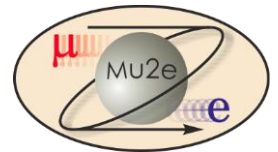




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# Conventional Facility RFP, Cost and Schedule

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L2 Manager  
10/22/2014



# RFP

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- The Mu2e Conventional Facilities, project # 6-10-2 was issued with the GPP, MC Beamline Enclosure, Project # 6-10-22, to be awarded to a single proposer.
  - RFP issued on 6/18/2014.
  - Initial proposals received on 8/12/2014.
  - Final proposals received 9/18/2014
  - Evaluation team finalized their choice on 9/22/2014
- Provisions have been added to keep the reporting of progress separate between the two scopes.

# RFP Constraints

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- Issuing the RFP was contingent on DOE's consent to the Acquisition Plan and RFP for mu2e Conventional Facilities and the MC Beamline Enclosure, received on 6/17/2014.
- RFP also contingent on the Accelerator Div. ES&H approval of the Preliminary Radiation Assessment, received 6/16/2014.
- NEPA approved 6/12/2012.

# Cost Estimate

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- The cost estimate was developed by Middough Inc.
  - Estimates and schedules were prepared at the 60% and 90% design level.
    - Discipline engineers and estimator worked together developing the estimates.
    - Fermilab engineers reviewed the estimates and took ownership of scope and costs.
      - This was useful not only as a check of the estimate but also brought to light a number of material issues that were able to be resolved.
  - Estimate performed using RS Means and Middough's Cost data.
  - Middough's estimate was adjusted for additions and changes made after receipt of final drawings from the A&E.
    - \$11,966,300 (Middough) + \$344,127 (Fermi) = \$12,310,427

# Management and Engineering Estimate

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- The estimate for Management and engineering costs was developed using a percent of the estimated construction cost.
  - Subdivided by:
    - Preliminary / Final Design
    - Construction Phase
    - Project Close
  - Subdivided by:
    - In-house labor (hours)
    - Travel, Equipment and in-house consultants (M&S)
    - Consultants (M&S)
  - Subdivided by year
- Costs and scope not included in % of construction such as survey and JULIE, which used to be provided by Fermilab at no cost to projects, have been added in as activities w/ budget.

# Example showing Final Design Costs

5/14/2014

Projected EDIA estimate based on the cost of contraction

Used for Final Design Estimate

Distribution to Mu2e

See EDIA Summary for Construction and Project Close phase

Construction Cost Basis for determining EDIA Estimate

		\$12,310,427
	Base Estimated Cost of Construction	
	Mu2e Detector Service Building & Hall	\$11,966,300
	Addendum cost estimate	\$344,127



Projected EDIA



			Inception to Date Obligations			EDIA based on Estimated Cost of Construction				Projected Labor Hours and M&S by Year and Phase of work								
			Engineering costs and obligations from Crystal reports April 30, 2014	M&S	Labor Hours Spent	M&S	Labor Hours (based on \$96/Hr.)	Unspent M&S	Unspent Labor Hours	FY12	FY14	FY14 1st Q to April 30.	FY14May 1 to CD-2/3	FY15	FY16	FY17	FY18	FY19
Preliminary/Final	13.5% of TECC=P(EDIA)	\$1,661,808				\$1,201,959	4,791											
475.159	Engineering, Design and Inspection	27% of P(EDIA)	\$448,715	\$363,800	\$115,410	2,438	\$140,000	3,216										
									\$24,592	778	Labor							
											M&S							
475.697	Management and Administration	13% of P(EDIA)	\$216,048	\$120,007	\$48,113	749	\$64,814	1,575										
									\$16,702	826	Labor							
											M&S							
475.161	Consultants	60% of P(EDIA)	\$997,145	\$967,352			\$997,145											

5/14/2014

Projected EDIA estimate based on the cost of contraction

EDIA Estimate for Construction and Project Closeout Phases

Construction Cost Basis for determining EDIA

		\$14,046,095
	Base Estimated Cost of Construction	
	Mu2e Detector Service Building & Hall	\$12,310,427
	B Procured Items	\$1,469,207
	Delivery Ring Upgrades	\$266,460



Const Oversight



			Inception to Date Obligations			EDIA based on Base Cost				Remaining Labor Hours and M&S by Year and Phase of work						
			Engineering costs and obligations from Crystal reports Feb 28 2014	M&S	Labor Hours Spent	M&S	Labor Hours (based on \$96/Hr. Current Rate)	Unspent M&S	Unspent Labor Hours	May 1 to FY14	FY15	FY16	FY17	FY18	FY19	

Construction Phase	10.30% of TECC=CP(EDIA)		\$1,456,918				\$308,068	\$10,897				12	9					
	Engineering, Design and Insp	78% of CP(EDIA)		\$1,102,966			\$155,342	\$9,871		\$9,721	Labor	\$,416	4,642		150			
				\$0						\$0	M&S	\$97,200	\$74,000		\$0			
	Survey QA FY15 Labor											80						
	Survey QA FY15 Equipment & Travel (LOE)											\$12,500						
	Survey QA FY16 Labor (LOE)													80				
	Survey QA FY16 Equipment & Travel (LOE)														\$12,500			
	Engineering, Design & Inspection FY15 Equipment & Travel (LOE)					Julie						\$2,100						
	Engineering, Design & Inspection LOE FY16 to Beneficial Occupancy Equipment & Travel														\$1,400			
	Management and Administrati	16% of CP(EDIA)		\$218,538			\$21,414	\$2,053		\$2,013	Labor	1,239	967		40			
				\$0														
												\$13,600	\$9,800		\$0			
	Consultants	9% of CP(EDIA)		\$135,415			\$135,415	\$0		\$0	M&S	\$121,900	\$13,515		\$0			

# Independent Cost Estimate (ICE)

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- DOE Washington is managing the ICE for Conventional Construction.
- Civil Construction – ICE within ~2% (lower) of project estimate. ICE review was held at Fermilab on 8/26-28/2014
  - Differences at the CSI division was discussed
    - Packaging accounted for much of the difference
      - Project estimate included duct bank cost in Div. 2, civil while independent estimator place these costs in Div 16, electrical.
    - Some user items included in electrical
    - Ice estimator used straight RS Means for concrete; Project estimate accounted for difficult placement methods and heavier formwork/falsework due to configuration.
- DOE determined no further effort was needed to resolve the small differences.

# Schedule

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- Primavera P6 used as scheduling tool
  - Planning package for fixed price construction packages
  - FY 14 Base costs in schedule
    - BOE assigns contingencies, Resource type
  - Cobra delivers the total numbers, transforms labor hours to dollars, adds escalation, contingency and indirects.
- Number of Activities – 298
- Number of Completed Activities - 111
- Number of Milestones – 73
- 22 Level of Effort
- 79 labor Activities
- 0 Critical Activities



# Schedule

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- Middough generated two schedules
  - One based on a sophisticated subcontractor, multi-tasking and;
  - One based on a less sophisticated, one trade at a time, type subcontractor.
  - I independently generated a schedule that is in between the two Middough schedules
- The Fermi schedule (my schedule) is used for the baseline planning package durations and has an 85% confidence.
- The Fermi schedule (my schedule) was used to generate durations and subcontract milestones.