



**FACULTY OF ENGINEERING
CHULALONGKORN UNIVERSITY
FIRE SAFETY RESEARCH CENTER**

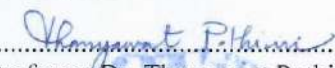


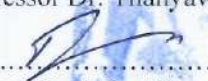
- TYPE OF TEST** : DETERMINATION OF THE FIRE RESISTANCE OF NON-LOADBEARING ELEMENTS OF CONSTRUCTION
- TEST SPECIMEN** : **FD-PSV-4HRS**
The specimen is a doorset consisting of a single-sided composite door leaf having dimensions of 2000 mm x 900 mm x 45 mm and a steel door frame. The specimen was mounted in a 15-cm thick reinforced concrete wall, which was installed on the 3 m x 3 m steel testing frame. The door leaf is composed of 1.6-mm thick steel sheets and rock wool with a density of 110 kg/m³. The door leaf was locked with the door frame by a panic bar and 3 stainless steel hinges. Intumescent fire seal was installed around the inner perimeter of the door frame. The details of the specimen are shown in Appendix C. The specimen was provided and installed by the client.
- CLIENT** : **P.S.V. SMART ENGINEERING CO., LTD.**
18/112 Moo 4 Ladsawai
Lamlukka, Pathumthani 12150, Thailand
- DATE OF TEST** : September 10, 2020
- TEST MACHINE** : Large-scale vertical furnace (Fire Tester III) at the Fire Safety Research Center (FSRC), Department of Civil Engineering, Chulalongkorn University (Thailand). The furnace is capable of producing a standard temperature-time relationship according to BS 476 Part 20: 1987.
- TEST METHOD** : The testing procedures follow the British Standard BS 476: Fire tests on building materials and structures
BS 476 Part 20: 1987: Method for determination of the fire resistance of elements of construction (general principles)
BS 476 Part 22: 1987: Methods for determination of the fire resistance of non-loadbearing elements of construction Section 6: Determination of the fire resistance of fully insulated doorsets and shutter assemblies.
- TEST RESULTS** : The non-loadbearing element of construction described above has the fire resistance of each criterion for the period stated:
(The test results are good only for the specimen tested.)

Criteria	Fire Resistance (hr:min)	Remarks
Insulation	0:16	The average temperature of the unexposed face of the specimen exceeded 140°C above its initial value of 33°C.
Integrity	4:00	The test was terminated by the client. During the test, all integrity criteria were fulfilled (no sustained flaming and no through gap such that the 6 mm diameter gap gauge could penetrate).

Date: September 24, 2020

Tested by: 
(Associate Prof. Dr. Jaroon Rungamornrat)

Checked by: 
(Professor Dr. Thanyawat Pothisiri)

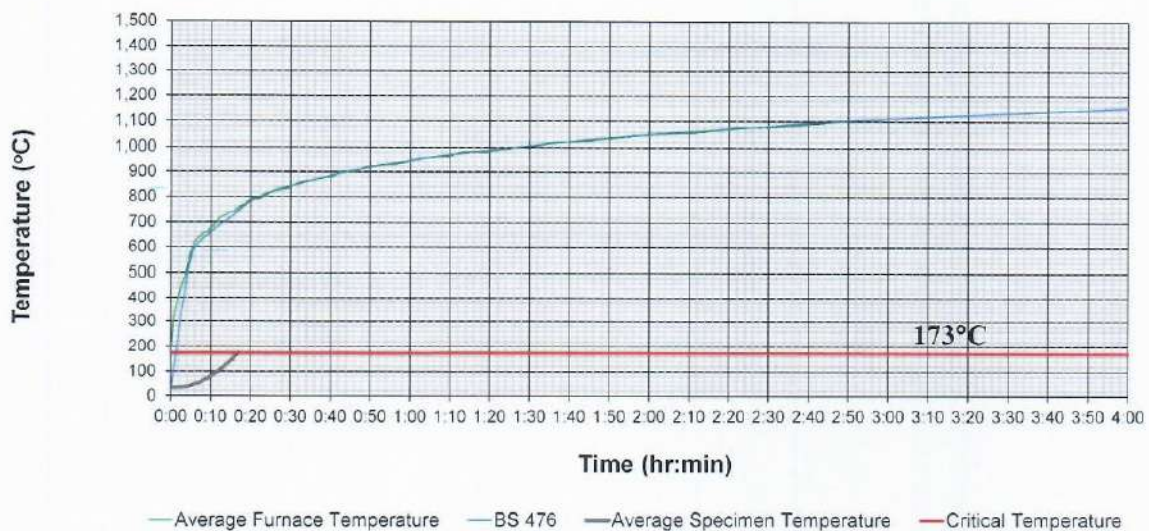

(Associate Prof. Dr. Tirawat Boonyatee)
On Behalf of Head of Civil Engineering Department

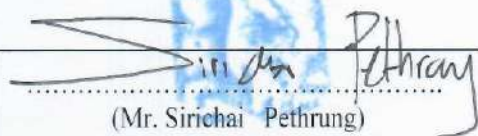


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FURNACE TEMPERATURE




(Mr. Sirichai Pethrung)
Authorized Testing Officer

APPENDIX A: TEMPERATURE OF THE FURNACE AND THE SPECIMEN

Time (hr.min.sec)	Furnace Temperature(°C)										Time (hr.min.sec)	BS 478 (°C)
	P1	P2	P3	P4	P5	P6	P7	P8	P9	Average		
0:00:00	133	347	109	156	211	75	141	281	212	185	0:00	20
0:01:00	197	533	252	281	370	242	273	446	390	331	0:05	556
0:02:00	264	593	368	347	439	371	375	489	461	412	0:10	659
0:03:00	346	630	452	402	479	394	445	526	483	462	0:15	718
0:04:00	421	663	503	454	527	452	495	570	531	513	0:20	781
0:05:00	489	703	566	517	597	535	560	646	598	579	0:25	821
0:06:00	550	730	604	563	629	564	609	675	632	617	0:30	842
0:07:00	591	750	626	592	642	571	630	688	643	637	0:35	865
0:08:00	623	755	638	618	652	587	645	699	657	653	0:40	885
0:09:00	644	750	648	634	658	601	654	701	655	660	0:45	902
0:10:00	664	770	658	652	676	614	665	712	666	675	0:50	918
0:11:00	680	777	667	671	684	628	679	725	685	688	0:55	932
0:12:00	698	799	691	686	704	652	699	749	713	710	1:00	945
0:13:00	714	811	704	701	718	667	713	761	717	723	1:05	957
0:14:00	728	817	713	716	726	671	722	767	714	731	1:10	968
0:15:00	736	821	718	723	735	682	730	776	736	740	1:15	979
0:16:00	746	822	728	728	735	690	734	777	732	744	1:20	988
0:17:00	754	829	737	742	750	700	748	797	744	756	1:25	997
0:18:00	762	840	747	752	760	710	758	803	749	764	1:30	1006
0:19:00	770	838	760	764	772	723	769	818	767	776	1:35	1014
0:20:00	783	863	771	777	785	734	788	839	792	792	1:40	1022
0:21:00	789	865	771	779	786	735	791	834	790	793	1:45	1029
0:22:00	793	860	765	781	788	733	790	833	789	792	1:50	1036
0:23:00	797	861	773	786	789	743	792	834	791	796	1:55	1043
0:24:00	805	868	788	800	806	755	807	851	796	808	2:00	1049
0:25:00	811	882	793	805	809	766	813	858	816	817	2:05	1055
0:26:00	819	894	804	810	818	770	819	865	818	824	2:10	1061
0:27:00	824	894	807	815	819	775	822	865	821	827	2:15	1067
0:28:00	827	890	808	820	823	778	827	868	829	830	2:20	1072
0:29:00	831	894	814	822	828	778	827	871	821	832	2:25	1077
0:30:00	835	896	816	826	831	785	833	875	834	837	2:30	1082
0:31:00	840	904	824	836	844	798	848	893	843	848	2:35	1087
0:32:00	848	909	834	845	854	806	856	898	851	856	2:40	1092
0:33:00	853	910	834	853	859	806	861	904	867	861	2:45	1097
0:34:00	858	918	839	852	860	812	865	906	865	864	2:50	1101
0:35:00	861	912	843	857	861	816	867	910	854	864	2:55	1106
0:36:00	863	925	841	861	867	819	872	911	864	869	3:00	1110
0:37:00	866	925	843	863	869	819	873	913	869	871	3:05	1114
0:38:00	869	927	845	866	871	823	876	917	879	875	3:10	1118
0:39:00	870	927	842	869	872	830	878	919	881	876	3:15	1122
0:40:00	874	930	856	871	877	831	879	919	869	878	3:20	1126
0:41:00	877	928	862	876	881	835	883	921	868	881	3:25	1129
0:42:00	883	945	868	886	895	849	898	939	902	896	3:30	1133
0:43:00	890	952	877	891	900	852	902	943	897	900	3:35	1136
0:44:00	893	949	873	892	900	851	904	939	900	900	3:40	1140
0:45:00	893	948	870	889	895	848	897	935	904	898	3:45	1143
0:46:00	895	951	878	892	896	854	900	938	891	899	3:50	1146
0:47:00	898	958	871	898	904	861	908	950	915	907	3:55	1150
0:48:00	904	958	890	905	915	870	915	953	908	913	4:00	1153
0:49:00	909	967	896	910	917	875	920	960	921	919		
0:50:00	914	970	897	913	920	875	921	960	928	922		
0:51:00	916	971	897	916	922	878	927	965	928	924		
0:52:00	918	971	896	918	923	882	928	966	924	925		
0:53:00	920	977	897	919	928	888	930	968	934	929		
0:54:00	922	969	902	922	930	880	932	966	937	929		
0:55:00	922	979	901	922	929	884	932	970	938	931		
0:56:00	924	973	902	923	930	886	933	970	933	930		
0:57:00	925	973	905	925	931	890	935	972	938	932		
0:58:00	928	979	906	927	935	893	937	974	942	936		
0:59:00	931	963	912	931	938	895	940	975	933	937		


 (Mr. Sirichai Pethrung)
 Authorized Testing Officer

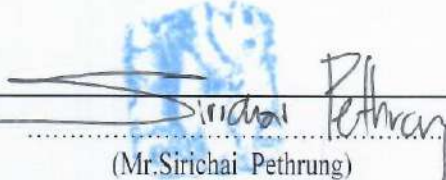
Time (hr:min:sec)	Furnace Temperature(°C)									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	Average
1:00:00	936	995	921	936	944	904	945	983	945	945
1:01:00	940	993	928	939	947	909	949	985	940	948
1:02:00	944	1000	925	943	951	912	951	987	952	952
1:03:00	946	993	931	946	955	914	955	989	955	954
1:04:00	949	1002	929	949	955	916	957	992	957	956
1:05:00	951	999	931	950	956	917	959	992	958	957
1:06:00	952	996	935	952	957	917	960	993	965	958
1:07:00	954	1006	937	951	959	919	958	992	957	959
1:08:00	954	998	933	953	961	921	961	994	965	960
1:09:00	955	1002	941	955	962	920	962	994	962	961
1:10:00	958	1009	942	955	959	923	961	995	955	962
1:11:00	959	1010	946	959	967	931	966	1004	975	969
1:12:00	966	1021	955	970	980	940	981	1015	974	978
1:13:00	970	1024	948	972	979	940	983	1018	991	980
1:14:00	973	1021	958	973	980	944	982	1015	988	981
1:15:00	973	1018	960	973	982	946	982	1015	981	981
1:16:00	974	1021	954	974	983	951	984	1019	983	982
1:17:00	974	1017	967	974	982	949	983	1015	984	983
1:18:00	973	1010	961	972	979	946	980	1013	988	980
1:19:00	972	1014	964	973	978	950	981	1013	967	979
1:20:00	974	1021	966	974	983	956	982	1016	991	985
1:21:00	976	1025	968	976	985	956	985	1015	988	986
1:22:00	978	1021	979	979	988	959	989	1019	987	989
1:23:00	981	1030	981	980	991	962	989	1021	998	993
1:24:00	984	1027	983	982	991	966	992	1022	992	993
1:25:00	985	1034	980	984	994	965	993	1023	995	995
1:26:00	988	1030	990	988	999	971	996	1025	1001	999
1:27:00	991	1032	990	990	998	975	998	1028	994	999
1:28:00	992	1039	987	991	1002	975	1000	1029	1003	1002
1:29:00	994	1040	991	992	1001	975	1000	1028	1005	1003
1:30:00	995	1043	988	994	1004	978	1003	1031	1005	1005
1:31:00	996	1039	992	995	1007	980	1005	1032	1006	1006
1:32:00	998	1041	996	997	1007	978	1006	1033	1008	1007
1:33:00	1000	1042	995	999	1007	985	1008	1035	1012	1009
1:34:00	1004	1051	1002	1002	1015	990	1012	1043	1020	1015
1:35:00	1006	1048	1008	1007	1018	990	1015	1043	1017	1017
1:36:00	1009	1052	1010	1008	1019	994	1018	1048	1021	1020
1:37:00	1011	1049	1009	1010	1020	994	1018	1047	1020	1020
1:38:00	1012	1054	1008	1009	1021	993	1019	1047	1024	1021
1:39:00	1011	1054	1007	1011	1021	996	1020	1047	1020	1021
1:40:00	1012	1049	1009	1012	1020	995	1021	1048	1025	1021
1:41:00	1013	1055	1011	1012	1021	997	1021	1050	1019	1022
1:42:00	1014	1055	1006	1013	1023	999	1022	1050	1016	1022
1:43:00	1015	1056	1012	1013	1024	1001	1023	1051	1022	1024
1:44:00	1015	1059	1011	1014	1025	999	1024	1050	1031	1025
1:45:00	1015	1055	1013	1015	1026	1001	1025	1051	1026	1025
1:46:00	1016	1061	1015	1017	1026	1002	1027	1052	1020	1026
1:47:00	1018	1065	1016	1019	1027	1007	1028	1055	1031	1030
1:48:00	1020	1062	1023	1019	1030	1006	1028	1054	1033	1031
1:49:00	1022	1065	1020	1021	1032	1007	1029	1055	1035	1032
1:50:00	1023	1067	1019	1023	1033	1009	1030	1056	1030	1032
1:51:00	1024	1068	1021	1023	1033	1011	1032	1057	1030	1033
1:52:00	1026	1073	1026	1025	1035	1013	1033	1060	1038	1037
1:53:00	1027	1072	1028	1027	1036	1014	1035	1062	1035	1037
1:54:00	1030	1076	1022	1029	1037	1021	1035	1063	1043	1040
1:55:00	1031	1075	1032	1029	1042	1018	1038	1062	1039	1040
1:56:00	1033	1080	1037	1033	1043	1025	1043	1071	1052	1046
1:57:00	1036	1081	1035	1037	1031	1027	1047	1073	1048	1046
1:58:00	1038	1078	1042	1039	1029	1028	1049	1074	1054	1048
1:59:00	1040	1079	1039	1042	1031	1032	1051	1077	1053	1049


 (Mr. Sirichai Pethrung)
 Authorized Testing Officer

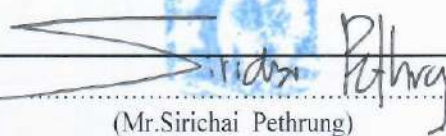
Time (hr:min:sec)	Furnace Temperature(°C)									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	Average
2:00:00	1043	1083	1044	1044	1033	1032	1054	1078	1053	1051
2:01:00	1045	1084	1045	1044	1034	1033	1053	1077	1048	1051
2:02:00	1045	1088	1038	1044	1033	1033	1054	1079	1059	1053
2:03:00	1045	1092	1043	1044	1035	1034	1055	1080	1059	1054
2:04:00	1046	1086	1041	1045	1035	1036	1055	1080	1048	1052
2:05:00	1046	1087	1045	1046	1036	1037	1056	1081	1052	1054
2:06:00	1047	1090	1045	1046	1036	1034	1056	1080	1059	1055
2:07:00	1048	1086	1045	1047	1038	1037	1057	1082	1056	1055
2:08:00	1049	1086	1047	1048	1038	1036	1058	1082	1062	1056
2:09:00	1050	1088	1048	1049	1039	1038	1058	1081	1055	1056
2:10:00	1050	1086	1048	1049	1040	1036	1058	1082	1062	1057
2:11:00	1050	1090	1045	1049	1040	1040	1059	1082	1080	1057
2:12:00	1051	1088	1052	1051	1041	1039	1059	1083	1063	1058
2:13:00	1052	1096	1047	1052	1042	1042	1061	1084	1062	1060
2:14:00	1054	1093	1053	1053	1044	1044	1061	1085	1061	1061
2:15:00	1055	1098	1057	1055	1046	1047	1063	1087	1068	1064
2:16:00	1057	1100	1059	1056	1048	1047	1064	1087	1067	1065
2:17:00	1058	1105	1060	1057	1049	1049	1066	1090	1064	1066
2:18:00	1059	1103	1061	1059	1050	1050	1067	1089	1071	1068
2:19:00	1061	1099	1062	1062	1053	1054	1071	1096	1075	1070
2:20:00	1064	1104	1061	1065	1056	1057	1075	1099	1077	1073
2:21:00	1066	1108	1069	1068	1059	1060	1078	1100	1074	1076
2:22:00	1069	1109	1067	1070	1062	1061	1081	1103	1082	1078
2:23:00	1070	1109	1068	1071	1063	1060	1081	1104	1082	1079
2:24:00	1070	1110	1067	1070	1062	1061	1080	1103	1085	1079
2:25:00	1070	1108	1064	1071	1062	1061	1080	1103	1080	1078
2:26:00	1070	1113	1062	1070	1062	1060	1081	1104	1087	1079
2:27:00	1070	1109	1067	1071	1062	1061	1080	1103	1076	1078
2:28:00	1071	1106	1067	1072	1063	1061	1081	1103	1077	1078
2:29:00	1071	1113	1069	1071	1064	1063	1082	1104	1078	1079
2:30:00	1071	1107	1068	1072	1065	1062	1082	1105	1075	1079
2:31:00	1072	1109	1070	1072	1065	1062	1082	1105	1077	1079
2:32:00	1072	1113	1065	1072	1065	1065	1082	1105	1079	1080
2:33:00	1073	1113	1070	1073	1066	1065	1083	1106	1086	1082
2:34:00	1074	1113	1070	1074	1068	1068	1085	1108	1087	1083
2:35:00	1075	1112	1074	1076	1069	1068	1086	1107	1092	1084
2:36:00	1076	1115	1071	1077	1070	1069	1087	1109	1089	1085
2:37:00	1077	1114	1078	1078	1071	1069	1087	1109	1090	1086
2:38:00	1079	1117	1078	1079	1072	1070	1089	1111	1088	1087
2:39:00	1080	1119	1079	1081	1074	1073	1090	1111	1089	1088
2:40:00	1081	1120	1079	1081	1075	1072	1091	1112	1088	1089
2:41:00	1082	1120	1081	1083	1077	1073	1092	1114	1095	1091
2:42:00	1083	1123	1077	1083	1078	1078	1094	1116	1094	1092
2:43:00	1083	1119	1082	1084	1079	1076	1094	1116	1094	1092
2:44:00	1086	1122	1086	1087	1081	1078	1095	1116	1092	1094
2:45:00	1088	1127	1090	1087	1082	1081	1096	1118	1096	1096
2:46:00	1089	1127	1089	1089	1083	1084	1097	1120	1099	1098
2:47:00	1090	1132	1090	1090	1085	1086	1100	1120	1099	1099
2:48:00	1091	1135	1091	1091	1086	1086	1101	1122	1106	1101
2:49:00	1093	1135	1093	1093	1088	1087	1101	1123	1097	1101
2:50:00	1093	1138	1093	1094	1089	1088	1103	1123	1101	1102
2:51:00	1095	1128	1095	1095	1090	1089	1105	1125	1106	1103
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2:53:00	1096	1138	1094	1095	1091	1090	1105	1126	1102	1104
2:54:00	1097	1136	1097	1096	1092	1090	1106	1126	1105	1105
2:55:00	1097	1139	1096	1097	1093	1091	1106	1126	1104	1106
2:56:00	1098	1138	1092	1097	1093	1093	1107	1128	1108	1106
2:57:00	1099	1135	1100	1099	1095	1093	1107	1127	1104	1106
2:58:00	1100	1139	1099	1100	1096	1095	1109	1129	1109	1108
2:59:00	1100	1138	1097	1100	1096	1094	1109	1129	1105	1108


 (Mr. Sirichai Pethrung)
 Authorized Testing Officer

Time (hr:min:sec)	Furnace Temperature(°C)									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	Average
3:00:00	1100	1140	1089	1099	1096	1095	1109	1131	1110	1108
3:01:00	1100	1138	1095	1100	1096	1094	1108	1130	1108	1108
3:02:00	1101	1138	1094	1100	1096	1093	1109	1129	1106	1107
3:03:00	1101	1140	1095	1100	1096	1094	1110	1130	1107	1108
3:04:00	1101	1136	1097	1101	1097	1095	1109	1130	1101	1107
3:05:00	1102	1138	1099	1101	1098	1095	1109	1130	1110	1109
3:06:00	1103	1137	1102	1103	1098	1096	1110	1133	1107	1110
3:07:00	1104	1138	1103	1104	1101	1100	1114	1136	1111	1112
3:08:00	1105	1144	1105	1106	1103	1103	1116	1137	1117	1115
3:09:00	1106	1145	1101	1108	1104	1104	1118	1139	1116	1116
3:10:00	1108	1144	1107	1108	1105	1105	1117	1138	1110	1116
3:11:00	1109	1147	1105	1109	1106	1106	1119	1140	1122	1118
3:12:00	1109	1144	1106	1110	1107	1105	1119	1141	1116	1117
3:13:00	1110	1150	1109	1111	1108	1108	1121	1142	1123	1120
3:14:00	1112	1147	1101	1112	1109	1108	1122	1144	1122	1120
3:15:00	1112	1149	1108	1113	1110	1107	1121	1144	1124	1121
3:16:00	1113	1150	1108	1114	1111	1110	1124	1145	1124	1122
3:17:00	1113	1149	1111	1114	1112	1111	1125	1144	1123	1122
3:18:00	1114	1149	1112	1115	1112	1111	1124	1144	1119	1122
3:19:00	1115	1153	1114	1115	1113	1112	1125	1145	1115	1123
3:20:00	1116	1151	1113	1116	1114	1111	1126	1147	1122	1124
3:21:00	1116	1152	1112	1117	1114	1112	1126	1148	1121	1124
3:22:00	1117	1154	1115	1117	1115	1112	1126	1147	1121	1125
3:23:00	1117	1155	1114	1117	1116	1115	1127	1147	1122	1126
3:24:00	1118	1155	1114	1118	1116	1115	1127	1149	1117	1126
3:25:00	1119	1153	1117	1119	1117	1115	1127	1149	1125	1126
3:26:00	1120	1158	1119	1121	1120	1118	1129	1151	1122	1129
3:27:00	1122	1158	1118	1122	1122	1121	1131	1151	1122	1129
3:28:00	1123	1160	1119	1123	1121	1119	1131	1153	1133	1131
3:29:00	1124	1164	1120	1124	1123	1121	1133	1154	1134	1133
3:30:00	1125	1164	1123	1125	1124	1122	1133	1155	1129	1133
3:31:00	1127	1166	1120	1126	1126	1125	1135	1156	1126	1134
3:32:00	1128	1165	1123	1127	1127	1126	1136	1157	1131	1135
3:33:00	1129	1167	1125	1128	1128	1125	1137	1159	1131	1136
3:34:00	1129	1168	1125	1128	1128	1127	1138	1158	1126	1136
3:35:00	1130	1163	1125	1130	1129	1126	1138	1159	1131	1137
3:36:00	1130	1162	1123	1130	1129	1127	1139	1159	1133	1137
3:37:00	1130	1165	1123	1131	1130	1127	1139	1160	1130	1137
3:38:00	1130	1164	1123	1131	1130	1128	1139	1160	1131	1138
3:39:00	1131	1167	1125	1131	1131	1128	1140	1160	1136	1139
3:40:00	1131	1165	1124	1131	1132	1129	1140	1161	1134	1139
3:41:00	1132	1169	1123	1132	1131	1129	1140	1163	1133	1139
3:42:00	1133	1167	1126	1133	1133	1130	1142	1163	1138	1140
3:43:00	1134	1169	1126	1133	1133	1129	1142	1164	1142	1141
3:44:00	1134	1163	1126	1135	1135	1130	1143	1165	1134	1141
3:45:00	1135	1175	1125	1133	1135	1132	1143	1165	1134	1142
3:46:00	1135	1184	1124	1135	1136	1133	1144	1166	1135	1141
3:47:00	1135	1172	1126	1135	1136	1132	1144	1167	1139	1143
3:48:00	1136	1171	1125	1135	1136	1132	1144	1168	1143	1143
3:49:00	1136	1167	1126	1136	1136	1132	1145	1167	1143	1143
3:50:00	1136	1167	1124	1135	1137	1132	1144	1166	1137	1142
3:51:00	1136	1164	1126	1136	1137	1134	1145	1167	1137	1142
3:52:00	1136	1169	1127	1136	1137	1133	1145	1165	1138	1143
3:53:00	1137	1174	1127	1137	1138	1134	1146	1168	1141	1145
3:54:00	1138	1170	1127	1138	1139	1135	1147	1169	1146	1145
3:55:00	1138	1175	1126	1138	1140	1138	1147	1170	1138	1145
3:56:00	1139	1175	1128	1140	1141	1137	1147	1170	1148	1147
3:57:00	1140	1177	1130	1140	1142	1141	1150	1172	1142	1148
3:58:00	1142	1175	1134	1144	1145	1142	1152	1173	1147	1150
3:59:00	1144	1175	1134	1146	1147	1143	1154	1177	1153	1152
4:00:00	1146	1182	1136	1146	1148	1146	1156	1177	1146	1154


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Time (hr:min:sec)	Specimen Temperature(°C)										
	A	B	C	D	E	F	G	H	I	Max. (A-I)	Average (A-E)
0:00:00	34	34	34	33	33	34	32	32	32	34	33
0:01:00	35	35	34	33	33	34	32	32	32	35	34
0:02:00	35	35	35	34	33	35	32	33	33	35	34
0:03:00	37	37	37	35	34	36	33	34	35	37	36
0:04:00	40	40	39	39	36	39	34	35	37	40	39
0:05:00	44	43	44	43	39	41	34	37	39	44	42
0:06:00	49	48	49	49	44	44	34	41	42	49	48
0:07:00	54	54	55	56	48	48	36	45	46	56	54
0:08:00	62	62	63	66	55	52	44	50	52	66	62
0:09:00	70	70	72	75	62	56	57	64	57	75	70
0:10:00	79	80	83	87	70	61	80	77	65	87	80
0:11:00	89	90	94	98	78	66	92	83	96	98	90
0:12:00	100	102	108	111	88	73	95	85	98	111	102
0:13:00	111	114	121	123	98	79	95	88	99	123	113
0:14:00	125	129	138	137	110	87	94	91	100	138	128
0:15:00	140	143	155	153	122	95	94	95	105	155	143
0:16:00	156	159	173	170	135	98	94	98	109	173	159
0:17:00	173	175	191	188	149	101	96	102	113	191	175


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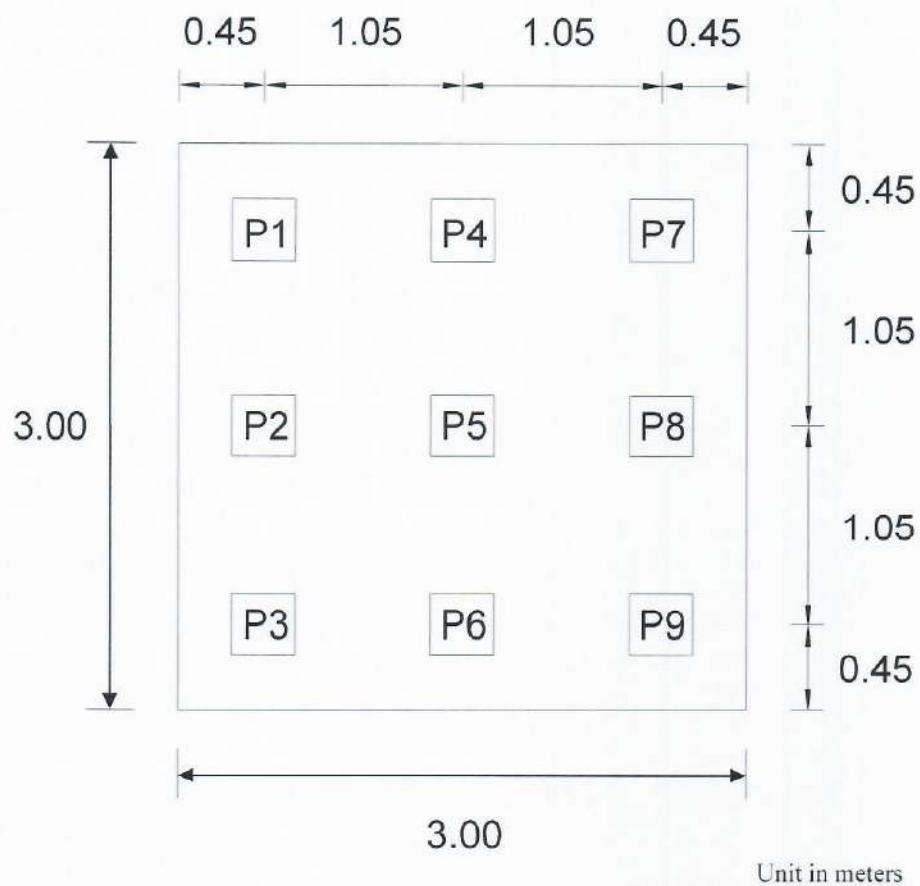
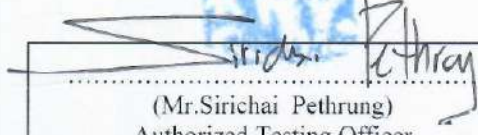


Figure A-1: Location of thermocouples inside the furnace


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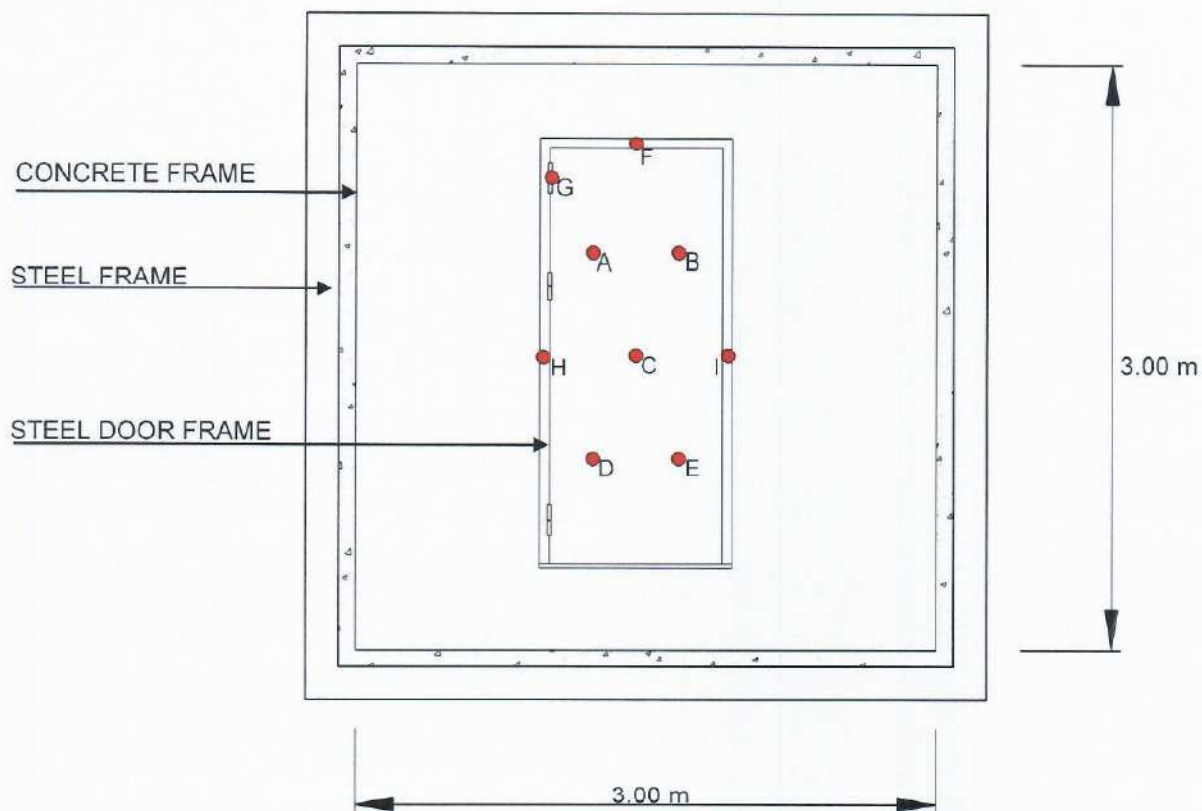
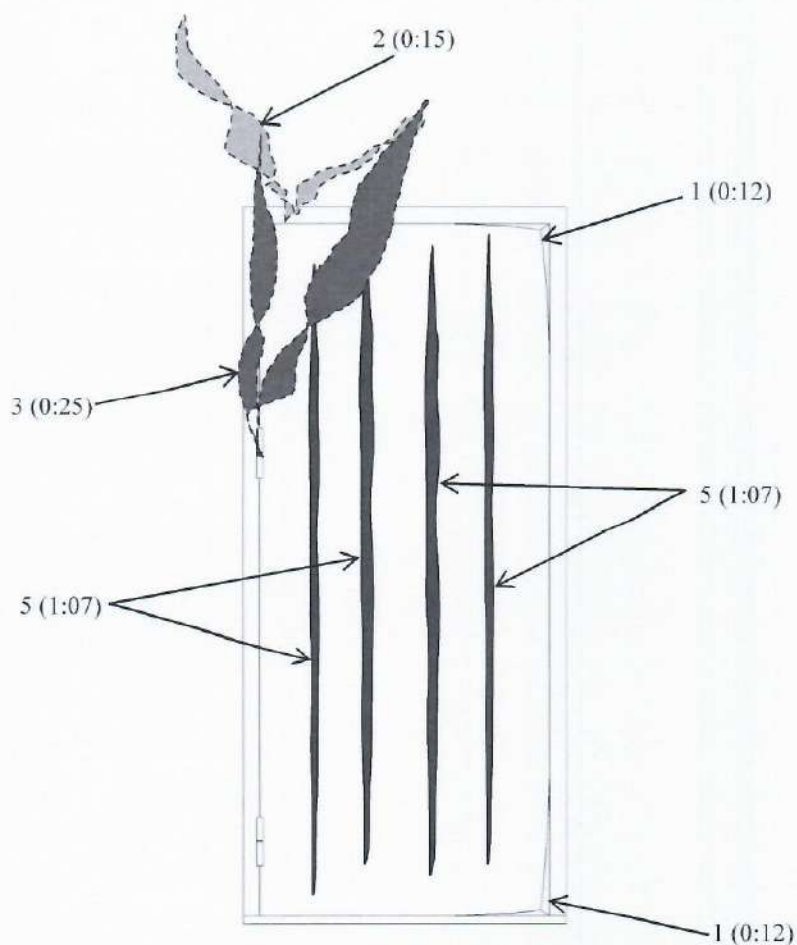


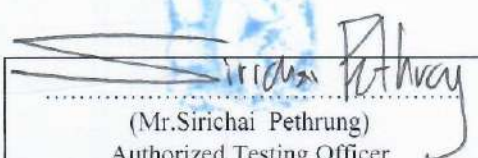
Figure A-2: Location of thermocouples on the specimen


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APPENDIX B: OBSERVATIONS

No.	Time (hr:min)	Observations
1	0:12	The door leaf deflected outward at the upper and lower right corners.
2	0:15	Smoke leaking from the upper edge of the door.
3	0:25	Smoke leaking from the left edge of the door.
4	0:30	No significant change was observed.
5	1:07	Multiple burnt areas were observed on the unexposed face of the door.
6	1:30	No significant change was observed.
7	2:00	No significant change was observed.
8	2:30	No significant change was observed.
9	3:00	No significant change was observed.
10	3:30	No significant change was observed.
11	4:00	The test was terminated by the client.




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APPENDIX D: PHOTOGRAPHS



Figure D-1: Specimen preparation prior to the test



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(a) 0:00 hr



(b) 0:15 hr



(c) 0:30 hr



(d) 0:45 hr

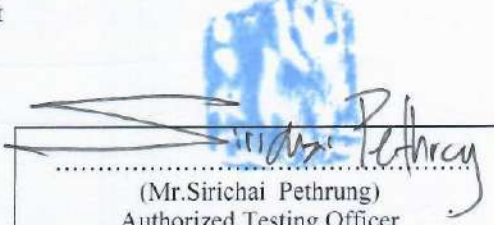


(e) 1:00 hr



(f) 1:15 hr

Figure D-2: The specimen during the test


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(g) 1:45 hr



(h) 2:00 hr



(i) 2:15 hr



(j) 2:30 hr



(k) 2:45 hr



(l) 3:00 hr

Figure D-2 (continued): The specimen during the test


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(m) 3:16 hr



(n) 3:30 hr



(o) 3:45 hr



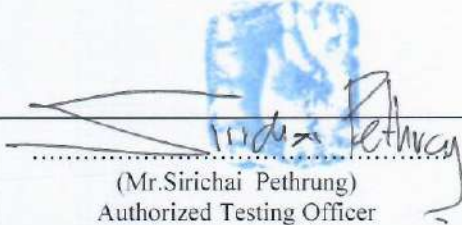
(p) 4:00 hr

Figure D-2 (continued): The specimen during the test


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Figure D-3: The specimen after the test


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