


Appendix 1 – Proposed UL Design Assemblies

**VANGUARD VILLAS
APPENDIX 1
PROPOSED UL DESIGN ASSEMBLIES**

UL Index

UL Design No.

Fire Wall Assemblies

- 
1. 2 Hour fire wall assembly - U347
2. 2 Hour fire wall assembly - alternate to U347 - U370

Fire Barrier/Partition wall Assemblies

1. 1 Hour wood exterior bearing wall assembly - U356

Head of Wall Assemblies

1. 1 & 2 Hour rated assembly - HW-D-0088

Rated Wall Through-Penetration Assemblies

1. 1 & 2 Hour rated nonmetallic pipe penetration assembly - W-L-2093
2. 1 & 2 Hour rated nonmetallic pipe penetration assembly - W-L-2101
3. 1 & 2 Hour rated cable penetration assembly - W-L-3001
4. 1 & 2 Hour rated cable bundle penetration assembly - W-L-3076
5. 1 & 2 Hour rated metallic pipe penetration assembly - W-L-5040
6. 1 & 2 Hour rated steel vent pipe penetration assembly - W-L-7019

**VANGUARD VILLAS
APPENDIX 1
PROPOSED UL DESIGN ASSEMBLIES**

BXUV.U370 - Fire-resistance Ratings - ANSI/UL 263

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

[See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States](#)
[Design Criteria and Allowable Variances](#)

[See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada](#)
[Design Criteria and Allowable Variances](#)

Design No. U370

June 18, 2020

System A

Bearing wall rating — 1-1/2, 2 Hr, or 3 Hr (See Items 3 and 5)

Load Restricted for 2 Hr. Rating, 3 Hr. Rating — See Items 3 and 5

System B

Bearing wall rating — 2 Hr

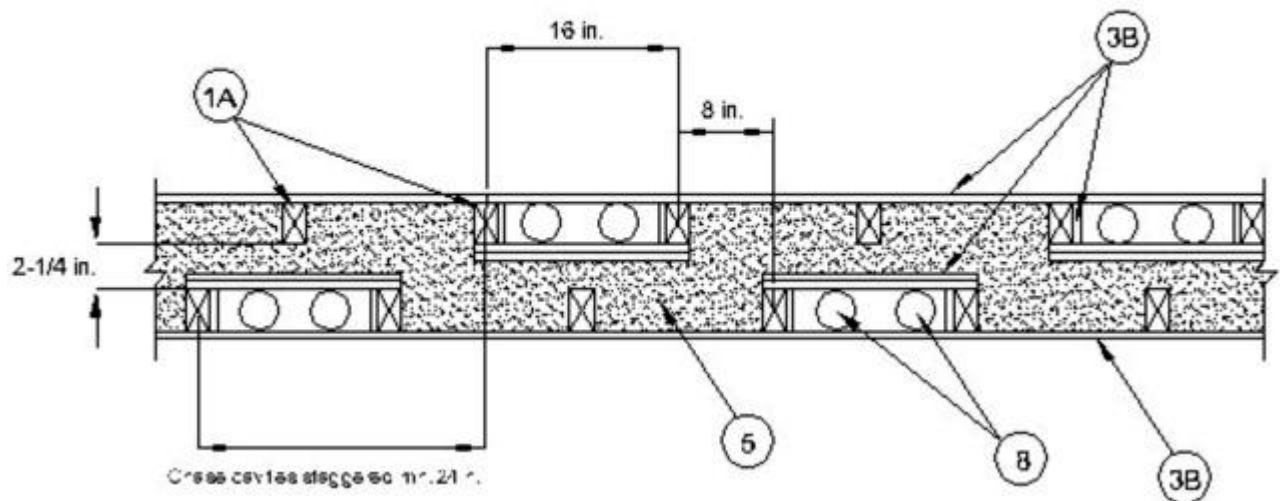
Load Restricted for 2 Hr. Rating — See Items 3 and 5

Finish Rating — 21 Minutes

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.**

Diagram of System B: A cross-section of a reinforced concrete beam with two layers of reinforcement. The top layer has two bars (1) spaced 16 inches apart, followed by two bars (3) spaced 8 inches apart, and then two bars (5). The bottom layer has two bars (5), followed by two bars (1) spaced 16 inches apart, and then two bars (3) spaced 8 inches apart. The total width of the beam is 12 inches.



1. Wood Studs —

System A

Double row of nominal 2 x 4 in. studs, spaced 16 in. OC and cross-braced at mid-height. Opposite rows spaced 1 in. apart, staggered 8 in. OC and joined at the top and bottom with bearing plates.

System B

Double row of nominal 2 x 4 in. studs, spaced 16 in. OC and cross-braced at mid-height, except in the chase cavities. Opposite rows spaced 2-1/4 in. apart, staggered 8 in. OC and joined at the top and bottom with bearing plates.

2. **Bearing Plates** — (Not Shown) — Nominal 2 x 4 in. Two layers on top and one layer on bottom for each row of studs.

3. Gypsum Board* —

System A (For 1-1/2 and 2 Hr Ratings)

4 ft wide. gypsum board applied horizontally (backed by 2 x 4 in. wood framing) or vertically and nailed to studs and bearing plates 7 in. OC with 6d cement coated nails, 1-7/8 in. long, 0.0915 in. shank diameter and 1/4 in. diameter head. When gypsum board is applied vertically, joints to be centered over studs. When gypsum board is applied horizontally, vertical butt joints to be centered over the studs

and horizontal joints to be backed by 2 x 4 in. wood framing. As an alternative, No. 6 bugle head drywall screws, 1-7/8 in. long may be substituted for the 6d cement coated nails. The thickness and number of layers and percent of design load for the 1-1/2 hr and 2 hr ratings are as follows:

Wallboard Protection on Each Side of Wall

Rating	No. of Layers & Thkns of Panel	% of Design Load
1-1/2 Hr	1 layer, 5/8 in. thick	100
2 Hr	1 layer, 5/8 in. thick	75

AMERICAN GYPSUM CO — Type AG-C

CERTAINTED GYPSUM INC — Type C

CERTAINTED GYPSUM INC — Type LGFC-C/A

GEORGIA-PACIFIC GYPSUM L L C — Type TG-C

NATIONAL GYPSUM CO — FSW-C, eXP-C

UNITED STATES GYPSUM CO — Type C

USG BORAL DRYWALL SFZ LLC — Type C

System A (For 3 Hr Rating)

4 ft wide gypsum board applied vertically, with the first layer of gypsum board attached with 6d cement coated nails spaced 10 in. OC., and the second layer of gypsum board attached with 8d nails spaced 7 in. OC. 1st and 2nd layer vertical joints are to be spaced at a maximum of 24 in.

Wallboard Protection on Each Side of Wall

Rating	No. of Layers & Thkns of Panel	% of Design Load
3 Hr	2 layers, 5/8 in. thick	75

CERTAINTED GYPSUM INC — Type C

CERTAINTED GYPSUM INC — Type LGFC-C/A

NATIONAL GYPSUM CO — FSW-C, eXP-C

UNITED STATES GYPSUM CO — Type C

USG BORAL DRYWALL SFZ LLC — Type C

System B (For 2 Hr Rating)

To form chase cavities, two layers of 5/8 in. thick gypsum board, with tapered edges removed, applied vertically to the interior face of wood studs (between the 2-1/4 in. spacing as specified in Item 1A). The base layer of wallboard attached with 1-7/8 in. long, 5/16 in. dia. head, 3/16 in. shank dia. nails spaced 7 in. OC. to wood studs and bearing plates. The face layer of gypsum board attached with 1-7/8 in. long, 5/16 in. dia. head, 3/16 in. shank dia. nails spaced 7 in. OC. to wood studs and bearing plates with 3-1/2 in. offset from base layer. 3-1/2 in. wide strips attached to the side of the studs along the perimeter of the chase cavities. Strips were secured to the wood studs with 1-7/8 in. long nails spaced a maximum 8 in. OC. Maximum, 2 chase cavities per 10 ft. span on each face of the wall, chase cavities spaced a minimum 32 in. from each other and staggered a minimum 24 in. from chase cavities located on the opposite side. **To enclose assembly**, one layer of 4 ft. wide, 5/8 in. thick gypsum board, applied vertically to the exterior face of wood studs. Gypsum board attached with 1-7/8 in. long, 5/16 in. dia. head, 3/16 in. shank dia. nails spaced 7 in. OC. with screws starting 1/2 in. from board edge, to wood studs and bearing plates. Load restricted to 75% of the design load. Finish Rating is 21 minutes.

CERTAINTED GYPSUM INC — Type C

CERTAINTED GYPSUM INC — Type LGFC-C/A

NATIONAL GYPSUM CO — FSW-C, eXP-C

UNITED STATES GYPSUM CO — Type C

USG BORAL DRYWALL SFZ LLC — Type C

4. Joints and Fastener Heads — (Not Shown) — Gypsum board joints taped and both joints and fastener heads covered with joint compound.

5. Fiber, Sprayed* —

System A

Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed 8 in. cavity in accordance with the application instructions supplied with the product. The nominal dry density and percent of design load for the 1-1/2 hr, 2 hr, and 3 hr ratings are as follows:

Rating	Dry Density	% of Design Load
1-1/2 Hr	2.60-3.65 lb/ft ³	100
2 Hr	3.35-4.40 lb/ft ³	75
3 Hr	3.89-4.94 lb/ft ³	75

U S GREENFIBER L L C — FRM (Fire Rated Material)

System B

Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed 8 in. cavity in accordance with the application instructions supplied with the product. The nominal dry density and percent of design load for the 2 hr rating are as follows:

Rating	Dry Density	% of Design Load
2 Hr	3.14-4.19 lb/ft ³	75

U S GREENFIBER L L C — FRM (Fire Rated Material)

6. **Mesh Netting** — (Not Shown) — Any thin, woven or non-woven fibrous netting material attached with staples to the outer face of one row of studs to facilitate the installation of the sprayed fiber from the opposite row.

7. **Oriented Strand Board or OSB** —

System A

(Optional) — Minimum 1/4 in. thick OSB panels applied vertically or horizontally to either interior side of wood studs (between the stud rows). A minimum 1 in. clearance must be maintained between stud rows. Joints located over the wood studs. OSB panels fastened to the wood studs with 6d nails at a maximum of 6 in. OC. at the perimeter and 12 in. OC. at the field.

8. **Non-Metallic Plumbing Components** —

System B

Maximum two, 2 in. diameter Schedule 40 PVC pipe. The PVC pipe may be connected to a maximum quantity of 2 PVC tees. The PVC pipe and tees must not penetrate the wood studs or gypsum wallboard.

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

Last Updated on 2020-06-18

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2021 UL LLC"