ASTM E119, NON-LOADED
FIRE RESISTANCE & HOSE STREAM TESTING
FOR
PERMACAST
ON
PERMACAST FIRE TEST PANEL

[redacted]

April 21, 2025

Client: Permacast
6015 21st St. E
Bradebton, FL 34203

Attn: [redacted]

Subject: Non-Loaded Fire Resistance Testing According to ASTM E119

SAMPLE DESCRIPTION: PermacastFire Test Panel

The wall was made up of three panels butted side by side. Each panel was 10'-6" x 3'-6" x 4" thick. The panel were installed in the test frame so that the 10'-6" side was vertical. Angles were run along the top and bottom of each side of the test panel to secure it in place.

Thermocouples secured to the unexposed side of the wall were placed in accordance to ASTM E119 requirements.

[redacted]

PROCEDURE:

Fire Endurance Test:

The furnace used in this test measures 10 ft wide by 10 ft high. The outside construction is steel and the furnace is lined with a ceramic refractory insulation. A single burner is centered vertically in the wall opposite the sample. This burner is rated for 1.5 million Btu/hr and is of the flat flame or non-impinging flame design. Two additional burners were mounted on the side of the furnace. Furnace conditions are monitored by nine Inconel-sheathed chromel-alumel thermocouples. These thermocouples are positioned approximately 6" from the face of the sample.

The sample was oriented vertically in the front opening of the 10 ft wide by 10 ft high furnace opening. The unexposed surface temperature of the sample was monitored by nine, 20-gauge type K, fiberglass sheathed thermocouples. An insulating pad was placed over each thermocouple on the unexposed side of the sample.

The metal frame in which the wall assembly is installed was wheeled over in position and locked in place. All gaps and openings between the wall assembly and furnace were filled with a ceramic refractory insulation. Once secured, the burners and data acquisition system were turned on and the test was started. The fire test was run following the ASTM E119 time-temperature curve.

The endpoint for the ASTM E 119 fire test occurs when either all the thermocouples on the sample reach an average of 250ºF plus ambient starting temperature, or any individual thermocouple on the sample exceeds 325ºF plus ambient starting temperature, or when the sample experiences burn-through.

Hose Stream Test:

Immediately after the fire endurance test the sample was subjected to the impact, erosion, and cooling effects of a hose stream directed first at the middle and then all parts of the sample.

The stream was delivered through a 2-1/2” hose equipped with a 1-1/8” discharge tip. The distance between the nozzle tip and the sample was 20 feet. The sample was exposed to the hose stream for 2-1/2 minutes.

The sample shall be considered to have failed the hose stream test if any opening develops that permits a projection of water beyond the unexposed surface.

OBSERVATIONS AND RESULTS:

The ambient temperature was 62□F.

At 18 minutes, water was running down the unexposed surface of the wall, which stopped around 1 hour into the test.

After 120 minutes the wall assembly met all of the passing requirements and the furnace was shut off.

Two small chunks fell off of the unexposed surface of the wall after the fire test was stopped but before the hose steam was applied. These missing chunks did not create full openings in the wall.

The sample withstood the Hose Stream Test without any openings formed that permit a projection of water beyond the unexposed surface.

.The time-temperature data are contained on the following pages.

[redacted] Executive Director

[redacted] Technical Director

DISCLAIMER: This test should be used to measure and describe the properties of materials, products or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazards or fire risks of materials, products or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment, which takes into account all of the factors that are pertinent to an assessment of fire hazard of a particular end use.

Notice: VTEC Laboratories Inc. will not be liable for any loss or damage resulting from the use of the data in this report, in excess of the invoice. This report pertains to the sample tested only. Such report shall not be interpreted to be a warranty, either expressed or implied as to the suitability or fitness of said sample for such uses or applications, as the party contracting for the report may apply such sample.

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
0	62	62	62	62	62	62	62	62	62	62	61
0.5	62	62	62	62	62	62	62	62	62	62	287
1	62	62	62	62	62	62	62	62	62	62	388
1.5	62	62	62	62	62	62	62	62	62	62	539
2	62	62	62	62	62	62	62	62	62	62	659
2.5	62	62	62	62	62	62	62	62	62	62	759
3	62	62	62	62	62	62	62	62	62	62	834
3.5	62	62	62	62	62	62	62	62	62	62	890
4	62	62	62	62	62	62	62	62	62	62	931
4.5	62	62	62	62	62	62	62	62	62	62	960
5	62	62	62	62	62	62	62	62	62	62	984
5.5	63	62	62	62	62	62	62	62	62	62	1004
6	63	62	62	62	62	62	62	62	62	62	1021
6.5	63	62	62	62	62	62	62	62	62	62	1059
7	63	62	62	62	62	62	62	62	62	62	1090
7.5	63	62	62	62	62	62	62	62	62	62	1211
8	63	62	62	62	62	62	62	62	62	62	1226
8.5	62	62	63	62	62	62	62	62	62	62	1239
9	62	62	62	62	62	62	62	62	62	62	1249
9.5	62	62	63	62	62	62	62	62	62	62	1262
10	63	62	63	62	62	62	62	62	62	62	1271
10.5	63	62	63	62	62	62	62	62	62	62	1281
11	63	62	63	62	62	62	62	62	62	62	1291
11.5	63	62	63	62	62	62	62	62	62	62	1309
12	63	62	63	62	62	62	62	62	62	62	1320
12.5	63	62	63	62	62	62	62	62	62	62	1328
13	63	62	63	62	62	62	62	62	62	62	1336
13.5	63	63	64	62	62	63	62	62	62	62	1350
14	64	63	64	62	62	63	62	62	62	63	1359
14.5	64	63	64	63	62	63	62	63	62	63	1367
15	64	63	64	63	62	64	62	63	62	63	1374

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
15.5	64	63	65	63	62	64	63	63	63	63	1381
16	64	63	65	63	63	64	63	64	63	63	1389
16.5	64	63	65	63	63	64	63	64	63	64	1385
17	64	64	65	63	63	64	63	64	63	64	1389
17.5	64	64	66	64	63	65	64	65	64	64	1390
18	65	64	66	64	63	65	64	66	64	64	1398
18.5	65	64	66	64	63	65	64	66	64	65	1405
19	65	65	67	64	64	66	64	67	65	65	1413
19.5	66	65	67	65	64	66	65	68	66	66	1421
20	66	65	68	65	64	67	66	69	66	66	1431
20.5	66	66	68	65	65	67	66	69	66	67	1441
21	67	66	69	66	65	69	66	71	67	67	1450
21.5	68	67	69	66	66	71	67	72	67	68	1460
22	68	67	70	67	66	72	68	73	68	69	1471
22.5	68	68	71	67	66	73	68	74	71	70	1476
23	69	68	72	68	67	73	69	75	72	70	1486
23.5	69	69	72	68	68	74	70	77	73	71	1495
24	70	70	73	69	68	75	71	78	73	72	1501
24.5	71	71	74	70	69	76	72	80	75	73	1503
25	72	71	75	70	69	76	72	81	77	74	1506
25.5	72	72	76	71	70	79	73	83	77	75	1509
26	73	73	77	72	71	81	74	84	79	76	1513
26.5	74	74	77	73	69	83	75	86	82	77	1518
27	75	75	78	74	70	84	76	88	84	78	1525
27.5	76	76	79	75	71	86	77	90	86	79	1533
28	77	77	80	75	73	89	78	92	88	81	1540
28.5	78	78	79	77	75	91	80	94	90	82	1545
29	79	79	80	77	76	93	81	96	93	84	1551
29.5	81	80	80	78	78	96	82	97	95	85	1558
30	82	82	81	80	79	100	83	100	97	87	1564
30.5	84	83	82	81	80	105	85	102	100	89	1571

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
31	85	84	83	82	80	109	86	104	102	91	1526
31.5	87	86	84	83	81	115	87	106	104	93	1532
32	89	87	86	85	82	121	89	103	106	94	1539
32.5	91	89	87	86	84	128	90	106	108	96	1547
33	93	90	88	87	86	133	92	110	110	99	1551
33.5	95	92	90	89	88	137	94	111	113	101	1555
34	97	93	91	91	89	138	95	113	113	102	1561
34.5	99	95	92	92	91	141	97	115	116	104	1567
35	98	97	93	94	93	145	99	116	118	106	1572
35.5	98	99	94	96	95	143	101	118	121	107	1577
36	99	101	98	98	96	146	102	120	122	109	1582
36.5	100	103	100	100	99	152	104	122	122	111	1586
37	102	105	103	102	101	150	107	124	123	113	1590
37.5	104	107	104	102	114	162	109	126	124	117	1594
38	106	108	105	101	117	168	110	128	125	119	1599
38.5	108	106	107	102	119	180	112	129	127	121	1602
39	111	109	108	103	121	185	114	131	129	124	1607
39.5	113	112	110	104	124	192	116	133	130	126	1612
40	115	114	110	105	126	193	118	135	132	128	1614
40.5	118	117	111	107	127	192	120	136	134	129	1619
41	120	119	113	108	128	191	122	138	136	131	1625
41.5	122	121	114	109	130	189	124	139	138	132	1628
42	125	122	115	111	131	190	126	140	140	133	1612
42.5	127	122	116	112	132	192	128	142	141	135	1615
43	130	123	118	113	133	194	130	144	143	136	1618
43.5	132	124	119	115	136	194	132	145	145	138	1621
44	135	124	120	116	136	193	133	147	148	139	1625
44.5	139	125	122	118	137	192	136	149	149	141	1627
45	143	126	123	119	138	193	138	151	150	142	1630
45.5	146	126	124	120	138	193	140	154	152	144	1634
46	148	127	125	122	139	194	141	156	154	145	1636

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
46.5	150	128	127	124	138	195	143	158	155	146	1639
47	151	129	128	126	139	197	144	159	156	148	1643
47.5	152	130	130	127	140	197	146	161	158	149	1646
48	153	131	131	129	141	198	147	163	159	150	1649
48.5	154	132	132	130	142	199	149	164	161	151	1653
49	156	133	134	131	143	199	150	165	162	153	1656
49.5	157	134	135	132	144	199	152	165	162	153	1658
50	158	135	136	134	145	201	154	167	162	155	1661
50.5	159	136	138	136	146	202	155	167	163	156	1663
51	160	137	139	138	147	203	157	167	164	157	1665
51.5	161	139	140	140	148	204	158	167	164	158	1669
52	161	140	141	141	149	205	160	168	164	159	1670
52.5	162	141	143	141	150	205	162	169	165	160	1672
53	163	142	144	141	150	205	163	170	166	160	1675
53.5	163	144	146	140	152	206	165	171	166	161	1676
54	164	145	147	139	152	206	167	172	167	162	1676
54.5	165	146	148	138	153	206	168	172	167	163	1678
55	165	147	149	138	154	206	170	173	167	163	1681
55.5	166	149	151	138	155	207	172	174	167	164	1683
56	167	150	152	137	156	206	173	175	168	165	1684
56.5	167	151	153	137	157	206	175	176	168	166	1687
57	169	152	154	137	157	206	177	177	169	166	1687
57.5	170	153	155	136	158	207	179	178	168	167	1690
58	170	154	156	135	159	206	180	179	169	168	1691
58.5	170	156	158	135	159	207	182	180	168	168	1694
59	170	157	158	135	160	207	183	181	169	169	1696
59.5	170	158	159	135	161	207	185	181	171	170	1697
60	169	159	160	135	161	208	187	182	169	170	1699
60.5	169	160	162	134	162	206	189	183	168	170	1701
61	170	161	163	135	163	208	190	184	172	172	1703
61.5	170	162	164	134	163	210	192	185	173	172	1704

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
62	171	163	165	135	164	209	194	186	172	173	1705
62.5	171	163	166	135	165	209	196	186	172	174	1706
63	171	164	167	135	165	209	197	187	182	175	1708
63.5	171	165	168	135	166	209	199	188	183	176	1708
64	171	166	168	135	166	208	201	189	187	177	1710
64.5	170	167	170	136	167	208	202	189	188	177	1712
65	170	168	171	136	167	208	204	190	189	178	1713
65.5	170	168	172	135	167	205	205	191	189	178	1714
66	170	169	173	136	168	201	207	192	188	178	1717
66.5	169	170	174	137	168	195	209	192	191	178	1718
67	168	170	175	137	168	195	210	193	195	179	1719
67.5	168	171	176	137	169	189	212	194	196	179	1718
68	167	172	177	138	169	189	213	194	196	179	1720
68.5	167	172	177	138	170	184	215	195	198	179	1721
69	167	173	179	138	170	182	216	196	199	180	1723
69.5	166	173	179	138	170	181	217	196	197	180	1725
70	166	174	180	139	170	177	219	197	197	180	1725
70.5	165	174	181	140	170	176	221	197	200	180	1727
71	166	174	182	140	171	176	222	198	200	181	1728
71.5	165	174	183	140	171	176	223	198	203	182	1728
72	166	175	183	141	171	174	224	199	202	182	1729
72.5	165	175	184	141	172	172	226	199	203	182	1730
73	165	176	185	141	172	172	227	200	200	182	1731
73.5	165	176	185	142	172	171	228	200	201	182	1732
74	165	176	186	142	172	169	229	201	201	182	1734
74.5	165	176	187	143	172	169	231	201	202	183	1735
75	165	177	187	144	173	168	232	201	202	183	1736
75.5	165	177	188	144	173	166	233	201	202	183	1737
76	165	177	188	145	173	166	234	202	203	184	1738
76.5	165	177	189	145	173	165	235	202	203	184	1738
77	165	178	190	146	173	165	236	202	202	184	1740

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
77.5	166	178	190	146	174	164	237	202	203	184	1740
78	166	179	191	147	174	163	238	203	203	185	1739
78.5	166	179	191	148	174	163	239	203	203	185	1740
79	167	179	192	147	174	163	240	203	202	185	1741
79.5	167	179	192	148	174	163	241	203	205	186	1742
80	167	180	193	149	175	163	242	204	204	186	1743
80.5	167	180	193	149	175	163	243	204	202	186	1744
81	168	180	193	149	175	163	244	204	202	186	1744
81.5	168	181	193	149	176	163	245	204	202	187	1744
82	168	181	193	149	176	163	246	204	202	187	1744
82.5	168	181	193	149	176	162	247	204	203	187	1745
83	169	181	193	150	176	162	247	204	203	187	1745
83.5	168	181	194	150	176	163	248	205	203	188	1744
84	169	182	194	150	176	162	249	205	203	188	1745
84.5	169	182	194	151	177	162	250	205	203	188	1745
85	169	182	194	151	176	163	250	205	203	188	1746
85.5	169	182	194	150	176	162	251	205	203	188	1745
86	169	182	194	151	176	163	252	205	203	188	1746
86.5	169	183	193	151	176	162	252	205	203	188	1746
87	170	183	194	152	177	162	253	205	203	189	1748
87.5	169	183	194	151	177	162	253	205	203	189	1749
88	170	183	194	151	177	162	254	206	203	189	1749
88.5	170	183	194	152	177	161	255	206	203	189	1750
89	170	183	194	152	177	161	255	206	203	189	1750
89.5	170	183	194	152	177	161	256	206	203	189	1751
90	170	183	193	152	177	161	256	206	203	189	1750
90.5	170	184	194	152	177	161	257	206	203	189	1750
91	171	184	194	153	177	161	257	206	203	189	1750
91.5	171	184	194	152	178	161	258	206	203	189	1750
92	171	184	194	152	178	161	258	206	204	190	1751
92.5	171	184	194	153	178	161	259	205	203	190	1752

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
93	171	184	194	154	178	161	259	205	203	190	1755
93.5	171	185	194	154	178	161	260	206	203	190	1756
94	172	185	194	154	179	161	260	205	204	190	1759
94.5	172	185	195	154	179	161	261	206	203	190	1760
95	172	185	195	155	179	161	261	206	203	191	1763
95.5	172	185	195	154	179	161	262	206	204	191	1765
96	172	185	195	160	179	161	262	205	204	191	1767
96.5	173	185	196	170	179	161	262	205	204	193	1769
97	173	185	196	176	179	161	263	205	203	194	1789
97.5	173	185	196	187	179	161	263	205	203	195	1790
98	173	185	197	191	179	161	264	205	204	195	1811
98.5	174	186	197	194	180	162	264	205	204	196	1813
99	174	186	197	200	180	162	264	205	204	197	1814
99.5	174	186	197	204	180	162	264	205	203	197	1816
100	174	186	197	205	180	162	265	205	204	198	1817
100.5	174	186	198	209	181	163	265	205	204	198	1818
101	175	186	198	209	181	163	265	205	204	198	1819
101.5	175	186	198	210	181	162	265	205	203	198	1820
102	175	186	198	211	181	163	265	205	204	199	1819
102.5	175	186	198	211	182	163	265	205	204	199	1820
103	175	186	198	211	181	163	265	205	205	199	1823
103.5	175	186	199	211	182	163	265	205	204	199	1827
104	176	186	199	211	182	163	266	205	204	199	1830
104.5	176	187	199	212	182	163	266	206	205	199	1830
105	176	187	199	212	182	163	266	206	205	199	1831
105.5	176	187	199	212	182	163	266	205	204	199	1831
106	176	187	200	212	183	164	266	205	204	200	1832
106.5	176	187	200	212	183	164	266	205	204	200	1834
107	176	187	200	212	182	164	267	205	204	200	1835
107.5	176	187	200	212	183	164	267	205	205	200	1837
108	177	187	201	213	183	165	267	205	205	200	1839

	Unexposed Temperature										
Time	1	2	3	4	5	6	7	8	9	Unexposed Avg.	Furnace Avg.
(min)	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF	degF
108.5	177	188	201	212	184	166	268	205	205	201	1839
109	177	188	201	213	184	165	268	206	206	201	1840
109.5	177	188	201	213	184	165	268	206	206	201	1840
110	178	188	201	213	184	165	269	206	205	201	1841
110.5	178	188	201	213	184	166	269	206	205	201	1843
111	179	188	201	213	184	166	270	206	206	201	1845
111.5	179	188	201	212	184	166	270	206	205	201	1846
112	180	188	201	213	185	166	270	206	204	201	1845
112.5	180	188	202	213	185	165	271	206	204	201	1846
113	180	188	202	213	185	165	271	206	205	202	1847
113.5	180	188	202	213	185	165	272	206	204	202	1847
114	181	189	202	213	185	166	273	206	205	202	1847
114.5	181	189	203	213	186	167	273	206	206	203	1848
115	181	189	203	213	186	167	274	206	205	203	1849
115.5	182	189	203	213	186	166	274	206	206	203	1850
116	182	189	203	213	186	167	275	206	206	203	1851
116.5	182	189	203	213	186	166	275	206	205	203	1850
117	183	190	203	213	186	166	276	206	204	203	1853
117.5	183	189	204	213	186	168	276	206	205	203	1854
118	183	190	204	213	187	168	277	206	204	204	1843
118.5	184	190	204	213	187	168	278	206	204	204	1830
119	184	190	204	213	187	168	278	206	205	204	1846
119.5	185	191	205	213	187	168	279	206	204	204	1852
120	185	191	205	213	188	169	280	207	204	204	1853