Design No. L585
October 23, 2019

Unrestrained Assembly Rating — 1 Hr.
Finish Rating — 22 Min

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

**System No. 1**

**Subflooring** — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or nonveneer APA Sturd-I-Floor T & G panels per APA specifications PRP 108. Face grain of plywood or strength axis of panel to be perpendicular to trusses with joints staggered 4 ft. Plywood or panels secured to trusses with No. 6d ring shank nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

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

**Finish Flooring** — Min 1 by 4 in. T & G lumber fastened diagonally to trusses, or min 15/32 in. plywood, min grade “Underlayment” or “Sturd-I-Floor” with T & G edges and conforming with PS1-83 specifications, or nonveneer APA rated Sturd-I-Floor, T & G panels per APA
specifications PRP-108. Face grain of plywood to be perpendicular to joists with joints staggered.

**System No. 2**

**Subflooring** — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with joints staggered 4 ft. Plywood or nonveneer APA rated panels secured to trusses with construction adhesive and No. 6d ring shank nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

**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 minimum compressive strength of 1500 psi.

**MAXXON CORP** — Types D-C, GC, GC 2000, L-R, T-F, CT, SS

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

**Floor Mat Materials** — (Optional) — Floor mat material loose laid over the subfloor.


**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. 3**

**Subflooring** — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or nonveneer APA Sturd-I-Floor T & G panels per APA specifications PRP 108. Face grain of plywood or strength axis of panel to be perpendicular to trusses with joints staggered 4 ft. Plywood or panels secured to trusses with No. 6d ring shank nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

**Vapor Barrier** — (Optional) Nom 0.030 in. thick commercial asphalt saturated felt.
**System No. 4**

**Subflooring** — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or nonveneer APA Sturd-I-Floor T & G panels per APA specifications PRP 108. Face grain of plywood or strength axis of panel to be perpendicular to trusses with joints staggered 4 ft. Plywood or panels secured to trusses with No. 6d ring shank nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

**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

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**System No. 5**
**Subflooring** — Min 23/32 in. thick T & G wood structural panels, min grade "Underlayment" or "Single Floor". Face grain of plywood or strength axis of panel to be perpendicular to the joists with end joints staggered. Plywood or panels secured to trusses with construction adhesive and No. 6d ringed shank nails. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d ring shank nails.

**Floor Mat Materials*** — (Optional) — Floor mat material nom 5/64 in. (2 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 in. of floor-topping mixture.

**ECORE INTERNATIONAL INC** — Type QTscu 4002

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

**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 3/4 in. (19 mm).

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

**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 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. 6

Subflooring — Min 23/32 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) — 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 — Type 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 — Type 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 — Type 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 — Type 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 — Quiet Qurl 55/025 MT and Quiet Qurl 55/025 N MT

System No. 7

Subflooring — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or nonveneer APA Sturd-I-Floor T & G panels per APA specifications PRP 108. Face grain of plywood or strength axis of panel to be perpendicular to trusses with joints staggered 4 ft. Plywood or panels secured to trusses with No. 6d ring shank nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

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.

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

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 P80, C40, D13, D-18, D25, DX38, EM.125, EM.125S, EM.250, EM.250S, EM.375, EM.375S, EM.750, and EM.750S.

System No. 8
**Subflooring** — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or nonveneer APA Sturd-I-Floor T & G panels per APA specifications PRP 108. Face grain of plywood or strength axis of panel to be perpendicular to trusses with joints staggered 4 ft. Plywood or panels secured to trusses with No. 6d ring shank nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

**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** — 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** — Type 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** — Type 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** — Type 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** — Type 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** — Quiet Qurl 55/025 MT and Quiet Qurl 55/025 N
System No. 9

Subflooring — Min 23/32 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) — 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 3/32 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

PLITEQ INC — Type GenieMat RST02

Floor Mat Materials* — (Optional) — Nom 3/16 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 3/4 in.

PLITEQ INC — Type GenieMat FF03NP

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.

PLITEQ INC — Type GenieMat FF06

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

PLITEQ INC — Type GenieMat FF10

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

PLITEQ INC — Type GenieMat FF17

Floor Mat Materials* — (Optional) — Nom 1 in. thick loose laid over the subfloor. Floor topping thickness shall be a minimum of 1-1/2 in.
PLITEQ INC — Type GenieMat FF25

System No. 10

Subflooring — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or nonveneer APA Sturd-I-Floor T & G panels per APA specifications PRP 108. Face grain of plywood or strength axis of panel to be perpendicular to trusses with joints staggered 4 ft. Plywood or panels secured to trusses with No. 6d ring shank nails spaced 12 in. OC along each truss. Staples having equal or greater withdrawal and lateral resistance strength may be substituted for the 6d nails.

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

2. Trusses — 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 18 in. Truss members secured together with min 0.0356 in. thick galvanized 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 tool 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.

3. Air Duct* — (Optional) — Any UL Class 0 or Class 1 flexible air duct installed in accordance with the instructions provided by the damper manufacturer.

4. Damper* — (Optional. To be used with Air Duct Item 3.) — Max nom 20 in. long by 18 in. wide by 2-1/8 in. high, fabricated from galvanized steel. Plenum box max size nom 21 in. long by 18 in. wide by 16 in. high fabricated from either galvanized steel or Classified Air Duct Materials bearing the UL Classification Marking for Class 0 or Class 1 rigid air duct material. 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.

NAILOR INDUSTRIES INC — Types 0755, 0755A, 0756, 0756D, 0757, 0757D, 0757FP, 0757DFP, 0758, 0759, 0760, 0761, 0762, 0763, CRD5, CRD5D, CRD6, CRD6D, CRD6FP, CRD6DFP.

SAFE AIR DOWCO — 0455, 0455A, 0456, 0456D, 0457, 0457D, 0457-DB, 0457-CB, 0463-FB, 0457-EB, 0463-GB, 0463
4A. Alternate Ceiling Damper* — 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 9) shall be installed in accordance with installation instructions.

C&S AIR PRODUCTS — Model RD-521

POTTORFF — Model CFD-521

4B. Alternate Ceiling Damper* — 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 9) not to exceed 144 in.\(^2\) shall be installed in accordance with installation instructions.

C&S AIR PRODUCTS — Model RD-521-BT

POTTORFF — Model CFD-521-BT.

4C. Alternate Ceiling Damper* — (Optional. To be used with Air Duct Item 3.) — 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 9) 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

4D. 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 9) 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

4E. **Alternate Ceiling Damper** — For use with min 18 in. deep trusses Max plenum box size nom 19 in. long by 19 in. wide and 11-7/8 in. high fabricated from galv steel. 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.

**AIRE TECHNOLOGIES INC** — Models: CRD model 50 w/Boot, CRD model 50EA w/Boot, CRD model 55 w/Boot, CRD model 55 EA w/Boot

**LLOYD INDUSTRIES INC** — Model CRD 50-BT, CRD 50-EA-BT, CRD 55-BT, CRD 55 EA-BT

4F. **Alternate Ceiling Damper** — For use with min 18 in. deep trusses Max plenum box size nom 13 in. long by 13 in. wide and 11-7/8 in. high fabricated from galv steel. Aggregate damper openings shall not exceed 50 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper.

**LLOYD INDUSTRIES INC** — Model CRD 50-BT-6, CRD 50-EA-BT-6, CRD 55-BT-6, CRD 55 EA-BT-6, CRD50-**X-BT-6**

4G. **Alternate Ceiling Damper** — For use with min 18 in. deep trusses Max size ceiling outlet in plenum box nom 12 in. long by 12 in. wide. Plenum box fabricated from galv steel. Aggregate damper openings shall not exceed 72 sq in. per 100 sq ft of ceiling area. Installed in accordance with the manufacturers installation instructions provided with the damper.

**AIRE TECHNOLOGIES INC** — Models: CRD model 50 w/Boot, CRD model 50EA w/Boot, CRD model 55 w/Boot, CRD model 55 EA w/Boot

**LLOYD INDUSTRIES INC** — Model CRD 50-95BT, CRD 50-EA-95BT, CRD 55-95BT, CRD 55 EA-95BT
4H. **Alternate Ceiling Damper**—For use with min 18 in. deep trusses. Max size ceiling outlet in plenum box nom 16 in. long by 16 in. wide. 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.

**CROWN PRODUCTS CO INC** — Models CRD50-FGPB-4.2-CP, -6.0-CP; CRD50-FGPB-4.2-EA-CP, -6.0-EA-CP

**LLOYD INDUSTRIES INC** — Models CRD 50-FGPB-4.2, -4.2 NI, -6.0, -6.0 NI; CRD50-EA-FGPB-4.2, -4.2 NI, -6.0, -6.0 NI

4L. **Ceiling Damper**—For use with min 18 in. deep trusses. Max plenum box size nom 15 in. long by 15 in. wide and 11-7/8 in. high fabricated from galv steel. Aggregate damper openings shall not exceed 72 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper.

**LLOYD INDUSTRIES INC** — Models 45-CRD-LT-BT and 45-CRD-LTD-BT

4J. **Alternate Ceiling Damper**—For use with min 18 in. deep trusses. Max size ceiling outlet in plenum box nom 10 in. long by 10 in. wide. Plenum box fabricated from galv steel. Aggregate damper openings shall not exceed 50 sq in. per 100 sq ft of ceiling area. Installed in accordance with the manufacturers installation instructions provided with the damper.

**LLOYD INDUSTRIES INC** — Model 45-LTD-95-BT-4

4K. **Alternate Ceiling Damper**—For use with min 18 in. deep trusses. Max plenum box size nom 19 in. long by 15 in. wide and 11-7/8 in. high fabricated from galv steel. Aggregate damper openings shall not exceed 96 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturers installation instructions provided with the damper.

**LLOYD INDUSTRIES INC** — Model CRD50-“ X-BT

4L. **Alternate Ceiling Damper**—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 9) shall be installed in accordance with installation instructions.
DELTA ELECTRONICS INC — Models CRD2, GBR-CRD, ITG-CRD

4M. Alternate Ceiling Damper* — 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 length of 20 in. and a max width of 22 in. Max height of damper shall be 14 in. Aggregate damper openings shall not exceed 154 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturer’s installation instructions provided with the damper. An aluminum or steel grille shall be installed in accordance with installation instructions.

UNITED ENERTECH CORP — Type C-S/R-WT or C-S/R-WTP (Max nom area 324 sq. in.) or C-S/R-WTS or C-S/R-WTPS (Max nom area 162 sq. in.)

4N. Alternate Ceiling Damper* — 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 9) shall be installed in accordance with installation instructions.

DELTA ELECTRONICS INC — Model SIG-CRD

4O. 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 9) shall be installed in accordance with installation instructions.

DELTA ELECTRONICS INC — Model SMT-CRD

4P. Alternate Ceiling Damper* — 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 9) shall be installed in accordance with installation instructions.
4Q. **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 9) shall be installed in accordance with installation instructions.

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

4R. **Alternate Ceiling Damper**— 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 9) shall be installed in accordance with installation instructions.

**BROAN-NUTONE LLC** — Model RDFUWT

4S. **Alternate Ceiling Damper**— 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 9) shall be installed in accordance with installation instructions.

**BROAN-NUTONE LLC** — Models RDJ1 and RDH

4T. **Alternate Ceiling Damper**— For use with min 18 in. deep trusses. Max nom area shall be 349 sq in. Max overall length and width shall not exceed 18-11/16 in. by 18-11/16 in. with max 16 in. by 16 in. register opening. Aggregate damper openings shall not exceed 175 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 9) shall be installed in accordance with installation instructions.

**MIAMI TECH INC** — Model Series RxCRD, RxCRDS or RxCRPD
4U. **Alternate Ceiling Damper** — For use with min 18 in. deep trusses. Max plenum box size nom 19 in. long by 19 in. wide and 11-7/8 in. high fabricated from galv steel. Aggregate damper openings shall not exceed 128 sq in. per 100 sq ft of ceiling area. Damper installed in accordance with the manufacturer's installation instructions provided with the damper.

**METAL-FAB INC** — Models MSCD-HC and MRCD-HC

4V. **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 9) shall be installed in accordance with installation instructions.

**BROAN-NUTONE L L C** — Model RDMWT

4W. **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 9) shall be installed in accordance with installation instructions.

**BROAN-NUTONE L L C** — Model RDMWT2

4X. **Alternate Ceiling Damper** — (Optional, to be used with Air Duct Item 3) — 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
4Y. **Alternate Ceiling Damper** — (Optional, to be used with Air Duct Item 3) — 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

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4Z **Alternate Ceiling Damper** — (Optional. To be used with Air Duct Item 3.) For use with min 18 in. deep trusses. Max 12 in. diameter damper and insulated register box assembly. The maximum size of the register box assembly is nom. 20 in. long by 20 in. wide and 4 in. high fabricated from galv steel. The aggregate area of the register opening(s) through the ceiling membrane shall not exceed 128 sq in. per 100 sq ft of ceiling area. Damper assembly installed in accordance with the manufacturers installation instructions.

**AIRE TECHNOLOGIES INC** — Model 57IB.

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4AA. **Alternate Ceiling Damper** — (Optional. To be used with Air Duct Item 3.) For use with min 18 in. deep trusses. Max 20 in. long by 16 in. wide by 4 in. high rectangular damper with plenum box assembly. The maximum outer dimensions of the plenum box assembly is 23-1/2 in. long by 19-1/2 in. wide and 17 in. high fabricated from 6pcf, 1-1/2 to 2 in. thick Knauf Air Duct Board M*. The aggregate area of the register opening(s) through the ceiling membrane shall not exceed 160 sq in. per 100 sq ft ceiling area. Damper assembly installed in accordance with the manufacturers installation instructions.

**AIRE TECHNOLOGIES INC** — Series 58.

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4AB. **Alternate Ceiling Damper** — (Optional. To be used with Air Duct, Item 3) — For use with min 18 in. deep trusses. Max 14 in. long by 14 in. wide and 18 in. high ceiling damper with boot or box assembly, fabricated from galv steel. The aggregate area of the register opening(s) through the ceiling membrane shall not exceed 98 sq in. per 100 sq ft of ceiling area. Damper assembly installed in accordance with the manufacturers installation instructions.

**AIRE TECHNOLOGIES INC** — Model 51 w/Boot.

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4AC. **Alternate Ceiling Damper** — (Optional. To be used with Air Duct, Item 3) — For use with min 18 in. deep trusses. Max nom 18 in. long by 18 in. wide, fabricated from galvanized steel. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 162 sq in. per 100 sq ft of ceiling area.

**RUSKIN COMPANY** — Model CRF7T
4AD. **Alternate Ceiling Damper** — (Optional. To be used with Air Duct, Item 3) — For use with min 18 in. deep trusses. Max 8 in. diameter damper, fabricated from galvanized steel. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 25 sq in. per 100 sq ft of ceiling area.

**RUSKIN COMPANY — Model CFDR7T**

4AE. **Damper** — (Optional, to be used with Air Duct Item 3) 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**

5. **Batts and Blankets** — (Optional) — Max 3-1/2 in. thickness of glass fiber insulation. Insulation secured to plywood subfloor with staples spaced 12 in. OC., loosely laid on the back of the gypsum board, or fastened to the trusses with 0.090 in. diam galv steel wires spaced 12 in. OC. Any glass fiber insulation bearing the UL Classification Marking for Surface Burning Characteristics and/or Fire Resistance, and having a min density of 0.5 pcf may be used.

6. **Resilient Channels** — Resilient channels formed of 25 MSG galv steel, spaced 16 in. OC perpendicular to trusses. When Batts and Blankets (Item 5) are loosely laid on the back of the gypsum board, channels are spaced a maximum of 12 in. OC. perpendicular to the trusses. Channels secured to each truss with 1-1/4 in. long Type S bugle head steel screws. Channels overlapped 4 in. at splices. Two channels, spaced 6 in. OC, oriented opposite each gypsum board end joint as shown in the above illustration. Additional channels shall extend min 6 in. beyond each side edge of board.

6D. **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 as indicated in Item 6, 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. Two furring channels used at end joints of gypsum board (Item 7), 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 6Dd) 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 6Dd) 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-S1-CRC EZ Clip

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6E. **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 as indicated in Item 6, perpendicular to trusses and friction fit into Steel Framing Members (Item 6Ec). 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. Two furring channels used at end joints of gypsum board (Item 7). 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 6Ec) location with 16d nails or minimum 2-1/2 in. screws.

c. **Steel Framing Members*** — Used to attach furring channels (Item 6Ec) 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** — Nom 5/8 in. thick, 48 in. wide gypsum board installed with long dimension perpendicular to resilient channels. Gypsum board secured with 1 in. long Type S bugle head steel screws spaced 12 in. OC and located a min of 5/8 in. from side joints and 3 in. from the end joints. End joints secured to both resilient channels as shown in end joint detail. When **Batts and Blankets** (Item 5) are loosely laid on the back of the gypsum board, gypsum board secured to resilient channels with 1 in. long Type S bugle head screws spaced a maximum 8 in. OC. and located a min. of 5/8 in. from side and end joints. When **Steel Framing Members** (Item 6A) are used, one layer of nom 5/8 in. thick, 4 ft wide gypsum board is installed with long dimensions perpendicular to furring channels. Gypsum board secured to furring channels with nom 1 in. long No. 6 Type S bugle-head steel screws spaced 12 in. OC in the field of the board. Screw spacing is reduced to 8 in. OC when insulation is applied over the furring channel/gypsum panel ceiling membrane. Gypsum board butted end joints shall be staggered minimum 16 in. within the assembly. At the gypsum board butt joints, each end of each gypsum board shall be supported by a single length of furring channel equal to the width of the gypsum board plus 6 in. on each end. These additional furring channels shall be attached to underside of the truss with Genie clips as described in Item 6A. Screw spacing along the gypsum board butt joint shall be 6 in. OC. When **Steel Framing Members** (Item 6B) are used, one layer of nom 5/8 in. thick, 4 ft wide gypsum board is installed with long dimensions perpendicular to furring channels. Gypsum board secured to furring channels with nom 1 in. long Type S bugle-head steel screws spaced 8 in. OC in the field of the board. Gypsum board butted end joints shall be staggered minimum 48 in. and centered over main furring channels. At the gypsum board butt joints, each end of each gypsum board shall be supported by a single length of furring channel equal to the width of the gypsum board plus 3 in. on each end. The two support furring channels shall be spaced approximately 3 in. in from joint. Screw spacing along the gypsum board butt joint and along both additional channels shall be 8 in. OC. Additional screws shall be placed in the adjacent section of gypsum board into the aforementioned 3 in. extension of the extra butt joint channels as well as into the main channel that runs between. Butt joint furring channels shall be attached with one RESILMOUNT Sound Isolation Clip at each end of the channel.

When **Steel Framing Members** (Item 6C) are used, one layer of nom 5/8 in. thick, 4 ft wide gypsum board is installed with long dimensions perpendicular to furring channels. Gypsum board secured to furring channels with nom 1 in. long Type S bugle-head steel screws spaced 8 in. OC in the field of the board. Gypsum board butted end joints shall be staggered minimum 48 in. and centered over main furring channels. At the gypsum board butt joints, an additional single length of furring channel shall be installed and be spaced approximately 3 in. from the butt joint (6 in. from the continuous furring channels) to support the floating end of the gypsum board. Each of these shorter sections of furring channel shall extend one truss beyond the width of the gypsum panel and be attached to the adjacent trusses with one SonusClip at every truss involved with the butt joint.

When **Steel Framing Members** (Item 6D) are used, 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 6E) are used, nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 7. Butt joints staggered minimum 24 in. OC.
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. **Grille** — (Not Shown — Required where indicated in Items 4 - 4V) — 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.