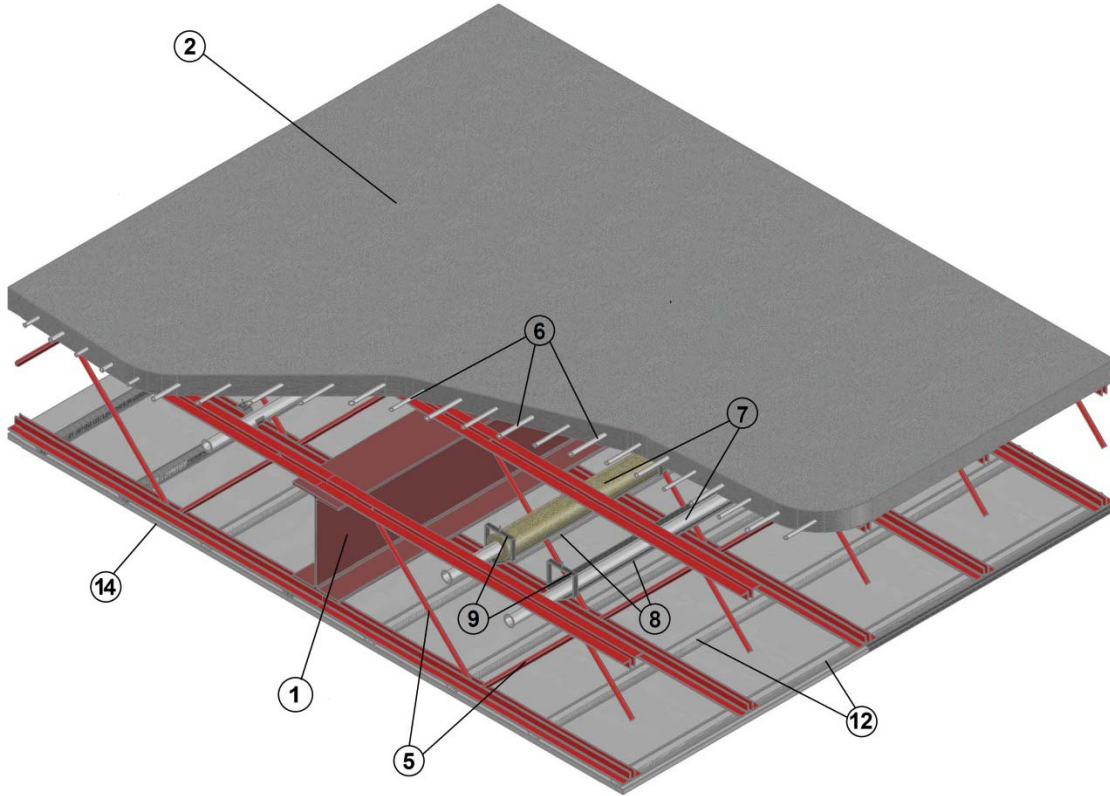


QAI Listing P321-1E Uponor PEX Filled Floor/Ceiling Assembly
UL 263, ASTM E119, CAN/ULC S101
2 Hour Fire Resistance Rated Restrained and Unrestrained Floor/Ceiling Assembly
Load Bearing*



No.	COMPONENT	DESCRIPTION
1	Beam	Min. W8 x 15
2	Concrete	Normal weight concrete, 150 +/- 3 pcf unit weight, 3500 psi compressive strength. Min. concrete slab thickness of 3.5 in.
	Concrete (Alternate Assembly)	Normal weight concrete, 150 +/- 3 pcf unit weight, 3500 psi compressive strength. Min. concrete slab thickness of 3.5 in. measured from the top of the fluted steel decking with minimum 1-1/4 in. concrete cover above the top elevation of the top chord.
3	Steel Floor and Form Units (Not Shown) (Alternate Assembly)	Min. 1-1/2 in. deep, 22 gauge uncoated or galvanized fluted steel floor decking attached with no. 10 x 3/4 in. long self-tapping screws spaced a maximum of 36 in. OC
4	Welded Wire Fabric (Not Shown)	Min. 6x6 – W2.9 x W2.9
	Welded Wire Fabric (Alternate Assembly)	As required to develop the structural capacity of the floor in accordance with the applicable ACI specifications

No.	COMPONENT	DESCRIPTION
5	Structural Steel Members	Canam Steel Corp. Type D500 composite steel joists, min. nominal depth 10 in. spaced a max. 6 ft. on center (OC). As alternates to the D500 joists, mini joists designated RMD may be used for max spans of 5 ft. 0 in.
	Structural Steel Members (Alternate Assembly)	Canam Steel Corp. Type MD2000, min. nominal depth 10 in. spaced a max. 6 ft. on center (OC)
6	Non-Metallic Tubing (Cast in Place)	Uponor Inc. AquaPEX (natural, red, blue) nominal 1/2 in. to 3/4 in. tubing; hePEX (natural) nominal 1/2 in. to 3/4 in. tubing; RCW PEX nominal 1/2 in. to 3/4 in. tubing. Installed a min. 10 in. OC in the concrete floor above the wire mesh. The tubing is attached to the wire mesh with wire ties spaced a max. 30 in. OC. The amount of tubing including the PVC bend supports installed shall not exceed a max. of 6 lbs per 100 sq. ft. area of the concrete floor.
7	Non-Metallic Tubing (In Ceiling Plenum)	Uponor Inc. AquaPEX (natural, red, blue) nominal 1/2 in. to 2 in. tubing; Pre-Insulated AquaPEX nominal 1/2 in. to 1 in. tubing; hePEX (natural) nominal 1/2 in. to 2 in. tubing; RCW PEX nominal 1/2 in. to 1 in. tubing. Installed in the ceiling plenum attached to the bottom of the concrete slab. Nominal 1/2 in. and 3/4 in. uninsulated tubing attached to the concrete slab with perforated metal hanger straps and 1-1/4 in. Tapcon concrete screws or power actuated fasteners spaced a max. 16 in. OC. Or attached to the top chords of the steel joists with wire ties spaced 16 in. OC. Nominal 1 in. to 2 in. and pre-insulated tubing supported in V-shaped channels (Item 7) attached to the concrete slab with V-shaped clevis hangers (Item 8) and 1-1/4 in. Tapcon concrete screws or power actuated fasteners spaced a max. 48 in. OC. The amount of non-metallic tubing, including engineered plastic, brass fittings, and end plugs, installed shall not exceed a maximum of 8.7 lbs per 100 sq. ft. of ceiling area.
8	Support Channels	Channels fabricated from min. 0.060 in. thick galvanized steel, 2-3/16 in. by 2-3/16 in. angled 130° from each other. V-shaped channel installed with V-shaped clevis hangers or Uponor 23 gauge galvanized steel PEX-a pipe supports shall support the entire length of tubing if they are required (See Item 6).
9	Clevis Hangers	Clevis hangers fabricated from 0.0575 in. thick galvanized steel, 4 in. by 5-1/2 in. by 3/4 in. V-shaped clevis hangers installed with V-shaped channels or appropriate Uponor PEX-a pipe clevis hangars (Item 7) to support non-metallic tubing (Item 6). Fastened to the bottom of the concrete slab using 1-1/4 in. long Tapcon concrete screws or powder-driven galvanized steel fasteners.

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No.	COMPONENT	DESCRIPTION
11	Tie Wire (Not Shown)	No. 12 SWG single strand galvanized steel wire and No. 18 SWG double stranded galvanized steel wire. The 18 SWG tie wire is used to attach the wallboard furring channels to the steel joists or cold rolled channels. The no. 12 SWG tie wire is used to attach the cold rolled channels to the hanger clips.
12	Furring Channels	Min. 0.020 in. thick (25 gauge) galvanized steel, 13/16 in. high by 2-3/4 in. base width by 1-3/8 in. face width by 12 ft. long. Installed perpendicular to the steel joists 16 in. OC. All channels are tied to the bottom chord of each joist (and each cold rolled channel (Item 12), when used) with double strand of 18 SWG tie wire (Item 10). At each splice location the channel shall overlap 8 in. and be tied at each end of the overlap using 18 SWG tie wire.
13	Cold-Rolled Channels (Not Shown)	Min. 0.056 in. thick (18 gauge) cold-rolled steel channels, 1-1/2 in. deep with 1/2 in. flanges. When the composite steel joists are spaced more than 52 in. OC, a cold-rolled steel channel shall be suspended midway between joists with its web vertical and its lower flange flush with the plane at the bottom of the joists to provide an intermediate support for the furring channels (Item 11). The cold-rolled channels are suspended from hanger clips (Item 9) using 12 SWG galvanized steel hanger wire (Item 10) spaced max. 48 in. OC. Adjoining lengths of cold-rolled channel spliced together by overlapping a min. of 12 in., face to face or back to back, and tying with three double strands of 18 SWG galvanized steel wire. The spacing of the channels shall be no greater than the spacing of the joists.
14	Gypsum Board	Min. 1/2 in. thick Type C 4 ft. wide gypsum board listed for fire resistance rating by an approved agency, installed with the long dimension perpendicular to the furring channels and butt joints located between joists. End joints in adjacent rows to be staggered a min. of 48 in. When the end joint occurs within 12 in. of the steel beam it must be backed by a 3 in. wide strip of gypsum board. The gypsum board shall be fastened to the furring channels with 1 in. long Type S bugle head screws; spaced 8 in. OC in the perimeter with two screws located 3/4 in. and 4 in. from each board edge; and 12 in. OC in the field with 2 screws located 3/4 in. and 6 in. from each board edge.
15	Joint Tape and Compound (Not Shown)	Vinyl, dry or premixed joint compound, applied in two coats to joints and screw heads. 2 in. wide paper tape embedded in the first layer of compound over all joints.
16	Air Duct (Optional, Not Shown)	The duct shall be made of min. 0.023 in. thick (24 gauge) galvanized steel. The duct shall be supported by cold-rolled steel channels (Item 12) spaced at a max. 48 in. OC. Min. clearance of 3-1/2 in. is required between the back of the concrete slab and the top of the air duct. Total area of unprotected duct outlets shall not exceed 20 sq. in. per 100 sq. ft. of ceiling area. The area of an individual duct opening shall not exceed 20 sq. in.

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