



OFFICE OF THE
GENERAL COUNSEL

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 25, 2002

Denise Chancellor, Esq.
Utah Attorney General's Office
160 East 300 South, 5th Floor
P.O. Box 140873
Salt Lake City, Utah 84114-0873

In the Matter of
Private Fuel Storage, L.L.C.
(Independent Spent Fuel Storage Installation)
Docket No. 72-22-ISFSI

Dear Ms. Chancellor:

By letter dated April 17, 2002, the NRC Staff ("Staff") produced various documents to the State of Utah ("State") related, *inter alia*, to the Staff's testimony of Michael D. Waters concerning radiological dose consequences under Unified Contention Utah L/QQ, Part E. Enclosed herewith is an additional document relating to that testimony, as follows:

E-mail message from Michael Waters to Sherwin Turk, transmitting an "EXCEL" file containing data extracted from the Cobra-SFS temperature calculations performed by Thomas Michener at Pacific Northwest National Laboratories ("PNNL").

As indicated in Mr. Waters' E-mail message, the attached EXCEL file contains the specific temperatures within the horizontal cask and concrete shield, utilized in Mr. Waters' calculations. These temperatures relate to the temperature profile plot which the Staff produced on April 17, 2002, concerning Answer 20 in Mr. Waters' testimony.

Sincerely,

A handwritten signature in black ink that reads "Sherwin E. Turk".

Sherwin E. Turk
Counsel for NRC Staff

Enclosures: As stated

cc w/Encl.: Service List

From: Michael Waters
To: Turk, Sherwin
Date: 4/25/02 10:18AM
Subject: Excel File with extracted Cobra temperatures for horizontal HI-STORM.

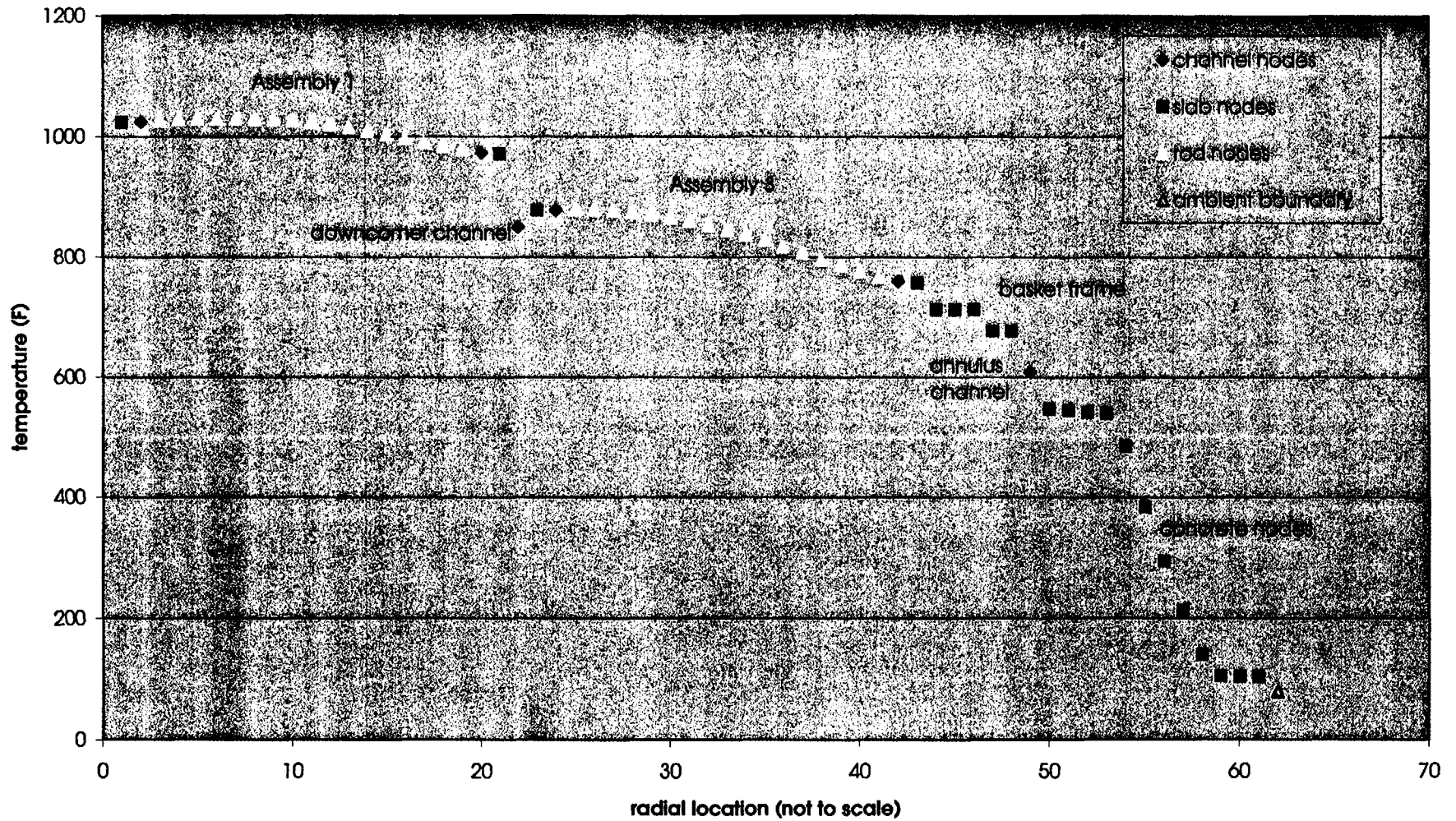
Shep,

Attached is an Excel file with data extracted from the Cobra-SFS temperature calculations performed by Tom Michner at PNNL. This file contains the exact temperatures within the horizontal cask and concrete shield. A plot of the temperature profile has already been forwarded by you to the State of Utah (i.e. the staff calculations & analyses supporting my Answer 20). The exact temperature values can be viewed electronically, within Excel, for that same temperature profile plot.

Thanks,

Mike

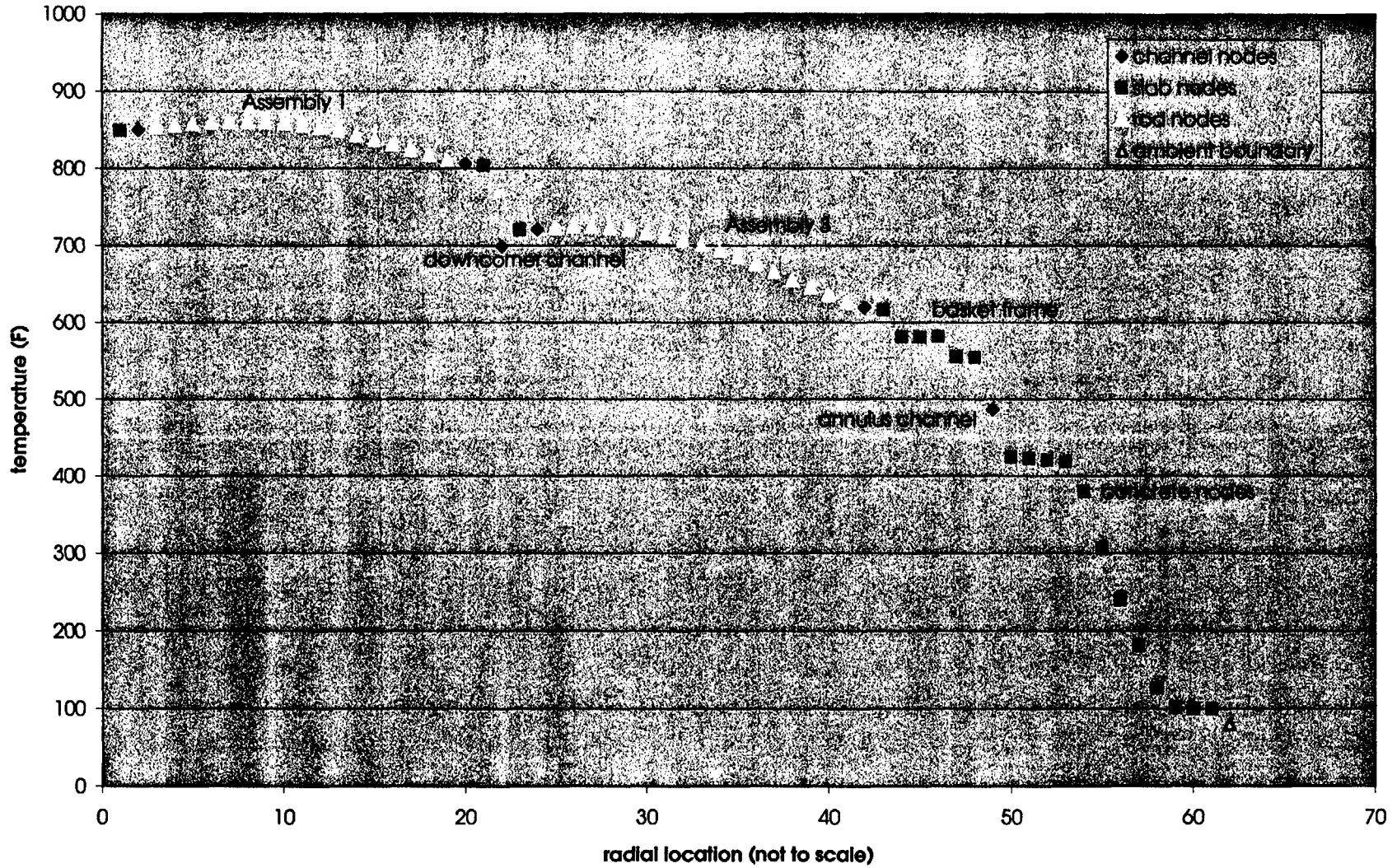
temperature profile near end of fuel (138.1 in.)



radial location	nodes along temperature in	1/8th upper	section region	line (138.1 channel noc slab nodes	of (in.)	symmetry: rod nodes ambient bo
slab	1		1023.26			1023.26
assembly	1 channel		1 1024.0935	1024.0935		
assembly	1 rod		1 1026.1			1026.1
assembly	1 rod		3 1028			1028
assembly	1 rod		6 1029.3			1029.3
assembly	1 rod		10 1029.5			1029.5
assembly	1 rod		15 1029.9			1029.9
assembly	1 rod		21 1029			1029
assembly	1 rod		28 1028			1028
assembly	1 rod		36 1026			1026
assembly	1 rod		45 1022.8			1022.8
assembly	1 rod		55 1019.4			1019.4
assembly	1 rod		66 1014.9			1014.9
assembly	1 rod		78 1009.1			1009.1
assembly	1 rod		91 1003.3			1003.3
assembly	1 rod		105 996.5			996.5
assembly	1 rod		120 990.3			990.3
assembly	1 rod		136 983.9			983.9
assembly	1 rod		153 977.7			977.7
assembly	1 channel		171 972.9634	972.9634		
slab	5		970.9471			970.9471
assembly	5 channel		4 849.4797	849.4797		
slab	16		877.2882			877.2882
assembly	3 channel		1 877.6281	877.6281		
assembly	3 rod		1 878.5			878.5
assembly	3 rod		3 878.4			878.4
assembly	3 rod		6 876.9			876.9
assembly	3 rod		10 873.5			873.5
assembly	3 rod		15 869.9			869.9
assembly	3 rod		21 864.6			864.6
assembly	3 rod		28 859.2			859.2
assembly	3 rod		36 852.4			852.4
assembly	3 rod		45 844.5			844.5
assembly	3 rod		55 836.6			836.6
assembly	3 rod		66 827.3			827.3
assembly	3 rod		78 816.9			816.9
assembly	3 rod		91 806.7			806.7
assembly	3 rod		105 795.7			795.7
assembly	3 rod		120 785.7			785.7
assembly	3 rod		136 775.6			775.6
assembly	3 rod		153 766.1			766.1
assembly	3 channel		171 759.4725	759.4725		
slab	20		756.6319			756.6319
slab	47		711.939			711.939
slab	48		711.9549			711.9549
slab	49		712.2289			712.2289
slab	53		676.7341			676.7341
slab	81		676.0009			676.0009
assembly	6 channel		4 608.0906	608.0906		
slab	85		546.0303			546.0303

slab	89	544.4127	544.4127
slab	93	540.7019	540.7019
slab	97	538.6216	538.6216
slab	109	484.6028	484.6028
slab	113	383.7496	383.7496
slab	117	294.2628	294.2628
slab	121	213.7404	213.7404
slab	125	140.4697	140.4697
slab	129	105.4709	105.4709
slab	101	104.2733	104.2733
slab	105	103.7632	103.7632
ambient		80	

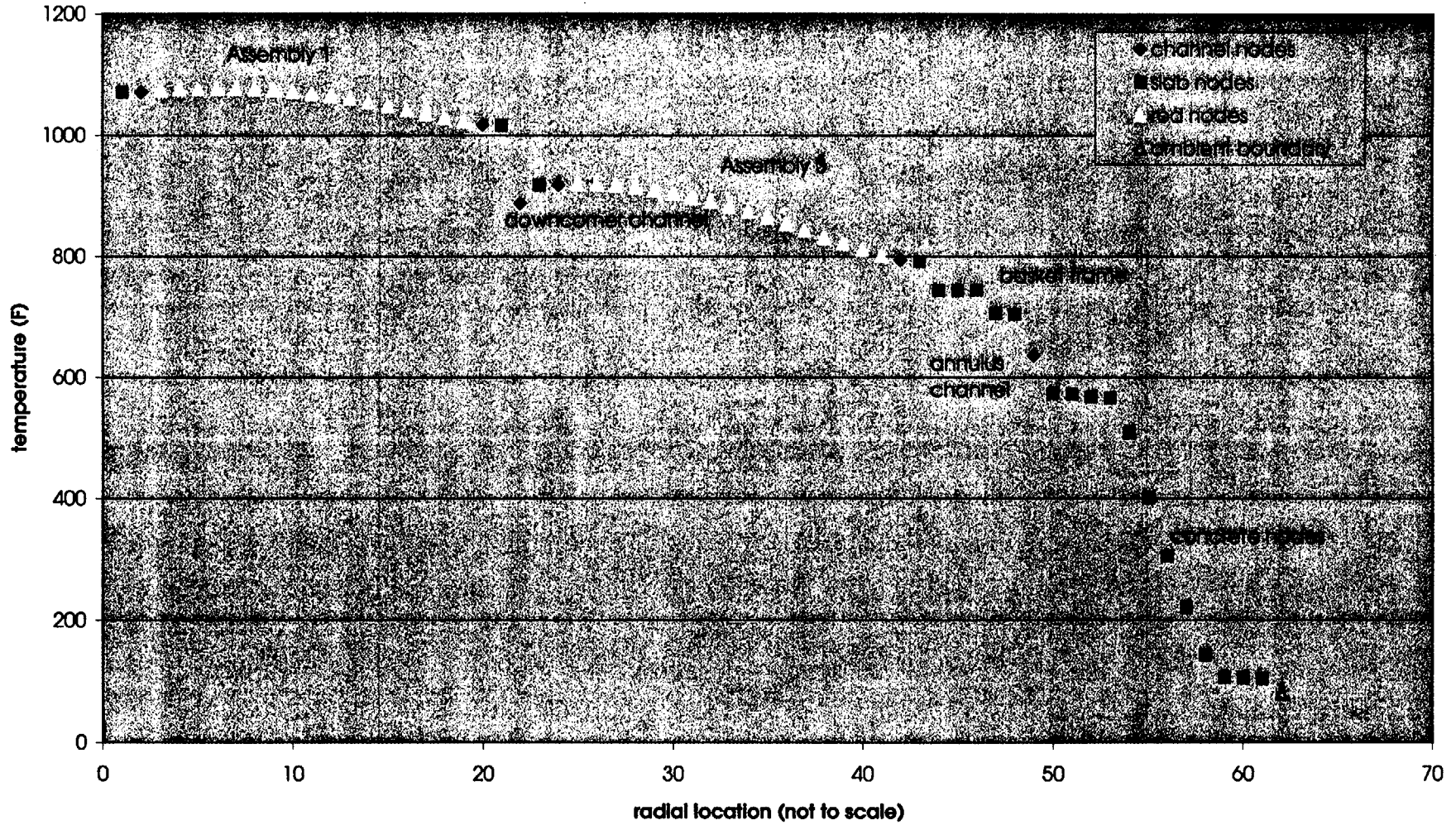
temperature profile near beginning of fuel (43.6 in.)



radial location	nodes along temperature in	1/8th lower	section region	line (43.6 channel noc	of slab nodes	symmetry: rod nodes	ambient bo
slab	1		849.0301			849.0301	
assembly	1 channel		1 850.0976	850.0976			
assembly	1 rod		1 852.7			852.7	
assembly	1 rod		3 855.4			855.4	
assembly	1 rod		6 857.5			857.5	
assembly	1 rod		10 858.6			858.6	
assembly	1 rod		15 859.8			859.8	
assembly	1 rod		21 859.6			859.6	
assembly	1 rod		28 859.5			859.5	
assembly	1 rod		36 858			858	
assembly	1 rod		45 855.3			855.3	
assembly	1 rod		55 852.4			852.4	
assembly	1 rod		66 848.2			848.2	
assembly	1 rod		78 842.6			842.6	
assembly	1 rod		91 836.9			836.9	
assembly	1 rod		105 830.2			830.2	
assembly	1 rod		120 824			824	
assembly	1 rod		136 817.3			817.3	
assembly	1 rod		153 810.9			810.9	
assembly	1 channel		171 806.0871	806.0871			
slab	5		804.0523			804.0523	
assembly	5 channel		4 698.7913	698.7913			
slab	16		720.1869			720.1869	
assembly	3 channel		1 720.8961	720.8961			
assembly	3 rod		1 722.6			722.6	
assembly	3 rod		3 723.8			723.8	
assembly	3 rod		6 723.7			723.7	
assembly	3 rod		10 721.8			721.8	
assembly	3 rod		15 719.7			719.7	
assembly	3 rod		21 715.8			715.8	
assembly	3 rod		28 711.9			711.9	
assembly	3 rod		36 706.5			706.5	
assembly	3 rod		45 699.7			699.7	
assembly	3 rod		55 692.9			692.9	
assembly	3 rod		66 684.5			684.5	
assembly	3 rod		78 674.7			674.7	
assembly	3 rod		91 665.3			665.3	
assembly	3 rod		105 654.7			654.7	
assembly	3 rod		120 645.1			645.1	
assembly	3 rod		136 635.1			635.1	
assembly	3 rod		153 625.5			625.5	
assembly	3 channel		171 618.9908	618.9908			
slab	20		616.2125			616.2125	
slab	47		580.7476			580.7476	
slab	48		580.7757			580.7757	
slab	49		581.2583			581.2583	
slab	53		554.6391			554.6391	
slab	81		554.1163			554.1163	
assembly	6 channel		4 486.1086	486.1086			
slab	85		423.9684			423.9684	

slab	89	422.8091	422.8091
slab	93	420.124	420.124
slab	97	418.6092	418.6092
slab	109	379.3752	379.3752
slab	113	305.7836	305.7836
slab	117	240.1786	240.1786
slab	121	180.9082	180.9082
slab	125	126.8242	126.8242
slab	129	100.9582	100.9582
slab	101	100.0731	100.0731
slab	105	99.6959	99.6959
ambient		80	

profile at location of peak clad temperature (101.8 in.)



radial location	nodes along temperature(1 at	1/8th axial section peak	line of (101.8 channel noc slab nodes	of in.)	symmetry: rod nodes ambient bol
slab	1		1070.3844		1070.3844
assembly	1 channel	1	1071.1494	1071.1494	
assembly	1 rod	1	1073		1073
assembly	1 rod	3	1074.7		1074.7
assembly	1 rod	6	1075.7		1075.7
assembly	1 rod	10	1075.7		1075.7
assembly	1 rod	15	1075.8		1075.8
assembly	1 rod	21	1074.7		1074.7
assembly	1 rod	28	1073.5		1073.5
assembly	1 rod	36	1071.3		1071.3
assembly	1 rod	45	1067.9		1067.9
assembly	1 rod	55	1064.4		1064.4
assembly	1 rod	66	1059.7		1059.7
assembly	1 rod	78	1053.9		1053.9
assembly	1 rod	91	1048		1048
assembly	1 rod	105	1041.1		1041.1
assembly	1 rod	120	1034.9		1034.9
assembly	1 rod	136	1028.4		1028.4
assembly	1 rod	153	1022.4		1022.4
assembly	1 channel	171	1017.5735	1017.5735	
slab	5		1015.5549		1015.5549
assembly	5 channel	4	888.101	888.101	
slab	16		917.9418		917.9418
assembly	3 channel	1	918.1753	918.1753	
assembly	3 rod	1	918.8		918.8
assembly	3 rod	3	918.4		918.4
assembly	3 rod	6	916.4		916.4
assembly	3 rod	10	912.7		912.7
assembly	3 rod	15	908.6		908.6
assembly	3 rod	21	902.8		902.8
assembly	3 rod	28	896.9		896.9
assembly	3 rod	36	889.7		889.7
assembly	3 rod	45	881.4		881.4
assembly	3 rod	55	873.2		873.2
assembly	3 rod	66	863.5		863.5
assembly	3 rod	78	852.7		852.7
assembly	3 rod	91	842.3		842.3
assembly	3 rod	105	831		831
assembly	3 rod	120	820.7		820.7
assembly	3 rod	136	810.5		810.5
assembly	3 rod	153	801		801
assembly	3 channel	171	794.264	794.264	
slab	20		791.3885		791.3885
slab	47		743.5195		743.5195
slab	48		743.5329		743.5329
slab	49		743.7632		743.7632
slab	53		705.36		705.36
slab	81		704.5619		704.5619
assembly	6 channel	4	635.877	635.877	
slab	85		573.1376		573.1376

slab	89	571.3788	571.3788
slab	93	567.3813	567.3813
slab	97	565.154	565.154
slab	109	507.2787	507.2787
slab	113	399.794	399.794
slab	117	304.9477	304.9477
slab	121	220.0181	220.0181
slab	125	143.0098	143.0098
slab	129	106.2866	106.2866
slab	101	105.03	105.03
slab	105	104.4952	104.4952
ambient		80	

ndary

