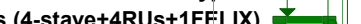


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MVTX-Barrel-112917																					
ID	Tas Moc	WBS	Task Name	Duration	Start	Finish	Fixed Cost	Calculated Fixed Cost	Resource Costs	Cost	Institut Me	To col	Co	cost+continge	Total cost with passthrough						
																2014					
																'17	'18	'19	'20	2019 '21	'22
55		1.4.9	Optical Cables	22 days	Tue 12/13/16	Thu 1/12/17	\$0	\$500	\$2,400	\$2,900				\$2,900	\$2,973						
56		1.4.9.1	Procure 5 Optical Cables	20 days	Tue 12/13/16	Tue 1/10/17	\$500	\$500	\$1,200	\$1,700	LDRD	0	0	\$1,700	\$1,743	es 					
57		1.4.9.2	Test Optical Cables	2 days	Wed 1/11/17	Thu 1/12/17	\$0	\$0	\$1,200	\$1,200	LDRD	0	0	\$1,200	\$1,230	bles 					
58		1.4.10	Procure Ancillaries	344 days	Tue 12/13/16	Thu 4/26/18	\$0	\$111,000	\$14,292	\$125,292	LDRD			\$125,292	\$128,424						
59		1.4.10.1	Procure LV,HV,etc	90 days	Tue 12/13/16	Wed 4/19/17	\$50,000	\$50,000	\$5,400	\$55,400	LDRD	0	0	\$55,400	\$56,785	etc 					
60		1.4.10.2	Procure Racks	90 days	Thu 12/15/16	Fri 4/21/17	\$10,000	\$10,000	\$5,400	\$15,400	LDRD	0	0	\$15,400	\$15,785	ks 					
61		1.4.10.3	Procure CAEN PS	100 days	Fri 12/1/17	Thu 4/26/18	\$20,000	\$20,000	\$0	\$20,000		0	0	\$20,000	\$20,500	Procure CAEN PS 					
62		1.4.10.4	Procure PU	30 days	Fri 9/1/17	Mon 10/16/17	\$6,000	\$6,000	\$0	\$6,000		0	0	\$6,000	\$6,150	Procure PU 					
63		1.4.10.5	Procure Chiller	90 days	Mon 5/1/17	Wed 9/6/17	\$10,000	\$10,000	\$3,492	\$13,492	LDRD	0	0	\$13,492	\$13,829	ure Chiller 					
64		1.4.10.6	Procure Laser System	90 days	Mon 10/2/17	Thu 2/15/18	\$15,000	\$15,000	\$0	\$15,000		0	0	\$15,000	\$15,375	cure Laser System 					
65		1.4.11	Readout R&D	281 days	Tue 6/6/17	Wed 7/18/18	\$0	\$0	\$965,040	\$1,159,800				\$965,040	\$989,166						
66		1.4.11.1	ALPIDE Evaluation and Op	60 days	Fri 2/16/18	Thu 5/10/18	\$0	\$0	\$14,160	\$24,000				\$14,160	\$14,514						
67		1.4.11.1.1	Setup Laser System & AL	60 days	Fri 2/16/18	Thu 5/10/18	\$0	\$0	\$14,160	\$14,160		0	0	\$14,160	\$14,514	stem & ALPIDE evaluation 					
68		1.4.11.2	Firmware Development	201 days	Tue 6/6/17	Wed 3/28/18	\$0	\$0	\$380,480	\$565,400				\$380,480	\$389,992						
69		1.4.11.2.1	ROU Trigger/Control Mod	20 days	Tue 6/6/17	Mon 7/3/17	\$0	\$0	\$36,800	\$36,800		0	0	\$36,800	\$37,720	odifications 					
70		1.4.11.2.2	KC705 + FELIXv1.5 integ	30 days	Thu 8/31/17	Fri 10/13/17	\$0	\$0	\$38,400	\$38,400		0	0	\$38,400	\$39,360	Xv1.5 integration 					
71		1.4.11.2.3	ALPIDE+RU and FELIXv	60 days	Mon 10/16/17	Wed 1/17/18	\$0	\$0	\$76,800	\$76,800		0	0	\$76,800	\$78,720	LIXv1.5 integration 					
72		1.4.11.2.4	FELIX Data Aggregation	40 days	Thu 11/30/17	Wed 1/31/18	\$0	\$0	\$76,480	\$76,480		0	0	\$76,480	\$78,392	ELIX Data Aggregation 					
73		1.4.11.2.5	RCDAQ Data Formatting	40 days	Thu 2/1/18	Wed 3/28/18	\$0	\$0	\$41,600	\$41,600		0	0	\$41,600	\$42,640	RCDAQ Data Formatting 					
74		1.4.11.2.6	ALPIDE+RU+FELIXv2.0 I	60 days	Wed 7/5/17	Wed 9/27/17	\$0	\$0	\$110,400	\$110,400		0	0	\$110,400	\$113,160	2.0 Integration 					
75		1.4.11.2.7	FELIXv2.0+RCDAQ+GTM	40 days	Thu 9/28/17	Tue 11/28/17	\$0	\$0	\$0	\$0		0	0	\$0	\$0	Q+GTM Integration 					
76		1.4.11.3	Validation Firmware Deve	100 days	Thu 3/1/18	Wed 7/18/18	\$0	\$0	\$184,000	\$184,000				\$184,000	\$188,600						
77		1.4.11.3.1	Stave, RU & FELIX Simul	60 days	Thu 3/1/18	Wed 5/23/18	\$0	\$0	\$110,400	\$110,400		0	0	\$110,400	\$113,160	ave, RU & FELIX Simulation 					
78		1.4.11.3.2	State of Health of Full Re	40 days	Thu 5/24/18	Wed 7/18/18	\$0	\$0	\$73,600	\$73,600		0	0	\$73,600	\$75,440	of Health of Full Readout Chain 					
79		1.4.11.4	Software Development	130 days	Thu 1/18/18	Wed 7/18/18	\$0	\$0	\$386,400	\$386,400				\$386,400	\$396,060						
80		1.4.11.4.1	RU/PU Controls	60 days	Thu 1/18/18	Wed 4/11/18	\$0	\$0	\$110,400	\$110,400		0	0	\$110,400	\$113,160	RU/PU Controls 					
81		1.4.11.4.2	RU/FELIX Contorls	40 days	Thu 3/29/18	Wed 5/23/18	\$0	\$0	\$73,600	\$73,600		0	0	\$73,600	\$75,440	RU/FELIX Contorls 					
82		1.4.11.4.3	RCDAQ and FELIX Read	50 days	Thu 5/10/18	Wed 7/18/18	\$0	\$0	\$92,000	\$92,000		0	0	\$92,000	\$94,300	ut/Aggregation and Formatting 					
83		1.4.11.4.4	Hardware(PS,Slow Contr	60 days	Thu 1/18/18	Wed 4/11/18	\$0	\$0	\$110,400	\$110,400		0	0	\$110,400	\$113,160	ontrols & Monitoring,etc) 					
84		1.4.12	Mechanical Support and Co	289 days	Mon 1/23/17	Tue 3/20/18	\$0	\$40,000	\$219,040	\$259,040				\$259,040	\$265,516						
85		1.4.12.1	Specifications & Design	49 days	Mon 1/23/17	Fri 3/31/17	\$0	\$0	\$109,040	\$109,040				\$109,040	\$111,766						
86		1.4.12.1.1	Review & Simulate Heat l	40 days	Mon 4/3/17	Fri 5/26/17	\$0	\$0	\$42,560	\$42,560	LDRD	0	0	\$42,560	\$43,624	eat Load 					
87		1.4.12.1.2	review mechanical tolerar	10 days	Tue 5/30/17	Mon 6/12/17	\$0	\$0	\$11,040	\$11,040	LDRD	0	0	\$11,040	\$11,316	/distortions 					
88		1.4.12.1.3	review disassembly/repair	10 days	Tue 6/13/17	Mon 6/26/17	\$0	\$0	\$11,520	\$11,520	LDRD	0	0	\$11,520	\$11,808	pair options 					
89		1.4.12.1.4	MVTX Mechanical Frame	180 days	Tue 6/27/17	Tue 3/20/18	\$0	\$0	\$43,920	\$43,920	LDRD	0	0	\$43,920	\$45,018	aptual Design 					
90		1.4.12.2	Safety Systems	60 days	Fri 12/1/17	Thu 3/1/18	\$0	\$10,000	\$25,440	\$35,440				\$35,440	\$36,326						
91		1.4.12.2.1	review sensors & interlock	20 days	Fri 12/1/17	Thu 1/4/18	\$0	\$0	\$7,200	\$7,200	LDRD	0	0	\$7,200	\$7,380	v sensors & interlocks 					
92		1.4.12.2.2	electrical interlock design	20 days	Fri 1/5/18	Thu 2/1/18	\$5,000	\$5,000	\$7,200	\$12,200	LDRD	0	0	\$12,200	\$12,505	ectrical interlock design 					
93		1.4.12.2.3	cooling interlocks design	20 days	Fri 2/2/18	Thu 3/1/18	\$5,000	\$5,000	\$11,040	\$16,040	LDRD	0	0	\$16,040	\$16,441	cooling interlocks design 					
94		1.4.12.3	Cooling System	100 days	Thu 9/7/17	Tue 2/6/18	\$0	\$20,000	\$40,880	\$60,880				\$60,880	\$62,402						
95		1.4.12.3.1	Prototype Design (modify	30 days	Thu 9/7/17	Thu 10/19/17	\$0	\$0	\$27,600	\$27,600	LDRD	0	0	\$27,600	\$28,290	n (modify ALICE) 					
96		1.4.12.3.2	Chiller Fabrication	60 days	Fri 10/20/17	Tue 1/23/18	\$10,000	\$10,000	\$0	\$10,000		0	0	\$10,000	\$10,250	Chiller Fabrication 					
97		1.4.12.3.3	Cooling Mockup Test	10 days	Wed 1/24/18	Tue 2/6/18	\$10,000	\$10,000	\$13,280	\$23,280	LDRD	0	0	\$23,280	\$23,862	Cooling Mockup Test 					
98		1.4.12.4	Telescope frame	100 days	Fri 9/1/17	Thu 2/1/18	\$0	\$10,000	\$43,680	\$53,680				\$53,680	\$55,022						
99		1.4.12.4.1	Telescope Mechanical Fr	40 days	Fri 9/1/17	Mon 10/30/17	\$0	\$0	\$11,040	\$11,040	LDRD	0	0	\$11,040	\$11,316	cal Frame Design 					
100		1.4.12.4.2	Telescope frame producti	60 days	Tue 10/31/17	Thu 2/1/18	\$10,000	\$10,000	\$32,640	\$42,640	LDRD	0	0	\$42,640	\$43,706	pe frame production 					
101		1.4.13	Telescope System Test	90 days	Wed 2/7/18	Tue 6/12/18	\$0	\$0	\$32,880	\$32,880				\$32,880	\$33,702						
102		1.4.13.1	Assemble Prototype	30 days	Wed 2/7/18	Tue 3/20/18	\$0	\$0	\$32,880	\$32,880		0	0	\$32,880	\$33,702	Assemble Prototype 					
103																					

MVTX-Barrel-112917																								
ID	Tas Moc	WBS	Task Name	Duration	Start	Finish	Fixed Cost	Calculated Fixed Cost	Resource Costs	Cost	Institut Me	To col	Co	cost+continge	Total cost with passthrough									
																2014								
																'17	'18	'19	'20	2019	'21	'22		
113		1.4.16.1	MIE preproposal Development	5 mons	Mon 5/1/17	Wed 9/20/17	\$20,000	\$20,000	\$128,000	\$148,000		0	0	\$148,000	\$151,700	Development	→	LDRD Physicist[50%],LDRD PostDoc[50%]						
114		1.4.16.2	MIE Full Development and F	100 days	Thu 9/21/17	Tue 2/20/18	\$30,000	\$30,000	\$128,000	\$158,000		0	0	\$158,000	\$161,950	Development and Reviews	→	LDRD Physicist[50%],LDRD PostDoc[50%]						
115		1.4.17	Test Beam Operation	332 days	Fri 6/22/18	Mon 9/30/19	\$0	\$30,000	\$371,620	\$401,620	LDRD			\$401,620	\$411,661									
116		1.4.17.1	Cosmic Ray Run	145 days	Fri 6/22/18	Thu 1/10/19	\$0	\$0	\$266,800	\$266,800		0	0	\$266,800	\$273,470	Cosmic Ray Run	→	LDRD Physicist						
117		1.4.17.2	Shipping/Transport to FNAL	20 days	Fri 12/28/18	Thu 1/24/19	\$10,000	\$10,000	\$4,800	\$14,800	LDRD	0	0	\$14,800	\$15,170	Shipping/Transport to FNAL	→	LDRD Mechanical Tech [20%]						
118		1.4.17.3	Setup	5 days	Fri 1/25/19	Thu 1/31/19	\$0	\$0	\$8,720	\$8,720	LDRD	0	0	\$8,720	\$8,938	Setup	→	Physicist[50%],LDRD Electronics Tech[50%],LDRD Mechanical Tech [50%],						
119		1.4.17.4	Operations	30 days	Fri 2/1/19	Thu 3/14/19	\$20,000	\$20,000	\$25,600	\$45,600	LDRD	0	0	\$45,600	\$46,740	Operations	→	Physicist,LDRD Physicist,LDRD PostDoc						
120		1.4.17.5	Test Beam Data Analysis &	67.5 days	Thu 6/27/19	Mon 9/30/19	\$0	\$0	\$65,700	\$65,700		0	0	\$65,700	\$67,343	Test Beam Data Analysis & Publication	→	LDRD Physicist[50%],LDRD PostDoc[50%],Physicist[50%]						
121		1.4.18	Theoretical Efforts	767 days	Mon 10/3/16	Mon 9/30/19	\$0	\$0	\$1,270,152	\$1,270,152				\$1,270,152	\$1,301,906									
122		1.4.18.1	pQCD	767 days	Mon 10/3/16	Mon 9/30/19	\$0	\$0	\$705,640	\$705,640		0	0	\$705,640	\$723,281									
123		1.4.18.2	LQCD	767 days	Mon 10/3/16	Mon 9/30/19	\$0	\$0	\$282,256	\$282,256		0	0	\$282,256	\$289,312									
124		1.4.18.3	QMD	767 days	Mon 10/3/16	Mon 9/30/19	\$0	\$0	\$282,256	\$282,256		0	0	\$282,256	\$289,312									
125		1.5	MVTX Project	1129 days	Mon 9/3/18	Thu 12/29/22	\$0	\$2,847,249	\$1,890,411	\$4,737,660				\$6,364,311	\$6,523,419									
126		1.5.1	MVTX Project Management	774 days	Mon 10/1/18	Thu 9/16/21	\$0	\$322,842	\$399,158	\$722,000	LANL			\$957,200	\$981,130									
127		1.5.1.1	Milestone Start MVTX	0 days	Mon 10/1/18	Mon 10/1/18	\$0	\$0	\$0	\$0		0	0	\$0	\$0									
128		1.5.1.2	lead Coordinator	774 days	Mon 10/1/18	Thu 9/16/21	\$272,842	\$272,842	\$0	\$272,842		.35	.35	\$368,337	\$377,545	lead Coordinator	→							
129		1.5.1.3	Project Manager	774 days	Mon 10/1/18	Thu 9/16/21	\$0	\$0	\$311,214	\$311,214		.35	.35	\$420,138	\$430,642									
130		1.5.1.4	Mechanical Integration Engineer	774 days	Mon 10/1/18	Thu 9/16/21	\$0	\$0	\$43,972	\$43,972		.35	.35	\$59,362	\$60,846	Mechanical Integration Engineer	→	PROF4_institution_						
131		1.5.1.5	Electronics Integration Engineer	774 days	Mon 10/1/18	Thu 9/16/21	\$0	\$0	\$43,972	\$43,972		.35	.35	\$59,362	\$60,846	Electronics Integration Engineer	→	PROF4_institution_						
132		1.5.1.6	Travel	342 days	Mon 10/1/18	Tue 1/21/20	\$50,000	\$50,000	\$0	\$50,000		0	0	\$50,000	\$51,250									
133		1.5.2	Electronics	492 days	Mon 10/1/18	Tue 8/18/20	\$0	\$771,030	\$171,950	\$942,980	LANL			\$1,269,971	\$1,301,720									
134		1.5.2.1	Stave Extension Cable	122 days	Wed 9/4/19	Thu 2/20/20	\$0	\$24,400	\$24,370	\$48,770	LANL			\$65,840	\$67,486									
135		1.5.2.1.1	design	1 mon	Wed 9/4/19	Tue 10/1/19	\$0	\$0	\$22,097	\$22,097		.35	.35	\$29,831	\$30,577									
136		1.5.2.1.2	prototype	2 mons	Wed 10/2/19	Tue 11/26/19	\$10,000	\$10,000	\$0	\$10,000		.35	.35	\$13,500	\$13,838									
137		1.5.2.1.3	review	2 days	Wed 11/27/19	Thu 11/28/19	\$0	\$0	\$2,273	\$2,273		.35	.35	\$3,068	\$3,145									
138		1.5.2.1.4	procure	2 mons	Fri 11/29/19	Thu 1/23/20	\$14,400	\$14,400	\$0	\$14,400		.35	.35	\$19,440	\$19,926									
139		1.5.2.1.5	test	20 days	Fri 1/24/20	Thu 2/20/20	\$0	\$0	\$0	\$0		.35	.35	\$0	\$0									
140		1.5.2.2	RU	373 days	Fri 3/15/19	Tue 8/18/20	\$0	\$425,030	\$54,653	\$479,683				\$647,572	\$663,761									
141		1.5.2.2.1	Produce RU first production unit	4 wks	Fri 3/15/19	Thu 4/11/19	\$10,000	\$10,000	\$2,546	\$12,546		.35	.35	\$16,937	\$17,360	Produce RU first production unit	→	TECH4_Institution_LANL[10%]						
142		1.5.2.2.2	Procure SamTec Cable	4 wks	Fri 3/15/19	Thu 4/11/19	\$230	\$230	\$1,273	\$1,503		.35	.35	\$2,029	\$2,080	Procure SamTec Cable	→	TECH4_Institution_LANL[5%]						
143		1.5.2.2.3	Test/QA RU	2 wks	Fri 4/12/19	Thu 4/25/19	\$0	\$0	\$3,600	\$3,600		.35	.35	\$4,860	\$4,982	Test/QA RU	→	SCI3_Institution_LANL[50%],ElectTech_Institution_UTAustin[50%]						

The Gantt chart displays the project schedule from 2017 to 2022. The tasks and their durations are as follows:

- Fabricate PB to Stave Cables**: 2017 to 2019
- Fabricate Production PB**: 2018 to 2019
- Procure and Integrate Power**: 2018 to 2019
- Procure and terminate PS-to-Pb**: 2018 to 2019
- test PB with power supplies**: 2018 to 2019
- Document ship to BNL**: 2018 to 2019
- Produce 84 Inner Staves at CERN**: 2018 to 2019
- Tests and QA at CERN**: 2018 to 2019
- CERN Test System**: 2018 to 2019
- Travel and Per Diem at CERN**: 2018 to 2019
- Ship to LBNL and customs**: 2018 to 2019
- design prototype final jig design**: 2019 to 2020
- procure Assembly Fixtures and tooling**: 2019 to 2020
- Metrology design Design jigs Procure jigs ship to LBNL**: 2019 to 2020
- Design&Fabricate Storage Cabinets for Staves**: 2019 to 2020
- &Fabricate Shipping and Storage Containers (Half-Barrels)**: 2019 to 2020
- Design shipping container for 84 staves**: 2019 to 2020
- ship to CERN**: 2019 to 2020
- MAPS inner tracker mechanical model**: 2019 to 2020
- Design Prototype Review Procure end-wheels**: 2019 to 2020
- Travel LBNL**: 2019 to 2020
- review CYSS Design-Fabrication Compatibility**: 2019 to 2020
- modify design**: 2019 to 2020

Wed 11/29/17															MVTX-Barrel-112917														
ID	Task	WBS	Task Name	Duration	Start	Finish	Fixed Cost	Calculated Fixed Cost	Resource Costs	Cost	Institution	Material	Total cost+contingency	Total cost with passthrough	2014														
															'17	'18	'19	'20	2019	'21	'22								
245		1.5.3.3.1.5.4	Validation Of Final Assembly	20 days	Wed 11/25/20	Tue 12/22/20	\$2,576	\$2,576	\$12,707	\$15,283	LBNL	.35	.35	\$20,632	\$21,148														
246		1.5.3.3.1.5.5	Pack/Ship Final Assemblies To BNL	15 days	Wed 12/23/20	Tue 1/12/21	\$3,827	\$3,827	\$4,472	\$8,299	LBNL	.35	.35	\$11,204	\$11,484														
247		1.5.3.3.1.5.6	Milestone: Complete Barrel (RR)	0 days	Tue 1/12/21	Tue 1/12/21	\$0	\$0	\$0	\$0	LBNL	0	0	\$0	\$0														
248		1.5.4	Integration and Infrastructure	1109 days	Mon 10/1/18	Thu 12/29/22	\$0	\$274,200	\$432,752	\$706,952			\$990,424	\$1,015,184															
249		1.5.4.1	Clean Tent/Room	100 days	Mon 10/1/18	Fri 2/15/19	\$50,000	\$50,000	\$0	\$50,000		.35	.35	\$67,500	\$69,188														
250		1.5.4.2	Cooling System	700 days	Mon 10/1/18	Fri 6/4/21	\$0	\$87,000	\$18,431	\$105,431	MIT			\$142,332	\$145,890														
251		1.5.4.2.1	travel	700 days	Mon 10/1/18	Fri 6/4/21	\$25,000	\$25,000	\$0	\$25,000		.35	.35	\$33,750	\$34,594														
252		1.5.4.2.2	Design (modify ALICE)	1 wk	Wed 9/4/19	Tue 9/10/19	\$0	\$0	\$6,520	\$6,520		.35	.35	\$8,802	\$9,022														
253		1.5.4.2.3	Mock up Testing	1 wk	Wed 9/11/19	Tue 9/17/19	\$20,000	\$20,000	\$3,820	\$23,820		.35	.35	\$32,157	\$32,961														
254		1.5.4.2.4	Final Design of Cooling System	5 days	Wed 9/18/19	Tue 9/24/19	\$0	\$0	\$6,520	\$6,520		.35	.35	\$8,802	\$9,022														
255		1.5.4.2.5	Procure Cooling Plant	100 days	Wed 9/25/19	Tue 2/11/20	\$40,000	\$40,000	\$1,571	\$41,571	MIT	.35	.35	\$56,121	\$57,524														
256		1.5.4.2.6	Ship to BNL	1 wk	Wed 2/12/20	Tue 2/18/20	\$2,000	\$2,000	\$0	\$2,000		.35	.35	\$2,700	\$2,768														
257		1.5.4.3	Safety Systems	700 days	Mon 10/1/18	Fri 6/4/21	\$0	\$35,200	\$104,093	\$139,293	MIT			\$186,702	\$191,369														
258		1.5.4.3.1	travel	700 days	Mon 10/1/18	Fri 6/4/21	\$25,000	\$25,000	\$0	\$25,000		.35	.35	\$33,750	\$34,594														
259		1.5.4.3.2	Define MVTX Safety and Interlock requirements	2 wks	Wed 9/25/19	Tue 10/8/19	\$0	\$0	\$6,640	\$6,640	LBNL	.35	.35	\$8,964	\$9,188														
260		1.5.4.3.3	review sensors & interlocks with BNL	10 days	Wed 10/9/19	Tue 10/22/19	\$0	\$0	\$6,720	\$6,720	LBNL	.15	.15	\$7,728	\$7,921														
261		1.5.4.3.4	Design electronics safety system	4 wks	Wed 10/23/19	Tue 11/19/19	\$0	\$0	\$22,057	\$22,057	LBNL	.35	.35	\$29,777	\$30,521														
262		1.5.4.3.5	cooling interlocks design	30 days	Wed 11/20/19	Tue 12/31/19	\$0	\$0	\$20,160	\$20,160		.35	.35	\$27,216	\$27,896														
263		1.5.4.3.6	Procure Safety Systems	8 wks	Wed 1/1/20	Tue 2/25/20	\$10,000	\$10,000	\$8,562	\$18,562		.35	.35	\$25,058	\$25,685														
264		1.5.4.3.7	Test	3 wks	Wed 2/26/20	Tue 3/17/20	\$0	\$0	\$18,650	\$18,650		.35	.35	\$25,178	\$25,808														
265		1.5.4.3.8	Ship to BNL	1 wk	Wed 3/18/20	Tue 3/24/20	\$200	\$200	\$0	\$200		.35	.35	\$270	\$277														
266		1.5.4.3.9	Test at BNL	2 wks	Wed 3/25/20	Tue 4/7/20	\$0	\$0	\$21,304	\$21,304		.35	.35	\$28,760	\$29,479														
267		1.5.4.4	Stave Support Frame & Global Interface to	300 days	Wed 9/4/19	Tue 10/27/20	\$0	\$102,000	\$206,279	\$308,279	LANL			\$454,080	\$465,432														
268		1.5.4.4.1	travel	300 days	Wed 9/4/19	Tue 10/27/20	\$20,000	\$20,000	\$0	\$20,000		.1	.1	\$22,000	\$22,550														
269		1.5.4.4.2	Design Interface to sPHE	100 days	Wed 9/4/19	Tue 1/21/20	\$0	\$0	\$113,009	\$113,009		.50	.50	\$169,514	\$173,752														
270		1.5.4.4.3	FEA,Thermal,stress analy	30 days	Wed 4/1/20	Tue 5/12/20	\$0	\$0	\$34,092	\$34,092		.50	.50	\$51,138	\$52,417														
271		1.5.4.4.4	design interface to rail system	10 wks	Wed 1/22/20	Tue 3/31/20	\$0	\$0	\$56,820	\$56,820		.50	.50	\$85,230	\$87,361														
272		1.5.4.4.5	procure support structure	8 wks	Wed 1/22/20	Tue 3/17/20	\$40,000	\$40,000	\$1,049	\$41,049		.50	.50	\$61,573	\$63,113														
273		1.5.4.4.6	Procure rail interface	8 wks	Wed 4/1/20	Tue 5/26/20	\$40,000	\$40,000	\$1,049	\$41,049		.50	.50	\$61,573	\$63,113														
274		1.5.4.4.7	ship to BNL	0.1 wks	Wed 5/27/20	Wed 5/27/20	\$2,000	\$2,000	\$260	\$2,260		.35	.35	\$3,051	\$3,128														
275		1.5.4.5	Half detector Assembly Readout and Cooling Test at BNL	435.67 days	Tue 6/4/19	Tue 2/2/21	\$0	\$0	\$26,348	\$26,348				\$35,570	\$36,459														
276		1.5.4.5.1	Test Half Barrel #1	15 days	Wed 12/16/20	Tue 1/5/21	\$0	\$0	\$5,310	\$5,310	LBNL	.35	.35	\$7,169	\$7,348														
277		1.5.4.5.2	Test Half Barrel #2	15 days	Wed 1/13/21	Tue 2/2/21	\$0	\$0	\$5,310	\$5,310	LBNL	.35	.35	\$7,169	\$7,348														
278		1.5.4.5.3	Assemble & Test Cooling System at BNL	20 days	Wed 2/19/20	Tue 3/17/20	\$0	\$0	\$15,728	\$15,728	MIT	.35	.35	\$21,233	\$21,764														
279		1.5.4.5.4	test RU at BNL	2 wks	Fri 10/18/19	Thu 10/31/19	\$0	\$0	\$0	\$0	LANL	.35	.35	\$0	\$0														
280		1.5.4.5.5	test FELIX at BNL	2 wks	Mon 11/18/19	Fri 11/29/19	\$0	\$0	\$0	\$0	LANL	.35	.35	\$0	\$0														
281		1.5.4.5.6	PS tests at BNL	1 wk	Tue 6/4/19	Tue 6/11/19	\$0	\$0	\$0	\$0	LBNL	.35	.35	\$0	\$0														
282		1.5.4.6	Installation and Commissioning	497 days	Wed 2/3/21	Thu 12/29/22	\$0	\$0	\$77,600	\$77,600				\$104,240	\$106,846														
283		1.5.4.6.1	Installation Prep	10 days	Wed 2/3/21	Tue 2/16/21	\$0	\$0	\$15,520	\$15,520	ALL	.35	.35	\$20,952	\$21,476														
284		1.5.4.6.2	Installation Review	1 day	Wed 2/17/21	Wed 2/17/21	\$0	\$0	\$2,080	\$2,080	ALL	.10	.10	\$2,288	\$2,345														
285		1.5.4.6.3	Install FELIX	2 days	Thu 2/18/21	Fri 2/19/21	\$0	\$0	\$2,341	\$2,341		.35	.35	\$3,160	\$3,239														
286		1.5.4.6.4	Install Optical fibers	1 wk	Mon 2/22/21	Fri 2/26/21	\$0	\$0	\$6,752	\$6,752		.35	.35	\$9,115	\$9,343														
287		1.5.4.6.5	Install RU	2 days	Mon 3/1/21	Tue 3/2/21	\$0	\$0	\$2,341	\$2,341		.35	.35	\$3,160	\$3,239														
288		1.5.4.6.6	Install Samtec Cables	2 days	Wed 3/3/21	Thu 3/4/21	\$0	\$0	\$2,701	\$2,701		.35	.35	\$3,646	\$3,737														
289		1.5.4.6.7	Install Half-Barrel 1	1 mon	Fri 7/1/22	Thu 7/28/22	\$0	\$0	\$22,933	\$22,933		.35	.35	\$30,959	\$31,733														
290		1.5.4.6.8	Install Half-Barrel 2	1 mon	Fri 7/29/22	Thu 8/25/22	\$0	\$0	\$22,933	\$22,933		.35	.35	\$30,959	\$31,733														
291		1.5.4.6.9	Commissioning	90 days	Fri 8/26/22	Thu 12/29/22	\$0	\$0	\$0	\$0		0	0	\$0	\$0														
292		1.5.5	Ready for beam	0 days	Thu 12/29/22	Thu 12/29/22	\$0	\$0	\$0	\$0		0	0	\$0	\$0														