



Design No. L563
BXUV.L563
Fire Resistance Ratings - ANSI/UL 263

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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.
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BXUV - Fire Resistance Ratings - ANSI/UL 263

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

[See General Information for Fire-resistance Ratings - ANSI/UL 263](#)

[See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada](#)

Design No. L563

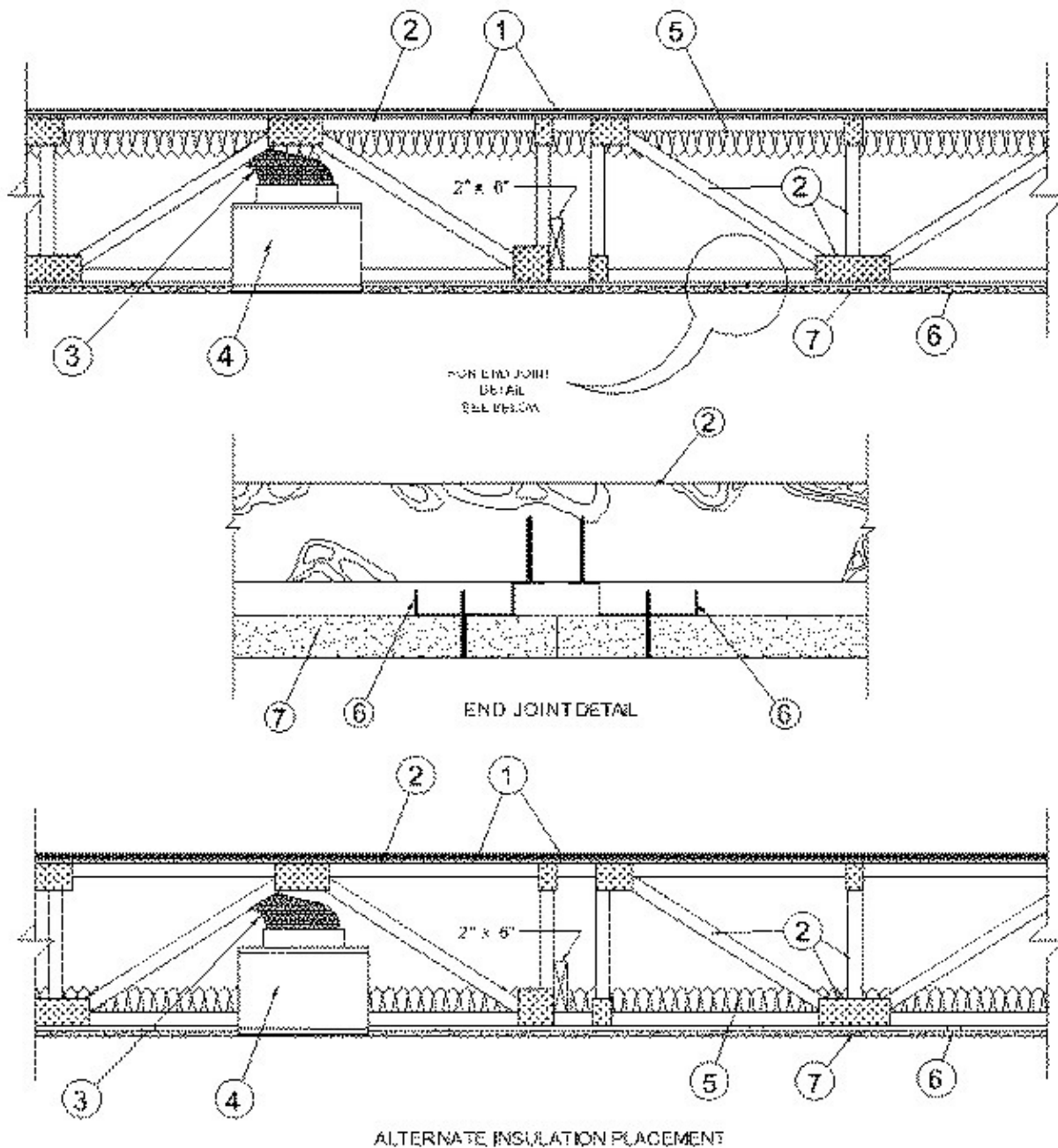
February 26, 2015

Unrestrained Assembly Rating - 1 Hr

Finish Rating - 25 Min (See Items 5 or 5A)

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 — Nom 23/32 in. thick wood structural panels installed perpendicular to trusses with end joints staggered. Plywood 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.

Subflooring (Alternate) - Structural Cement-Fiber Units* — Nominal 19 mm (3/4 in.) thick tongue and groove structural cement-fiber units. Long dimension of panels to be perpendicular to trusses with end joints staggered. Panels fastened to the trusses with #10 self-drilling, self-tapping cement board screws 1-3/4 in. long. Screws shall be spaced 6 in. OC along the perimeter of each sheet and 12 in. OC in the field of each sheet. Screws shall be spaced 1/2 in. from end joints and 1 in. from side joints.

ECTEK INTERNATIONAL INC — Armoroc Panel

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. thick wood structural panels, min grade "Underlayment" or "Single Floor". Face grain of plywood or strength axis of panel to be perpendicular to trusses with joints staggered.

System No. 2

Subflooring — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with end joints staggered 4 ft. Plywood or nonveneer APA rated 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.

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

ECORE INTERNATIONAL INC — Type QTscu 4002

HACKER INDUSTRIES INC — Type Hacker Sound-Mat

Alternate 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.

ECORE INTERNATIONAL INC — Type QTrbm 3006-3

HACKER INDUSTRIES INC — Type Hacker Sound-Mat II.

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

HACKER INDUSTRIES INC — FIRM-FILL SCM 125

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

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

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

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

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

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

Metal Lath (Optional) — For use with 3/8 in. (10 mm) floor mat materials, 3/8 in. expanded steel diamond mesh, 3.4 lbs/sq yd placed over the floor mat material. Hacker Floor Primer to be applied prior to the placement of the metal lath. When metal lath is used, floor topping 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 T & G wood structural panels installed perpendicular to trusses with end joints staggered 4 ft. Plywood or nonveneer APA rated 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 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 — Min 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

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. thick T & G wood structural panels installed perpendicular to trusses with end joints staggered 4 ft. Plywood or nonveneer APA rated 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 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

Subflooring — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with end joints staggered 4 ft. Plywood or nonveneer APA rated 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 1 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, 62.5 lb of pea gravel, 312.5 lbs of sand with 5-1/2 gal of water.

LITE-CRETE INC — Type I

System No. 7

Subflooring — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with end joints staggered 4 ft. Plywood or nonveneer APA rated 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 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. 8

Subflooring — Min 23/32 in. thick T & G wood structural panels installed perpendicular to trusses with end joints staggered 4 ft. Plywood or nonveneer APA rated 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 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. 9**

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.

Floor Mat Materials* - (Optional) — Nom 1/4 in. thick floor mat material loose laid over the subfloor. Maxxon Floor Primer to be applied to the surface of the mat prior to the floor topping placement. When floor mat material is used, min thickness of floor topping mixture is 1 in. Floor topping thickness a min 3/4 in. over Acousti-Mat I floor mat.

MAXXON CORP — Type Acousti-Mat I, Acousti-Mat II, Acousti-Mat II HP.

Alternate Floor Mat Materials* — Nom 0.8 in. thick floor mat material loose laid over the subfloor with Crack Suppression Mat (CSM) loose laid over the floor mat material. Floor topping thickness shall be min 1-1/2 in.

MAXXON CORP — Type Acousti-Mat 3, Acousti-Mat 3 HP, Crack Suppression Mat (CSM)

Metal Lath (Alternate to Crack Suppression Mat (CSM)) — 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.

Fiber Glass Mesh Reinforcement — (Optional) — Maxxon Corp's "Maxxon Reinforcement (MR)" for use with or as an alternate to CSM or metal lath reinforcement, the materials consists of a plastic coated non-woven fiber glass mesh grid intended to suppress cracks in the Floor Topping Mixture

Alternate Floor Mat Materials* — Nom 0.4 in. thick floor mat material loose laid over the subfloor. Maxxon Floor Primer to be applied to the surface of the mat prior to the floor topping placement. Floor topping thickness shall be min 1 in. Floor topping thickness shall be min 3/4 in. when used with Crack Suppression Mat (CSM), Metal Lath, or Maxxon Reinforcement (MR).

MAXXON CORP — Type Enkasonic 9110, Enkasonic 9110 HP.

Alternate Floor Mat Materials* - (Optional) — Nom 0.2 in. thick floor mat material loose laid over the subfloor. Maxxon Floor Primer may be applied to the surface of the mat prior to the floor topping placement. Floor topping thickness shall be as specified under **Floor Topping Mixture**.

MAXXON CORP — Type Acousti-Mat LP-R

Metal Lath (Optional) — For use with floor mat materials, 3/8 in. expanded galvanized steel diamond mesh, 3.4 lbs/sq yd or Maxxon Corp. UL Classified Crack Suppression Mat (CSM) loose laid over the floor mat material. Floor topping thickness shall be min 1 in.

MAXXON CORP — Type Crack Suppression Mat (CSM)

Fiber Glass Mesh Reinforcement — (Optional) — Maxxon Corp's "Maxxon Reinforcement (MR)" for use with or as an alternate to CSM or metal lath reinforcement, the materials consists of a plastic coated non-woven fiber glass mesh grid intended to suppress cracks in the Floor Topping Mixture

Finish Flooring - Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture depending upon floor mat system as specified above, having a min compressive strength of 1000 psi. Mixture shall consist of 3 to 7 gal of water to 80 lbs of floor topping mixture to 1.0 to 2.1 cu ft of sand.

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

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 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.

Floor Mat Materials* - (Optional) — Nom 1/4 in. thick floor mat material loose laid over the subfloor. Maxxon Floor Primer to be applied to the surface of the mat prior to the floor topping placement. When floor mat material is used, min thickness of floor topping mixture is 1 in. Floor topping thickness a min 3/4 in. over Acousti-Mat I floor mat.

MAXXON CORP — Type Acousti-Mat I, Acousti-Mat II, Acousti-Mat II HP.

Alternate Floor Mat Materials* — Nom 0.8 in. thick floor mat material loose laid over the subfloor with Crack Suppression Mat (CSM) loose laid over the floor mat material. Floor topping thickness shall be min 1-1/2 in.

MAXXON CORP — Type Acousti-Mat 3, Acousti-Mat 3 HP, Crack Suppression Mat (CSM)

Metal Lath (Alternate to Crack Suppression Mat (CSM)) — 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.

Fiber Glass Mesh Reinforcement — (Optional) — Maxxon Corp's "Maxxon Reinforcement (MR)" for use with or as an alternate to CSM or metal lath reinforcement, the materials consists of a plastic coated non-woven fiber glass mesh grid intended to suppress cracks in the Floor Topping Mixture

Alternate Floor Mat Materials* — Nom 0.4 in. thick floor mat material loose laid over the subfloor. Maxxon Floor Primer to be applied to the surface of the mat prior to the floor topping placement. Floor topping thickness shall be min 1 in. Floor topping thickness shall be min 3/4 in. when used with Crack Suppression Mat (CSM), Metal Lath, or Maxxon Reinforcement (MR).

MAXXON CORP — Type Enkasonic 9110, Enkasonic 9110 HP.

Alternate Floor Mat Materials* - (Optional) — Nom 0.2 in. thick floor mat material loose laid over the subfloor. Maxxon Floor Primer may be applied to the surface of the mat prior to the floor topping placement. Floor topping thickness shall be as specified under **Floor Topping Mixture**.

MAXXON CORP — Type Acousti-Mat LP-R

Metal Lath (Optional) — For use with floor mat materials, 3/8 in. expanded galvanized steel diamond mesh, 3.4 lbs/sq yd or Maxxon Corp. UL Classified Crack Suppression Mat (CSM) loose laid over the floor mat material. Floor topping thickness shall be min 1 in.

MAXXON CORP — Type Crack Suppression Mat (CSM)

Fiber Glass Mesh Reinforcement — (Optional) — Maxxon Corp's "Maxxon Reinforcement (MR)" for use with or as an alternate to CSM or metal lath reinforcement, the materials consists of a plastic coated non-woven fiber glass mesh grid intended to suppress cracks in the Floor Topping Mixture

Finish Flooring - Floor Topping Mixture* — Min 3/4 in. thickness of floor topping mixture depending upon floor mat system as specified above, having a min compressive strength of 1200 psi. Mixture shall consist of 4 to 7 gal of water to 80 lbs of floor topping mixture to 1.4 to 1.9 cu ft of sand.

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

System No. 11

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. ¼ 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. 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 ¾ 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.

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. ¾ 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. ¼ 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 — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue, or nonveneer APA Rated "Sturd-I-Floor" T & G panels per APA specifications PRP-108. Plywood or nonveneer APA rated 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 ¾ 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.

ALLIED CUSTOM GYPSUM — Accu-Crete, AccuRadiant, AccuLevel G40 and AccuLevel 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 ¾ in.

ALLIED CUSTOM GYPSUM — Type AccuQuiet P80, Type AccuQuiet C40, AccuQuiet D13, and Type AccuQuiet D-18.

System No. 14

Flooring System - Structural Cement-Fiber Units* — Minimum Nom ¾ in. (19 mm) thick, with long edges tongue and grooved. Long dimension of panels to be perpendicular to trusses with end joints staggered. Panels secured to trusses with

2 in. (51 mm) long No. 8 self-drilling, self-countersinking steel screws spaced 12 in. (305 mm) OC in both the field and perimeter and located 1 in. (25 mm) from the side edges of the board. "Enerbond" 45 spray foam adhesive applied to butt joints and to tongue and grooved edges of flooring during installation. When panels thicker than 3/4 in. are used the minimum fastener length shall be the thickness of the panel plus a minimum 1-1/4 in. As an option, any finished floor system for use in this design may be installed over the Structural Cement-Fiber Units.

VIROC/PORTUGAL INDUSTRIAS DE MADEIRA E CIMENTO S A

System No. 15

Subflooring — Min 23/32 in. thick plywood with T & G edges along the 8 ft sides and exterior glue, or nonveneer APA Rated "Sturd-I-Floor" T & G panels per APA specifications PRP-108. Plywood or nonveneer APA rated 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 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

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 12 in. when Ceiling Dampers* are not used. Min truss depth is 18 in. when Ceiling Damper* is used. Truss members secured together with min 0.036 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. Ceiling Damper* (Optional). To be used with Air Duct Item 3. — 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

4A. 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-^W X-BT-6

4B. 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

4C. 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.

4D. Alternate 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

4E. 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

4F. 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-^W X-BT

4G. Alternate Ceiling Damper* — For use with min. 18 in. deep trusses. Max. nom area shall be 349 sq in. Max. overall length and width 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. An aluminum or steel grille (Item 9) shall be installed in accordance with installation instructions.

MIAMI TECH INC — Model Series RxCRD, RxCRDS or RxCRPD

5. Batts and Blankets* — (Optional) - Glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. When no insulation is installed in the concealed space resilient channels (Item 6) are spaced 24 in. OC. When the resilient channels (Item 6) are spaced 16 in. OC, the insulation shall be a max of 3-1/2 in. thick, and shall be secured against the subflooring with staples at 12 in. OC or held suspended in the concealed space with 0.090 in. diam galv steel wires attached to the wood trusses at 12 in. OC. When the resilient channels are spaced a max of 12 in. OC or when the Steel Framing Members (Item 6A) are used, there is no limit in the overall thickness of insulation, and the insulation can be secured against the subflooring, held suspended in the concealed space or draped over the resilient channels (or Steel Framing Members) and gypsum panel membrane. The finished rating has only been determined when the insulation is secured to the subflooring.

5A. Loose Fill Material* — (Optional) - As an alternate to Item 5, when the resilient channels (Item 6) are spaced a max of 12 in. OC, or when the Steel Framing Members (Item 6A) are used - Any loose fill material bearing the UL Classification Marking for Surface Burning Characteristics. There is no limit in the overall thickness of insulation. The finished rating when loose fill material is used has not been determined

6. Resilient Channels — Formed from min 25 MSG galv steel installed perpendicular to the trusses. When insulation (Item 5) is secured to the underside of the subfloor, the resilient channels are spaced 16 in. OC.. When insulation (Items 5 or 5A) is applied over the resilient channel/gypsum panel ceiling membrane, the resilient channels are spaced 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 panel end joint as shown in the above illustration. Additional channels shall extend min 6 in. beyond each side edge of panel.

6A. Alternate Steel Framing Members — (Not Shown) - As an alternate to Items 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.

6B. **Steel Framing Members*** — (Not Shown) — As an alternate to Items 6 and 6A.

a. **Furring Channels** — Formed of No. 25 MSG galv steel, 2-3/8 in. wide by 7/8 in. deep, spaced 16 in. OC perpendicular to wood structural members. When insulation, Items 5 or 5A is applied over the furring channel/gypsum panel ceiling membrane, the furring channel spacing shall be reduced to 12 in. OC. 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 AWG galvanized 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, and secured to the bottom chord of alternating trusses with one No. 8 x 2-1/2 in. coarse drywall screw through center grommet. When insulation, Items 5 or 5A is applied over the furring channel/gypsum panel ceiling membrane, the clip spacing shall be reduced to 24 in. OC and secured to consecutive trusses. Furring channels are friction fitted into clips. 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. Additional clips required to hold furring channel that supports the gypsum board butt joints, as described in Item 7.

PLITEQ INC — Type Genie Clip

7. **Gypsum Board*** — Nom 5/8 in. thick, 48 in. wide gypsum panels. When resilient channels (Item 6) are used, gypsum panels installed with long dimension perpendicular to resilient channels. Gypsum panels secured with 1 in. long Type S bugle head steel screws spaced 12 in. OC and located a min of 1/2 in. from side joints and 3 in. from end joints. When insulation (Items 5 or 5A) is applied over the resilient channel/gypsum panel ceiling membrane the screw spacing shall be reduced to 8 in. OC. End joints secured to both resilient channels as shown in end joint detail. When Steel Framing Members (Item 6A) are used, gypsum panels installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Panels fastened to cross tees with 1 in. long Type S bugle-head screws spaced 8 in. OC in the field and along end joints. Panels fastened to main runners with 1 in. long Type S bugle-head screws spaced midway between cross tees. Screws along sides and ends of panels spaced 3/8 to 1/2 in. from board edge. End joints of panels shall be staggered with spacing between joints on adjacent panels not less than 2 ft 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 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 6B. Screw spacing along the gypsum board butt joint shall be 6 in. OC.

CGC INC — Types C, IP-X2, IPC-AR

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

NATIONAL GYPSUM CO — Types eXP-C, FSW-G, FSW-C, FSK-G, FSK-C.

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** — Aluminum or Steel 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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