FULLER MIDDLE SCHOOL FEASIBILITY STUDY

School Building Committee
August 6, 2018

Jonathan Levi Architects

PROJECT MANAGEMENT SMMA

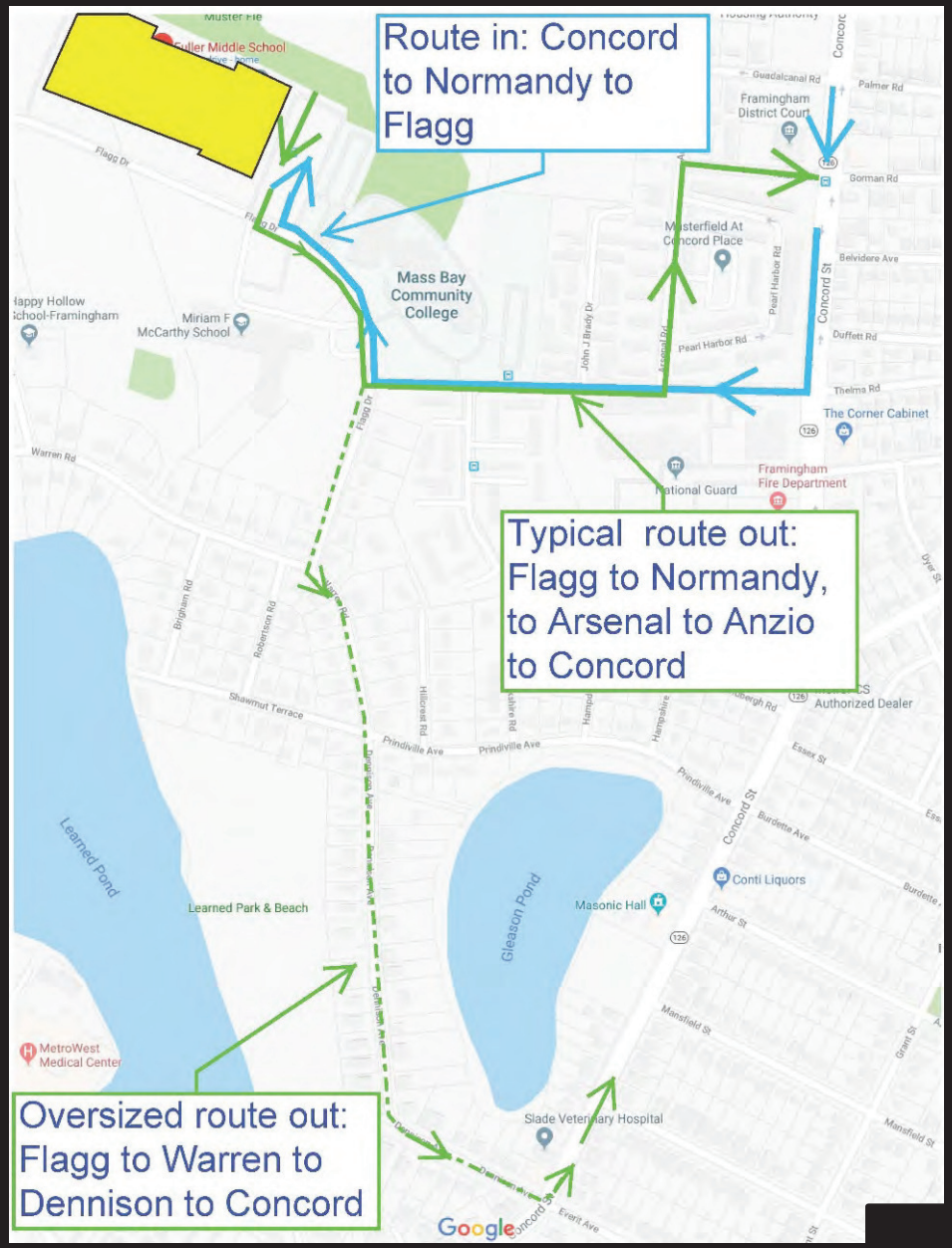
TRAFFIC UPDATE

McCarthy Parent Drop-Off

- Project will provide a safer route than exists today with crosswalks from new parking areas to McCarthy over raised traffic table with separated driveway entrances.

- Potential temporary or permanent additional parking at McCarthy will be investigated.

Construction Vehicle Routes



TRAFFIC UPDATE

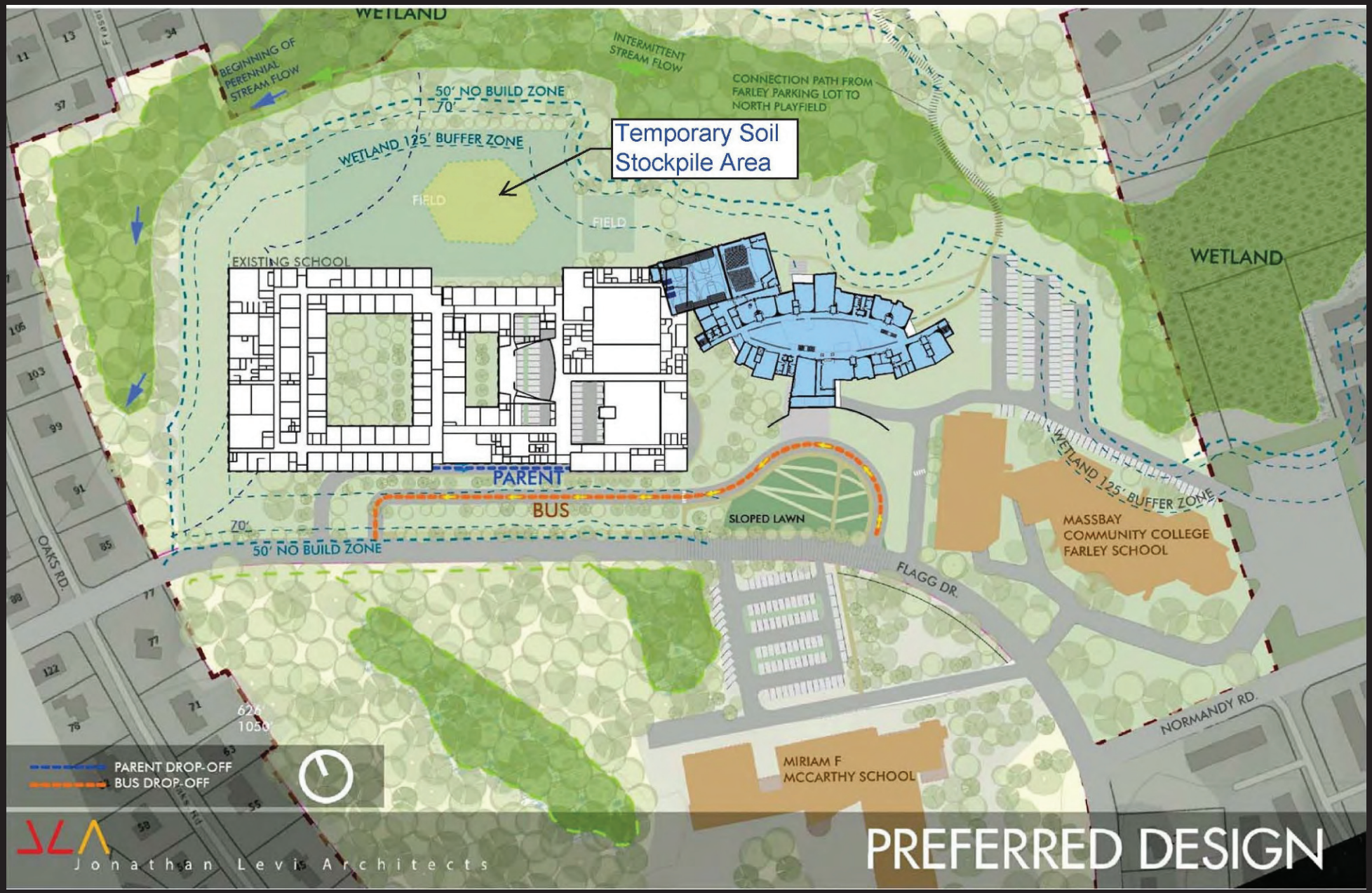
Impact on Adjacent Intersections

- Formal Traffic Impact Assessment still in progress and will be submitted in advance of 8/27 meeting when VAI will present the report. Initial findings are that the traffic at nearby intersections will not be dramatically different than it is today.

New Geotechnical Boring Results

- New Geotechnical boring results reveal "no surprises" compared to prior borings. They are still quite useful and provide additional refinement for foundation design.
- New geotechnical information will be incorporated into Schematic Design Pricing Set
- Formal updated Foundation Engineering Report will be submitted as part of the Schematic Design Set.

SD Refinement – Site Plan



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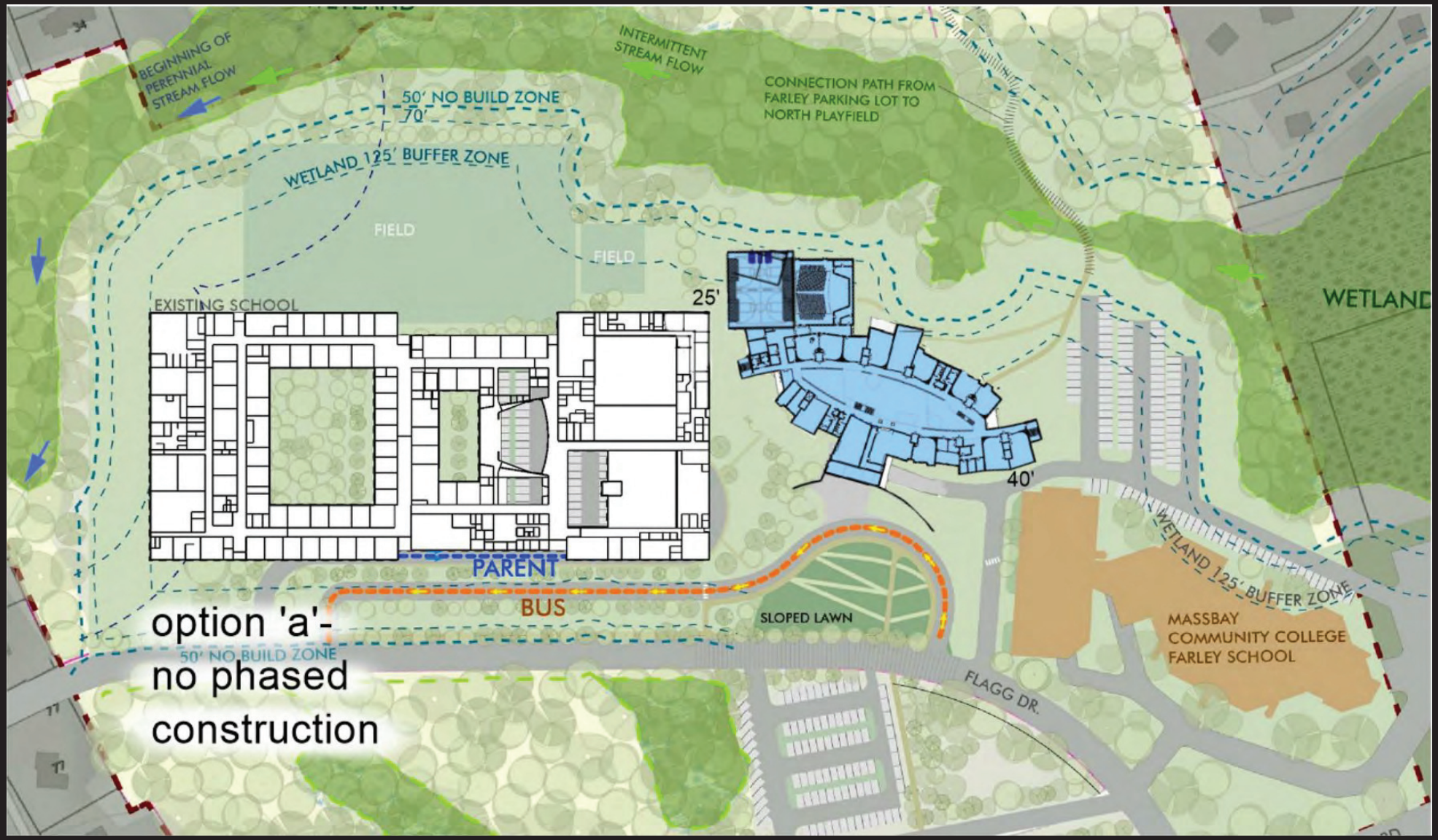
SD Refinement – Option A



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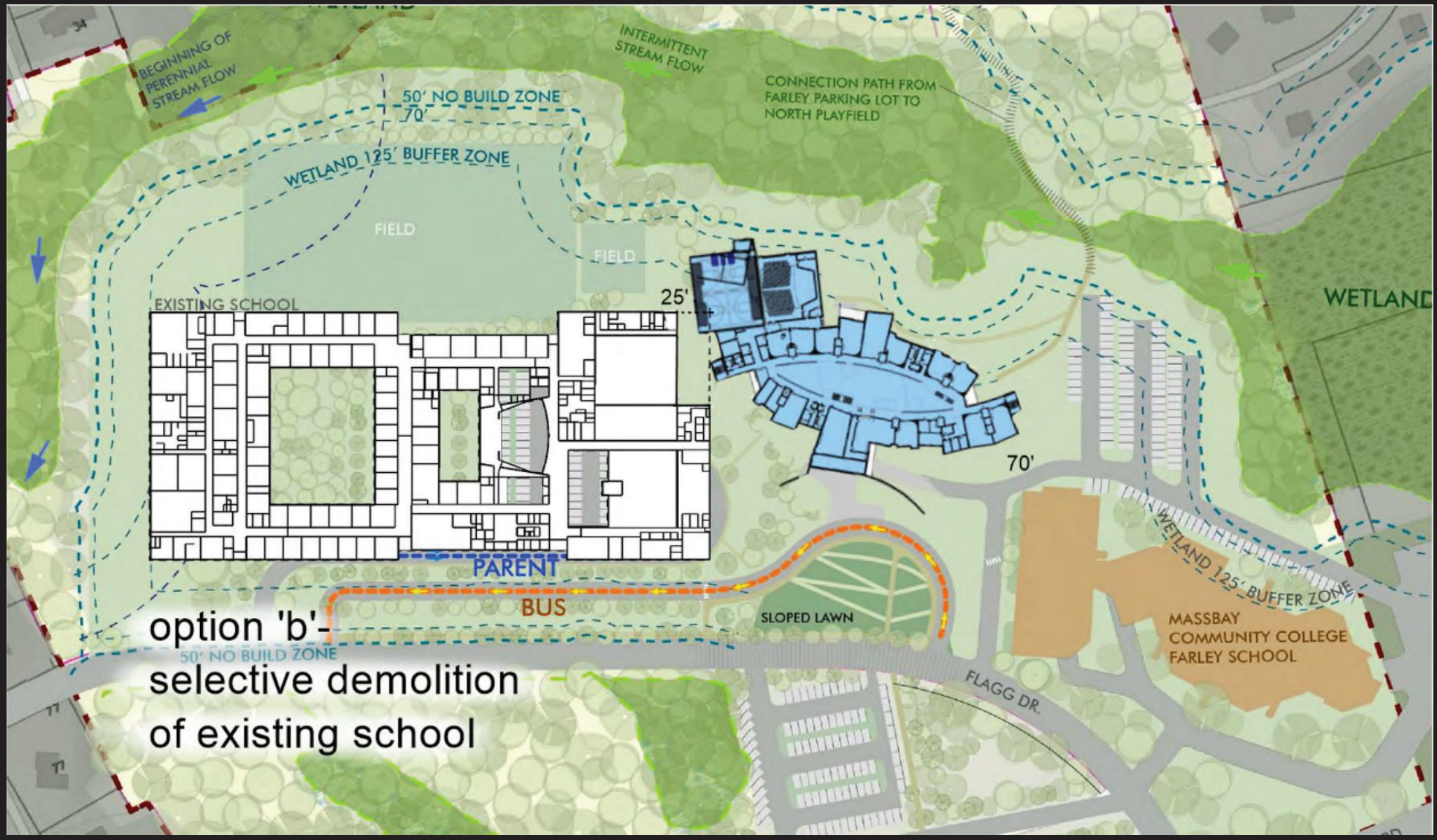
SD Refinement – Option B



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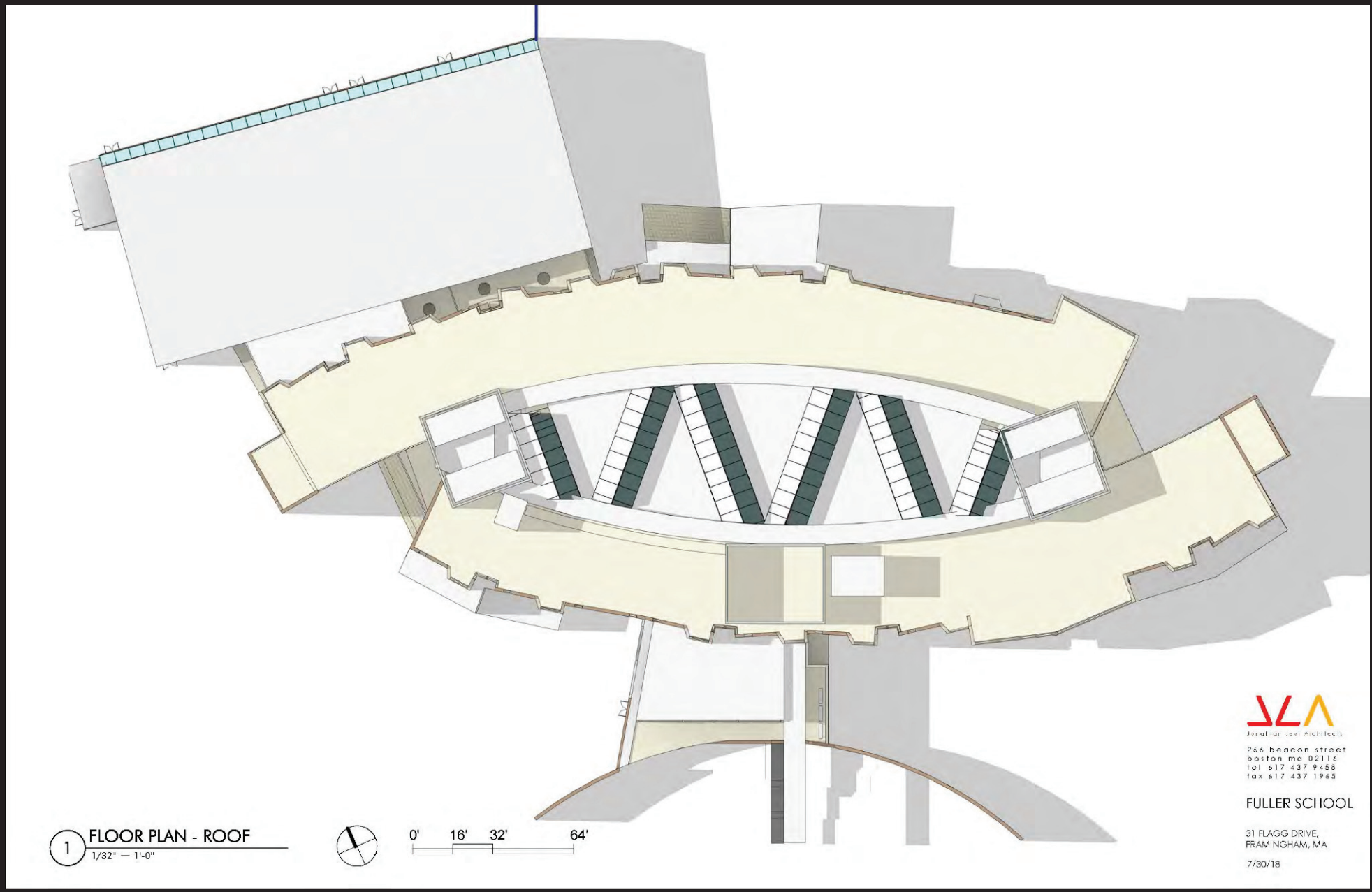
SD Refinement – Landscape

SD Refinement – Level 1 Plan

SD Refinement – Level 2 Plan

SD Refinement – Level 3 Plan

SD Refinement – Roof Plan

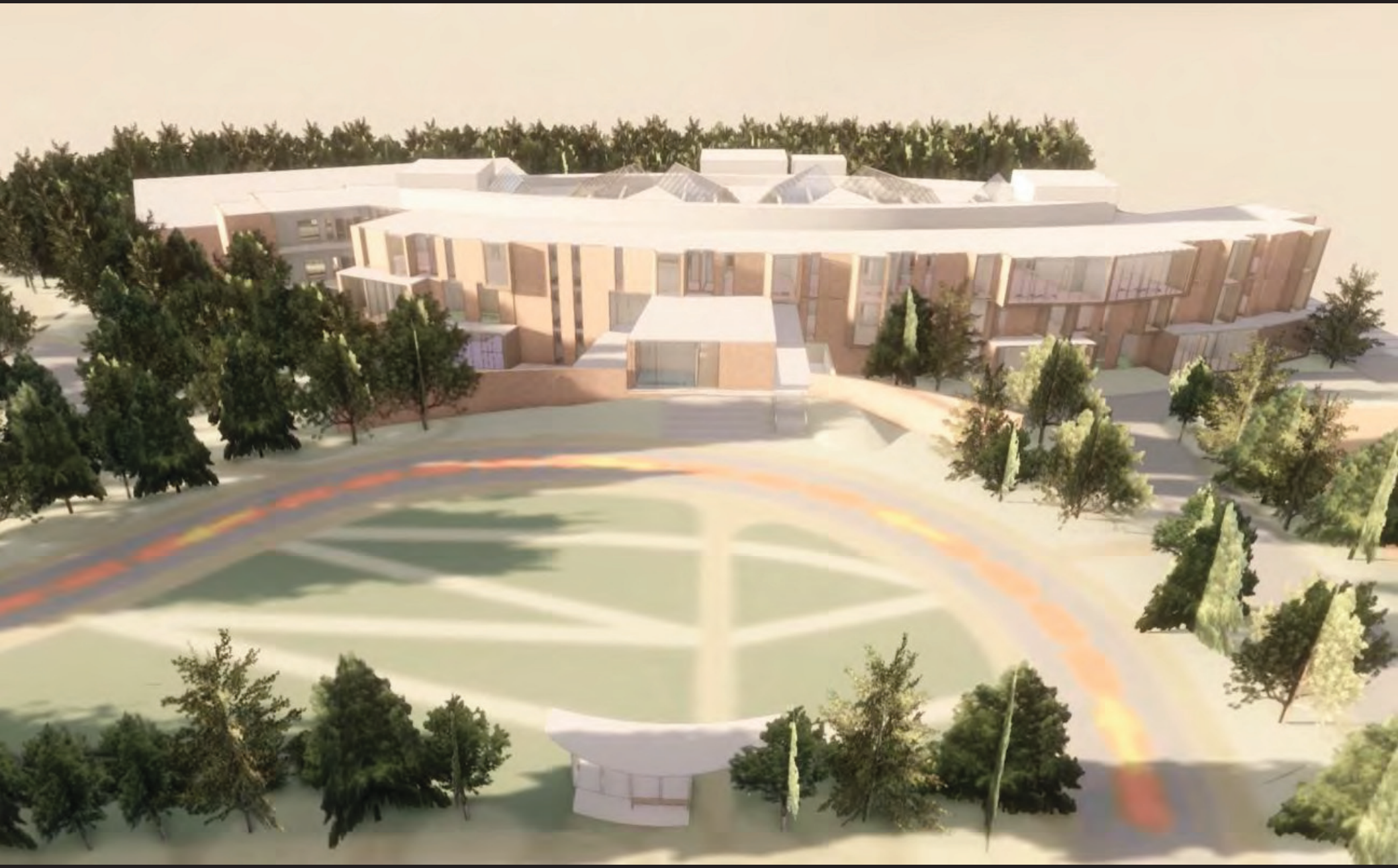


SD Refinement – Interior Perspective

SD Refinement – Interior Perspective

SD Refinement – Interior Perspective

Front View



Rear View

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Technology Systems

- The data system infrastructure will consist of fiber optic backbone cabling. Horizontal wiring will consist of Category 6A UTP cabling for both data and telephone systems for gigabit connectivity. The telephone infrastructure will accommodate VOIP based voice systems. A new IP telephone system will be used.

- Each Classroom will have data, video and audio connections to a wall mounted touch screen monitor. A wall phone will be provided for communications with administration in each classroom. Wireless access points will be provided in all classrooms and other spaces with two (2) CAT6A cables.

Technology Systems

- A central paging system will be provided and integrated with the telephone system. The speakers shall be IP.

- The Main Distribution Frame (MDF) will contain all core network switching and IP voice switch. Intermediate Distribution Frames (IDFs) will serve each floor/wing of the school. A fiber optic backbone will be provided from each IDF to MDF. The backbone will be designed for 10 Gbps Ethernet.

SD Refinement – Level 1 Plan – FF&E

Classroom Suite ‘Building Block’ FF&E

Structural Systems

- Steel frame / composite steel deck throughout
- Ground floor will be slab on grade with aggregate piers over entire building site at 10'x10' grid.
- Footings: 10'x10'x2' spread footing. Continuous frost wall footings along perimeter.
- The auditorium roof will be framed with long-span trusses designed for theater lighting
- The atrium balconies will be supported by steel hangers up to the roof steel.

Mechanical System Payback Summary

Option	System Description ALL OPTIONS HAVE FULL AIR CONDITIONING. High efficiency gas-fired condensing boiler plant and energy recovery	Capital Costs ($M)	Annual Energy Costs ($K)	Annual Maint Costs ($K)	Total Annual Costs ($K)	Total Annual Savings ($K)	Total Life-Cycle Savings
Baseline	Code Driven - VAV AHU system with gas-fired non-condensing boiler Water-cooled chiller plant with cooling tower	$7.5	$207	$31	$238	-	-
1	VAV AHU system Water-cooled chiller with cooling tower	$7.6	$202	$31	$233	$5	$22,000
2	Displacement air with VAV boxes Water-cooled chiller with cooling tower	$7.3	$142	$27	$169	$69	$1,850,000
2a	Displacement air with VAV boxes with static plate energy recovery Water-cooled chiller with cooling tower	$7.4	$145	$25	$170	$68	$1,760,000
2b	Displacement air with VAV boxes with static plate energy recovery Air-cooled chiller	$7.3	$143	$24	$167	$71	$1,890,000
3	Displacement air with chilled beams Water-cooled chiller plant	$7.3	$140	$30	$170	$68	$1,870,000
3a	Displacement air with chilled beam with static plate energy recovery Water-cooled chiller plant with cooling tower	$7.3	$142	$28	$170	$68	$1,810,000
3b	Displacement air with chilled beams with static plate energy recovery Air-cooled chiller plant	$7.3	$141	$27	$168	$70	$1,930,000
4	Displacement air with chilled beams Geothermal wells with heat pump chillers	$10.1	$169	$26	$195	$43	-$1,580,000

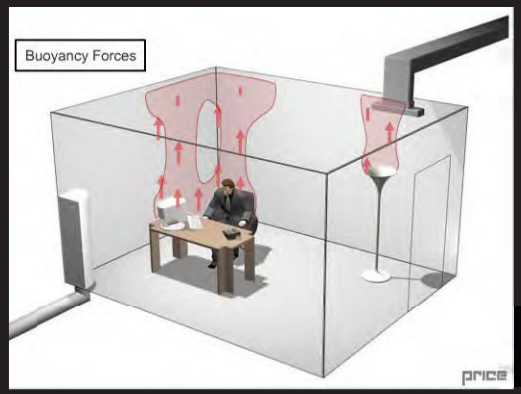
Fuller Middle School Proposed HVAC System Design

HVAC Central Heating & Cooling Plants

- High-efficiency gas-fired condensing boiler plant
- High-efficiency air-cooled chiller plant
- Lower maintenance
- Good equipment access

HVAC Distribution System

- Variable air volume (VAV) displacement ventilation w/ perimeter hot water heating
- Cooling load and equipment size reduction
- High level of energy efficiency (36.9% above LEED baseline with and E.U.I. OF 34.7 kBTU/s.f.)
- Provides high level of indoor air quality
- Superior acoustical performance
- Provides good thermal comfort and control
- Central air handling units with service vestibule
- Web accessible temperature controls



Architects

GARCIA • GALUSKA • DESOUSA

Renewable Design
Geothermal Plant Design Findings

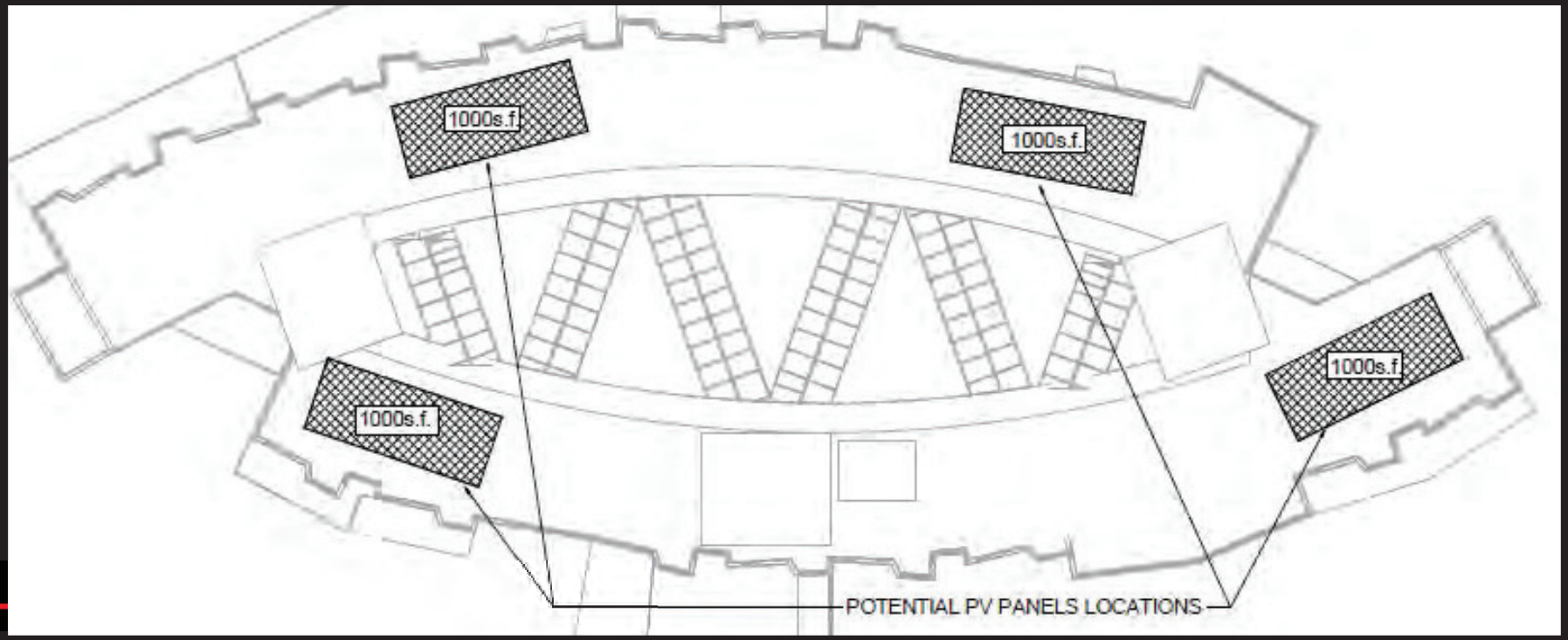
An alternate simulation of the design system with a geothermal plant was studied (Option 4) in the life cycle cost analyses report to determine the cost effectiveness of the system. Due to the significant increase in initial capital investment (+ $2,802,200) and maintenance (+ $2,200) above the design displacement system served by central hot water boilers and air-cooled chiller cooling plants, the geothermal design did not achieve a payback within the 30 year study period. Though the system is not cost effective due to higher installation and annual operating costs compared to the design system, it is able to achieve a lower Energy Usage Intensity (EUI) of 28.9 kBTU/s.f. compared to the design system of 34.7 kBTU/s.f.

RENEWABLE DESIGN - PHOTOVOLTAIC ARRAY (PV) SYSTEM

ROOF MOUNTED SYSTEM:

- Estimated Size: 52KW
- Generated kWh = 69,629 kWH= 10% of total electrical usage for mechanical option 2B.
- LEED points renewable energy production= 2 Points
- Cost of usable energy produced by PV system: $12,806= 9% of total combined utility cost of mechanical option 2B.
- **Estimated cost: $130,000**
- **Estimated discounted payback: 7 years***

*Includes utility incentive from SMART Program



GGD

LEED Goals

1. Site:

- Credit for Building on Developed Site
- Control Erosion During Construction
- Improve Storm Water Runoff
- Assess Potential Hazards in the Soil
- Reduce Heat Island Solar Absorption
- Reduce Light Pollution
- Provide Community Use

2. Reduce Energy Use:

- 3rd Party Verification of Mechanical Systems and Envelope Performance
- High Efficiency Heat and Hot Water Systems
- Excellent Thermal Insulation
- Make “Solar Ready”

3. Reduce Water Consumption:

- Low Flow Fixtures
- Minimize Irrigation
- Meter Usage

4. Materials and Resources:

- Design for Reduced Life / Cycle Costs
- Use Environmentally Friendly Materials
- Recycle Demolition and Construction Waste

5. Indoor Environmental Quality :

- Excellent Indoor Air Quality
- Use Low -Emitting Materials
- Enhanced Acoustic Performance
- Incorporate Daylighting
- Provide Access to Outdoor Views