

# Work Approval Form (WAF)

**Cost Center:** 9417  
**Job Number:** 1200  
**Job Title:** Vacuum Vessel & Support Structure  
**Job Manager:** D. Mangra & M. Smith

**Description:**

Includes the analytical and CAD design of the support structures associated with the Magnet upgrade activities.

Scope includes

- 1200-Vacuum Vessel & Structural Support
  - 1201-Outer TF Structure
  - 1202-PF2 Support Structure
  - 1203-PF3 Support Structure
  - 1204-PF4-5 Leads, Radial Support
  - 1205-Umbrella Reinforcement
  - 1206-Pedestal
  - 1207-Vacuum Vessel Leg's
  - 1208 - PF4 PF5 Verticle Support
  - 1220-Misc

Includes the procurement and fabrication of these structures.

Does not include installation costs.

**Schedule:**

See Tab B or attached

**Approvals:**

\_\_\_\_\_  
Job Manager

\_\_\_\_\_  
Project Manager

\_\_\_\_\_  
Engineering Department Head

**Cost Center:** 9417  
**Job Number:** 1200  
**Job Title:** Vacuum Vessel & Support Structure  
**Job Manager:** D. Mangra & M. Smith

**Estimate (user input)**

**SCHEDULE**

**FY10\$K**

**HOURS**

**USER INPUT TASKS AND DESCRIPTIONS**

**USER INPUT**

\$1 \$1,000 \$1,716 \$1,716 \$1,716

task	TASK DESCRIPTION	Responsible	DURATION in WORK DAYS	Logical Pre- requisites (one task numbers in each column ,any order)	actual= A	FY10\$K					HOURS													Contingency %	Category			
						M&S (41)	CREDIT CARD (43)	OTHER (89)	TRAVEL (35)	OVERTIME (31)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (computing Engr)	EC** SB (Computing Tech)	EE** EM (Elictr Engr)	EE** TB (Electr Tech)	EM** EM (FO&M Engr)	EM** TB (FO&M Tech)	FC** AM (P&C Officer)	LP** TB (HP Tech)	R** RM (Researcher)	Other:	Other:			Other:		
1						1.18	1.18	1.63	1.10	0.18	176.86	118.62	135	101.3	172.2	83.39	150.89	89.06	145.7	120.6	158.9	150	150	150				
2				The TF Outer Support consists of the: Outer support ring, TF clamp reinforcement, VV-TFO Leg Clevis, Connection Rod and Rod Ends, Installation Fixtures, Hardware																								
5	<b>1201 Outer TF Structure</b>																											
26	<i>Final Design Activities</i>																											
28	Final Design Eng Iterations, Detailed CAD Modeling (38 models)											24					8									5%	2, 4, 9, 11	
30	Final Design Analysis	Titus									144						36									5%	2,4,9	
31	Design Drawings (25 dwg)											8																
32	Validation of Design Complete	Titus																										
34	Assembly Drawings Updated for FDR											8														0%	2, 4, 9, 11	
35	FDR Drawings Ready																											
36	FDR																											
38	Update / Sign Off Drawings per completed calcs (25 drawings)											100					63									10%	2, 4, 9	
39	Review, check, update models & drawings before Procurement											25					8									5%	2, 4, 9	
40	<i>Procurement &amp; Fabrication</i>																									10%	2, 4, 9	
42	Prep Req & Procurement Package											12					40											
43	Submit Req to Procurement																											
44	Procurement Processing	Procurement																										
45	Submit for Vendor Quotes																											
46	Eval Quotes	Procurement															8											
47	Tech Eval of Vendors																16											
48	Award / Order Approved																											
49	Vendor Oversight																40											
50	Receipt of Hardware																											
51	QA Inspection																9	48										
52	Resolve Procurement Issues																2											
53	Documentation: Assembly Procedures											8					40											
54	Assembly of Components																4	80										
55	Parts ready for installation																											
56	Handling / Warehouse / Storage																	96										
<b>TOTALS</b>																												
<b>TOTAL Preliminary Cost Estimate (\$k)=</b>																												

\$109

\$0 \$0 \$0 \$0 \$0 \$0 144 185 - - - - 273 224 - - - - -

1 - National Standard

**Cost Center:** 9417  
**Job Number:** 1200  
**Job Title:** Vacuum Vessel & Support Structure  
**Job Manager:** D. Mangra & M. Smith

**Estimate (user input)**

task numb	P3 cross ref (optional)	TASK DESCRIPTION	Responsible	actual= A	FY10\$K												Contingency %	Category									
					HOURS																						
					M&S (41)	CREDIT CARD (43)	OTHER (39)	TRAVEL (35)	OVERTIME (31)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (computing Engr)	EC** SB (Computing Tech)	EE** EM (Elctr Engr)	EE** TB (Electr Tech)	EM** EM (FO&M Engr)			EM** TB (FO&M Tech)	FC** AM (P&C Officer)	LP** TB (HP Tech)	R** RM (Researcher)	Other:	Other:	Other:		
					S1 #####	168.7	168.7	156.5	128.6	108.4	78.33	180.8							116.7								
1					1.17	1.17	1.63	1.10	1.77	176.9	118.6	135	101.3	172.2	83.39	150.9	89.06	145.7	120.6	158.9	150	150	150				
2																											
3		PF2 Support consists of: 1. Increase number of clamps from 6 to 7 using existing design. 2. Remove & Replace all																									
4																											
5		<b>1202 PF2 Support Structure</b>																									
25																											
26		<i>Final Design Activities</i>																									
27																											
28																											
29		Update CAD & Design Drawings ( 8 models, 5 dwg)									4														0%	2, 4, 9, 11	
30																											
31																											
32		Analysis & Validation of Design Complete	Titus							12						2									5%	2, 4, 9	
33		Update CAD Models per Validation																									
34		Assembly Drawings Updated for FDR								2																0%	2, 4, 9
35		FDR Drawings Ready																									
36		FDR																									
37																											
38		Update / Sign Off Drawings per completed calcs (5 drawings)								20						2										5%	2, 4, 9
39		Review, check, update models & drawings before Procurement								2						1										5%	2, 4, 9
40		<i>Procurement &amp; Fabrication</i>																								5%	2, 4, 9
41																											
42		Prep Req & Procurement Package								2						16											
43		Submit Req to Procurement																									
44		Procurement Processing	Procurement																								
45		Submit for Vendor Quotes																									
46		Eval Quotes	Procurement													1											
47																											
48		Award / Order Approved																									
49		Vendor Oversight														1											
50		Receipt of Hardware																									
51		QA Inspection														1	2										
52		Resolve Procurement Issues														1											
53																											
54																											
55		Parts ready for installation																									
56		Handling / Warehouse / Storage															1										
57																											
58																											
59																											
60																											
61																											
62																											
63																											
<b>TOTALS</b>							\$0	\$0	\$0	\$0	\$0	12	30	-	-	-	-	-	25	3	-	-	-	-	-	-	
<b>TOTAL Preliminary Cost Estimate (\$k)=</b>							\$0	\$0	\$0	\$0	\$0	\$2	\$4	\$0	\$0	\$0	\$0	\$0	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Cost Center: 9417  
 Job Number: 1200  
 Job Title: Vacuum Vessel & Support Structure  
 Job Manager: D. Mangra & M. Smith

Estimate (user input)

USER INPUT TASKS AND DESCRIPTIONS			SCHEDULE		FY10\$K														HOURS		Contingency %	Category		
			USER INPUT		M&S (41)	CREDIT CARD (43)	OTHER (39)	TRAVEL (35)	OVERTIME (31)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (computing Engr)	EC** SB (Computing Tech)	EE** EM (Electr Tech)	EM** EM (FO&M Engr)	EM** TB (FO&M Tech)	FC** AM (P&C Officer)	LP** TB (HP Tech)	R*** RM (Researcher)	Other:			Other:	Other:
task	TASK DESCRIPTION	Responsible	DURATION in WORK DAYS	Logic al Pre-requis ites (one task num bers in each colu	\$1	#####	#####	#####	#####	168.7	168.7	156.5	128.6	108.4	78.33	180.8			116.7					
numb	P3 cross ref (optional)				1.17	1.17	1.63	1.10	1.77	176.9	118.6	135	101.3	172.2	83.39	150.9	89.06	145.7	120.6	158.9	150	150	150	
1																								
2																								
3																								
4																								
5																								
25																								
26	Final Design Activities																							
27																								
28																								
29	Update CAD & Design Drawings ( 8 models, 5 dwg)																							
30																								
31																								
32	Analysis & Validation of Design Complete	Titus								12											2			
33																								
34	Assembly Drawings Updated for FDR																							
35	FDR Drawings Ready																							
36	FDR																							
37																								
38	Update / Sign Off Drawings per completed calcs (5 drawings)																							
39	Review, check, update models & drawings before Procurement																							
40	Procurement & Fabrication																							
41																								
42	Prep Req & Procurement Package																							
43	Submit Req to Procurement																							
44	Procurement Processing	Procurement																						
45	Submit for Vendor Quotes																							
46	Eval Quotes	Procurement																						
47																								
48	Award / Order Approved																							
49	Vendor Oversight																							
50	Receipt of Hardware																							
51	QA Inspection																							
52																								
53																								
54																								
55	Parts ready for installation																							
56	Handling / Warehouse / Storage																							
57																								
58																								
59																								
60																								
61																								
62																								
63																								
TOTALS																								
TOTAL Preliminary Cost Estimate (\$k)=					\$8	\$0	\$0	\$0	\$0	\$0	\$2	\$3	\$0	\$0	\$0	\$0	\$0	\$2	\$0	\$0	\$0	\$0	\$0	\$0

Cost Center:	9417
Job Number:	1200
Job Title:	Vacuum Vessel & Support Structure
Job Manager:	D. Mangra & M. Smith

**Estimate (user input)**

**SCHEDULE**

**FY10\$K**

**HOURS**

***USER INPUT TASKS AND DESCRIPTIONS***

***USER INPUT***

\$1	###	###	###	###	###	###	###	###	###	###	###	###	###	###	###	###	###	###	###	###
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Task	TASK DESCRIPTION	Responsible	DURATION in WORK DAYS	actual= A	M&S (41)	CREDIT CARD (43)	OTHER (39)	TRAVEL (05)	OVERTIME (01)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (Computing Engr)	EC** SB (Computing Tech)	EE** EM (E Electr Engr)	EE** TB (E Electr Tech)	EM** EM (FO&M Engr)	EM** TB (FO&M Tech)	EC** AM (P&C Officer)	LP** TB (HP Tech)	R*** RM (Researcher)	Other	Other	Other	Contingency %	Category	
																										1-17
1																										
2																										
3																										
4																										
5	1204 PF5 Leads, PF4/5 Radial Support																									
6																										
7																										
8																										
9																										
10																										
11																										
12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										
21	DOE CD-2 (Lehman) Review																									
22																										
23																										
24																										
25																										
26	Final Design Activities																									
27																										
28																										
29																										
30																										
31																										
32																										
33																										
34																										
35																										
36																										
37																										
38																										
39																										
40																										
41																										
42																										
43																										
44																										
45																										
46																										
47																										
48																										
49																										
50																										
51																										
52																										
53																										
54																										
55																										
56																										
57																										
58																										
59																										
60																										
61																										
62																										
63																										
<b>TOTALS</b>																										
<b>TOTAL Preliminary Cost Estimate (\$k)=</b>					<b>\$0</b>																					

Cost Center: 9417  
 Job Number: 1200  
 Job Title: Vacuum Vessel & Support Structure  
 Job Manager: D. Mangra & M. Smith

Estimate (user input)

USER INPUT TASKS AND DESCRIPTIONS	SCHEDULE	FY10\$K														HOURS				Contingency %	Category
		M&S (41)	CREDIT CARD (43)	OTHER (38)	TRAVEL (35)	OVERTIME (31)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (computing Engr)	EC** SB (Computing Tech)	EE** EM (Electr Engr)	EE** TB (Electr Tech)	EM** EM (FO&M Engr)	EM** TB (FO&M Tech)	FC** AM (P&C Officer)	LP** TB (HP Tech)	R** RM (Researcher)	Other	Other		
TASK DESCRIPTION	DURATION in WORK DAYS	1.17	1.17	1.63	1.10	1.77	176.9	118.6	135	101.3	172.2	83.39	150.9	89.06	145.7	120.6	158.9	150	150	150	
P3 cross ref (optional)																					
1																					
2																					
3																					
4	1205 Umbrella Support Structure																				
5	Lower Umbrella																				
Lower Umbrella defined as: lower (lid / spokes, umbrella, legs), and interface to Center Stack, interface to pedestal, and the AI Block																					
6	Preliminary Design Activities																				
7																					
8																					
9																					
25																					
26	Final Design Activities																				
27																					
28	Final Design Eng Iterations, Detailed CAD Modeling (17.5 models)									16					8						5%
29																					2, 4, 9, 11
30	Final Design Analysis									72					18						5%
31	Design Drawings (14 dwg)									8											2, 4, 9
32	Validation of Design Complete																				
33	Update CAD Models per Validation																				
34	Assembly Drawings Updated for FDR									8											5%
35	FDR Drawings Ready																				2, 4, 9, 11
36	FDR																				
37																					
38	Update / Sign Off Drawings per completed calcs (14 drawings)									56					35						10%
39	Review, check, update models & drawings before Procurement									14					4						5%
40	Procurement & Fabrication																				10%
41																					2, 4, 9
42	Prep Req & Procurement Package									12					40						
43	Submit Req to Procurement																				
44	Procurement Processing																				
45	Submit for Vendor Quotes																				
46	Eval Quotes														8						
47	Tech Eval of Vendors														8						
48	Award / Order Approved																				
49	Vendor Oversight														10						
50	Receipt of Hardware																				
51	QA Inspection														12	48					
52	Resolve Procurement Issues														2						
53	Documentation: Assembly Procedures									16					32						
54	Assembly of Components														4	32					
55	Handling / Warehouse / Storage															8					
56																					
57	Parts ready for installation																				
58																					
59																					
60																					
61																					
62	1205 Umbrella Support Structure																				
63	Upper Umbrella																				
Upper Umbrella defined as: upper( lid, umbrella, legs) and interface to Center Stack, and the AI Block reinforcements.																					
64	Preliminary Design Activities																				
65																					
66																					
84	Final Design Activities																				
85																					
86	Final Design Eng Iterations, Detailed CAD Modeling (17.5 models)									16					8						5%
87																					2, 4, 9, 11
88	Final Design Analysis									72					18						5%
89	Design Drawings (14 dwg)									8											2, 4, 9
90	Validation of Design Complete																				
91	Update CAD Models per Validation																				
92	Assembly Drawings Updated for FDR									8											5%
93	FDR Drawings Ready																				2, 4, 9, 11
94	FDR																				
95																					
96	Update / Sign Off Drawings per completed calcs (14 drawings)									56					35						10%
97	Review, check, update models & drawings before Procurement									14					4						5%
98	Procurement & Fabrication																				10%
99																					2, 4, 9
100	Prep Req & Procurement Package									12					40						
101	Submit Req to Procurement																				
102	Procurement Processing																				
103	Submit for Vendor Quotes																				
104	Eval Quotes														8						
105	Tech Eval of Vendors														8						
106	Award / Order Approved																				
107	Vendor Oversight														10						
108	Receipt of Hardware																				
109	QA Inspection														12	48					
110	Resolve Procurement Issues														2						
111	Documentation: Assembly Procedures									16					40						
112	Assembly of Components														4	32					
113	Handling / Warehouse / Storage															8					
114																					
115	Parts ready for installation																				
116																					
TOTALS										\$0	\$0	\$0	\$0	\$0	144	260					\$370
TOTAL Preliminary Cost Estimate (\$k)=										\$128					\$0	\$0					\$0

**Cost Center:** 9417  
**Job Number:** 1200  
**Job Title:** Vacuum Vessel & Support Structure  
**Job Manager:** D. Mangra & M. Smith

**Estimate (user input)**

task	P3 cross ref numb (optional)	TASK DESCRIPTION	Responsible	SCHEDULE <b>USER INPUT</b> DURATION in WORK DAYS <small>Logical Pre-requisites (one task numbers in each column)</small>	actual= A	FY10\$K																Contingency %	Category						
						M&S (41)	CREDIT CARD (43)	OTHER (39)	TRAVEL (35)	OVERTIME (31)	EA* EM (analysis engr)	EA* SB (Designer)	EC* EM (computing Engr)	EC* SB (Computing Tech)	EE* EM (Elctr Engr)	EE* TB (Electr Tech)	EM* EM (FO&M Engr)	EM* TB (FO&M Tech)	FC* AM (P&C Officer)	LP* TB (HP Tech)	R*** RM (Researcher)			Other	Other	Other			
1						1.17	1.17	1.63	1.10	1.77	176.9	118.6	135	101.3	172.2	83.39	150.9	89.06	145.7	120.6	158.9	150	150	150					
2		The pedestal support consists of: lower & upper pedestal, grout plate, epoxy bonded insert bolts, and interfaces to the lower lid and center stack.																											
5		<b>1206 Pedestal Support Structure</b>																											
26		<i>Final Design Activities</i>																											
28		Final Design Eng Iterations, Detailed CAD Modeling (17 models)																											
29																													
30		Final Design Analysis	Titus								48												16		8			5%	2,4,9, 11
31		Design Drawings (10 dwg)																										5%	2,4,9
32		Validation of Design Complete	Titus																									5%	2,4,9
33		<del>80% of drawings updated for FDR</del>																											
34		Assembly Drawings Updated for FDR																											
35		FDR Drawings Ready																											
36		FDR																											
37																													
38		Update / Sign Off Drawings per completed calcs (10 drawings)										40														25		10%	2,4,9
39		Review, check, update models & drawings before Procurement											10														3	5%	2,4,9
40		<b>Procurement &amp; Fabrication</b>																										10%	2,4,9
41																													
42		Prep Req & Procurement Package											12													40			
43		Submit Req to Procurement																											
44		Procurement Processing	Procurement																										
45		Submit for Vendor Quotes																											
46		Eval Quotes	Procurement																								8		
47		Tech Eval of Vendors																									8		
48		Award / Order Approved																											
49		Vendor Oversight																									8		
50		Receipt of Hardware																											
51		QA Inspection																									4	16	
52		Resolve Procurement Issues																									2		
53		Documentation: Assembly Procedures																											
54		Assembly of Components										4															4	80	
55		Parts ready for installation																											
56		Handling / Warehouse / Storage																									12		

**TOTALS** \$0 \$0 \$0 \$0 \$0 48 98 - - - - 154 108 - - - - -  
**TOTAL Preliminary Cost Estimate (\$k)=** \$53 \$0 \$0 \$0 \$0 \$0 \$8 \$12 \$0 \$0 \$0 \$0 \$23 \$10 \$0 \$0 \$0 \$0 \$0 \$0

**Notes:**  
 (1) Procurement lead time:  
 Purchase orders-Commercial, off-the-shelf items  
 Purchase orders-Noncommercial items  
 Subcontracts (non construction)  
 Construction subcontracts

Installation of the clamps requires drilling holes for anchors which is field work for Mike Viola. This will also require alignment, possibly using an alignment fixture.

Cost Center: 9417  
 Job Number: 1200  
 Job Title: Vacuum Vessel & Support Structure  
 Job Manager: D. Mangra & M. Smith

**Estimate (user input)**

SCHEDULE		FY10\$K		HOURS																					
USER INPUT TASKS AND DESCRIPTIONS			USER INPUT			S1 *****																Contingency %	Category		
task	TASK DESCRIPTION	Responsible	DURATION in WORK DAYS	actual= A	M&S (41)	CREDIT CARD (43)	OTHER (39)	TRAVEL (35)	OVERTIME (31)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (computing Engr)	EC** SB (Computing Tech)	EE** EM (Elctr Engr)	EE** TB (Electr Tech)	EM** EM (FO&M Engr)	EM** TB (FO&M Tech)	FC** AM (P&C Officer)	LP** TB (HP Tech)	R*** RM (Researcher)	Other:			Other:	Other:
numb	P3 cross ref (optional)				1.17	1.17	1.63	1.10	1.77	176.9	118.6	135	101.3	172.2	83.39	150.9	89.06	145.7	120.6	158.9	150			150	150
1																									
2																									
3			Vessel leg support upgrades consists of 4 S.S. clamps and 16-0.5 inch epoxy bonded anchor bolts.																						
4																									
5			<b>1207 Vessel Leg Support Structure</b>																						
6			<u>Preliminary Design Activities</u>																						
26			<u>Final Design Activities</u>																						
27																									
28																									
29			Update CAD & Design Drawings ( 3 models, 1 dwg)								4					8								5%	2,4,9,11
30																									
31																									
32			Analysis & Validation of Design Complete	Titus						24						5								5%	2,4,9
33			Assembly Drawings Updated for FDR																						
34			FDR Drawings Ready																						
35			FDR																						
36																									
37																									
38			Update / Sign Off Drawings per completed calcs (1 drawings)								4					1								5%	2,4,9
39			Review, check, update models & drawings before Procurement								1					1								5%	2,4,9
40			<u>Procurement &amp; Fabrication</u>																					5%	2,4,9
41																									
42			Prep Req & Procurement Package														8								
43			Submit Req to Procurement																						
44			Procurement Processing	Procurement																					
45			Submit for Vendor Quotes																						
46			Eval Quotes	Procurement												1									
47																									
48			Award / Order Approved																						
49																									
50			Receipt of Hardware																						
51			QA Inspection													1	2								
52			Resolve Procurement Issues													1									
53																									
54																									
55			Parts ready for installation																						
56			Handling / Warehouse / Storage														1								
57																									
58																									
59																									
60			Installation of the clamps requires drilling holes for the hilti anchors which is field work for Mike Viola. This will also require alignment, possibly using an alignment fixture.																						
61																									
62																									
TOTALS											24	9	-	-	-	25	3	-	-	-	-	-	-	-	-

**TOTAL Preliminary Cost Estimate (\$k)= \$9**



**Cost Center:** 9417  
**Job Number:** 1200  
**Job Title:** Vacuum Vessel & Support Structure  
**Job Manager:** D. Mangra & M. Smith

**Estimate (user input)**

**SCHEDULE**

**FY10\$K**

**HOURS**

**USER INPUT TASKS AND DESCRIPTIONS**

**USER INPUT**

\$1 \$1,000 \$1,716 \$1,716 \$1,716 168.7 168.7 156.5 128.6 108.4 78.33 180.8 116.7

task	TASK DESCRIPTION	Responsible	DURATION in WORK DAYS	actual= A	M&S (41)	CREDIT CARD (43)	OTHER (39)	TRAVEL (35)	OVERTIME (31)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (computing Engr)	EC** SB (Computing Tech)	EE** EM (Elctr Engr)	EE** TB (Electr Tech)	EM** EM (FO&M Engr)	EM**TB (FO&M Tech)	FC** AM (P&C Officer)	LP** TB (HP Tech)	R*** RM (Researcher)	Other: _____	Other: _____	Other: _____	Contingency %	Category	
																										1.17
1																										
2																										
3																										
4																										
5	<b>1208 PF4 PF5 Verticle Support</b>																									
26	<i>Final Design Activities</i>																									
27																										
28	Final Design Eng Iterations, Detailed CAD Modeling (30 models)									24						12							5%	2,4,9,11		
29																										
30	Final Design Analysis	Titus								96						29							5%	2,4,9		
31	Design Drawings (16 dwg)									16													5%	2,4,9		
32	Validation of Design Complete	Titus																								
33	Update CAD Models per Validation																									
34	Assembly Drawings Updated for FDR									16													5%	2,4,9		
35	FDR Drawings Ready																									
36	FDR																									
37																										
38	Update / Sign Off Drawings per completed calcs (16 drawings)									64						40							10%	2,4,9		
39	Review, check, update models & drawings before Procurement									16						5							10%	2,4,9		
40	<i>Procurement &amp; Fabrication</i>																						10%	2,4,9		
41																										
42	Prep Req & Procurement Package									12						40										
43	Submit Req to Procurement																									
44	Procurement Processing	Procurement																								
45	Submit for Vendor Quotes																									
46	Eval Quotes	Procurement														8										
47	Tech Eval of Vendors															16										
48	Award / Order Approved																									
49	Vendor Oversight															40										
50	Receipt of Hardware																									
51	QA Inspection														8	12										
52	Resolve Procurement Issues															2										
53	Documentation: Assembly Procedures															24										
54	Assembly of Components														4	80										
55	Parts ready for installation																									
56	Handling / Warehouse / Storage															24										
<b>TOTALS</b>										96	148	-	-	-	-	228	116	-	-	-	-	-	-			
<b>TOTAL Preliminary Cost Estimate (\$k)=</b>					<b>\$79</b>	\$0	\$0	\$0	\$0	\$0	\$17	\$18	\$0	\$0	\$0	\$0	\$34	\$10	\$0	\$0	\$0	\$0	\$0	\$0		

**Cost Center:** 9417  
**Job Number:** 1200  
**Job Title:** Vacuum Vessel & Support Structure  
**Job Manager:** D. Mangra & M. Smith

**Estimate (user input)**

**SCHEDULE**

**FY10\$K**

**HOURS**

**USER INPUT TASKS AND DESCRIPTIONS**

**USER INPUT**

**Calculated**

\$1 \$1,000 \$1,716 \$1,716 \$1,716 168.7 168.7 156.5 128.6 108.4 78.33 180.79 116.7

task	TASK DESCRIPTION	Responsible	DURATION in WORK DAYS	Logical Pre-requisites (one task numbers in each column ,any order)	User Input Start Date (optional)	START DATE	FINISH DATE	actual= A	Estimate (user input)														Contingency %	Category							
									M&S (41)	CREDIT CARD (43)	OTHER (39)	TRAVEL (35)	OVERTIME (31)	EA** EM (analysis engr)	EA** SB (Designer)	EC** EM (computing Engr)	EC** SB (Computing Tech)	EE** EM (Electr Engr)	EE** TB (Electr Tech)	EM** EM (FO&M Engr) smith	EM** TB (FO&M Tech)	FC** AM (P&C Officer)			LP** TB (HP Tech)	R** RM (Researcher)	EM** EM (FO&M Engr) Bay L 2NB	EM** EM (FO&M Engr) neway	Other:		
1	P3 cross ref (optional)								1.17	1.17	1.63	1.10	1.77	176.9	118.6	135	101.3	172.2	83.39	150.89	89.06	145.7	120.6	158.9	150.9	150.9	150				
2	<b>1220 Misc</b>																														
15	<i>Final Design Activities</i>																														
16	Project Oversight & Analysis Support		20		5/27/11	5/27/11	6/24/2011																								
17	Design/Analysis EMEM: VV, SS, Global Model (Linked to Thomson, NB2)																									272					
18	<b>VV &amp; Support Structure Peer Review</b>																														
19	Prep for FDR																														
20	FDR		-		6/23/11	6/23/11	6/23/2011																								
21	Laboratory Misc / Admin: meetings, training, safety, etc.																														
22	Resolve FDR Chits																														
23	Resolve Calc Issues: design & calc consistent, sign off completed																														
24	Design LOE to CD3 approval: meetings, model changes, calc revs		110		5/27/11	5/27/11	10/28/2011																								
25	WAF Estimate Structural Diagnostics (Neway)																									80					
26																															
27																															
28																															
29																															
	<b>TOTALS</b>																														
	<b>TOTAL Preliminary Cost Estimate (\$k)=</b>		<b>\$207</b>																												