

ID	WBS	Task Name	Duration	Start	Finish	Fixed Cost	Calculated Fixed Cost	Resource Names	Resource Costs	Cost	Institu	Mat con	Total Con	Overcost+conting		H1	2018 H2	H1	2019 H2	H1	2020 H2	H1	2021 H2	H1	2022 H2	H1	2023 H2
1	3	MVTX Inner Barrel	1130 days	Mon 4/1/19	Fri 7/28/23	\$0	\$1,206,230		\$2,492,894	\$3,699,124				0	\$4,909,463												
2	3.0	ALICE ITS Key Tasks	380 days	Mon 4/1/19	Fri 9/11/20	\$0	\$0		\$0	\$0		0		0	\$0												
3	3.0.1	ALICE MAPS Production	240 days	Mon 4/1/19	Fri 2/28/20	\$0	\$0		\$0	\$0		0	0	0	\$0												
4	3.0.2	ALICE ITS IB FPC Production	200 days	Mon 4/1/19	Fri 1/3/20	\$0	\$0		\$0	\$0		0	0	0	\$0												
5	3.0.3	ALICE ITS IB Stave frame Production	240 days	Mon 5/27/19	Fri 4/24/20	\$0	\$0		\$0	\$0		0	0	0	\$0												
6	3.0.4	ALICE ITS IB Stave Assembly	300 days	Mon 7/22/19	Fri 9/11/20	\$0	\$0		\$0	\$0		0	0	0	\$0												
7	3.0.5	MVTX stave production at CERN	260 days	Wed 5/1/19	Tue 4/28/20	\$0	\$0		\$0	\$0	CERN			0	\$0												
8	3.0.5.1	Stave production batch #1	13 wks	Wed 5/1/19	Tue 7/30/19	\$0	\$0		\$0	\$0		0	0	0	\$0												
9	3.0.5.2	Stave production batch #2	13 wks	Wed 7/31/19	Tue 10/29/19	\$0	\$0		\$0	\$0		0	0	0	\$0												
10	3.0.5.3	Stave production batch #3	13 wks	Wed 10/30/19	Tue 1/28/20	\$0	\$0		\$0	\$0		0	0	0	\$0												
11	3.0.5.4	Stave production batch #4	13 wks	Wed 1/29/20	Tue 4/28/20	\$0	\$0		\$0	\$0		0	0	0	\$0												
12	3.0.6	ALICE ITS Electronics Pre-Production	100 days	Mon 4/1/19	Fri 8/16/19	\$0	\$0		\$0	\$0		0	0	0	\$0												
13	3.0.7	ALICE ITS Electronics Production	240 days	Mon 8/19/19	Fri 7/17/20	\$0	\$0		\$0	\$0		0	0	0	\$0												
14	3.1	sPHENIX Milestones	849 days	Mon 10/2/17	Wed 1/13/21	\$0	\$0		\$0	\$0				0	\$0												
15	3.1.1	sPHENIX CD-1 Review	0 days	Tue 5/8/18	Tue 5/8/18	\$0	\$0		\$0	\$0		0	0	0	\$0												
16	3.1.2	sPHENIX Construction starts PD2/3	0 days	Mon 5/20/19	Mon 5/20/19	\$0	\$0		\$0	\$0		0	0	0	\$0												
17	3.1.3	sPHENIX Installation Starts	0 days	Thu 4/1/21	Thu 4/1/21	\$0	\$0		\$0	\$0		0	0	0	\$0												
18	3.1.4	INTT Ready for Installation	0 days	Fri 4/1/22	Fri 4/1/22	\$0	\$0		\$0	\$0		0	0	0	\$0												
19	3.1.5	MVTX Ready for Installation	0 days	Fri 4/1/22	Fri 4/1/22	\$0	\$0		\$0	\$0		0	0	0	\$0												
20	3.1.6	sPHENIX Installed and Ready for Beam	0 days	Fri 7/1/22	Fri 7/1/22	\$0	\$0		\$0	\$0		0	0	0	\$0												
21	3.2	MVTX Project	1000 days	Mon 4/1/19	Fri 1/27/23	\$0	\$1,206,230		\$2,492,894	\$3,699,124				0	\$4,909,463												
22	3.2.1	MVTX Project Management	904 days	Mon 4/1/19	Thu 9/15/22	\$0	\$50,000		\$493,050	\$543,050	LANL			0	\$641,660												
23	3.2.1.1	Milestone Start MVTX	0 days	Mon 4/1/19	Mon 4/1/19	\$0	\$0		\$0	\$0		0	0	0	\$0												
24	3.2.1.2	lead Coordinator	774 days	Mon 4/1/19	Thu 3/17/22	\$0	\$0		\$0	\$0		.2	.2	0	\$0												
25	3.2.1.3	Project Manager	774 days	Mon 4/1/19	Thu 3/17/22	\$0	\$0	MGR_Ins	\$394,478	\$394,478		.2	.2	0	\$473,374												
26	3.2.1.4	Mechanical Integration Engineer	774 days	Mon 4/1/19	Thu 3/17/22	\$0	\$0	PROF4_i	\$98,572	\$98,572		.2	.2	0	\$118,286												
27	3.2.1.5	Electronics Integration Engineer(sPHENIX)	774 days	Mon 4/1/19	Thu 3/17/22	\$0	\$0		\$0	\$0		.2	.2	0	\$0												
28	3.2.1.6	Travel	774 days	Mon 4/1/19	Thu 3/17/22	\$50,000	\$50,000		\$0	\$50,000		0	0	0	\$50,000												
29	3.2.2	Electronics	332 days	Mon 4/1/19	Tue 7/7/20	\$0	\$298,544		\$102,337	\$400,881	LANL			0	\$492,286												
30	3.2.2.1	Stave Extension Cable	182 days	Mon 4/1/19	Tue 12/10/19	\$0	\$0		\$0	\$0	LANL			0	\$0												
31	3.2.2.1.1	design	4 mons	Mon 4/1/19	Fri 7/19/19	\$0	\$0		\$0	\$0		.35	.35	0	\$0												
32	3.2.2.1.2	prototype	2 mons	Mon 7/22/19	Fri 9/13/19	\$0	\$0		\$0	\$0		.35	.35	0	\$0												
33	3.2.2.1.3	review	2 days	Mon 9/16/19	Tue 9/17/19	\$0	\$0		\$0	\$0		.35	.35	0	\$0												
34	3.2.2.1.4	procure	2 mons	Wed 9/18/19	Tue 11/12/19	\$0	\$0		\$0	\$0		.30	.30	0.09	\$0												
35	3.2.2.1.5	test	20 days	Wed 11/13/19	Tue 12/10/19	\$0	\$0	SCI3_Ins	\$0	\$0		.35	.35	0.09	\$0												
36	3.2.2.2	RU	130 days	Mon 4/1/19	Fri 9/27/19	\$0	\$66,005		\$21,694	\$87,699				0	\$116,167												
37	3.2.2.2.1	Cold Plate	4 wks	Mon 4/1/19	Fri 4/26/19	\$12,104	\$12,104	ElectTech	\$5,472	\$17,576		.35	.35	0.09	\$23,728												
38	3.2.2.2.2	Transition board for RU	2 wks	Mon 4/29/19	Fri 5/10/19	\$8,716	\$8,716	ElectTech	\$720	\$9,436		.2	.2	0	\$11,323												
39	3.2.2.2.3	Power Mezzanine for RU	2 wks	Mon 5/13/19	Fri 5/24/19	\$4,685	\$4,685	ElectTech	\$720	\$5,405		.2	.2	0	\$6,486												
40	3.2.2.2.4	Test/QA RU	1.25 mo...	Mon 5/27/19	Fri 6/28/19	\$7,500	\$7,500	SCI3_Ins	\$13,500	\$21,000		.35	.35	0.09	\$28,350												
41	3.2.2.2.5	Procure 60 SamTec Cables	60 days	Mon 7/1/19	Fri 9/20/19	\$30,000	\$30,000	TECH4_Ins	\$922	\$30,922	LANL		.35	.35	0.09	\$41,745											
42	3.2.2.2.6	Ship to UT Austin from CERN	1 wk	Mon 9/23/19	Fri 9/27/19	\$2,000	\$2,000		\$0	\$2,000		.35	.35	0.09	\$2,700												
43	3.2.2.2.7	Ship to BNL	5 days	Mon 4/1/19	Fri 4/5/19	\$1,000	\$1,000	ElectTech	\$360	\$1,360		.35	.35	0	\$1,836												
44	3.2.2.3	FELIX	70.33 da...	Wed 4/1/20	Wed 7/8/20	\$0	\$76,400		\$20,275	\$96,675				0	\$116,310												
45	3.2.2.3.1	Produce first production unit	4 wks	Wed 4/1/20	Tue 4/28/20	\$8,000	\$8,000	TECH4_Ins	\$3,152	\$11,152		.2	.2	0.12	\$13,382												
46	3.2.2.3.2	Procure Optical fiber	2 wks	Wed 4/1/20	Tue 4/14/20	\$50	\$50	TECH4_Ins	\$315	\$365		.2	.2	0.09	\$438												
47	3.2.2.3.3	Test/QA	2 wks	Wed 4/15/20	Tue 4/28/20	\$0	\$0	SCI3_Ins	\$0	\$0		.2	.2	0.09	\$0												
48	3.2.2.3.4	Procure 7 Remaining Units	8 wks	Wed 4/29/20	Tue 6/23/20	\$56,000	\$56,000	TECH4_Ins	\$1,261	\$57,261	LANL		.2	.2	0.09	\$68,713											
49	3.2.2.3.5	Procure 57 optical fibers	2 wks	Wed 4/29/20	Tue 5/12/20	\$2,850	\$2,850	TECH4_Ins	\$315	\$3,165		.2	.2	0.12	\$3,798												
50	3.2.2.3.6	test/QA	5.33 days	Wed 6/24/20	Wed 7/1/20	\$7,500	\$7,500	SCI3_Ins	\$15,232	\$22,732		.2	.2	0.09	\$27,278												
51	3.2.2.3.7	Ship to BNL	1 wk	Wed 7/1/20	Wed 7/8/20	\$2,000	\$2,000		\$0	\$2,000		.35	.35	0.12	\$2,700												
52	3.2.2.4	MAPS Power System	200.77 d...	Mon 4/1/19	Mon 1/6/20	\$0	\$156,139		\$60,368	\$216,507	BNL			0	\$259,808												
53	3.2.2.4.1	Power Boards	75 days	Mon 4/1/19	Fri 7/12/19	\$0	\$79,020		\$49,672	\$128,692	BNL			0	\$154,431												
54	3.2.2.4.1.1	Fabricate Break Out Boards	20 days	Mon 4/1/19	Fri 4/26/19	\$6,600	\$6,600		\$0	\$6,600		.2	.2	0.09	\$7,920												
55	3.2.2.4.1.2	Fabricate PB to Stave Cables	60 hrs	Mon 4/29/19	Wed 5/8/19	\$8,000	\$8,000	ELTECH4	\$7,080	\$15,080		.2	.2	0.09	\$18,096												
56	3.2.2.4.1.3	Fabricate cold (cooling) plates	2 wks	Mon 4/29/19	Fri 5/10/19	\$3,420	\$3,420	MECHTECH4	\$2,112	\$5,532		.2	.2	0	\$6,638												
57	3.2.2.4.1.4	Fabricate Production PB	40 days	Mon 4/29/19	Fri 6/21/19	\$60,000	\$60,000	ELENG3	\$8,620	\$68,620		.2	.2	0.09	\$82,345												
58	3.2.2.4.1.5	Assemble power boards	30 hrs	Mon 6/24/19	Thu 6/27/19	\$0	\$0	ELTECH4	\$3,540	\$3,540		.2	.2	0	\$4,248												
59	3.2.2.4.1.6	Test PB	90 hrs	Thu 6/27/19	Fri 7/12/19	\$0	\$0	ELTECH4	\$10,620	\$10,620		.2	.2	0	\$12,744												

ID	WBS	Task Name	Duration	Start	Finish	Fixed Cost	Calculated Fixed Cost	Resource Names	Resource Costs	Cost	Institu	Mat con	Total Con	Overcost	conting		2018 H1	2018 H2	2019 H1	2019 H2	2020 H1	2020 H2	2021 H1	2021 H2	2022 H1	2022 H2	2023 H1	2023 H2
60	3.2.2.4.1.7	Power cable harness	15 days	Mon 4/29/19	Fri 5/17/19	\$0	\$0	ELTECH4	\$14,160	\$14,160		.2	.2	0	\$16,992													
61	3.2.2.4.1.8	Ship to BNL	30 hrs	Mon 4/1/19	Thu 4/4/19	\$1,000	\$1,000	ELTECH4	\$3,540	\$4,540		.2	.2	0	\$5,448													
62	3.2.2.4.2	Power Supplies	200.77 d...	Mon 4/1/19	Mon 1/6/20	\$0	\$77,119		\$10,696	\$87,815				0	\$105,377													
63	3.2.2.4.2.1	CAEN A3484 48V PS	200.77 d...	Mon 4/1/19	Mon 1/6/20	\$8,607	\$8,607	POSTD_I	\$0	\$8,607		.2	.2	0.09	\$10,328													
64	3.2.2.4.2.2	CAEN SY4527 Main Frame	30 days	Mon 4/1/19	Fri 5/10/19	\$11,620	\$11,620		\$0	\$11,620		.2	.2	0.09	\$13,944													
65	3.2.2.4.2.3	CAEN A4532 Power Booster	1 wk	Mon 5/13/19	Fri 5/17/19	\$1,216	\$1,216		\$0	\$1,216		.2	.2	0.09	\$1,459													
66	3.2.2.4.2.4	CAEN A2518 power module(16)	1.33 days	Mon 5/20/19	Tue 5/21/19	\$43,676	\$43,676		\$0	\$43,676		.2	.2	0.09	\$52,411													
67	3.2.2.4.2.5	Cabling	1 wk	Tue 5/21/19	Tue 5/28/19	\$10,000	\$10,000	ELTECH4	\$4,720	\$14,720		.2	.2	0	\$17,664													
68	3.2.2.4.2.6	test PB with PS	1 wk	Tue 5/28/19	Tue 6/4/19	\$0	\$0	ELTECH4	\$4,720	\$4,720		.2	.2	0	\$5,664													
69	3.2.2.4.2.7	ship to BNL	1.33 days	Tue 6/4/19	Wed 6/5/19	\$2,000	\$2,000	ELTECH4	\$1,256	\$3,256		.2	.2	0.09	\$3,907													
70	3.2.3	Mechanics and Detector Assembly	1000 days	Mon 4/1/19	Fri 1/27/23	\$0	\$523,486		\$1,260,914	\$1,784,400	LBNL			0	\$2,430,522													
71	3.2.3.1	Staves	289 days	Mon 4/1/19	Thu 5/7/20	\$0	\$146,852		\$124,034	\$270,886				0	\$365,131													
72	3.2.3.1.1	Production	267 days	Mon 4/1/19	Tue 4/7/20	\$0	\$57,360		\$72	\$57,432				0	\$77,534													
73	3.2.3.1.1.1	Tests and QA at CERN	160 days	Wed 7/31/19	Tue 3/10/20	\$0	\$0	SCI3_Ins	\$0	\$0	LANL	.35	.35	0.09	\$0													
74	3.2.3.1.1.2	CERN Test System	1 day	Mon 4/1/19	Mon 4/1/19	\$7,360	\$7,360	ELENG3	\$72	\$7,432	LANL	.35	.35	0.09	\$10,034													
75	3.2.3.1.1.3	Travel and Per Diem at CERN	1 day	Mon 5/20/19	Mon 5/20/19	\$50,000	\$50,000		\$0	\$50,000	LANL	.35	.35	0.09	\$67,500													
76	3.2.3.1.1.4	Tests and QA at CERN	180 days	Wed 7/31/19	Tue 4/7/20	\$0	\$0	SCI3_Ins	\$0	\$0	LANL	.35	.35	0.09	\$0													
77	3.2.3.1.2	Stave Assembly Tooling	109 days	Tue 10/22/19	Fri 3/20/20	\$0	\$25,000		\$44,352	\$69,352	MIT			0	\$93,625													
78	3.2.3.1.2.1	design	2 wks	Tue 10/22/19	Mon 11/4/19	\$0	\$0	PROF4_I	\$13,440	\$13,440		.35	.35	0.09	\$18,144													
79	3.2.3.1.2.2	final jig design	20 days	Mon 12/2/19	Fri 12/27/19	\$0	\$0	PROF4_I	\$26,880	\$26,880		.35	.35	0.09	\$36,288													
80	3.2.3.1.2.3	procure Assembly Fixtures and tooli	60 days	Mon 12/30/19	Fri 3/20/20	\$25,000	\$25,000	PROF4_I	\$4,032	\$29,032		.35	.35	0.09	\$39,193													
81	3.2.3.1.3	Metrology	65 days	Tue 10/22/19	Mon 1/20/20	\$0	\$7,000		\$58,007	\$65,007	MIT			0	\$87,759													
82	3.2.3.1.3.1	Metrology design	1 mon	Tue 10/22/19	Mon 11/18/19	\$0	\$0	PROF4_I	\$26,880	\$26,880		.35	.35	0.09	\$36,288													
83	3.2.3.1.3.2	Design jigs	20 days	Tue 11/19/19	Mon 12/16/19	\$0	\$0	PROF4_I	\$26,880	\$26,880		.35	.35	0.09	\$36,288													
84	3.2.3.1.3.3	Procure jigs	4 wks	Tue 12/17/19	Mon 1/13/20	\$5,000	\$5,000	TECH4_I	\$315	\$5,315		.35	.35	0.09	\$7,175													
85	3.2.3.1.3.4	ship to LBNL	1 wk	Tue 1/14/20	Mon 1/20/20	\$2,000	\$2,000	TECH4_I	\$3,932	\$5,932		.35	.35	0.09	\$8,008													
86	3.2.3.1.4	Shipping and Storage Containers	196 days	Mon 4/1/19	Mon 12/30/19	\$0	\$33,492		\$21,603	\$55,095	LBNL			0	\$73,814													
87	3.2.3.1.4.1	Design&Fabricate Storage Cabinets for Staves	39 days	Mon 4/1/19	Thu 5/23/19	\$6,992	\$6,992	MECHTE	\$5,355	\$12,347		.35	.35	0.09	\$16,668													
88	3.2.3.1.4.2	Design&Fabricate Shipping and Storage Containers (Half-Barrels)	50 days	Tue 10/22/19	Mon 12/30/19	\$11,500	\$11,500	MECHTE	\$5,480	\$16,980		.35	.35	0.09	\$22,923													
89	3.2.3.1.4.3	Design shipping container for 21 staves	1 wk	Mon 5/20/19	Fri 5/24/19	\$0	\$0	MECHEN	\$9,480	\$9,480		.35	.35	0.09	\$12,798													
90	3.2.3.1.4.4	procure stave shipping plate 84	1 day	Mon 4/1/19	Mon 4/1/19	\$10,000	\$10,000	MECHEN	\$1,288	\$11,288		.3	.3	0	\$14,674													
91	3.2.3.1.4.5	ship to CERN	2 mons	Tue 4/2/19	Mon 5/27/19	\$5,000	\$5,000		\$0	\$5,000		.35	.35	0.09	\$6,750													
92	3.2.3.1.5	Shipping staves to LBNL	202 days	Wed 7/31/19	Thu 5/7/20	\$0	\$24,000		\$0	\$24,000	LBNL			0	\$32,400													
93	3.2.3.1.5.1	Shipping staves from CERN to LBNL, Batch #1	7 days	Wed 7/31/19	Thu 8/8/19	\$6,000	\$6,000	STAFFPH	\$0	\$6,000		.35	.35	0	\$8,100													
94	3.2.3.1.5.2	Shipping staves from CERN to LBNL, Batch #2	7 days	Wed 10/30/19	Thu 11/7/19	\$6,000	\$6,000	STAFFPH	\$0	\$6,000		.35	.35	0	\$8,100													
95	3.2.3.1.5.3	Shipping staves from CERN to LBNL, Batch #3	7 days	Wed 1/29/20	Thu 2/6/20	\$6,000	\$6,000	STAFFPH	\$0	\$6,000		.35	.35	0	\$8,100													
96	3.2.3.1.5.4	Shipping staves from CERN to LBNL, Batch #4	7 days	Wed 4/29/20	Thu 5/7/20	\$6,000	\$6,000	STAFFPH	\$0	\$6,000		.35	.35	0	\$8,100													
97	3.2.3.2	Carbon Structures	1000 days	Mon 4/1/19	Fri 1/27/23	\$0	\$347,820		\$943,104	\$1,290,924	LBNL			0	\$1,762,080													
98	3.2.3.2.1	Mechanics Detector Design	80 days	Mon 4/1/19	Fri 7/19/19	\$0	\$0		\$348,723	\$348,723	LANL			0	\$470,776													
99	3.2.3.2.1.1	Develop MAPS inner tracker mechanical model	4 mons	Mon 4/1/19	Fri 7/19/19	\$0	\$0	PROF4_i	\$348,723	\$348,723		.35	.35	0.09	\$470,776													
100	3.2.3.2.2	End Wheels	145 days	Mon 7/22/19	Fri 2/7/20	\$0	\$75,940		\$273,227	\$349,167				0	\$506,292													
101	3.2.3.2.2.1	Tooling Design	1.75 mo...	Mon 7/22/19	Fri 9/6/19	\$0	\$0	PROF4_i	\$85,534	\$85,534		.45	.45	0.09	\$124,025													
102	3.2.3.2.2.2	Tooling material	30 days	Mon 9/9/19	Fri 10/18/19	\$60,000	\$60,000	TECH4_I	\$2,333	\$62,333		.45	.45	0.09	\$90,382													
103	3.2.3.2.2.3	Tooling assembly	30 days	Mon 10/21/19	Fri 11/29/19	\$0	\$0	MECHTE	\$32,880	\$32,880	LBNL	.45	.45	0	\$47,676													
104	3.2.3.2.2.4	Material	2 days	Mon 12/2/19	Tue 12/3/19	\$15,940	\$15,940	PROF4_i	\$5,024	\$20,964		.45	.45	0.09	\$30,398													
105	3.2.3.2.2.5	Production and Test	48 days	Wed 12/4/19	Fri 2/7/20	\$0	\$0	MECHTE	\$147,456	\$147,456	LBNL	.45	.45	0.09	\$213,811													
106	3.2.3.2.3	Mechanics Fabrication	1000 days	Mon 4/1/19	Fri 1/27/23	\$0	\$261,880		\$267,298	\$529,178				0	\$714,770													
107	3.2.3.2.3.1	Travel LBNL	1000 days	Mon 4/1/19	Fri 1/27/23	\$70,000	\$70,000		\$0	\$70,000		.35	.35	0.09	\$94,500													
108	3.2.3.2.3.2	CYSS Cylindrical Structure	98 days	Mon 7/22/19	Wed 12/4/19	\$0	\$75,940		\$139,971	\$215,911	LBNL			0	\$313,072													
109	3.2.3.2.3.2.1	tooling design	1.2 mons	Mon 7/22/19	Thu 8/22/19	\$0	\$0	PROF4_i	\$58,652	\$58,652		.45	.45	0.09	\$85,046													
110	3.2.3.2.3.2.2	tooling material	15 days	Fri 8/23/19	Thu 9/12/19	\$30,000	\$30,000	STAFFPH	\$0	\$30,000		.45	.45	0.09	\$43,500													
111	3.2.3.2.3.2.3	tooling iteration	15 days	Fri 9/13/19	Thu 10/3/19	\$30,000	\$30,000	STAFFPH	\$0	\$30,000		.45	.45	0	\$43,500													
112	3.2.3.2.3.2.4	Procure CYSS Material	5 days	Fri 10/4/19	Thu 10/10/19	\$15,940	\$15,940	STAFFPH	\$0	\$15,940	LBNL	.45	.45	0.09	\$23,113													
113	3.2.3.2.3.2.5	Tolling Assembly	15 days	Fri 10/11/19	Thu 10/31/19	\$0	\$0	MECHTE	\$16,440	\$16,440		.45	.45	0	\$23,838													
114	3.2.3.2.3.2.6	Production & Test CYSS	24 days	Fri 11/1/19	Wed 12/4/19	\$0	\$0	MECHEN	\$64,879	\$64,879	LBNL	.45	.45	0.09	\$94,075													

ID		WBS	Task Name	Duration	Start	Finish	Fixed Cost	Calculated Fixed Cost	Resource Names	Resource Costs	Cost	Institu	Mat con	Total Con	Overcost+conting												
																H1	2018 H2	H1	2019 H2	H1	2020 H2	H1	2021 H2	H1	2022 H2	H1	2023 H2
115		3.2.3.2.3.2.7	Milestone: Complete CYSS	0 days	Wed 12/4/19	Wed 12/4/19	\$0	\$0		\$0	\$0	LBNL	0	0	0	\$0											
116		3.2.3.2.3.3	Service Barrel (SB)	80 days	Fri 9/13/19	Thu 1/2/20	\$0	\$115,940		\$127,327	\$243,267	LBNL			0	\$307,199											
117		3.2.3.2.3.3.1	Review SB Design-Fabrication Compatibility	40 days	Fri 9/13/19	Thu 11/7/19	\$0	\$0	MECHEN	\$12,493	\$12,493		.30	.30	0.09	\$16,241	B	Design-Fabrication Compatibility				MECHENG4	Institution_LBNL[16%],STAFFPHYS			Institution_LBNL[50%]	
118		3.2.3.2.3.3.2	Hold SB Review (PRR)	15 days	Fri 9/13/19	Thu 10/3/19	\$0	\$0	MECHEN	\$12,230	\$12,230		.30	.30	0.09	\$15,900		Hold SB Review (PRR)				MECHENG4	Institution_LBNL[20%],STAFFPHYS			Institution_LBNL[20%],F	
119		3.2.3.2.3.3.3	Tooling	20 days	Fri 10/4/19	Thu 10/31/19	\$40,000	\$40,000	MECHTE	\$50,480	\$90,480		.2	.2	0	\$108,576		Tooling				MECHTECH4	Institution_LBNL[50%],MECHENG4			Institution_LBNL	
120		3.2.3.2.3.3.4	Procure SB Material	5 days	Fri 11/1/19	Thu 11/7/19	\$75,940	\$75,940	STAFFPH	\$0	\$75,940	LBNL	.30	.30	0.09	\$98,722		Procure SB Material				STAFFPHYS	Institution_LBNL[20%]				
121		3.2.3.2.3.3.5	Production & Test SB	21 days	Thu 12/5/19	Thu 1/2/20	\$0	\$0	MECHEN	\$52,123	\$52,123	LBNL	.30	.30	0.09	\$67,760		Production & Test SB				MECHENG4	Institution_LBNL[67%],MECHTECH4			Institution_LBNL	
122		3.2.3.2.3.3.6	Milestone: Complete SB	0 days	Thu 1/2/20	Thu 1/2/20	\$0	\$0		\$0	\$0	LBNL	0	0	0	\$0											
123		3.2.3.2.4	MVTX Final Design Review	12 days	Fri 10/4/19	Mon 10/21/19	\$0	\$10,000		\$53,856	\$63,856				0	\$70,242											
124		3.2.3.2.4.1	MVTX Design Review	2 days	Fri 10/4/19	Mon 10/7/19	\$10,000	\$10,000	MECHEN	\$8,976	\$18,976	ALL	.1	.1	0.09	\$20,874		MVTX Design Review				MECHENG4	Institution_LBNL,STAFFPHYS			Institution_LBNL,PROF4_inst	
125		3.2.3.2.4.2	Incorporate review comments	9 days	Tue 10/8/19	Fri 10/18/19	\$0	\$0	MECHEN	\$40,392	\$40,392	ALL	.10	.10	0.09	\$44,431		Incorporate review comments				MECHENG4	Institution_LBNL,PROF4_institution			LANL	
126		3.2.3.2.4.3	Complete Final Design	1 day	Mon 10/21/19	Mon 10/21/19	\$0	\$0	MECHEN	\$4,488	\$4,488	ALL	.10	.10	0.09	\$4,937		Complete Final Design				MECHENG4	Institution_LBNL,PROF4_institution			LANL	
127		3.2.3.3	Barrel Assembly	386 days	Fri 8/9/19	Fri 1/29/21	\$0	\$28,814		\$193,777	\$222,591				0	\$303,311											
128		3.2.3.3.1	Assembly and Testing	386 days	Fri 8/9/19	Fri 1/29/21	\$0	\$28,814		\$193,777	\$222,591				0	\$303,311											
129		3.2.3.3.1.1	Receive 1st batch Staves from CERN	1 day	Fri 8/9/19	Fri 8/9/19	\$0	\$0		\$0	\$0	LBNL	0	0	0	\$0	eive 1st batch Staves from CERN										
130		3.2.3.3.1.2	Test and Rework 1st batch Staves	12 days	Mon 8/12/19	Tue 8/27/19	\$0	\$0	ELENG3	\$5,240	\$5,240	LBNL	.30	.30	0.09	\$6,812	est and Rework 1st batch Staves					ELENG3	Institution_LBNL[10%],MECHENG3			Institution_LBNL[8%],ELTECH	
131		3.2.3.3.1.3	Receive 2nd batch Staves from CER	1 day	Fri 11/8/19	Fri 11/8/19	\$0	\$0		\$0	\$0		.3	.3	0	\$0	Receive 2nd batch Staves from CERN										
132		3.2.3.3.1.4	Test and Rework 2nd batch Staves	12 days	Mon 11/11/19	Tue 11/26/19	\$0	\$0		\$0	\$0		.3	.3	0	\$0	Test and Rework 2nd batch Staves										
133		3.2.3.3.1.5	Receive 3rd batch Staves from CERN	1 day	Fri 2/7/20	Fri 2/7/20	\$0	\$0		\$0	\$0		.3	.3	0	\$0	Receive 3rd batch Staves from CERN										
134		3.2.3.3.1.6	Test and Rework 3rd batch Staves	12 days	Mon 2/10/20	Tue 2/25/20	\$0	\$0		\$0	\$0		.3	.3	0	\$0	Test and Rework 3rd batch Staves										
135		3.2.3.3.1.7	Receive 4th batch Staves from CERN	1 day	Fri 5/8/20	Fri 5/8/20	\$0	\$0		\$0	\$0		.3	.3	0	\$0	Receive 4th batch Staves from CERN										
136		3.2.3.3.1.8	Test and Rework 4th batch Staves	12 days	Mon 5/11/20	Tue 5/26/20	\$0	\$0		\$0	\$0		.3	.3	0	\$0	Test and Rework 4th batch Staves										
137		3.2.3.3.1.9	Layer Assembly and Test	140 days	Mon 2/10/20	Fri 8/21/20	\$0	\$5,336		\$68,670	\$74,006	LBNL			0	\$101,329											
138		3.2.3.3.1.9.1	Test Installation of Staves onto Layer End-Wheels	20 days	Mon 2/10/20	Fri 3/6/20	\$0	\$0	MECHEN	\$7,056	\$7,056	LBNL	.35	.35	0.09	\$9,526	stallation of Staves onto Layer End-Wheels					MECHENG3	Institution_LBNL[10%],MECHTECH4			Institution_LBNL	
139		3.2.3.3.1.9.2	Hold Half-Detector Assembly Review (PRR)	5 days	Mon 3/9/20	Fri 3/13/20	\$0	\$0	MECHEN	\$2,672	\$2,672	LBNL	.20	.20	0.09	\$3,206	Hold Half-Detector Assembly Review (PRR)					MECHENG3	Institution_LBNL[40%],POSTD			Institution_LBNL,STA	
140		3.2.3.3.1.9.3	Install Staves Onto Layer End-Wheels To Form Layers	70 days	Mon 3/16/20	Fri 6/19/20	\$2,760	\$2,760	MECHEN	\$33,656	\$36,416	LBNL	.40	.40	0.09	\$50,982	ives Onto Layer End-Wheels To Form Layers					MECHENG3	Institution_LBNL[10%],ELENG3			Institution_LBNL	
141		3.2.3.3.1.9.4	Test and Rework Layers After Assembly	30 days	Mon 6/22/20	Fri 7/31/20	\$2,576	\$2,576	ELENG3	\$14,278	\$16,854	LBNL	.35	.35	0.09	\$22,752	Test and Rework Layers After Assembly					ELENG3	Institution_LBNL[10%],MECHENG3			Institution_LBNL	
142		3.2.3.3.1.9.5	Perform Half-Detector Metrology On Layers	15 days	Mon 8/3/20	Fri 8/21/20	\$0	\$0	CMMTEC	\$11,009	\$11,009	LBNL	.35	.35	0.09	\$14,862	Perform Half-Detector Metrology On Layers					CMMTECH4	Institution_LBNL[66%],STAFFPHYS			Institution_LBNL	
143		3.2.3.3.1.9.6	Milestone: Complete Layers	0 days	Fri 8/21/20	Fri 8/21/20	\$0	\$0		\$0	\$0	LBNL	0	0	0.09	\$0											
144		3.2.3.3.1.10	Half Barrel #1 Assembly and Test	95 days	Mon 8/24/20	Fri 1/1/21	\$0	\$11,739		\$59,660	\$71,399	LBNL			0	\$97,208											
145		3.2.3.3.1.10.1	Assemble Layers and CYSS Into Half-Detector	20 days	Mon 8/24/20	Fri 9/18/2																					

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