

Architect-Led Design-Build:

Embedding Alternative Delivery System Practices as the Focus of an Undergraduate Architecture Education

Professor William C. Dean, RA, AIA, NCARB, LEED AP

May 15, 2025



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Abstract

This presentation explores the integration of architect-led design-build (ALDB) practices into undergraduate architecture education, advocating for a curriculum that goes beyond traditional design-centric approaches. The ALDB model, characterized by architects taking the lead in both design and construction processes, offers a holistic understanding of the built environment. By embedding ALDB practices into undergraduate education, students can gain practical insights into construction, project management, and client relations, complementing their design skills.

The proposed curriculum framework emphasizes hands-on experience, interdisciplinary collaboration, and a deeper engagement with the socioeconomic and environmental contexts of architecture. A key component involves collaborative projects with real clients, providing students with practical experience in managing the complexities of actual construction projects. This experience is augmented by coursework in project management, sustainable practices, and ethical considerations in architecture.

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Abstract (cont.)

The presentation argues that such a curriculum fosters a more comprehensive understanding of the architect's role in society. By directly involving students in the construction planning process, they develop a practical skill set that empowers them to be more effective, responsible, and innovative practitioners. The outcome is a generation of architects equipped not only with design acumen but also with the ability to lead and execute complex projects, making them more adaptable and relevant in the rapidly evolving field of architecture.



DESIGN



BUILD

3

The Department of Architecture + Design

Four Degrees:

A.A.S. Architectural Technology

A.A.S. Interior Design

B.S. Architectural Technology

B.Arch Bachelor of Architecture

- MINORS**
- Business
 - **Construction Management**
 - Graphic Design
 - Interior Design



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Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

Second Place

2007

Paul Farrell
Matt Abrams
Lindon Paul
Alex Nowak
Josh Torrance
Mike Roetzer

Faculty Advisor: **Jeffry Marshall**

ASC

Design-Build Division
Student Construction Competition

Second Place

2013

Alexander Bragg
Ryan Grace
Steve Hickey
Zach Kohler
Kristen Szkolnik
Carly Youngman

Faculty Advisor: **Timothy Piotrowski**

5

Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

Second Place

2014

Brian Williamson
Kristen Szkolnik
Mike Goddard
Ryan Grace
Derrick Clark
Trentin Reese

Faculty Advisor: **Timothy Piotrowski**

ASC

Design-Build Division
Student Construction Competition

Second Place

2015

Derrick Clark
Wade Franklin
Mike Goddard
Josh Greenaker
Trentin Reese
Nicholas Scalise

Faculty Advisor: **Erin Vitale**

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Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

2016

Matt Adymy
Tyler Elliott
Wade Franklin
Tim O'donnell
Trentin Reese
Roman Zawojski

Faculty Advisor: **Erin Vitale and William Dean**



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Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

Third Place

2017

Amber Barnhart
Adrienne Drumm (PM)
Nathan Hilker
Andrew Hammond
Gabriel Marino
Christiana Mehmel

Faculty Advisor: **William Dean**



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Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

2018

Michael Bowman
Judy Dreyer
Daniel Garcia
Nicholas Hennig
Christiana Mehmel (PM)
Steven Mignoli

Faculty Advisor: **William Dean**



DBIA National Student Competition: **Regional Submission**

9

Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

First Place

2022

JoAnna Musacchio (PM)
Juan Perez
John Snyder
Colin Thompson
Alex Vaquero
Connor Weihoneig

Faculty Advisor: **William Dean**



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Design-Build at Alfred State



DBIA

National Student Competition
Liberty Northeast Region

Second Place

2023

Sean Kempf
JoAnna Musacchio (PM)
John Snyder
Colin Thompson
Connor Weihoneig

Faculty Advisor: **William Dean**



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Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

First Place

2023

JoAnna Musacchio (PM)
Juan Perez
Lexie Salamone
John Snyder
Colin Thompson
Connor Weihoneig

Faculty Advisor: **William Dean**



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Design-Build at Alfred State



DBIA

National Student Competition
Liberty Northeast Region
Regional Winner
2024

Ella Brenner
Abigail Jones
Ryan Koplin
Owen Lantiegne
Katie Petix (PM)

Faculty Advisor: **William Dean**



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STATEMENT OF QUALIFICATIONS

GOVERNOR JOHN DUTTON III MEMORIAL AIRPORT
TERMINAL 'B' EXPANSION PROJECT



SEPTEMBER 23, 2024

ALFRED
VIATORS

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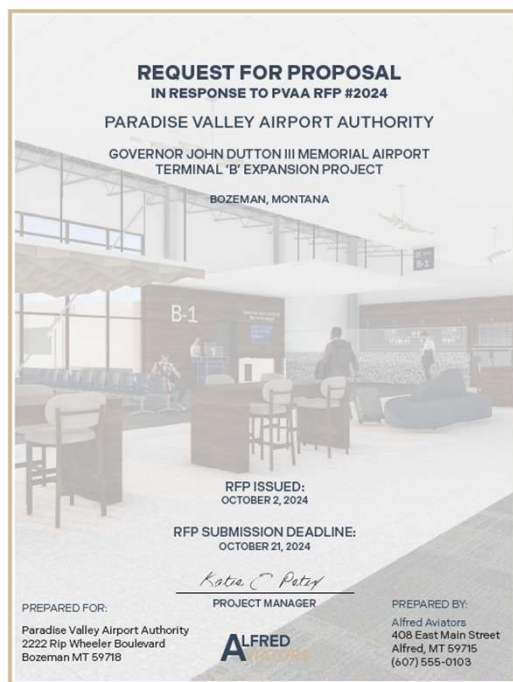
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REQUEST FOR PROPOSAL
IN RESPONSE TO PVAA RFP #2024

PARADISE VALLEY AIRPORT AUTHORITY

**GOVERNOR JOHN DUTTON III MEMORIAL AIRPORT
 TERMINAL 'B' EXPANSION PROJECT**

BOZEMAN, MONTANA

RFP ISSUED:
OCTOBER 2, 2024

RFP SUBMISSION DEADLINE:
OCTOBER 21, 2024

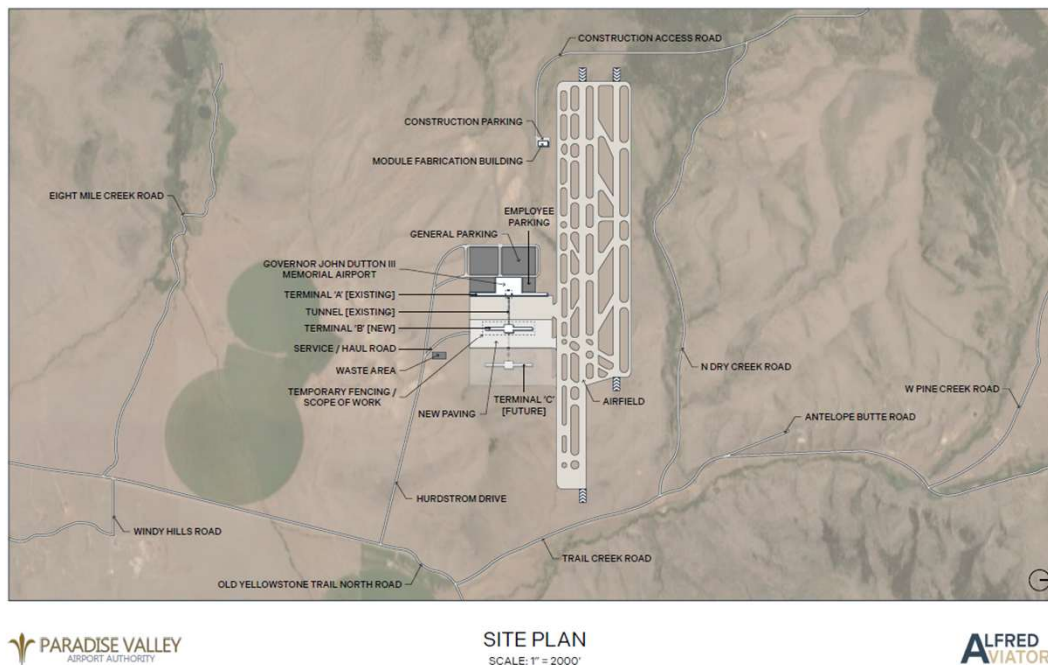
Katie C. Perry
PROJECT MANAGER

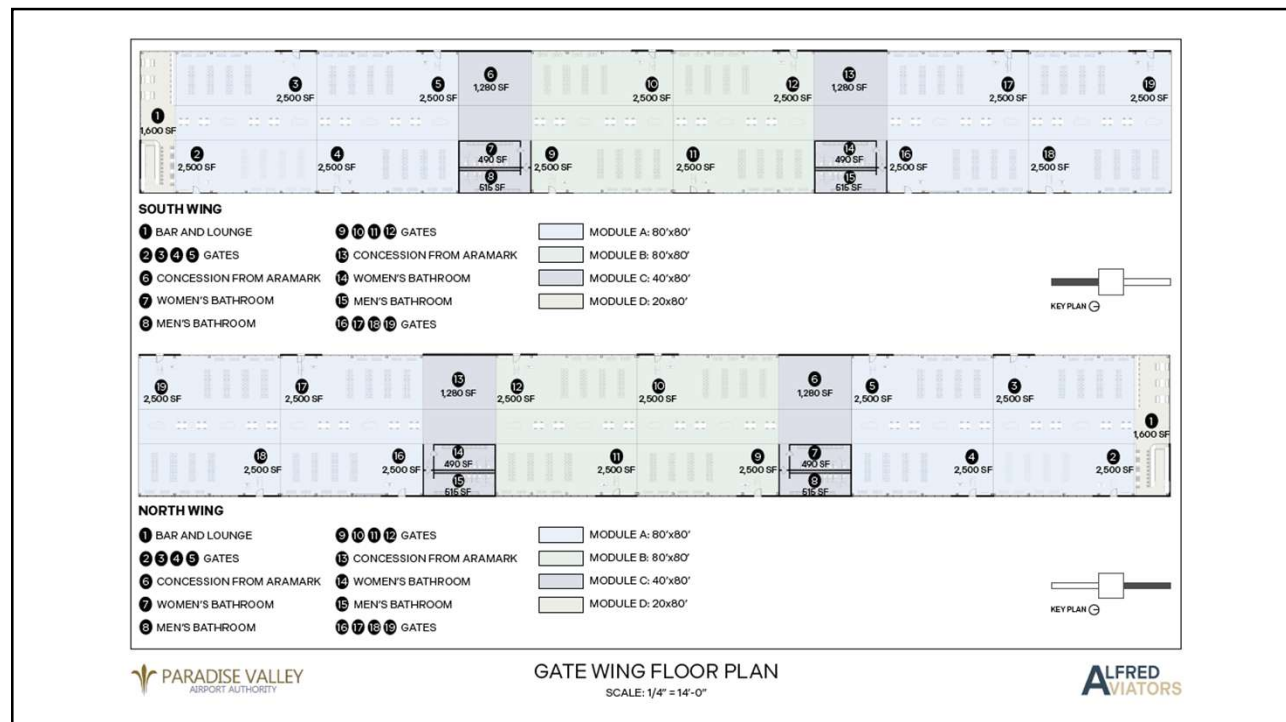
PREPARED FOR:
 Paradise Valley Airport Authority
 2222 Rip Wheeler Boulevard
 Bozeman MT 59718

PREPARED BY:
 Alfred Aviators
 408 East Main Street
 Alfred, MT 59715
 (607) 555-0103

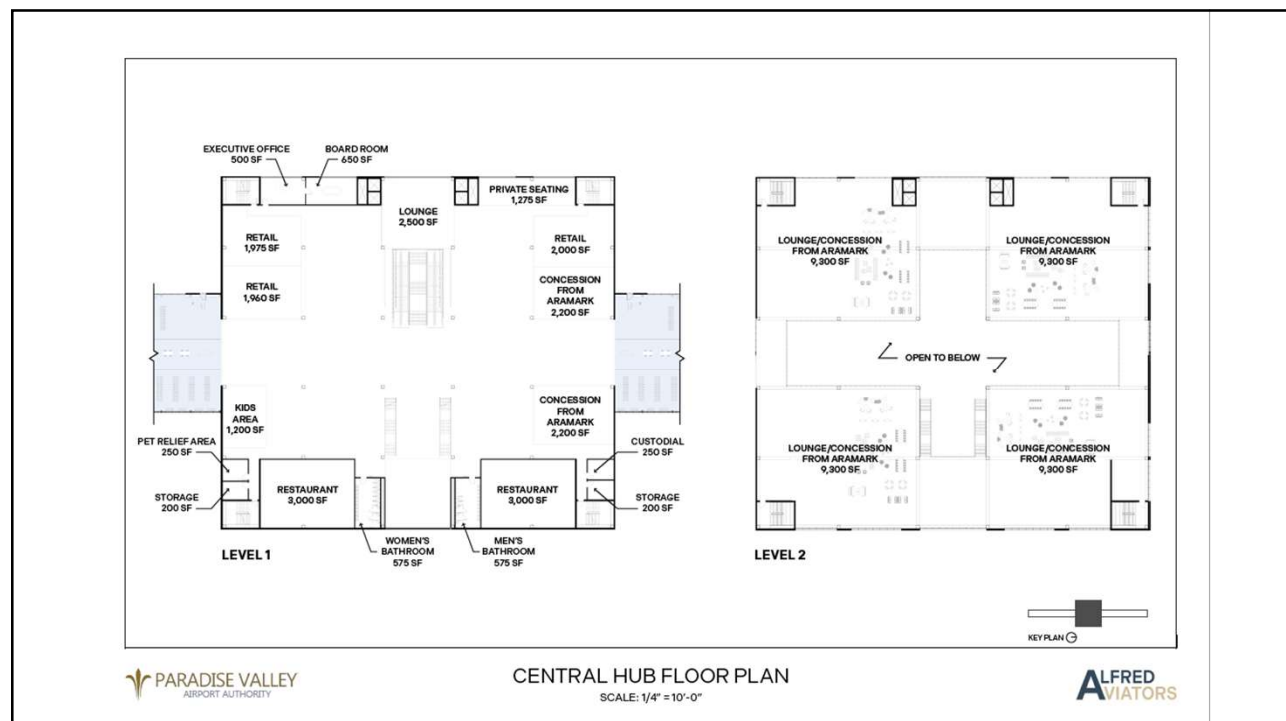
ALFRED
aviators

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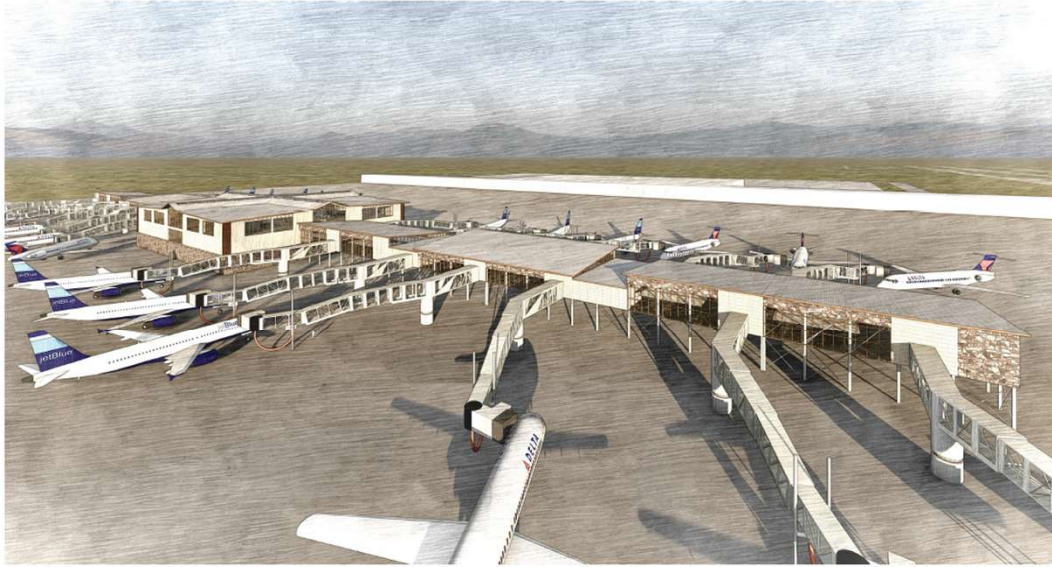




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PARADISE VALLEY
AIRPORT AUTHORITY

EXTERIOR PERSPECTIVE

ALFRED
VIATORS

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PARADISE VALLEY
AIRPORT AUTHORITY

INTERIOR PERSPECTIVE

ALFRED
VIATORS

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Design-Build at Alfred State



ASC

Design-Build Division
Student Construction Competition

First Place

2024

Jack Christie
Jackson Eigg
Lauren Fisher
Abigail Jones
Lexie Salamone (PM)
Katie Petix

Faculty Advisor: **William Dean**



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The SKANSKA Port Facility Building Proposal

Prepared by **SPEC Design Build**

SPEC ²/₂



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SPEC

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Overview

Company Values

Organizational Chart and Job Description

Design

Safety

Pile Strategy

Major Risks of Project

Schedule

Cost Estimate

Site Incident

SPEC

24

Project Team



Project Manager

AGC

Lexie Salamone



Lead Architect

AIAS, LEED Certified

John Christie



Project Designer

AIAS, DBIA Certified

Katie Petix



Chief Estimator

AIAS, DBIA Certified

Abigail Jones



Schedule Engineer

AIAS

Jackson Eigg



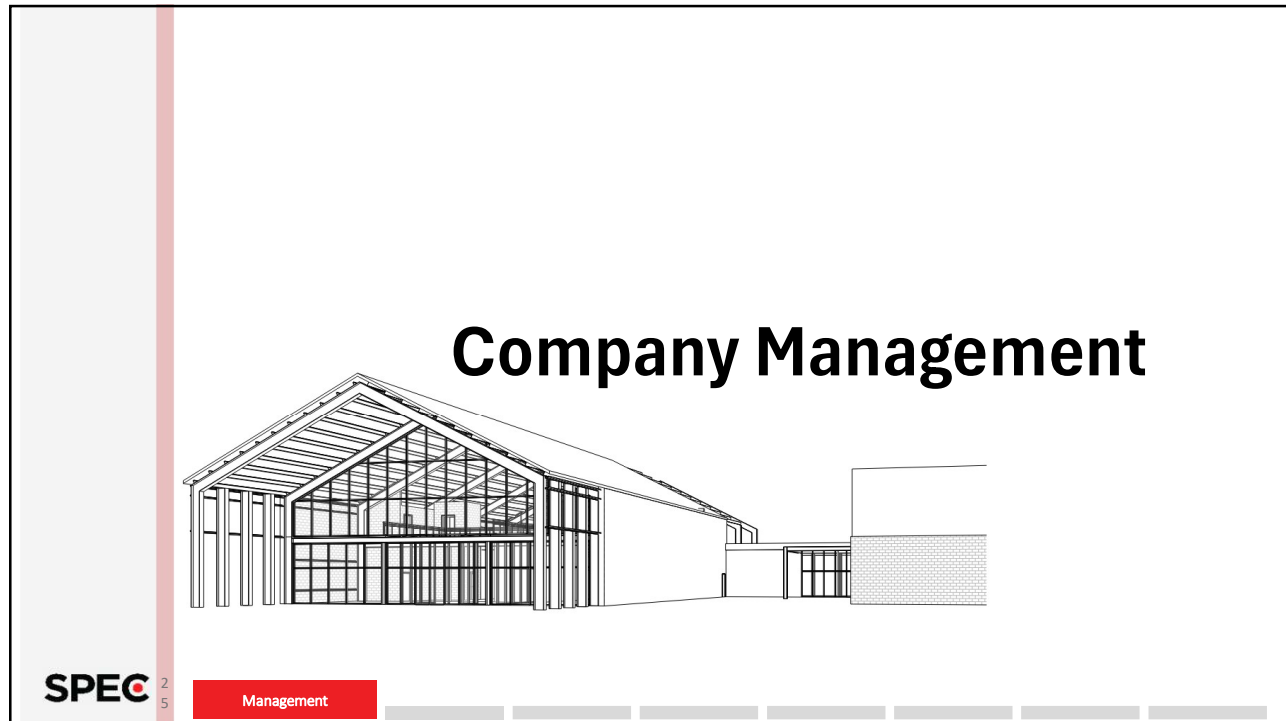
Safety Coordinator

AIAS

Lauren Fisher

24

12



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Values Moment

SPEC Design Build is dedicated to bringing a cost effective, on time, safe and LEED Certified building.

Our Key Values:

- Safety Oriented
- Perspective
- Ethical minded
- Considerate

SPEC ²/₆

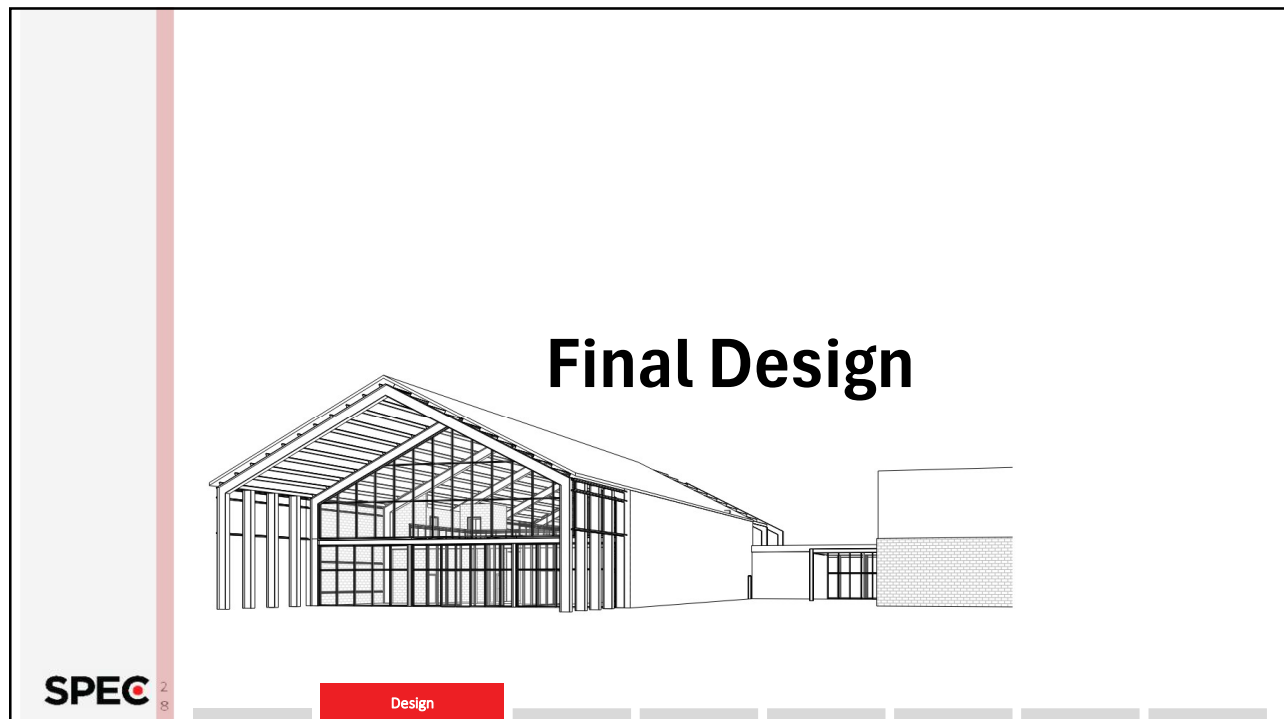
Management

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Organizational Chart & Management

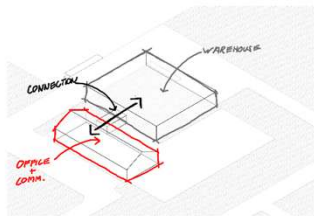


27

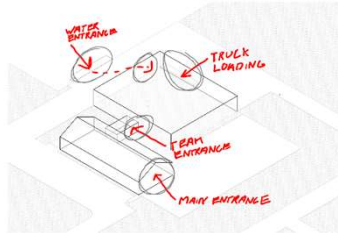


28

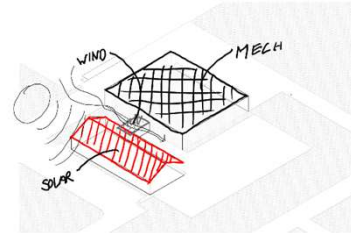
Design Process



Program



Entry



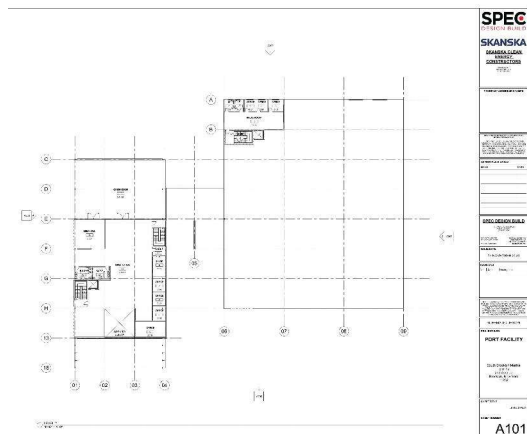
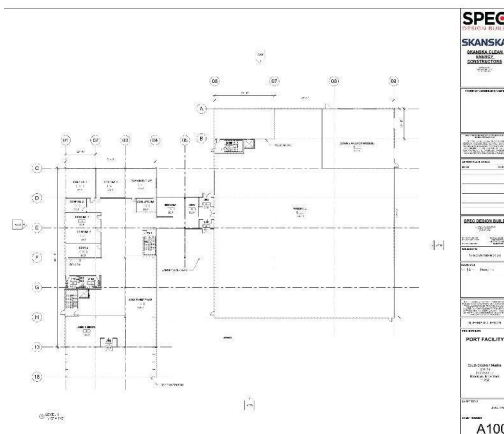
Sustainable Roof

2
9

Design

29

Floor Plans

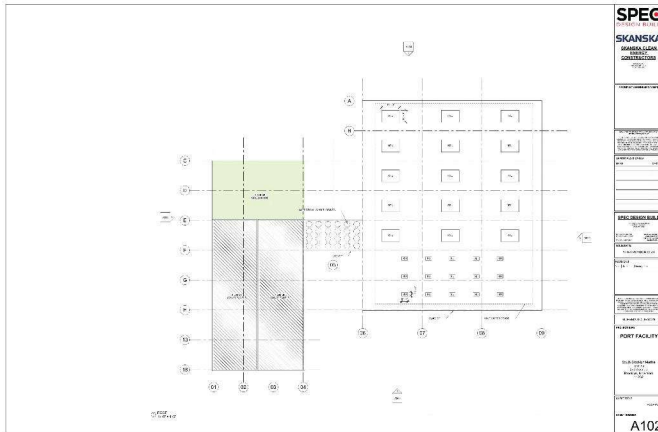


3
0

Design

30

Roof Plan



35,000 sf Roof Required for Mechanical

Design Approach

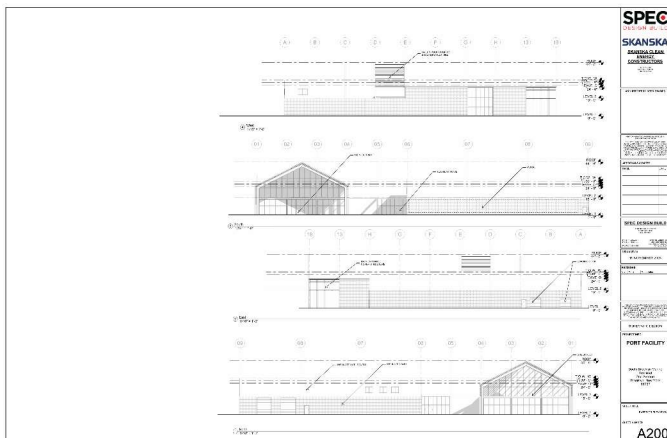
- 26,400 sf flat roof – Mechanical
- 1,500 sf flat roof – Vertical wind turbines
- 9,000 sf pitched roof – Ideal for solar panels
- 3,845 sf – Green roof

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Design

31

Elevations



Design Approach

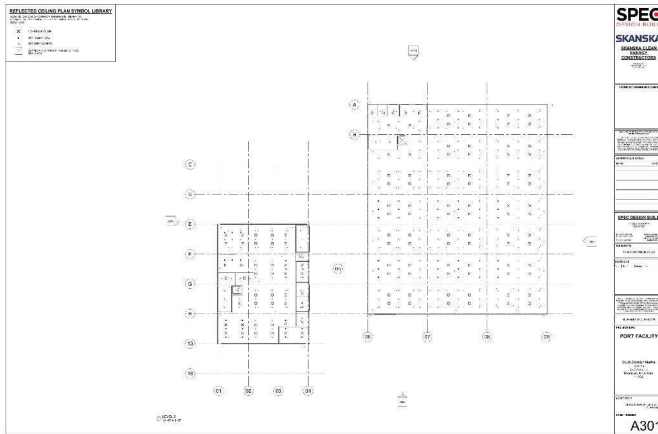
- Omniblock - Insulated CMU block to connect with context
- Butler - Insulated metal panels provide structural strength in the (Butler) PMB system while leading to reduced installation times
- Exterior shading structures to protect the interior from Summer heat while letting in natural light
- Tile Tech Paver System – Green roof

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Design

32

RCP



Design Approach

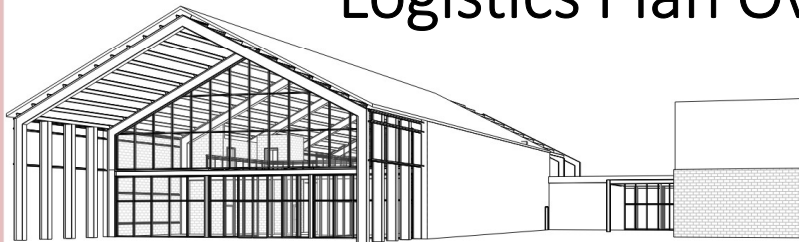
- Reliable – Model N252EC Pendant Sprinkler Head
- Metalux
 - HB LED – Warehouse
 - SkyBar LED – Office
 - Invue – Exterior
- FLEXFIRELEDS – IP65 LED Strip – Exterior
- Honeywell – Indoor/outdoor equip Cameras
- DUCTSOX – C-Series Fabric Diffuser
- RCD – Round Cone Diffuser - Office

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Design

33

Logistics Plan Overview



SPEC 34

Safety

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Logistics Plan

1.00 25 Foot Safety zone around train/rail

2.00 Specific PPE requirements

3.00 Daily training with flaggers

4.00 Well defined pathways for workers and vehicles

5.00 Controlled access zone for pile cutting

6.00 Barricades to protect personnel and structures

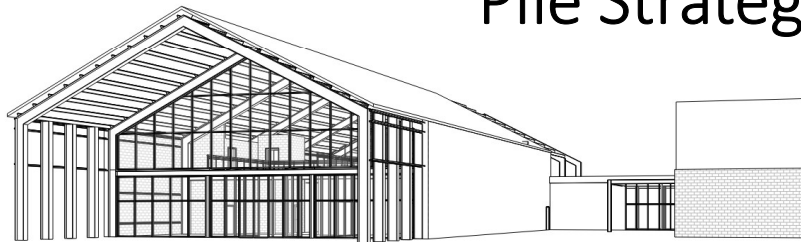
7.00 Temporary and permanent light fixtures where necessary

SPEC 35

Safety

35

Pile Strategy

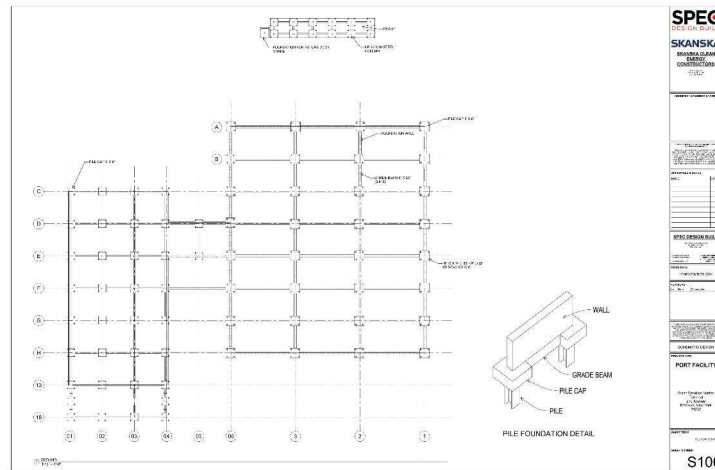


SPEC 36

Foundations

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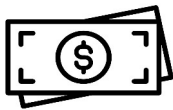
Foundation Plan

SPEC³⁷

Foundations

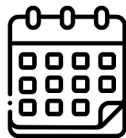
37

Pile Strategy



Cost

Steel transportation costs under \$700k total



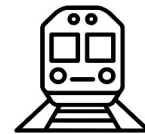
Schedule

Material delivery speed met deadlines for steel construction



Location

Quebec, Canada closer than Istanbul, Turkey



Transportation

Proximity to intermodal railway system

SPEC³⁸

Foundations

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Design Strategy

Design Approach

- Natural Resource Equipment (Weight + Size)
- Site Requires Deep Foundation
- ASCE Code Compliance (ASCE 7 – Structural Criteria)



H-Piles (Steel) – Foundation

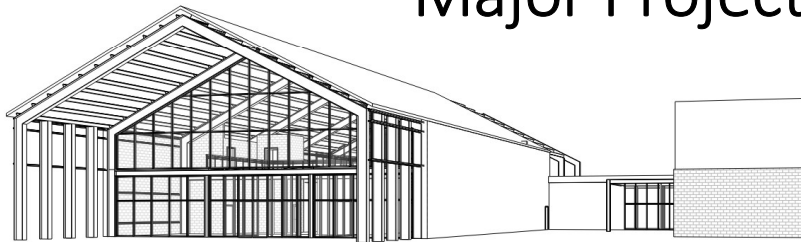
- **Readily Available** (Mitigate time + cost with no long lead times).
- **Versatility** (Adaptable to unforeseen on-site pile driving predicaments).
- **Greater Stiffness + Capacity** (Soil + Bedrock Penetration).
- **Durable + Long Lasting** (Less corrosion of material in corrosive environments).

SPEC³⁹

Foundations

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Major Project Risks



SPEC⁴⁰

Risks

40

Top 3 Project Risks

Safety

- Pile unloading, staging and installation
- Waterfront lot
- Train / rail line

Financial

- Location & climate
- Insurance premiums
- Local codes and zoning regulations

Logistics

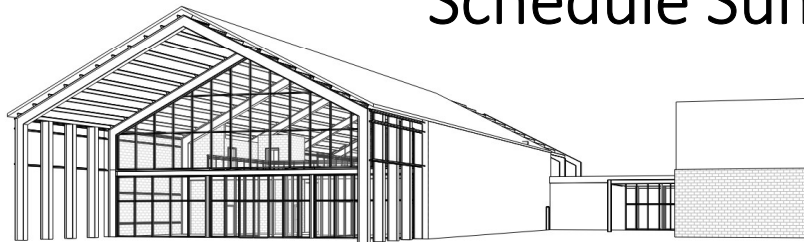
- Limited site access
- Local opposition
- Coordination with multiple agencies

SPEC ⁴¹

Risks

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Schedule Summary

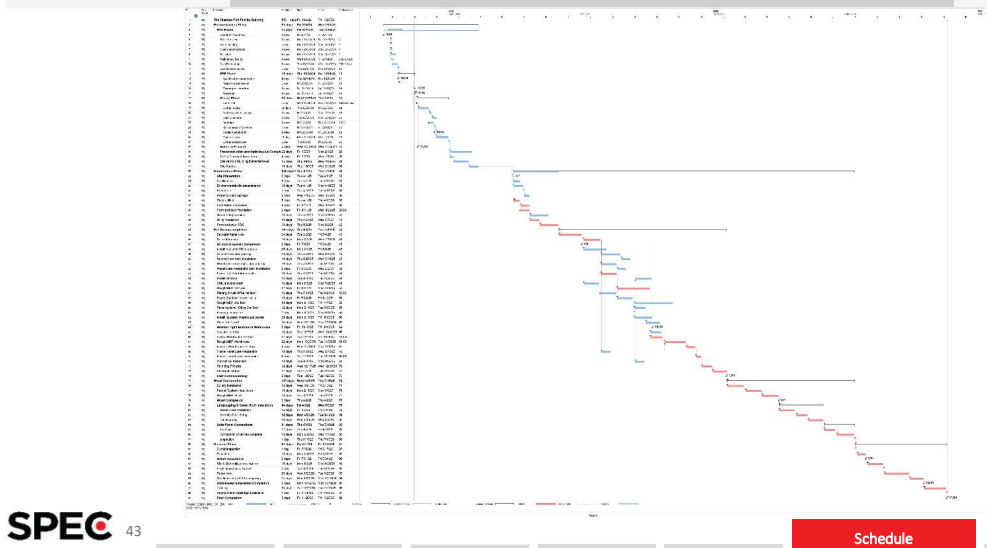


SPEC ⁴²

Schedule

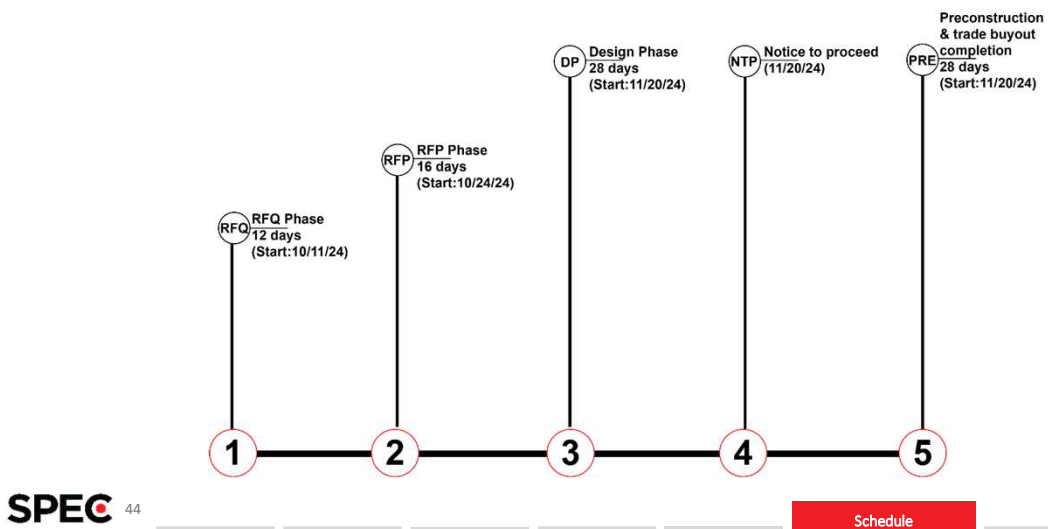
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The Skanska Port Facility Building Schedule



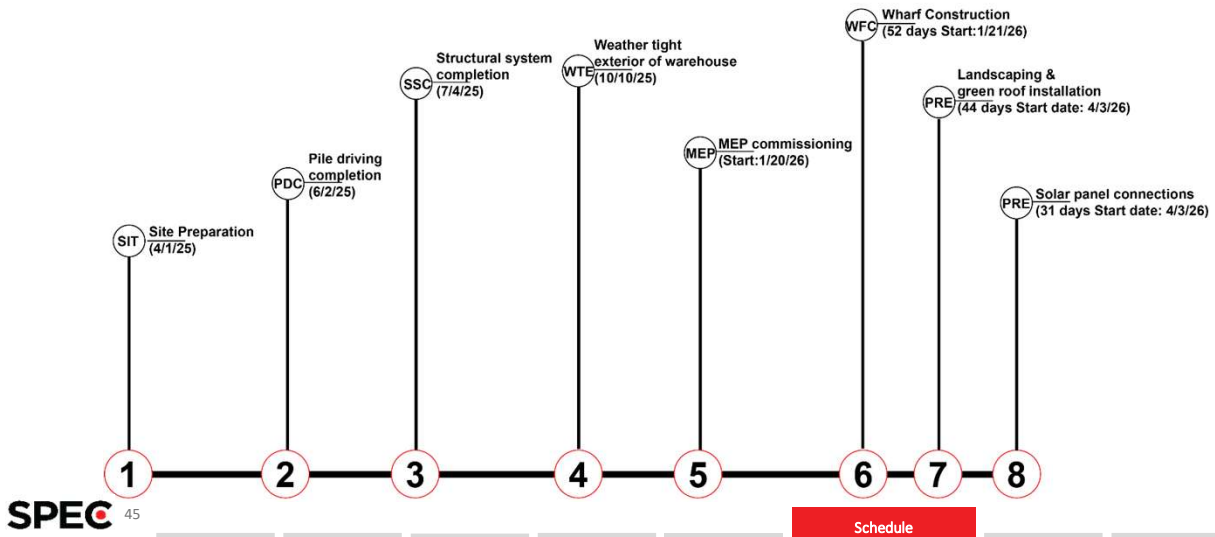
43

Preconstruction Phase (90 days)



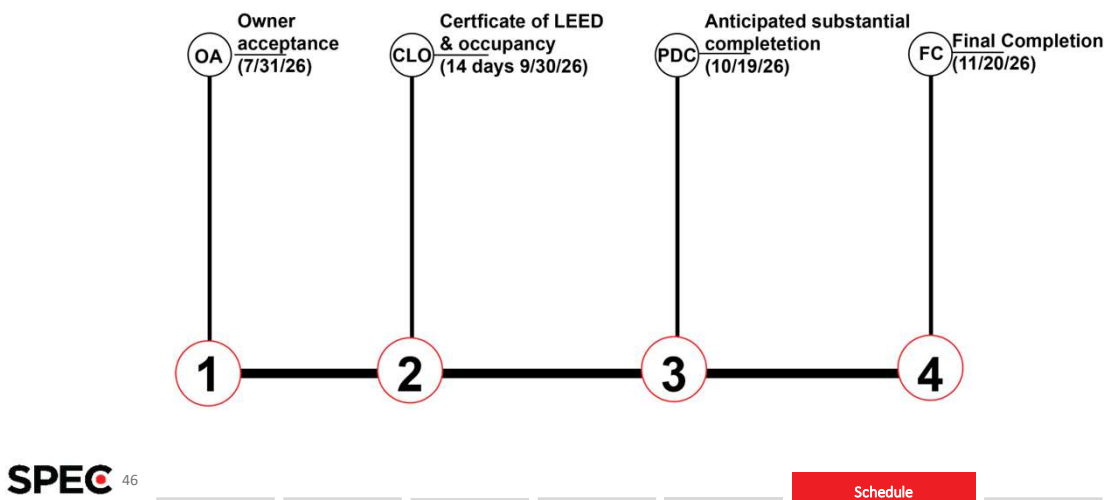
44

Construction Phase (399 days)



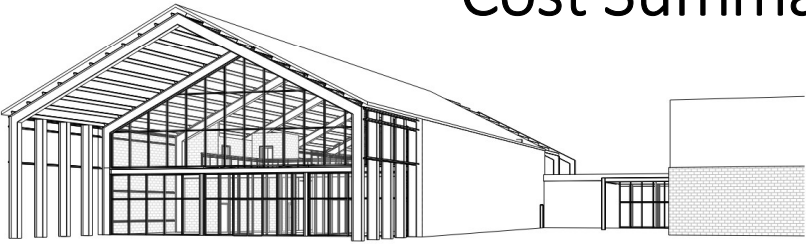
45

Closeout Phase (92 days)



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Cost Summary




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Cost Estimate

47

Cost Breakdown

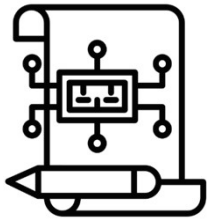
CATEGORY	GUARANTEED MAXIMUM PRICE
Architectural	\$28,273,089.88
Structural	\$8,078,025.68
Landscaping	\$4,039,012.84
TOTAL	\$40,390,128.40


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Cost Estimate

48

Cost Considerations



**Schematic Design
Estimate**



Escalation Clause



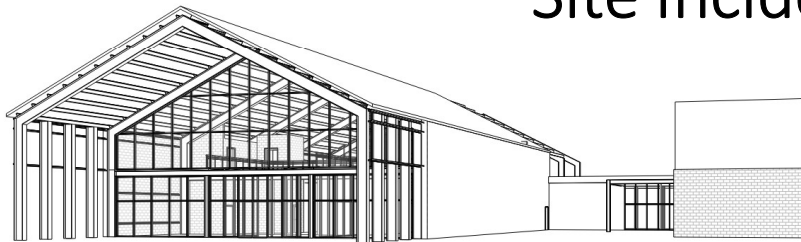
Volatile Materials

SPEC ⁴⁹

Cost Estimate

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Site Incident

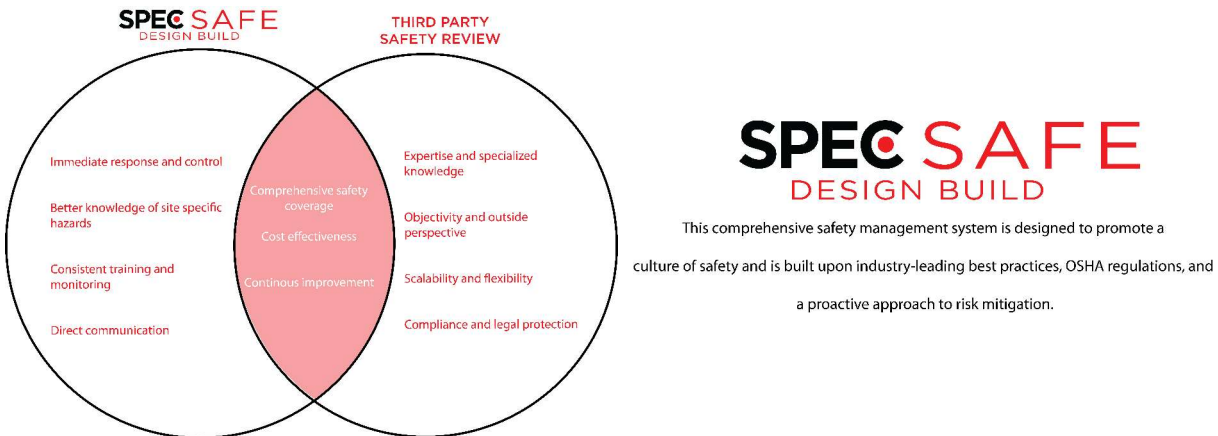


SPEC ⁵⁰

Incident

50

Safety Strategy



SPEC 51

Incident

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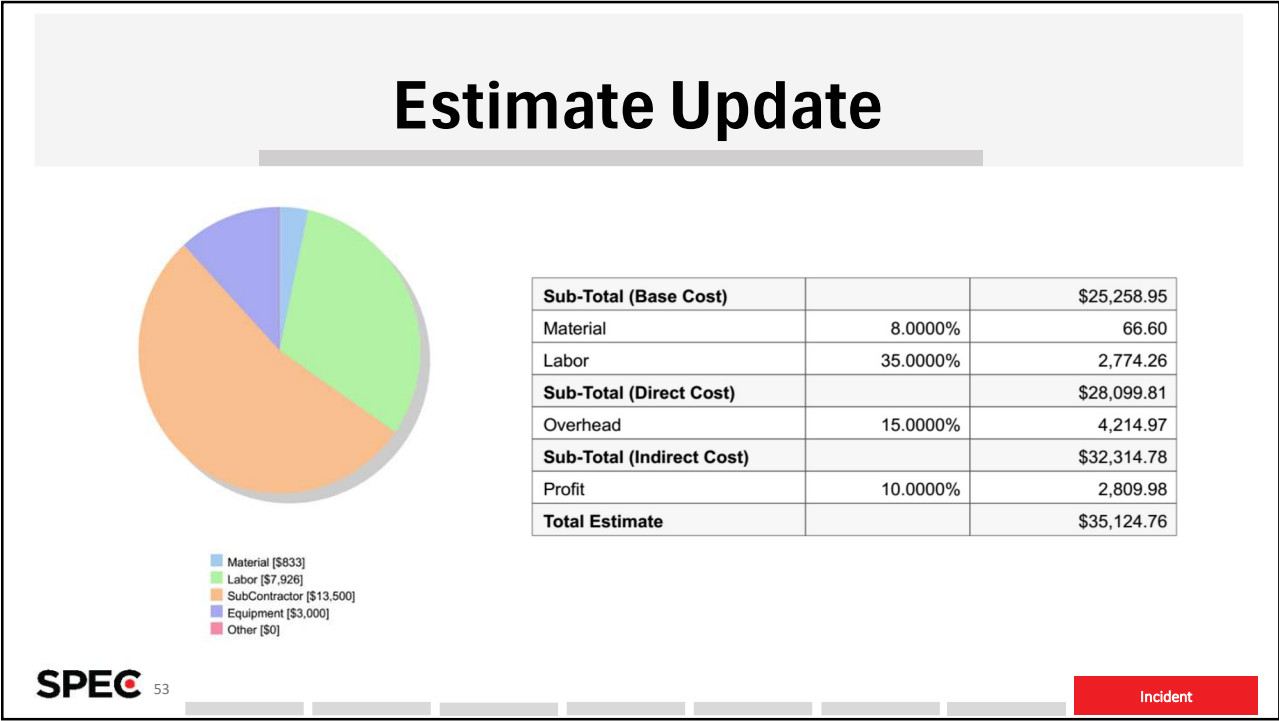
Safety Response



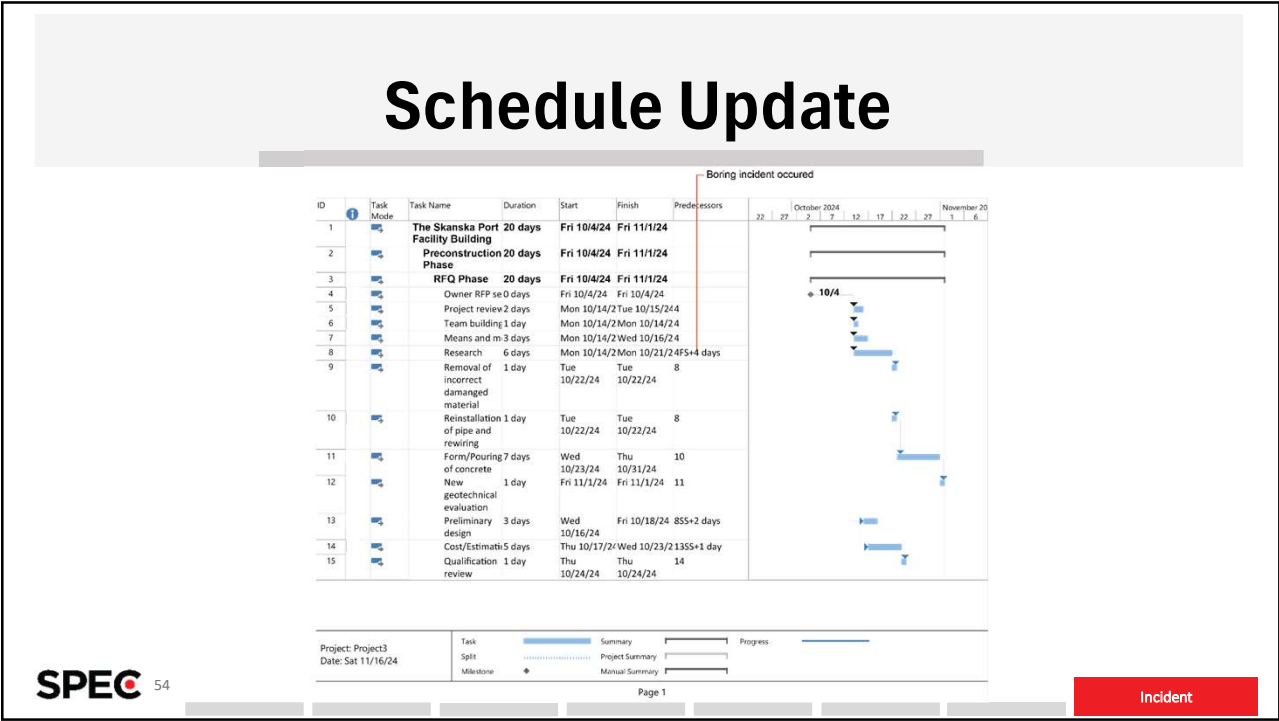
SPEC 52

Incident

52



53



54

Final Overview



Final Cost Estimate:
\$40,425,253.16

Final Duration:
553 Working Days

SPEC 55

55

Thank you,
Questions?

SPEC 56

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Why Design-Build Concepts Matter

The 5 Difficult Truths Contractors Want Designers to Know:

1. Establish a **relationship** with the contractors—not just the clients.
2. **Communication** among all team members of the project is essential.
3. **Trust** your contractors, and respect what they do.
4. Constructing a well-designed project takes time and should be **thoroughly planned out**.
5. Recognize that intricate details and design changes will translate into extra **cost**.

[The 5 Difficult Truths Contractors Want Designers to Know | Architectural Digest](#)

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The Proposed Plan – Option A

A Five-Step Process:

1. Research precedents...
2. Pursue LAS credit for one ARCH courses through the campus process...
3. Submit a Program Revision Proposal to the College, SUNY, and NYSED...
4. Require CIVL 6214 Advanced Estimating **or** CIVL 6154 Supervisory Estimating (OL), **and** CIVL 7223 Construction Project Planning **or** CIVL 7523 Construction Scheduling (OL), **and** CIVL 6212 Construction Safety to address construction estimating, scheduling, and safety in the revised B.S. program...
5. Systematically integrate elements of estimating, scheduling, and safety into all design studio courses...

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The Proposed Plan – Option B

A Five-Step Process:

1. Research precedents...
2. Submit a New Program Proposal to the College, SUNY, and NYSED...
3. Transition B.S. Architectural Technology to a B.Tech Architectural Technology...
4. Require CIVL 6214 Advanced Estimating or CIVL 6154 Supervisory Estimating (OL), and CIVL 7223 Construction Project Planning or CIVL 7523 Construction Scheduling (OL), and CIVL 6212 Construction Safety to address construction estimating, scheduling, and safety in the new B.Tech program...
5. Systematically integrate estimating, scheduling, and safety into all design studio courses...

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Existing B.S. Architectural Technology

First Semester

ARCH 1184-Design Fundamentals 1	4
GLST 2113-Global & Diverse Persp. (GEWCA)	3
FNAT 1303-Arch History I (GEFA)	3
MATH 1034-College Algebra of Functions (GEMA)	4
ELEC XXX3-GenEd/LAS Elective	3
	17

Third Semester

ARCH 3104-Design Studio 1	4
ARCH 3014-Construction Technology 1	4
ARCH 3003-Environmental Controls 1	3
MATH 1063-Tech. Calculus I	3
ELEC XXX3-GenEd/LAS Elective	3
	17

Fifth Semester

ARCH 5306-Design Studio 3	6
FNAT 5303-Arch History II	3
ELEC XXX3-GenEd/LAS Elective (Upper Level)	3
ELEC XXX3-GenEd/LAS Elective	3
	15

Seventh Semester

ARCH 7306-Design Studio 5	6
ARCH 7003-Environmental Controls 2	3
ELEC XXX3-GenEd/LAS Elective (Upper)	3
ELEC XXX3-GenEd/LAS Elective (Upper)	3
ELEC XXX3-GenEd/LAS Elective	3
	18

Second Semester

ARCH 2394-Design Fundamentals 2	4
ARCH 2014-Computer Visualization	4
COMP 1503-Writing Studies (GEBC)	3
MATH 2043-College Trigonometry	3
PHYS 1024-General Physics I (GENS)	4
	18

Fourth Semester

ARCH 4304-Design Studio 2	4
ARCH 4014-Construction Technology 2	4
ARCH 4013-Municipal Codes & Regs.	3
CIVL 4103-Structures 1	3
SPCH 1083-Public Speaking (GEBC)	3
OR SPCH XXX3-Effective Speaking Equiv.	17

Sixth Semester

ARCH 6306-Design Studio 4	6
CIVL 5213-Reinforced Concrete	3
ELEC XXX4-GenEd/LAS Elective	3
ELEC XXX4-GenEd/LAS Elective	4
	16

Eighth Semester

ARCH 8306-Design Studio 8	6
ARCH 8003-Professional Practices	3
ELEC XXX3-GenEd/LAS Elective	3
ELEC XXX3-GenEd/LAS Elective	3
	15

Curr. Core:	70
GenEd/LAS:	63 (*60 reqd. incl. FNAT 1303, FNAT 5303)
Total:	133

Upper Level: 45 (45 reqd.)

GenEd Total: 6 of 10

60

Proposed B.Tech Architectural Technology

First Semester

ARCH 1184-Design Fundamentals 1	4
FNAT 1303-Arch History I (GEFA)	3
FNAT 2333-Survey of Design	3
COMP 1503-Writing Studies (GEBC)	3
MATH 1034-College Algebra of Functions (GEMA)	4
	<u>17</u>

Third Semester

ARCH 3104-Architecture Studio 1	4
ARCH 3014-Construction Technology 1	4
ARCH 3003-Environmental Controls 1	3
GLST 2113-Global & Diverse Persp. (GEWCA)	3
	<u>14</u>

Fifth Semester

ARCH 5306-Architecture Studio 3	6
ARCH 5013-Municipal Codes & Regs.	3
SOCI 1163-General Sociology (GESS)	3
ELEC XXX3-Technical Elective	3
	<u>15</u>

Seventh Semester

ARCH 7306-Architecture Studio 5	6
ARCH 7003-Environmental Controls 2	3
COMP 5703-Technical Writing II	3
ELEC XXX3-Technical Elective (Upper)	3
	<u>15</u>

Second Semester

ARCH 2394-Design Fundamentals 2	4
ARCH 2014-Computer Visualization	4
FNAT 2303-Arch History II	3
MATH 2043-College Trigonometry	3
PHYS 1024-General Physics I (GENS)	4
	<u>18</u>

Fourth Semester

ARCH 4304-Architecture Studio 2	4
ARCH 4014-Construction Technology 2	4
CIVL 4103-Structures 1	3
SPCH 1083-Public Speaking (GEBC)	3
	<u>14</u>

Sixth Semester

ARCH 6306-Architecture Studio 4	6
CIVL 5213-Reinforced Concrete	3
LITR XXX3-GenEd/LAS Elective(GEHU)	3
ELEC XXX3-Technical Elective	3
	<u>15</u>

Eighth Semester

ARCH 8306-Architecture Studio 8	6
ARCH 8003-Professional Practices	3
ELEC XXX3-GenEd/LAS Elective (Upper)	3
ELEC XXX3-Technical Elective	3
	<u>15</u>

Curr. Core:	70
GenEd/LAS:	41 (*30 reqd. incl. FNAT 1303, FNAT 2303, FNAT 2333)
Tech Elec:	12
Total:	<u>123</u>
Upper Level:	45 (45 reqd.)
GenEd Total:	7 of 10

Note: The proposal reduces the total credits of the degree from 133 to 123 credit hours with no loss of technical content.

Key:

Existing course requiring major modification
Specific GenEd/LAS Elective Proposed
Existing course moved to a different semester
Existing course requiring minor modification

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In Support of the Department Mission

The Alfred State architecture experience goes beyond the design studio - cultivating engaged and **collaborative** life-long learners who build meaningful connections with the dynamic regional, national, and global communities that surround us. Students develop into emerging professionals through a carefully planned sequence of **applied learning** and civic engagement experiences and apply sustainable solutions to address social and environmental challenges using integrated and **innovative** digital and building technologies.



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Thank You!

Contact Information:

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