



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



TYPE OF TEST : POSITIVE PRESSURE FIRE TEST OF DOOR ASSEMBLIES

TEST SPECIMEN : "SPR" Steel Fireproof Door with Glass Vision Size 1200×2100 mm

The specimen is a doorset consisting of single-sided steel door leaf with a vision panel and a steel door frame. The dimensions of the door leaf are 2054 mm x 1125 mm x 45 mm. The door leaf has a fixed 127 mm x 508 mm Pyran clear fire rated glass (9 mm) vision panel located at the height of 1246 mm measured from its lower edge. The door leaf is constructed of 1.5-mm thick cold rolled steel sheet in-filled with rock wool with a density of 100 kg/m³. The specimen was mounted in a 15-cm thick reinforced concrete wall, which was installed on the 3.5 m x 3.5 m testing frame, such that the door opened into the furnace chamber. The door leaf was locked with the door frame by a door knob (Fire Mortise Lock) together with a panic bar, and 5 stainless steel hinges. Smoke rubber 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 : SUPA RICH CO., LTD.

27 Ramintra Soi 48, Ramintra Road, Kannayao
Kannayao, Bangkok 10230, Thailand

DATE OF TEST : June 15, 2019

TEST MACHINE : Large-scale vertical furnace at the Fire Safety Research Center (FSRC), Department of Civil Engineering, Chulalongkorn University in Saraburi province, Thailand. The furnace is capable of producing a standard temperature-time relationship according to several fire resistance standards including UL 10C.

TEST METHOD : The testing procedures follow UL 10C: Positive pressure fire tests of door assemblies for a desired fire rating of 3:00 hr.

TEST RESULTS : The test assembly described above has withstood the fire endurance classification period and hose-stream test as stated in the table below:
(The test results are good only for the specimen tested.)

Criteria	Fire Resistance (hr:min)	Remarks
Integrity	3:00	No flaming occurred on the unexposed surface of the door for the fire test duration of 180 minutes.
Hose Stream Test	Passed	- No portion of the door edges adjacent to the door frame moved from the original position greater than 1½ times the door thickness as a result of the hose stream test. - The latch bolt remained projected and intact after the test. - The door frame remained securely fastened to the wall on all sides. - No separation of the glass edges from the glazing frame during the hose stream test.

Date: June 28, 2019

Tested by:
(Professor Dr. Thanyawat Pothisiri)

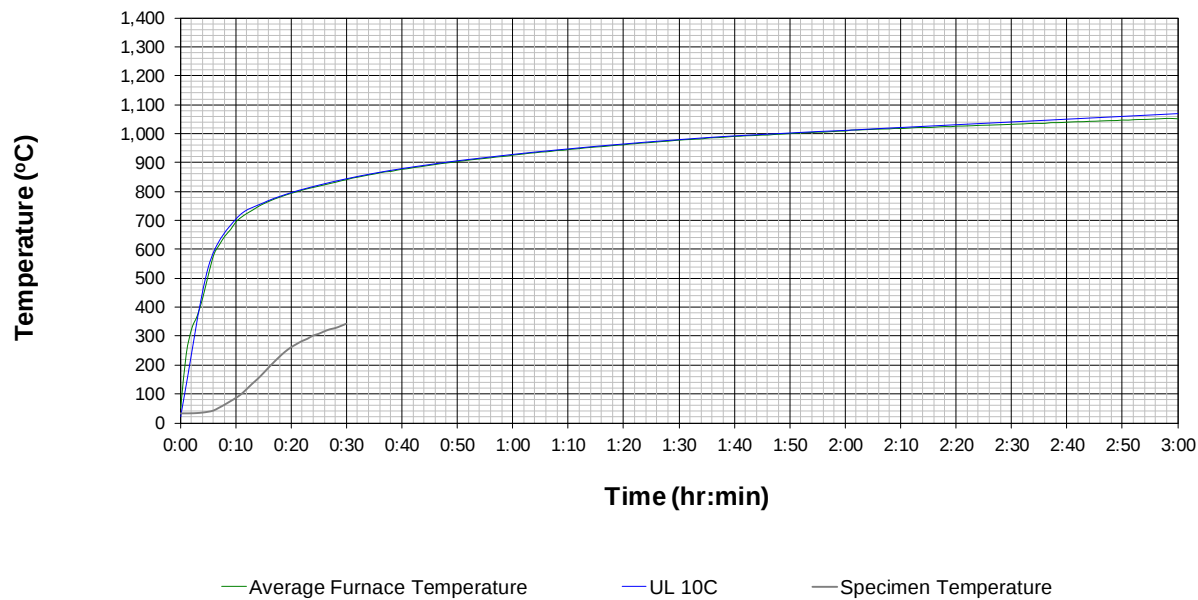
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(Associate Prof. Dr. Tirawat Boonyatee)
On Behalf of Head of Civil Engineering Department



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



FURNACE TEMPERATURE



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(Mr. Sirichai Pethrung)
Authorized Testing Officer

APPENDIX A: TEMPERATURE OF THE FURNACE AND THE SPECIMEN

Time (hr:min:sec)	Furnace Temperature(°C)																	Time	UL 10C
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	Average	(hr:min:sec)	(°C)
0:00:00	71	41	54	37	55	51	36	40	93	46	36	39	94	65	45	39	53	0:00	20
0:01:00	303	154	390	107	218	361	153	172	357	140	110	120	334	409	327	153	238	0:05	538
0:02:00	392	269	472	198	304	449	260	301	425	215	229	176	411	466	417	254	327	0:10	704
0:03:00	422	358	482	252	365	470	329	347	451	282	323	225	434	474	438	299	372	0:15	760
0:04:00	468	429	542	316	417	524	394	422	487	361	393	365	477	515	501	345	435	0:20	795
0:05:00	528	511	606	408	487	590	473	530	543	453	502	490	539	574	580	396	513	0:25	821
0:06:00	585	583	648	478	571	646	545	608	617	538	593	588	601	627	645	464	583	0:30	843
0:07:00	607	626	669	520	605	667	599	641	636	590	639	639	628	654	663	498	617	0:35	862
0:08:00	632	658	692	557	640	694	638	666	663	634	673	671	652	676	688	523	647	0:40	878
0:09:00	653	682	712	592	661	707	670	683	682	662	696	690	671	695	704	546	669	0:45	892
0:10:00	678	704	741	627	688	737	696	709	712	693	720	717	697	722	733	573	697	0:50	905
0:11:00	694	723	749	651	708	749	718	725	725	714	737	732	711	734	742	593	713	0:55	916
0:12:00	707	736	764	663	722	759	733	737	737	728	750	745	724	744	754	610	726	1:00	927
0:13:00	717	745	777	680	733	770	745	746	749	741	761	755	735	753	763	622	737	1:05	937
0:14:00	729	757	784	695	744	780	758	759	757	753	773	773	744	765	776	637	749	1:10	946
0:15:00	738	766	791	704	755	790	771	770	768	763	782	783	754	770	788	649	759	1:15	955
0:16:00	748	776	803	714	764	798	779	779	775	771	791	785	760	781	792	663	767	1:20	963
0:17:00	754	783	807	725	769	806	787	786	785	780	799	796	770	789	800	671	775	1:25	971
0:18:00	762	788	814	735	777	810	794	795	790	788	805	800	776	794	808	678	782	1:30	978
0:19:00	767	794	821	743	786	817	800	802	797	795	811	810	783	800	809	688	789	1:35	985
0:20:00	774	800	826	746	791	822	808	805	803	801	818	815	789	806	818	696	795	1:40	991
0:21:00	779	807	828	753	797	827	813	811	807	807	822	820	796	813	826	699	800	1:45	996
0:22:00	786	810	841	765	801	832	818	817	813	814	826	825	798	817	827	707	806	1:50	1001
0:23:00	789	816	843	768	807	838	823	822	818	817	833	830	805	821	831	719	811	1:55	1006
0:24:00	795	822	839	771	811	842	827	824	822	822	837	836	811	825	840	722	815	2:00	1010
0:25:00	797	825	845	782	815	846	833	831	825	827	842	839	813	829	842	727	820	2:05	1015
0:26:00	802	830	848	783	819	850	837	833	832	832	846	846	819	833	848	731	824	2:10	1020
0:27:00	806	835	856	787	823	854	843	839	835	835	851	850	823	837	851	736	829	2:15	1025
0:28:00	810	837	863	797	828	858	846	846	840	838	854	850	827	841	855	741	833	2:20	1030
0:29:00	815	843	869	800	833	863	852	848	843	845	859	857	833	847	858	745	838	2:25	1034
0:30:00	820	847	873	803	837	866	855	850	847	848	863	864	836	849	863	755	842	2:30	1039
0:31:00	824	851	883	814	842	870	860	860	854	854	866	863	841	855	866	756	847	2:35	1044
0:32:00	827	854	880	816	845	874	865	859	855	857	871	870	845	858	871	764	851	2:40	1049
0:33:00	831	857	884	820	848	878	868	865	860	861	874	876	849	862	874	768	855	2:45	1054
0:34:00	834	861	884	823	852	882	871	868	863	866	878	881	852	866	880	772	858	2:50	1058
0:35:00	837	867	889	827	854	884	874	870	867	869	881	884	856	870	881	776	862	2:55	1063
0:36:00	842	867	895	834	859	888	879	877	870	873	885	884	859	873	886	780	866	3:00	1068
0:37:00	844	872	899	837	862	892	882	880	873	875	888	889	863	875	888	787	869		
0:38:00	848	874	895	836	864	892	884	880	876	877	891	892	865	877	890	789	871		
0:39:00	851	878	901	841	870	897	888	887	879	881	894	894	869	880	894	791	875		
0:40:00	853	882	901	846	870	900	891	886	883	884	896	900	872	884	899	797	878		
0:41:00	856	884	904	849	873	902	894	889	885	886	899	902	875	886	900	796	880		
0:42:00	859	887	911	855	876	906	897	894	888	890	901	905	876	888	902	804	884		
0:43:00	861	891	911	854	879	909	899	895	890	891	903	907	880	893	906	806	886		
0:44:00	864	890	916	861	880	909	902	900	895	895	907	910	883	896	907	808	889		
0:45:00	868	894	921	862	885	913	905	901	896	897	908	912	887	898	910	811	892		
0:46:00	871	897	921	866	886	916	909	903	898	900	912	916	889	900	912	817	895		
0:47:00	874	901	920	868	890	919	910	905	901	904	915	920	891	902	917	821	897		
0:48:00	875	903	930	873	892	920	913	909	903	905	915	919	893	904	916	825	900		
0:49:00	878	904	925	874	895	922	915	910	906	908	919	925	897	907	922	825	902		
0:50:00	881	906	926	878	898	926	917	913	909	911	921	926	898	912	922	828	905		
0:51:00	883	908	931	879	900	928	920	916	912	913	923	930	901	914	925	829	907		
0:52:00	885	910	938	887	902	929	922	920	913	916	925	929	903	914	927	832	909		
0:53:00	888	913	934	888	903	933	924	922	916	918	928	932	906	916	929	837	912		
0:54:00	889	914	935	889	906	933	926	922	917	920	930	937	907	918	933	841	914		
0:55:00	891	917	938	891	908	934	928	922	919	922	932	938	910	921	935	845	916		
0:56:00	894	919	943	893	910	938	930	927	922	923	933	938	911	922	935	845	918		
0:57:00	896	921	944	895	913	941	933	928	923	926	936	941	914	925	940	849	920		
0:58:00	899	925	946	897	913	942	935	929	926	928	937	943	917	926	939	850	922		
0:59:00	900	926	946	900	917	944	936	932	928	930	939	945	918	927	942	852	924		

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(Mr.Sirichai Pethrung)
Authorized Testing Officer

Time (hr:min:sec)	Furnace Temperature(°C)																
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	Average
1:00:00	902	927	952	906	919	947	939	937	930	932	941	944	921	932	942	857	927
1:01:00	904	928	954	909	920	948	940	938	932	935	943	949	923	933	947	859	929
1:02:00	907	930	954	907	923	950	943	938	935	937	945	952	925	935	950	863	931
1:03:00	909	933	956	911	925	951	946	943	936	938	948	955	929	937	951	867	933
1:04:00	911	938	959	910	926	954	948	940	937	940	949	957	928	939	951	870	935
1:05:00	913	939	958	915	929	957	949	945	940	942	952	958	931	942	954	871	937
1:06:00	914	939	959	916	930	956	951	945	941	943	952	961	933	942	956	873	938
1:07:00	916	941	962	922	932	959	952	950	943	945	953	960	934	945	955	874	940
1:08:00	919	943	966	921	935	963	955	952	947	948	956	965	937	947	961	875	943
1:09:00	919	943	975	928	935	962	955	956	946	949	956	958	936	947	954	877	943
1:10:00	922	946	970	927	938	964	958	954	948	951	960	967	940	949	963	881	946
1:11:00	924	949	972	926	940	968	960	955	951	952	961	968	941	951	964	882	948
1:12:00	925	949	975	931	940	968	961	959	953	955	962	967	943	954	965	884	949
1:13:00	928	951	976	935	942	970	964	964	955	956	964	971	945	955	967	886	952
1:14:00	929	956	976	932	945	972	965	959	956	959	966	975	947	957	970	889	953
1:15:00	931	954	979	937	946	973	966	962	958	960	967	975	949	958	970	892	955
1:16:00	932	955	980	940	948	973	967	965	959	962	968	975	949	959	971	893	956
1:17:00	934	957	986	939	949	976	969	968	959	964	971	975	951	962	969	897	958
1:18:00	935	958	986	944	951	977	971	969	962	964	972	979	953	964	975	897	960
1:19:00	936	962	983	943	952	979	973	968	965	966	973	985	956	965	977	901	961
1:20:00	938	963	988	945	954	981	974	970	965	968	974	982	956	966	976	900	962
1:21:00	941	966	986	949	956	984	976	973	968	970	977	983	960	968	979	903	965
1:22:00	942	965	993	953	958	983	976	977	968	972	977	981	960	969	979	904	966
1:23:00	944	967	996	954	959	986	979	979	970	974	979	985	962	971	980	904	968
1:24:00	946	968	995	954	961	987	980	980	972	975	981	985	963	972	981	909	969
1:25:00	947	970	993	955	961	988	982	980	973	976	982	990	965	974	986	908	971
1:26:00	948	974	994	955	964	990	984	979	974	977	984	993	966	976	988	912	972
1:27:00	950	975	995	956	965	992	985	980	977	979	985	994	968	978	990	914	974
1:28:00	951	973	1001	962	965	991	986	987	977	982	986	991	967	979	988	915	975
1:29:00	952	976	1001	962	969	995	988	987	979	982	988	996	971	979	991	917	977
1:30:00	954	977	1005	967	969	995	989	990	980	983	990	994	972	981	991	920	978
1:31:00	956	981	1005	966	971	998	991	990	983	985	990	996	974	982	992	921	980
1:32:00	957	982	1002	964	973	999	992	987	983	985	991	1001	976	983	996	922	981
1:33:00	959	979	1010	968	973	997	993	993	984	987	993	1000	975	985	994	925	982
1:34:00	959	981	1011	972	974	999	994	998	984	988	994	996	976	984	989	926	983
1:35:00	961	984	1006	973	976	1002	996	996	987	990	997	1005	978	988	998	928	985
1:36:00	962	986	1011	976	978	1004	997	999	988	991	997	1002	980	989	998	931	987
1:37:00	962	985	1013	978	977	1003	998	1000	989	991	998	1002	980	990	998	932	987
1:38:00	964	986	1013	979	979	1004	1000	998	989	992	999	1007	981	990	1001	934	988
1:39:00	964	987	1013	981	980	1006	1001	1002	992	995	1001	1009	984	994	1003	934	990
1:40:00	966	989	1009	979	981	1008	1003	1000	994	996	1002	1013	986	994	1007	936	991
1:41:00	967	989	1022	987	981	1007	1003	1009	993	995	1001	1005	985	993	1002	935	992
1:42:00	968	991	1022	986	983	1009	1005	1009	995	997	1003	1008	987	995	1002	939	994
1:43:00	969	992	1019	984	985	1010	1005	1004	995	998	1004	1013	987	996	1005	938	994
1:44:00	971	993	1021	987	985	1010	1005	1012	996	1000	1004	1006	987	997	1003	942	995
1:45:00	971	992	1023	989	986	1010	1006	1011	997	999	1006	1011	989	998	1006	940	996
1:46:00	971	994	1022	989	986	1011	1007	1011	997	1000	1006	1010	990	997	1005	941	996
1:47:00	973	998	1022	988	988	1014	1009	1009	999	1003	1007	1013	992	999	1010	942	998
1:48:00	974	996	1017	990	989	1014	1011	1007	1001	1004	1009	1018	993	1002	1012	946	999
1:49:00	974	997	1023	993	990	1014	1010	1012	1002	1004	1010	1016	994	1002	1011	946	1000
1:50:00	976	998	1028	995	991	1015	1012	1016	1002	1005	1010	1016	994	1001	1010	949	1001
1:51:00	977	999	1025	994	992	1018	1014	1013	1004	1006	1012	1020	995	1004	1015	949	1002
1:52:00	978	1003	1022	993	992	1019	1015	1011	1005	1006	1013	1024	997	1006	1017	951	1003
1:53:00	979	1003	1026	996	994	1020	1016	1013	1006	1007	1014	1023	998	1005	1017	953	1004
1:54:00	980	1003	1026	998	995	1021	1017	1016	1005	1009	1015	1021	999	1007	1017	953	1005
1:55:00	981	1003	1031	996	996	1022	1018	1014	1007	1010	1016	1027	999	1008	1020	955	1006
1:56:00	982	1003	1032	1000	997	1020	1018	1021	1007	1010	1015	1018	1000	1007	1013	955	1006
1:57:00	982	1005	1035	1002	997	1022	1018	1020	1008	1010	1016	1022	1001	1008	1016	957	1008
1:58:00	984	1006	1037	1004	999	1022	1019	1025	1008	1011	1017	1021	1000	1009	1015	957	1008
1:59:00	984	1007	1037	1004	999	1024	1020	1023	1010	1013	1018	1026	1003	1010	1018	959	1010

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(Mr.Sirichai Pethrung)
Authorized Testing Officer

Time (hr:min:sec)	Furnace Temperature(°C)																
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	Average
2:00:00	985	1006	1035	1003	1000	1025	1021	1024	1010	1014	1019	1024	1003	1011	1021	959	1010
2:01:00	985	1008	1038	1006	1000	1025	1022	1025	1012	1014	1020	1023	1004	1012	1020	960	1011
2:02:00	987	1008	1038	1007	1001	1025	1021	1026	1011	1015	1020	1022	1003	1011	1018	963	1011
2:03:00	988	1009	1038	1005	1002	1026	1023	1025	1013	1015	1021	1027	1005	1015	1021	963	1012
2:04:00	988	1010	1038	1008	1002	1026	1023	1030	1013	1016	1022	1024	1005	1013	1020	965	1013
2:05:00	989	1010	1043	1011	1003	1027	1024	1031	1013	1017	1022	1023	1006	1014	1020	966	1014
2:06:00	989	1011	1038	1007	1004	1028	1025	1025	1015	1018	1023	1032	1007	1015	1026	967	1014
2:07:00	990	1011	1040	1010	1004	1028	1025	1029	1014	1018	1023	1029	1007	1015	1022	967	1015
2:08:00	991	1013	1042	1011	1005	1029	1026	1030	1015	1018	1024	1028	1008	1015	1024	967	1015
2:09:00	992	1016	1042	1008	1006	1031	1027	1025	1017	1019	1025	1035	1008	1018	1027	969	1017
2:10:00	992	1014	1044	1012	1006	1030	1027	1030	1016	1019	1025	1029	1008	1016	1023	968	1016
2:11:00	993	1016	1043	1012	1007	1032	1028	1032	1017	1020	1026	1031	1009	1018	1025	970	1017
2:12:00	995	1016	1046	1015	1008	1032	1029	1034	1018	1021	1027	1030	1011	1019	1026	971	1019
2:13:00	995	1016	1047	1016	1008	1032	1030	1034	1019	1022	1027	1033	1012	1020	1028	972	1020
2:14:00	995	1017	1046	1016	1009	1034	1030	1034	1020	1023	1028	1033	1012	1020	1026	973	1020
2:15:00	995	1016	1045	1014	1010	1033	1030	1032	1019	1023	1028	1036	1011	1020	1028	973	1019
2:16:00	996	1019	1043	1015	1011	1036	1032	1030	1020	1024	1029	1038	1013	1021	1032	973	1021
2:17:00	997	1019	1048	1018	1012	1035	1033	1036	1022	1024	1030	1038	1015	1022	1031	975	1022
2:18:00	998	1019	1049	1020	1013	1035	1033	1037	1022	1026	1031	1036	1014	1023	1030	976	1023
2:19:00	998	1018	1047	1019	1013	1035	1033	1036	1023	1026	1031	1037	1015	1023	1031	978	1023
2:20:00	999	1022	1049	1019	1014	1038	1035	1036	1024	1027	1033	1043	1017	1025	1036	976	1024
2:21:00	1000	1020	1052	1021	1014	1037	1036	1039	1025	1028	1033	1037	1017	1025	1033	978	1025
2:22:00	1001	1022	1052	1021	1014	1038	1036	1039	1025	1028	1033	1040	1017	1025	1034	978	1025
2:23:00	1002	1023	1052	1022	1016	1039	1037	1041	1026	1029	1035	1037	1018	1028	1032	981	1026
2:24:00	1002	1024	1052	1022	1016	1041	1037	1038	1027	1029	1035	1045	1019	1028	1038	982	1027
2:25:00	1003	1024	1050	1024	1017	1041	1039	1040	1027	1030	1036	1043	1020	1029	1038	980	1027
2:26:00	1005	1026	1054	1024	1018	1041	1038	1044	1027	1031	1037	1041	1019	1029	1036	983	1028
2:27:00	1004	1025	1054	1024	1018	1041	1039	1045	1029	1031	1037	1040	1021	1029	1034	983	1028
2:28:00	1006	1027	1057	1027	1019	1042	1039	1046	1028	1032	1038	1040	1021	1029	1034	985	1029
2:29:00	1006	1028	1048	1023	1020	1044	1041	1036	1030	1033	1038	1049	1023	1032	1042	985	1030
2:30:00	1006	1027	1051	1025	1020	1045	1042	1039	1031	1033	1039	1050	1024	1033	1043	986	1031
2:31:00	1007	1027	1055	1028	1021	1044	1042	1043	1031	1034	1039	1049	1024	1032	1041	987	1032
2:32:00	1007	1028	1056	1026	1022	1045	1042	1042	1032	1035	1041	1048	1025	1034	1042	989	1032
2:33:00	1008	1029	1055	1028	1023	1046	1044	1043	1033	1035	1042	1053	1027	1035	1046	988	1033
2:34:00	1010	1031	1059	1030	1024	1046	1044	1045	1033	1037	1042	1050	1025	1035	1044	991	1034
2:35:00	1010	1031	1058	1029	1024	1047	1045	1046	1034	1037	1043	1047	1027	1036	1042	991	1034
2:36:00	1011	1029	1056	1025	1024	1047	1043	1042	1035	1038	1040	1052	1028	1038	1046	987	1034
2:37:00	1013	1034	1057	1029	1027	1051	1045	1041	1038	1040	1042	1054	1030	1038	1048	988	1036
2:38:00	1014	1035	1057	1026	1027	1051	1045	1041	1038	1040	1042	1056	1032	1038	1051	991	1036
2:39:00	1014	1034	1058	1028	1029	1052	1047	1042	1038	1040	1043	1056	1032	1039	1048	990	1037
2:40:00	1016	1036	1060	1032	1030	1051	1046	1048	1039	1042	1043	1055	1031	1040	1048	990	1038
2:41:00	1016	1037	1060	1031	1030	1054	1048	1043	1040	1043	1045	1059	1034	1040	1051	993	1039
2:42:00	1017	1039	1059	1030	1031	1055	1050	1043	1041	1044	1046	1059	1034	1041	1053	996	1040
2:43:00	1017	1039	1057	1030	1031	1055	1049	1044	1042	1043	1046	1060	1036	1042	1052	996	1040
2:44:00	1018	1040	1061	1032	1032	1056	1050	1044	1042	1044	1046	1061	1035	1044	1054	994	1041
2:45:00	1019	1040	1061	1034	1033	1056	1050	1047	1042	1045	1047	1059	1036	1042	1053	995	1041
2:46:00	1020	1041	1061	1035	1033	1057	1051	1047	1044	1046	1048	1061	1036	1045	1054	997	1042
2:47:00	1021	1041	1063	1035	1035	1058	1052	1048	1044	1046	1049	1063	1038	1045	1055	998	1043
2:48:00	1021	1043	1064	1034	1034	1059	1053	1047	1045	1047	1049	1064	1038	1045	1056	999	1044
2:49:00	1021	1041	1067	1038	1035	1057	1053	1053	1045	1047	1050	1062	1037	1045	1054	998	1044
2:50:00	1023	1041	1067	1039	1036	1058	1053	1055	1046	1050	1051	1064	1038	1047	1057	1001	1045
2:51:00	1022	1043	1065	1038	1036	1060	1054	1050	1047	1049	1051	1065	1039	1046	1057	1000	1045
2:52:00	1023	1041	1066	1039	1037	1060	1055	1054	1048	1051	1052	1067	1041	1050	1060	1002	1046
2:53:00	1025	1047	1065	1038	1038	1061	1057	1051	1048	1051	1053	1068	1042	1049	1061	1004	1047
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2:55:00	1025	1047	1069	1039	1040	1063	1058	1052	1049	1050	1054	1068	1044	1049	1060	1006	1048
2:56:00	1027	1046	1068	1042	1041	1064	1058	1054	1051	1053	1054	1068	1044	1051	1062	1003	1049
2:57:00	1028	1049	1070	1041	1042	1064	1059	1054	1052	1054	1056	1070	1044	1052	1062	1004	1050
2:58:00	1028	1050	1070	1044	1042	1066	1060	1056	1052	1054	1056	1071	1046	1053	1063	1006	1051
2:59:00	1029	1049	1068	1043	1042	1065	1060	1055	1052	1054	1057	1072	1046	1053	1063	1008	1051
3:00:00	1038	1039	1097	991	1050	1062	1073	1042	1053	1062	1067	1044	1046	1059	1081	1030	1052

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Time (hr:min:sec)	Specimen Temperature(°C)					Max. (A-E)	Average (A-E)
	A	B	C	D	E		
0:00:00	32	32	32	31	32	32	32
0:01:00	32	32	32	31	32	32	32
0:02:00	32	32	32	31	32	32	32
0:03:00	32	34	34	31	32	34	33
0:04:00	34	37	36	31	33	37	34
0:05:00	36	42	40	31	36	42	37
0:06:00	40	50	46	32	39	50	41
0:07:00	46	61	53	-	44	61	51
0:08:00	54	79	62	-	51	79	61
0:09:00	62	99	72	-	59	99	73
0:10:00	70	116	82	-	68	116	84
0:11:00	80	139	94	-	78	139	98
0:12:00	92	170	108	-	90	170	115
0:13:00	106	200	124	-	105	200	134
0:14:00	118	226	141	-	117	226	151
0:15:00	132	252	161	-	136	252	170
0:16:00	148	275	182	-	157	275	190
0:17:00	166	294	202	-	178	294	210
0:18:00	183	311	221	-	199	311	228
0:19:00	198	327	238	-	218	327	245
0:20:00	210	341	253	-	235	341	260
0:21:00	218	351	266	-	248	351	271
0:22:00	226	361	278	-	261	361	282
0:23:00	232	368	288	-	270	368	290
0:24:00	241	379	302	-	280	379	301
0:25:00	245	384	310	-	287	384	307
0:26:00	251	393	320	-	295	393	315
0:27:00	256	402	330	-	301	402	322
0:28:00	257	408	337	-	304	408	326
0:29:00	263	417	346	-	309	417	334
0:30:00	270	425	358	-	313	425	342

Note: Temperatures were recorded only during the first 30 minutes of the fire endurance test.

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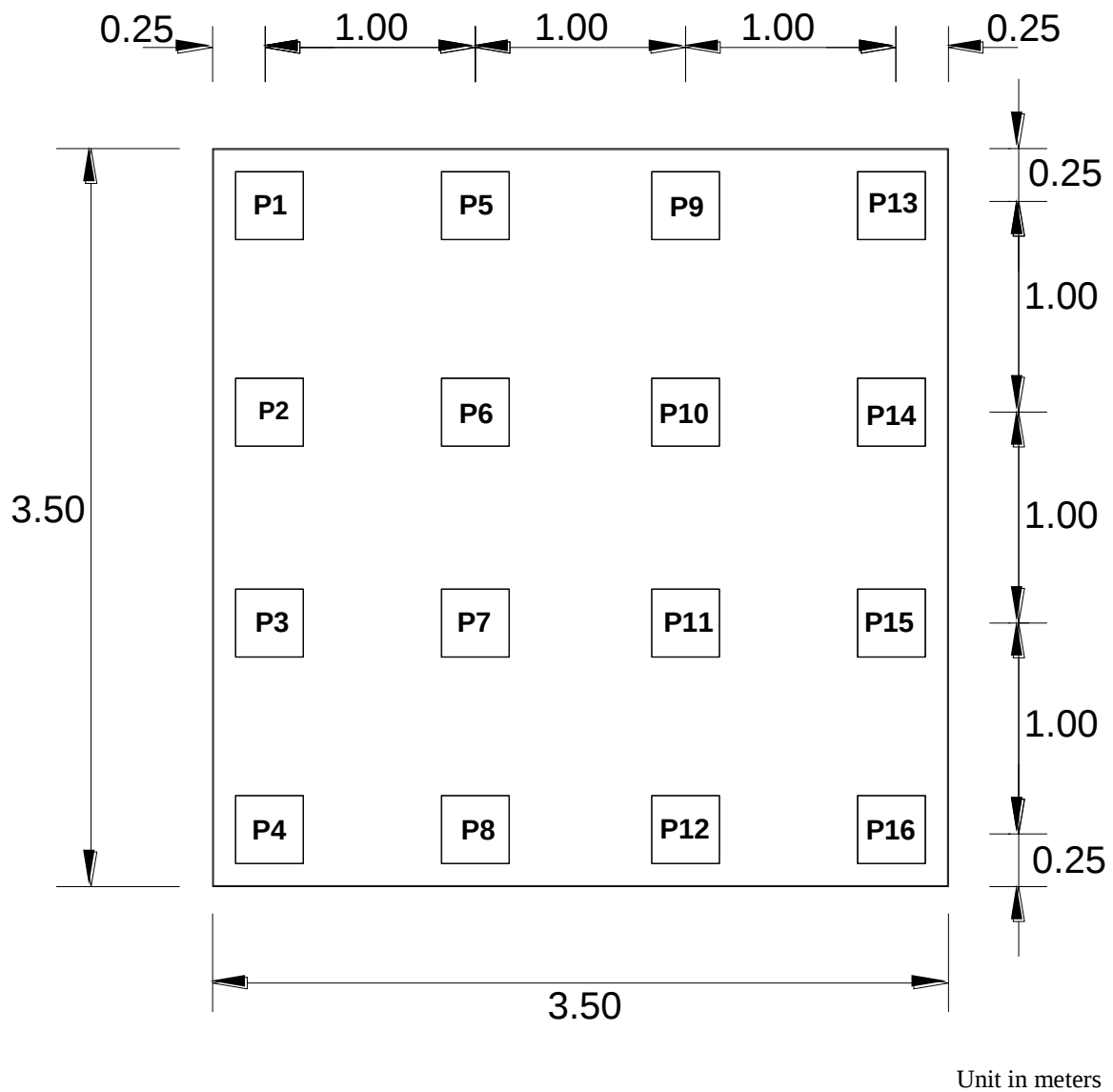


Figure A-1: Location of thermocouples inside the furnace

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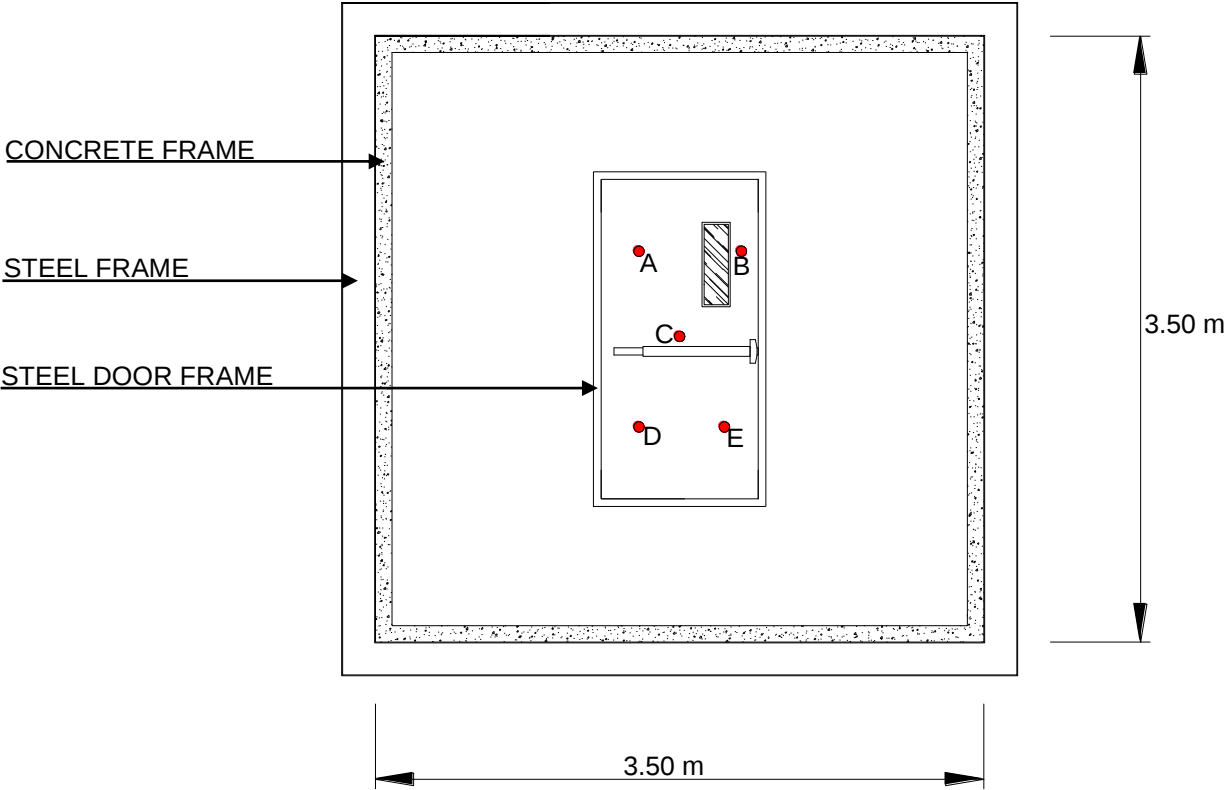


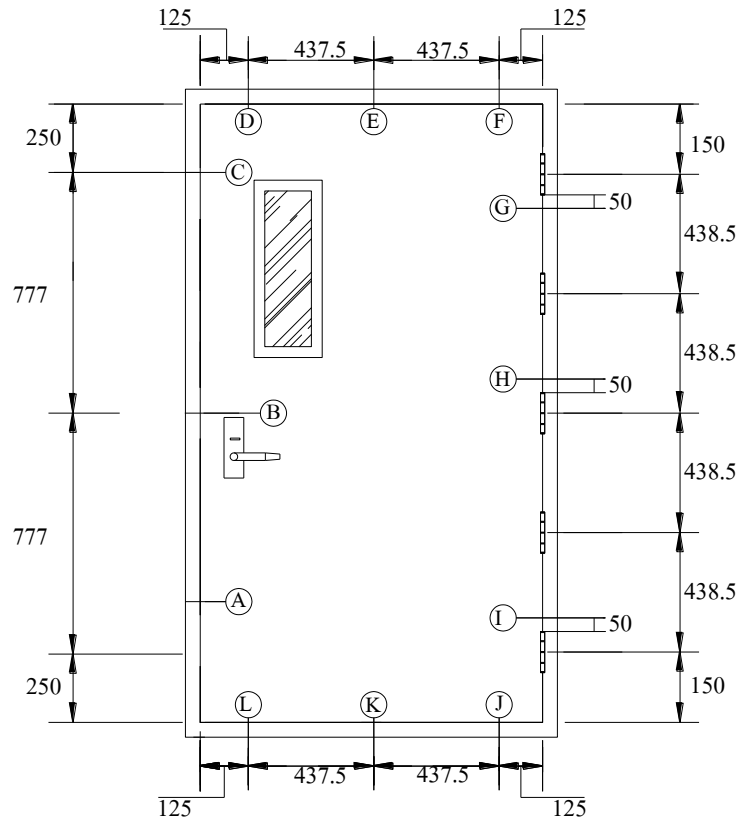
Figure A-2: Location of thermocouples on the specimen

APPENDIX B: CLEARANCE MEASUREMENTS

Location*	Clearance (mm)	Clearance Range in UL 10C, Part 9.3 (mm)
A	2.83	1.6-3.1
B	1.78	1.6-3.1
C	1.67	1.6-3.1
D	2.19	1.6-3.1
E	2.58	1.6-3.1
F	2.27	1.6-3.1
G	2.58	1.6-3.1
H	2.87	1.6-3.1
I	2.55	1.6-3.1
J	8.13	7.9-9.5
K	8.86	7.9-9.5
L	8.14	7.9-9.5

Note: The locations of clearance measurements are shown in Figure B-1.

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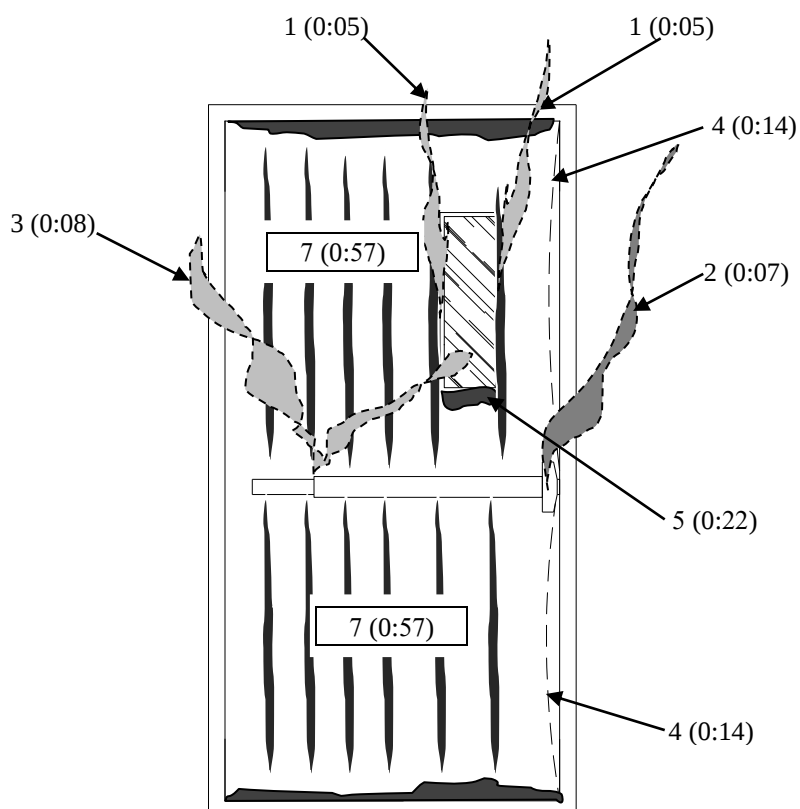
Unit in millimeters

Figure B-1: Location of clearance measurements for the door

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APPENDIX C: OBSERVATIONS

No.	Time (hr:min)	Observations
1	0:05	Smoke leaking from the left and right edges of the vision panel.
2	0:07	Smoke leaking from the right edge of the door.
3	0:08	Smoke leaking from the panic bar.
4	0:14	The door leaf deflected into the furnace at the upper and lower right edges.
5	0:22	A dark area was observed on the lower edge of the vision panel.
6	0:30	No significant change was observed.
7	0:57	Multiple dark areas were observed on the unexposed face of the door.
8	1:00	No significant change was observed.
9	1:30	No significant change was observed.
10	2:00	No significant change was observed.
11	2:30	No significant change was observed.
12	3:00	The fire endurance test was terminated and the hose stream test was conducted.



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APPENDIX D: DRAWINGS & DETAILS OF THE SPECIMEN

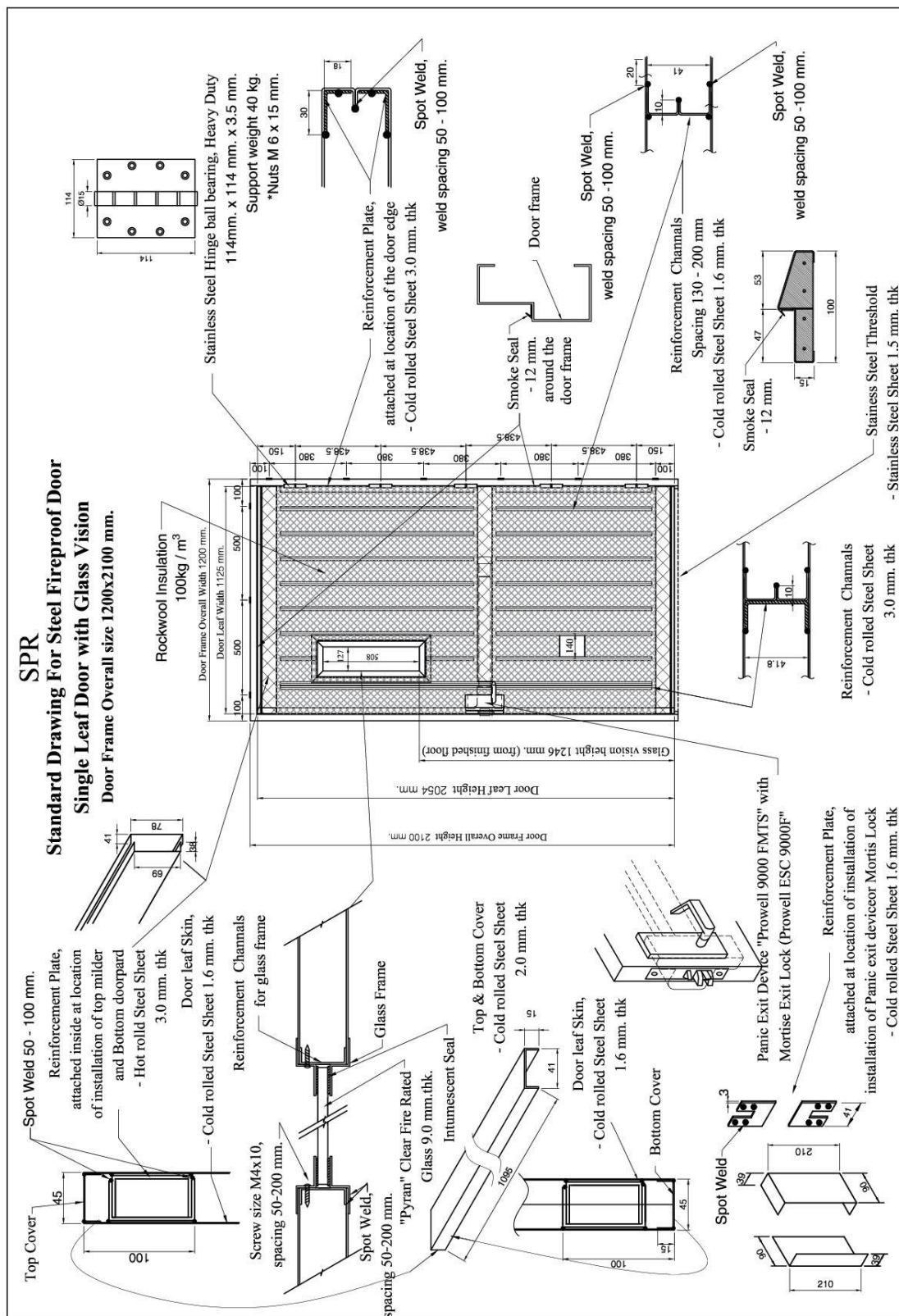


Figure D-1: Details of the specimen (as provided by the client)

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APPENDIX E: PHOTOGRAPHS



Figure E-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 E-2: The specimen during the fire endurance test

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(g) 1:30 hr



(h) 2:00 hr



(i) 2:15 hr



(j) 2:30 hr



(k) 2:45 hr



(l) 3:00 hr

Figure E-2 (continued): The specimen during the fire endurance test

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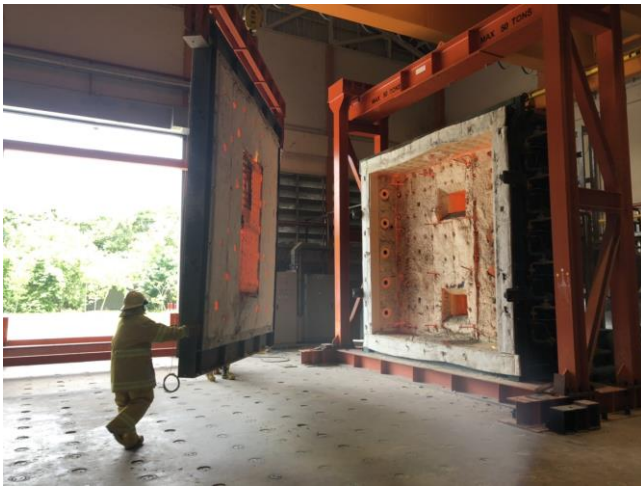


Figure E-3: The hose stream test

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Figure E-4: The specimen after the hose stream test

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