Construction Management

IPD|BIM Thesis Tech I

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Management. Engineering. Consulting.

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Summary

- Schedule Narrative
- Building & Construction Systems
- Constructability Issues
- Project Cost Evaluation
- Project Site Logistics
- Project Staffing
- BIM Process Guidelines
- Project Delivery Method
- Client Information

Schedule Narrative

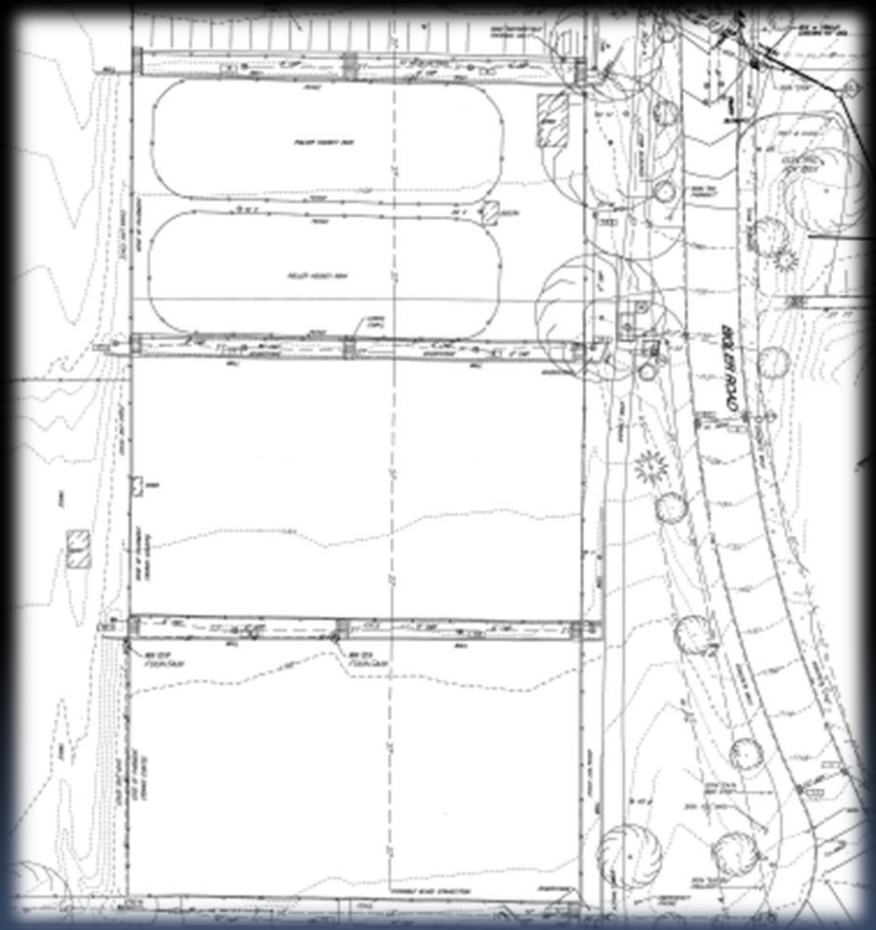
Construction Phase	Duration (Days)	Start	Finish
Foundation/Substructure	270	2-16-09	2-26-10
Superstructure	274	7-7-09	7-23-10
Enclosure	303	11-9-09	1-5-11
Building Systems/Finishes	345	12-14-09	4-8-11
Construction Duration	758	8-12-08	7-7-11

- Preconstruction began March 2008
  - Includes design, bid and award
- Drawing Coordination began May 2009
- Structural Steel Erection began July 2009
  - Top out April 2010
- Commissioning is planned to start in November 2010
- Building turnover is projected for July 2011
  - However, Whiting-Turner still holds that the building will be turned over by June 2011

Building & Construction Systems

Demolition

- Existing asphalt reused for parking.
- Water fountains and storage sheds demolished.
- Walkways remain.



Building & Construction Systems

Excavation Support

- H-piles with lagging
- Shotcrete
- Trench boxes

Building & Construction Systems

Mini Pile Foundation

- 785 piles totaling 51,213 LF
- Rotational forces of cantilever
- Piles in tension and compression
- Depths reaching 145’

Building & Construction Systems

Enclosure

- 334 precast panels with brick veneer
- 22’ x 12’ panels with bearing and lateral connections cast in concrete
- Curtain wall glazing

Constructability Concerns

Logistics

- Existing utilities provided on drawing C1.3
- Steel delivery via Hastings Rd.
- Pedestrian walkway provided

Construction

- Steel and Precast panels standardized where possible
- Cantilever welds require three 8-hour shifts a day
- Deflections monitored at column lines on 5-10 day intervals.

Project Cost Evaluation

Total Cost	Total Cost Per Square Foot
$215,000,000	$788/SF

Construction Cost*	Construction Cost Per Square Foot
$139,176,843	$510/SF

Building System	Percentage of Project Cost	Cost	Cost Per Square Foot
Structure	17.6%	$24,559,974	$90.06/SF
Plumbing	4.8%	$6,731,107	$24.68/SF
Fire Protection	1.0%	$1,362,000	$4.99/SF
HVAC	18.1%	$25,159,105	$92.26/SF
Electrical	8.9%	$12,313,658	$45.15/SF

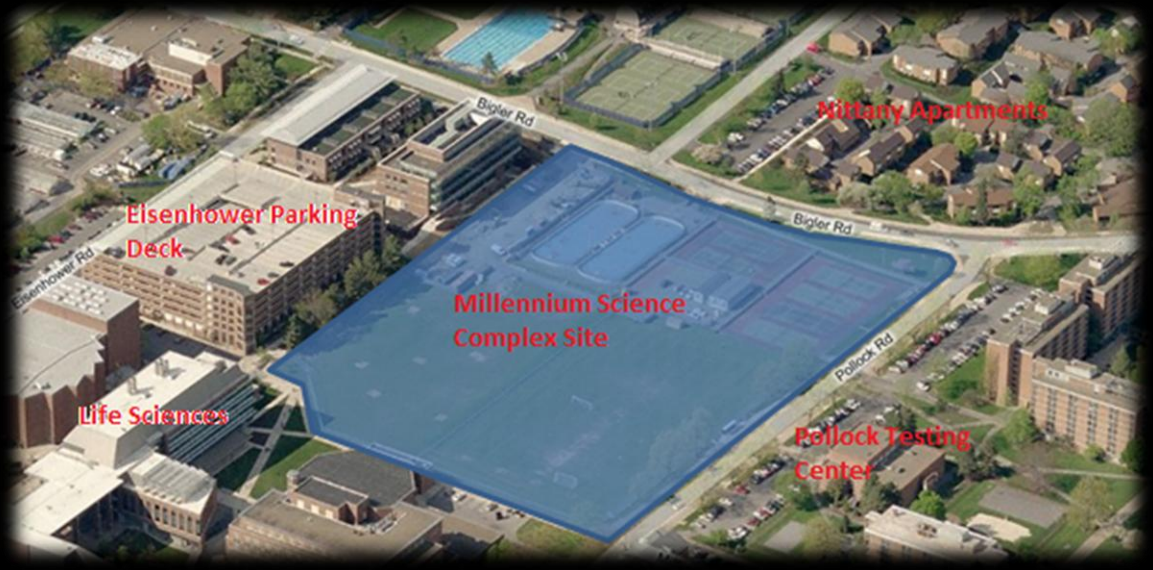
*Construction Cost does not include contingency, general conditions, insurance and fees.

Project Cost Evaluation

Building Type	Cost	Cost Per Square Foot
Office Building	$47,772,500	$183.74/SF
Hospital	$77,436,500	$224.46/SF
College Laboratory	$15,325,000	$144.85/SF
The New York Times Building*	$1 billion	$667.00/SF
The New Dickinson School of Law – Katz Building*	$60,000,000	$530.97/SF
Life Sciences Building*	$37,790,085	$245.39/SF
Student Health Center*	$26,000,000	$406.25/SF

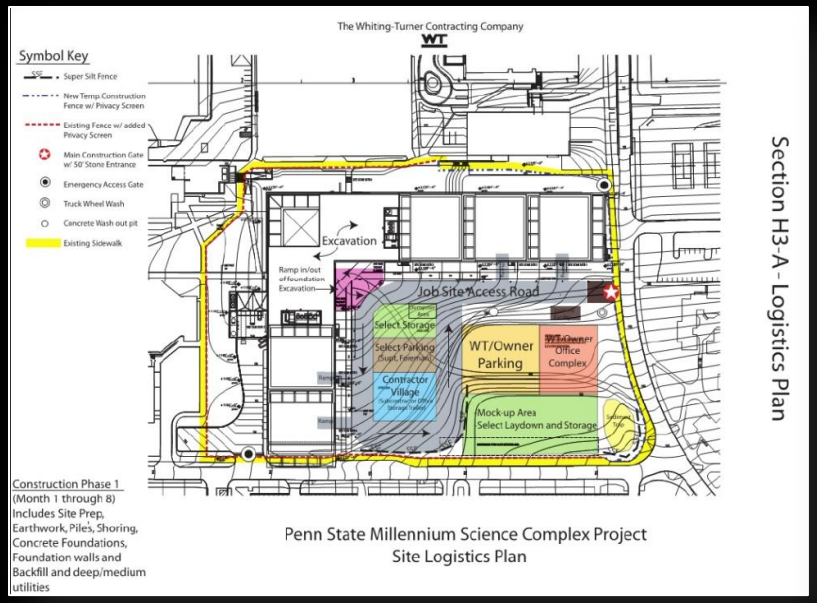
**These costs are based on student work and evaluations. References can be found in Appendix B.*

Project Site Logistics

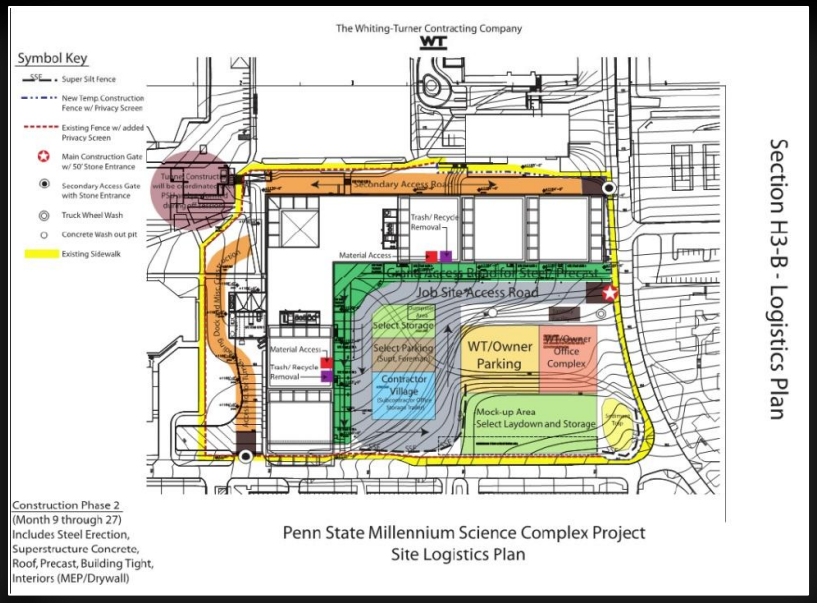


- Surrounding Buildings.
- Site originally occupied by two roller hockey rinks, tennis courts, and intramural fields.
- Pedestrian and vehicular safety concerns.

Project Site Logistics



Phase I = Site Prep – Foundation Completion



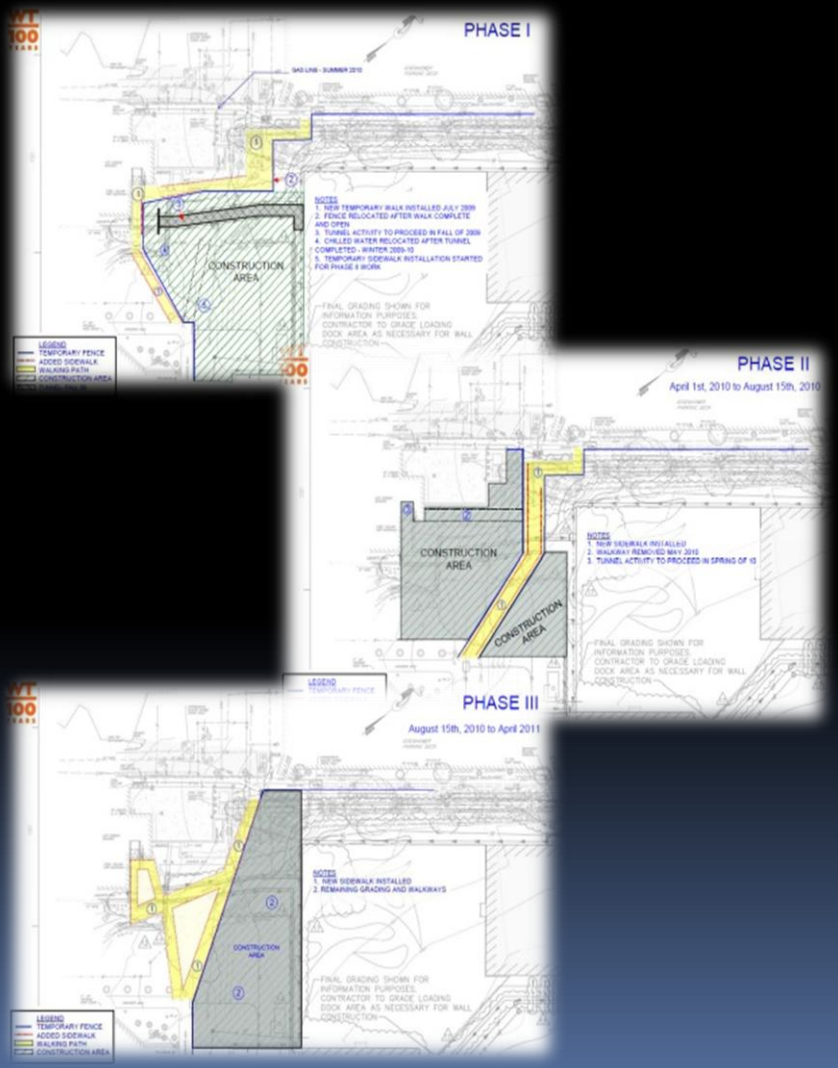
Phase II = Structural Erection – Interior Finishes

Project Site Logistics

- **Site Utilities**
- What is available:
  - Sanitary Sewer
  - Compressed Air
  - Steam
  - Electrical
- Located along the North side of the project along the Eisenhower Parking Deck.

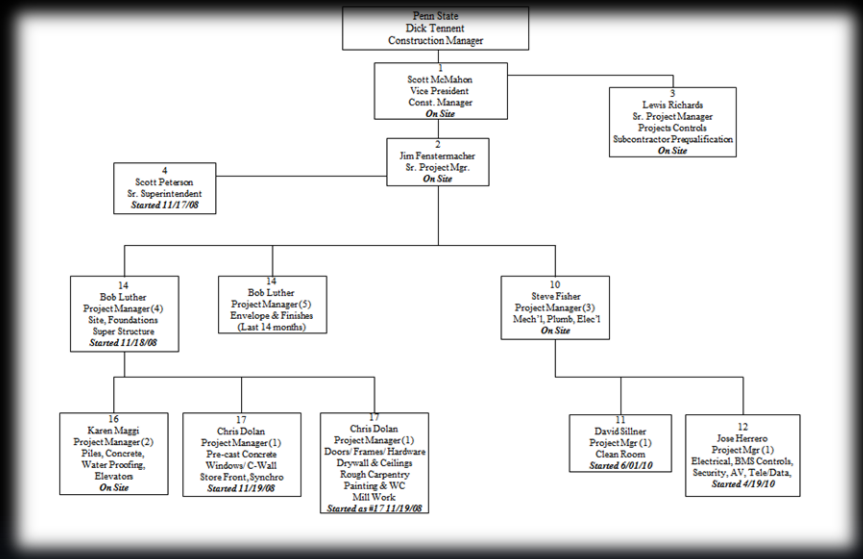
Project Site Logistics

- **Tunnel Phasing**
- Life Sciences I to Life Sciences wing of MSC.
- Major paths of travel for students had to be blocked in order to proceed with this work.
- Limit the impact on the direct paths of travel for students.



Project Staffing

- Owner Representative
  - Dick Tennant
- Whiting-Turner
  - Two Sr. Project Managers
  - Four Project Managers
  - Sr. Superintendent
  - Two Superintendents
  - Five Project Engineers
  - PSU AE Faithful Interns



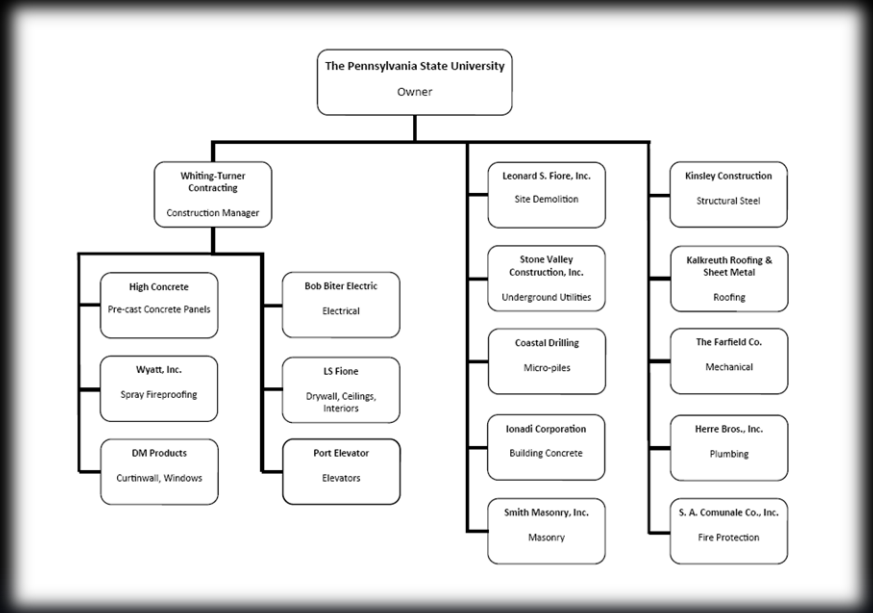
BIM Process Guidelines

Whiting-Turner

- Coordination is the key!
- WT is combining all of the subcontractor generated models into the master file.
- WT demanded that models be built with compatibility for Revit and Navisworks.
- Other demands.

Project Delivery Method

- Design-Bid-Build
  - DGS Funded Construction
  - CM "Agency"
- Design-Build
  - Clean Rooms
  - Evaluation process based on quality and needs before cost



Client Information

- The Pennsylvania State University
  - Office of Physical Plant
- The Vision
  - Bring Chemistry, Engineering, Biology, Physics, & Medicine to one facility.
  - High expectations for now and the future.
    - Major benefit to research and education.

Questions?

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