Underwriters' Laboratories of Canada®

Corporate Headquarters
7 Underwriters Road
Toronto, ON M1R 3B4
Canada
www.ulc.ca
tel: 1 416 757 3611
fax: 1 416 757 8915

An affiliate of Underwriters Laboratories Inc.

File R22350
Project 05CA38931

2007-06-18

REPORT

on

CONCRETE WALL SYSTEM INCORPORATING INSULATED CONCRETE FORMS (ICFs) FOR USE IN BEARING WALL AND PARTITION SYSTEMS

Logix Insulated Concrete Forms Ltd
Port Moody, BC

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INTRODUCTION

This Report describes an investigation undertaken to evaluate the fire resistance rating of a load-bearing reinforced concrete wall assembly formed by Insulated Concrete Forms. The performance of the Logix Wall was assessed by subjecting a representative test assembly to a fire endurance test in accordance with the Standard Methods of Fire Endurance Tests of Building Construction and Materials, CAN/ULC-S101-04, and the Standard for Fire Tests of Building Construction and Materials, ANSI/UL 263 - 13th edition (ASTM E119-07).

The fire test was conducted April 18, 2007 at the testing facilities of Underwriters' Laboratories of Canada located at 7 Underwriters Road, Toronto, Ontario, Canada, M1R 3B4.

The fire test was supplemented by other tests and examinations intended to supply information concerning the properties of the materials used.

At the conclusion of the Report, reference is made to ULC Design Nos. W017 and W018 and UL Design Nos. U932 and U933, which have been generated as a result of the investigation described herein.

DESCRIPTION

MATERIALS COVERED:

Insulated Concrete Forms (ICFs) incorporating EPS foamed plastic panels linked by polypropylene webs. The webs are horizontally spaced at 200 mm OC. The outside flanges of webs have approximately 16 mm of EPS cover. Surface of EPS is marked to show locations of web flanges. This permits exterior or interior claddings, such as gypsum wallboard, to be fastened directly to the webs.

GENERAL CHARACTER AND USE:

The EPS panels of the ICFs interconnect vertically so as to create a continuous hollow wall form. When filled with reinforcing rods and concrete, the assembly may be used as a load-bearing wall.

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2	Exposed surface prior to the fire test
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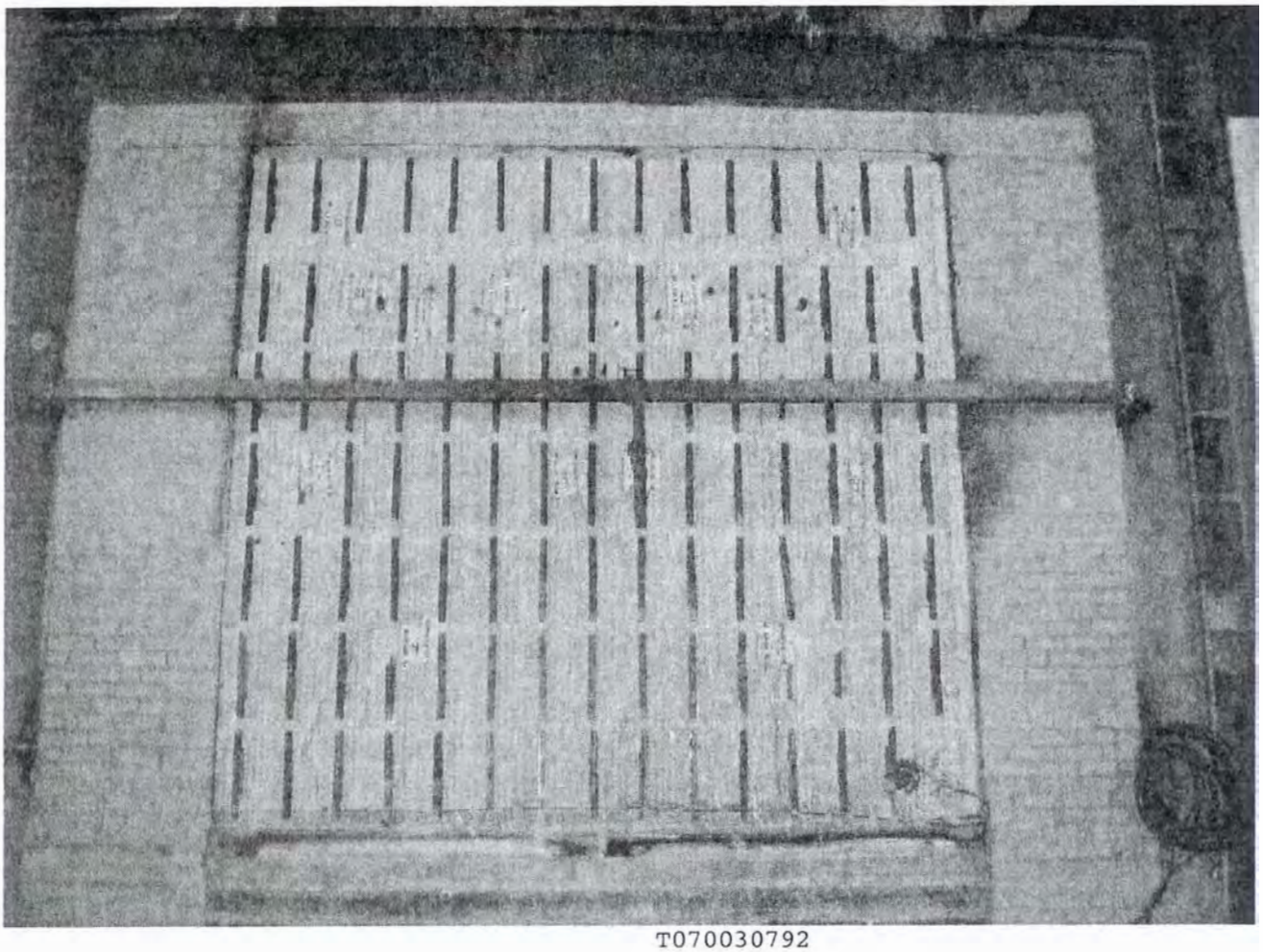
4	Exposed surface between Fire and Hose Stream test
5	Unexposed surface after Hose Stream test
6	Exposed surface after hose stream test
7	Furnace time-temperature Curve, sample temperatures and deflections
8	UL Design U932
9	UL Design U933
10	ULC Design W017
11	ULC Design W018



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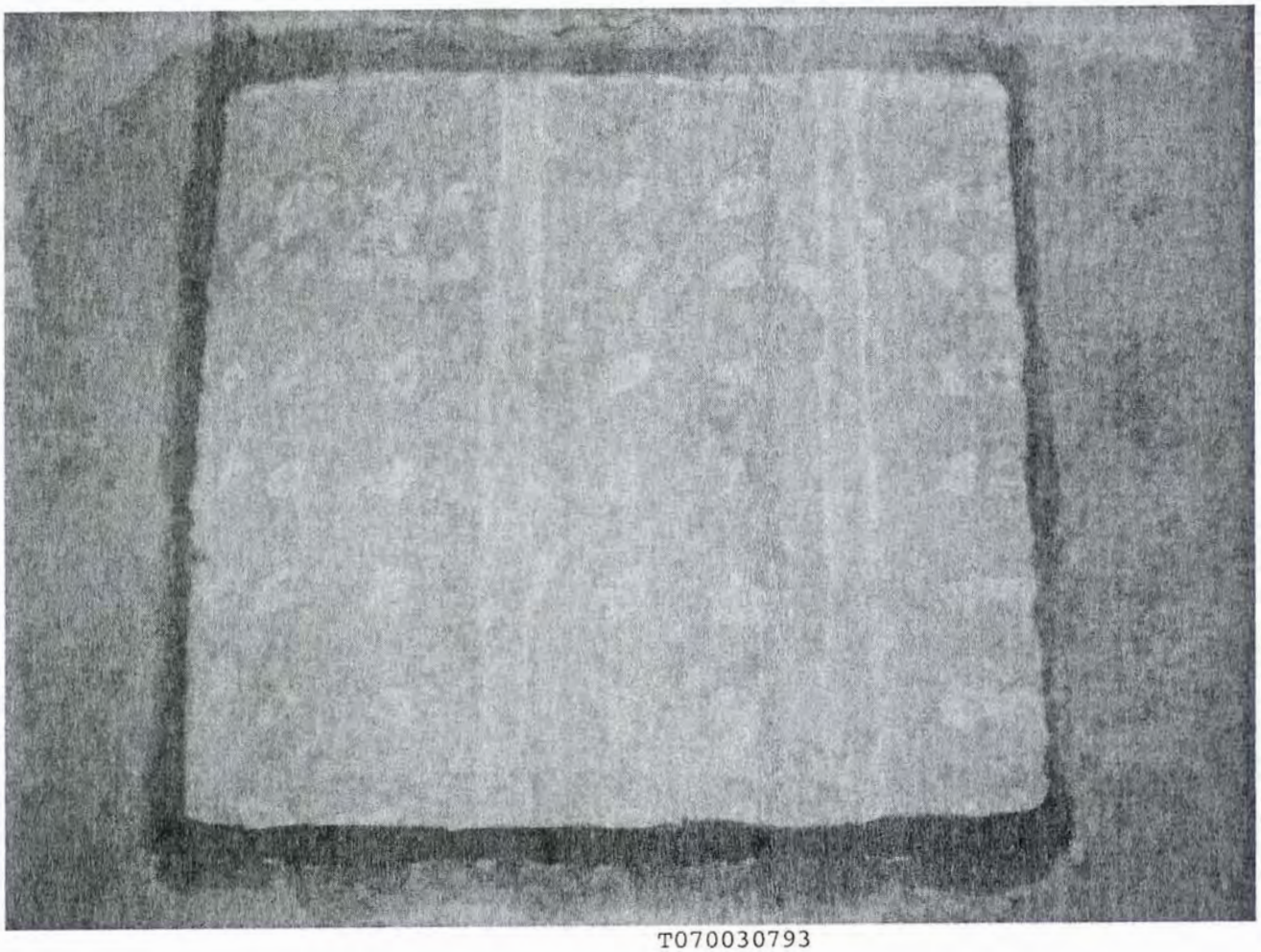

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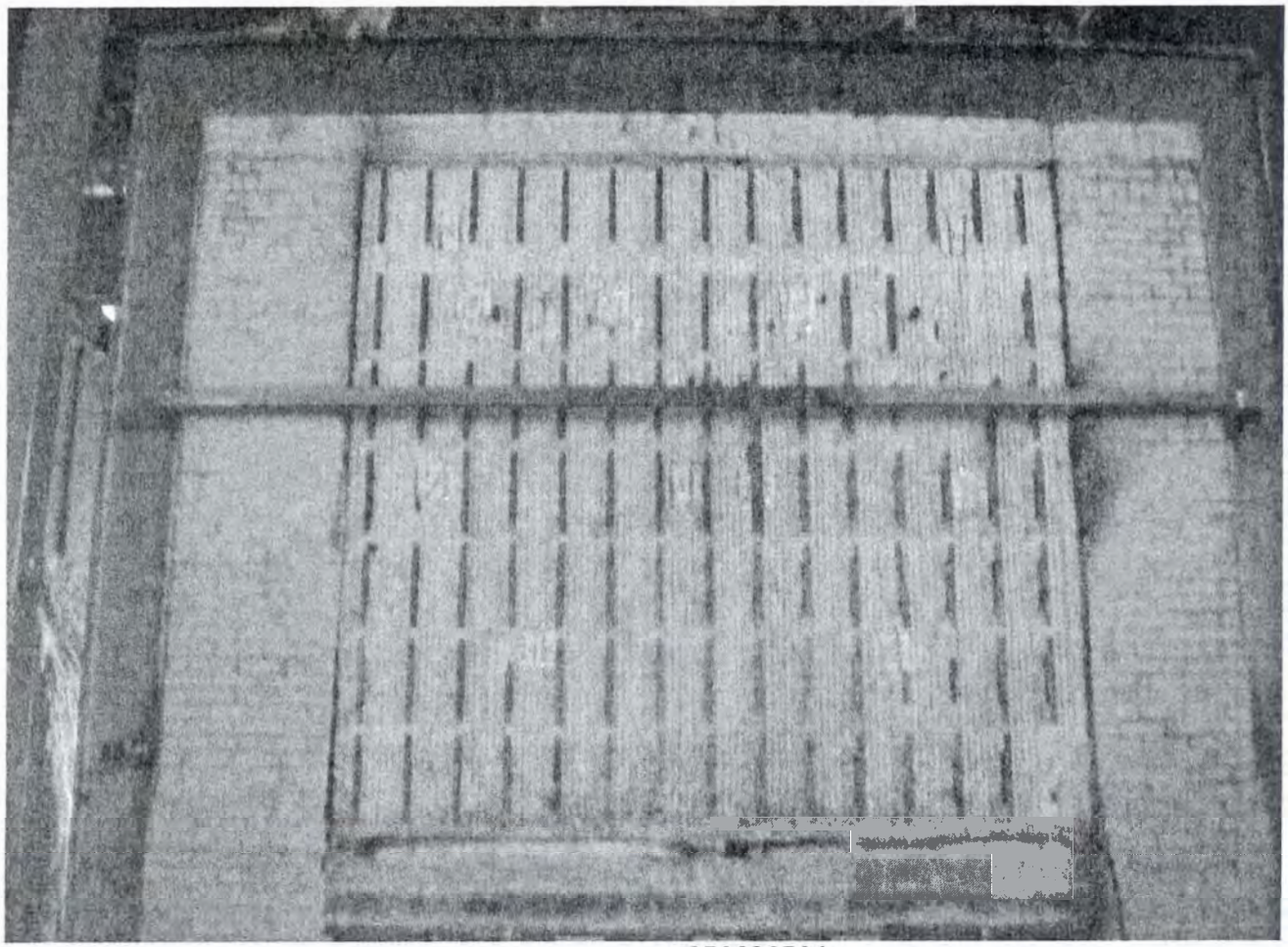

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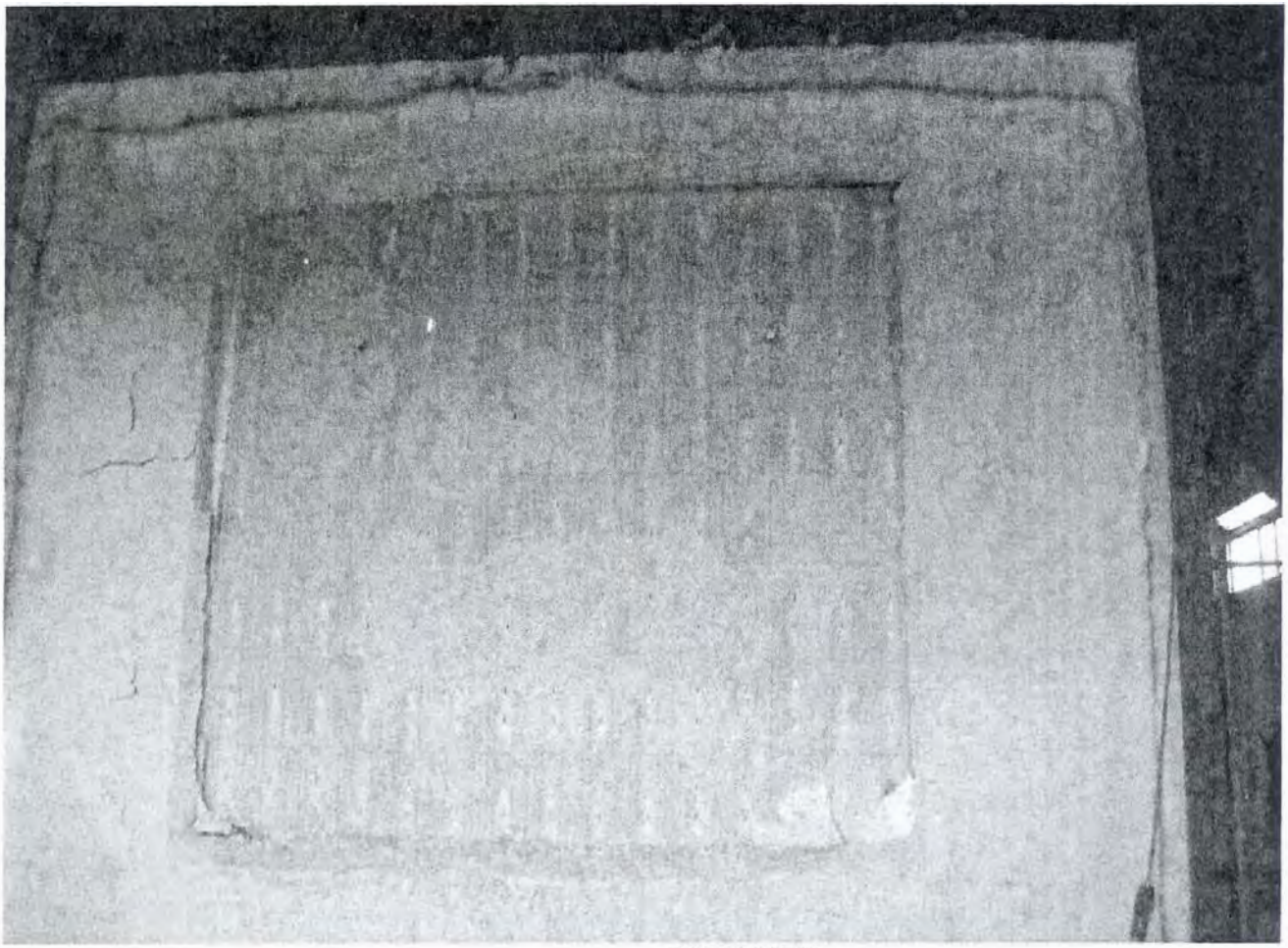

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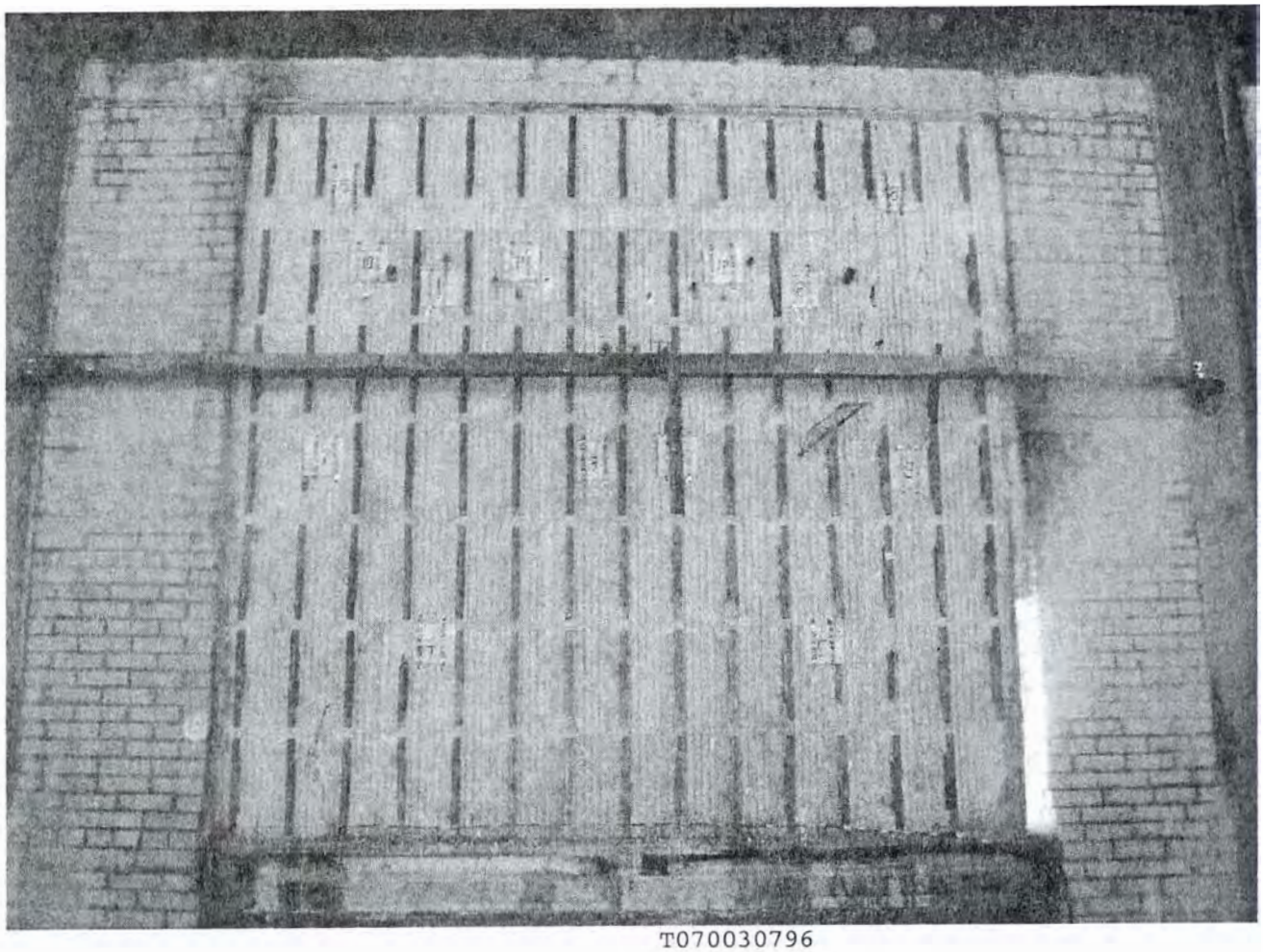

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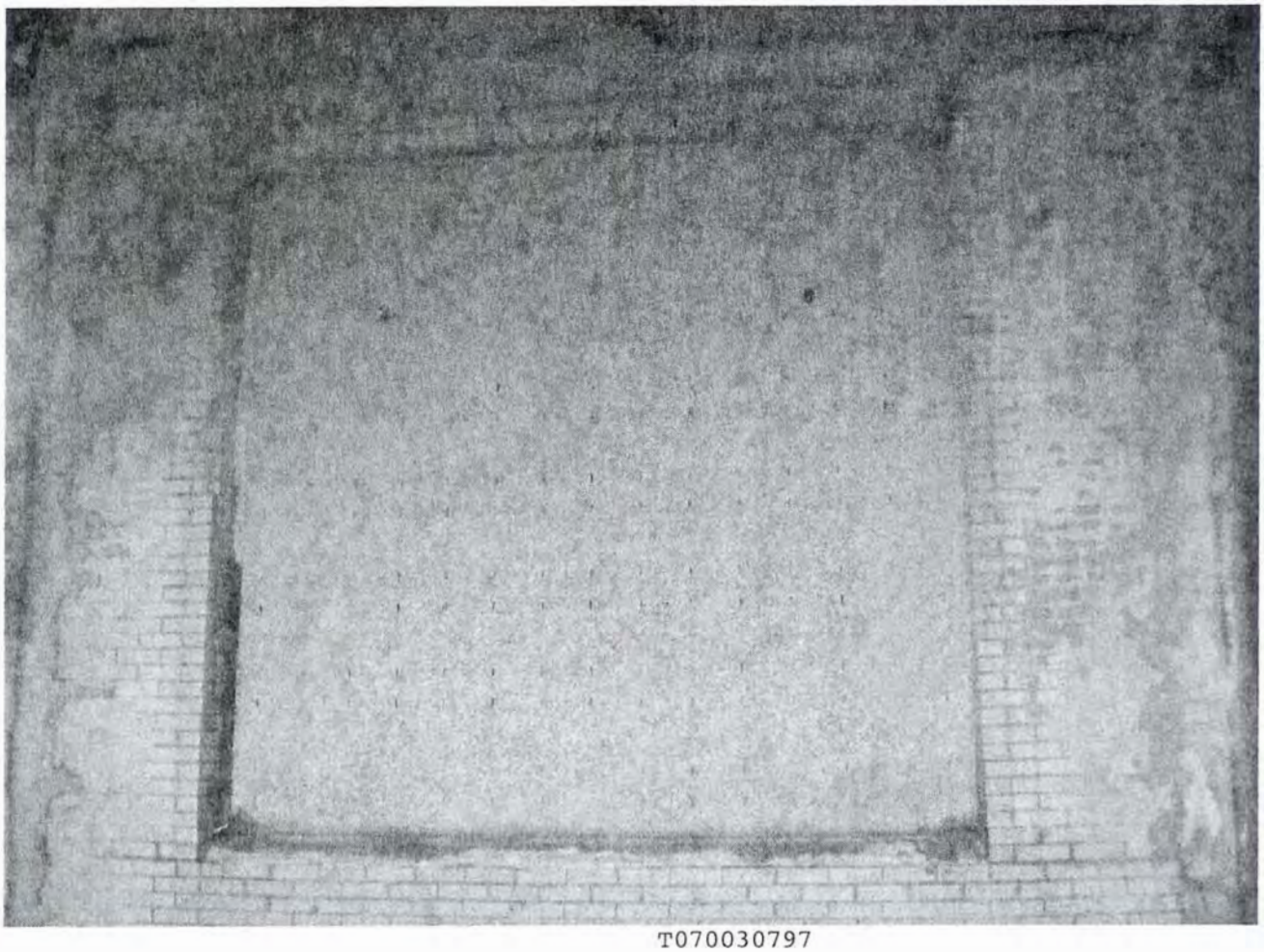

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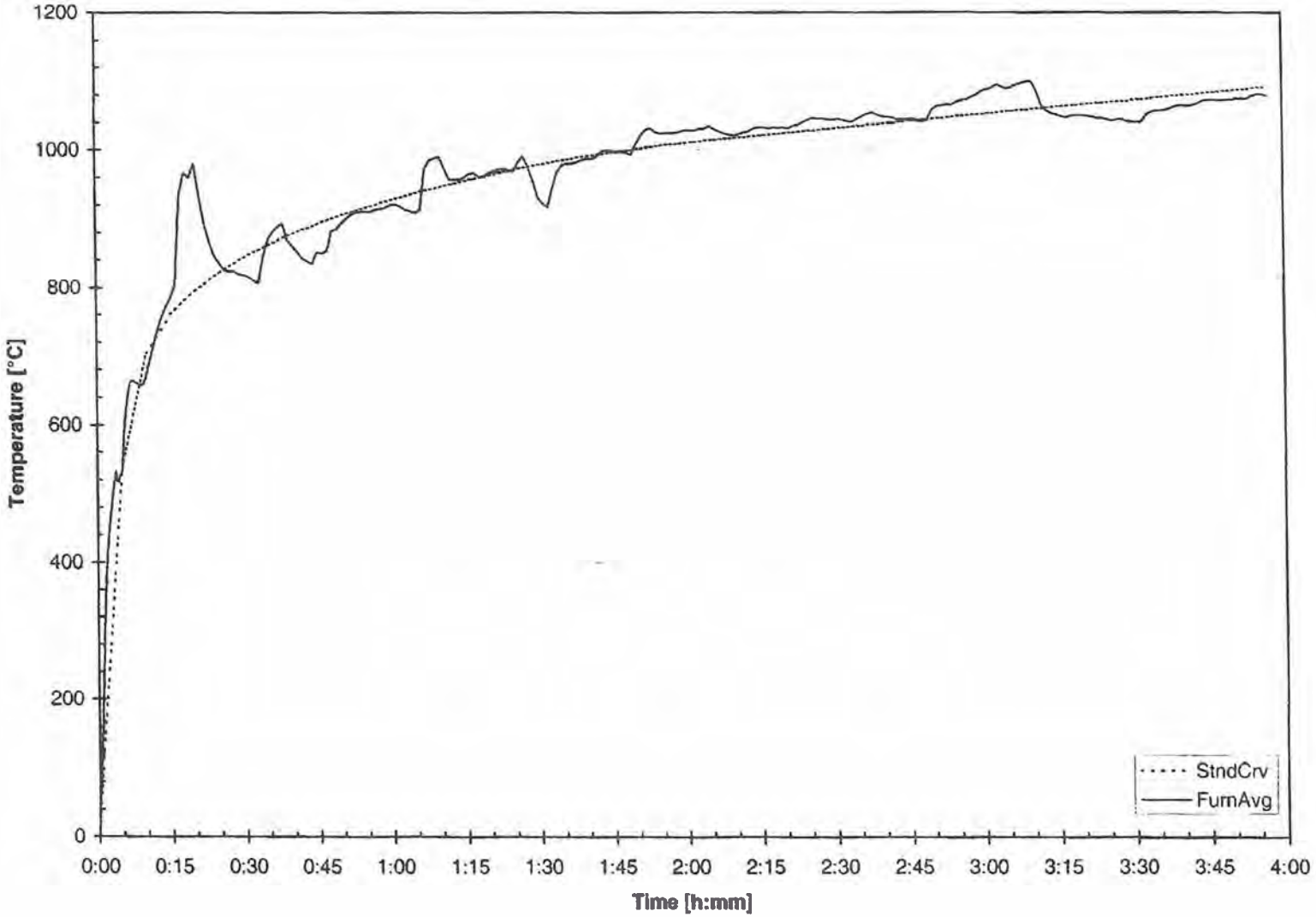
LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE CURVE
Test Start Time: April 18, 2007, 11:12:43



File R22350 Project 05CA38931

Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Temperatures								
h:mm:ss	StndCrv	FurnAvg	%Area	Furn01	Furn02	Furn03	Furn04	Furn05	Furn06	Furn07	Furn08	Furn09
0:00:00	20	41	0.0	33	61	33	37	59	31	36	54	29
0:00:15	46	68	168.9	55	112	48	56	108	45	53	100	38
0:00:30	72	111	101.5	94	188	77	84	183	64	77	176	53
0:00:45	98	163	89.8	149	264	119	122	270	94	109	263	78
0:01:00	124	226	90.8	213	364	161	169	358	133	154	362	118
0:01:15	150	292	95.8	270	498	200	213	430	175	203	463	175
0:01:30	175	349	100.4	337	585	245	262	482	223	252	519	235
0:01:45	201	389	102.2	407	617	284	307	506	264	298	536	279
0:02:00	227	420	101.2	472	629	321	348	518	299	340	538	312
0:02:15	253	442	98.1	521	630	349	381	522	328	372	535	337
0:02:30	279	461	93.8	563	631	377	412	523	355	402	531	360
0:02:45	305	478	88.9	597	631	401	440	524	381	427	526	380
0:03:00	331	495	83.7	627	631	426	467	524	406	451	522	398
0:03:15	357	508	78.6	648	633	449	489	525	428	471	520	413
0:03:30	383	521	73.5	665	637	472	509	526	448	489	518	426
0:03:45	409	532	68.5	678	641	493	527	528	462	505	518	435
0:04:00	434	518	63.3	483	642	514	543	530	475	519	517	442
0:04:15	460	517	58.0	417	642	530	554	531	487	529	517	448
0:04:30	486	523	52.8	412	642	550	564	533	499	536	520	455
0:04:45	512	528	48.0	395	646	569	573	536	511	541	523	462
0:05:00	538	533	43.4	376	650	588	582	540	522	545	526	470
0:05:15	546	566	39.6	595	653	607	599	552	529	557	533	473
0:05:30	555	594	36.7	733	662	630	623	570	537	572	544	477
0:05:45	563	613	34.4	794	667	651	648	588	546	589	555	482
0:06:00	571	629	32.6	831	671	671	672	607	553	605	567	486
0:06:15	580	642	31.1	856	676	687	692	622	559	619	578	489
0:06:30	588	654	29.7	876	682	699	712	637	565	632	588	493
0:06:45	596	662	28.6	888	686	708	727	648	569	643	596	496
0:07:00	604	665	27.5	872	690	719	732	652	571	648	601	499
0:07:15	613	664	26.5	854	690	728	727	650	575	648	602	502
0:07:30	621	663	25.4	837	689	736	722	646	581	645	602	506
0:07:45	629	662	24.4	825	689	741	718	642	586	643	603	511
0:08:00	638	661	23.4	813	689	744	712	639	591	640	603	515
0:08:15	646	660	22.4	805	688	748	709	636	593	638	603	518
0:08:30	654	659	21.4	797	688	752	706	634	593	636	604	518
0:08:45	663	658	20.4	794	689	755	706	633	592	635	607	516
0:09:00	671	658	19.5	790	689	755	707	633	590	635	610	514
0:09:15	679	659	18.5	787	691	754	709	635	589	637	613	514
0:09:30	687	660	17.6	785	693	756	712	637	589	638	617	515
0:09:45	696	665	16.7	787	699	761	719	641	595	642	623	518
0:10:00	704	671	15.8	790	706	771	726	647	603	647	629	524
0:11:00	715	699	13.2	799	735	802	754	679	644	667	654	554
0:12:00	726	728	11.4	807	764	813	790	763	663	696	682	575
0:13:00	738	752	10.3	816	794	826	814	817	683	718	708	593
0:14:00	749	769	9.5	820	809	833	831	842	702	734	727	621
0:15:00	760	784	8.9	797	810	834	822	845	750	732	737	725
0:16:00	767	804	8.5	782	812	837	837	874	801	745	752	794
0:17:00	774	936	8.8	901	828	900	1029	1137	876	958	950	848
0:18:00	781	966	9.9	923	877	923	1062	1173	881	1018	996	844
0:19:00	788	959	10.8	914	922	931	1020	1112	890	1005	986	855
0:20:00	795	980	11.7	901	1016	946	968	1088	944	1005	980	976
0:21:00	800	935	12.2	873	1013	914	945	1024	866	969	921	893
0:22:00	805	894	12.3	841	1013	892	910	978	814	907	867	822
0:23:00	811	868	12.2	825	1002	888	866	951	794	858	826	798

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Temperatures								
h:mm:ss	StndCrv	FurnAvg	%Area	Furn01	Furn02	Furn03	Furn04	Furn05	Furn06	Furn07	Furn08	Furn09
0:24:00	816	847	11.8	814	989	878	845	933	769	832	793	769
0:25:00	821	835	11.3	811	982	871	838	920	750	819	778	747
0:26:00	825	825	10.8	786	964	869	817	901	768	794	762	768
0:27:00	830	823	10.3	735	920	868	772	872	854	752	741	893
0:28:00	834	823	9.8	747	893	873	743	862	895	724	733	936
0:29:00	839	819	9.3	751	878	869	732	861	902	709	728	942
0:30:00	843	818	8.8	777	873	857	735	864	898	703	720	938
0:31:00	847	815	8.3	785	864	855	736	860	893	697	714	936
0:32:00	851	810	7.8	785	854	849	731	858	887	687	710	930
0:33:00	854	807	7.3	785	848	846	728	855	883	682	710	926
0:34:00	858	845	6.9	890	894	864	792	884	889	727	738	931
0:35:00	862	869	6.7	960	919	867	852	892	882	773	745	934
0:36:00	865	881	6.5	990	926	863	890	894	879	805	743	937
0:37:00	868	888	6.3	1001	938	861	907	901	880	819	748	937
0:38:00	872	893	6.2	1011	939	862	915	905	886	824	750	941
0:39:00	875	869	6.0	890	931	870	843	912	891	778	760	942
0:40:00	878	860	5.8	841	919	886	806	911	911	750	770	946
0:41:00	881	852	5.6	821	903	893	788	912	925	734	769	923
0:42:00	884	842	5.3	812	890	890	778	908	921	722	758	903
0:43:00	886	838	5.0	805	884	885	773	907	923	715	752	896
0:44:00	889	834	4.7	798	878	881	763	909	922	707	751	895
0:45:00	892	851	4.4	857	907	953	767	862	939	708	770	892
0:46:00	895	850	4.2	903	926	947	788	820	911	717	786	853
0:47:00	897	853	3.9	889	925	958	787	805	909	742	806	857
0:48:00	900	882	3.7	877	937	964	817	899	957	762	808	916
0:49:00	902	885	3.6	856	932	951	814	937	972	757	809	937
0:50:00	905	893	3.5	874	912	943	837	945	990	787	801	948
0:51:00	907	899	3.4	890	895	950	859	945	993	823	799	934
0:52:00	909	905	3.3	896	890	964	874	945	998	845	802	928
0:53:00	912	909	3.2	902	888	971	881	946	1003	852	804	930
0:54:00	914	910	3.1	905	888	968	883	948	1003	855	807	931
0:55:00	916	910	3.0	906	889	964	884	953	997	858	811	926
0:56:00	918	910	2.9	909	890	956	885	953	994	859	812	933
0:57:00	920	913	2.9	907	886	966	887	952	1003	861	812	942
0:58:00	923	914	2.8	913	887	958	888	953	1006	862	813	943
0:59:00	925	916	2.7	914	889	958	890	958	1010	864	817	946
1:00:00	927	920	2.6	913	892	959	891	962	1016	867	821	955
1:01:00	929	921	2.6	915	893	956	892	962	1016	869	823	959
1:02:00	931	918	2.5	933	878	957	895	946	1015	866	814	959
1:03:00	933	913	2.4	940	861	971	894	930	1008	854	805	955
1:04:00	935	911	2.3	950	853	965	896	919	1012	839	803	963
1:05:00	937	908	2.2	955	846	973	894	902	1015	822	798	971
1:06:00	939	913	2.1	941	847	987	901	901	1027	829	804	978
1:07:00	941	972	2.1	1013	937	1031	973	955	1068	901	871	999
1:08:00	942	985	2.1	999	967	1031	982	976	1076	925	906	1007
1:09:00	944	988	2.2	1027	978	1047	987	961	1065	919	902	1003
1:10:00	946	990	2.2	997	987	1034	984	977	1074	924	917	1013
1:11:00	948	973	2.3	957	960	1005	957	965	1068	916	913	1013
1:12:00	950	957	2.2	933	946	987	932	946	1056	902	901	1005
1:13:00	951	957	2.2	923	933	987	935	951	1052	913	919	1001
1:14:00	953	957	2.2	911	918	982	935	956	1046	925	939	996
1:15:00	955	960	2.2	917	913	979	943	962	1046	936	944	1001
1:16:00	957	965	2.1	918	919	984	948	965	1051	942	950	1006
1:17:00	958	966	2.1	922	921	986	948	967	1051	944	952	1005

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Temperatures								
h:mm:ss	StndCrv	FurnAvg	%Area	Furn01	Furn02	Furn03	Furn04	Furn05	Furn06	Furn07	Furn08	Furn09
1:18:00	960	961	2.1	912	915	978	943	963	1044	940	953	997
1:19:00	961	961	2.1	911	904	979	945	960	1047	940	954	1011
1:20:00	963	966	2.0	911	899	981	956	965	1048	954	959	1022
1:21:00	965	969	2.0	915	897	981	959	965	1049	960	965	1027
1:22:00	966	971	2.0	918	895	984	963	969	1051	964	966	1031
1:23:00	968	972	2.0	918	896	982	965	972	1050	966	972	1031
1:24:00	969	970	1.9	917	892	976	965	970	1048	966	972	1027
1:25:00	971	969	1.9	914	891	977	962	971	1049	963	974	1025
1:26:00	972	982	1.9	944	897	981	982	984	1053	984	981	1032
1:27:00	974	991	1.9	961	906	987	995	992	1057	995	988	1039
1:28:00	975	975	1.9	940	898	968	977	976	1041	978	973	1023
1:29:00	977	955	1.8	919	877	946	955	953	1021	957	950	1013
1:30:00	978	931	1.8	895	857	924	928	925	998	930	927	993
1:31:00	979	922	1.7	889	842	914	923	917	987	924	916	985
1:32:00	981	917	1.6	884	834	908	920	915	981	921	912	981
1:33:00	982	946	1.5	913	852	938	951	945	1014	954	944	1006
1:34:00	984	968	1.4	935	873	959	973	969	1034	977	965	1027
1:35:00	985	977	1.4	943	887	969	982	979	1039	986	972	1032
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1:37:00	987	980	1.4	948	891	968	984	981	1041	991	977	1037
1:38:00	989	982	1.3	952	894	970	986	983	1043	991	980	1039
1:39:00	990	985	1.3	958	894	972	994	986	1043	998	982	1039
1:40:00	991	987	1.3	953	899	973	993	989	1047	998	986	1043
1:41:00	992	987	1.3	953	899	972	993	990	1049	999	987	1043
1:42:00	993	990	1.2	956	904	975	995	991	1053	1002	991	1046
1:43:00	994	997	1.2	966	908	982	1003	1000	1058	1010	996	1050
1:44:00	995	1000	1.2	967	912	983	1007	1003	1060	1013	999	1056
1:45:00	996	999	1.2	965	913	982	1005	1000	1060	1010	1000	1055
1:46:00	997	996	1.2	958	908	980	1001	1000	1056	1009	999	1050
1:47:00	998	997	1.2	962	906	979	1006	1000	1056	1012	1001	1050
1:48:00	999	996	1.2	964	904	975	1007	997	1054	1013	998	1049
1:49:00	1000	993	1.2	954	903	975	1000	997	1053	1008	996	1048
1:50:00	1001	1007	1.1	969	914	991	1015	1012	1066	1023	1013	1058
1:51:00	1002	1020	1.1	976	932	1001	1029	1026	1079	1038	1027	1071
1:52:00	1003	1029	1.2	992	939	1011	1041	1034	1086	1048	1035	1075
1:53:00	1004	1032	1.2	988	946	1014	1043	1037	1090	1052	1039	1079
1:54:00	1005	1026	1.2	975	942	1010	1036	1033	1086	1046	1035	1075
1:55:00	1006	1024	1.2	971	939	1006	1031	1033	1084	1043	1033	1074
1:56:00	1007	1024	1.2	979	937	1004	1034	1030	1083	1044	1032	1073
1:57:00	1008	1025	1.2	985	937	1006	1036	1030	1081	1045	1032	1074
1:58:00	1008	1025	1.2	975	940	1005	1033	1030	1083	1045	1034	1075
1:59:00	1009	1026	1.2	980	940	1006	1037	1031	1081	1047	1036	1075
2:00:00	1010	1029	1.2	984	943	1011	1040	1034	1083	1049	1035	1079
2:01:00	1011	1029	1.2	983	943	1010	1039	1034	1085	1050	1037	1077
2:02:00	1011	1028	1.2	978	941	1010	1037	1031	1088	1050	1040	1072
2:03:00	1012	1031	1.2	984	941	1014	1041	1035	1090	1053	1043	1074
2:04:00	1013	1031	1.2	982	943	1012	1041	1037	1089	1053	1044	1074
2:05:00	1014	1035	1.2	984	950	1018	1044	1042	1096	1057	1048	1081
2:06:00	1014	1030	1.3	977	947	1013	1038	1036	1091	1051	1040	1078
2:07:00	1015	1027	1.3	977	941	1009	1036	1032	1086	1048	1036	1077
2:08:00	1016	1024	1.3	974	939	1004	1032	1029	1083	1047	1036	1073
2:09:00	1016	1022	1.2	975	935	1002	1030	1026	1082	1043	1032	1072
2:10:00	1017	1021	1.2	968	935	1002	1029	1027	1082	1044	1036	1071
2:11:00	1018	1023	1.2	976	932	1003	1033	1029	1081	1046	1037	1071

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Temperatures								
h:mm:ss	StndCrv	FurnAvg	%Area	Furn01	Furn02	Furn03	Furn04	Furn05	Furn06	Furn07	Furn08	Furn09
2:12:00	1018	1025	1.2	981	936	1004	1033	1031	1082	1046	1035	1073
2:13:00	1019	1027	1.2	980	939	1008	1036	1034	1085	1047	1038	1078
2:14:00	1020	1031	1.2	982	943	1012	1041	1037	1089	1054	1043	1081
2:15:00	1021	1033	1.2	987	945	1015	1043	1036	1089	1055	1044	1081
2:16:00	1021	1033	1.2	984	945	1015	1043	1037	1088	1055	1044	1083
2:17:00	1022	1031	1.2	980	946	1011	1039	1035	1089	1053	1042	1081
2:18:00	1023	1033	1.2	983	947	1015	1040	1037	1091	1054	1044	1084
2:19:00	1023	1032	1.2	979	945	1012	1040	1040	1091	1054	1044	1082
2:20:00	1024	1033	1.2	982	945	1014	1043	1041	1091	1056	1046	1083
2:21:00	1025	1031	1.2	980	943	1010	1041	1039	1087	1055	1045	1081
2:22:00	1025	1035	1.2	989	945	1014	1044	1041	1090	1058	1046	1083
2:23:00	1026	1036	1.2	987	945	1017	1044	1044	1092	1058	1047	1087
2:24:00	1027	1040	1.2	991	951	1022	1049	1047	1098	1063	1051	1089
2:25:00	1028	1043	1.2	994	954	1022	1052	1048	1101	1065	1055	1092
2:26:00	1028	1046	1.2	998	956	1026	1056	1053	1103	1069	1059	1093
2:27:00	1029	1045	1.2	994	955	1025	1055	1054	1104	1069	1060	1093
2:28:00	1030	1045	1.2	994	954	1024	1054	1053	1102	1069	1058	1092
2:29:00	1030	1044	1.2	992	955	1022	1054	1051	1101	1069	1059	1091
2:30:00	1031	1043	1.2	995	953	1021	1054	1051	1099	1069	1059	1091
2:31:00	1032	1045	1.2	994	956	1022	1055	1054	1102	1071	1060	1092
2:32:00	1032	1043	1.2	989	955	1018	1053	1051	1100	1069	1059	1091
2:33:00	1033	1041	1.2	989	953	1015	1052	1049	1099	1068	1058	1089
2:34:00	1034	1041	1.2	986	953	1017	1050	1050	1100	1068	1059	1088
2:35:00	1035	1045	1.2	987	958	1022	1054	1054	1102	1071	1063	1093
2:36:00	1035	1049	1.2	994	958	1029	1059	1056	1105	1075	1065	1096
2:37:00	1036	1052	1.2	1002	961	1028	1064	1061	1108	1079	1067	1100
2:38:00	1037	1054	1.2	1004	964	1031	1065	1063	1108	1081	1069	1101
2:39:00	1037	1051	1.2	997	962	1031	1062	1060	1108	1079	1067	1097
2:40:00	1038	1048	1.2	996	958	1022	1058	1056	1105	1075	1065	1097
2:41:00	1039	1048	1.2	996	959	1025	1058	1057	1103	1074	1064	1092
2:42:00	1039	1047	1.2	993	957	1023	1056	1054	1102	1073	1062	1099
2:43:00	1040	1044	1.2	993	952	1018	1054	1053	1100	1071	1061	1096
2:44:00	1041	1044	1.2	995	952	1020	1055	1051	1100	1072	1061	1094
2:45:00	1042	1044	1.2	991	952	1017	1055	1053	1100	1073	1063	1093
2:46:00	1042	1046	1.2	990	956	1019	1056	1056	1102	1072	1064	1097
2:47:00	1043	1042	1.2	987	954	1015	1052	1049	1099	1069	1060	1093
2:48:00	1044	1041	1.2	987	949	1014	1052	1051	1097	1071	1060	1091
2:49:00	1044	1043	1.2	990	951	1017	1053	1053	1099	1071	1061	1094
2:50:00	1045	1058	1.2	1004	963	1033	1070	1066	1115	1087	1077	1107
2:51:00	1046	1064	1.2	1005	972	1040	1076	1074	1119	1094	1081	1111
2:52:00	1046	1065	1.2	1013	974	1038	1076	1073	1119	1095	1083	1112
2:53:00	1047	1066	1.2	1014	974	1038	1078	1074	1120	1096	1084	1113
2:54:00	1048	1066	1.2	1014	975	1037	1078	1075	1120	1097	1085	1114
2:55:00	1049	1070	1.2	1016	980	1043	1083	1079	1123	1100	1088	1118
2:56:00	1049	1072	1.2	1017	981	1046	1084	1079	1125	1103	1090	1121
2:57:00	1050	1073	1.2	1023	979	1046	1085	1082	1128	1103	1092	1120
2:58:00	1051	1077	1.2	1035	984	1049	1085	1084	1130	1105	1094	1124
2:59:00	1051	1080	1.2	1038	985	1054	1091	1087	1132	1111	1099	1126
3:00:00	1052	1086	1.2	1046	989	1056	1100	1094	1136	1117	1105	1128
3:01:00	1053	1088	1.2	1049	991	1055	1104	1098	1138	1121	1107	1129
3:02:00	1053	1090	1.2	1049	995	1059	1104	1100	1140	1123	1109	1132
3:03:00	1054	1095	1.3	1060	996	1063	1110	1104	1144	1128	1113	1135
3:04:00	1055	1092	1.3	1050	999	1063	1104	1101	1142	1124	1112	1135
3:05:00	1056	1089	1.3	1045	994	1057	1103	1098	1138	1122	1108	1132

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Temperatures								
h:mm:ss	StndCrv	FurnAvg	%Area	Furn01	Furn02	Furn03	Furn04	Furn05	Furn06	Furn07	Furn08	Furn09
3:06:00	1056	1091	1.3	1049	997	1058	1106	1100	1141	1126	1111	1134
3:07:00	1057	1095	1.3	1057	1001	1062	1107	1103	1145	1127	1115	1137
3:08:00	1058	1097	1.3	1054	1005	1063	1110	1107	1148	1129	1117	1139
3:09:00	1058	1099	1.3	1054	1005	1066	1113	1110	1147	1133	1120	1140
3:10:00	1059	1100	1.4	1060	1006	1066	1116	1111	1148	1135	1122	1140
3:11:00	1060	1086	1.4	1043	995	1053	1097	1094	1136	1116	1105	1129
3:12:00	1060	1065	1.4	1019	977	1034	1074	1072	1119	1095	1086	1113
3:13:00	1061	1057	1.4	1010	966	1022	1067	1064	1111	1088	1079	1105
3:14:00	1062	1053	1.4	1007	959	1018	1064	1059	1107	1085	1072	1103
3:15:00	1063	1051	1.3	1006	957	1018	1062	1057	1103	1083	1071	1099
3:16:00	1063	1048	1.3	1004	957	1016	1058	1052	1103	1079	1067	1099
3:17:00	1064	1047	1.3	1001	954	1013	1055	1053	1103	1077	1068	1099
3:18:00	1065	1049	1.3	1004	955	1016	1058	1055	1103	1079	1069	1099
3:19:00	1065	1050	1.3	1011	953	1018	1061	1056	1102	1081	1070	1099
3:20:00	1066	1050	1.3	1015	952	1020	1060	1056	1103	1080	1069	1097
3:21:00	1067	1049	1.2	1004	955	1020	1058	1055	1103	1078	1068	1100
3:22:00	1067	1048	1.2	1005	953	1017	1057	1053	1103	1077	1067	1097
3:23:00	1068	1046	1.2	1000	953	1014	1056	1053	1102	1077	1065	1097
3:24:00	1068	1046	1.2	996	953	1012	1057	1053	1102	1077	1067	1097
3:25:00	1069	1044	1.2	997	953	1013	1052	1050	1101	1075	1065	1094
3:26:00	1070	1042	1.2	993	950	1012	1051	1048	1096	1072	1061	1092
3:27:00	1070	1043	1.1	996	950	1013	1052	1049	1099	1073	1061	1096
3:28:00	1071	1044	1.1	998	952	1012	1052	1050	1098	1074	1062	1095
3:29:00	1071	1041	1.1	997	949	1009	1051	1047	1096	1071	1060	1094
3:30:00	1072	1040	1.1	992	947	1005	1051	1048	1096	1070	1060	1092
3:31:00	1073	1040	1.0	994	945	1006	1049	1045	1097	1070	1059	1091
3:32:00	1073	1040	1.0	994	946	1008	1050	1046	1096	1071	1059	1093
3:33:00	1074	1051	1.0	1003	956	1018	1063	1059	1104	1084	1069	1103
3:34:00	1075	1055	1.0	1009	960	1024	1066	1060	1108	1088	1073	1105
3:35:00	1076	1057	1.0	1011	963	1028	1068	1064	1109	1089	1076	1108
3:36:00	1076	1057	1.0	1006	963	1025	1068	1065	1112	1090	1078	1107
3:37:00	1077	1058	0.9	1011	965	1026	1069	1066	1111	1091	1079	1108
3:38:00	1078	1061	0.9	1014	966	1030	1072	1070	1111	1093	1082	1110
3:39:00	1078	1064	0.9	1017	970	1032	1075	1074	1114	1095	1084	1113
3:40:00	1079	1065	0.9	1022	971	1032	1076	1073	1115	1097	1085	1112
3:41:00	1080	1064	0.9	1022	972	1031	1073	1071	1115	1094	1085	1111
3:42:00	1080	1065	0.9	1020	972	1029	1076	1075	1116	1097	1086	1112
3:43:00	1081	1067	0.9	1025	972	1034	1079	1075	1119	1101	1089	1113
3:44:00	1082	1071	0.9	1030	975	1037	1084	1078	1123	1104	1091	1115
3:45:00	1083	1072	0.9	1031	976	1038	1082	1079	1122	1105	1092	1118
3:46:00	1083	1073	0.8	1028	977	1039	1084	1079	1126	1106	1095	1120
3:47:00	1084	1072	0.8	1023	979	1039	1083	1079	1124	1105	1093	1122
3:48:00	1085	1072	0.8	1022	979	1040	1083	1080	1124	1105	1093	1121
3:49:00	1085	1073	0.8	1023	980	1041	1084	1082	1127	1106	1095	1122
3:50:00	1086	1073	0.8	1027	977	1040	1085	1080	1127	1105	1095	1121
3:51:00	1087	1074	0.8	1023	980	1040	1085	1083	1129	1106	1096	1122
3:52:00	1087	1074	0.8	1024	980	1041	1085	1082	1127	1106	1096	1122
3:53:00	1088	1074	0.8	1029	979	1039	1084	1081	1127	1106	1096	1123
3:54:00	1089	1078	0.8	1034	981	1046	1089	1084	1131	1111	1101	1124
3:55:00	1090	1080	0.8	1037	986	1049	1090	1088	1132	1112	1101	1125
3:56:00	1090	1080	0.7	1035	987	1046	1091	1088	1132	1112	1102	1126
3:57:00	1091	1078	0.7	1030	985	1045	1090	1086	1130	1110	1101	1123

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Pressures		
h:mm:ss	StndCrv	FurnAvg	%Area	FurnP1	FurnP2	FurnP3
0:00:00	20	41	0.0	0.030	-0.004	-0.026
0:00:15	46	68	168.9	0.027	-0.008	-0.035
0:00:30	72	111	101.5	0.024	-0.014	-0.043
0:00:45	98	163	89.8	0.182	0.138	0.116
0:01:00	124	226	90.8	0.187	0.140	0.128
0:01:15	150	292	95.8	-0.018	-0.056	-0.087
0:01:30	175	349	100.4	0.007	-0.034	-0.062
0:01:45	201	389	102.2	-0.008	-0.045	-0.072
0:02:00	227	420	101.2	-0.011	-0.042	-0.067
0:02:15	253	442	98.1	0.004	-0.037	-0.059
0:02:30	279	461	93.8	0.011	-0.029	-0.052
0:02:45	305	478	88.9	0.011	-0.024	-0.053
0:03:00	331	495	83.7	0.023	-0.015	-0.038
0:03:15	357	508	78.6	0.015	-0.018	-0.046
0:03:30	383	521	73.5	0.006	-0.029	-0.056
0:03:45	409	532	68.5	0.010	-0.021	-0.048
0:04:00	434	518	63.3	0.014	-0.023	-0.049
0:04:15	460	517	58.0	0.020	-0.019	-0.042
0:04:30	486	523	52.8	0.016	-0.017	-0.044
0:04:45	512	528	48.0	0.022	-0.012	-0.045
0:05:00	538	533	43.4	0.026	-0.007	-0.032
0:05:15	546	566	39.6	0.028	-0.010	-0.038
0:05:30	555	594	36.7	0.032	-0.009	-0.033
0:05:45	563	613	34.4	0.030	-0.003	-0.033
0:06:00	571	629	32.6	0.028	-0.007	-0.038
0:06:15	580	642	31.1	0.013	-0.020	-0.050
0:06:30	588	654	29.7	0.006	-0.030	-0.059
0:06:45	596	662	28.6	0.007	-0.024	-0.054
0:07:00	604	665	27.5	0.013	-0.017	-0.044
0:07:15	613	664	26.5	0.012	-0.020	-0.049
0:07:30	621	663	25.4	0.022	-0.014	-0.043
0:07:45	629	662	24.4	0.009	-0.021	-0.055
0:08:00	638	661	23.4	0.022	-0.020	-0.048
0:08:15	646	660	22.4	0.013	-0.012	-0.095
0:08:30	654	659	21.4	-0.009	-0.050	-0.076
0:08:45	663	658	20.4	-0.006	-0.041	-0.075
0:09:00	671	658	19.5	-0.001	-0.023	-0.057
0:09:15	679	659	18.5	-0.002	-0.034	-0.067
0:09:30	687	660	17.6	0.000	-0.025	-0.069
0:09:45	696	665	16.7	0.006	-0.031	-0.060
0:10:00	704	671	15.8	0.011	-0.026	-0.057
0:11:00	715	699	13.2	0.007	-0.028	-0.056
0:12:00	726	728	11.4	0.012	-0.023	-0.053
0:13:00	738	752	10.3	0.019	-0.018	-0.053
0:14:00	749	769	9.5	0.021	-0.016	-0.049
0:15:00	760	784	8.9	0.011	-0.027	-0.062
0:16:00	767	804	8.5	-0.015	-0.056	-0.088
0:17:00	774	936	8.8	-0.003	-0.043	-0.076
0:18:00	781	966	9.9	-0.004	-0.047	-0.072
0:19:00	788	959	10.8	0.009	-0.028	-0.058
0:20:00	795	980	11.7	0.028	-0.007	-0.041
0:21:00	800	935	12.2	0.000	-0.041	-0.063
0:22:00	805	894	12.3	-0.005	-0.046	-0.076
0:23:00	811	868	12.2	-0.002	-0.040	-0.067

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Pressures		
h:mm:ss	StndCrv	FurnAvg	%Area	FurnP1	FurnP2	FurnP3
0:24:00	816	847	11.8	0.000	-0.041	-0.065
0:25:00	821	835	11.3	-0.002	-0.042	-0.068
0:26:00	825	825	10.8	0.002	-0.038	-0.067
0:27:00	830	823	10.3	0.002	-0.038	-0.070
0:28:00	834	823	9.8	0.001	-0.038	-0.072
0:29:00	839	819	9.3	0.008	-0.039	-0.067
0:30:00	843	818	8.8	0.003	-0.038	-0.070
0:31:00	847	815	8.3	0.003	-0.038	-0.069
0:32:00	851	810	7.8	-0.009	-0.046	-0.079
0:33:00	854	807	7.3	0.009	-0.033	-0.063
0:34:00	858	845	6.9	0.005	-0.035	-0.062
0:35:00	862	869	6.7	0.012	-0.027	-0.060
0:36:00	865	881	6.5	0.007	-0.035	-0.066
0:37:00	868	888	6.3	0.005	-0.036	-0.067
0:38:00	872	893	6.2	0.005	-0.041	-0.072
0:39:00	875	869	6.0	0.007	-0.038	-0.065
0:40:00	878	860	5.8	0.003	-0.038	-0.064
0:41:00	881	852	5.6	0.005	-0.036	-0.068
0:42:00	884	842	5.3	0.010	-0.035	-0.061
0:43:00	886	838	5.0	0.014	-0.030	-0.059
0:44:00	889	834	4.7	0.019	-0.028	-0.055
0:45:00	892	851	4.4	0.175	0.136	0.107
0:46:00	895	850	4.2	0.136	0.093	0.063
0:47:00	897	853	3.9		0.240	-0.241
0:48:00	900	882	3.7	-0.008	-0.054	-0.084
0:49:00	902	885	3.6	0.000	-0.037	-0.075
0:50:00	905	893	3.5	0.009	-0.030	-0.060
0:51:00	907	899	3.4	0.015	-0.032	-0.061
0:52:00	909	905	3.3	0.010	-0.031	-0.063
0:53:00	912	909	3.2	0.003	-0.039	-0.067
0:54:00	914	910	3.1	0.011	-0.030	-0.060
0:55:00	916	910	3.0	0.017	-0.031	-0.063
0:56:00	918	910	2.9	0.008	-0.038	-0.066
0:57:00	920	913	2.9	0.011	-0.029	-0.062
0:58:00	923	914	2.8	0.010	-0.033	-0.063
0:59:00	925	916	2.7	0.017	-0.028	-0.058
1:00:00	927	920	2.6	0.015	-0.032	-0.058
1:01:00	929	921	2.6	0.063	0.024	-0.004
1:02:00	931	918	2.5	0.063	0.022	-0.007
1:03:00	933	913	2.4	0.078	0.026	-0.004
1:04:00	935	911	2.3	0.077	0.032	0.003
1:05:00	937	908	2.2	0.068	0.024	-0.005
1:06:00	939	913	2.1	-0.083	-0.127	-0.161
1:07:00	941	972	2.1	0.015	-0.030	-0.062
1:08:00	942	985	2.1	0.008	-0.044	-0.075
1:09:00	944	988	2.2	-0.200	-0.239	-0.276
1:10:00	946	990	2.2	-0.075	-0.116	-0.140
1:11:00	948	973	2.3	-0.009	-0.051	-0.079
1:12:00	950	957	2.2	-0.012	-0.054	-0.085
1:13:00	951	957	2.2	-0.007	-0.048	-0.078
1:14:00	953	957	2.2	-0.014	-0.060	-0.088
1:15:00	955	960	2.2	0.004	-0.043	-0.071
1:16:00	957	965	2.1	0.011	-0.035	-0.067
1:17:00	958	966	2.1	-0.008	-0.049	-0.080

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Pressures		
h:mm:ss	StndCrv	FurnAvg	%Area	FurnP1	FurnP2	FurnP3
1:18:00	960	961	2.1	-0.008	-0.051	-0.080
1:19:00	961	961	2.1	-0.002	-0.046	-0.078
1:20:00	963	966	2.0	-0.001	-0.043	-0.073
1:21:00	965	969	2.0	-0.005	-0.049	-0.076
1:22:00	966	971	2.0	-0.004	-0.044	-0.073
1:23:00	968	972	2.0	-0.003	-0.048	-0.076
1:24:00	969	970	1.9	-0.011	-0.057	-0.086
1:25:00	971	969	1.9	-0.003	-0.050	-0.078
1:26:00	972	982	1.9	-0.005	-0.050	-0.080
1:27:00	974	991	1.9	-0.006	-0.049	-0.080
1:28:00	975	975	1.9	-0.011	-0.056	-0.084
1:29:00	977	955	1.8	-0.006	-0.049	-0.074
1:30:00	978	931	1.8	-0.005	-0.049	-0.078
1:31:00	979	922	1.7	-0.004	-0.048	-0.077
1:32:00	981	917	1.6	-0.011	-0.052	-0.081
1:33:00	982	946	1.5	-0.003	-0.047	-0.076
1:34:00	984	968	1.4	0.000	-0.044	-0.071
1:35:00	985	977	1.4	-0.003	-0.048	-0.076
1:36:00	986	980	1.4	-0.001	-0.045	-0.078
1:37:00	987	980	1.4	0.000	-0.044	-0.074
1:38:00	989	982	1.3	0.001	-0.044	-0.073
1:39:00	990	985	1.3	0.003	-0.043	-0.071
1:40:00	991	987	1.3	0.000	-0.045	-0.072
1:41:00	992	987	1.3	0.000	-0.045	-0.073
1:42:00	993	990	1.2	0.000	-0.045	-0.076
1:43:00	994	997	1.2	0.011	-0.038	-0.065
1:44:00	995	1000	1.2	0.007	-0.036	-0.068
1:45:00	996	999	1.2	-0.014	-0.057	-0.086
1:46:00	997	996	1.2	-0.006	-0.049	-0.078
1:47:00	998	997	1.2	-0.005	-0.049	-0.080
1:48:00	999	996	1.2	-0.013	-0.058	-0.091
1:49:00	1000	993	1.2	-0.010	-0.056	-0.086
1:50:00	1001	1007	1.1	-0.005	-0.047	-0.074
1:51:00	1002	1020	1.1	0.007	-0.040	-0.068
1:52:00	1003	1029	1.2	0.000	-0.044	-0.075
1:53:00	1004	1032	1.2	0.002	-0.047	-0.076
1:54:00	1005	1026	1.2	0.003	-0.045	-0.070
1:55:00	1006	1024	1.2	0.008	-0.038	-0.068
1:56:00	1007	1024	1.2	-0.005	-0.050	-0.080
1:57:00	1008	1025	1.2	-0.004	-0.044	-0.071
1:58:00	1008	1025	1.2	-0.006	-0.046	-0.079
1:59:00	1009	1026	1.2	0.002	-0.045	-0.073
2:00:00	1010	1029	1.2	-0.001	-0.044	-0.073
2:01:00	1011	1029	1.2	-0.003	-0.045	-0.074
2:02:00	1011	1028	1.2	-0.005	-0.047	-0.074
2:03:00	1012	1031	1.2	0.002	-0.045	-0.073
2:04:00	1013	1031	1.2	0.013	-0.035	-0.066
2:05:00	1014	1035	1.2	-0.004	-0.046	-0.075
2:06:00	1014	1030	1.3	-0.003	-0.047	-0.078
2:07:00	1015	1027	1.3	-0.003	-0.047	-0.075
2:08:00	1016	1024	1.3	-0.011	-0.053	-0.082
2:09:00	1016	1022	1.2	-0.006	-0.051	-0.080
2:10:00	1017	1021	1.2	-0.002	-0.046	-0.075
2:11:00	1018	1023	1.2	-0.007	-0.048	-0.078

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Pressures		
h:mm:ss	StndCrv	FurnAvg	%Area	FurnP1	FurnP2	FurnP3
2:12:00	1018	1025	1.2	0.002	-0.043	-0.074
2:13:00	1019	1027	1.2	-0.002	-0.045	-0.076
2:14:00	1020	1031	1.2	-0.003	-0.039	-0.070
2:15:00	1021	1033	1.2	-0.007	-0.048	-0.077
2:16:00	1021	1033	1.2	0.001	-0.043	-0.074
2:17:00	1022	1031	1.2	-0.002	-0.045	-0.078
2:18:00	1023	1033	1.2	-0.004	-0.047	-0.077
2:19:00	1023	1032	1.2	0.002	-0.042	-0.071
2:20:00	1024	1033	1.2	-0.007	-0.048	-0.078
2:21:00	1025	1031	1.2	-0.002	-0.047	-0.075
2:22:00	1025	1035	1.2	0.000	-0.041	-0.072
2:23:00	1026	1036	1.2	0.006	-0.037	-0.066
2:24:00	1027	1040	1.2	0.000	-0.044	-0.071
2:25:00	1028	1043	1.2	0.006	-0.038	-0.070
2:26:00	1028	1046	1.2	0.006	-0.040	-0.069
2:27:00	1029	1045	1.2	0.001	-0.042	-0.072
2:28:00	1030	1045	1.2	-0.005	-0.046	-0.076
2:29:00	1030	1044	1.2	-0.005	-0.049	-0.078
2:30:00	1031	1043	1.2	0.004	-0.041	-0.071
2:31:00	1032	1045	1.2	-0.004	-0.050	-0.078
2:32:00	1032	1043	1.2	-0.008	-0.052	-0.080
2:33:00	1033	1041	1.2	-0.011	-0.052	-0.083
2:34:00	1034	1041	1.2	-0.007	-0.050	-0.078
2:35:00	1035	1045	1.2	0.004	-0.043	-0.073
2:36:00	1035	1049	1.2	0.003	-0.038	-0.070
2:37:00	1036	1052	1.2	-0.002	-0.043	-0.072
2:38:00	1037	1054	1.2	0.009	-0.033	-0.063
2:39:00	1037	1051	1.2	0.000	-0.045	-0.072
2:40:00	1038	1048	1.2	-0.003	-0.048	-0.077
2:41:00	1039	1048	1.2	-0.001	-0.044	-0.072
2:42:00	1039	1047	1.2	-0.009	-0.051	-0.080
2:43:00	1040	1044	1.2	-0.005	-0.048	-0.078
2:44:00	1041	1044	1.2	-0.002	-0.047	-0.074
2:45:00	1042	1044	1.2	-0.007	-0.048	-0.078
2:46:00	1042	1046	1.2	-0.007	-0.051	-0.078
2:47:00	1043	1042	1.2	-0.012	-0.051	-0.082
2:48:00	1044	1041	1.2	-0.001	-0.046	-0.077
2:49:00	1044	1043	1.2	-0.008	-0.048	-0.076
2:50:00	1045	1058	1.2	-0.004	-0.044	-0.078
2:51:00	1046	1064	1.2	-0.002	-0.044	-0.071
2:52:00	1046	1065	1.2	0.002	-0.044	-0.076
2:53:00	1047	1066	1.2	-0.002	-0.047	-0.079
2:54:00	1048	1066	1.2	0.001	-0.043	-0.071
2:55:00	1049	1070	1.2	0.002	-0.044	-0.072
2:56:00	1049	1072	1.2	0.000	-0.043	-0.073
2:57:00	1050	1073	1.2	0.004	-0.041	-0.071
2:58:00	1051	1077	1.2	0.004	-0.043	-0.069
2:59:00	1051	1080	1.2	0.001	-0.043	-0.073
3:00:00	1052	1086	1.2	-0.004	-0.045	-0.074
3:01:00	1053	1088	1.2	-0.003	-0.045	-0.077
3:02:00	1053	1090	1.2	0.004	-0.042	-0.070
3:03:00	1054	1095	1.3	-0.004	-0.047	-0.076
3:04:00	1055	1092	1.3	-0.002	-0.043	-0.070
3:05:00	1056	1089	1.3	-0.007	-0.048	-0.077

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
FURNACE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:43

Time	Furnace Conditions			Furnace Pressures		
h:mm:ss	StndCrv	FurnAvg	%Area	FurnP1	FurnP2	FurnP3
3:06:00	1056	1091	1.3	-0.001	-0.044	-0.078
3:07:00	1057	1095	1.3	0.000	-0.045	-0.073
3:08:00	1058	1097	1.3	0.000	-0.048	-0.079
3:09:00	1058	1099	1.3	-0.001	-0.041	-0.073
3:10:00	1059	1100	1.4	-0.005	-0.045	-0.080
3:11:00	1060	1086	1.4	-0.002	-0.047	-0.077
3:12:00	1060	1085	1.4	-0.001	-0.044	-0.072
3:13:00	1061	1057	1.4	-0.010	-0.048	-0.078
3:14:00	1062	1053	1.4	-0.008	-0.050	-0.080
3:15:00	1063	1051	1.3	-0.006	-0.046	-0.073
3:16:00	1063	1048	1.3	0.001	-0.045	-0.075
3:17:00	1064	1047	1.3	-0.003	-0.046	-0.078
3:18:00	1065	1049	1.3	-0.007	-0.048	-0.076
3:19:00	1065	1050	1.3	-0.006	-0.048	-0.078
3:20:00	1066	1050	1.3	-0.009	-0.050	-0.076
3:21:00	1067	1049	1.2	-0.005	-0.050	-0.079
3:22:00	1067	1048	1.2	-0.004	-0.046	-0.075
3:23:00	1068	1046	1.2	-0.008	-0.049	-0.077
3:24:00	1068	1046	1.2	-0.005	-0.049	-0.078
3:25:00	1069	1044	1.2	-0.009	-0.048	-0.076
3:26:00	1070	1042	1.2	-0.003	-0.049	-0.075
3:27:00	1070	1043	1.1	-0.002	-0.042	-0.073
3:28:00	1071	1044	1.1	-0.006	-0.048	-0.076
3:29:00	1071	1041	1.1	-0.007	-0.049	-0.078
3:30:00	1072	1040	1.1	-0.005	-0.050	-0.078
3:31:00	1073	1040	1.0	-0.005	-0.047	-0.076
3:32:00	1073	1040	1.0	-0.005	-0.045	-0.074
3:33:00	1074	1051	1.0	-0.006	-0.050	-0.079
3:34:00	1075	1055	1.0	0.001	-0.044	-0.073
3:35:00	1076	1057	1.0	-0.005	-0.049	-0.079
3:36:00	1076	1057	1.0	-0.008	-0.048	-0.076
3:37:00	1077	1058	0.9	-0.008	-0.049	-0.076
3:38:00	1078	1061	0.9	-0.003	-0.044	-0.072
3:39:00	1078	1064	0.9	-0.003	-0.048	-0.078
3:40:00	1079	1065	0.9	-0.003	-0.045	-0.076
3:41:00	1080	1064	0.9	-0.007	-0.048	-0.079
3:42:00	1080	1065	0.9	0.000	-0.044	-0.072
3:43:00	1081	1067	0.9	0.000	-0.044	-0.073
3:44:00	1082	1071	0.9	-0.006	-0.050	-0.075
3:45:00	1083	1072	0.9	-0.003	-0.044	-0.075
3:46:00	1083	1073	0.8	-0.003	-0.046	-0.075
3:47:00	1084	1072	0.8	-0.003	-0.048	-0.074
3:48:00	1085	1072	0.8	-0.002	-0.047	-0.075
3:49:00	1085	1073	0.8	0.001	-0.044	-0.076
3:50:00	1086	1073	0.8	-0.008	-0.049	-0.079
3:51:00	1087	1074	0.8	-0.006	-0.049	-0.077
3:52:00	1087	1074	0.8	-0.002	-0.047	-0.076
3:53:00	1088	1074	0.8	-0.001	-0.046	-0.073
3:54:00	1089	1078	0.8	-0.004	-0.044	-0.075
3:55:00	1090	1080	0.8	-0.003	-0.045	-0.075
3:56:00	1090	1080	0.7	-0.001	-0.043	-0.073
3:57:00	1091	1078	0.7	-0.003	-0.048	-0.079

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:44

Time	Unexposed Surface Temperatures										Web Temperatures			
h:mm:ss	TC01	TC02	TC03	TC04	TC05	TC06	TC07	TC08	TC09	AVG1	TC10	TC11	TC12	TC13
0:00:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:01:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:02:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:03:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:04:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:05:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:06:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:07:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:08:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:09:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:10:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:11:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:12:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:13:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:14:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:15:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:16:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:17:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:18:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:19:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:20:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:21:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:22:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:23:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:24:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:25:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:26:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:27:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:28:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:29:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:30:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:31:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:32:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:33:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:34:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:35:00	19	19	19	19	19	19	19	19	19	19	19	19	19	19
0:36:00	19	19	19	19	19	19	19	19	19	19	19	19	19	20
0:37:00	19	19	19	20	19	19	19	19	19	19	20	20	19	20
0:38:00	19	19	20	20	19	19	20	19	19	19	20	20	20	20
0:39:00	20	19	20	20	20	19	20	19	20	20	20	20	20	20
0:40:00	20	19	20	20	20	19	20	19	20	20	20	20	20	21
0:41:00	20	20	20	21	20	19	20	19	20	20	20	20	20	21
0:42:00	20	20	21	21	21	20	20	19	20	20	20	20	20	21
0:43:00	21	20	21	22	21	20	21	19	20	21	20	21	21	22
0:44:00	21	20	21	22	21	20	21	19	21	21	21	21	21	22
0:45:00	21	21	22	23	22	20	21	20	21	21	21	21	21	23
0:46:00	22	21	22	23	22	20	22	20	22	22	21	22	22	23
0:47:00	22	21	23	24	23	21	22	20	22	22	22	22	22	24
0:48:00	23	22	23	25	24	21	23	20	23	22	22	23	23	25
0:49:00	23	22	24	25	24	21	23	20	23	23	22	23	23	25
0:50:00	24	23	25	26	25	21	24	20	24	24	23	24	24	26
0:51:00	25	23	25	27	26	22	25	21	25	24	23	24	25	27
0:52:00	25	24	26	28	26	22	25	21	25	25	23	25	25	28
0:53:00	26	24	27	29	27	22	26	21	26	25	24	26	26	29

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:44

Time	Unexposed Surface Temperatures										Web Temperatures			
h:mm:ss	TC01	TC02	TC03	TC04	TC05	TC06	TC07	TC08	TC09	AVG1	TC10	TC11	TC12	TC13
0:54:00	27	25	28	30	28	23	27	22	27	26	24	26	27	31
0:55:00	29	26	28	31	29	23	27	22	28	27	25	27	28	32
0:56:00	29	27	29	32	30	24	28	22	29	28	26	28	29	33
0:57:00	30	28	30	33	31	24	29	23	30	29	26	29	30	35
0:58:00	30	29	31	34	32	25	30	23	31	29	27	30	31	37
0:59:00	31	32	32	36	34	25	30	24	32	31	27	31	32	39
1:00:00	32	33	33	37	35	26	31	24	33	32	28	32	33	41
1:01:00	33	35	34	38	36	26	32	25	34	33	29	33	36	44
1:02:00	34	36	35	40	38	27	33	26	35	34	30	34	37	47
1:03:00	35	38	37	41	40	28	34	27	36	35	31	35	39	63
1:04:00	36	39	38	43	41	29	35	27	37	36	31	36	41	70
1:05:00	37	40	39	44	42	29	36	28	39	37	32	38	43	79
1:06:00	38	42	40	46	44	30	37	29	40	38	33	39	46	80
1:07:00	39	43	41	47	45	31	38	30	42	40	34	40	48	83
1:08:00	40	45	43	49	48	32	39	31	40	41	35	42	51	84
1:09:00	41	46	44	50	49	33	40	33	40	42	36	43	54	84
1:10:00	42	48	45	52	50	34	41	34	40	43	37	45	58	86
1:11:00	43	50	47	54	52	35	42	35	41	44	38	46	61	86
1:12:00	44	51	48	55	53	36	43	37	41	45	39	48	63	86
1:13:00	45	53	50	57	54	37	44	38	42	47	40	49	65	87
1:14:00	47	55	51	59	54	38	45	40	42	48	41	50	66	88
1:15:00	48	58	53	60	55	39	46	42	43	49	41	52	67	87
1:16:00	49	61	54	62	56	40	48	44	44	51	41	53	69	88
1:17:00	50	65	56	64	57	41	49	46	45	52	42	55	70	87
1:18:00	51	70	57	65	57	42	50	48	46	54	43	56	71	88
1:19:00	52	75	59	67	58	43	51	50	47	56	45	57	72	85
1:20:00	53	79	60	68	59	44	52	52	48	57	46	59	74	87
1:21:00	54	81	61	70	60	46	53	54	49	59	48	60	75	86
1:22:00	55	83	63	71	61	47	54	57	49	60	49	61	78	85
1:23:00	56	84	64	72	62	48	55	59	50	61	50	62	81	91
1:24:00	56	86	65	74	63	49	56	61	51	62	51	63	85	92
1:25:00	57	87	66	75	64	50	58	63	52	64	52	64	87	98
1:26:00	57	89	67	76	65	52	59	66	53	65	54	65	89	98
1:27:00	58	90	68	77	66	53	60	70	54	66	55	66	89	98
1:28:00	58	92	69	78	66	54	61	74	55	68	56	67	89	97
1:29:00	59	92	70	79	67	55	62	76	56	69	57	68	90	98
1:30:00	59	92	71	81	68	57	63	78	57	70	58	69	92	98
1:31:00	60	93	72	82	69	58	64	79	57	70	59	70	93	98
1:32:00	60	92	73	83	69	59	66	80	58	71	60	71	93	98
1:33:00	60	92	74	84	69	60	67	81	59	72	61	72	90	98
1:34:00	61	92	75	84	70	62	68	82	60	73	62	73	90	98
1:35:00	61	92	76	85	71	63	69	83	61	73	62	73	90	97
1:36:00	61	92	77	86	71	64	70	84	61	74	63	74	90	98
1:37:00	61	92	78	87	72	65	72	85	62	75	64	75	90	98
1:38:00	62	92	79	88	73	67	73	86	63	76	65	76	90	97
1:39:00	62	92	80	89	75	68	74	85	63	77	66	76	91	97
1:40:00	62	92	81	90	78	69	75	86	65	77	67	78	91	97
1:41:00	62	92	82	91	78	71	77	86	66	78	67	79	92	99
1:42:00	63	92	83	91	79	72	78	86	67	79	68	80	92	98
1:43:00	63	92	83	92	80	73	79	87	70	80	69	81	93	98
1:44:00	63	92	84	93	80	75	81	87	74	81	70	82	93	98
1:45:00	64	92	86	94	84	76	82	87	77	82	70	82	93	98
1:46:00	65	92	86	94	86	77	84	87	79	83	72	83	93	99
1:47:00	67	92	87	95	87	79	86	87	81	85	73	84	93	99

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:44

Time	Unexposed Surface Temperatures										Web Temperatures			
h:mm:ss	TC01	TC02	TC03	TC04	TC05	TC06	TC07	TC08	TC09	AVG1	TC10	TC11	TC12	TC13
1:48:00	69	92	88	96	80	80	87	87	83	85	76	84	93	98
1:49:00	72	92	89	96	78	81	88	88	84	85	79	84	93	99
1:50:00	75	92	90	97	75	82	89	88	85	86	81	85	93	99
1:51:00	77	92	91	98	74	83	90	88	86	87	83	85	93	99
1:52:00	80	92	92	98	73	85	91	89	87	87	85	86	93	99
1:53:00	81	92	93	99	72	86	92	89	87	88	90	87	93	99
1:54:00	82	92	94	99	72	87	93	89	87	88	90	87	93	99
1:55:00	83	92	95	100	72	88	94	90	88	89	91	88	93	99
1:56:00	84	92	95	100	71	89	95	91	88	89	91	89	93	98
1:57:00	84	92	96	101	71	90	95	91	88	90	91	89	93	99
1:58:00	84	91	97	101	71	92	96	91	89	90	89	90	94	99
1:59:00	85	91	97	102	70	93	97	92	89	91	90	91	93	99
2:00:00	85	91	98	102	70	94	97	92	89	91	91	91	93	99
2:01:00	85	91	99	103	70	95	98	93	90	91	91	91	93	98
2:02:00	86	91	99	103	70	96	99	93	90	92	91	91	93	95
2:03:00	87	91	100	104	70	97	99	93	90	92	91	91	93	98
2:04:00	88	91	100	104	71	98	100	94	90	93	91	92	93	98
2:05:00	88	91	101	105	71	99	101	94	91	93	91	91	93	97
2:06:00	89	91	102	105	71	100	101	94	91	94	90	92	93	95
2:07:00	90	91	102	106	71	100	102	95	91	94	91	92	93	98
2:08:00	91	91	103	106	72	101	103	95	91	95	90	92	92	97
2:09:00	92	91	103	107	72	102	103	95	91	95	90	92	93	95
2:10:00	93	91	104	107	72	103	104	96	91	96	90	92	93	96
2:11:00	93	91	104	108	72	104	104	96	91	96	90	93	94	96
2:12:00	94	91	105	108	73	104	105	96	91	96	91	93	93	95
2:13:00	95	90	106	109	73	105	106	97	91	97	90	93	92	96
2:14:00	96	90	106	109	73	106	106	97	91	97	91	93	92	96
2:15:00	97	90	107	110	73	107	107	97	91	98	90	93	93	95
2:16:00	98	90	107	110	73	108	108	98	91	98	89	93	93	97
2:17:00	99	90	108	111	73	108	108	98	91	98	89	93	92	96
2:18:00	100	90	108	111	73	109	109	98	91	99	88	94	92	97
2:19:00	101	89	109	112	73	110	109	99	91	99	87	93	93	97
2:20:00	102	89	109	112	73	110	110	99	91	100	88	93	93	97
2:21:00	102	89	110	113	73	111	110	100	91	100	88	94	93	98
2:22:00	103	89	110	113	73	112	111	100	91	100	87	94	92	98
2:23:00	104	89	111	114	74	112	111	101	91	101	88	95	92	98
2:24:00	105	89	111	114	74	113	112	102	91	101	88	95	92	97
2:25:00	106	89	112	115	74	114	113	102	91	102	88	96	92	97
2:26:00	106	89	112	115	74	114	113	103	91	102	88	96	92	97
2:27:00	107	88	113	116	74	115	114	103	91	102	88	97	92	97
2:28:00	108	88	113	116	74	116	114	104	91	103	88	99	92	97
2:29:00	109	88	114	117	74	116	115	104	91	103	88	100	92	97
2:30:00	109	88	114	117	74	117	115	105	91	103	88	101	92	98
2:31:00	110	88	115	118	74	117	116	106	91	104	89	102	92	98
2:32:00	111	87	115	118	74	118	116	106	91	104	89	103	92	98
2:33:00	111	87	116	119	74	118	117	107	91	104	90	104	92	98
2:34:00	112	87	116	119	75	119	117	107	91	105	91	105	92	99
2:35:00	112	87	117	120	75	119	118	108	91	105	92	106	92	98
2:36:00	113	86	117	120	75	120	119	109	91	106	93	106	92	98
2:37:00	113	86	118	121	76	121	119	109	91	106	94	107	92	99
2:38:00	114	86	118	121	76	121	119	110	91	106	95	108	92	99
2:39:00	115	86	119	122	76	121	120	111	91	107	96	108	92	99
2:40:00	115	87	119	122	76	122	120	112	91	107	96	109	92	100
2:41:00	116	89	120	123	76	122	121	112	91	108	97	109	92	100

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:44

Time	Unexposed Surface Temperatures										Web Temperatures			
h:mm:ss	TC01	TC02	TC03	TC04	TC05	TC06	TC07	TC08	TC09	AVG1	TC10	TC11	TC12	TC13
2:42:00	116	91	120	123	76	123	121	113	91	108	98	110	92	101
2:43:00	117	92	120	124	76	123	122	114	91	109	99	111	92	101
2:44:00	117	94	121	124	77	124	122	114	91	109	100	111	92	101
2:45:00	118	95	121	125	77	124	123	115	91	110	100	112	92	101
2:46:00	118	96	122	125	77	124	123	116	92	110	101	112	92	102
2:47:00	119	97	122	126	77	125	124	117	92	111	102	113	92	102
2:48:00	119	98	123	126	77	125	124	117	93	111	103	113	91	102
2:49:00	119	99	123	127	77	125	125	118	94	112	103	114	91	103
2:50:00	120	100	124	127	77	126	125	119	94	112	104	115	91	103
2:51:00	120	101	124	128	77	126	126	120	95	113	106	115	91	104
2:52:00	121	102	125	128	77	127	126	120	96	113	107	116	91	104
2:53:00	121	102	125	128	77	127	127	121	96	114	108	116	90	105
2:54:00	122	103	126	129	77	127	127	122	97	114	109	117	91	106
2:55:00	122	104	126	129	77	128	127	123	98	115	110	117	90	105
2:56:00	123	104	127	130	78	128	128	124	98	115	111	118	90	106
2:57:00	123	105	127	130	78	128	128	125	99	116	112	119	90	106
2:58:00	124	106	128	131	79	129	129	126	99	117	113	119	90	107
2:59:00	124	107	128	131	80	129	129	127	100	117	114	120	89	108
3:00:00	124	107	129	132	81	129	130	128	100	118	115	121	89	108
3:01:00	125	108	129	132	82	129	130	129	101	118	115	121	89	109
3:02:00	125	109	130	132	82	130	130	130	101	119	116	122	89	110
3:03:00	126	110	130	133	83	130	131	131	102	119	117	123	89	110
3:04:00	126	110	131	133	84	130	131	132	102	120	118	124	88	111
3:05:00	127	111	131	134	85	131	132	133	103	121	118	124	88	112
3:06:00	127	112	131	134	85	131	132	134	103	121	119	125	88	112
3:07:00	127	113	132	135	86	131	133	135	104	122	120	126	89	114
3:08:00	128	114	132	135	87	132	133	136	104	122	121	127	89	115
3:09:00	128	114	133	135	87	132	133	137	105	123	121	127	92	115
3:10:00	129	115	133	136	88	132	134	138	105	123	122	128	95	117
3:11:00	129	116	133	136	89	132	134	140	106	124	123	129	97	117
3:12:00	129	117	134	137	90	133	135	141	106	125	123	129	98	118
3:13:00	130	118	134	137	91	133	135	142	107	125	124	130	100	119
3:14:00	130	118	134	138	91	133	135	143	108	126	125	131	102	120
3:15:00	131	119	135	138	93	134	136	144	108	126	126	131	103	121
3:16:00	131	120	135	139	93	134	136	145	109	127	127	132	104	122
3:17:00	131	121	135	139	94	134	137	146	110	127	128	132	105	123
3:18:00	132	122	136	140	95	134	137	147	110	128	129	133	107	123
3:19:00	132	123	136	141	96	134	137	148	111	129	130	133	108	124
3:20:00	133	123	136	141	97	135	138	149	112	129	131	134	109	125
3:21:00	133	124	137	142	97	135	138	150	112	130	131	134	110	126
3:22:00	133	125	137	143	98	135	139	151	113	130	132	135	111	127
3:23:00	134	126	137	143	99	135	139	152	114	131	133	136	112	127
3:24:00	134	127	137	144	100	136	140	153	115	132	133	136	114	128
3:25:00	135	128	138	145	101	136	140	154	116	132	134	137	115	129
3:26:00	135	129	138	146	101	136	141	155	116	133	135	137	116	130
3:27:00	135	130	138	146	102	136	141	156	117	134	135	137	117	130
3:28:00	136	131	139	147	103	137	142	157	118	134	136	138	118	131
3:29:00	136	132	139	148	104	137	142	158	119	135	136	139	120	132
3:30:00	137	133	139	149	105	137	142	159	120	136	136	139	121	133
3:31:00	137	135	140	150	106	137	143	160	121	137	137	140	122	134
3:32:00	137	136	140	151	107	138	143	161	122	137	137	140	123	134
3:33:00	138	138	140	152	108	138	144	162	123	138	138	141	125	135
3:34:00	138	140	141	153	109	138	144	163	124	139	138	141	126	136
3:35:00	139	142	141	154	110	138	145	164	126	140	139	142	127	137

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-TEMPERATURE DATA
Test Start Time: April 18, 2007, 11:12:44

Time	Unexposed Surface Temperatures										Web Temperatures			
h:mm:ss	TC01	TC02	TC03	TC04	TC05	TC06	TC07	TC08	TC09	AVG1	TC10	TC11	TC12	TC13
3:36:00	139	143	142	155	111	139	146	165	127	141	139	142	129	138
3:37:00	140	144	142	156	112	139	146	166	128	141	140	143	131	138
3:38:00	140	145	142	157	113	139	147	167	129	142	140	143	134	139
3:39:00	140	146	143	158	114	140	147	168	131	143	141	144	136	140
3:40:00	141	147	143	159	116	140	148	169	132	144	141	145	138	141
3:41:00	141	148	144	160	120	140	148	170	133	145	142	145	139	142
3:42:00	142	149	144	161	121	141	149	171	135	146	143	146	140	143
3:43:00	142	150	145	162	122	141	150	172	136	147	143	146	142	143
3:44:00	143	151	145	163	124	141	151	173	138	148	144	147	143	144
3:45:00	144	152	146	164	125	141	151	174	139	148	144	148	144	145
3:46:00	144	152	146	164	126	142	152	176	141	149	145	148	145	146
3:47:00	145	153	147	165	127	142	153	177	142	150	146	149	146	147
3:48:00	145	154	148	166	128	142	153	178	144	151	146	150	146	149
3:49:00	146	155	148	167	129	143	154	179	146	152	147	150	147	150
3:50:00	147	156	149	168	131	143	155	180	147	153	148	151	148	151
3:51:00	147	157	150	169	132	143	156	181	148	154	148	152	149	152
3:52:00	148	158	150	170	133	144	156	182	150	155	149	153	150	153
3:53:00	149	159	151	171	134	144	157	183	151	155	150	153	151	154
3:54:00	149	160	152	172	135	145	158	184	152	156	151	154	152	155
3:55:00	150	161	153	172	137	145	159	185	154	157	152	155	153	156
3:56:00	151	162	153	173	139	145	159	186	155	158	152	156	154	157
3:57:00	152	164	154	174	142	146	160	187	156	159	153	157	154	158

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
PRE-TEST DEFLECTION DATA
Test Start Time: April 18, 2007, 10:48:16

Percent	Pre-Test Deflection			Total Deflection		
Load	DF01	DF02	DF03	TD01	TD02	TD03
0	0.0	0.0	0.0	0.0	0.0	0.0
25	2.2	8.6	0.9	2.2	8.6	0.9
50	5.0	19.8	5.3	5.0	19.8	5.3
75	8.0	30.5	8.2	8.0	30.5	8.2
100	11.5	40.7	11.2	11.5	40.7	11.2

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-DEFLECTION DATA
Test Start Time: April 18, 2007, 11:12:45

Time	In-Test Deflection			Total Deflection		
h:mm:ss	DF01	DF02	DF03	TD01	TD02	TD03
0:00:00	0.0	0.0	0.0	11.5	40.7	11.2
0:01:00	1.1	0.5	0.0	12.6	41.2	11.2
0:02:00	0.2	0.5	0.2	11.7	41.2	11.4
0:03:00	0.9	0.9	0.0	12.4	41.6	11.2
0:04:00	1.4	0.3	-0.6	12.9	41.0	10.6
0:05:00	-0.3	0.9	0.1	11.2	41.6	11.3
0:06:00	0.9	0.2	-0.6	12.4	40.9	10.6
0:07:00	-0.5	0.6	0.1	11.0	41.3	11.3
0:08:00	-0.1	0.2	-0.2	11.4	40.9	11.0
0:09:00	-0.4	0.7	0.1	11.1	41.4	11.3
0:10:00	0.0	0.4	-0.2	11.5	41.1	11.0
0:11:00	-0.1	0.5	-0.2	11.4	41.2	11.0
0:12:00	-0.1	0.8	0.2	11.4	41.5	11.4
0:13:00	1.3	1.4	0.0	12.8	42.1	11.2
0:14:00	0.7	0.5	-0.6	12.2	41.2	10.6
0:15:00	0.4	0.8	-0.6	11.9	41.5	10.6
0:16:00	0.3	1.4	-0.6	11.8	42.1	10.6
0:17:00	0.2	2.5	-0.5	11.7	43.2	10.7
0:18:00	-0.5	4.0	0.4	11.0	44.7	11.6
0:19:00	0.9	5.2	-0.4	12.4	45.9	10.8
0:20:00	1.3	6.7	-0.3	12.8	47.4	10.9
0:21:00	0.2	7.3	0.1	11.7	48.0	11.3
0:22:00	0.2	8.8	0.7	11.7	49.5	11.9
0:23:00	0.7	10.3	0.8	12.2	51.0	12.0
0:24:00	0.7	11.3	0.8	12.2	52.0	12.0
0:25:00	0.4	11.6	0.6	11.9	52.3	11.8
0:26:00	0.5	12.3	0.6	12.0	53.0	11.8
0:27:00	1.0	12.9	0.3	12.5	53.6	11.5
0:28:00	0.8	13.5	0.2	12.3	54.2	11.4
0:29:00	0.9	14.1	0.2	12.4	54.8	11.4
0:30:00	0.5	14.6	0.4	12.0	55.3	11.6
0:31:00	1.7	15.6	0.3	13.2	56.3	11.5
0:32:00	0.5	15.5	0.4	12.0	56.2	11.6
0:33:00	1.1	16.8	0.8	12.6	57.5	12.0
0:34:00	1.0	17.3	1.1	12.5	58.0	12.3
0:35:00	1.8	17.6	0.5	13.3	58.3	11.7
0:36:00	1.3	18.2	0.9	12.8	58.9	12.1
0:37:00	1.6	18.4	0.7	13.1	59.1	11.9
0:38:00	0.4	18.4	1.3	11.9	59.1	12.5
0:39:00	1.7	19.1	1.0	13.2	59.8	12.2
0:40:00	0.8	19.5	1.4	12.3	60.2	12.6
0:41:00	1.1	19.0	0.6	12.6	59.7	11.8
0:42:00	0.3	19.5	1.2	11.8	60.2	12.4
0:43:00	1.7	20.1	0.7	13.2	60.8	11.9
0:44:00	0.3	20.1	1.3	11.8	60.8	12.5
0:45:00	1.6	20.2	0.6	13.1	60.9	11.8
0:46:00	1.5	21.5	1.2	13.0	62.2	12.4
0:47:00	0.9	20.8	1.0	12.4	61.5	12.2
0:48:00	1.6	22.1	1.2	13.1	62.8	12.4
0:49:00	1.7	22.1	0.9	13.2	62.8	12.1
0:50:00	1.1	22.3	1.3	12.6	63.0	12.5
0:51:00	0.7	21.8	1.8	12.2	62.5	13.0
0:52:00	2.5	22.1	1.3	14.0	62.8	12.5
0:53:00	0.9	22.2	2.0	12.4	62.9	13.2

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-DEFLECTION DATA
Test Start Time: April 18, 2007, 11:12:45

Time	In-Test Deflection			Total Deflection		
h:mm:ss	DF01	DF02	DF03	TD01	TD02	TD03
0:54:00	1.0	22.2	1.9	12.5	62.9	13.1
0:55:00	2.2	22.3	1.4	13.7	63.0	12.6
0:56:00	0.6	21.7	1.8	12.1	62.4	13.0
0:57:00	1.0	22.1	2.0	12.5	62.8	13.2
0:58:00	2.4	22.0	1.3	13.9	62.7	12.5
0:59:00	1.6	21.5	1.1	13.1	62.2	12.3
1:00:00	1.8	22.0	1.3	13.3	62.7	12.5
1:01:00	1.0	22.3	1.8	12.5	63.0	13.0
1:02:00	2.2	22.1	1.3	13.7	62.8	12.5
1:03:00	0.6	21.4	1.6	12.1	62.1	12.8
1:04:00	0.9	21.4	1.5	12.4	62.1	12.7
1:05:00	2.2	21.6	1.2	13.7	62.3	12.4
1:06:00	1.7	21.9	1.5	13.2	62.6	12.7
1:07:00	0.7	21.4	1.9	12.2	62.1	13.1
1:08:00	0.4	21.0	1.6	11.9	61.7	12.8
1:09:00	0.9	21.9	2.1	12.4	62.6	13.3
1:10:00	2.6	22.2	1.6	14.1	62.9	12.8
1:11:00	1.0	20.9	1.2	12.5	61.6	12.4
1:12:00	1.3	21.7	2.1	12.8	62.4	13.3
1:13:00	2.5	21.9	1.9	14.0	62.6	13.1
1:14:00	0.6	20.6	1.5	12.1	61.3	12.7
1:15:00	0.2	20.7	1.6	11.7	61.4	12.8
1:16:00	0.1	20.3	1.4	11.6	61.0	12.6
1:17:00	1.3	21.1	2.0	12.8	61.8	13.2
1:18:00	1.2	20.6	1.1	12.7	61.3	12.3
1:19:00	0.9	20.6	1.1	12.4	61.3	12.3
1:20:00	1.2	21.0	1.2	12.7	61.7	12.4
1:21:00	0.2	20.1	1.8	11.7	60.8	13.0
1:22:00	1.8	20.6	1.3	13.3	61.3	12.5
1:23:00	1.3	20.0	1.1	12.8	60.7	12.3
1:24:00	1.1	20.0	1.1	12.6	60.7	12.3
1:25:00	-0.5	19.5	1.6	11.0	60.2	12.8
1:26:00	1.9	20.3	1.4	13.4	61.0	12.6
1:27:00	1.7	19.7	1.3	13.2	60.4	12.5
1:28:00	2.0	20.1	1.6	13.5	60.8	12.8
1:29:00	1.3	19.5	2.0	12.8	60.2	13.2
1:30:00	1.4	19.0	1.1	12.9	59.7	12.3
1:31:00	0.1	18.5	1.7	11.6	59.2	12.9
1:32:00	1.3	18.6	1.2	12.8	59.3	12.4
1:33:00	1.6	19.0	1.7	13.1	59.7	12.9
1:34:00	1.3	18.3	1.2	12.8	59.0	12.4
1:35:00	0.9	18.5	1.9	12.4	59.2	13.1
1:36:00	0.5	18.1	1.8	12.0	58.8	13.0
1:37:00	0.7	17.7	1.0	12.2	58.4	12.2
1:38:00	1.8	18.7	2.0	13.3	59.4	13.2
1:39:00	1.7	18.1	1.2	13.2	58.8	12.4
1:40:00	-0.2	17.3	1.2	11.3	58.0	12.4
1:41:00	1.5	18.2	2.1	13.0	58.9	13.3
1:42:00	1.9	17.8	1.3	13.4	58.5	12.5
1:43:00	0.7	16.9	1.0	12.2	57.6	12.2
1:44:00	0.5	16.9	1.0	12.0	57.6	12.2
1:45:00	-0.5	16.7	1.3	11.0	57.4	12.5
1:46:00	1.4	17.7	2.1	12.9	58.4	13.3
1:47:00	2.0	17.5	1.3	13.5	58.2	12.5

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-DEFLECTION DATA
Test Start Time: April 18, 2007, 11:12:45

Time	In-Test Deflection			Total Deflection		
h:mm:ss	DF01	DF02	DF03	TD01	TD02	TD03
1:48:00	-0.2	16.4	1.3	11.3	57.1	12.5
1:49:00	2.0	17.6	1.8	13.5	58.3	13.0
1:50:00	1.9	17.3	1.4	13.4	58.0	12.6
1:51:00	-0.5	16.2	1.4	11.0	56.9	12.6
1:52:00	1.5	17.2	1.5	13.0	57.9	12.7
1:53:00	-0.2	16.1	1.6	11.3	56.8	12.8
1:54:00	1.2	16.6	1.2	12.7	57.3	12.4
1:55:00	0.5	16.6	1.9	12.0	57.3	13.1
1:56:00	2.0	17.1	2.0	13.5	57.8	13.2
1:57:00	1.2	16.5	2.0	12.7	57.2	13.2
1:58:00	1.9	16.5	1.3	13.4	57.2	12.5
1:59:00	0.5	15.6	1.0	12.0	56.3	12.2
2:00:00	0.9	16.3	2.0	12.4	57.0	13.2
2:01:00	2.0	16.8	1.9	13.5	57.5	13.1
2:02:00	-0.1	15.2	1.5	11.4	55.9	12.7
2:03:00	-0.1	15.1	1.3	11.4	55.8	12.5
2:04:00	0.4	15.3	1.0	11.9	56.0	12.2
2:05:00	0.4	15.7	1.9	11.9	56.4	13.1
2:06:00	0.5	15.3	1.8	12.0	56.0	13.0
2:07:00	1.1	15.0	1.1	12.6	55.7	12.3
2:08:00	0.7	15.3	2.0	12.2	56.0	13.2
2:09:00	1.1	14.8	1.2	12.6	55.5	12.4
2:10:00	1.5	15.3	2.0	13.0	56.0	13.2
2:11:00	1.2	14.9	2.0	12.7	55.6	13.2
2:12:00	0.8	14.4	1.8	12.3	55.1	13.0
2:13:00	0.3	13.9	1.6	11.8	54.6	12.8
2:14:00	1.9	14.7	1.8	13.4	55.4	13.0
2:15:00	1.6	14.2	2.1	13.1	54.9	13.3
2:16:00	0.3	13.2	1.5	11.8	53.9	12.7
2:17:00	0.5	13.0	1.0	12.0	53.7	12.2
2:18:00	0.7	13.4	1.2	12.2	54.1	12.4
2:19:00	1.2	14.0	2.0	12.7	54.7	13.2
2:20:00	0.7	13.1	1.8	12.2	53.8	13.0
2:21:00	0.4	12.5	1.6	11.9	53.2	12.8
2:22:00	0.5	12.7	1.8	12.0	53.4	13.0
2:23:00	1.8	13.4	2.0	13.3	54.1	13.2
2:24:00	-0.2	11.9	1.4	11.3	52.6	12.6
2:25:00	-0.2	11.9	1.1	11.3	52.6	12.3
2:26:00	0.5	12.4	1.9	12.0	53.1	13.1
2:27:00	-0.2	11.6	1.3	11.3	52.3	12.5
2:28:00	1.6	13.0	1.7	13.1	53.7	12.9
2:29:00	1.2	12.5	2.0	12.7	53.2	13.2
2:30:00	0.0	11.6	1.5	11.5	52.3	12.7
2:31:00	0.7	11.8	1.9	12.2	52.5	13.1
2:32:00	1.8	12.4	1.9	13.3	53.1	13.1
2:33:00	0.9	11.4	1.2	12.4	52.1	12.4
2:34:00	0.7	11.6	1.3	12.2	52.3	12.5
2:35:00	0.1	11.0	1.0	11.6	51.7	12.2
2:36:00	0.4	11.4	1.9	11.9	52.1	13.1
2:37:00	1.1	11.1	1.3	12.6	51.8	12.5
2:38:00	1.1	11.3	1.6	12.6	52.0	12.8
2:39:00	-0.7	10.2	1.3	10.8	50.9	12.5
2:40:00	0.7	10.9	1.9	12.2	51.6	13.1
2:41:00	0.2	10.0	1.1	11.7	50.7	12.3

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-DEFLECTION DATA
Test Start Time: April 18, 2007, 11:12:45

Time	In-Test Deflection			Total Deflection		
h:mm:ss	DF01	DF02	DF03	TD01	TD02	TD03
2:42:00	1.2	11.1	1.9	12.7	51.8	13.1
2:43:00	0.3	10.1	1.8	11.8	50.8	13.0
2:44:00	1.7	10.6	1.8	13.2	51.3	13.0
2:45:00	1.5	10.5	1.6	13.0	51.2	12.8
2:46:00	-0.5	9.2	1.3	11.0	49.9	12.5
2:47:00	1.2	10.2	2.0	12.7	50.9	13.2
2:48:00	1.3	10.2	2.0	12.8	50.9	13.2
2:49:00	0.5	8.9	1.1	12.0	49.6	12.3
2:50:00	-0.4	9.0	1.5	11.1	49.7	12.7
2:51:00	-0.4	8.5	1.2	11.1	49.2	12.4
2:52:00	1.1	9.7	2.0	12.6	50.4	13.2
2:53:00	1.6	9.8	1.8	13.1	50.5	13.0
2:54:00	-0.7	8.8	1.7	10.8	49.5	12.9
2:55:00	1.2	9.1	1.4	12.7	49.8	12.6
2:56:00	0.8	9.1	1.9	12.3	49.8	13.1
2:57:00	1.6	9.2	1.9	13.1	49.9	13.1
2:58:00	0.5	8.6	1.8	12.0	49.3	13.0
2:59:00	0.2	8.0	1.1	11.7	48.7	12.3
3:00:00	0.2	8.1	1.7	11.7	48.8	12.9
3:01:00	0.9	8.5	1.9	12.4	49.2	13.1
3:02:00	1.8	8.9	1.8	13.3	49.6	13.0
3:03:00	0.2	7.5	1.1	11.7	48.2	12.3
3:04:00	0.8	8.3	1.9	12.3	49.0	13.1
3:05:00	0.3	7.3	1.1	11.8	48.0	12.3
3:06:00	0.1	7.2	1.1	11.6	47.9	12.3
3:07:00	-0.4	7.1	1.2	11.1	47.8	12.4
3:08:00	0.4	7.4	1.7	11.9	48.1	12.9
3:09:00	0.7	7.1	1.1	12.2	47.8	12.3
3:10:00	-0.2	6.6	1.1	11.3	47.3	12.3
3:11:00	-0.1	6.6	1.1	11.4	47.3	12.3
3:12:00	0.6	7.1	1.8	12.1	47.8	13.0
3:13:00	0.3	6.4	0.9	11.8	47.1	12.1
3:14:00	0.0	6.3	1.2	11.5	47.0	12.4
3:15:00	1.1	6.6	1.1	12.6	47.3	12.3
3:16:00	-0.3	5.9	1.0	11.2	46.6	12.2
3:17:00	0.0	5.8	1.1	11.5	46.5	12.3
3:18:00	0.0	5.6	1.1	11.5	46.3	12.3
3:19:00	0.4	5.6	0.9	11.9	46.3	12.1
3:20:00	0.4	5.8	1.4	11.9	46.5	12.6
3:21:00	0.4	5.7	1.3	11.9	46.4	12.5
3:22:00	1.3	5.8	1.6	12.8	46.5	12.8
3:23:00	1.1	5.7	1.5	12.6	46.4	12.7
3:24:00	0.8	5.2	0.9	12.3	45.9	12.1
3:25:00	1.2	5.2	1.1	12.7	45.9	12.3
3:26:00	0.7	5.0	1.0	12.2	45.7	12.2
3:27:00	0.6	5.0	1.5	12.1	45.7	12.7
3:28:00	1.3	5.3	1.6	12.8	46.0	12.8
3:29:00	0.9	5.2	1.6	12.4	45.9	12.8
3:30:00	1.3	5.3	1.6	12.8	46.0	12.8
3:31:00	0.3	4.4	1.0	11.8	45.1	12.2
3:32:00	0.0	4.2	1.1	11.5	44.9	12.3
3:33:00	1.3	4.7	1.2	12.8	45.4	12.4
3:34:00	1.2	4.8	1.2	12.7	45.5	12.4
3:35:00	0.3	4.6	1.4	11.8	45.3	12.6

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

File R22350 Project 05CA38931
Last Revised: April 19, 2007

LOGIX INSULATED CONCRETE FORMS LTD
SAMPLE TIME-DEFLECTION DATA
Test Start Time: April 18, 2007, 11:12:45

Time	In-Test Deflection			Total Deflection		
h:mm:ss	DF01	DF02	DF03	TD01	TD02	TD03
3:36:00	1.4	4.8	1.6	12.9	45.5	12.8
3:37:00	0.8	4.5	1.5	12.3	45.2	12.7
3:38:00	1.4	4.7	1.6	12.9	45.4	12.8
3:39:00	0.3	4.0	1.1	11.8	44.7	12.3
3:40:00	0.4	3.9	0.9	11.9	44.6	12.1
3:41:00	1.3	4.7	1.5	12.8	45.4	12.7
3:42:00	1.4	4.6	1.3	12.9	45.3	12.5
3:43:00	1.0	4.5	1.6	12.5	45.2	12.8
3:44:00	0.4	3.8	0.9	11.9	44.5	12.1
3:45:00	0.8	4.3	1.5	12.3	45.0	12.7
3:46:00	0.5	3.7	0.9	12.0	44.4	12.1
3:47:00	0.9	4.1	1.1	12.4	44.8	12.3
3:48:00	0.0	3.8	1.2	11.5	44.5	12.4
3:49:00	0.9	4.3	1.5	12.4	45.0	12.7
3:50:00	1.6	4.5	1.6	13.1	45.2	12.8
3:51:00	0.6	4.1	1.4	12.1	44.8	12.6
3:52:00	1.2	4.3	1.5	12.7	45.0	12.7
3:53:00	0.2	3.7	1.0	11.7	44.4	12.2
3:54:00	0.3	3.9	1.3	11.8	44.6	12.5
3:55:00	0.2	3.7	0.9	11.7	44.4	12.1
3:56:00	0.4	3.6	1.0	11.9	44.3	12.2
3:57:00	1.1	4.2	1.5	12.6	44.9	12.7

All temperatures in °C and pressures in inches of water
Blank entries denote thermocouple malfunction

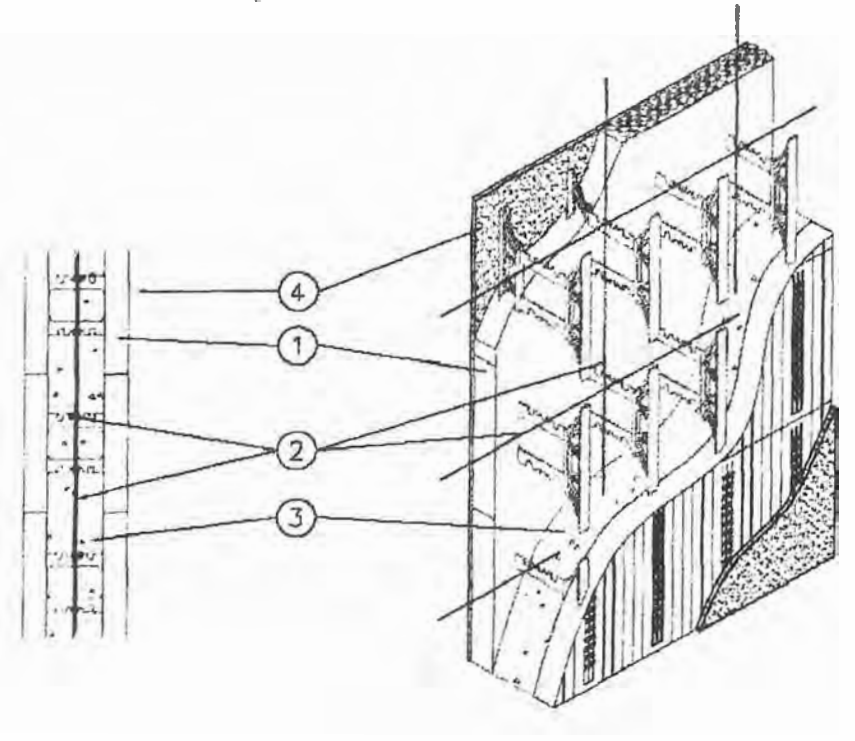
File R22350 Project 05CA38931
Last Revised: April 19, 2007

Design No. U932

Fire Resistance Ratings - ANSI/UL 263

See General Information for Fire Resistance Ratings

Design No. U932
Bearing Wall Rating - 2, 3 or 4 Hr (See item 1)



1. **Insulated Concrete Forms*** —Standard form units comprised of two 48 in. by 16 in. by 2-3/4 in. thick expanded polystyrene (EPS) panels linked by polypropylene webs at 8 in. OC. The min width of the ICF cavity is 4 in. as shown in the table below. Height adjusters consist of 24 in. long, 4 in. high and 2-3/4 in. thick flat EPS panels. End caps vary with wall thickness from 4 in. to 10 in. wide, 16 in. high and 2-1/4 thick flat EPS panels. Assembly ratings depend on width of ICF cavity as shown in table below:

Assembly Rating, (Hr)	Min. ICF Cavity Thickness, (in)
2	4
3	6.25
4	8

LOGIX INSULATED CONCRETE FORMS LTD

2. **Reinforcing Steel** — No. 4 steel rebars inserted horizontally into each ICF course within polypropylene web notches. No. 4 rebars placed vertically at 16 in. OC into centre of ICFs.

3. **Normal Weight Concrete** — 145 ± 5 pcf density, 2900 psi nominal compressive strength.

4. **Gypsum Wallboard** — Min ½ in. thick, 1.5 psf min area density, 48 in. wide gypsum wallboard fastened to flanges of polypropylene webs with 2 in. long drywall screws at 16 in. OC vertically and horizontally. Joints covered with joint compound, covered with joint tape, and covered with an additional coat of joint compound. Screwheads covered with joint compound.

*Bearing the UL Classification Mark

Subscriber ID: 106377001
Directory: FIRERES

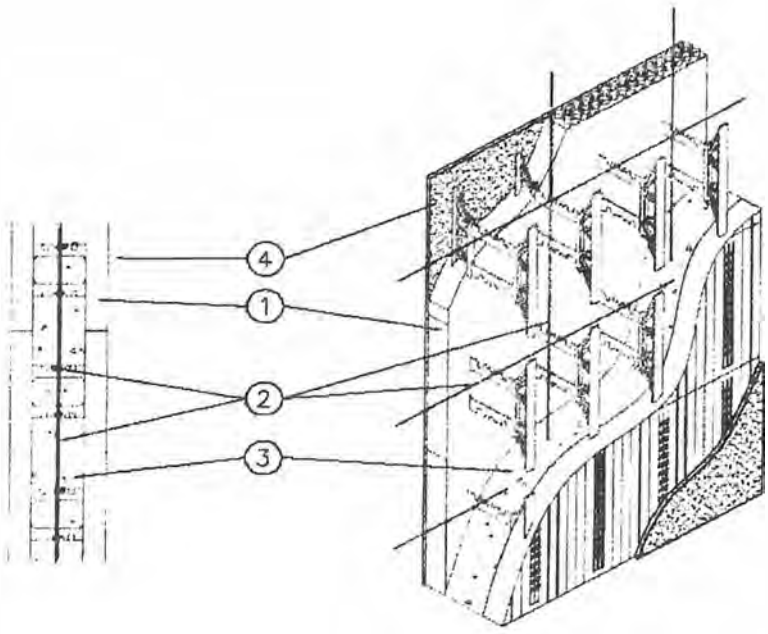
Design No. U933

Fire Resistance Ratings - ANSI/UL 263

See General Information for Fire Resistance Ratings

Design No. U933

Bearing Wall Rating - 4 Hr



1. **Insulated Concrete Forms*** —Standard form units comprised of two 48 in. by 16 in. by 2-3/4 in. thick expanded polystyrene (EPS) panels linked by polypropylene webs at 8 in. OC. The min width of the ICF cavity is 6.25 in. Height adjusters consist of 24 in. long, 4 in. high and 2-3/4 in. thick flat EPS panels. End caps vary with wall thickness from 4 in. to 10 in. wide, 16 in. high and 2-1/4 thick flat EPS panels.

LOGIX INSULATED CONCRETE FORMS LTD

2. **Reinforcing Steel** — No. 4 steel rebars inserted horizontally into each ICF course within polypropylene web notches. No. 4 rebars placed vertically at 16 in. OC into centre of ICFs.

3. **Normal Weight Concrete** — 145 ± 5 pcf density, 2900 psi nominal compressive strength.

4. **Gypsum Board*** — Min 5/8 in. thick, 48 in. wide gypsum wallboard fastened to flanges of polypropylene webs with 2 in. long drywall screws at 16 in. OC vertically and horizontally. Joints covered with joint compound, covered with joint tape, and covered with an additional coat of joint compound. Screwheads covered with joint compound.

See Gypsum Board (CKNX) Category for names of manufacturers

*Bearing the UL Classification Mark

Subscriber ID: 106377001

Directory: FIRERES

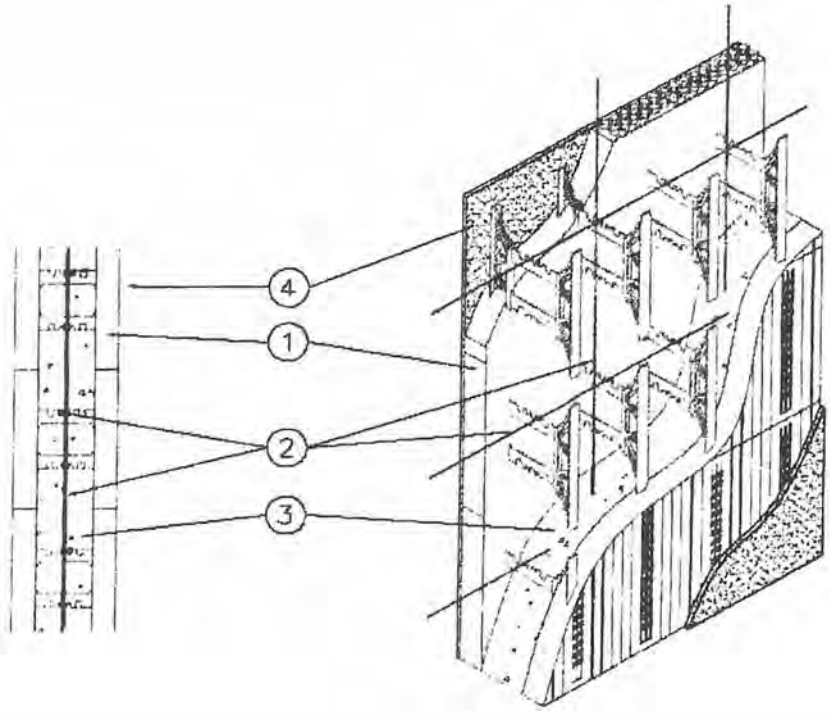
Design No. W017

Fire Resistance Ratings

See General Information for Fire Resistance Ratings

Design No. W017

Assembly Rating - 2, 3 or 4 h (See item 1)



Bearing Wall

1. **Insulated Concrete Forms** — CDELC (Guide No. 40 U18.45). Standard form units comprised of two 1220 mm by 406 mm by 70 mm thick expanded polystyrene (EPS) panels linked by polypropylene webs at 200 mm OC. The minimum width of the ICF cavity is 102 mm as shown in the table below. Height adjusters consist of 610 mm long, 102 mm high and 70 mm thick flat EPS panels. End caps vary with wall thickness from 102 mm to 250 mm wide, 406 mm high and 57 mm thick flat EPS panels. Assembly ratings depend on width of ICF cavity as shown in table below:

Assembly Rating, h	Min ICF Cavity Thickness, mm
2	102
3	159
4	203

LOGIX INSULATED CONCRETE FORMS LTD

2. **Reinforcing Steel** — 10M reinforcing bars inserted horizontally into each ICF course within polypropylene web notches. Reinforcing bars placed vertically at 400 mm OC into centre of ICFs.

3. **Sand-Limestone Concrete** — 2300 ± 50 kg/m^3 density, 20 MPa nominal compressive strength.

4. **Gypsum Wallboard** — 12.7 mm thick, 7.5 kg/m^2 minimum, 1220 mm wide gypsum wallboard fastened to flanges of polypropylene webs with 50 mm long drywall screws at 406 mm OC vertically and horizontally. Joints covered with joint compound, covered with joint tape, and covered with an additional coat of joint compound. Screwheads covered with joint compound.

Subscriber ID: 106377001
Directory: ULCFIRERES

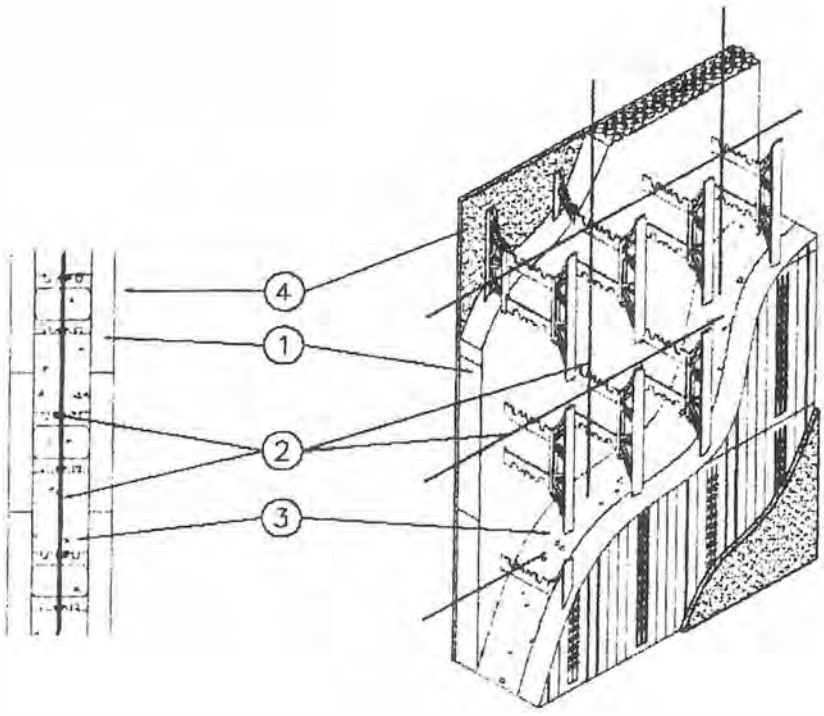
Design No. W018

Fire Resistance Ratings

See General Information for Fire Resistance Ratings

Design No. W018

Assembly Rating - 4 h



Bearing Wall

* 1. **Insulated Concrete Forms** — CDELC (Guide No. 40 U18.45). Standard form units comprised of two 1220 by 406 mm by 70 mm thick expanded polystyrene (EPS) panels linked by polypropylene webs at 200 mm OC. The minimum width of the ICF cavity is 159 mm. Height adjusters consist of 610 mm long, 102 mm high and 70 mm thick flat EPS panels. End caps vary with wall thickness from 102 mm to 250 mm wide, 406 mm high and 57 mm thick flat EPS panels.

LOGIX INSULATED CONCRETE FORMS LTD

2. **Reinforcing Steel** — 10M reinforcing bars inserted horizontally into each ICF course within polypropylene web notches. Reinforcing bars placed vertically at 400 mm OC into centre of ICFs.

3. **Sand-Limestone Concrete** — 2300 ± 50 kg/m^3 density, 20 MPa nominal compressive strength.

* 4. **Gypsum Wallboard** — CKNXC (Guide 40 U18.23). Minimum 15.9 mm thick, 1220 mm wide gypsum wallboard fastened to flanges of polypropylene webs with 50 mm long drywall screws at 406 mm OC vertically and horizontally. Joints covered with joint compound, covered with joint tape, and covered with an additional coat of joint compound. Screwheads covered with joint compound. See ULC List of Equipment and Materials, Fire Resistance for names of manufacturers.

CGC INC

BPB CANADA INC

LAFARGE NORTH AMERICA INC

G-P GYPSUM CORP, SUB OF

GEORGIA-PACIFIC CORP

Subscriber ID: 106377001
Directory: ULCFIRERES

TEST RECORD NO. 1

THE INVESTIGATION

The object of the investigation was to evaluate the fire resistance rating of a load-bearing wall assembly described herein, when investigated in accordance with the Standard Methods of Fire Endurance Tests of Building Construction and Materials, CAN/ULC-S101-04, and Standard for Fire Tests of Building Construction and Materials, ANSI/UL 263, 13th edition and ASTM E119-07.

MATERIALS:

The following is a description of the materials used in the preparation of the tested wall assembly:

1 Logix Standard Form Unit - Two 1220 mm by 406 mm by 70 mm thick expanded polystyrene (EPS) panels linked by polypropylene webs at 200 mm OC. The width of the ICF cavity is minimum 159 mm.

2. Logix Height Adjuster - 610 mm long, 102 mm high and 70 mm thick. Pairs of height adjusters were placed on top of standard form units.

3 Logix End Caps - 159 mm wide, 406 mm high and 57 mm thick. The end caps were installed at the ends of the ICF courses to contain the concrete within the wall.

4. 10 M steel reinforcing bar.

5. Sand-Limestone Concrete - 2400 kg/m^3, 20 MPa nominal 28 day compressive strength.

6. Gypsum Wallboard - 1220 mm by 3050 mm by 12.7 mm thick, 7.5 kg/m^2 area density non-fire-rated gypsum wallboard.

7. Joint Compound - CGC Drywall Compound.

8. Joint tape- CGC Drywall Tape, 50 mm wide.

ERECTION OF TEST ASSEMBLY:

The assembly of Logix Insulated Concrete Forms, installation of reinforcing rods and pouring of concrete was done at Underwriters' Laboratories of Canada.

Two walls were constructed. The ICFs were hand-placed on a plywood base sitting on a concrete surface. End caps were installed appropriately. Horizontal reinforcing steel was clipped at 406 mm OC into the polypropylene webs as each course was laid.

A total of seven vertical courses of ICFs were stacked. The vertical joints between ICFs were staggered. One course of height adjusters was placed on top of the last ICF course to increase the overall height of the wall to 2972 mm.

Vertical steel reinforcement bars were installed at 400 mm OC (between every second pair of webs) on the centerline of the ICF cavities.

The concrete was poured into the ICF cavities and mechanically vibrated after each lift to ensure the concrete filled the cavities around the reinforcing rods.

The concrete slump was measured and found to be 80 ± 20 mm.

The finished wall was 3060 mm wide by 2972 mm high by 298 mm thick and mounted into a 9.3 m^2 opening.

To minimize the concrete drying time, the EPS panels were removed from the unexposed side of the concrete core on the 2 slabs after it had cured for 30 days. The wall assemblies were conditioned at ambient conditions for (6) months and subsequently conditioned at approximately 40°C for another (8) months prior to testing.

On the exposed side of the test wall assembly, 12.7 mm thick gypsum wallboard panels were fastened vertically to the flanges of the polypropylene webs. The gypsum wallboard panels consisted of two identical panels 3050 mm long by 1220 mm wide and one panel 3050 mm long by 570 mm wide 50 mm long drywall screws were driven at 406 mm OC vertically and horizontally. Two layers of joint compound were applied to the wallboard joints and the screw heads. Joint tape was applied to the wallboard joints after the first layer of compound was trowelled on.

FIRE ENDURANCE TESTING:

SAMPLES

The test assembly was constructed from components as described in "Materials" and assembled as described in "Erection of Test Assembly".

The average moisture content of the concrete core measured at the mid depth at the time of test was approximately 70% R.H. at 21 ° C.

METHOD

The furnace was fired in accordance with the Time-Temperature Curve shown in the Standards CAN/ULC-S101-04 and UL 263. Throughout this period, observations were made of the character of the fire and the condition of the exposed and unexposed surfaces of the assembly. Developments pertinent to the performance of the assembly, with particular reference to structural stability and passage of flame, were noted and recorded.

Temperature Measurements - The furnace temperatures were measured with 12 thermocouples symmetrically located in the furnace chamber.

Temperatures on the unexposed concrete surface were measured with nine thermocouples positioned as indicated in Illustration 1. (Thermocouples TC1 through TC9)

The ambient temperature at the start of the test was 18° C.

For information purposes, four additional thermocouples numbered 10 to 13 were placed on webbing on the unexposed surface.

Pressure Measurements - The furnace pressures with respect to atmospheric pressure were measured with 3 pressure gauges positioned through the back wall of the furnace chamber along the vertical centreline of the furnace. The gauges were situated near the top, 2/3 height and bottom of the wall assembly. The gauges were attached to a manometer. See Illustration 7 for pressure data.

Loading - The test assembly was loaded by means of a hydraulic loading system along the bottom of the assembly.

The required superimposed loads computed as per the Standards CSA A23.3-94, Chapter 14 and ACI 318-99 are 1566 kN (352 kips) and 1628 kN (366 kips) respectively.

The wall assembly was subjected to the most critical load, 1628 kN (366 kips). The load was distributed to the sample via (6) hydraulic jacks and was applied in 25% increments prior to commencement of the fire test, in accordance with the Standards CAN/ULC-S101 and UL 263.

Deflections - The deflections of the assembly in the vertical and horizontal planes were monitored continuously by a total of three deflection gauges. Horizontal deflection was monitored at the mid-point of the wall. Vertical deflections were monitored at the quarter points of the wall.

Refer to Illustrations 1 and 2 for images of the unexposed and exposed surfaces respectively before the fire test.

RESULTS

Character and Distribution of the Fire - The furnace was luminous and well distributed throughout the test and the temperatures developed followed the Time-Temperature Curve specified in the Standards CAN/ULC-S101 and UL 263 as shown in Figure 7.

Observations on the exposed and unexposed side:

Time (h: min: sec)	Observations
0:0:00	Gas on.
0:3:30	Drywall paper darkened. Paper has burned off
0:9:00	Drywall joint compound beginning to delaminate
0:12:00	Large piece of joint compound fell off.
0:13:00	Drywall joints beginning to open. Drywall buckling.
0:15:47	Large piece of drywall has fallen from centre of wall
0:16:50	Centre of wall on exposed side flaming
0:19:00	All EPS insulation flaming on exposed side
0:22:10	Some spalling of concrete on exposed side
0:24:00	Most of EPS and webs consumed on exposed side
0:36:00	Hydraulic pressure to rams has increased. Reduced by 100 psi.
0:58:00	Some moisture escaping from concrete on unexposed side
1:00:00	Maximum unexposed temp. 37°C on TC #4
1:05:00	Crack has developed in bottom of wall North side
1:36:00	Several cracks have developed in concrete on unexposed side
2:00:00	Maximum temp. 102°C. Average unexposed temp. 91°C
3:00:00	No change.

Observations on the exposed and unexposed side: (cont'd)

Time (h: min: sec)	Observations
3:19:00	Web on unexposed side has fallen off. No through opening
3:30:00	Cotton pad applied to area of unexposed side where webs have come off. No ignition of cotton pad.
3:57:00	Max individual temperature 187°C. Average unexposed temp. 159°C which is over allowable limit. Gas off.

Note:

A roving thermocouple was available as required in CAN/ULC-S101-04, however the condition of the wall on the unexposed side did not warrant its use.

HOSE STREAM EXPOSURE:

The hose stream was applied to the test assembly immediately after the fire endurance test. The test was conducted in accordance with the Standards CAN/ULC-S101 and UL 263. The water pressure was maintained at 310 kPa for 5 minutes which satisfies the hose stream requirement for a 4 hr fire exposure. The test assembly withstood the hose stream test without developing any through-holes or openings, or penetrations of the water stream.

Observations After Test - No concrete was displaced from the exposed face of the wall during the hose stream test.

Consumption of the polypropylene webs left holes up to 140 mm deep on the exposed side of the wall.

The appearance of the unexposed surface after the hose stream is shown in Figure 5. The appearance of the exposed surface is shown in Figure 6.

STUDY FOR CERTIFICATION

Following this test, the client requested that an engineering review be conducted to allow a 159 mm and 200 mm thick concrete wall to carry a 4 hr rating and a 102 mm thick concrete wall to carry a 2 hr rating. Details of the engineering study are on file at ULC.

As a result of the aforementioned test and engineering study, ULC design W017 and UL design U932 have been issued with 2, 3 and 4 hr assembly ratings for the 102, 152 and 203 mm thick concrete walls respectively. In addition, ULC design W018 and UL design U933 have been issued with a 4 hr rating for the 159 mm thick concrete wall provided 15.9 mm thick listed gypsum board is installed on both faces of wall.

CONCLUSION:

The following conclusions represent the judgment of Underwriters' Laboratories of Canada based on the results of the investigation described in this Report as they relate to currently established principles and previously recorded data.

FIRE RESISTIVE PROPERTIES:

The transmission of heat through the assembly was not sufficient to raise the temperature of the unexposed surface in excess of the permitted rise of 140°C average or 180°C individual above the initial temperature of the assembly during the 3 hr rating period. The wall assembly sustained the applied load without passage of flame through the assembly for a period of 3 hour 57 minutes. The assembly also withstood the impact, cooling and eroding effects of the hose stream for a 4 hr resistance period.

As a result, Design Nos. W017 and W018 have been established and will appear in the ULC List of Equipment and Materials,

The above classification is based upon the conditions of acceptance and performance requirements contained the Standards CAN/ULC-S101-04.

UL LISTING SUMMARY PAGE

This Report describes a fire test program of a reinforced concrete bearing wall system incorporating Insulated Concrete Forms (ICF). The program involved the construction of a full-scale wall assembly. The concrete poured in the wall contained no polypropylene fibres.

The wall assembly was subjected to a fire exposure and hose stream test in accordance with the "Standard for Fire Tests of Building Construction and Materials", UL 263, 13th edition and ASTM E119-07.

Based upon the favorable results of the fire and hose stream tests and the aforementioned engineering review, ULI Design Nos. U932 and U933 have been established to include unfibrated concrete for which a 2, 3 or 4 hr fire resistance rating has been assigned

LISTING TEXT

On the basis of the foregoing, a Listing under Guide No. 40 U18.45 (CDELC), Insulated Concrete Forms, will be promulgated to include the product covered by this Report.

The Listing Text will be as follows:

Logix Insulated Concrete Forms Ltd., Port Moody, BC
Insulated concrete forms (ICFs) consisting of two 2440 mm long by 406 mm high by 70 mm thick EPS panels linked by polypropylene webs at a minimum spacing of 200 mm OC.

Design Number	Min Width of ICF Cavity, mm	Thickness of EPS Panels, mm
W017	102	70
W018	159	70

Marking: ULC label on each bundle of ICFs.

REPORT BY:

Claude Travers, P.Eng.
Project Engineer
Fire Protection Division

REVIEWED BY:

G. Abbas Nanji, P.Eng.
Engineering Group Leader
Fire Protection Division

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