLESS STEEL SEATS , REDUCED PRESSURE ZONE ASSEMBLY WITH RELIEF DRAIN ASSEMBLY. PIPE RELIEF TO FLOOR DRAIN AS SHOWN.

C. PLUMBING FIXTURES: ALL PLUMBING FIXTURES AND TRIM SHALL BE NEW AS MANUFACTURED BY FIRMS REGULARLY ENGAGED IN THE MANUFACTURE OF PLUMBING FIXTURES, AND TRIM OF TYPE, STYLE AND CONFIGURATION REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE AND SIMILAR SERVICE.

D. PROVIDE PROTECTION OF ALL FIXTURES DURING CONSTRUCTION FROM DAMAGE. EACH WATER SUPPLY CONNECTION SERVING A FIXTURE SHALL BE EQUIPPED WITH AN ACCESSIBLE STOP VALVE. CAULK ALL GAPS IN AROUND WALLS/FLOORS AND THE PLUMBING FIXTURES. SPECIFICATIONS FOR THE PLUMBING FIXTURES ARE BASED ON THE FOLLOWING TYPES.

E. PIPE INSULATION:
1. CLOSED CELL ELASTOMERIC (PIPE SIZES UP TO 5 INCHES): FLEXIBLE ELASTOMERIC, CLOSED CELLULAR, TUBULAR MOLDED TO ACCOMMODATE PIPING, SMOOTH OUTER SURFACE SUITABLE FOR PAINTING WITH VINYL LACQUER TYPE COATING, WATER RESISTANT, NONABSORBENT, OZONE RESISTANT, MINIMUM DENSITY OF 4 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF 0.27 AT 75 F MEAN TEMPERATURE

APPLICATIONS:
1. DOMESTIC HOT AND COLD WATER (ALL SIZES) ON ALL EXTERIOR WALL PIPING OR IN UNCONDITIONED SPACES ONLY: PROVIDE 1/2" CLOSED CELL ELASTOMERIC.

F. WATER HEATERS :
ELECTRIC WATER HEATER - FULLY INSULATED BAKED ENAMEL STEEL JACKET, INSULATED IN CONFORMANCE WITH ASHRAE 90A-1980 STANDARD FOR ELECTRIC DOMESTIC WATER HEATER. GLASS LINING, RELIEF VALVE TAP, HEAT TRAPS, RATED FOR 150 PSI. PLATED COPPER ELEMENT, LOW WATT DENSITY, REPLACEABLE IMMERSION TYPE. PROVIDE WITH RELIEF VALVE AND FACTORY PACKAGED CONTROL WIRING.

EWH-1 - 40 GALLON 4.5 KW DUAL ELEMENT WATER HEATER. HEATER SHALL BE "SHORT" CONSTRUCTION. PROVIDE WITH 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE. BASED ON RUUD MODEL PROE38-S2-RU55.

PROVIDE WATER HEATERS WITH 2.5-GAL EXPANSION TANK (ET-1).

WATER HEATERS ARE LOCATED WITHIN A VENTILATED SPACE AND OVER AN IMPERVIOUS FLOOR.

G. FIXTURES :

MAKE AND MODELS OF SPECIFIC FIXTURES TO BE USED.
PROVIDE INDICATED QUANTITIES OF FIXTURES. SEE ARCHITECTS DRAWING FOR

WB-1: WASHING MACHINE BOX (PLASTIC): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER.

WB-2: WASHING MACHINE BOX (FIRE RATED): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 FIRE RATED WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER .

IM-1: REFRIGERATOR BOX (PLASTIC): WATER-TIGHT RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

IM-2: REFRIGERATOR BOX (FIRE RATED): IPS FIRE GUARD RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

FCO: PROVIDE SIZING AS INDICATED ON THE DRAWINGS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES CLEANOUTS WITH NICKEL BRONZE ADJUSTABLE TOPS. MATCH MATERIALS OF CONSTRUCTION FOR BODY TYPE.

WCO: PROVIDE CHROME PLATED COVER FOR SANITARY TEST TEE AT ALL INDICATED LOCATIONS.

FD: FLOOR DRAINS - PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS. FLOOR DRAINS SHALL BE SUPPLIED WITH NICKEL BRONZE ADJUSTABLE TOPS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES 834 FLOOR DRAINS. PROVIDE DRAINS SUBJECT TO EVAPORATION WITH A TRAP SEAL.

WH-1: FREEZELESS WALL HYDRANT - BACKFLOW PROTECTED WITH ANTI-SIPHON VACUUM BREAKER (ASSE 1011), TEE KEY, COPPER TUBES, CHROME FINISH, PERMANENT TYPE BRASS VALVE BODY, ASSE STANDARD 1019-B, WITH AUTOMATIC DRAINING. BASED ON WOODFORD MODEL 65.

RH-1: ROOF HYDRANT - SPECIFICATION BASED ON WOODFORD MODEL SRH-MS, FREEZELESS ROOF HYDRANT, WITH INTEGRAL ANIT-SIPHON VACUUM BREAKER, BACKFLOW PROTECTED WITH FIELD TESTABLE ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER. NO DRAIN REQUIRED - A VENTURI ACTION DRAWS WATER OUT OF THE INTERNAL RESERVOIR AND DISCHARGES OF THE BACKFLOW PREVENTER. ALL NECESSARY MOUNTING HARDWARE FOR PROPER INSTALLATION ON A COMMERCIAL ROOF IS TO BE SUPPLIED WITH DEVICE.

PROVIDE KITCHEN SINKS WITH TAILPIECE FOR DISHWASHER CONNECTION AND DISPOSAL. DISPOSAL TO BE EQUAL TO SINK GUARD MODEL SE150, 1/3 HP, CORROSION RESISTANT COMPOSITE HOPPER WITH CAST STAINLESS STEEL ANTI-JAM SWIVEL IMPELLERS. PROVIDE WHA AND SHUT OFF VALVE FOR CONNECTION TO DISHWASHER.

MISCELLANEOUS PLUMBING ITEMS:

1. TRAP SEAL: PROVIDE A TRAP SEAL AT ALL OPENSITE AND FLOOR DRAINS SUBJECT TO EVAPORATION. TRAP SEAL SPECIFICATIONS ARE BASED ON JOSAM 88240 SERIES TRAP SEAL INSERT. MUST BE AN ASSE 1072 TRAP SEAL DEVICE.

2. AIR ADMITTANCE VALVE (AAV): AAV'S MAY BE EITHER OATEY OR STUDOR TYPE. ALL AAV'S USED WITH WB'S SHALL BE BY OATEY (SUBSTITUTION BY APPROVAL ONLY).

3. WATER HAMMER ARRESTORS (WHA): PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON. DESIGNED TO OPERATE UP TO 150 PSI WORKING PRESSURE.

4. ALL APARTMENT DOMESTIC WATER SHUT OFF VALVES WILL BE LOCATED IN AN EASILY ACCESSIBLE LOCATION.

5. IDENTIFY ALL MAIN SHUT OFF VALVES BY TAGGING EACH.

6. IT IS THE INTENT OF THESE DRAWINGS THAT ALL TUB/SHOWERS WILL BE ABOVE FLOOR ROUGH IN.

7. PROVIDE QUARTER TURN SHUT OFF VALVES FOR ALL PLUMBING FIXTURES.

8. PROVIDE WHA'S ON ALL CONNECTIONS SERVING DISHWASHERS.

9. ALL PLUMBING FIXTURES TO HAVE SHUT OFF VALVES OR INTEGRAL STOPS.

10. ALL LAVATORIES ARE TO MEET THE PROPER CLEARANCES PER SECTION 405.3.1 OF THE IPC. SEE ARCHITECTS DRAWINGS FOR DIMENSIONED BATHROOM DRAWINGS.

11. PROVIDE A CLEAN OUT AT THE BASE OF ALL SANITARY STACKS.

12. ALL RISERS SHALL HAVE AN ACCESSIBLE SHUT OFF VALVE. PROVIDE 12x12 FIRE RATED ACCESS DOORS TO ALL VALVES IF REQUIRED.

13. ALL PIPING TO BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS.

14. ALL WATER LINES TO PLUMBING FIXTURES SHALL BE BURST PROOF, FLEXIBLE STAINLESS STEEL TYPE SUPPLY LINES.

15. RUN AIR HANDLING UNIT AND WATER HEATER RELIEF LINES TO NEAREST STORMWATER PIPES.

16. PROVIDE A DRAIN PAN UNDER THE WASHING MACHINE WITH A WATER SENSING DEVICE THAT SHUTS OFF WATER TO THE WASHER WHEN WATER IS DETECTED WITHIN THE DRAIN PAN.

ALABAMA LICENSED
PATRICK J. O'NEIL
NO. 25835
PROFESSIONAL ENGINEER

TERRACES AT HIGH MOUNTAIN - A1
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

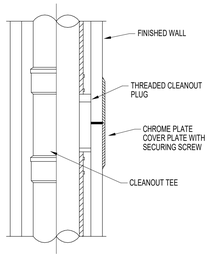
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	NONE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING ABBREVIATIONS, LEGENDS, SCHEDULES, AND SPECIFICATIONS

SHEET:

P1.001

HIGH MOUNTAIN DEVELOPMENT - A



WALL CLEANOUTS

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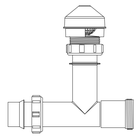

AIR ADMITTANCE VALVE - TUBULAR ADAPTER FOR UNDER SINK INSTALLATION

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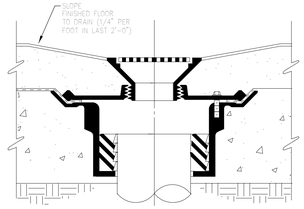
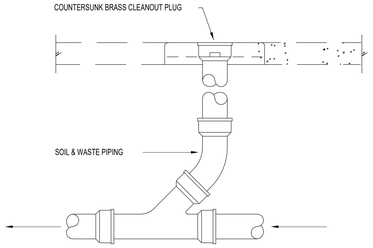


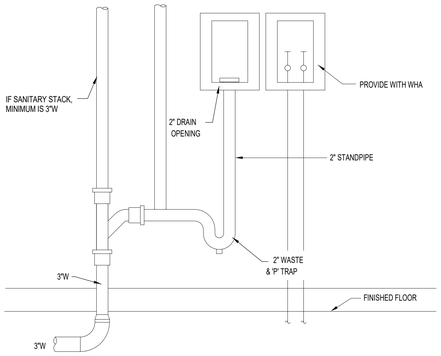
FLOOR DRAIN DETAIL

NOT TO SCALE



C.O. UP TO GRADE

NOT TO SCALE



PLUMBING CONNECTIONS FOR LAUNDRY OUTLET W/ SIOUX CHIEF OX BOX & CONDENSATE DRAIN ADAPTER

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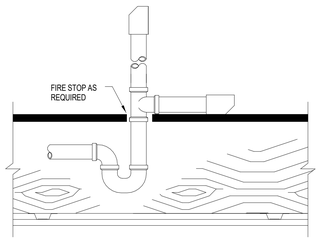
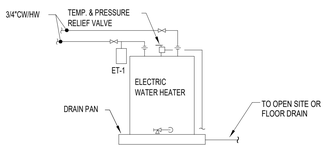


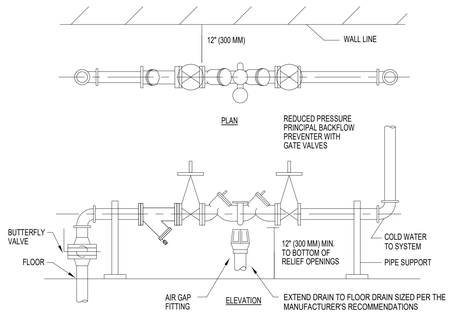
ABOVE FLOOR ROUGH IN DETAIL TUB/SHOWER

NO SCALE



WATER HEATER DRAIN DETAIL

NOT TO SCALE



BACKFLOW PREVENTER PIPING DETAIL - DOMESTIC WATER

NOT TO SCALE

NOTES:

1. BACKFLOW TO BE MOUNTED IN HORIZONTAL POSITION. ALL MOUNTING CLEARANCES AND INSTALLATION TO BE PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTER WITH GATE VALVES. PROVIDE FULL OPEN PORT SHUT OFF VALVE AND STRAINER UPSTREAM OF BACKFLOW.
3. BACKFLOW WILL NOT BE PLACED WITHIN A VAULT.
4. BACKFLOW TO BE MOUNTED AT A HEIGHT SUCH THAT NO LADDER WILL BE NEEDED TO SERVICE THE BACKFLOW.

Design Specification Sheet

FR 12 Fire Resistant Ice Box

IPS CORPORATION
202 Industrial Park Lane
Collierville, TN 38017
(901) 853-5001

Ratings: ASTM-E814 - 1 Hour (F), 1 Hour (T)
CAN/ULC - S115 1 Hour (F/FH), 1 Hour (FT/FTH)
ASTM-E814 - 2 Hour (F), 1.25 Hour (T)
CAN/ULC- S115 2 Hour (F/FH), 1.25 Hour (FT/FTH)
Firestop Device, Design No. IPS/PV 120-01

Models 82408 to 82444, 82462 to 82470

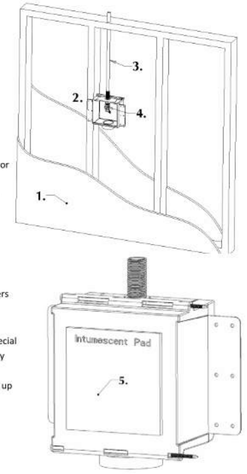
1. Wall Construction
- Wood Or Steel Stud
- 1 Hour firewall construction consisting of each stud face being finished with 5/8 gypsum
- 2 Hour firewall construction consisting of each stud face being finished with 2 layers of 5/8 gypsum

2. Box Mounting
- Box should be securely fastened to stud with screws or nails
- Box units cannot be installed back to back within the same wall cavity

3. Piping Options
- Supply tubing may be metallic or plastic

4. Valve Options
- Quarter Turn Valves with or without hammer arresters

5. Intumescent Pad
- The IPS FR12 Series Ice Box is manufactured from special frame resistant resin with an intumescent pad factory installed on the back of the box (do not remove).
- Gaps between the box and the gypsum may be filled up to ½" with dry wall plaster.



Design Specification Sheet

FR12 Fire Resistant Washer Box

IPS CORPORATION
202 Industrial Park Lane
Collierville, TN 38017
(901) 853-5001

Ratings: ASTM-E814 - 1 Hour (F), 1 Hour (T)
CAN/ULC - S115 1 Hour (F/FH), 1 Hour (FT/FTH)
ASTM-E814 - 2 Hour (F), 1.25 Hour (T)
CAN/ULC- S115 2 Hour (F/FH), 1.25 Hour (FT/FTH)
Firestop Device, Design No. IPS/PV 120-01

Models 82353 to 82399

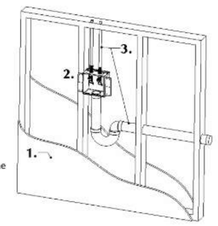
1. Wall Construction
- Wood Or Steel Stud
- 1 Hour firewall construction consisting of each stud face being finished with 5/8 gypsum
- 2 Hour firewall construction consisting of each stud face being finished with 2 layers of 5/8 gypsum

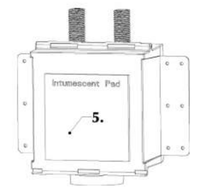
2. Box Mounting
- Box should be securely fastened to stud with screws or nails
- Box units cannot be installed back to back within the same wall cavity

3. Piping Options
- Drains may be nominal 2" or larger PVC, ABS or metallic pipe
- Supply tubing may be either metallic or plastic
- All plumbing within the wall must be secured

4. Valve Options
- Single Lever with or without hammer arresters
- Quarter Turn Valves with or without hammer arresters

5. Intumescent Pad
- The IPS FR series washer box is manufactured from special flame resistant resin with an intumescent pad factory installed on the back of the box (do not remove).
- Gaps between the box and the gypsum may be filled up to ½" with dry wall plaster.





ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1
4130 HIGH MOUNTAIN ROAD NE
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SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P1.002

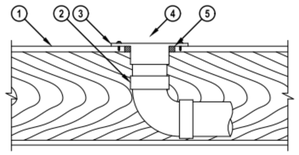
HIGH MOUNTAIN DEVELOPMENT - A

UL SYSTEM NO. F-C-2203

CLOSET FLANGE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1-HR.

CROSS-SECTIONAL VIEW



FC2203d.011617

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
   B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. (NOT SHOWN). FLOOR MOUNTED VITREOUS CHINA WATER CLOSET.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

Hilti Firestop Systems	HILTI, Inc. Plano, Texas USA (800) 879-8000	Sheet: 1 of 1 Scale: 1/8" = 1" Date: Jan. 16, 2017	Drawing No. FC 2203d

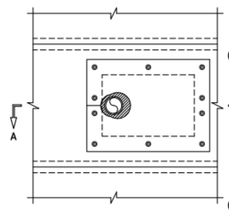
Saving Lives through Innovation and Education

UL SYSTEM NO. F-C-2204

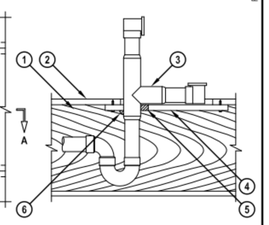
PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1/2-HR.

BOTTOM VIEW



SECTION A-A



FC2204b.010715

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. MAXIMUM 1-1/2" NOMINAL DIAMETER PVC OR ABS PLASTIC PIPE (SCHEDULE 40) AND DRAIN FITTINGS CEMENTED TOGETHER WITH PVC OR ABS BATHTUB WASTE/OVERFLOW FITTINGS.
4. 3/4" THICK PLYWOOD PATCH SIZED TO OVERLAP MINIMUM 2" BEYOND EACH EDGE OF RECTANGULAR OPENING. TWO PIECES POSITIONED AROUND DRAIN PIPING WITH CUT EDGES TIGHTLY BUTTED, AND SCREW ATTACHED TO UNDERSIDE OF SUBFLOOR WITH 1-1/4" LONG STEEL SCREWS (SPACED MAXIMUM 6" C/C). (SEE NOTE NO. 3 BELOW).
5. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM SIZE OF OPENING = 12" x 8".
2. ANNULAR SPACE BETWEEN DRAIN PIPING AND PATCH = MINIMUM 0", MAXIMUM 1".
3. AS AN ALTERNATE TO PLYWOOD, 5/8" THICK GYPSUM WALL BOARD MAY BE USED.

Hilti Firestop Systems	HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000	Sheet: 1 of 1 Scale: 1/8" = 1" Date: Jan. 07, 2015	Drawing No. FC 2204b

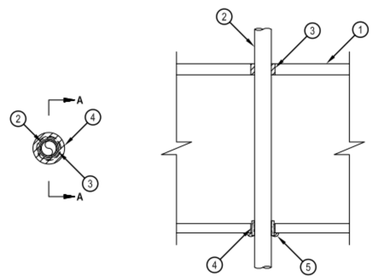
Saving Lives through Innovation and Education

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2230

F Rating - 1 Hr
T Rating - 1/4 Hr

FC 2230



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 1-5/8 in. (41 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design.

Hilti Firestop Systems

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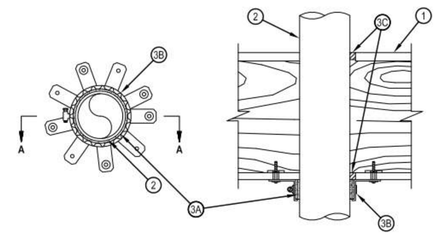
Page: 1 of 2

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2232

F Rating — 1 Hr
T Rating — 3/4 and 1 Hr (See Item 3)

FC 2232



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
2. Through Penetrants — One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) and max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

Hilti Firestop Systems

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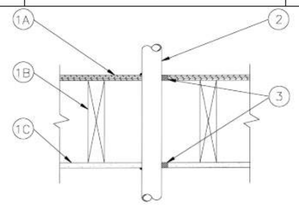
Page: 1 of 2

F Rating – 1 Hr T Rating – 1 Hr	F-C-2080



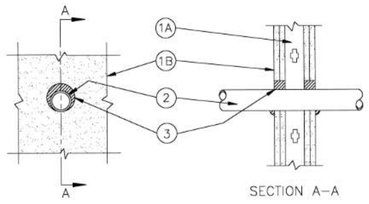
1. **Floor-Ceiling Assembly –** The fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Flooring System –** Lumber of plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of floor opening is 3-1/8 in.
   B. **Wood Joists –** Nom 2 by 10 in. deep (or deeper) lumber joists spaced 16 in. OC, with nom 1 by 3 in. lumber bridging and with ends firestopped or steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board* –** Nom 5/8 in. thick as specified in the individual Floor-Ceiling Design. Max diam of opening is 3-1/8 in.
2. **Through Penetrant –** One non-metallic pipe or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. Pipe to be rigidly supported on both sides of floor assembly.
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 cellular or solid core chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   B. **Polyvinyl Chloride (PVC) –** Nom 2 in. diam (or smaller) Schedule 40 (or heavier) PVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit* –** Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).

Underwriters Laboratories Inc.®

09/16 (1)

F Ratings – 1, 2, 3 and 4 Hr (See Item 1) T Ratings – 1, 2, 3 and 4 Hr (See Item 1)	W-L-2126

ANSI/UL1479 (ASTM E814)
F Ratings — 1, 2, 3 and 4 Hr (See Item 1)
T Ratings — 1, 2, 3 and 4 Hr (See Item 1)



SECTION A–A

1. **Wall Assembly –** The 1, 2, 3 or 4 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs –** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC.
   B. **Gypsum Board* –** The gypsum wallboard type, thickness, number of layers, fasteners and sheet orientation shall be as specified in the individual U300 or U400 Series Designs in the UL Fire Resistance Directory. Max diam of opening is 3-1/8 in.
   The hourly F and T Ratings of the firestop system is equal to the hourly fire rating of the assembly in which it is installed.

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09/16 (1)

System No. F-C-2230

FC 2230

2. Through Penetrants — One non-metallic tube to be installed concentrically within the firestop system. Annular space between tube and periphery of opening shall be 1/4 in. (6 mm). Tube to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of non-meyallic tubes or pipes may be used:
   Crosslinked Polyethylene (PEX) Tubing — Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Fill, Void or Cavity Materials* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1 in. (25 mm) wide intumescentwrap strip. One layer of wrap strip tightly wrapped around tube and held in place with tape. Wrap strip centered in annular space extending from both sides of gypsum board.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W25/1" Wrap Strip
4. Fill, Void or Cavity Materials* - Sealant — Min 3/4 in. (19 mm) depth of fill material applied within the annulus, flush with the top surface of floor. A 1/4 in. (6 mm) diam bead of fill material shall also be applied at the wrap strip/gypsum board interface.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Sealant - FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems

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System No. F-C-2232

FC 2232

3. Nonmetallic Pipe Coupling — (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC, Schedule 40 ABS or SDR13.5 CPVC coupling corresponding to pipe type installed such that the top of the coupling is flush with the bottom surface of the ceiling and extending downward.
4. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1-3/4 in. (44 mm) wide intumescent wrap strip. Layers of wrap strip continuously wrapped around the pipe and held in place with tape. Wrap strip butted tightly against surface of ceiling.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W45/1-3/4" Wrap Strip

Nom Diam of Pipe, in. (mm)	Number of Wrap Strips	Min/Max Annular Space, in. (mm)	T-Rating - Hr.
2 (51)	1	0-1/4 (0-6)	1
3 (76)	2	0-1/2 (0-13)	3/4
4 (102)	2	0-1/2 (0-13)	3/4

   B. Steel Collar — Collar fabricated from coils of precut min 0.017 in. (0.43 mm) thick (No. 28 MSG) galv steel available from the sealant manufacturer. Collar shall be nom 1-3/4 in. (44 mm) deep with 1 in. (25 mm) wide by 2 in. (51 mm) long anchors tabs on 2 in. (51 mm) centers for securement to floor/ceiling assembly. The opposite side incorporates retainer tabs, 1/2 in. (13 mm) wide by 3/16 in. (5 mm) long, prebent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 1 in at seam. A nom 1/2 in. (13 mm) wide stainless steel hose clamp shall be secured to the collar at its mid-height. Every other anchor tab of collar secured to gypsum ceiling with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel toggle bolts in conjunction with 1/4 in. by 3/4 in. (6 by 19 mm) diameter steel washers.
   C. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface on top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX SEALANT
   4A. Firestop System — (Optional, Not shown) As an option to Item 4, the firestop system shall consist of the following:
   A. Firestop Device* — Galv steel collar lined with an intumescent material sized to fit the specific diam of pipe shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the gypsum board ceiling with 1/4 in. diam by 1-1/2 in. (38 mm) long steel toggle bolts with 3/4 in. (19 mm) diam steel washers through hanger tabs provided.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N or CP 643 110/4"N Firestop Collar.
   B. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface, flush with top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems

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Page: 2 of 2

Continued … F-C-2080

3. **Fill, Void or Cavity Material* – Sealant –** Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling. Min 1/2 in. diam bead of fill material applied at the penetrant/floor and penetrant/ceiling interfaces at point contact locations on both sides of assembly.
   Passive Fire Protection Partners – 3600EX, 4800DW

* Bearing the UL Classification Marking
+ Bearing the UL Listing Mark

Continued… W-L-2126

2. **Through Penetrants –** One nonmetallic pipe or tubing installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes or tubing may be used:
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 CPVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.
   B. **Crosslinked Polyethylene (PEX) Tubing –** Nom 1-1/2 in. diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems. The annular space between tubing and periphery of opening shall be min 1/4 in. to max 3/8 in.
   C. **Polyvinyl Chloride (PVC) Pipe –** Nom 2 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.

3. **Fill, Void or Cavity Material* – Sealant –** Min 5/8 in. thickness of fill material for a 1 hr rated wall assembly, min 1 in. thickness of fill material for 2, 3 and 4 hr rated assemblies applied within the annulus, flush with both surfaces of wall.
   Passive Fire Protection Partners – 3600EX, 4800DW

*Bearing the UL Classification Marking

ALABAMA LICENSED NO. PE36516 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

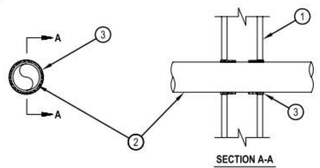
P1.003

HIGH MOUNTAIN DEVELOPMENT - A

WL 2284

System No. W-L-2284

F Rating - 1 Hr
T Rating - 1 Hr



SECTION A-A

1. Wall Assembly -- The 1 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing shall consist of wood studs or steel channel studs. Wood studs to consist of 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- Min 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers and orientation shall be as specified in the individual U300 or U400 Wall and Partition Design. Max diam of opening is 4 in.
2. Through Penetrants -- One nonmetallic pipe to be centered within the firestop system. An annular space of 3/16 to 1/4 in. is required within the firestop system. Pipe to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe -- Nom 3 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 3 in. diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Material* -- Wrap Strip - Layers of intumescent wrap strip are continuously wrapped around the pipe with ends held in place with tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall. Size of wrap strip and number of layers are shown in table below.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP648-E W25/1" or CP648-E W45/1-3/4" Firestop Wrap Strip

ProductDesignation	Pipe Diameter (in.)	Number of Layers	Nom. Wrap Strip Width (in.)
CP648-E-W25/1*	1-1/2 and 2	1	1
CP648-E-W45/1-3/4*	1-1/2, 2 and 3	1	1-3/4

   A. Fill, Void or Cavity Material* - Wrap Strip -- (As an alternate to the wrap strip in Item 3) - One layer of intumescent wrap strip is tightly wrapped around the pipe with ends butted and held in place with integrated tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- CP648-S-1.5" US, CP648-S-2" US, CP648-S-3" US
*Bearing the UL Classification Mark

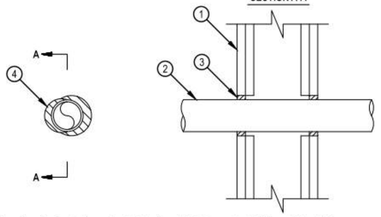
Hilti Firestop Systems

WL 2474

System No. W-L-2474

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating at 400 F - 4 CFM/Sq Ft

SECTION A-A



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below.
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Diam of opening shall be 1 in. (25 mm) larger than the nom pipe diam.

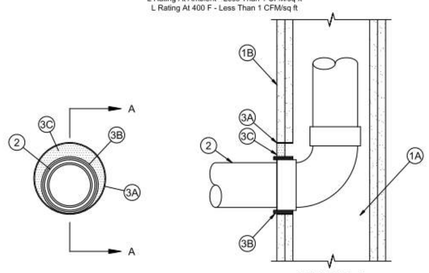
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and the periphery of the opening shall be min 0 in. (point contact) to a max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) cellular or solid core Schedule 40 (or heavier) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
   D. Rigid Nonmetallic Conduit (RNC)+ — Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
3. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At point contact location, a min 5/8 in. (16 mm) diam bead of fill material shall be applied to the wall/penetrant interface on both surfaces of the wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
+ Bearing the UL Listing Mark

Hilti Firestop Systems

System No. W-L-2636

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



SECTION A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing to consist of nom 2 by 6 in. (51 by 152 mm) (or larger) wood or steel channel studs or doubled or staggered nom 2 by 4 in. (51 by 102 mm) (or larger) wood studs spaced in accordance with the individual U300, U400, V400 or W400 Series Wall and Partition Designs.
   B. **Gypsum Board* -** One or two layers of nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max diam of opening is 5-1/2 in. (140 mm).

   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Nonmetallic Penetrant -** One nonmetallic pipe or conduit to be installed within stud cavity and connected to a 90° elbow. Hub of the elbow may be recessed into the annular space within the opening. Additional nonmetallic pipe or conduit shall be connected to elbow and penetrate one side of the wall either concentrically or eccentrically within the firestop system. The annular space between pipe or conduit and periphery of the opening shall be min 1/4 in. (6 mm) to max 1-1/4 in. (32 mm). Pipe or conduit shall be rigidly supported within the wall and on the penetrated side of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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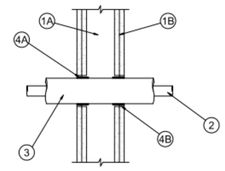
Created or Revised: August 26, 2016
(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com
W-L-2636
PAGE 1 OF 2

System No. W-L-5290

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening shall be 4 in. (102 mm).

   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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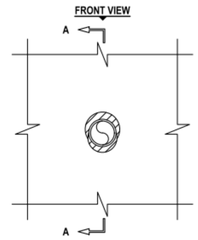
Created or Revised: August 24, 2011
(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com
W-L-5290
PAGE 1 OF 2

MK

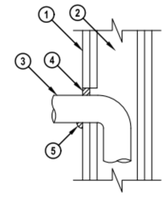
ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : TERRACES AT HIGH MOUNTAIN
ENGINEER : ONEIL ENGINEERING SERVICES
F-RATING = 1-HR. OR 2-HR.

FRONT VIEW



SECTION A-A



1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300, U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 3-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40 OR HEAVIER) (CELLULAR OR SOLID CORE) (CLOSED OR VENTED PIPING SYSTEM).
   B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY).
   C. MAXIMUM 2" NOMINAL DIAMETER PEX TUBING (SDR 9) (CLOSED PIPING SYSTEM ONLY).
   D. MAXIMUM 2" NOMINAL DIAMETER RNC-PVC CONDUIT (SCHEDULE 40).
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. DIAMETER OF OPENING SHALL BE 1" LARGER THAN NOMINAL PIPE DIAMETER.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5/8".

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL SYSTEM NO. W-L-2474)

Hilti Firestop Systems

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Designed by

Sheet	1 of 1
Scale	1/8" = 1"
Date	June 07, 2021

Drawing No. 524232a

Saving Lives through Innovation and Education

ALABAMA LICENSED
No. 25833 PROFESSIONAL
ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

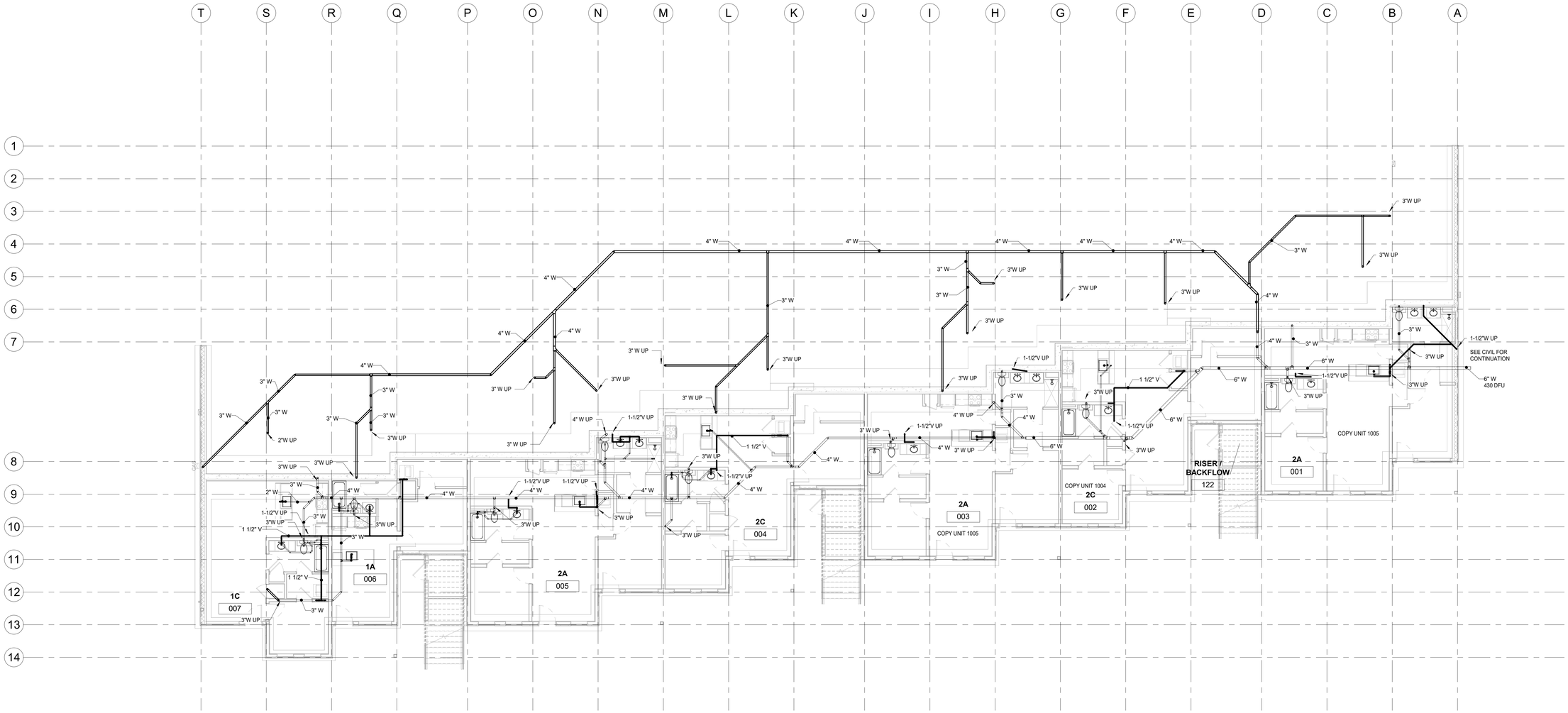
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P1.004

HIGH MOUNTAIN DEVELOPMENT - A



1 PLUMBING BASEMENT FLOOR PLAN - WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING BASEMENT FLOOR PLAN - WASTE & VENT

SHEET:

P1.100

HIGH MOUNTAIN DEVELOPMENT - A

PLUMBING FIRST FLOOR PLAN - WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
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4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

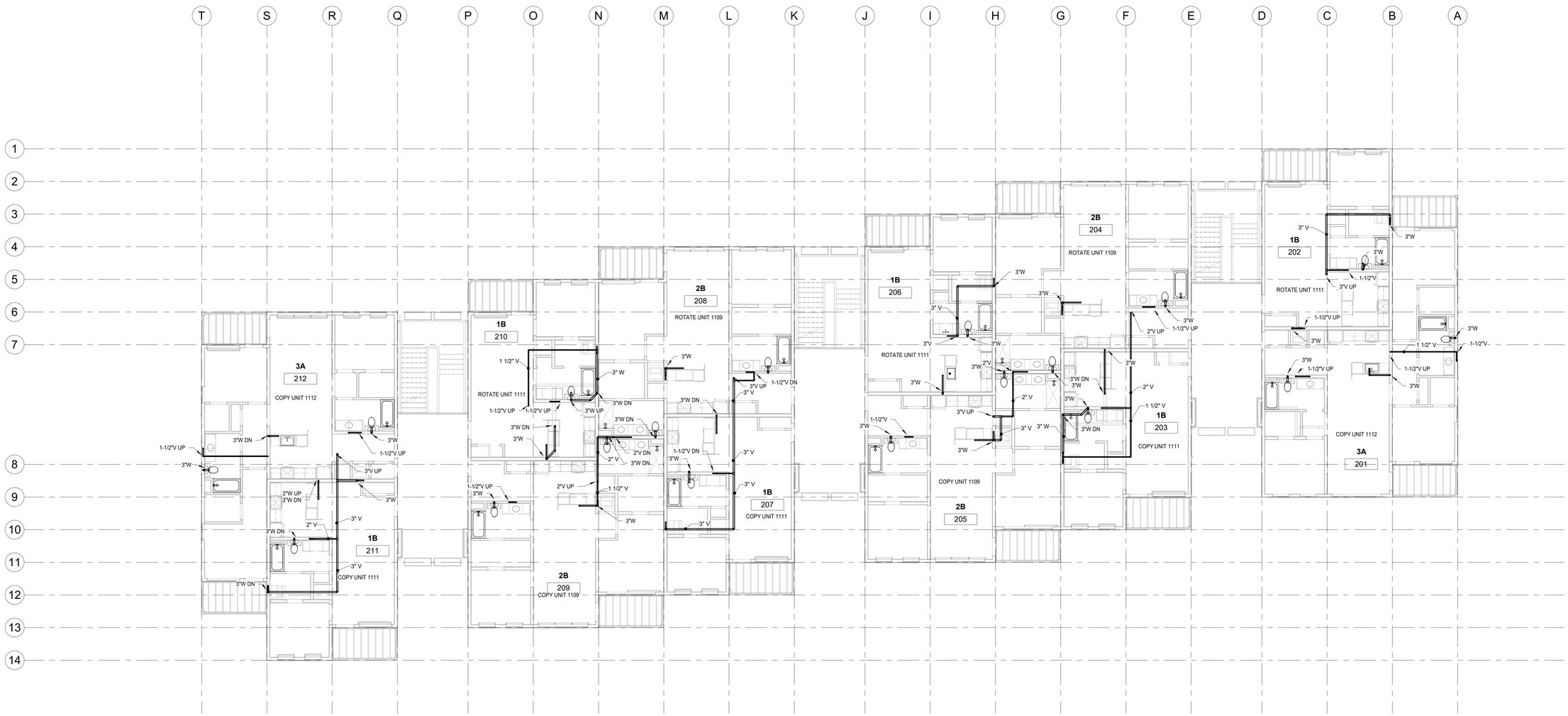
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
FIRST FLOOR PLAN - WASTE & VENT

SHEET:

P1.101

HIGH MOUNTAIN DEVELOPMENT - A



1 PLUMBING SECOND FLOOR PLAN - WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
SECOND FLOOR PLAN - WASTE & VENT

SHEET:

P1.102

HIGH MOUNTAIN DEVELOPMENT - A

1 PLUMBING THIRD FLOOR PLAN WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

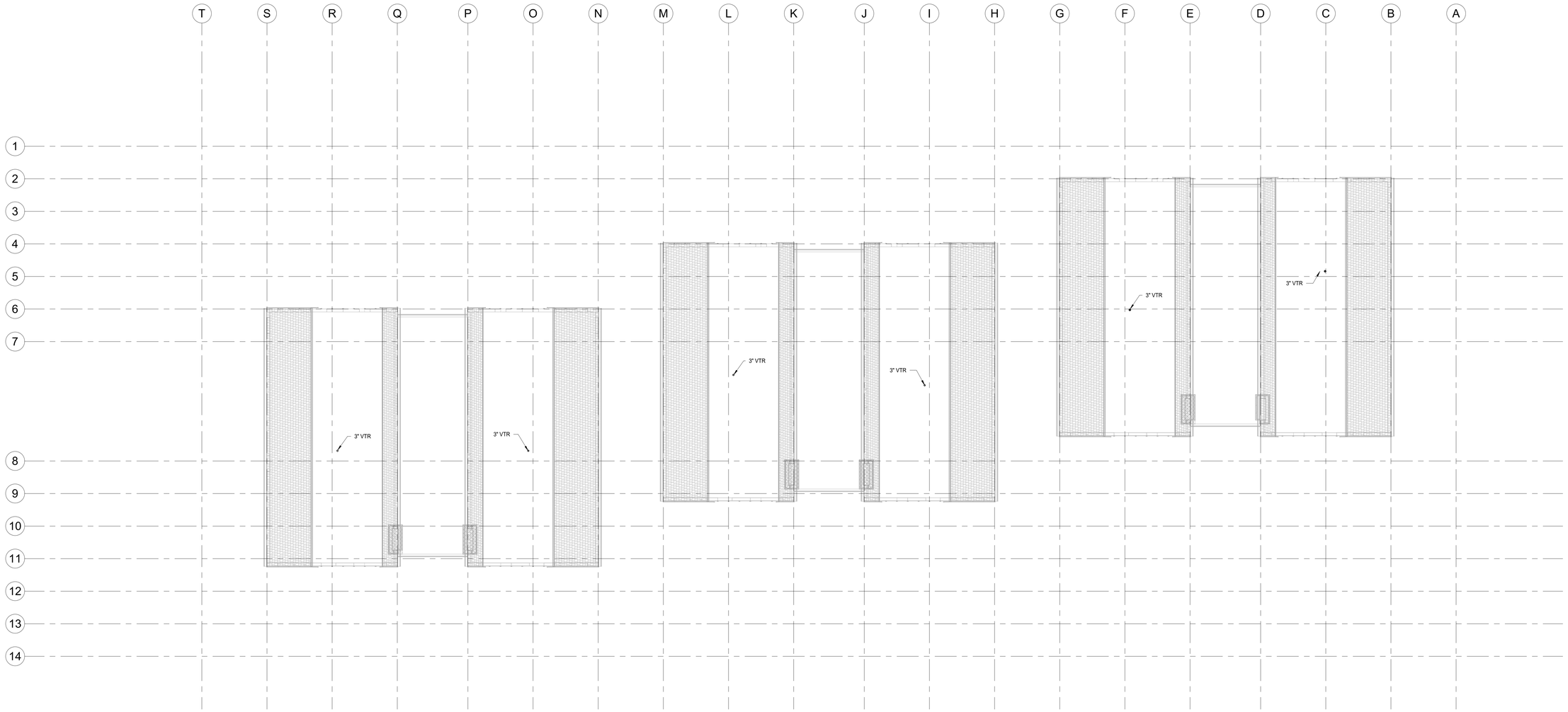
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
THIRD FLOOR PLAN - WASTE & VENT

SHEET:

P1.103

HIGH MOUNTAIN DEVELOPMENT - A



1 PLUMBING ROOF PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
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ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
ROOF PLAN

SHEET:

P1.104

HIGH MOUNTAIN DEVELOPMENT - A

1 PLUMBING BASEMENT FLOOR PLAN - SUPPLY
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING BASEMENT FLOOR PLAN - SUPPLY

SHEET:

P1.200

HIGH MOUNTAIN DEVELOPMENT - A

1 PLUMBING FIRST FLOOR PLAN - SUPPLY
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

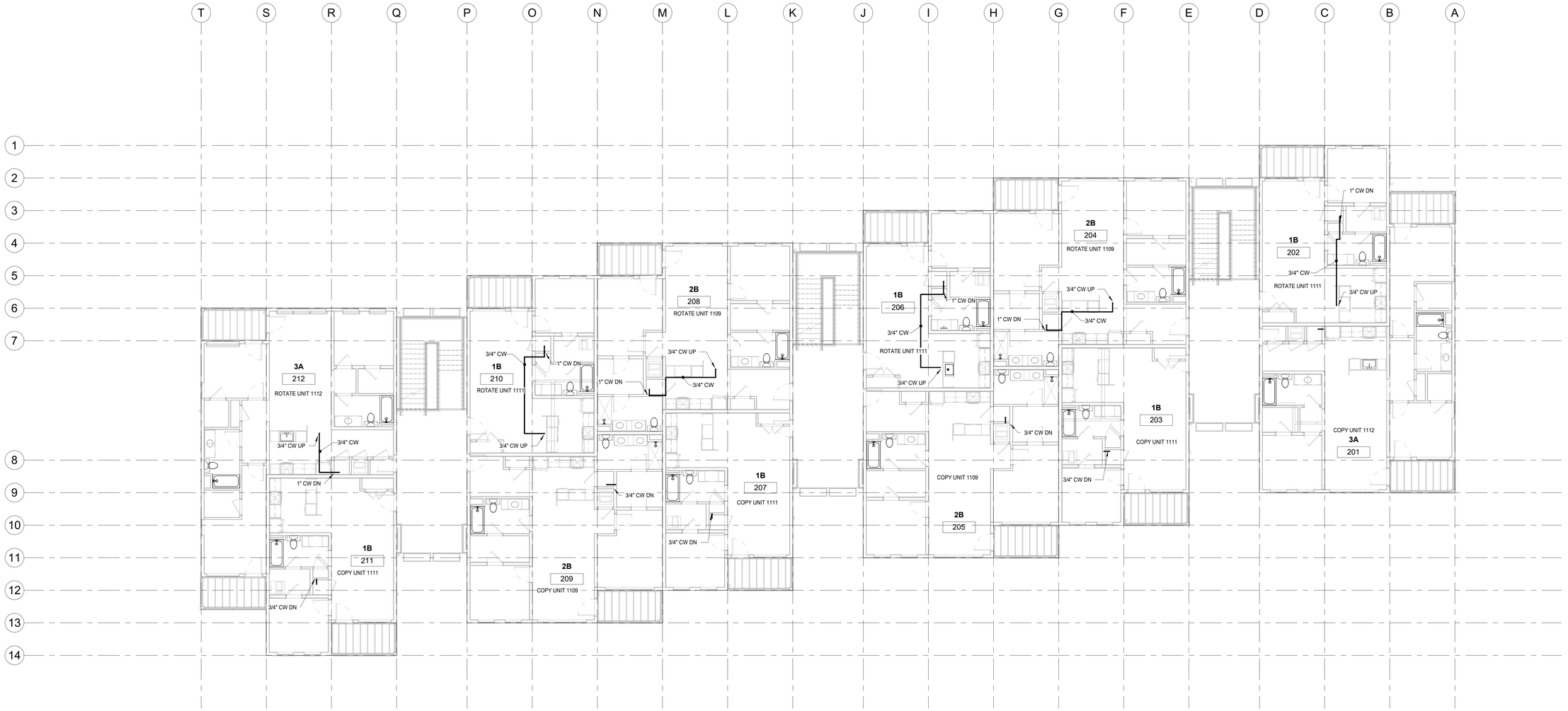
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
FIRST FLOOR PLAN - SUPPLY

SHEET:

P1.201

HIGH MOUNTAIN DEVELOPMENT - A



1 PLUMBING SECOND FLOOR PLAN - SUPPLY
1/8" = 1'-0"

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
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3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
SECOND FLOOR PLAN - SUPPLY

SHEET:

P1.202

HIGH MOUNTAIN DEVELOPMENT - A

1 PLUMBING THIRD FLOOR PLAN - SUPPLY
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

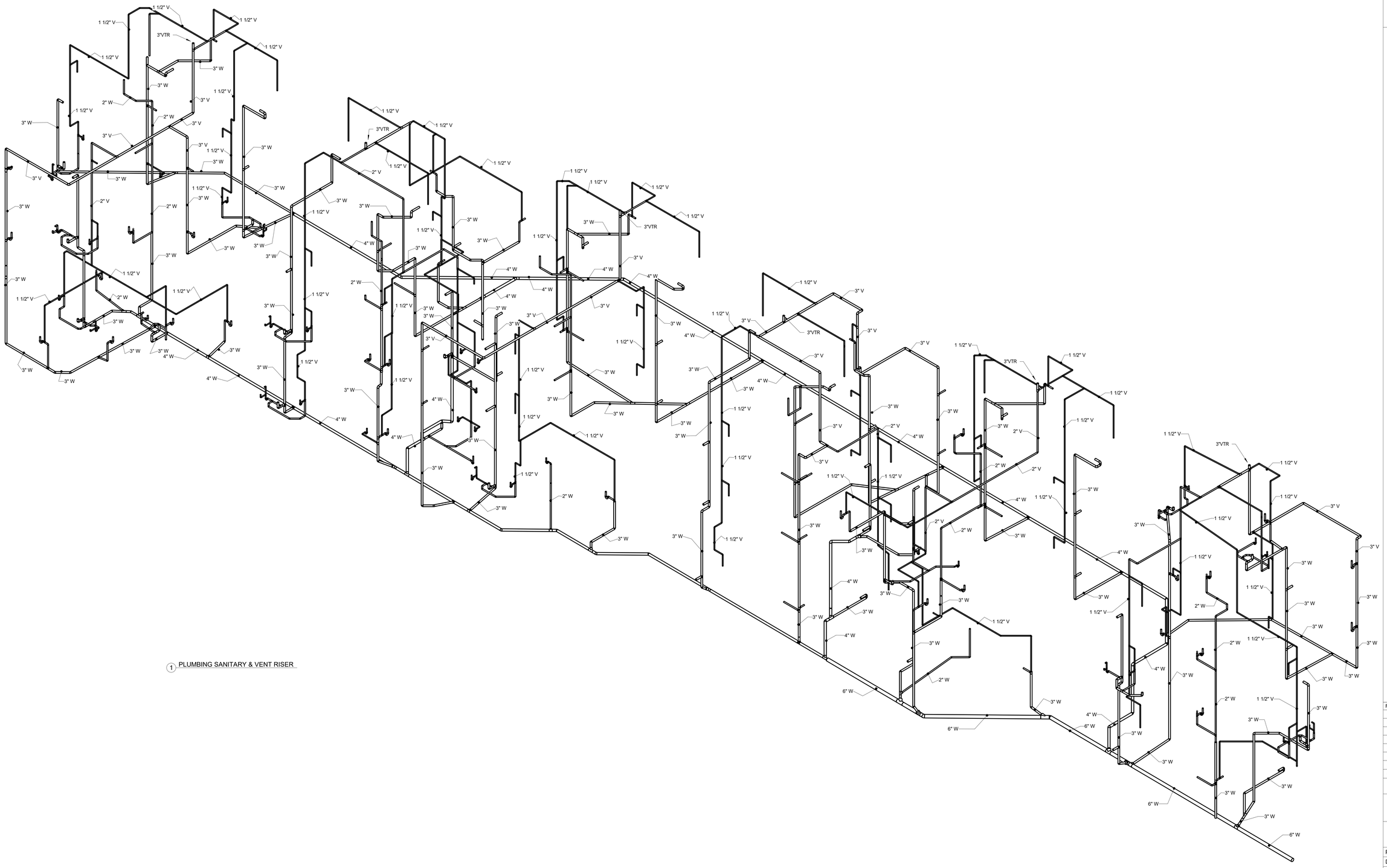
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
THIRD FLOOR PLAN - SUPPLY

SHEET:

P1.203

HIGH MOUNTAIN DEVELOPMENT - A



1 PLUMBING SANITARY & VENT RISER

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

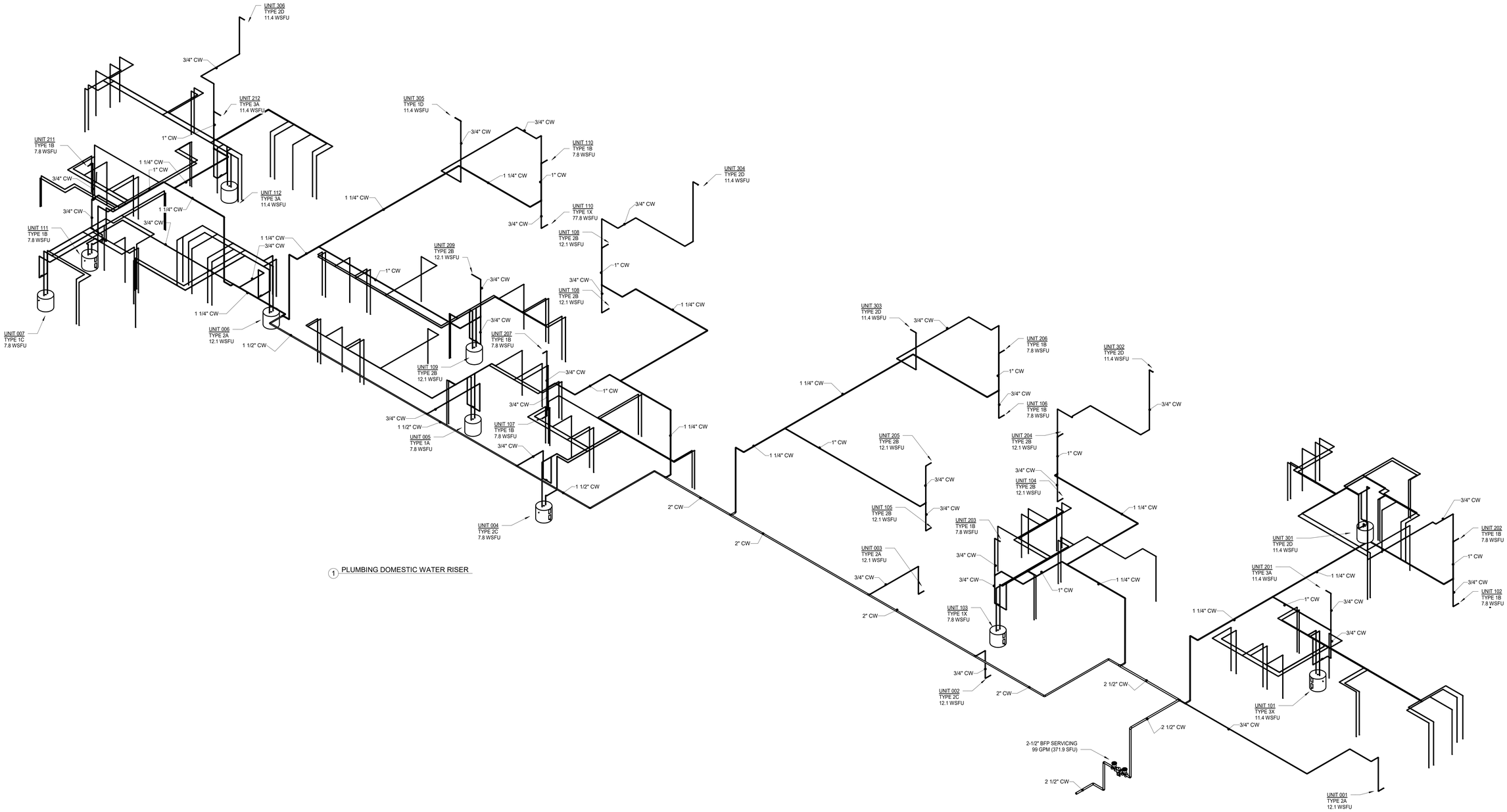
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	NONE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING WASTE & VENT RISER DIAGRAM

SHEET:

P1.300

HIGH MOUNTAIN DEVELOPMENT - A



1 PLUMBING DOMESTIC WATER RISER

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

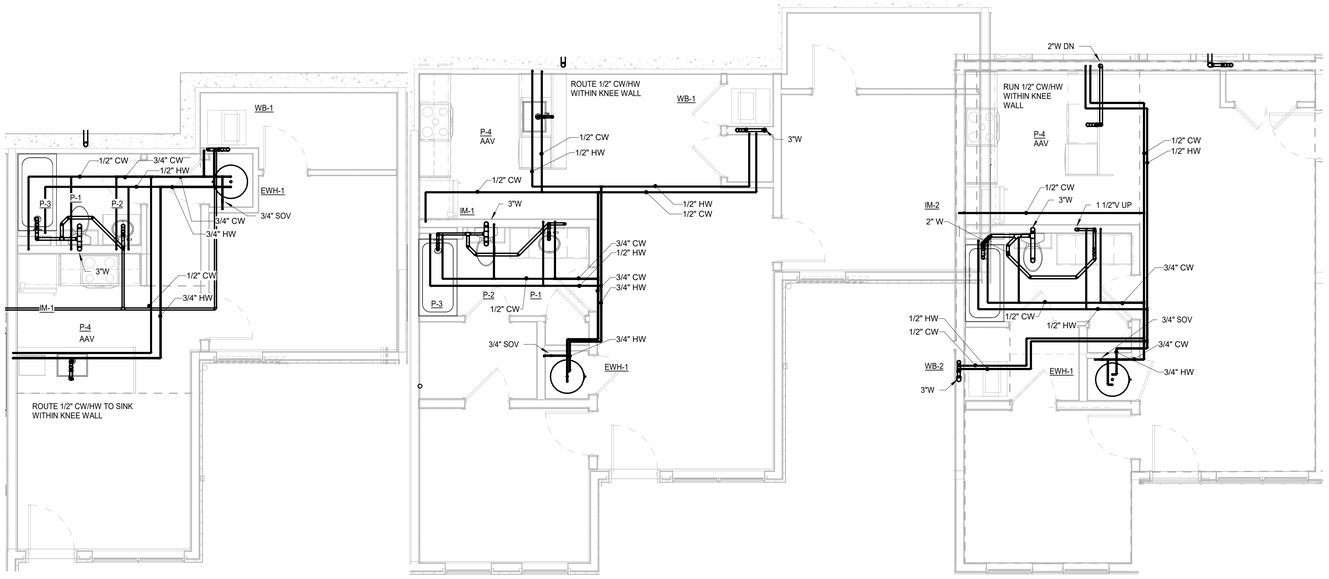
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	NONE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DOMESTIC WATER RISER DIAGRAM

SHEET:

P1.301

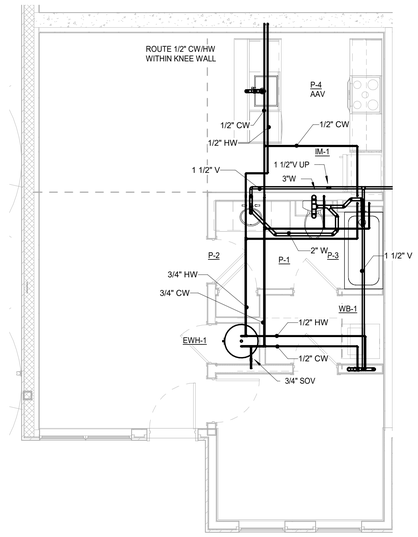
HIGH MOUNTAIN DEVELOPMENT - A



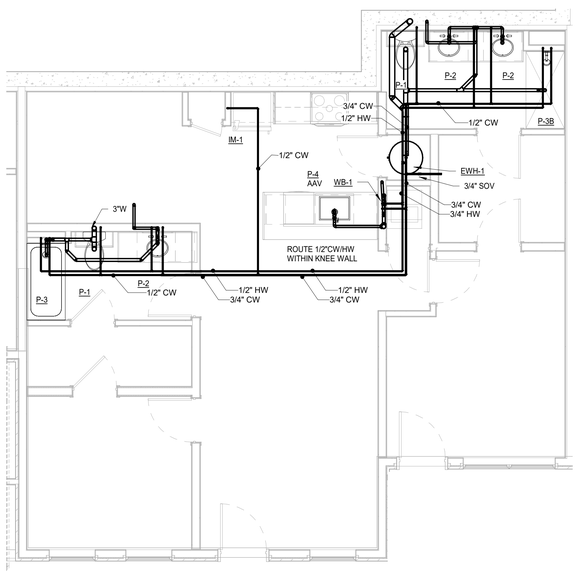
1 PLUMBING TYPICAL UNIT TYPE 1A
1/4" = 1'-0"

2 PLUMBING TYPICAL UNIT TYPE 2C
1/4" = 1'-0"

3 PLUMBING TYPICAL UNIT TYPE 1B
1/4" = 1'-0"



4 PLUMBING TYPICAL UNIT TYPE 1C
1/4" = 1'-0"



5 PLUMBING TYPICAL UNIT TYPE 2A
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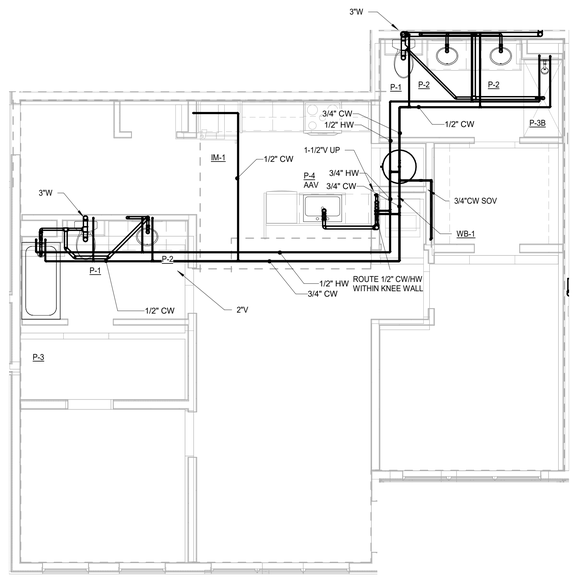


6 PLUMBING TYPICAL UNIT TYPE 2B
1/4" = 1'-0"

ALABAMA LICENSED NO. 29855 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

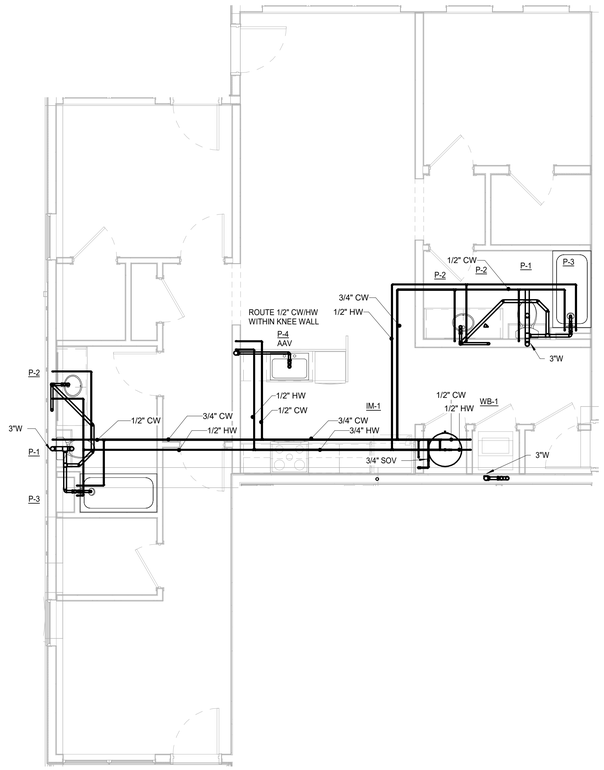
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/4" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
ENLARGED PLANS

SHEET:

P1.900

HIGH MOUNTAIN DEVELOPMENT - A



1 PLUMBING TYPICAL UNIT TYPE 3A
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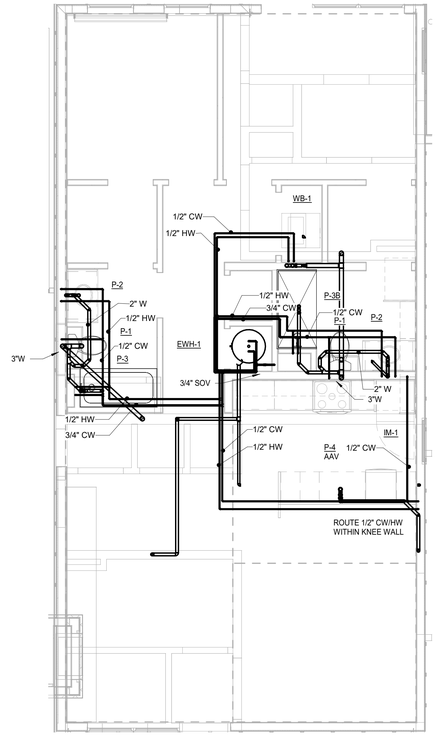

2 PLUMBING TYPICAL UNIT TYPE 2D
1/4" = 1'-0"

ALABAMA LICENSED
NO. 29855
PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A1

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
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6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/4" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
ENLARGED PLANS

SHEET:

P1.901

HIGH MOUNTAIN DEVELOPMENT - A

PLUMBING DRAWING LIST

PLUMBING FIXTURE SCHEDULE

ITEM NO.	FIXTURE TYPE	WASTE CONN.	VENT CONN.	CW CONN.	HW CONN.	REMARKS
P-1	WATER CLOSET	3"	-	1 1/2"	-	
P-1A	WATER CLOSET (ADA)	3"	-	1 1/2"	-	
P-2	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	
P-2A	LAVATORY (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3	TUB/SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3A	TUB/SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3B	SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3C	SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-4	KITCHEN SINK	1 1/2"	1 1/2"	1/2"	1/2"	
P-4A	KITCHEN SINK (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	

PLUMBING LEGEND

SYMBOL	DESCRIPTION
W	SANITARY PIPING WASTE (ABOVE GRADE)
W	SANITARY PIPING WASTE (BELOW FLOOR)
GW	GREASE WASTE (BELOW FLOOR)
V	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWR	HOT WATER RECIRCULATION PIPING
	PIPE TURNING UP/DOWN
	FULL OPEN PORT GATE VALVE
	FLOOR DRAIN
	FLOOR CLEANOUT
	CLEANOUT
	1 HR RATED WALLS
	2 HR RATED WALLS
WHA	WATER HAMMER ARRESTOR
P-1	FIXTURE TYPE
	MIXING VALVE
	AIR ADMITTANCE VALVE
	BACKFLOW PREVENTOR

PLUMBING GENERAL NOTES

APPLICABLE CODES:
INTERNATIONAL PLUMBING CODE (IPC) 2015
INTERNATIONAL BUILDING CODE (IBC) 2015
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI A117.1-2009)
UNIFORM STATEWIDE BUILDING CODE OF ALABAMA 2015

PLUMBING SYSTEMS:
PROVIDE ALL PLUMBING FIXTURES AND TRIM AS INDICATED ON THE DRAWINGS AND AS SPECIFIED ELSEWHERE HEREIN. ALL FIXTURES SHALL BE CONNECTED TO THE PLUMBING SYSTEMS AS INDICATED AND REQUIRED FOR PROPER OPERATION. PIPING MATERIALS, ACCESSORIES AND EQUIPMENT SHALL BE SPECIFIED ELSEWHERE WITHIN THIS SPECIFICATION.

SANITARY WASTE AND VENT SYSTEMS:
PROVIDE A COMPLETE SANITARY, WASTE AND VENT SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING REQUIRING CONNECTIONS. ALL WASTE FROM THE BUILDING SHALL DISCHARGE BY GRAVITY OUT THE BUILDING TO BE PICKED UP BY CIVIL AND EXTENDED TO THE SEWER SYSTEM. SANITARY PIPING TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE OTHERWISE NOTED.

WATER SUPPLY SYSTEM:
PROVIDE A COMPLETE WATER SUPPLY SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING INCLUDING DOMESTIC WATER HEATERS. PROVIDE APPROVED GATE OR COMPRESSION STOPS AT EVERY CONNECTION TO FIXTURES AND EQUIPMENT.

STORM DRAINAGE SYSTEM:
REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND SIZING.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND FIXTURES. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGARS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.

PERMIT, FEES AND NOTICES:
COMPLY WITH THE GENERAL CONDITIONS AND PROVIDE ALL PERMITS AS REQUIRED FOR THE INSTALLATION OF ALL INDICATED PLUMBING SYSTEMS.

FIRE RATINGS:
SEPARATIONS BETWEEN R-2 TENANTS ARE 1-HR RATED.
CEILINGS ARE 1-HR RATED.
STAIRWELLS AND ELEVATOR ARE 2-HR RATED..

FULLY SPRINKLERED PER NFPA 13

USE GROUP : R-2
CONSTRUCTION : 5-A

PLUMBING SPECIFICATIONS

A. PIPE AND PIPE FITTINGS: 1. DOMESTIC (POTABLE) WATER (CW/HW) PIPING: SYSTEM DESIGN PRESSURE = 80 PSIG. PIPING 1" AND SMALLER SHALL BE PEX TUBING. BETWEEN 1-1/4" AND 2" SHALL BE SDR 11 CPVC TUBING. FOR PIPING GREATER THAN 2" PROVIDE SCHEDULE 80 CPVC TUBING.

2. SANITARY (W) AND VENT (V) PIPING: ALL SANITARY AND VENT PIPING SHALL BE SCHEDULE 40 PVC.

3. CONDENSATE DRAIN (D) PIPING: SYSTEM DESIGN PRESSURE = 10 PSIG. PROVIDE SCHEDULE 40 PVC.

4. STORM WATER (SW) PIPING: PROVIDE SCHEDULE 40 PVC.

B. VALVES:
1. GATE VALVES: POTABLE WATER SERVICE SIZES 1/2" - 2-1/2" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC PIPING SYSTEMS. ALL SHUT OFF VALVES SHALL BE FULL OPEN PORT TYPE VALVES.

2. DRAIN VALVES: POTABLE WATER SERVICE SIZES 1/2" AND 3/4" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC SYSTEMS.

3. BACKFLOW PREVENTER: SPECIFICATIONS ARE BASED ON WATTS LF909 LARGE SERIES WITH 909AG-F AIR GAP. PROVIDE AT LOCATIONS IN WHICH THE PUBLIC WATER SUPPLY SYSTEM MUST BE PROTECTED. MATERIALS OF CONSTRUCTION - EPOXY COATED CAST IRON BODY AND STRAINER, LEAD FREE COPPER SILICONE ALLOY TEST COCKS, STAINLESS STEEL SEATS , REDUCED PRESSURE ZONE ASSEMBLY WITH RELIEF DRAIN ASSEMBLY. PIPE RELIEF TO FLOOR DRAIN AS SHOWN.

C. PLUMBING FIXTURES: ALL PLUMBING FIXTURES AND TRIM SHALL BE NEW AS MANUFACTURED BY FIRMS REGULARLY ENGAGED IN THE MANUFACTURE OF PLUMBING FIXTURES, AND TRIM OF TYPE, STYLE AND CONFIGURATION REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE AND SIMILAR SERVICE.

D. PROVIDE PROTECTION OF ALL FIXTURES DURING CONSTRUCTION FROM DAMAGE. EACH WATER SUPPLY CONNECTION SERVING A FIXTURE SHALL BE EQUIPPED WITH AN ACCESSIBLE STOP VALVE. CAULK ALL GAPS IN AROUND WALLS/FLOORS AND THE PLUMBING FIXTURES. SPECIFICATIONS FOR THE PLUMBING FIXTURES ARE BASED ON THE FOLLOWING TYPES.

E. PIPE INSULATION:
1. CLOSED CELL ELASTOMERIC (PIPE SIZES UP TO 5 INCHES): FLEXIBLE ELASTOMERIC, CLOSED CELLULAR, TUBULAR MOLDED TO ACCOMMODATE PIPING, SMOOTH OUTER SURFACE SUITABLE FOR PAINTING WITH VINYL LACQUER TYPE COATING, WATER RESISTANT, NONABSORBENT, OZONE RESISTANT, MINIMUM DENSITY OF 4 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF 0.27 AT 75 F MEAN TEMPERATURE

APPLICATIONS:
1. DOMESTIC HOT AND COLD WATER (ALL SIZES) ON ALL EXTERIOR WALL PIPING OR IN UNCONDITIONED SPACES ONLY: PROVIDE 1/2" CLOSED CELL ELASTOMERIC.

F. WATER HEATERS :
ELECTRIC WATER HEATER - FULLY INSULATED BAKED ENAMEL STEEL JACKET, INSULATED IN CONFORMANCE WITH ASHRAE 90A-1980 STANDARD FOR ELECTRIC DOMESTIC WATER HEATER, GLASS LINING, RELIEF VALVE TAP, HEAT TRAPS, RATED FOR 150 PSI. PLATED COPPER ELEMENT, LOW WATT DENSITY, REPLACEABLE IMMERSION TYPE. PROVIDE WITH RELIEF VALVE AND FACTORY PACKAGED CONTROL WIRING.

EWH-1 - 40 GALLON 4.5 KW DUAL ELEMENT WATER HEATER. HEATER SHALL BE "SHORT" CONSTRUCTION. PROVIDE WITH 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE. BASED ON RUUD MODEL PRDE38-52-RU55.

PROVIDE WATER HEATERS WITH 2.5-GAL EXPANSION TANK (ET-1).

WATER HEATERS ARE LOCATED WITHIN A VENTILATED SPACE AND OVER AN IMPERVIOUS FLOOR.

G. FIXTURES :

MAKE AND MODELS OF SPECIFIC FIXTURES TO BE USED.
PROVIDE INDICATED QUANTITIES OF FIXTURES. SEE ARCHITECTS DRAWING FOR
WB-1: WASHING MACHINE BOX (PLASTIC): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER.

WB-2: WASHING MACHINE BOX (FIRE RATED): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 FIRE RATED WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER .

IM-1: REFRIGERATOR BOX (PLASTIC): WATER-TIGHT RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

IM-2: REFRIGERATOR BOX (FIRE RATED): IPS FIRE GUARD RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

FCO: PROVIDE SIZING AS INDICATED ON THE DRAWINGS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES CLEANOUTS WITH NICKEL BRONZE ADJUSTABLE TOPS. MATCH MATERIALS OF CONSTRUCTION FOR BODY TYPE.

WCO: PROVIDE CHROME PLATED COVER FOR SANITARY TEST TEE AT ALL INDICATED LOCATIONS.

FD: FLOOR DRAINS - PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS. FLOOR DRAINS SHALL BE SUPPLIED WITH NICKEL BRONZE ADJUSTABLE TOPS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES 834 FLOOR DRAINS. PROVIDE DRAINS SUBJECT TO EVAPORATION WITH A TRAP SEAL.

WH-1: FREEZELESS WALL HYDRANT - BACKFLOW PROTECTED WITH ANTI-SIPHON VACUUM BREAKER (ASSE 1011), TEE KEY, COPPER TUBES, CHROME FINISH, PERMANENT TYPE BRASS VALVE BODY, ASSE STANDARD 1019-B, WITH AUTOMATIC DRAINING. BASED ON WOODFORD MODEL 65.

RH-1: ROOF HYDRANT - SPECIFICATION BASED ON WOODFORD MODEL SRH-MS, FREEZELESS ROOF HYDRANT, WITH INTEGRAL ANIT-SIPHON VACUUM BREAKER, BACKFLOW PROTECTED WITH FIELD TESTABLE ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER. NO DRAIN REQUIRED - A VENTURI ACTION DRAWS WATER OUT OF THE INTERNAL RESERVOIR AND DISCHARGES OF THE BACKFLOW PREVENTER. ALL NECESSARY MOUNTING HARDWARE FOR PROPER INSTALLATION ON A COMMERCIAL ROOF IS TO BE SUPPLIED WITH DEVICE.

PROVIDE KITCHEN SINKS WITH TAILPIECE FOR DISHWASHER CONNECTION AND DISPOSAL. DISPOSAL TO BE EQUAL TO SINK GUARD MODEL SE150, 1/3 HP, CORROSION RESISTANT COMPOSITE HOPPER WITH CAST STAINLESS STEEL ANTI-JAM SWIVEL IMPELLERS. PROVIDE WHA AND SHUT OFF VALVE FOR CONNECTION TO DISHWASHER.

MISCELLANEOUS PLUMBING ITEMS:

1. TRAP SEAL: PROVIDE A TRAP SEAL AT ALL OPENSITE AND FLOOR DRAINS SUBJECT TO EVAPORATION. TRAP SEAL SPECIFICATIONS ARE BASED ON JOSAM 88240 SERIES TRAP SEAL INSERT. MUST BE AN ASSE 1072 TRAP SEAL DEVICE.

2. AIR ADMITTANCE VALVE (AAV): AAV'S MAY BE EITHER OATEY OR STUDOR TYPE. ALL AAV'S USED WITH WB'S SHALL BE BY OATEY (SUBSTITUTION BY APPROVAL ONLY).

3. WATER HAMMER ARRESTORS (WHA): PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON. DESIGNED TO OPERATE UP TO 150 PSI WORKING PRESSURE.

4. ALL APARTMENT DOMESTIC WATER SHUT OFF VALVES WILL BE LOCATED IN AN EASILY ACCESSIBLE LOCATION.

5. IDENTIFY ALL MAIN SHUT OFF VALVES BY TAGGING EACH.

6. IT IS THE INTENT OF THESE DRAWINGS THAT ALL TUB/SHOWERS WILL BE ABOVE FLOOR ROUGH IN.

7. PROVIDE QUARTER TURN SHUT OFF VALVES FOR ALL PLUMBING FIXTURES.

8. PROVIDE WHA'S ON ALL CONNECTIONS SERVING DISHWASHERS.

9. ALL PLUMBING FIXTURES TO HAVE SHUT OFF VALVES OR INTEGRAL STOPS.

10. ALL LAVATORIES ARE TO MEET THE PROPER CLEARANCES PER SECTION 405.3.1 OF THE IPC. SEE ARCHITECTS DRAWINGS FOR DIMENSIONED BATHROOM DRAWINGS.

11. PROVIDE A CLEAN OUT AT THE BASE OF ALL SANITARY STACKS.

12. ALL RISERS SHALL HAVE AN ACCESSIBLE SHUT OFF VALVE. PROVIDE 12x12 FIRE RATED ACCESS DOORS TO ALL VALVES IF REQUIRED.

13. ALL PIPING TO BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS.

14. ALL WATER LINES TO PLUMBING FIXTURES SHALL BE BURST PROOF, FLEXIBLE STAINLESS STEEL TYPE SUPPLY LINES.

15. RUN AIR HANDLING UNIT AND WATER HEATER RELIEF LINES TO NEAREST STORMWATER PIPES.

16. PROVIDE A DRAIN PAN UNDER THE WASHING MACHINE WITH A WATER SENSING DEVICE THAT SHUTS OFF WATER TO THE WASHER WHEN WATER IS DETECTED WITHIN THE DRAIN PAN.

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

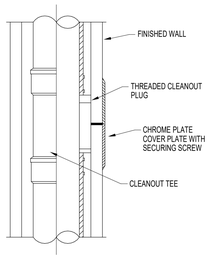
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

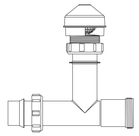
PLUMBING ABBREVIATIONS, LEGENDS, SCHEDULES, AND SPECIFICATIONS

SHEET:
P2.001

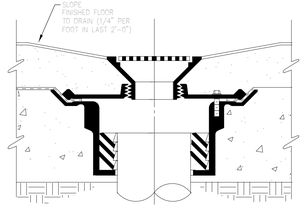
TERRACE AT HIGH MOUNTAIN - A2



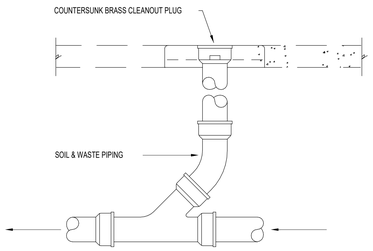
WALL CLEANOUTS
NO SCALE



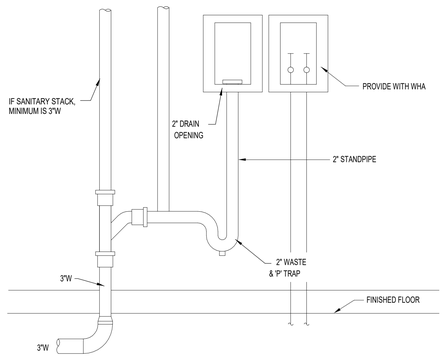
AIR ADMITTANCE VALVE - TUBULAR ADAPTER FOR UNDER SINK INSTALLATION
NO SCALE



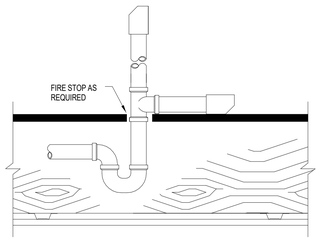
FLOOR DRAIN DETAIL
NOT TO SCALE



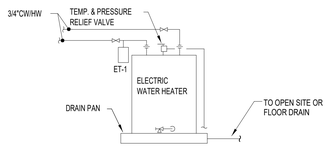
C.O. UP TO GRADE
NOT TO SCALE



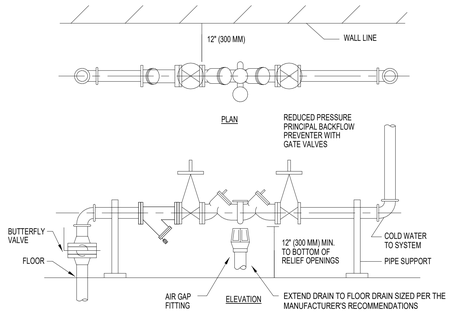
PLUMBING CONNECTIONS FOR LAUNDRY OUTLET
W/ SIOUX CHIEF OX BOX & CONDENSATE DRAIN ADAPTER
NO SCALE



ABOVE FLOOR ROUGH IN DETAIL TUB/SHOWER
NO SCALE



WATER HEATER DRAIN DETAIL
NOT TO SCALE



BACKFLOW PREVENTER PIPING DETAIL - DOMESTIC WATER
NOT TO SCALE

NOTES:
1. BACKFLOW TO BE MOUNTED IN HORIZONTAL POSITION. ALL MOUNTING CLEARANCES AND INSTALLATION TO BE PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTER WITH GATE VALVES. PROVIDE FULL OPEN PORT SHUT OFF VALVE AND STRAINER UPSTREAM OF BACKFLOW.
3. BACKFLOW WILL NOT BE PLACED WITHIN A VAULT.
4. BACKFLOW TO BE MOUNTED AT A HEIGHT SUCH THAT NO LADDER WILL BE NEEDED TO SERVICE THE BACKFLOW.

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE36574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P2.002

TERRACE AT HIGH MOUNTAIN - A2

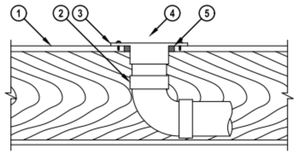
UL SYSTEM NO. F-C-2203

CLOSET FLANGE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1-HR.

CROSS-SECTIONAL VIEW

FC2203d.010817



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
   B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. (NOT SHOWN). FLOOR MOUNTED VITREOUS CHINA WATER CLOSET.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

Hilti Firestop Systems	HILTI, Inc. Plano, Texas USA (800) 879-8000	Sheet 1 of 1 · Scale 1/8" = 1" · Date Jan. 16, 2017	Drawing No. FC 2203d

Saving Lives through Innovation and Education

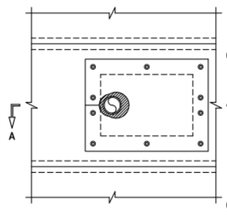
UL SYSTEM NO. F-C-2204

PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY

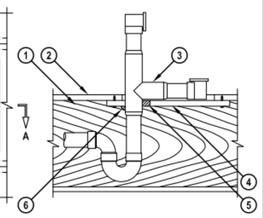
F-RATING = 1-HR.
T-RATING = 1/2-HR.

FC2204a.010715

BOTTOM VIEW



SECTION A-A



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. MAXIMUM 1-1/2" NOMINAL DIAMETER PVC OR ABS PLASTIC PIPE (SCHEDULE 40) AND DRAIN FITTINGS CEMENTED TOGETHER WITH PVC OR ABS BATHTUB WASTE/OVERFLOW FITTINGS.
4. 3/4" THICK PLYWOOD PATCH SIZED TO OVERLAP MINIMUM 2" BEYOND EACH EDGE OF RECTANGULAR OPENING. TWO PIECES POSITIONED AROUND DRAIN PIPING WITH CUT EDGES TIGHTLY BUTTED, AND SCREW ATTACHED TO UNDERSIDE OF SUBFLOOR WITH 1-1/4" LONG STEEL SCREWS (SPACED MAXIMUM 6" C/C). (SEE NOTE NO. 3 BELOW).
5. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM SIZE OF OPENING = 12" x 8".
2. ANNULAR SPACE BETWEEN DRAIN PIPING AND PATCH = MINIMUM 0", MAXIMUM 1".
3. AS AN ALTERNATE TO PLYWOOD, 5/8" THICK GYPSUM WALL BOARD MAY BE USED.

Hilti Firestop Systems	HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000	Sheet 1 of 1 · Scale 1/8" = 1" · Date Jan. 07, 2015	Drawing No. FC 2204b

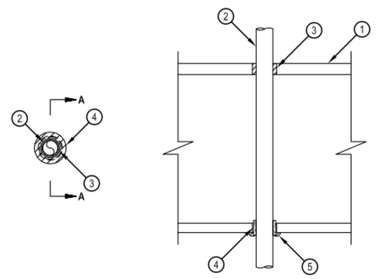
Saving Lives through Innovation and Education

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2230

F Rating - 1 Hr
T Rating - 1/4 Hr

FC 2230



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 1-5/8 in. (41 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design.

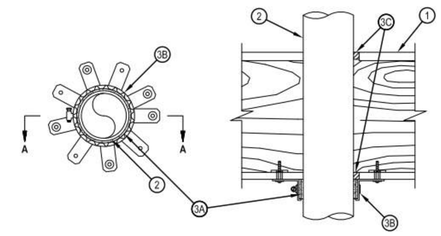
Hilti Firestop Systems	Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 21, 2015	Page: 1 of 2

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2232

F Rating — 1 Hr
T Rating — 3/4 and 1 Hr (See Item 3)

FC 2232



SECTION A-A

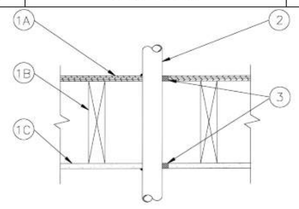
1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
2. Through Penetrants — One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) and max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

Hilti Firestop Systems	Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 15, 2015	Page: 1 of 2

Classified by UL US

F Rating – 1 Hr
T Rating – 1 Hr

F-C-2080



1. **Floor-Ceiling Assembly –** The fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Flooring System –** Lumber of plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of floor opening is 3-1/8 in.
   B. **Wood Joists –** Nom 2 by 10 in. deep (or deeper) lumber joists spaced 16 in. OC, with nom 1 by 3 in. lumber bridging and with ends firestopped or steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board* –** Nom 5/8 in. thick as specified in the individual Floor-Ceiling Design. I diam of opening is 3-1/8 in.
2. **Through Penetrant –** One non-metallic pipe or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. Pipe to be rigidly supported on both sides of floor assembly.
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 2 in. diam (or smaller) SDR 11 cellular or solid core chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   B. **Polyvinyl Chloride (PVC) –** Nom 2 in. diam (or smaller) Schedule 40 (or heavier) PVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ –** Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).

Underwriters Laboratories Inc.®

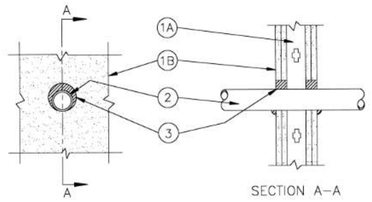
09/16 (1)

Classified by UL US

F Ratings – 1, 2, 3 and 4 Hr (See Item 1)
T Ratings – 1, 2, 3 and 4 Hr (See Item 1)

W-L-2126

ANSI/UL1479 (ASTM E814)
F Ratings — 1, 2, 3 and 4 Hr (See Item 1)
T Ratings — 1, 2, 3 and 4 Hr (See Item 1)



SECTION A–A

1. **Wall Assembly –** The 1, 2, 3 or 4 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs –** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC.
   B. **Gypsum Board* –** The gypsum wallboard type, thickness, number of layers, fasteners and sheet orientation shall be as specified in the individual U300 or U400 Series Designs in the UL Fire Resistance Directory. Max diam of opening is 3-1/8 in.
   The hourly F and T Ratings of the firestop system is equal to the hourly fire rating of the assembly in which it is installed.

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09/16 (1)

System No. F-C-2230

FC 2230

2. **Through Penetrants** — One non-metallic tube to be installed concentrically within the firestop system. Annular space between tube and periphery of opening shall be 1/4 in. (6 mm). Tube to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of non-meyallic tubes or pipes may be used:
   Crosslinked Polyethylene (PEX) Tubing — Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Fill, Void or Cavity Materials* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1 in. (25 mm) wide intumescentwrap strip. One layer of wrap strip tightly wrapped around tube and held in place with tape. Wrap strip centered in annular space extending from both sides of gypsum board.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W25/1" Wrap Strip
4. Fill, Void or Cavity Materials* - Sealant — Min 3/4 in. (19 mm) depth of fill material applied within the annulus, flush with the top surface of floor. A 1/4 in. (6 mm) diam bead of fill material shall also be applied at the wrap strip/gypsum board interface.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Sealant - FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems	Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 21, 2015	Page: 2 of 2

System No. F-C-2232

FC 2232

3. Nonmetallic Pipe Coupling — (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC, Schedule 40 ABS or SDR13.5 CPVC coupling corresponding to pipe type installed such that the top of the coupling is flush with the bottom surface of the ceiling and extending downward.
4. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1-3/4 in. (44 mm) wide intumescent wrap strip. Layers of wrap strip continuously wrapped around the pipe and held in place with tape. Wrap strip butted tightly against surface of ceiling.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W45/1-3/4" Wrap Strip

Nom Diam of Pipe, in. (mm)	Number of Wrap Strips	Min/Max Annular Space, in. (mm)	T-Rating - Hr.
2 (51)	1	0-1/4 (0-6)	1
3 (76)	2	0-1/2 (0-13)	3/4
4 (102)	2	0-1/2 (0-13)	3/4

   B. Steel Collar — Collar fabricated from coils of precut min 0.017 in. (0.43 mm) thick (No. 28 MSG) galv steel available from the sealant manufacturer. Collar shall be nom 1-3/4 in. (44 mm) deep with 1 in. (25 mm) long anchors tabs on 2 in. (51 mm) centers for securement to floor/ceiling assembly. The opposite side incorporates retainer tabs, 1/2 in. (13 mm) wide by 3/16 in. (5 mm) long, prebent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 1 in at seam. A nom 1/2 in. (13 mm) wide stainless steel hose clamp shall be secured to the collar at its mid-height. Every other anchor tab of collar secured to gypsum ceiling with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel toggle bolts in conjunction with 1/4 in. by 3/4 in. (6 by 19 mm) diameter steel washers.
   C. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface on top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX SEALANT
   4A. Firestop System — (Optional, Not shown) As an option to Item 4, the firestop system shall consist of the following:
   A. Firestop Device* — Galv steel collar lined with an intumescent material sized to fit the specific diam of pipe shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the gypsum board ceiling with 1/4 in. diam by 1-1/2 in. (38 mm) long steel toggle bolts with 3/4 in. (19 mm) diam steel washers through hanger tabs provided.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N or CP 643 110/4"N Firestop Collar.
   B. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface. flush with top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems	Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 15, 2015	Page: 2 of 2

Continued … F-C-2080

3. **Fill, Void or Cavity Material* – Sealant –** Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling. Min 1/2 in. diam bead of fill material applied at the penetrant/floor and penetrant/ceiling interfaces at point contact locations on both sides of assembly.
   Passive Fire Protection Partners – 3600EX, 4800DW

* Bearing the UL Classification Marking
\+ Bearing the UL Listing Mark

Continued… W-L-2126

2. **Through Penetrants –** One nonmetallic pipe or tubing installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes or tubing may be used:
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 CPVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.
   B. **Crosslinked Polyethylene (PEX) Tubing –** Nom 1-1/2 in. diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems. The annular space between tubing and periphery of opening shall be min 1/4 in. to max 3/8 in.
   C. **Polyvinyl Chloride (PVC) Pipe –** Nom 2 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.

3. **Fill, Void or Cavity Material* – Sealant –** Min 5/8 in. thickness of fill material for a 1 hr rated wall assembly, min 1 in. thickness of fill material for 2, 3 and 4 hr rated assemblies applied within the annulus, flush with both surfaces of wall.
   Passive Fire Protection Partners – 3600EX, 4800DW

*Bearing the UL Classification Marking

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30316 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA 23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

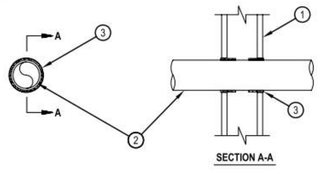
SHEET: P2.003

TERRACE AT HIGH MOUNTAIN - A2

WL 2284

System No. W-L-2284

F Rating - 1 Hr
T Rating - 1 Hr



SECTION A-A

1. Wall Assembly -- The 1 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing shall consist of wood studs or steel channel studs. Wood studs to consist of 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- Min 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers and orientation shall be as specified in the individual U300 or U400 Wall and Partition Design. Max diam of opening is 4 in.
2. Through Penetrants -- One nonmetallic pipe to be centered within the firestop system. An annular space of 3/16 to 1/4 in. is required within the firestop system. Pipe to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe -- Nom 3 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 3 in. diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Material* -- Wrap Strip - Layers of intumescent wrap strip are continuously wrapped around the pipe with ends held in place with tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall. Size of wrap strip and number of layers are shown in table below.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP648-E W25/1" or CP648-E W45/1-3/4" Firestop Wrap Strip

ProductDesignation	Pipe Diameter (in.)	Number of Layers	Nom. Wrap Strip Width (in.)
CP648-E-W25/1*	1-1/2 and 2	1	1
CP648-E-W45/1-3/4*	1-1/2, 2 and 3	1	1-3/4

   A. Fill, Void or Cavity Material* - Wrap Strip -- (As an alternate to the wrap strip in Item 3) - One layer of intumescent wrap strip is tightly wrapped around the pipe with ends butted and held in place with integrated tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF
   HILTI INC -- CP648-S-1.5" US, CP648-S-2" US, CP648-S-3" US
*Bearing the UL Classification Mark

Hilti Firestop Systems

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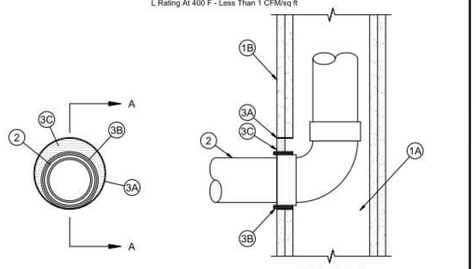
April 22, 2005

System No. W-L-2636

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



SECTION A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing to consist of nom 2 by 6 in. (51 by 152 mm) (or larger) wood or steel channel studs or doubled or staggered nom 2 by 4 in. (51 by 102 mm) (or larger) wood studs spaced in accordance with the individual U300, U400, V400 or W400 Series Wall and Partition Designs.
   B. **Gypsum Board* -** One or two layers of nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max diam of opening is 5-1/2 in. (140 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Nonmetallic Penetrant -** One nonmetallic pipe or conduit to be installed within stud cavity and connected to a 90° elbow. Hub of the elbow may be recessed into the annular space within the opening. Additional nonmetallic pipe or conduit shall be connected to elbow and penetrate one side of the wall either concentrically or eccentrically within the firestop system. The annular space between pipe or conduit and periphery of the opening shall be min 1/4 in. (6 mm) to max 1-1/4 in. (32 mm). Pipe or conduit shall be rigidly supported within the wall and on the penetrated side of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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Created or Revised: August 26, 2016
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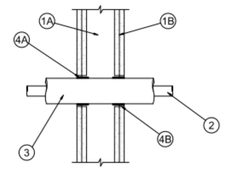
W-L-2636
PAGE 1 OF 2

System No. W-L-5290

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening shall be 4 in. (102 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.

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Created or Revised: August 24, 2011
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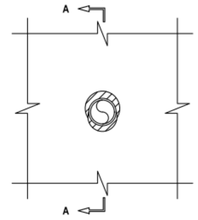
W-L-5290
PAGE 1 OF 2

MK

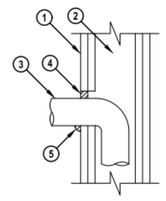
ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : TERRACES AT HIGH MOUNTAIN
ENGINEER : ONEIL ENGINEERING SERVICES
F-RATING = 1-HR. OR 2-HR.

FRONT VIEW



SECTION A-A



1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300, U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 3-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40 OR HEAVIER) (CELLULAR OR SOLID CORE) (CLOSED OR VENTED PIPING SYSTEM).
   B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY).
   C. MAXIMUM 2" NOMINAL DIAMETER PEX TUBING (SDR 9) (CLOSED PIPING SYSTEM ONLY).
   D. MAXIMUM 2" NOMINAL DIAMETER RNC-PVC CONDUIT (SCHEDULE 40).
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. DIAMETER OF OPENING SHALL BE 1" LARGER THAN NOMINAL PIPE DIAMETER.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5/8".

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL SYSTEM NO. W-L-2474)

Hilti Firestop Systems

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Designed by

Sheet	1 of 1	Drawing No.
Scale	1/8" = 1"	524232a
Date	June 07, 2021	

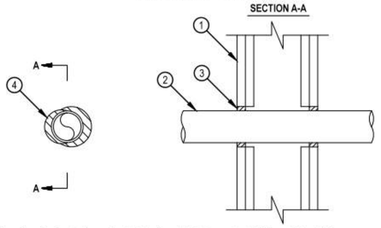
Saving Lives through Innovation and Education

WL 2474

System No. W-L-2474

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating at 400 F - 4 CFM/Sq Ft

SECTION A-A



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Diam of opening shall be 1 in. (25 mm) larger than the nom pipe diam.
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and the periphery of the opening shall be min 0 in. (point contact) to a max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) cellular or solid core Schedule 40 (or heavier) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
   D. Rigid Nonmetallic Conduit (RNC)+ — Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
3. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At point contact location, a min 5/8 in. (16 mm) diam bead of fill material shall be applied to the wall/penetrant interface on both surfaces of the wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
+ Bearing the UL Listing Mark

Hilti Firestop Systems

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January 26, 2015

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Metallic Sleeve -** Cylindrical sleeve fabricated from min 0.016 in. (0.4 mm) thick (30 gauge) galv sheet steel and having a 1 in. (25 mm) lap along the longitudinal seam. Length of steel sleeve to be 5/8 in. (16 mm) in 1 hr fire rated walls and 1-1/4 in. (32 mm) in 2 hr fire rated walls. Sleeve installed by coiling the sheet steel to a diam smaller than the opening, inserting the coil into the opening and releasing the coil to let it uncoil against the circular cutout in the wallboard layers. Sleeve shall be installed flush with wall surfaces on the penetrated side of the wall assembly.
   B. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/4 in. (6 mm) thick by 1-1/2 in. (38 mm) wide (RED), 1/8 in. (3.2 mm) thick by 1-1/2 in. (38 mm) wide (RED2), 3/16 in. (4.8 mm) thick by 2 in. (51 mm) wide (BLU), 1/8 in. (3.2 mm) thick by 2 in. (51 mm) wide (BLU2), intumescent strips faced on both sides with a plastic film. Two layers of wrap strip individually wrapped around the through penetrant with the ends butted or continuously wrapped around the penetrant and held in place by means of foil tape. The wrap strip is slid along the penetrant into annulus such that the trailing edge of the wrap strip extends 1/4 in. (6 mm) from the surface of the wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal RED, RED2, BLU, or BLU2 Wrap Strip
   C. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with surface of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant
   +Bearing the UL Listing Mark
   *** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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Created or Revised: August 26, 2016
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W-L-2636
PAGE 2 OF 2

3. **Pipe and Equipment Covering Materials* -** Max 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 57 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between insulated penetrating item and the edge of the through opening shall be nom 11/32 in. (8.7 mm).
4. **Firestop System -** The firestop system shall consist of the following items:
   A. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips or 1/8 or 1/4 in. (3.2 or 6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. Single layer of wrap strip wrapped around the through penetrant with the ends butted and held in place by means of foil tape. The wrap strip is slid along the through penetrant into annulus such that outer edge of wrap strip is flush with wall surface. One set of wrap strips to be installed on each side of wall. As an option when 1/8 in. (3.2 mm) thick wrap strip (BLU2) is used, the strips may be cut to a width of 1-1/2 in. (38 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip, SpecSeal BLU2 Wrap Strip or SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or SpecSeal Series SSS Sealant
   * Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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W-L-5290
PAGE 2 OF 2

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED PATRICK J. O'NEIL NO. 29301 PROFESSIONAL ENGINEER

TERRACE AT HIGH MOUNTAIN - A2
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

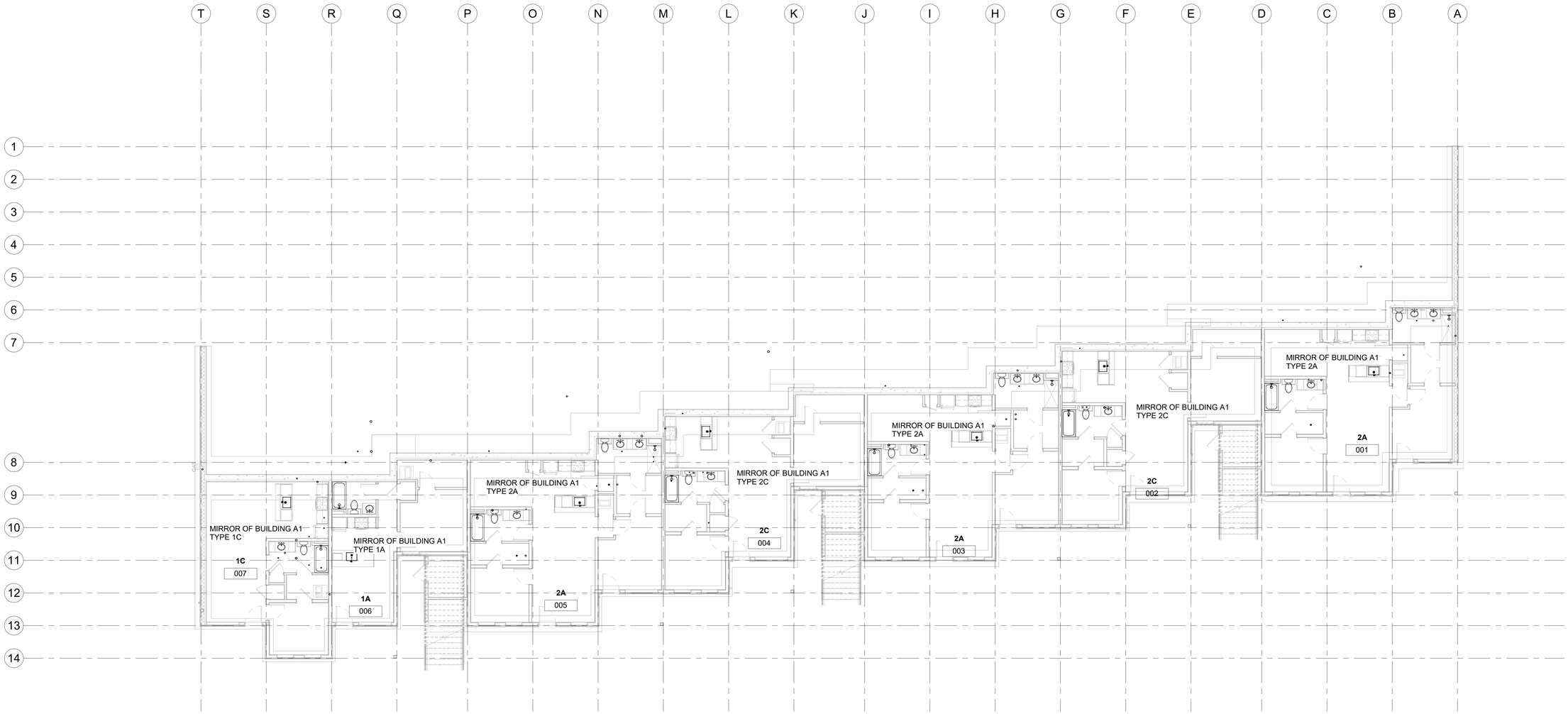
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P2.004

TERRACE AT HIGH MOUNTAIN - A2



1 PLUMBING BASEMENT FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
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4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
BASEMENT FLOOR PLAN

SHEET:
P2.100

TERRACE AT HIGH MOUNTAIN - A2

1 PLUMBING FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE36574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

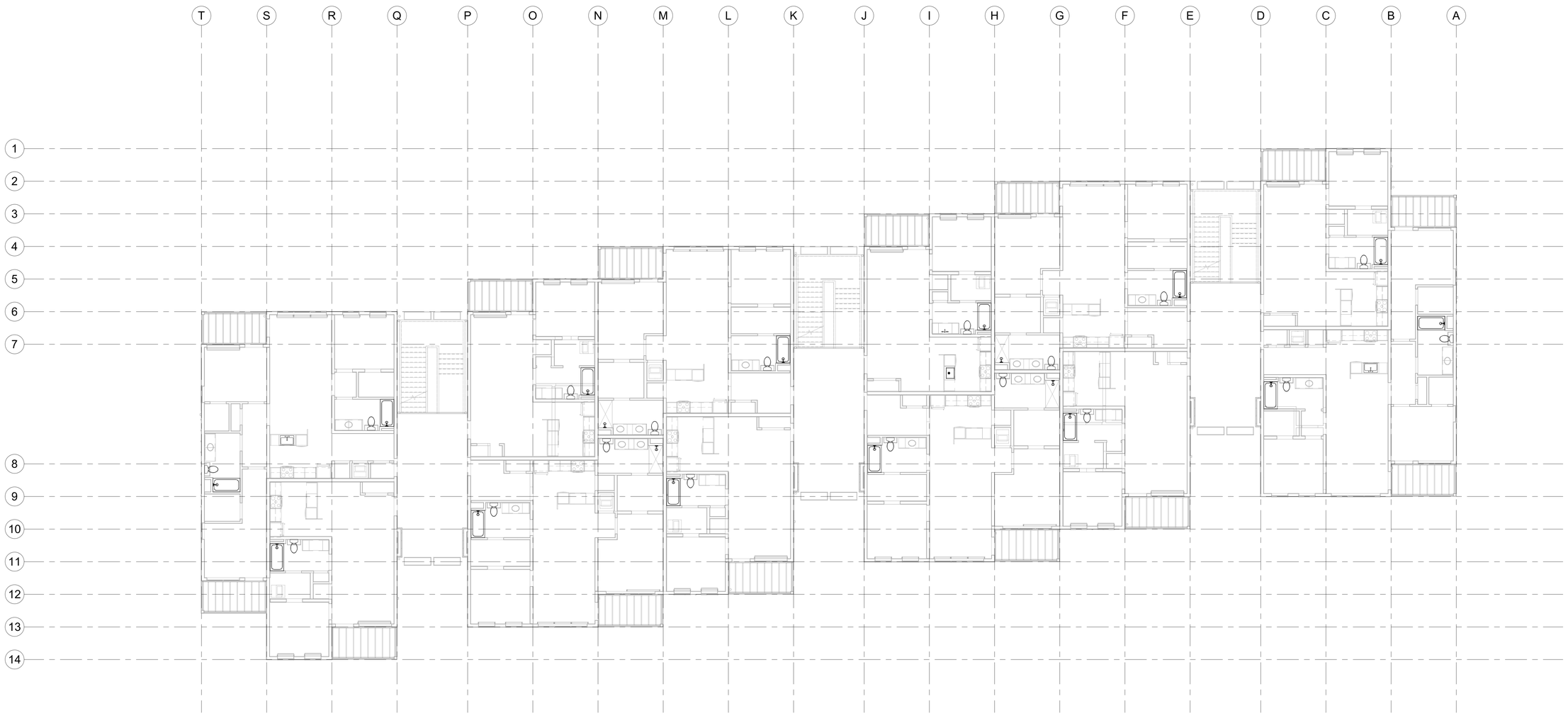
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
FIRST FLOOR PLAN

SHEET:
P2.101

TERRACE AT HIGH MOUNTAIN - A2



1 PLUMBING SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
SECOND FLOOR PLAN

SHEET:

P2.102

TERRACE AT HIGH MOUNTAIN - A2

1 PLUMBING THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

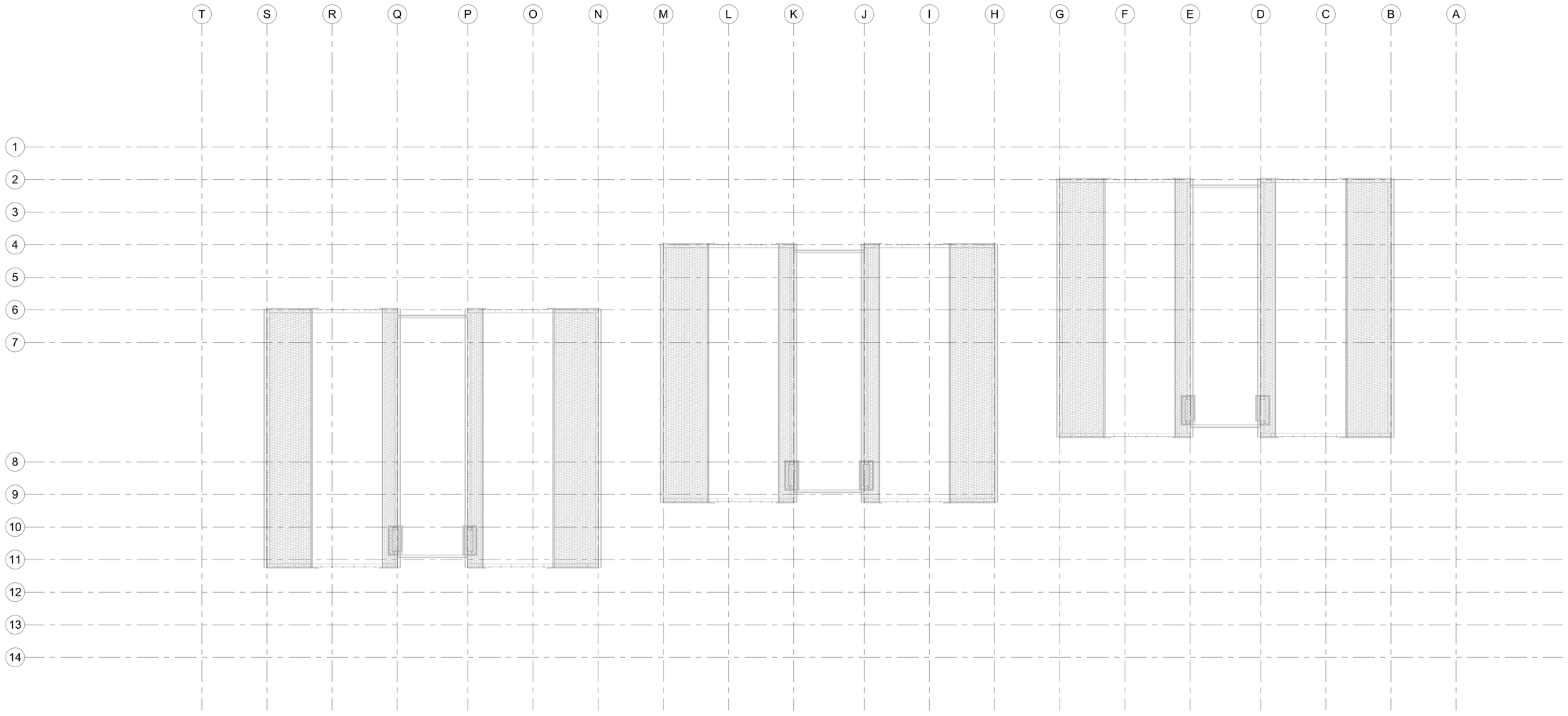
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
THIRD FLOOR PLAN

SHEET:

P2.103

TERRACE AT HIGH MOUNTAIN - A2



1 PLUMBING ROOF PLAN
1/8" = 1'-0"

GENERAL NOTE:

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PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NO. PE30574 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A2

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
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ONEIL
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PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
ROOF PLAN

SHEET:
P2.104

TERRACE AT HIGH MOUNTAIN - A2

PLUMBING DRAWING LIST

PLUMBING FIXTURE SCHEDULE

ITEM NO.	FIXTURE TYPE	WASTE CONN.	VENT CONN.	CW CONN.	HW CONN.	REMARKS
P-1	WATER CLOSET	3"	-	1 1/2"	-	
P-1A	WATER CLOSET (ADA)	3"	-	1 1/2"	-	
P-2	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	
P-2A	LAVATORY (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3	TUB/SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3A	TUB/SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3B	SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3C	SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-4	KITCHEN SINK	1 1/2"	1 1/2"	1/2"	1/2"	
P-4A	KITCHEN SINK (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	

PLUMBING LEGEND

SYMBOL	DESCRIPTION
W	SANITARY PIPING WASTE (ABOVE GRADE)
W	SANITARY PIPING WASTE (BELOW FLOOR)
GW	GREASE WASTE (BELOW FLOOR)
V	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWR	HOT WATER RECIRCULATION PIPING
	PIPE TURNING UP/DOWN
	FULL OPEN PORT GATE VALVE
	FLOOR DRAIN
	FLOOR CLEANOUT
	CLEANOUT
	1 HR RATED WALLS
	2 HR RATED WALLS
WHA	WATER HAMMER ARRESTOR
P-1	FIXTURE TYPE
	MIXING VALVE
	AIR ADMITTANCE VALVE
	BACKFLOW PREVENTOR

PLUMBING GENERAL NOTES

APPLICABLE CODES:
INTERNATIONAL PLUMBING CODE (IPC) 2015
INTERNATIONAL BUILDING CODE (IBC) 2015
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI A117.1-2009)
UNIFORM STATEWIDE BUILDING CODE OF ALABAMA 2015

PLUMBING SYSTEMS:
PROVIDE ALL PLUMBING FIXTURES AND TRIM AS INDICATED ON THE DRAWINGS AND AS SPECIFIED ELSEWHERE HEREIN. ALL FIXTURES SHALL BE CONNECTED TO THE PLUMBING SYSTEMS AS INDICATED AND REQUIRED FOR PROPER OPERATION. PIPING MATERIALS, ACCESSORIES AND EQUIPMENT SHALL BE SPECIFIED ELSEWHERE WITHIN THIS SPECIFICATION.

SANITARY WASTE AND VENT SYSTEMS:
PROVIDE A COMPLETE SANITARY, WASTE AND VENT SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING REQUIRING CONNECTIONS. ALL WASTE FROM THE BUILDING SHALL DISCHARGE BY GRAVITY OUT THE BUILDING TO BE PICKED UP BY CIVIL AND EXTENDED TO THE SEWER SYSTEM. SANITARY PIPING TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE OTHERWISE NOTED.

WATER SUPPLY SYSTEM:
PROVIDE A COMPLETE WATER SUPPLY SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING INCLUDING DOMESTIC WATER HEATERS. PROVIDE APPROVED GATE OR COMPRESSION STOPS AT EVERY CONNECTION TO FIXTURES AND EQUIPMENT.

STORM DRAINAGE SYSTEM:
REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND SIZING.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND FIXTURES. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGARS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.

PERMIT, FEES AND NOTICES:
COMPLY WITH THE GENERAL CONDITIONS AND PROVIDE ALL PERMITS AS REQUIRED FOR THE INSTALLATION OF ALL INDICATED PLUMBING SYSTEMS.

FIRE RATINGS:
SEPARATIONS BETWEEN R-2 TENANTS ARE 1-HR RATED.
CEILINGS ARE 1-HR RATED.
STAIRWELLS AND ELEVATOR ARE 2-HR RATED..

FULLY SPRINKLERED PER NFPA 13

USE GROUP: R-2
CONSTRUCTION: 5-A

PLUMBING SPECIFICATIONS

A. PIPE AND PIPE FITTINGS: 1. DOMESTIC (POTABLE) WATER (CW/HW) PIPING: SYSTEM DESIGN PRESSURE = 80 PSIG. PIPING 1" AND SMALLER SHALL BE PEX TUBING. BETWEEN 1-1/4" AND 2" SHALL BE SDR 11 CPVC TUBING. FOR PIPING GREATER THAN 2" PROVIDE SCHEDULE 80 CPVC TUBING.

2. SANITARY (W) AND VENT (V) PIPING: ALL SANITARY AND VENT PIPING SHALL BE SCHEDULE 40 PVC.

3. CONDENSATE DRAIN (D) PIPING: SYSTEM DESIGN PRESSURE = 10 PSIG. PROVIDE SCHEDULE 40 PVC.

4. STORM WATER (SW) PIPING: PROVIDE SCHEDULE 40 PVC.

B. VALVES:
1. GATE VALVES: POTABLE WATER SERVICE SIZES 1/2" - 2-1/2" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC PIPING SYSTEMS. ALL SHUT OFF VALVES SHALL BE FULL OPEN PORT TYPE VALVES.

2. DRAIN VALVES: POTABLE WATER SERVICE SIZES 1/2" AND 3/4" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC SYSTEMS.

3. BACKFLOW PREVENTER: SPECIFICATIONS ARE BASED ON WATTS LF909 LARGE SERIES WITH 909AG-F AIR GAP. PROVIDE AT LOCATIONS IN WHICH THE PUBLIC WATER SUPPLY SYSTEM MUST BE PROTECTED. MATERIALS OF CONSTRUCTION - EPOXY COATED CAST IRON BODY AND STRAINER, LEAD FREE COPPER SILICONE ALLOY TEST COCKS, STAINLESS STEEL SEATS , REDUCED PRESSURE ZONE ASSEMBLY WITH RELIEF DRAIN ASSEMBLY. PIPE RELIEF TO FLOOR DRAIN AS SHOWN.

C. PLUMBING FIXTURES: ALL PLUMBING FIXTURES AND TRIM SHALL BE NEW AS MANUFACTURED BY FIRMS REGULARLY ENGAGED IN THE MANUFACTURE OF PLUMBING FIXTURES, AND TRIM OF TYPE, STYLE AND CONFIGURATION REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE AND SIMILAR SERVICE.

D. PROVIDE PROTECTION OF ALL FIXTURES DURING CONSTRUCTION FROM DAMAGE. EACH WATER SUPPLY CONNECTION SERVING A FIXTURE SHALL BE EQUIPPED WITH AN ACCESSIBLE STOP VALVE. CAULK ALL GAPS IN AROUND WALLS/FLOORS AND THE PLUMBING FIXTURES. SPECIFICATIONS FOR THE PLUMBING FIXTURES ARE BASED ON THE FOLLOWING TYPES.

E. PIPE INSULATION:
1. CLOSED CELL ELASTOMERIC (PIPE SIZES UP TO 5 INCHES): FLEXIBLE ELASTOMERIC, CLOSED CELLULAR, TUBULAR MOLDED TO ACCOMMODATE PIPING, SMOOTH OUTER SURFACE SUITABLE FOR PAINTING WITH VINYL LACQUER TYPE COATING, WATER RESISTANT, NONABSORBENT, OZONE RESISTANT, MINIMUM DENSITY OF 4 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF 0.27 AT 75 F MEAN TEMPERATURE

APPLICATIONS:
1. DOMESTIC HOT AND COLD WATER (ALL SIZES) ON ALL EXTERIOR WALL PIPING OR IN UNCONDITIONED SPACES ONLY: PROVIDE 1/2" CLOSED CELL ELASTOMERIC.

F. WATER HEATERS :
ELECTRIC WATER HEATER - FULLY INSULATED BAKED ENAMEL STEEL JACKET, INSULATED IN CONFORMANCE WITH ASHRAE 90A-1980 STANDARD FOR ELECTRIC DOMESTIC WATER HEATER. GLASS LINING, RELIEF VALVE TAP, HEAT TRAPS, RATED FOR 150 PSI. PLATED COPPER ELEMENT, LOW WATT DENSITY, REPLACEABLE IMMERSION TYPE. PROVIDE WITH RELIEF VALVE AND FACTORY PACKAGED CONTROL WIRING.

EWH-1 - 40 GALLON 4.5 KW DUAL ELEMENT WATER HEATER. HEATER SHALL BE "SHORT" CONSTRUCTION. PROVIDE WITH 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE. BASED ON RUUD MODEL PROE38-S2-RU55.

PROVIDE WATER HEATERS WITH 2.5-GAL EXPANSION TANK (ET-1).

WATER HEATERS ARE LOCATED WITHIN A VENTILATED SPACE AND OVER AN IMPERVIOUS FLOOR.

G. FIXTURES :

MAKE AND MODELS OF SPECIFIC FIXTURES TO BE USED.
PROVIDE INDICATED QUANTITIES OF FIXTURES. SEE ARCHITECTS DRAWING FOR

WB-1: WASHING MACHINE BOX (PLASTIC): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER.

WB-2: WASHING MACHINE BOX (FIRE RATED): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 FIRE RATED WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER .

IM-1: REFRIGERATOR BOX (PLASTIC): WATER-TIGHT RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

IM-2: REFRIGERATOR BOX (FIRE RATED): IPS FIRE GUARD RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

FCO: PROVIDE SIZING AS INDICATED ON THE DRAWINGS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES CLEANOUTS WITH NICKEL BRONZE ADJUSTABLE TOPS. MATCH MATERIALS OF CONSTRUCTION FOR BODY TYPE.

WCO: PROVIDE CHROME PLATED COVER FOR SANITARY TEST TEE AT ALL INDICATED LOCATIONS.

FD: FLOOR DRAINS - PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS. FLOOR DRAINS SHALL BE SUPPLIED WITH NICKEL BRONZE ADJUSTABLE TOPS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES 834 FLOOR DRAINS. PROVIDE DRAINS SUBJECT TO EVAPORATION WITH A TRAP SEAL.

WH-1: FREEZELESS WALL HYDRANT - BACKFLOW PROTECTED WITH ANTI-SIPHON VACUUM BREAKER (ASSE 1011), TEE KEY, COPPER TUBES, CHROME FINISH, PERMANENT TYPE BRASS VALVE BODY, ASSE STANDARD 1019-B, WITH AUTOMATIC DRAINING. BASED ON WOODFORD MODEL 65.

RH-1: ROOF HYDRANT - SPECIFICATION BASED ON WOODFORD MODEL SRH-MS, FREEZELESS ROOF HYDRANT, WITH INTEGRAL ANIT-SIPHON VACUUM BREAKER, BACKFLOW PROTECTED WITH FIELD TESTABLE ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER. NO DRAIN REQUIRED - A VENTURI ACTION DRAWS WATER OUT OF THE INTERNAL RESERVOIR AND DISCHARGES OF THE BACKFLOW PREVENTER. ALL NECESSARY MOUNTING HARDWARE FOR PROPER INSTALLATION ON A COMMERCIAL ROOF IS TO BE SUPPLIED WITH DEVICE.

PROVIDE KITCHEN SINKS WITH TAILPIECE FOR DISHWASHER CONNECTION AND DISPOSAL. DISPOSAL TO BE EQUAL TO SINK GUARD MODEL SE150, 1/3 HP, CORROSION RESISTANT COMPOSITE HOPPER WITH CAST STAINLESS STEEL ANTI-JAM SWIVEL IMPELLERS. PROVIDE WHA AND SHUT OFF VALVE FOR CONNECTION TO DISHWASHER.

MISCELLANEOUS PLUMBING ITEMS:

1. TRAP SEAL: PROVIDE A TRAP SEAL AT ALL OPENSITE AND FLOOR DRAINS SUBJECT TO EVAPORATION. TRAP SEAL SPECIFICATIONS ARE BASED ON JOSAM 88240 SERIES TRAP SEAL INSERT. MUST BE AN ASSE 1072 TRAP SEAL DEVICE.

2. AIR ADMITTANCE VALVE (AAV): AAV'S MAY BE EITHER OATEY OR STUDOR TYPE. ALL AAV'S USED WITH WB'S SHALL BE BY OATEY (SUBSTITUTION BY APPROVAL ONLY).

3. WATER HAMMER ARRESTORS (WHA): PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON. DESIGNED TO OPERATE UP TO 150 PSI WORKING PRESSURE.

4. ALL APARTMENT DOMESTIC WATER SHUT OFF VALVES WILL BE LOCATED IN AN EASILY ACCESSIBLE LOCATION.

5. IDENTIFY ALL MAIN SHUT OFF VALVES BY TAGGING EACH.

6. IT IS THE INTENT OF THESE DRAWINGS THAT ALL TUB/SHOWERS WILL BE ABOVE FLOOR ROUGH IN.

7. PROVIDE QUARTER TURN SHUT OFF VALVES FOR ALL PLUMBING FIXTURES.

8. PROVIDE WHA'S ON ALL CONNECTIONS SERVING DISHWASHERS.

9. ALL PLUMBING FIXTURES TO HAVE SHUT OFF VALVES OR INTEGRAL STOPS.

10. ALL LAVATORIES ARE TO MEET THE PROPER CLEARANCES PER SECTION 405.3.1 OF THE IPC. SEE ARCHITECTS DRAWINGS FOR DIMENSIONED BATHROOM DRAWINGS.

11. PROVIDE A CLEAN OUT AT THE BASE OF ALL SANITARY STACKS.

12. ALL RISERS SHALL HAVE AN ACCESSIBLE SHUT OFF VALVE. PROVIDE 12x12 FIRE RATED ACCESS DOORS TO ALL VALVES IF REQUIRED.

13. ALL PIPING TO BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS.

14. ALL WATER LINES TO PLUMBING FIXTURES SHALL BE BURST PROOF, FLEXIBLE STAINLESS STEEL TYPE SUPPLY LINES.

15. RUN AIR HANDLING UNIT AND WATER HEATER RELIEF LINES TO NEAREST STORMWATER PIPES.

16. PROVIDE A DRAIN PAN UNDER THE WASHING MACHINE WITH A WATER SENSING DEVICE THAT SHUTS OFF WATER TO THE WASHER WHEN WATER IS DETECTED WITHIN THE DRAIN PAN.

GENERAL NOTE:

THIS PLAN IS A DIRECT COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

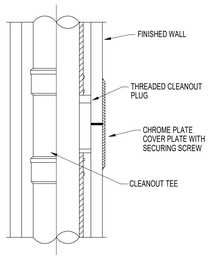
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING ABBREVIATIONS, LEGENDS, SCHEDULES, AND SPECIFICATIONS

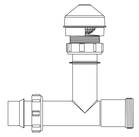
SHEET:

P3.001

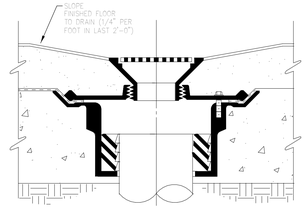
TERRACES AT HIGH MOUNTAIN - A3



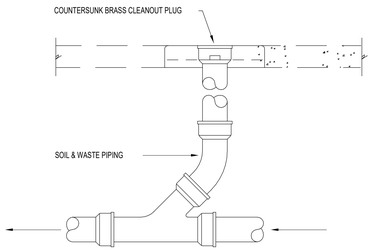
WALL CLEANOUTS
NO SCALE



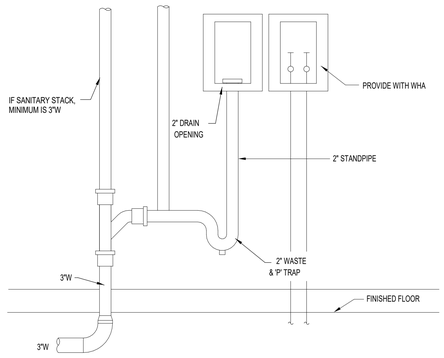
AIR ADMITTANCE VALVE - TUBULAR ADAPTER FOR UNDER SINK INSTALLATION
NO SCALE



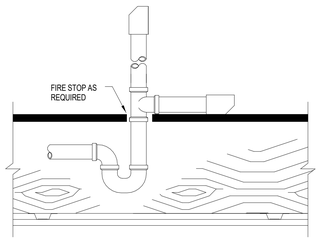
FLOOR DRAIN DETAIL
NOT TO SCALE



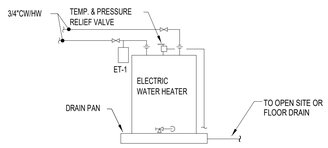
C.O. UP TO GRADE
NOT TO SCALE



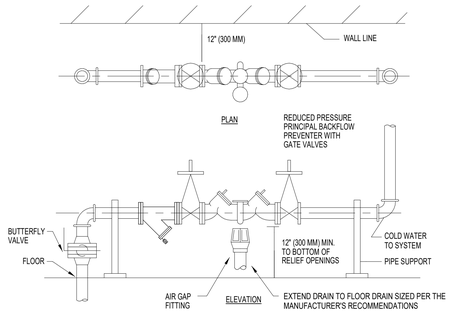
PLUMBING CONNECTIONS FOR LAUNDRY OUTLET
W/ SIOUX CHIEF OX BOX & CONDENSATE DRAIN ADAPTER
NO SCALE



ABOVE FLOOR ROUGH IN DETAIL TUB/SHOWER
NO SCALE



WATER HEATER DRAIN DETAIL
NOT TO SCALE



BACKFLOW PREVENTER PIPING DETAIL - DOMESTIC WATER
NOT TO SCALE

NOTES:

1. BACKFLOW TO BE MOUNTED IN HORIZONTAL POSITION. ALL MOUNTING CLEARANCES AND INSTALLATION TO BE PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTER WITH GATE VALVES. PROVIDE FULL OPEN PORT SHUT OFF VALVE AND STRAINER UPSTREAM OF BACKFLOW.
3. BACKFLOW WILL NOT BE PLACED WITHIN A VAULT.
4. BACKFLOW TO BE MOUNTED AT A HEIGHT SUCH THAT NO LADDER WILL BE NEEDED TO SERVICE THE BACKFLOW.

GENERAL NOTE:

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ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P3.002

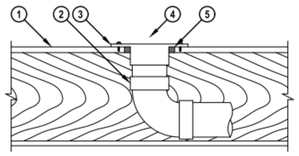
TERRACES AT HIGH MOUNTAIN - A3

UL SYSTEM NO. F-C-2203

CLOSET FLANGE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1-HR.

CROSS-SECTIONAL VIEW



FC2203d.011617

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
   B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. (NOT SHOWN). FLOOR MOUNTED VITREOUS CHINA WATER CLOSET.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Sheet	1 of 1
Scale	1/8" = 1"
Date	Jan. 16, 2017

Drawing No. FC 2203d

Hilti Firestop Systems

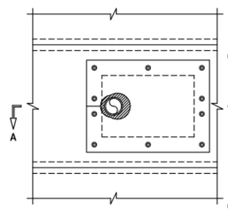
Saving Lives through Innovation and Education

UL SYSTEM NO. F-C-2204

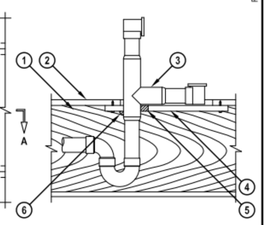
PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1/2-HR.

BOTTOM VIEW



SECTION A-A



FC2204b.010715

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. MAXIMUM 1-1/2" NOMINAL DIAMETER PVC OR ABS PLASTIC PIPE (SCHEDULE 40) AND DRAIN FITTINGS CEMENTED TOGETHER WITH PVC OR ABS BATHTUB WASTE/OVERFLOW FITTINGS.
4. 3/4" THICK PLYWOOD PATCH SIZED TO OVERLAP MINIMUM 2" BEYOND EACH EDGE OF RECTANGULAR OPENING. TWO PIECES POSITIONED AROUND DRAIN PIPING WITH CUT EDGES TIGHTLY BUTTED, AND SCREW ATTACHED TO UNDERSIDE OF SUBFLOOR WITH 1-1/4" LONG STEEL SCREWS (SPACED MAXIMUM 6" C/C). (SEE NOTE NO. 3 BELOW).
5. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM SIZE OF OPENING = 12" x 8".
2. ANNULAR SPACE BETWEEN DRAIN PIPING AND PATCH = MINIMUM 0", MAXIMUM 1".
3. AS AN ALTERNATE TO PLYWOOD, 5/8" THICK GYPSUM WALL BOARD MAY BE USED.

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	1/8" = 1"
Date	Jan. 07, 2015

Drawing No. FC 2204b

Hilti Firestop Systems

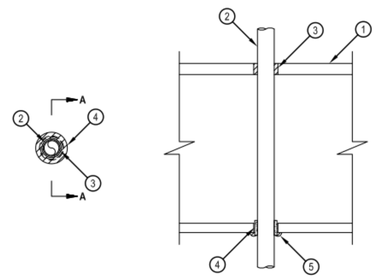
Saving Lives through Innovation and Education

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2230

F Rating - 1 Hr
T Rating - 1/4 Hr

FC 2230



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 1-5/8 in. (41 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design.

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January 21, 2015

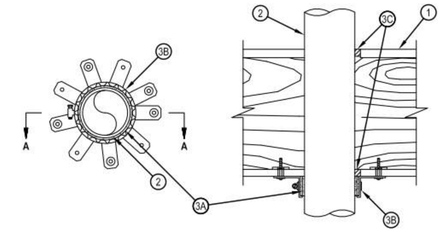
Hilti Firestop Systems

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2232

F Rating — 1 Hr
T Rating — 3/4 and 1 Hr (See Item 3)

FC 2232



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
2. Through Penetrants — One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) and max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

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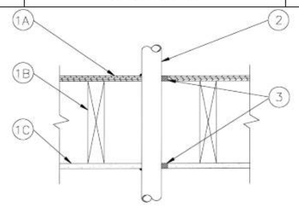
January 15, 2015

Hilti Firestop Systems

F Rating – 1 Hr T Rating – 1 Hr	F-C-2080



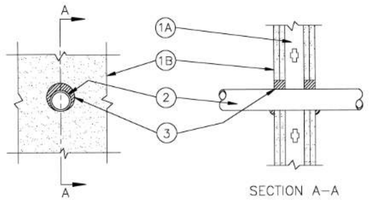
1. **Floor-Ceiling Assembly –** The fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Flooring System –** Lumber of plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of floor opening is 3-1/8 in.
   B. **Wood Joists –** Nom 2 by 10 in. deep (or deeper) lumber joists spaced 16 in. OC, with nom 1 by 3 in. lumber bridging and with ends firestopped or steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board* –** Nom 5/8 in. thick as specified in the individual Floor-Ceiling Design. diam of opening is 3-1/8 in.
2. **Through Penetrant –** One non-metallic pipe or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. Pipe to be rigidly supported on both sides of floor assembly.
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 cellular or solid core chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   B. **Polyvinyl Chloride (PVC) –** Nom 2 in. diam (or smaller) Schedule 40 (or heavier) PVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ –** Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).

Underwriters Laboratories Inc.®

09/16 (1)

F Ratings – 1, 2, 3 and 4 Hr (See Item 1) T Ratings – 1, 2, 3 and 4 Hr (See Item 1)	W-L-2126

ANSI/UL1479 (ASTM E814)
F Ratings — 1, 2, 3 and 4 Hr (See Item 1)
T Ratings — 1, 2, 3 and 4 Hr (See Item 1)



SECTION A–A

1. **Wall Assembly –** The 1, 2, 3 or 4 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs –** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC.
   B. **Gypsum Board* –** The gypsum wallboard type, thickness, number of layers, fasteners and sheet orientation shall be as specified in the individual U300 or U400 Series Designs in the UL Fire Resistance Directory. Max diam of opening is 3-1/8 in.
   The hourly F and T Ratings of the firestop system is equal to the hourly fire rating of the assembly in which it is installed.

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09/16 (1)

System No. F-C-2230

FC 2230

2. Through Penetrants — One non-metallic tube to be installed concentrically within the firestop system. Annular space between tube and periphery of opening shall be 1/4 in. (6 mm). Tube to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of non-meyallic tubes or pipes may be used:
   Crosslinked Polyethylene (PEX) Tubing — Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Fill, Void or Cavity Materials* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1 in. (25 mm) wide intumescentwrap strip. One layer of wrap strip tightly wrapped around tube and held in place with tape. Wrap strip centered in annular space extending from both sides of gypsum board.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W25/1" Wrap Strip
4. Fill, Void or Cavity Materials* - Sealant — Min 3/4 in. (19 mm) depth of fill material applied within the annulus, flush with the top surface of floor. A 1/4 in. (6 mm) diam bead of fill material shall also be applied at the wrap strip/gypsum board interface.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Sealant - FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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January 21, 2015

Hilti Firestop Systems

System No. F-C-2232

FC 2232

3. Nonmetallic Pipe Coupling — (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC, Schedule 40 ABS or SDR13.5 CPVC coupling corresponding to pipe type installed such that the top of the coupling is flush with the bottom surface of the ceiling and extending downward.
4. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1-3/4 in. (44 mm) wide intumescent wrap strip. Layers of wrap strip continuously wrapped around the pipe and held in place with tape. Wrap strip butted tightly against surface of ceiling.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W45/1-3/4" Wrap Strip

Nom Diam of Pipe, in. (mm)	Number of Wrap Strips	Min/Max Annular Space, in. (mm)	T-Rating - Hr.
2 (51)	1	0-1/4 (0-6)	1
3 (76)	2	0-1/2 (0-13)	3/4
4 (102)	2	0-1/2 (0-13)	3/4

   B. Steel Collar — Collar fabricated from coils of precut min 0.017 in. (0.43 mm) thick (No. 28 MSG) galv steel available from the sealant manufacturer. Collar shall be nom 1-3/4 in. (44 mm) deep with 1 in. (25 mm) wide by 2 in. (51 mm) long anchors tabs on 2 in. (51 mm) centers for securement to floor/ceiling assembly. The opposite side incorporates retainer tabs, 1/2 in. (13 mm) wide by 3/16 in. (5 mm) long, prebent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 1 in at seam. A nom 1/2 in. (13 mm) wide stainless steel hose clamp shall be secured to the collar at its mid-height. Every other anchor tab of collar secured to gypsum ceiling with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel toggle bolts in conjunction with 1/4 in. by 3/4 in. (6 by 19 mm) diameter steel washers.
   C. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface on top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX SEALANT
   4A. Firestop System — (Optional, Not shown) As an option to Item 4, the firestop system shall consist of the following:
   A. Firestop Device* — Galv steel collar lined with an intumescent material sized to fit the specific diam of pipe shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the gypsum board ceiling with 1/4 in. diam by 1-1/2 in. (38 mm) long steel toggle bolts with 3/4 in. (19 mm) diam steel washers through hanger tabs provided.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N or CP 643 110/4"N Firestop Collar.
   B. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface, flush with top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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January 15, 2015

Hilti Firestop Systems

Continued … F-C-2080

3. **Fill, Void or Cavity Material* – Sealant –** Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling. Min 1/2 in. diam bead of fill material applied at the penetrant/floor and penetrant/ceiling interfaces at point contact locations on both sides of assembly.
   Passive Fire Protection Partners – 3600EX, 4800DW

* Bearing the UL Classification Marking
\+ Bearing the UL Listing Mark

Continued… W-L-2126

2. **Through Penetrants –** One nonmetallic pipe or tubing installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes or tubing may be used:
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 CPVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.
   B. **Crosslinked Polyethylene (PEX) Tubing –** Nom 1-1/2 in. diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems. The annular space between tubing and periphery of opening shall be min 1/4 in. to max 3/8 in.
   C. **Polyvinyl Chloride (PVC) Pipe –** Nom 2 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.

3. **Fill, Void or Cavity Material* – Sealant –** Min 5/8 in. thickness of fill material for a 1 hr rated wall assembly, min 1 in. thickness of fill material for 2, 3 and 4 hr rated assemblies applied within the annulus, flush with both surfaces of wall.
   Passive Fire Protection Partners – 3600EX, 4800DW

*Bearing the UL Classification Marking

GENERAL NOTE:

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PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED ENGINEER
NO. PE30316 PROFESSIONAL
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
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3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

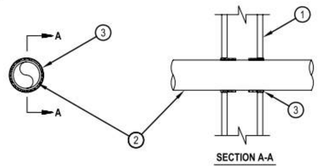
P3.003

TERRACES AT HIGH MOUNTAIN - A3

WL 2284

System No. W-L-2284

F Rating - 1 Hr
T Rating - 1 Hr



SECTION A-A

1. Wall Assembly -- The 1 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing shall consist of wood studs or steel channel studs. Wood studs to consist of 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- Min 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers and orientation shall be as specified in the individual U300 or U400 Wall and Partition Design. Max diam of opening is 4 in.
2. Through Penetrants -- One nonmetallic pipe to be centered within the firestop system. An annular space of 3/16 to 1/4 in. is required within the firestop system. Pipe to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe -- Nom 3 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 3 in. diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Material* -- Wrap Strip - Layers of intumescent wrap strip are continuously wrapped around the pipe with ends held in place with tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall. Size of wrap strip and number of layers are shown in table below.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP648-E W25/1" or CP648-E W45/1-3/4" Firestop Wrap Strip

ProductDesignation	Pipe Diameter (in.)	Number of Layers	Nom. Wrap Strip Width (in.)
CP648-E-W25/1*	1-1/2 and 2	1	1
CP648-E-W45/1-3/4*	1-1/2, 2 and 3	1	1-3/4

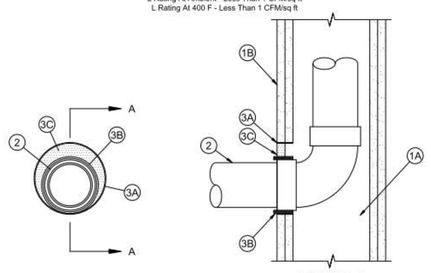
A. Fill, Void or Cavity Material* - Wrap Strip -- (As an alternate to the wrap strip in Item 3) - One layer of intumescent wrap strip is tightly wrapped around the pipe with ends butted and held in place with integrated tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- CP648-S-1.5" US, CP648-S-2" US, CP648-S-3" US
*Bearing the UL Classification Mark

Hilti Firestop Systems

System No. W-L-2636

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



SECTION A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing to consist of nom 2 by 6 in. (51 by 152 mm) (or larger) wood or steel channel studs or doubled or staggered nom 2 by 4 in. (51 by 102 mm) (or larger) wood studs spaced in accordance with the individual U300, U400, V400 or W400 Series Wall and Partition Designs.
   B. **Gypsum Board*** - One or two layers of nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max diam of opening is 5-1/2 in. (140 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Nonmetallic Penetrant -** One nonmetallic pipe or conduit to be installed within stud cavity and connected to a 90° elbow. Hub of the elbow may be recessed into the annular space within the opening. Additional nonmetallic pipe or conduit shall be connected to elbow and penetrate one side of the wall either concentrically or eccentrically within the firestop system. The annular space between pipe or conduit and periphery of the opening shall be min 1/4 in. (6 mm) to max 1-1/4 in. (32 mm). Pipe or conduit shall be rigidly supported within the wall and on the penetrated side of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

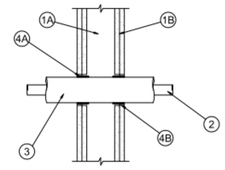
Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com

W-L-2636

System No. W-L-5290

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening shall be 4 in. (102 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.

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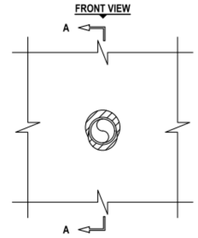
W-L-5290

MK

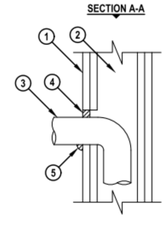
ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : TERRACES AT HIGH MOUNTAIN
ENGINEER : ONEIL ENGINEERING SERVICES
F-RATING = 1-HR. OR 2-HR.

FRONT VIEW



SECTION A-A



1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300, U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 3-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40 OR HEAVIER) (CELLULAR OR SOLID CORE) (CLOSED OR VENTED PIPING SYSTEM).
   B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY).
   C. MAXIMUM 2" NOMINAL DIAMETER PEX TUBING (SDR 9) (CLOSED PIPING SYSTEM ONLY).
   D. MAXIMUM 2" NOMINAL DIAMETER RNC-PVC CONDUIT (SCHEDULE 40).
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. DIAMETER OF OPENING SHALL BE 1" LARGER THAN NOMINAL PIPE DIAMETER.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5/8".

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL SYSTEM NO. W-L-2474)

Hilti Firestop Systems

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Designed by

Sheet	1 of 1
Scale	1/8" = 1"
Date	June 07, 2021

Drawing No. 524232a

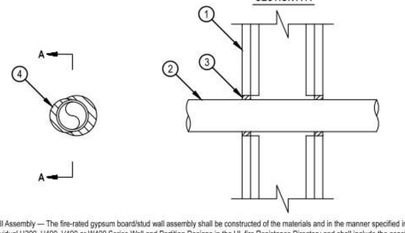
Saving Lives through Innovation and Education

WL 2474

System No. W-L-2474

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating at 400 F - 4 CFM/Sq Ft

SECTION A-A



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Diam of opening shall be 1 in. (25 mm) larger than the nom pipe diam.
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and the periphery of the opening shall be min 0 in. (point contact) to a max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) cellular or solid core Schedule 40 (or heavier) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
   D. Rigid Nonmetallic Conduit (RNC)+ — Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
3. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At point contact location, a min 5/8 in. (16 mm) diam bead of fill material shall be applied to the wall/penetrant interface on both surfaces of the wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
\+ Bearing the UL Listing Mark

Hilti Firestop Systems

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Metallic Sleeve -** Cylindrical sleeve fabricated from min 0.016 in. (0.4 mm) thick (30 gauge) galv sheet steel and having a 1 in. (25 mm) lap along the longitudinal seam. Length of steel sleeve to be 5/8 in. (16 mm) in 1 hr fire rated walls and 1-1/4 in. (32 mm) in 2 hr fire rated walls. Sleeve installed by coiling the sheet steel to a diam smaller than the opening, inserting the coil into the opening and releasing the coil to let it uncoil against the circular cutout in the wallboard layers. Sleeve shall be installed flush with wall surfaces on the penetrated side of the wall assembly.
   B. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/4 in. (6 mm) thick by 1-1/2 in. (38 mm) wide (RED), 1/8 in. (3.2 mm) thick by 1-1/2 in. (38 mm) wide (RED2), 3/16 in. (4.8 mm) thick by 2 in. (51 mm) wide (BLU), 1/8 in. (3.2 mm) thick by 2 in. (51 mm) wide (BLU2), intumescent strips faced on both sides with a plastic film, Two layers of wrap strip individually wrapped around the through penetrant with the ends butted or continuously wrapped around the penetrant and held in place by means of foil tape. The wrap strip is slid along the penetrant into annulus such that the trailing edge of the wrap strip extends 1/4 in. (6 mm) from the surface of the wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal RED, RED2, BLU, or BLU2 Wrap Strip
   C. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with surface of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant
   +Bearing the UL Listing Mark
   *** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com

W-L-2636

3. **Pipe and Equipment Covering Materials* -** Max 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 57 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between insulated penetrating item and the edge of the through opening shall be nom 11/32 in. (8.7 mm).
4. **Firestop System -** The firestop system shall consist of the following items:
   A. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips or 1/8 or 1/4 in. (3.2 or 6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. Single layer of wrap strip wrapped around the through penetrant with the ends butted and held in place by means of foil tape. The wrap strip is slid along the through penetrant into annulus such that outer edge of wrap strip is flush with wall surface. One set of wrap strips to be installed on each side of wall. As an option when 1/8 in. (3.2 mm) thick wrap strip (BLU2) is used, the strips may be cut to a width of 1-1/2 in. (38 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip, SpecSeal BLU2 Wrap Strip or SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or SpecSeal Series SSS Sealant
   * Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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W-L-5290

GENERAL NOTE:

THIS PLAN IS A DIRECT COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

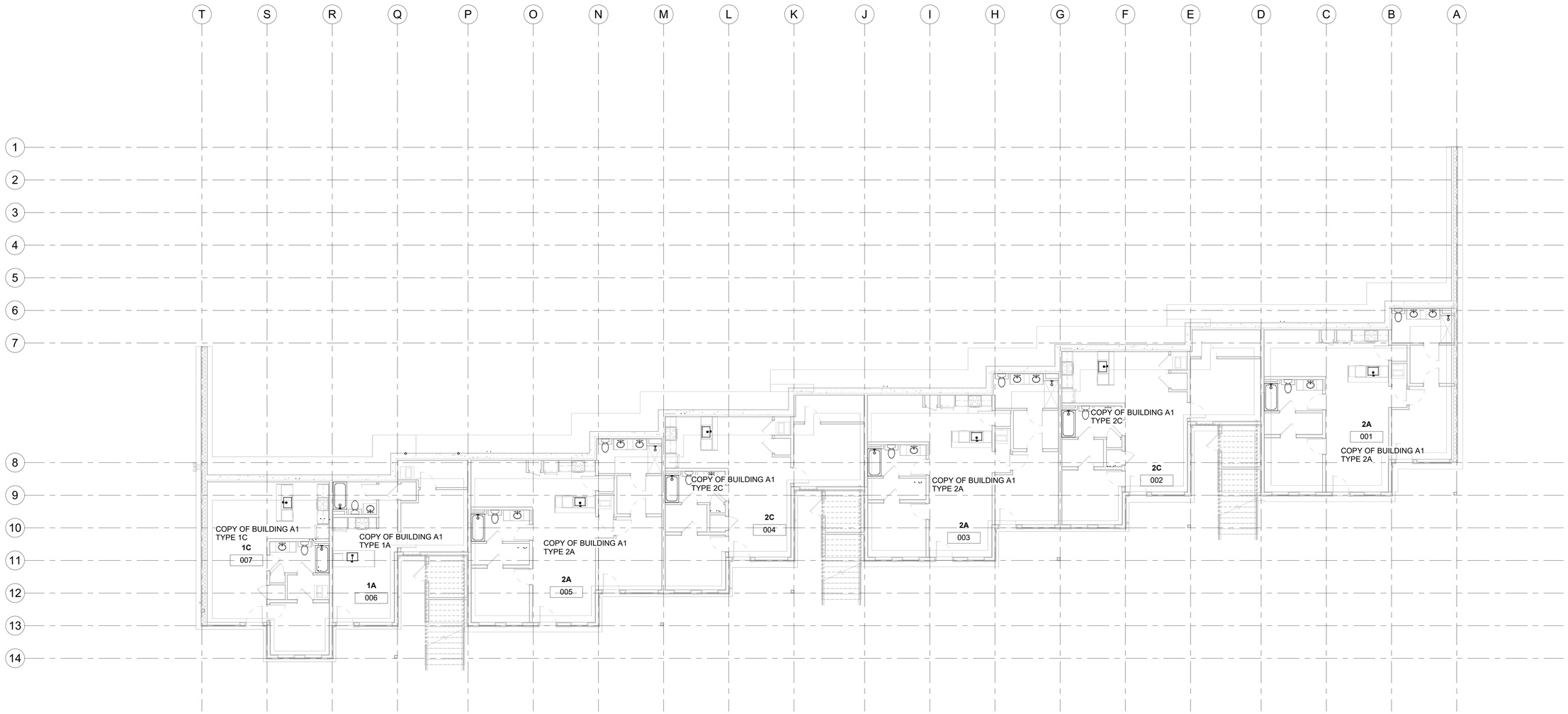
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P3.004

TERRACES AT HIGH MOUNTAIN - A3



1 PLUMBING BASEMENT FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

THIS PLAN IS A DIRECT COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
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4		XX
5		XX
6		XX

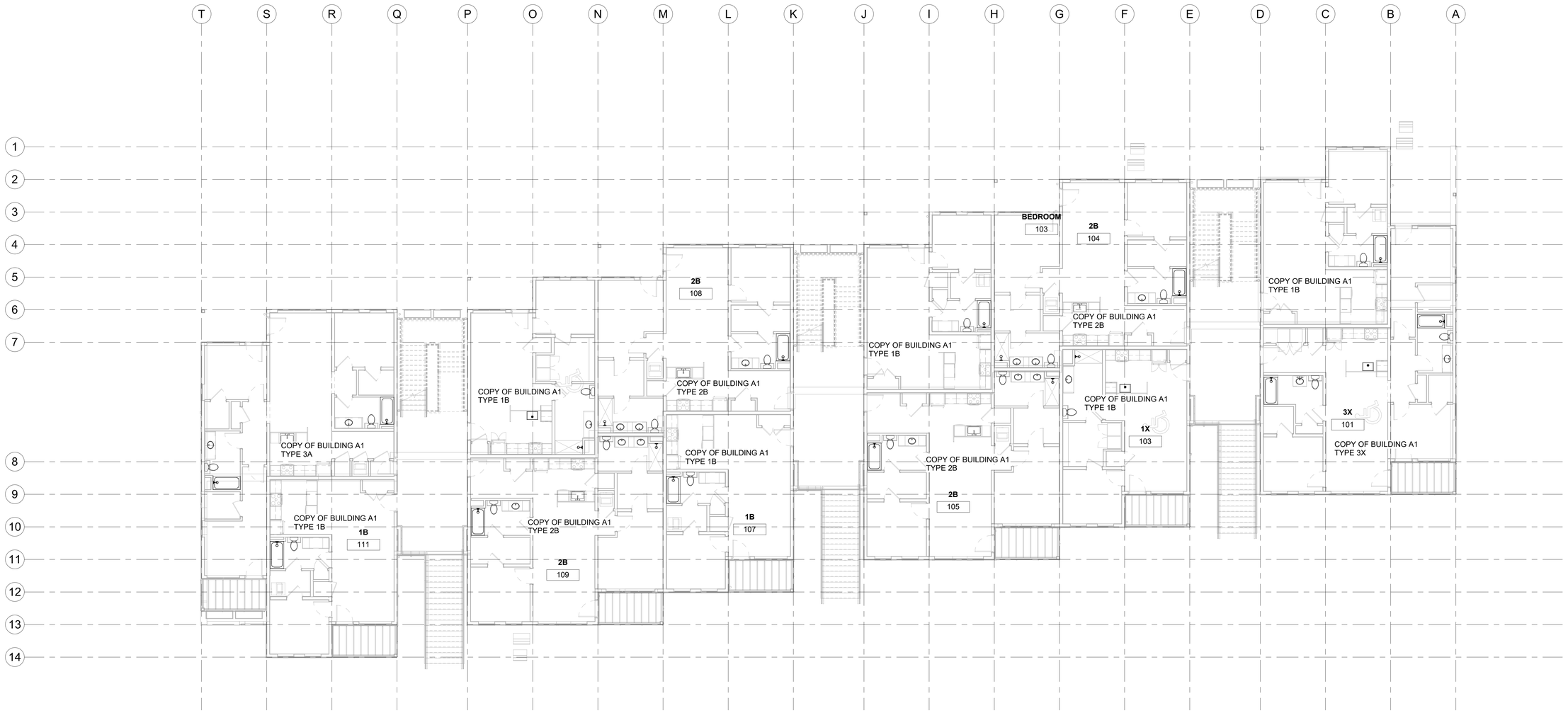
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
BASEMENT FLOOR PLAN

SHEET:
P3.100

TERRACES AT HIGH MOUNTAIN - A3



1 PLUMBING FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
FIRST FLOOR PLAN

SHEET:

P3.101

TERRACES AT HIGH MOUNTAIN - A3

1 PLUMBING SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
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5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
SECOND FLOOR PLAN

SHEET:
P3.102

TERRACES AT HIGH MOUNTAIN - A3

1 PLUMBING THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

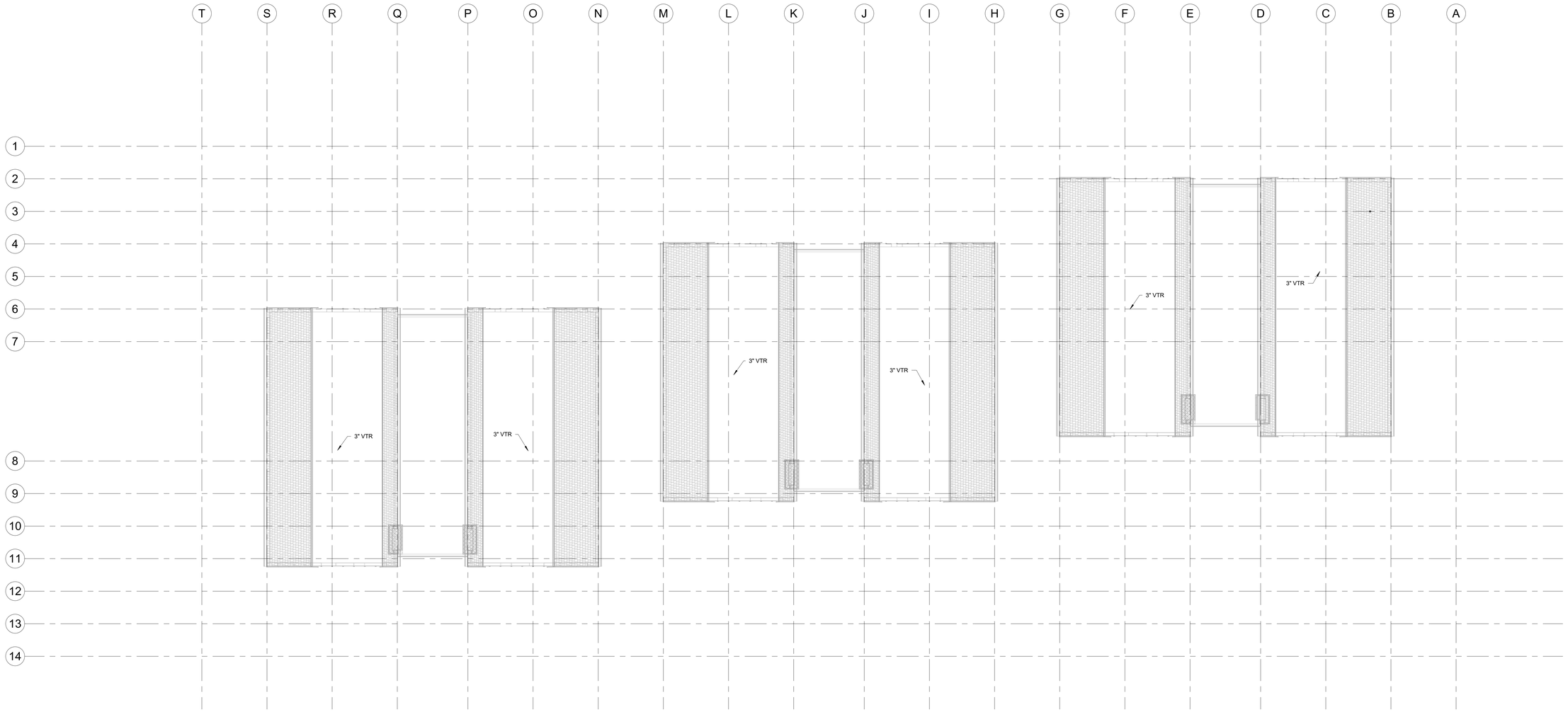
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
THIRD FLOOR PLAN

SHEET:

P3.103

TERRACES AT HIGH MOUNTAIN - A3



1 PLUMBING ROOF PLAN
1/8" = 1'-0"

GENERAL NOTE:

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ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A3

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
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3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
ROOF PLAN

SHEET:

P3.104

TERRACES AT HIGH MOUNTAIN - A3

PLUMBING DRAWING LIST

PLUMBING FIXTURE SCHEDULE

ITEM NO.	FIXTURE TYPE	WASTE CONN.	VENT CONN.	CW CONN.	HW CONN.	REMARKS
P-1	WATER CLOSET	3"	-	1 1/2"	-	
P-1A	WATER CLOSET (ADA)	3"	-	1 1/2"	-	
P-2	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	
P-2A	LAVATORY (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3	TUB/SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3A	TUB/SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-3B	SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3C	SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	
P-4	KITCHEN SINK	1 1/2"	1 1/2"	1/2"	1/2"	
P-4A	KITCHEN SINK (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	

PLUMBING LEGEND

SYMBOL	DESCRIPTION
W	SANITARY PIPING WASTE (ABOVE GRADE)
W	SANITARY PIPING WASTE (BELOW FLOOR)
GW	GREASE WASTE (BELOW FLOOR)
V	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWR	HOT WATER RECIRCULATION PIPING
	PIPE TURNING UP/DOWN
	FULL OPEN PORT GATE VALVE
	FLOOR DRAIN
	FLOOR CLEANOUT
	CLEANOUT
	1 HR RATED WALLS
	2 HR RATED WALLS
WHA	WATER HAMMER ARRESTOR
P-1	FIXTURE TYPE
	MIXING VALVE
	AIR ADMITTANCE VALVE
	BACKFLOW PREVENTOR

PLUMBING GENERAL NOTES

APPLICABLE CODES:
INTERNATIONAL PLUMBING CODE (IPC) 2015
INTERNATIONAL BUILDING CODE (IBC) 2015
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI A117.1-2009)
UNIFORM STATEWIDE BUILDING CODE OF ALABAMA 2015

PLUMBING SYSTEMS:
PROVIDE ALL PLUMBING FIXTURES AND TRIM AS INDICATED ON THE DRAWINGS AND AS SPECIFIED ELSEWHERE HEREIN. ALL FIXTURES SHALL BE CONNECTED TO THE PLUMBING SYSTEMS AS INDICATED AND REQUIRED FOR PROPER OPERATION. PIPING MATERIALS, ACCESSORIES AND EQUIPMENT SHALL BE SPECIFIED ELSEWHERE WITHIN THIS SPECIFICATION.

SANITARY WASTE AND VENT SYSTEMS:
PROVIDE A COMPLETE SANITARY, WASTE AND VENT SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING REQUIRING CONNECTIONS. ALL WASTE FROM THE BUILDING SHALL DISCHARGE BY GRAVITY OUT THE BUILDING TO BE PICKED UP BY CIVIL AND EXTENDED TO THE SEWER SYSTEM. SANITARY PIPING TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE OTHERWISE NOTED.

WATER SUPPLY SYSTEM:
PROVIDE A COMPLETE WATER SUPPLY SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING INCLUDING DOMESTIC WATER HEATERS. PROVIDE APPROVED GATE OR COMPRESSION STOPS AT EVERY CONNECTION TO FIXTURES AND EQUIPMENT.

STORM DRAINAGE SYSTEM:
REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND SIZING.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND FIXTURES. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGARS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.

PERMIT, FEES AND NOTICES:
COMPLY WITH THE GENERAL CONDITIONS AND PROVIDE ALL PERMITS AS REQUIRED FOR THE INSTALLATION OF ALL INDICATED PLUMBING SYSTEMS.

FIRE RATINGS:
SEPARATIONS BETWEEN R-2 TENANTS ARE 1-HR RATED.
CEILINGS ARE 1-HR RATED.
STAIRWELLS AND ELEVATOR ARE 2-HR RATED..

FULLY SPRINKLERED PER NFPA 13

USE GROUP : R-2
CONSTRUCTION : 5-A

PLUMBING SPECIFICATIONS

A. PIPE AND PIPE FITTINGS: 1. DOMESTIC (POTABLE) WATER (CW/HW) PIPING: SYSTEM DESIGN PRESSURE = 80 PSIG. PIPING 1" AND SMALLER SHALL BE PEX TUBING. BETWEEN 1-1/4" AND 2" SHALL BE SDR 11 CPVC TUBING. FOR PIPING GREATER THAN 2" PROVIDE SCHEDULE 80 CPVC TUBING.

2. SANITARY (W) AND VENT (V) PIPING: ALL SANITARY AND VENT PIPING SHALL BE SCHEDULE 40 PVC.

3. CONDENSATE DRAIN (D) PIPING: SYSTEM DESIGN PRESSURE = 10 PSIG. PROVIDE SCHEDULE 40 PVC.

4. STORM WATER (SW) PIPING: PROVIDE SCHEDULE 40 PVC.

B. VALVES:
1. GATE VALVES: POTABLE WATER SERVICE SIZES 1/2" - 2-1/2" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC PIPING SYSTEMS. ALL SHUT OFF VALVES SHALL BE FULL OPEN PORT TYPE VALVES.

2. DRAIN VALVES: POTABLE WATER SERVICE SIZES 1/2" AND 3/4" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC SYSTEMS.

3. BACKFLOW PREVENTER: SPECIFICATIONS ARE BASED ON WATTS LF909 LARGE SERIES WITH 909AG-F AIR GAP. PROVIDE AT LOCATIONS IN WHICH THE PUBLIC WATER SUPPLY SYSTEM MUST BE PROTECTED. MATERIALS OF CONSTRUCTION - EPOXY COATED CAST IRON BODY AND STRAINER, LEAD FREE COPPER SILICONE ALLOY TEST COCKS, STAINLESS STEEL SEATS , REDUCED PRESSURE ZONE ASSEMBLY WITH RELIEF DRAIN ASSEMBLY. PIPE RELIEF TO FLOOR DRAIN AS SHOWN.

C. PLUMBING FIXTURES: ALL PLUMBING FIXTURES AND TRIM SHALL BE NEW AS MANUFACTURED BY FIRMS REGULARLY ENGAGED IN THE MANUFACTURE OF PLUMBING FIXTURES, AND TRIM OF TYPE, STYLE AND CONFIGURATION REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE AND SIMILAR SERVICE.

D. PROVIDE PROTECTION OF ALL FIXTURES DURING CONSTRUCTION FROM DAMAGE. EACH WATER SUPPLY CONNECTION SERVING A FIXTURE SHALL BE EQUIPPED WITH AN ACCESSIBLE STOP VALVE. CAULK ALL GAPS IN AROUND WALLS/FLOORS AND THE PLUMBING FIXTURES. SPECIFICATIONS FOR THE PLUMBING FIXTURES ARE BASED ON THE FOLLOWING TYPES.

E. PIPE INSULATION:
1. CLOSED CELL ELASTOMERIC (PIPE SIZES UP TO 5 INCHES): FLEXIBLE ELASTOMERIC, CLOSED CELLULAR, TUBULAR MOLDED TO ACCOMMODATE PIPING, SMOOTH OUTER SURFACE SUITABLE FOR PAINTING WITH VINYL LACQUER TYPE COATING, WATER RESISTANT, NONABSORBENT, OZONE RESISTANT, MINIMUM DENSITY OF 4 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF 0.27 AT 75 F MEAN TEMPERATURE

APPLICATIONS:
1. DOMESTIC HOT AND COLD WATER (ALL SIZES) ON ALL EXTERIOR WALL PIPING OR IN UNCONDITIONED SPACES ONLY: PROVIDE 1/2" CLOSED CELL ELASTOMERIC.

F. WATER HEATERS :
ELECTRIC WATER HEATER - FULLY INSULATED BAKED ENAMEL STEEL JACKET, INSULATED IN CONFORMANCE WITH ASHRAE 90A-1980 STANDARD FOR ELECTRIC DOMESTIC WATER HEATER, GLASS LINING, RELIEF VALVE TAP, HEAT TRAPS, RATED FOR 150 PSI. PLATED COPPER ELEMENT, LOW WATT DENSITY, REPLACEABLE IMMERSION TYPE. PROVIDE WITH RELIEF VALVE AND FACTORY PACKAGED CONTROL WIRING.

EWH-1 - 40 GALLON 4.5 KW DUAL ELEMENT WATER HEATER. HEATER SHALL BE "SHORT" CONSTRUCTION. PROVIDE WITH 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE. BASED ON RUUD MODEL PROE38-S2-RU95.

PROVIDE WATER HEATERS WITH 2.5-GAL EXPANSION TANK (ET-1).

WATER HEATERS ARE LOCATED WITHIN A VENTILATED SPACE AND OVER AN IMPERVIOUS FLOOR.

G. FIXTURES :

MAKE AND MODELS OF SPECIFIC FIXTURES TO BE USED.
PROVIDE INDICATED QUANTITIES OF FIXTURES. SEE ARCHITECTS DRAWING FOR

WB-1: WASHING MACHINE BOX (PLASTIC): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER.

WB-2: WASHING MACHINE BOX (FIRE RATED): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 FIRE RATED WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER .

IM-1: REFRIGERATOR BOX (PLASTIC): WATER-TIGHT RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

IM-2: REFRIGERATOR BOX (FIRE RATED): IPS FIRE GUARD RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

FCO: PROVIDE SIZING AS INDICATED ON THE DRAWINGS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES CLEANOUTS WITH NICKEL BRONZE ADJUSTABLE TOPS. MATCH MATERIALS OF CONSTRUCTION FOR BODY TYPE.

WCO: PROVIDE CHROME PLATED COVER FOR SANITARY TEST TEE AT ALL INDICATED LOCATIONS.

FD: FLOOR DRAINS - PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS. FLOOR DRAINS SHALL BE SUPPLIED WITH NICKEL BRONZE ADJUSTABLE TOPS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES 834 FLOOR DRAINS. PROVIDE DRAINS SUBJECT TO EVAPORATION WITH A TRAP SEAL.

WH-1: FREEZELESS WALL HYDRANT - BACKFLOW PROTECTED WITH ANTI-SIPHON VACUUM BREAKER (ASSE 1011), TEE KEY, COPPER TUBES, CHROME FINISH, PERMANENT TYPE BRASS VALVE BODY, ASSE STANDARD 1019-B, WITH AUTOMATIC DRAINING. BASED ON WOODFORD MODEL 65.

RH-1: ROOF HYDRANT - SPECIFICATION BASED ON WOODFORD MODEL SRH-MS, FREEZELESS ROOF HYDRANT, WITH INTEGRAL ANIT-SIPHON VACUUM BREAKER, BACKFLOW PROTECTED WITH FIELD TESTABLE ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER. NO DRAIN REQUIRED - A VENTURI ACTION DRAWS WATER OUT OF THE INTERNAL RESERVOIR AND DISCHARGES OF THE BACKFLOW PREVENTER. ALL NECESSARY MOUNTING HARDWARE FOR PROPER INSTALLATION ON A COMMERCIAL ROOF IS TO BE SUPPLIED WITH DEVICE.

PROVIDE KITCHEN SINKS WITH TAILPIECE FOR DISHWASHER CONNECTION AND DISPOSAL. DISPOSAL TO BE EQUAL TO SINK GUARD MODEL SE150, 1/3 HP, CORROSION RESISTANT COMPOSITE HOPPER WITH CAST STAINLESS STEEL ANTI-JAM SWIVEL IMPELLERS. PROVIDE WHA AND SHUT OFF VALVE FOR CONNECTION TO DISHWASHER.

MISCELLANEOUS PLUMBING ITEMS:

1. TRAP SEAL: PROVIDE A TRAP SEAL AT ALL OPENSITE AND FLOOR DRAINS SUBJECT TO EVAPORATION. TRAP SEAL SPECIFICATIONS ARE BASED ON JOSAM 88240 SERIES TRAP SEAL INSERT. MUST BE AN ASSE 1072 TRAP SEAL DEVICE.

2. AIR ADMITTANCE VALVE (AAV): AAV'S MAY BE EITHER OATEY OR STUDOR TYPE. ALL AAV'S USED WITH WB'S SHALL BE BY OATEY (SUBSTITUTION BY APPROVAL ONLY).

3. WATER HAMMER ARRESTORS (WHA): PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON. DESIGNED TO OPERATE UP TO 150 PSI WORKING PRESSURE.

4. ALL APARTMENT DOMESTIC WATER SHUT OFF VALVES WILL BE LOCATED IN AN EASILY ACCESSIBLE LOCATION.

5. IDENTIFY ALL MAIN SHUT OFF VALVES BY TAGGING EACH.

6. IT IS THE INTENT OF THESE DRAWINGS THAT ALL TUB/SHOWERS WILL BE ABOVE FLOOR ROUGH IN.

7. PROVIDE QUARTER TURN SHUT OFF VALVES FOR ALL PLUMBING FIXTURES.

8. PROVIDE WHA'S ON ALL CONNECTIONS SERVING DISHWASHERS.

9. ALL PLUMBING FIXTURES TO HAVE SHUT OFF VALVES OR INTEGRAL STOPS.

10. ALL LAVATORIES ARE TO MEET THE PROPER CLEARANCES PER SECTION 405.3.1 OF THE IPC. SEE ARCHITECTS DRAWINGS FOR DIMENSIONED BATHROOM DRAWINGS.

11. PROVIDE A CLEAN OUT AT THE BASE OF ALL SANITARY STACKS.

12. ALL RISERS SHALL HAVE AN ACCESSIBLE SHUT OFF VALVE. PROVIDE 12x12 FIRE RATED ACCESS DOORS TO ALL VALVES IF REQUIRED.

13. ALL PIPING TO BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS.

14. ALL WATER LINES TO PLUMBING FIXTURES SHALL BE BURST PROOF, FLEXIBLE STAINLESS STEEL TYPE SUPPLY LINES.

15. RUN AIR HANDLING UNIT AND WATER HEATER RELIEF LINES TO NEAREST STORMWATER PIPES.

16. PROVIDE A DRAIN PAN UNDER THE WASHING MACHINE WITH A WATER SENSING DEVICE THAT SHUTS OFF WATER TO THE WASHER WHEN WATER IS DETECTED WITHIN THE DRAIN PAN.

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED
NO. PE30319 PROFESSIONAL
ENGINEER
PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

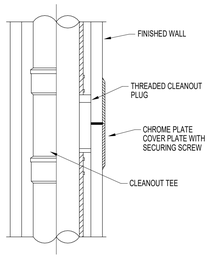
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING ABBREVIATIONS, LEGENDS, SCHEDULES, AND SPECIFICATIONS

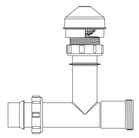
SHEET:

P4.001

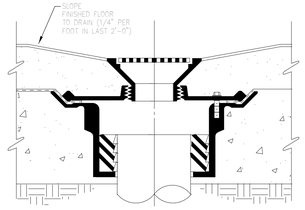
TERRACE AT HIGH MOUNTAIN - A4



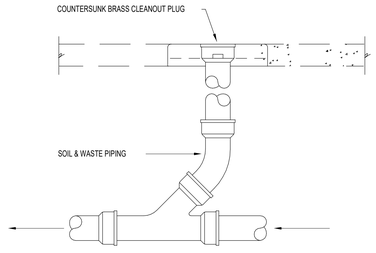
WALL CLEANOUTS
NO SCALE



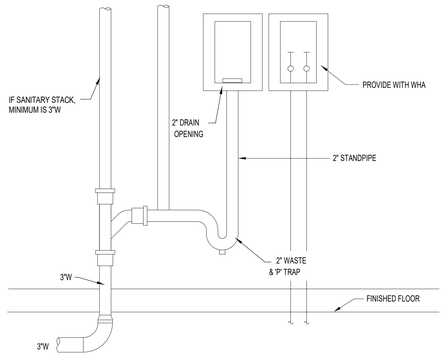
AIR ADMITTANCE VALVE - TUBULAR ADAPTER FOR UNDER SINK INSTALLATION
NO SCALE



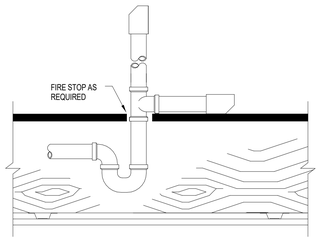
FLOOR DRAIN DETAIL
NOT TO SCALE



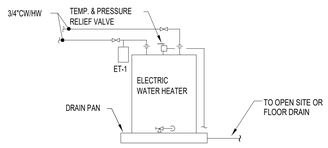
C.O. UP TO GRADE
NOT TO SCALE



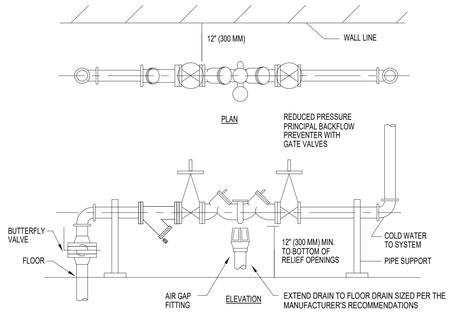
PLUMBING CONNECTIONS FOR LAUNDRY OUTLET W/ SIOUX CHIEF OX BOX & CONDENSATE DRAIN ADAPTER
NO SCALE



ABOVE FLOOR ROUGH IN DETAIL TUB/SHOWER
NO SCALE



WATER HEATER DRAIN DETAIL
NOT TO SCALE



BACKFLOW PREVENTER PIPING DETAIL - DOMESTIC WATER
NOT TO SCALE

NOTES:
1. BACKFLOW TO BE MOUNTED IN HORIZONTAL POSITION. ALL MOUNTING CLEARANCES AND INSTALLATION TO BE PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTER WITH GATE VALVES. PROVIDE FULL OPEN PORT SHUT OFF VALVE AND STRAINER UPSTREAM OF BACKFLOW.
3. BACKFLOW WILL NOT BE PLACED WITHIN A VAULT.
4. BACKFLOW TO BE MOUNTED AT A HEIGHT SUCH THAT NO LADDER WILL BE NEEDED TO SERVICE THE BACKFLOW.

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1. PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

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DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P4.002

TERRACE AT HIGH MOUNTAIN - A4

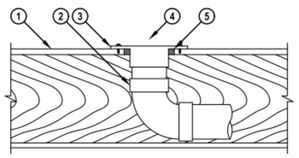
UL SYSTEM NO. F-C-2203

CLOSET FLANGE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1-HR.

FC2203d.011617

CROSS-SECTIONAL VIEW



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
   B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. (NOT SHOWN). FLOOR MOUNTED VITREOUS CHINA WATER CLOSET.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Sheet	1 of 1
Scale	1/8" = 1"
Date	Jan. 16, 2017
Drawing No.	FC 2203d

Hilti Firestop Systems

Saving Lives through Innovation and Education

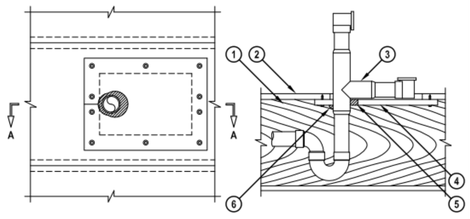
UL SYSTEM NO. F-C-2204

PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1/2-HR.

FC2204b.010715

BOTTOM VIEW **SECTION A-A**



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. MAXIMUM 1-1/2" NOMINAL DIAMETER PVC OR ABS PLASTIC PIPE (SCHEDULE 40) AND DRAIN FITTINGS CEMENTED TOGETHER WITH PVC OR ABS BATHTUB WASTE/OVERFLOW FITTINGS.
4. 3/4" THICK PLYWOOD PATCH SIZED TO OVERLAP MINIMUM 2" BEYOND EACH EDGE OF RECTANGULAR OPENING. TWO PIECES POSITIONED AROUND DRAIN PIPING WITH CUT EDGES TIGHTLY BUTTED, AND SCREW ATTACHED TO UNDERSIDE OF SUBFLOOR WITH 1-1/4" LONG STEEL SCREWS (SPACED MAXIMUM 6" C/C). (SEE NOTE NO. 3 BELOW).
5. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM SIZE OF OPENING = 12" x 8".
2. ANNULAR SPACE BETWEEN DRAIN PIPING AND PATCH = MINIMUM 0", MAXIMUM 1".
3. AS AN ALTERNATE TO PLYWOOD, 5/8" THICK GYPSUM WALL BOARD MAY BE USED.

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	1/8" = 1"
Date	Jan. 07, 2015
Drawing No.	FC 2204b

Hilti Firestop Systems

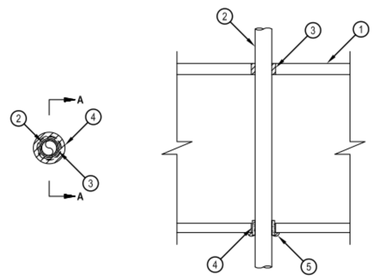
Saving Lives through Innovation and Education

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2230

F Rating - 1 Hr
T Rating - 1/4 Hr

FC 2230



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 1-5/8 in. (41 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design.

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 21, 2015

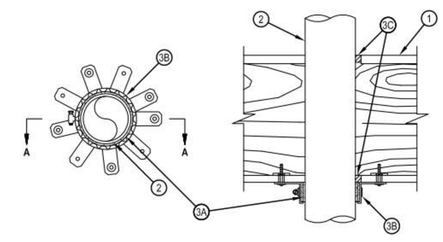
Hilti Firestop Systems

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2232

F Rating — 1 Hr
T Rating — 3/4 and 1 Hr (See Item 3)

FC 2232



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
2. Through Penetrants — One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) and max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

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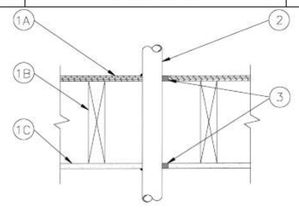
Hilti Firestop Systems

Classified by UL US

F Rating – 1 Hr
T Rating – 1 Hr

F-C-2080



1. **Floor-Ceiling Assembly** – The fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Flooring System** – Lumber of plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of floor opening is 3-1/8 in.
   B. **Wood Joists** – Nom 2 by 10 in. deep (or deeper) lumber joists spaced 16 in. OC, with nom 1 by 3 in. lumber bridging and with ends firestopped or steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board*** – Nom 5/8 in. thick as specified in the individual Floor-Ceiling Design. diam of opening is 3-1/8 in.
2. **Through Penetrant** – One non-metallic pipe or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. Pipe to be rigidly supported on both sides of floor assembly.
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 2 in. diam (or smaller) SDR 11 cellular or solid core chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   B. **Polyvinyl Chloride (PVC)** – Nom 2 in. diam (or smaller) Schedule 40 (or heavier) PVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+** – Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).

Underwriters Laboratories Inc.®

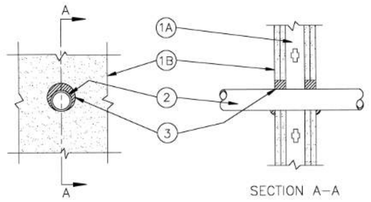
09/16 (1)

Classified by UL US

F Ratings – 1, 2, 3 and 4 Hr (See Item 1)
T Ratings – 1, 2, 3 and 4 Hr (See Item 1)

W-L-2126

ANSI/UL1479 (ASTM E814)
F Ratings — 1, 2, 3 and 4 Hr (See Item 1)
T Ratings — 1, 2, 3 and 4 Hr (See Item 1)



SECTION A–A

1. **Wall Assembly** – The 1, 2, 3 or 4 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs** – Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC.
   B. **Gypsum Board*** – The gypsum wallboard type, thickness, number of layers, fasteners and sheet orientation shall be as specified in the individual U300 or U400 Series Designs in the UL Fire Resistance Directory. Max diam of opening is 3-1/8 in.
   The hourly F and T Ratings of the firestop system is equal to the hourly fire rating of the assembly in which it is installed.

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09/16 (1)

System No. F-C-2230

FC 2230

2. Through Penetrants — One non-metallic tube to be installed concentrically within the firestop system. Annular space between tube and periphery of opening shall be 1/4 in. (6 mm). Tube to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of non-meyallic tubes or pipes may be used:
   Crosslinked Polyethylene (PEX) Tubing — Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Fill, Void or Cavity Materials* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1 in. (25 mm) wide intumescentwrap strip. One layer of wrap strip tightly wrapped around tube and held in place with tape. Wrap strip centered in annular space extending from both sides of gypsum board.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E WGS1* Wrap Strip
4. Fill, Void or Cavity Materials* - Sealant — Min 3/4 in. (19 mm) depth of fill material applied within the annulus, flush with the top surface of floor. A 1/4 in. (6 mm) diam bead of fill material shall also be applied at the wrap strip/gypsum board interface.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Sealant - FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Hilti Firestop Systems

System No. F-C-2232

FC 2232

3. Nonmetallic Pipe Coupling — (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC, Schedule 40 ABS or SDR13.5 CPVC coupling corresponding to pipe type installed such that the top of the coupling is flush with the bottom surface of the ceiling and extending downward.
4. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1-3/4 in. (44 mm) wide intumescent wrap strip. Layers of wrap strip continuously wrapped around the pipe and held in place with tape. Wrap strip butted tightly against surface of ceiling.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W45/1-3/4" Wrap Strip

Nom Diam of Pipe, in. (mm)	Number of Wrap Strips	Min/Max Annular Space, in. (mm)	T-Rating - Hr.
2 (51)	1	0-1/4 (0-6)	1
3 (76)	2	0-1/2 (0-13)	3/4
4 (102)	2	0-1/2 (0-13)	3/4

   B. Steel Collar — Collar fabricated from coils of precut min 0.017 in. (0.43 mm) thick (No. 28 MSG) galv steel available from the sealant manufacturer. Collar shall be nom 1-3/4 in. (44 mm) deep with 1 in. (25 mm) wide by 2 in. (51 mm) long anchors tabs on 2 in. (51 mm) centers for securement to floor/ceiling assembly. The opposite side incorporates retainer tabs, 1/2 in. (13 mm) wide by 3/16 in. (5 mm) long, prebent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 1 in at seam. A nom 1/2 in. (13 mm) wide stainless steel hose clamp shall be secured to the collar at its mid-height. Every other anchor tab of collar secured to gypsum ceiling with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel toggle bolts in conjunction with 1/4 in. by 3/4 in. (6 by 19 mm) diameter steel washers.
   C. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface on top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX SEALANT
   4A. Firestop System — (Optional, Not shown) As an option to Item 4, the firestop system shall consist of the following:
   A. Firestop Device* — Galv steel collar lined with an intumescent material sized to fit the specific diam of pipe shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the gypsum board ceiling with 1/4 in. diam by 1-1/2 in. (38 mm) long steel toggle bolts with 3/4 in. (19 mm) diam steel washers through hanger tabs provided.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N or CP 643 110/4"N Firestop Collar.
   B. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface, flush with top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Hilti Firestop Systems

Continued … **F-C-2080**

3. **Fill, Void or Cavity Material* – Sealant –** Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling. Min 1/2 in. diam bead of fill material applied at the penetrant/floor and penetrant/ceiling interfaces at point contact locations on both sides of assembly.
   Passive Fire Protection Partners – 3600EX, 4800DW

* Bearing the UL Classification Marking
\+ Bearing the UL Listing Mark

Continued… **W-L-2126**

2. **Through Penetrants –** One nonmetallic pipe or tubing installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes or tubing may be used:
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 CPVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.
   B. **Crosslinked Polyethylene (PEX) Tubing –** Nom 1-1/2 in. diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems. The annular space between tubing and periphery of opening shall be min 1/4 in. to max 3/8 in.
   C. **Polyvinyl Chloride (PVC) Pipe –** Nom 2 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.

3. **Fill, Void or Cavity Material* – Sealant –** Min 5/8 in. thickness of fill material for a 1 hr rated wall assembly, min 1 in. thickness of fill material for 2, 3 and 4 hr rated assemblies applied within the annulus, flush with both surfaces of wall.
   Passive Fire Protection Partners – 3600EX, 4800DW

*Bearing the UL Classification Marking

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED PROFESSIONAL ENGINEER
NO. PE36016
PATRICK J. ONEILL

TERRACE AT HIGH MOUNTAIN - A4
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

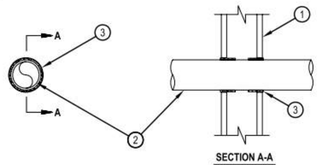
P4.003

TERRACE AT HIGH MOUNTAIN - A4

WL 2284

System No. W-L-2284

F Rating - 1 Hr
T Rating - 1 Hr



SECTION A-A

1. Wall Assembly -- The 1 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing shall consist of wood studs or steel channel studs. Wood studs to consist of 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- Min 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers and orientation shall be as specified in the individual U300 or U400 Wall and Partition Design. Max diam of opening is 4 in.
2. Through Penetrants -- One nonmetallic pipe to be centered within the firestop system. An annular space of 3/16 to 1/4 in. is required within the firestop system. Pipe to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe -- Nom 3 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 3 in. diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Material* -- Wrap Strip - Layers of intumescent wrap strip are continuously wrapped around the pipe with ends held in place with tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall. Size of wrap strip and number of layers are shown in table below.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP648-E W25/1" or CP648-E W45/1-3/4" Firestop Wrap Strip

ProductDesignation	Pipe Diameter (in.)	Number of Layers	Nom. Wrap Strip Width (in.)
CP648-E-W25/1"	1-1/2 and 2	1	1
CP648-E-W45/1-3/4"	1-1/2, 2 and 3	1	1-3/4

   A. Fill, Void or Cavity Material* - Wrap Strip -- (As an alternate to the wrap strip in Item 3) - One layer of intumescent wrap strip is tightly wrapped around the pipe with ends butted and held in place with integrated tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- CP648-S-1.5" US, CP648-S-2" US, CP648-S-3" US
*Bearing the UL Classification Mark

Hilti Firestop Systems

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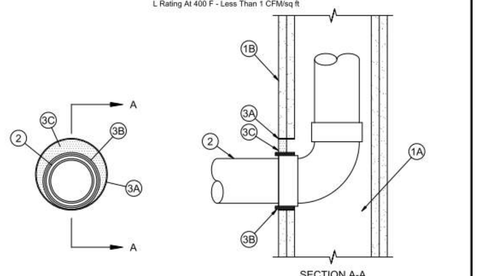
System No. W-L-2636

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



SECTION A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing to consist of nom 2 by 6 in. (51 by 152 mm) (or larger) wood or steel channel studs or doubled or staggered nom 2 by 4 in. (51 by 102 mm) (or larger) wood studs spaced in accordance with the individual U300, U400, V400 or W400 Series Wall and Partition Designs.
   B. **Gypsum Board* -** One or two layers of nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max diam of opening is 5-1/2 in. (140 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Nonmetallic Penetrant -** One nonmetallic pipe or conduit to be installed within stud cavity and connected to a 90° elbow. Hub of the elbow may be recessed into the annular space within the opening. Additional nonmetallic pipe or conduit shall be connected to elbow and penetrate one side of the wall either concentrically or eccentrically within the firestop system. The annular space between pipe or conduit and periphery of the opening shall be min 1/4 in. (6 mm) to max 1-1/4 in. (32 mm). Pipe or conduit shall be rigidly supported within the wall and on the penetrated side of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

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Created or Revised: August 26, 2016
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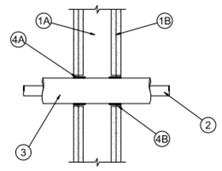
W-L-2636 PAGE 1 OF 2

System No. W-L-5290

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening shall be 4 in. (102 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.

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Created or Revised: August 24, 2011
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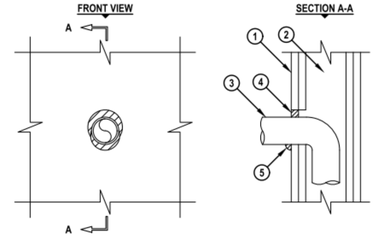
W-L-5290 PAGE 1 OF 2

MK

ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : TERRACES AT HIGH MOUNTAIN
ENGINEER : ONEIL ENGINEERING SERVICES
F-RATING = 1-HR. OR 2-HR.



1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300, U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 3-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40 OR HEAVIER) (CELLULAR OR SOLID CORE) (CLOSED OR VENTED PIPING SYSTEM).
   B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY).
   C. MAXIMUM 2" NOMINAL DIAMETER PEX TUBING (SDR 9) (CLOSED PIPING SYSTEM ONLY).
   D. MAXIMUM 2" NOMINAL DIAMETER RNC-PVC CONDUIT (SCHEDULE 40).
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. DIAMETER OF OPENING SHALL BE 1" LARGER THAN NOMINAL PIPE DIAMETER.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5/8".

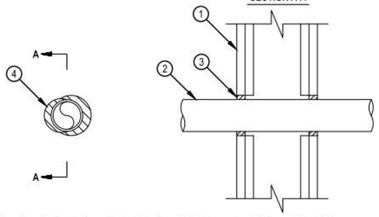
THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL SYSTEM NO. W-L-2474)

Hilti Firestop Systems
HILTI, Inc.
Plano, Texas USA (800) 879-8000
Designed by
Sheet 1 of 1
Scale 1/8" = 1"
Date June 07, 2021
Drawing No. 524232a
Saving Lives through Innovation and Education

WL 2474

System No. W-L-2474

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating at 400 F - 4 CFM/Sq Ft



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Diam of opening shall be 1 in. (25 mm) larger than the nom pipe diam.
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and the periphery of the opening shall be min 0 in. (point contact) to a max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) cellular or solid core Schedule 40 (or heavier) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
   D. Rigid Nonmetallic Conduit (RNC)+ — Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
3. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At point contact location, a min 5/8 in. (16 mm) diam bead of fill material shall be applied to the wall/penetrant interface on both surfaces of the wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
+ Bearing the UL Listing Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 26, 2015

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Metallic Sleeve -** Cylindrical sleeve fabricated from min 0.016 in. (0.4 mm) thick (30 gauge) galv sheet steel and having a 1 in. (25 mm) lap along the longitudinal seam. Length of steel sleeve to be 5/8 in. (16 mm) in 1 hr fire rated walls and 1-1/4 in. (32 mm) in 2 hr fire rated walls. Sleeve installed by coiling the sheet steel to a diam smaller than the opening, inserting the coil into the opening and releasing the coil to let it uncoil against the circular cutout in the wallboard layers. Sleeve shall be installed flush with wall surfaces on the penetrated side of the wall assembly.
   B. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/4 in. (6 mm) thick by 1-1/2 in. (38 mm) wide (RED), 1/8 in. (3.2 mm) thick by 1-1/2 in. (38 mm) wide (RED2), 3/16 in. (4.8 mm) thick by 2 in. (51 mm) wide (BLU), 1/8 in. (3.2 mm) thick by 2 in. (51 mm) wide (BLU2), intumescent strips faced on both sides with a plastic film, Two layers of wrap strip individually wrapped around the through penetrant with the ends butted or continuously wrapped around the penetrant and held in place by means of foil tape. The wrap strip is slid along the penetrant into annulus such that the trailing edge of the wrap strip extends 1/4 in. (6 mm) from the surface of the wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal RED, RED2, BLU, or BLU2 Wrap Strip
   C. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with surface of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant
   +Bearing the UL Listing Mark
   *** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876
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W-L-2636 PAGE 2 OF 2

3. **Pipe and Equipment Covering Materials* -** Max 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 57 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between insulated penetrating item and the edge of the through opening shall be nom 11/32 in. (8.7 mm).
4. **Firestop System -** The firestop system shall consist of the following items:
   A. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips or 1/8 or 1/4 in. (3.2 or 6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. Single layer of wrap strip wrapped around the through penetrant with the ends butted and held in place by means of foil tape. The wrap strip is slid along the through penetrant into annulus such that outer edge of wrap strip is flush with wall surface. One set of wrap strips to be installed on each side of wall. As an option when 1/8 in. (3.2 mm) thick wrap strip (BLU2) is used, the strips may be cut to a width of 1-1/2 in. (38 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip, SpecSeal BLU2 Wrap Strip or SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or SpecSeal Series SSS Sealant
   * Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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W-L-5290 PAGE 2 OF 2

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A1.
PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

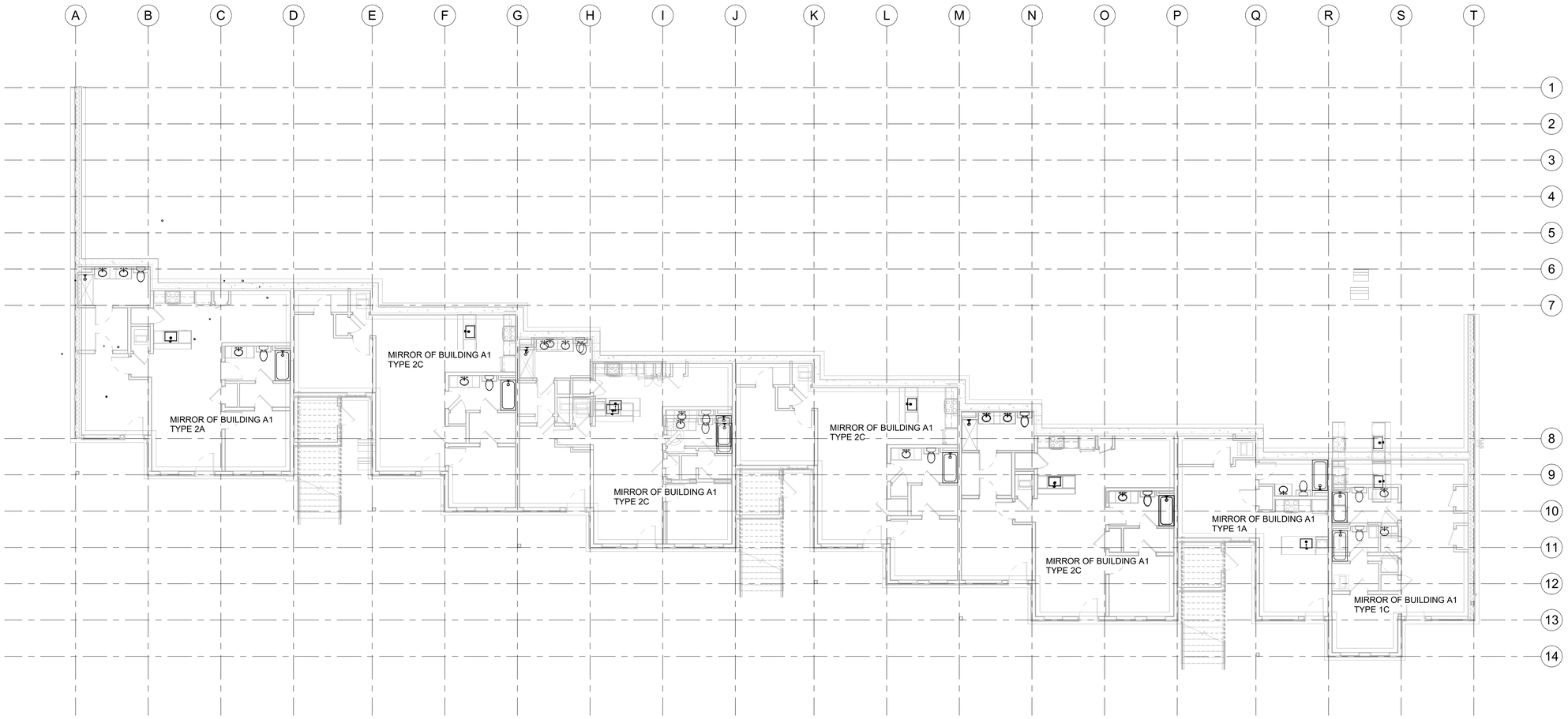
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P4.004

TERRACE AT HIGH MOUNTAIN - A4



1 PLUMBING BASEMENT FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
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ONEIL
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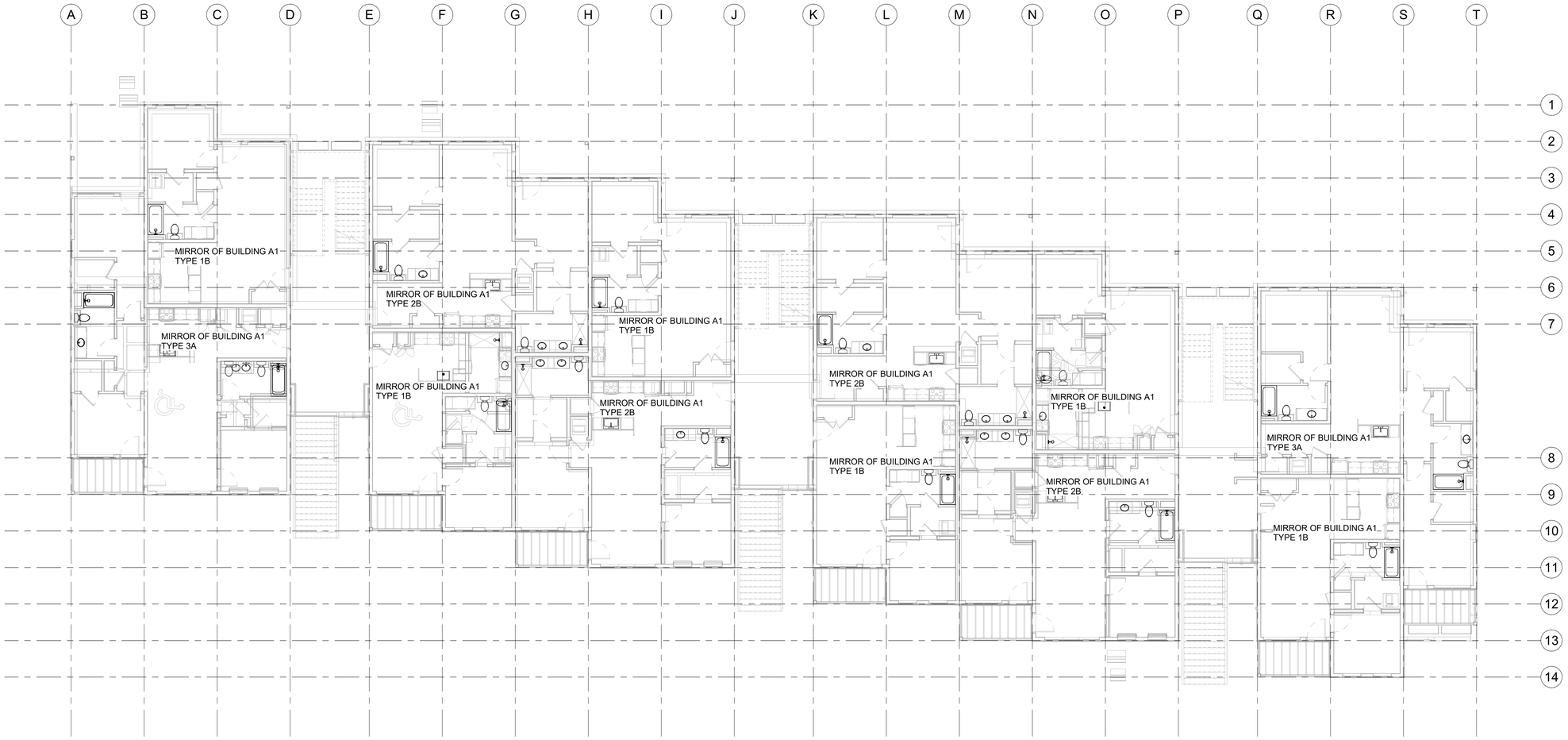
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
BASEMENT FLOOR PLAN

SHEET:
P4.100

TERRACE AT HIGH MOUNTAIN - A4



1 PLUMBING FIRST FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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PLEASE REFER TO A1 FOR LAYOUTS.

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACE AT HIGH MOUNTAIN - A4

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	04-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
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ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

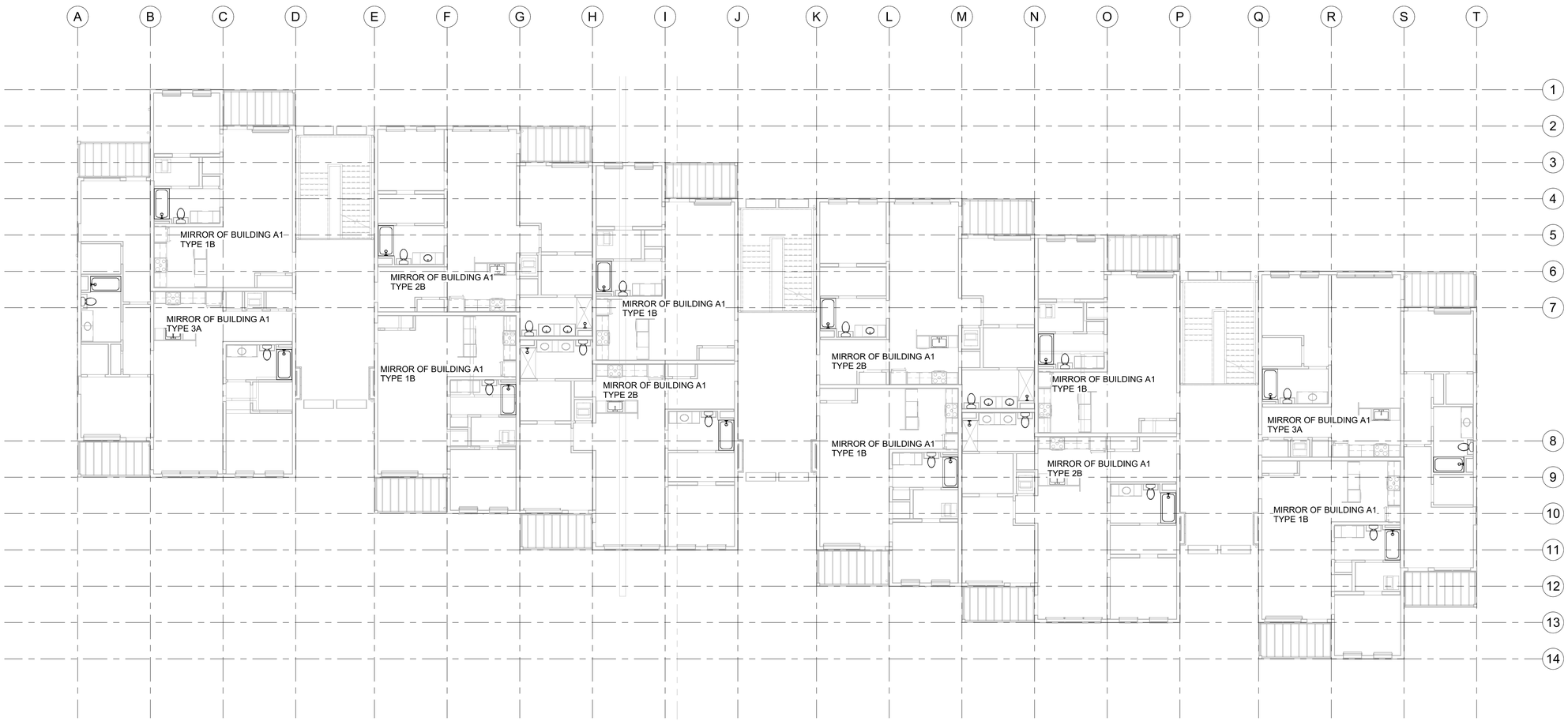
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
FIRST FLOOR PLAN

SHEET:

P4.101

TERRACE AT HIGH MOUNTAIN - A4



1 PLUMBING SECOND FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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TERRACE AT HIGH MOUNTAIN - A4

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
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23139
PHONE: 804-372-3501

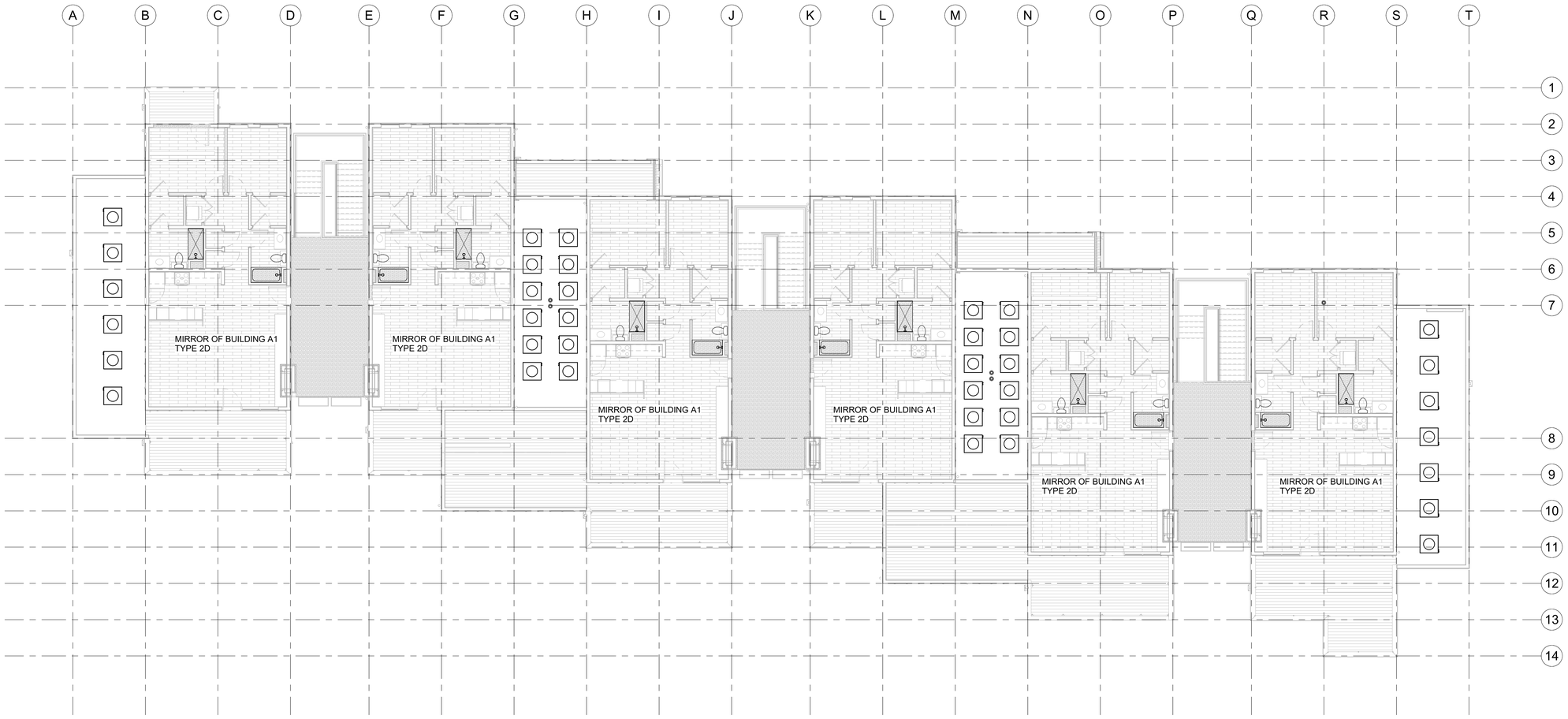
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
SECOND FLOOR PLAN

SHEET:

P4.102

TERRACE AT HIGH MOUNTAIN - A4



1 PLUMBING THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE:

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TERRACE AT HIGH MOUNTAIN - A4

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HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
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23139
PHONE: 804-372-3501

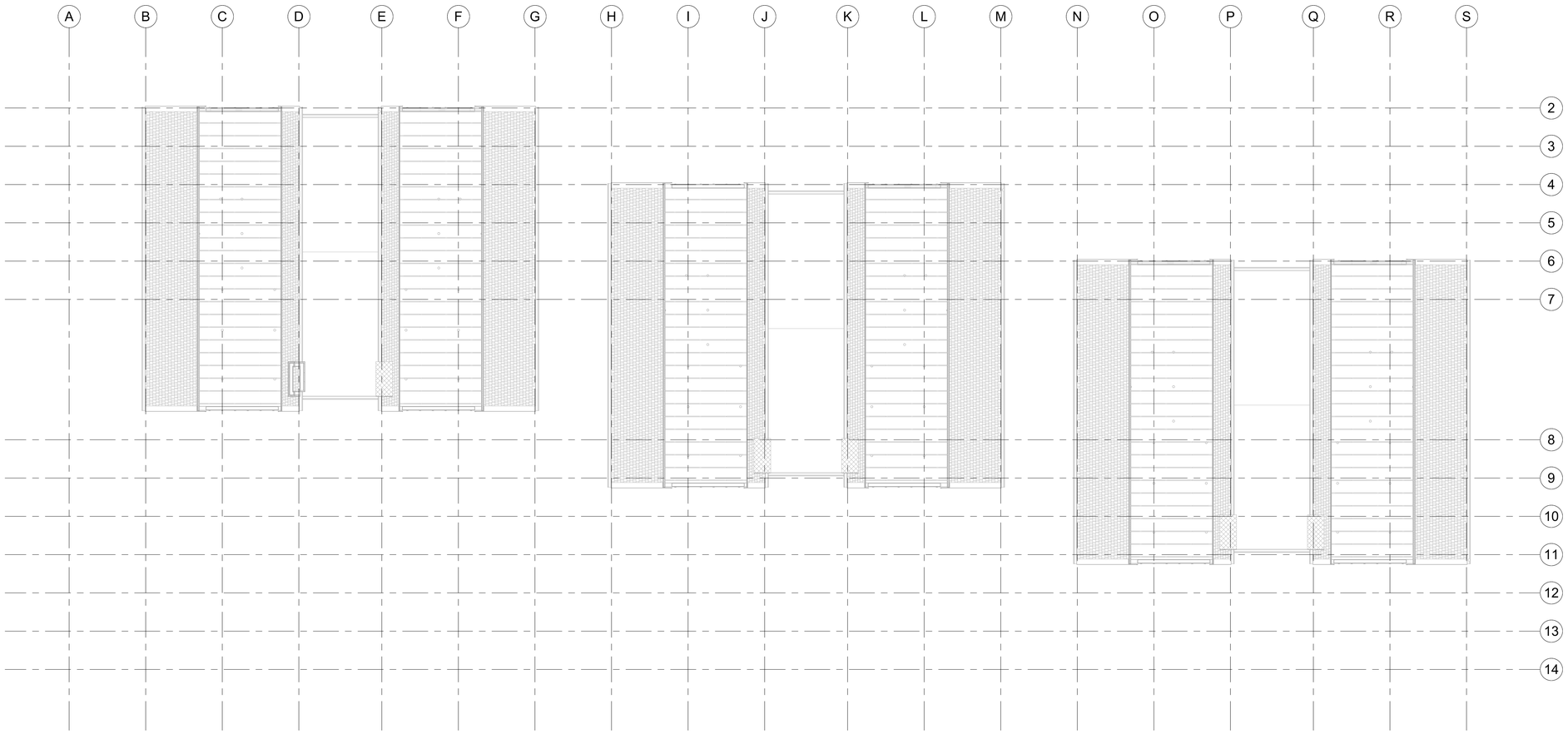
PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
THIRD FLOOR PLAN

SHEET:

P4.103

TERRACE AT HIGH MOUNTAIN - A4



1 PLUMBING ROOF PLAN
1/8" = 1'-0"

GENERAL NOTE:

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HUNTSVILLE, AL 35811

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POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	04-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING
ROOF PLAN

SHEET:

P4.140

TERRACE AT HIGH MOUNTAIN - A4

PLUMBING DRAWING LIST

LEGEND & ABBREVIATIONS

SYMBOL	DESCRIPTIONS
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISHED FLOOR
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
CO	CLEAN OUT
CW	COLD WATER (DISTRIBUTION LINE)
DFU	DRAINAGE FIXTURE UNITS
DW	DOMESTIC WATER (SERVICE LINE)
CW	COLD WATER (DISTRIBUTION LINE)
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
HB	HOSE BIBB
HW	HOT WATER
P-1	PLUMBING FIXTURE
SFU	SUPPLY FIXTURE UNITS
V	VENT
VTR	VENT THROUGH ROOF
WCO	WALL CLEAN OUT
WHA	WATER HAMMER ARRESTOR

5 Plumbing Abbreviations
12" = 1'-0"

PLUMBING FIXTURE SCHEDULE

ITEM NO.	FIXTURE TYPE	WASTE CONN.	VENT CONN.	CW CONN.	HW CONN.	REMARKS
P-1	WATER CLOSET	3"	-	1 1/2"	-	
P-1A	WATER CLOSET (ADA)	3"	-	1 1/2"	-	NOT USED
P-2	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	
P-2A	LAVATORY (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED
P-3	TUB/SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3A	TUB/SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED
P-3B	SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3C	SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED
P-4	KITCHEN SINK	1 1/2"	1 1/2"	1/2"	1/2"	
P-4A	KITCHEN SINK (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED

PLUMBING GENERAL NOTES

APPLICABLE CODES:
INTERNATIONAL PLUMBING CODE (IPC) 2015
INTERNATIONAL BUILDING CODE (IBC) 2015
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI A117.1-2009)
UNIFORM STATEWIDE BUILDING CODE OF ALABAMA 2015

PLUMBING SYSTEMS:
PROVIDE ALL PLUMBING FIXTURES AND TRIM AS INDICATED ON THE DRAWINGS AND AS SPECIFIED ELSEWHERE HEREIN. ALL FIXTURES SHALL BE CONNECTED TO THE PLUMBING SYSTEMS AS INDICATED AND REQUIRED FOR PROPER OPERATION. PIPING MATERIALS, ACCESSORIES AND EQUIPMENT SHALL BE SPECIFIED ELSEWHERE WITHIN THIS SPECIFICATION.

SANITARY WASTE AND VENT SYSTEMS:
PROVIDE A COMPLETE SANITARY, WASTE AND VENT SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING REQUIRING CONNECTIONS. ALL WASTE FROM THE BUILDING SHALL DISCHARGE BY GRAVITY OUT THE BUILDING TO BE PICKED UP BY CIVIL AND EXTENDED TO THE SEWER SYSTEM. SANITARY PIPING TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE OTHERWISE NOTED.

WATER SUPPLY SYSTEM:
PROVIDE A COMPLETE WATER SUPPLY SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING INCLUDING DOMESTIC WATER HEATERS. PROVIDE APPROVED GATE OR COMPRESSION STOPS AT EVERY CONNECTION TO FIXTURES AND EQUIPMENT.

STORM DRAINAGE SYSTEM:
REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND SIZING.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND FIXTURES. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGARS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.

PERMIT, FEES AND NOTICES:
COMPLY WITH THE GENERAL CONDITIONS AND PROVIDE ALL PERMITS AS REQUIRED FOR THE INSTALLATION OF ALL INDICATED PLUMBING SYSTEMS.

FIRE RATINGS:
SEPARATIONS BETWEEN R-2 TENANTS ARE 1-HR RATED.
CEILINGS ARE 1-HR RATED.
STAIRWELLS AND ELEVATOR ARE 2-HR RATED..

FULLY SPRINKLERED PER NFPA 13

USE GROUP : R-2
CONSTRUCTION : 5-A

PLUMBING SPECIFICATIONS

A. PIPE AND PIPE FITTINGS: 1. DOMESTIC (POTABLE) WATER (CW/HW) PIPING: SYSTEM DESIGN PRESSURE = 80 PSIG. PIPING 1" AND SMALLER SHALL BE PEX TUBING. BETWEEN 1-1/4" AND 2" SHALL BE SDR 11 CPVC TUBING. FOR PIPING GREATER THAN 2" PROVIDE SCHEDULE 80 CPVC TUBING.

2. SANITARY (W) AND VENT (V) PIPING: ALL SANITARY AND VENT PIPING SHALL BE SCHEDULE 40 PVC.

3. CONDENSATE DRAIN (D) PIPING: SYSTEM DESIGN PRESSURE = 10 PSIG. PROVIDE SCHEDULE 40 PVC.

4. STORM WATER (SW) PIPING: PROVIDE SCHEDULE 40 PVC.

B. VALVES:
1. GATE VALVES: POTABLE WATER SERVICE SIZES 1/2" - 2-1/2" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC PIPING SYSTEMS. ALL SHUT OFF VALVES SHALL BE FULL OPEN PORT TYPE VALVES.

2. DRAIN VALVES: POTABLE WATER SERVICE SIZES 1/2" AND 3/4" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC SYSTEMS.

3. BACKFLOW PREVENTER: SPECIFICATIONS ARE BASED ON WATTS LF909 LARGE SERIES WITH 909AG-F AIR GAP. PROVIDE AT LOCATIONS IN WHICH THE PUBLIC WATER SUPPLY SYSTEM MUST BE PROTECTED. MATERIALS OF CONSTRUCTION - EPOXY COATED CAST IRON BODY AND STRAINER, LEAD FREE COPPER SILICONE ALLOY TEST COCKS, STAINLESS STEEL SEATS, REDUCED PRESSURE ZONE ASSEMBLY WITH RELIEF DRAIN ASSEMBLY. PIPE RELIEF TO FLOOR DRAIN AS SHOWN.

C. PLUMBING FIXTURES: ALL PLUMBING FIXTURES AND TRIM SHALL BE NEW AS MANUFACTURED BY FIRMS REGULARLY ENGAGED IN THE MANUFACTURE OF PLUMBING FIXTURES, AND TRIM OF TYPE, STYLE AND CONFIGURATION REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE AND SIMILAR SERVICE.

D. PROVIDE PROTECTION OF ALL FIXTURES DURING CONSTRUCTION FROM DAMAGE. EACH WATER SUPPLY CONNECTION SERVING A FIXTURE SHALL BE EQUIPPED WITH AN ACCESSIBLE STOP VALVE. CAULK ALL GAPS IN AROUND WALLS/FLOORS AND THE PLUMBING FIXTURES. SPECIFICATIONS FOR THE PLUMBING FIXTURES ARE BASED ON THE FOLLOWING TYPES.

E. PIPE INSULATION:
1. CLOSED CELL ELASTOMERIC (PIPE SIZES UP TO 5 INCHES): FLEXIBLE ELASTOMERIC, CLOSED CELLULAR, TUBULAR MOLDED TO ACCOMMODATE PIPING, SMOOTH OUTER SURFACE SUITABLE FOR PAINTING WITH VINYL LACQUER TYPE COATING, WATER RESISTANT, NONABSORBENT, OZONE RESISTANT, MINIMUM DENSITY OF 4 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF 0.27 AT 75 F MEAN TEMPERATURE

APPLICATIONS:
1. DOMESTIC HOT AND COLD WATER (ALL SIZES) ON ALL EXTERIOR WALL PIPING OR IN UNCONDITIONED SPACES ONLY. PROVIDE 1/2" CLOSED CELL ELASTOMERIC.

F. WATER HEATERS :
ELECTRIC WATER HEATER - FULLY INSULATED BAKED ENAMEL STEEL JACKET, INSULATED IN CONFORMANCE WITH ASHRAE 90A-1980 STANDARD FOR ELECTRIC DOMESTIC WATER HEATER, GLASS LINING, RELIEF VALVE TAP, HEAT TRAPS, RATED FOR 150 PSI. PLATED COPPER ELEMENT, LOW WATT DENSITY, REPLACEABLE IMMERSION TYPE. PROVIDE WITH RELIEF VALVE AND FACTORY PACKAGED CONTROL WIRING.

EWH-1 - 40 GALLON 4.5 KW DUAL ELEMENT WATER HEATER. HEATER SHALL BE "SHORT" CONSTRUCTION. PROVIDE WITH 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE. BASED ON RUUD MODEL PROE38-S2-RU95.

PROVIDE WATER HEATERS WITH 2.5-GAL EXPANSION TANK (ET-1).

WATER HEATERS ARE LOCATED WITHIN A VENTILATED SPACE AND OVER AN IMPERVIOUS FLOOR.

G. FIXTURES :

MAKE AND MODELS OF SPECIFIC FIXTURES TO BE USED.
PROVIDE INDICATED QUANTITIES OF FIXTURES. SEE ARCHITECTS DRAWING FOR
WB-1: WASHING MACHINE BOX (PLASTIC): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER.

WB-2: WASHING MACHINE BOX (FIRE RATED): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 FIRE RATED WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER .

IM-1: REFRIGERATOR BOX (PLASTIC): WATER-TIGHT RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

IM-2: REFRIGERATOR BOX (FIRE RATED): IPS FIRE GUARD RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

FCO: PROVIDE SIZING AS INDICATED ON THE DRAWINGS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES CLEANOUTS WITH NICKEL BRONZE ADJUSTABLE TOPS. MATCH MATERIALS OF CONSTRUCTION FOR BODY TYPE.

WCO: PROVIDE CHROME PLATED COVER FOR SANITARY TEST TEE AT ALL INDICATED LOCATIONS.

FD: FLOOR DRAINS - PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS. FLOOR DRAINS SHALL BE SUPPLIED WITH NICKEL BRONZE ADJUSTABLE TOPS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES 834 FLOOR DRAINS. PROVIDE DRAINS SUBJECT TO EVAPORATION WITH A TRAP SEAL.

WH-1: FREEZELESS WALL HYDRANT - BACKFLOW PROTECTED WITH ANTI-SIPHON VACUUM BREAKER (ASSE 1011), TEE KEY, COPPER TUBES, CHROME FINISH, PERMANENT TYPE BRASS VALVE BODY, ASSE STANDARD 1019-B, WITH AUTOMATIC DRAINING. BASED ON WOODFORD MODEL 65.

RH-1: ROOF HYDRANT - SPECIFICATION BASED ON WOODFORD MODEL SRH-MS, FREEZELESS ROOF HYDRANT, WITH INTEGRAL ANIT-SIPHON VACUUM BREAKER, BACKFLOW PROTECTED WITH FIELD TESTABLE ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER. NO DRAIN REQUIRED - A VENTURI ACTION DRAWS WATER OUT OF THE INTERNAL RESERVOIR AND DISCHARGES OF THE BACKFLOW PREVENTER. ALL NECESSARY MOUNTING HARDWARE FOR PROPER INSTALLATION ON A COMMERCIAL ROOF IS TO BE SUPPLIED WITH DEVICE.

PROVIDE KITCHEN SINKS WITH TAILPIECE FOR DISHWASHER CONNECTION AND DISPOSAL. DISPOSAL TO BE EQUAL TO SINK GUARD MODEL SE150, 1/3 HP, CORROSION RESISTANT COMPOSITE HOPPER WITH CAST STAINLESS STEEL ANTI-JAM SWIVEL IMPELLERS. PROVIDE WHA AND SHUT OFF VALVE FOR CONNECTION TO DISHWASHER.

MISCELLANEOUS PLUMBING ITEMS:

1. TRAP SEAL: PROVIDE A TRAP SEAL AT ALL OPENSITE AND FLOOR DRAINS SUBJECT TO EVAPORATION. TRAP SEAL SPECIFICATIONS ARE BASED ON JOSAM 88240 SERIES TRAP SEAL INSERT. MUST BE AN ASSE 1072 TRAP SEAL DEVICE.

2. AIR ADMITTANCE VALVE (AAV): AAVS MAY BE EITHER OATEY OR STUDOR TYPE. ALL AAV'S USED WITH WB'S SHALL BE BY OATEY (SUBSTITUTION BY APPROVAL ONLY).

3. WATER HAMMER ARRESTORS (WHA): PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON. DESIGNED TO OPERATE UP TO 150 PSI WORKING PRESSURE.

4. ALL APARTMENT DOMESTIC WATER SHUT OFF VALVES WILL BE LOCATED IN AN EASILY ACCESSIBLE LOCATION.

5. IDENTIFY ALL MAIN SHUT OFF VALVES BY TAGGING EACH.

6. IT IS THE INTENT OF THESE DRAWINGS THAT ALL TUB/SHOWERS WILL BE ABOVE FLOOR ROUGH IN.

7. PROVIDE QUARTER TURN SHUT OFF VALVES FOR ALL PLUMBING FIXTURES.

8. PROVIDE WHA'S ON ALL CONNECTIONS SERVING DISHWASHERS.

9. ALL PLUMBING FIXTURES TO HAVE SHUT OFF VALVES OR INTEGRAL STOPS.

10. ALL LAVATORIES ARE TO MEET THE PROPER CLEARANCES PER SECTION 405.3.1 OF THE IPC. SEE ARCHITECTS DRAWINGS FOR DIMENSIONED BATHROOM DRAWINGS.

11. PROVIDE A CLEAN OUT AT THE BASE OF ALL SANITARY STACKS.

12. ALL RISERS SHALL HAVE AN ACCESSIBLE SHUT OFF VALVE. PROVIDE 12x12 FIRE RATED ACCESS DOORS TO ALL VALVES IF REQUIRED.

13. ALL PIPING TO BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS.

14. ALL WATER LINES TO PLUMBING FIXTURES SHALL BE BURST PROOF, FLEXIBLE STAINLESS STEEL TYPE SUPPLY LINES.

15. RUN AIR HANDLING UNIT AND WATER HEATER RELIEF LINES TO NEAREST STORMWATER PIPES.

16. PROVIDE A DRAIN PAN UNDER THE WASHING MACHINE WITH A WATER SENSING DEVICE THAT SHUTS OFF WATER TO THE WASHER WHEN WATER IS DETECTED WITHIN THE DRAIN PAN.

PLUMBING LEGEND

SYMBOL	DESCRIPTION
W	SANITARY PIPING WASTE (ABOVE GRADE)
W	SANITARY PIPING WASTE (BELOW FLOOR)
GW	GREASE WASTE (BELOW FLOOR)
V	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWR	HOT WATER RECIRCULATION PIPING
	PIPE TURNING UP/DOWN
	FULL OPEN PORT GATE VALVE
	FLOOR DRAIN
	FLOOR CLEANOUT
	CLEANOUT
	1 HR RATED WALLS
	2 HR RATED WALLS
WHA	WATER HAMMER ARRESTOR
P-1	FIXTURE TYPE
	MIXING VALVE
	AIR ADMITTANCE VALVE
	BACKFLOW PREVENTOR

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. ONEIL

HIGH MOUNTAIN DEVELOPMENT - A5
HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS

#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

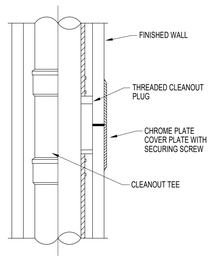
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING ABBREVIATIONS, LEGEND, SCHEDULES AND SPECIFICATIONS

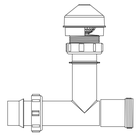
SHEET:

P5.001

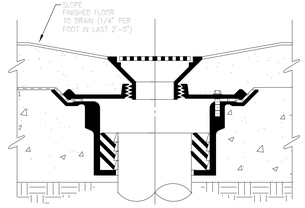
HIGH MOUNTAIN DEVELOPMENT - A5



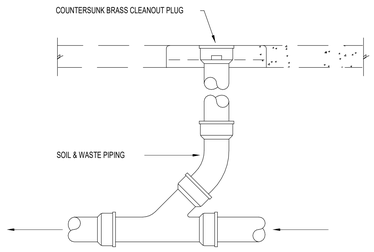
WALL CLEANOUTS
NO SCALE



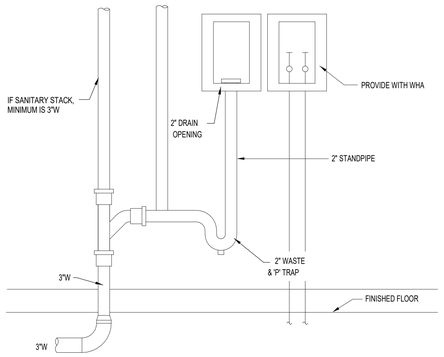
AIR ADMITTANCE VALVE - TUBULAR ADAPTER FOR UNDER SINK INSTALLATION
NO SCALE



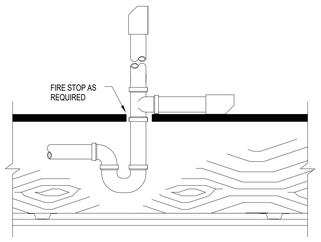
FLOOR DRAIN DETAIL
NOT TO SCALE



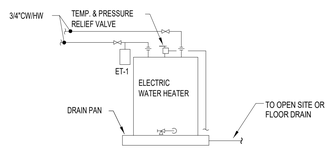
C.O. UP TO GRADE
NOT TO SCALE



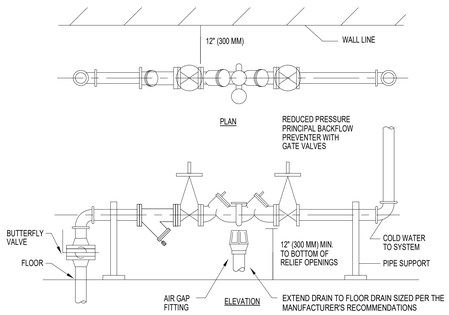
PLUMBING CONNECTIONS FOR LAUNDRY OUTLET W/ SIOUX CHIEF OX BOX & CONDENSATE DRAIN ADAPTER
NO SCALE



ABOVE FLOOR ROUGH IN DETAIL TUB/SHOWER
NO SCALE



WATER HEATER DRAIN DETAIL
NOT TO SCALE



BACKFLOW PREVENTER PIPING DETAIL - DOMESTIC WATER
NOT TO SCALE

NOTES:

1. BACKFLOW TO BE MOUNTED IN HORIZONTAL POSITION. ALL MOUNTING CLEARANCES AND INSTALLATION TO BE PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTER WITH GATE VALVES. PROVIDE FULL OPEN PORT SHUT OFF VALVE AND STRAINER UPSTREAM OF BACKFLOW.
3. BACKFLOW WILL NOT BE PLACED WITHIN A VAULT.
4. BACKFLOW TO BE MOUNTED AT A HEIGHT SUCH THAT NO LADDER WILL BE NEEDED TO SERVICE THE BACKFLOW.

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P5.002

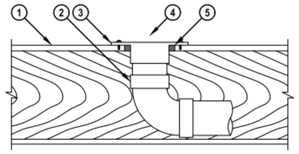
HIGH MOUNTAIN DEVELOPMENT - A5

UL SYSTEM NO. F-C-2203

CLOSET FLANGE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1-HR.

CROSS-SECTIONAL VIEW



FC2203d.011617

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
   B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. (NOT SHOWN). FLOOR MOUNTED VITREOUS CHINA WATER CLOSET.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Sheet	1 of 1
Scale	1/8" = 1"
Date	Jan. 16, 2017

Drawing No. FC 2203d

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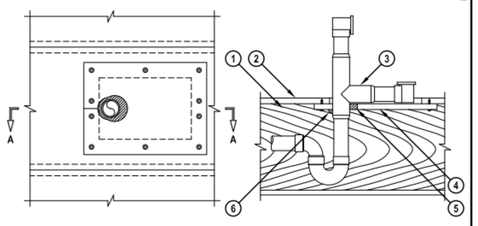
Saving Lives through Innovation and Education

UL SYSTEM NO. F-C-2204

PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1/2-HR.

BOTTOM VIEW SECTION A-A



FC2204b.010715

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. MAXIMUM 1-1/2" NOMINAL DIAMETER PVC OR ABS PLASTIC PIPE (SCHEDULE 40) AND DRAIN FITTINGS CEMENTED TOGETHER WITH PVC OR ABS BATHTUB WASTE/OVERFLOW FITTINGS.
4. 3/4" THICK PLYWOOD PATCH SIZED TO OVERLAP MINIMUM 2" BEYOND EACH EDGE OF RECTANGULAR OPENING. TWO PIECES POSITIONED AROUND DRAIN PIPING WITH CUT EDGES TIGHTLY BUTTED, AND SCREW ATTACHED TO UNDERSIDE OF SUBFLOOR WITH 1-1/4" LONG STEEL SCREWS (SPACED MAXIMUM 6" C/C). (SEE NOTE NO. 3 BELOW).
5. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM SIZE OF OPENING = 12" x 8".
2. ANNULAR SPACE BETWEEN DRAIN PIPING AND PATCH = MINIMUM 0", MAXIMUM 1".
3. AS AN ALTERNATE TO PLYWOOD, 5/8" THICK GYPSUM WALL BOARD MAY BE USED.

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet	1 of 1
Scale	1/8" = 1"
Date	Jan. 07, 2015

Drawing No. FC 2204b

Hilti Firestop Systems

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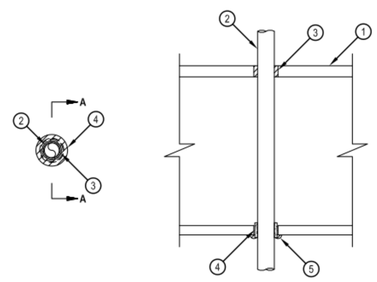
Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2230

F Rating - 1 Hr
T Rating - 1/4 Hr

FC 2230



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 1-5/8 in. (41 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design.

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January 21, 2015

Hilti Firestop Systems

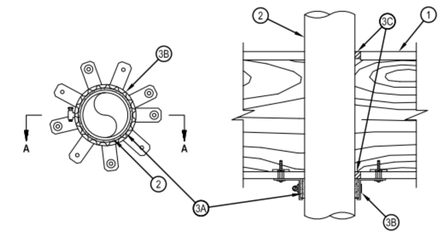
Page: 1 of 2

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2232

F Rating — 1 Hr
T Rating — 3/4 and 1 Hr (See Item 3)

FC 2232



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
2. Through Penetrants — One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) and max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

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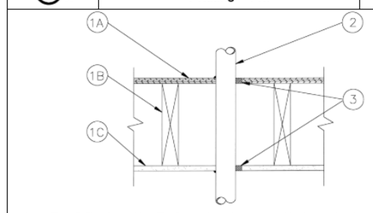
Hilti Firestop Systems

Page: 1 of 2

Classified UL US

F Rating – 1 Hr
T Rating – 1 Hr

F-C-2080



1. **Floor-Ceiling Assembly –** The fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Flooring System –** Lumber of plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of floor opening is 3-1/8 in.
   B. **Wood Joists –** Nom 2 by 10 in. deep (or deeper) lumber joists spaced 16 in. OC, with nom 1 by 3 in. lumber bridging and with ends firestopped or steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board* –** Nom 5/8 in. thick as specified in the individual Floor-Ceiling Design. I diam of opening is 3-1/8 in.
2. **Through Penetrant –** One non-metallic pipe or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. Pipe to be rigidly supported on both sides of floor assembly.
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 cellular or solid core chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   B. **Polyvinyl Chloride (PVC) –** Nom 2 in. diam (or smaller) Schedule 40 (or heavier) PVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ –** Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).

Underwriters Laboratories Inc.®

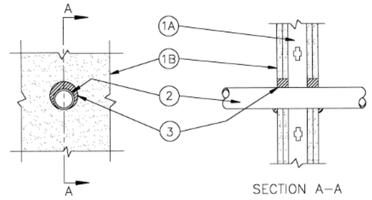
09/16 (1)

Classified UL US

F Ratings – 1, 2, 3 and 4 Hr (See Item 1)
T Ratings – 1, 2, 3 and 4 Hr (See Item 1)

W-L-2126

ANSI/UL1479 (ASTM E814)
F Ratings — 1, 2, 3 and 4 Hr (See Item 1)
T Ratings — 1, 2, 3 and 4 Hr (See Item 1)



SECTION A–A

1. **Wall Assembly –** The 1, 2, 3 or 4 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs –** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC.
   B. **Gypsum Board* –** The gypsum wallboard type, thickness, number of layers, fasteners and sheet orientation shall be as specified in the individual U300 or U400 Series Designs in the UL Fire Resistance Directory. Max diam of opening is 3-1/8 in.
   The hourly F and T Ratings of the firestop system is equal to the hourly fire rating of the assembly in which it is installed.

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09/16 (1)

System No. F-C-2230

FC 2230

2. Through Penetrants — One non-metallic tube to be installed concentrically within the firestop system. Annular space between tube and periphery of opening shall be 1/4 in. (6 mm). Tube to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of non-meyallic tubes or pipes may be used:
   Crosslinked Polyethylene (PEX) Tubing — Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Fill, Void or Cavity Materials* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1 in. (25 mm) wide intumescentwrap strip. One layer of wrap strip tightly wrapped around tube and held in place with tape. Wrap strip centered in annular space extending from both sides of gypsum board.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W25/1" Wrap Strip
4. Fill, Void or Cavity Materials* - Sealant — Min 3/4 in. (19 mm) depth of fill material applied within the annulus, flush with the top surface of floor. A 1/4 in. (6 mm) diam bead of fill material shall also be applied at the wrap strip/gypsum board interface.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Sealant - FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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January 21, 2015

Hilti Firestop Systems

Page: 2 of 2

System No. F-C-2232

FC 2232

3. Nonmetallic Pipe Coupling — (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC, Schedule 40 ABS or SDR13.5 CPVC coupling corresponding to pipe type installed such that the top of the coupling is flush with the bottom surface of the ceiling and extending downward.
4. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1-3/4 in. (44 mm) wide intumescent wrap strip. Layers of wrap strip continuously wrapped around the pipe and held in place with tape. Wrap strip butted tightly against surface of ceiling.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W45/1-3/4" Wrap Strip

Nom Diam of Pipe, in. (mm)	Number of Wrap Strips	Min/Max Annular Space, in. (mm)	T-Rating - Hr.
2 (51)	1	0-1/4 (0-6)	1
3 (76)	2	0-1/2 (0-13)	3/4
4 (102)	2	0-1/2 (0-13)	3/4

   B. Steel Collar — Collar fabricated from coils of precut min 0.017 in. (0.43 mm) thick (No. 28 MSG) galv steel available from the sealant manufacturer. Collar shall be nom 1-3/4 in. (44 mm) deep with 1 in. (25 mm) wide by 2 in. (51 mm) long anchors tabs on 2 in. (51 mm) centers for securement to floor/ceiling assembly. The opposite side incorporates retainer tabs, 1/2 in. (13 mm) wide by 3/16 in. (5 mm) long, prebent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 1 in at seam. A nom 1/2 in. (13 mm) wide stainless steel hose clamp shall be secured to the collar at its mid-height. Every other anchor tab of collar secured to gypsum ceiling with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel toggle bolts in conjunction with 1/4 in. by 3/4 in. (6 by 19 mm) diameter steel washers.
   C. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface on top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX SEALANT
   4A. Firestop System — (Optional, Not shown) As an option to Item 4, the firestop system shall consist of the following:
   A. Firestop Device* — Galv steel collar lined with an intumescent material sized to fit the specific diam of pipe shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the gypsum board ceiling with 1/4 in. diam by 1-1/2 in. (38 mm) long steel toggle bolts with 3/4 in. (19 mm) diam steel washers through hanger tabs provided.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N or CP 643 110/4"N Firestop Collar.
   B. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface, flush with top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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January 15, 2015

Hilti Firestop Systems

Page: 2 of 2

Continued … F-C-2080

3. **Fill, Void or Cavity Material* – Sealant –** Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling. Min 1/2 in. diam bead of fill material applied at the penetrant/floor and penetrant/ceiling interfaces at point contact locations on both sides of assembly.
   Passive Fire Protection Partners – 3600EX, 4800DW

* Bearing the UL Classification Marking
\+ Bearing the UL Listing Mark

Continued… W-L-2126

2. **Through Penetrants –** One nonmetallic pipe or tubing installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes or tubing may be used:
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 CPVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.
   B. **Crosslinked Polyethylene (PEX) Tubing –** Nom 1-1/2 in. diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems. The annular space between tubing and periphery of opening shall be min 1/4 in. to max 3/8 in.
   C. **Polyvinyl Chloride (PVC) Pipe –** Nom 2 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.

3. **Fill, Void or Cavity Material* – Sealant –** Min 5/8 in. thickness of fill material for a 1 hr rated wall assembly, min 1 in. thickness of fill material for 2, 3 and 4 hr rated assemblies applied within the annulus, flush with both surfaces of wall.
   Passive Fire Protection Partners – 3600EX, 4800DW

*Bearing the UL Classification Marking

HIGH MOUNTAIN DEVELOPMENT - A5
HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

ALABAMA LICENSED NO. PE36516 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P5.003

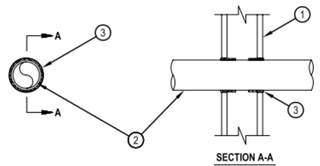
HIGH MOUNTAIN DEVELOPMENT - A5

WL 2284

System No. W-L-2284

F Rating - 1 Hr
T Rating - 1 Hr

Classified by Underwriters Laboratories, Inc. to UL 1479



SECTION A-A

1. Wall Assembly -- The 1 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing shall consist of wood studs or steel channel studs. Wood studs to consist of 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- Min 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers and orientation shall be as specified in the individual U300 or U400 Wall and Partition Design. Max diam of opening is 4 in.
2. Through Penetrants -- One nonmetallic pipe to be centered within the firestop system. An annular space of 3/16 to 1/4 in. is required within the firestop system. Pipe to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe -- Nom 3 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 3 in. diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Material* -- Wrap Strip - Layers of intumescent wrap strip are continuously wrapped around the pipe with ends held in place with tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall. Size of wrap strip and number of layers are shown in table below.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP648-E W25/1" or CP648-E W45/1-3/4" Firestop Wrap Strip

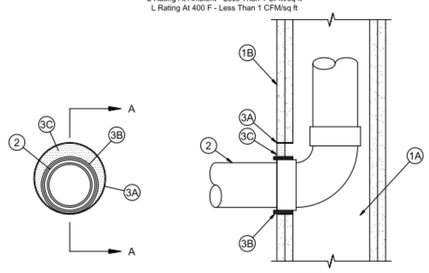
ProductDesignation	Pipe Diameter (in.)	Number of Layers	Nom. Wrap Strip Width (in.)
CP648-E-W25/1*	1-1/2 and 2	1	1
CP648-E-W45/1-3/4*	1-1/2, 2 and 3	1	1-3/4

   A. Fill, Void or Cavity Material* - Wrap Strip -- (As an alternate to the wrap strip in Item 3) - One layer of intumescent wrap strip is tightly wrapped around the pipe with ends butted and held in place with integrated tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF
   HILTI INC -- CP648-S-1.5" US, CP648-S-2" US, CP648-S-3" US
*Bearing the UL Classification Mark

HILTI Firestop Systems

System No. W-L-2636

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



SECTION A-A

1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing to consist of nom 2 by 6 in. (51 by 152 mm) (or larger) wood or steel channel studs or doubled or staggered nom 2 by 4 in. (51 by 102 mm) (or larger) wood studs spaced in accordance with the individual U300, U400, V400 or W400 Series Wall and Partition Designs.
   B. **Gypsum Board* -** One or two layers of nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max diam of opening is 5-1/2 in. (140 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Nonmetallic Penetrant -** One nonmetallic pipe or conduit to be installed within stud cavity and connected to a 90° elbow. Hub of the elbow may be recessed into the annular space within the opening. Additional nonmetallic pipe or conduit shall be connected to elbow and penetrate one side of the wall either concentrically or eccentrically within the firestop system. The annular space between pipe or conduit and periphery of the opening shall be min 1/4 in. (6 mm) to max 1-1/4 in. (32 mm). Pipe or conduit shall be rigidly supported within the wall and on the penetrated side of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

STI

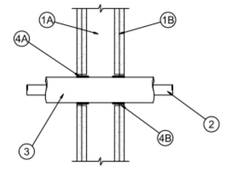
Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com

W-L-2636
PAGE 1 OF 2

System No. W-L-5290

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening shall be 4 in. (102 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.

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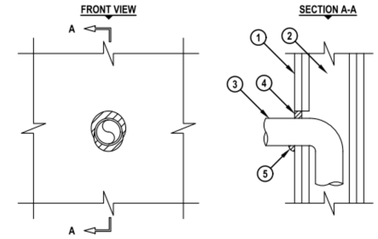
W-L-5290
PAGE 1 OF 2

MK

ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : TERRACES AT HIGH MOUNTAIN
ENGINEER : ONEIL ENGINEERING SERVICES
F-RATING = 1-HR. OR 2-HR.



1. **GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300, U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).**
2. **[NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 3-1/2" WIDE.**
3. **PENETRATING ITEM TO BE ONE OF THE FOLLOWING :**
   A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40 OR HEAVIER) (CELLULAR OR SOLID CORE) (CLOSED OR VENTED PIPING SYSTEM).
   B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY).
   C. MAXIMUM 2" NOMINAL DIAMETER PEX TUBING (SDR 9) (CLOSED PIPING SYSTEM ONLY).
   D. MAXIMUM 2" NOMINAL DIAMETER RNC-PVC CONDUIT (SCHEDULE 40).
4. **MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.**
5. **MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.**

NOTES : 1. DIAMETER OF OPENING SHALL BE 1" LARGER THAN NOMINAL PIPE DIAMETER.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5/8".

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL SYSTEM NO. W-L-2474)

HILTI Firestop Systems

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Designed by

Sheet	1 of 1
Scale	1/8" = 1"
Date	June 07, 2021

Drawing No. 524232a

Saving Lives through Innovation and Education

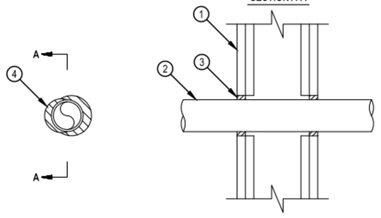
WL 2474

System No. W-L-2474

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating at 400 F - 4 CFM/Sq Ft

Classified by Underwriters Laboratories, Inc. to UL 1479

SECTION A-A



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Diam of opening shall be 1 in. (25 mm) larger than the nom pipe diam.
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and the periphery of the opening shall be min 0 in. (point contact) to a max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) cellular or solid core Schedule 40 (or heavier) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
   D. Rigid Nonmetallic Conduit (RNC)+ — Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
3. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At point contact location, a min 5/8 in. (16 mm) diam bead of fill material shall be applied to the wall/penetrant interface on both surfaces of the wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
+ Bearing the UL Listing Mark

HILTI Firestop Systems

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Metallic Sleeve -** Cylindrical sleeve fabricated from min 0.016 in. (0.4 mm) thick (30 gauge) galv sheet steel and having a 1 in. (25 mm) lap along the longitudinal seam. Length of steel sleeve to be 5/8 in. (16 mm) in 1 hr fire rated walls and 1-1/4 in. (32 mm) in 2 hr fire rated walls. Sleeve installed by coiling the sheet steel to a diam smaller than the opening, inserting the coil into the opening and releasing the coil to let it uncoil against the circular cutout in the wallboard layers. Sleeve shall be installed flush with wall surfaces on the penetrated side of the wall assembly.
   B. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/4 in. (6 mm) thick by 1-1/2 in. (38 mm) wide (RED), 1/8 in. (3.2 mm) thick by 1-1/2 in. (38 mm) wide (RED2), 3/16 in. (4.8 mm) thick by 2 in. (51 mm) wide (BLU), 1/8 in. (3.2 mm) thick by 2 in. (51 mm) wide (BLU2), intumescent strips faced on both sides with a plastic film. Two layers of wrap strip individually wrapped around the through penetrant with the ends butted or continuously wrapped around the penetrant and held in place by means of foil tape. The wrap strip is slid along the penetrant into annulus such that the trailing edge of the wrap strip extends 1/4 in. (6 mm) from the surface of the wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal RED, RED2, BLU, or BLU2 Wrap Strip
   C. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with surface of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant
   +Bearing the UL Listing Mark
   *** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

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W-L-2636
PAGE 2 OF 2

3. **Pipe and Equipment Covering Materials* -** Max 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 57 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between insulated penetrating item and the edge of the through opening shall be nom 11/32 in. (8.7 mm).
4. **Firestop System -** The firestop system shall consist of the following items:
   A. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips or 1/8 or 1/4 in. (3.2 or 6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. Single layer of wrap strip wrapped around the through penetrant with the ends butted and held in place by means of foil tape. The wrap strip is slid along the through penetrant into annulus such that outer edge of wrap strip is flush with wall surface. One set of wrap strips to be installed on each side of wall. As an option when 1/8 in. (3.2 mm) thick wrap strip (BLU2) is used, the strips may be cut to a width of 1-1/2 in. (38 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip, SpecSeal BLU2 Wrap Strip or SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or SpecSeal Series SSS Sealant
   * Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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W-L-5290
PAGE 2 OF 2

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL
No. 24911

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P5.004

HIGH MOUNTAIN DEVELOPMENT - A5

1 PLUMBING BASEMENT FLOOR PLAN - WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

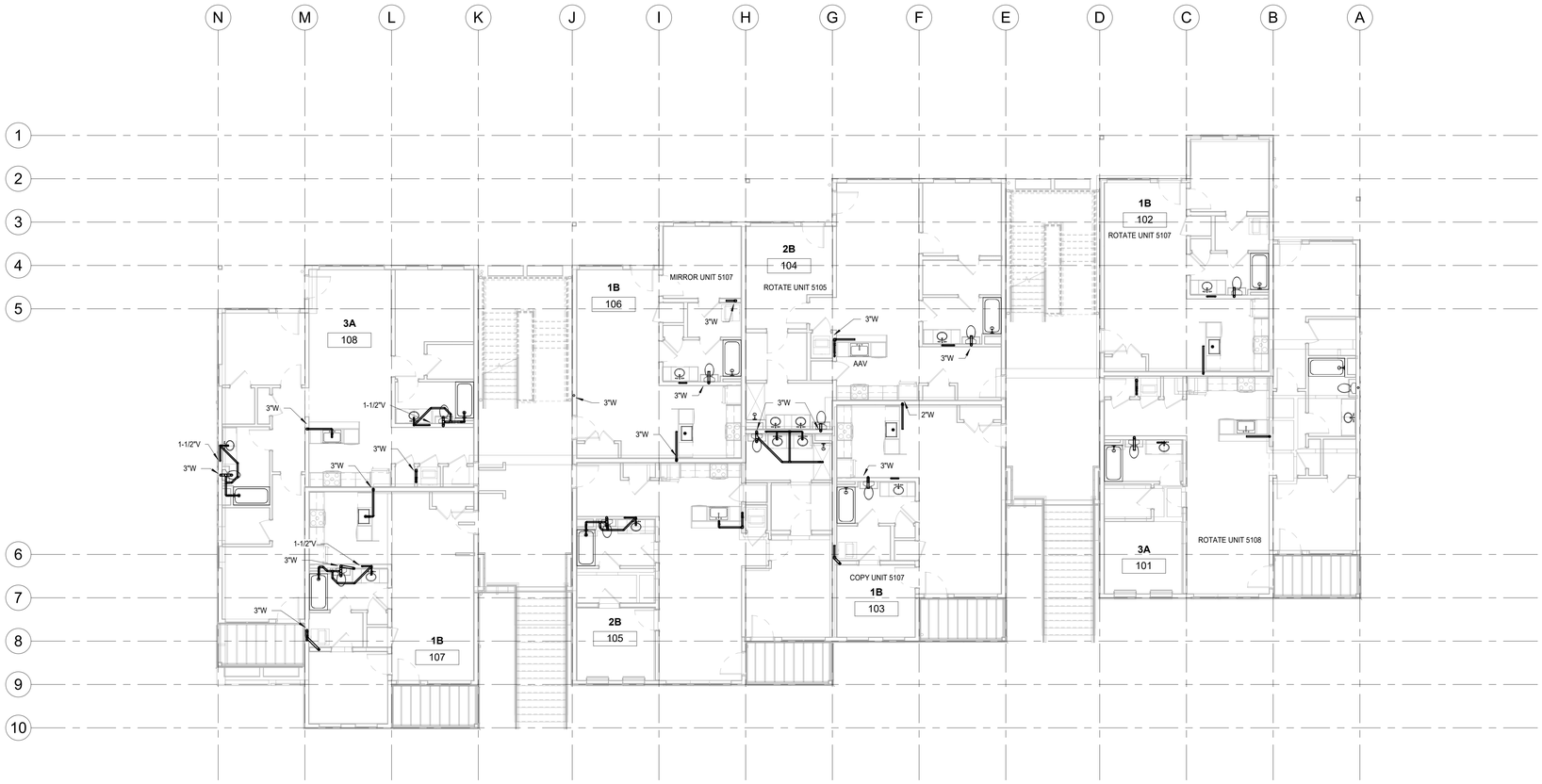
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING BASEMENT FLOOR PLAN - WASTE & VENT

SHEET:

P5.100

HIGH MOUNTAIN DEVELOPMENT - A5



1 PLUMBING FIRST FLOOR PLAN - WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
FIRST FLOOR PLAN - WASTE & VENT

SHEET:

P5.101

HIGH MOUNTAIN DEVELOPMENT - A5

1 PLUMBING SECOND FLOOR PLAN - WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

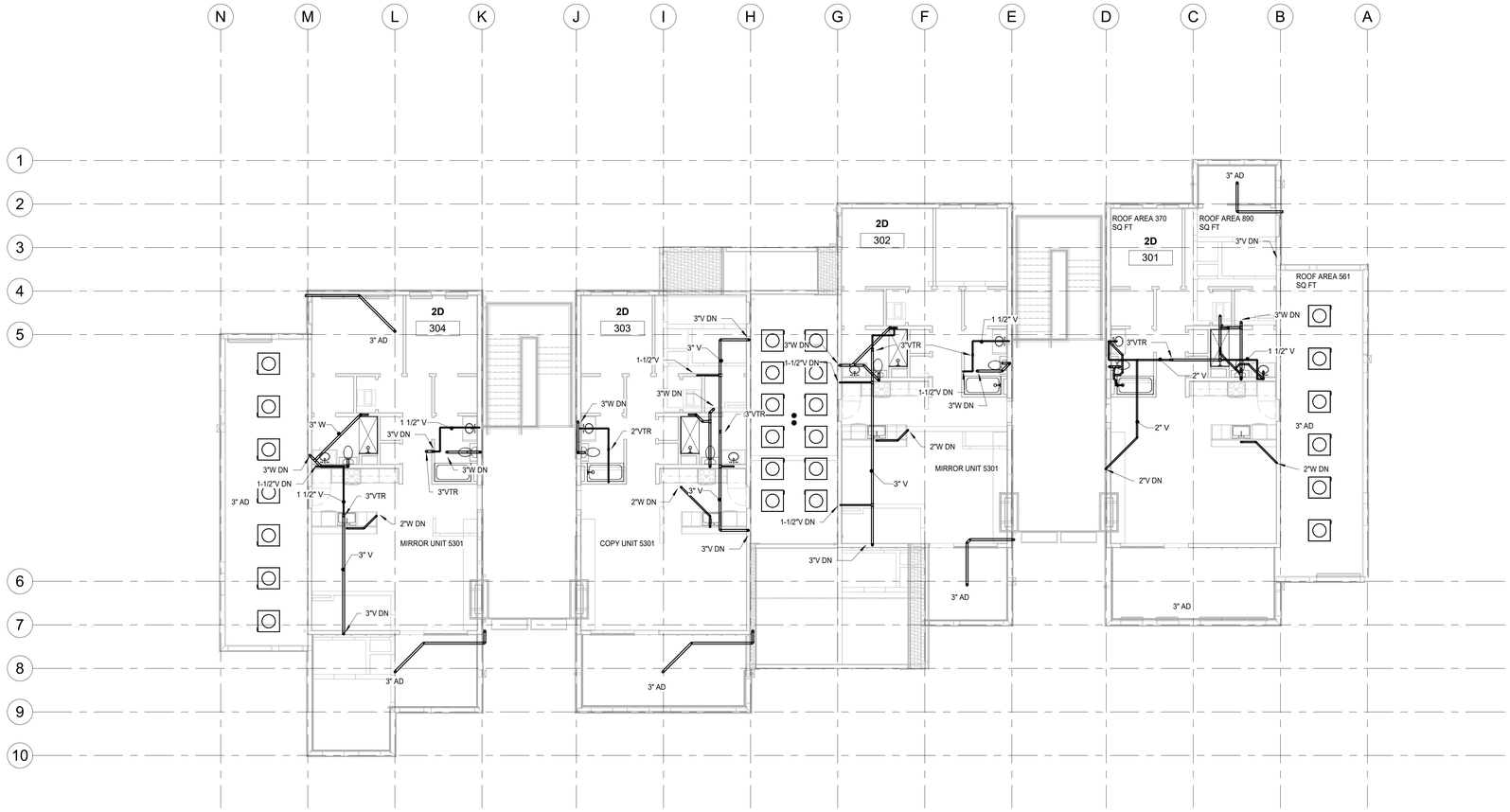
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING SECOND FLOOR PLAN - WASTE & VENT

SHEET:

P5.102

HIGH MOUNTAIN DEVELOPMENT - A5



1 PLUMBING THIRD FLOOR PLAN - WASTE & VENT
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
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PHONE: 804-372-3501

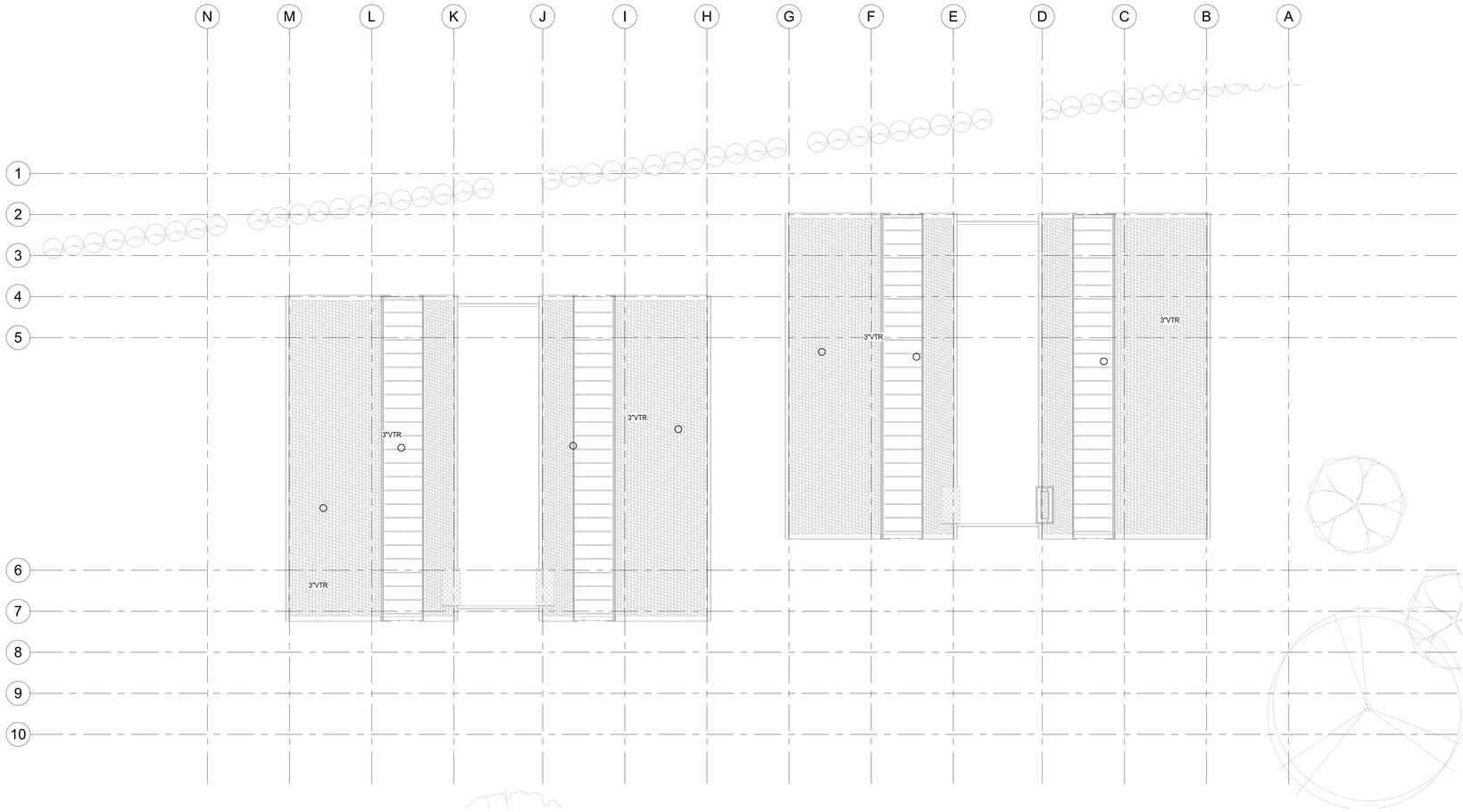
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING THIRD FLOOR PLAN - WASTE & VENT

SHEET:

P5.103

HIGH MOUNTAIN DEVELOPMENT - A5



1 PLUMBING ROOF PLAN
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

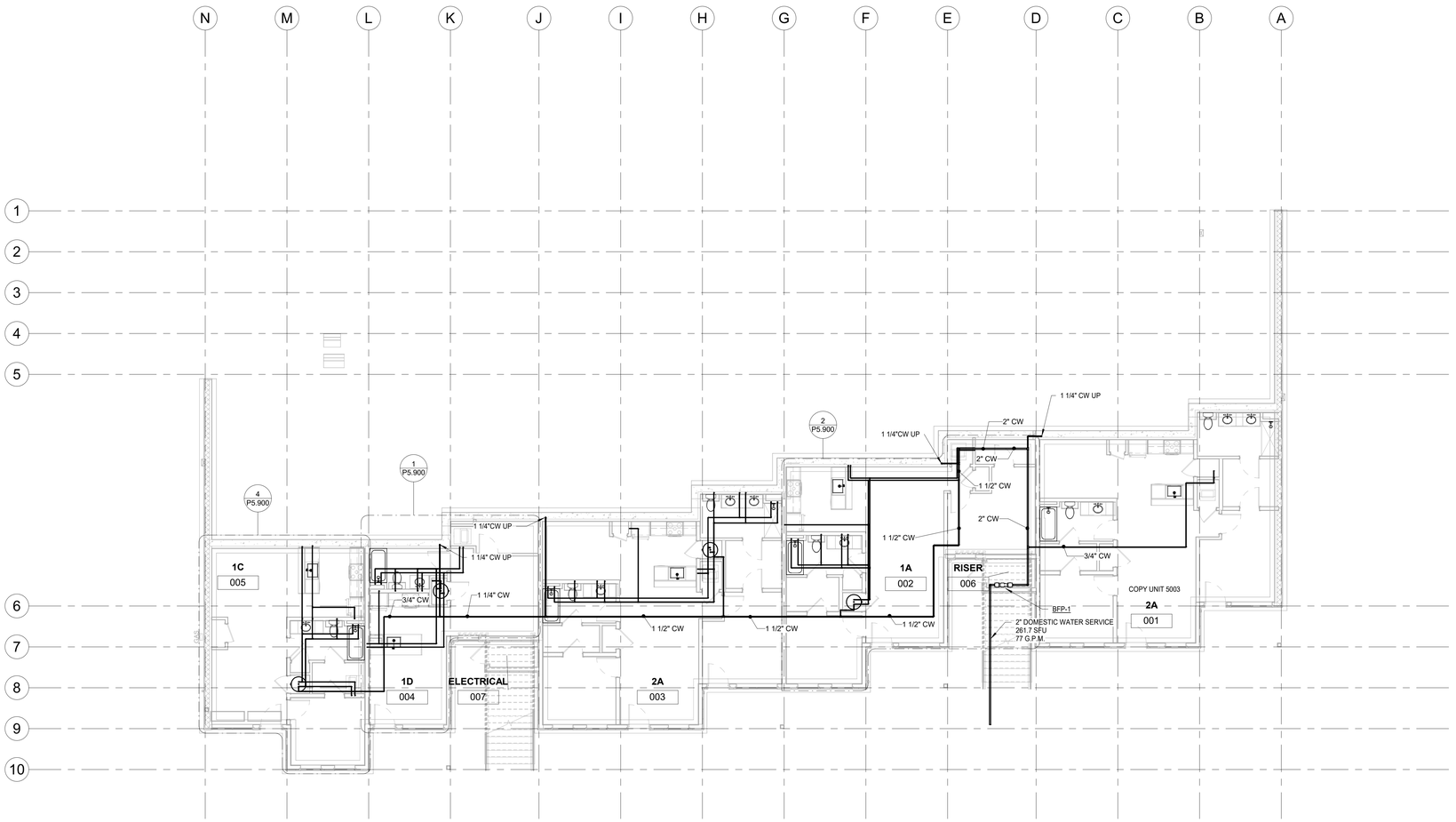
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
ROOF PLAN

SHEET:

P5.104

HIGH MOUNTAIN DEVELOPMENT - A5



1 PLUMBING BASEMENT FLOOR PLAN - SUPPLY
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

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HUNTSVILLE, AL 35805

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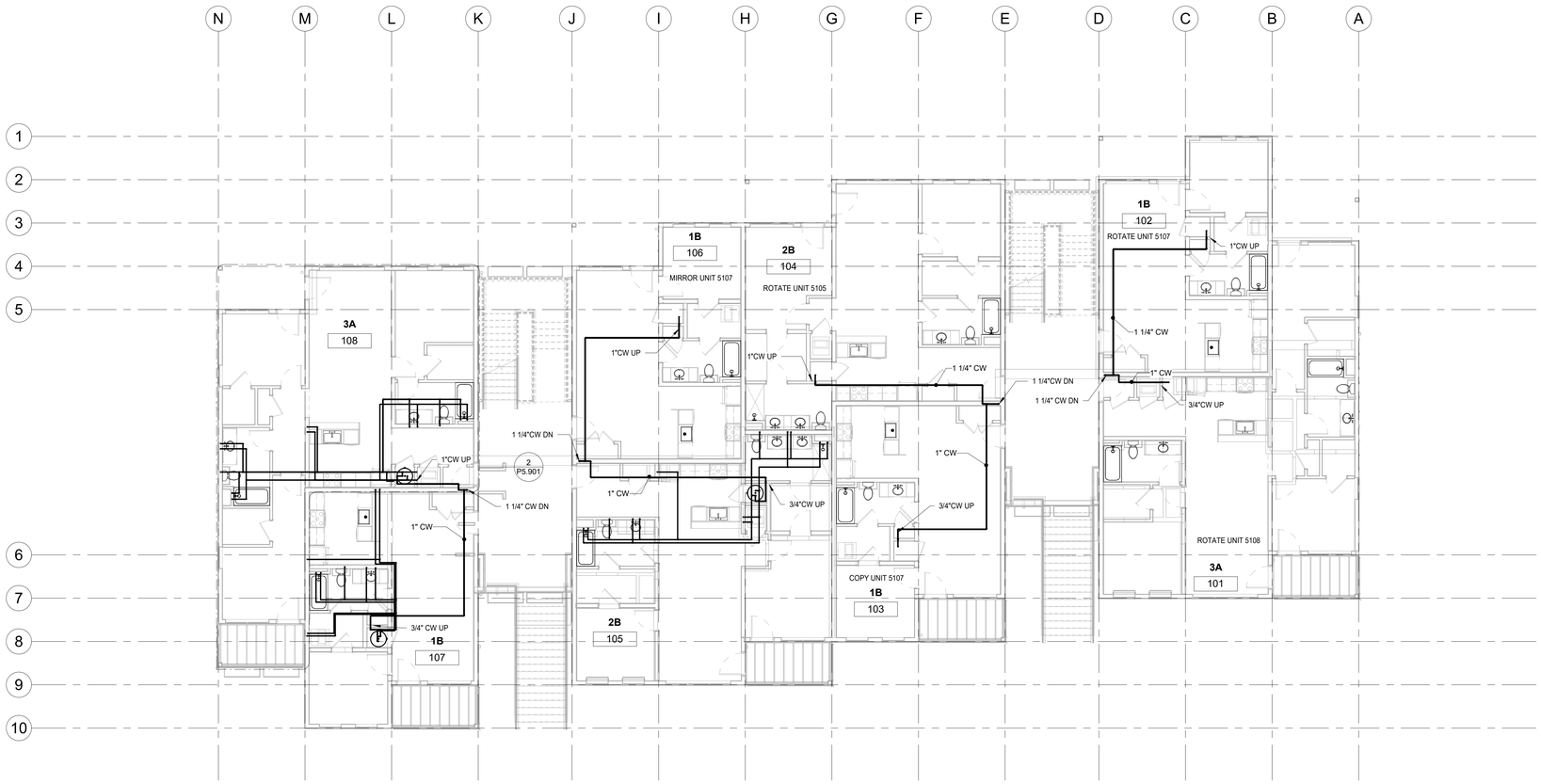
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
BASEMENT FLOOR
PLAN - SUPPLY

SHEET:

P5.200

HIGH MOUNTAIN DEVELOPMENT - A5



1 PLUMBING FIRST FLOOR PLAN - SUPPLY
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

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APPROVED BY:	PJO

PLUMBING
FIRST FLOOR
PLAN - SUPPLY

SHEET:

P5.201

HIGH MOUNTAIN DEVELOPMENT - A5

1 PLUMBING SECOND FLOOR PLAN - SUPPLY
1/8" = 1'-0"

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

ALABAMA LICENSED PROFESSIONAL ENGINEER
PATRICK J. O'NEIL

REVISIONS		
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ONEIL
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23139
PHONE: 804-372-3501

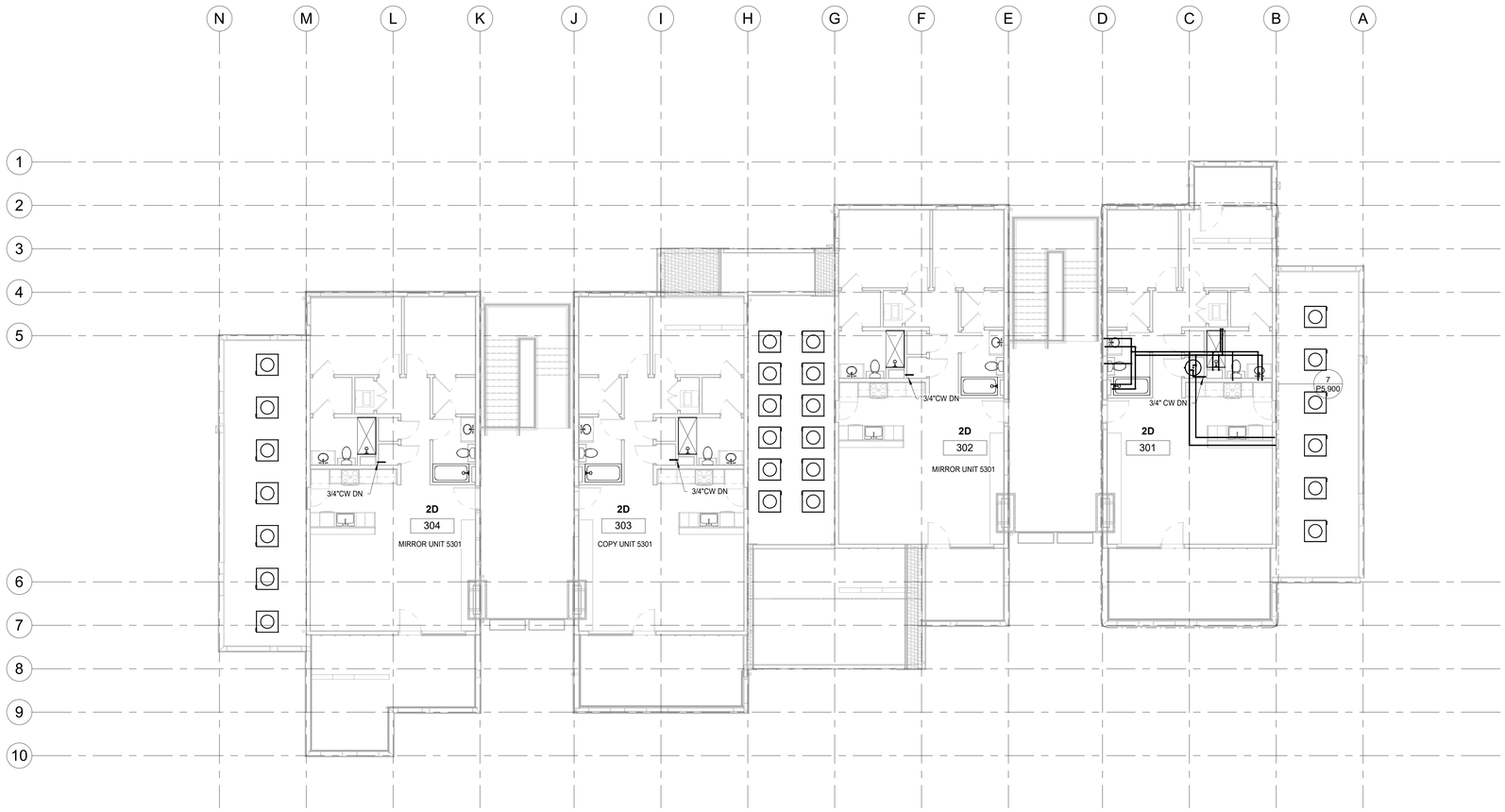
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING SECOND FLOOR PLAN - SUPPLY

SHEET:

P5.202

HIGH MOUNTAIN DEVELOPMENT - A5



1 PLUMBING THIRD FLOOR PLAN - SUPPLY
1/8" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
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23139
PHONE: 804-372-3501

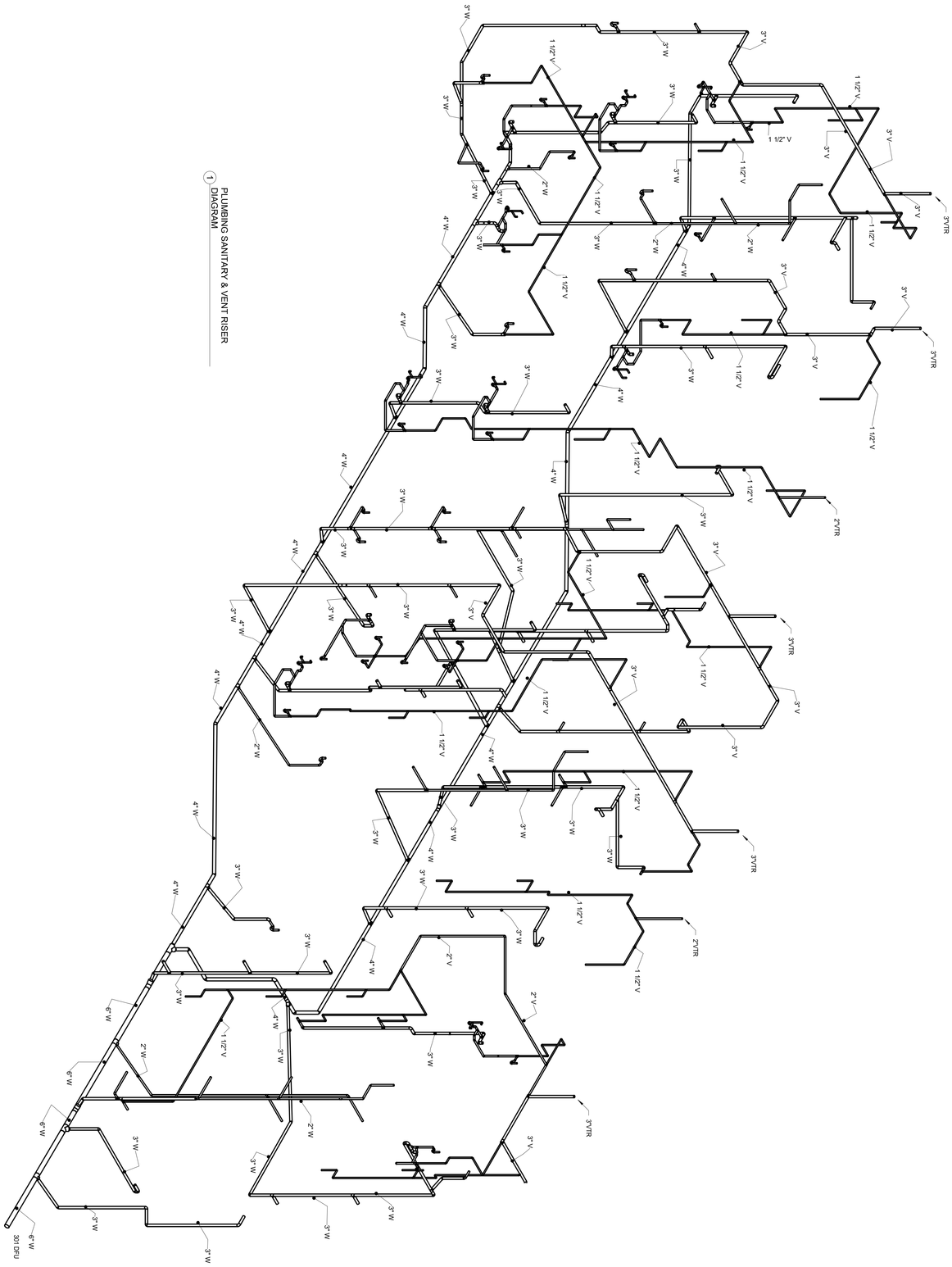
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
THIRD FLOOR PLAN - SUPPLY

SHEET:

P5.203

HIGH MOUNTAIN DEVELOPMENT - A5



1 PLUMBING SANITARY & VENT RISER DIAGRAM

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD

HUNTSVILLE, AL 35805

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

REVISIONS

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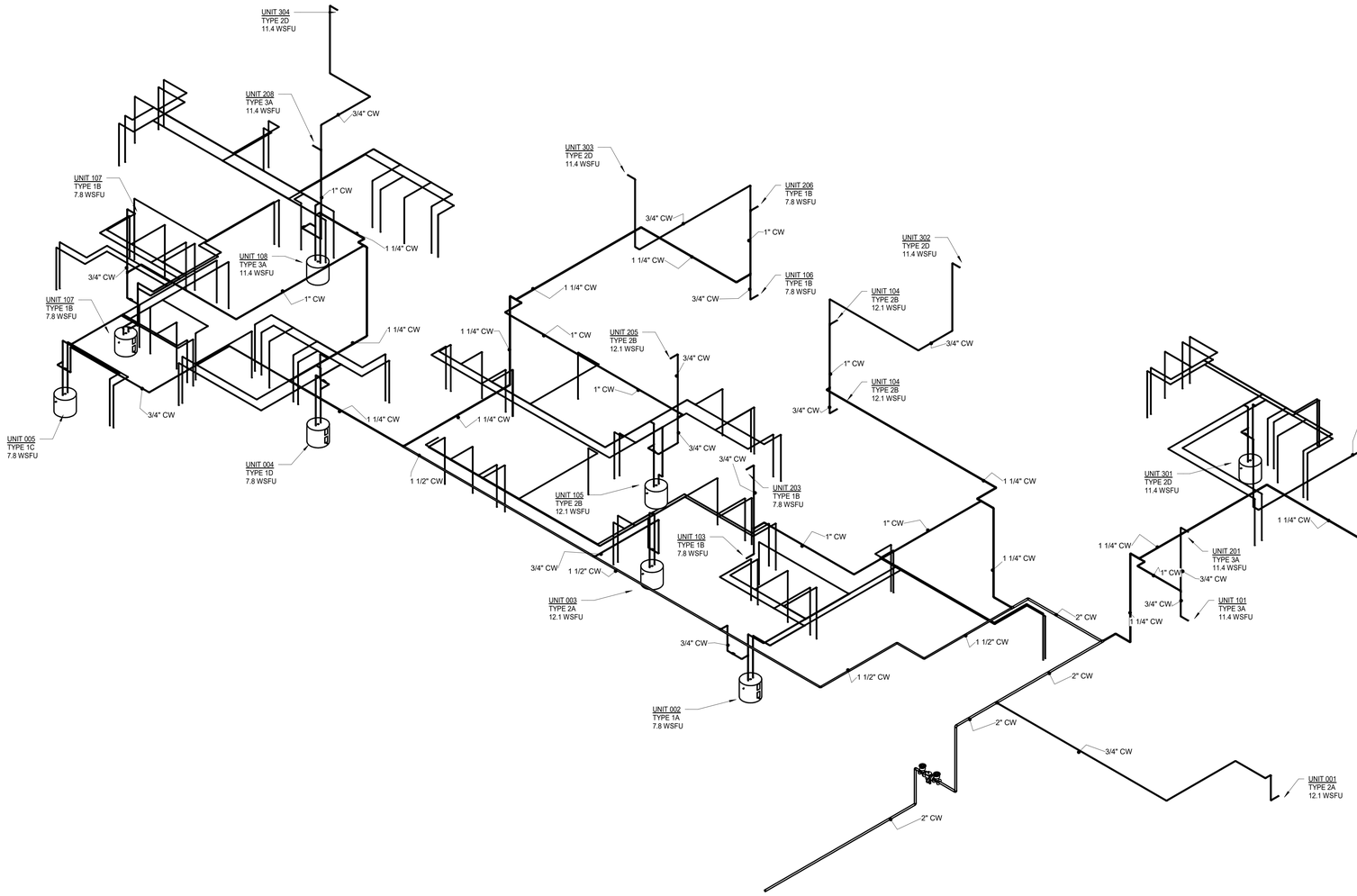
ONEIL
ENGINEERING SERVICES
1480 CAMBRIDGE COURT
HUNTSVILLE, ALABAMA 35803
PHONE: 904-373-3301

PROJECT #: K118
DATE: 11-JUNE-2021
SCALE: NONE
DRAWN BY: RD
APPROVED BY: PJO

PLUMBING SANITARY & VENT RISER DIAGRAM

SHEET: P5.300



1 PLUMBING DOMESTIC WATER RISER DIAGRAM

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

REVISIONS		
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

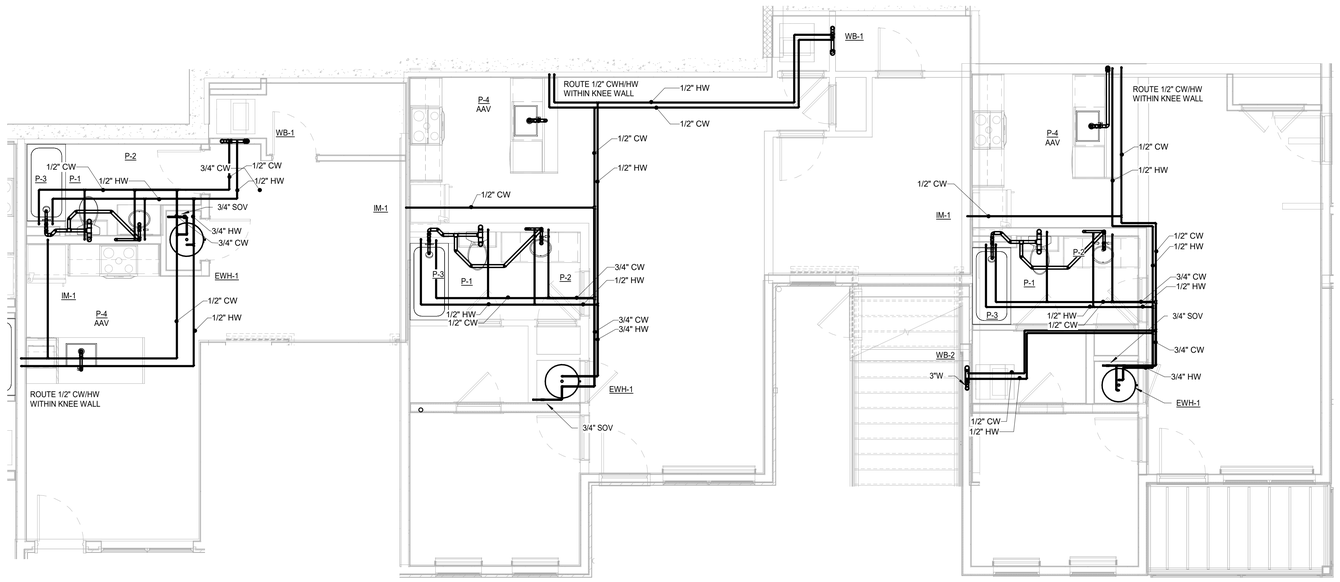
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NONE
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING DOMESTIC WATER RISER DIAGRAM

SHEET:

P5.301

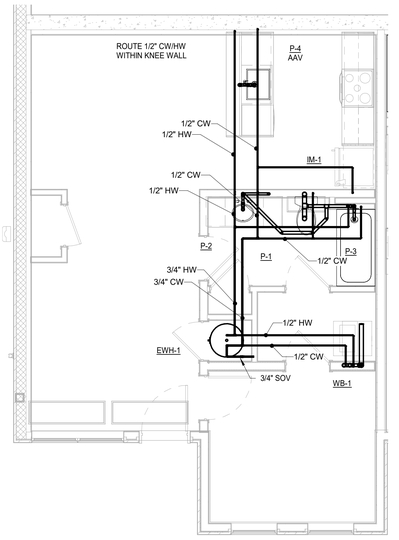
HIGH MOUNTAIN DEVELOPMENT - A5



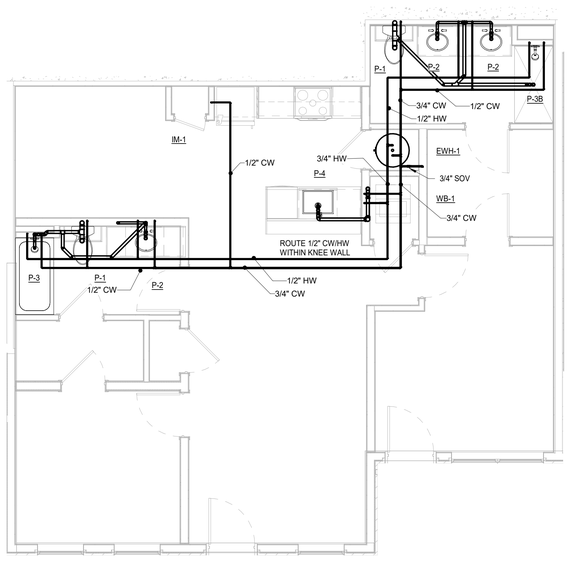
1 PLUMBING TYPICAL PLAN - TYPE 1D
1/4" = 1'-0"

2 PLUMBING TYPICAL PLAN - TYPE 1A
1/4" = 1'-0"

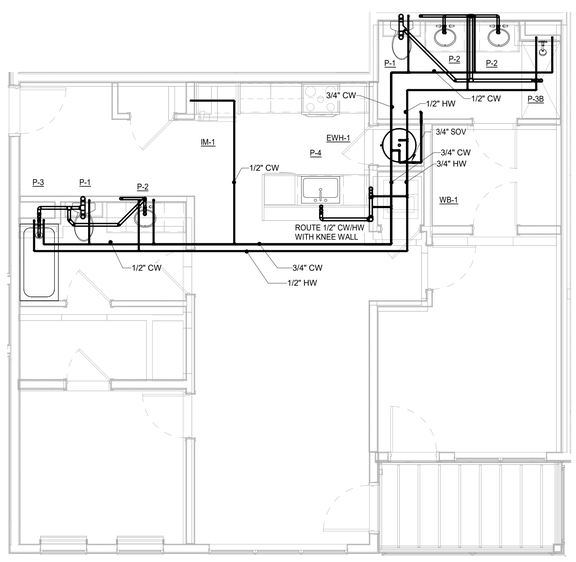
3 PLUMBING TYPICAL PLAN - TYPE 1B
1/4" = 1'-0"



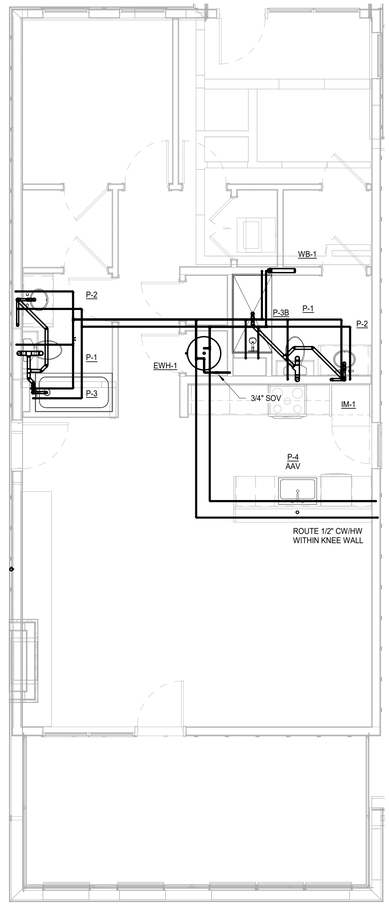
4 PLUMBING TYPICAL PLAN - TYPE 1C
1/4" = 1'-0"



5 PLUMBING TYPICAL PLAN - TYPE 2A
1/4" = 1'-0"



6 PLUMBING TYPICAL PLAN - TYPE 2B
1/4" = 1'-0"



7 PLUMBING TYPICAL PLAN - TYPE 2D
1/4" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

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23139
PHONE: 804-372-3501

PROJECT #:	K118
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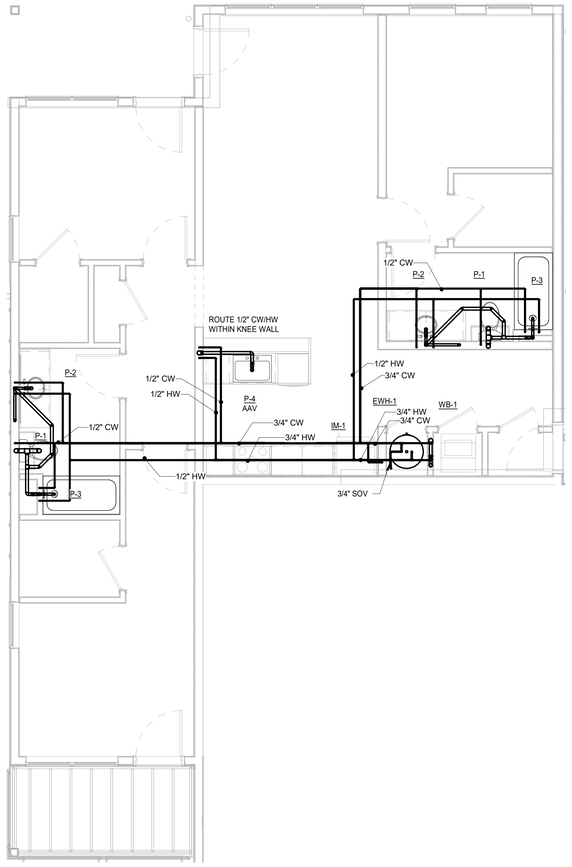
SCALE:	1/4" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
ENLARGED PLANS

SHEET:

P5.900

HIGH MOUNTAIN DEVELOPMENT - A5



2 PLUMBING TYPICAL PLAN - TYPE 3A
1/4" = 1'-0"

ALABAMA LICENSED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

HIGH MOUNTAIN DEVELOPMENT - A5

HARRIS HILL BOULEVARD
HUNTSVILLE, AL 35805

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23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/4" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
ENLARGED PLANS

SHEET:

P5.301

HIGH MOUNTAIN DEVELOPMENT - A5

PLUMBING DRAWING LIST

LEGEND & ABBREVIATIONS

SYMBOL	DESCRIPTIONS
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISHED FLOOR
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
CO	CLEAN OUT
CW	COLD WATER (DISTRIBUTION LINE)
DFU	DRAINAGE FIXTURE UNITS
DW	DOMESTIC WATER (SERVICE LINE)
CW	COLD WATER (DISTRIBUTION LINE)
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
HB	HOSE BIBB
HW	HOT WATER
P-1	PLUMBING FIXTURE
SFU	SUPPLY FIXTURE UNITS
V	VENT
VTR	VENT THROUGH ROOF
WCO	WALL CLEAN OUT
WHA	WATER HAMMER ARRESTOR

PLUMBING FIXTURE SCHEDULE

ITEM NO.	FIXTURE TYPE	WASTE CONN.	VENT CONN.	CW CONN.	HW CONN.	REMARKS
P-1	WATER CLOSET	3"	-	1 1/2"	-	
P-1A	WATER CLOSET (ADA)	3"	-	1 1/2"	-	NOT USED
P-2	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	
P-2A	LAVATORY (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED
P-3	TUB/SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3A	TUB/SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED
P-3B	SHOWER	1 1/2"	1 1/2"	1/2"	1/2"	
P-3C	SHOWER (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED
P-4	KITCHEN SINK	1 1/2"	1 1/2"	1/2"	1/2"	
P-4A	KITCHEN SINK (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	NOT USED

PLUMBING GENERAL NOTES

APPLICABLE CODES:
INTERNATIONAL PLUMBING CODE (IPC) 2015
INTERNATIONAL BUILDING CODE (IBC) 2015
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI A117.1-2009)
UNIFORM STATEWIDE BUILDING CODE OF ALABAMA 2015

PLUMBING SYSTEMS:
PROVIDE ALL PLUMBING FIXTURES AND TRIM AS INDICATED ON THE DRAWINGS AND AS SPECIFIED ELSEWHERE HEREIN. ALL FIXTURES SHALL BE CONNECTED TO THE PLUMBING SYSTEMS AS INDICATED AND REQUIRED FOR PROPER OPERATION. PIPING MATERIALS, ACCESSORIES AND EQUIPMENT SHALL BE SPECIFIED ELSEWHERE WITHIN THIS SPECIFICATION.

SANITARY WASTE AND VENT SYSTEMS:
PROVIDE A COMPLETE SANITARY, WASTE AND VENT SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING REQUIRING CONNECTIONS. ALL WASTE FROM THE BUILDING SHALL DISCHARGE BY GRAVITY OUT THE BUILDING TO BE PICKED UP BY CIVIL AND EXTENDED TO THE SEWER SYSTEM. SANITARY PIPING TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE OTHERWISE NOTED.

WATER SUPPLY SYSTEM:
PROVIDE A COMPLETE WATER SUPPLY SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING INCLUDING DOMESTIC WATER HEATERS. PROVIDE APPROVED GATE OR COMPRESSION STOPS AT EVERY CONNECTION TO FIXTURES AND EQUIPMENT.

STORM DRAINAGE SYSTEM:
REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND SIZING.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND FIXTURES. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGARS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.

PERMIT, FEES AND NOTICES:
COMPLY WITH THE GENERAL CONDITIONS AND PROVIDE ALL PERMITS AS REQUIRED FOR THE INSTALLATION OF ALL INDICATED PLUMBING SYSTEMS.

FIRE RATINGS:
SEPARATIONS BETWEEN R-2 TENANTS ARE 1-HR RATED.
CEILINGS ARE 1-HR RATED.
STAIRWELLS AND ELEVATOR ARE 2-HR RATED..

FULLY SPRINKLERED PER NFPA 13

USE GROUP: R-2
CONSTRUCTION : 5-A

PLUMBING SPECIFICATIONS

A. PIPE AND PIPE FITTINGS: 1. DOMESTIC (POTABLE) WATER (CW/HW) PIPING: SYSTEM DESIGN PRESSURE = 80 PSIG. PIPING 1" AND SMALLER SHALL BE PEX TUBING. BETWEEN 1-1/4" AND 2" SHALL BE SDR 11 CPVC TUBING. FOR PIPING GREATER THAN 2" PROVIDE SCHEDULE 80 CPVC TUBING.

2. SANITARY (W) AND VENT (V) PIPING: ALL SANITARY AND VENT PIPING SHALL BE SCHEDULE 40 PVC.

3. CONDENSATE DRAIN (D) PIPING: SYSTEM DESIGN PRESSURE = 10 PSIG. PROVIDE SCHEDULE 40 PVC.

4. STORM WATER (SW) PIPING: PROVIDE SCHEDULE 40 PVC.

B. VALVES:
1. GATE VALVES: POTABLE WATER SERVICE SIZES 1/2" - 2-1/2" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC PIPING SYSTEMS. ALL SHUT OFF VALVES SHALL BE FULL OPEN PORT TYPE VALVES.

2. DRAIN VALVES: POTABLE WATER SERVICE SIZES 1/2" AND 3/4" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC SYSTEMS.

3. BACKFLOW PREVENTER: SPECIFICATIONS ARE BASED ON WATTS LF909 LARGE SERIES WITH 909AG-F AIR GAP. PROVIDE AT LOCATIONS IN WHICH THE PUBLIC WATER SUPPLY SYSTEM MUST BE PROTECTED. MATERIALS OF CONSTRUCTION - EPOXY COATED CAST IRON BODY AND STRAINER, LEAD FREE COPPER SILICONE ALLOY TEST COCKS, STAINLESS STEEL SEATS , REDUCED PRESSURE ZONE ASSEMBLY WITH RELIEF DRAIN ASSEMBLY. PIPE RELIEF TO FLOOR DRAIN AS SHOWN.

C. PLUMBING FIXTURES: ALL PLUMBING FIXTURES AND TRIM SHALL BE NEW AS MANUFACTURED BY FIRMS REGULARLY ENGAGED IN THE MANUFACTURE OF PLUMBING FIXTURES, AND TRIM OF TYPE, STYLE AND CONFIGURATION REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE AND SIMILAR SERVICE.

D. PROVIDE PROTECTION OF ALL FIXTURES DURING CONSTRUCTION FROM DAMAGE. EACH WATER SUPPLY CONNECTION SERVING A FIXTURE SHALL BE EQUIPPED WITH AN ACCESSIBLE STOP VALVE. CAULK ALL GAPS IN AROUND WALLS/FLOORS AND THE PLUMBING FIXTURES. SPECIFICATIONS FOR THE PLUMBING FIXTURES ARE BASED ON THE FOLLOWING TYPES.

E. PIPE INSULATION:
1. CLOSED CELL ELASTOMERIC (PIPE SIZES UP TO 5 INCHES): FLEXIBLE ELASTOMERIC, CLOSED CELLULAR, TUBULAR MOLDED TO ACCOMMODATE PIPING, SMOOTH OUTER SURFACE SUITABLE FOR PAINTING WITH VINYL LACQUER TYPE COATING, WATER RESISTANT, NONABSORBENT, OZONE RESISTANT, MINIMUM DENSITY OF 4 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF 0.27 AT 75 F MEAN TEMPERATURE

APPLICATIONS:
1. DOMESTIC HOT AND COLD WATER (ALL SIZES) ON ALL EXTERIOR WALL PIPING OR IN UNCONDITIONED SPACES ONLY: PROVIDE 1/2" CLOSED CELL ELASTOMERIC.

F. WATER HEATERS :
ELECTRIC WATER HEATER - FULLY INSULATED BAKED ENAMEL STEEL JACKET, INSULATED IN CONFORMANCE WITH ASHRAE 90A-1980 STANDARD FOR ELECTRIC DOMESTIC WATER HEATER, GLASS LINING, RELIEF VALVE TAP, HEAT TRAPS, RATED FOR 150 PSI. PLATED COPPER ELEMENT, LOW WATT DENSITY, REPLACEABLE IMMERSION TYPE. PROVIDE WITH RELIEF VALVE AND FACTORY PACKAGED CONTROL WIRING.

EWH-1 - 40 GALLON 4.5 KW DUAL ELEMENT WATER HEATER. HEATER SHALL BE "SHORT" CONSTRUCTION. PROVIDE WITH 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE. BASED ON RUUD MODEL PROE38-S2-RU95.

PROVIDE WATER HEATERS WITH 2.5-GAL EXPANSION TANK (ET-1).

WATER HEATERS ARE LOCATED WITHIN A VENTILATED SPACE AND OVER AN IMPERVIOUS FLOOR.

G. FIXTURES :

MAKE AND MODELS OF SPECIFIC FIXTURES TO BE USED.
PROVIDE INDICATED QUANTITIES OF FIXTURES. SEE ARCHITECTS DRAWING FOR
WB-1: WASHING MACHINE BOX (PLASTIC): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER.

WB-2: WASHING MACHINE BOX (FIRE RATED): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 FIRE RATED WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER .

IM-1: REFRIGERATOR BOX (PLASTIC): WATER-TIGHT RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

IM-2: REFRIGERATOR BOX (FIRE RATED): IPS FIRE GUARD RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

FCO: PROVIDE SIZING AS INDICATED ON THE DRAWINGS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES CLEANOUTS WITH NICKEL BRONZE ADJUSTABLE TOPS. MATCH MATERIALS OF CONSTRUCTION FOR BODY TYPE.

WCO: PROVIDE CHROME PLATED COVER FOR SANITARY TEST TEE AT ALL INDICATED LOCATIONS.

FD: FLOOR DRAINS - PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS. FLOOR DRAINS SHALL BE SUPPLIED WITH NICKEL BRONZE ADJUSTABLE TOPS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES 834 FLOOR DRAINS. PROVIDE DRAINS SUBJECT TO EVAPORATION WITH A TRAP SEAL.

WH-1: FREEZELESS WALL HYDRANT - BACKFLOW PROTECTED WITH ANTI-SIPHON VACUUM BREAKER (ASSE 1011), TEE KEY, COPPER TUBES, CHROME FINISH, PERMANENT TYPE BRASS VALVE BODY, ASSE STANDARD 1019-B, WITH AUTOMATIC DRAINING. BASED ON WOODFORD MODEL 65.

RH-1: ROOF HYDRANT - SPECIFICATION BASED ON WOODFORD MODEL SRH-MS, FREEZELESS ROOF HYDRANT, WITH INTEGRAL ANIT-SIPHON VACUUM BREAKER, BACKFLOW PROTECTED WITH FIELD TESTABLE ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER. NO DRAIN REQUIRED - A VENTURI ACTION DRAWS WATER OUT OF THE INTERNAL RESERVOIR AND DISCHARGES OF THE BACKFLOW PREVENTER. ALL NECESSARY MOUNTING HARDWARE FOR PROPER INSTALLATION ON A COMMERCIAL ROOF IS TO BE SUPPLIED WITH DEVICE.

PROVIDE KITCHEN SINKS WITH TAILPIECE FOR DISHWASHER CONNECTION AND DISPOSAL. DISPOSAL TO BE EQUAL TO SINK GUARD MODEL SE150, 1/3 HP, CORROSION RESISTANT COMPOSITE HOPPER WITH CAST STAINLESS STEEL, ANTI-JAM SWIVEL IMPELLERS. PROVIDE WHA AND SHUT OFF VALVE FOR CONNECTION TO DISHWASHER.

MISCELLANEOUS PLUMBING ITEMS:

1. TRAP SEAL: PROVIDE A TRAP SEAL AT ALL OPENSITE AND FLOOR DRAINS SUBJECT TO EVAPORATION. TRAP SEAL SPECIFICATIONS ARE BASED ON JOSAM 88240 SERIES TRAP SEAL INSERT. MUST BE AN ASSE 1072 TRAP SEAL DEVICE.

2. AIR ADMITTANCE VALVE (AAV): AAV'S MAY BE EITHER OATEY OR STUDOR TYPE. ALL AAV'S USED WITH WB'S SHALL BE BY OATEY (SUBSTITUTION BY APPROVAL ONLY).

3. WATER HAMMER ARRESTORS (WHA): PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON. DESIGNED TO OPERATE UP TO 150 PSI WORKING PRESSURE.

4. ALL APARTMENT DOMESTIC WATER SHUT OFF VALVES WILL BE LOCATED IN AN EASILY ACCESSIBLE LOCATION.

5. IDENTIFY ALL MAIN SHUT OFF VALVES BY TAGGING EACH.

6. IT IS THE INTENT OF THESE DRAWINGS THAT ALL TUB/SHOWERS WILL BE ABOVE FLOOR ROUGH IN.

7. PROVIDE QUARTER TURN SHUT OFF VALVES FOR ALL PLUMBING FIXTURES.

8. PROVIDE WHA'S ON ALL CONNECTIONS SERVING DISHWASHERS.

9. ALL PLUMBING FIXTURES TO HAVE SHUT OFF VALVES OR INTEGRAL STOPS.

10. ALL LAVATORIES ARE TO MEET THE PROPER CLEARANCES PER SECTION 405.3.1 OF THE IPC. SEE ARCHITECTS DRAWINGS FOR DIMENSIONED BATHROOM DRAWINGS.

11. PROVIDE A CLEAN OUT AT THE BASE OF ALL SANITARY STACKS.

12. ALL RISERS SHALL HAVE AN ACCESSIBLE SHUT OFF VALVE. PROVIDE 12x12 FIRE RATED ACCESS DOORS TO ALL VALVES IF REQUIRED.

13. ALL PIPING TO BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS.

14. ALL WATER LINES TO PLUMBING FIXTURES SHALL BE BURST PROOF, FLEXIBLE STAINLESS STEEL TYPE SUPPLY LINES.

15. RUN AIR HANDLING UNIT AND WATER HEATER RELIEF LINES TO NEAREST STORMWATER PIPES.

16. PROVIDE A DRAIN PAN UNDER THE WASHING MACHINE WITH A WATER SENSING DEVICE THAT SHUTS OFF WATER TO THE WASHER WHEN WATER IS DETECTED WITHIN THE DRAIN PAN.

PLUMBING LEGEND

SYMBOL	DESCRIPTION
W	SANITARY PIPING WASTE (ABOVE GRADE)
W	SANITARY PIPING WASTE (BELOW FLOOR)
GW	GREASE WASTE (BELOW FLOOR)
V	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWR	HOT WATER RECIRCULATION PIPING
	PIPE TURNING UP/DOWN
	FULL OPEN PORT GATE VALVE
	FLOOR DRAIN
	FLOOR CLEANOUT
	CLEANOUT
	1 HR RATED WALLS
	2 HR RATED WALLS
WHA	WATER HAMMER ARRESTOR
P-1	FIXTURE TYPE
	MIXING VALVE
	AIR ADMITTANCE VALVE
	BACKFLOW PREVENTOR

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NO. 29307 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

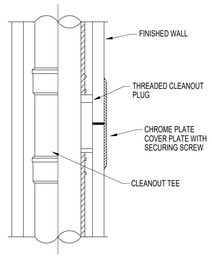
ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

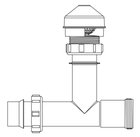
PLUMBING ABBREVIATIONS, LEGEND, SCHEDULES AND SPECIFICATIONS

SHEET:
P6.001

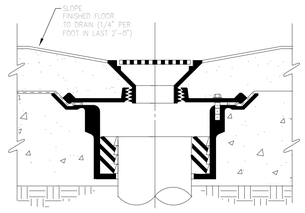
TERRACES AT HIGH MOUNTAIN - A6



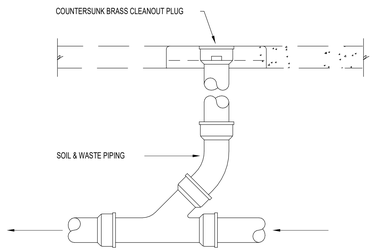
WALL CLEANOUTS
NO SCALE



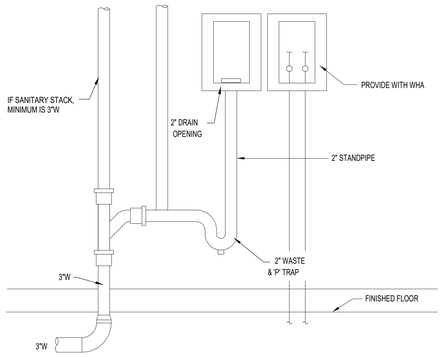
AIR ADMITTANCE VALVE - TUBULAR ADAPTER FOR UNDER SINK INSTALLATION
NO SCALE



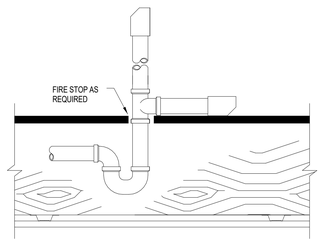
FLOOR DRAIN DETAIL
NOT TO SCALE



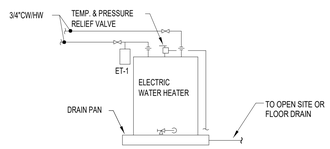
C.O. UP TO GRADE
NOT TO SCALE



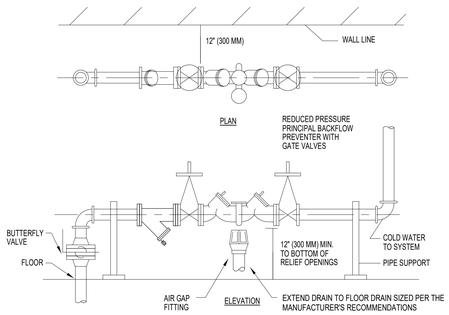
PLUMBING CONNECTIONS FOR LAUNDRY OUTLET
W/ SIOUX CHIEF OX BOX & CONDENSATE DRAIN ADAPTER
NO SCALE



ABOVE FLOOR ROUGH IN DETAIL TUB/SHOWER
NO SCALE



WATER HEATER DRAIN DETAIL
NOT TO SCALE



BACKFLOW PREVENTER PIPING DETAIL - DOMESTIC WATER
NOT TO SCALE

NOTES:

1. BACKFLOW TO BE MOUNTED IN HORIZONTAL POSITION. ALL MOUNTING CLEARANCES AND INSTALLATION TO BE PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTER WITH GATE VALVES. PROVIDE FULL OPEN PORT SHUT OFF VALVE AND STRAINER UPSTREAM OF BACKFLOW.
3. BACKFLOW WILL NOT BE PLACED WITHIN A VAULT.
4. BACKFLOW TO BE MOUNTED AT A HEIGHT SUCH THAT NO LADDER WILL BE NEEDED TO SERVICE THE BACKFLOW.

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5. PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NOT PERMIT PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
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4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P6.002

TERRACES AT HIGH MOUNTAIN - A6

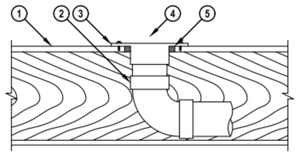
UL SYSTEM NO. F-C-2203

CLOSET FLANGE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1-HR.

CROSS-SECTIONAL VIEW

FC2203d.011617



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
   B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. (NOT SHOWN). FLOOR MOUNTED VITREOUS CHINA WATER CLOSET.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Sheet 1 of 1 | Scale 1/8" = 1" | Date Jan. 16, 2017 | Drawing No. FC 2203d

Hilti Firestop Systems

Saving Lives through Innovation and Education

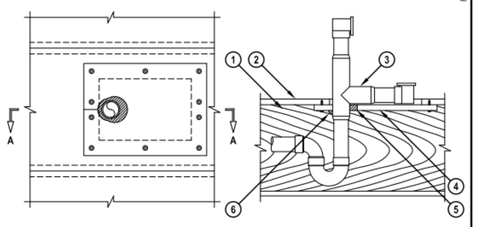
UL SYSTEM NO. F-C-2204

PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1/2-HR.

BOTTOM VIEW | SECTION A-A

FC2204b.010715



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. MAXIMUM 1-1/2" NOMINAL DIAMETER PVC OR ABS PLASTIC PIPE (SCHEDULE 40) AND DRAIN FITTINGS CEMENTED TOGETHER WITH PVC OR ABS BATHTUB WASTE/OVERFLOW FITTINGS.
4. 3/4" THICK PLYWOOD PATCH SIZED TO OVERLAP MINIMUM 2" BEYOND EACH EDGE OF RECTANGULAR OPENING. TWO PIECES POSITIONED AROUND DRAIN PIPING WITH CUT EDGES TIGHTLY BUTTED, AND SCREW ATTACHED TO UNDERSIDE OF SUBFLOOR WITH 1-1/4" LONG STEEL SCREWS (SPACED MAXIMUM 6" C/C). (SEE NOTE NO. 3 BELOW).
5. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM SIZE OF OPENING = 12" x 8".
2. ANNULAR SPACE BETWEEN DRAIN PIPING AND PATCH = MINIMUM 0", MAXIMUM 1".
3. AS AN ALTERNATE TO PLYWOOD, 5/8" THICK GYPSUM WALL BOARD MAY BE USED.

HILTI, Inc.
Tulsa, Oklahoma USA (800) 879-8000

Sheet 1 of 1 | Scale 1/8" = 1" | Date Jan. 07, 2015 | Drawing No. FC 2204b

Hilti Firestop Systems

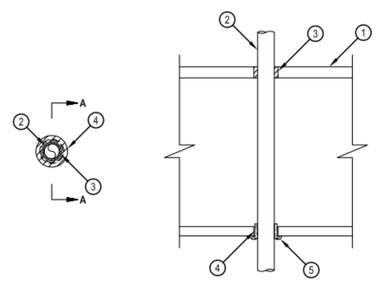
Saving Lives through Innovation and Education

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2230

F Rating - 1 Hr
T Rating - 1/4 Hr

FC 2230



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 1-5/8 in. (41 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design.

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Hilti Firestop Systems

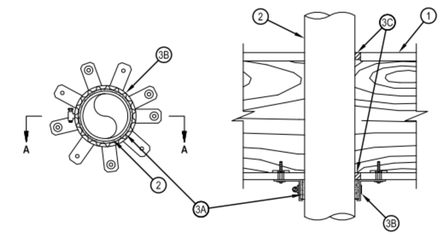
Page: 1 of 2

Classified by Underwriters Laboratories, Inc. to UL 1479

System No. F-C-2232

F Rating — 1 Hr
T Rating — 3/4 and 1 Hr (See Item 3)

FC 2232



SECTION A-A

1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction features of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
   B. Wood Joists* — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped.
   C. Gypsum Board* — Nom 5/8 in. (16 mm) thick, 4 ft (122 cm) wide as specified in the individual Floor-Ceiling Design. Max diam of opening shall be 5 in. (127 mm).
2. Through Penetrants — One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) and max 1/2 in. (13 mm). Pipe or conduit to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

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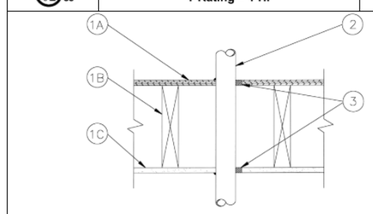
Hilti Firestop Systems

Page: 1 of 2

Classified UL US

F Rating – 1 Hr
T Rating – 1 Hr

F-C-2080



1. **Floor-Ceiling Assembly –** The fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Flooring System –** Lumber of plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max diam of floor opening is 3-1/8 in.
   B. **Wood Joists –** Nom 2 by 10 in. deep (or deeper) lumber joists spaced 16 in. OC, with nom 1 by 3 in. lumber bridging and with ends firestopped or steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   C. **Gypsum Board* –** Nom 5/8 in. thick as specified in the individual Floor-Ceiling Design. I diam of opening is 3-1/8 in.
2. **Through Penetrant –** One non-metallic pipe or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 7/8 in. Pipe to be rigidly supported on both sides of floor assembly.
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 cellular or solid core chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
   B. **Polyvinyl Chloride (PVC) –** Nom 2 in. diam (or smaller) Schedule 40 (or heavier) PVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ –** Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70).

Underwriters Laboratories Inc.®

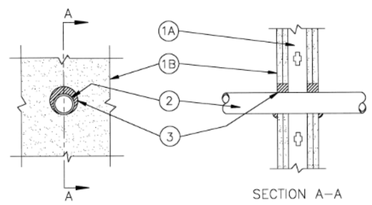
09/16 (1)

Classified UL US

F Ratings – 1, 2, 3 and 4 Hr (See Item 1)
T Ratings – 1, 2, 3 and 4 Hr (See Item 1)

W-L-2126

ANSI/UL1479 (ASTM E814)
F Ratings — 1, 2, 3 and 4 Hr (See Item 1)
T Ratings — 1, 2, 3 and 4 Hr (See Item 1)



SECTION A–A

1. **Wall Assembly –** The 1, 2, 3 or 4 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs –** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-5/8 in. wide and spaced max 24 in. OC.
   B. **Gypsum Board* –** The gypsum wallboard type, thickness, number of layers, fasteners and sheet orientation shall be as specified in the individual U300 or U400 Series Designs in the UL Fire Resistance Directory. Max diam of opening is 3-1/8 in.
   The hourly F and T Ratings of the firestop system is equal to the hourly fire rating of the assembly in which it is installed.

Underwriters Laboratories Inc.®

09/16 (1)

System No. F-C-2230

FC 2230

2. Through Penetrants — One non-metallic tube to be installed concentrically within the firestop system. Annular space between tube and periphery of opening shall be 1/4 in. (6 mm). Tube to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of non-meyallic tubes or pipes may be used:
   Crosslinked Polyethylene (PEX) Tubing — Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
3. Fill, Void or Cavity Materials* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1 in. (25 mm) wide intumescentwrap strip. One layer of wrap strip tightly wrapped around tube and held in place with tape. Wrap strip centered in annular space extending from both sides of gypsum board.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W25/1" Wrap Strip
4. Fill, Void or Cavity Materials* - Sealant — Min 3/4 in. (19 mm) depth of fill material applied within the annulus, flush with the top surface of floor. A 1/4 in. (6 mm) diam bead of fill material shall also be applied at the wrap strip/gypsum board interface.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — Sealant - FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Hilti Firestop Systems

Page: 2 of 2

System No. F-C-2232

FC 2232

3. Nonmetallic Pipe Coupling — (Optional) Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVC, Schedule 40 ABS or SDR13.5 CPVC coupling corresponding to pipe type installed such that the top of the coupling is flush with the bottom surface of the ceiling and extending downward.
4. Firestop System — The firestop system shall consist of the following:
   A. Fill, Void or Cavity Material* - Wrap Strip — Nom 3/16 in. (5 mm) thick by 1-3/4 in. (44 mm) wide intumescent wrap strip. Layers of wrap strip continuously wrapped around the pipe and held in place with tape. Wrap strip butted tightly against surface of ceiling.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP648-E W45/1-3/4" Wrap Strip

Nom Diam of Pipe, in. (mm)	Number of Wrap Strips	Min/Max Annular Space, in. (mm)	T-Rating - Hr.
2 (51)	1	0-1/4 (0-6)	1
3 (76)	2	0-1/2 (0-13)	3/4
4 (102)	2	0-1/2 (0-13)	3/4

   B. Steel Collar — Collar fabricated from coils of precut min 0.017 in. (0.43 mm) thick (No. 28 MSG) galv steel available from the sealant manufacturer. Collar shall be nom 1-3/4 in. (44 mm) deep with 1 in. (25 mm) wide by 2 in. (51 mm) long anchors tabs on 2 in. (51 mm) centers for securement to floor/ceiling assembly. The opposite side incorporates retainer tabs, 1/2 in. (13 mm) wide by 3/16 in. (5 mm) long, prebent toward the pipe surface. Collar shall be tightly wrapped over the wrap strip, overlapping min. 1 in at seam. A nom 1/2 in. (13 mm) wide stainless steel hose clamp shall be secured to the collar at its mid-height. Every other anchor tab of collar secured to gypsum ceiling with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) long steel toggle bolts in conjunction with 1/4 in. by 3/4 in. (6 by 19 mm) diameter steel washers.
   C. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface on top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX SEALANT
   4A. Firestop System — (Optional, Not shown) As an option to Item 4, the firestop system shall consist of the following:
   A. Firestop Device* — Galv steel collar lined with an intumescent material sized to fit the specific diam of pipe shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the gypsum board ceiling with 1/4 in. diam by 1-1/2 in. (38 mm) long steel toggle bolts with 3/4 in. (19 mm) diam steel washers through hanger tabs provided.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N or CP 643 110/4"N Firestop Collar.
   B. Fill, Void or Cavity Materials*-Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the bottom surface of the gypsum board ceiling. Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with the top surface of the floor. When ABS pipe is installed at point contact, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe/floor interface, flush with top surface of floor.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE-MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Hilti Firestop Systems

Page: 2 of 2

Continued … F-C-2080

3. **Fill, Void or Cavity Material* – Sealant –** Min 3/4 in. thickness of fill material applied within the annulus, flush with top surface of floor. Min 5/8 in. thickness of fill material applied within the annulus, flush with bottom surface of ceiling. Min 1/2 in. diam bead of fill material applied at the penetrant/floor and penetrant/ceiling interfaces at point contact locations on both sides of assembly.
   Passive Fire Protection Partners – 3600EX, 4800DW

* Bearing the UL Classification Marking
+ Bearing the UL Listing Mark

Continued… W-L-2126

2. **Through Penetrants –** One nonmetallic pipe or tubing installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes or tubing may be used:
   A. **Chlorinated Polyvinyl Chloride (CPVC) Pipe –** Nom 2 in. diam (or smaller) SDR 11 CPVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.
   B. **Crosslinked Polyethylene (PEX) Tubing –** Nom 1-1/2 in. diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems. The annular space between tubing and periphery of opening shall be min 1/4 in. to max 3/8 in.
   C. **Polyvinyl Chloride (PVC) Pipe –** Nom 2 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. The annular space between pipe and periphery of opening shall be min 1/4 in. to max 1/2 in.

3. **Fill, Void or Cavity Material* – Sealant –** Min 5/8 in. thickness of fill material for a 1 hr rated wall assembly, min 1 in. thickness of fill material for 2, 3 and 4 hr rated assemblies applied within the annulus, flush with both surfaces of wall.
   Passive Fire Protection Partners – 3600EX, 4800DW
*Bearing the UL Classification Marking

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5. PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NO. PE36516 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6
4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET: P6.003

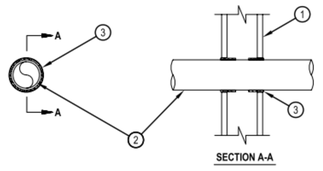
TERRACES AT HIGH MOUNTAIN - A6

WL 2284

System No. W-L-2284

F Rating - 1 Hr
T Rating - 1 Hr

Classified by Underwriters Laboratories, Inc. to UL 1479



SECTION A-A

1. Wall Assembly -- The 1 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs -- Wall framing shall consist of wood studs or steel channel studs. Wood studs to consist of 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
   B. Gypsum Board* -- Min 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers and orientation shall be as specified in the individual U300 or U400 Wall and Partition Design. Max diam of opening is 4 in.
2. Through Penetrants -- One nonmetallic pipe to be centered within the firestop system. An annular space of 3/16 to 1/4 in. is required within the firestop system. Pipe to be rigidly supported on both sides of wall assembly. The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe -- Nom 3 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 3 in. diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
3. Fill, Void or Cavity Material* -- Wrap Strip - Layers of intumescent wrap strip are continuously wrapped around the pipe with ends held in place with tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall. Size of wrap strip and number of layers are shown in table below.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- CP648-E W25/1" or CP648-E W45/1-3/4" Firestop Wrap Strip

ProductDesignation	Pipe Diameter (in.)	Number of Layers	Nom. Wrap Strip Width (in.)
CP648-E-W25/1*	1-1/2 and 2	1	1
CP648-E-W45/1-3/4*	1-1/2, 2 and 3	1	1-3/4

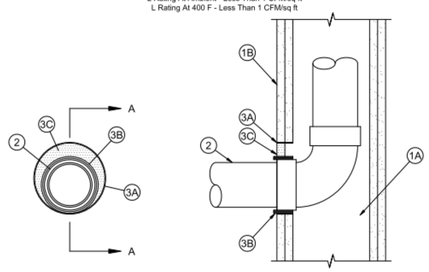
   A. Fill, Void or Cavity Material* - Wrap Strip -- (As an alternate to the wrap strip in Item 3) - One layer of intumescent wrap strip is tightly wrapped around the pipe with ends butted and held in place with integrated tape. Wrap strip installed such that ends protrude nom. 1/8 in. beyond both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- CP648-S-1.5" US, CP648-S-2" US, CP648-S-3" US
*Bearing the UL Classification Mark

Hilti Firestop Systems

System No. W-L-2636

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



SECTION A-A

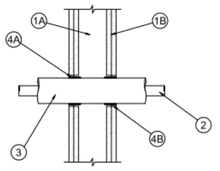
1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing to consist of nom 2 by 6 in. (51 by 152 mm) (or larger) wood or steel channel studs or doubled or staggered nom 2 by 4 in. (51 by 102 mm) (or larger) wood studs spaced in accordance with the individual U300, U400, V400 or W400 Series Wall and Partition Designs.
   B. **Gypsum Board* -** One or two layers of nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max diam of opening is 5-1/2 in. (140 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Nonmetallic Penetrant -** One nonmetallic pipe or conduit to be installed within stud cavity and connected to a 90° elbow. Hub of the elbow may be recessed into the annular space within the opening. Additional nonmetallic pipe or conduit shall be connected to elbow and penetrate one side of the wall either concentrically or eccentrically within the firestop system. The annular space between pipe or conduit and periphery of the opening shall be min 1/4 in. (6 mm) to max 1-1/4 in. (32 mm). Pipe or conduit shall be rigidly supported within the wall and on the penetrated side of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 3 in. (76 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Rigid Nonmetallic Conduit+ -** Nom 3 in. (76 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA 70).

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

W-L-2636

System No. W-L-5290

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1 and 2 Hr (See Item 1)	FT Ratings - 1 and 2 Hr (See Item 1)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 1 and 2 Hr (See Item 1)
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly -** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs -** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board* -** Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening shall be 4 in. (102 mm).
   The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. **Through Penetrant -** One nonmetallic pipe, conduit or tube to be centered within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 1 in. (25 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Cross Linked Polyethylene (PEX) Tubing -** Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems.

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

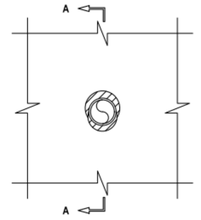
W-L-5290

MK

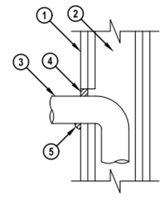
ENGINEERING JUDGMENT FIRESTOP DETAIL

PROJECT : TERRACES AT HIGH MOUNTAIN
ENGINEER : ONEIL ENGINEERING SERVICES
F-RATING = 1-HR. OR 2-HR.

FRONT VIEW



SECTION A-A



1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300, U400 OR V400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 3-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40 OR HEAVIER) (CELLULAR OR SOLID CORE) (CLOSED OR VENTED PIPING SYSTEM).
   B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY).
   C. MAXIMUM 2" NOMINAL DIAMETER PEX TUBING (SDR 9) (CLOSED PIPING SYSTEM ONLY).
   D. MAXIMUM 2" NOMINAL DIAMETER RNC-PVC CONDUIT (SCHEDULE 40).
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. DIAMETER OF OPENING SHALL BE 1" LARGER THAN NOMINAL PIPE DIAMETER.
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5/8".

THIS ENGINEERING JUDGMENT REPRESENTS A FIRESTOP SYSTEM THAT WOULD BE EXPECTED TO PASS THE STATED RATINGS IF TESTED.
(REFERENCE : UL SYSTEM NO. W-L-2474)

Hilti Firestop Systems

HILTI, Inc.
Plano, Texas USA (800) 879-8000

Designed by

Sheet	1 of 1	Drawing No.
Scale	1/8" = 1"	524232a
Date	June 07, 2021	

Saving Lives through Innovation and Education

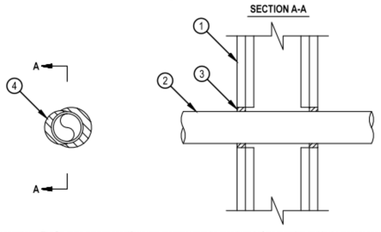
WL 2474

System No. W-L-2474

F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating at 400 F - 4 CFM/Sq Ft

Classified by Underwriters Laboratories, Inc. to UL 1479

SECTION A-A



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Diam of opening shall be 1 in. (25 mm) larger than the nom pipe diam.
   The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and the periphery of the opening shall be min 0 in. (point contact) to a max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. Polyvinyl Chloride (PVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) cellular or solid core Schedule 40 (or heavier) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. Crosslinked Polyethylene (PEX) Tubing — Nom 2 in. (51 mm) diam (or smaller) SDR 9 PEX tubing for use in closed (process or supply) piping systems.
   D. Rigid Nonmetallic Conduit (RNC)+ — Nom 2 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).
3. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At point contact location, a min 5/8 in. (16 mm) diam bead of fill material shall be applied to the wall/penetrant interface on both surfaces of the wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.
+ Bearing the UL Listing Mark

Hilti Firestop Systems

3. **Firestop System -** The firestop system shall consist of the following:
   A. **Metallic Sleeve -** Cylindrical sleeve fabricated from min 0.016 in. (0.4 mm) thick (30 gauge) galv sheet steel and having a 1 in. (25 mm) lap along the longitudinal seam. Length of steel sleeve to be 5/8 in. (16 mm) in 1 hr fire rated walls and 1-1/4 in. (32 mm) in 2 hr fire rated walls. Sleeve installed by coiling the sheet steel to a diam smaller than the opening, inserting the coil into the opening and releasing the coil to let it uncoil against the circular cutout in the wallboard layers. Sleeve shall be installed flush with wall surfaces on the penetrated side of the wall assembly.
   B. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/4 in. (6 mm) thick by 1-1/2 in. (38 mm) wide (RED), 1/8 in. (3.2 mm) thick by 1-1/2 in. (38 mm) wide (RED2), 3/16 in. (4.8 mm) thick by 2 in. (51 mm) wide (BLU), 1/8 in. (3.2 mm) thick by 2 in. (51 mm) wide (BLU2), intumescent strips faced on both sides with a plastic film. Two layers of wrap strip individually wrapped around the through penetrant with the ends butted or continuously wrapped around the penetrant and held in place by means of foil tape. The wrap strip is slid along the penetrant into annulus such that the trailing edge of the wrap strip extends 1/4 in. (6 mm) from the surface of the wall.
   SPECIFIED TECHNOLOGIES INC - SpecSeal RED, RED2, BLU, or BLU2 Wrap Strip
   C. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with surface of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant
   +Bearing the UL Listing Mark
   *** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

W-L-2636

3. **Pipe and Equipment Covering Materials* -** Max 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 57 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between insulated penetrating item and the edge of the through opening shall be nom 11/32 in. (8.7 mm).
4. **Firestop System -** The firestop system shall consist of the following items:
   A. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips or 1/8 or 1/4 in. (3.2 or 6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. Single layer of wrap strip wrapped around the through penetrant with the ends butted and held in place by means of foil tape. The wrap strip is slid along the through penetrant into annulus such that outer edge of wrap strip is flush with wall surface. One set of wrap strips to be installed on each side of wall. As an option when 1/8 in. (3.2 mm) thick wrap strip (BLU2) is used, the strips may be cut to a width of 1-1/2 in. (38 mm).
   SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip, SpecSeal BLU2 Wrap Strip or SpecSeal RED Wrap Strip, SpecSeal RED2 Wrap Strip
   B. **Fill, Void or Cavity Material* - Sealant -** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or SpecSeal Series SSS Sealant
   * Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

W-L-5290

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NO. 29303 PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

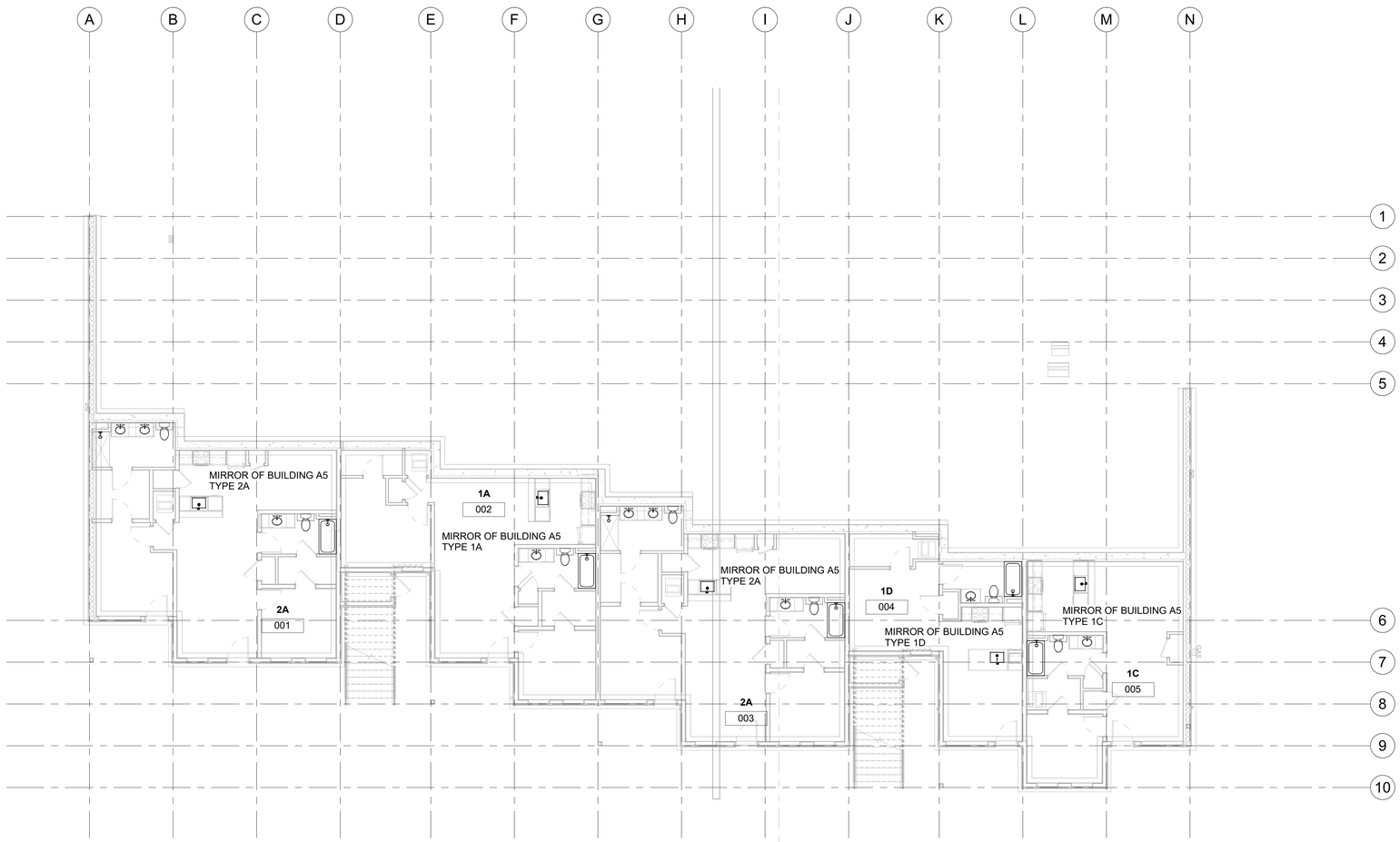
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	NOT TO SCALE
DRAWN BY:	RWD
APPROVED BY:	PJO

PLUMBING DETAILS

SHEET:

P6.004

TERRACES AT HIGH MOUNTAIN - A6



GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

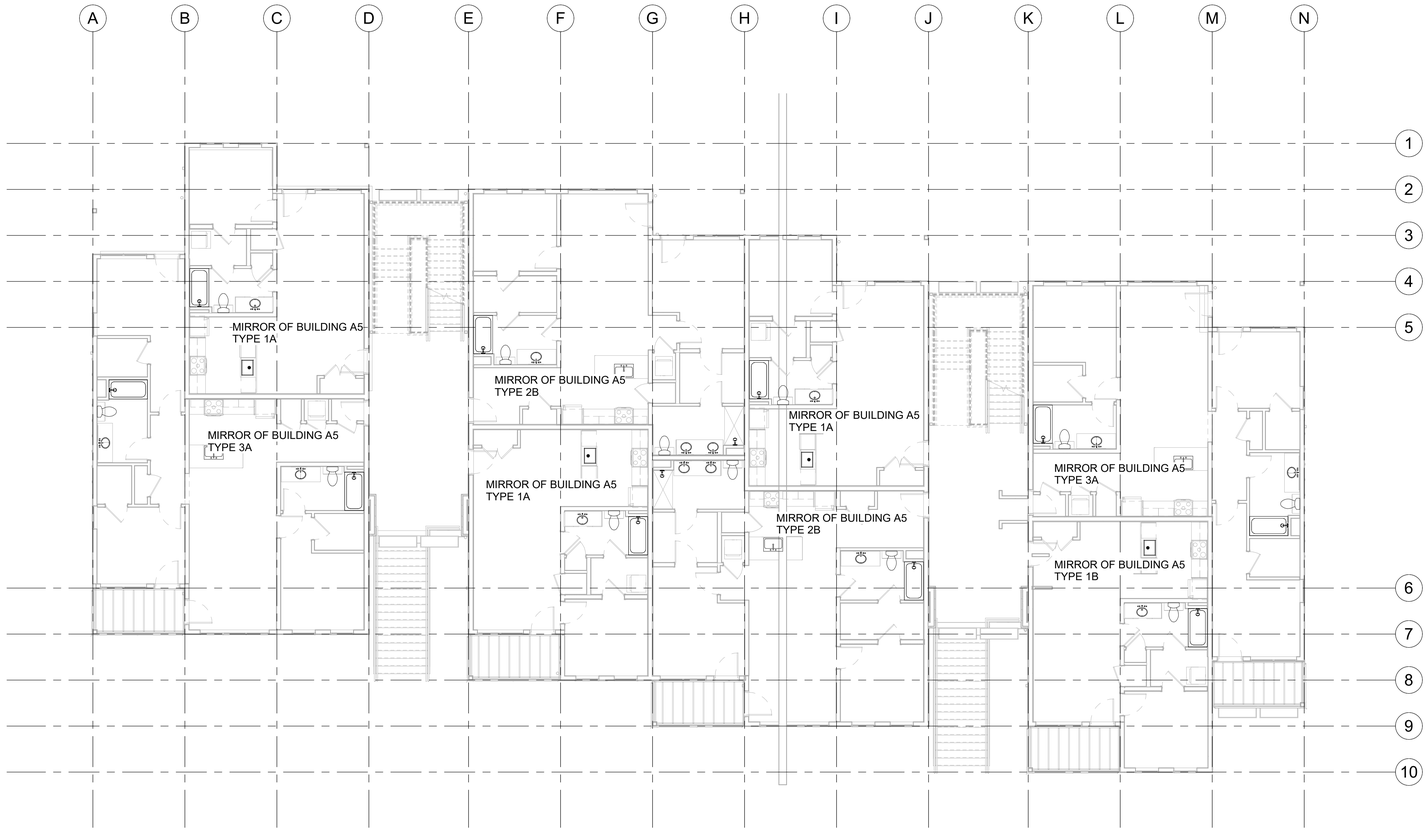
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING BASEMENT FLOOR PLAN - WASTE & VENT

SHEET:

P6.100

TERRACES AT HIGH MOUNTAIN - A6



GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NOT PERMITTED PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
FIRST FLOOR PLAN - WASTE & VENT

SHEET:
P6.101

TERRACES AT HIGH MOUNTAIN - A6

GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5. PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NOT PERMIT PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
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ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

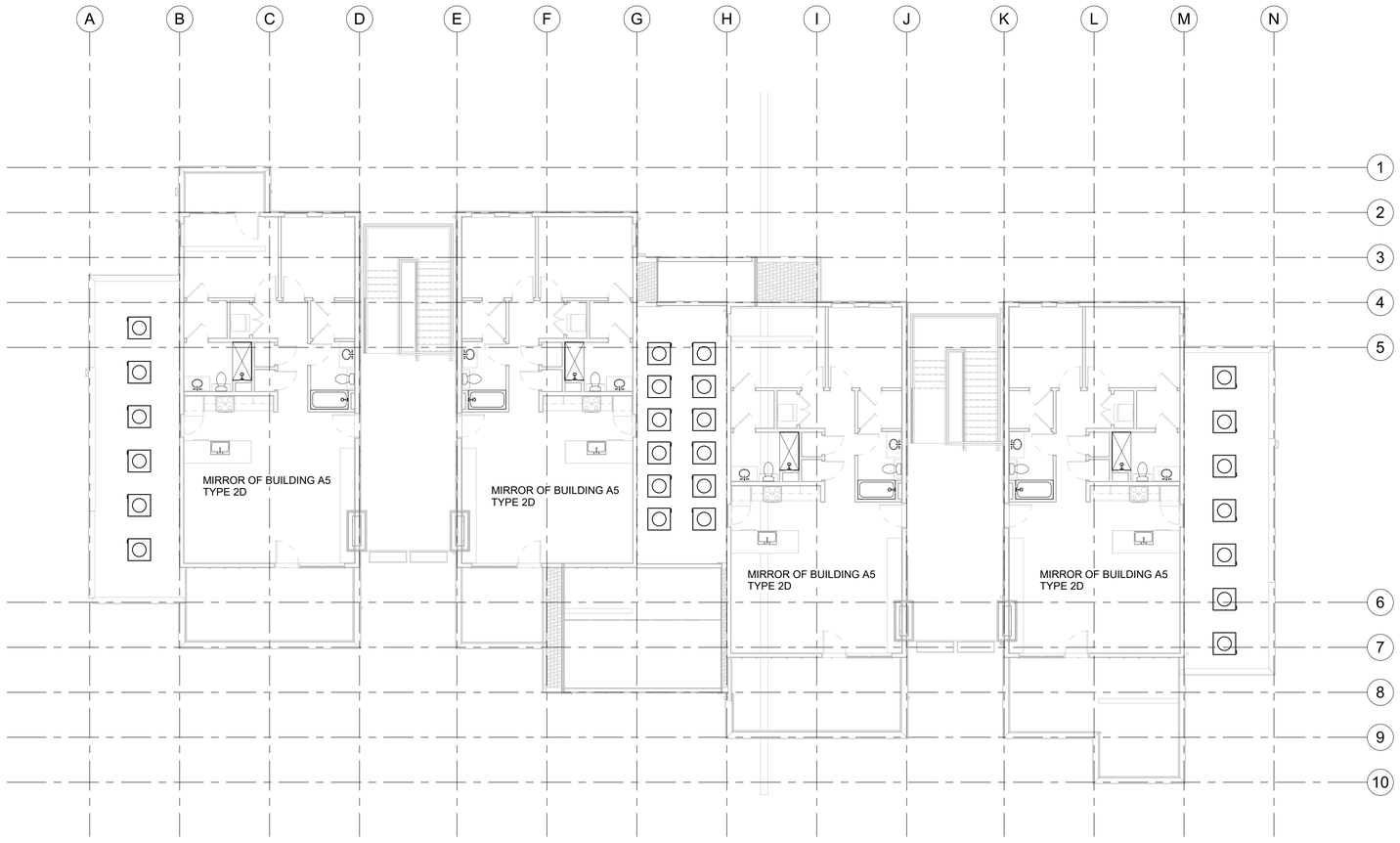
PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING SECOND FLOOR PLAN - WASTE & VENT

SHEET:

P6.102

TERRACES AT HIGH MOUNTAIN - A6



GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NOT PERMIT PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
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5		XX
6		XX

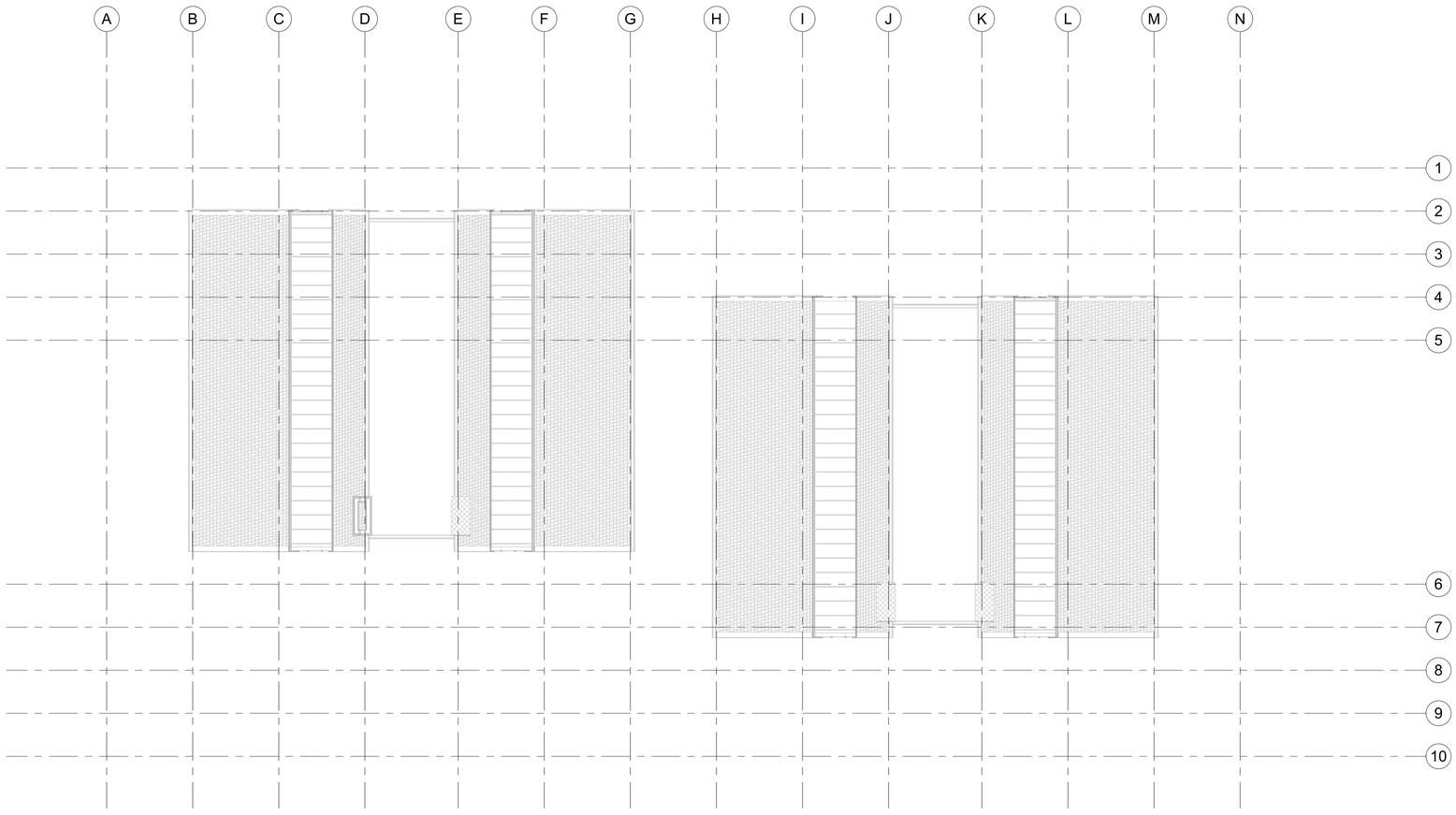
ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
THIRD FLOOR
PLAN - WASTE
& VENT

SHEET:
P6.103

TERRACES AT HIGH MOUNTAIN - A6



GENERAL NOTE:

THIS PLAN IS A MIRROR COPY OF BUILDING A5.
PLEASE REFER TO A5 FOR LAYOUTS.

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A6

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUNE-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
ROOF PLAN

SHEET:
P6.104

TERRACES AT HIGH MOUNTAIN - A6

PLUMBING DRAWING LIST

LEGEND & ABBREVIATIONS

SYMBOL	DESCRIPTIONS
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISHED FLOOR
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
CO	CLEAN OUT
CW	COLD WATER (DISTRIBUTION LINE)
DFU	DRAINAGE FIXTURE UNITS
DW	DOMESTIC WATER (SERVICE LINE)
CW	COLD WATER (DISTRIBUTION LINE)
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
HB	HOSE BIBB
HW	HOT WATER
P-1	PLUMBING FIXTURE
SFU	SUPPLY FIXTURE UNITS
V	VENT
VTR	VENT THROUGH ROOF
WCO	WALL CLEAN OUT
WHA	WATER HAMMER ARRESTOR

Plumbing Supply Fixture Units
High Mountain
April 20, 2021

Fixture	Quantity	SFU ea	SFU Total
Bathroom Group	0	3.6	0
Kitchen Sink	2	1.4	2.8
Pet Spa	2	1.4	2.8
Dishwasher	1	1.4	1.4
Mop Sink	1	3	3
Water Closet (FV)	4	10	40
Water Closet (Tank)	2	5	10
Lavatory	6	2	12
Club Rm Sink	1	2	2
Drinking Fountain	1	0.25	0.25

SFU Total = 74.25
Demand (GPM) = 60
BFP size = 2"

PLUMBING GENERAL NOTES

APPLICABLE CODES:
INTERNATIONAL PLUMBING CODE (IPC) 2015
INTERNATIONAL BUILDING CODE (IBC) 2015
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI A117.1-2009)
UNIFORM STATEWIDE BUILDING CODE OF VIRGINIA 2015

PLUMBING SYSTEMS:
PROVIDE ALL PLUMBING FIXTURES AND TRIM AS INDICATED ON THE DRAWINGS AND AS SPECIFIED ELSEWHERE HEREIN. ALL FIXTURES SHALL BE CONNECTED TO THE PLUMBING SYSTEMS AS INDICATED AND REQUIRED FOR PROPER OPERATION. PIPING MATERIALS, ACCESSORIES AND EQUIPMENT SHALL BE SPECIFIED ELSEWHERE WITHIN THIS SPECIFICATION.

SANITARY WASTE AND VENT SYSTEMS:
PROVIDE A COMPLETE SANITARY, WASTE AND VENT SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING REQUIRING CONNECTIONS. ALL WASTE FROM THE BUILDING SHALL DISCHARGE BY GRAVITY OUT THE BUILDING TO BE PICKED UP BY CIVIL AND EXTENDED TO THE SEWER SYSTEM. SANITARY PIPING TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE OTHERWISE NOTED.

WATER SUPPLY SYSTEM:
PROVIDE A COMPLETE WATER SUPPLY SYSTEM FOR ALL FIXTURES AND EQUIPMENT IN THE BUILDING INCLUDING DOMESTIC WATER HEATERS. PROVIDE APPROVED GATE OR COMPRESSION STOPS AT EVERY CONNECTION TO FIXTURES AND EQUIPMENT.

STORM DRAINAGE SYSTEM:
ROOF TO BE SERVED BY INTERNAL ROOF DRAINS AND OVERFLOWS. CONTRACTOR TO COORDINATE BETWEEN CIVIL AND PLUMBING DRAWINGS. DRAINAGE TO BE SLOPED AT 1/8" PER FOOT EXCEPT WHERE INDICATED. RAINFALL RATE USED - 4.0" PER HOUR.

THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO SHOW THE GENERAL ROUTING, LOCATION, AND SIZE OF EQUIPMENT, PIPING AND FIXTURES. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ALL MATERIALS AND LABOR NECESSARY TO MAKE FINAL CONNECTIONS. NOT ALL NECESSARY OFFSETS OR FITTINGS ARE SHOWN, BUT SHALL BE PROVIDED WHERE REQUIRED. THE CONTRACTOR SHALL PROVIDE ALL ACCESSORIES, SUPPORTS, AND HANGARS TO ALLOW FOR COMPLETE AND FUNCTIONAL SYSTEMS. ALL WORK SHALL MEET OR EXCEED PUBLISHED OR ACCEPTED STANDARDS OF QUALITY WORKMANSHIP, AND SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS AND/OR INSTALLATION INSTRUCTIONS. THE INTENT OF THESE CONTRACT DOCUMENTS IS TO PROVIDE COMPLETE FUNCTIONING SYSTEMS.

PERMIT, FEES AND NOTICES:
COMPLY WITH THE GENERAL CONDITIONS AND PROVIDE ALL PERMITS AS REQUIRED FOR THE INSTALLATION OF ALL INDICATED PLUMBING SYSTEMS.

FIRE RATINGS:
NO FIRE RATINGS ARE PENETRATED.

FULLY SPRINKLERED PER NFPA 13

USE GROUP: XXX
CONSTRUCTION : XXX
OCCUPANCY: XXX

PLUMBING SPECIFICATIONS

A. PIPE AND PIPE FITTINGS: 1. DOMESTIC (POTABLE) WATER (CW/HW) PIPING: SYSTEM DESIGN PRESSURE = 80 PSIG. PIPING 1" AND SMALLER SHALL BE PEX TUBING. BETWEEN 1-1/4" AND 2" SHALL BE SDR 11 CPVC TUBING. FOR PIPING GREATER THAN 2" PROVIDE SCHEDULE 80 CPVC TUBING.

2. SANITARY (W) AND VENT (V) PIPING: ALL SANITARY AND VENT PIPING SHALL BE SCHEDULE 40 PVC.

3. CONDENSATE DRAIN (D) PIPING: SYSTEM DESIGN PRESSURE = 10 PSIG. PROVIDE SCHEDULE 40 PVC.

4. STORM WATER (SW) PIPING: PROVIDE SCHEDULE 40 PVC.

B. VALVES:
1. GATE VALVES: POTABLE WATER SERVICE SIZES 1/2" - 2-1/2" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC PIPING SYSTEMS. ALL SHUT OFF VALVES SHALL BE FULL OPEN PORT TYPE VALVES.

2. DRAIN VALVES: POTABLE WATER SERVICE SIZES 1/2" AND 3/4" SHALL BE GLUE TYPE SUITABLE FOR USE IN SCHEDULE 40 CPVC SYSTEMS.

3. BACKFLOW PREVENTER: SPECIFICATIONS ARE BASED ON WATTS LF909 LARGE SERIES WITH 909AQ AIR GAP. PROVIDE AT LOCATIONS IN WHICH THE PUBLIC WATER SUPPLY SYSTEM MUST BE PROTECTED. MATERIALS OF CONSTRUCTION - EPOXY COATED CAST IRON BODY AND STRAINER, LEAD FREE COPPER SILICONE ALLOY TEST COCKS, STAINLESS STEEL SEATS, REDUCED PRESSURE ZONE ASSEMBLY WITH RELIEF DRAIN ASSEMBLY. PIPE RELIEF TO FLOOR DRAIN AS SHOWN.

C. PLUMBING FIXTURES: ALL PLUMBING FIXTURES AND TRIM SHALL BE NEW AS MANUFACTURED BY FIRMS REGULARLY ENGAGED IN THE MANUFACTURE OF PLUMBING FIXTURES, AND TRIM OF TYPE, STYLE AND CONFIGURATION REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE AND SIMILAR SERVICE.

D. PROVIDE PROTECTION OF ALL FIXTURES DURING CONSTRUCTION FROM DAMAGE. EACH WATER SUPPLY CONNECTION SERVING A FIXTURE SHALL BE EQUIPPED WITH AN ACCESSIBLE STOP VALVE. CAULK ALL GAPS IN AROUND WALLS/FLOORS AND THE PLUMBING FIXTURES. SPECIFICATIONS FOR THE PLUMBING FIXTURES ARE BASED ON THE FOLLOWING TYPES.

E. PIPE INSULATION:
1. CLOSED CELL ELASTOMERIC (PIPE SIZES UP TO 5 INCHES): FLEXIBLE ELASTOMERIC, CLOSED CELLULAR, TUBULAR MOLDED TO ACCOMMODATE PIPING, SMOOTH OUTER SURFACE SUITABLE FOR PAINTING WITH VINYL, LACQUER TYPE COATING, WATER RESISTANT, NONABSORBENT, OZONE RESISTANT, MINIMUM DENSITY OF 4 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF 0.27 AT 75 F MEAN TEMPERATURE

2. RIGID FIBERGLASS: RESIN BONDED FIBROUS GLASS, FLAME RETARDANT, FACTORY APPLIED ALL SERVICE JACKET VAPOR BARRIER WITH SELF SEALING PRESSURE SENSITIVE LAP JOINTS, MOLDED TO ACCOMMODATE PIPE, MAXIMUM VAPOR PERMEANCE OF .02 PERM/IN. AND A PUNCTURE RESISTANCE OF 50 UNITS, MINIMUM DENSITY 4.0 LB/CF, MAXIMUM CONDUCTIVITY PER 1" THICKNESS OF .23 AT 75°F, .29 AT 200°F AND .43 AT 400°F MEAN TEMPERATURE.

APPLICATIONS:
1. DOMESTIC HOT AND COLD WATER (ALL SIZES) ON ALL EXTERIOR WALL PIPING OR IN UNCONDITIONED SPACES ONLY: PROVIDE 1/2" CLOSED CELL ELASTOMERIC.
2. FLOOR DRAINS OR OPEN SITE DRAINS RECEIVING AHU CONDENSATE: INSULATE P-TRAP WITH 1/2" CLOSED CELL ELASTOMERIC INSULATION.

F. WATER HEATERS :
ELECTRIC WATER HEATER - FULLY INSULATED BAKED ENAMEL STEEL JACKET, INSULATED IN CONFORMANCE WITH ASHRAE 90A-1980 STANDARD FOR ELECTRIC DOMESTIC WATER HEATER, GLASS LINING, RELIEF VALVE TAP, HEAT TRAPS, RATED FOR 150 PSI. PLATED COPPER ELEMENT, LOW WATT DENSITY, REPLACEABLE IMMERSION TYPE. PROVIDE WITH RELIEF VALVE AND FACTORY PACKAGED CONTROL WIRING.

EWH-1 - 40 GALLON 4.5 KW DUAL ELEMENT WATER HEATER. HEATER SHALL BE "SHORT" CONSTRUCTION. PROVIDE WITH 3/4" TEMPERATURE AND PRESSURE RELIEF VALVE: BASED ON RUUD MODEL PROE38-S2-RU95.

PROVIDE WATER HEATERS WITH 2.5-GAL EXPANSION TANK (ET-1).

WATER HEATERS ARE LOCATED WITHIN A VENTILATED SPACE AND OVER AN IMPERVIOUS FLOOR.

G. FIXTURES :
DRAWING FOR MAKE AND MODELS OF SPECIFIC FIXTURES TO BE USED.
PROVIDE INDICATED QUANTITIES OF FIXTURES. SEE ARCHITECTS
WB-1: WASHING MACHINE BOX (PLASTIC): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER.

WB-2: WASHING MACHINE BOX (FIRE RATED): RECESSED SINGLE DRAIN WITH INTEGRAL WATER HAMMER ARRESTORS. BASED ON IPS FR 12 FIRE RATED WASHING MACHINE BOXES. PROVIDE WITH CONDENSATE DRAIN ADAPTER .

IM-1: REFRIGERATOR BOX (PLASTIC): WATER-TIGHT RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

IM-2: REFRIGERATOR BOX (FIRE RATED): IPS FIRE GUARD RECESSED OUTLET BOX WITH INTEGRAL WATER HAMMER ARRESTOR.

FCO: PROVIDE SIZING AS INDICATED ON THE DRAWINGS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES CLEANOUTS WITH NICKEL BRONZE ADJUSTABLE TOPS. MATCH MATERIALS OF CONSTRUCTION FOR BODY TYPE.

WCO: PROVIDE CHROME PLATED COVER FOR SANITARY TEST TEE AT ALL INDICATED LOCATIONS.

FD: FLOOR DRAINS - PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS. FLOOR DRAINS SHALL BE SUPPLIED WITH NICKEL BRONZE ADJUSTABLE TOPS. SPECIFICATION BASED ON SIOUX CHIEF FINISH LINE SERIES 834 FLOOR DRAINS. PROVIDE DRAINS SUBJECT TO EVAPORATION WITH A TRAP SEAL.

WH-1: FREEZELESS WALL HYDRANT - BACKFLOW PROTECTED WITH ANTI-SIPHON VACUUM BREAKER (ASSE 1011), TEE KEY, COPPER TUBES, CHROME FINISH, PERMANENT TYPE BRASS VALVE BODY, ASSE STANDARD 1019-B, WITH AUTOMATIC DRAINING. BASED ON WOODFORD MODEL 65.

RH-1: ROOF HYDRANT - SPECIFICATION BASED ON WOODFORD MODEL SRH-MS, FREEZELESS ROOF HYDRANT, WITH INTEGRAL ANIT-SIPHON VACUUM BREAKER, BACKFLOW PROTECTED WITH FIELD TESTABLE ASSE 1052 DOUBLE CHECK BACKFLOW PREVENTER. NO DRAIN REQUIRED - A VENTURI ACTION DRAWS WATER OUT OF THE INTERNAL RESERVOIR AND DISCHARGES OF THE BACKFLOW PREVENTER. ALL NECESSARY MOUNTING HARDWARE FOR PROPER INSTALLATION ON A COMMERCIAL ROOF IS TO BE SUPPLIED WITH DEVICE.

LT: LAMB'S TONGUE - BASED ON ZURN Z199 DOWNSPOUT MODEL .

MIXING VALVES:
1. MV-1 - 1/2" TO 1" - DOUBLE THROTTLING DESIGN, INTEGRAL INLET FILTER WASHERS AND CHECK VALVES, BRONZE BODY CONSTRUCTION, THERMOSTAT CONTROLS, ADJUSTABLE CAP WITH LOCKING FEATURE, ASSE 1070 LISTED. ADJUSTABLE TEMPERATURE FROM 80°F TO 120°F. SET TO TEMPERATURES INDICATED ON THE DRAWINGS. BASED ON WATTS MODEL LFMMV.

PROVIDE KITCHEN SINKS WITH TAILPIECE FOR DISHWASHER CONNECTION AND DISPOSAL. DISPOSAL TO BE EQUAL TO SINK GUARD MODEL SE150, 1/3 HP, CORROSION RESISTANT COMPOSITE HOPPER WITH CAST STAINLESS STEEL ANTI-JAM SWIVEL IMPELLERS. PROVIDE WHA AND SHUT OFF VALVE FOR CONNECTION TO DISHWASHER.

MISCELLANEOUS PLUMBING ITEMS:

1. TRAP SEAL: PROVIDE A TRAP SEAL AT ALL OPEN SITE AND FLOOR DRAINS SUBJECT TO EVAPORATION. TRAP SEAL SPECIFICATIONS ARE BASED ON JOSAM 88240 SERIES TRAP SEAL INSERT. MUST BE AN ASSE 1072 TRAP SEAL DEVICE.

2. AIR ADMITTANCE VALVE (AAV): AAV'S MAY BE EITHER OATEY OR STUDOR TYPE. ALL AAV'S USED WITH WB'S SHALL BE BY OATEY (SUBSTITUTION BY APPROVAL ONLY).

3. WATER HAMMER ARRESTORS (WHA): PRE-CHARGED HARD DRAWN COPPER SHOCK ABSORBER WITH BRASS PISTON. DESIGNED TO OPERATE UP TO 150 PSI WORKING PRESSURE.

4. ALL APARTMENT DOMESTIC WATER SHUT OFF VALVES WILL BE LOCATED IN AN EASILY ACCESSIBLE LOCATION.

5. IDENTIFY ALL MAIN SHUT OFF VALVES BY TAGGING EACH.

6. IT IS THE INTENT OF THESE DRAWINGS THAT ALL TUB/SHOWERS WILL BE ABOVE FLOOR ROUGH IN.

7. PROVIDE QUARTER TURN SHUT OFF VALVES FOR ALL PLUMBING FIXTURES.

8. PROVIDE WHA'S ON ALL CONNECTIONS SERVING DISHWASHERS.

9. ALL PLUMBING FIXTURES TO HAVE SHUT OFF VALVES OR INTEGRAL STOPS.

10. ALL LAVATORIES ARE TO MEET THE PROPER CLEARANCES PER SECTION 405.3.1 OF THE IPC. SEE ARCHITECTS DRAWINGS FOR DIMENSIONED BATHROOM DRAWINGS.

11. PROVIDE A CLEAN OUT AT THE BASE OF ALL SANITARY STACKS.

12. ALL RISERS SHALL HAVE AN ACCESSIBLE SHUT OFF VALVE. PROVIDE 12x12 FIRE RATED ACCESS DOORS TO ALL VALVES IF REQUIRED.

13. ALL PIPING TO BE CONCEALED WITHIN WALLS OR ABOVE CEILINGS.

14. ALL WATER LINES TO PLUMBING FIXTURES SHALL BE BURST PROOF, FLEXIBLE STAINLESS STEEL TYPE SUPPLY LINES.

15. RUN AIR HANDLING UNIT AND WATER HEATER RELIEF LINES TO NEAREST STORMWATER PIPING.

16. PROVIDE A DRAIN PAN UNDER THE WASHING MACHINE WITH A WATER SENSING DEVICE THAT SHUTS OFF WATER TO THE WASHER WHEN WATER IS DETECTED WITHIN THE DRAIN PAN.

PLUMBING LEGEND

SYMBOL	DESCRIPTION
W	SANITARY PIPING WASTE (ABOVE GRADE)
W	SANITARY PIPING WASTE (BELOW FLOOR)
GW	GREASE WASTE (BELOW FLOOR)
V	VENT PIPING
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWC	HOT WATER RECIRCULATION PIPING
	PIPE TURNING UP/DOWN
	FULL OPEN PORT GATE VALVE
	FLOOR DRAIN
	FLOOR CLEANOUT
	CLEANOUT
	1 HR RATED WALLS
	2 HR RATED WALLS
WHA	WATER HAMMER ARRESTOR
P-1	FIXTURE TYPE
	MIXING VALVE
	AIR ADMITTANCE VALVE
	BACKFLOW PREVENTER

PLUMBING FIXTURE SCHEDULE

ITEM NO.	FIXTURE TYPE	WASTE CONN.	VENT CONN.	CW CONN.	HW CONN.	REMARKS
P-1	WATER CLOSET	4"	2"	1"	-	FLUSH VALVE
P-1A	WATER CLOSET (ADA)	4"	2"	1"	-	FLUSH VALVE
P-1B	WATER CLOSET (ADA)	3"	1 1/2"	1/2"	-	FLUSH TANK
P-2	LAVATORY	1 1/2"	1 1/2"	1/2"	1/2"	COUNTER MOUNT
P-2A	LAVATORY (ADA)	1 1/2"	1 1/2"	1/2"	1/2"	WALL MOUNT
P-3	KITCHEN SINK	1 1/2"	1 1/2"	1/2"	1/2"	FIRST LEVEL
P-3A	KITCHEN SINK	2"	1 1/2"	1/2"	1/2"	SECOND LEVEL
P-4	PET SPA	2"	1 1/2"	1/2"	1/2"	
P-5	WATER COOLER	2"	1 1/2"	1/2"	1/2"	
P-6	MOP SINK	2"	1 1/2"	1/2"	1/2"	

PLUMBING PUMP SCHEDULE

UNIT NO.	SERVING	TYPE	GPM	HEAD FT. H20	CONN. SIZE		MOTOR DATA				SELECTIONS BASED ON		REMARKS
					INLET	OUTLET	HP	RPM	VOLT	PH	MANUFACTURER	MODEL	
RCP-1	HOT WATER SYSTEM	RECIRCULATING	1.0	5'	1/2"	1/2"	1/12"	3400	120	1	BELL & GOSSETT	NBF-9X/LW	

ALABAMA LICENSED NO. PE30174 PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A7

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS

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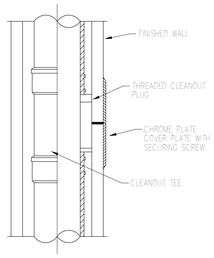
PLUMBING ABBREVIATIONS, LEGEND, SCHEDULES, AND SPECIFICATIONS

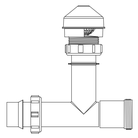
SHEET:

P7.001

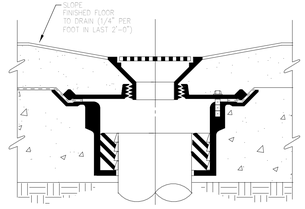
HIGH MOUNTAIN DEVELOPMENT - A7



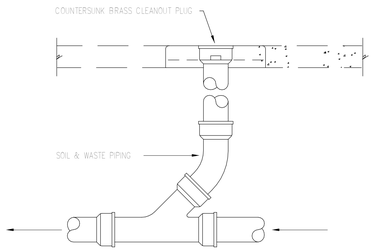
WALL CLEANOUTS
NO SCALE



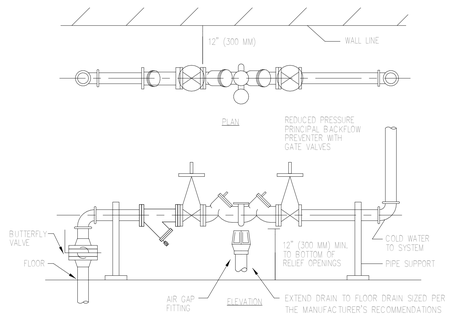
AIR ADMITTANCE VALVE – TUBULAR ADAPTER FOR UNDER SINK INSTALLATION
NO SCALE



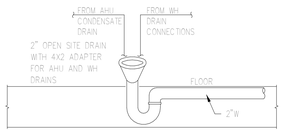
FLOOR DRAIN DETAIL
NOT TO SCALE



C.O. UP TO GRADE
NOT TO SCALE



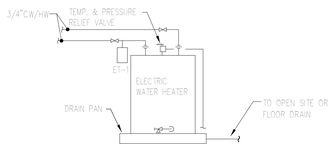
BACKFLOW PREVENTER PIPING DETAIL – DOMESTIC WATER
NOT TO SCALE



AHU CONDENSATE/WH DRAIN DETAIL
OPEN SITE DRAIN IN MECHANICAL CLOSET
NOT TO SCALE

NOTES:

1. BACKFLOW TO BE MOUNTED IN HORIZONTAL POSITION. ALL MOUNTING CLEARANCES AND INSTALLATION TO BE PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTER WITH GATE VALVES. PROVIDE FULL OPEN PORT SHUT OFF VALVE AND STRAINER UPSTREAM OF BACKFLOW.
3. BACKFLOW WILL NOT BE PLACED WITHIN A VAULT.
4. BACKFLOW TO BE MOUNTED AT A HEIGHT SUCH THAT NO LADDER WILL BE NEEDED TO SERVICE THE BACKFLOW.



WATER HEATER DRAIN DETAIL
NOT TO SCALE

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. ONEIL

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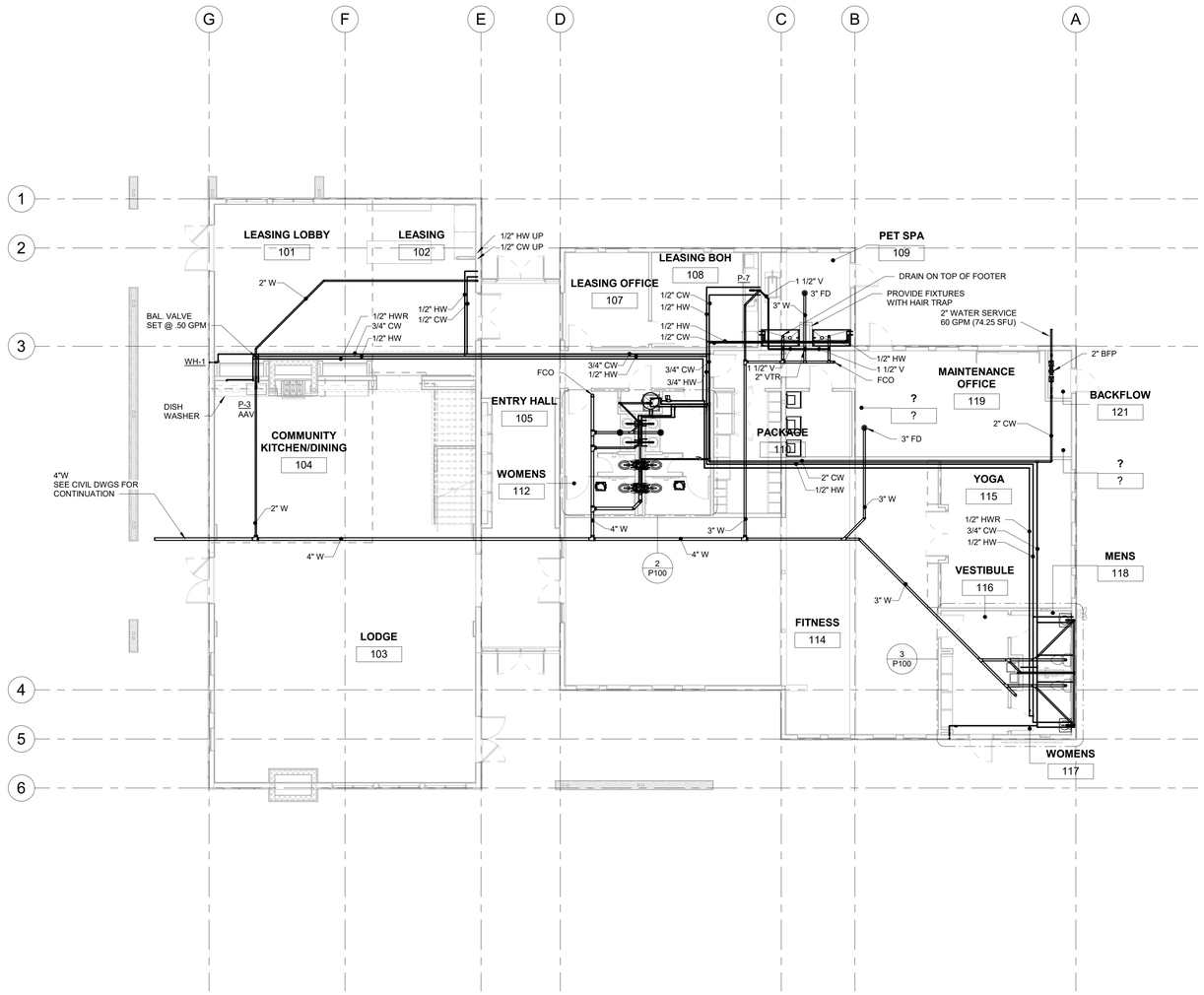
PLUMBING DETAILS

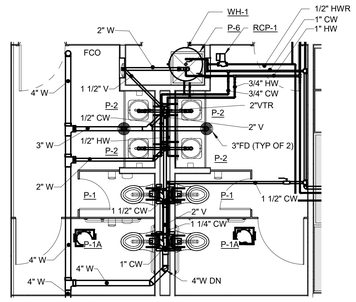
SHEET:

P7.002

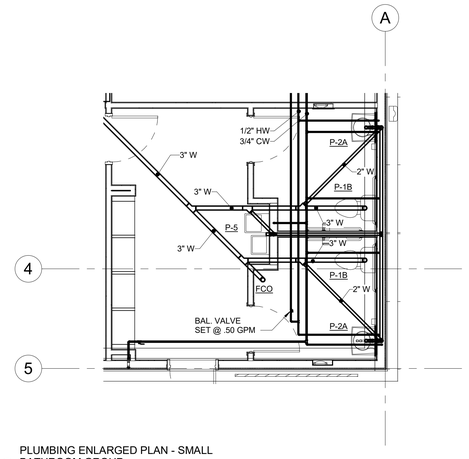
HIGH MOUNTAIN DEVELOPMENT - A7



1 PLUMBING FIRST FLOOR PLAN
1/8" = 1'-0"



2 PLUMBING ENLARGED PLAN - LARGE BATHROOM GROUP
1/4" = 1'-0"



3 PLUMBING ENLARGED PLAN - SMALL BATHROOM GROUP
1/4" = 1'-0"

TERRACES AT HIGH MOUNTAIN - A7

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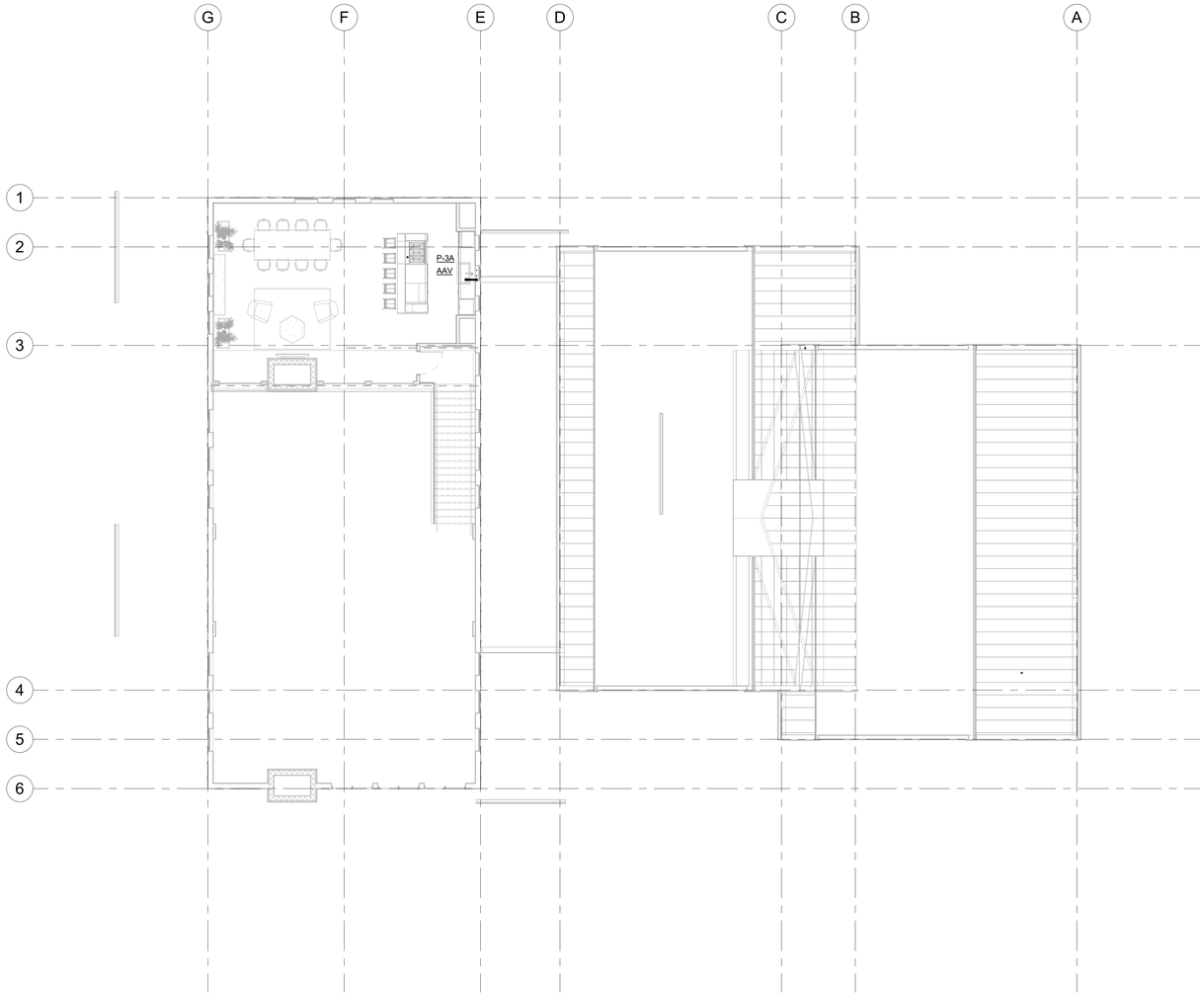
PLUMBING
FIRST FLOOR PLAN

SHEET:

P7.100

HIGH MOUNTAIN DEVELOPMENT - A7



1 PLUMBING SECOND FLOOR
1/8" = 1'-0"

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. O'NEIL

TERRACES AT HIGH MOUNTAIN - A7

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

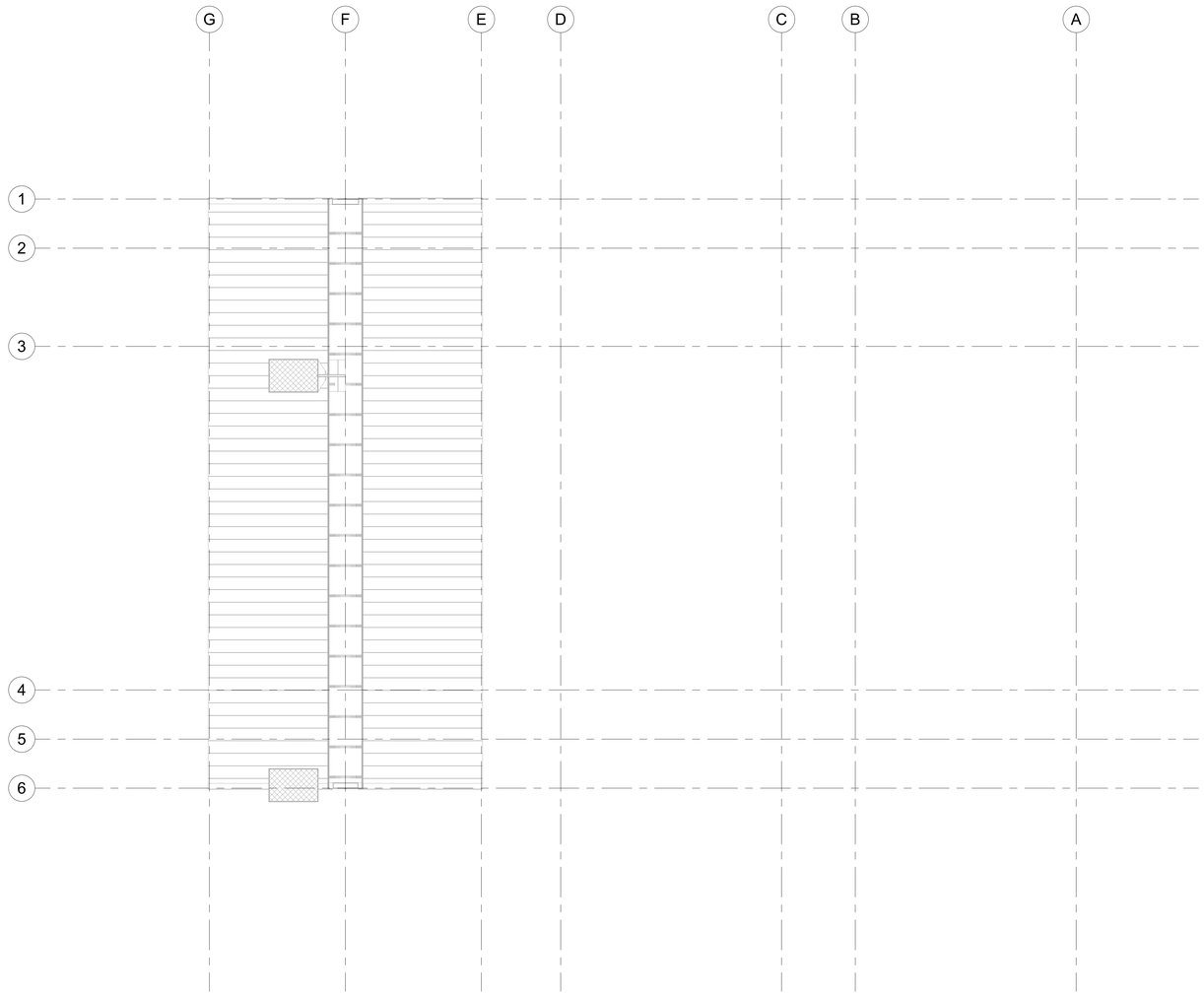
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
SECOND FLOOR PLAN

SHEET:

P7.101

HIGH MOUNTAIN DEVELOPMENT - A7



1 PLUMBING ROOF PLAN
1/8" = 1'-0"

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. ONEIL

TERRACES AT HIGH MOUNTAIN - A7

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

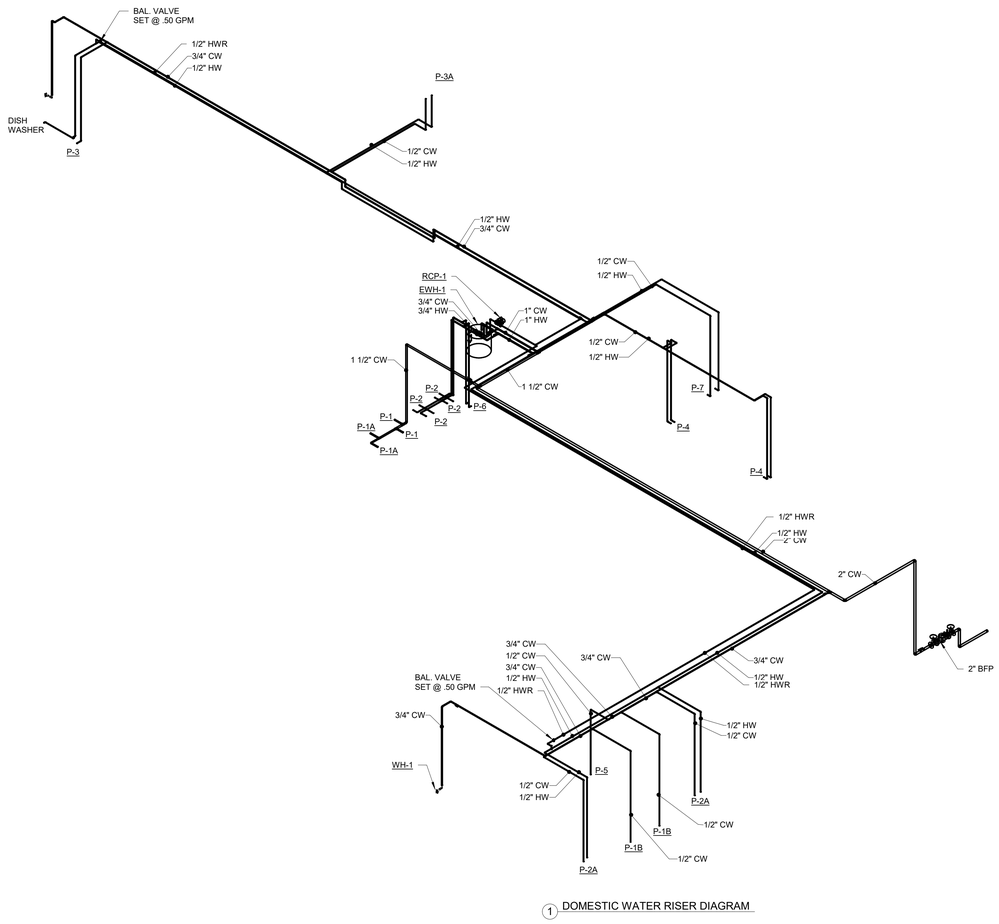
PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	1/8" = 1'-0"
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
ROOF PLAN

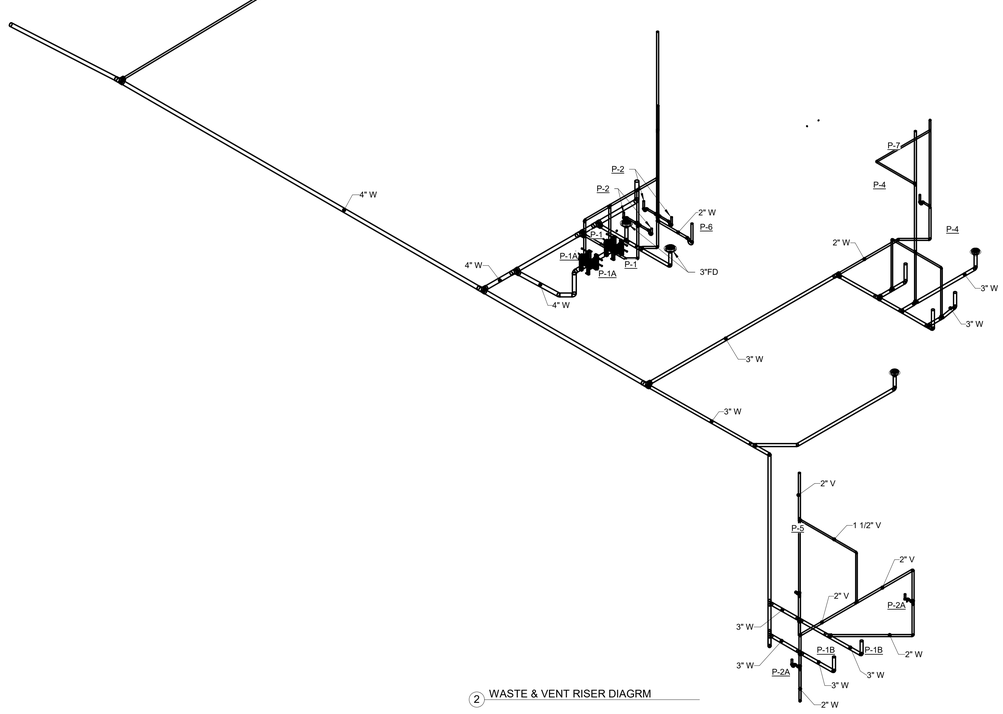
SHEET:

P7.102

HIGH MOUNTAIN DEVELOPMENT - A7



1 DOMESTIC WATER RISER DIAGRAM



2 WASTE & VENT RISER DIAGRM

TERRACES AT HIGH MOUNTAIN - A7

4130 HIGH MOUNTAIN ROAD NE
HUNTSVILLE, AL 35811

ALABAMA LICENSED NOT PERSONAL PROFESSIONAL ENGINEER PATRICK J. ONEIL

REVISIONS		
#	DATE	DESCRIPTION
#	11-JUN-21	PERMIT SET
1		XX
2		XX
3		XX
4		XX
5		XX
6		XX

ONEIL
ENGINEERING SERVICES
1480 OAKBRIDGE COURT
POWHATAN, VIRGINIA
23139
PHONE: 804-372-3501

PROJECT #:	K118
DATE:	11-JUN-2021
SCALE:	NO SCALE
DRAWN BY:	RD
APPROVED BY:	PJO

PLUMBING
RISER DIAGRMS

SHEET:

P7.200

HIGH MOUNTAIN DEVELOPMENT - A7