DLR Group
Architecture Engineering Planning Interiors

June 07, 2018

Design for Learning

PGCPS_International High School

listen.DESIGN.deliver

Elevate the Human Experience through Design

- **Agenda**

1 WELCOME & REMARKS

2 UPDATES & SCHEDULE

3 REVIEW & WHAT WE'VE HEARD

4 FOUR CONCEPT PROPOSALS

Updates & Schedule

International High School

Project Parameters

1. Create a sustainable, collaborative learning environment.
2. Support PGCPS Strategic Plan Goals esp. Int'l School Network model.
3. Design an inviting and de-institutionalized environment, while simultaneously providing a safe and secure experience, based on passive & applied active concepts.
4. Achieve LEED Gold for High Performance Schools.
5. Utilize evidence-based design strategies for better health and learning outcomes.
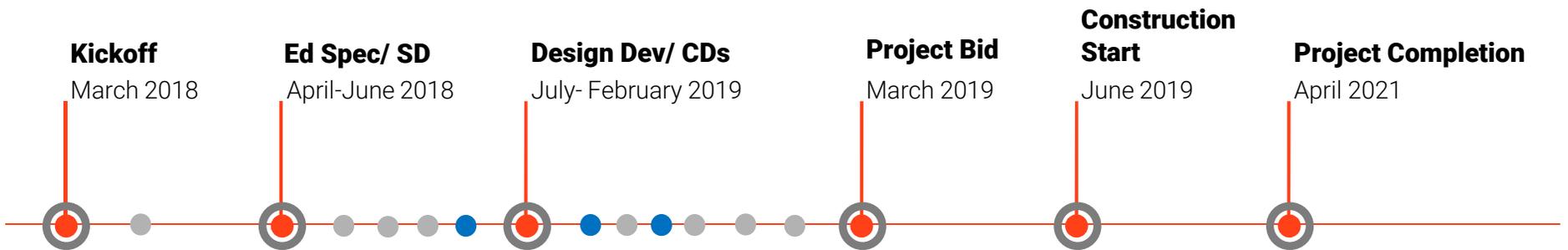
International High School

Project Parameters

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6. Create an integrated neighborhood campus with shared potential.
7. Address a capacity for 400 students and 34 faculty/staff.
8. Open in Fall 2021 within budget of $23M.
9. Pursue sustainable means, methods of construction [modular].
10. Explore parking options to accommodate 40 spaces.

International High School
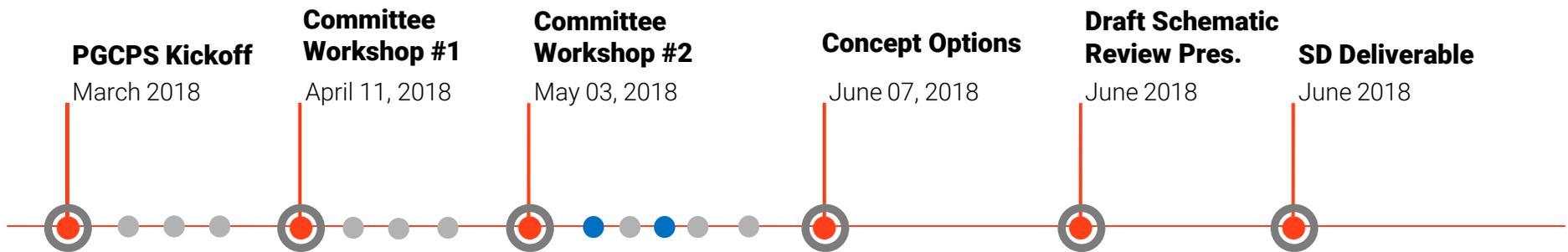## Overall Project Timeline

Kickoff
March 2018

Ed Spec/ SD
April-June 2018

Design Dev/ CDs
July- February 2019

Project Bid
March 2019

Construction Start
June 2019

Project Completion
April 2021

⬤ Workshops

🔵 Permit Submissions

International High School

Concept / Schematic Design Timeline

PGCPS Kickoff
March 2018

Committee Workshop #1
April 11, 2018

Committee Workshop #2
May 03, 2018

Concept Options
June 07, 2018

Draft Schematic Review Pres.
June 2018

SD Deliverable
June 2018

⬤ Investigative Activities/ School Visits/ Survey/ Traffic Data Collection/ Concept Development

🔵 Regulatory Review Activities

WHAT TO CREATE

International High School at Langley Park

International High School

Review & Results
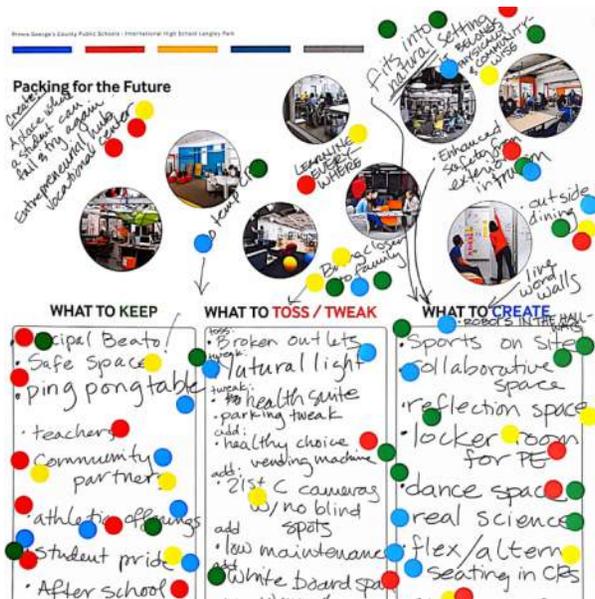
SUCCESS FACTORS

- School Pride | Legacy | Empowerment
- Community Asset & Ownership / Partnerships
- Onsite Athletics (Soccer)
- Collaborative and Reflective
- Welcoming – Inclusive
- Celebrating Culture & Diversity
- Pioneers | Trailblazers
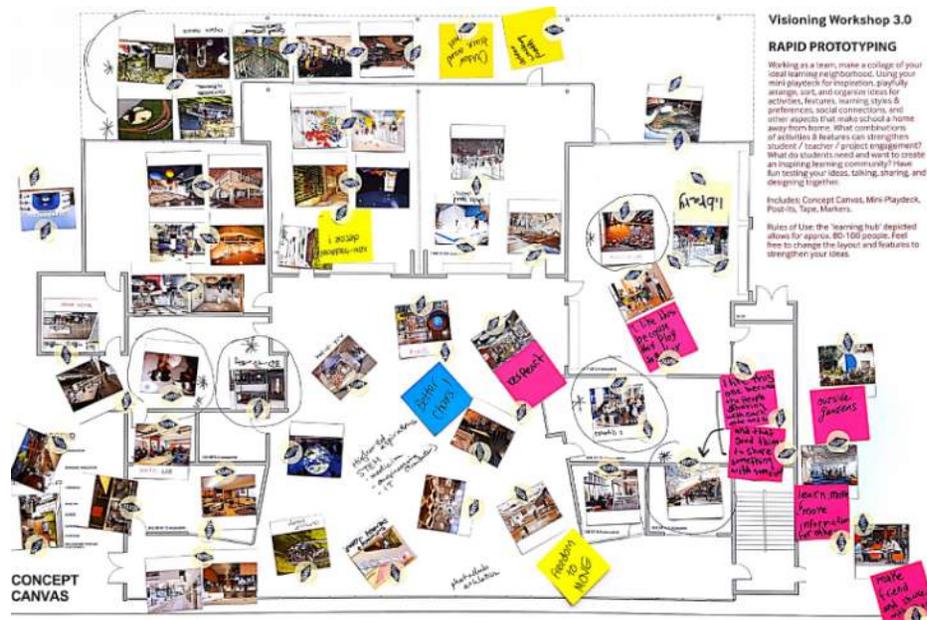
WORKSHOPS

International High School at Langley Park

International High School
Review & Results

- Build for Change
- Bring Outside In
- Let Students Lead
- Design with Words
- Do Your Homework

International High School

Review & Results

'Rapid Prototyping'

- Outdoor Learning
- Learner Centered - Fluid
- Technology - Arts Infused
- Diversity (space/activities)
- Sensory - Inspirational
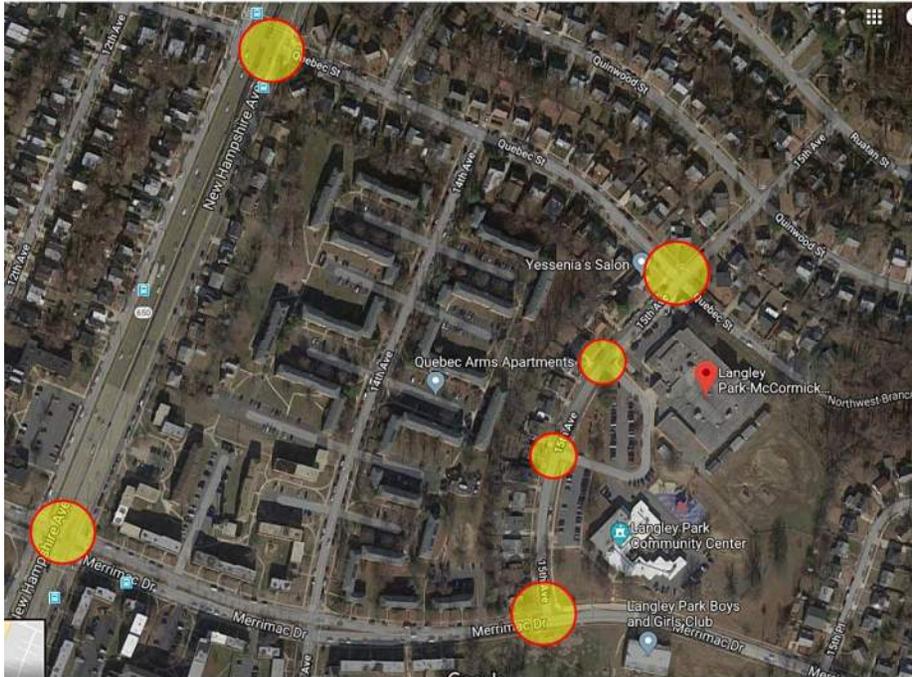- Expertise - Mastery

SITE

International High School
Site

- Traffic Study Update
- Zoning Info
- Topography / Cut & Fill Diagrams
- Parking Options
- Open Space / Soccer / Play
- Natural Resources

International High School – Traffic Study

- New Hampshire Avenue/Quebec Street
- New Hampshire Avenue/Merrimac
- Merrimac Drive/15th Avenue
- Quebec Street/15th Avenue
- 15th Avenue/All Site Access Points

- Preliminary Findings-
  Intersections are expected to remain within capacity. **New signalization is not anticipated to support IHSLP.**

- In Progress-
  Inventory of on/ off site pedestrian, bicycle, and transit facilities. Research future improvements and transportation.

International High School - Zoning

- Zone – R-55

- Front Setbacks – 25'
  Side Setbacks – 8'

- Building Height-
  120 ft. (Public Bldgs)

- Lot Coverage
  (60% Max)

International High School – Topography Cut/Fill Study A
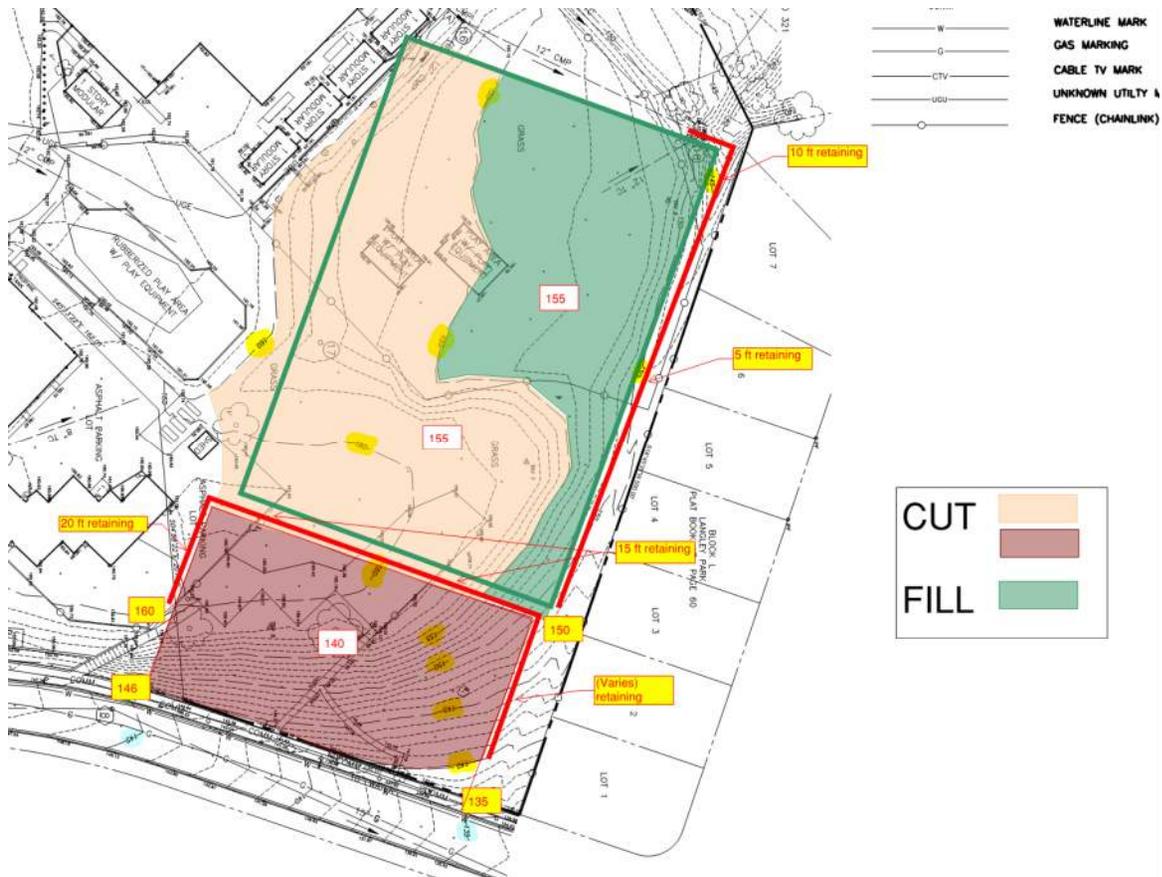
Merrimac Drive

Merrimac Drive

International High School – Topography Cut/Fill Study B
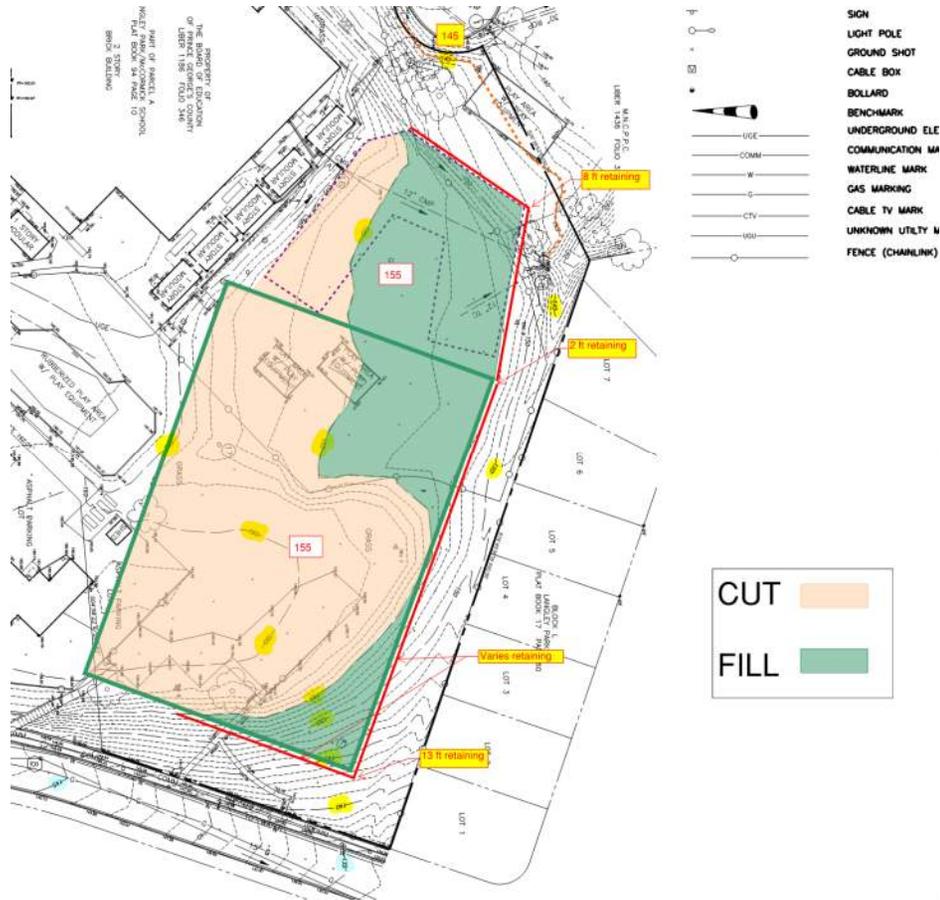
Quebec St.

Existing Field

International High School – Existing Parking
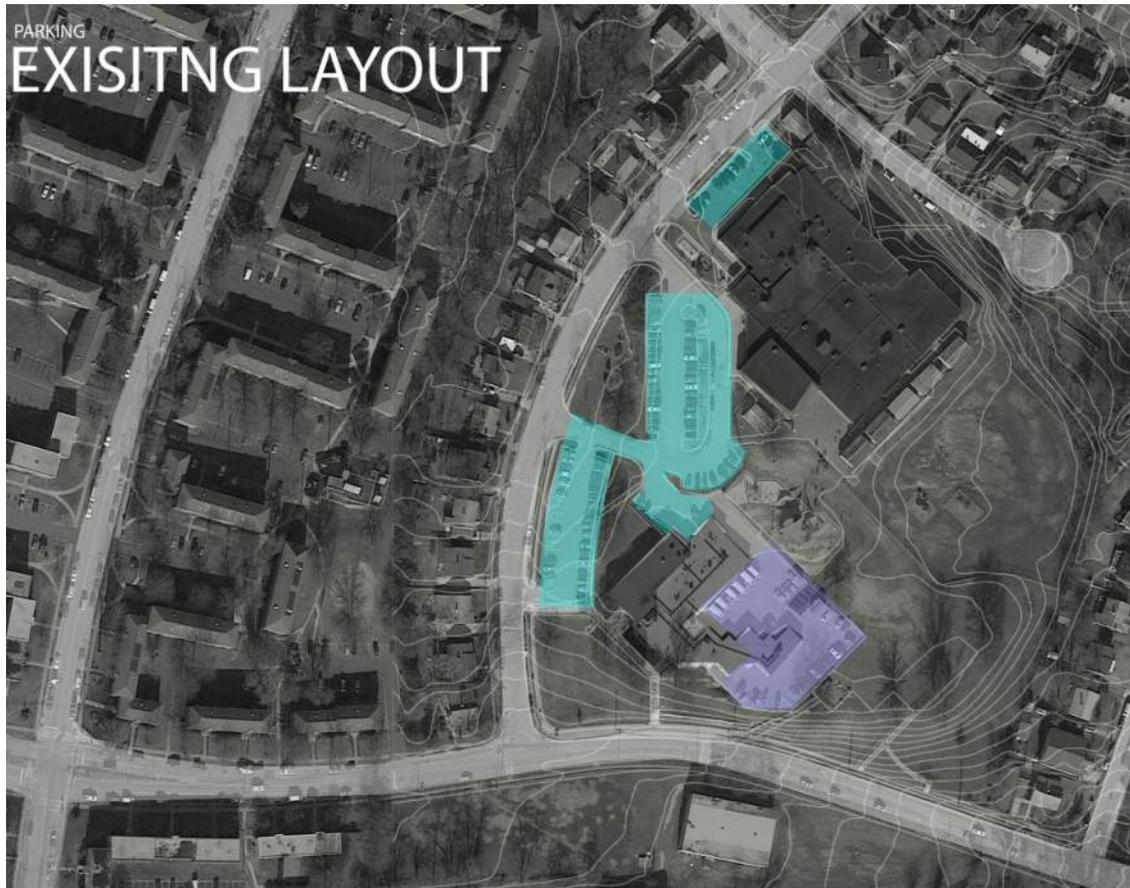
'Existing'

- Approx. 53 Stalls (LMC-ES)

- Approx. 42 Public Stalls (Comm. Center)

- Approx. 21 Staff Stalls

- New IHSLP Parking 40 New Stalls

International High School – Parking Expansion 1

PARKING
INFILL LAYOUT
INFILL AND GROW EXITSTING LOT
REPAVING OF ENITRE LOT
EST. $580K - $600K

EXISTING PARKING

EXTENDED PARKING

EXISTING PARKING

EXTENDED PARKING
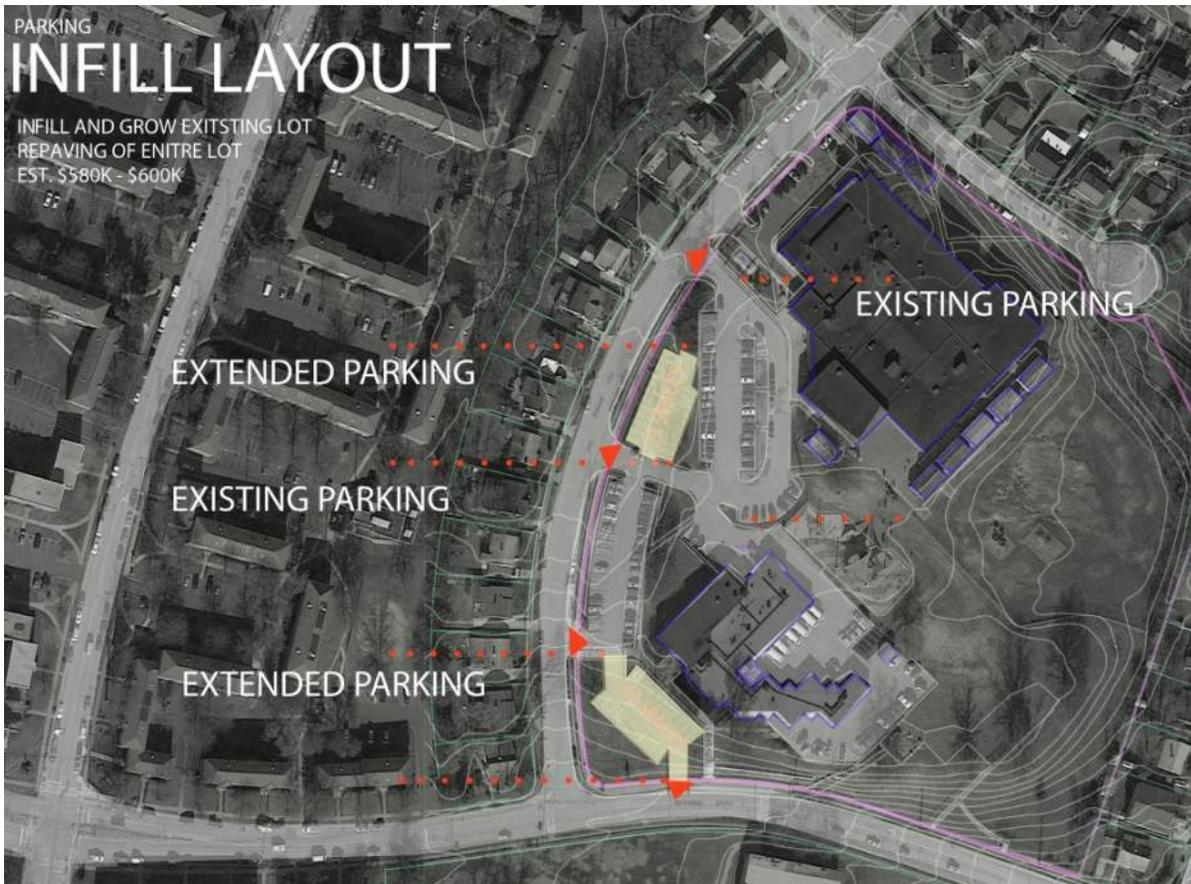
'Infill Layout'

- Surface parking infill within existing lot

- 45 Added Spaces

- Repaving of entire lot.

- SE Corner Grading

- Est. $580k - $600k

International High School – Parking Expansion 2

PARKING
CAMPUS LAYOUT

ENTIRE MAIN PARKING LOT REPLACEMENT WITH INCREASED EFFICIENCY
TEMPORARY PARKING DURING CONSTRUCTION REQUIRED
EST. $1M TO $1.2M

EXISTING PARKING AND LOADING

COMBINED PARKING AND BUS LOOP

International High School – Parking Expansion 2

'Campus Layout'

- Entire main parking lot replacement.

- 121 New Stalls Replacing 85 Stalls

- Shared Parking

- Combined Bus-Parking Loop

- Temporary parking during construction required.

- Est. $1M - $1.2M

International High School – Parking Expansion 3

PARKING
PERIMETER LAYOUT

ALL NEW ADDITIONAL PARKING
CUT, FILL, RETAINING TO CREATE FLATTENED DRIVE
EST. $850K - $1.6M

MODIFIED STREET PARKING

EXTENDED PARKING

DESIRED PARKING

CAR DROP OFF

DROP OFF AND TEMPORARY PARKING

International High School – Parking Expansion 3

'Perimeter Layout'

- All new added parking.
  Up to 84 Stalls.

- Cut/ Fill/ Retaining

- Topography

- Est. $850k - $1.6M

International High School – Parking Expansion 4
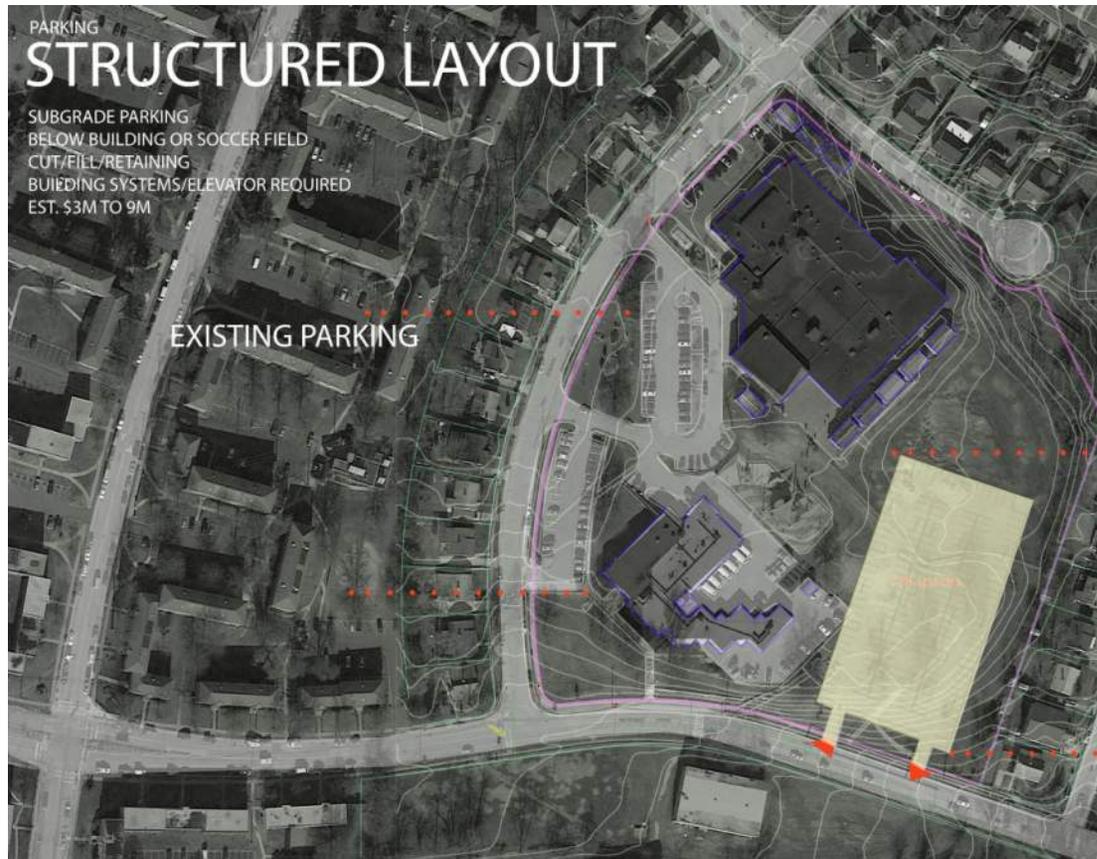
'Structured Layout'

- Subgrade parking. Up to 178 New Stalls.

- Below building or soccer field.

- Cut/ Fill/ Retaining

- Building Systems/ Elevator Required

- Est. $3M - $9M

International High School – Open Space/ Soccer

Soccer Field

- Regulation Size (NFHS)-
  55 yd x 100 yd (Min.)
  80 yd x 120 yd (Max.)
- Natural vs Synthetic
- SWM

Open Space

- Existing Playgrounds

- LPMC-ES Open Space

International High School – Natural Resources
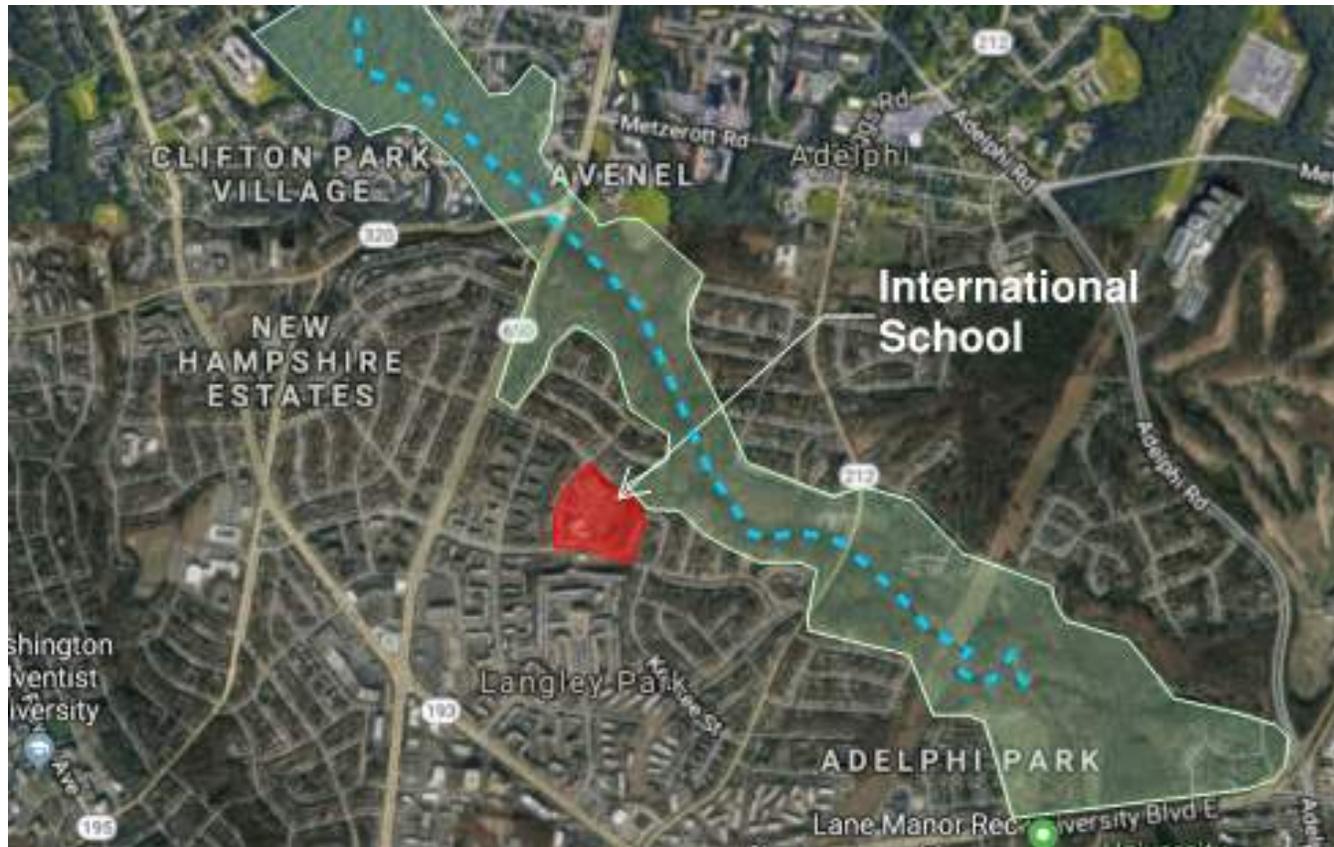
International High School – Natural Resources

PROGRAM

International High School – Ed Spec and Program Distribution
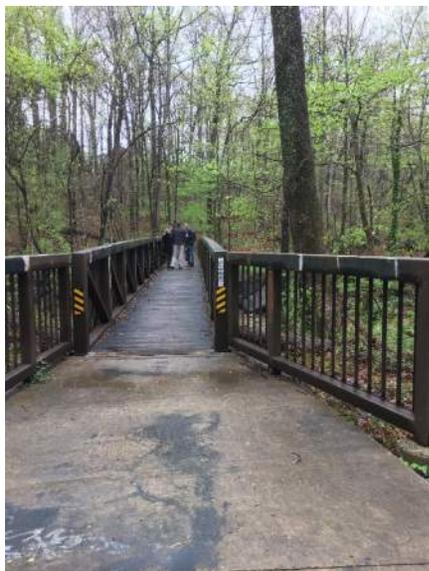
CONCEPTS

International High School

Outcome for concept review

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1. Describe design intent as framework to help you evaluate concepts.
2. Evaluate four site concepts.
3. Identify site opportunities and challenges.
4. Share and describe preferences.
5. Work toward consensus on what works well and should move forward.

Hilltown

Terraforma

Forest

Village

HILLTOWN

Hilltown
Site Massing

Hilltown
View from Southeast

Hilltown
Quantitative & Qualitative Analysis

ENERGY PROGRESS REPORT: HILLTOWN

Nutrition Facts
New International High School
Hilltown Scheme

Based on Advanced Energy Design Guide Recommendation

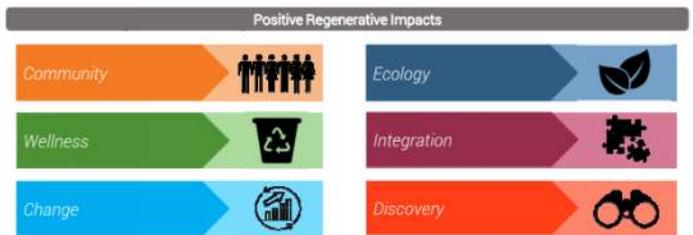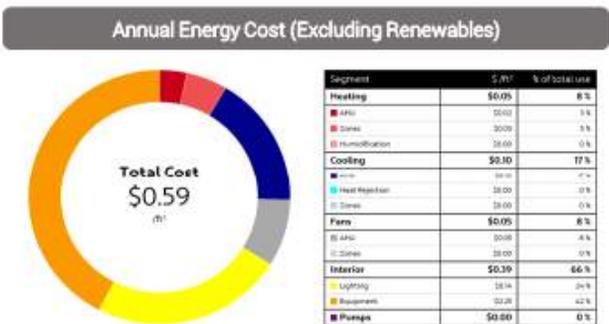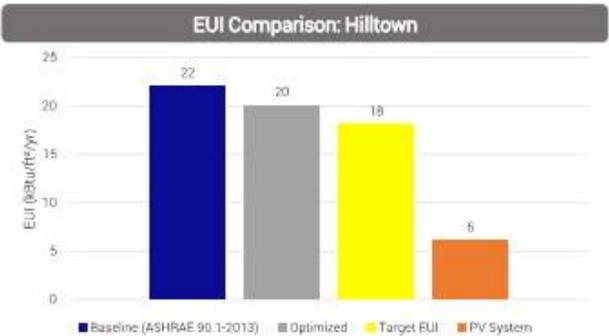|	
Target EUI	18 kBtu/ft²/yr
	Units
[1]Energy Usage Intensity	**10%**
Baseline EUI	22 kBtu/ft²/yr
[2]Optimized EUI	20 kBtu/ft²/yr
Embodied Carbon Footprint	**22%**
Baseline GHG Emissions	79,382 lbCO₂/yr
[2]Optimized GHG Emissions	61,955 lbCO₂/yr
[3]Annual Energy Cost	**6.4%**
Baseline Cost	$0.63/ft²
[2]Optimized Cost	$0.59/ft²
Resources & Materials	
Red List	*
Healthy Interior Environment	*
Living Economy Sourcing	*
Net Positive Waste	*
Responsible Industry	*
Projected Energy Star Score	**97**
Approx. Square Footage	50,247 ft²

1. EUI does not take into account internal loads produced by food service/equipment
2. Optimized case assumes 20% WWR
3. Annual Energy Cost is weighted for Area
* Will examine moving forward

EUI Comparison: Hilltown

Bar chart values: 22, 20, 18, 6
Legend: Baseline (ASHRAE 90.1-2013), Optimized, Target EUI, PV System

Annual Energy Cost (Excluding Renewables)

Total Cost $0.59 /ft²

Segment	$/ft²	% of total use
Heating	**$0.05**	**8 %**
AHU	$0.02	5 %
Zones	$0.03	5 %
Humidification	$0.00	0 %
Cooling	**$0.10**	**17 %**
AHU	$0.10	4 %
Heat Rejection	$0.00	0 %
Zones	$0.00	0 %
Fans	**$0.05**	**8 %**
AHU	$0.05	4 %
Zones	$0.00	0 %
Interior	**$0.39**	**66 %**
Lighting	$0.14	24 %
Equipment	$0.25	42 %
Pumps	**$0.00**	**0 %**

Positive Regenerative Impacts

Community | Ecology | Wellness | Integration | Change | Discovery

TERRAFORMA

Terraforma
Site Massing

Terraforma
View from Southeast

Terraforma
Quantitative & Qualitative Analysis

ENERGY PROGRESS REPORT: TERRAFORMA

Nutrition Facts

New International High School
Terraforma Scheme

Based on Advanced Energy Design Guide Recommendation

Target EUI	18 kBtu/ft²/yr
	Units
Energy Usage Intensity	**15%**
Baseline EUI	27 kBtu/ft²/yr
[1]Optimized EUI	23 kBtu/ft²/yr
Embodied Carbon Footprint	**29%**
Baseline GHG Emissions	151,833 lbCO₂/yr
[1]Optimized GHG Emissions	108,240 lbCO₂/yr
[3]Annual Energy Cost	**9.5%**
Baseline Cost	$0.73/ft²
[1]Optimized Cost	$0.66/ft²
Resources & Materials	
Red List	*
Healthy Interior Environment	*
Living Economy Sourcing	*
Net Positive Waste	*
Responsible Industry	*
Projected Energy Star Score	**100**
Approx. Square Footage	62,016 ft²

1. EUI does not take into account internal loads produced by food service/equipment
2. Optimized case assumes 20% WWR
3. Annual Energy Cost is weighted for Area
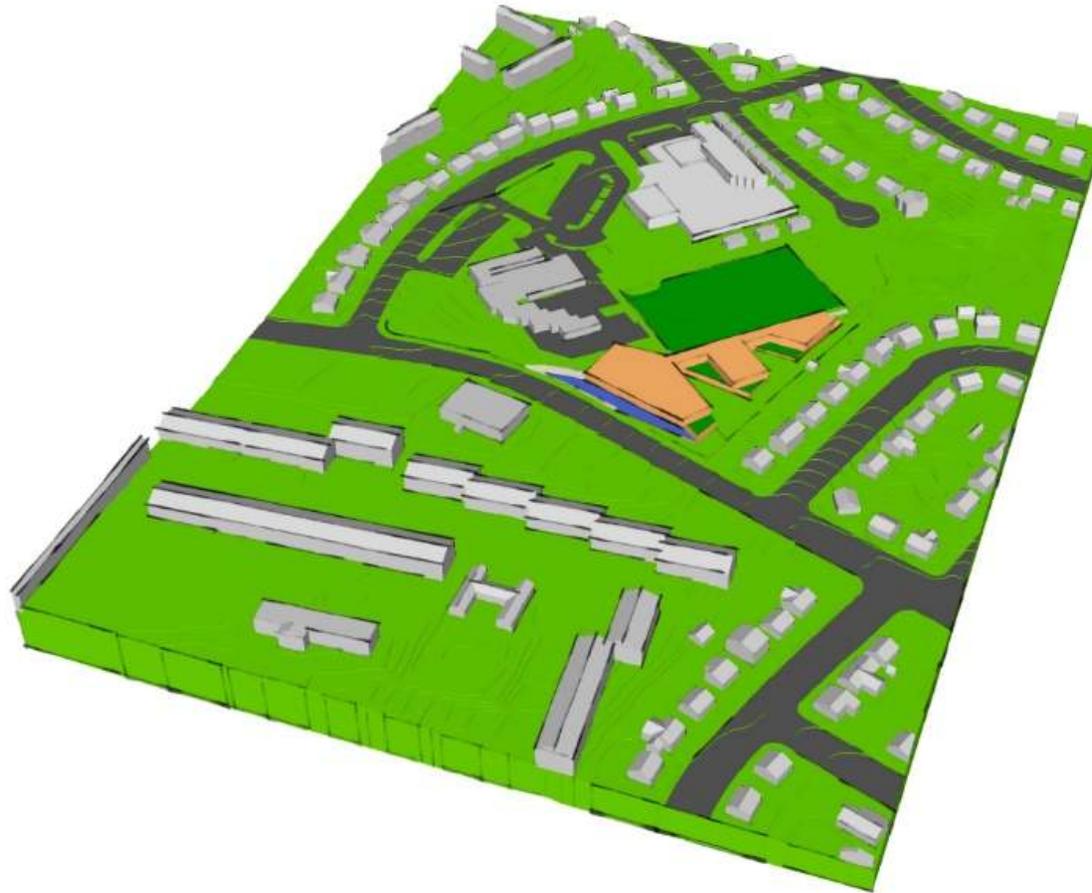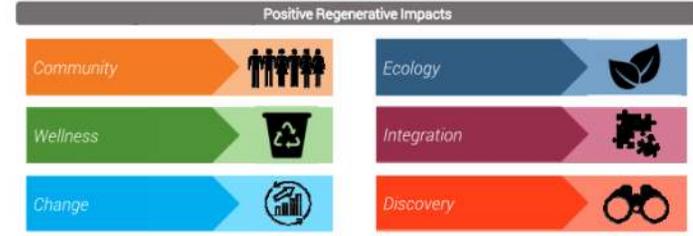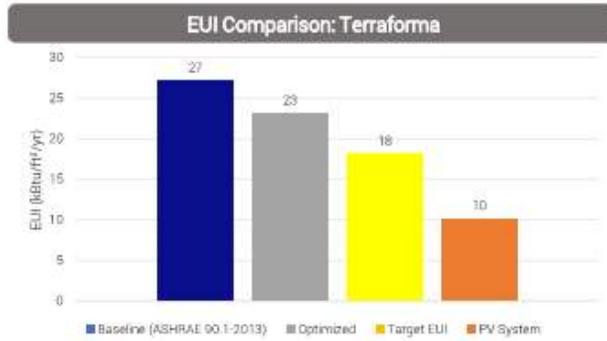* Will examine moving forward

EUI Comparison: Terraforma

Legend: Baseline (ASHRAE 90.1-2013), Optimized, Target EUI, PV System

Annual Energy Cost (Excluding Renewables)

Total Cost $0.66 /ft²

Segment	$/ft²	% of total use
Heating	**$0.08**	**12%**
AHU	$0.00	3%
Zones	$0.06	9%
Humidification	$0.00	0%
Cooling	**$0.12**	**18%**
AHU		
Heat Rejection	$0.00	0%
Zones	$0.00	0%
Fans	**$0.07**	**11%**
AHU	$0.07	11%
Zones	$0.00	0%
Interior	**$0.39**	**59%**
Lighting	$0.14	21%
Equipment	$0.25	38%
Pumps	**$0.00**	**0%**

Positive Regenerative Impacts

Community

Wellness

Change

Ecology

Integration

Discovery

FOREST

Forest
View from Southeast

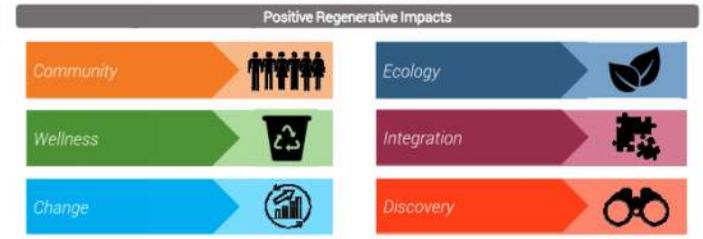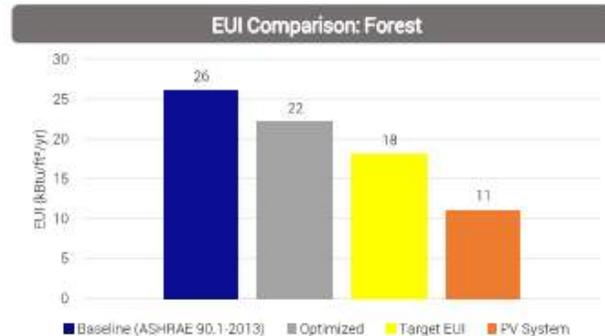# Forest
Quantitative & Qualitative Analysis

ENERGY PROGRESS REPORT: FOREST

Nutrition Facts
New International High School
Forest Scheme

Based on Advanced Energy Design Guide Recommendation

Target EUI	18 kBtu/ft²/yr
	Units
Energy Usage Intensity	**12%**
Baseline EUI	26 kBtu/ft²/yr
¹Optimized EUI	22 kBtu/ft²/yr
Embodied Carbon Footprint	**31%**
Baseline GHG Emissions	129,549 lbCO₂/yr
¹Optimized GHG Emissions	89,676 lbCO₂/yr
²Annual Energy Cost	**5.8%**
Baseline Cost	$0.69/ft²
¹Optimized Cost	$0.65/ft²
Resources & Materials	
Red List	*
Healthy Interior Environment	*
Living Economy Sourcing	*
Net Positive Waste	*
Responsible Industry	*
Projected Energy Star Score	**96**
Approx. Square Footage	59,980 ft²

1. EUI does not take into account internal loads produced by food service/equipment
2. Optimized case assumes 20% WWR
3. Annual Energy Cost is weighted for Area
* Will examine moving forward

EUI Comparison: Forest

Legend: Baseline (ASHRAE 90.1-2013) · Optimized · Target EUI · PV System

Annual Energy Cost (Excluding Renewables)

Total Cost $0.65 /ft²

Segment	$/ft²	% of total use
Heating	$0.07	11%
AHU	$0.02	3%
Zones	$0.05	8%
Humidification	$0.00	0%
Cooling	$0.12	18%
AHU	$0.12	18%
Heat Rejection	$0.00	0%
Zones	$0.00	0%
Fans	$0.07	11%
AHU	$0.07	11%
Zones	$0.00	0%
Interior	$0.39	60%
Lighting	$0.14	12%
Equipment	$0.00	48%
Pumps	$0.00	0%

Positive Regenerative Impacts

Community · Ecology · Wellness · Integration · Change · Discovery

Village
Site Massing
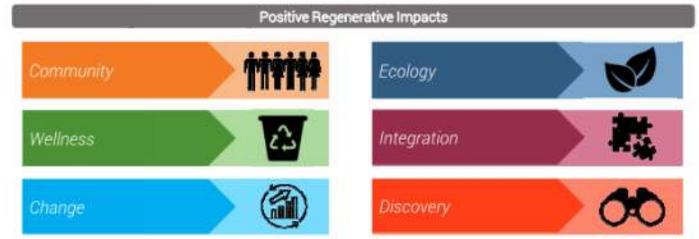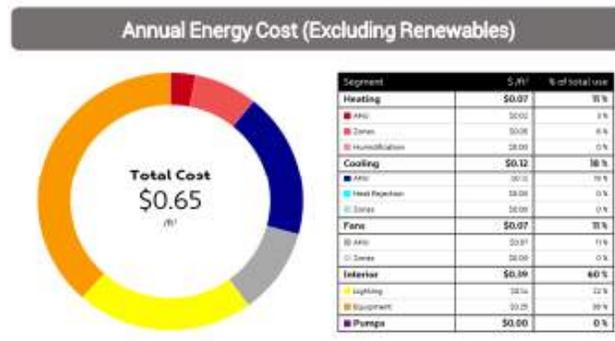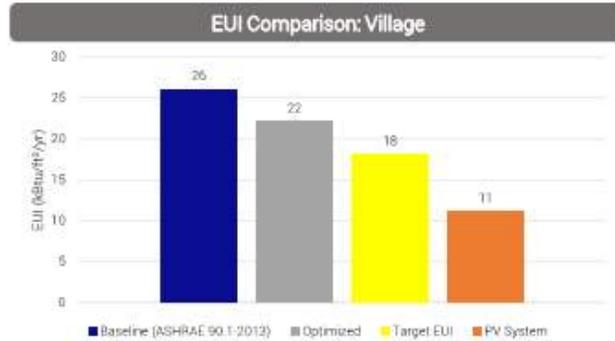
Village
View from Southeast

Village
Quantitative & Qualitative Analysis

ENERGY PROGRESS REPORT: VILLAGE

Nutrition Facts
New International High School
Village Scheme

Based on Advanced Energy Design Guide Recommendation

Target EUI	18 kBtu/ft²/yr
	Units
Energy Usage Intensity	**12%**
Baseline EUI	26 kBtu/ft²/yr
¹Optimized EUI	22 kBtu/ft²/yr
Embodied Carbon Footprint	**30%**
Baseline GHG Emissions	135,621 lbCO₂/yr
¹Optimized GHG Emissions	94,322 lbCO₂/yr
³Annual Energy Cost	**7.1%**
Baseline Cost	$0.70/ft²
¹Optimized Cost	$0.65/ft²
Resources & Materials	
Red List	*
Healthy Interior Environment	*
Living Economy Sourcing	*
Net Positive Waste	*
Responsible Industry	*
Projected Energy Star Score	**95**
Approx. Square Footage	61,878 ft²

1. EUI does not take into account internal loads produced by food service/equipment
2. Optimized case assumes 20% WWR
3. Annual Energy Cost is weighted for Area
* Will examine moving forward

EUI Comparison: Village

Legend: Baseline (ASHRAE 90.1-2013) · Optimized · Target EUI · PV System

Values shown: 26, 22, 18, 11

Annual Energy Cost (Excluding Renewables)

Total Cost $0.65 /ft²

Segment	$/ft²	% of total use
Heating	**$0.07**	**11%**
AHU	$0.00	1%
Zones	$0.06	6%
Humidification	$0.00	0%
Cooling	**$0.12**	**18%**
AHU	$0.12	18%
Heat Rejection	$0.00	0%
Zones	$0.00	0%
Fans	**$0.07**	**11%**
AHU	$0.07	11%
Zones	$0.00	0%
Interior	**$0.39**	**60%**
Lighting	$0.14	22%
Equipment	$0.25	39%
Pumps	**$0.00**	**0%**

Positive Regenerative Impacts

Community
Wellness
Change
Ecology
Integration
Discovery

Concept Comparison
Pathway to High Performance

Hilltown

Terraforma

Forest

Village

ENERGY PROGRESS REPORT: SUMMARY

Baseline Summary

	Forest	Terraforma	Bridge	Hilltown
Gross Area (ft²)	59,980	62,016	61,878	50,247
Peak Cooling (tons)	194	195	203	173
Peak Heating (MBh)	1,945	2,144	2,019	1,436
EUI (kBtu/ft²/yr)	26	27	26	22
GHG (lbCO₂/yr)	129,549	151,833	135,621	79,382
Cost/ft² (Area weighted)	0.69	0.73	0.70	0.63

Target EUI
18 (kBtu/ft²/yr)

Design Considerations

LIVING BUILDING CHALLENGE

EUI Comparison

Path to High Performance

Renewables
Geothermal
Food Service
Natural Ventilation

Behavioral Change

DISCUSSION

NEXT STEPS

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