

## Design No. L583

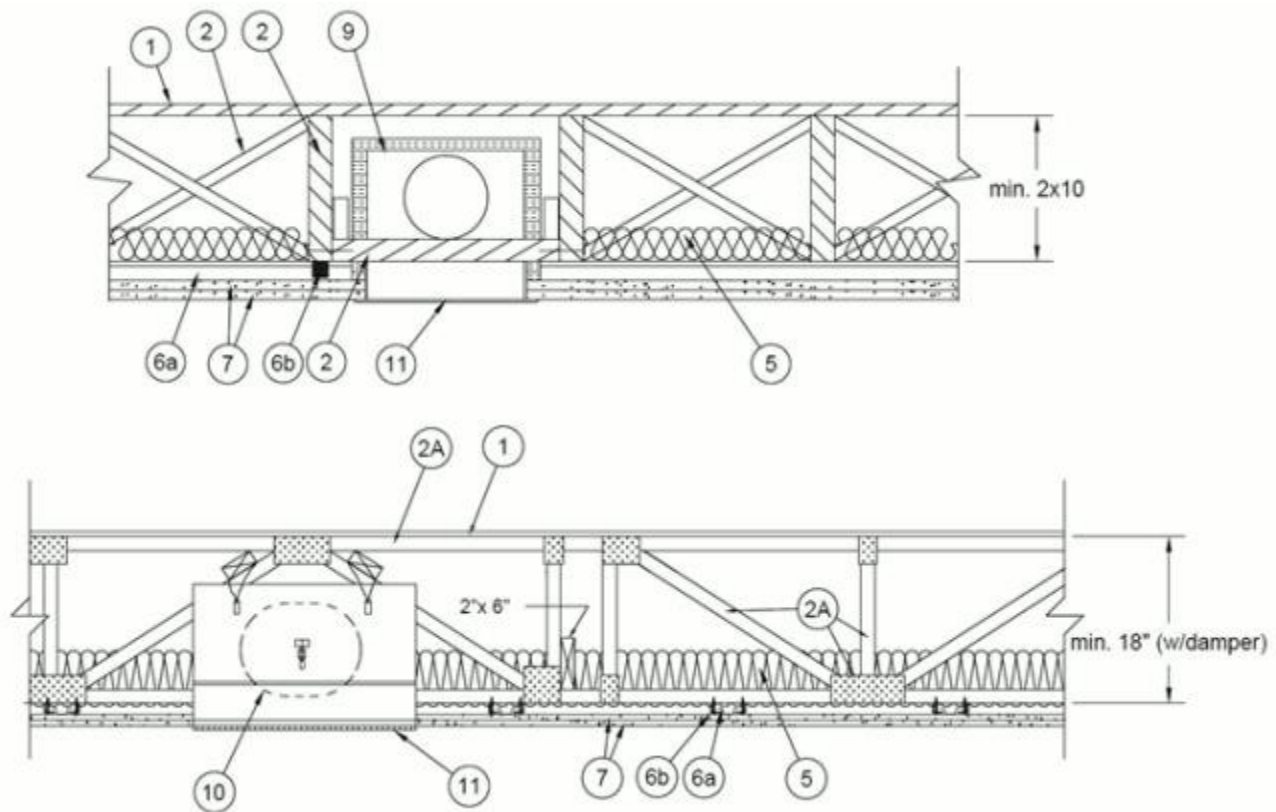
July 23, 2020

**Unrestrained Assembly Rating — 1 Hr**

**Finish Rating — 58 Min (See Item 2B)**

**This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide [BXUV](#) or [BXUV7](#)**

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



**1. Floor Systems** — The flooring system shall consist of one of the following:

### **System No. 1**

**Subflooring** — Min 23/32 in. thick T & G wood structural panels, min grade "Underlayment" or "Single-Floor". Face grain of plywood to be perpendicular to the joists or trusses with end joints staggered 4 ft. Plywood secured to joists or trusses with construction adhesive and No. 8d cement coated nails spaced 12 in. OC along each truss. Adhesive applied as 3/8 in. diam bead to top chord of joists or trusses and grooved edges of plywood.

### **System No. 2**

**Subflooring** — Min 23/32 in. thick T & G wood structural panels, min grade "Underlayment" or "Single-Floor". Face grain of plywood to be perpendicular to the joists or trusses with end joints staggered 4 ft. Plywood secured to joists or trusses with construction adhesive and No. 8d cement coated nails spaced 12 in. OC along each truss. Adhesive applied as 3/8 in. diam bead to top chord of joists or trusses and grooved edges of plywood.

**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 lightweight insulating concrete with **Perlite Aggregate\*** or **Vermiculite Aggregate\***, or gypsum concrete.

See **Perlite Aggregate** (CFFX) and **Vermiculite Aggregate** (CJZZ) categories for names of manufacturers.

### **System No. 3**

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses with joints staggered.

**Vapor Barrier** — (Optional) — Commercial asphalt saturated felt, 0.030 in. thick.

**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.

**HACKER INDUSTRIES INC** — Type Hacker Sound-Mat.

**Alternate Floor Mat Materials** — (Optional) — Floor mat material nom 1/4 in. (6 mm) 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. (32 mm) of floor-topping mixture.

**HACKER INDUSTRIES INC** — Type Hacker Sound-Mat II.

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

**HACKER INDUSTRIES INC** — FIRM-FILL SCM 125

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

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

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

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

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

**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 thickness a nom 1-1/4 in. over the floor mat.

**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. 4

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses with joints staggered.

**Vapor Barrier** — (Optional) - —Commercial asphalt saturated felt, 0.030 in. thick.

**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. 5

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses with joints staggered.

**Vapor Barrier** — (Optional) — Commercial asphalt saturated felt, 0.030 in. thick.

**Finish Flooring — Floor Topping Mixture\*** — Min 1-1/2 in. thickness of floor topping mixture having a min compressive strength of 1000 psi and a cast density of 100 plus or minus 5 pcf. Foam concentrate mixed 40:1 by volume with water and expanded at 100 psi through nozzle. Mixture shall consist of 1.4 cu feet of preformed foam concentrate to 94 lbs Type I Portland cement, 300 lbs of sand with 5-1/2 gal of water.

**ELASTIZELL CORP OF AMERICA** — Type FF

## System No. 6

Deleted.

## System No. 7

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses with joints staggered.

**Vapor Barrier** — (Optional) — Commercial asphalt saturated felt, 0.030 in. thick.

**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 Maxxon Standard and Maxxon High Strength

**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 Encapsulated Sound Mat.

**Floor Mat Reinforcement** — (Optional) Refer to manufacturer's instructions regarding minimum thickness of floor topping for use with floor mat reinforcement.

**Metal Lath** — (Optional) — 3/8 in. expanded galvanized steel diamond mesh, 3.4 lbs/sq yd loose laid over the floor mat material.

**Fiber Glass Reinforcement** — (Optional) 0.015 in. thick PVC coated non-woven fiberglass mesh, 0.368 lbs./sq. yd loose laid over the floor mat material.

## System No. 8

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses with joints staggered.

**Vapor Barrier** — (Optional) Commercial asphalt saturated felt, 0.030 in. thick.

**Alternate Floor Mat Material\*** — (Optional) Floor mat material nominal 2 - 9.5 mm thick loose laid over the subfloor. Floor topping shall be a min of 3/4 in.

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

**Finish Flooring — Floor Topping Mixture\*** — Min 3/4 in. thickness of floor topping having a min 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

## System No. 9

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses with joints staggered

**Vapor Barrier** — (Optional) — Commercial asphalt saturated felt, 0.030 in. thick.

**Alternate Floor Mat Material\*** — (Optional) — Floor mat material nominal 2 - 9.5 mm thick loose laid over the subfloor. Floor topping shall be a min of 3/4 in.

**ACG MATERIALS** — AccuQuiet types D13, D-18, D25, DX38, EM.125, EM.125S, EM.250, EM.250S, EM.375, EM.375S, EM.750, and EM.750S.

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

**ACG MATERIALS** — AccuCrete types NexGen, Green, Prime, B, M, and PrePour, AccuRadiant, AccuLevel types G40, G50 and SD30.

## System No. 10

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses 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. 11**

**Subflooring** — Min 3/4 in. thick plywood with exterior glue, conforming to PS 1-83, min grade "Standard". Face grain of plywood to be perpendicular to the joists or trusses 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, GSL-CSD and GSL RH

**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. 12

**Subflooring** — Min 23/32 in. thick T & G wood structural panels, min grade "Underlayment" or "Single-Floor". Face grain of plywood to be perpendicular to the joists or trusses with end joints staggered 4 ft. Plywood secured to joists or trusses with construction adhesive and No. 8d cement coated nails spaced 12 in. OC along each truss. Adhesive applied as 3/8 in. diam bead to top chord of joists or trusses and grooved edges of plywood.

**Finish Flooring - Floor Topping Mixture\*** — Min 1 in. thickness of floor topping mixture having a min compressive strength of 4500 psi. Refer to manufacturer's instructions accompanying the material for specific mix design.

**SIKA DEUTSCHLAND GMBH** — Type SCHONOX AP Rapid Plus

## System No. 13

**Subflooring** — Min 23/32 in. thick T & G wood structural panels, min grade "Underlayment" or "Single-Floor". Face grain of plywood to be perpendicular to the joists or trusses with end joints staggered 4 ft. Plywood secured to joists or trusses with construction adhesive and No. 8d cement coated nails spaced 12 in. OC along each truss. Adhesive applied as 3/8 in. diam bead to top chord of joists or trusses and grooved edges of plywood.

**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 - Floor Topping Mixture\*** — 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, Not Shown) - 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.

**LOW & BONAR INC** — EnkaSonic® by Colbond a member of the Low & Bonar group Types 125, 250, 250 Plus, 400, 400 Plus, 750 and 750 Plus.

**Floor Mat Reinforcement** — (Optional) - Refer to manufacturer's instructions regarding minimum thickness of floor topping for use with floor mat reinforcement.

**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.

2. **Wood Joists** — Min 2 by 10, spaced max 16 in. OC and effectively fireblocked in accordance with local codes. Cross bridging shall be min 1 by 3 in. or min 2 by 10 solid blocking. When ceiling damper (Item 10) is employed, wood 2 by 4 in. horizontal bridging used in lieu of cross bridging and secured between joists with nails.

2A. **Trusses** — As an alternate to Item 2, Parallel chord trusses, spaced a max of 24 in. OC, fabricated from nom 2 by 4 lumber, with lumber oriented vertically or horizontally. Min truss depth is 12 in. Truss members secured together with min 0.0356 in. thick galv steel plates. Plates have 5/16 in. long teeth projecting perpendicular to the plane of the plate. The teeth are in pairs facing each other (made by the same punch), forming a split tooth type plate. Each tooth has a chisel point on its outside edge. These points are diagonally opposite each other for each pair. The top half of each tooth has a twist for stiffness. The pairs are repeated on approx. 7/8 in. centers with four rows of teeth per inch of plate width. The finish rating has only been determined when parallel chord trusses are used.

2B. **Alternate to Item 2: Structural Wood Members** — Min 9-1/2 in. deep "I" shaped wood joists spaced at a max of 24 in. OC. Joists shall conform to ICC-ES ESR-1153 Report. Joist top and bottom chords minimum 1-3/8 in. deep by 2.3 in. wide and constructed of either Microllam laminated veneer lumber (LVL) or TimberStrand laminated strand lumber (LSL). Webs constructed of minimum 3/8 in. thick Performance Plus OSB, PS2, Exposure 1. Installation shall be in accordance with manufacturers published literature.

3. **Bearing** — (Not Shown) — When the wood joists or trusses described in Item 2 and 2A are used, factory-installed bearing clips, formed of min 0.084 in. (13 gauge) galv steel shall be used to attach the joists or trusses to the bearing plate.

4. **Bridging** — (Not Shown) — When the wood joists or trusses described in Item 2 and 2A are used, nom 2 by 6 in. lumber attached to each joist or truss with two, min 0.045 in. thick (18-gauge) galv bridging clips. The bridging clips are pin-connected to the joists or trusses and nailed to the bridging lumber with four 3 in. long 10d nails.

5. **Batts and Blankets\*** — Glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. Nom 6-1/4 in. thick, nom 0.5 pcf density insulation shall be draped over the furring channels (Item 6a) and gypsum board ceiling membrane, and friction-fitted between joists or trusses.

6. **Steel Framing Members\*** —

a. **Furring Channels** — Formed of No. 25 MSG galv steel, 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC (16 in. OC when Item 7A is used) perpendicular to joists or trusses. Channels secured to joists or trusses as described in Item b. Ends of adjoining channels overlapped 4 in. and tied together with double strand of No. 18 AWG galv steel wire near each end of overlap.

b. **Steel Framing Members\*** — Used to attach furring channels (Item a) to joists or trusses (Item 2, or 2A). Clips spaced max. 48 in. OC, and secured to the bottom chord of joists or trusses with two No. 8 x 2-1/2 in. course thread drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips. Adjoining channels are overlapped as described in Item a.

**KINETICS NOISE CONTROL INC** — Type Isomax

6A. **Steel Framing Members\*** — (Optional, Not Shown) — As an alternate to Item 6.



a. **Furring Channels** — Formed of No. 25 MSG galv steel, nominal 2-1/2 in. wide by 7/8 in. deep, spaced 24 in. OC (16 in. OC when Item 7A is used) perpendicular to the trusses. Channels secured to Cold Rolled Channels at every intersection with a 3/4 in. TEK screw through each furring channel leg. Ends of adjoining channels overlapped 12 in. and fastened together with two double strand No. 18 SWG galv steel wire ties, one at each end of overlap, or with two 3/4 in. TEK screws in each leg of the overlap section. Gypsum board (Item 7) butted end joints centered on the furring channels, each extending a min of 6 in. beyond both side edges of the board.

b. **Cold Rolled Channels** — 1-1/2 in. by 1/2 in., formed from No. 16 ga. galv steel, positioned vertically and parallel to trusses, friction-fitted into the channel caddy on the Steel Framing Members (Item 6Ad) and secured with two 3/4 in. TEK screws. Adjoining lengths of cold rolled channels lapped min. 12 in. and secured along bottom legs with four 3/4 in. TEK screws and wire-tied together with two double strand 18 SWG galv steel wire ties, one at each end of overlap.

c. **Blocking** — Where truss design does not permit direct, full contact of the hanger bracket, a piece of nominal 2 by 4 in. lumber (blocking), min. 12 in. long to permit full contact of the hanger bracket, to be secured vertically to the side of the trusses at the top and bottom of the blocking at each Steel Framing Member (Item 6Ad) location with 16d nails or minimum 2-1/2 in. screws.

d. **Steel Framing Members\*** — Spaced 48 in. OC. max along truss, and secured to the truss on alternating trusses with two, #10 x 1-1/2 in. screws through mounting holes on the hanger bracket.

**PAC INTERNATIONAL L L C** — Type RSIC-SI-CRC EZ Clip

6B. **Steel Framing Members\*** — (Not Shown) — As an alternate to Item 6.

a. **Furring Channels** — Formed of No. 25 MSG galv steel, nominal 2-1/2 in. wide by 7/8 in. deep, spaced 24 in. OC (16 in. OC when Item 7A is used) perpendicular to trusses and friction fit into Steel Framing Members (Item 6Bc). Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap or with two TEK screws along each leg of the 6 in. overlap. Gypsum board (Item 7) butted end joints centered on the furring channels. Butt joint channels held in place by strong back channels placed upside down, on top of, and running perpendicular to primary furring channels, extending 6 in. longer than length of gypsum side joint. Strong back channels spaced maximum 48 in. OC. Strong back channels secured to every intersection of primary furring channels with four 7/16 in. pan head screws, two along each of the legs at intersections. Butt joint channels run perpendicular to strong back channels and shall be minimum 6 in. longer than length of joint, secured to strong back channels with 7/16 in. pan head screws, two along each of the legs at intersection with strong back channels.

b. **Blocking** — Where truss design does not permit direct, full contact of the hanger bracket, a piece of nominal 2 by 4 in. lumber (blocking), min. 12 in. long to permit full contact of the hanger bracket, to be secured vertically to the side of the trusses at the top and bottom of the blocking at each Steel Framing Member (Item 6Bc) location with 16d nails or minimum 2-1/2 in. screws.

c. **Steel Framing Members\*** — Used to attach furring channels (Item 6Ba) to trusses. Clips spaced 48 in. OC and secured along truss webs at each furring channel intersection with min. 3/4 in. long self-drilling #10 x 1-1/2 in. screws through each of the provided hole locations. Furring channels are friction fitted into clips.

**PAC INTERNATIONAL L L C** — Type RSIC-S1-1 Ultra

7. **Gypsum Board\*** — Two layers of nom 5/8 in. thick, 4 ft wide gypsum board panels are installed with long dimensions perpendicular to furring channels (Item 6a). Base layer attached to the furring channels using 1 in. long Type S bugle-head steel screws spaced 12 in. OC in the field of the board and along butted end joints, with the two end screws located 1-1/2 in. from the board edge. Butted end joints centered on the continuous furring channels. Butted base layer end joints to be offset a min of 24 in. in adjacent courses. Outer layer attached to the furring channels using 1-5/8 in. long Type S bugle-head steel screws spaced 12 in. OC in the field and along butted end joints, with the last two screws located 1-1/2 in. and 6 in. from the board edge. Butted end joints centered on the continuous furring channels and offset a min of 24 in. from butted end joints of base layer. Butted side joints of outer layer to be offset min 12 in. from butted side joints of base layer. Outer layer shall be finished as described in Item 8.

When **Steel Framing Members** (Item 6A) are used, Two layers of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 7. Adjacent butt joints staggered minimum 48 in. OC.

When **Steel Framing Members** (Item 6B) are used, Two layers of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 7. Butt joints staggered minimum 24 in. OC.

**AMERICAN GYPSUM CO** — Types AG-C

**CGC INC** — Types C, IP-X2, IPC-AR.

**UNITED STATES GYPSUM CO** — Types C, IP-X2, IPC-AR.

**USG BORAL DRYWALL SFZ LLC** — Type C

**USG MEXICO S A DE C V** — Types C, IP-X2, IPC-AR.

7A. **Gypsum Board\*** — (As an alternative to Item 7) Two layers of nom 5/8 in. thick, 48 in. wide gypsum board, installed and secured as described in Item 7 with max screw spacing 8 in. OC (both layers).

**CGC INC** — ULIX

**UNITED STATES GYPSUM CO** — ULIX

8. **Finishing System** — (Not shown) - Vinyl, dry or premixed joint compound, applied in two coats to joints and screw-heads. 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.

9. **Air Duct\*** — (Optional, for use only when Item 2 and 2A is used) — Any UL Class 0 or Class 1 flexible air duct installed in accordance with the instructions provided by the damper manufacturer.

10. **Ceiling Damper\*** — (Optional, for use only when Item 2 is used, not for use with Item 2A) — Max nom area shall be 198 sq in. Max rectangular size shall be 12 in. wide by 16-1/2 in. long. Max height of damper shall be 8-3/4 in. Aggregate damper openings shall not exceed 99 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper. A steel grille (Item 11) shall be installed in accordance with installation instructions.

**AIR KING VENTILATION PRODUCTS** — Series FRAS, Series FRAK, Series FRAKV

**CENTRAL VENTILATION SYSTEMS CO L L C** — Models C-S/R-HC(-A), C-RD-HC(-A)

**METAL-FAB INC** — Models MSCDHC, MRCDHC

**METAL INDUSTRIES INC** — Models CD-S/R-HC, CD-S/R-HC-A, CD-RD-HC, CD-RD-HC-A

**NCA MFG INC** — Models CD-S/R-HC, CD-S/R-HC-A, CD-RD-HC , CD-RD-HC-A

**BRISK MFG INC** — Model BMI-50-CRD-S/R-WT

**PRICE INDUSTRIES LTD** — Models CD-S/R-HC, CD-RD-HC

**RUSKIN COMPANY** — Model CFD7

**UNITED ENERTECH CORP** — Models C-S/R-HC(-A), C-RD-HC(-A)

10A. **Ceiling Damper\*** — (Optional, for use only when Item 2A is used) — For use with min 18 in. deep trusses. Max nom area shall be 324 sq in. Max square size shall be 18 in. by 18 in. Rectangular sizes not to exceed 324 sq in. with a max width of 18 in. Max height of damper shall be 14 in. Aggregate damper openings shall not exceed 162 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper. A steel grille (Item 11) shall be installed in accordance with installation instructions.

**C&S AIR PRODUCTS** — Model RD-521

**POTTORFF** — Model CFD-521

10B. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) — Max nom area shall be 196 sq in. Max square size shall be 14 in. by 14 in. Rectangular sizes not to exceed 196 sq in. with a max width of 26 in. Max height of damper shall be 7 in. Aggregate damper openings shall not exceed 98 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper. A steel grille (Item 11) not to exceed 144 in.<sup>2</sup> shall be installed in accordance with installation instructions.

**C&S AIR PRODUCTS** — Model RD-521-BT

**POTTORFF** — Model CFD-521-BT

10C. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) — For use with min 18 in. deep trusses. Max nom area shall be 256 sq in. with the length not to exceed 24 in. and the width not to exceed 20 in. Max height of damper shall be 17 in. Aggregate damper openings shall not exceed 128 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper. A steel grille (Item 11) shall be installed in accordance with installation instructions.

**C&S AIR PRODUCTS** — Model RD-521-IP, RD-521-NP

**POTTORFF** — Models CFD-521-IP, CFD-521-NP

10D. **Alternate Ceiling Damper\*** — For use with min 18 in. deep trusses. Max nom area shall be 144 sq in. with the length not to exceed 14 in. and the width not to exceed 12 in. Max height of damper shall be 17-7/8 in. Aggregate damper openings shall not exceed 74 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper. A steel grille (Item 11) shall be installed in accordance with installation instructions.

**C&S AIR PRODUCTS** — Model RD-521-90, RD-521-NP90

**POTTORFF** — Models CFD-521-90, CFD-521-90NP

10E. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) — Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 75 sq in. with the length not to exceed 8-9/16 in. and the width not to exceed 8-3/4 in. Max height of damper shall be 9-7/8 in. Aggregate damper openings shall not exceed 38 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturers installation instructions provided with the damper. A plastic grille (Item 12) shall be installed in accordance with installation instructions.

**DELTA ELECTRONICS INC** — Models CRD2, GBR-CRD, ITG-CRD

10F. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 75 sq in. with the length not to exceed 9-1/4 in. and the width not to exceed 9-3/4 in. Max height of damper shall be 9-7/8 in. Aggregate damper openings shall not exceed 45 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturer's installation instructions provided with the damper. A plastic grille (Item 11) shall be installed in accordance with installation instructions.

**DELTA ELECTRONICS INC** — Model SIG-CRD

10G. **Alternate Ceiling Damper\*** — Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 131 sq in. with the length not to exceed 11-1/16 in. and the width not to exceed 11-7/8 in. Aggregate damper openings shall not exceed 66 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturer's installation instructions provided with the damper. A plastic grille (Item 11) shall be installed in accordance with installation instructions.

**DELTA ELECTRONICS INC** — Model SMT-CRD

10H. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 103 sq in. with the length not to exceed 10-1/8 in. and the width not to exceed 10-1/8 in. Aggregate damper openings shall not exceed 52 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturer's installation instructions provided with the damper. A plastic grille (Item 11) shall be installed in accordance with installation instructions.

**PANASONIC CORPORATION, PANASONIC CORPORATION OF NORTH AMERICA** — Model PC-RD05C5

10I. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 113 sq in. with the length not to exceed 10-1/8 in. and the width not to exceed 11-1/8 in. Aggregate damper openings shall not exceed 57 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturer's installation instructions provided with the damper. A plastic grille (Item 11) shall be installed in accordance with installation instructions.

**BROAN-NUTONE L L C** — Model RDFUWT

10J. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 79 sq in. with the length not to exceed 10 in. and the width not to exceed 7-15/16 in. Aggregate damper openings shall not exceed 40 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturer's installation instructions provided with the damper. A metallic grille (Item 11) shall be installed in accordance with installation instructions.

**BROAN-NUTONE L L C** — Models RDJ1 and RDH

10K. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 87 sq in. with the length not to exceed 9 in. and the width not to exceed 9-11/16 in. Aggregate damper openings shall not exceed 44 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturer's installation instructions provided with the damper. A plastic grille (Item 11) shall be installed in accordance with installation instructions.

**BROAN-NUTONE L L C** — Model RDMWT

10L. **Alternate Ceiling Damper\*** — Ceiling damper & fan assembly for use with min 18 in. deep trusses. Max nom area shall be 87 sq in. with the length not to exceed 9 in. and the width not to exceed 9-11/16 in. Aggregate damper openings shall not exceed 44 sq in. per 100 sq ft of ceiling area. Damper shall be installed in combination with one of the fan models described in, and in accordance with, the manufacturer's installation instructions provided with the damper. A plastic grille (Item 11) shall be installed in accordance with installation instructions.

**BROAN-NUTONE L L C** — Model RDMWT2

10M. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) For use with min 18 in. deep trusses. Max nom 21 in. long by 18 in. wide, fabricated from galvanized steel. Plenum box max size nom 21 in. long by 18 in. wide by 14 in. high (inner dimension) fabricated from either galvanized steel or min 1 in. thick Listed Duct Board

bearing the UL Listing Marking having a min R-Value of 4.3. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 180 sq in. per 100 sq ft of ceiling area.

**GREENHECK FAN CORP** — Model CRD-1WT

10N. **Alternate Ceiling Damper\*** — (Optional, for use only when Item 2A is used) For use with min 18 in. deep trusses. Max nom 12 in. long by 12 in. wide with an 8 in. diameter damper, fabricated from galvanized steel. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 72 sq in. per 100 sq ft of ceiling area.

**GREENHECK FAN CORP** — Model CRD-2WT

10O. **Damper\*** — (Optional, for use only when Item 2A is used. To be used with Air Duct Item 9) For use with min 18 in. deep trusses. Max nom 11-1/8 in. long by 13-5/8 in. wide, fabricated from galvanized steel. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 76 sq in. per 100 sq ft of ceiling area.

**GREENHECK FAN CORP** — Model CRD-310WT

10P. **Damper\*** — (Optional, for use only when Items 2A and 9) For use with min 18 in. deep trusses. Max nom 12-3/8 in. long by 14-1/2 in. wide, fabricated from galvanized steel. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 90 sq in. per 100 sq ft of ceiling area.

**GREENHECK FAN CORP** — Model CRD-320WT

11. **Grille** — Grille installed in accordance with the installation instructions provided with the ceiling damper.

**\* 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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