© COPYRIGHT 2007, DAVIS, STOKES COLLABORATIVE P.C. ALL RIGHTS RESERVED.

ONE HOUR FIRE RATED FLOOR ASSEMBLY

Design No. G801

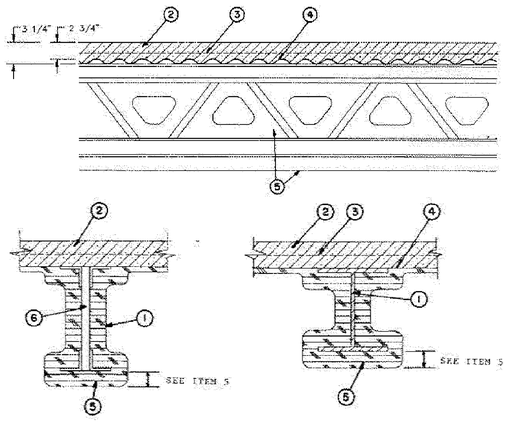
May 20, 2010

Restrained Assembly Rating — 1, 1-1/2, 2 or 3 h (See Items 2, 5)

Unrestrained Assembly Ratings — 1, 1-1/2, 2 or 3 h (See Items 2, 5)

Unrestrained Beam Ratings — 1, 1-1/2, 2 or 3 h (See Item 5)

Load Restricted for Canadian Applications — See Guide BXUV7



1. **Beam** — W8x24 min size. As an alternate to steel beams, **Joist girders** — (Not shown) — 20 in. min depth and 20 lb/lin ft min weight.

1A. **Steel Joists** — Min. 16K6 or heavier, with min 3/4 in. diam or larger cross sectional area web members. As an alternate, any LH Series steel joists spanning no greater than 60 ft may be used. For spans greater than 60 ft, LH Series joists may be used provided that the deflection under their published total load shall not be greater than 1/277 of the joist span.

1B. **Horizontal Bridging** — (Not shown) — Min 1-1/4 by 1-1/4 by 1/8 in. thick steel angles for use with noncomposite joists (Items 1A and 1D). Number and spacing per Steel Joist Institute specifications. Welded to top and bottom chord of the joists.

1C. **Structural Steel Members*** — (Not Shown) — As alternate to Items 1A and 1B - Steel Joists, designed for full composite action with the concrete slab. Min area of joist members shall be 0.708 sq in. for top and bottom chord steel sections, 0.442 sq in. for web section. Designed in accordance with SJI specifications for K-Series joists as revised to November 15, 1989.

VESCOM STRUCTURAL SYSTEMS INC — Type V.

1D. **Steel Joists** — May be either uncoated or provided with a shop coat of paint. Composite or noncomposite. Welded or bolted to end supports. Designed per S.J.I. specifications for a max design stress of 30 ksi. The top chords shall consist of two angles measuring 1-1/4 by 1-1/4 by 0.127 in. thick. Bottom chords shall consist of two round bars measuring 0.566 in. in diam. or two angles measuring 1 by 1 by 0.125 in. thick. Bearing plates shall conform to S.J.I. specifications. Web members shall consist of 0.565 in. diam bars. The min depth and weight shall be 8 in. and 4.9 lb/ft, respectively.

1E. **Steel Joist** — As an alternate to Items 1A through 1 D - Composite or noncomposite and welded or bolted to end supports. May be uncoated or provided with a shop coat of paint. Designed per S.J.I. specifications for a max design stress of 30,000 psi. Top chords shall consist of two angles measuring 1-1/2 by 1-1/2 by 0.156 in. thick. Bottom chords shall consist of two round bars measuring 0.675 in. in diam. Bearing plates shall consist of two angles measuring 2 by 2 by 0.192 in. thick and shall be min 4-15/16 in. long. The second web member at each end shall consist of 0.654 in. diam round bar. All remaining web members, including the end web members, shall consist of 0.774 in. diam round bars. Bridging per S.J.I. specifications is required when noncomposite joists are used.

2. **Normal Weight or Lightweight Aggregate Concrete** — Normal weight, carborate or siliceous aggregate concrete, 150 pcf unit weight, 3500 psi compressive strength, vibrated. Lightweight concrete (expanded shale, clay or slate aggregate by rotary-kiln method), 120 pcf unit weight, 3500 psi min compressive strength, vibrated, and an air content of 6 plus or minus percent. For 1-1/2 and 2 h assembly ratings, the 2-3/4 in. concrete topping thickness may be reduced to 2-1/2 in. when noncomposite joists are used. The Unrestrained Assembly Rating depends on the type of concrete aggregate and supporting element spacing as shown below.

	Unrestrained Assembly Rating	
	Max Spacing 3 ft, 6 in.	**Spacing Greater than 3 ft, 6 in. OC**
Lightweight aggregate	1-1/2 h	1-1/2 h
Normal weight aggregate	2 h	1-1/2 h

3. **Welded Wire Fabric** — 6 by 6 in. — W2.0 by W2.0.

4. **Steel Floor and Form Units*** — No. 28 MSG min galv corrugated steel, 2-1/2 in. pitch and 1/2. in depth of corrugations. Units welded to each beam or joist, 36 welds per 100 sq/ft of units, with at least one weld at each joint, or **Classified Steel Floor and Form Units*** — min 9/16 in. deep, 28 MSG galv or ptd/ptd corrugated deck. Units welded to each beam or joist with 36 welds per 100 sq ft of units, with min one weld at each side joint of units.

VULCRAFT, DIV OF NUCOR CORP — Types 0.6 C, 1.0 C or 1.3 C.

4A. **Steel Floor and Form Units*** — (Not shown) As an alternate to Item 4, Composite 1-1/2 in. deep, 30, 35 or 36 in. wide, galv steel units. Min gauge is 22 MSG. Welded to supports 12 in. OC. Adjacent units button-punched, welded or screwed together 36 in. OC max along side joints. The concrete thickness shall be measured to the top plane of the steel deck.

VULCRAFT, DIV OF NUCOR CORP — Types 1.5VL, 1.5VLI.

5. **Spray-Applied Fire Resistive Materials*** — Applied by spraying with water, in one untamped coat at the thickness shown in the table below, to steel surfaces which are free of dirt, oil or scale. Use of adhesive is optional. Min avg untamped density is 13 pcf with min ind untamped density of 11 pcf for D-C/F or Type II. Min avg and min ind densities of 22 and 19 pcf, respectively, for Type HP. Tamping is optional. For method of density determination refer to Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly & Unrestrained Beam Rating	Min Thkns In. Deck	Beam	Item 1A, 1B, 1C	Item 1D Normal Weight Concrete	Item 1D Lightweight Concrete	Item 1E
1	1	1/2	7/16	1-1/8+	1++	1-1/8++	1-11/16
1-1/2	1	1/2	7/16	1-1/2	1-9/16	1-3/4	2-1/16
2	1	1/2	7/16	1-1/2	2-1/16	2-1/4	2-1/16
2	1-1/2	1/2	3/4	1-1/2	2-1/16	2-1/4	2-1/16
2	2	1/2	3/4	1-1/2	2-1/16	2-1/4	2-1/16
3	2	1/2	1-1/8	1-1/2	—	—	3-1/4
3	3	1-1/8	1-5/8	3-1/4	—	—	3-1/4

+ May be reduced to 1 in. when normal weight concrete is used .

++ - When bottom chords consist of 1 by 1 by 0.125 in. thick steel angles, the thickness of spray-applied fire resistive material shall be increased by 1/4 in. on the bottom chord only.

ISOLATEK INTERNATIONAL — Type D-C/F, HP or Type II, Type EBS or Type X adhesive/sealer optional.

6. **Metal Lath** — (Optional) — Diamond mesh, 3/8 in. expanded steel lath, 1.7 to 3.4 lb/sq yd. Lath secured to one side of each steel joist with No. 18 SWG galv steel wire at joist web and bottom chord members, spaced 15 in. OC max.

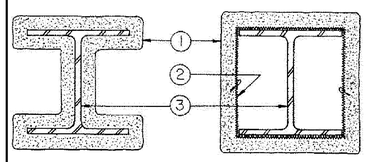
7. **Glass Fiber Mesh** — (Optional) — Square mesh, 3/32 in. to 3/16 in. fiberglass scrim fabric, weighing approx 1.9 to 2.5 oz/sq yd shall be attached to one side of each joist web member. The method of attaching the mesh must be sufficient to hold the mesh and spray-applied fiber fire protection material in place during application of the fiber material and until it has cured. An acceptable method to attach the mesh is by embedding the mesh in min 1/4 in. long beads of hot melted glue. The beads of glue shall be spaced min 12 in. OC along the top chord of the bar joists.

*Bearing the UL Classification Mark

ONE HOUR FIRE RATED COLUMN ASSEMBLY

Design No. X772
December 31, 2007

Ratings — 1, 1-1/2, 2, 3 and 4 h.



1. **Spray-Applied Fire Resistive Materials*** — Applied by mixing with water and spraying in more than one coat to the thicknesses shown below, to steel surfaces which are clean and free of dirt, loose scale, and oil. Min avg and min ind density of 15/14 pcf respectively. Min avg and min ind density of 22/19 pcf respectively for Types Z-106, Z-106/G. Min avg and min ind density of 19/18 pcf respectively for Types 7GP and 7HD. Min avg and min ind density of 40/36 pcf respectively for Types Z-146, Z-146PC and Z-146T cementitious mixture. Min avg and min ind density of 50/45 pcf respectively for Types Z-156, Z-156T and Z-156PC. For method of density determination, see Design Information Section, Sprayed Material.

The thickness of Spray-Applied Fire Resistive Materials to be applied to all surfaces of the column (Item 1) required for rating periods of 1 h, 1-1/2 h, 2 h, 3 h, 4 h may be determined by the equation:

$$h = \frac{R}{1.05\,(W/D) + 0.61}$$

Where:

h = Spray-Applied Fire Resistive Materials thickness in the range 0.25-3.875 in.

R = Fire resistance rating in hours (1 - 4 h)

D = Heated perimeter of steel column in inches

W = Weight of steel column in lbs per foot

W/D = 0.33 to 6.62

As an alternate to the equation, the minimum thickness of Spray-Applied Fire Resistive Materials Z-106, Z-106/G, Types 7GP and 7HD required for various fire resistance ratings of contour sprayed or boxed columns may be determined from the table below:

Min Col Size	W/D	Min Thk In. 1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr
W6X9	0.33	1-1/8	1-1/2	2	2-1/2	3-13/16
W6x16	0.57	13/16	1-1/4	1-11/16	2-1/2	3-5/16
W8x28	0.67	3/4	1-3/16	1-3/8	2	2-11/16
W10x49	0.83	11/16	7/8	1-1/8	1-11/16	2-1/2
W14x228	2.49	5/16	1/2	9/16	7/8	1-1/4
W14x730	6.62	5/16	5/16	5/16	3/8	9/16

The thicknesses contained in the table below are applicable when the Spray-Applied Fire Resistive Materials Z-106, Z-106/G, Types 7GP and 7HD applied to columns' flange tips are reduced to one-half that shown in the table below:

Min Col Size	W/D	Min Thk In. 1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr
W6x9	0.33	1-1/8	1-5/8	2-1/16	2-15/16	3-13/16
W6x16	0.57	7/8	1-5/16	1-3/4	2-9/16	3-3/8
W8x28	0.67	13/16	1-3/16	1-1/2	2-1/4	2-15/16
W10x49	0.83	3/4	1-1/16	1-3/8	2-1/16	2-3/4
W14x233	2.49	5/16	1/2	11/16	1-3/16	1-5/8
W14x730	6.62	5/16	5/16	5/16	9/16	3/4

As an alternate to the equation, the min thickness of Spray-Applied Fire Resistive Materials Types Z-146, Z-146PC, Z-146T, Z-156, Z-156T and Z-156PC required for various fire resistance ratings of contours sprayed or boxed wide flange columns are shown in the table below:

Column Size In.	Min Thkns In. 1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr
W6x9	1-1/16	1-7/16	1-1/2	2-1/4	3
W6x12	1	1-3/8	1-1/2	2-1/4	3
W6x16	13/16	1-1/4	1-1/2	2-1/4	2-15/16
W8x28	3/4	1-3/16	1-3/8	2	2-1/2
W10x49	11/16	7/8	1-1/8	1-9/16	1-15/16
W21x73	11/16	7/8	1-1/8	1-9/16	1-15/16
W12x106	9/16	7/8	1-1/8	1-9/16	1-15/16
W14x233	5/16	1/2	9/16	7/8	1-1/4
W14x730	5/16	5/16	5/16	3/8	9/16

ARABIAN VERMICULITE INDUSTRIES — Types MK-5, MK-6/CBF, MK-6/ED, MK-6/HY, MK-6/HY Extended Set, MK-6s, Sonophone 1, Sonophone 5, Z-106, Z-106/G.

W R GRACE & CO - CONN — Types MK-4, MK-5, MK-6/HY, MK-6/HY Extended Set, MK-6s, RG, Monokote Acoustic 1, Monokote Acoustic 5, Z-106, Z-106/G, Z-146, Z-146PC. Z-146T, Z-156, Z-156T and Z-156PC (Types Z-146, Z-146PC, Z-146T, Z-156, Z-156PC, Z-156T also investigated for exterior use).

GRACE KOREA INC — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6/HY Extended Set, MK-6s, Monokote Acoustic 1, Monokote Acoustic 5, Z-106, Z-106/G.

PYROK INC — Type LD.

SOUTHWEST FIREPROOFING PRODUCTS CO — Types 4, 5, 5EF, 5GP, 5MD, 7GP, 7HD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD.

VERMICULITE PRODUCTS INC — Type MK-4 or MK-5.

2. **Metal Lath** — (Optional for contour application) — 3.4 lb/sq yd galvanized or painted expanded steel lath. Lath shall be lapped 1 in. and tied together with No. 18 SWG galvanized steel; wire spaced vertically 6 in. O.C.

3. **Steel Column** — Wide flange steel column, min sizes as shown in the tables below.

*Bearing the UL Classification Mark

WILLIE O. STOKES
STATE OF GEORGIA
REGISTERED ARCHITECT

ATHENS MEDICAL PLAZA I
2142 WEST BROAD STREET
ATHENS, GEORGIA

THIS DOCUMENT CONTAINS INFORMATION WHICH IS PROPRIETARY TO DAVIS, STOKES COLLABORATIVE, P.C. THIS DOCUMENT AND/OR ITS CONTENTS MAY NOT BE REPRODUCED OR DISCLOSED TO OTHERS, EITHER IN WHOLE OR IN PART, WITHOUT THE PRIOR WRITTEN CONSENT OF DAVIS, STOKES COLLABORATIVE, P.C. COPYRIGHT 2007, ALL RIGHTS RESERVED

DAVIS · STOKES
COLLABORATIVE, P.C.
A · R · C · H · I · T · E · C · T · S
7121 CROSSROADS BLVD. BRENTWOOD, TENNESSEE 37027
http://www.dscocol.com EMAIL: dscinfo@dscocol.com
TEL: 615-726-0010 FAX: 615-726-2090

REVISION

NO.	DATE	DESCRIPTION

G3.02

ISSUE DATE: 12.21.10 | JOB NUMBER 08004

DRAWING CREATED: 11/11/2010 9:12 AM
LAST DRAWING UPDATE: 12/21/2010 1:39 PM
PLOT DATE: 12/21/2010 1:39 PM
FILE NAME: 08004_LS101.dwg
SCALE FACTOR: 1:96