

HUB RENOVATIONS & ADDITION

THE PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK, PA

PROJECT OVERVIEW

Building Function: **Student Union Center**

Overall Project Cost: **\$44.6 Million**

Size: **40,000 GSF Renovation**

64,000 GSF New Construction

Schedule: **Start | May 2013**

End | March 2015

Analysis #1: Schedule Resequence

Contractual & Existing Condition Issues

Need for: **Schedule Acceleration** to keep Project on track

Schedule Resequence: Look at Schedule for Areas of:

Unnecessary Float, Sequencing Improvements, & Schedule Overlap

Implementation of Lean Construction Practice:

Last Planner System

Table 3: Schedule Bookstore Exterior | RJB

Schedule Breakdown – Bookstore Exterior			
Description	Start Date	End Date	Total Duration
Roof Membrane	02 December 2013	13 December 2013	10 Days
Exterior Façade Terra Cotta	02 December 2013	17 January 2014	35 Days
Green Roof / Accessories	16 December 2013	24 January 2014	30 Days
Install Green Roof - Planting	27 January 2014	14 February 2014	15 Days

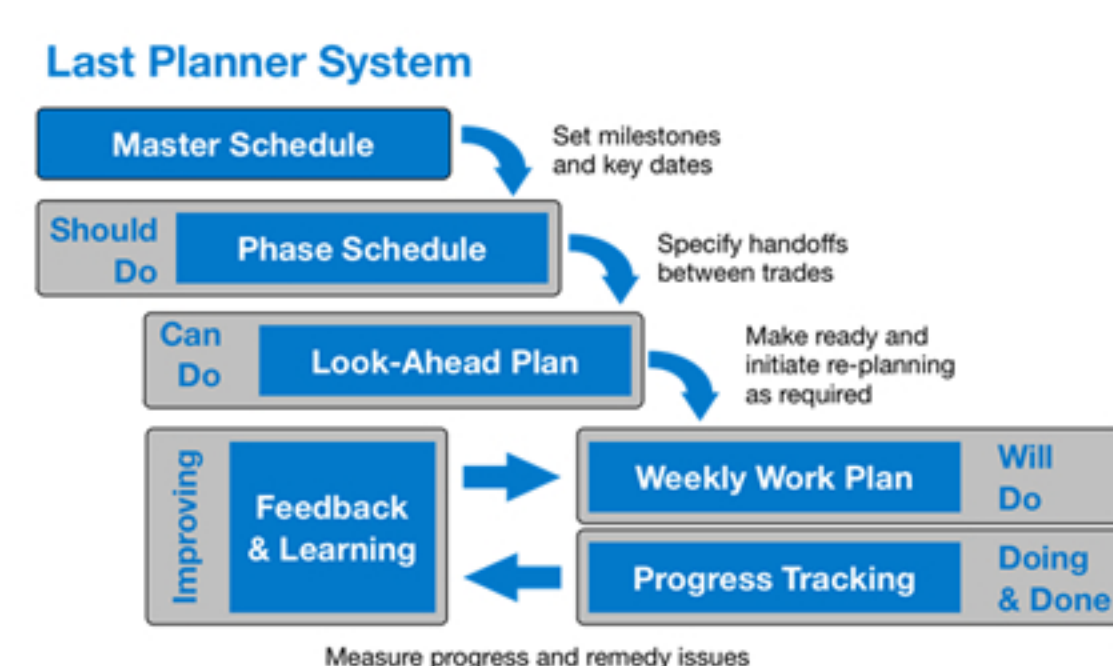


Figure 20: Last Planner Process | <http://www.leanconstruction.org/>

Analysis #3: GPS Material Tracking System

Just-In-Time Delivery & Site Congestion Issues

Intelliwave Technologies: Track Material, Equipment, & Personnel

SiteSense Material Tracking: Web-Based Software

Track Steel Delivery in **Real Time** from **Mill to Site**

215 GPS Units required to Ensure **Quality Control**



Figure 15.1: Tablet Used in Field | intelliwave.com



Figure 15.2: RFID Tag | intelliwave.com



Figure 15.3: SiteSense Diagram | intelliwave.com

PENNSSTATE



PROJECT TEAM

Owner: **The Pennsylvania State University**

Construction Manager: **Gilbane Building Company**

Architect: **GUND Partnership**

Structural Engineer: **LeMessurier Consultants**

M/E/P Engineer: **Vanderweil Engineers**

Civil Engineer: **Sweetland Engineering & Associates**

Analysis #2: Terra Cotta Façade Redesign

Alternative **Brick Veneer** Design

Exterior Bookstore Façade:

6 Day Schedule Reduction & \$64,142.00 Savings

Similar Thermal Properties: DesignBuilder Model

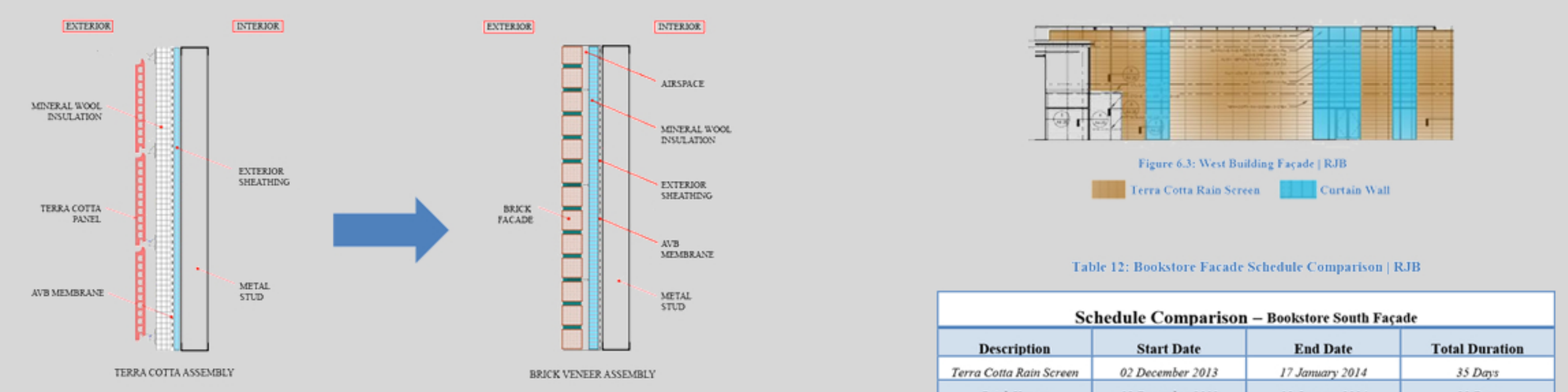


Table 12: Bookstore Façade Schedule Comparison | RJB

Analysis #4: Removal of Green Roof

Alternative **Duro-Last Cool Zone** Roof Design

Existing Bookstore Roof Design:

40 Day Schedule Reduction & \$154,896.00 Savings

Greater CO₂ offset than Green Roof (compared to Black Roof)

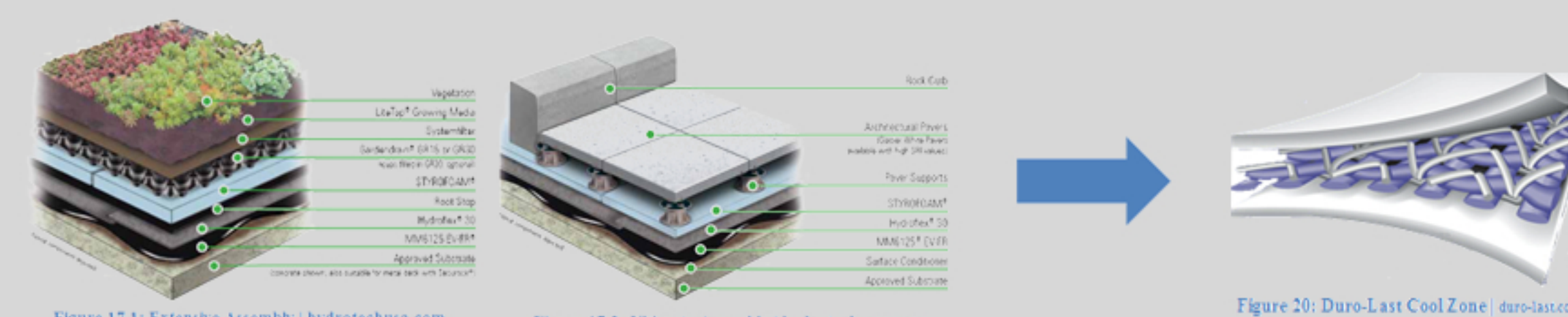


Figure 17.1: Existing Assembly | hydrotechnica.com

Figure 17.2: Duro-Last Assembly | hydrotechnica.com

Figure 20: Duro-Last Cool Zone | moss-n-sun.com

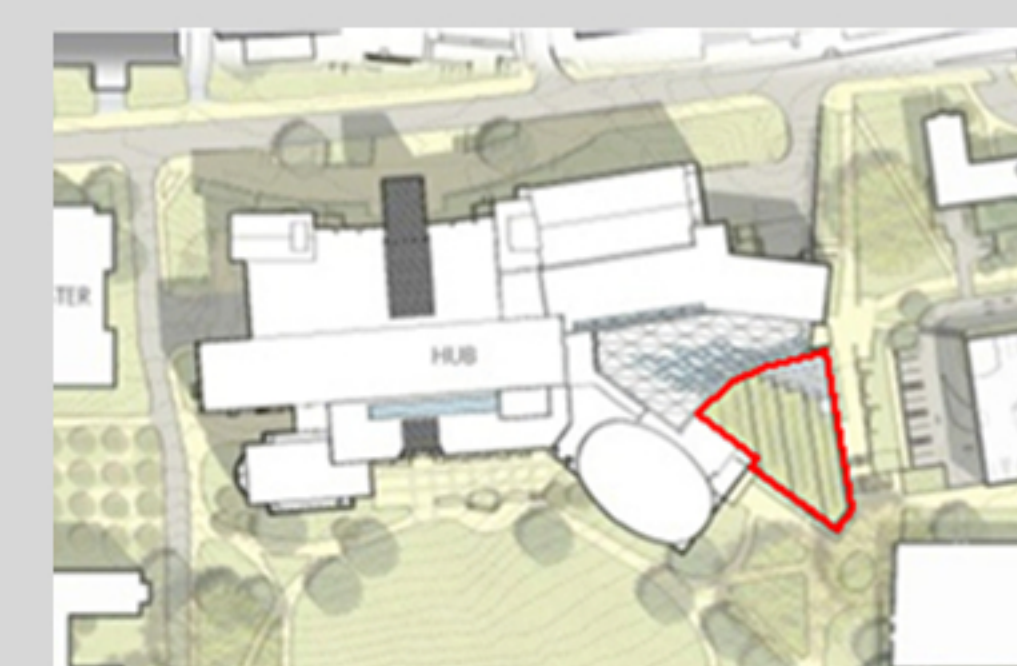
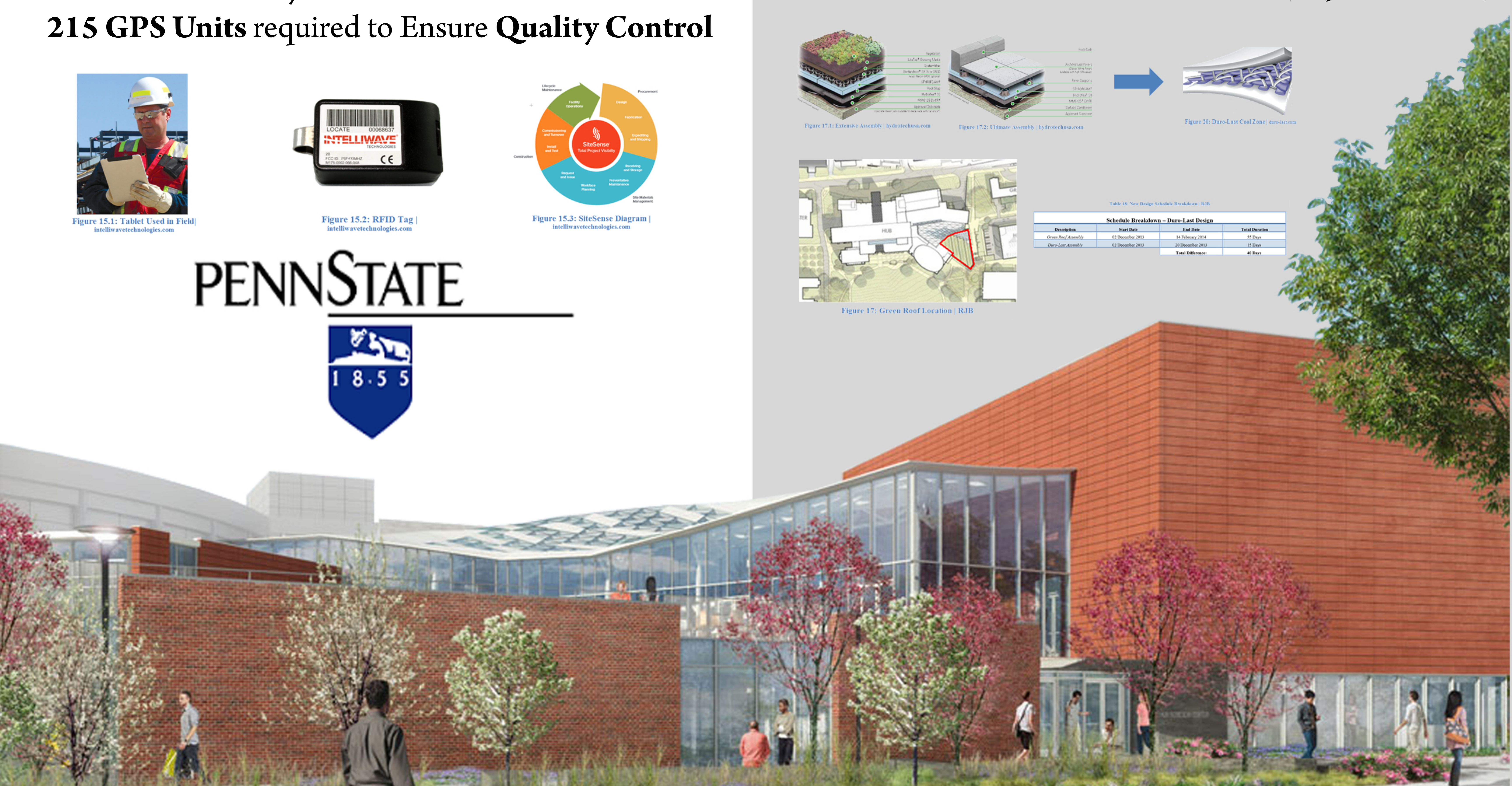


Figure 17: Green Roof Location | RJB

Table 18: New Design Schedule Breakdown | RJB

Schedule Breakdown – Duro-Last Design			
Description	Start Date	End Date	Total Duration
Green Roof Assembly	02 December 2013	14 February 2014	43 Days
Duro-Last Assembly	02 December 2013	20 December 2013	18 Days
Total Difference:			49 Days



ROBERT JUSTIN BARLOW | CONSTRUCTION OPTION

<http://www.engr.psu.edu/ae/thesis/portfolios/2014/rjb5258/index.html>

