

Pennsylvania State University Burrowes Building: Technical Report III

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Courtesy of BLT Architects

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Executive Summary

The Burrowes Building located on the Pennsylvania State University campus is a renovation project that was selected for use as part of an AE Senior Capstone Thesis. The purpose of the AE Senior Capstone Thesis is to test a Construction Management students' knowledge they've obtained over the past 4 years in the AE program by researching and presenting on a construction project from beginning to end. This Technical Report III will cover a wide range of topics including: project challenges, schedule concerns, sustainability, value engineering and an evaluation of Building Information Modeling (BIM) use on the project. There will also be an evaluation of leading industry practices from the 24th Annual PACE Roundtable.

The beginning of this report will overview an interview performed with PJ Dick's project manager for the Burrowes Renovation project. This interview highlighted some of the project challenges as well as the client's requirements. Value engineering for the project was also discussed and other ways to improve the overall project.

The 24th Annual PACE Roundtable was held November 2nd-3rd, 2015 at the Nittany Lion Inn. This discussion brought together a diversity of industry leaders from all aspects of the industry. The two discussions attended for this report was, "Distributed Leadership vs. Centralized Decisions" facilitated by Dr. Robert Leicht. The other discussion was "Driving Collaboration into the Field" facilitated by Dr. Robert Leicht. Both of these discussions dealt with project team integration. The details of these discussions between students and industry leaders can be found in the report below.

BIM or Building Information Modeling is a growing and evolving process in the construction industry. This report will detail how well BIM was implemented on the Burrowes Renovation project and where there are areas that could've been improved to enhance the BIM experience. Penn State requires BIM on all projects and there are strategies that they require for all projects to be implemented. In this report a BIM use list was developed as well as a level 1 process map for the project.

Sustainability and LEED is becoming more and more of a standard in today's construction industry. A LEED checklist was performed for this report based on the Pennsylvania State University requirements and standards. The point's breakdown and Penn State requirements can be found in the sections below. The Burrowes Renovation project is striving to achieve LEED Silver with 57 points.

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Project Manager Interview

Andy Schrenk the senior project manager for PJ Dick was interviewed in the job trailer on the Burrowes Renovation job site on November 5th, 2015. Andy was asked a variety of questions dealing with: project management services, project challenges, client requirements, project improvements, and value engineering topics. The questions and answers to this interview can be found in Appendix A.

Critical Industry Issues-PACE

Session 1-C: Distributed Leadership vs. Centralized Decisions

There were many great discussions at the PACE Roundtable this year. The two events attended for this report were, “Distributed Leadership vs. Centralized Decisions” and “Driving Collaboration into the Field”. Both of these discussions were facilitated by Dr. Robert Leicht. The first discussion kicked off by asking the group “what is distributed leadership?” The conversation was started with John Bechtel from Penn State’s OPP describing what he feels is distributed leadership. Sharing risks is one of the descriptions that kept reoccurring throughout the discussion. This is a term that is used a lot with Integrated Project Delivery methods to describe the team’s contractual agreement. This then lead the conversation into a discussion about IPD topics. Industry leaders mentioned the decisions on a project need to be unanimous with all parties accepting the decisions. This kind of leadership allows for collaboration and gives every team member a stake in the success of a project. Planning out teams was an idea discussed to make teams more appealing to owners. It was also discussed about how these ideas can be implemented on non-IPD projects. Jerry Shaheen from Gilbane then made a statement that the whole group appreciated. He said that there was 20% high performing teams, 40% average performing teams, and 20% underperforming teams. He then spoke about how IPD is not a silver bullet and that we need to look more into implementing lean concepts into all projects. Every project is different and not every project will work using an IPD approach. A CM @ Risk project can be just as successful as an IPD project.

Implementing lean construction concepts could’ve benefitted the Burrowes Renovation Project. I feel that an IPD approach wouldn’t have worked for this project just because of the WBE/MBE requirements and trying to hire local contractors. There are not many if any contractors in the immediate area that are familiar with IPD or have performed work on an IPD project before. Lean concepts such as implementing the Last Planner System and Target Value Design into the project would’ve been very beneficial to the project team. Co-location also could’ve improved this project’s communication and would’ve allowed for more collaboration between the owner,

construction manager, contractors, and architect. The industry leaders that really stood out to me during the discussion were Sue Klawans and Jerry Shaheen with Gilbane Building Company, and John Bechtel from Office of Physical Plant at Penn State. Sue was very knowledgeable in a vast variety of topics with the industry. Jerry gave a very different perspective of IPD whereas John Bechtel is an expert on lean construction and is pro-IPD.

Session 2-C: Driving Collaboration into the Field

This session dealt specifically with getting collaboration into the field. It was discussed that using ideas such as surveying field members, pull planning, co-location trailer, and using a BIM box in the field were effective tools for field collaboration. The topic then switched into “what is collaboration?” and what are the challenges of it. For collaboration to be successful there needs to be transparency with information distributed. This means not keeping information from the project team that could affect the schedule or project completion. The problem with collaboration is that one person can ruin collaboration for everyone. One of the keys topics the industry leaders discussed is making foreman feel as if they are leaders on the project which will trickle down the whole project team. The last topic discussed was today’s generation gap with communication. This is a topic that I have had a situation with during an internship. The superintendent did not like the use of iPads and smart TVs on the job. It wasn’t until after I explained to him how the iPad worked and what you could do with them that he changed his outlook. Communication is the key to everything in the construction industry and the better we can communicate, the better the industry will become.

Feedback from PACE Industry Roundtable

As the PACE Roundtable was wrapping up, we were asked to pair up with an industry leader and discuss possible research topics for our thesis. I spoke with John Bechtel from OPP because of his vast knowledge with lean construction concepts and delivery methods. We explored 6 different topics to explore for the Burrowes Renovation project. One of the ideas explored was to survey two different projects such as North Halls and Ag Engineering and survey members from both teams to compare the different delivery methods. The North Halls project is a CM @ Risk whereas Ag Engineering is the first IPD project on campus. Another topic explored was researching different safety innovations that could be executed on the Burrowes Renovation. This idea was brainstormed from the fact that there was a fatality on the Burrowes project over the summer. The site is located in the center of campus near the library which means there is a large volume of student traffic around the job site during work hours. An idea was discussed about looking into site logistics and how producing and using a good site logistics plan could improve student safety. The feedback from the Roundtable can be found in Appendix B.

Leading Industry Practice Evaluation

BIM Use Evaluation

The BIM uses that were chosen for the BIM use list and Level 1 Process Map were developed from interviewing the project manager and reviewing Penn State's requirements for BIM use on projects. Penn State requires that all projects implement BIM to improve collaboration and convey information. BIM allows for early detection of issues in designs and layouts of the model. This allows for potential time and money savings if caught early enough. The actual BIM use on the Burrowes Renovation project implemented a design BIM use, a construction BIM use, and an operations BIM use. These each contained topics such as 3D coordination and site utilization planning that were ranked from "mandatory" to "not pursued". The BIM use for turnover is implementing a record model and Maximo System Integration to track design vs. what's installed. The BIM uses and process for implementing these were the best choices for this project because they were determined with the owner to fit their needs and wants. As stated before the actual BIM uses and processes were very similar to what I suggested for uses and the process based on Penn State requirements. The BIM use list and Level 1 Process Map can be seen in Appendix D.

Sustainability Implementation

LEED was not a major concern for this project. The team did however attempt to achieve LEED Silver on the project. This was a big push from Penn State to achieve at least Silver certification. There was a LEED checklist performed for this project to determine what level of LEED certification could be achieved. After my analysis which can be seen in Appendix D has a breakdown of the points system. My analysis achieved 57 points which is the same number that the project is looking to reach. The Energy and Atmosphere category is the weakest category only achieving 8 out of 35 points. This is mainly because of the cost involved with improving a renovation 50% from an energy standpoint. Renewable energy is not utilized much on campus and the budget has tight margins so those points were eliminated. Materials were recycled when possible but there wasn't any recycled material used on the project. The other topics covered in the checklist were pretty standard for new construction and the number of credits actually achieved can vary till the end of the project. For this project the 57 points Silver Certification that the project team is trying to pursue is what was presented by Penn State that they wanted to achieve LEED Silver on this project if possible.

APPENDIX A:

Project Manager Interview

Project Manager Interview**1. What kind of preconstruction services did you provide the owner for this project?**

- PJ Dick was involved in all of the design review meetings with user group, OPP services, and architect to provide constructability input and provided estimates throughout the design phase (DD, 50%, 75%, 100%). Involved in Pre-Construction for at least a year.

2. What are the biggest challenges or concerns for the client such as financing, phasing, or quality drivers?

- Budget was always the driving factor because we were over budget, so how to drive down the budget was always the discussion. Talk of phasing the project was brought up because of limited temporary space but temporary space was found for faculty and the job was performed in one phase.

3. What are key areas that have the potential to better fit the project approach to the client's needs?

- The basement excavation because a lot of time and money was spent and there could've been better options that saved time and money. This was a major discussion between PJ Dick and Penn State because the facilities manager (OPP) wanted adequate space to perform maintenance on equipment.

4. What would be the costs and methods associate with the approaches above?

- Priced 2 big air handlers in areaways and build two additions in the area way to house these units and the savings would've been only a couple hundred dollars. After review with PSU however it was decided by architects, engineers, and service members that the basement would be the better option.

5. What did you see as the biggest challenges for this project at the beginning?

- The basement and knuckle work. This was because of the confined space and rock excavation of the knuckles. Also there was shoring and underpinning requirements to support the existing structures.

6. If possible would you have considered changing the delivery method of the project?

- No, maybe Design-Build, but CM @ Risk was the best choice for this project.

7. If you could change one thing about this project, what would it be?

- The knuckle design to move the elevator out of the knuckle and not running the knuckles down to the basement. Possibly moving elevators to the Core building. Still rebuild the knuckles but not excavate down to the basement. Just demo and re-pour the footers and

take the knuckles up without an elevator shaft. It would've saved a ton of time on the schedule.

8. How well was BIM implemented on this project?

- Very well, contractor's all were well experienced with BIM and PJ Dick took the reins with the model and managed the BIM ex plan that was drafted by them and Penn State for this project. The model is constantly updated with as-builts that the contractors address in a timely fashion.

9. Was there any collaboration or co-location implemented for this project?

- No, just for BIM coordination.

Value Engineering Topics

10. Can you describe key areas of value engineering that were implemented on this project?

- Tried to do some things with mechanical and site utilities, but improvements were so small they weren't implemented.

11. How did these correlate/detract from the goals of the owner?

- They had to accept a higher construction budget which took away money from owner's Furniture, Fixtures, and Equipment (FF & E) budget.

12. What ideas for value engineering were considered but not implemented?

- Change the scope of the site utilities in the mall and make some minor mechanical system changes.

APPENDIX B:

PACE-Industry Issues Notes & Roundtable Feedback

Project Team Integration - Session 1-C:

Distributed Leadership vs. Centralized Decisions

Facilitator: Dr. Robert Leicht

Ballroom DE

Questions

- What comes to mind when you hear the term "Distributed Leadership"? *Sharing risks*
- To what extent are we seeing leadership roles distributed within teams?
- How are these interactions, particularly in integrated teams, changing from traditional leadership models in construction?
- What opportunities do the use of distributed leadership models in design and construction teams offer?
- What challenges are emerging in the sharing of information, clarity of roles and responsibilities, and process for meeting commitments?
- How does the shift to building integrated teams influencing the process for making decisions in the design and construction phases of projects?
- What tensions need to be balanced to enable distributed teams and leadership to function effectively, while still maintaining the appropriate involvement and input from key stakeholders and overall project leaders?

Notes

- #1 {
- Many firms w/ Leaders & not just one leader in charge
 - Sharing risks & responsibilities & resources
 - Decision making is not necessarily done by leaders
 - Allow most appropriate person to leave
 - Trust & Accountability needed to distribute leadership

Industry Views

Need to define governance & decision making process

With IPD decisions need to be unanimous with all parties accepting decisions

Enables collaboration

Every team member - Stake in success of project

Who's role is it to "Unify" the team?

- "Know your role, do your job"

- Accountability

Need to plan the team/org.

Opportunities

Session 1-C

Appealing to have teams aligned

- Better customers
- Not limited to IPD contract

Decision by those with the risk

To receive full benefits → Need new contract

20% high performing teams, 40% Avg performing teams, 20% underperforming teams

Can also have high collaboration on other contracts than IPD

Emerging Leaders - Social Psych. of High Performance Team

Practice → Rehearsal → Execute

Hold each other accountable

↳ How do you build this trust in teams.

Competition

How to relate to people

Recognize/Discuss desired behaviors

Stop + Sharpen your Axe (or chainsaw)

Balance between Risks + Values

↳ Take the right risks + learning from failure

-
1. Training for IPD Teams
 2. "Unconscious" movement towards distributed leadership?
 3. Take sample projects + map decisions possibly by project or by stages
 4. Are there better decision tools?
 5. How many decisions (IPD)?
 - Are group consensus (PMT)
 - Are Led by experts/recommendation
 6. Survey project team
 - Keys to success
 - How did they influence decisions
 - Were they met?
 7. Can we use small collab. projects to build industry teams?

Project Team Integration - Session 2-C:

Driving Collaboration into the Field

Facilitator: Dr. Robert Leicht

Ballroom DE

Questions

- What is the current model, or level, of collaboration we see amongst field personnel?
- To what extent, and in what ways, do we expect to see field personnel sharing information and working collaboratively?
- Do we know of any examples of teams or projects that were able to create a high performing collaborative field team?
- What benefits do we expect from having our foremen and field personnel working more collaboratively?
- What challenges or limitations are limiting the current levels of collaboration in the field?
- How could greater levels of collaboration for field staff be enabled?
- What barriers, contractual or behavioral, are creating these limitations?
- How does technology influence the sharing of information and collaboration amongst field personnel (e.g. mobile devices, modeling, etc.)

Notes

1.) Field surveys, pull planning, BIM box in the field, Co-location trailer, Driven by Superintendent as far as level of collaboration, Foreman meetings, communication is key.

2.) What is Collaboration? Ans: Shared goals, accountability,

Challenges

- Info transparency
- Open environment → Trades to share their opinion / experience
- Procurement
 - ↳ Trades
 - ↳ Supply Chain
- One bad egg can mess up the whole batch
 - ↳ Domino effect
- Moving from coordination to collaboration
 - ↳ what + why
 - ↳ Mindset / Worldview

Need to have foreman feel as leaders

Session 2-c

↳ Trickle-down collab.

Right people on the bus, wrong people off the bus

Consider local contractors for jobs

Project Purpose

Last Question on Previous Page

Generation Gap → Communication

Get foreman engaged early in model generation, etc...

Research Ideas

How do we best introduce technology to field personnel?

Tools/Techniques to job specific or general for each project?

Find techniques/methods that enable field collaboration?

Flowchart of Collab./Non.collab. project members?

Assigning collaborators vs. non-collaborators?

How is info. about past project team performance used?

Comparing cost of collab. vs. non-collab. projects

STUDENT FORM

Student Name

Josh Fry

Session 1:

Research Ideas:

Topic:

Project Team Integration

- 1) Survey 2 different projects. Survey one IPD project on their experiences, collaboration, etc... Then survey a team on a project using a different delivery method.
- 2) Research projects that have had an IPD contract + have failed or not worked so you can compare to successful IPD projects.

Session 2:

Research Ideas:

Topic:

Driving Collaboration Into the Field

- 1) How can we best introduce technology to field personnel + training field with the technology.
- 2) Research how info. on past project teams performance was + how that info. is used for future projects.

Session 3:

Research Ideas:

Topic:

1)

2)

STUDENT FORM

Industry Member: John Bechtel

Key Feedback:

Which research topic is most relevant to industry? What is the scope of the topic?

Research + survey 2 different project teams currently involved in construction. Survey/Interview one team on a IPD project and one team that is on a project with a different delivery method. Compare and analyze their experiences and attitudes toward the way their projects were ran + controlled.

Suggested Resources:

What industry contacts are needed? Is the information available?

John Bechtel - OPP
Ag Eng. / North Halls
DPR / ESP
+
ESP

I can receive the contact information needed from John Bechtel who is overseeing both projects.

Appendix C:

BIM Use List & Level 1 Process Map

Design and Construction BIM Use List

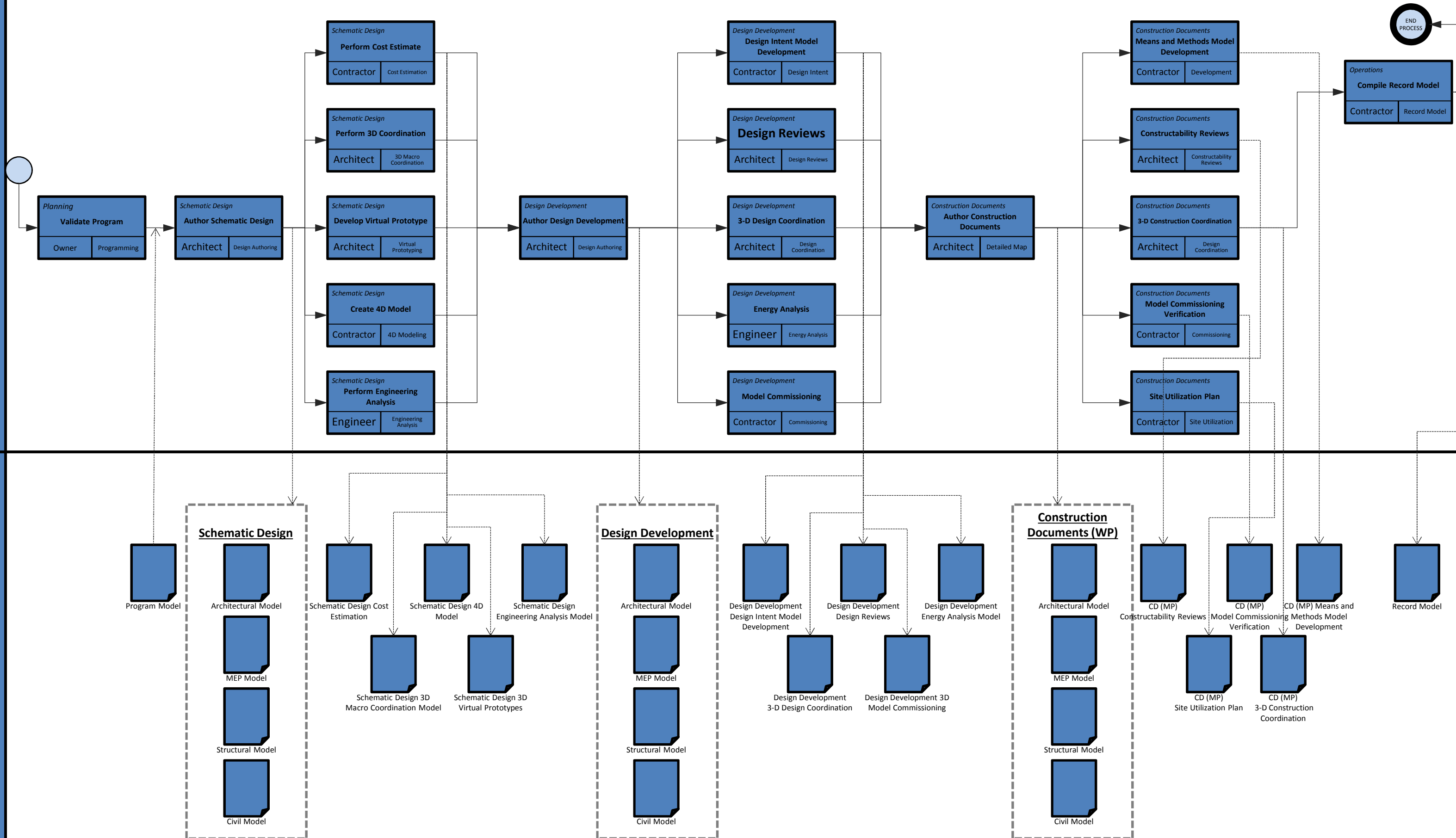
BIM Use*	Value to Project	Responsible Party	Value to Resp Party	Capability Rating	Additional Resources / Competencies Required to Implement	Notes	Proceed with Use
	Mandatory/Significant/Minimal/N/A		Med / Low	Scale 1-3 (1 = Low)			YES / NO / MAYBE
				Resources Competency Experience			
Design Intent Model Development	Mandatory	Contractor Penn State Architect	HIGH HIGH MED	2 3 3 2 2 3 3 2 3			YES
Design Reviews	Mandatory	Architect Contractor OPP	HIGH MED HIGH	3 2 2 2 2 2 3 3 3			YES
3D Design Coordination	Mandatory	Architect MEP Eng Structural Eng	HIGH HIGH HIGH	3 3 3 3 2 2 3 2 2			YES
Energy Analysis	Mandatory	Contractor Subcontractors Architect	HIGH HIGH MED	2 2 2 1 2 2 2 3 3			YES
Model Commissioning	Mandatory	MEP Engineer Architect Contractor	HIGH MED HIGH	2 2 2 2 2 2 2 2 2			YES
Preconstruction Coordination	Significant Effort	Architect Contractor Penn State	LOW	1 2 1			YES
MEP and Structural Analysis	Significant Effort	Architect MEP Engineer Structural Engineer	HIGH MED HIGH	3 2 2 3 2 3 3 2 3			YES
LEED Evaluation	Minimal	Architect MEP Engineer Structural Engineer Contractor	HIGH MED HIGH LOW	3 3 3 2 2 2 3 2 2 2 2 2			MAYBE
Code Evaluation	N/A						NO

BIM Use*	Value to Project	Responsible Party	Value to Reso	Capability Rating	Additional Resources / Competencies Required to	Notes	Proceed with Use
	Mandatory/Significant/Minimal/NA		Med / Low	Scale 1-3 (1 = Low)			YES / NO / MAYBE
Means and Methods Model Development	Mandatory	Contractor	MED	2	2	2	YES
		OPP	HIGH	1	2	1	
		Architect	MED	3	3	3	
Constructability Reviews	Mandatory	Contractor	HIGH	2	3	3	YES
		Architect	MED	2	2	2	
		Penn State	HIGH	2	2	3	
3-D Construction Coordination	Mandatory	Contractor	HIGH	3	2	2	YES
		Subcontractors	HIGH	2	3	3	
		Architect	MED	3	3	3	
Model Commissioning Verification	Mandatory	Contractor	HIGH	2	2	2	YES
		MEP Eng	HIGH	3	3	3	
		Architect	MED	2	2	2	
4-D Modeling	Minimal	Contractor	LOW	2	2	2	MAYBE
					Need training on latest software	High value to owner due to phasing complications	
					Infrastructure needs	Use for Phasing & Construction	
Site Utilization Planning	Significant Effort	Contractor	HIGH	2	3	3	YES
		Penn State	HIGH	3	3	3	
		Contractors	LOW	1	2	2	
Record Model	Mandatory	Contractor	MED	2	2	2	YES
		OPP	HIGH	1	2	1	
		Architect	MED	3	3	3	
As-Built Model	Mandatory	Architect	HIGH	3	3	3	YES
		MEP Engineer	MED	3	3	3	
		Structural Engineer	HIGH	3	3	3	
		Contractor	HIGH	3	3	3	
Maximo System Integration	Mandatory	Penn State	HIGH	3	3	3	YES
		Contractor	MED	2	3	1	
					Requires Training and Software		

* Additional BIM Uses as well as information on each Use can be found at <http://www.engr.psu.edu/ae/cic/bimex/>

BIM USES

INFO EXCHANGE



Appendix D:

Sustainability Implementation



LEED 2009 for New Construction and Major Renovations

Project Checklist

PSU Burrowes Building Renovation

Aug-15

18 0 8

Sustainable Sites

Possible Points: 26

Y	?	N	d/C				Effort per PSU Policy 2011
Y				C Prereq 1	Construction Activity Pollution Prevention		
1				d Credit 1	Site Selection	1	Minimal
5				d Credit 2	Development Density and Community Connectivity	5	Minimal
1				d Credit 3	Brownfield Redevelopment	1	Minimal
6				d Credit 4.1	Alternative Transportation—Public Transportation Access	6	Minimal
		1		d Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1	Significant
		3		d Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3	Minimal
2				d Credit 4.4	Alternative Transportation—Parking Capacity	2	Minimal
		1		C Credit 5.1	Site Development—Protect or Restore Habitat	1	Minimal
		1		d Credit 5.2	Site Development—Maximize Open Space	1	Significant
1				d Credit 6.1	Stormwater Design—Quantity Control	1	Mandatory
1				d Credit 6.2	Stormwater Design—Quality Control	1	Significant
1				C Credit 7.1	Heat Island Effect—Non-roof	1	Minimal
		1		d Credit 7.2	Heat Island Effect—Roof	1	Significant
		1		d Credit 8	Light Pollution Reduction	1	Not Pursued

7 0 3

Water Efficiency

Possible Points: 10

Y	?	N				Notes:
Y			d Prereq 1	Water Use Reduction—20% Reduction		
4			d Credit 1	Water Efficient Landscaping	2 to 4	Minimal
				Y Reduce by 50%	2	Minimal
				Y No Potable Water Use or Irrigation	4	Minimal
		2	d Credit 2	Innovative Wastewater Technologies	2	Minimal
3		1	d Credit 3	Water Use Reduction	2 to 4	
				X Reduce by 30%	2	Minimal
				X Reduce by 35%	3	Minimal
				X Reduce by 40%	4	Minimal

8	0	27
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Energy and Atmosphere

Possible Points: 35

Y ? N

Y		
Y		
Y		
4		15

C Prereq 1 Fundamental Commissioning of Building Energy Systems

d Prereq 2 Minimum Energy Performance

d Prereq 3 Fundamental Refrigerant Management

d Credit 1 Optimize Energy Performance

Improve by 12% for New Buildings or 8% for Existing Building Renovations

Improve by 14% for New Buildings or 10% for Existing Building Renovations

Improve by 16% for New Buildings or 12% for Existing Building Renovations

X Improve by 18% for New Buildings or 14% for Existing Building Renovations

Improve by 20% for New Buildings or 16% for Existing Building Renovations

Improve by 22% for New Buildings or 18% for Existing Building Renovations

Improve by 24% for New Buildings or 20% for Existing Building Renovations

Improve by 26% for New Buildings or 22% for Existing Building Renovations

Improve by 28% for New Buildings or 24% for Existing Building Renovations

Improve by 30% for New Buildings or 26% for Existing Building Renovations

Improve by 32% for New Buildings or 28% for Existing Building Renovations

Improve by 34% for New Buildings or 30% for Existing Building Renovations

Improve by 36% for New Buildings or 32% for Existing Building Renovations

Improve by 38% for New Buildings or 34% for Existing Building Renovations

Improve by 40% for New Buildings or 36% for Existing Building Renovations

Improve by 42% for New Buildings or 38% for Existing Building Renovations

Improve by 44% for New Buildings or 40% for Existing Building Renovations

Improve by 46% for New Buildings or 42% for Existing Building Renovations

Improve by 48%+ for New Buildings or 44%+ for Existing Building Renovations

1 to 19

Notes:

Mandatory

Mandatory

Mandatory

Mandatory

Mandatory

Mandatory

Mandatory

Mandatory

Mandatory

Mandatory

Mandatory

Not Pursued

Not Pursued

Not Pursued

Not Pursued

Not Pursued

Not Pursued

Not Pursued

Not Pursued

Not Pursued

		7
--	--	---

d Credit 2 On-Site Renewable Energy

1% Renewable Energy

3% Renewable Energy

5% Renewable Energy

7% Renewable Energy

9% Renewable Energy

11% Renewable Energy

13% Renewable Energy

1 to 7

Significant

Significant

Significant

Significant

Significant

Significant

Significant

Significant

2		
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C Credit 3 Enhanced Commissioning

2

Mandatory

2		
---	--	--

d Credit 4 Enhanced Refrigerant Management

2

Mandatory

		3
--	--	---

C Credit 5 Measurement and Verification

3

Not Pursued

		2
--	--	---

C Credit 6 Green Power

2

Mandatory

9	0	5
---	---	---

Materials and Resources

Possible Points: 14

Y ? N

Y		
2		1

d Prereq 1 Storage and Collection of Recyclables

c Credit 1.1 Building Reuse—Maintain Existing Walls, Floors, and Roof

1 to 3

Notes:

Minimal

Reuse 55%

1

Minimal

Reuse 75%

2

Minimal

Reuse 95%

3

Minimal

		1
2		

c Credit 1.2 Building Reuse—Maintain 50% of Interior Non-Structural Elements

1

Minimal

c Credit 2 Construction Waste Management

1 to 2

Mandatory

50% Recycled or Salvaged

1

Mandatory

75% Recycled or Salvaged

2

Mandatory

		2
--	--	---

c Credit 3 Materials Reuse

1 to 2

Minimal

Reuse 5%

1

Minimal

Reuse 10%

2

Minimal

2		
---	--	--

c Credit 4 Recycled Content

1 to 2

Mandatory

10% of Content

1

Mandatory

20% of Content

2

Significant

2		
---	--	--

c Credit 5 Regional Materials

1 to 2

Mandatory

10% of Materials

1

Mandatory

20% of Materials

2

Mandatory

		1
1		

c Credit 6 Rapidly Renewable Materials

1

Minimal

c Credit 7 Certified Wood

1

Mandatory

9	0	6
---	---	---

Y ? N

Y		
Y		
1		
		1
1		
1		
1		
1		
1		
1		
1		
		1
		1
1		
		1
		1
		1

Indoor Environmental Quality			Possible Points: 15
d	Prereq 1	Minimum Indoor Air Quality Performance	
d	Prereq 2	Environmental Tobacco Smoke (ETS) Control	
d	Credit 1	Outdoor Air Delivery Monitoring	1
d	Credit 2	Increased Ventilation	1
C	Credit 3.1	Construction IAQ Management Plan—During Construction	1
C	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
C	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
C	Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
C	Credit 4.3	Low-Emitting Materials—Flooring Systems	1
C	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
d	Credit 5	Indoor Chemical and Pollutant Source Control	1
d	Credit 6.1	Controllability of Systems—Lighting	1
d	Credit 6.2	Controllability of Systems—Thermal Comfort	1
d	Credit 7.1	Thermal Comfort—Design	1
d	Credit 7.2	Thermal Comfort—Verification	1
d	Credit 8.1	Daylight and Views—Daylight	1
d	Credit 8.2	Daylight and Views—Views	1

Notes:
Mandatory
Not Pursued
Mandatory
Mandatory
Mandatory
Mandatory
Mandatory
Mandatory
Mandatory
Mandatory
Mandatory
Mandatory
Mandatory
Significant
Mandatory
Significant
Significant
Minimal

4	0	2
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Y ? N

		1
		1
1		
1		
1		
1		

Innovation and Design Process			Possible Points: 6
d/C	Credit 1.1	Innovation in Design: Exemplary Water Use Reduction	1
d/C	Credit 1.2	Innovation in Design: Low Mercury Fixtures	1
d/C	Credit 1.3	Innovation in Design: Green Outreach Program	1
d/C	Credit 1.4	Innovation in Design: Green Housekeeping Program	1
d/C	Credit 1.5	Innovation in Design: Exemplary Regional Materials	1
d/C	Credit 2	LEED Accredited Professional	1

Notes:
Significant
Significant
Significant
Significant
Significant
Mandatory

2	0	2
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Y ? N

		1
1		
1		
		1

Regional Priority Credits			Possible Points: 4
d/C	Credit 1.1	Regional Priority: EAc2 Renewable Energy	1
d/C	Credit 1.2	Regional Priority: WEC1 Reduce by 50%	1
d/C	Credit 1.3	Regional Priority: WEC1 Mp Portable / Irrigation	1
d/C	Credit 1.4	Regional Priority: Specific Credit	1

Notes:
Significant
Significant
Minimal
TBD

57	0	53
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Total			Possible Points: 110
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Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110