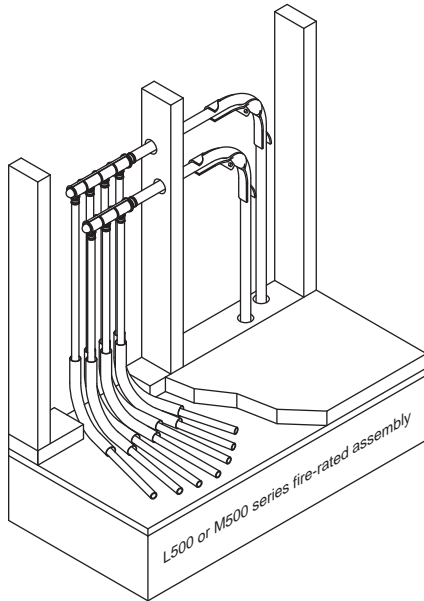


**CEYD.R25563
Nonmetallic Plumbing System Components Certified for Fire Resistance**

HEATLINK GROUP INC R25563
4603E 13TH ST NE
CALGARY, AB T2E 6M3 CANADA

Types Purelink PEXa, Heatlink PEXa and Purelink Plus nonmetallic tubing for use in Design Nos. K917, L588, U383, V461.

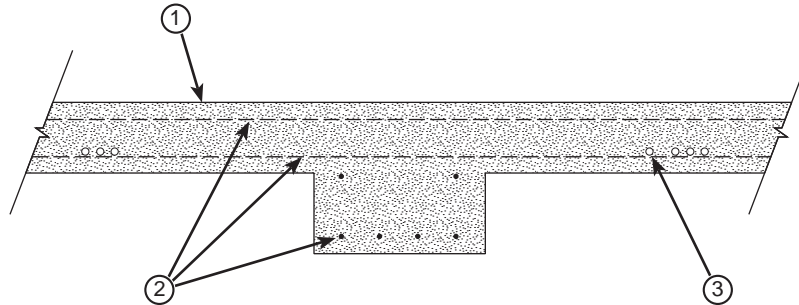


As an option, Purelink PEXa, Heatlink PEXa and Purelink Plus nonmetallic tubing covered with Classified Floor Topping Mixtures or other concrete toppings may be installed over the required floor system components in L500 and M500 series designs.

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

Design No. K917
BXUV.K917
May 01, 2017
Restrained Assembly Rating — 2 h
Unrestrained Assembly Rating — 1-1/2 and 2 h (See Item 1)



1. **Normal Weight Reinforced Concrete** — Reinforced slab and beam designed in accordance with the current ACI-318, Building Code Requirements for Structural Concrete. Carbonate aggregate, minimum compressive strength of 3500 psi. Minimum slab thickness and reinforcement cover specified in the table below:

Restrained Assembly Rating, h	Unrestrained Assembly Rating, h	Min Total Slab Thickness (in.)	Min Concrete Cover for Positive Reinforcement (in.)
2	1-1/2	5.9	1
2	2	5.9	1-1/2

2. **Steel Reinforcement** — Various sized Grade 40 and Grade 60 deformed steel bars located as required by ACI-318 design for positive and negative reinforcement. Minimum concrete cover for positive reinforcement as specified in Item 1.

3. **Non-Metallic Plumbing Components*** — 1/2 in through 2 in. O.D. tubing, evenly distributed and tied to the top side of the positive reinforcing bars. The tubing may be placed inside a flexible or rigid polyethelene or rigid PVC sleeve of the same nominal size as the tube. The tubing may penetrate the floor slab through a sill plate and into a stud cavity of a wall as necessary. Tube bends may be supported by suitably sized PVC elbows. The maximum amount of tubing shall be as specified in the table below:

Restrained Assembly Rating, h	Unrestrained Assembly Rating, h	Max. volume of tube per cubic foot of concrete, cubic inches
2	1-1/2 or 2	16.7

HEATLINK GROUP INC — Types Purelink PEXa, Heatlink PEXa, PureLink Plus

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**Design No. L588
BXUV.L588
October 19, 2017
Unrestrained Assembly Rating - 1 Hr
Finish Rating - 27 Min**

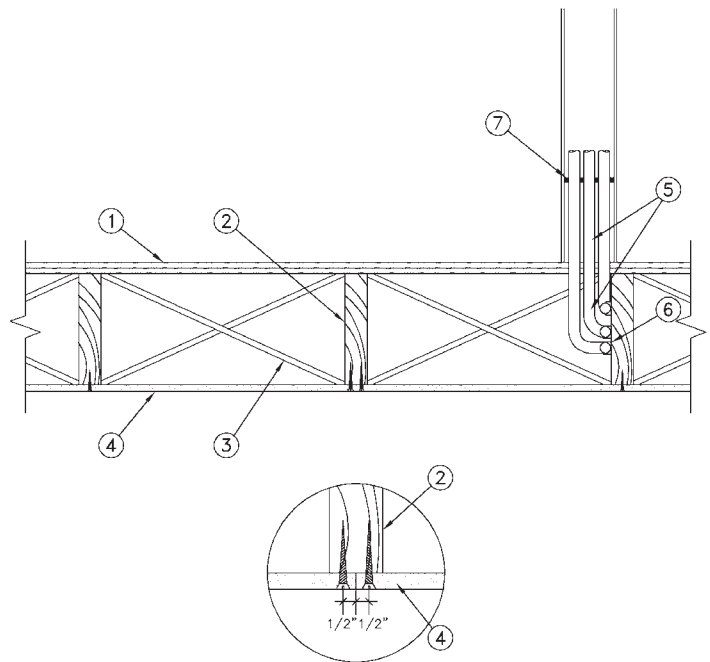
1. Flooring System — The flooring system shall consist of one of the following:

System No. 1

Subflooring — Min 15/32 in. thick wood structural panels, min grade "C-D" or "Sheathing". Face grain of plywood or strength axis of panels to be perpendicular to the joists with joints staggered.

Vapor Barrier — Nominal 0.010 in. thick commercial rosin-sized building paper.

Finish Flooring — Min 19/32 in. thick plywood, min grade "Underlayment" or "Single Floor". Face grain of plywood to be perpendicular to the joists with joints staggered.



System No. 2

Subflooring — Base layer of subflooring shall be min 15/32 in. thick plywood, min grade "C-D" or "Sheathing". Face grain of plywood to be perpendicular to joists with joints staggered. Second layer of subflooring shall be min 19/32 in. thick plywood min grade "Underlayment" or "Single Floor". Face grain of plywood to be perpendicular to joists with joints staggered.

Vapor Barrier — Commercial rosin-sized, 0.010 in. thick to be laid between base and second layer of subfloor.

Floor Mat Materials* - (Optional) — Floor mat material nom 5/64 in. (2mm) thick adhered to subfloor with Hacker Floor Primer. Primer to be applied to the surface of the mat prior to the placement of a min 1 in. of floor-topping mixture.

ECORE INTERNATIONAL INC — Type QTscu 4002

HACKER INDUSTRIES INC — Type Hacker Sound-Mat

Alternate Finish Mat Materials* - (Optional) — Floor mat material nom 1/4 in. (6mm) thick adhered to subfloor with Hacker Floor Primer. Primer to be applied to the surface of the mat prior to the placement of a min 1-1/4 in. (32mm) of floor-topping mixture.

ECORE INTERNATIONAL INC — Type QTrbm 3006-3

HACKER INDUSTRIES INC — Type Hacker Sound-Mat II.

Alternate Floor Mat Materials - (Optional) — Floor mat material nom 1/8 in. (3mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 3/4 in. (19mm)

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HACKER INDUSTRIES INC — FIRM-FILL SCM 125

Alternate Floor Mat Materials - (Optional) — Floor mat material nom 1/4 in. (6mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 1 in. (25mm)

HACKER INDUSTRIES INC — Type FIRM-FILL SCM 250, Quiet Qurl 55/025

Alternate Floor Mat Materials - (Optional) — Floor mat material nom 3/8 in. (10mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 1-1/4 in. (32mm)

HACKER INDUSTRIES INC — FIRM-FILL SCM 400, Quiet Qurl 60/040

Alternate Floor Mat Materials - (Optional) — Floor mat material nom 3/4 in. (19mm) thick loose laid over the subfloor. Floor topping thickness shall be a min of 1-1/2 in. (38mm)

HACKER INDUSTRIES INC — Type FIRM-FILL SCM 750, Quiet Qurl 65/075

Metal Lath (Optional) — For use with 3/8 in. (10 mm) floor mat materials, 3/8 in. expanded steel diamond mesh, 3.4 lbs/sq yd placed over the floor mat material. Hacker Floor Primer to be applied prior to the placement of the metal lath. When metal lath is used, floor topping over the floor mat is a nom 1-1/4 in. thick.

Finish Flooring - Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a min compressive strength of 1100 psi. Mixture shall consist of 6.8 gal of water to 80 lbs of floor topping mixture to 1.9 cu ft of sand.

HACKER INDUSTRIES INC — Firm-Fill Gypsum Concrete, Firm-Fill 2010, Firm-Fill 3310, Firm-Fill 4010, Firm-Fill High Strength, Gyp-Span Radiant

System No. 3

Sub-flooring — Base layer of subflooring shall be min 15/32 in. thick plywood, min grade "C-D" or "Sheathing". Face grain of plywood to be perpendicular to joists with joints staggered. Second layer of subflooring shall be min 19/32 in. thick plywood min grade "Underlayment" or "Single Floor". Face grain of plywood to be perpendicular to joists with joints staggered.

Vapor Barrier — Commercial rosin-sized, 0.010 in. thick to be laid between base and second layer of sub-floor.

Finish Flooring — Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a minimum compressive strength of 1500 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.

MAXXON CORP — Type D-C, GC, GC2000, L-R, T-F, CT, SS

RAPID FLOOR SYSTEMS — Type RF, RFP, RFU, RFR, Ortecrete

Floor Mat Materials* - (Optional) — Floor mat material loose laid over the subfloor. Refer to manufacturer's instructions regarding the minimum thickness of floor topping over each floor mat material.

MAXXON CORP — Type Acousti-Mat I, Acousti-Mat II, Acousti-Mat II HP, Enkasonic 9110, Enkasonic 9110 HP, Acousti-Mat 3, Acousti-Mat 3 HP, Acousti-Mat LP, Acousti-Mat LP-R, Acousti-Mat SD.

Floor Mat Reinforcement - (Optional) - Refer to manufacturer's instructions regarding minimum thickness of floor topping over each floor mat material, primers, and use of crack suppression reinforcement.

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MAXXON CORP — Crack Suppression Mat (CSM) or Maxxon Reinforcement (MR)

Metal Lath (For use with or as an alternate to Crack Suppression Mat (CSM) or Maxxon Reinforcement (MR)) - 3/8 in. expanded galvanized steel diamond mesh, 3.4 lbs/sq yd loose laid over the floor mat material. Floor topping thickness shall be min 1-1/2 in.

System No. 4

Subflooring — Min 19/32 in. thick wood structural panels, min grade "C-D" or "Sheathing". Face grain of plywood or strength axis of panels to be perpendicular to the joists with joints staggered.

Vapor Barrier — (Optional) Nom 0.010 in. thick commercial asphalt saturated felt.

Finish Flooring — Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a minimum compressive strength of 1000 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.

FORMULATED MATERIALS LLC — Types FR-25, FR-30, and SiteMix

Floor Mat Materials* — (Optional) Floor mat material loose laid over the subfloor. Refer to manufacturer's instructions regarding the minimum thickness of floor topping over each floor mat material.

FORMULATED MATERIALS LLC — — Types M1, M2, M3, R1, and R2

System No. 5

Subflooring — Min 19/32 in. thick wood structural panels, min grade "C-D" or "Sheathing". Face grain of plywood or strength axis of panels to be perpendicular to the joists with joints staggered.

Vapor Barrier — (Optional) - Nom 0.010 in. thick commercial asphalt saturated felt.

Finish Flooring - Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture having a minimum compressive strength of 1800 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.

UNITED STATES GYPSUM CO — Types LRK, HSLRK, CSD

USG MEXICO S A DE C V — Types LRK, HSLRK, CSD

Floor Mat Materials* — (Optional) - Floor mat material loose laid over the subfloor. Refer to manufacturer's instructions regarding the minimum thickness of floor topping over each floor mat material.

UNITED STATES GYPSUM CO — Types SAM, LEVELROCK[®] Brand Sound Reduction Board, LEVELROCK[®] Brand Floor Underlayment SRM-25.

Alternate Floor Mat Materials* — (Optional) - Nom 3/8 in. thick floor mat material loose laid over the subfloor.

GRASSWORX L L C — Type SC50

System No. 6

Subflooring — Base layer of subflooring shall be min 15/32 in. thick plywood, min grade "C-D" or "Sheathing". Face grain of plywood to be perpendicular to joists with joints staggered. Second layer of subflooring shall be min 19/32 in. thick plywood min grade "Underlayment" or "Single Floor". Face grain of plywood to be perpendicular to joists with joints staggered.

Vapor Barrier — (Optional) — Commercial asphalt saturated felt, 0.030 in. thick. Vapor Barrier — (Optional) — Nom 0.010 in. thick commercial rosin-sized building paper.

Finish Flooring* — Min 3/4 in. thickness of any Floor Topping Mixture bearing the UL Classification Marking as to Fire Resistance. See Floor- and Roof-Topping Mixtures (CCOX) category for names of Classified Companies.

Floor Mat Materials* — (Optional) — Nom. 1/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 55/025 and Quiet Qurl 55/025 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 60/040 and Quiet Qurl 60/040 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1-1/2 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 65/075, Quiet Qurl 65/075 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 52/013 and Quiet Qurl 52/013 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/4 in. entangled net core with a compressible fabric attached to the bottom loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 55/025 MT and Quiet Qurl 55/025 N MT

System No. 7

Subflooring — Base layer of subflooring shall be min 15/32 in. thick plywood, min grade "C-D" or "Sheathing". Face grain of plywood to be perpendicular to joists with joints staggered. Second layer of subflooring shall be min 19/32 in. thick plywood min grade "Underlayment" or "Single Floor". Face grain of plywood to be perpendicular to joists with joints staggered.

Vapor Barrier — (Optional) — Nom 0.030 in. thick commercial asphalt saturated felt.

Finish Flooring — Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture, having a min compressive strength of 1000 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.

DEPENDABLE LLC — Types GSL M3.4, GSL K2.6 and GSL RH

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Floor Mat Materials* — (Optional) — Nom. 1/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 55/025 and Quiet Qurl 55/025 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 60/040 and Quiet Qurl 60/040 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 3/4 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1-1/2 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 65/075, Quiet Qurl 65/075 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/8 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 52/013 and Quiet Qurl 52/013 N

Alternate Floor Mat Materials* — (Optional) — Floor mat material Nom. 1/4 in. entangled net core with a compressible fabric attached to the bottom loose laid over the subfloor. Floor topping thickness shall be a minimum of 1 in.

KEENE BUILDING PRODUCTS CO INC — Types Quiet Qurl 55/025 MT and Quiet Qurl 55/025 N MT

System No. 8

Subflooring — Min 15/32 in. thick wood structural panels, min grade "C-D" or "Sheathing". Face grain of plywood or strength axis of panels to be perpendicular to the joists with joints staggered.

Finish Flooring* — Floor Topping Materials — Min 3/4 in. to 1-1/2 in. thickness of any Floor Topping Mixture bearing the UL Classification Marking as to Fire Resistance with a minimum compressive strength of 1500 psi.

See **Floor- and Roof-Topping Mixtures** (CCOX) category for names of Classified Companies.

Floor Mat Materials* — (Optional) — Floor mat material nom 1/8 in. to 3/4 in. thick. Loose laid over the subfloor. When used, Acousti-flor CSM (crack suppression mat) is loose laid over the floor mat material. Floor topping material thickness is dependent on thickness of floor mat used.

WALFLOR INDUSTRIES INC — Type Acousti-flor, Acousti-flor CSM. Floor topping thickness depends on products used as follows:

Acousti-flor (1/8 in. thick) - Floor topping thickness shall be a minimum of 3/4 in.

Acousti-flor (1/4 in. thick) - Floor topping thickness shall be a minimum of 1 in.

Acousti-flor (3/8 in. thick) - Floor topping thickness shall be a minimum of 1 in.

Acousti-flor (3/4 in. thick) - Floor topping thickness shall be a minimum of 1-1/2 in.

Metal Lath — (Optional) — Expanded steel diamond mesh, 2.5 lb / sq yd loose laid over floor mat material.

Fiberglass Mesh Reinforcement — (Optional) — Coated non-woven glass fiber mesh grid loose laid over floor mat material.

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2. **Wood Joists** — Min 2 by 10, spaced 16 in. OC and effectively fireblocked in accordance with local codes.

3. **Cross Bridging** — Min 1 by 3 in. or min 2 by 10 solid blocking.

4. **Gypsum Board*** — Nom 5/8 in. thick, 4 ft wide gypsum board installed with long dimension perpendicular to joists with end joints located under bottom of joists. End joints in adjacent rows shall be staggered on adjacent joists. Gypsum board secured with 8d cement coated common nails spaced 6 in. OC along the edges and in the field. Nails located 1/2 in. from butted end joints.

AMERICAN GYPSUM CO — Type AG-C.

CERTAINTED GYPSUM INC — Type FRPC, SF3 or Type C.

CGC INC — Type C, IP-X1, IP-X2, IPC-AR, SCX, SHX or WRX.

CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C — Type LGFC-C/A.

GEORGIA-PACIFIC GYPSUM L L C — Types 5, C, GPFS1, DAPC, TG-C.

NATIONAL GYPSUM CO — Type FSW-G or FSK-G.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type C, PG-3 or PG-C.

UNITED STATES GYPSUM CO — Type C, IP-X1, IP-X2, IPC-AR, SCX, SHX or WRX.

USG BORAL ZAWAWI DRYWALL L L C SFZ — Types C, SCX

USG MEXICO S A DE C V — Type C, IP-X1, IP-X2, IPC-AR, SCX, SHX or WRX.

4A. **Gypsum Board*** — As an alternate to Item 4 — Nom 5/8 in. thick, 48 in. wide gypsum board, installed with long dimension perpendicular to joists. Gypsum board secured to joists with 2 in. long Type S steel screws spaced 6 in. OC with the last two screws located 1 and 3 in from each end of the board.

UNITED STATES GYPSUM CO — Type ULIX

5. Non-Metallic Plumbing Components * — Nom 1/4 in., 3/8 in., 1/2 in., 5/8 in., 3/4 in., 1 in., 1-1/4 in., 1-1/2 in. and 2 in. diameter tubing attached to joists with plastic, steel or copper hangers (Item 6), spaced max 40 in. OC. The min spacing between the bottom of tubing and the top or back side of the gypsum board shall be 3 in. The tubing shall penetrate the floor through a sill plate and into a stud cavity of a wall. The max amount of tubing shall be 0.21 lb. of tube per 1 ft length of joist cavity.

HEATLINK GROUP INC — Types Purelink PEXa, Heatlink PEXa, Purelink Plus

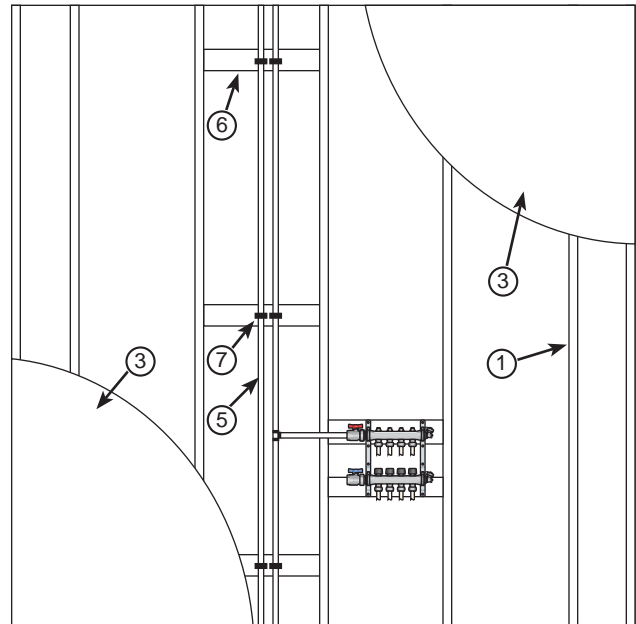
6. Fasteners — Nom 1/2 in. to 1 in. wide perforated steel or copper straps, or steel or copper U or C shaped brackets with a radius conforming to the outer circumference of the tube to be supported. Plastic fastener supplied by tubing manufacturer may also be used. Fasteners to be nailed to the wood joists using min 1 in. long nails.

7. Fill Void or Cavity Material* - Sealant — Min 3/8 in. thickness of fill material applied within the annulus, flush with top surface of the sill plate. Prior to the application of the sealant, 3/8 in. thickness of 4 pcf mineral wool insulation shall be installed in the annular space and recessed by 3/8 in. from the top surface of the sill plate. Maximum annular space between tube and edge of opening shall be 1/4 in. Tubing (Item 5) intended as a process or supply plumbing component.

3M COMPANY 3M FIRE PROTECTION PRODUCTS — Type CP 25W+

8. Finishing System — (Not shown) Vinyl, dry or premixed joint compound, applied in two coats to joints and nailheads. Nom 2 in. wide paper tape embedded in first layer of compound over all joints. As an alternate, nom 3/32 in. thick veneer plaster may be applied to the entire surface of gypsum board.

**Design No. U383
BXUV.U383
October 10, 2017
Bearing Wall Rating - 1 Hr.
Finish Rating - 23 Min.**



1. **Wood Studs** — Nominal 2 by 4 in. spaced 16 in. on center, effectively cross braced at mid-height and fire stopped at top and bottom.

2. **Batts and Blankets*** — (Optional, Not shown) - Mineral wool or glass fiber batts partially or completely filling stud cavity.

See **Batts and Blankets** (BZJZ) category for names of Classified companies.

3. **Gypsum Board*** — 5/8 in. thick gypsum board paper, glass mat or vinyl surfaced, with beveled or tapered edges, applied vertically. Gypsum board nailed 7 in. OC with 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam and 1/4 in. diam heads.

CGC INC — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, USGX, WRC or WRX (Joint tape and compound, Item 9, optional for use with Type USGX).

UNITED STATES GYPSUM CO — Type AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, ULX, WRC, WRX, USGX (Joint tape and compound, Item 9, optional for use with Type USGX).

USG BORAL ZAWAWI DRYWALL L L C SFZ — Types C, SCX, USGX (Joint tape and compound, Item 9, optional for use with Type USGX).

USG MEXICO S A DE C V — Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, USGX, WRC or WRX (Joint tape and compound, Item 9, optional for use with Type USGX).

3A. **Gypsum Board*** — (As an alternate to Items 3) - Nom 3/4 in. thick, 4 ft wide, installed as described in Item 4A with screw length increased to 1-1/4 in.

CGC INC — Types AR, IP-AR.

UNITED STATES GYPSUM CO — Types AR, IP-AR.

USG MEXICO S A DE C V — Types AR, IP-AR.

4. **Joint Tape and Compound** — (Not Shown)- Vinyl, dry or premixed joint compound, applied in two coats to joints and screw heads; paper tape embedded in first layer of compound over all joints. As an alternate, nominal 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard with joints reinforced with paper tape.

5. **Non-Metallic Plumbing System Components** * — 1/4 in., 3/8 in., 1/2 in., 5/8 in., 3/4 in., 1 in., 1-1/4 in., 1-1/2 in. and 2 in. diameter tubing attached to cross bracing (Item 6) with plastic, steel or copper fasteners (Item 7). The tubing may be connected to standard copper or brass plumbing components, tees, bend supports and manifolds within the cavity. Plastic manifolds, with a weight not exceeding 4.7 lb. per cavity may be used in lieu of or in addition to copper or brass manifolds. The maximum amount of tubing per stud cavity shall be 0.56 lbs./ft and shall not exceed a total weight of 5.6 lbs per stud cavity.

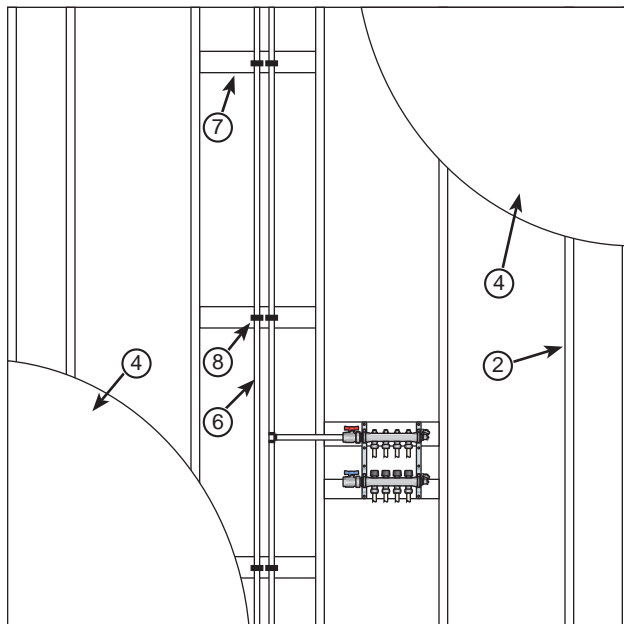
HEATLINK GROUP INC — Types Purelink PEXa, Heatlink PEXa, Purelink Plus

6. **Bracing** — Nominal 2 by 4 in. lumber cut to fit within the stud cavity. The maximum spacing between bracing in cavities that contain tubing shall be 40 in. OC. The bracing shall be screw attached to the studs using standard 1 in. long Type S screws or nailed with nails suitable for wood framing construction.

7. **Fasteners** — Standard copper, brass, steel or plastic plumbing fasteners. The fasteners shall be screw attached to the bracing using a minimum 7/8 in long screw.

Design No. V461
BXUV.V461
October 23, 2017
Nonbearing Wall Rating - 1 Hr.

1. **Floor and Ceiling Runners** — (not shown) - Channel shaped runners, 3-5/8 in. wide (min), 1-1/4 in. legs, formed from min No. 20 MSG galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
2. **Steel Studs** — Channel shaped, 3-5/8 in. wide (min), 1-1/4 in. legs, 3/16 in. folded back returns, formed from min No. 20 MSG galv steel spaced 24 in. OC max.
3. **Batts and Blankets*** — (Optional, Not shown) - Mineral wool or glass fiber batts partially or completely filling stud cavity.



See **Batts and Blankets** (BZJZ) category for names of Classified companies.

3A. **Batts and Blankets*** — For use with Item 4B. Placed in stud cavities, any min. 3-1/2 in. thick glass fiber insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. See Batts and Blankets (BKNV or BZJZ) Categories for names of Classified companies.

4. **Gypsum Board*** — 5/8 in. thick, 4 ft wide, attached to steel studs and floor and ceiling track with 1 in. long, Type S steel screws spaced 8 in. OC. along edges of board and 12 in. OC in the field of the board. Joints oriented vertically and staggered on opposite sides of the assembly.

CGC INC — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, USGX (Joint tape and compound, Item 5, optional for use with Type USGX), WRC or WRX.

UNITED STATES GYPSUM CO — Type AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, WRC, WRX, USGX (Joint tape and compound, Item 5, optional for use with Type USGX).

USG BORAL ZAWAWI DRYWALL L L C SFZ — Types C, SCX, USGX (Joint tape and compound, Item 5, optional for use with Type USGX).

USG MEXICO S A DE C V — Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, USGX (Joint tape and compound, Item 5, optional for use with Type USGX), WRC or WRX.

4A. **Gypsum Board*** — (As an alternate to Items 4) - Nom 3/4 in. thick, 4 ft wide, installed as described in Item 4A with screw length increased to 1-1/4 in.

CGC INC — Types AR, IP-AR.

UNITED STATES GYPSUM CO — Types AR, IP-AR.

USG MEXICO S A DE C V — Types AR, IP-AR.

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4B. **Gypsum Board*** — As an alternate to Item 4, for use with Item 3A, Batts and Blakents* - 5/8 in. thick, 4 ft wide, attached to steel studs and floor and ceiling track with 1 in. long, Type S steel screws spaced 8 in. OC. along edges of board and 12 in. OC in the field of the board. Joints oriented vertically and staggered on opposite sides of the assembly.

UNITED STATES GYPSUM CO — Type ULIX

5. **Joint Tape and Compound** — (Not Shown)- Vinyl, dry or premixed joint compound, applied in two coats to joints and screw heads; paper tape, 2 in. wide, embedded in first layer of compound over all joints. As an alternate, nominal 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard. Joints reinforced.

6. **Non-Metallic Plumbing System Components *** — 1/4 in., 3/8 in., 1/2 in., 5/8 in., 3/4 in., 1 in., 1-1/4 in., 1-1/2 in. and 2 in. diameter tubing attached to cross bracing (item 7) with plastic, steel or copper fasteners (item 8). The tubing may be connected to standard copper or brass plumbing components, tees, bend supports and manifolds within the cavity. Plastic manifolds, with a weight not exceeding 4.7 lb. per cavity may be used in lieu of or in addition to copper or brass manifolds. The maximum amount of tubing per stud cavity shall be 0.47 lbs./ft and shall not exceed a total weight of 4.7 lb. per stud cavity.

HEATLINK GROUP INC — Types Purelink PEXa, Heatlink PEXa, Purelink Plus

7. **Bracing** — Standard No. 20 MSG, 3-5/8 in. wide (min), 1-1/4 in. legs, 3/16 in. folded back returns, or 2x4 dimensional lumber cut to fit within the stud cavity. The maximum spacing between bracing in cavities that contain tubing shall be 40 in. OC. The bracing shall be screw attached to the studs using two standard 1 in. long Type S screws at each end of bracing member.

8. **Fasteners** — Standard copper, brass, steel or plastic plumbing fasteners. The fasteners shall be screw attached to the bracing using a minimum 7/8 in long screw.