

BROOKLINE
DRISCOLL SCHOOL EXPANSION

Sustainability Update
April 23, 2020



Agenda

1. Sustainability
2. Pedestrian, Bike, and Vehicle Access



Agenda

1. Sustainability



Sustainability – LEED Scorecard

Driscoll School: LEED Schools v4 Project Checklist



57 13 24 15 Total (Silver Certification is targeted) Possible Points: 110

Likely	Possible	Less Likely	Not Viable
L	P	LL	NV
			1

Certified 40 points
Silver 50 points
 Gold 60 points
 Platinum 80 points

Developed in accordance with 3/12/20 drawings

1 Integrative Process Possible Points: 1

Comments
 Requires energy modeling and water system analyses prior to SD

7 5 3 Location and Transportation Possible Points: 15

			15
1			
		2	
2		3	
1		3	
1			
1			
1			

Credit 1 LEED for Neighborhood Development Location 15
 Credit 2 Sensitive Land Protection 1
 Credit 3 High Priority Site 2
 Credit 4 Surrounding Density and Diverse Uses 5
 Credit 5 Access to Quality Transit 4
 Credit 6 Bicycle Facilities 1
 Credit 7 Reduced Parking Footprint 1
 Credit 8 Green Vehicles 1

Comments
 Project is not within an ND location
 Site is previously developed
 Less likely unless soil contamination is present
 Neighborhood density, services determine viability
 Green Line stops within 1/2 mile, pts dependent on frequency of service
 Bike lanes on Washington, Westbourne, covered racks, staff shower
 Total parking capacity to be 30% below ITE basis of 0.25/student
 2% parking (2 space minimum) to include electric charging stations

7 2 2 Sustainable Sites Possible Points: 12

Y			
Y			
	1		
		2	
1			
2	1		
2			
1			
			1
1			

Prereq 1 Construction Activity Pollution Prevention RQD
 Prereq 2 Environmental Site Assessment RQD
 Credit 1 Site Assessment 1
 Credit 2 Site Development--Protect or Restore Habitat 2
 Credit 3 Open Space 1
 Credit 4 Rainwater Management 3
 Credit 5 Heat Island Reduction 2
 Credit 6 Light Pollution Reduction 1
 Credit 7 Site Master Plan 1
 Credit 8 Joint Use of Facilities 1

Comments
 ESC drawings will address requirements
 Phase I / II ESA must be performed
 Existing conditions to be evaluated for compliance
 30% site restoration to native/adaptive plantings, soils unlikely
 Courtyards, playground, landscaped areas sufficient to earn credit
 Onsite infiltration with large playfields, some structural measures
 Achievable through roofing, paving material selection, limited parking
 Design to be developed to meet criteria for uplight and light trespass
 Not applicable to single building site design
 Achievable if spaces are shared with community after school hours

4 4 4 Water Efficiency Possible Points: 12

Y			
Y			
Y			
2			
2		1	4
		2	
		1	

Prereq 1 Outdoor Water Use Reduction RQD
 Prereq 2 Indoor Water Use Reduction RQD
 Prereq 3 Building-Level Water Metering RQD
 Credit 1 Outdoor Water Use Reduction 2
 Credit 2 Indoor Water Use Reduction 7
 Credit 3 Cooling Tower Water Use 2
 Credit 4 Water Metering 1

Comments
 No potable water used for irrigation; native/adaptive plantings
 Achievable through fixture selection
 All required meters to be included
 No potable water used for irrigation; native/adaptive plantings
 Achievable through fixture selection
 Design, water testing will determine viability
 Requires submetering of 2 systems (i.e. irrigation, DHW)

Sustainability – LEED Scorecard

Driscoll School: LEED Schools v4 Project Checklist



Energy and Atmosphere				Possible Points:	31	Comments	
17	7	6	1				
Y				Prereq 1	Fundamental Commissioning and Verification	RQD	CxA will be included on team
Y				Prereq 2	Minimum Energy Performance	RQD	Design will exceed required 5% improvement over ASHRAE 90.1-2010
Y				Prereq 3	Building-Level Energy Metering	RQD	All required meters to be included
Y				Prereq 4	Fundamental Refrigerant Management	RQD	Equipment will meet requirements
3	2		1	Credit 1	Enhanced Commissioning	6	School to determine scope (Enhanced, Monitoring based, Envelope)
13	3			Credit 2	Optimize Energy Performance	16	EEMS, fossil fuel reduction evaluated with whole building modeling
		1		Credit 3	Advanced Energy Metering	1	Additional costs to meter all individual energy uses ≥ 10%
		2		Credit 4	Demand Response	2	Availability of program from local utility will determine viability
1	1	1		Credit 5	Renewable Energy Production	3	PV array on roof (points earned for 1%,5%,10%)
	1			Credit 6	Enhanced Refrigerant Management	1	Dependent on HVAC equipment, refrigerant types/charge
		2		Credit 7	Green Power and Carbon Offsets	2	School to determine viability, requires purchase of RECs and offsets
Materials and Resources				Possible Points:	13	Comments	
4		5	4				
Y				Prereq 1	Storage and Collection of Recyclables	RQD	Collection and storage areas required
Y				Prereq 2	Construction and Demolition Waste Management Planning	RQD	Requirements to be included in project specifications
		4	1	Credit 1	Building Life-Cycle Impact Reduction	5	Requires building LCA, demonstrable reduction possible with mass timber
1			1	Credit 2	Building Product Disclosure and Optimization - EPDs	2	1 pt achievable through product selection
1			1	Credit 3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2	1 pt achievable through product selection
1			1	Credit 4	Building Product Disclosure and Optimization - Material Ingredients	2	1 pt achievable through product selection
1		1		Credit 5	Construction and Demolition Waste Management	2	Requires onsite separation, diversion targets of 50%,75%
Indoor Environmental Quality				Possible Points:	16	Comments	
11	3	2					
Y				Prereq 1	Minimum Indoor Air Quality Performance	RQD	Based on ASHRAE 62.1- 2010, airflow,exhaust measurement
Y				Prereq 2	Environmental Tobacco Smoke Control	RQD	Will require site and building signage
Y				Prereq 3	Minimum Acoustic Performance	RQD	Requires acoustical analysis of site, reverberation,mechanical noise
2				Credit 1	Enhanced Indoor Air Quality Strategies	2	Walk off mats, MERV 13 filters, neg pressurization; CO2 monitoring
3				Credit 2	Low-Emitting Materials	3	Achievable through product selection and specification
1				Credit 3	Construction Indoor Air Quality Management Plan	1	Based on SMACNA measures
1	1			Credit 4	Indoor Air Quality Assessment	2	Achievable through flush-out (1pt)or IAQ testing (2pts)
	1			Credit 5	Thermal Comfort	1	ASHRAE 55-2010 compliance, 100% shared, 50% individual controls
1		1		Credit 6	Interior Lighting	2	Lighting control option is achievable, Lighting Quality to be evaluated
2	1			Credit 7	Daylight	3	Classrooms design, glazing and lightshelves to maximize daylight
1				Credit 8	Quality Views	1	75% of regularly occupied spaces to have direct view to outdoors
		1		Credit 9	Acoustic Performance	1	Difficult to achieve HVAC background noise less than 35 dB

Sustainability – LEED Scorecard

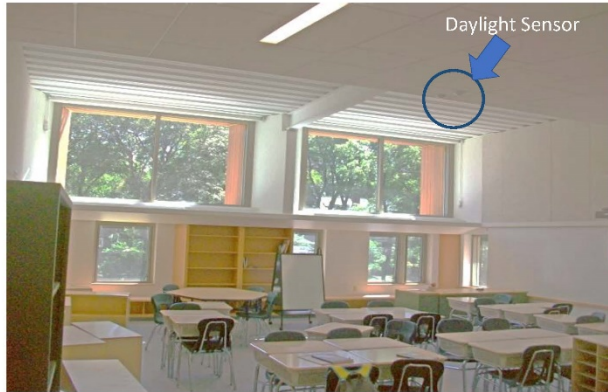
Driscoll School: LEED Schools v4 Project Checklist



6				Innovation	Possible Points:	6	Comments
1				Credit 1	ID Green Cleaning Program	1	Plan to be based on LEED Existing Building criteria
1				Credit 2	ID Integrated Pest Management Plan	1	Plan to be based on LEED Existing Building criteria
1				Credit 3	ID Occupant Comfort Survey or Design for Active Occupants	1	Survey occupants or Design to promote physical activity
1				Credit 4	ID School as a Teaching Tool / Green Education	1	Integrate sustainable features into curriculum
1				Credit 5	Pilot- Assessment and Planning for Resiliency	1	Address long-term building performance in changing climate
1				Credit 6	LEED Accredited Professional	1	Many project team members are LEED APs
1 1 2				Regional Priority	Possible Points:	4	Comments
1				Credit 1	Optimize Energy Performance (8 pts)	1	
	1			Credit 2	Renewable Energy Production (2 pts)	1	
		1		Credit 3	Building Life Cycle Impact Reduction (2 pts)	1	
			1	Credit 4	Access to Quality Transit (1 pt)	1	
57	13	24	15	Total	Possible Points:	110	
Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110							

Sustainability – Daylighting

HIGH EFFICIENCY LED LIGHTING WITH OCCUPANCY SENSOR & DAYLIGHT HARVESTING



Wellington Elementary School Daylighting

- Dual Technology Occupancy Sensor & Daylight Photosensor
- Lighting Control System
- LPD Target of .4 to .5



Cove Lighting



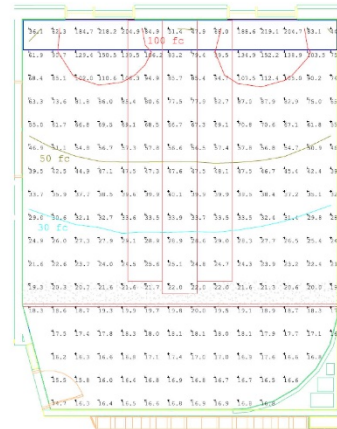
Occupancy/Daylight Sensor

LEED V4 DAYLIGHT CREDIT REQUIREMENTS:
 DEMONSTRATE THROUGH COMPUTER MODELING THAT ILLUMINANCE LEVELS WILL BE BETWEEN 30 AND 300 FOOTCANDLES FOR 9AM AND 3PM ON A CLEAR SKY DAY AT THE EQUINOX, FOR THE FLOOR AREA INDICATED IN THE TABLE:

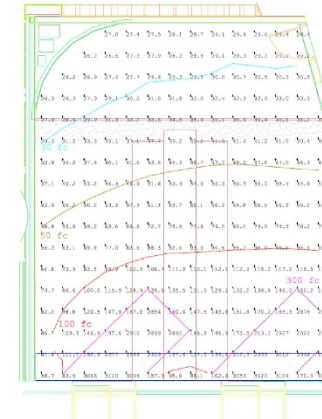
PERCENTAGE OF REGULARLY OCCUPIED FLOOR AREA	POINTS
75%	1
90%	2



Dearborn Academy Daylighting



48.32 FOOTCANDLE AVERAGE,
 NORTH FACING CLASSROOM WITH NATURAL LIGHTING ONLY
 (MARCH 30TH, 2018 - 3:00PM, CLEAR SKY)

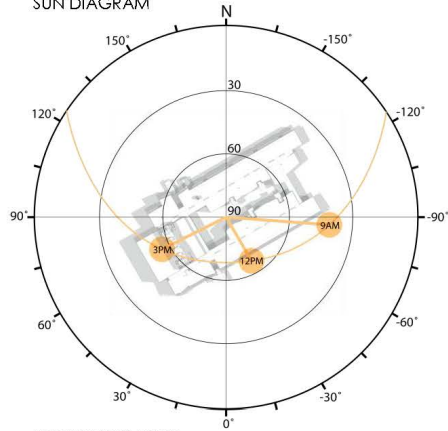


326.88 FOOTCANDLE AVERAGE,
 SOUTH FACING CLASSROOM WITH NATURAL LIGHTING ONLY
 WITH EXTERIOR WINDOW SUNSHADES
 (MARCH 30TH, 2018 - 3:00PM, CLEAR SKY)



Sustainability – Daylighting

SUMMER SOLSTICE
SUN DIAGRAM



SUMMER SOLSTICE
SUPPORTING IMAGES



SUMMER SOLSTICE
SOUTH CLASSROOM 9:00 AM

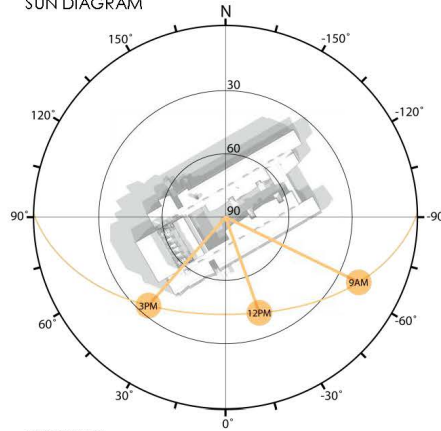


SUMMER SOLSTICE
SOUTH CLASSROOM 12:00 PM

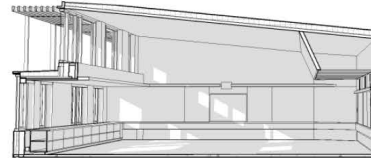


SUMMER SOLSTICE
NORTH CLASSROOM 3:00 PM

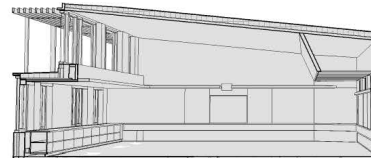
EQUINOX
SUN DIAGRAM



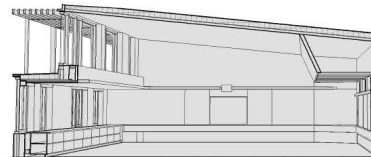
EQUINOX
SUPPORTING IMAGES



EQUINOX
SOUTH CLASSROOM 9:00 AM

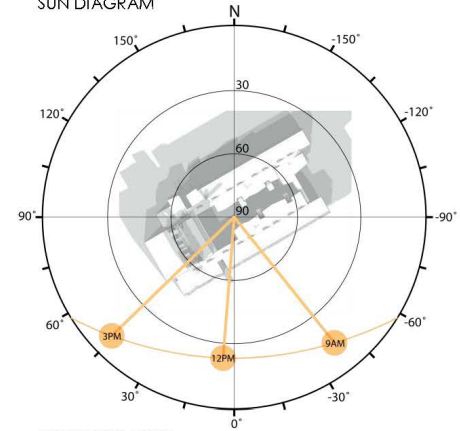


EQUINOX
SOUTH CLASSROOM 12:00 PM

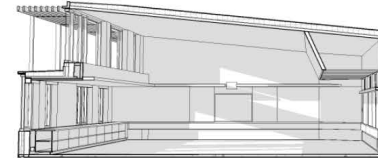


EQUINOX
SOUTH CLASSROOM 3:00 PM

WINTER SOLSTICE
SUN DIAGRAM



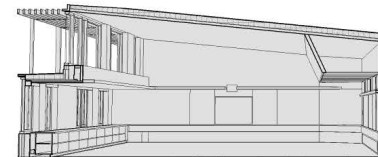
WINTER SOLSTICE
SUPPORTING IMAGES



WINTER SOLSTICE
SOUTH CLASSROOM 9:00 AM



WINTER SOLSTICE
SOUTH CLASSROOM 12:00 PM



WINTER SOLSTICE
SOUTH CLASSROOM 3:00 PM

Sustainability – Daylighting



Light Shelf Radiant Panel

RPLS

Price Light Shelf Radiant Panel, RPLS, offers a unique way to passively channel natural daylight while maintaining a comfortable environment with radiant heating or cooling. The upper surface of this panel will reflect sunlight on the ceiling of a room, allowing the light to penetrate deeper in the occupied space, and reducing the need for artificial lighting.

Increased natural light and architectural appeal.



Increased natural light and architectural appeal with various face finishes

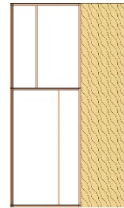
Simple installation process with pre-drilled fastener clips

Upper surface reflects sunlight on the ceiling of a room

Light shelf options include activated radiant top and bulbous end finish

www.price-hvac.com for additional product information, including product videos and brochures.

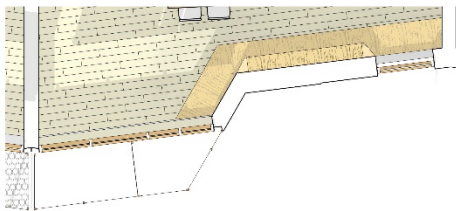
Sustainability – Daylighting



EXTERIOR ELEVATION - SIDE



EXTERIOR ELEVATION - FRONT



PLAN OF TYPICAL CLASSROOM WINDOW BAY



3D VIEW OF CLASSROOM FENESTRATION / SOLAR SHADING

CLASSROOM FENESTRATION/ SOLAR SHADING

01 41 81 161

321



 Jonathan Levi Architects

MARCH 30, 2020
DESIGN DEVELOPMENT WORKSHOP 5
DRISCOLL SCHOOL



Jonathan Levi Architects

Mar. 30, 2020

DRISCOLL SCHOOL, BROOKLINE

Sustainability – Daylighting

HIGH EFFICIENCY LED LIGHTING WITH OCCUPANCY SENSOR & DAYLIGHT HARVESTING

- Local Dual Technology Occupancy Sensor & Daylight Photosensor
- Lighting Control System
- LPD Target of 0.4 to .5
- Low light power density (LPD) 40% below code
- Lower LPD improves HVAC system efficiency
- Energy reduction by harvesting natural daylight
- 90% reflective ceiling surface for improved light levels



Daylight/Occupancy Sensor

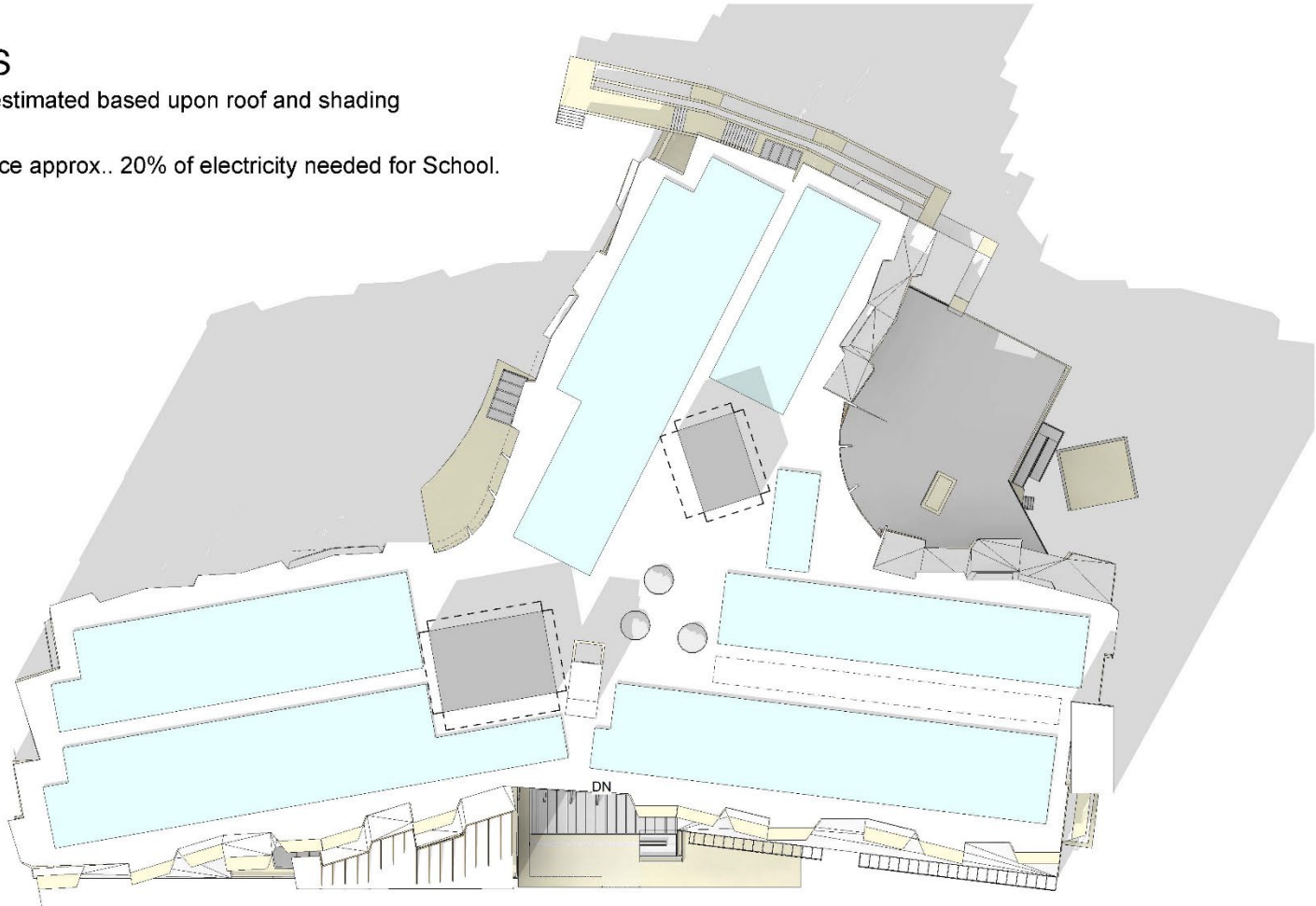


GGD

Sustainability – Photovoltaic Energy

PV SYSTEMS

- 180 KW PV array estimated based upon roof and shading
- PV array will produce approx.. 20% of electricity needed for School.



Sustainability – Water Use

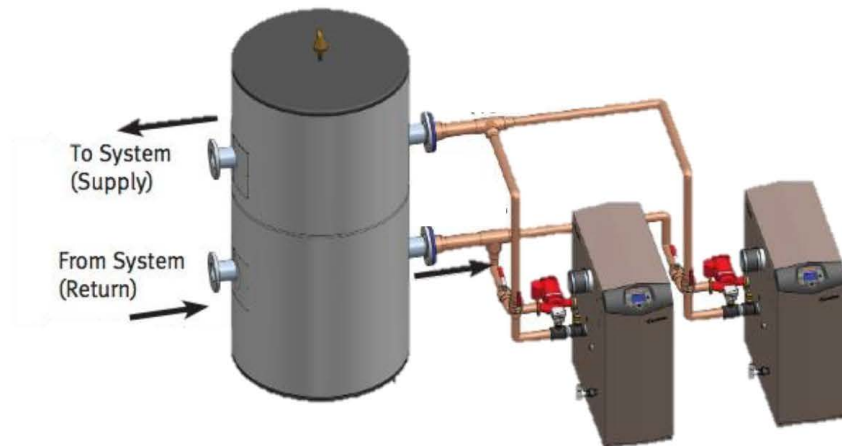
PLUMBING SYSTEMS

Water Conserving Fixtures:

- Water Closets w/ 1.28 gpf
 - Urinals w/ 0.125 gpm
 - Lavatories w/ 0.35 gpm faucet
 - Staff/Classroom Sinks w/manual 0.5 GPM faucet
 - Accessible shower w/1.5 GPM shower head
 - Water Coolers with Bottle Fillers
-
- Water Sub-Meters with integration into Building Energy Management System



- * Point of use electric for remote toilets
- High Efficiency Domestic Hot Water heat pump System with Storage Tank and Circulator Pump

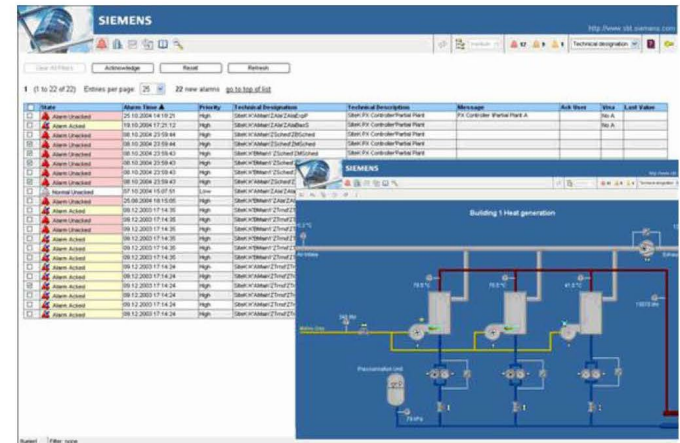
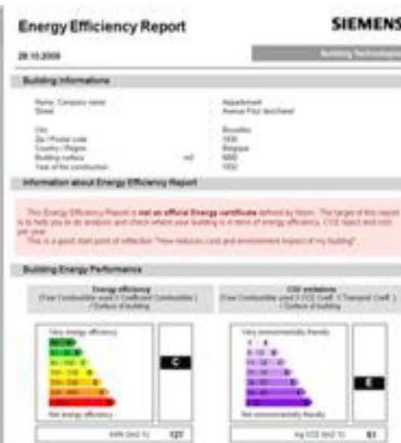


Sustainability – Dashboard Display

BUILDING AUTOMATION AND ENERGY MANAGEMENT SYSTEM

BUILDING DASHBOARD SYSTEM Johnson Metasys

- Utility Data
- On-Site Generation System
- Submetering
- Water and electric meters



Sustainability – Mass Timber



Sustainability – Mass Timber

Embodied Carbon Materials Comparison

		Quartz Project - Global Warming Potential						Rank Low to High
		Cradle-to-gate LCA Results		End-of-life LCA Results		Combined LCA Results (Not Including Installation + Use Phases)		
#	Material Type	kg CO2e	%	kg CO2e	%	kg CO2e	%	
1	Ready-mix Concrete, NW (3,000 - 4,000 psi) No slag or flyash	0.2420 1 kg of product	--	0.0265 55% for recovery; 45% landfilled	--	0.2685	--	7
2	Ready-mix Concrete, NW (3,000 - 4,000 psi) 35% Flyash replacement	0.1940 1 kg of product	80%	0.0265 55% for recovery; 45% landfilled	100%	0.2205	82%	6
3	Ready-mix Concrete, NW (3,000 - 4,000 psi) 70% GGBFS replacement	0.1420 1 kg of product	59%	0.0265 55% for recovery; 45% landfilled	100%	0.1685	63%	5
4	Glulam structure	(1.4300) 1 kg of product	-591%	0.6640 17.5% incinerated; 17.5% recycled; 65% to landfill	2506%	(0.7660)	-285%	2
5	Cross-laminated Timber	(1.1500) 1 kg of product	-475%	0.6340 17.5% incinerated; 17.5% recycled; 65% to landfill	2392%	(0.5160)	-192%	3
6	Medium Density Fiberboard	(0.9230) 1 kg of product	-381%	0.6350 17.5% incinerated; 17.5% recycled; 65% to landfill	2396%	(0.2880)	-107%	4
7	Plywood	(1.5300) 1 kg of product	-632%	0.6650 17.5% incinerated; 17.5% recycled; 65% to landfill	2509%	(0.8650)	-322%	1
8	Anodized Aluminum Curtainwall 29% post-consumer recycled content	6.5700 1 kg of product	2715%	(4.3000) 95% recovered, 5% landfilled	-16226%	2.2700	845%	11
9	Double-pane IGU 3.56% aluminum scrap content	2.7000 1 kg of product	1116%	0.0688 100% to landfill	260%	2.7688	1031%	12
10	Steel I-beams 100% post-consumer recycled content	0.9380 1 kg of product	388%	0.2270 97.5% recycled, 2.5% to landfill	857%	1.1650	434%	9
11	Steel stud 45% post-consumer recycled content	2.3600 1 kg of product	975%	(0.7880) 97.5% recycled, 2.5% to landfill	-2974%	1.5720	585%	10
12	Gypsum wallboard Natural gypsum	0.3640 1 kg of product	150%	0.0872 100% landfilled	329%	0.4512	168%	8

Prepared by Vidaris Inc.

Agenda

1. Sustainability
2. Pedestrian, Bike, and Vehicle Access



Existing Aerial



New Driscoll School Student Walkers

- STUDENTS INCREASE FROM 631 TO 800
- BECAUSE OF DENSITY IN SURROUNDING NEIGHBORHOOD, SCHOOL ASSIGNMENT ZONE WILL NOT INCREASE SIGNIFICANTLY
- ALL K-8 STUDENTS WILL CONTINUE TO LIVE WITHIN WALKING DISTANCE
- THE VAST MAJORITY OF STUDENTS WILL CONTINUE TO GET TO SCHOOL BY WALKING

Improving Safety for Walkers

- Widen and upgrade sidewalks on Westbourne (both sides), and Washington (north side)
- Improve crosswalks at: Salisbury Road, Westbourne, Beacon, and at service delivery right of way
- Improve signage on Westbourne, Beacon, Bartlett, and Washington including “Your Speed Is” electronic warning signs, and a rectangular rapid flash beacon on Washington
- Organize vehicle traffic so cars, deliveries, and buses/vans have separate and distinct drop off areas with sufficient space that does not interfere with pedestrians
- Add stops signs on Bartlett Crescent (both ends), school driveway, service delivery right of way



Improving Safety for Walkers



Encouraging Biking and Improving Safety for Cyclist

All of the improvements for walkers PLUS

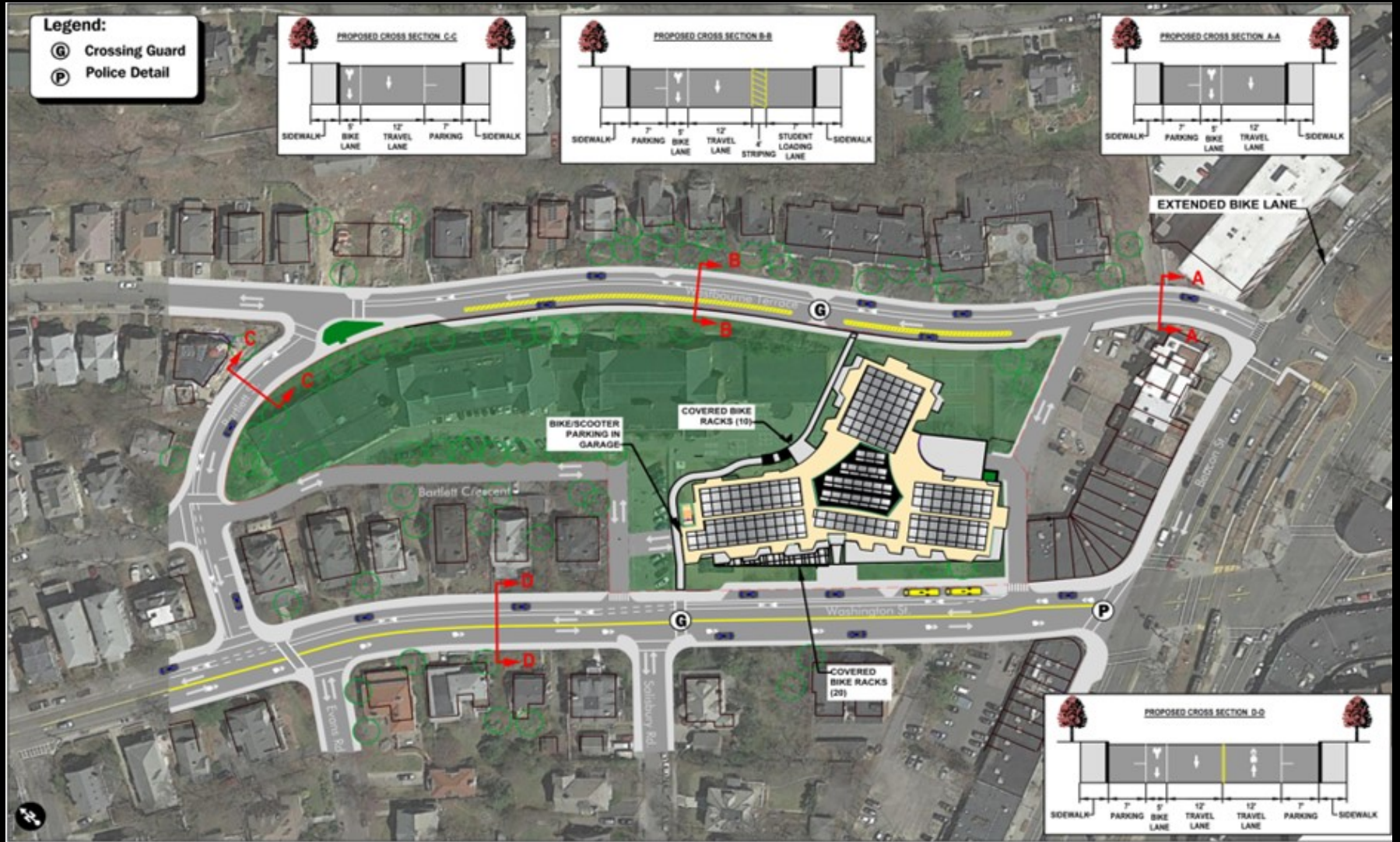
Covered bike racks at both entrances (*will confirm how many during Design Development*)

Two staff showers

Designated bike lanes

Improving Safety for Cyclists

Westbound bike lanes on Westbourne and Washington



Improving Vehicle Safety

- Separate, designated areas for car drop off (Westbourne), bus drop off (Washington) and deliveries (Service Road Right of Way)
- Designated staff stationed at drop off areas to support safety for those exiting cars and pedestrians
- Staff will help enforce these guidelines
- Westbourne widened to have a full parking lane that will be used for drop off and pick up. Includes 4' lined safety buffer separating cars dropping off/picking up students from travel lane
- Washington St widened to provide bus, van, and handicapped parking that is separate from the westbound travel lane



Improving Vehicle Safety

