

SECTION 3: Project Execution Plan



**Office, Technical, and Education
Building**

FESS/Engineering Project No. 10-8-1



3.1 RESOURCE REQUIREMENTS

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The following resource requirements have been identified for this project.

3.1.1 FUNDING

This project is primarily funded by two grants from the State of Illinois Department of Commerce and Economic Opportunity: Grant Award No. 10-203828 in an amount not to exceed \$17,000,000 and Grant Award No. 10-203829 in an amount not to exceed \$3,000,000. In addition, DOE will provide an additional TEC not to exceed \$2,000,000 to be part of this project. The Total Estimated Cost (TEC) of the project shall not exceed \$22,000,000.

3.1.2 HUMAN RESOURCES

Divisions/Sections/Research Centers (D/S/C) are responsible for assigning the responsibilities of individuals within the Integrated Project Team (IPT) as indicated in Figure 1 of the Project Charter. In addition, D/S/C will provide additional resources for specialized or unique elements of the project, or as necessary to support the IPT.

Design reviews will occur at varying levels through Final Design. All Divisions/Sections/Research Centers are aware of the design review process and will assign appropriate personnel to complete the reviews for conformance and compliance with D/S/C requirements.

Divisions/Sections/Research Centers will provide required personnel to coordinate construction phase activities that directly affect their operations. For example, the Facilities Engineering Services Section (FESS) will provide personnel to coordinate related activities with the Fermilab Construction Coordinator.

FESS/Engineering will provide licensed professional architects, professional engineers and structural engineers for the oversight of the design and coordination of the project. FESS/Engineering will retain the professional services of an architectural/engineer firm for final design and construction support.

The FESS/Engineering department will provide the oversight of the construction management for the project, overseeing the subcontractor's construction subcontract. Field inspection, environment, safety and health, and quality control of construction activity will be the responsibility of the subcontractor. FESS/Engineering will provide quality and safety assurance oversight during construction phase activities.



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The Project Baseline identifies the basis for evaluating project performance. The components are the Work Breakdown Structure, which identifies each component of the project, the Baseline Costs, Escalation Rates, and Baseline Schedule and Milestones.

3.2.1 Scope Baseline

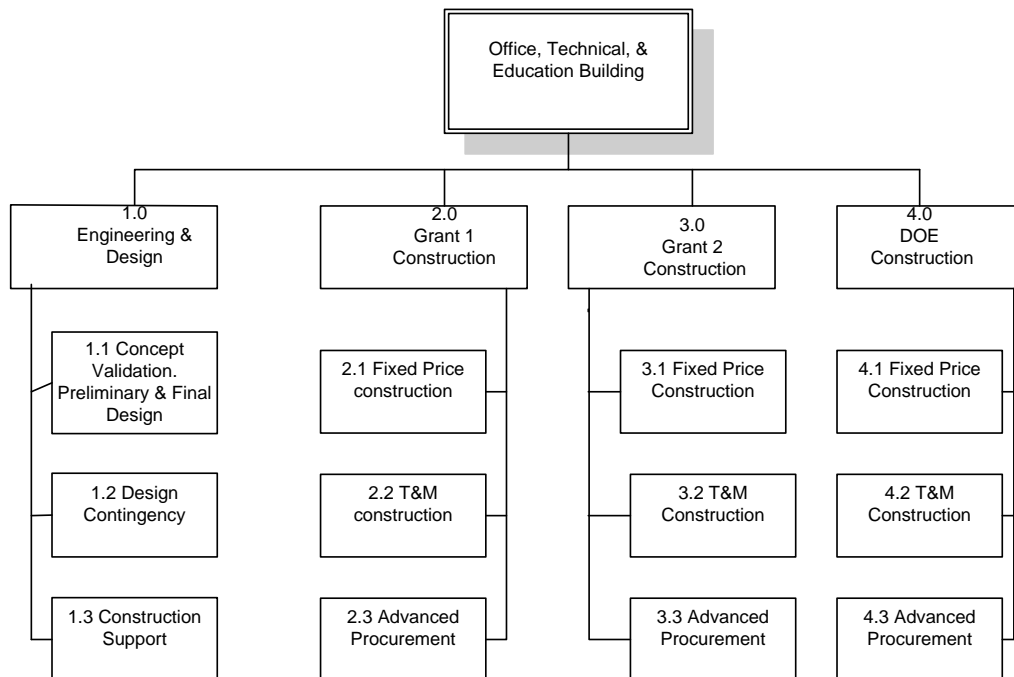
The work outlined in the Conceptual Design Report (CDR) forms the basis for the preliminary baseline scope. Project Completion will be accomplished when the design and construction of the building meeting the goals and objectives described in the CDR is complete and ready for Beneficial Occupancy.

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3.2.2 WORK BREAKDOWN STRUCTURE (WBS)

In order to provide DCEO the required verifiable costing, the WBS will be broken down by funding sources. Listed below is the planned WBS for this project.

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Listed below is further breakdown of the WBS for this project. Breakdown of the listed structure is as required for accounting purposes in order to provide DCEO financial tracking.

1.0 State Grant #1 and #2: Engineering and Design (ED)

This WBS will cover A/E subcontractor services needed to prepare all building design documents, including preliminary and final design, LEED documentation, commissioning documentation, project costs and schedules, and to provide construction support activities. The descriptions are based on DOE Directive G430.1-1, Chapter 6. In addition, DOE Directive G430.1-1, Chapter 25 was used as guidance in estimating the ED cost for this project. This DOE Directive can be found at the DOE website. Appendix B of this document contains the URL link to this chapter.

- 1.1 This WBS item will be used for State Grant 1 Preliminary and Final Design - 1205
- 1.2 This WBS item will be used for State Grant 1 Design Contingency - 1235
- 1.3 This WBS item will be used for State Grant 2 Construction Support - 1221

2.0 State Grant 1 Construction: Grant No. 10-203829

- 2.1 This WBS item will be used for the fixed-price State funded construction portion of the project;
 - 2.1.1 Equipment/Material/Labor - 1217
 - 2.1.2 Contingency - 1235
- 2.2 This WBS item will be used for the Time and Materials construction orders for this project;
 - 2.2.1 Equipment/Material/Labor - 1217
 - 2.2.2 Contingency - 1235
- 2.3 This WBS item will be used for advanced procured materials.
 - 2.3.1 Equipment/Material/Labor - 1217
 - 2.3.2 Contingency - 1235

3.0 State Grant 2 Construction: Grant No. 10-203828

- 3.1 This WBS item will be used for the fixed-price State funded construction portion of the project;



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- 3.1.1 Wiring/Electrical - 1215
- 3.1.2 Equipment/Material/Labor -1217
- 3.1.3 Paving/Concrete/Masonry - 1219
- 3.1.4 Mechanical systems - 1223
- 3.1.5 Excavation/Site Prep/Demo - 1225
- 3.1.6 Plumbing -1229
- 3.1.7 Other Construction Expenses - 1233
- 3.1.8 Contingency -1235

- 3.2 This WBS item will be used for the Time and Materials construction orders for this project;

- 3.2.1 Wiring/Electrical - 1215
- 3.2.2 Equipment/Material/Labor -1217
- 3.2.3 Paving/Concrete/Masonry - 1219
- 3.2.4 Mechanical systems - 1223
- 3.2.5 Excavation/Site Prep/Demo - 1225
- 3.2.6 Plumbing -1229
- 3.2.7 Other Construction Expenses - 1233
- 3.2.8 Contingency -1235

- 3.3 This WBS item will be used for advanced procured materials.

- 3.3.1 Wiring/Electrical - 1215
- 3.3.2 Equipment/Material/Labor -1217
- 3.3.3 Paving/Concrete/Masonry - 1219
- 3.3.4 Mechanical systems - 1223
- 3.3.5 Excavation/Site Prep/Demo - 1225
- 3.3.6 Plumbing -1229
- 3.3.7 Other Construction Expenses - 1233
- 3.3.8 Contingency -1235

4.0 DOE Construction

This WBS will be used for the DOE funded construction costs.

- 4.1 This is fixed-price construction portion of the project;
- 4.2 This is Time and Materials construction orders for this project;
- 4.3 This WBS item will be used for advanced procured materials.

State Budget Definitions

The following definitions are for types or costs associated with the individual WBS for State expenditures:

- X.X.1 Wiring/Electrical – purchase of materials necessary for completion of the



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project scope such as: electrical wiring; conduit; switches; etc. including associated labor/installation costs.

X.X.2 Equipment/Material/Labor – purchase of materials and/or purchase/lease of equipment, to use or install for the project, such as steel; drywall; lumber; wiring; doors; windows; roofing; rock; etc. including labor/installation costs.

X.X.3 Paving/Concrete/Masonry – purchase of materials necessary for completion of the project scope such as bituminous pavement; concrete; rock; bricks; blocks; mortar; tuckpointing; etc. including labor/installation costs.

X.X.4 Mechanical systems – purchase of materials necessary for completion of the project scope such as: HVAC, elevators; fire alarm, sprinkler, or ventilation systems; etc. including labor/installation costs.

X.X.5 Excavation/Site Prep/Demo – costs associated with demolition of existing structures on the project site and/or preparation of the project site including excavation, etc., ahead of actual new construction activities.

X.X.6 Plumbing – purchase of materials necessary for completion of the project scope such as: internal or external pipes for water, gas, and/or sewage; fixtures; etc. including associated labor/installation costs.

X.X.7 Other Construction Expenses – costs that can't be easily broken out to or covered by other individual/specific budgetary line items such as: landscaping; hauling; equipment rental; insurance; environmental fees.

X.X.8 Contingency – coverage of potential cost overruns in any of the other Budget line items.

Final cost estimates and construction breakdown costs will be in accordance with these definitions.

For accounting purposes, the above listed State funded WBS items will be separated WBS items.

For accounting purposes, the management reserve of the above listed DOE WBS items will be included in the WBS costs. DOE Directive G430.1-1, Chapter 11 was used as guidance in estimating the appropriate management reserve for this project. This DOE Directive can be found at the DOE website. Appendix B of this document contains the URL link to this chapter.

For accounting purposes, the indirect costs of the above listed WBS items will be included in all WBS items. For reference purposes, Indirect Costs rates are defined by DOE Order 4700.1 that states indirect costs are "...costs incurred by an organization for common or joint objectives and which cannot be identified specifically with a



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particular activity or project.” The multipliers used in this document are based on current Fermilab rates with maximum cap threshold taken into consideration. Appendix B of this document contains the URL link to the Fermilab Indirect Cost rates. While Indirect Costs have been estimated and included in the Total Project Cost, the Finance Section will confirm that the allocated funds are adequate. The Indirect Costs are not considered as part of the managed baseline.

3.2.3 BASELINE PROJECT COSTS

Listed on the following page are the baseline project costs for this project. The indicated State project costs are identified in the Grants as Budget Line Items. Variance greater than 10% for any Budget Line Item requires DCEO approval; however, in no case shall the total of the Budget Line Items exceed the total Grant award amount.

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	DCEO Budget Cost Category	Base Cost	Management Reserve	Indirect Costs	Subtotal
1.0	Engineering Design & Inspection	\$ 2,579,100	\$ 128,050	\$ 244,000	\$ 2,951,150
1.1	State Grant #1 Design/Engineering 10-203829	1205 \$ 1,252,050		150,000	1,402,050
1.2	State Grant #1 Design Contingency	1235	128,050	19,000	147,050
1.3	State Grant #2: Construction Support 10-203828	1221 1,327,050		75,000	1,402,050
2.0	State Grant #1: 10-203829 Construction	\$ 1,208,150	\$ 151,100	\$ 91,650	\$ 1,450,900
2.1	State Fixed Price Construction 10-203829	1,108,000	139,000	75,000	1,322,000
2.1.1	State Equipment/Material/Labor 10-203829	1217 1,108,000		75,000	1,183,000
2.1.2	State Contingency 10-203829	1235	139,000		139,000
2.2	State T & M Construction 10-203829	25,150	3,100	4,300	32,550
2.2.1	State T&M Equipment /Material/Labor 10-203829	1217 25,150		3,800	28,950
2.2.2	State T&M Contingency 10-203829	1235	3,100	500	3,600
2.3	State Pre-procurement 10-203829	75,000	9,000	12,350	96,350
2.3.1	State Pre Pro Equipment /Material/Labor 10-203829	1217 75,000		11,000	86,000
2.3.2	State Contingency 10-203829	1235	9,000	1,350	10,350
3.0	State Grant #2: 10-203828 Construction	\$ 13,792,402	\$ 1,695,185	\$ 110,363	\$ 15,597,950
3.1	State funded Fixed priced construction 10-203828	13,588,748	1,663,085	75,000	15,326,833
3.1.1	Wiring/Electrical 10-203828	1215 1,751,881			1,751,881
3.1.2	Equipment/Material/Labor 10-203828	1217 6,071,946		75,000	6,146,946
3.1.3	Paving/Concrete/Masonry 10-203828	1219 1,435,847			1,435,847
3.1.4	Mechanical systems 10-203828	1223 2,957,778			2,957,778
3.1.5	Excavation/Site Prep/Demo 10-203828	1225 143,429			143,429
3.1.6	Plumbing 10-203828	1229 430,754			430,754
3.1.7	Other Construction Expenses 10-203828	1233 797,112			797,112
3.1.8	Contingency 10-203828	1235	1,663,085		1,663,085
3.2	State funded T&M construction 10-203828	13,654	1,700	2,303	17,657
3.2.1	Wiring/Electrical T&M 10-203828	1215 1,625		244	1,869
3.2.2	Equipment/Material/Labor T&M 10-203828	1217 6,177		927	7,104
3.2.3	Paving/Concrete/Masonry T&M 10-203828	1219 1,438		216	1,653
3.2.4	Mechanical systems T&M 10-203828	1223 3,019		453	3,472
3.2.5	Excavation/Site Prep/Demo T&M 10-203828	1225 144		22	165
3.2.6	Plumbing T&M 10-203828	1229 431		65	496
3.2.7	Other Construction Expenses T&M 10-203828	1233 821		123	944
3.2.8	Contingency T&M 10-203828	1235	1,700	255	1,955
3.3	State funded Pre-procurement construction 10-203828	190,000	30,400	33,060	253,460
3.3.1	Wiring/Electrical Pre Pro 10-203828	1215 100,000		15,000	115,000
3.3.2	Equipment/Material/Labor Pre Pro 10-203828	1217 20,000		3,000	23,000
3.3.3	Paving/Concrete/Masonry Pre Pro 10-203828	1219		0	0
3.3.4	Mechanical systems Pre Pro 10-203828	1223 50,000		7,500	57,500
3.3.5	Excavation/Site Prep/Demo Pre Pro 10-203828	1225		0	0
3.3.6	Plumbing Pre Pro 10-203828	1229		0	0
3.3.7	Other Construction Expenses Pre Pro 10-203828	1233 20,000		3,000	23,000
3.3.8	Contingency Pre Pro 10-203828	1235	30,400	4,560	34,960
4.0	DOE Funding	1,650,000	259,000	91,000	2,000,000
4.1	DOE Fixed Price Construction	1,550,000	248,000	75,000	1,873,000
4.2	DOE T & M Construction	30,000	5,000	5,000	40,000
4.3	DOE Pre-procurement	70,000	6,000	11,000	87,000
PROJECT TOTAL		\$ 19,229,652	\$ 2,233,335	\$ 537,013	\$ 22,000,000



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3.2.4 MANAGEMENT RESERVE

Management Reserve, identified as “contingency” in the State Grant is a line-item cost category for the State reporting documents. The Grant specifically limits contingency to 10% of the total Grant Amounts. The total contingency for the State Grant is \$2,000,000, which is approximately 12% of the estimated construction costs.

Normally at the CDR stage of the project, a 20% management reserve is applied to cover the cost that may result due the early design stage or uncertainties associated with project execution such as unknown future market conditions.

In order to execute and manage the design-to-cost budget several items of scope management reserve have been identified. This list will continue to be refined during the final design stage. These scope-deduct items will be identified on the final construction documents as “alternate deducts” during the competitive procurement activities. During the source evaluation process, the project team will review the alternate deducts and determine which ones should be excluded from the scope of work, if necessary, while still providing a fully-functional building at project completion.

The Request for Proposal (RFP) will ask for a base-bid price incorporating the full scope as defined by the subcontract documents. In addition to a base-bid price, the RFP will ask for alternate deducts based on the following scope deduct items (or alternative scope deducts developed during the final design stage), as well as separate contract option prices:

Scope Deducts	North side, screens, vertical shading devices	\$133,000
	South, screens, horizontal shading devices	\$63,000
	Window film, graphic	\$64,000
	Outdoor seating, Wood deck, 4” thick, cedar	\$12,500
	Green Roof over Tech Space	\$46,000
	West Stair, rated glazing	\$100,000
	Classrooms, Acoustic partitions, operable, with track, 3” thick, deluxe,	\$253,000
	Tech space, Acoustic partitions, operable, with track, 3” thick, deluxe	\$234,000
	Tech space, change flooring	\$88,000
	Lobby, change flooring	\$38,000
	Hydraulic, passenger elevator, 3500 lb, 100 FPM	\$187,000
	Change paving system	\$380,000
	Interior CDF Bridge	\$650,000
	Movable Partition System	\$680,000
	Light Crane – Tech Area	\$130,000
	Education and Conference A/V Equipment	\$90,000
	Tech Area Acoustical Upgrades	\$52,000
	TOTAL	\$3,200,500.00

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In the event that proposals are favorable, additional interior furnishings and equipment, sustainability elements, landscaping, and other fit-up features will be added and enhanced.

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3.2.5 ESCALATION

The baseline project and associated cost estimate assumes that the midpoint of construction will be the 1st quarter of fiscal year 2013 (FY13). DOE Directive G430.1-1 was used as guidance in estimating the appropriate escalation for this project. This directive can be found at the DOE website. Escalation rates are based on “*Escalation Rate Assumptions for DOE Projects*” (November 27, 2009, reviewed June 2010). These rates are considered conservative with respect to recent decline in construction price indices as well as slow economic recovery expectations. Escalation rates will be closely monitored during the design process.

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YEAR	Start Date Design	Mid-point Construction	DOE Rate	Effective Rate
2010	06/15/10		2.3%	0.0115
2011			2.2%	0.0220
2012		10/12	2.4%	0.0200

Calculation of Construction Escalation Rate:		1.0115
	X	1.0220
	X	1.0200
		<u>1.0544</u>

Construction Escalation Rate= 5.4%



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3.2.6 BASELINE PROJECT SCHEDULE AND MILESTONES

The baseline schedule listed below sets forth the major activities and milestones essential for the completion of the project within the constraints of Lab operations.

The Grants require the Grant Scope of Work to be completed within the grant term, 06/01/2010 - 05/31/2012. Grant Section 4.2 allows for extensions of the grant term for good cause. This schedule is based on obtaining a one-year Grant Extension from DCEO. The milestones are defined as:

MILESTONE	DEFINITION	BASELINE
Start Project	Director sign-off	Month 0
Start Engineering	Engineering work for the project starts when a task is entered into the Task Database	Month 1
Begin Construction	Notice To Proceed/Purchase Order Issued	Month 13
Construction Complete	Final acceptance of all work	Month 31
Engineering Complete	Completion of Close-out Documents	Month 33
Project Complete	Project Closed	Month 34



3.3 ACQUISITION EXECUTION PLAN

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3.3.1 DESIGN

The development of construction documents and bid packages will be accomplished by use of an Architectural-Engineering (A/E) firm. The selection of the A/E firm will be from the 2009 Large A/E Selection master list for General A/E's of firms that have been prequalified and that are under a master contract.

3.3.1.1 Source Selection Process

The selection of the A/E firm will be in accordance with the FESS-Engineering procedures established for Selecting and Tasking New Large A/E Contracts. These procedures consist of:

- Identification and department head approval of appropriate A/E category;
- Establishment of Selection Committee(SC) consisting of FESS Project Manager, FESS 2009 Large A/E Evaluation Team, Fess-Engineering Department Head, Fermi Project Director, and the Procurement Officer;
- Development of project specific Requests for Information (RFI) and scoring criteria with approval by the SC.
- RFI distributed to all A/E's in the appropriate A/E category;
- On-site presentation to the SC of each A/E's response to the RFI;
- SC ranks A/E's based on scoring criteria, with final selection based on highest technical ability. (Fees are not part of the RFI or scoring criteria.)

3.3.2 CONSTRUCTION

In order to manage costs and schedules, it is anticipated that this project may be accomplished by at least two (2) separate construction packages: Underground Work and Above Ground Work. The Conventional Construction packages will be a competitively bid, lump sum contract. Time and Materials (T&M) tasks may be used for work that is specialized and difficult to include in the competitive procurement process. Advanced procurement may be used for items with long-lead procurement timeframes.

3.3.2.1 Possible Sources for the Conventional Construction Subcontractors

Fermilab has access to several Subcontractors that have sufficient qualifications to execute this Subcontract. Subcontractors are selected in response to a Request for Proposal and must meet specific safety and quality requirements. When applicable, there will be a close-out meeting to formally assess the performance of subcontractors in accordance with FESHM Chapter 7010.

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3.3.2.2 Performance Based Incentive Process

The subcontractor will be paid only for work completed. In addition, retention may be reduced from 10% to as little as 2% during the subcontract if the subcontractor maintains a safe environment and meets subcontract milestones.

3.3.2.3 Methods of Completion

The Request for Proposal (RFP) process will be used to solicit proposals from area Subcontractors with the appropriate safety records and experience to accomplish this work.

3.3.2.4 Source Selection Process

A Source Evaluation Team (SET) will be established to evaluate the proposal offers, which will include the Fermi Project Director, Fermi Project Manager, Fermi Project Coordinator, and Fermi Procurement Officer to evaluate and select a Subcontractor for the Conventional Construction Package. Evaluation criteria will be included in the Request for Proposal (RFP) documents as a basis for the SET evaluation of proposals.

3.3.2.5 Justification for Non-competitive Acquisitions

Anticipated non-competitive acquisitions may include Time and Material (T&M) tasks and advanced-procured items requiring longer than tolerable fabrication or delivery time. These items will be identified during the Final Design phase.

3.3.2.6 Milestones for Acquisition

Construction milestones will be established for inclusion into the subcontract documents.



3.4 MONITORING AND CONTROLS

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3.4.1 COST CONTROL

A separate cost account will be maintained for the following elements listed in the project Work Breakdown Schedule (WBS):

- 1.0 Engineering Design & Inspection**
 - 1.1 State Design/Engineering ED&I Grant 10-203829
 - 1.2 State Design Contingency ED&I Grant 10-203829
 - 1.3 State Construct. Support ED&I Grant 10-203828
- 2.0 State Grant 10-203829 Construction**
 - 2.1 State Fixed Price Construction**
 - 2.1.1 State Equipment/Material/Labor
 - 2.1.2 State Contingency
 - 2.2 State T & M Construction 10-203829**
 - 2.2.1 State Equipment/Material/Labor
 - 2.2.2 State Contingency
 - 2.3 State Pre-procurement 10-203829**
 - 2.3.1 State Equipment/Material/Labor
 - 2.3.2 State Contingency
- 3.0 State Grant 10-203828 Construction**
 - 3.1 State Fixed priced construction**
 - 3.1.1 Wiring/Electrical
 - 3.1.2 Equipment/Material/Labor
 - 3.1.3 Paving/Concrete/Masonry
 - 3.1.4 Mechanical systems
 - 3.1.5 Excavation/Site Prep/Demo
 - 3.1.6 Plumbing
 - 3.1.7 Other Construction Expenses
 - 3.1.8 Contingency
 - 3.2 State T&M construction 10-203828**
 - 3.2.1 Wiring/Electrical
 - 3.2.2 Equipment/Material/Labor
 - 3.2.3 Paving/Concrete/Masonry
 - 3.2.4 Mechanical systems
 - 3.2.5 Excavation/Site Prep/Demo
 - 3.2.6 Plumbing
 - 3.2.7 Other Construction Expenses
 - 3.2.8 Contingency
 - 3.3 State Pre-procurement construction 10-203828**
 - 3.3.1 Wiring/Electrical
 - 3.3.2 Equipment/Material/Labor
 - 3.3.3 Paving/Concrete/Masonry

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- 3.3.4 Mechanical systems
- 3.3.5 Excavation/Site Prep/Demo
- 3.3.6 Plumbing
- 3.3.7 Other Construction Expenses
- 3.3.8 Contingency
- 4.0 **DOE**
- 4.1 DOE Fixed Price Construction
- 4.2 DOE T & M Construction
- 4.3 DOE Pre-procurement

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The baseline budget for each element will be shown on all reports. Costs charged to these accounts will be reported monthly on a report available on the Business Services Section (BSS) website. In addition, costs in these accounts will be reported quarterly to the State in the format required by the Grant. The Fermilab Project Manager will review the report as needed and verify the validity of all cost charges during the reporting period; that commitments are correct; and that projections of costs can be covered by the baseline budget for each work element.

The Fermilab Project Manager has the responsibility for the use and commitment of project funds. Any costs or commitments that are made without the project manager's signed approval or that of higher Laboratory management may be rejected. Progress payments to the Architect/Engineer, suppliers, and subcontractors will be made upon receipt and approval of acceptable invoices, nominally on a monthly basis.

The Fermilab Project Manager, within authorized limits, will be responsible for the administration of the project's management reserve funds.

The Fermilab Project Manager is responsible for updating, as needed, the project Estimate at Completion (EAC) for each work element to reflect changes in design and construction, and for overall project fiscal management.

3.4.2 SCHEDULE CONTROL

The Baseline Schedule, shown in Section 3.2.5 of this project plan, depicts the milestones. As the project develops, the schedule may be further refined. The Fermilab Project Manager shall have the responsibility to monitor and control these tasks within the baseline. The baseline may be revised with the change control board and PMG concurrence.

The Project manager/construction manager will review work progress with the subcontractor at regular intervals. Any identified difficulties will require the subcontractor to provide a plan for their resolution. Significant schedule slippage will



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be cause for expediting actions by BSS at the request of the Fermilab Project Manager.

The following Preliminary Tracking Milestones will be used as a basis for schedule control:

Tracking Milestone	Definition	Date
CDR Complete	RBA delivers CDR document	Oct 6, 2010
Director's Review	Review by FNAL mgmt of Proj Plan	Oct 13, 2010
Engineering Start	Proj Plan approved, directorate sign-off	Nov 3, 2010
A/E start	Proposal negotiations complete	Nov 18, 2010
Eng Drawings complete	CCR comments incorporated	July 14, 2011
Award Construction Contract	Source Evaluation Team evaluation complete, BSS complete, establish initial project scope, retain 10% contingency	Nov 3, 2011
Substructure	Details based on construction contract	TBD
Shell	Details based on construction contract	TBD
Interiors	Details based on construction contract	TBD
Building Systems	Details based on construction contract. Reduce contingency	TBD
Equipment and Furnishings	Details based on construction contract	TBD
Site Work	Details based on construction contract	TBD
Construction 100% complete	Final acceptance of all construction work	May 16, 2013
Engineering complete	Completion of close-out documents	Aug 8, 2013
Project complete	Final reports to DCEO, DOE, project closed	Sept 5, 2013

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3.4 MONITORING AND CONTROLS

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3.4.3 CHANGE CONTROL PROCEDURES AND AUTHORITIES

Changes to the project’s internal baseline can occur to the scope, cost, or schedule aspects of the project. Changes at WBS Level 1 and below will be made with the approval of the Fermilab Project Manager for cost changes up to \$75,000 and schedule changes up to 3 months. Cost and schedule changes above these amounts and changes to the scope of the project as outlined in the CDR will require the approvals outlined below. Any change to the Total Project Cost will require the approval of the Change Control Board, the IAU-PMG, and DOE. Project change control will be accomplished in accordance with practices listed below.

Change Control Procedures		
Change	Approval Required	Change Request Form
Normal Field Changes no added cost or time	Fermilab Project Manager	None
In scope ≤\$75k or ≤3 mos. schedule change	Fermilab Project Manager	None
In scope >\$75k or >3 mos. schedule change	Control Board	Required
Total Project Cost	Control Board DOE FSO	Required
Non-Emergency Required for ES&H regulations	Fermilab Project Manager	Required
Change to Project Scope or Project Schedule (milestones)	Control Board DOE FSO	Required

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The Change Control Board (Control Board) will be comprised of the following named individuals or the designees:

DOE Fermi Area Office
Sponsor - Chief Operating Officer
Stakeholder – FESS Head
Fermilab Business Service Section
Fermilab Project Director
Fermilab Project Manager

S. Webster (non-voting)
B. Chrisman
R. Ortgiesen
D. Carlson
R. Kephart
R. Merchut (Chair)



3.4 MONITORING AND CONTROLS

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The Fermilab Project Manager will act as Chair to the Control Board. The Control Board will consider the change requests promptly and, in cases not requiring additional information or discussion, will respond within two (2) weeks. The project manager will report the actions of the change control board to the PMG.



3.5 ORGANIZATIONAL PROCESS ASSETS

3.5.1 INTEGRATED SAFETY MANAGEMENT (ISM)

Fermilab subscribes to the philosophy of Integrated Safety Management (ISM), in accordance with Department of Energy Order 413.3 “Program and Project Management for the Acquisition of Capital Assets.” Appendix B of this document contains a URL link to the DOE order. Fermilab requires its subcontractors and sub-tier subcontractors to do the same. ISM is a system for performing work safely and in an environmentally responsible manner. The term “integrated” is used to indicate that the Environment, Safety & Health (ES&H) management systems are normal and natural elements of doing work. The intent is to integrate the management of ES&H with the management of the other primary elements of design and construction: quality, cost, and schedule.

The final design documents shall be based on comprehensive life safety and code analysis. Preliminary safety and hazard plans shall be developed during design. Radiation safety plans to be part of final design documents.

The construction subcontractor(s) shall submit proof of an effective integrated safety management program. The program must be described in the terms listed below.

- Line Management Responsibility for Safety;
- Clear Roles and Responsibilities;
- Competence Commensurate with Responsibility;
- Balanced Priorities;
- Identification of Safety Standards and Requirements;
- Hazard Controls Tailored to Work Being Performed;
- Operations Authorization.

3.5.2 QUALITY ASSURANCE

All aspects of this project will be periodically reviewed with regard to Quality Assurance issues from Conceptual Design through Close-out. This review process will be completed in accordance with the Engineering Manual and applicable portions of the Fermilab Director’s Policy Manual, Section 10. Appendix B of this document contains a URL link to the Fermilab Director’s Policies. The following elements will be included in the design and construction effort:

- An identification of staff assigned to this project with clear definition of responsibility levels and limit of authority as well as delineated lines of communication for exchange of information;
- Requirement for comprehensive quality control program from design A/E.



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- Requirements for design criteria as identified in the Project Plan
- Standards and codes as identified in the Project Plan;
- Periodic review of design process, drawings and specification to insure compliance with accepted design criteria in bid document preparation;
- Identification of underground utilities and facility interface points prior to the commencement of any construction in affected areas;
- Conformance to procedures regarding project updating and compliance with the approved construction schedule;
- Conformance to procedures regarding the review and approval of shop drawings, samples test results and other required submittals;
- Conformance to procedures for site inspection by Fermilab personnel to record construction progress and adherence to the approved contract documents;
- Verification of project completion, satisfactory system start-up and final project acceptance.

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3.5.3 HIGH PERFORMANCE BUILDING DESIGN

Following DOE Order 430.2B, new construction and major renovation projects over \$5 million will be designed to achieve LEED-NC Gold certification.

This project is a new building; therefore the adherence to HPSB Guiding Principles and LEED Gold certification are required.

Fermilab incorporates sustainable design principals into the planning, design and construction of projects. This direction is taken from the Fermilab Director's Policy 3. Appendix B of this document contains a URL link to the Fermilab Director's Policies

Sustainability is broadly defined as the design and implementation of projects to simultaneously minimize their adverse environmental impacts, maximize occupants' health and well-being, and improve bottom line, life cycle, economic performance. The concept of sustainability is a desirable approach to development that recognizes that resources are limited, and that there is a responsibility of the present generation to preserve resources for future ones.

The United States Green Building Council (USGBC) has developed the Leadership in Energy and Environmental Design (LEED) standard to provide guidance for builders



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who wish to incorporate sustainable elements into their projects. LEED for new construction (and remodeling) is a set of specific and quantifiable measures, each of which confers a credit towards certification of a project as a “LEED-certified” building.

The project processes and each project element are evaluated to reduce their impact on natural resources without sacrificing program objectives. Fermilab designs will incorporate maintainability, aesthetics, environmental justice and program requirements to deliver a well-balanced project. If appropriate, internal and external reviews of design and construction provide a check and balance system for environmental, aesthetic and maintenance issues.

See Appendix B of this Project Plan for LEED 2009 Checklist.

3.5.4 RELIABILITY AND MAINTAINABILITY

Both reliability and future maintenance are considered in the design of all components of Fermilab site. Materials and construction techniques are selected during the design process to provide adequate design life, accessibility, and minimal maintenance.

When completed, this project will become the formal combined responsibility of the Fermilab FESS Section and a landlord to be determined. Formal MOU’s will be developed regarding operation and maintenance responsibilities. The completed project, and the utilities and systems that support it, will be added to the overall laboratory maintenance and building inspection program of the Facilities Engineering Services Section. The Facilities Engineering Services Section will coordinate the preventative maintenance, normal service and emergency repairs for the building equipment.

The Building Research Board National Research Council states that if a property receives an adequate level of maintenance and repair funding, a steady-state situation should exist wherein the inventory would remain in a service condition that would neither decline nor improve and a maintenance and repair backlog would not develop. Maintenance is defined as the day-to-day work necessary to sustain property in order to realize the originally anticipated useful life of a fixed asset. Maintenance includes periodic inspection, adjustment, lubrication, and cleaning (non janitorial) of equipment, replacement of parts etc. to assure continuing service and to prevent breakdown. Repair is defined as the work required to restore damaged or worn-out property to a normal operating condition. In general, repairs are curative and maintenance is preventive.



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Operations are the activities related to a building’s normal performance of the function for which it is used. The cost of utilities, janitorial services, window cleaning, rodent control and waste management are generally included within the scope of operations and are not maintenance.

The following preliminary maintenance and repair costs forecast is based on information contained in the Whitestone Building and Repair Cost Reference 2002 escalated to FY2009 and indexed for the Chicago, Illinois area. The Building M&R Cost Profile is based on the Community Center model. While not an exact match, the functions and basic material selections are considered similar in nature to provide a preliminary forecast of maintenance and repair costs for this project.

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<i>Cost (FY2010)</i>	Annual Cost Per Square Foot	Annual Cost as % of Replac. Cost
PM and Minor Repair	\$1.00	1.04%
Unscheduled Maintenance	\$1.15	1.18%
Renewal and Replacement	\$3.02	3.12%
Total M&R Costs	\$5.16	5.34%

If requested, a detailed maintenance and repair forecast for this project will be developed after the completion of construction. A copy of the referenced Whitestone Building and Repair Cost Reference data is included in the Appendix B of this project plan.

3.5.5 VALUE MANAGEMENT

It is not anticipated that a separate value management exercise will be required for this project. However, internal reviews of designs at various levels of completion will be performed by the most experienced individuals at Fermilab with the goal to identify cost effective design solutions. These internal reviews will focus on understanding the impact of the technical requirements on the overall project including optimization to reduce the life cycle costs.



3.5 ORGANIZATIONAL PROCESS ASSETS

3.5.7 DESIGN REVIEWS

Design reviews have been on-going since the pre-conceptual stage and have included reviews of site location, massing and blocking, functional reviews, and conceptual design reviews.

Design reviews are accomplished in accordance with FESS/Engineering Standard Operating Procedure 8.3.5.1, “Document Reviews.”

Designs are reviewed for conformance to project requirements and for appropriateness of the proposed systems, impacts on existing systems and operations, specific technical requirements to be incorporated into the design and compliance with best and required practices of authority having jurisdiction.

A Comment and Compliance Review (CCR) will be undertaken during the Final Design Phase. Other reviews may be undertaken for specific elements of the project.



3.6 RISK MANAGEMENT

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An important part of the project planning will be to ensure the risks associated with the project have been identified, analyzed, and determined to be either avoidable or manageable.

Ten (10) risks have been identified. Of the ten risks, 2 have been identified as having a moderate risk level and 8 are believed to be low. The assessment has been made based on past Fermilab experience and consultation with Argonne National Laboratory on previous DCEO work. Each of the identified risks will be monitored on an on-going basis to assure they have been satisfactorily addressed, eliminated, or managed.

No.	Potential Risk	Risk Level
1	Ongoing Operational Constraints	Moderate
2	Site access delays	Moderate
3	A/E design team changes/loss of key member	Low
4	Design Changes/change in occupancy	Low
5	Delay in the Bidding/Procurement Approval Process	Low
6	State approval of budget variances	Low
7	State approval of schedule variances	Low
8	Unknown Existing Conditions	Low
9	Change in market conditions	Low
10	Field Permit Delays – wetland	Low

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Risk No. 1: A significant risk management item on this project involves the coordinated activities affecting ongoing Fermilab operations. Sufficient float in the Schedule is currently projected for the activities related to constructing the project to accommodate potential disruptions. Coordination meetings with affected users will occur frequently throughout the design period to identify impact on ongoing Fermilab operations and identify strategies to reduce risk.

Risk No. 2: Project Start delay due to delays in other Fermilab construction projects, including, the Industrial Area Site Upgrades project and the Sanitary Sewer Pipe Burst project also presents a moderate risk. Sufficient float in the Schedule is currently projected to accommodate delays in site access and to fully mitigate this risk.



3.6 RISK MANAGEMENT

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DCEO Grant Risks:

Risk No. 6: State approval of budget variances in excess of 10% of the State line-item budget is required by Grant Section 5.7. The individual line item budgets were developed at a pre-conceptual stage and are expected to change based on the final design. Approval of line item budget variances is considered a low risk, because as a design-to cost-project, the total Grant amounts will not be exceeded therefore, reducing the risk of not receiving line item budget variations. Cost estimates will be closely evaluated at multiple stages of design.

Risk No. 7: In order to accommodate Risks #1 and #2, ongoing Lab operations and site availability, the current schedule indicates the project completion to be 12 months after the grant terms of 24-month. This will require a Grant extension under the provisions of Grant section 4.2, with the possibility of DCEO requiring a grant refund. (Section 4.14, Grant Recovery Act has been deleted from the Grants, section 4.3(A) Expenditure of Funds: Right to Refund has not.) Nearly all state funds will be obligated prior to the end of the Grant term. Based on consultation with Argonne National Laboratory, term extensions for good cause are easily obtainable from DCEO. On-going Lab operations and site availability are believed to be good cause. Fermilab legal office was consulted. As a result of this consultation, approval of a term extension is considered a low risk.

Risk No. 10: The parking lot adjacent to the building encroaches upon a small wetland, which requires a jurisdictional determination by the Army Corps of Engineers and possibly a wetlands permit in compliance with the Clean Water Act (CWA). As part of an existing maintained drainage system, this wetland is not expected to require a permit. However, because of the length of time involved with the permit determination process it is considered a low risk until the process is complete.

Risk No. 3, 4, 5, 8, and 9: The remainder of the risks are considered low, with sufficient schedule and budget controls and monitoring to mitigate impact on schedule or budget.

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The objective of the reporting and review activity is to provide the collection and integration of essential technical, cost, schedule and performance data into reports for the monitoring and management of the project.

3.7.1 REPORTING

Quarterly Work for Others Status Reports -- The Fermilab Project Manager will provide to the Project Management Group (PMG) and DOE management Quarterly General Plant Project (GPP) type reports covering status of cost and schedule, progress towards meeting established milestones, issues and problems with proposed corrective actions.

Quarterly State Reporting -- The Fermilab Project Manager will provide to the Fermilab Manager of Grants and Contracts Quarterly Project Status progress reports, including end-of-Grant reports, in accordance with the DCEO Reports Deliverable Schedule, dated June 28, 2010, contained in Appendix C. Project Status Reports will be approved by the Fermilab Project Director.

In accordance with the DCEO Reports Deliverable Schedule, the Fermilab Manager of Grants and Contracts will develop Quarterly Financial Status progress reports from the Fermilab Accounting system based on paid invoices. All costs incurred, whether funded by DCEO or DOE must be accounted for within the Lab's Oracle-based accounting system. All financial reports to be prepared and submitted must be based on and reconciled to the Oracle Record of accounts.

The Fermilab Manager of Grants and Contracts will electronically submit to the DCEO quarterly Project Status and Financial Status Reports

Monthly Progress Reports – The Fermilab Project Manager will provide reports on a regular basis to the PMG. The reporting will include cost, schedule and performance data. Problems or issues will be addressed.

The Budget Officer and the Controls Manager will submit monthly written narrative reports to the Project Manager detailing specific progress on the pertinent subsystems. The reports summarize the activities of the previous month, including progress, problems, budget and schedule status, including comparison of projected status versus actual status.

The Design and Construction Subcontractors will submit a monthly invoice, schedule update, EVMS reporting, and narrative description of project progress.



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Weekly – The Design and Construction Subcontractors will submit a summary report that details the activities performed, progress on completion of major activities and milestones, hours worked the previous week, and quality control activities for the previous week. These reports will include a “look ahead” schedule that details the expected progress in the coming weeks.

Daily – If appropriate, construction logs may be prepared by the Fermilab Construction Coordinator that document the ongoing construction progress, quality assurance, safety and change issues. When required, the Subcontractor prepares daily quality control reports documenting their efforts on field activities. The Fermilab Project Manager and Fermilab Construction Manager are provided these reports on the following workday.

3.7.2 REVIEWS

Bi-Weekly IPT meetings – General project meetings will take place on a bi-weekly basis and provide the opportunity for update and review for project participants at every level.

The Fermilab Project Manager as well as the IPT will review design and construction progress, changes, subcontractor payouts and general project progress.

Technical, cost, and schedule performance will be monitored, evaluated, and reported.

Directorate Level Review – If appropriate and requested, the project team will meet with the Directorate to review the project related cost data, schedule status and performance progress.

Various meetings between the Directorate, PMG, and the Integrated Project Team will be held at appropriate intervals to ensure management of the overall project and provide opportunity for review.

Multi-Organization Construction Site Safety Walkthrough – These walkthroughs will occur periodically as determined by the Fermilab Project Manager. The walkthroughs will be completed in accordance with Section 7010 of the Fermilab Environment Safety and Health Manual (FESHM). A copy of the procedure is included in Appendix B of this Project Plan.

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