

## 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.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States  
 BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

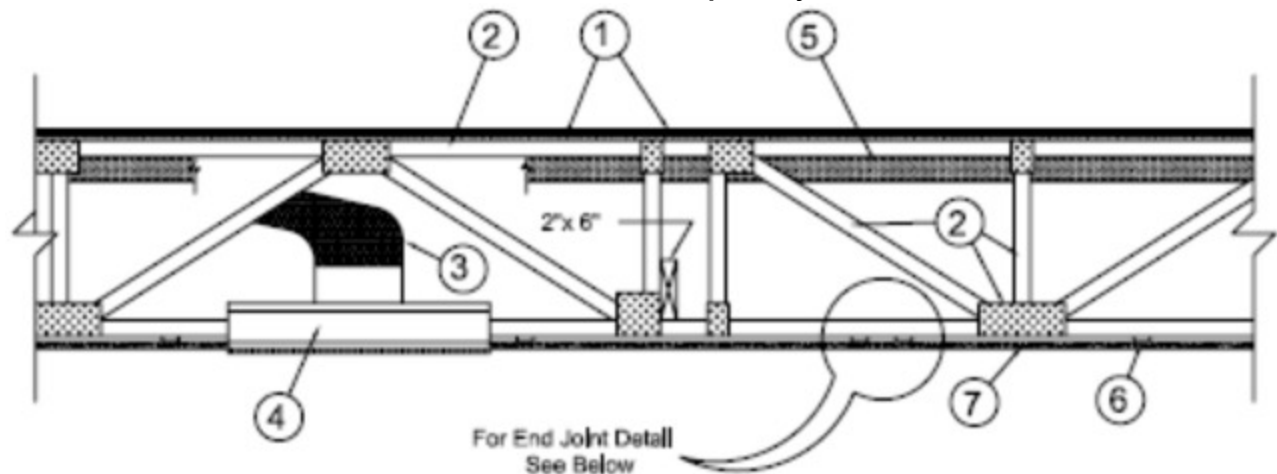
## Design No. M503

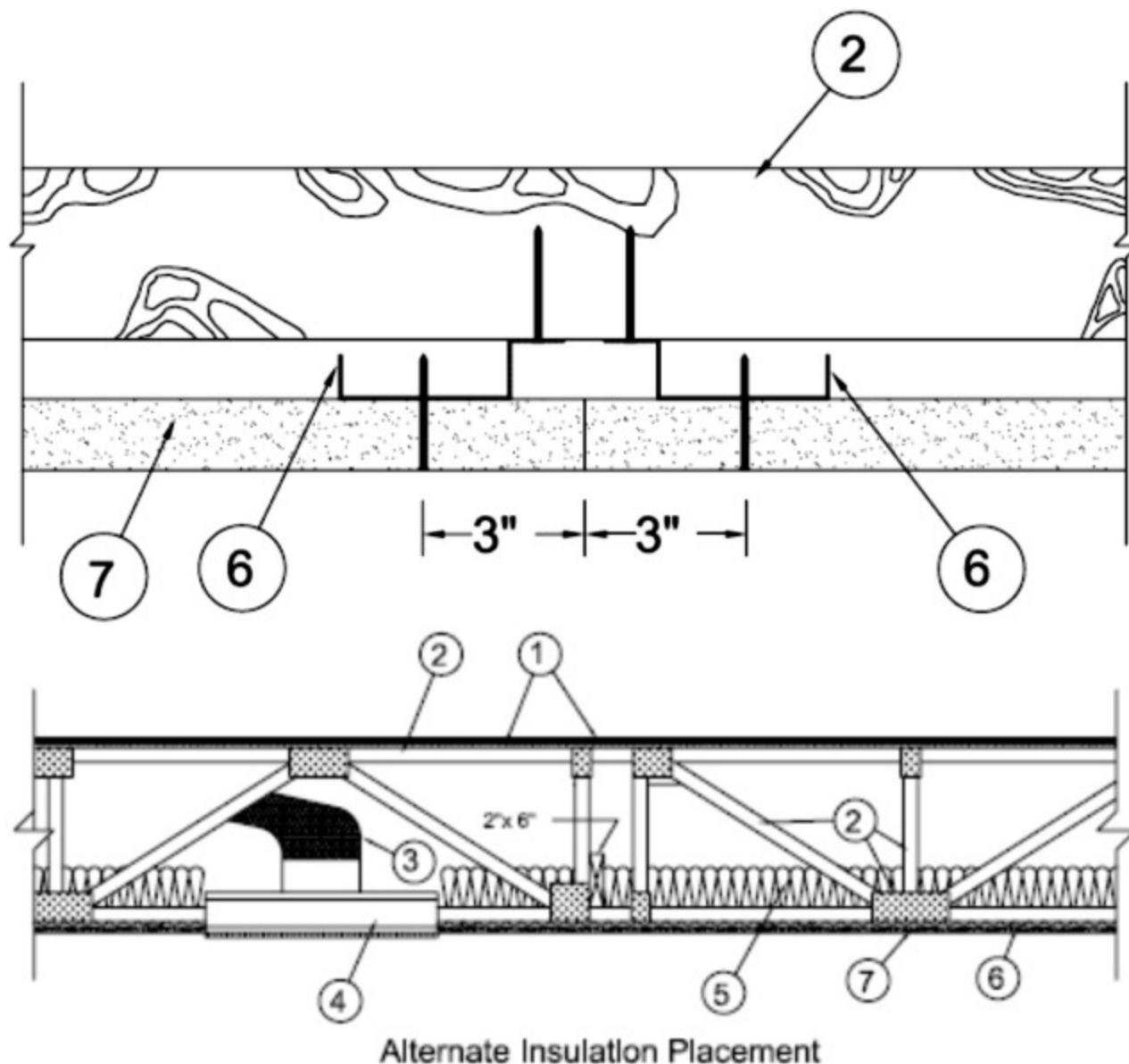
December 18, 2024

**Unrestrained Assembly Rating — 1 Hr.  
 Finish Rating — 25 Min (See Item 5)**

**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.**





**Alternate Insulation Placement**

1. **Flooring System** — The flooring system shall consist 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 or strength axis of panels to be perpendicular to the trusses with end joints staggered 4 ft. Panels secured to trusses with construction adhesive and No. 6d ringed shank nails spaced 12 in. OC along each truss. Adhesive applied as 3/8 in. diam bead to top chord of trusses and grooved edges of plywood or panels. 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 or perpendicularly 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 plywood with T & G edges along the 8 ft sides and exterior glue or non-veneer 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 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.

**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)

**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** — Types FIRM-FILL SCM 250 and FIRM-FILL SCM 250+

**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** — Types FIRM-FILL SCM 400 and FIRM-FILL SCM 400+

**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** — Types FIRM-FILL SCM 750 and FIRM-FILL SCM 750+

**Alternate 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. (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.

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

**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. 3

**Subflooring** — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or non-veneer 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 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.

**Finish Floor - Mineral and Fiber Board\*** — Min 1/2 in. thick, supplied in sizes ranging from 3 ft by 4 ft to 8 ft by 12 ft. All joints to be staggered a min of 12 in. with adjacent sub-floor joints.

**HOMASOTE CO** — Type 440-32 Mineral and Fiber Board

### System No. 4

**Subflooring** — Nom 23/32 in. thick wood structural panels installed perpendicular to trusses with end joints staggered. Plywood or panels secured to trusses with construction adhesive and No. 6d ringed 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

### System No. 5

**Subflooring** — Min 23/32 in. wood structural panels, min grade "C-D" or "Sheathing". Face grain of plywood or strength axis of panels 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 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 over each floor mat material, primers, and use of crack suppression reinforcement.

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

**Metal Lath** (Optional - 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. 6

**Subflooring** — Nom 23/32 in. thick wood structural panels installed perpendicular to trusses with end joints staggered. Plywood or panels secured to trusses with construction adhesive and No. 6d ringed 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.

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

**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

### System No. 7

**Subflooring** — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with joints staggered 4 ft. Plywood or non-veneer 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 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. 8**

Deleted.

**System No. 9**

**Subflooring** — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with joints staggered 4 ft. Plywood or non-veneer 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 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 1.2 cu feet of preformed foam concentrate to 94 lbs Type I Portland cement, 300 lbs of sand with 5.5 gal of water.

**AERIX INDUSTRIES** — Floor-Topping Mixture

**System No. 10**

**Subflooring** — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with joints staggered 4 ft. Plywood or non-veneer 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.

**Finish Flooring - Floor Topping Mixture\*** — Min 3/4 in. thickness of floor topping mixture having a min compressive strength of 1000 psi. Mixture shall consist of 5 to 8 gal of water to 80 lbs of floor topping mixture to 2.1 cu ft of sand.

**ULTRA QUIET FLOORS** — Types UQF-A, UQF-Super Blend, UQF-Plus 200

**System No. 11**

**Subflooring** — Nom 23/32 in. thick wood structural panels installed perpendicular to trusses with end joints staggered. Plywood or panels secured to trusses with construction adhesive and No. 6d ringed 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.

**ARCOSA SPECIALTY MATERIALS** — AccuCrete® Types NexGen, Green, Prime 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.

**ARCOSA SPECIALTY 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.

**System No. 12**

**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. Refer to the manufacturer's instructions accompanying the material and/or contact the manufacturer's technical support for specific mix design and minimum thickness recommended for use with eligible floor mat(s).

**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. 13

**Subflooring** — Nom 23/32 in. thick wood structural panels installed perpendicular to trusses with end joints staggered. Plywood or panels secured to trusses with construction adhesive and No. 6d ringed 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 MT

### System No. 14

**Subflooring — Building Units\*** — Nom 3/4 in. thick, tongue and grooved boards. Long dimension of boards to be perpendicular to

trusses with end joints staggered a min of 4 ft. and centered over the trusses. Boards secured to trusses with 2 in. long self-drilling, self-tapping screws spaced a max of 12 in. OC in the field with screws located 1 in. from long edge, and max 8 in. OC along the end joints with screws located 1/2 in. from end joint.

**ECTEK INTERNATIONAL INC** — Type MegaBoard

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

**Finish Flooring** — Min 1 by 4 in. T & G lumber fastened diagonally or perpendicularly 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. Finish Flooring is optional when the alternate subfloor Type MegaBoard is used.

#### System No. 15

**Structural Cement-Fiber Units\*** — Nom 3/4 in. thick, with long edges tongue and grooved. Long dimension of panels to be perpendicular to wood trusses with end joints staggered a min of 2 ft and centered over the trusses. Panels secured to wood trusses with 1-5/8 in. long, No. 8, self-countersinking wood screw spaced a max of 12 in. OC in the field with a screw located 1 in. and 2 in. from each edge, and 8 in. OC on the perimeter with a screw located 2 in. from each edge, located 1/2 in. from the end edges of the panel.

**UNITED STATES GYPSUM CO** — — Types STRUCTO-CRETE, USGSP

#### System No. 16

**Subflooring** — Nom 23/32 in. thick wood structural panels installed perpendicular to trusses with end joints staggered. Plywood or panels secured to trusses with construction adhesive and No. 6d ringed 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

#### System No. 17

**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 panels to be perpendicular to the trusses with end joints staggered 4 ft. Panels secured to trusses with construction adhesive and No. 6d ringed shank nails spaced 12 in. OC along each truss. Adhesive applied as 3/8 in. diam bead to top chord of trusses and grooved edges of plywood or panels. 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 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. Refer to the manufacturer's instructions accompanying the material and/or contact the manufacturer's technical support for specific mix design and minimum thickness recommended for use with eligible floor mat(s).

**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.

**Freudenberg Performance Materials LP** — 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.

**System No. 18**

**Subflooring** — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue or non-veneer 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 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.

**Finish Floor -- Building Units\*** — Min 1/2 in. thick, supplied in 4 by 8 ft panels, fastened to trusses through subfloor. All joints to be staggered a min of 12 in. with sub-floor joints.

**ECTEK INTERNATIONAL INC** — Type MegaBoard, 1/2 in. thick

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\*** — Any UL Class 0 or Class 1 flexible air duct installed in accordance with the instructions provided by the damper manufacturer.

4. **Ceiling Damper\*** — 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. When **Steel Framing Members\*** (Item 9) is used, Max damper openings not to exceed 100 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\*** — (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

4B **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

4C. **Alternate Ceiling 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

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

4E. **Alternate Ceiling Damper\*** — (Optional, to be used with Air Duct Item 3) For use with min 18 in. deep trusses. Max nom 10-3/8 in. long by 10-3/8 in. wide, fabricated from galvanized steel. Installed in accordance with the instructions provided by the manufacturer. Max damper openings not to exceed 54 sq in. per 100 sq ft of ceiling area.

**GREENHECK FAN CORP** — Model CRD-300WT

5. **Batts and Blankets\*** — Insulation may alternately be secured to plywood subfloor with staples spaced 12 in. OC or to the trusses with 0.090 in. diam galv steel wires spaced 12 in. OC. Insulation may be draped over the resilient channels and gypsum board ceiling membrane and the resilient channels and gypsum board attachment shall be modified as specified in Items 6 and 7. 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 and max thickness of 3-1/2 in. may be used. The Finish Rating is 25 min. when the insulation is draped over the resilient channels and gypsum board ceiling membrane or when installed on the underside of the plywood subfloor. When Item 7A is used, insulation shall be secured to plywood subfloor or trusses only.

6. **Resilient Channels** — Resilient channels, 1/2 in. deep by 2-3/8 in. wide at the base and 1-3/8 in. wide at the face, formed from min 0.020 in. thick galv steel, spaced 16 in. OC perpendicular to trusses. When batt insulation (Item 5) is draped over the resilient channel/gypsum board ceiling membrane, the resilient channel spacing shall be reduced to 12 in. OC. 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.

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 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 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 as indicated in Item 6, 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. 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 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

**6C. Steel Framing Members\*** — (Optional - Not Shown) — Used to attach resilient channels (Item 6) to trusses (Item 2). Clips spaced 48 in. OC and secured to trusses with one No. 8 x 2-1/2 in. coarse drywall screw through center grommet hole. Channels secured to clips with one #10 x 1/2 in. pan-head self-drilling screw. Ends of adjoining channels overlapped 6 in. and secured together with two #8 15 x 1/2 in. Philips Modified screws spaced 2-1/2 in. from the center of the overlap. Gypsum board butt joints require additional resilient channels spaced 1-1/2 in. from the butt joint on either side. One edge of the extra channels will extend to an adjacent truss where it is secured with a clip.

**KEENE BUILDING PRODUCTS CO INC** — Type RC+ Assurance Clip

**6D. Steel Framing Members\*** — (Optional, Not Shown) As an alternate to Item 6, furring channels and Steel Framing Members\* as described below:

a. **Furring Channels** — Formed of No. 25 MSG galv steel, 2-9/16 in. wide by 7/8 in. deep, spaced as described in item 6 perpendicular to trusses. Channels secured to trusses as described in Item b. 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.

b. **Steel Framing Members\*** — Used to attach furring channels (Item a) to trusses (Item 2). Clips spaced 48 in. OC. RSIC-1 clips secured to alternating trusses with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clips for use with 2-9/16 in. wide furring channels. Adjoining channels are overlapped as described in Item a. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping No. 6 framing screws, min 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel.

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

**6E. Steel Framing Members\*** — (Optional, Not Shown) — Used as an alternate method to attach resilient channels to structural members. A resilient sound isolation accessory shall be used at each attachment point of the resilient channels and spaced max 24 in. O.C. Channel ends butted and centered under the structural members and attached with one accessory at each end. Additional accessories used to hold resilient channels that support the gypsum board end joints. The accessory envelops the mounting edge of the resilient channel. The accessory and resilient channel are fastened to the structural members with the screws supplied with the accessory and per the accessory manufacturer's installation instructions. Gypsum Board butt joints staggered minimum 24 in. OC and field Gypsum Board screws spaced 8 in. OC (in lieu of 12 in.) when used.

**PAC INTERNATIONAL L L C** — Type RC-1 Boost

**6F. Steel Framing Members\*** — (Optional, Not Shown, As an alternate to Item 6) — Furring channels and Steel Framing Members as described below:

a. **Furring Channels** — Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. When insulation (Item 5) is secured to the underside of the subfloor the furring channels are spaced 16 in. OC max. When insulation (Item 5) is applied over the furring channel/gypsum panel ceiling membrane, the furring channels are spaced 12 in. OC max. Channels secured to trusses as described in Item 6Fb. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 7.

b. **Steel Framing Members\*** — Used to attach furring channels (Item 6Fa) to trusses (Item 2). Clips spaced 48 in. OC max with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips.

**CLARKDIETRICH BUILDING SYSTEMS** — Type ClarkDietrich Sound Clips

**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. Screws spaced 1/2 in. and 6 in. from side joints, and 12 in. OC in the rest of the field. Screws spaced 3 in. from the end joints. End joints secured to both resilient channels as shown in end joint details. When batt insulation (Item 5) are draped over the resilient channel/gypsum board ceiling membrane, screws spaced 1/2 in. and 4 in. from side joints, and 8 in. OC in the rest of the field. When **Steel Framing Members\*** (Item 9) is used, gypsum board installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Gypsum board secured to cross tees with 1 in. long No. 7 Type S bugle head screws spaced 12 in. OC in the field and 8 in. OC along end joints. Gypsum board also secured to main runners with 1 in. long No. 7 Type S bugle head screws midway between cross tees. Screws along sides and ends of boards spaced 3/4 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing between joints on adjacent boards not less than 4 ft OC.

When **Steel Framing Members** (Item 6A) 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 6B) 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.

When **Steel Framing Members** (Item 6D, 6F) are used, gypsum panels installed with long dimensions perpendicular to furring channels. Panels attached to the furring channels using 1 in. long Type S bugle-head steel screws spaced 8 in. OC along butted end joints and in the field of the panel. Butted end joints shall be staggered min. 2 ft within the assembly, and occur midway between the continuous furring channels. Each end of each gypsum panel shall be supported by a single length of furring channel equal to the width of the gypsum panel plus 6 in. on each end. The two support furring channels shall be spaced approximately 3-1/2 in. OC, and be attached with one clip at each end of the channel.

**GEORGIA-PACIFIC GYPSUM L L C** — Type 5, TG-C

7A. **Gypsum Board\*** — As an alternate to Item 7 — 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. Screws spaced 1/2 in. and 6 in. from side joints, and 12 in. OC in the rest of the field. Screws spaced 3 in. from the end joints. End joints secured to both resilient channels as shown in end joint details. Batt insulation (Item 5) shall be secured to plywood subfloor or trusses. Not evaluated when batt insulation (Item 5) is draped over resilient channels and gypsum board.

**GEORGIA-PACIFIC GYPSUM L L C** — Type DAPC

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. **Steel Framing Members\*** — (Not Shown) - As an alternate to Item 6. Main runners, cross tees, cross channels and wall angle as listed below:

A. **Main Runners** — Nom 10 or 12 ft long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft. OC. Main runners suspended by min 12 SWG galv steel hanger wires spaced 48 in. OC. Hanger wires to be located adjacent to main runner/cross tee intersections. Hanger wires wrapped and twist-tied on 16d nails driven in to side of trusses at least 5 in. above the bottom face.

B. **Cross Tees** — Nom 4 ft long, 1-1/2 in. wide face, installed perpendicular to the main runners, spaced 16 in. OC. Additional cross tees or cross channels used at 8 in. from each side of butted gypsum panel end joints. The cross tees or cross channels may be riveted or screw attached to the wall angle or channel to facilitate the ceiling installation.

C. **Cross Channels** — Nom 4 or 12 ft long, installed perpendicular to main runners, spaced 16 in. OC.

D. **Wall Angle or Channel** — Painted or galv steel angle with 1 in. legs or channel with 1 in. legs, 1-9/16 in. deep attached to walls at perimeter of ceiling with fasteners 16 in. OC. To support steel framing member ends and for screw-attachment of the gypsum panel.

**CGC INC** — Type DGL or RX

**USG INTERIORS LLC** — Type DGL or RX.

**\* 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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