



WBS 2.1

Site and Buildings

June 4, 2007

S. Dixon

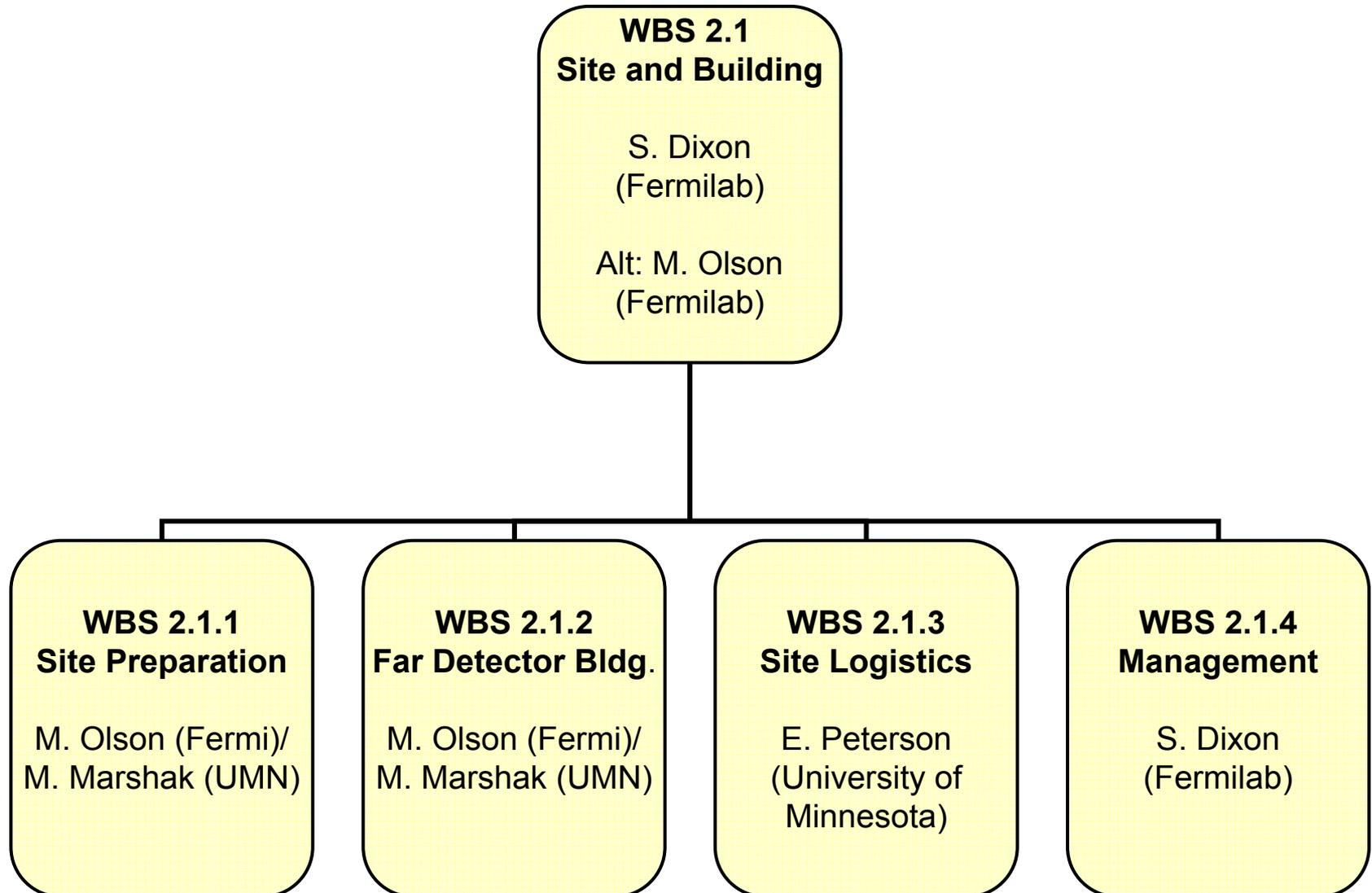


Project Summary – Two Major Components

- Site Preparation Package
 - 3.5 miles of improvement to an existing logging road to accommodate all weather access;
 - Wetland Mitigation (~3.5 acres);
 - Rock Excavation
- Far Detector Building
 - Below Grade Enclosure
 - 373.3' long x 63' wide x 67' high
 - 40 feet below grade (spill containment)
 - 9.86 feet of earth equivalent shielding
 - Service Building
 - 147' long x 69.7' wide x 35' tall
 - Accommodates support functions
 - Loading Dock
 - Scintillator Transfer Facility
 - Offices



WBS 2.1 Organization Chart



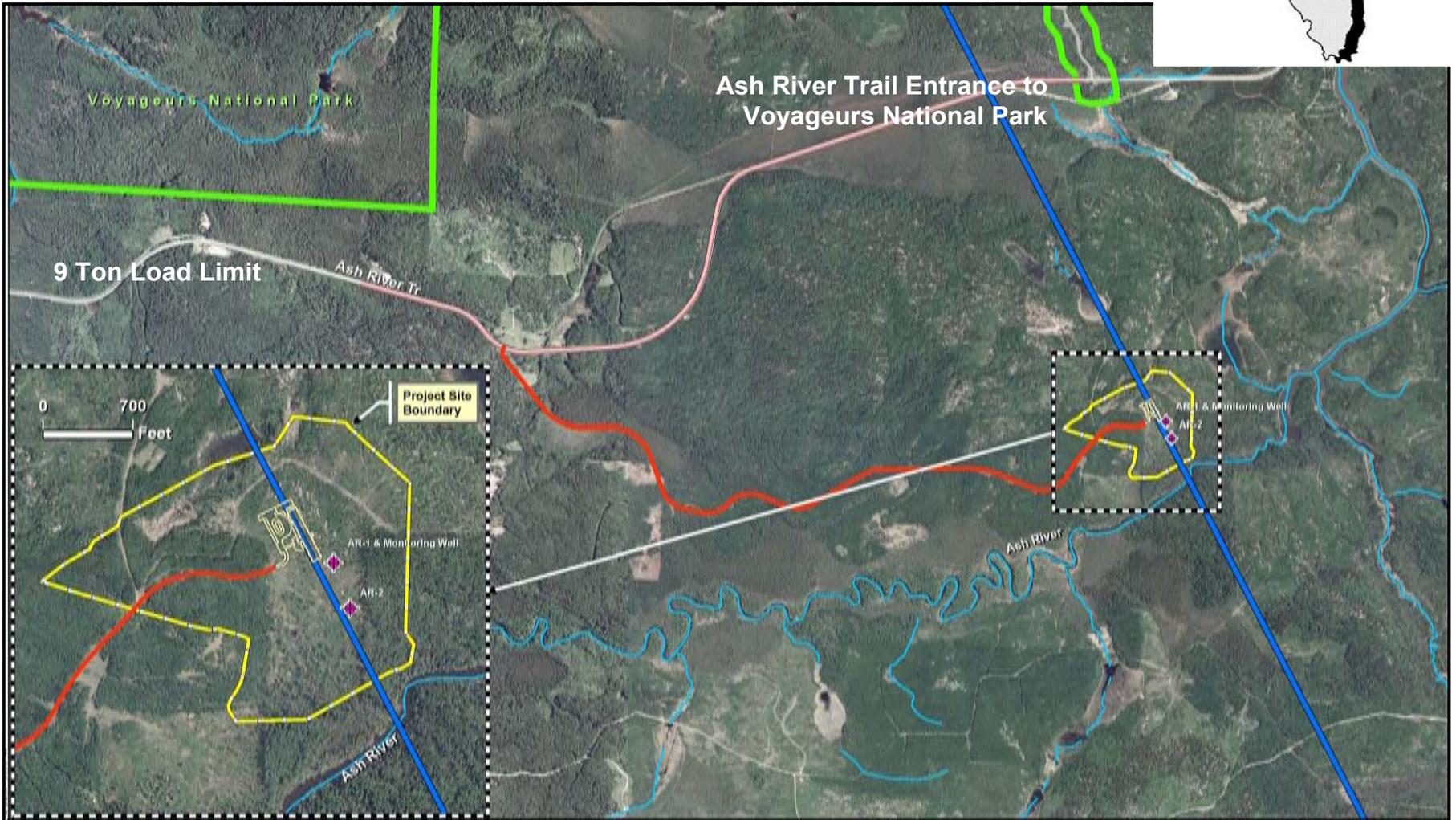


Project Team

- Fermilab
- University of Minnesota
- Shirmer Engineering - Life Safety/Fire Protection
- Burns and McDonnell
 - Site Preparation Design
 - Secondary Containment Study
 - Cost and Schedule Development
 - Mechanical Systems Review
- Short Elliot Hendrickson
 - Environmental Assessment Worksheet
 - Wetland Delineation/Permitting
 - Subsurface Investigation
- Hanson Professional Services
 - Topographic Survey
- J.E Dunn - Independent Cost Estimate
- Constructive Ideas – Independent Cost Estimate



Ash River Site

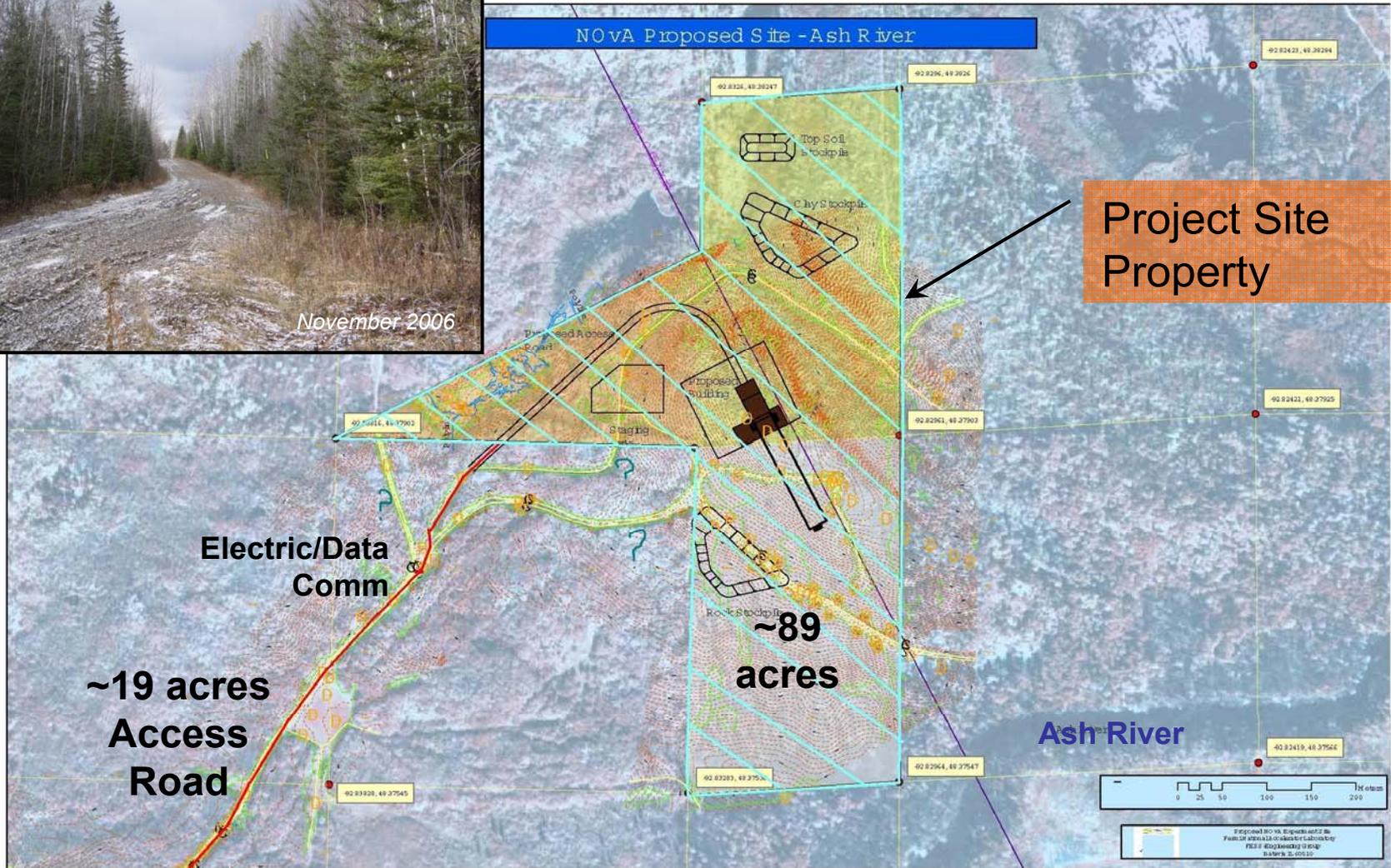




Ash River Site



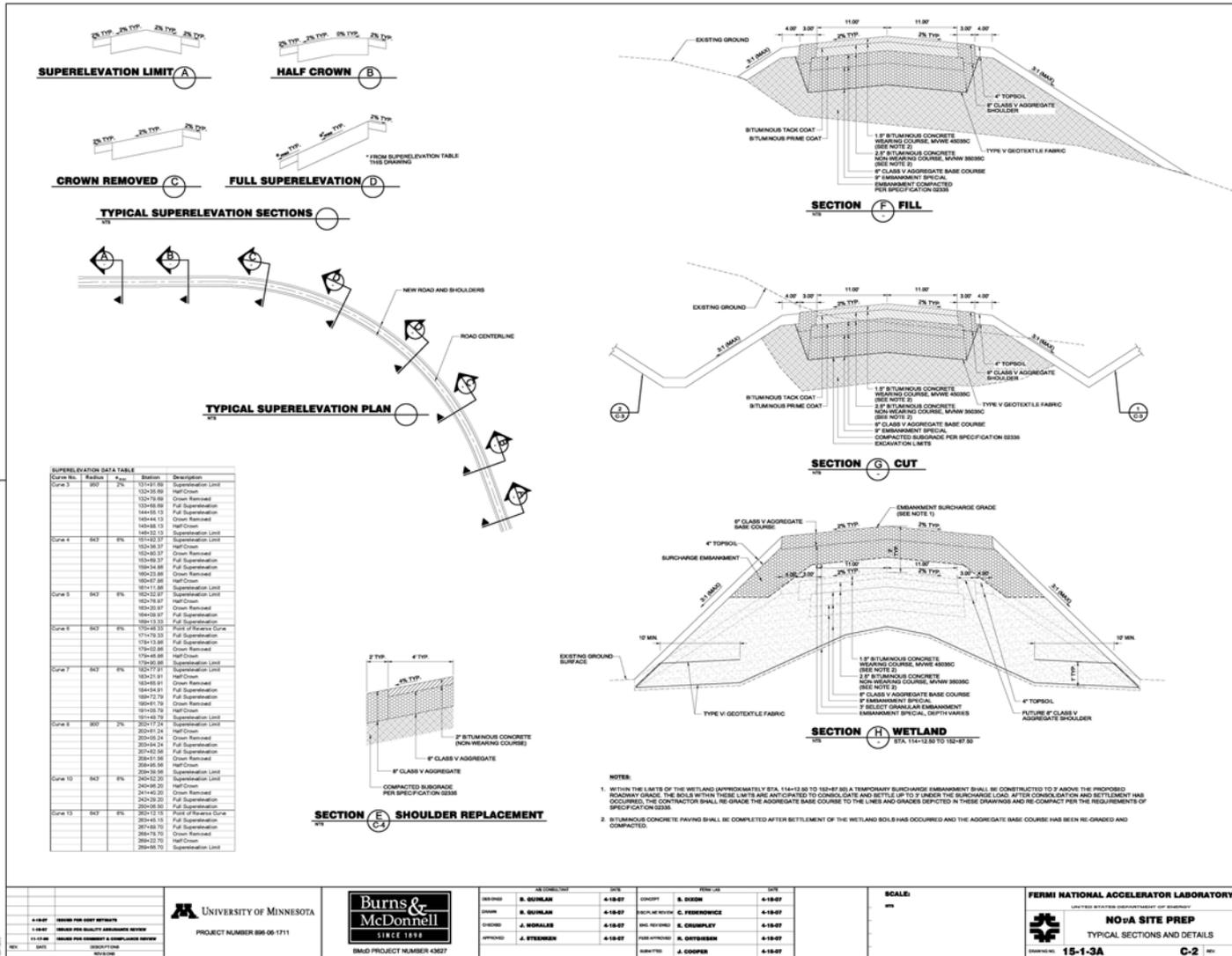
November 2006



Project Site Property

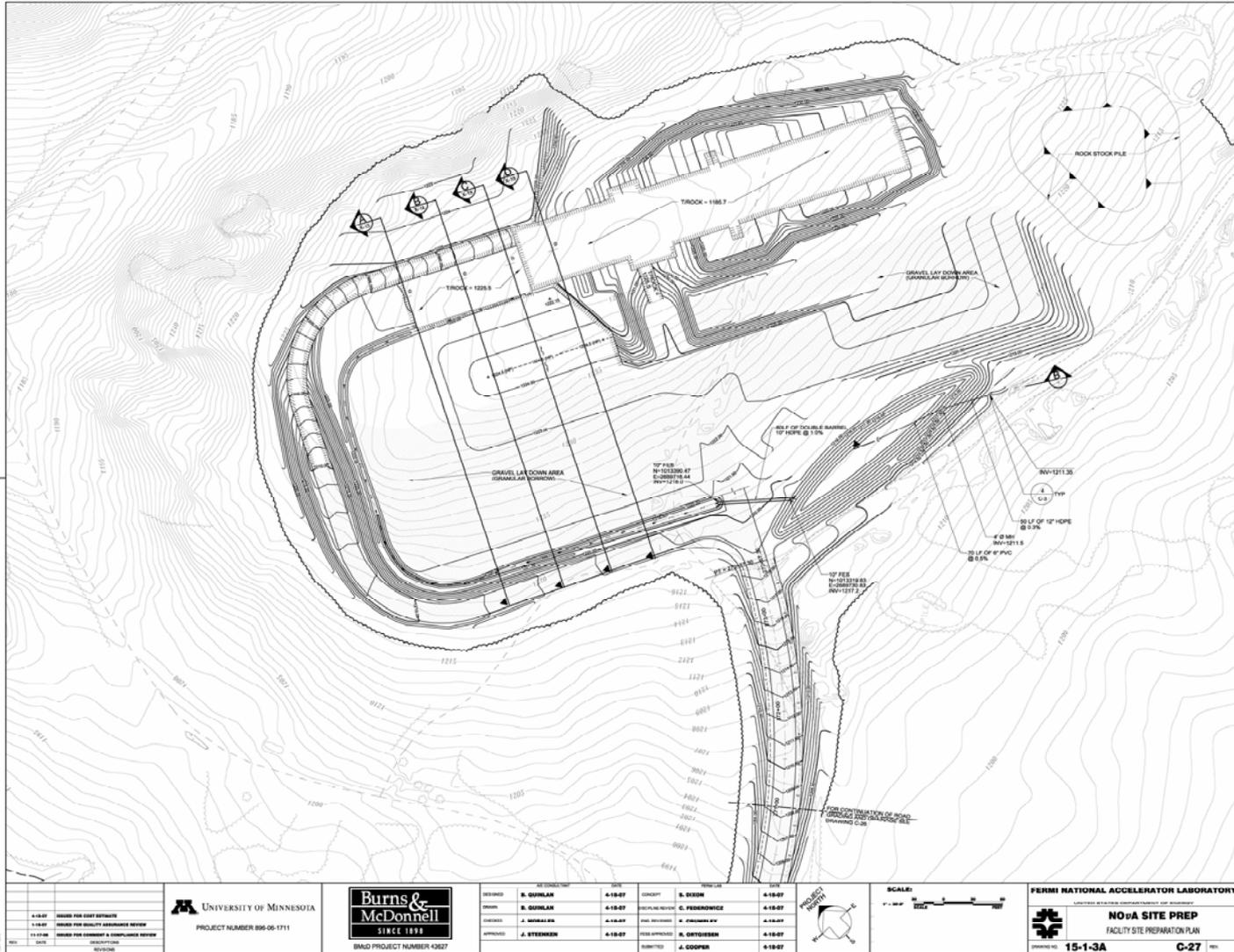


Site Preparation Package





Site Preparation Package

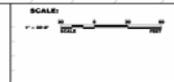


4-18-07	ISSUED FOR COST ESTIMATE
5-16-07	ISSUED FOR QUALITY ASSURANCE REVIEW
11-16-06	ISSUED FOR COMMENTS & COMPLIANCE REVIEW
11-16-06	ISSUED FOR COMMENTS & COMPLIANCE REVIEW
11-16-06	ISSUED FOR COMMENTS & COMPLIANCE REVIEW

UNIVERSITY OF MINNESOTA
 PROJECT NUMBER 096-06-1711

Burns & McDonnell
 SINCE 1898
 BRNO PROJECT NUMBER 4327

DESIGNED BY	DATE	CONCEPT	DATE
B. GUILAR	4-18-07	S. DIXON	4-18-07
B. GUILAR	4-18-07	C. PEDROWICZ	4-18-07
J. GUILAR	4-18-07	AND APPROVED BY	4-18-07
J. STEINER	4-18-07	AND APPROVED BY	4-18-07
		APPROVED BY	4-18-07
		APPROVED BY	4-18-07



FERMION NATIONAL ACCELERATOR LABORATORY
 LIMITED SECTOR DEPARTMENT OF ENERGY
NOVA SITE PREP
 FACILITY SITE PREPARATION PLAN
 DRAWING NO. 15-1-3A C-27



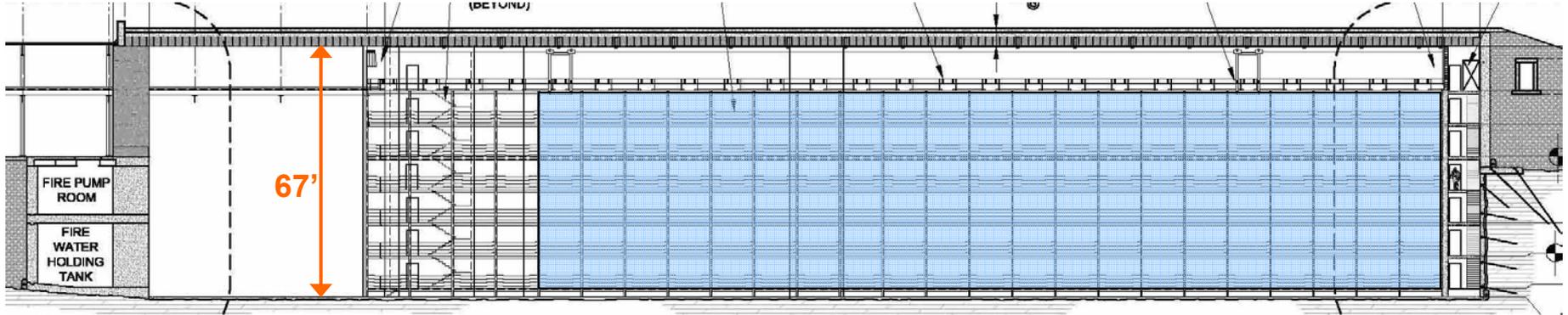
Far Detector Building



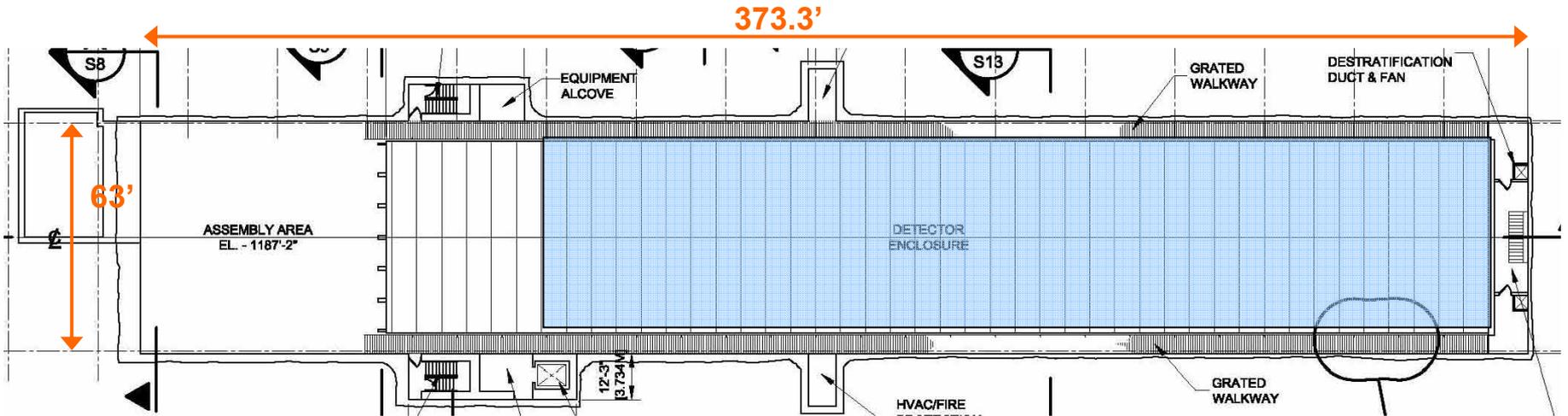
- Two Components
 - Below Grade: Detector Enclosure and Assembly Area
 - At-Grade: Service Building



Below Grade Components



Section

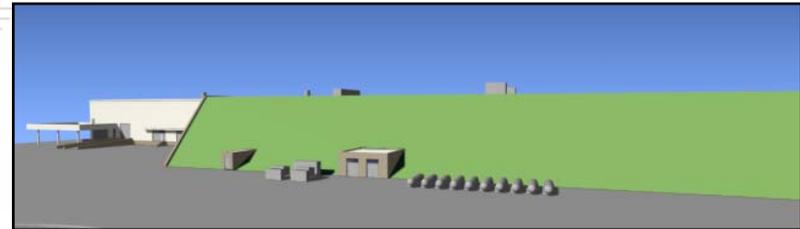
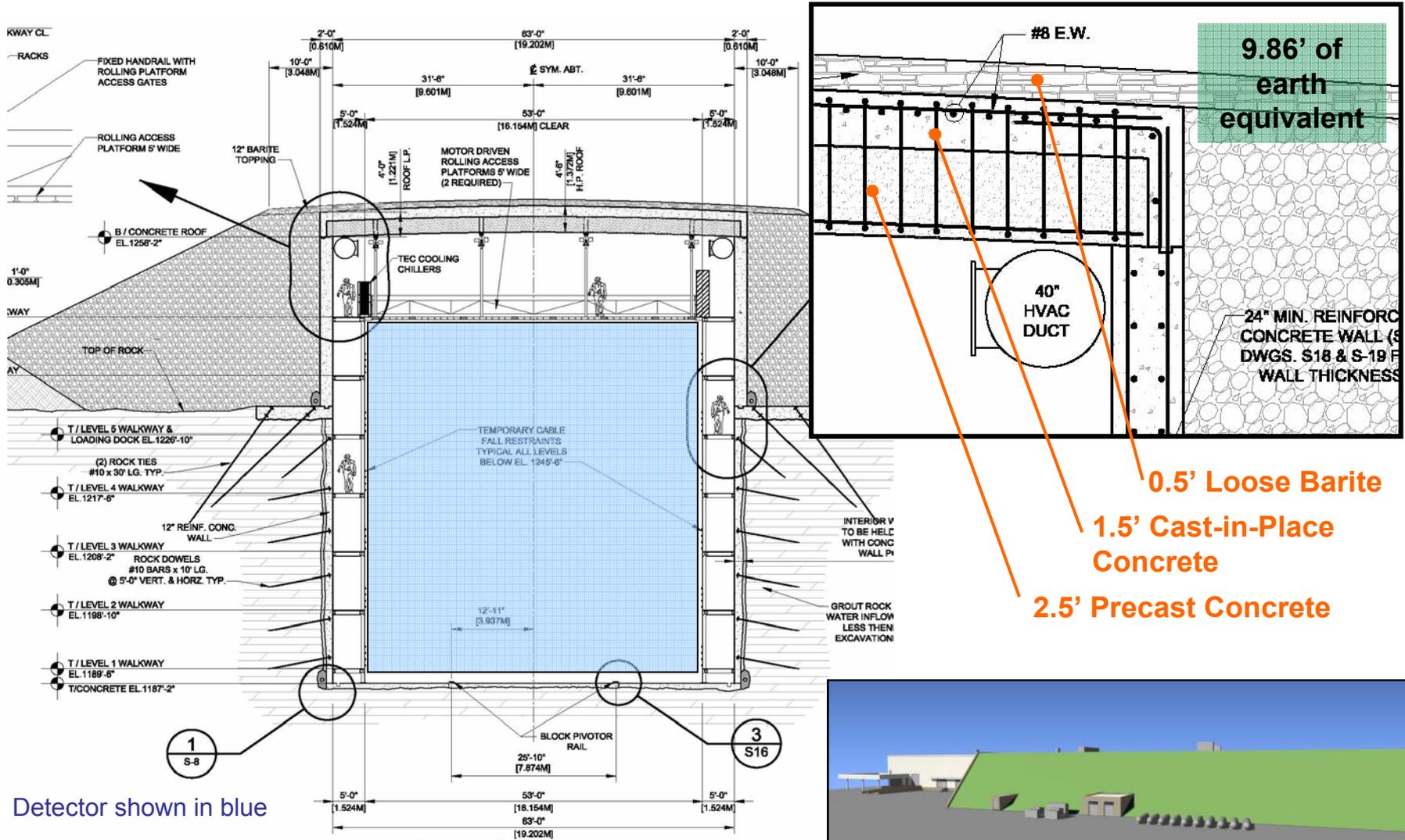


Detector shown in blue

Plan



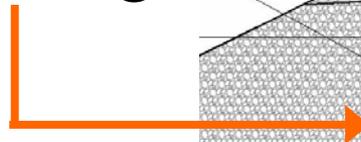
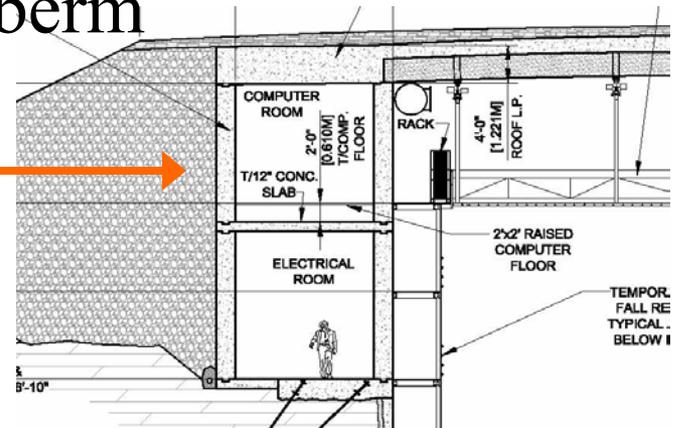
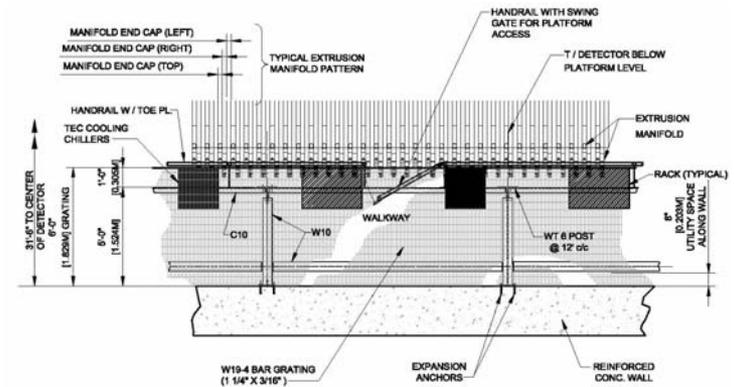
Below Grade Components





Below Grade Components

- Top Access – 2 Moveable Access Platforms
- Side Access Walkways – 7 levels
- Support Spaces
 - Electrical Equipment Room
 - Computer Room
 - Control Room
 - Located within the shielding berm





Below Grade Components

- HVAC Requirements – Two Conditions
 - Assembly Area – 75 Ton HVAC unit
 - Adhesive Requirements: 20,000 cfm of outside air
 - Driven by adhesive choice – selected worst case
 - PVC Temperature Requirements: 70 degrees (+/- 5)
 - PVC Relative Humidity Requirements: 50% in summer, 15% in winter
 - Detector Enclosure – 50 Ton HVAC Unit
 - Temperature: 72 degrees (+/- 5)
 - Relative Humidity: 50 degree dewpoint in summer, 15% minimum relative humidity in winter



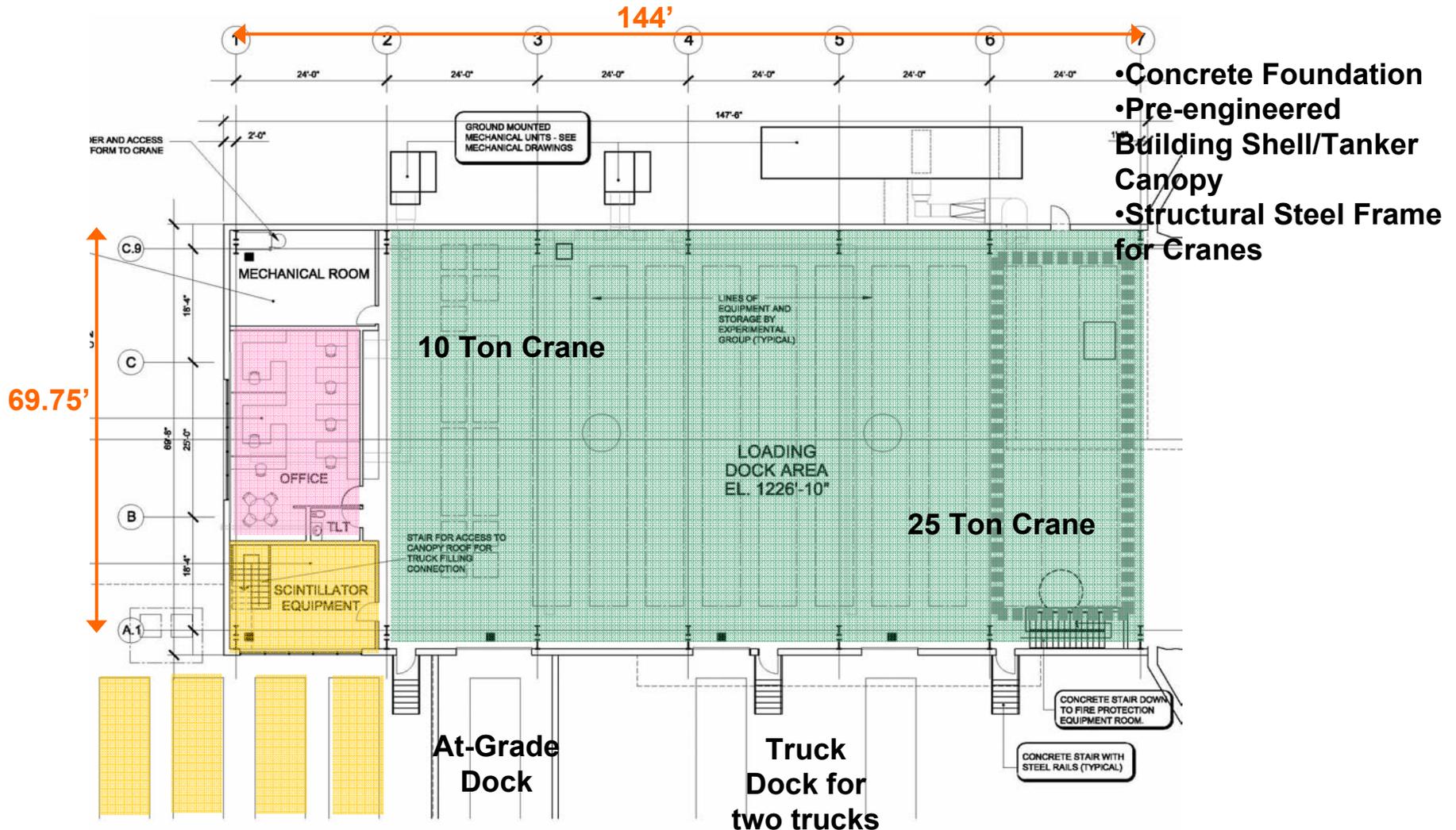
Service Building



- Support Functions
 - Loading Dock
 - Scintillator Transfer Facility
 - Office Space
 - Mechanical/Fire Protection Spaces



Service Building



- Concrete Foundation
- Pre-engineered Building Shell/Tanker Canopy
- Structural Steel Frame for Cranes

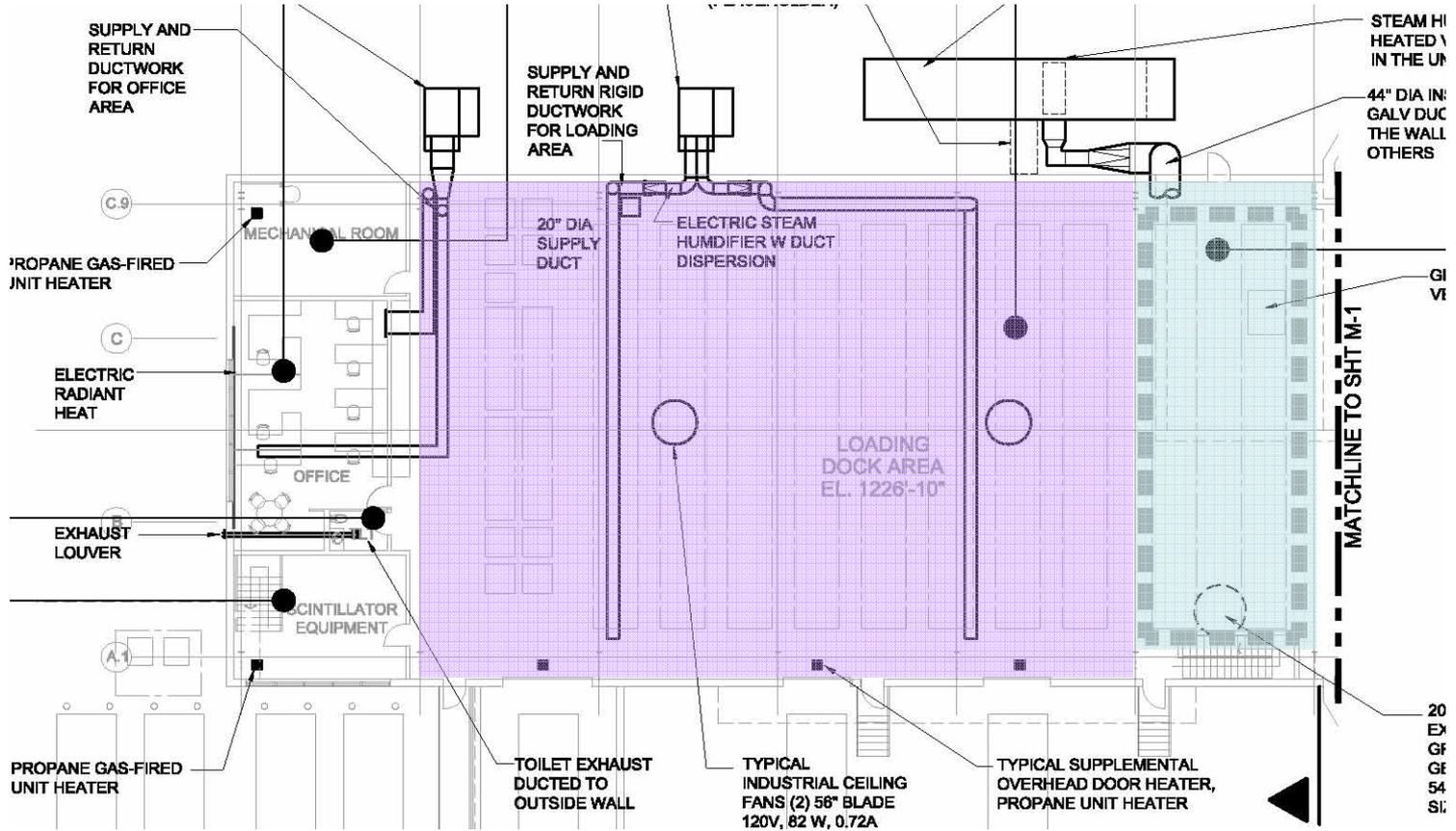


Service Building

- HVAC Requirements – Two Conditions
 - Assembly Conditions – 75 ton HVAC Unit + 10 Ton HVAC Unit
 - Adhesive Requirements: 20,000 cfm of outside air
 - Driven by adhesive choice – selected worst case
 - PVC Temperature Requirements: 70 degrees (+/- 5)
 - PVC Relative Humidity Requirements: 50% in summer, 15% in winter
 - Operating Conditions
 - Temperature: 65 degrees in winter, ventilation only in summer
 - Humidity: None



Service Building





Process/Quality Assurance

- Function
 - Collaborative process with other WBSs
 - Integration Meetings (NOVA-doc-1089)
 - Formal and informal communications
 - WBS Responsibility Matrix (NOVA-doc-1170)
- Design
 - Peer Review – Holabird & Root – December 2005
 - Independent Expert Review – July 2006
 - Comment and Compliance Review for the Site Preparation Package – November 2006
 - Quality Assurance Review for the Site Preparation Package – January 2007
 - Mechanical Systems Review – Burns and McDonnell – June 2007
 - Rock Condition Review – July 2007
- Cost/Schedule
 - Burns and McDonnell in July 2006, January 2007 and May 2007
 - J.E. Dunn scheduled for late May 2007
 - Constructive Ideas scheduled for mid-June 2007

WBS	Sub-element	WBS 1 Responsibility	WBS 2 Responsibility	WBS 3 Responsibility	WBS 4 Responsibility	Notes
1.0	Site Preparation					
1.1	Site Preparation					
1.2	Site Preparation					
1.3	Site Preparation					
1.4	Site Preparation					
1.5	Site Preparation					
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1.46	Site Preparation					
1.47	Site Preparation					
1.48	Site Preparation					
1.49	Site Preparation					
1.50	Site Preparation					

Responsibility Matrix



Risk Management

- Follow DOE and NOvA Risk Management Process
- Identified 13 medium/high risks
 - Site Topography (NOVA-doc-1457) - Moderate to Low
 - Construction Cost (NOVA-doc-1461) – High
 - Wetlands (NOVA-doc-1459) – Moderate
 - Subsurface Conditions (NOVA-doc-1458) – High to Moderate
 - Spill Containment (NOVA-doc-1460) – Moderate to Low
 - Barite Supply (NOVA-doc-1485) – Moderate
 - Sump Failure (NOVA-doc-1488) – Moderate
 - WBS Interface Issues (NOVA-doc-1500) – Moderate
 - Significant Injury (NOVA-doc-1502) – Moderate
 - Environmental Assessment Worksheet (NOVA-doc-1510) – Moderate
 - Environmental Conditions (NOVA-doc-1827) – Moderate
 - Mechanical Systems Functions (NOVA-doc-1829) – Moderate
 - Adhesive Ventilation Requirements (NOVA-doc-1828) – High
- Identified 15 low risks (NOVA-doc-1491)
- Continuing effort to track existing and identify new risks.



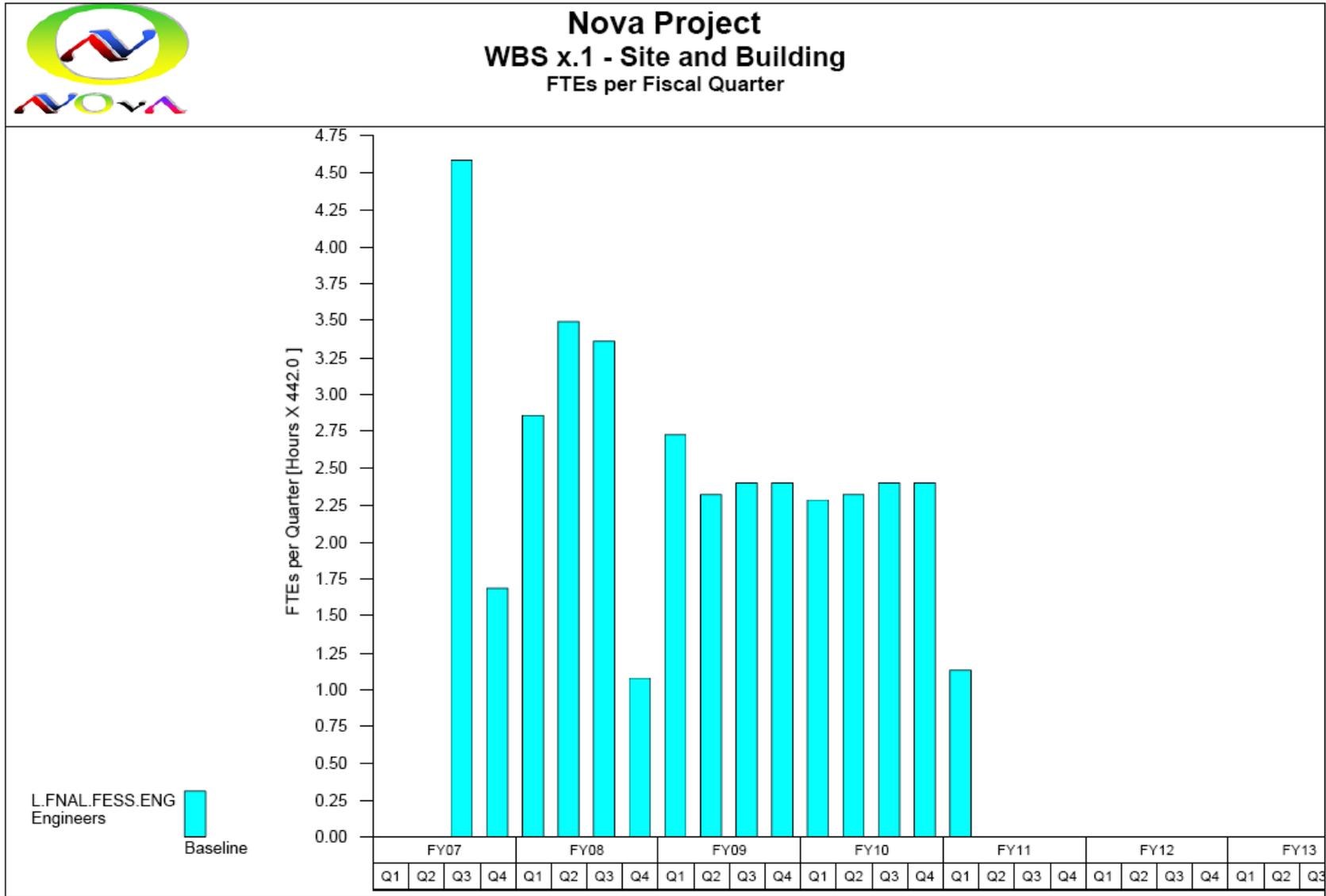
Cost

WBS x.1 Site & Building	Estimated Cost (AY \$M)	Contingency Estimate (AY \$M)	Contingency (%)	Total Cost (AY \$M)
Construction w indirects				
M&S	0.0	0.0	0%	0.0
Labor¹	1.9	0.5	24%	2.4
Construction total:	1.9	0.5	24%	2.4
Cooperative Agreement				
M&S	46.9	9.3	20%	56.2
Labor¹	0.0	0.0	0%	0.0
CA total:	46.9	9.3	20%	56.2
R&D				
M&S	0.1	0.2	155%	0.3
Labor¹	0.3	0.1	23%	0.4
R&D total:	0.4	0.3	59%	0.7

¹ Labor costs presented here include all project labor from Fermilab, other DOE facilities, and Universities.



Human Resources





Schedule

		 Nova Project WBS x.1- Nova_Milestones_Site_and_Building Milestone Gantt Chart																																				
Activity ID	Milestone Description	Date	FY06				FY07				FY08				FY09				FY10				FY11				FY12				FY13							
			Q1	Q2	Q3	Q4																																
2.1 -- Site and Building																																						
2.1.1.1.2	Issue request for proposal to A/E	01Oct07																																				
2.1.1.2.2	Wetland permit submitted	01Oct07																																				
2.1.2.1.2	Issue request for proposal to A/E	16Oct07																																				
2.1.1.1.7	PO released - design phase	19Nov07																																				
2.1.2.1.7	PO released - design phase	30Nov07																																				
2.1.1.2.8	Permit issued	04Dec07																																				
2.1.1.1.21	Design phase completed	07Feb08																																				
2.1.1.3.4	Issue request for proposal	22Feb08																																				
2.1.1.3.7	Site preparation purchase order released	11Apr08																																				
2.1.1.4.1	Notice to proceed - far detector site preparation package	14Apr08																																				
2.1.2.1.21	Design phase completed	17Jun08																																				
2.1.2.2.4	Issue request for proposal	03Jul08																																				
2.1.2.2.7	Purchase order released - far detector building	26Sep08																																				
2.1.1.4.7	Beneficial occupancy - far detector site preparation package	15Oct08																																				
2.1.2.3.1	Notice to proceed - far detector building construction	16Oct08																																				
2.1.1.4.9	Final acceptance - far detector site preparation package	12Dec08																																				
2.1.2.3.3.6	Detector enclosure/assembly area concrete completed	19Nov09																																				



Schedule (cont.)

 Nova Project WBS x.1- Nova_Milestones_Site_and_Building Milestone Gantt Chart		Date	FY06				FY07				FY08				FY09				FY10				FY11				FY12				FY13							
			Q1	Q2	Q3	Q4																																
2.1.2.3.4.4	Service building shell completed	01Feb10																																				
2.1.2.3.5.9	Outfitting completed	29Mar10																																				
2.1.2.3.20	Beneficial occupancy - far detector building construction	29Mar10																																				
2.1.2.3.30	Final acceptance - far detector building construction	14May10																																				

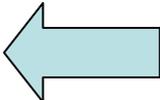


CD-3A Approval Requests

- Site Preparation Package
 - \$
 - Construction Phase
 - Risks:
 - Schedule Driven
 - Timed with Construction season
 - Excavation driven by Far Detector size
- Far Detector Building
 - \$
 - Construction of the Concrete package
 - Risks:
 - Schedule Driven
 - Timed with Construction season
 - Continuity with subsequent phases



Summary

- Technical
 - Understanding of the physics driven requirements and a method of accommodating them.
- Cost 
- Schedule
 - Site and Building remains on the critical path until Beneficial Occupancy of the Far Detector Building in April 2010
- CD-3A Requests
 - Site Preparation Package Construction
 - Concrete Package Construction