



FIRE TESTING LABORATORIES, INC.

Testing & Listing Field Labeling
Engineering & Consulting Services

Guardian Fire Testing Laboratories, Inc.
15 Wenonah Terr. (Office)
Tonawanda, NY 14150

Phone: 716 835 6880; Fax: 716 835 5682
Lab Phone & Fax: 716 884 9690
Email: gftli@earthlink.net
Web Site: www.firetesting.com

FIRE TEST REPORT: SOUTH SHORE IRON WORKS INTEGRITY WALL

CLIENT/MFG: South Shore Iron Works, Inc.
407 West 109th St.
Chicago, IL 60628

PRODUCT: South Shore Iron Works Integrity Wall

STANDARD TESTED TO: ASTM E 119-08a
Standard Test Method for Fire Tests of Building
Construction and Materials

FIRE TEST ENDURANCE RATING: 1 Hour

REPORT NO.: GL 62009

REPORT DATE: May 2, 2009

TEST DATE: April 28, 2009

REPORT PREPARED BY: GUARDIAN FIRE TESTING LABORATORIES, INC
15 Wenonah Terrace (office)
Tonawanda, NY 14150

Guardian Fire Testing Lab Location:
474 Hinman Ave.
Buffalo, NY 14216

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Abstract

This report describes the one-hour successful Fire Endurance Test for South Shore Iron Works Integrity Wall which was tested in accordance with ASTM E 119-08a, Standard Test Methods for Fire Tests of Building Construction and Materials.

The wall consisted of South Shore Iron Works Tubular Load Bearing Steel Studs, one layer of 5/8" SCX Gypsum Wallboard and 2" thick, 8 pound density mineral wool insulation. The steel studs were 24" on center and the wallboard was applied vertically.

The load bearing capacity was determined by the recording of the steel studs' temperatures during the test. The average steel temperature did not exceed 1,000 ° F as per the test standard.

The wall system met the fire endurance requirements for a one-hour rating as per the ASTM E 119-08a test standard.

2. General

- 2.1 Units of measurement used in this test are English: inches, feet and Fahrenheit.
- 2.2 The testing was conducted by Guardian Fire Testing Laboratories, Inc. with Guardian's testing equipment in the laboratory facilities of Guardian in accordance with the test standard ASTM E 119-08a edition.

3. Performance

This report presents the results of a fire test of a fire wall system as per ASTM E 119-08a . This report contains a description of the material evaluated, procedures used and the test results. The results listed apply only to the specimens tested, in the manner tested.

3.1 Procedure:

The furnace test wall is 5 feet wide by 8 feet high.

The fire wall is non- directional with 5/8" SCX Gypsum Wallboard on both sides of the wall,.

The temperatures on the unexposed side of the wall did not exceed the allowable limits.

A drawing of the wall construction is attached.

4 Construction

4.1 General:

The following is a detailed account of the construction of the South Shore Iron Works Integrity Wall. See attached drawings.

- 4.1.1 The wall tubular studs, tubular header and track, an all-welded system, is 6" wide. It consists of a 6" wide by 4" high by 3/16" thick steel tube header. The bottom track is 6" wide, 16 gauge steel with 1" legs. The studs are 2" x 2" by 1/8" steel tubes spaced 2" apart with a 2" tube horizontal stabilizer in the center at mid height.
- 4.1.2 Mineral wool batts, 8 pounds per cubic foot weight, 2 inches thick, 2 feet wide by 4 feet long were installed into the steel studs via friction fit.
- 4.1.3 5/8" type SCX gypsum wallboard was installed vertically. Each side had vertical joints.

4.1 General (cont'd.)

4.1.3 (cont'd)

The wallboard was fastened to the tubular steel with 1 5/8 inch long self-drilling, self topping screws, 8 inches on center.

4.1.4 2 inch wide fiberglass joint tape, self sticking, was applied to the wallboard joints on the unexposed side..

4.1.5 One coat of setting type wallboard joint compound, Dura Bond 90, was applied to the joints and the screw heads on the unexposed side.

4.1.6 Mineral wool batts, 8 pounds per cubic feet weight, 2 inches thick, 2 feet wide by 4 feet long was installed in the wall.

5 Fire Endurance Test

5.1 Conditions of Acceptance

5.1.1 The wall system withstood the fire endurance test without passage of flame or gases hot enough to ignite cotton waste for a period equal to that for which classification is desired.

5.1.2 Transmission of heat through the wall or partition during the fire endurance test shall not have been such as to raise the temperature on its unexposed surface more than 250°F above its initial temperature of 59°F.

6 Control and Conduct of Fire Test

6.1 The furnace control followed the test standard limits.

6.2 The furnace pressure was maintained slightly higher than atmospheric at the top of the furnace. The pressure gauge at a 48 inch high location remained at 0.0 inches of water.

6.3 The fire test was continued for 1 hour.

7 Fire Test Instrumentation

Furnace Temperatures:

Thermocouples were equally spaced in the furnace. The temperatures are shown on the attached chart.

Unexposed Surface Temperatures:

5 thermocouples were placed on the unexposed face of the wall. One was placed in the center of the test wall, 2 were over stud locations and 2 were in the field. Temperatures are shown on the attached chart.

8 **Load bearing temperatures** were recorded at 3 points on each of 2 steel tubular stud locations.

The average temperatures did not exceed 1000 ° F, and no single T/C temperature exceeded 1200° F.


9 **Test Temperatures, Observations and Test Photos are attached.**

10 **Conclusion**

- 10.1 South Shore Iron Works' Integrity Wall, as a load bearing wall, successfully withstood the 1 hour fire endurance test as per the test standard, ASTM E 119-08a.
- 10.2 This wall system also receives a 1-hour fire endurance rating.

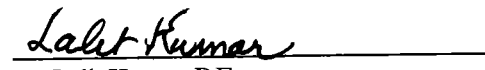
GUARDIAN FIRE TESTING LABORATORIES, INC.

Test Performed and Reported by:



R. Joseph Pearson
Fire Testing Engineer

Report Reviewed by:



Dr. Lalit Kumar, P.E.
President

Uncertainty Measurement in Guardian's fire testing is less than 1% as per ASTM E-2536-06.

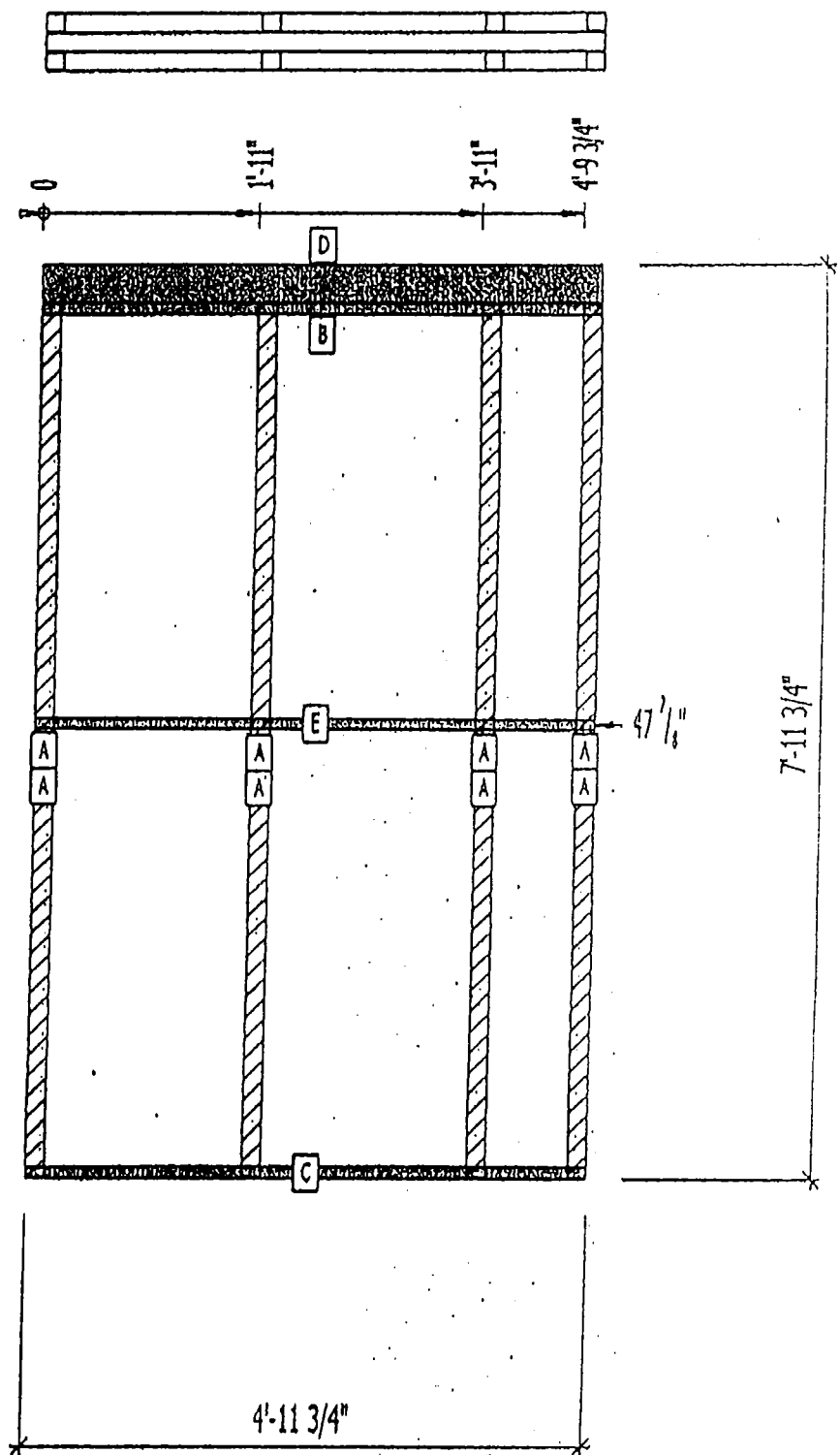
Guardian is an ISO 17025 fire testing laboratory accredited by ANSI (American National Standards Institute)/ASQ/ACLASS.

Guardian also is accredited as an Inspection (ISO 17020) and Product Certification (ISO Guide 65) Agency by IAS.

The results reported in this document apply to specific samples submitted for measurement.
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The laboratory's test report in no way constitutes or implies product certification, approval or endorsement by this laboratory.

Guardian Fire Testing Laboratories, Inc.
15 Wenonah Terrace, Tonawanda, NY 14150 (office) 716 835 6880: Fax: 716 835 5682
474 Hinman, Buffalo, NY 14216 (laboratory) 716 877 2760
email: gftli@earthlink.net
web site: www.firetesting.com

Drawing of Wall Construction



PIECE LIST

LABEL	QTY	SIZE	LENGTH	USE
A	8	2x2x16GA	7'-7 1/2"	STUD
B	1	600T125-54	4'-11 3/4"	TOP TRACK
C	1	600T125-54	4'-11 3/4"	BOTTOM TRACK
D	1	6x4x.1875	4'-11 3/4"	TOP STUD
E	1	2x1x16GA	4'-11 5/8"	HORIZONTAL BRACING

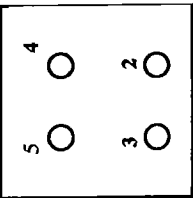
Integrity Wall

South Shore Iron Works Integrity Wall

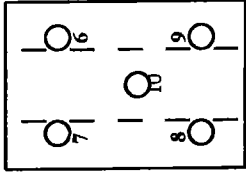
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Furnace & Unexposed Side Temperatures

250° F + ambient = 309° F



Furnace T/Cs



Unexposed Side T/Cs

Date: 4/28/02

Time Min.	Amb.		Furnace T/Cs		Furnace Avg.		Furnace		Unexposed Surface T/C							Pressure Mag.		
	1	2	3	4	5	Avg	6	7	8	9	10	11	12	13	14		15	16
0	59	59	59	59	59				61	62	61	59	61					0
5	61	898	786	885	891				61	62	61	60	62					0
10	60	1233	1365	1208	1164				78	79	73	62	82					0
15	61	1255	1499	1228	1202				96	96	86	68	97					0
20	62	1322	1539	1298	1257				118	117	101	81	115					0
25	62	1346	1564	1329	1286	1382			126	125	112	95	123					
30	62	1384	1586	1366	1328	1434			123	122	114	104	122					
35	62	1408	1591	1388	1349	1434			119	117	112	106	119					0
40	62	1421	1617	1403	1368	1452			120	119	115	106	122					0
45	63	1419	1609	1410	1369	1452			127	130	124	109	132					0
50	63	1428	1590	1416	1376	1452			135	141	135	115	144					0
55	64	1432	1598	1419	1373	1456			143	152	142	125	157					0
60	61	1431	1581	1418	1368				148	156	147	131	152					
62		1426	1581															

Note: Furnace pressure gage was 48" above floor line
Test time was extended 2 minutes

South Shore Iron Works Load Bearing Stud Temperatures

Fire Side

1x x4

5x x8

2x
upper

6x
lower

Stud T/Cs

Time	1	2	4	5	6	8
0						
5	138	83	131	149	62	160
10	168	112	162	176	75	186
15	191	143	189	192	102	200
20	200	161	200	198	127	206
25	231	161	224	214	142	250
30	330	157	309	292	144	383
35	437	156	414	412	143	511
40	538	171	511	529	145	627
45	633	218	600	643	154	737
50	726	245	692	725	175	814
55	817	288	776	799	208	885
60	890	327	839	863	242	949
62	908	339	860	885	254	985

Test Observations: There were no changes to the unexposed side during the entire test time.

After Test Notes: The fire side type SCX wallboard was in place.

South Shore Iron Works Unexposed Side Temperature Data
High Temperature in °F: T/C#

The highest temperatures were at 60 minutes as shown below

<u>T/C#</u>	<u>Location</u>	<u>Temperature °F</u>
1	ambient	64
6	left lower	147
7	center	152
8	upper right	148
9	lower right on stud	131
10	upper left on stud	156

Failure temperature was 314°F



Before test: tubular load bearing steel studs



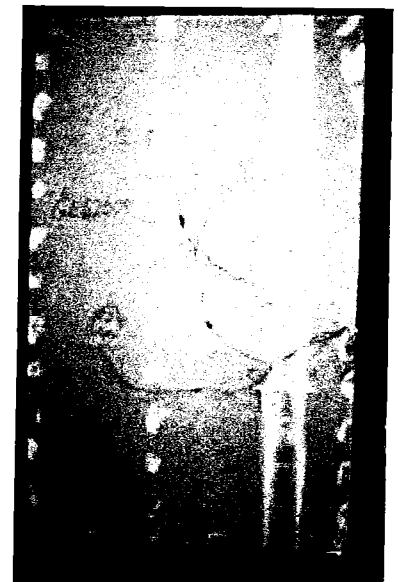
5/8" SCX gypsum wallboard placed on exposed side



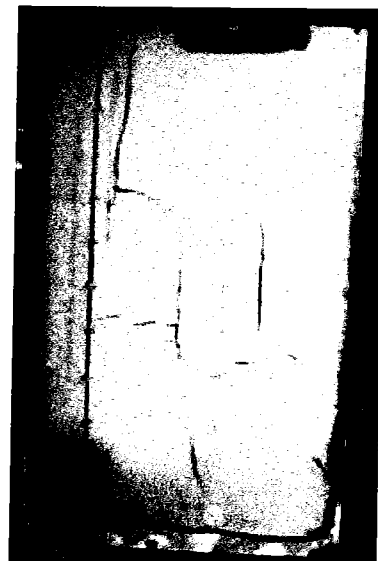
Before test: unexposed side 5/8" SCX



30:00



60:00: gas off



After test: exposed side