## Competition Challenge

<table>
<thead>
<tr>
<th>Project Background</th>
<th>Goals</th>
<th>BIM Execution Plan</th>
<th>Site Plan</th>
<th>Building Analysis</th>
<th>Site Logistics</th>
<th>Schedule</th>
<th>Cost Estimate</th>
<th>Sustainability Analysis</th>
<th>Conclusion</th>
<th>Supporting Documentation</th>
</tr>
</thead>
</table>

### Supporting Documentation
Reading School District

PA Average - $14,535
Reading - $12,989

OpenPagov.org
Delivery Method

CM Agent with Multiple Primes

- Reading School District
- Architect
- CM Agent
- Engineers
- Consultants
- Prime Contractor
- Prime Contractor
- Prime Contractor
- Etc...

Design/Build

- Reading School District
- Nexus Design/Build
- Contractor
- Contractor
- Contractor
- Etc...
Goals

**Owner Core Values**

- Safety & Security
- Lifecycle & Maintenance
- Cost Effective

**Nexus Goals**

- Integration
- Reduce, Reuse, Recover
- Learning Tool
Site Plan

- No room for pool
- Old Main Entrance
- New Main Entrance
- Parking Relocation
- Bus Lane
- Congregation Area
- Pool

Supporting Documentation
Second Floor Lobby

Project Background

Goals

BIM Execution Plan

Site Plan

Building Analysis

Site Logistics

Schedule

Cost Estimate

Sustainability Analysis

Conclusion

Supporting Documentation
Safety

Nexus’ School Security and Occupant Safety Checklist

<table>
<thead>
<tr>
<th>Level of Integration</th>
<th>Significant</th>
<th>Acceptable</th>
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</thead>
<tbody>
<tr>
<td>Secure Main Entrance</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Safe Main Entrance</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Parking Lot Balusters</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Public Address System</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Security Alarms</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Intrusion Detection System</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Lockdown Security Doors</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Manual Window Shades</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Video Surveillance</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>First Floor Bullet-Resistant Glass</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Supporting Documentation

Nexus’ School Security and Occupant Safety Checklist

• Secure Main Entrance
• Safe Main Entrance
• Parking Lot Balusters
• Public Address System
• Security Alarms
• Intrusion Detection System
• Lockdown Security Doors
• Manual Window Shades
• Video Surveillance
• First Floor Bullet-Resistant Glass

Building Analysis

Project Background  Goals  BIM Execution Plan  Site Plan  Building Analysis  Site Logistics  Schedule  Cost Estimate  Sustainability Analysis  Conclusion  Supporting Documentation
Site Logistics

Excavation - 6/16/14 to 7/18/14

- Zone 1
- Zone 2
- Zone 3

Alternative

Supporting Documentation
Site Logistics

- Superstructure Erection: 8/29/14 to 1/23/15
- Laydown Area
- 3 Story Elementary
- Zone 1
- Zone 2
- Zone 3
- Park Street
- 13th Street
- 7th Street
- Schedule
- Cost Estimate
- Sustainability Analysis
- Conclusion
- Supporting Documentation
Schedule
# Schedule

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Schedule</th>
<th>Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconstruction</td>
<td>344 days</td>
<td>Nov 1/2013</td>
<td>Feb 1/2014</td>
<td>Jun 1/2014</td>
</tr>
<tr>
<td>Design</td>
<td>30 days</td>
<td>Dec 1/2013</td>
<td>Feb 1/2014</td>
<td>Jun 1/2014</td>
</tr>
<tr>
<td>Site Logistics</td>
<td>30 days</td>
<td>Mar 1/2014</td>
<td>Jun 1/2014</td>
<td>Jun 1/2014</td>
</tr>
<tr>
<td>Support Documentation</td>
<td>14 days</td>
<td>May 1/2014</td>
<td>Jun 1/2014</td>
<td>Jun 1/2014</td>
</tr>
<tr>
<td>Project Background</td>
<td>3 days</td>
<td>Jun 1/2014</td>
<td>Jun 1/2014</td>
<td>Jun 1/2014</td>
</tr>
</tbody>
</table>

## Site Plan

- Site Preparation
- Driveway Cut
- Building Foundation
- Electrical and Plumber
- Excavation
- Site Development
- Site Development Documents
- Site Construction Documents

## Building Analysis

- Project Plan
- Project Request
- Project Scope
- Project Documentation
- Project Evaluation

## BIM Execution Plan

- Preconstruction
- Design
- Site Logistics
- Support Documentation
- Project Background

## Cost Estimate

- Schedule
- Cost
- Sustainability Analysis
- Conclusion

## Sustainability Analysis

- Site Selection
- Project Plan
- Project Request
- Project Scope
- Project Documentation
- Project Evaluation

## Conclusion

- Project Plan
- Project Request
- Project Scope
- Project Documentation
- Project Evaluation
Navisworks

Project Background            Goals            BIM Execution Plan            Site Plan            Building Analysis

Site Logistics            Schedule            Cost Estimate            Sustainability Analysis            Conclusion

Supporting Documentation

Task Name | Location | Start | End | Duration |
--- | --- | --- | --- | --- |
Construction | | | |
Last Day of School - Spring 2014 | | | |
| | | | |
Structural Steel | | | |
Total | | | |
| | | | |
Ginding | | | |
Total | | | |
| | | | |
Last Day of School - Spring 2015 | | | |
<p>| | | | |
| | | | |</p>
<table>
<thead>
<tr>
<th>Uniformat Categories (A-G, Z)</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>$17,447,650</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$196.04</td>
</tr>
<tr>
<td>% of Cost</td>
<td>89,000 SF</td>
</tr>
<tr>
<td>A. Substructure</td>
<td>$713,750</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$8.02</td>
</tr>
<tr>
<td>% of Cost</td>
<td>4%</td>
</tr>
<tr>
<td>B. Shell</td>
<td>$6,516,250</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$73.22</td>
</tr>
<tr>
<td>% of Cost</td>
<td>37%</td>
</tr>
<tr>
<td>C. Interiors</td>
<td>$1,970,000</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$22.13</td>
</tr>
<tr>
<td>% of Cost</td>
<td>11%</td>
</tr>
<tr>
<td>D. Services</td>
<td>$6,475,000</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$72.75</td>
</tr>
<tr>
<td>% of Cost</td>
<td>37%</td>
</tr>
<tr>
<td>E. Equipment &amp; Furnishings</td>
<td>$300,000</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$3.37</td>
</tr>
<tr>
<td>% of Cost</td>
<td>2%</td>
</tr>
<tr>
<td>F. Special Construction &amp; Demolition</td>
<td>$475,000</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$5.34</td>
</tr>
<tr>
<td>% of Cost</td>
<td>3%</td>
</tr>
<tr>
<td>G. Building Sitework</td>
<td>$997,650</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$11.21</td>
</tr>
<tr>
<td>% of Cost</td>
<td>6%</td>
</tr>
<tr>
<td>Z. General Conditions</td>
<td>$997,650</td>
</tr>
<tr>
<td>$ / SF</td>
<td>$11.21</td>
</tr>
<tr>
<td>% of Cost</td>
<td>6%</td>
</tr>
</tbody>
</table>

- **General Works - $1,800,000**
  - metal stud interior partitions; gypsum wallboard; casework; finishes; painting; exterior and interior doors; retractable wall systems in gymnasium and stage
- **Concrete - $2,425,000**
  - footers; pile caps; column heads; insulated concrete forms; cast-in-place concrete walls; slab-on-grade concrete floors
- **Mechanical and Plumbing - $4,120,000**
  - mechanical equipment and units; sheetmetal; piping; domestic and sanitary piping; diffusers, registers, grilles
- **Electrical - $1,575,000**
  - electrical equipment; transformers; switchgear; utility connections; conduit; wiring; fixtures; luminaries
- **Data - $350,000**
  - cable trays; data and telecommunication wiring; data and telecommunication devices
- **Excavation - $400,000**
  - soil excavation;% of Cost filling; disposal of contaminated soil
- **Utilities - $125,000**
  - underground utility runs and connections
- **Pipes - $200,000**
  - steel-driven piles
- **Fire Protection - $175,000**
  - sprinkler piping and heads
- **Testing, Adjusting, Balancing - $80,000**
  - mechanical, plumbing, electrical, and the fire protection system commissioning
- **Structural Steel - $1,275,000**
  - structural steel members (HSS columns and lateral bracing); wide-flange girders and beams; joists; trusses; truss beams; and diagonal bracing, shear walls
- **Roofing - $700,000**
  - built-up and single-ply roofing
- **Carpet Wall - $800,000**
  - curtain wall elements in classrooms; aluminum panel interior cladding
- **Masonry - $1,490,000**
  - concrete masonry and steel walls; face brick exterior cladding
- **Glazing - $850,000**
  - glazing elements
- **Carpet - $200,000**
  - carpet tiles in the classroom spaces
- **Flooring - $800,000**
  - finished concrete flooring in corridors and auxiliary spaces; gymnasium hardwood floor; stage floor
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  - mechanical, plumbing, electrical, and the fire protection system commissioning

*NOTE: The above information is illustrative and subject to change based on the actual project specifications and requirements.*
## Cost Estimate

### PlanCon Calculation

- Full time equivalent capacity: 875 students
- Conversion factor: 1.3205
- Rated Pupil Capacity: 1155 students
- Elementary legislated per pupil amount: $4,700
- Reimbursable Amount: $5,428,500
- Additional funding for LEED Silver Certification: $470
- Total Additional funding for LEED Silver Certification: $542,850
- Total Reimbursable Project Cost: $5,971,350
- Reimbursable Percent: 34.12%
- Less 0.5% reduction until final project accounting: 33.62%
- Reading School District - Market Value Aid Ratio: 0.9003
- State of Pennsylvania Contribution: $5,296,915.05

### Value Engineered Finishes

<table>
<thead>
<tr>
<th>SF</th>
<th>$/SF</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete with Epoxy Finish</td>
<td>21,000</td>
<td>$0.51</td>
</tr>
<tr>
<td>VCT</td>
<td>21,000</td>
<td>$4.31</td>
</tr>
<tr>
<td>Acoustic Ceiling Tile</td>
<td>55,600</td>
<td>$3.51</td>
</tr>
</tbody>
</table>

### Total Savings

- $17,500,000 * 0.3362 * 0.9003 = $4,700 * 1155 = $470 * 1155 = $5,428,500 + $542,850 = $5,971,350

### PlanCon Calculation

- $5,428,500 / $17,500,000 = 31.26%

---

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<td>3.37</td>
<td>2%</td>
</tr>
<tr>
<td>F. Special Construction &amp; Demolition</td>
<td>-</td>
<td>-</td>
<td>0%</td>
</tr>
<tr>
<td>G. Building Sitework</td>
<td>$475,000</td>
<td>5.34</td>
<td>3%</td>
</tr>
<tr>
<td>Z. General Conditions</td>
<td>$997,650</td>
<td>11.21</td>
<td>6%</td>
</tr>
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<td>*Uniformat Categories (A-G, Z)</td>
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<td>196.04</td>
<td>89,000 SF</td>
</tr>
</tbody>
</table>

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### Supporting Documentation

- Project Background
- Goals
- BIM Execution Plan
- Site Plan
- Building Analysis
- Site Logistics
- Schedule
- Cost Estimate
- Sustainability Analysis
- Conclusion

---

**Full time equivalent capacity** 875 students

**Conversion factor** 1.3205

**Rated Pupil Capacity** 1155 students

**Elementary legislated per pupil amount** $4,700

**Reimbursable Amount** $5,428,500

**Additional funding for LEED Silver Certification** $470

**Total Additional funding for LEED Silver Certification** $542,850

**Total Reimbursable Project Cost** $5,971,350

---

**State of Pennsylvania Contribution** $5,296,915.05
### Sustainability Analysis

#### LEED 2009 for Schools

<table>
<thead>
<tr>
<th>Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable Site</td>
<td>13</td>
</tr>
<tr>
<td>Water Efficiency</td>
<td>7</td>
</tr>
<tr>
<td>Energy and Atmosphere</td>
<td>14</td>
</tr>
<tr>
<td>Materials and Resources</td>
<td>4</td>
</tr>
<tr>
<td>Indoor Environmental Quality</td>
<td>15</td>
</tr>
<tr>
<td>Innovation and Design Process</td>
<td>2</td>
</tr>
<tr>
<td>Regional Priority Credits</td>
<td>0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>55</strong></td>
</tr>
</tbody>
</table>

**Total Credits:** 55

LEED 2009 for Schools

- Sustainable Site: 13
- Water Efficiency: 7
- Energy and Atmosphere: 14
- Materials and Resources: 4
- Indoor Environmental Quality: 15
- Innovation and Design Process: 2
- Regional Priority Credits: 0

**Total:** 55

**LEED Silver USGBC**

[https://www.google.com/imghp?hl=en&tab=wi](https://www.google.com/imghp?hl=en&tab=wi)
Conclusion

- Safety & Security
- Lifecycle & Maintenance
- Cost Effective
- Integration
- Reduce, Reuse, Recover
- Learning Tool
Cost Estimate

School Cost Comparisons

<table>
<thead>
<tr>
<th>School Name</th>
<th>Cost</th>
<th>Grade</th>
<th>Students</th>
<th>SF / Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woodbridge Elementary School</td>
<td>$315,700,000</td>
<td>3 years</td>
<td>1,000</td>
<td>$315,700</td>
</tr>
<tr>
<td>Conestoga Elementary School</td>
<td>$316,500,000</td>
<td>3 years</td>
<td>1,000</td>
<td>$316,500</td>
</tr>
<tr>
<td>New Lunch Elementary School</td>
<td>$137,859,583</td>
<td>3 years</td>
<td>675</td>
<td>$206,480</td>
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Pool Phase 1

<table>
<thead>
<tr>
<th>SF</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>8,925</td>
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<td>Total Cost: $2,012,568</td>
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Pool Phase 2

<table>
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<th>SF</th>
<th>Cost</th>
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<tr>
<td>8,925</td>
<td>$300.69</td>
</tr>
<tr>
<td>Total Cost: $2,683,654</td>
<td></td>
</tr>
</tbody>
</table>

Variance:

$671,067
Conclusion

- Safety & Security
- Lifecycle & Maintenance
- Cost Effective
- Integration
- Reduce, Reuse, Recover
- Learning Tool