



# OCONEE COUNTY COMMUNITY DEVELOPMENT

Addressing | Codes | Permitting | Planning & Zoning

## Building Code Appeal Board Application

**\*\*Both the owner and authorized agent (if there is one) must sign the application.\*\***

Permit #: 15000 296

Address of property which is subject of the request:

Owner Section:

Owner Name: Gaile L. Dickie

Owner Address: 224 Ridge Rd., Westminster SC

Owner Phone: 804-903-1666 Owner Email: gldickie@gmail.com

Authorized Agent Section:

Agent Name: Harold Knight Builders

Agent Address: 335 Hoston Circle, Westminster, S.C. 29693

Agent Phone: 864-710-4923 Agent Email:  
11 11 5876

Request (Cite specific section of the code for which the appeal and the specific relief requested):

<input checked="" type="checkbox"/>	IRC 309.2	2006 Code Book			
	IRC 104.10		11	11	11
	IRC 104.8		11	11	11
	IRC 104.11		11	11	11

Date: 12-12-15

Owner Signature: Gaile L. Dickie

Agent Signature: Harold A Knight

**Read code on the next page for important information regarding your appeal:**

## **Chapter 6 Article III Section 6-85. Appeals (Oconee County Code of Ordinances)-**

Any person who is aggrieved by any determinations or actions made or taken by the building official or his designated representative may appeal the determination or action to the county board of appeals. The appeal shall be in writing and shall clearly set forth the reasons for appeal. Procedures for filing appeals, administering appeals, establishing the board of appeals, and conducting hearings will be in full compliance with the appeals process as established in the International Building Code, referenced in section 6-41.

### **ICC 113.2 Limitations on Authority**

An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted there under have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The Board shall have no authority to requirements of this code.

## **SECTION R112 BOARD OF APPEALS**

### **R112.1 General.**

In order to hear and decide appeals of orders, decisions or determinations made by the building official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The building official shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the building official.

### **R112.2 Limitations on authority:**

An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.



Sales Bulletin 2013-4R

1 877-276-7876

Ken

none aware of UL system

April 25, 2013

new

## What's New

not for 302.6

### Meeting Section R501.3 of International Residential Code (IRC)



We are pleased to announce that we have a ceiling solution for protecting TJI wood framed floor/ceiling assemblies. According to the current Section R501.3 of the 2012 IRC, either a 1/2" gypsum board or plywood protective layer must be applied over engineered TJI joists. Now, you can also apply equivalent protection using an Armstrong ceiling assembly, consisting of a fire rated main beam (#8300RVH) with standard Class A cross tees and any sag resistant or fire guard panel.

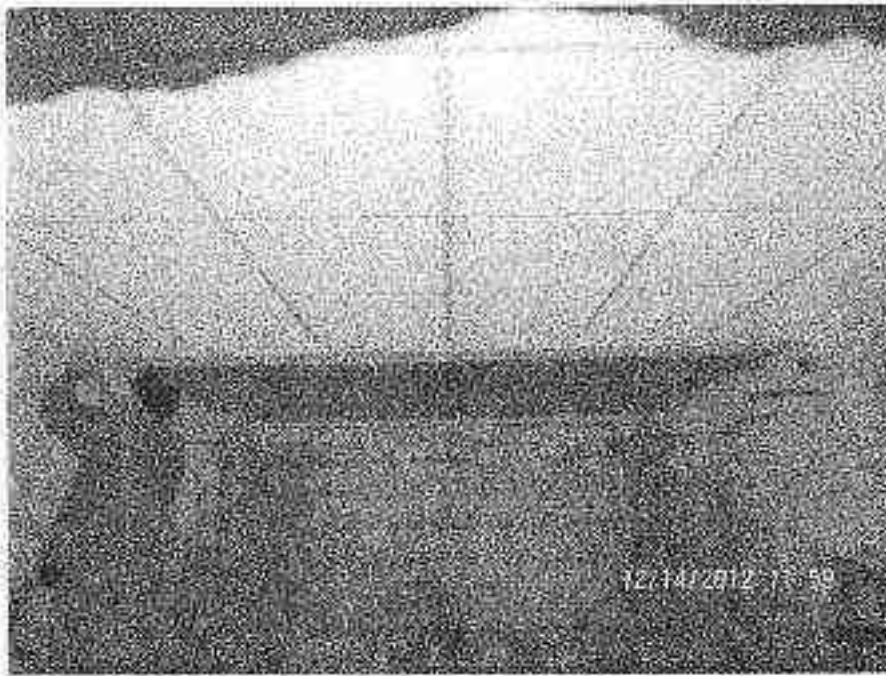


The benefits of this new solution are:

1. Ability to maintain access to pipes, wiring, ductwork, etc in the basement.
2. The Armstrong assembly performs better than existing drywall & plywood options; thereby providing a longer safety factor for fire & rescue.
3. The Armstrong assembly provides flexibility of various design options.
4. Armstrong's sag-resistant, mildew and bacteria resistant panels provide a perfect solution for basement applications.

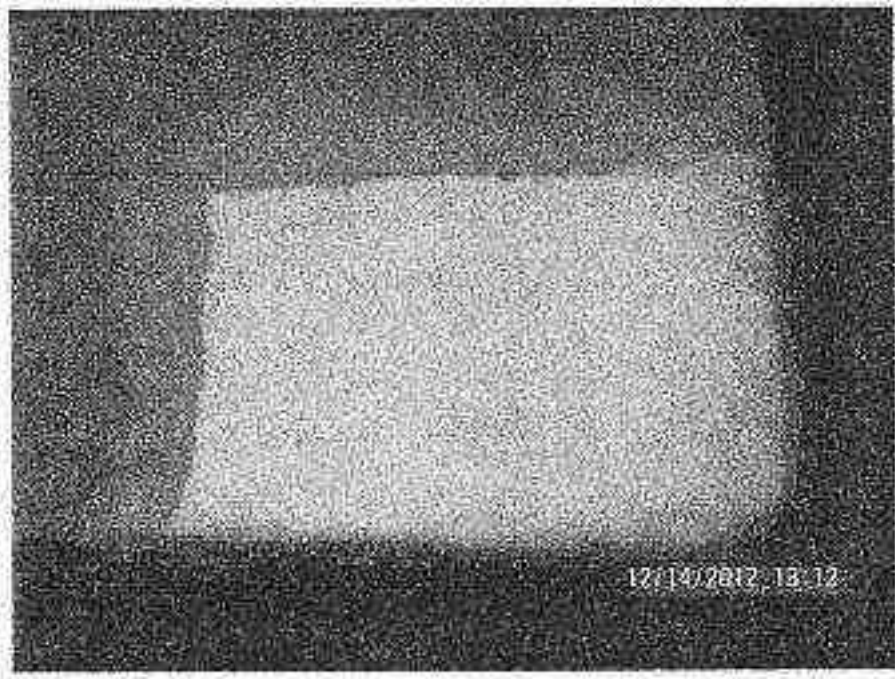
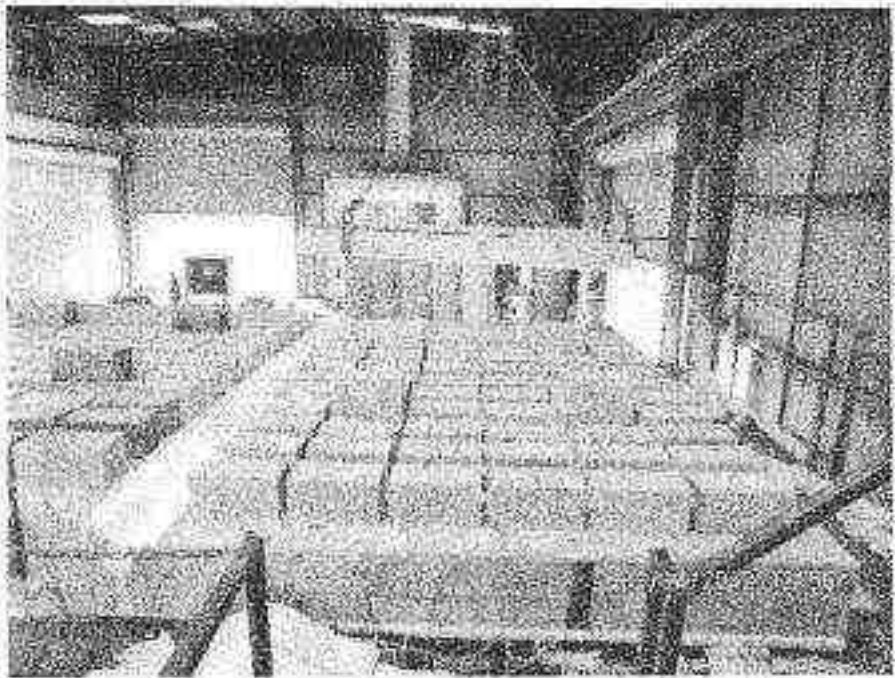
## REVISION SUMMARY

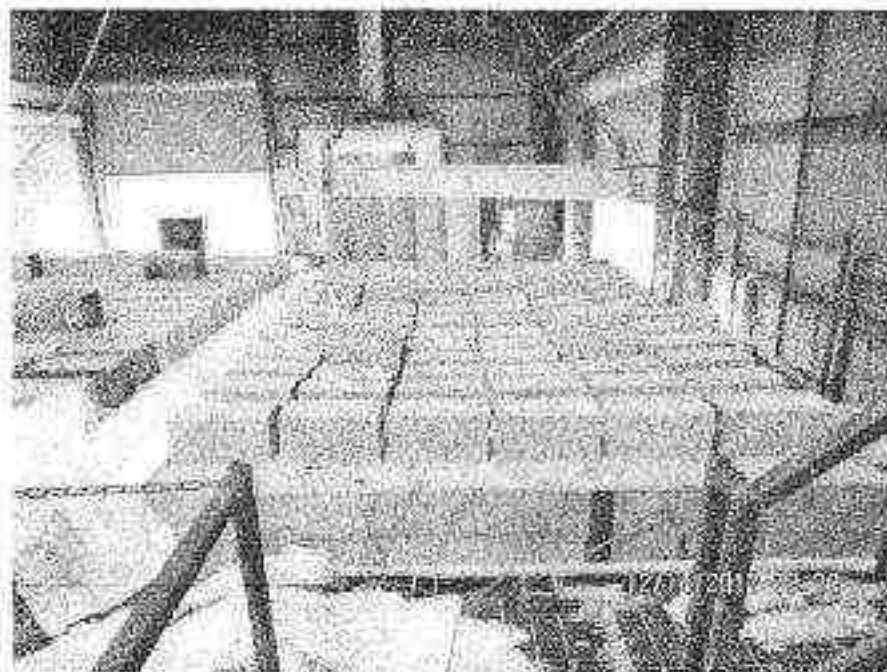
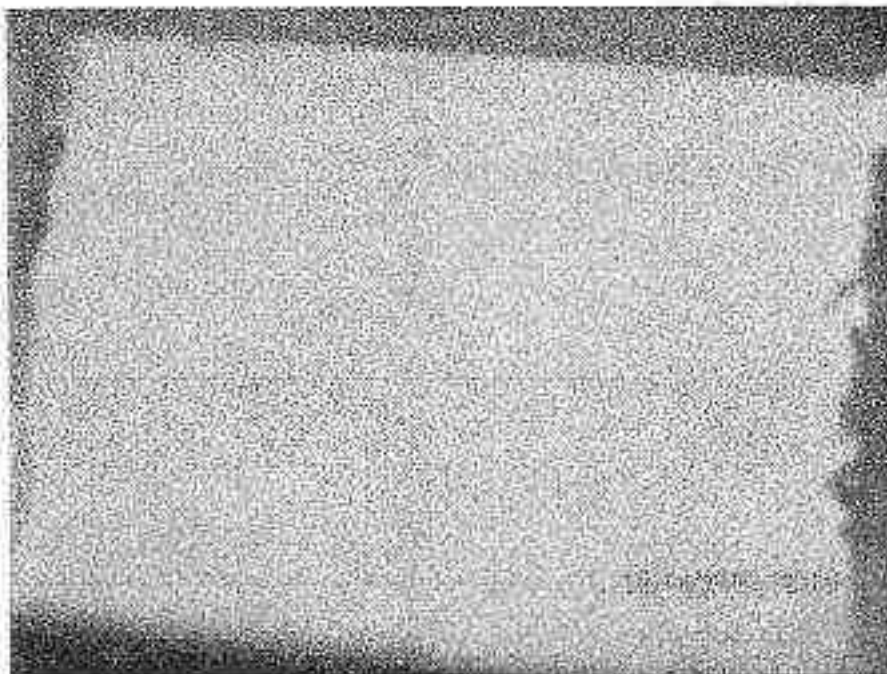
DATE	SUMMARY
December 28, 2012	Original Issue Date
February 13, 2013 MA Brown  VM Burgos 	1) Inserted Revision Number and Revision Date throughout 2) Revised underside plywood thickness to 19/32" (pg 3) 3) Deleted reference to Load calculations in Appendix B (pg 5) 4) Replaced all client drawings with client-supplied revised drawings 5) Replaced TC Drawings with revised drawings 6) Revised labeling on test data tables



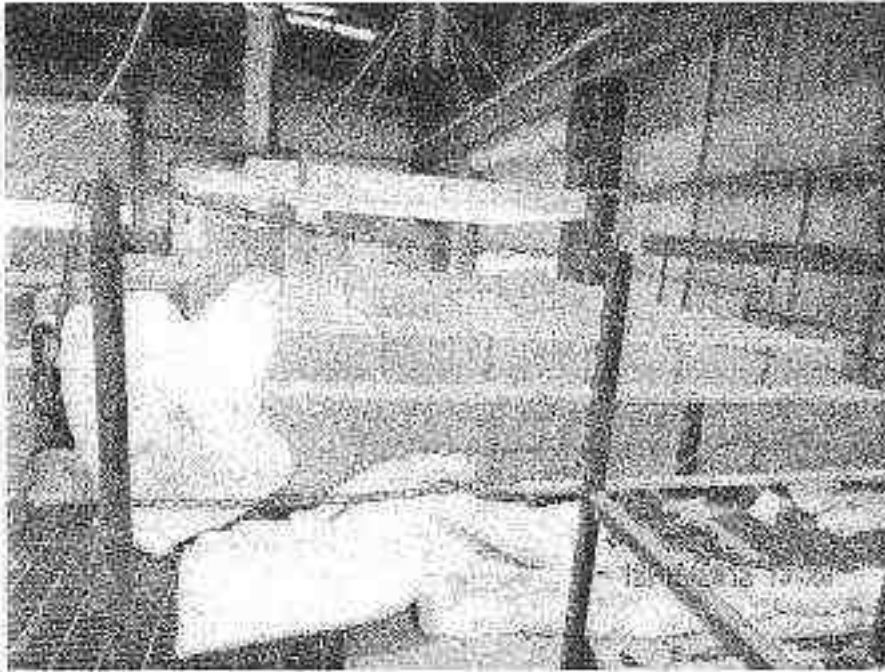


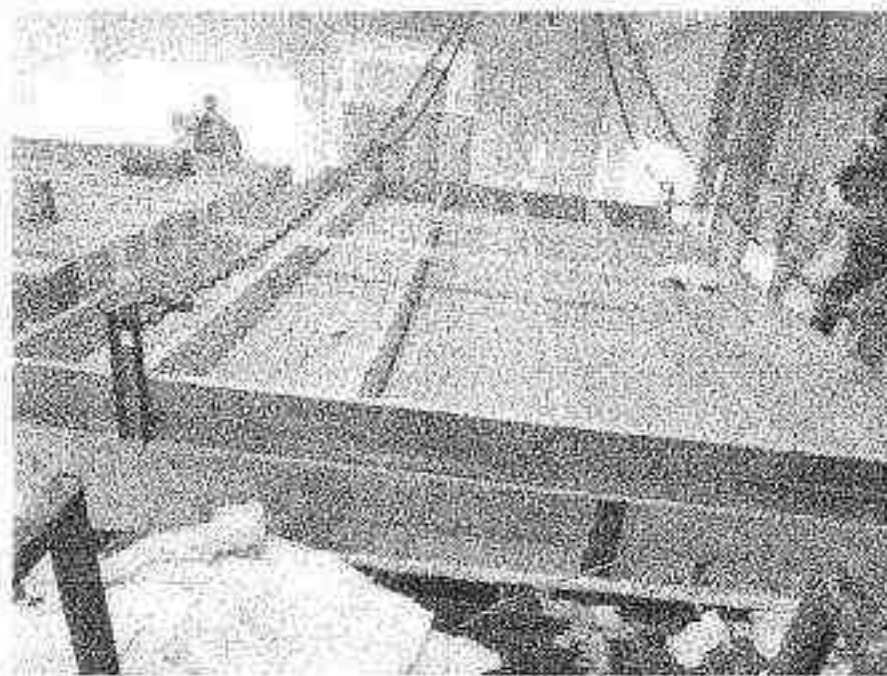


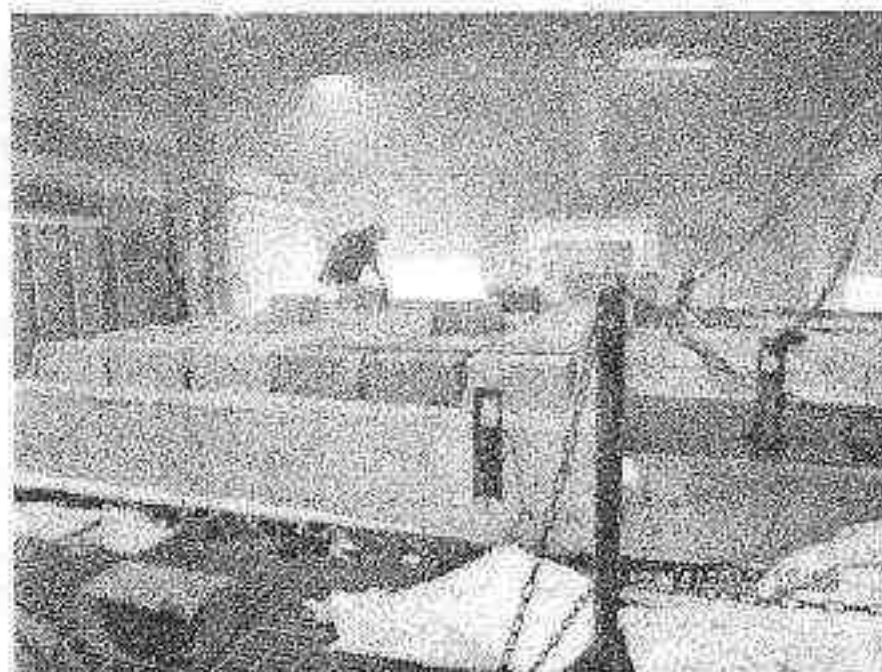
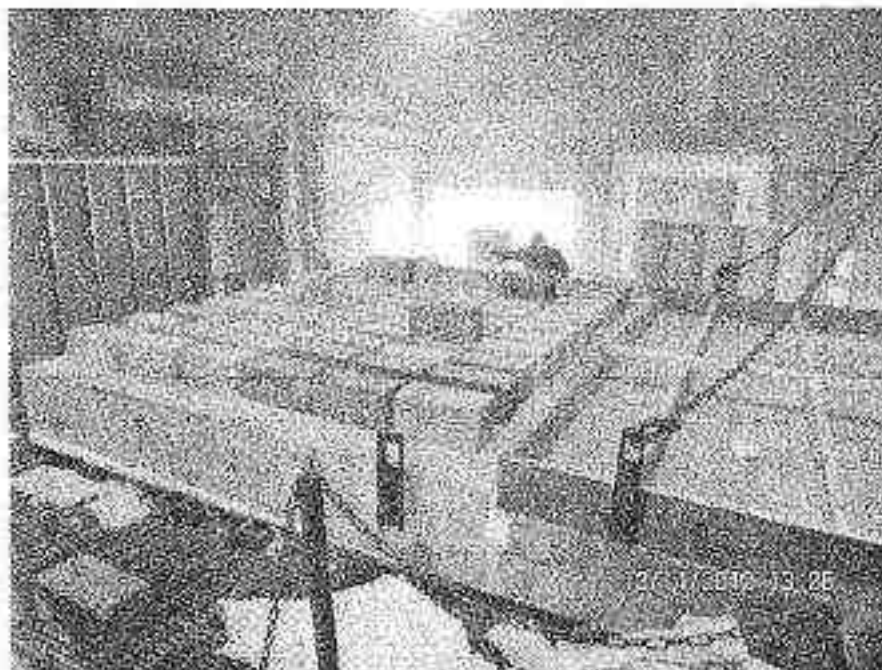




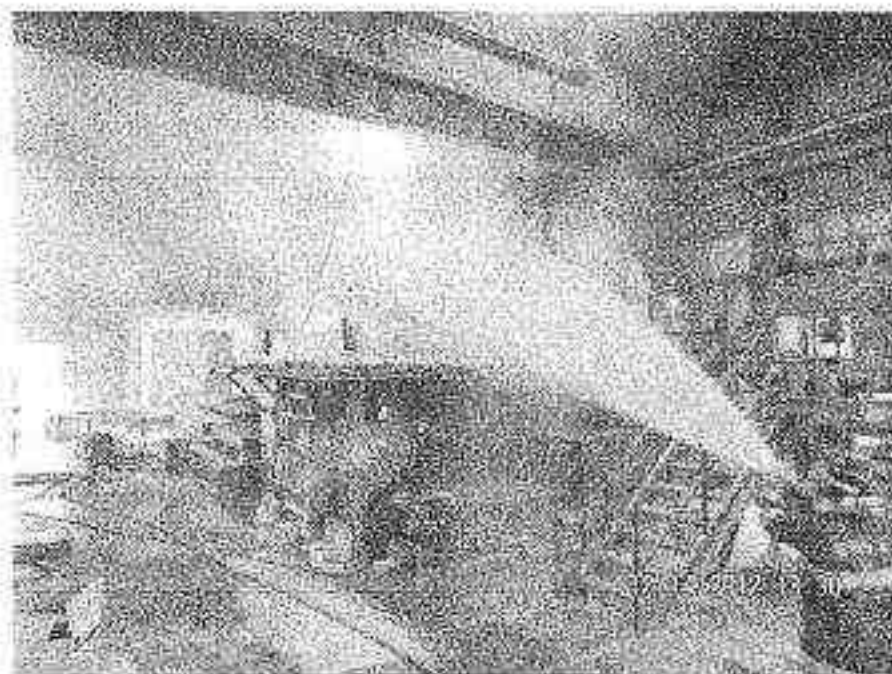
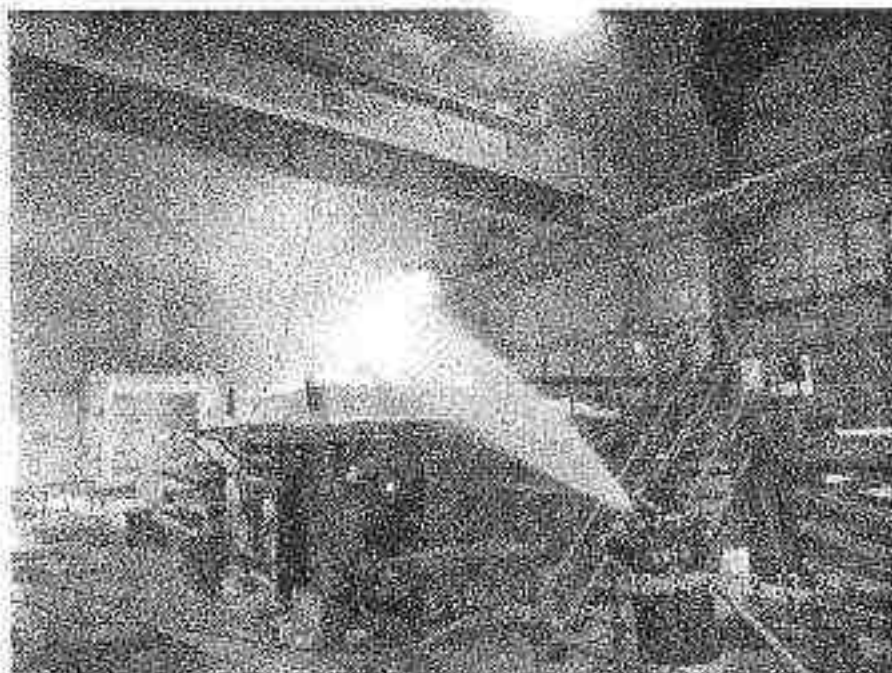




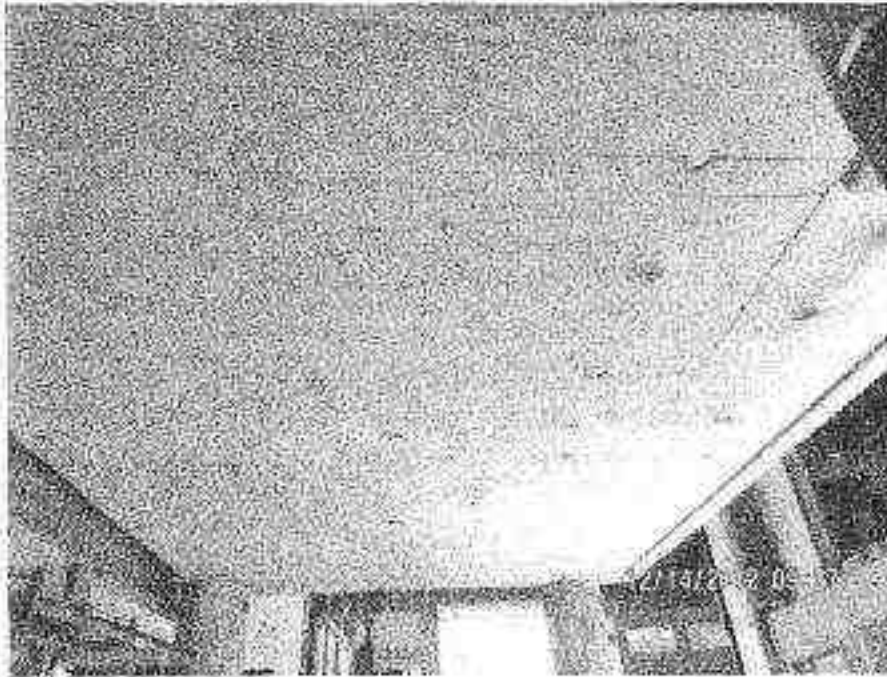










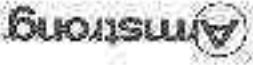




### CALIBRATED INSTRUMENTATION USED FOR TESTING

Description	Serial No.	Calibration Due Date
Thermo-Hygrometer (Horizontal Furnace)	111901142	11/2/2013
300-Channel Data Acquisition System	48JF0082	3/11/2013
Stop Watch	111765171	8/30/2013





Item	Material	Thickness	Fire Rating	Notes
1000	1/2" Gypsum Board	1/2"	1/2 hr	
1001	1/2" Gypsum Board	1/2"	1 hr	
1002	1/2" Gypsum Board	1/2"	1 1/2 hr	
1003	1/2" Gypsum Board	1/2"	2 hr	
1004	1/2" Gypsum Board	1/2"	2 1/2 hr	
1005	1/2" Gypsum Board	1/2"	3 hr	
1006	1/2" Gypsum Board	1/2"	3 1/2 hr	
1007	1/2" Gypsum Board	1/2"	4 hr	
1008	1/2" Gypsum Board	1/2"	4 1/2 hr	
1009	1/2" Gypsum Board	1/2"	5 hr	
1010	1/2" Gypsum Board	1/2"	5 1/2 hr	
1011	1/2" Gypsum Board	1/2"	6 hr	
1012	1/2" Gypsum Board	1/2"	6 1/2 hr	
1013	1/2" Gypsum Board	1/2"	7 hr	
1014	1/2" Gypsum Board	1/2"	7 1/2 hr	
1015	1/2" Gypsum Board	1/2"	8 hr	
1016	1/2" Gypsum Board	1/2"	8 1/2 hr	
1017	1/2" Gypsum Board	1/2"	9 hr	
1018	1/2" Gypsum Board	1/2"	9 1/2 hr	
1019	1/2" Gypsum Board	1/2"	10 hr	
1020	1/2" Gypsum Board	1/2"	10 1/2 hr	
1021	1/2" Gypsum Board	1/2"	11 hr	
1022	1/2" Gypsum Board	1/2"	11 1/2 hr	
1023	1/2" Gypsum Board	1/2"	12 hr	
1024	1/2" Gypsum Board	1/2"	12 1/2 hr	
1025	1/2" Gypsum Board	1/2"	13 hr	
1026	1/2" Gypsum Board	1/2"	13 1/2 hr	
1027	1/2" Gypsum Board	1/2"	14 hr	
1028	1/2" Gypsum Board	1/2"	14 1/2 hr	
1029	1/2" Gypsum Board	1/2"	15 hr	
1030	1/2" Gypsum Board	1/2"	15 1/2 hr	
1031	1/2" Gypsum Board	1/2"	16 hr	
1032	1/2" Gypsum Board	1/2"	16 1/2 hr	
1033	1/2" Gypsum Board	1/2"	17 hr	
1034	1/2" Gypsum Board	1/2"	17 1/2 hr	
1035	1/2" Gypsum Board	1/2"	18 hr	
1036	1/2" Gypsum Board	1/2"	18 1/2 hr	
1037	1/2" Gypsum Board	1/2"	19 hr	
1038	1/2" Gypsum Board	1/2"	19 1/2 hr	
1039	1/2" Gypsum Board	1/2"	20 hr	
1040	1/2" Gypsum Board	1/2"	20 1/2 hr	
1041	1/2" Gypsum Board	1/2"	21 hr	
1042	1/2" Gypsum Board	1/2"	21 1/2 hr	
1043	1/2" Gypsum Board	1/2"	22 hr	
1044	1/2" Gypsum Board	1/2"	22 1/2 hr	
1045	1/2" Gypsum Board	1/2"	23 hr	
1046	1/2" Gypsum Board	1/2"	23 1/2 hr	
1047	1/2" Gypsum Board	1/2"	24 hr	
1048	1/2" Gypsum Board	1/2"	24 1/2 hr	
1049	1/2" Gypsum Board	1/2"	25 hr	
1050	1/2" Gypsum Board	1/2"	25 1/2 hr	
1051	1/2" Gypsum Board	1/2"	26 hr	
1052	1/2" Gypsum Board	1/2"	26 1/2 hr	
1053	1/2" Gypsum Board	1/2"	27 hr	
1054	1/2" Gypsum Board	1/2"	27 1/2 hr	
1055	1/2" Gypsum Board	1/2"	28 hr	
1056	1/2" Gypsum Board	1/2"	28 1/2 hr	
1057	1/2" Gypsum Board	1/2"	29 hr	
1058	1/2" Gypsum Board	1/2"	29 1/2 hr	
1059	1/2" Gypsum Board	1/2"	30 hr	
1060	1/2" Gypsum Board	1/2"	30 1/2 hr	
1061	1/2" Gypsum Board	1/2"	31 hr	
1062	1/2" Gypsum Board	1/2"	31 1/2 hr	
1063	1/2" Gypsum Board	1/2"	32 hr	
1064	1/2" Gypsum Board	1/2"	32 1/2 hr	
1065	1/2" Gypsum Board	1/2"	33 hr	
1066	1/2" Gypsum Board	1/2"	33 1/2 hr	
1067	1/2" Gypsum Board	1/2"	34 hr	
1068	1/2" Gypsum Board	1/2"	34 1/2 hr	
1069	1/2" Gypsum Board	1/2"	35 hr	
1070	1/2" Gypsum Board	1/2"	35 1/2 hr	
1071	1/2" Gypsum Board	1/2"	36 hr	
1072	1/2" Gypsum Board	1/2"	36 1/2 hr	
1073	1/2" Gypsum Board	1/2"	37 hr	
1074	1/2" Gypsum Board	1/2"	37 1/2 hr	
1075	1/2" Gypsum Board	1/2"	38 hr	
1076	1/2" Gypsum Board	1/2"	38 1/2 hr	
1077	1/2" Gypsum Board	1/2"	39 hr	
1078	1/2" Gypsum Board	1/2"	39 1/2 hr	
1079	1/2" Gypsum Board	1/2"	40 hr	
1080	1/2" Gypsum Board	1/2"	40 1/2 hr	
1081	1/2" Gypsum Board	1/2"	41 hr	
1082	1/2" Gypsum Board	1/2"	41 1/2 hr	
1083	1/2" Gypsum Board	1/2"	42 hr	
1084	1/2" Gypsum Board	1/2"	42 1/2 hr	
1085	1/2" Gypsum Board	1/2"	43 hr	
1086	1/2" Gypsum Board	1/2"	43 1/2 hr	
1087	1/2" Gypsum Board	1/2"	44 hr	
1088	1/2" Gypsum Board	1/2"	44 1/2 hr	
1089	1/2" Gypsum Board	1/2"	45 hr	
1090	1/2" Gypsum Board	1/2"	45 1/2 hr	
1091	1/2" Gypsum Board	1/2"	46 hr	
1092	1/2" Gypsum Board	1/2"	46 1/2 hr	
1093	1/2" Gypsum Board	1/2"	47 hr	
1094	1/2" Gypsum Board	1/2"	47 1/2 hr	
1095	1/2" Gypsum Board	1/2"	48 hr	
1096	1/2" Gypsum Board	1/2"	48 1/2 hr	
1097	1/2" Gypsum Board	1/2"	49 hr	
1098	1/2" Gypsum Board	1/2"	49 1/2 hr	
1099	1/2" Gypsum Board	1/2"	50 hr	
1100	1/2" Gypsum Board	1/2"	50 1/2 hr	

Fire Resistance Assembly Chart

IMPROVE SAFETY







# DX/DXL

# Grid



Now Available



High R-value of Content



DX/DXL® Acoustic Ceiling Grid  
Acoustic Panels with Acoustic Performance

### Features and Benefits

- 15/17" square tile system. Components for use in general and fire-rated applications.
- Maximum acoustic absorption available.
- Compatible with USG® Drop Grid Ceiling Systems.
- DXL system features excellent acoustical design options including:
  - One-size, one-fixture, one-piece design for easy installation by the field laborer.
  - Available in several material and finish options.
  - Proprietary Quick-Turn™ technology.
- High-rack and economy VFRS available.
- Custom color available.
- DXL-55 available in premium finish for design installations (USG DXL-55-0250).

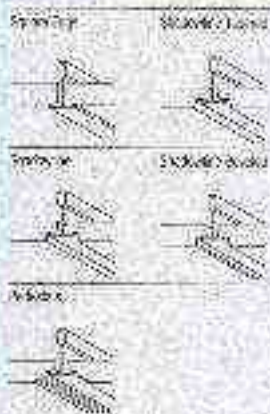
### Applications

- Fire-rated, non-fire-rated applications
- Low-Integrated Ceiling Systems

See USG report for [usgdesignstudio.com](http://usgdesignstudio.com) for design ideas. Share your ideas.



Profile



Edge Detail

To see the samples, go to [usg.com](http://usg.com)







Item No.	Item Name	Unit	Quantity	Rate	Total	Remarks
1	...	...	...	...	...	...
2	...	...	...	...	...	...
3	...	...	...	...	...	...
4	...	...	...	...	...	...
5	...	...	...	...	...	...
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10	...	...	...	...	...	...

Item No.	Item Name	Unit	Quantity	Rate	Total	Remarks
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1. 2024-2025  
 2. 2024-2025  
 3. 2024-2025  
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 5. 2024-2025  
 6. 2024-2025  
 7. 2024-2025  
 8. 2024-2025  
 9. 2024-2025  
 10. 2024-2025

## PERFORMANCE

Fire-resistance ratings have long been used by UL, ASTM and building codes to measure the performance of various constructions for fire containment purposes. As applied to elements of buildings, the fire-resistance rating classifies the ability of an assembly to confine and isolate fire within a zone comprised of fire-resistance rated walls, ceiling and floor assemblies. The ratings relate to fire tests designed to determine how quickly fire can raise the temperature to unacceptable levels. Fire-rated assemblies are tested and certified in their entirety. These designs are identified in the UL Fire Resistance Directory, which is updated yearly and can be referenced at the Underwriters Laboratories website at [ul.com](http://ul.com).

These ratings are described in terms of fire resistance, surface-burning characteristics and non-combustibility. The following standards are used for fire safety certification:

### fire resistance

This is the period of time an assembly will serve as a barrier to the spread of fire and how long fire resistance the assembly can function structurally after it is exposed to a fire of standard intensity, as defined by ASTM E119 and UL263. Sometimes this is also called the assembly's fire endurance.

The test procedure consists of the fire endurance test for all assemblies and, in addition, a hose stream test for partition and wall assemblies. The test specimen must meet all of the following requirements to pass the test. An assembly must resist heat transmission so that temperatures on the side opposite the fire may be maintained below designated values. The temperature of the unexposed surface is measured by thermocouples attached directly to the surface. In the case of walls and partitions, one thermocouple is located at the center of the assembly, one in the center of each quarter section, and the other four at the discretion of the testing authority. In addition, the assembly must support its design load without structural failure or collapse for the duration of the test. Finally, the assembly must not develop gaps or openings that allow it to be breached by flames and hot gases from the fire. The earliest point at which any of these three criteria is violated terminates the test and establishes the maximum fire resistance of the assembly. Walls and partitions must also pass one more criterion, the hose stream test, before a fire resistance rating can be assigned.

The hose stream test consists of subjecting a duplicate test assembly to one-half of the indicated fire exposure (but not more than one hour), followed immediately by exposure to a jet stream of water from a fire nozzle at a prescribed pressure and distance. (See table on page 157 for conditions of hose stream test.) The time-temperature curve used for the furnace is shown below. The temperature is obtained from the average readings of nine thermocouples symmetrically located near all parts of the assembly, and placed 6" from the exposed surface of the walls or 12" from the exposed surface of floors, ceilings or columns.

Additional information on ASTM E119 can be found at this link: <http://www.astm.org/Standards/E119.htm>

Additional information on UL263 can be found at this link:  
<http://ulstandardsinfo.ul.com/scopes/scopes.asp?fr=0263.html>

### through penetration



Through-penetration fire stop systems are intended to restore the hourly rating of fire-resistive assemblies that have been breached due to penetration by electrical, plumbing or mechanical items. The ASTM E814 test method was developed in recognition of the special role of through-penetration fire stops. This standard test is applicable to through penetration fire stops of various materials and types of construction. Fire stops are intended for use in openings in fire-resistive walls and floors. They consist of materials that fill the opening around penetrating items such as cables, cable trays, conduits, ducts and pipes.

The test method considers the resistance of fire stops to an external force simulated by a hose stream. Two ratings are established for each fire stop. An F rating is based on flame occurrence on the unexposed surface, while the T rating is based on the temperature rise and flame occurrence on the unexposed side of the fire stop.

More information on ASTM E814 can be found at this link: <http://www.astm.org/Standards/E814.htm>

## flame spread

Flame spread is a measure of a material's relative burning behavior. Both the flame spread and smoke developed are measured in accordance with ASTM E84.

Materials with a low flame spread prevent a small, localized fire, such as a waste basket ignited by a cigarette butt, from spreading to other combustible materials in the room. Hence, a low flame spread rating indicates a reduced probability of having a small fire develop into a room fire. The production of dense, black smoke when burning creates an additional hazard for building occupants by making it more difficult for them to see and find their way to an exit. Materials that have high flame spread and produce large quantities of smoke are considered undesirable, especially when used in areas where people assemble or are confined. ASTM E84 and UL 723 measure the flame spread and smoke density of building materials when subjected to fire. These indices are collectively known as the surface burning characteristics of the material. The test is often referred to as the Steiner Tunnel test in honor of the originator of the test method.

In the test, a 20' x 25' sample, which is installed as the "roof" of a rectangular furnace, is subjected to a fire of controlled severity. The fire is 12" from one end of the sample. From ignition the distance and time of flaming of the sample material, along with the smoke it produces, are compared against the performance of red oak planks and inorganic reinforced board, which are arbitrarily assigned values of 100 and 0, respectively, for these characteristics.

Interior wall and ceiling finish materials are grouped in classes in accordance with their flame spread and smoke-developed indexes. The classes are:

Class A: Flame spread index 0-25; Smoke developed index 0-450

Class B: Flame spread index 26-75; Smoke developed index 0-450

Class C: Flame spread index 76-200; Smoke developed index 0-450

The Class A designation refers to material that may ignite but will not sustain a flame. Class A products will not generate excessive visibility-obscuring smoke, an important factor in designing safe egress for building occupants. *Note that Class A is not a fire-resistance designation.*

More information on ASTM E84 can be found at this link: <http://www.astm.org/Standards/E84.htm>

More information on UL723 can be found at this link:  
<http://ulstandardsinfo.ul.com/scopes/scopes.asp?fn=0723.html>

## non-combustibility

A non-combustible material is one that does not ignite, burn, support combustion, or release flammable vapors when subject to fire or heat, in the form in which it is used and under anticipated conditions, as determined through ASTM E136. In this test, a sample of the material is placed in a ceramic tube furnace operating at 1382° F. If flaming occurs after the first 30 seconds, the test specimen loses 50% or more of its weight, or the temperature of the test specimen rises by more than 54° F, the material fails and is deemed to be combustible. If none of these three conditions occur over an exposure period of 30 minutes then the material passes and is classified as noncombustible.

More information on ASTM E136 can be found at this link: <http://www.astm.org/Standards/E136.htm>

- See more at: <https://www.usg.com/content/usgcom/en/products-solutions/solutions/fire-performance/performance.html#sthash.bFMuy4kK.dpuf>



# Fire-Rated Ceiling Assemblies

Technical Service 800 USG 4TQ6  
 Web Site www.usg.com  
 Samples/Literature 888 874.2450  
 Samples/Literature Fax 888 874.2348  
 Customer Service 800 950.3889

4479

## Suspension Ceiling Designs

**A Floor-Ceiling Design—**  
 Concrete with Pultruse  
 Block/Floor Joists and  
 Beam Support.  
 Overall 21' 0" System and  
 Clear

**B Floor-Ceiling Design—**  
 Concrete with Steel Floor  
 Joists and Beam Support.  
 Overall 21' 0" System and  
 Clear

**C Floor-Ceiling Design—**  
 Concrete and Steel Joists  
 Block/Floor Joists and  
 Beam Support

UL Design No.	Assembly Rating (Minimum)	Approved Ceiling Tiles/Panels	Tile Panel Size	Suspension System	Maximum Fix. Size % Ceiling Area	Grid Area per 100 Sq. Ft. of Ceiling Area	Assembly Construction Details
400	2 1/2 hr. 2 hr. UG 2 hr. UR	34 FR 51; 34 FR 52	24x24 24x24	1-Track	Fluorescent type 24x48—45%	None	2-1/2" concrete; Metal hangers; 10" bar joists; 21' x 21' beam
628	2 hr. R; 1-1/2 hr. R; 1-1/2 hr. UR 1-1/2 hr. UR	FR 21, FR FR 4; FR 22 (24-3) FR 23	24x24 24x24	UL, DALI	Fluorescent type 24x48—25%	None	2-1/2" concrete; Metal hangers; Metal deck; 21' x 21' beam
3213	4 hr. UR; 2 hr. R 2 hr. UR; 2 hr. UR; 1-1/2 hr. R; 1-1/2 hr. UR 1-1/2 hr. UR	24 FR 52	24x24	UL, 207, 500L	Fluorescent type 24x48—10%; Incandescent type 6-12" dia.	11 sq. ft.	2-1/2" concrete; Cable or metal deck; Metal hangers
6210	2 hr. R; 2 hr. R 3 hr. UR; 2 hr. R 2 hr. UR; 2 hr. UR	FR 23 Metal Panel	24x24	ULP DALI, DALI, 500L	Fluorescent type 24x48—25%; 24x48—45%; Incandescent type 6-12" dia.	10 sq. ft. 10 sq. ft.	2-1/2" concrete; 21' x 21' beam; Cable or metal deck; 10" bar joists; 21' x 21' beam
6219	2 hr. R; 2 hr. UR; 34 FR 23; 34 FR; 2 hr. UR; 2 hr. UR 1-1/2 hr. R; 1-1/2 hr. UR 1-1/2 hr. UR; 1 hr. R; 1 hr. R; 1 hr. UR	FR 23; FR 24 FR 24	24x24 24x24	UL, DALI, DALI, DALI, 500L, 500L, 7074	Fluorescent type 24x48—10%; 24x48—25%; 24x48—45%; 24x48—45%	11 sq. ft.	2-1/2" concrete; 21' x 21' beam; Cable or metal deck; Metal hangers
3202	2 hr. R; 2 hr. UR 2 hr. UR	FR 23 (FR 2) Acro FR	24x24 24x24 24x24	UL, 707	Fluorescent type 24x48—20—100 Incandescent type 6-12" dia.—15%	854 sq. ft. 679 sq. ft.	2-1/2" concrete; 21' x 21' beam; Cable or metal deck; 10" bar joists; 21' x 21' beam; 10" bar joists; 21' x 21' beam
321	2 hr. R; 2 hr. UR	FR 23 (FR 2) FR 23; FR 23 Acro FR (FR 1)	24x24 24x24	UL, 704 FR 7 DALI, DALI, 500L	Fluorescent type 24x48—10%	11 sq. ft.	2-1/2" concrete; Metal hangers; 10" bar joists; 21' x 21' beam
6213	2 hr. R; 2 hr. R 2 hr. UR; 2 hr. R; 2 hr. UR; 2 hr. UR 1-1/2 hr. R; 1-1/2 hr. R 1-1/2 hr. UR; 1 hr. R 1 hr. R; 1 hr. UR	FR 24; FR 24; FR 24; FR 24; FR 24 FR 23 (FR 1) (FR 2) Acro FR (FR 1)	24x24 24x24	UL, DALI, 500L	Fluorescent type 24x48—24%; Incandescent type 6-12" dia.	24 sq. ft.	2-1/2" concrete; Metal hangers; Cable or metal deck; 10" bar joists; 21' x 21' beam; Metal hangers
6220	2 hr. R; 2 hr. UR	FR 24 FR 24; FR 24 Acro FR (FR 1)	24x24 24x24 24x60	UL, DALI, 500L	Fluorescent type 24x48 24x48—24%; 24x60—12%; Incandescent type 6-12" dia.	276 sq. ft.	2-1/2" concrete; Metal hangers; 10" bar joists; 21' x 21' beam
6204	2 hr. R; 2 hr. UR; 2 hr. UR	FR 21; FR 23 FR 21; FR 23 Acro FR (FR 1)	24x24 24x24	DALI, DALI, DALI, 500L, 7074 500L	Fluorescent type 24x24, 24x48, 24x60, 24x 24x24 Incandescent type 6-12" dia.	113 sq. ft. 1570 sq. ft.	2-1/2" concrete; Metal hangers; Cable or metal deck; 10" bar joists; 21' x 21' beam; Metal hangers

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UL Design No.	Assembly Making (Minimum)	Approved Ceiling Tiles/Panels	Tile Panel Size	Suspension System	Maximum No. Size % Ceiling Area	Deck Area per 100 Sq. Ft. of Ceiling Area	Assembly Construction Details	
0-Rate-Ceiling Designs— Concrete and Steel Joists— Exposed, 240/360/480/600 Lay-In Panels 900/1200	G206	2 hr U 2 hr UR 2 hr UR	FR-R, FR-RS; FC-CB; FC-A Acro FR (FR-I)	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A, FR-2A	Fluorescent; 2x4—24% Incandescent; 6-12" diam.	57 sq. ft.	2-1/2" concrete (2 hr) 2-1/2" concrete (2 hr) 2-1/2" joists, 24" oc. 2 hr ceiling 10-1/2" joists 45" oc. 13 hr ceiling
	G209	2 hr U 2 hr UR 2 hr UR 2 hr UR	FR-R FR-R, FR-R, FR-R Acro FR (FR-I)	FR-2; 2x4, 2x4-60	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 20x48/60—24% 2x21/12—24% Incandescent; 6-12" diam.	154 sq. ft.	2-1/2" concrete; Metal deck, 10" joists; 24" oc. 2 hr ceiling system W10 x 21 beam
	G222	2 hr R, 2 hr UR 2 hr UR	FR-RB	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—12% Incandescent; 6-12" diam.	57 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 24 beam 4-1/2" beam
	G227	2 hr U 2 hr UR 2 hr UR	FR-RS Acro FR (FR-I)	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—16%	57 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 24 beam 4-1/2" beam
	G228	2 hr R, 2 hr UR 2 hr UR	FR-RB	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x2—12% Incandescent; 6-12" diam.	57 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 24 beam
	G230	2 hr R, 2 hr UR 2 hr UR	FR-RS, FR-R Acro FR (FR-I)	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—16%	115 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 21 beam
	G231	2 hr U, 2 hr UR 2 hr UR	FR-RS	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—16%	67 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 21 beam
	G233	2 hr R, 2 hr UR 2 hr UR	FR-RB FR-R	FR-2; 2x4, L-edge	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x2—24% Incandescent; 6-12" diam.	115 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 21 beam
	G234	1-1/2 hr R 1-1/2 hr U 1-1/2 hr UR	FR-RB	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—16% Incandescent; 6-12" diam.	57 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 21 beam
	G201	1 hr R 1 hr U	FR-I, FR-R, FR-R, FR-R	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—8% Incandescent; 6-12" diam.	4 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. 21/2" FR-2; FR-R, FR-R, FR-R
G202	1-1/2 hr R 1-1/2 hr U	FR-R, FR-RS FR-R, FR-R, FR-R	FR-2; FR-2	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—24%	115 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc.	
G204	1-1/2 hr R 1-1/2 hr U	FR-R, FR-RS FR-R, FR-R, FR-R	FR-2; FR-2	FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x2—24% Incandescent; 6-12" diam.	115 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc.	
0-Rate-Ceiling Designs— Concrete and Steel Joists— Concealed Grid System and Tile	G203	2 hr R 2 hr U	FR-R, FR-RS	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—24%	57 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc.
	G207	2 hr R, 2 hr UR 2 hr UR	FR-R, FR-RS	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—16% 2x4—24%	57 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W10 x 21 beam
	G208	2 hr R, 2 hr UR 2 hr UR	FR-RS	FR-2; 2x4	FR-2, FR-2, FR-2, FR-2, FR-2, FR-2, FR-2A, FR-2, FR-2A	Fluorescent; 2x4—12% 2x4—12%	35 sq. ft.	2-1/2" concrete, Metal deck, 10" joists 24" oc. W8 x 21 beam

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	UL Design No.	Assembly Rating (Minimum)	Approved Ceiling Tiles/Panels	Tile/Panels	Support System	Minimum Fire Stop Ceiling Area	Cost Area per 100 Sq. Ft. of Ceiling Area	Assembly Construction Details
6-Floor Ceiling Designs—Concrete and Steel Joists On-Frame Grid System (See Table Continued)	C206	1 hr. 0 min. 2 1/2 hr. 0 min.	FR-45	12x12	Resilient Grid	Fluorocel Type, 2x4—15%	13 sq. ft.	2 1/2" concrete, Molded 10' concrete blocks
	C207	1 1/2 hr. 0 min. 2 1/2 hr. 0 min.	FR-45, FR-45 (A)	2x2	Gal. Steel Grid	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep	13 sq. ft.	2 1/2" concrete, Skelopak, 17 1/2" concrete
	C208	2 hr. 0 min. 2 1/2 hr. 0 min. 3 hr. 0 min.	FR-45, FR-45 (A)	2x2	Gal. Steel Grid	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep	57 sq. ft.	2 1/2" concrete, Molded 10' concrete blocks, 15 1/2" concrete
	C209	2 hr. 0 min. 2 1/2 hr. 0 min.	FR-45	12x12 12x24	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15%	113 sq. ft.	2 1/2" concrete, 15 1/2" concrete, 17 1/2" concrete
4-Floor Ceiling Designs—Concrete and Steel Joists On-Frame Grid System (See Table Continued)	C210	2 hr. 0 min. 2 1/2 hr. 0 min. 3 hr. 0 min.	FR-45, FR-45 (A), FR-45 (B)	2x2 2x4 20x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep	57 sq. ft.	2 1/2" concrete with 10' concrete blocks
	C211	2 hr. 0 min. 2 1/2 hr. 0 min.	FR-45, FR-45 (A)	2x2 2x4 20x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep	57 sq. ft.	Fluorocel Type, 2x4—15%
1-Floor Ceiling Designs—Wood or Composite Wood and Steel Joists Assemblies On-Frame Grid System (See Table Continued)	C212 (207)	2 hr. 0 min. Fire Rating: 75 min.	FR-45, FR-45 (A)	2x4	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% 2x4—25% 2x4—25% Fluorocel Type, 6-12" deep	57 sq. ft.	2 1/2" concrete with 10' concrete blocks
	C213	1 hr. 0 min. Fire Rating: 75 min.	FR-45, FR-45 (A), FR-45 (B) (FR-1)	2x2 2x4 12x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% 2x4—25% Fluorocel Type, 6-12" deep, 15"	139 sq. ft.	Wood floor, 2 1/2" concrete blocks
	C214	1 hr. 0 min. Fire Rating: 75 min.	FR-45, FR-45 (A)	2x2 2x4 12x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep, 15"	139 sq. ft.	Wood floor, 2 1/2" concrete blocks
	C215	1 hr. 0 min. Fire Rating: 75 min.	FR-45, FR-45 (A)	2x2 2x4 12x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep, 15"	139 sq. ft.	Wood floor, 2 1/2" concrete blocks
	C216	1 hr. 0 min. Fire Rating: 75 min.	FR-45, FR-45 (A)	2x2 2x4 12x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep, 15"	139 sq. ft.	Wood floor, 2 1/2" concrete blocks
	C217	1 hr. 0 min. Fire Rating: 75 min.	FR-45, FR-45 (A)	2x2 2x4 12x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep, 15"	139 sq. ft.	Wood floor, 2 1/2" concrete blocks
	C218	1 hr. 0 min. Fire Rating: 75 min.	FR-45, FR-45 (A)	2x2 2x4 12x80	Gal. Steel, 25# Gal. ST, 10' x 10'	Fluorocel Type, 2x4—15% Fluorocel Type, 6-12" deep, 15"	139 sq. ft.	Wood floor, 2 1/2" concrete blocks
1-Floor Ceiling Designs—Wood or Composite Wood and Steel Joists Assemblies On-Frame Grid System (See Table Continued)	C219	1 hr. 0 min. Fire Rating: 120 min.	FR-45, FR-45 (A)	12x12 12x24	Gal. Steel Grid	Fluorocel Type, 2x4—15% 2x4—25% 2x4—25%	57 sq. ft. 139 sq. ft. 57 sq. ft.	2 1/2" concrete, 15 1/2" concrete

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 4x12/12x12



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Fire-Rated Ceiling Designs Exposed Grid System and Lay-in Panels

UL Design No.	Assembly Rating (Minimum)	Approved Ceiling Tiles/Panels	Tile Panel Size	Suspension System	Maximum Fire Size % Ceiling Area	Best Area per 100 Sq. Ft. of Ceiling Area	Assembly Construction Details
P23	1 hr R 2 hr LR	SW FR-SS, FR-3	2x4	DL, DL2, SDR	Fluorescent type, 2x4—10%; Incandescent type, 6-12" diam.—1.2%	110 sq. ft.	2" x 4" steel joists 14" floor joists 24" o.c.
P237	1 hr R, 2 hr LR 2 hr LRB	FR-1, FR-50, FR-1; ER-1	2x4	DR grid only (DL, DL X, 70 X, DL2, SDR, DLX, SDR-A suspension)	Fluorescent type, 1x4—10%; 1x4—10%; 2x2—10%; 2x4—24%; Incandescent type, 6-12" diam.	144 sq. ft. Used as wall top	Uninsulated exterior steel deck, 2" floor joists 24" o.c.; 1/2" insulation (Type II) over ceiling and floor joists insulation
P241	2 hr R 2 hr LR	FR-1, FR-50, FR-1; (FR-1)	2x4	DR grid only, DL, DLX, DL2, DLX, SDR-A suspension joist panel	Fluorescent type, 1x4—10%; 2x2—10%; 2x4—24%; 2x4—24%; Incandescent type, 6-12" diam.	270 sq. ft.	2x4 steel joists Steel deck; 10" floor joists 24" o.c.; 10" insulation (Type II) over floor and ceiling joists insulation
P239	1 hr R, 1 hr LR 1 hr LR, 1 hr LRB 1 hr LR, 1 hr LRB 1 hr LR, 1 hr LRB	FR-1 FR-50, FR-1; FR-1 (used as wall FR-1)	4x4; 2x4; 4x8	DL, DL X, DL2, DLX, DL2, SDR, DL X, SDR-A	Fluorescent type 2x4—24%; Incandescent type 6-12" diam. 2x2 DR	200 sq. ft. (57 sq. ft. 5" tile); 5" tile	Uninsulated exterior gypsum panel or floor joist on steel deck; 10" floor joists 24" o.c.; 5" insulation
P240	1 hr R, 1 hr LR, 1 hr LRB	FR-50, FR-1; (FR-1)	2x4	DL, DL X, DL2, DLX, SDR, DL2, SDR-A	Kera	None	Steel deck; 2x4 steel joists; 12" floor joists 24" o.c.; 2x4 joist beam
P242	1 hr R, 1 hr LR, 1 hr LRB	FR-50, FR-1; (FR-1)	2x4	Kera (used as deck)	Fluorescent type, 2x4—12%	57 sq. ft.	Steel deck; 1" insulation; 5" floor joists 48" o.c.
P24	1 hr R, 1 hr LR, 1 hr LRB	2x4 FR-50, FR-1	2x2 2x4	DL, DL2, SDR	Fluorescent type, 2x4—15%; Incandescent type, 6-12" diam.—1%	57 sq. ft.	Steel deck; 2x4 joists 24" o.c. Insulation 10" floor joists 24" o.c.
P247	1 hr R 1 hr LR 1 hr LRB	FR-50, FR-1; (FR-1) FR-1 (used as wall FR-1)	2x2 2x4	DL, DL X, DL2, DLX, DL2, SDR, DL X, SDR-A	Fluorescent type, 2x4—10%	57 sq. ft.	1" x 2" insulation; Steel deck; 8" floor joists 48" o.c.
P238	1 hr R 1 hr LR 1 hr LRB	FR-50, FR-1; (FR-1) Wall FR-1 (FR-1)	2x4 2x4	DL, DL2, SDR	Fluorescent type 2x4—10%	100 sq. ft.	Panel joists to joists; gypsum panel; Steel deck; 10" floor joists 24" o.c. WSA Joist
P235	1 hr R 1 hr LR 1 hr LRB	FR-4	2x2; 2x4	DL, DL2, SDR	Fluorescent type 1x4—10%; 2x2—10%; 2x4—24%; Incandescent type, 6-12" diam.	57 sq. ft.	1" x 2" insulation; Steel deck; 8" floor joists 48" o.c.
P246 (P236)	1 hr R, 1 hr LR	FR-4	2x2; 2x4	DL, DL2, SDR	Fluorescent type, 1x4—12%; 2x2—10%; 2x4—24%; Incandescent type, 6-12" diam.	57 sq. ft.	2x4 insulation over 2" ceiling joist; 1" floor joists 24" o.c. Ceiling and floor joist insulation
P248	1 hr R, 1 hr LR, 1 hr LRB	FR-50, FR-1; (FR-1)	2x2; 2x4; 2x8	DL, DL X, DL2	Fluorescent type, 2x2—20%; 2x4—24%; 2x8 DR; Incandescent type, 6-12" diam.	57 sq. ft.	Fluorescent type over 2" ceiling joist; 1" floor joists 24" o.c. Ceiling and floor joist insulation

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**Fire-Rated Ceiling Designs**  
 Panels, Grids, Joists  
 and Lay-In Panels  
 (continued)

UL Design No.	Assembly Rating (Minimum)	Approved Ceiling Tiles/Panels	Tile Panel Size	Exposition System	Maximum Per. Size % Ceiling Area	Dist. Area per 100 Sq. Ft. of Ceiling Area	Assembly Description Details
P254	1 hr R, 2 1/2 hr UR, 3 1/2 hr IFR	34 FR 8, 24 FR 42	2 x 2 1 Edge	GRF	Fluorescent type, 2 x 2 ft 2 x 4—24% Incandescent type, 6—10% max.	113 sq. ft.	Unfaced header; 3/8" steel wallboard steel joist deck; fire blocking 45" x 72" max.
P255	1 hr R, 1 1/2 hr UR, 1 hr IFR	16-40 FR XI, (FR II)	2 x 2 2 x 4	GR1, GR2, GR2, GR3, GR7A, GR8A	Fluorescent type, 2 x 4—24% Incandescent type, 6—10% max.	57 sq. ft.	Including concrete over joists; 1/2" steel deck; 3" x 3" steel joist; 10" x 16 beam
P257	1 hr R	16-40 FR XI, (FR V)	2 x 2 2 x 4	GR1, GR2, GR2, GR3, GR7A, GR8A	Fluorescent type, 2 x 4—24%	255 sq. ft.	4" x 8" header; 3/8" steel wallboard over steel deck; 4" x 4" steel joist; 2" x 8" steel joist
P258	1 1/2 hr R, 1 1/2 hr UR, 1 1/2 hr IFR	14" FR 51; 34" FR 53; 54" FR 54; FR XI	2 x 4	GR1, GR2, GR2, GR7, GR8, GR8A, GR8B	Fluorescent type, 2 x 4—24%	675 sq. ft.	Unfaced header; 3/8" steel wallboard over steel deck; 4" x 4" steel joist; 2" x 8" steel joist; 10" x 16 beam
P259	1 1/2 hr R, 1 1/2 hr UR, 1 1/2 hr IFR	FR 55; FR XI, FR 4, FR 5	2 x 2 2 x 4	GR1, GR2, GR2	Fluorescent type, 2 x 4—24% Incandescent type, 6—10% max.—1.4%	255 sq. ft.	Unfaced header; 3/8" steel deck; 3" x 3" steel joist; 10" x 16 beam
P263	3 1/2 hr R, 3 1/2 hr UR, 3 1/2 hr IFR	FR 55; FR XI, (FR II)	2 x 4	GR1, GR2, GR2	Fluorescent type, 2 x 4—24%	113 sq. ft.	Steel deck 17" x 21" insulation 3" x 3" steel joist



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## Drywall Suspension Designs

	UL Design No.	Assembly Rating (Minimum)	Ceiling Membrane	Suspension System	Minimum F.R. Rtn. % Ceiling Area	Duct Area per 100 Sq. Ft. of Ceiling Area	Assembly Description Details	
<b>D Floor Ceiling Design—Concrete or 6 Steel Floor Units and Beam Support</b>	D001	2 hr R 1 hr L 2 hr LR	5/8" Gypsum Type C	AC	K015	None	2-1/2" concrete block, 2x10 beam	
	D002	2 hr R 2 hr L 2 hr LR	5/8" Gypsum Type C	AC	K015	44 sq. ft.	2-1/2" concrete block, 2x10 beam	
<b>G Floor-Ceiling Design—Concrete and Steel Joist</b>	G025	3 hr R 3 hr LR 3 hr LR	1/2" or 5/8" Gypsum Type C	AC	123/124/125/126/2x4-24%	74 sq. ft.	2-1/2" or 3" concrete block, 2" or 1" bar joist, 24" oc, W10 x 21 beam	
	G024	3 hr R 3 hr LR	1/2" Gypsum Type C	AC	K015	113 sq. ft.	2-1/2" or 3" concrete block, 2" or 1" bar joist, 48-12" oc, W10 x 21 beam	
	G026	3 hr R 3 hr L 3 hr LR	5/8" Gypsum Type C	DEL	K015	153 sq. ft.	3-1/4" or 3-1/2" concrete block, 2" or 1" bar joist, 48-12" oc, W10 x 21 beam	
	G028	2 hr R 2 hr LR 2 hr LR	1/2" or 5/8" Gypsum Type C	AC	Unrated type, 2x4-23%	55 sq. ft.	2-1/2" concrete block, 2" bar joist, 24" oc, W10 x 21 beam	
	G027	2 hr R 2 hr LR 4 hr LR	1/2" or 5/8" Gypsum Type C	DEL	K015	None	2-1/2" concrete block, 2" bar joist, 24" oc, W10 x 21 beam	
	G025	1-1/2 hr R 1-1/2 hr LR	1/2" or 5/8" Gypsum Type C	AC	K015	None	2-1/2" concrete block, 2" bar joist, 24" oc, W10 x 21 beam	
	G027	3 hr R 3 hr LR 3 hr LR	1/2" or 5/8" Gypsum Type C	DEL	Unrated type, 2x4-24%	67 sq. ft.	2-1/2" or 3" concrete block, 2" bar joist, 24" oc, W10 x 21 beam	
	G031	1 hr R 1 hr LR	1/2" Gypsum Type C	DEL	Unrated type, 2x4-21%	57 sq. ft.	3-1/2" concrete block, 2" bar joist, 24" oc, W10 x 21 beam	
	<b>J Floor-Ceiling Design—Concrete</b>	J009	3 hr R 3 hr LR	5/8" Gypsum Type C	DEL	K015	K015	Precast concrete, 2-1/2" or 3" bar joist, 24" oc, W10 x 21 beam
		J011	2 hr LR	1/2" Gypsum Type C	AC	Unrated type, 1x4, 2x2, 2x4-24% maximum, 1/4" = 1/2" max	67 sq. ft.	Wood floor, 2x10 wood joist, 18" oc, 2x4 metal joist hanger, metal plate
<b>L Floor-Ceiling Design—Wood or Combination Wood and Steel Joist Assemblies</b>	L006	1 hr LR	1/2" Gypsum Type C	DEL	None	None	Wood floor, 2x10 wood joist, 18" oc	
	L005	1 hr LR	5/8" Gypsum Type C	DEL	None	None	Wood floor, 2x10 wood joist, 18" oc	
	L013	1 hr LR	5/8" Gypsum Type C	DEL	K015	None	Wood floor, 2x10 wood joist, 24" oc	
	L010	1 hr LR	1/2" Gypsum Type C	DEL	K015	K015	Wood floor, 2x10 wood joist, 18" oc	
	L020	1 hr LR	1/2" or 5/8" Gypsum Type C	AC	Unrated type, 2x4-24%	57 sq. ft.	Wood floor, 2x10 wood joist, 18" oc	
	L020	1 hr LR	5/8" Gypsum Type C	DEL	Unrated type, 2x4-24%	144 sq. ft.	Wood floor, 2x10 wood joist, 18" oc	
	L029	1 hr LR	1/2" Gypsum Type C	DEL	Unrated type, 2x4-24%	57 sq. ft.	Wood floor, 2x4 wood joist, metal hanger, 24" oc	
	L048	1 hr R 1 hr L	1/2" Gypsum Type C	DEL	None	None	Wood floor, 2x4 wood joist, metal hanger, 24" oc	
	L049	1 hr LR 1 hr LR	5/8" Gypsum Type C	DEL	None	None	Wood floor, 2x4 wood joist, metal hanger, 24" oc, 18" x 35 beam	
	L049	1 hr LR	5/8" Gypsum Type C	DEL	None	None	Wood floor, 2x4 wood joist, metal hanger, 24" oc, 18" x 35 beam	

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# Fire-Rated Ceiling Assemblies

Technical Service 800 USG 4700  
 Web Site www.usg.com  
 Samples/Literature 888 874 2450  
 Samples/Literature Fax 888 874 2348  
 Customer Service 800 950 3838

## Drywall Suspension Designs

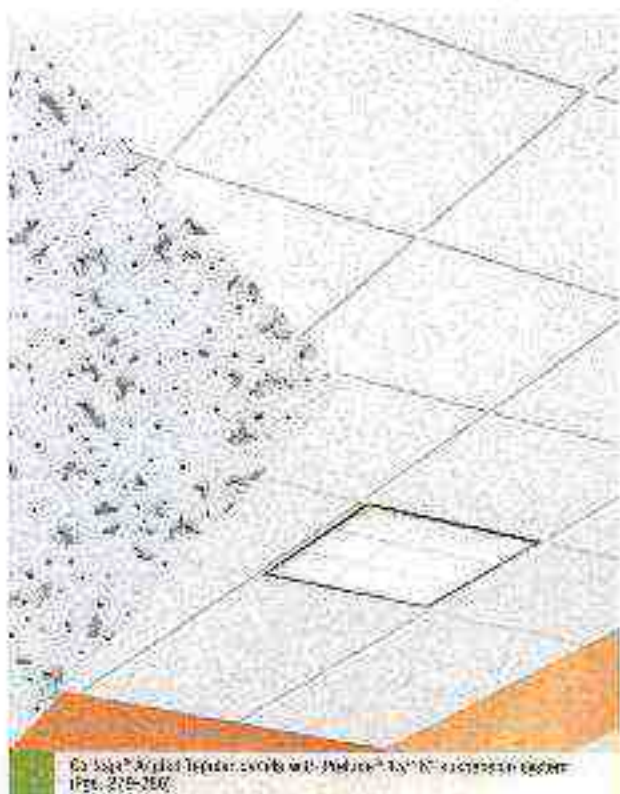
	UL Design No.	Assembly Rating (Maximum)	Ceiling Materials	Suspension System	Minimum R.C. Size % Ceiling Area	Best Area per 100 Sq. Ft. of Ceiling Area	Assembly Construction Details
<b>L-Floor-Ceiling Design—Wood or Composite Wood and Steel Joist Assembly</b>	CS1	1 hr. R	5/8" Steel Joist Type C	DCI	None	104 sq. ft.	Wood floor, 2" x 4" joists wood truss 24" o.c.
	CS2	1 hr., II	5/8" Steel Joist Type C	DCI	None	None	Wood floor, 1 1/2" gauge steel truss 45" o.c.
	CS3	1 hr., II	5/8" Steel Joist Type C	DCI	None	None	Wood floor, 1 1/2" gauge steel truss 45" o.c.
	CS4	1 hr., II	5/8" Steel Joist Type C	DCI	None	None	Wood floor, light gauge steel truss 48" o.c.
<b>P-Floor-Ceiling Design</b>	PS7	2 hr. R 2 1/2 hr. II 2 hr. IRR	1/2" Gypsum Type C	DCI	Flashed joint 1 x 4—15#, 2 x 2—20% 2 x 4—24% 3 x 4—24% 3 x 6—24% 3 x 8—24%	575 sq. ft.	1 1/2" x 12" insulation Steel deck 2" or 10" joist 24" o.c. Insulated upper ceiling materials
	PS9	1-1/2 hr. R 1-1/2 hr. II 1-1/2 hr. IRR	1/2" Gypsum Type C	DCI	Flashed joint 1 x 4—15#, 2 x 2—20% 2 x 4—24% 3 x 4—24% 3 x 6—24% 3 x 8—24%	575 sq. ft.	Cyclo-Insulor, Plywood sub-panel, 1/2" or 1 1/2" 45" o.c.; Insulated upper ceiling materials; 1/2" x 12" beam
	PS4	2 hr. R 2 hr. II	1/2" Gypsum Type C	DCI	Flashed joint 1 x 4—15#, 2 x 2—20%	575 sq. ft.	Insulating concrete; Steel deck; 2" joist 24" o.c. Insulated upper ceiling materials
	PS1	2 hr. R 2 hr. II	5/8" Steel Joist Type C	DCI	None	None	1 1/2" x 12" insulation; Building materials 24" o.c.; Ceiling truss; 1 1/2" x 12" joist 48" o.c.
	PS6	1-1/2 hr. R 1-1/2 hr. II	5/8" Steel Joist Type C	DCI	Flashed joint 2 x 4—24%	575 sq. ft.	1 1/2" x 12" insulation; Gypsum board; 1/2" joist 48" o.c.
	PS8	1 hr. R 1 hr. II	5/8" Steel Joist Type C	DCI	Flashed joint 2 x 4—24%	575 sq. ft.	Flashed joint; Insulating concrete; 1/2" x 12" joist 48" o.c.
	PS5	1 hr. R 1 hr. II	3/8" Gypsum Type C	DCI	Flashed joint 2 x 4—24%	44 sq. ft.	1 1/2" x 12" insulation; Steel deck; 10" joist 48" o.c.
	PS3	1 hr. R 1 hr. II	3/8" Gypsum Type C	DCI	Flashed joint 2 x 4—24%	44 sq. ft.	2" x 4" insulation; Gypsum board; 1/2" joist 48" o.c.; 1 1/2" x 12" joist 48" o.c.; 1/2" x 12" beam
	PS10	1-1/2 hr. R 1-1/2 hr. II	1/2" or 5/8" Gypsum Type C	DCI	Flashed joint 2 x 4—24%	57 sq. ft.	1 1/2" x 12" insulation; Gypsum board; Steel deck; 10" or 12" joist 48" o.c.; 1/2" x 12" beam
	PS18	1-1/2 hr. R 1-1/2 hr. II 1-1/2 hr. IRR	5/8" Steel Joist Type C	DCI	Flashed joint 2 x 4—24%	144 sq. ft.	Insulating concrete; Steel deck; 1 1/2" x 12" joist 48" o.c.; 1/2" x 12" beam
	PS14	2 hr. R 2 hr. II	5/8" Steel Joist Type C	DCI	Flashed joint 2 x 4—24%	285 sq. ft.	1 1/2" x 12" insulation; Gypsum board; Steel deck; 2" or 2 1/2" joist 48" o.c.
	PS19	1 hr. R 1 hr. II	5/8" Steel Joist Type C	DCI	None	None	Insulated metal deck; Plywood; Steel deck; Light gauge steel truss
	PS16	1 hr. R 1 hr. IRR	5/8" Steel Joist Type C	DCI	None	None	Insulated metal deck; Insulation; 8" or 2" x 12" joist 48" o.c.; 1/2" x 12" beam
	PS21	2 hr. R 2 hr. II	5/8" Steel Joist Type C	DCI	None	None	Insulated metal deck; Plywood; Steel deck; Light gauge steel truss 48" o.c.
	PS22	1 hr. R	5/8" Steel Joist Type C	DCI	None	None	Flashed joint; Insulating concrete; Light gauge steel truss

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 Atlanta, GA 30338

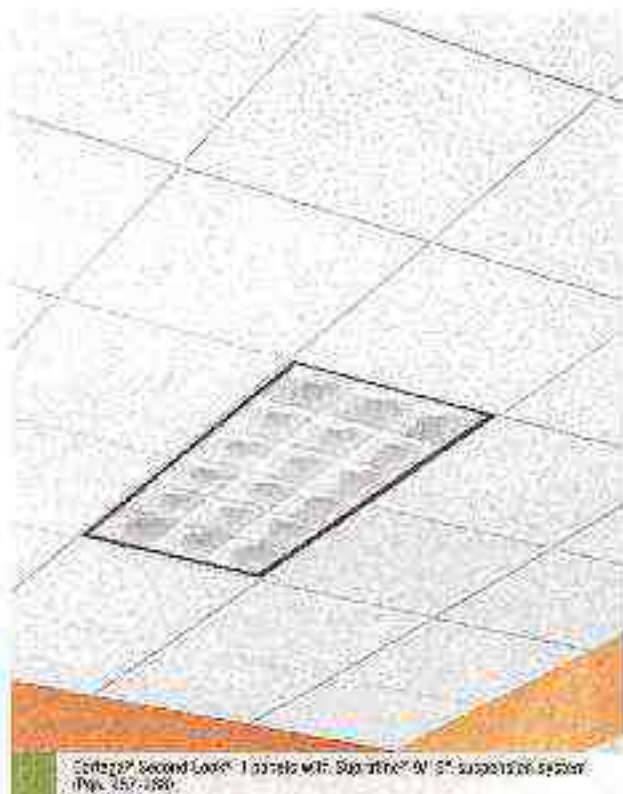


# CORTEGA®/CORTEGA® Second Look®

Square Lay-In & Regular  
medium texture



Cortega® Applied Regular tiles with Protek® 2 1/2\"/>



Cortega® Second Look® 1 panels with Spectra® W 2\"/>

Cortega® offers a medium textured, uniform ceiling solution with standard acoustical absorption.

## KEY SELECTION ATTRIBUTES

- Commercial
- Non-dripping, dust-repellent and mold-resistant
- 100% Recycled Fiber (RFF)
- Available in Standard & Second Look series

## TYPICAL APPLICATIONS

- Schools and college campuses
- Office spaces
- Utility rooms

## FACE VIEW



Cortega Second Look 1 panel

Standard installation with 2 1/2\"/>



Cortega Second Look 1 panel -

Using metal channel with 2 1/2\"/>

**COLORS** Cortega® is available in a wide variety of colors. For a full color chart, visit [www.armstrongceiling.com](http://www.armstrongceiling.com).



**DETAILS** Please refer to the System Construction Book for a complete listing.



1. Cortega® Tiles (front)
2. Cortega® Tiles (back view)
3. Cortega® Second Look
4. Cortega Lay-In with Protek® 2 1/2\"/>

5. Cortega® Bonded Regular with Spectra® W 2\"/>



# CORTEGA®/CORTEGA® Second Look®

Square Lay-in & Regular  
medium texture.



## VISUAL SELECTION

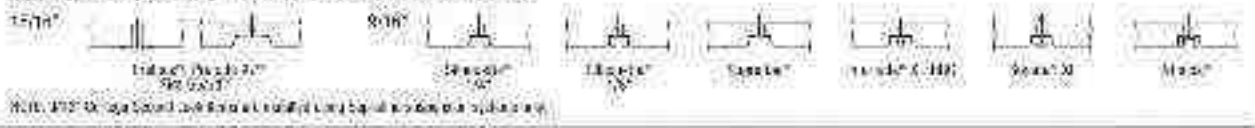
Edge Profile	Susp. Sys. No. of Tiles	Tile No.	Dimensions (inches)
CORTEGA® Square Lay-in 	1516	770	24 x 24 x 5/8"
		770M	602 x 602 x 15mm
	1517	799**	24 x 48 x 5/8"
		799W	602 x 1202 x 15mm
	1518	823	24 x 30 x 5/8"
		827	24 x 30 x 5/8"
	1519	773	24 x 24 x 5/8"
		773M	602 x 1020 x 15mm
1520	777	24 x 30 x 5/8"	
	777M	602 x 1020 x 15mm	
<b>Other Slot Panels</b> W: 12" - 30" L: 12" - 72"			
CORTEGA Regular 	12	784	24 x 24 x 5/8"
		784M	602 x 602 x 15mm
	12	818	24 x 24 x 5/8"
1516	2155	24 x 24 x 5/8"	
		<b>Other Slot Panels</b> W: 12" - 30" L: 12" - 72"	
CORTEGA® Second Look® I 	11	2758	24 x 48 x 5/8"
	<b>CORTEGA Second Look II</b>		
CORTEGA® Second Look® II 	11	2758	24 x 48 x 5/8"
		2767	24 x 48 x 5/8"
1516	27	2778	24 x 48 x 5/8"

## PERFORMANCE SELECTION

UL Classified Acoustic	Tile Assembly	Traffic Loading	Light reflect	Acoustic Absorption	Slip Resist	Permitted on Job	Available	Acoustic Coefficient	Acoustic Program	Warranty
0.05	54	Class 1	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	30	Class 2	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 3	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	16	Class 4	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	54	Class 5	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	30	Class 6	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	100	Class 7	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	30	Class 8	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 9	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 10	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 11	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 12	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 13	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 14	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 15	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 16	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 17	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 18	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 19	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 20	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 21	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 22	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 23	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 24	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 25	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 26	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 27	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 28	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 29	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10
0.05	36	Class 30	0.82	0.82	SA1	SA1	SA1	SA1	SA1	10

Tile Acoustic Coefficient (alpha) is based on the tile and suspension system. See the product literature for more information on acoustic performance.

## SUSPENSION SYSTEMS



## PHYSICAL DATA

**Material:** Cor-Tek® 1000 Series  
**Surface Finish:** Medium texture  
**Tile Profile:** 1516, 1517, 1518, 1519, 1520, 1521, 1522  
**Weight:** 1.10 lb/sq ft (0.053 kg/sq ft)  
**Thickness:** 5/8" (15.88 mm)  
**Expansion/Contraction:** 0.0004 in/in (0.015 mm/mm)  
**Compressive Strength:** 10,000 psi (689.5 MPa)  
**Flexural Strength:** 1,500 psi (103.4 MPa)  
**Modulus of Rupture:** 1,500 psi (103.4 MPa)  
**Modulus of Elasticity:** 1.1 x 10<sup>6</sup> psi (75.8 GPa)  
**Water Absorption:** 0.1% (ASTM C155)  
**Fire Rating:** Class 1 (ASTM E119)

**Warranty:** 10-year limited warranty  
**Installation:** See literature for details  
**Substrate:** Concrete or gypsum board  
**Grout:** Type III Portland Cement  
**Adhesive:** Armstrong 3000 Series  
**Sealer:** Armstrong 3000 Series  
**Accessories:** Armstrong 3000 Series  
**Tools:** Armstrong 3000 Series  
**Colors:** Armstrong 3000 Series  
**Finish:** Armstrong 3000 Series  
**Texture:** Armstrong 3000 Series  
**Weight:** Armstrong 3000 Series  
**Thickness:** Armstrong 3000 Series  
**Expansion/Contraction:** Armstrong 3000 Series  
**Compressive Strength:** Armstrong 3000 Series  
**Flexural Strength:** Armstrong 3000 Series  
**Modulus of Rupture:** Armstrong 3000 Series  
**Modulus of Elasticity:** Armstrong 3000 Series  
**Water Absorption:** Armstrong 3000 Series  
**Fire Rating:** Armstrong 3000 Series

**Weight:** Square Foot/Center  
1516: 1.10 lb/sq ft (0.053 kg/sq ft)  
1517: 1.10 lb/sq ft (0.053 kg/sq ft)  
1518: 1.10 lb/sq ft (0.053 kg/sq ft)  
1519: 1.10 lb/sq ft (0.053 kg/sq ft)  
1520: 1.10 lb/sq ft (0.053 kg/sq ft)  
1521: 1.10 lb/sq ft (0.053 kg/sq ft)  
1522: 1.10 lb/sq ft (0.053 kg/sq ft)  
**Minimum Order:** 100 sq ft (9.3 sq m)  
**Notes:** See literature for details  
**Colors:** Armstrong 3000 Series  
**Finish:** Armstrong 3000 Series  
**Texture:** Armstrong 3000 Series  
**Weight:** Armstrong 3000 Series  
**Thickness:** Armstrong 3000 Series  
**Expansion/Contraction:** Armstrong 3000 Series  
**Compressive Strength:** Armstrong 3000 Series  
**Flexural Strength:** Armstrong 3000 Series  
**Modulus of Rupture:** Armstrong 3000 Series  
**Modulus of Elasticity:** Armstrong 3000 Series  
**Water Absorption:** Armstrong 3000 Series  
**Fire Rating:** Armstrong 3000 Series

MINERAL FIBER

identifies Fire Guard ceilings. Use only Fire Guard products for Fire-Rated assemblies.



Main Runner Expansion Relief

#### **Fire Guard Ceilings**

Specially formulated to provide enhanced resistance against structural failure.

#### **Fire Guard Suspension Systems**

Patented expansion reliefs to help maintain the structural integrity of the ceiling.

#### **Armstrong Fire Guard Products:**

- Include specially formulated ceilings in a variety of textures
- Are the only Armstrong products approved for UL assemblies
- Include specially designed suspension systems

Local building codes, which require fire-safe construction for many building applications, rely on two ratings to evaluate compliance:

- Flame spread rating of material
- Fire-resistance rating of a construction assembly

These ratings are based on ASTM standards, and compliance is determined by several independent, nongovernmental testing services such as Underwriters Laboratories, Inc.

*Flame spread and fire-resistance ratings are two separate issues, and they must be addressed independently in selection and specification.*

#### **Selecting the Right UL Fire-Rated Assembly**

1. Establish the hourly rating needed to meet code requirements
2. Determine the existing or planned building elements, including structural, mechanical, electrical and finish materials, in the fire-rated assembly.
3. Refer to UL Fire Resistive Ceiling Assemblies for additional information, or contact TechLine (877-ARMSTRONG) for assistance.

**Fire Endurance** Measure of elapsed time during which an assembly continues to exhibit fire resistance under specified conditions of test and performance.

As applied to elements of buildings, it shall be measured by the methods and to the criteria defined in ASTM Method E119, Fire

Tests of Building Construction and Materials; ASTM Method E152, Fire Tests of Door Assemblies; ASTM Method E814, Fire Test of

Through-Penetration Fire Stops; or ASTM Method E163, Fire Tests of Window Assemblies.

**Fireproof** Use of this term in reference to buildings is discouraged because few, if any, building materials can withstand extreme heat for an

extended time without some effect. The term "fire-resistive" or "fire-resistant" is more descriptive.

**Fire Resistance** Relative term, used with a numerical rating or modifying adjective to indicate the extent to which a material or structure resists the

effect of fire and serves as a barrier to the spread of fire to an adjacent building zone.

**Fire-Resistive** Refers to properties or designs to resist effects of any fire to which a material or structure may be expected to be subjected.

**Fire-Retardant** Denotes substantially lower degree of fire resistance than "fire-resistive." Often used to describe materials that are combustible but

have been treated to retard ignition or spread of fire under conditions for which they were designed.

**Flame Spread Index** of the capacity of a material to spread fire under test conditions, as defined by ASTM Standard E84. Materials are rated by comparison

with the flame spread index of red oak flooring assigned a value of 100 and inorganic reinforced cement board assigned a

value of 0.

**Flammable** Capability of a combustible material to ignite easily, burn intensely, or have rapid rate of flame spread.



## ASTM E 84

### Standard test method for surface burning characteristics of building materials.

The flame spread Index and Smoke Developed Index values obtained by the ASTM E 84 test are used by code officials and regulatory agencies in the acceptance of interior finish materials for various applications. The most widely accepted classification system is described in the National Fire Protection Association publication NFPA 101 *Life Safety Code*.

#### 1. 2006 International Building Code

a. Section 803 Wall and Ceiling Finishes, Paragraph 803.1 General states, "Interior wall and ceiling finishes shall be classified in accordance with ASTM E 84. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

- i. Class A: Flame Spread 0-25; smoke-developed 0-450
- ii. Class B: Flame Spread 26-75; smoke-developed 0-450
- iii. Class C: Flame Spread 76-200; smoke-developed 0-450

Class A, B, and C correspond to type I, II, and III respectively in other codes such as SBCCI, BOCA, ICBO. They do not preclude a material being otherwise classified by the authority of jurisdiction.

#### 2. NFPA 101®: Life Safety Code®

a. Chapter 10 Interior Finish, Contents, and Furnishings, Paragraph 10.2.3 Interior Wall or Ceiling Finish Testing and Classification states, "Interior wall or ceiling finish that is required elsewhere in this Code to be Class A, Class B, or Class C shall be classified based on test results from NFPA 255, ASTM E-84, or UL 723."

**Armstrong**

BP 823 09

Make a check against labels by following the symbols for fire and fire-resistance ratings (see also labels 75-1103)

CLASSIFIED **ACOUSTICAL MATERIAL** CLASSIFIED

UL **UL**

UL 1800-1300 P  
 (Form B) Issue No. BP-6072

**SURFACE BURNING CHARACTERISTICS**

FLAME SPREAD ... 25  
SMOKE DEVELOPED ... 50

**FIRE RESISTANCE CLASSIFICATION**

DESIGN NUMBER  
 (SEE U.L. FIRE RESISTANCE DIRECTORY AND U.L. DIRECTORY OF PRODUCTS CERTIFIED FOR SAFETY)

**ACOUSTICAL PROPERTIES**

NRC 0.55 in accordance with ASTM C423-07  
 CAC 35 in accordance with ASTM E1414-06

ASTM E 119, 1267  
 Approved by the Board of Standards and Appeals  
 For use in New York City under Cal. No. 72-59-SM

*1/2 to 1/4 in*

**Cortega** Fire Guard<sup>TM</sup>  
 Square Lay - In

24 in x 48 in x 5/8 in (nominal)  
 610 mm x 1219 mm x 16 mm

WHITE  
 BLANCO  
 BLANC

64 sq ft (5.95 m<sup>2</sup>)

6 pieces  
 6 pieces  
 8 pieces

15 1/2"  
 24 1/2"

SHIPPING DIMENSIONS (EFFECTIVE)

4225-87202

31 JAN 10





# OCONEE COUNTY COMMUNITY DEVELOPMENT

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## Planning | Zoning | Codes

January 11, 2016

Harold Knight  
Harold Knight Builders  
335 Gaston Circle  
Westminster SC, 29693

Re: Appeal application for 114 Chrisley Rd Westminster SC, 29691

Mr. Knight,

The department has received your application for a hearing before the Building Code Board of Appeals. The appeal has been scheduled for February 4, 2016 at 3:00 PM in the Council Chambers at the Oconee County Complex at 415 S Pine Street, Walhalla SC, 29691.

In reference to your application, the department has the informational materials you requested the Board to consider. The specific relief that you are requesting should take the form of a narrative and drawings to explain the alternative construction you wish to Board to consider. This narrative information and drawings need to be delivered to this office no later than January 19, 2016 so it can be included in the Board's informational package.

Regards,

A handwritten signature in blue ink that reads "David Stokes".

David Stokes  
Building Official