Sengupta, Abhijit

From: Williams, Charles R. [Charles.Williams@pgnmail.com]
Sent: Monday, January 11, 2010 5:38 PM
To: Lake, Louis; Thomas, George; Carrion, Robert; 'nausdj@ornl.gov'; 'daniel.fiorello@exeloncorp.com'; Lese, Joseph A.
Cc: Miller, Craig L
Subject: FM 4.7 Draft for Review
Attachments: FM 4.7 Exhibit 4 - Pour Location Drawing Buttress 6-1 and 3-4 color.pdf; FM 4.7.pdf; FM 4.7 Exhibit 1 - Break Test Summary - core v original table.pdf; FM 4.7 Exhibit 2 Cylinder Tests exterior wall 28 days.pdf; FM 4.7 Exhibit 3 - Concrete .pdf

2 pages 1 page 1 page 1 page 15 pages

Mr Lake and others,

Attached for your review is draft of FM 4.7 and its exhibits. If you have any questions, please contact me or Craig Miller.

Thank you,

Charles Williams
919-516-7417

The message is ready to be sent with the following file or link attachments:

FM 4.7 Exhibit 4 - Pour Location Drawing Buttress 6-1 and 3-4 color.pdf FM 4.7.pdf FM 4.7 Exhibit 1 - Break Test Summary - core v original table.pdf FM 4.7 Exhibit 2 Cylinder Tests exterior wall 28 days.pdf FM 4.7 Exhibit 3 - Concrete .pdf

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P/ 112

1B

APPROVED DESIGN MIX FORMULAS

C. A. T-21510 (3000) -4

#67
Cement: 517 lbs.
C. A. : 1800 "
F. A. : 1237 "
Dx: 4.0 ozs.
Dtd.: 16.5 ozs.
Water: 271 lbs.

C. A. T-21510 Mod. (3000) -4

#67
Cement: 562 lbs.
C.A.: 1800 "
F.A.: 1220 "
Dx: 4.0 ozs.
Dtd: 16.5 ozs.
Water: 271 "

C. A. DM-5 (5000) -3

#67
Cement: 625 lbs.
C.A.: 1800 "
F.A.: 1140 "
Dx: 3.6 ozs.
Dtd.: 21.0 ozs.
Water: 276 lbs.

USED FOR DOME

DM-5 Mod. (5000) -3

#67
Cement: 682 lbs.
C.A.: 1800 "
F.A.: 1100 "
Dx: 3.6 ozs.
Dtd: 21.0 ozs.
Water: 276 lbs. - 33.1

APPROVED

727550-2 (5000) -4

#67
Cement: 705 lbs.
C.A.: 1800 "
F.A.: 1080 "
Dx: 4.5 ozs.
Dtd: 23.0 ozs.
Water: 286 lbs.

727550-2 Mod. (5000) -4

#67
Cement: 752 lbs.
C.A.: 1800 "
F.A.: 1050 "
Dx: 4.5 ozs.
Dtd: 23.0 ozs.
Water: 286 lbs.

DM-7 (5000 Ohstt) -3

#67
Cement: 825 lbs.
C.A.: 1650 "
F.A.: 1070 "
Dx: 5.0 ozs.
Dtd: 25.0 ozs.
Water: 335 lbs.

DM-16 (1500) -5

#67
Cement: 365 lbs.
C.A.: 1760 "
F.A.: 1690 "
Dx: 1.3 ozs.
Dtd: 10.5 ozs.
Water: 290 lbs.

DM-16 Mod. (1500) -5

#67
Cement: 413 lbs.
C.A.: 1760 "
F.A.: 1640 "
Dx: 1.3 ozs.
Dtd: 10.5 ozs.
Water: 290 lbs.

736641-4 1/2 (5000)

#67
Cement: 752 lbs.
C.A.: 1650 "
F.A.: 1185 "
Dx: 4.5 ozs.
Dtd: 20 ozs.
Water: 294 lbs.

4.7 Excessive Stresses from Differential Material Properties

Description:
When concrete mixes of different physical properties are combined they may perform differently under stress. These differences can cause stress concentrations at the interface, leading to bond failure and cracking. In concrete construction it is possible to have concretes of different strength placed adjacent to each other while expected to perform as a uniform material with the same properties.
The purpose of this document is to determine if such conditions existed at the delamination area and contributed to the delamination.

Data to be collected and Analyzed:
1. Review original records for concrete mixes used in the construction of the structure (FM 4.7 Exhibit 3).
2. Review pour records for information on materials used in adjacent lifts (FM 4.7 Exhibit 4 is a graphical summary).
3. Test core samples from different concrete/grout mixes. (FM 4.7 Exhibit 1 is a summary of core tests, presented with original strength data for the corresponding pours)

Verified Supporting Evidence:
a. Three different concrete mixes were used in bay RBCN-0015. A total of four concrete mixes were used in the containment structure for the 5000 psi level.

Verified Refuting Evidence:
a. Different concrete mixes were used in the containment structure. It appears that this was allowed as long as the strength exceeded the design strength and the strength variation was acceptable. FM 4.7 Exhibit 2 is a statistical analysis of the two main mixes used anywhere in the containment structure. It shows that for mixes DM-5 and 727550-2 the average strength was 5640 psi and 5774 psi (with Standard deviation of 508 and 541 psi) respectively.

Discussion:
a) The concrete mixes used in the containment wall had similar physical properties and are not expected to have significantly different strength properties.
b) Even when placed on top of each other, different concrete mixes were blended at the interface by adequate vibration (see FM 2.7). This procedure prevents the creation of defined interface and eliminates differential properties at the location.
c) All interfaces between different concrete mixes in the wall were horizontal and full depth. It is not expected that such interface could have a significant effect on delamination in the vertical plane.

Conclusion:
There were no excessive stresses from differential material properties in the containment wall and this Failure Mode did not cause the delamination.

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Draft1

Cylinder Tests exterior wall - 28 days

Detail and Summary of 28 days Cylinder Tests for Containment Building

Mix	Pour	Elev	Description	Cylinder	A	Fc
RB	**Structure Summary:**		Standard Variation: **605.23**	**451**	Samples	Ave. Fc: **5650**
727550-2	**Mix Summary:**		Standard Variation: **541.071**	**200**	Samples	Ave. Fc: **5774**
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2071	C	5360
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2071	D	5550
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2072	D	5750
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2072	C	5040
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2073	D	5570
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2073	C	5130
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2074	C	5320
727550-2	641	132	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2074	D	5520
641	**Pour Summary:**		Standard Variation: **238.627**	**8**	Samples	Ave. Fc: **5405**
727550-2	642	122	EXTERIOR WALL BUTTRESS 1 - 6, PERSONNEL	2077	D	5590
727550-2	642	122	EXTERIOR WALL BUTTRESS 1 - 6, PERSONNEL	2077	C	5780
727550-2	642	122	EXTERIOR WALL BUTTRESS 1 - 6, PERSONNEL	2078	C	5500
727550-2	642	122	EXTERIOR WALL BUTTRESS 1 - 6, PERSONNEL	2078	D	5340
642	**Pour Summary:**		Standard Variation: **183.553**	**4**	Samples	Ave. Fc: **5553**
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2117	C	5840
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2117	D	5570
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2118	C	5820
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2118	D	5780
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2119	C	5590
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2119	D	5750
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2120	C	5570
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2120	D	5700
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2121	D	5320
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2121	C	5430
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2122	D	5640
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2122	C	5710
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2123	D	5640
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2123	C	5660
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2124	C	6170
727550-2	666	160	EXTERIOR WALL BUTTRESS 3 - 4, EQUIPMENT	2124	D	5780
666	**Pour Summary:**		Standard Variation: **189.56**	**16**	Samples	Ave. Fc: **5686**
727550-2	742	160	SECONDARY SHIELD WALL, SE QUADRANT	2224	C	5850
727550-2	742	160	SECONDARY SHIELD WALL, SE QUADRANT	2224	D	6420
742	**Pour Summary:**		Standard Variation: **403.051**	**2**	Samples	Ave. Fc: **6135**
727550-2	743	240	EXTERIOR WALL BUTTRESS 3 - 4	2225	C	5470
727550-2	743	240	EXTERIOR WALL BUTTRESS 3 - 4	2225	D	5750
727550-2	743	240	EXTERIOR WALL BUTTRESS 3 - 4	2226	D	6230
727550-2	743	240	EXTERIOR WALL BUTTRESS 3 - 4	2226	C	5680

Mix	Pour	Elev	Description	Cylinder	A	Fc
743	**Pour Summary:**		Standard Variation: **321.183**		**4** Samples	Ave. Fc: **5783**
727550-2	746	160	SECONDARY SHIELD WALL, NORTH	2231	D	4630
727550-2	746	160	SECONDARY SHIELD WALL, NORTH	2231	C	5520
746	**Pour Summary:**		Standard Variation: **629.325**		**2** Samples	Ave. Fc: **5075**
727550-2	747	250	EXTERIOR WALL BUTTRESS 3 - 4	2232	C	6740
727550-2	747	250	EXTERIOR WALL BUTTRESS 3 - 4	2232	D	5640
727550-2	747	250	EXTERIOR WALL BUTTRESS 3 - 4	2233	C	5780
727550-2	747	250	EXTERIOR WALL BUTTRESS 3 - 4	2233	D	5730
727550-2	747	250	EXTERIOR WALL BUTTRESS 3 - 4	2234	D	5520
727550-2	747	250	EXTERIOR WALL BUTTRESS 3 - 4	2234	C	5750
747	**Pour Summary:**		Standard Variation: **441.316**		**6** Samples	Ave. Fc: **5860**
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2239	C	5870
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2239	D	6010
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2240	C	5220
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2240	D	5680
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2241	D	5310
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2241	C	5310
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2242	C	5130
727550-2	753	160	SECONDARY SHIELD WALL & INCORE PIT	2242	D	5130
753	**Pour Summary:**		Standard Variation: **346.276**		**8** Samples	Ave. Fc: **5458**
727550-2	754	160	SECONDARY SHIELD WALL, NW QUADRANT	2243	C	5470
727550-2	754	160	SECONDARY SHIELD WALL, NW QUADRANT	2243	D	5660
754	**Pour Summary:**		Standard Variation: **134.350**		**2** Samples	Ave. Fc: **5565**
727550-2	759	170	SECONDARY SHIELD WALL, SE QUADRANT	2249	C	6080
727550-2	759	170	SECONDARY SHIELD WALL, SE QUADRANT	2249	D	5910
759	**Pour Summary:**		Standard Variation: **120.208**		**2** Samples	Ave. Fc: **5995**
727550-2	765	170	SECONDARY SHIELD WALL, NE QUADRANT	2257	C	5500
727550-2	765	170	SECONDARY SHIELD WALL, NE QUADRANT	2257	D	5980
727550-2	765	170	SECONDARY SHIELD WALL, NE QUADRANT	2258	C	5750
727550-2	765	170	SECONDARY SHIELD WALL, NE QUADRANT	2258	D	5680
765	**Pour Summary:**		Standard Variation: **198.557**		**4** Samples	Ave. Fc: **5728**
727550-2	768	170	SECONDARY SHIELD WALL, SE QUADRANT	2261	C	5130
727550-2	768	170	SECONDARY SHIELD WALL, SE QUADRANT	2261	D	5240
768	**Pour Summary:**		Standard Variation: **77.7817**		**2** Samples	Ave. Fc: **5185**
727550-2	769	250	EXTERIOR WALL BUTTRESS 1 - 6	2262	C	5840
727550-2	769	250	EXTERIOR WALL BUTTRESS 1 - 6	2262	D	5480
727550-2	769	250	EXTERIOR WALL BUTTRESS 1 - 6	2263	C	5310
727550-2	769	250	EXTERIOR WALL BUTTRESS 1 - 6	2263	D	5680
769	**Pour Summary:**		Standard Variation: **231.283**		**4** Samples	Ave. Fc: **5578**
727550-2	774	180	SECONDARY SHIELD WALL, NE QUADRANT	2270	D	5310

Mix	Pour	Elev	Description	Cylinder	A		Fc
727550-2	774	180	SECONDARY SHIELD WALL, NE QUADRANT	2270	C		5730
727550-2	774	180	SECONDARY SHIELD WALL, NE QUADRANT	2271	D		5480
727550-2	774	180	SECONDARY SHIELD WALL, NE QUADRANT	2271	C		5480
774	**Pour Summary:**		Standard Variation: **173.013**		**4** Samples	Ave. Fc:	**5500**
727550-2	776	131	CFT-1A ROOM NORTH WALL	2273	D		5700
727550-2	776	131	CFT-1A ROOM NORTH WALL	2273	C		6070
776	**Pour Summary:**		Standard Variation: **261.63**		**2** Samples	Ave. Fc:	**5885**
727550-2	783	160	FUEL HANDLING CANAL NORTH WALL	2280	C		5640
727550-2	783	160	FUEL HANDLING CANAL NORTH WALL	2280	D		5180
727550-2	783	160	FUEL HANDLING CANAL NORTH WALL	2281	C		5680
727550-2	783	160	FUEL HANDLING CANAL NORTH WALL	2281	D		5380
783	**Pour Summary:**		Standard Variation: **234.663**		**4** Samples	Ave. Fc:	**5470**
727550-2	795	160	SECONDARY SHIELD WALL, SE QUADRANT	2290	C		6300
727550-2	795	160	SECONDARY SHIELD WALL, SE QUADRANT	2290	D		6120
727550-2	795	160	SECONDARY SHIELD WALL, SE QUADRANT	2291	C		5240
727550-2	795	160	SECONDARY SHIELD WALL, SE QUADRANT	2291	D		5500
795	**Pour Summary:**		Standard Variation: **501.863**		**4** Samples	Ave. Fc:	**5790**
727550-2	797	170	FUEL HANDLING CANAL NORTH WALL	2295	C		5310
727550-2	797	170	FUEL HANDLING CANAL NORTH WALL	2295	D		6720
727550-2	797	170	FUEL HANDLING CANAL NORTH WALL	2297	C		6190
727550-2	797	170	FUEL HANDLING CANAL NORTH WALL	2297	D		6010
797	**Pour Summary:**		Standard Variation: **582.373**		**4** Samples	Ave. Fc:	**6058**
727550-2	805	160	FUEL HANDLING CANAL SOUTH & WEST WALL	2303	D		5660
727550-2	805	160	FUEL HANDLING CANAL SOUTH & WEST WALL	2303	C		5340
727550-2	805	160	FUEL HANDLING CANAL SOUTH & WEST WALL	2304	D		5320
727550-2	805	160	FUEL HANDLING CANAL SOUTH & WEST WALL	2304	C		5360
805	**Pour Summary:**		Standard Variation: **160.831**		**4** Samples	Ave. Fc:	**5420**
727550-2	810	109	RETAINING WALL, SW	2308	D		5480
727550-2	810	109	RETAINING WALL, SW	2308	C		5480
810	**Pour Summary:**		Standard Variation: **0**		**2** Samples	Ave. Fc:	**5480**
727550-2	813	180	FUEL HANDLING CANAL NORTH WALL	2312	C		6010
727550-2	813	180	FUEL HANDLING CANAL NORTH WALL	2312	D		5480
727550-2	813	180	FUEL HANDLING CANAL NORTH WALL	2313	C		5480
727550-2	813	180	FUEL HANDLING CANAL NORTH WALL	2313	D		6040
813	**Pour Summary:**		Standard Variation: **314.894**		**4** Samples	Ave. Fc:	**5753**
727550-2	815	131	SOUTH WALL CFT-1A ROOM	2315	D		5310
727550-2	815	131	SOUTH WALL CFT-1A ROOM	2315	C		5340
815	**Pour Summary:**		Standard Variation: **21.2132**		**2** Samples	Ave. Fc:	**5325**
727550-2	817	170	SECONDARY SHIELD WALL, SW QUADRANT	2317	C		5660
727550-2	817	170	SECONDARY SHIELD WALL, SW QUADRANT	2317	D		6310

Mix	Pour	Elev	Description	Cylinder	A	Fc
727550-2	817	170	SECONDARY SHIELD WALL, SW QUADRANT	2318	C	5940
727550-2	817	170	SECONDARY SHIELD WALL, SW QUADRANT	2318	D	5960
817	**Pour Summary:**		Standard Variation: **266.255**	**4** Samples	Ave. Fc:	**5968**
727550-2	820	135	CFT-1A ROOM SLAB & WALL	2321	C	5570
727550-2	820	135	CFT-1A ROOM SLAB & WALL	2321	D	5610
820	**Pour Summary:**		Standard Variation: **28.2843**	**2** Samples	Ave. Fc:	**5590**
727550-2	821	118	RETAINING WALL, SW	2322	C	6190
727550-2	821	118	RETAINING WALL, SW	2322	D	6350
821	**Pour Summary:**		Standard Variation: **113.137**	**2** Samples	Ave. Fc:	**6270**
727550-2	825	255	RING GIRDER, BUTTRESS 6	2329	C	6540
727550-2	825	255	RING GIRDER, BUTTRESS 6	2329	D	6370
825	**Pour Summary:**		Standard Variation: **120.208**	**2** Samples	Ave. Fc:	**6455**
727550-2	826	255	RING GIRDER, BUTTRESS 4	2330	C	4700
727550-2	826	255	RING GIRDER, BUTTRESS 4	2330	D	4930
826	**Pour Summary:**		Standard Variation: **162.635**	**2** Samples	Ave. Fc:	**4815**
727550-2	827	180	SECONDARY SHIELD WALL, SW QUADRANT	2331	C	5660
727550-2	827	180	SECONDARY SHIELD WALL, SW QUADRANT	2331	D	5520
727550-2	827	180	SECONDARY SHIELD WALL, SW QUADRANT	2332	C	5590
727550-2	827	180	SECONDARY SHIELD WALL, SW QUADRANT	2332	D	5660
827	**Pour Summary:**		Standard Variation: **67.0199**	**4** Samples	Ave. Fc:	**5608**
727550-2	828	115	RETAINING WALL, SW	2335	D	5710
727550-2	828	115	RETAINING WALL, SW	2335	C	5710
828	**Pour Summary:**		Standard Variation: **0**	**2** Samples	Ave. Fc:	**5710**
727550-2	829	255	RING GIRDER, BUTTRESS 2	2333	D	5310
727550-2	829	255	RING GIRDER, BUTTRESS 2	2333	C	5940
829	**Pour Summary:**		Standard Variation: **445.477**	**2** Samples	Ave. Fc:	**5625**
727550-2	830	143	CFT-1A ROOM WALLS	2334	D	6190
727550-2	830	143	CFT-1A ROOM WALLS	2334	C	5660
830	**Pour Summary:**		Standard Variation: **374.767**	**2** Samples	Ave. Fc:	**5925**
727550-2	841	170	FUEL HANDLING CANAL SOUTH WALL	2349	C	6370
727550-2	841	170	FUEL HANDLING CANAL SOUTH WALL	2349	D	6380
727550-2	841	170	FUEL HANDLING CANAL SOUTH WALL	2350	D	6080
727550-2	841	170	FUEL HANDLING CANAL SOUTH WALL	2350	C	6300
841	**Pour Summary:**		Standard Variation: **139.613**	**4** Samples	Ave. Fc:	**6283**
727550-2	843	172	SECONDARY SHIELD WALL, NW QUADRANT	2351	C	6010
727550-2	843	172	SECONDARY SHIELD WALL, NW QUADRANT	2351	D	6230
843	**Pour Summary:**		Standard Variation: **155.563**	**2** Samples	Ave. Fc:	**6120**
727550-2	844	180	SECONDARY SHIELD WALL, NW QUADRANT	2352	D	6560
727550-2	844	180	SECONDARY SHIELD WALL, NW QUADRANT	2352	C	6310

Detail and Summary of 28 days Cylinder Tests for Containment Building

Mix	Pour	Elev	Description	Cylinder	A	Fc
844	**Pour Summary:**		Standard Variation: **176.777**	**2** Samples	Ave. Fc:	**6435**
727550-2	846	180	FUEL HANDLING CANAL, SOUTH WALL	2354	C	6560
727550-2	846	180	FUEL HANDLING CANAL, SOUTH WALL	2354	D	6540
727550-2	846	180	FUEL HANDLING CANAL, SOUTH WALL	2355	D	5660
727550-2	846	180	FUEL HANDLING CANAL, SOUTH WALL	2355	C	5780
846	**Pour Summary:**		Standard Variation: **481.768**	**4** Samples	Ave. Fc:	**6135**
727550-2	853	160	EL 160 FLOOR SLAB, NW	2361	D	6560
727550-2	853	160	EL 160 FLOOR SLAB, NW	2361	C	6190
727550-2	853	160	EL 160 FLOOR SLAB, NW	2362	D	5660
727550-2	853	160	EL 160 FLOOR SLAB, NW	2362	C	5840
853	**Pour Summary:**		Standard Variation: **398.026**	**4** Samples	Ave. Fc:	**6063**
727550-2	865	206	ELEVATOR SHAFT	2382	D	5480
727550-2	865	206	ELEVATOR SHAFT	2382	C	5500
865	**Pour Summary:**		Standard Variation: **14.1421**	**2** Samples	Ave. Fc:	**5490**
727550-2	946	267	RING GIRDER; 0 - 60 DEGREES	2509	C	5550
727550-2	946	267	RING GIRDER; 0 - 60 DEGREES	2509	D	5540
946	**Pour Summary:**		Standard Variation: **7.07107**	**2** Samples	Ave. Fc:	**5545**
727550-2	951	267	RING GIRDER; 180 - 240 DEGREES	2519	D	6170
727550-2	951	267	RING GIRDER; 180 - 240 DEGREES	2519	C	6260
951	**Pour Summary:**		Standard Variation: **63.6396**	**2** Samples	Ave. Fc:	**6215**
727550-2	953	267	RING GIRDER; 0 - 300 DEGREES	2521	D	6770
727550-2	953	267	RING GIRDER; 0 - 300 DEGREES	2521	C	6930
953	**Pour Summary:**		Standard Variation: **113.137**	**2** Samples	Ave. Fc:	**6850**
727550-2	954	267	RING GIRDER; 60 - 120 DEGREES	2522	C	5700
727550-2	954	267	RING GIRDER; 60 - 120 DEGREES	2522	D	5770
954	**Pour Summary:**		Standard Variation: **49.4975**	**2** Samples	Ave. Fc:	**5735**
727550-2	974	270	RING GIRDER; 90 - 150 DEGREES	2560	C	6370
727550-2	974	270	RING GIRDER; 90 - 150 DEGREES	2560	D	5280
974	**Pour Summary:**		Standard Variation: **770.746**	**2** Samples	Ave. Fc:	**5825**
727550-2	976		DOME POUR G1, AZ 45 - 135	2579	C	6560
727550-2	976		DOME POUR G1, AZ 45 - 135	2579	D	6190
727550-2	976		DOME POUR G1, AZ 45 - 135	2580	D	6030
727550-2	976		DOME POUR G1, AZ 45 - 135	2580	C	6470
976	**Pour Summary:**		Standard Variation: **245.544**	**4** Samples	Ave. Fc:	**6313**
727550-2	978		DOME POUR G1, AZ 225 - 315	2586	C	6330
727550-2	978		DOME POUR G1, AZ 225 - 315	2586	D	6690
978	**Pour Summary:**		Standard Variation: **254.558**	**2** Samples	Ave. Fc:	**6510**
727550-2	980		DOME POUR G2, AZ 135 - 225	2595	C	4600
727550-2	980		DOME POUR G2, AZ 135 - 225	2595	D	5910

Detail and Summary of 28 days Cylinder Tests for Containment Building

Mix	Pour	Elev	Description	Cylinder	A	Fc
980	**Pour Summary:**		Standard Variation: **926.31**	**2** Samples	Ave. Fc:	**5255**
727550-2	981		DOME POUR G2, AZ 315 - 45	2598	D	6010
727550-2	981		DOME POUR G2, AZ 315 - 45	2598	C	5550
981	**Pour Summary:**		Standard Variation: **325.269**	**2** Samples	Ave. Fc:	**5780**
727550-2	983		DOME POUR H3, AZ 180 - 270	2610	C	5270
727550-2	983		DOME POUR H3, AZ 180 - 270	2610	D	5680
727550-2	983		DOME POUR H3, AZ 180 - 270	2612	D	4630
727550-2	983		DOME POUR H3, AZ 180 - 270	2612	C	4830
983	**Pour Summary:**		Standard Variation: **468.713**	**4** Samples	Ave. Fc:	**5103**
727550-2	987		DOME POUR H4, AZ 90 - 180	2628	C	6030
727550-2	987		DOME POUR H4, AZ 90 - 180	2628	D	4930
987	**Pour Summary:**		Standard Variation: **777.817**	**2** Samples	Ave. Fc:	**5480**
727550-2	988		DOME POUR H4, AZ 270 - 360	2629	D	5320
727550-2	988		DOME POUR H4, AZ 270 - 360	2629	C	5800
988	**Pour Summary:**		Standard Variation: **339.411**	**2** Samples	Ave. Fc:	**5560**
727550-2	994	269	DOME POUR R2, AZ 70 - 160	2652	C	5310
727550-2	994	269	DOME POUR R2, AZ 70 - 160	2652	D	4790
727550-2	994	269	DOME POUR R2, AZ 70 - 160	2653	C	4880
727550-2	994	269	DOME POUR R2, AZ 70 - 160	2653	D	4780
994	**Pour Summary:**		Standard Variation: **250.732**	**4** Samples	Ave. Fc:	**4940**
727550-2	996	269	DOME POUR R2, AZ 250 - 340	2666	C	4920
727550-2	996	269	DOME POUR R2, AZ 250 - 340	2666	D	5040
727550-2	996	269	DOME POUR R2, AZ 250 - 340	2667	C	5180
727550-2	996	269	DOME POUR R2, AZ 250 - 340	2667	D	4970
996	**Pour Summary:**		Standard Variation: **112.953**	**4** Samples	Ave. Fc:	**5028**
727550-2	998	269	DOME POUR R1, AZ 160 - 250	2684	C	5090
727550-2	998	269	DOME POUR R1, AZ 160 - 250	2684	D	4560
727550-2	998	269	DOME POUR R1, AZ 160 - 250	2685	C	5360
727550-2	998	269	DOME POUR R1, AZ 160 - 250	2685	D	4900
998	**Pour Summary:**		Standard Variation: **336.291**	**4** Samples	Ave. Fc:	**4978**
727550-2	999	269	DOME POUR R1, AZ 340 - 70	2686	D	4810
727550-2	999	269	DOME POUR R1, AZ 340 - 70	2686	C	4950
999	**Pour Summary:**		Standard Variation: **98.9949**	**2** Samples	Ave. Fc:	**4880**
727550-2	1012		DOME POUR P12	2885	C	6560
727550-2	1012		DOME POUR P12	2885	D	6670
727550-2	1012		DOME POUR P12	2886	D	5910
727550-2	1012		DOME POUR P12	2886	C	6230
1012	**Pour Summary:**		Standard Variation: **343.645**	**4** Samples	Ave. Fc:	**6343**
727550-2	1045	118	EQUIP HATCH SHIELD FLOOR SLAB	3080	C	6630
727550-2	1045	118	EQUIP HATCH SHIELD FLOOR SLAB	3080	D	6610

Detail and Summary of 28 days Cylinder Tests for Containment Building

Mix	Pour	Elev	Description	Cylinder	A	Fc
727550-2	1045	118	EQUIP HATCH SHIELD FLOOR SLAB	3081	D	6580
727550-2	1045	118	EQUIP HATCH SHIELD FLOOR SLAB	3081	C	7000
727550-2	1045	118	EQUIP HATCH SHIELD FLOOR SLAB	3082	D	6510
727550-2	1045	118	EQUIP HATCH SHIELD FLOOR SLAB	3082	C	6670
1045	**Pour Summary:**		Standard Variation: **171.891**	**6** Samples	Ave. Fc:	**6667**
727550-2	1047		EQUIP HATCH SHIELD SLAB & EAST WALL	3083	C	6210
727550-2	1047		EQUIP HATCH SHIELD SLAB & EAST WALL	3083	D	6790
1047	**Pour Summary:**		Standard Variation: **410.122**	**2** Samples	Ave. Fc:	**6500**
727550-2	1052	129	EQUIP HATCH SHIELD WALL & ROOF	3086	D	6840
727550-2	1052	129	EQUIP HATCH SHIELD WALL & ROOF	3086	C	6760
727550-2	1052	129	EQUIP HATCH SHIELD WALL & ROOF	3087	D	6260
727550-2	1052	129	EQUIP HATCH SHIELD WALL & ROOF	3087	C	6000
1052	**Pour Summary:**		Standard Variation: **402.451**	**4** Samples	Ave. Fc:	**6465**
727550-2	1062	146	EQUIP HATCH SHIELD WEST WALL	3090	C	6350
727550-2	1062	146	EQUIP HATCH SHIELD WEST WALL	3090	D	6670
1062	**Pour Summary:**		Standard Variation: **226.274**	**2** Samples	Ave. Fc:	**6510**
727550-2	1069	149	EQUIP HATCH SHIELD ROOF	3094	D	7150
727550-2	1069	149	EQUIP HATCH SHIELD ROOF	3094	C	7090
727550-2	1069	149	EQUIP HATCH SHIELD ROOF	3095	D	6140
727550-2	1069	149	EQUIP HATCH SHIELD ROOF	3095	C	5860
1069	**Pour Summary:**		Standard Variation: **657.115**	**4** Samples	Ave. Fc:	**6560**
727550-2	1089		EQUIP HATCH SHIELD REMOVABLE WALL SEC	3110	C	6210
727550-2	1089		EQUIP HATCH SHIELD REMOVABLE WALL SEC	3110	D	6470
1089	**Pour Summary:**		Standard Variation: **183.848**	**2** Samples	Ave. Fc:	**6340**
727550-2	**Mix Summary:**		Standard Variation: **541.071**	**200** Samples	Ave. Fc:	**5774**
DM-5	**Mix Summary:**		Standard Variation: **508.316**	**239** Samples	Ave. Fc:	**5640**
DM-5	51	93	RB6A	731	D	5390
DM-5	51	93	RB6A	731	C	5360
DM-5	51	93	RB6A	732	D	5520
DM-5	51	93	RB6A	732	C	5470
DM-5	51	93	RB6A	733	D	4850
DM-5	51	93	RB6A	733	C	4880
DM-5	51	93	RB6A	734	C	4990
DM-5	51	93	RB6A	734	D	5060
DM-5	51	93	RB6A	735	D	5160
DM-5	51	93	RB6A	735	C	4920
DM-5	51	93	RB6A	736	C	4670
DM-5	51	93	RB6A	736	D	4760
DM-5	51	93	RB6A	737	D	4790
DM-5	51	93	RB6A	737	C	4740
DM-5	51	93	RB6A	738	D	5590

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Mix	Pour	Elev	Description	Cylinder	A	Fc
DM-5	51	93	RB6A	738	C	5240
DM-5	51	93	RB6A	739	C	5340
DM-5	51	93	RB6A	739	D	5240
DM-5	51	93	RB6A	740	D	4920
DM-5	51	93	RB6A	740	C	4920
DM-5	51	93	RB6A	741	D	5130
DM-5	51	93	RB6A	741	C	5200
DM-5	51	93	RB6A	742	C	4530
DM-5	51	93	RB6A	742	D	5010
DM-5	51	93	RB6A	743	C	5340
DM-5	51	93	RB6A	743	D	5220
DM-5	51	93	RB6A	744	D	4880
DM-5	51	93	RB6A	744	C	4930
DM-5	51	93	RB6A	745	D	5480
DM-5	51	93	RB6A	745	C	5340
DM-5	51	93	RB6A	746	D	5240
DM-5	51	93	RB6A	746	C	5130
DM-5	51	93	RB6A	747	C	5480
DM-5	51	93	RB6A	747	D	5390
DM-5	51	93	RB6A	748	C	5780
DM-5	51	93	RB6A	748	D	5870
51	**Pour Summary:**		Standard Variation: **312.748**	**36**	Samples	Ave. Fc: **5160**
DM-5	184	103	SECONDARY SHIELD & LETDOWN HX WALLS	1226	D	5040
DM-5	184	103	SECONDARY SHIELD & LETDOWN HX WALLS	1226	C	4990
DM-5	184	103	SECONDARY SHIELD & LETDOWN HX WALLS	1228	C	6030
DM-5	184	103	SECONDARY SHIELD & LETDOWN HX WALLS	1228	D	5940
184	**Pour Summary:**		Standard Variation: **561.605**	**4**	Samples	Ave. Fc: **5500**
DM-5	219	114	SECONDARY SHIELD WALL & LETDOWN HX WA	1291	D	5870
DM-5	219	114	SECONDARY SHIELD WALL & LETDOWN HX WA	1291	C	5870
DM-5	219	114	SECONDARY SHIELD WALL & LETDOWN HX WA	1292	C	5730
219	**Pour Summary:**		Standard Variation: **80.8290**	**3**	Samples	Ave. Fc: **5823**
DM-5	276	120	EXTERIOR WALL BUTTRESS 1 - 2	1437	C	5360
DM-5	276	120	EXTERIOR WALL BUTTRESS 1 - 2	1437	D	5200
DM-5	276	120	EXTERIOR WALL BUTTRESS 1 - 2	1438	D	5480
DM-5	276	120	EXTERIOR WALL BUTTRESS 1 - 2	1438	C	5480
276	**Pour Summary:**		Standard Variation: **132.665**	**4**	Samples	Ave. Fc: **5380**
DM-5	281	120	EXTERIOR WALL BUTTRESS 5 - 6	1443	D	6370
DM-5	281	120	EXTERIOR WALL BUTTRESS 5 - 6	1443	C	5180
DM-5	281	120	EXTERIOR WALL BUTTRESS 5 - 6	1444	D	5080
DM-5	281	120	EXTERIOR WALL BUTTRESS 5 - 6	1444	C	5020
281	**Pour Summary:**		Standard Variation: **641.736**	**4**	Samples	Ave. Fc: **5413**

Mix	Pour	Elev	Description	Cylinder	A	Fc
DM-5	282	120	EXTERIOR WALL BUTTRESS 4 - 5	1445	C	6280
DM-5	282	120	EXTERIOR WALL BUTTRESS 4 - 5	1445	D	6050
DM-5	282	120	EXTERIOR WALL BUTTRESS 4 - 5	1446	D	5610
DM-5	282	120	EXTERIOR WALL BUTTRESS 4 - 5	1446	C	5660
282	**Pour Summary:**		Standard Variation: **320.728**	**4** Samples	Ave. Fc:	**5900**
DM-5	290	130	EXTERIOR WALL BUTTRESS 2 - 3	1459	D	6600
DM-5	290	130	EXTERIOR WALL BUTTRESS 2 - 3	1459	C	6350
DM-5	290	130	EXTERIOR WALL BUTTRESS 2 - 3	1460	D	5590
DM-5	290	130	EXTERIOR WALL BUTTRESS 2 - 3	1460	C	5480
290	**Pour Summary:**		Standard Variation: **554.046**	**4** Samples	Ave. Fc:	**6005**
DM-5	296	120	EXTERIOR WALL BUTTRESS 1 - 6	1485	C	5130
DM-5	296	120	EXTERIOR WALL BUTTRESS 1 - 6	1485	D	6010
DM-5	296	120	EXTERIOR WALL BUTTRESS 1 - 6	1486	D	6370
DM-5	296	120	EXTERIOR WALL BUTTRESS 1 - 6	1486	C	5470
296	**Pour Summary:**		Standard Variation: **552.178**	**4** Samples	Ave. Fc:	**5745**
DM-5	300	130	EXTERIOR WALL BUTTRESS 1 - 2	1487	C	5910
DM-5	300	130	EXTERIOR WALL BUTTRESS 1 - 2	1487	D	5590
DM-5	300	130	EXTERIOR WALL BUTTRESS 1 - 2	1488	D	6300
DM-5	300	130	EXTERIOR WALL BUTTRESS 1 - 2	1488	C	5380
300	**Pour Summary:**		Standard Variation: **401.040**	**4** Samples	Ave. Fc:	**5795**
DM-5	305	130	EXTERIOR WALL BUTTRESS 5 - 6	1497	C	6770
DM-5	305	130	EXTERIOR WALL BUTTRESS 5 - 6	1497	D	6510
DM-5	305	130	EXTERIOR WALL BUTTRESS 5 - 6	1498	C	6650
DM-5	305	130	EXTERIOR WALL BUTTRESS 5 - 6	1498	D	6770
305	**Pour Summary:**		Standard Variation: **123.693**	**4** Samples	Ave. Fc:	**6675**
DM-5	310	130	EXTERIOR WALL BUTTRESS 4 - 5	1504	C	5800
DM-5	310	130	EXTERIOR WALL BUTTRESS 4 - 5	1504	D	5850
DM-5	310	130	EXTERIOR WALL BUTTRESS 4 - 5	1505	D	5570
DM-5	310	130	EXTERIOR WALL BUTTRESS 4 - 5	1505	C	5430
310	**Pour Summary:**		Standard Variation: **197.21**	**4** Samples	Ave. Fc:	**5663**
DM-5	325	140	EXTERIOR WALL BUTTRESS 5 - 6	1525	D	5680
DM-5	325	140	EXTERIOR WALL BUTTRESS 5 - 6	1525	C	5660
DM-5	325	140	EXTERIOR WALL BUTTRESS 5 - 6	1526	C	6190
DM-5	325	140	EXTERIOR WALL BUTTRESS 5 - 6	1526	D	6190
325	**Pour Summary:**		Standard Variation: **300.333**	**4** Samples	Ave. Fc:	**5930**
DM-5	349	109	RETAINING WALL	1561	D	5910
DM-5	349	109	RETAINING WALL	1561	C	6100
DM-5	349	109	RETAINING WALL	1562	C	6170
DM-5	349	109	RETAINING WALL	1562	D	6050
349	**Pour Summary:**		Standard Variation: **109.962**	**4** Samples	Ave. Fc:	**6058**

Mix	Pour	Elev	Description	Cylinder	A		Fc
DM-5	350	109	RETAINING WALL	1563	D		6120
DM-5	350	109	RETAINING WALL	1563	C		5820
350	**Pour Summary:**		Standard Variation: **212.132**	**2**	Samples	Ave. Fc:	**5970**
DM-5	361	103	INCORE ROOM ENTRANCE WALLS	1576	C		5940
DM-5	361	103	INCORE ROOM ENTRANCE WALLS	1576	D		5480
361	**Pour Summary:**		Standard Variation: **325.269**	**2**	Samples	Ave. Fc:	**5710**
DM-5	364	140	EXTERIOR WALL BUTTRESS 2 - 3	1579	D		5520
DM-5	364	140	EXTERIOR WALL BUTTRESS 2 - 3	1579	C		5320
DM-5	364	140	EXTERIOR WALL BUTTRESS 2 - 3	1580	D		5680
DM-5	364	140	EXTERIOR WALL BUTTRESS 2 - 3	1580	C		5820
364	**Pour Summary:**		Standard Variation: **215.019**	**4**	Samples	Ave. Fc:	**5585**
DM-5	367	170	EXTERIOR WALL BUTTRESS 1 - 2	1582	C		6650
DM-5	367	170	EXTERIOR WALL BUTTRESS 1 - 2	1582	D		6240
DM-5	367	170	EXTERIOR WALL BUTTRESS 1 - 2	1583	C		6300
DM-5	367	170	EXTERIOR WALL BUTTRESS 1 - 2	1583	D		6190
367	**Pour Summary:**		Standard Variation: **208.247**	**4**	Samples	Ave. Fc:	**6345**
DM-5	[illegible]	107	INCORE ROOM ENTRANCE	1600	C		5700
DM-5	379	107	INCORE ROOM ENTRANCE	1600	D		5750
379	**Pour Summary:**		Standard Variation: **35.3553**	**2**	Samples	Ave. Fc:	**5725**
DM-5	[illegible]	[illegible]	SECONDARY SHIELD WALL, SE QUADRANT	1613	D		5390
DM-5	[illegible]	103	SECONDARY SHIELD WALL, SE QUADRANT	1613	C		6230
	385	103	SECONDARY SHIELD WALL, SE QUADRANT	1614	C		6000
DM-5	385	103	ECONDARY SHIELD WALL, SE QUADRANT	1614	D		5520
385	**Pour Summary:**		Standard Variation: **396.022**	**4**	Samples	Ave. Fc:	**5785**
D[illegible]	395	103	SECONDARY SHIELD WALL, NE QUADRANT	1630	C		5250
DM-5	[illegible]	[illegible]	ECONDARY SHIELD WALL, NE QUADRANT	1630	D		5520
395	**Pou[illegible]**		Standard Variation: **190.919**	**2**	Samples	Ave. Fc:	**5385**
DM-5	415	00	EXTERIOR WALL BUTTRESS 2 - 3	1655	C		5540
DM-5	415	00	EXTERIOR WALL BUTTRESS 2 - 3	1655	D		5480
DM-5	415	200	EXTERIOR WALL BUTTRESS 2 - 3	1656	D		5610
DM-5	415	200	EXTERIOR WALL BUTTRESS 2 - 3	1656	C		5570
415	**Pour Summary:**		Standard Variation: **54.7723**	**4**	Samples	Ave. Fc:	**5550**
DM-5	417	114	SECONDARY SHIELD WALL, SE QUADRANT	1660	C		4950
DM-5	417	114	SECONDARY SHIELD WALL, SE QUADRANT	1660	D		5480
DM-5	417	114	SECONDARY SHIELD WALL, SE QUADRANT	1661	D		5060
DM-5	417	114	SECONDARY SHIELD WALL, SE QUADRANT	1661	C		5280
417	**Pour Summary:**		Standard Variation: **235.708**	**4**	Samples	Ave. Fc:	**5193**
DM-5	442	114	SECONDARY SHIELD WALL, NE QUADRANT	1706	C		5750
DM-5	442	114	SECONDARY SHIELD WALL, NE QUADRANT	1706	D		6190
DM-5	442	114	SECONDARY SHIELD WALL, NE QUADRANT	1707	D		5430

Mix	Pour	Elev	Description	Cylinder	A	Fc
DM-5	442	114	SECONDARY SHIELD WALL, NE QUADRANT	1707	C	5520
442	**Pour Summary:**		Standard Variation: **339.546**	**4** Samples	Ave. Fc:	**5723**
DM-5	450	103	SECONDARY SHIELD WALL, SW QUADRANT	1708	D	6150
DM-5	450	103	SECONDARY SHIELD WALL, SW QUADRANT	1708	C	6130
DM-5	450	103	SECONDARY SHIELD WALL, SW QUADRANT	1709	D	5840
DM-5	450	103	SECONDARY SHIELD WALL, SW QUADRANT	1709	C	5570
450	**Pour Summary:**		Standard Variation: **274.393**	**4** Samples	Ave. Fc:	**5923**
DM-5	461	114	PRIMARY SHIELD WALL	1733	D	5520
DM-5	461	114	PRIMARY SHIELD WALL	1733	C	5640
DM-5	461	114	PRIMARY SHIELD WALL	1734	D	5750
DM-5	461	114	PRIMARY SHIELD WALL	1734	C	5090
DM-5	461	114	PRIMARY SHIELD WALL	1735	D	5980
DM-5	461	114	PRIMARY SHIELD WALL	1735	C	5520
DM-5	461	114	PRIMARY SHIELD WALL	1736	D	6100
DM-5	461	114	PRIMARY SHIELD WALL	1736	C	5680
461	**Pour Summary:**		Standard Variation: **309.146**	**8** Samples	Ave. Fc:	**5660**
DM-5	477	103	SECONDARY SHIELD WALL, NW QUADRANT	1821	C	5750
DM-5	477	103	SECONDARY SHIELD WALL, NW QUADRANT	1821	D	5660
DM-5	477	103	SECONDARY SHIELD WALL, NW QUADRANT	1822	C	5310
DM-5	477	103	SECONDARY SHIELD WALL, NW QUADRANT	1822	D	4780
DM-5	477	103	SECONDARY SHIELD WALL, NW QUADRANT	1823	D	5130
DM-5	477	103	SECONDARY SHIELD WALL, NW QUADRANT	1823	C	5130
477	**Pour Summary:**		Standard Variation: **363.355**	**6** Samples	Ave. Fc:	**5293**
DM-5	478	114	SECONDARY SHIELD WALL, SW QUADRANT	1824	C	5660
DM-5	478	114	SECONDARY SHIELD WALL, SW QUADRANT	1824	D	5590
DM-5	478	114	SECONDARY SHIELD WALL, SW QUADRANT	1825	D	5310
DM-5	478	114	SECONDARY SHIELD WALL, SW QUADRANT	1825	C	5240
478	**Pour Summary:**		Standard Variation: **206.074**	**4** Samples	Ave. Fc:	**5450**
DM-5	482	123	SECONDARY SHIELD WALL, SE QUADRANT	1846	C	4850
DM-5	482	123	SECONDARY SHIELD WALL, SE QUADRANT	1846	D	5150
482	**Pour Summary:**		Standard Variation: **212.132**	**2** Samples	Ave. Fc:	**5000**
DM-5	483	123	SECONDARY SHIELD WALL, NE QUADRANT	1847	C	5310
DM-5	483	123	SECONDARY SHIELD WALL, NE QUADRANT	1847	D	5610
483	**Pour Summary:**		Standard Variation: **212.132**	**2** Samples	Ave. Fc:	**5460**
DM-5	484	123	SECONDARY SHIELD WALL, EAST SIDE	1848	C	4860
DM-5	484	123	SECONDARY SHIELD WALL, EAST SIDE	1848	D	5040
484	**Pour Summary:**		Standard Variation: **127.279**	**2** Samples	Ave. Fc:	**4950**
DM-5	488	118	PRIMARY SHIELD WALL	1853	D	5340
DM-5	488	118	PRIMARY SHIELD WALL	1853	C	5360
488	**Pour Summary:**		Standard Variation: **14.1421**	**2** Samples	Ave. Fc:	**5350**

Detail and Summary of 28 days Cylinder Tests for Containment Building

Mix	Pour	Elev	Description	Cylinder	A	Fc
DM-5	492	122	PRIMARY SHIELD WALL	1858	C	5250
DM-5	492	122	PRIMARY SHIELD WALL	1858	D	5340
DM-5	492	122	PRIMARY SHIELD WALL	1859	C	5520
DM-5	492	122	PRIMARY SHIELD WALL	1859	D	5040
492	**Pour Summary:**		Standard Variation: **199.562**	**4** Samples	Ave. Fc:	**5288**
DM-5	495	114	SECONDARY SHIELD WALL, NW QUADRANT	1877	C	4970
DM-5	495	114	SECONDARY SHIELD WALL, NW QUADRANT	1877	D	5570
DM-5	495	114	SECONDARY SHIELD WALL, NW QUADRANT	1878	C	4970
DM-5	495	114	SECONDARY SHIELD WALL, NW QUADRANT	1878	D	5570
DM-5	495	114	SECONDARY SHIELD WALL, NW QUADRANT	1879	D	5520
DM-5	495	114	SECONDARY SHIELD WALL, NW QUADRANT	1879	C	5310
495	**Pour Summary:**		Standard Variation: **286.386**	**6** Samples	Ave. Fc:	**5318**
DM-5	498	115	NORTH WALL INCORE INSTR PIT	1883	C	6190
DM-5	498	115	NORTH WALL INCORE INSTR PIT	1883	D	6120
498	**Pour Summary:**		Standard Variation: **49.4975**	**2** Samples	Ave. Fc:	**6155**
DM-5	499	131	EAST END FUEL TRANSFER CANAL	1884	D	5750
DM-5	499	131	EAST END FUEL TRANSFER CANAL	1884	C	6000
DM-5	499	131	EAST END FUEL TRANSFER CANAL	1885	D	5680
DM-5	499	131	EAST END FUEL TRANSFER CANAL	1885	C	5730
499	**Pour Summary:**		Standard Variation: **143.062**	**4** Samples	Ave. Fc:	**5790**
DM-5	502	240	EXTERIOR WALL BUTTRESS 1 - 2	1886	D	5770
DM-5	502	240	EXTERIOR WALL BUTTRESS 1 - 2	1886	C	5410
DM-5	502	240	EXTERIOR WALL BUTTRESS 1 - 2	1887	C	5780
DM-5	502	240	EXTERIOR WALL BUTTRESS 1 - 2	1887	D	5850
502	**Pour Summary:**		Standard Variation: **198.221**	**4** Samples	Ave. Fc:	**5703**
DM-5	507	123	NORTH WALL INCORE INSTR PIT	1892	D	6510
DM-5	507	123	NORTH WALL INCORE INSTR PIT	1892	C	6330
507	**Pour Summary:**		Standard Variation: **127.279**	**2** Samples	Ave. Fc:	**6420**
DM-5	511	228	EXTERIOR WALL BUTTRESS 5 - 6	1913	D	6720
DM-5	511	228	EXTERIOR WALL BUTTRESS 5 - 6	1913	C	6460
DM-5	511	228	EXTERIOR WALL BUTTRESS 5 - 6	1914	D	6930
DM-5	511	228	EXTERIOR WALL BUTTRESS 5 - 6	1914	C	7160
511	**Pour Summary:**		Standard Variation: **298.482**	**4** Samples	Ave. Fc:	**6818**
DM-5	521	123	SECONDARY SHIELD WALL, SW QUADRANT	1925	C	6830
DM-5	521	123	SECONDARY SHIELD WALL, SW QUADRANT	1925	D	7060
521	**Pour Summary:**		Standard Variation: **162.635**	**2** Samples	Ave. Fc:	**6945**
DM-5	526	123	SECONDARY SHIELD WALL, NW QUADRANT	1930	D	6350
DM-5	526	123	SECONDARY SHIELD WALL, NW QUADRANT	1930	C	6560
DM-5	526	123	SECONDARY SHIELD WALL, NW QUADRANT	1931	D	5980
DM-5	526	123	SECONDARY SHIELD WALL, NW QUADRANT	1931	C	6370

Mix	Pour	Elev	Description	Cylinder	A	Fc
526	**Pour Summary:**		Standard Variation: **242.556**	**4** Samples	Ave. Fc:	**6315**
DM-5	534	123	SECONDARY SHIELD WALL, WEST SIDE	1950	D	6510
DM-5	534	123	SECONDARY SHIELD WALL, WEST SIDE	1950	C	6280
534	**Pour Summary:**		Standard Variation: **162.635**	**2** Samples	Ave. Fc:	**6395**
DM-5	537	131	SECONDAY SHIELD WALL, EAST SIDE	1953	D	6130
DM-5	537	131	SECONDAY SHIELD WALL, EAST SIDE	1953	C	6120
DM-5	537	131	SECONDAY SHIELD WALL, EAST SIDE	1954	C	6030
DM-5	537	131	SECONDAY SHIELD WALL, EAST SIDE	1954	D	6100
537	**Pour Summary:**		Standard Variation: **45.0925**	**4** Samples	Ave. Fc:	**6095**
DM-5	559	131	SECONDARY SHIELD WALL, NW QUADRANT	1988	D	6540
DM-5	559	131	SECONDARY SHIELD WALL, NW QUADRANT	1988	C	6300
DM-5	559	131	SECONDARY SHIELD WALL, NW QUADRANT	1989	D	6050
DM-5	559	131	SECONDARY SHIELD WALL, NW QUADRANT	1989	C	6050
559	**Pour Summary:**		Standard Variation: **235.018**	**4** Samples	Ave. Fc:	**6235**
DM-5	566	131	SECONDARY SHIELD WALL, SW QUADRANT	1997	D	6370
DM-5	566	131	SECONDARY SHIELD WALL, SW QUADRANT	1997	C	5980
DM-5	566	131	SECONDARY SHIELD WALL, SW QUADRANT	1998	D	5590
DM-5	566	131	SECONDARY SHIELD WALL, SW QUADRANT	1998	C	5980
566	**Pour Summary:**		Standard Variation: **318.434**	**4** Samples	Ave. Fc:	**5980**
DM-5	568	131	SECONDARY SHIELD WALL, WEST SIDE	1994	C	5240
DM-5	568	131	SECONDARY SHIELD WALL, WEST SIDE	1994	D	5750
568	**Pour Summary:**		Standard Variation: **360.624**	**2** Samples	Ave. Fc:	**5495**
DM-5	570	104	RC DRAIN TANK ROOM WALLS	1999	D	5220
DM-5	570	104	RC DRAIN TANK ROOM WALLS	1999	C	5220
570	**Pour Summary:**		Standard Variation: **0**	**2** Samples	Ave. Fc:	**5220**
DM-5	585	135	FLOOR SLAB, EAST SIDE	2012	D	5640
DM-5	585	135	FLOOR SLAB, EAST SIDE	2012	C	5220
DM-5	585	135	FLOOR SLAB, EAST SIDE	2013	C	5620
DM-5	585	135	FLOOR SLAB, EAST SIDE	2013	D	6010
DM-5	585	135	FLOOR SLAB, EAST SIDE	2014	C	5750
DM-5	585	135	FLOOR SLAB, EAST SIDE	2014	D	5750
585	**Pour Summary:**		Standard Variation: **258.515**	**6** Samples	Ave. Fc:	**5665**
DM-5	595	107	ROOF SLAB, RC DRAIN TANK ENTRY	2022	C	6050
DM-5	595	107	ROOF SLAB, RC DRAIN TANK ENTRY	2022	D	5800
595	**Pour Summary:**		Standard Variation: **176.777**	**2** Samples	Ave. Fc:	**5925**
DM-5	607	133	SECONDARY SHIELD WALL, SE QUADRANT	2035	D	5270
DM-5	607	133	SECONDARY SHIELD WALL, SE QUADRANT	2035	C	5010
607	**Pour Summary:**		Standard Variation: **183.848**	**2** Samples	Ave. Fc:	**5140**
DM-5	611	138	SECONDARY SHIELD WALL, SW QUADRANT	2039	C	5610
DM-5	611	138	SECONDARY SHIELD WALL, SW QUADRANT	2039	D	5500

Detail and Summary of 28 days Cylinder Tests for Containment Building

Mix	Pour	Elev	Description	Cylinder	A	Fc
611	**Pour Summary:**		Standard Variation: **77.7817**	**2**	Samples	Ave. Fc: **5555**
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2042	C	5750
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2042	D	5590
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2043	C	5470
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2043	D	5680
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2044	D	5010
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2044	C	5850
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2045	D	5820
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2045	C	5840
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2046	D	5110
DM-5	613	135	REFUEL CANAL FLOOR SLAB	2046	C	5220
613	**Pour Summary:**		Standard Variation: **316.832**	**10**	Samples	Ave. Fc: **5534**
DM-5	619	138	SECONDARY SHIELD WALL, NE QUADRANT	2053	D	5160
DM-5	619	138	SECONDARY SHIELD WALL, NE QUADRANT	2053	C	5430
619	**Pour Summary:**		Standard Variation: **190.919**	**2**	Samples	Ave. Fc: **5295**
DM-5	638	143	SECONDARY SHIELD WALL, SE QUADRANT	2070	D	5310
DM-5	638	143	SECONDARY SHIELD WALL, SE QUADRANT	2070	C	5450
638	**Pour Summary:**		Standard Variation: **98.9949**	**2**	Samples	Ave. Fc: **5380**
DM-5	648	143	SECONDARY SHIELD WALL, SW QUADRANT (N	2094	D	4790
DM-5	648	143	SECONDARY SHIELD WALL, SW QUADRANT (N	2094	C	5380
648	**Pour Summary:**		Standard Variation: **417.193**	**2**	Samples	Ave. Fc: **5085**
DM-5	649	143	SECONDARY SHIELD WALL, NE QUADRANT	2095	C	5020
DM-5	649	143	SECONDARY SHIELD WALL, NE QUADRANT	2095	D	4530
649	**Pour Summary:**		Standard Variation: **346.482**	**2**	Samples	Ave. Fc: **4775**
DM-5	650	140	SECONDARY SHIELD WALL, NW QUADRANT (N	2096	D	5550
DM-5	650	140	SECONDARY SHIELD WALL, NW QUADRANT (N	2096	C	5540
DM-5	650	140	SECONDARY SHIELD WALL, NW QUADRANT (N	2097	D	6190
DM-5	650	140	SECONDARY SHIELD WALL, NW QUADRANT (N	2097	C	5320
650	**Pour Summary:**		Standard Variation: **375.322**	**4**	Samples	Ave. Fc: **5650**
DM-5	653	143	FUEL TRANSFER CANAL WALL	2100	D	5770
DM-5	653	143	FUEL TRANSFER CANAL WALL	2100	C	6240
DM-5	653	143	FUEL TRANSFER CANAL WALL	2101	C	5680
DM-5	653	143	FUEL TRANSFER CANAL WALL	2101	D	5500
DM-5	653	143	FUEL TRANSFER CANAL WALL	2102	D	6400
DM-5	653	143	FUEL TRANSFER CANAL WALL	2102	C	6150
653	**Pour Summary:**		Standard Variation: **356.127**	**6**	Samples	Ave. Fc: **5957**
DM-5	662	119	ROOF SLAB, RC DRAIN TANK	2112	C	6130
DM-5	662	119	ROOF SLAB, RC DRAIN TANK	2112	D	6000
662	**Pour Summary:**		Standard Variation: **91.9239**	**2**	Samples	Ave. Fc: **6065**
DM-5	669	143	SECONDARY SHIELD WALL, NW QUADRANT	2128	D	5020

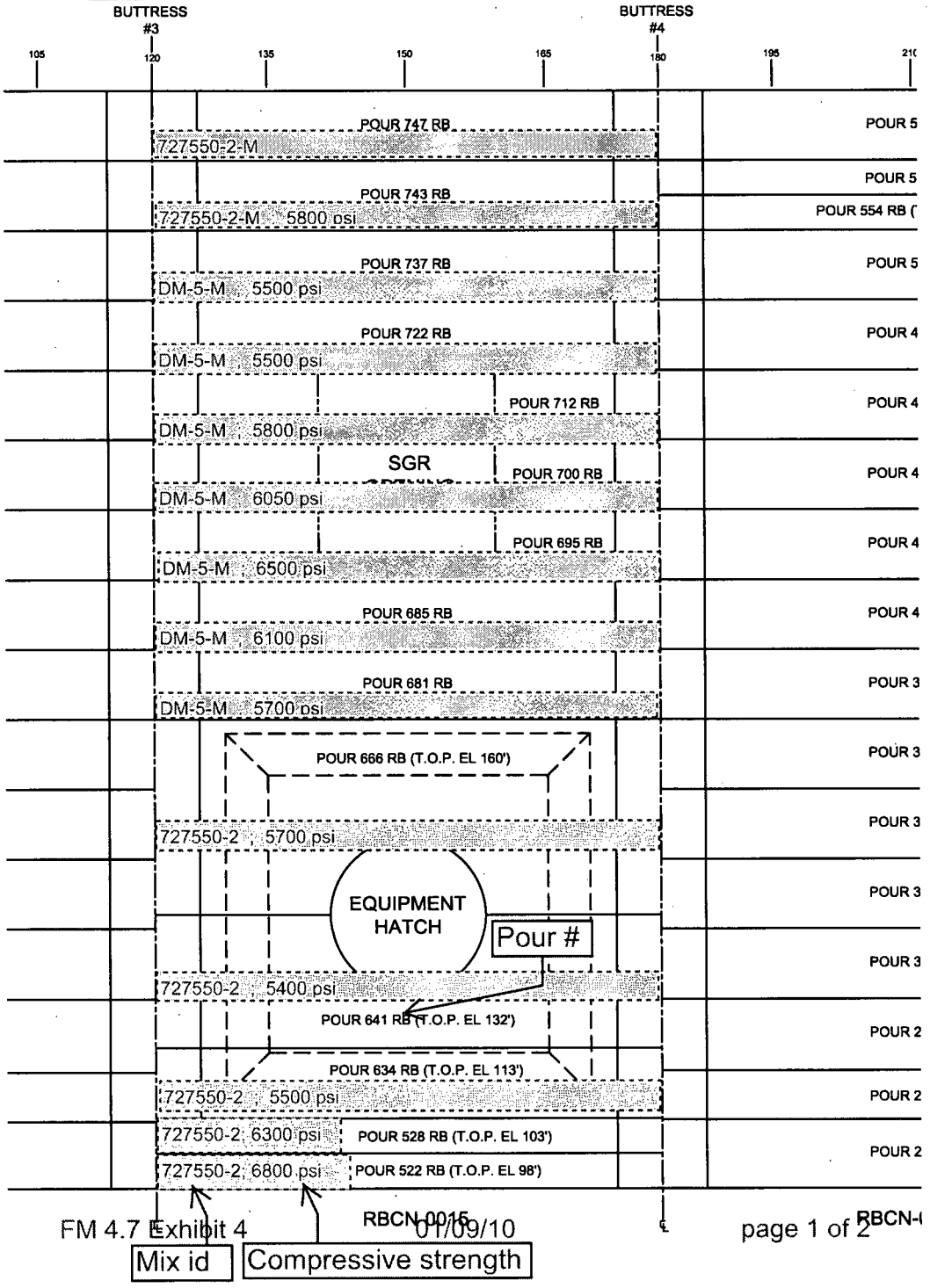
Mix	Pour	Elev	Description	Cylinder	A		Fc
DM-5	669	143	SECONDARY SHIELD WALL, NW QUADRANT	2128	C		4860
669	**Pour Summary:**		Standard Variation: **113.137**	**2**	Samples	Ave. Fc:	**4940**
DM-5	**Mix Summary:**		Standard Variation: **508.316**	**239**	Samples	Ave. Fc:	**5640**
T-21510	**Mix Summary:**		Standard Variation: **213.604**	**12**	Samples	Ave. Fc:	**3791**
T-21510	230	114	TEMPORARY & SECONDARY SHIELD WALL	1322	D		4000
T-21510	230	114	TEMPORARY & SECONDARY SHIELD WALL	1322	C		3890
230	**Pour Summary:**		Standard Variation: **77.7817**	**2**	Samples	Ave. Fc:	**3945**
T-21510	608	119	EL. 119 MEZZANINE FLOOR, SOUTH	2036	C		3590
T-21510	608	119	EL. 119 MEZZANINE FLOOR, SOUTH	2036	D		3770
608	**Pour Summary:**		Standard Variation: **127.279**	**2**	Samples	Ave. Fc:	**3680**
T-21510	740	119	EL 119 MEZZANINE FLOOR, WEST	2222	D		3630
T-21510	740	119	EL 119 MEZZANINE FLOOR, WEST	2222	C		3590
740	**Pour Summary:**		Standard Variation: **28.2843**	**2**	Samples	Ave. Fc:	**3610**
T-21510	760	168	ELEVATOR WALLS	2250	D		3700
T-21510	760	168	ELEVATOR WALLS	2250	C		3590
760	**Pour Summary:**		Standard Variation: **77.7817**	**2**	Samples	Ave. Fc:	**3645**
T-21510	780	160	EL 160 FLOOR SLAB, NE	2276	C		3710
T-21510	780	160	EL 160 FLOOR SLAB, NE	2276	D		3710
780	**Pour Summary:**		Standard Variation: **0**	**2**	Samples	Ave. Fc:	**3710**
T-21510	807	119	MEZZANINE EL 119, WEST	2306	C		4240
T-21510	807	119	MEZZANINE EL 119, WEST	2306	D		4070
807	**Pour Summary:**		Standard Variation: **120.208**	**2**	Samples	Ave. Fc:	**4155**
T-21510	**Mix Summary:**		Standard Variation: **213.604**	**12**	Samples	Ave. Fc:	**3791**
RB	**Structure Summary:**		Standard Variation: **605.23**	**451**	Samples	Ave. Fc:	**5650**

Core No.	Pour No.	Mix		Cylinder ID Number	Compressive Strength [psi] 7 days	ave.	28 days	ave.	90 days	ave	Fc Ratios 7/28 days	90/28 days	Cur./28 days	Cur./90 days	Current Density	Voids	Fc	ave	Ec	Poisson
63	472	DM-5		1799	5080		5840								2.54	14.6%	7530			
				1799	4950		5570										7650			
				1800	4390		5480													
				1800	4630	4763	5200	5523			86%		137%					7590	3.30E+06	0.21
65	425	DM-5		1670	4580		5480		6560						2.57	16.9%	5990			
				1670	4630		5680		6050								6800			
				1671	3540		5310		6180											
				1671	3870	4155	5660	5533	6010	6200	75%	112%	116%	103%				6395	2.70E+06	0.18
66	388	DM-5		1623	3340		5390		7000						2.56	15.8%	6830			
				1623	3540		5200		6830								6370			
				1624	3890		4860		6400											
				1624	4300	3768	4900	5088	5780	6503	74%	128%	130%	101%				6600	3.10E+06	0.22
40	475	DM-5		1809	4160		4510		5750						2.57	15.8%	6100			
				1809	4000		4740		6010								6610			
				1810	3910		5870		6150								6600			
				1810	4160	4058	5650	5193	5520	5858	78%	113%	124%	110%				6437	3.05E+06	0.22
31	487	SCM m*	Bay 0010	1851	4530		5290		5780								8810			
		DM-5	panel K	1851	4600		5020		6100											
				1852	4830		5500		6930											
				1852	4920		5320		6920											
				1853	4670		5340		6770											
				1853	4740	4715	5620	5348	6720	6537	88%	122%	165%	135%				8810		
45	452	SCM m*	Bay 0014	1712	4240		5700		6380								8310			
		DM-5	panel L	1712	4100		5450		6460								8970			
				1713	4990		6210		6740											
				1713	5010	4585	6030	5848	7340	6730	78%	115%	148%	128%				8640		
16	712	DM-5M			4900		6240		6650						2.54	14.4%	8220			
					4810		6190		6650								8030			
					5020		5410		7290								7520			
					5040	4943	5360	5800	7470	7015	85%	121%	137%	113%				7923	3.90E+06	0.24
60	Hatch	727550-2													2.47	14.4%				
59	Hatch	727550-2		3088	4670		6540		6860						2.46	14.5%	7520		3.35E+06	0.25
					4860		6810		6540											
						4765		6675		6700	71%	100%	113%	112%				7520		

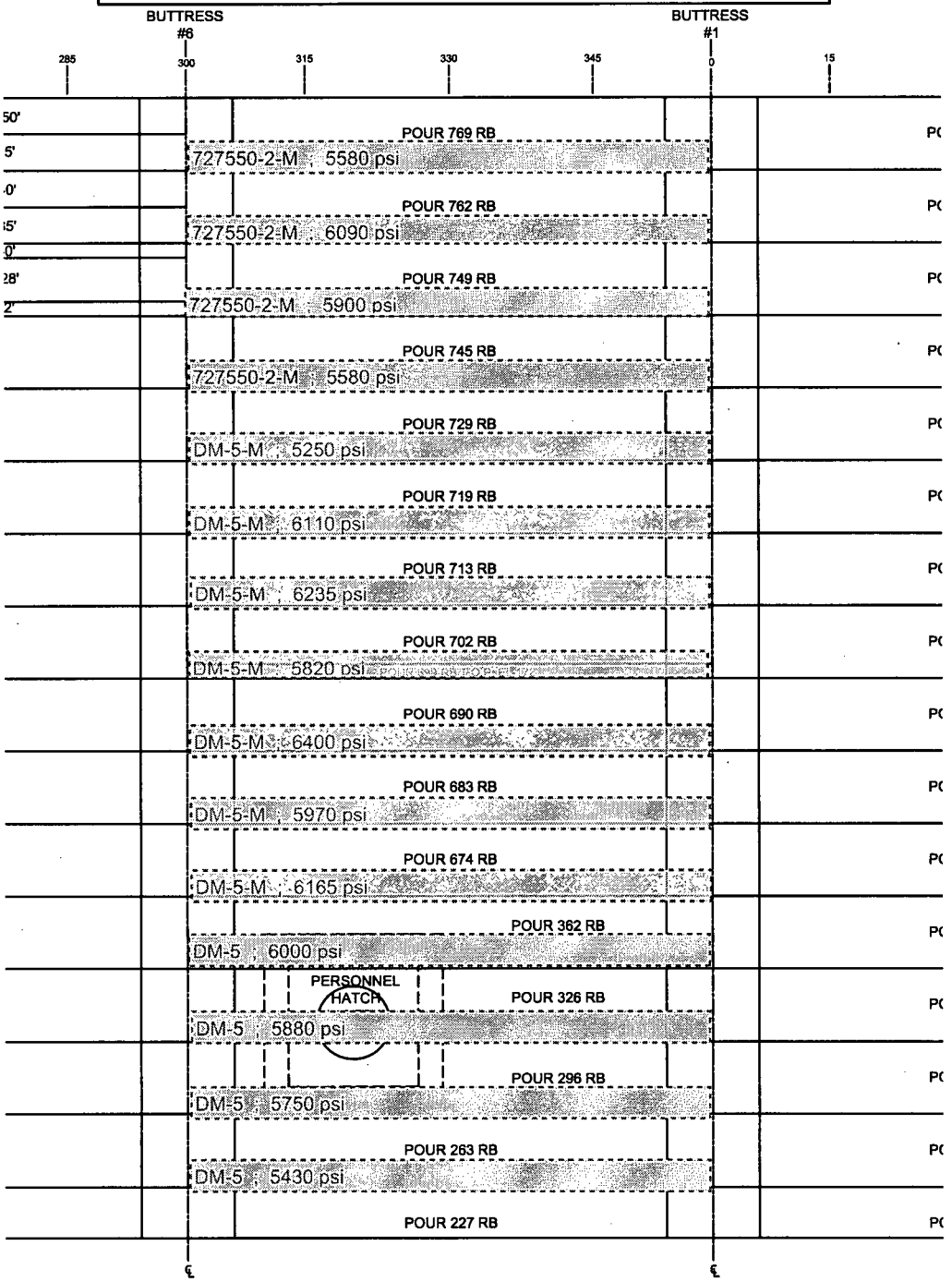
	Fc Ratios 7/28 days	90/28 days	Cur./28 days	Cur./90 days	Density	Voids	Current Fc	ave	Ec	Poisson
Average:	**80%**	**116%**	**134%**	**115%**	**2.53**	**15%**	**7366**	**7489**	**3.23E+06**	**0.22**
Max:	88%	128%	165%	135%	2.57	17%	8970	8810	3.90E+06	0.25
Min:	71%	100%	113%	101%	2.46	14%	5990	6395	2.70E+06	0.18
Count:	8	7	8	7	7	7	16	8	6	6

* Grout cores with aggregate inclusions

CO General Exhibit with pour locations, specific mix used, and tested cylinder strength for RBCN-0015 ONS



CO General Exhibit with pour locations, specific mix used, and tested cylinder strength for RBCN-0012 NS



NOTE 1: ADDITIONAL POURS AT THE PERSONNEL HATCH INCLUDE:
595 RB
642 RB
858 RB

RBCN-0012
01/09/10