DRISCOLL

Schematic Design Report

Driscoll School, Brookline, Massachusetts

MAY 22, 2019

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Owner

Brookline, Massachusetts

Client

Brookline, Massachusetts

Architect

Jonathan Levi Architects LLC

May 22. 2019

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1. Introduction

1.1 Overview and Background

Since 2005, Brookline has experienced historic enrollment growth in its public schools. The K-8 elementary schools have grown by 41% going from 5,503 students in 2006 to 5,482 students in 2018, which is equivalent to adding four schools into our existing schools in just over 10 years. For a decade now, the Town and School Department have been addressing the expanding student population by studying potential sites for a new elementary school and by adding classrooms to existing schools by dividing classrooms; converting offices, locker rooms, and hallways into classrooms; renting private buildings; and building new classrooms or adding modular classes. Despite adding nearly 60 classrooms to our existing schools through this "Expand-in-Place" strategy, the schools continue to be severely overcrowded.

On June 13, 2018, the Town completed its third study since 2013 on selecting a site for a new school. The Select Board and School Committee approved moving forward with expanding the Baldwin

School, expanding and renovating the Driscoll School, and renovating and possibly expanding the Pierce School.

Expanding and renovating Baldwin, Driscoll, and Pierce over time allows the town to address the enrollment increases in North Brookline and South Brookline while not overbuilding in either part of town. The Driscoll School expansion to 4 sections adding 8 classrooms, will directly address the ongoing student enrollment growth that is affecting all eight Brookline K-8 schools. Driscoll and Pierce have each grown by more than 57% since 2006.

The Baldwin School Expansion will add 18 classrooms and address ongoing and future growth in South Brookline and Townwide. It will also provide additional capacity for two of the town's fastest growing programs (RISE and English Language Education) and re-balance special education demand at Runkle.

Brookline Town Meeting voted to approve Schematic Design funding for the Driscoll and Baldwin School Expansion Projects on December 13, 2018.

1.2 Process

The study process was organized around regular meetings of the Driscoll School Building Committee (SBC) which is comprised of representatives from the Driscoll School Community, Town of Brookline departments, and Select Board and School Committee members. During the Feasibility Design and Schematic Design phases, the SBC held more than 30 public meetings and presented at various Town Boards (e.g. Transportation, School Committee, Advisory) to gather public input and commentary on the project. Additional introductory meetings have been held with representatives of the Department of Public Works, Police, Fire, Preservation and Transportation Departments.

Community and Staff Input

Since June 2018, the SBC has collaborated with the community to ensure that their voices are heard and listened to throughout the project. During the Schematic Design Phase, Driscoll staff, families, neighbors and abutters, and other interested community members provided important and constructive feedback regarding the school's educational vision, classroom configuration, learning spaces, open and play space, traffic, safety, on-street parking, construction disturbance and sustainability at public forums. The SBC, architects and School Department used this input during this Schematic and Feasibility Design Phases and have incorporated them into the design and plans for operation of the school.

During Schematic Design, there were over 25 meetings with 24 different groups of faculty, staff, and administrators to get input on classroom layout, adjacencies, learning and collaborative spaces, outdoor space, and offices. The design team met in January and again in April 2019 at Driscoll School full Staff Meetings and at small Staff Group Meetings to access and confirm their vision of the Driscoll School. The Faculty provided comments and suggestions specific to the Educational Plan as well as the Classroom Design.

The Town intends to continue the open and transparent process through the completion of the construction and the opening of the new Driscoll School. The Select Board, the School Committee, and the SBC will continue to hold public meetings and provide opportunities for input and feedback during the Design Development Phase. All meetings held by the SBC are open to the public. All presentation materials may be found on the School Department's website (https://www.brookline.k12.ma.us/driscoll-espansion)

1.3 Budget

The Driscoll School Expansion will have 155,890 square feet of space. The Project cost is estimated to be $108.8M with 25 underground parking spaces. This estimate includes:

- $2.5 million for new play area
- $6.3 million for fossil fuel free systems, as voted by Town Meeting on 12/13/18

Please see attached Sections:

13: Total Project Budget
14: Cost Estimates

Arial view from the northwest of the playfield, west entry, and Westbourne Terrace.

1.4 Description of Project

The project is a developed version of the "Modified Star" massing alternative recommended by the School Building Committee in the Feasibility Study phase. This alternative was preferred because of its flexible and appropriate organization of complementary site space, its generous expansion of additional open space that benefits the students and the community, its definition of the Washington Street frontage, its minimization of massing on Westbourne Terrace, and the ability to build on open space eliminating the new cost and inconvenience of swing space. Finally, the typical radiating floor plan exemplifies the District's educational vision through the conjoining of its educational subcommunity wings into a central shared visible Learning Commons/ Cafeteria atrium.

The design consists of a four-story structure, measured from the grade at Washington Street. The building would appear to be three stories in height from Westbourne Terrace due to the site topography. There is an additional basement level below the Washington Street elevation which comprises a 25-car garage, as well as an athletics suite with a 6,000 square-foot gymnasium and associated athletic facilities accessed from a multi-story lobby.

The main entrance is at Washington Street through a vestibule which is immediately adjacent to the central administration offices and welcome desk. The visitor would then be immediately presented with the panorama of the Learning Commons/Cafeteria and Media Center, both with broad views directly out to the level of the new playfield and recess areas. To the right of the entrance, conveniently situated for separated community access, is the two-story high multipurpose room which is grouped in a performance suite with the music spaces behind. Also, on the first floor is the service wing of the building including kitchen and custodial receiving areas with direct access to a service court off of the shared service alley.

Students may also enter from parent drop-off at the northwest corner of the building to the second-floor lobby which is contiguous with the Learning Commons atrium. This entrance is at grade with Westbourne Terrace and can be conveniently observed by parents dropping off at curbside. A third, minor entrance, also accessed from Westbourne Terrace, serves the Pre-Kindergarten area.

The second floor of the building begins the typical arrangement of classrooms in the three wings with collaborative project learning balconies and the glass enclosed Art, Maker, Fabrication Lab and Science classrooms overlooking the Learning Commons. A sense of shared learning community will be engendered by this central connective

View from the northeast including the Maker Court.

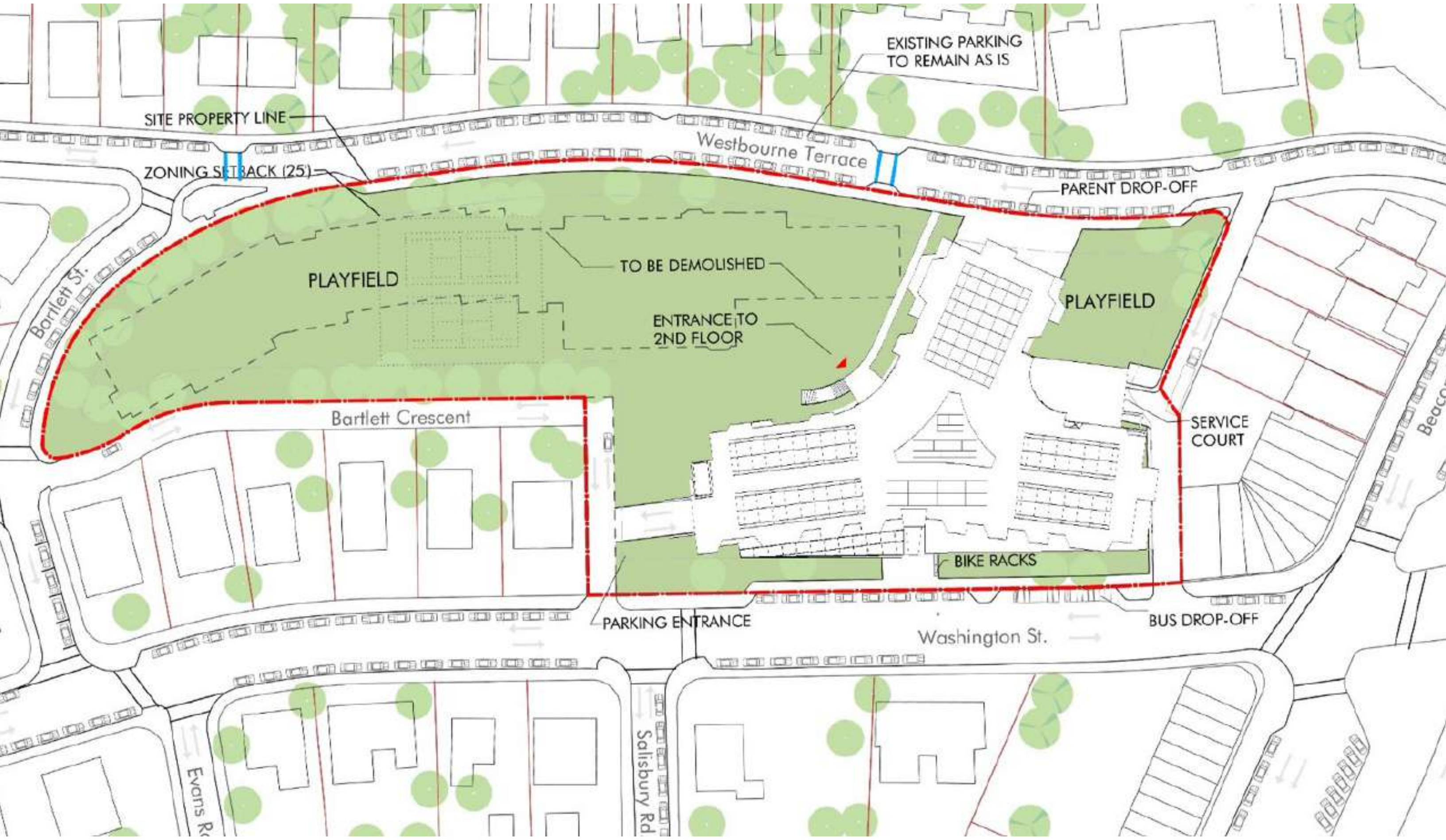
space, which is visible from all corners of the building and which breaks the barriers separating floors.

The building's overall massing will be minimized towards Westbourne Terrace with a narrow end elevation of one of the wings at a lower height than the imposing apartment buildings to the north. This height is also lower in the existing school structure.

Site

A primary objective for the placement of the new Driscoll footprint is the maximization of open space for the use of the students and the community. This has been achieved by a reduced footprint and the relocation of the school to the eastern end of the site. In doing so, the open space is situated in the midst of the residential neighborhood, with the building mass withdrawn to a more appropriate location adjoining the commercial buildings of Washington Square.

The resulting reconfiguration results in a net gain of 24,500sf of useable open space divided into two primary activity areas. To the west, a large green space will accommodate playfields and play equipment areas



for older children. This area will be entered by handicapped accessible ramps from Bartlett Crescent as well as from the school side. Working with the existing topography, there will be a combination of retaining walls and berms to maximize the north-south dimension of the playfields. In the northeast quadrant of the site, formed by the north and east academic wings, will be located smaller play area which is convenient to the Pre-Kindergarten classrooms.

The at-grade outdoor academic spaces will be supplemented by two roof top terraces – one at the northeast serving the maker space and fabrication lab; and the other to the south fronting Washington Street, for the use of the adjacent Kindergarten classrooms.

While the quantities and orientations for the outdoor areas have been established in conjunction with the building massing, further development of outdoor programming and detailed design will occur together with the Town's Parks and Recreation Department through a public process in the upcoming phase of work.

Unlike the existing Driscoll School, parent vehicles, buses, pedestrians and service vehicles will be safely separated from one another with the new layout. Westbourne Terrace will be widened to allow for dedicated parent drop off and bicycle lanes. Buses will be limited to the bus turn out along Washington Street. Finally, service will take advantage of a service alley to the east, which has been unutilized by the school. Walking students will now have the advantage of fully separated pathways, along with three new crossing areas and a host of safety signal and signage improvements.

1.5 Enrollment
The School is currently anticipated to accommodate 800 students from Pre-K through eighth grade, and to comprise approximately 156,000 gsf.

1.6 Summary of Capital Budget Statement
The project cost for the project is projected at $108.8M with 25 underground parking spaces provided on site and fossil fuel free systems.

1.7 Project Schedule
The currently proposed project schedule is as follows:

Design Feasibility Phase: August 2018 - December 2018
Schematic Design Phase: January 2019 - April 2019
Design Development/Construction Docs: July 2019 - June 2020
Construction: July 2020 - August 2022
Occupancy: Fall 2022

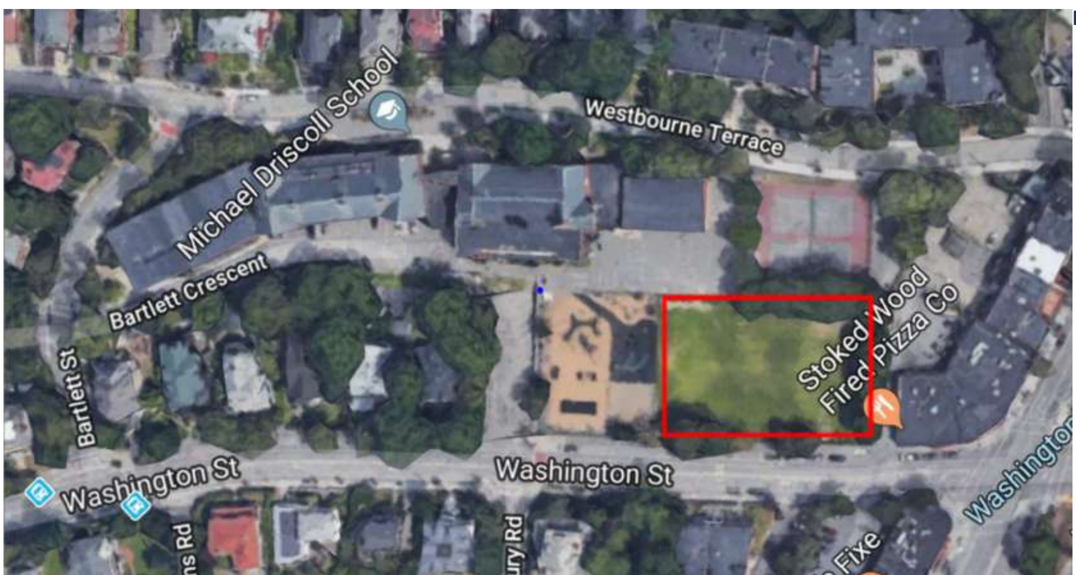
1.8 Phasing

As illustrated in the attached diagrams, the project will be built in two primary phases.

In the first phase, the new school will be built while the existing building remains in operation, causing the minimum possible disruption to Driscoll's current teaching and learning programs. Phase One will begin with the expansion of Westbourne Terrace and Washington Street to improve traffic flow by establishing a new dedicated vehicular drop-off area and new parking for the school. Temporary playgrounds will be also be added to serve the students during construction. Once this work is complete, a construction fence will safely separate the contractor's area so they can demolish the existing gym and build the Phase One new school. When complete, the students will move into the finished new school building.

In the second phase, a new construction fence will be erected, the old building will be demolished, and new finished outdoor play fields will be created.

PHASE 1

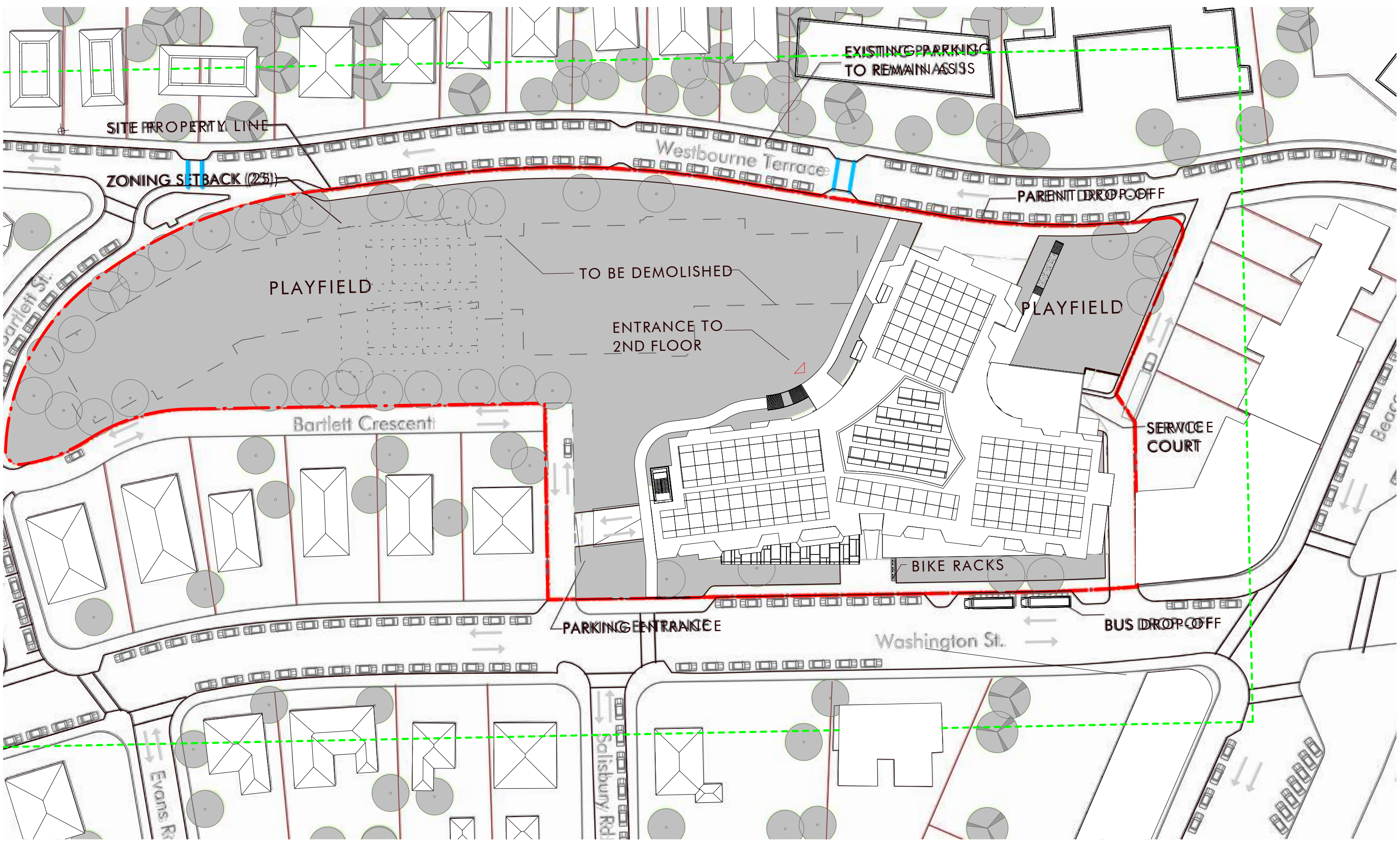


PHASE 2

1.9 Visual Aids

Please reference the following images::

- Site Plan
- Floor Plans
- Exterior Elevations

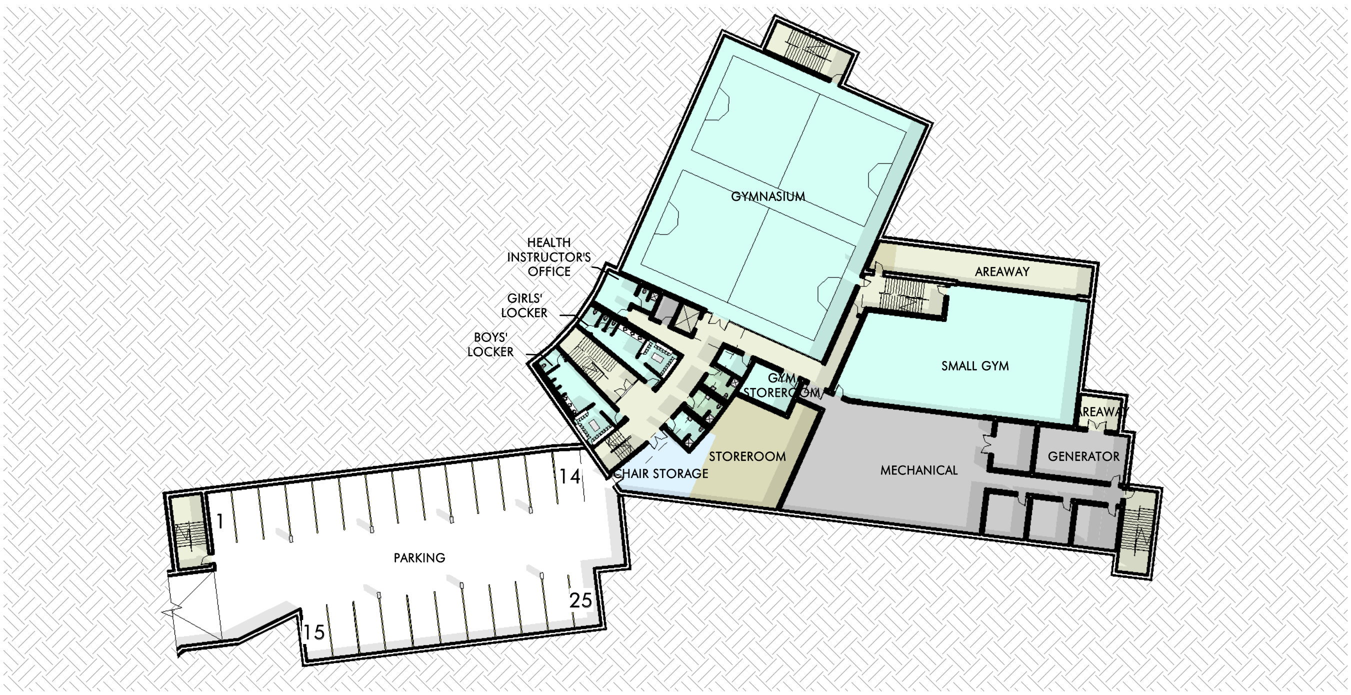


SITE_PLAN

1" = 60'-0"

LEGEND

- 1 CORE ACADEMIC SPACES
- 2 SWD/RESOURCE/GUIDANCE
- 3 ART & MUSIC
- 4 VOCATIONS & TECHNOLOGY
- 5 HEALTH & PHYSICAL ED.
- 6 MEDIA/LIBRARY
- 7 DINING & FOOD SERVICE
- 8 MEDICAL
- 9 ADMIN. & GUIDANCE
- 10 CUSTODIAL & MAINTENANCE
- 11 OTHER
- 12 CIRCULATION
- 12 ELECTRIC
- 12 MECHANICAL
- 12 TOILET



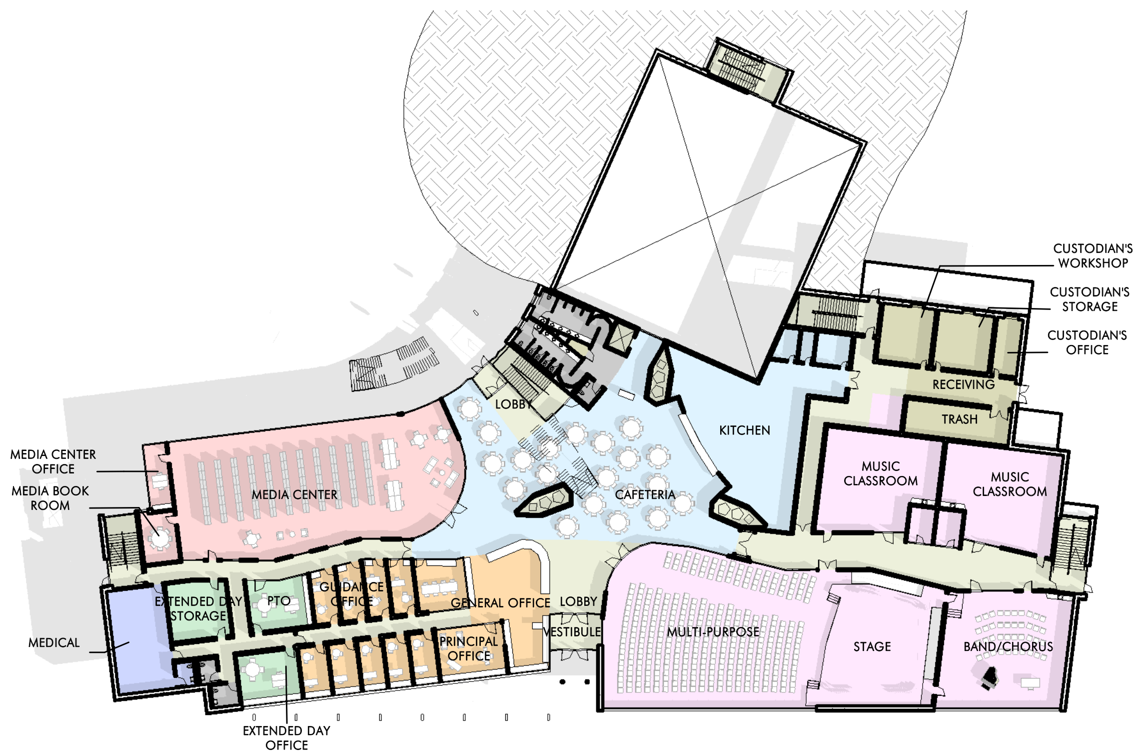
BASE FLOOR PLAN

Jonathan Levi Architects

0' 16' 32' 64'

LEGEND

- 1 CORE ACADEMIC SPACES
- 2 SWD/RESOURCE/GUIDANCE
- 3 ART & MUSIC
- 4 VOCATIONS & TECHNOLOGY
- 5 HEALTH & PHYSICAL ED.
- 6 MEDIA/LIBRARY
- 7 DINING & FOOD SERVICE
- 8 MEDICAL
- 9 ADMIN. & GUIDANCE
- 10 CUSTODIAL & MAINTENANCE
- 11 OTHER
- 12 CIRCULATION
- 12 ELECTRIC
- 12 MECHANICAL
- 12 TOILET



FIRST FLOOR PLAN

Jonathan Levi Architects

0' 16' 32' 64'

LEGEND

- 1 CORE ACADEMIC SPACES
- 2 SWD/RESOURCE/GUIDANCE
- 3 ART & MUSIC
- 4 VOCATIONS & TECHNOLOGY
- 5 HEALTH & PHYSICAL ED.
- 6 MEDIA/LIBRARY
- 7 DINING & FOOD SERVICE
- 8 MEDICAL
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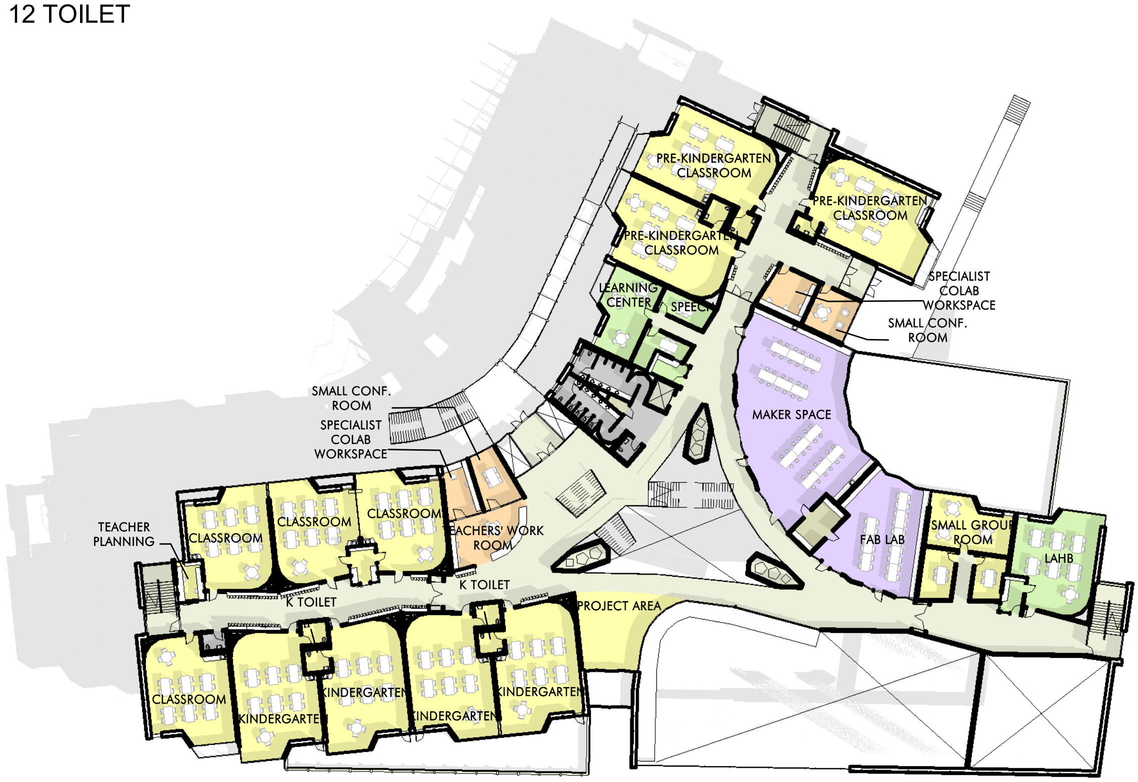
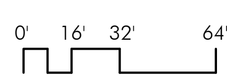


SECOND FLOOR PLAN

Jonathan Levi Architects



LEGEND

- 1 CORE ACADEMIC SPACES
- 2 SWD/RESOURCE/GUIDANCE
- 3 ART & MUSIC
- 4 VOCATIONS & TECHNOLOGY
- 5 HEALTH & PHYSICAL ED.
- 6 MEDIA/LIBRARY
- 7 DINING & FOOD SERVICE
- 8 MEDICAL
- 9 ADMIN. & GUIDANCE
- 10 CUSTODIAL & MAINTENANCE
- 11 OTHER
- 12 CIRCULATION
- 12 ELECTRIC
- 12 MECHANICAL
- 12 TOILET

THIRD FLOOR PLAN

Jonathan Levi Architects

0' 16' 32' 64'

LEGEND

- 1 CORE ACADEMIC SPACES
- 2 SWD/RESOURCE/GUIDANCE
- 3 ART & MUSIC
- 4 VOCATIONS & TECHNOLOGY
- 5 HEALTH & PHYSICAL ED.
- 6 MEDIA/LIBRARY
- 7 DINING & FOOD SERVICE
- 8 MEDICAL
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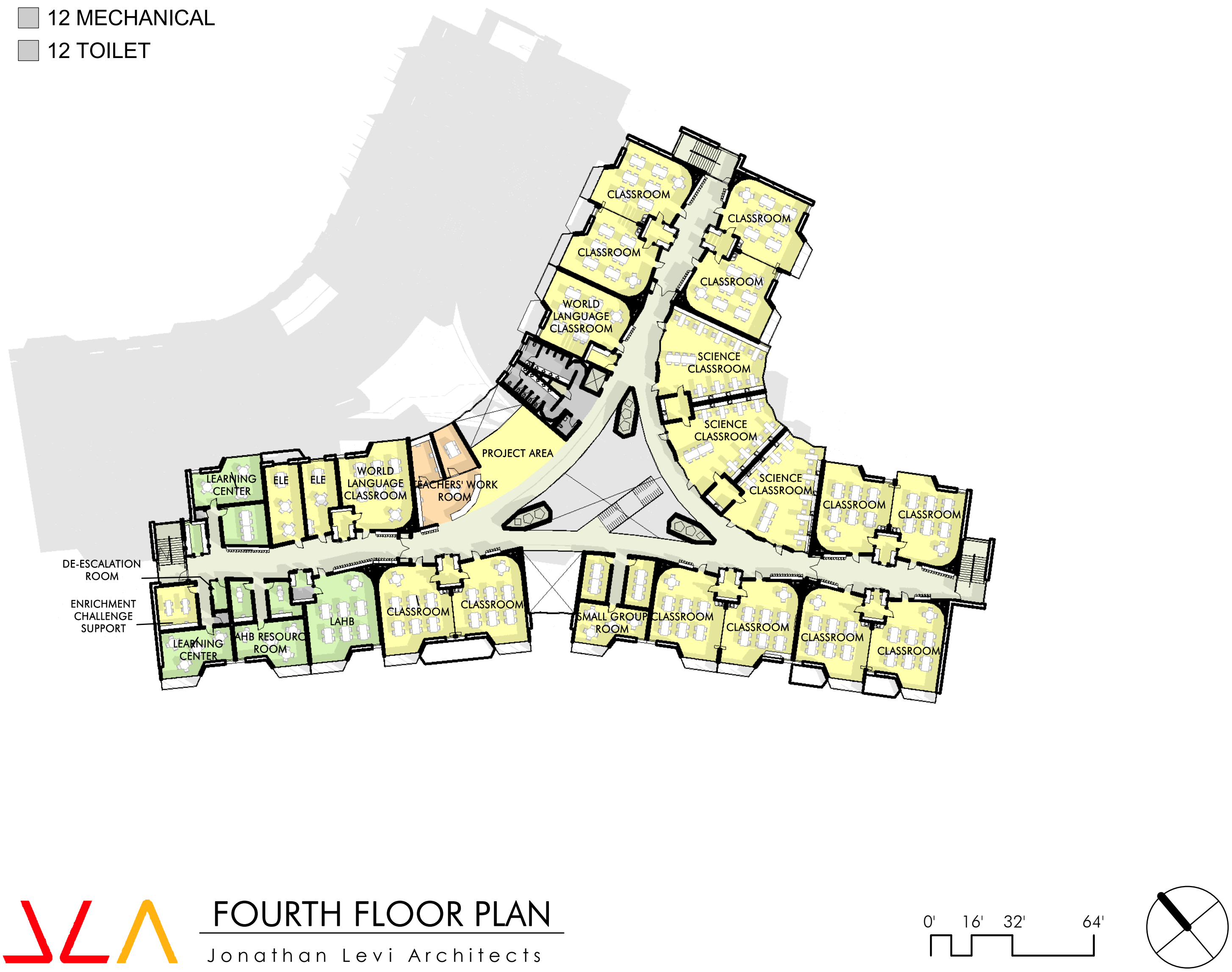

FOURTH FLOOR PLAN

Jonathan Levi Architects

ROOF PLAN

Jonathan Levi Architects

0' 16' 32' 64'

NORTH-WEST ELEVATION

WEST ELEVATION

NORTH ELEVATION

0' 8' 16' 32' 64'

SOUTH ELEVATION

0' 8' 16' 32' 64'

2. Final Design Program

2.1 Education Plan

Please see the attached updated Education Plan prepared by Public Schools of Brookline.

Driscoll School
Educational Program

Public Schools of Brookline

January 2019

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OVERVIEW - DRISCOLL SCHOOL EXPANSION EDUCATIONAL PROGRAM

The Public Schools of Brookline (PSB) provides an education to preschool through twelfth grade students in eight elementary schools, one comprehensive high school, and early childhood programs in rental spaces across town. In addition to school-based programs, the Public Schools of Brookline offers continuing education courses, summer school, enrichment programs, and numerous athletic opportunities.

The Public Schools of Brookline is guided by five core values: high achievement for all, excellence in teaching, collaboration, respect for human differences, and educational equity. These core values, along with a vision, mission, and set of aspirational goals, create the foundation for the work in our schools and across the district. PSB'S district vision begins with:

> *Brookline provides an extraordinary education for every child. Each child's unique path to achievement is supported in academically exciting and programmatically rich environments.*

These two sentences could be part of a school system's vision statement today or 50 years ago; however, the reality of what one would see in schools from these two eras is vastly different. Fifty years ago, or in some cases just ten years ago, learning that was considered engaging, and programmatically rich now borders on being irrelevant for the teaching and learning that is required today. No longer is learning confined to the classroom. No longer is there a finite body of knowledge that a teacher imparts to her students. Now, there is a vast amount of information available to students, not just by way of the teacher, but also by virtue of access to technology. Described as the "Four Cs" or "super skills" for the 21st century, communication, collaboration, critical thinking, and creativity are redefining the basics of children's learning experiences. Furthermore, learning and understanding are expressed in a variety of ways: applying knowledge, creating products, solving complex problems, systems thinking, design and testing, and knowing how to learn. This shift in what high quality learning is has necessitated a shift in the nature of the work students do and what instruction looks like in schools. In the Public Schools of Brookline we increasingly expect to see collaborative, project-based learning where students demonstrate their understanding in a variety of ways that utilize a combination of analytical, problem-solving, presentation, communication, and design skills.

These shifts in teaching and learning demand a similar shift in the nature of school buildings and learning spaces. The school building is a hive of a wide variety of work - ranging from quiet, individual tasks to small group team work, to large scale presentations produced by an entire grade. The variety in teaching and learning approaches is mirrored by a physical space that offers flexibility and a broader range of spaces - classrooms with furniture that can be used for numerous purposes; large and small group spaces that can be divided and joined easily; areas to display and present student work publicly, and collaborative spaces that can be used with or without a teacher present.

At the same time the school building also serves as a hub of community activity that spreads beyond the immediate school community or school day. Through partnerships that provide numerous on-site after school opportunities, community organizations use of common spaces, and community events, PSB's school buildings are and should continue to be used as townwide resources.

The Driscoll School is a relationship-oriented PreK-8 school community that practices and values inclusive partnerships and mutual support across the entire school community. This foundation of collaboration and collegiality has been built step by step over the years and is seen throughout the life of the school including examples such as students of different ages working together; the staff's weekly breakfasts; and annual traditions such as the Arts Equinox, the Science Solstice, and the Fall Fling that bring the entire community together. The community honors and values the diversity of the people and families who make up the school community and come from a broad range of racial, ethnic, cultural, and socioeconomic backgrounds.

During Fall 2018, staff, families, and school community members had a number of opportunities to provide input on the current strengths, areas of growth and opportunities that lay ahead for the school. Through these sessions a number of consistent themes came through including:

- The new facility should promote Driscoll's togetherness, culture of sharing, and community; it should be a place where we work together and support each other
- Having a school culture and facility that "grows with the child." allowing greater autonomy and independence as students grow older
- Building on Driscoll's long-standing commitment to the arts
- Building a middle school program that is engaging, develops excitement for learning, and allows students to take ownership for their learning and their place in the school community
- Integrating multiple disciplines to learn and to demonstrate learning - e.g. STEAM, design, technology, creating a "maker" culture, coding, engineering, a focus on problem solving
- Continuing the strong culture of faculty collaboration
- Making learning transparent and on display

DISTRICT-WIDE STRATEGIC PLAN GOALS

Our teaching and learning aspirations described in the district's strategic plan visionary goals drive our building plans. The Driscoll School Educational Plan has been developed with an understanding of how the physical structures can create and sustain an environment that maximizes student learning. It is essential that the school be flexible, with spaces that are used for multiple purposes, are accessible (both physically and technologically), and create an environment that generates interest, creativity, and multiple learning opportunities.

Goal 1: Every Student Achieving

Ensure that every student meets or exceeds Brookline's high standards and eliminate persistent gaps in student achievement by establishing educational equity across all classrooms, schools, and programs.

Goal 2: Every Student Invested in Learning

Increase every student's ownership of individual learning and achievement by using rigor, relevance, and relationships to foster a spirit of inquiry and the joy of learning.

Goal 3: Every Student Prepared for Change and Challenge

Instill in every student the habits of mind and life strategies critical for success in meeting the intellectual, civic, and social demands of life in a diverse, ever-changing, global environment.

Goal 4: Every Educator Growing Professionally

Foster dynamic professional learning communities that inspire inquiry, reflection, collaboration, and innovation, and use data to improve teaching, advance student learning, and refine the programs and practices of the Public Schools of Brookline.

GRADE AND SCHOOL CONFIGURATION POLICIES

The Public Schools of Brookline provides educational programs for students in preschool through grade 12. As of October 1, 2018, there were 7,938 Pre-K through 12 students enrolled in the Public Schools of Brookline. The eight elementary schools educate students in grades kindergarten through eighth grade, with an October 1, 2018 enrollment of 5,503 students. Typically, students attend the Brookline elementary school in their geographical neighborhoods. In 2018-2019, Brookline High School's official enrollment is 2,101, which includes students in grades 9-12 and 17 students who are have not yet reached 22 years old. 63 Public Schools of Brookline students were being educated in out of district placements. In 2018-2019 we enrolled 91 pre-kindergarten students in classrooms located in our elementary schools, and another 180 pre-kindergarten students in off-campus leased sites in town. For decades, Brookline has educated its children in PreK-8 elementary schools to promote a strong community between older and younger students, reduce school transitions, support middle school students with relationships developed over time, develop strong relationships with families that have students in a school for a longer period of time, and provide a wide variety of curriculum offerings across many grade levels. The Town and the school community continue their unwavering support of the PreK-8 elementary schools model.

The expansion and rebuilding of the Driscoll School is one part of the three-school solution the Select Board, School Committee, and Ad Hoc Subcommittee of the Advisory Committee decided on in June 2018 to address the historic enrollment growth, overcrowding, and substandard learning spaces in Brookline's public schools. These three committees approved moving forward with expanding and rebuilding the Baldwin School, expanding and renovating the Driscoll School, and renovating and possibly expanding the Pierce School. Expanding and rebuilding Baldwin, Driscoll, and Pierce over time allows the town to address the enrollment increases in North Brookline and South Brookline while not overbuilding in either part of town. The Driscoll School will directly address the overcrowding that has been affecting schools in North Brookline for years.

Since 2005, Driscoll has experienced the largest percentage increase of students of any school in the district, growing by more than 68%. The Driscoll student population has grown from 366 students in 2005-2006, to 614 in 2018-2019. This historic growth has resulted in the largest middle grades class sizes in the district, science classrooms that are out of date and overcrowded, core spaces such as the cafeteria, kitchen, gymnasium, auditorium, and hallways that cannot accommodate the student body effectively, and many other deficiencies. Small learning spaces for students with special needs, English learners, and students who need additional support in math and literacy are too small and do not exist in sufficient numbers. Often this important academic support will occur in hallways.

Pursuing the three-school solution to the public schools' enrollment growth allows the Town to address the overcrowding and substandard facilities that Driscoll students, educators, staff, and families deal with everyday while at the same time provide relief to neighboring schools.

Driscoll will become a four-section school with four homeroom classes at each grade K-8 and three pre-kindergarten classes. It will continue to house the Language Academic Home Base literacy program, and the a Native Language Support Program. With an average class size of 21 students in kindergarten through eighth grade and 15 student in each pre-kindergarten class, enrollment is anticipated to be 800 students across PreK- 8.

SCHOOL SIZE AND CLASS SIZE GUIDELINES

The Brookline School Committee recognizes that class size is an important factor in a quality education. Steadily increasing enrollment in Brookline, coupled with limited space in our school buildings, continues to put upward pressure on class sizes resulting in the average system-wide class size growing during the recent 13-year period of enrollment growth. A goal of the new Driscoll facility is to create classroom spaces that are small, personalized, and flexible learning environments and to create more classroom capacity across the district to relieve the class size increases all schools have experienced.

The rebuilt and expanded Driscoll School will serve between approximately 800 students from the immediate geographic neighborhood with a majority of students living close enough to walk to school. Based on current anticipated enrollment for 800 students and the School Committee's commitment to achieving class sizes of 21 or fewer, the number of required classrooms is outlined below.

Driscoll School Expansion - 4 Sections Plus Pre-Kindergarten

Grade Level	# of Homeroom Classes	Anticipated Average Class Size	Enrollment with Avg. Class Size
Pre-Kindergarten	3	15	45
Kindergarten	4	21	84
Grade 1	4	21	84
Grade 2	4	21	84
Grade 3	4	21	84
Grade 4	4	21	84
Grade 5	4	21	84
Grade 6	4	21	84
Grade 7	4	21	84
Grade 8	4	21	84
Total	39		801

Historically, all Brookline elementary schools have housed pre-kindergarten classrooms, providing inclusive educational opportunities to the children of Brookline. Since 2012, pre-kindergarten classes have been moved out of most elementary schools to other leased sites in town due to increasing enrollment and space constraints. We value PreK-8 configurations, and believe that pre-kindergarten classes serve students best as part of a contiguous PreK-8 school community. Therefore, the Driscoll School will include an additional pre-kindergarten classroom, bringing its total to three and allowing more of the Town's youngest learners to be educated within an elementary school setting.

Through programming and physical space this school will also take into consideration the separate and distinct needs of 6-8th grade students while still allowing older students to be leaders and role models for the entire school community and interact with and support their younger peers. The middle school program should have a space that is distinctly theirs and that provides a sense of "graduating" to a different and unique part of the school community. At the same time, it should feel "semi-permeable" in that the middle school program should not feel sequestered or separate from the rest of the school.

FUNCTIONAL AND SPATIAL RELATIONSHIPS AND ADJACENCIES

Functional and spatial relationships and adjacencies are the key to the successful design of the new facility. These relationships between classrooms and programs in the school define the programmatic, functional, spatial, and environmental requirements of the educational facility and become the basis for the school's final design. With addressing the diverse needs of learner and community being core values of the Driscoll School, the newly built school needs to be a warm and inviting place for all children, families, and staff.

Students thrive in a learning community where teachers know them well; in a community that supports a sense of safety, respect and trust; and in a community that is energizing and promotes creativity. With the school expanding by a section, it is a priority to design a school that creates a "small school" feel and can maintain and deepen the Driscoll's strong community and family-oriented feel.

To promote a small school feel, the educational plan calls for clustering grade levels. Grade levels should be clustered in three grade spans (PK-2, 3-5, and 6-8) that will allow for a more personalized learning environment and help ensure that every single student feels closely connected to their teachers, classroom, and fellow students. Clustering in these three groupings will support a professional culture where educators work in teams within each cluster and take collective responsibility for preparing students in their grade span for the upcoming grade span. Each cluster should have a sufficient number of learning areas inside and outside of classrooms for small group work, and specialized instruction, and collaboration to support the school and district's emphasis on inclusive practices. This physical organization creates the intimacy and scale necessary for educators and students to continue to build Driscoll's caring, connected, and collaborative learning community in the rebuilt and expanded school building.

While these clusters will help create an intimate and personal feel for students, they are not meant to operate as separate learning communities. The three clusters must be linked physically and educationally to create a PreK-8 school community that is an integrated whole. Easily accessible common core spaces, collaborative learning areas, and project spaces, the cafeteria/learning commons, multipurpose room, and other core spaces should serve as the connective tissue that bring the community together. Driscoll requires a welcoming community arrival space that can accommodate the influx of students during morning and support arrival and dismissal procedures that can easily be monitored by staff.

Input from teachers, principals, and district administrators makes it clear that classroom spaces need to be adaptable to the many different structures and instructional methods used today and into the future. While the choice of classroom furniture will play a large role in how flexibly a classroom can be used, the model classroom will have some consistent features such as areas for small group instruction and work, a seating area at desks or tables for an entire class for full group instruction, counter space that abuts a wall and can be used for individuals to work at while standing or sitting on stools, magnetic whiteboard space to be used during instruction as well as display space, built in storage, and movable walls that will enable the creation of larger or smaller spaces when needed.

The students, faculty and parent community in Brookline value spaces where the school community can gather to celebrate learning and to spotlight the arts through assemblies and performances. After school, extended day programming will be provided until 6:00 p.m. with several hundred students participating in these programs on a daily basis. While the extended day program will utilize the learning spaces in the building, an administrative office with storage space will be needed.

SCHOOL SCHEDULING AND LEARNING SPACES

The Public Schools of Brookline has a rich program of specials – visual arts, performing arts, physical education, and health -- that allows students to begin to develop mastery in these areas within separate classes and through the integration of these subjects with the other disciplines. An additional benefit of these classes is the use of this time for teachers' planning (individual and common planning time). Appropriate space for the specialists to provide a high level of instruction is essential.

Within a school week, all students in the school will take as many as five specials (typically two music, one art, and two physical education classes). For music, grades 4-8, students take Conservatory classes. With all grade 6-8 students scheduled *simultaneously* in Conservatory classes, students participating in Conservatory will need to be scheduled in 6 or 7 different spaces that can support music/performing arts instruction. Students also receive regular instruction in library and computer use that is scheduled with the librarian and the education technology specialist. The visual arts room requires storage that can accommodate the ongoing work of hundreds of students, stored from week to week as students are working on their projects. The school will also require spaces to display artwork and student work throughout the school. To properly schedule high-quality physical education, two appropriately sized gymnasiums will be required.

K-5 students also take world language within their homeroom classes, while students in sixth through eighth grade have dedicated world language classrooms. The world language program is described in detail later in the document and listed here only for purposes of understanding the complexity of the Driscoll School scheduling process. Typically world language is taught three times per week with the length of each class period lengthening as the grade level increases.

The English Language Education (ELE) program is another area of attention in the school district's master schedule. We provide support in English language instruction primarily through pull-out services, as determined by the student's level of English proficiency. Students at the entering and developing stage, and those who participate in the Native Language Support Program need classrooms designated for English language education. We anticipate needing four small ELE classrooms in the Driscoll School to provide instructional support in small group and whole-class settings for students.

In addition to the spaces needed for the programming described above, the Driscoll School must also provide additional types of spaces for the teaching and learning that is aligned to our local standards and our strategic goals. These include:

- Appropriate spaces to schedule math specialists and literacy specialists providing intervention services to students;
- Special education services stationed and provided throughout the school with proximity to the clustered grade levels;
- Fully accessible classrooms allowing students with physical disabilities to be scheduled into any learning space in the building;
- Open spaces/makerspaces and a Fab Lab that support the work of the *Engineering Design Process* including defining problems, and exploring, creating, testing, and refining solutions;
- Grade level project areas to allow elementary teachers to collaborate on interdisciplinary and project based learning across all the classes of the grade, integrating student learning across disciplines;
- Grade level clusters that allow elementary world language teachers to move from class to class across a grade level more efficiently;
- Instrumental lessons conducted in the proper space, and not in a classroom, hallway or an alcove where they can disrupt other classes; We anticipate classes will be provided in strings, chorus, clarinet, guitar, and orchestra with additional small group lessons;
- Appropriate professional spaces available for teacher collaboration during common planning time;
- Adequate and secure storage spaces with moveable furniture allowing use by multiple users;
- Availability of appropriate open space for informal gathering; and
- Adequate spaces (walls, glass cabinets, display areas) for extended display of student work so that a space is not deemed "not available" while displaying student work.

TEACHING METHODOLOGY AND STRUCTURE

"Form follows function" is a fundamental principle in science/engineering. The Driscoll School expansion provides the opportunity to create the school facility in a form that supports the functions of 21st century education and promotes the collaboration that drives the high-quality and innovative teaching and learning that is called for in our strategic plan goals.

Brookline's K-8 curriculum is created across all disciplines within our local standards, called *Learning Expectations* (LEs). We teach for understanding and mastery of the *Learning Expectations* and pay particular attention to personalization, 21st Century skills (e.g., critical thinking), Habits of

Mind (e.g., reflection), social emotional learning (e.g., respect), and non-cognitive skills (e.g., perseverance).

In addition, our goals require our curriculum, instruction, and assessment practices to prioritize the skills and essential knowledge needed to flourish in high school and succeed in the digital age. The Driscoll School will prioritize a collaborative, project-based learning approach that integrates disciplines, and engages students in working together, solving problems, investigating the world, thinking critically, demonstrating their learning, and taking action.

An overview of Brookline's educational programs follows that includes descriptions of how the new school building will support and promote this pedagogy to enable us to meet our goal of fully preparing students for their futures.

Tiered Instruction

Teachers at the Driscoll School support students through a variety of teaching models: team teaching, flexible grouping, small group instruction, co-teaching, and individualized instruction. PSB recognizes that all students learn in different ways, rates, and timeframes. To that end, the Driscoll School needs to be adaptable with its staffing support, instructional methodologies, and assessment practices.

In PSB, tiered levels of instruction provide the general education foundation in all classrooms. High quality Tier I instruction is provided to every student every day, wth Tier II support provided inside and outside of class, and Tier III interventions typically provided in a pullout or separate classroom. If a student demonstrates academic and/or social/emotional/behavioral concerns despite thorough Response to Intervention (RTI) procedures, the teacher refers the student to the building Child Study Team (CST). The CST supports teachers in implementing additional strategies. CST meetings require a professional space for collaboration.

Grouping Practices

General education teachers, in collaboration with special educators and other instructional specialists, determine a variety of grouping methods to meet the instructional needs of their students. Grouping and regrouping takes place weekly within classrooms and across a grade level. General education, special education, literacy and math specialists, ELE teachers, and ECS teachers collaborate to provide tiered instruction in an inclusive classroom environment. Pull out instruction is provided for students who require it, based on their identified need for Tier II support or Tier III interventions. Grade level classrooms should be organized within common hallways and adjacent locations. Close proximity of grade level classrooms and the necessary small group learning spaces is critical in order to achieve the requisite communication and collaboration for the variety of grouping methods used by grade level teams. Additionally, classrooms should include spaces where small groups of students can work independently, receive instructional support, and participate in interventions within the classroom.

English Language Arts/Literacy

The K-8 English Language Arts program emphasizes explicit instruction on the strategies of proficient readers and writers and meaningful exploration of Language Arts and literature.

Brookline was well positioned for the move to the Common Core State Standards. Through our rigorous Program Review process, an ambitious K-8 literacy initiative began in the 2010-2011 school year. This initiative provided a strong foundation with which to meet the demands of the Massachusetts Curriculum Frameworks. The literacy initiative, like the Massachusetts Curriculum Frameworks, emphasizes reading and writing in fiction and nonfiction. In addition, just as the Frameworks require students to read texts at ever increasing levels of difficulty, Brookline's efforts have focused on providing students access to challenging texts that support higher levels of reading achievement.

Literacy instruction in Brookline is guided by *The Continuum of Literacy Learning, PreK-8*, a comprehensive and detailed description of student proficiency in literacy in the elementary and middle grades. One of the many strengths of this guide is the broad definition of *Literacy Learning*, including:

- Interactive Read-Aloud and Literature Discussion
- Shared and Performance Reading
- Writing About Reading
- Writing
- Oral, Visual, and Technological Communication
- Phonics, Spelling, and Word Study
- Guided Reading (small-group reading instruction)

Schedules for grades 1 – 5 typically reflect a daily learning time of 60-90 minutes for English Language Arts. During this time, students receive whole class and/or small group reading instruction from their classroom teachers and may participate in a variety of language arts learning centers, allowing students to refine reading and writing skills. Students who receive targeted literacy interventions do so outside of this time. Interventions may be provided by one of the Driscoll School's literacy specialists, a special educator, or an ELE teacher.

In grades 6-8, at a minimum, students have a daily 50-60 minute block of English Language Arts instruction. Students requiring additional supports and literacy intervention typically receive targeted instruction from classroom teachers, special educators or ELE teachers during designated instructional blocks.

Teachers use multiple assessments to measure student progress, including the *Benchmark Assessment System* (BAS), running records and observational notes. In grade level data meetings, teachers examine whole class and small group instructional implications, and identify students who need individual literacy interventions. Tier II intervention includes the *Leveled Literacy Intervention (LLI)* and *Reading Recovery* (grade 1).

Although most of the reading and writing instruction takes place within the classroom environment, smaller spaces situated near classrooms are necessary to facilitate the wide range of learning and teaching that take place inside and outside the English Language Arts classroom, including student-directed and teacher-directed small groups, literacy interventions, and book discussions. The Driscoll School's literacy specialists and coaches also need space in which planning and coaching can take place. This space should be a part of one of the grade level hubs for faculty and staff described below in the Professional Learning and Teacher Planning section.

English Learner Education (ELE)

The English Learner Education (ELE) program provides services to students whose primary language is not English and who are not yet proficient in English. The program provides support at each school, with services focused on students' English language acquisition, literacy development, social integration, and academic achievement. In addition, we provide six Native Language Support Programs at seven of our elementary schools. In Native Language Support Programs the primary language of instruction and materials is English. Teachers also provide support in a student's native language for clarification purposes or additional explanation only.

The ELE program serves students outside of the classroom and, therefore, needs designated learning spaces. Like special education, placing the ELE programs in the general vicinity of the grade level clusters is intentional. Wall space and storage are also important, given the use of visuals and the need for storage of the general education program materials made available to the teachers and students in the ELE classrooms. ELE classrooms will be reflective of other learning spaces – flexible, well provisioned, and accessible, and able to be used to support small group instruction and center-based learning.

Just over 11% of the student population in our schools are English Learners so in a 800 student school, we anticipate that the ELE program will support between 90 and 100 students including those in the Russian Native Language Support Program. Small groups of students meet with EL teachers several times per week both in and out of the classroom for direct English instruction. Similarly the Native Language Support Program provides services outside of the general education classrooms multiple times per day. Because of the way they are scheduled, these two approaches can share four smaller classrooms that are organized within the cluster groupings.

Mathematics

All students, regardless of their personal characteristics, backgrounds, or physical challenges, can learn mathematics when they have access to high-quality, standards-based mathematics instruction. The goal of the mathematics program in Brookline is to develop conceptual understanding, procedural fluency, and problem solving so all students regardless of differences in cultural, ethnic, racial, language, or socioeconomic factors become well-rounded mathematical learners. By developing a growth mindset, students will be able to recognize the importance of reflecting on their thinking and learning from their mistakes. Students become confident in their ability to tackle difficult non-routine problems and willing to persevere when mathematical tasks are challenging. We also seek to stimulate student passion and curiosity so students can integrate their interest in mathematics and math-related problem solving in their academic career and as they grow up in our our evolving global, technological, and digital world.

The mathematics program is grounded in the 2017 Massachusetts Curriculum Frameworks for Mathematics, in both Standards for Mathematical Content and the Standards for Mathematical Practice and is currently undergoing a comprehensive program review.

The most effective instruction for in-depth math learning at the PK-2, 3-5 and 6-8 clusters requires flexible physical space that can adjust as instruction does. The physical space should provide for a variety of instructional approaches – individual learning, pairs and small groups engaging in mathematical discourse, whole-class instruction; furniture that can be easily configured for different groups; various surfaces like whiteboards for students to write on (either individually or in groups); technology efficiently deployed throughout the room; projection capabilities with robust internet access to provide real-life applications and simulations, examples of mathematical models, and student work. Appropriate, safe and secure storage space is also critical to accommodate the various manipulative materials that students use to make sense of mathematical ideas and solve problems.

While the K-8 mathematics program review is underway, Brookline teachers will continue to use instructional materials developed by teachers and the Math Department that align with the content and practice standards. Teachers utilize instructional practices and mathematical experiences that are accessible to all, and provide opportunities for all students to engage in meaningful mathematics. There are opportunities to work with other teachers to integrate the disciplines and highlight STEM project-based opportunities.

Students are supported and challenged in various ways through teacher collaboration with Math Specialists. Math Specialists at the Driscoll School serve as content specialists, provide coaching and planning support to teachers to strengthen Tier I instruction, and work with groups of students. Math specialists collaborate with teachers to design and provide high quality learning experiences aligned with NCTM's Effective Math Teaching Practices.Math Specialists will utilize office and meeting spaces that are located within the grade level clusters and professional workspace described below in the Professional Learning and Teacher Planning section. When working with small groups of students, math specialists need well-equipped learning spaces with access to the appropriate technology that supports math learning and assessment. The space should be adaptable to accommodate students of various ages as specialists work with teachers and students across all grade levels. Proximity to classrooms as well as other specialists is important due to frequent student transitions.

In addition, with the support of Enrichment and Challenge Support (ECS) specialist, teachers engage all students in challenging authentic learning tasks or projects that require a deep understanding of a topic. Students engage in projects or extensions that allow them to investigate math concepts more deeply. As with all other examples, this type of creative investigation requires flexible educational spaces.

Performing Arts

The Public Schools of Brookline is proud to continue a tradition of a strong performing arts department. Each K-8 school has music instruction for all students across all grades. Grades K-3 students meet for 40 minutes, twice a week for general music. Grades 4 and 5 meet for 45 minutes once a week for general music. In addition to general music classes, all grade four students begin by playing a string or band instrument, and in grade 5 choose to participate in band, orchestra, or choral ensembles. In grades 6 through 8, students may continue with band, orchestra, or chorus or take classes in music production, guitar, or general music. It is anticipated that the Driscoll School will host a variety of music concerts (choral and instrumental) and musical theater productions during the school year. At Driscoll, the music program requires four spaces - a large Band/Chorus room, two large group classrooms, and one room for grade 6-8 ensemble practice.

Driscoll's theatre program produces multiple large-scale productions (plays and musical theatre) every year, and anticipates growing and expanding in the future. Theatre and movement programs and instruction, both extra-curricular and integrated into the curriculum, require purpose built spaces. Music and theater performances will require a multipurpose space with a capacity of at least 400 people. The multipurpose space and the music rooms should be clustered together. Each of these spaces require large storage rooms for equipment, such as hundreds of folding chairs, music stands, large percussion instruments, sound equipment, guitars and ukuleles. The stage of the Multipurpose Room needs direct access to a music classroom that can serve as a backstage room during practices and performances. The stage should have wings that can provide off stage entrance and exits from stage left and stage right. A long term storage room for props and costumes is needed. A sound and light booth within the Multipurpose Room is also necessary. The small gym should be able to be used as a movement/dance studio with a fitness-studio-style flooring so it can be shared between performing arts and physical education, as well as other student programs. All of these spaces should have high-quality, built-in sound systems. In addition, acoustic separation, both internal and external, should be considered for all of these spaces.

Usage by outside and after school programs must be considered and planned for in the design of all of these spaces.

Science and Engineering

The Brookline PreK-8 Science & Engineering program is designed to actively engage students in their own learning using hands-on inquiry, outdoor learning, intriguing materials, scientific tools and high quality media (books, video and online resources) accessible to all learners. The curriculum integrates science/engineering content, science and engineering practices, and crosscutting concepts and is aligned with the Massachusetts Science Technology and Engineering Curriculum Frameworks that are based on the national Next Generation Science Standards. To inspire students to think of themselves as scientists and engineers and to reflect on how they use science/engineering practices throughout their learning we utilize the Nature of Science curriculum where students address questions such as: *What is science? Who are scientists? How and where to they work? How does science change over time based on new evidence and tools?*

In order to implement our robust and rigorous hands-on, inquiry-based science and engineering curriculum, the school requires three science labs. The labs need flexible spaces that invite and promote creativity, innovation, and collaboration including moveable tables so that open spaces can be created to allow for project-based learning. Every classroom needs to be equipped with wall space for recording questions and ideas, sinks to provide water for investigations and cleanup, space for storing tools and "making" materials (glue guns, cardboard, etc.), and adequate storage space for science materials. Sunny windows are needed to grow plants.

Outdoor learning is built into the PreK-8 science and engineering curriculum. We envision using the outdoor spaces of the school as learning labs (providing field trips right outside the school doors). Students can observe and study the natural world in areas that attract birds and butterflies through the planting of native plants. For example, students should have the opportunity to study rotting logs, observe birds at bird feeders, grow vegetables, create a milkweed/wildflower meadow to attract monarchs and other butterflies, and much more. Outdoor seating areas are also needed so that classes can go outside, not only to study science, but also to listen to stories and do other group work.

Although students will be "making" (solving real world problems by creating solutions) in their classrooms, a stand-alone makerspace (an updated version of an industrial arts shop) is needed to allow students to have a place to extend their projects. This space will provide a common area where students of all ages can meet before, during or after school to collaborate and pursue problems that are of interest to them. This space will need to be equipped with sinks, design thinking walls for recording ideas and questions, tools, tool walls, sewing machines, etc. as well as spaces for laptops or tablets.

In addition the inclusion of a Fab Lab that blends STEM (Science, Technology, Engineering and Math) skills into a unique learning opportunity would appeal to all students. Fab Labs, which are embedded in technology, allow for different learning styles to be embraced and create a collaborative environment in which students can make their ideas tangible and engage deeply in their learning. In the Fab Lab, students learn how to be project managers, engineers and designers – all at once. The lab simulates the research and development process and allows students to make everything from furniture to action figures to circuit boards. They learn what it takes to turn an image in their heads into an image on a computer screen and ultimately into a physical prototype. Typically a Fab Lab will contain equipment such as a three-dimensional (3D) printer, vinyl cutter, laser cutters/engravers, a milling machine or a computer-guided router. Such a lab will serve as a hub of invention, creation, discovery, inquiry, and sharing for students of a wide range of interests and abilities.

Ideally, the, makerspace Fab Lab, and art rooms would be centrally located or co-located to create visible areas of design, innovation, and the arts

Social Studies

The K-8 social studies department continually engages in process of curriculum revision and renewal. Across the grades, the curriculum coordinator, in collaboration with teacher-teams, develops new units of study and common assessments at a variety of grade levels. The skills and habits of social scientists are a thread throughout the K-8 social studies curriculum. Examples of content include: civics, physical and human geography, economics, and US and world history. Teachers continue to incorporate strategies for explicit literacy instruction, including how to make difficult primary texts accessible to all students. Each unit lesson includes modification and differentiation suggestions, assessment options, and identification of natural connections to other subjects to support the development of interdisciplinary units.

Teachers continue to incorporate more technology into social studies teaching, enabling them to access real-time data, utilize digital textbooks and atlases, and support the development of digital literacy that includes Internet research, online student learning activities, and diverse instructional strategies to accommodate all learning styles. Students are also taught media literacy skills to prepare them to be discerning media consumers and critical thinkers.

The social studies curriculum and instruction demand physical spaces similar to the other subjects – flexible, accessible, safe and secure storage, and wall space for visuals and student work displays. To make sure 21st Century learners can engage in classroom activities, classrooms require a combination of electrical outlets and power strips that are distributed through the classroom, along with a smart teacher control panel with USB ports that allow for easy document camera connections, interactive whiteboard equipment controls, and speakers. In addition, teachers need to be able to control natural and artificial lighting quickly. Lastly, the physical space available to students needs to go beyond the single classroom, extending into collaborative environments with breakout, presentation, project development and display space beyond a single room.

Visual Arts

The Public Schools of Brookline has a vibrant visual arts program that provides students multiple and ongoing opportunities to develop observational skills, personal expression, artistic voice, and craftsmanship using art as the visual language to communicate ideas and demonstrate understanding. The K-12 visual arts curriculum is based on a continuum of key understandings, concepts, and processes. The department continues to collaborate with other coordinators and teachers to create more interdisciplinary units in the K-8 curriculum.

The Driscoll School expansion provides an opportunity to update how we think of the physical space for visual arts instruction. The expansion can provide what's needed: two art classrooms with ample natural light and with enough space for the largest class to sit a maximum of four students per table. Also, the visual art classrooms need a separate storage area for materials, equipment, and teacher preparation and ample wall space to display student work using adhesive tape and/or T-pins. The visual art classrooms also require ample storage capacity within the classroom for artwork in process. The layout of the classroom should separate work tables from preparation/sink areas. Multiple sinks at appropriate student height and furniture sized to meet the needs of the range of grade levels and to be fully accessible to all students including those with disabilities, are required. Each art room should have its own attached storage room that can house a kiln. A contemporary visual art classroom needs a technology/media station (computers with photo/video software and Internet access) set-up to serve 4-6 students located away from paints and clay preparation. There should be ample space for whole-class teacher demonstrations, drying works of art and a printing press in each room, and space to exhibit exemplary artwork on the walls.

In the corridor outside the visual art classrooms, as well as in corridors throughout the school, there should be ample wall space designed for student artwork to be exhibited in compliance with state building and fire codes. 3D wall cases should be centrally located in the school and also close to the main entrance in order to display student work to the entire community in the most trafficked areas in the school. Displaying student work throughout the school is essential for: building a sense of pride and ownership of the space and the school; providing a public audience which serves as a natural motivator for students; and for providing models of high quality work that help to set expectations for students.

Wellness Education

The Wellness Education department provides standards-based instruction to all students across grades, K-8. Students participate in quality instructional physical education programming twice per week, for 40-45 minutes in each class. The curriculum is aligned with the Massachusetts Frameworks and the National Standards for Quality Physical Education. The curriculum follows a developmental sequence from body management competence, to fundamental skills, to specialized skills, while simultaneously addressing physical fitness and social skills.

As described in the School Scheduling Method section we require two gymnasiums, one of which is larger and can be divided so the space can be used by multiple classes concurrently without disturbing each other. The physical education facilities will require ample and appropriate storage space for large physical education equipment and supplies that can be easily accessed and set up in the gym.

The physical education department utilizes technology to enhance teaching and learning. Teachers engage students with the use of Polar Heart Rate Monitors, multiple iPad apps are used for instruction, monitoring student performance, taking pictures and videos, and to access the web-based Polar GoFit fitness assessment. The anticipated use of similar technology requires a facility with continuous wireless access and safe, secure storage.

Health Education

Students receive instruction in health education, in grades 7-8, two times per week. Health education is aligned in the Massachusetts Curriculum Frameworks and National Standards for Health Education. We strive to provide a “wellness” approach to student learning and well-being.

Wellness encompasses a culture of holistic well-being focused on educating, promoting and supporting all dimensions of health (physical, mental/intellectual, emotional, social, ethical) and aims to provide students with knowledge and habits that will help them live a longer, healthier, and more productive life. Health education is skills-based, offering students continuous opportunities to practice skills such as analyzing influences on health behaviors, decision-making, goal setting, and communication to enhance health and avoid or reduce risk behaviors. Health classes require a classroom for instructional delivery. The classroom needs to be large enough to allow for various student groupings, student movement, and fitness equipment that would allow us to modernize our health education classes and offer a wider variety of programming.

World Language

Brookline has a K-8 world language program that immerses students in language and culture beginning in kindergarten, with the ultimate goal of intermediate level proficiency for students at the end of grade 8. The curriculum is based on the "5 C's" of the World-Readiness Standards for Learning Languages: Communication, Cultures, Comparisons, Connections and Communities, and builds a solid foundation in what is known as oracy in grades K-5. While literacy entails the ability to read and write fluently, oracy is fluency in listening and speaking, or oral/aural language. Lessons are carried out through the use of songs, games, books, and other interactive activities designed to develop real-world communication skills rather than learning vocabulary words in isolation.

With a solid foundation in oracy, students are well prepared to move into literacy-based language instruction in grades 6-8. Two middle grades world language classrooms are needed. In grades 6-8, students continue to focus on oral proficiency while also developing skills in the interpretive and presentational modes of communication. Authentic materials in the target language become an essential source of input for students, requiring individual and group access to technology. As in other academic-based classrooms, flexible space is needed for students to circulate, to talk with each other, to work individually, in pairs or in small groups, and to read independently. An area where students can work quietly to listen and record while they are practicing speaking and listening independently is needed.

K-5 world language instruction takes place in the grade level classroom, and therefore is directly impacted by the distribution of classrooms throughout the building, individual classroom space, as well as individual classroom set-up. World language teachers need ample room to enter and navigate their teaching cart to the "rug area" (particularly in grades K-2) or the projection space/instructional area of the classroom. Space for full access to all sides of the cart is required: drawers on either side hold materials; a laptop and teacher organizational materials as well as large posters/books are in the rear; a magnetic white board, the center of instruction, holds a variety of visuals and other materials to support understanding of target language lessons. Grade-level classrooms clustered together would minimize world language teacher travel time between lessons within a grade level, allowing the world language and classroom teacher to touch base at the end of a lesson, to exchange quick observations about a particular student during a lesson, or to debrief an element of a lesson during the 5-minute travel time.

As K-5 world language teachers do not have one classroom in which they teach, a common office space is needed for them with a desk for each teacher, ample storage for K-5 world language materials, and space to meet with other teachers and parents.

Enrichment and Challenge Support Program (ECS)

Many students enter a grade with experiences and/or developmental sophistication that allow them to grasp concepts quickly and easily, with little repetition. These students need opportunities to apply what they know and investigate the curriculum in more depth. Some students show a level of advanced understanding that requires a more specialized response from teachers, providing time and opportunity for self-directed investigations and projects. A very small number of students may require very specialized interventions that extend outside the traditional classroom walls. The PSB Challenge Framework is a system of interconnected supports for addressing the range of needs of students who show advanced understanding of the curriculum and/or innovative and creative problem solving skills beyond their peers. PSB has shifted to a classroom-centered approach that includes, but is not limited to ECS resource teachers who have expertise in designing learning that is connected to the curriculum and addresses the needs of individuals through a project-based learning approach.

ECS Specialists work together with classroom teachers to meet the needs of their students for challenge, enrichment, and extension across all disciplines, within the classroom, throughout the school day. To provide this support, ECS Resource Teachers spend most of their time collaborating with classroom teachers in conjunction with other specialists. Collaboration among classroom teachers and ECS teachers could include:

- *Co-teaching a differentiated lesson;*
- *Working in the classroom with small groups of students or stations;*
- *Designing and implementing digital, inquiry-based, personalized, and project-based learning;*
- *Assessing students and co-planning appropriate follow-up.*

In support of this collaboration with classroom teachers, ECS Resource teachers should be located in one of the collaborative workspaces in the grade level clusters so they can easily plan with and debrief lessons with teachers. In addition, ECS Teachers will occasionally pull out students to facilitate small groups of students on Tier II enrichment interventions.

The Enrichment and Challenge Support Program is a vital component of the Public Schools of Brookline Challenge Framework and requires many of the same structural classroom components as other content areas such as: easily reconfigured furniture that lends itself to flexible student groupings and accessible areas where students can engage in the use of technology that provides Tier II interventions in the form of online courses and access to other online resources. Additionally, as mentioned in the Science section of the proposal a stand-alone makerspace and a Fab Lab are needed to allow students to have a space to engage in ongoing projects, and collaborate on and pursue problems that are of interest to them.

Library/Media Center

The school library/media center remains an integral part of the learning and school community in Brookline schools. The library/media center should be placed in the building so that it is easily accessible by classrooms and be large enough to accommodate multiple classes at once. Having moved well beyond being a repository for books and card catalogs, the media center/library can act as another learning hub that provides access to resources and tools essential to learning in the 21st century. The library/media center needs to provide large group and small group learning spaces that allow for both quiet and collaborative work. Flexible space with moveable and varied furniture will allow numerous configurations for work and learning. Space for computers and easy access to technological devices should be prevalent while, at the same time, there is a need for spaces where students can simply read comfortably without being disturbed. Group read alouds remain a central activity in the library media center and benefit form tiered or angled seating. There should be an allowance for integrated office space, workroom, and storage space to be used by the library media center staff and volunteers. Configuration, organization, and the size of the space must take into account that the library/media center is staffed by one person at most times. In Brookline's elementary schools, it is typical to have a book room integrated into the library that is overseen by the school's literacy team where class sets of books are available for teachers to access for their classes and reading groups. A well-provisioned school book room is a vital element of our literacy efforts. Beyond use by students and educators, the library/media center or an adjoining space that is integrated into the library/media center will be used as community meeting space for the PTO and similar community-based organizations.

Educational Technology

Technology and digital learning play an ever-increasing and critical role in teaching and learning, both inside and outside of schools. Technology provides an opportunity to transform learning, when used purposefully. Our classrooms need to be flexible and dynamic spaces that allow for all types of learning, have reliable access to the digital resources available to enhance teaching and learning, and operate with an understanding of the appropriate role of technology in our schools and students' lives.

In Brookline, we envision technology improving our ability to:

- Communicate and collaborate in our schools, our community, and the evolving global society;
- Create and demonstrate understanding across a wide range of disciplines such as art, design, social studies, engineering, science, and music;
- Maximize learning for all students using techniques and materials that take into account varying backgrounds, capabilities, and learning styles;
- Ensure that all students obtain digital literacy, media literacy, and digital citizenship skills that are required in the 21st century;
- Create a well-integrated, learner-centered environment focused on inquiry into engaging problems;
- Enrich and extend professional learning for all teachers and instructional leaders; and,
- Enable all school personnel to effectively and comfortably use technology as a teaching and administrative tool so that more resources and time can be focused on teaching students.

The new school building will support a variety of what are now considered basics in a school's technology infrastructure including, but not limited to: a robust and reliable wireless network to support multiple devices per user; multiple and strategically placed electrical outlets and drops for easy access, relocation and setup; sufficient space for technology closets; and well provisioned classrooms that are aligned with the current standards and anticipate new ones. Standard learning spaces should include: a wireless access point and appropriate network drops; voice over internet protocol (VOIP) phone; a mounted projection/interactive whiteboard with enhanced audio system; a district-issued teacher laptop; and a document camera. Teachers should have access to control and utilize much of this technology through a smart teacher control panel with USB ports that allow for easy document camera connections, interactive whiteboard equipment controls, and speakers. With these guidelines as the standard, there will be learning spaces that have more technology in the room and others possibly less. The technology in the room should be dependent on the educational goals and functional demands of the space.

In addition to the technology integrated into all typical classrooms, the fab lab and maker spaces will require specific space and storage requirements such as a lockable closets for materials and tools, flexible workspaces, ceiling drops for power and LAN access as well as clean spaces.

The School Building and School Setting as a Classroom

With Town Meeting committing to a fossil fuel-free school, the rebuilt Driscoll School will be on the forefront of school building design and construction in the Commonwealth. With our community and society more conscious than ever of the delicate balance between environmental sustainability and ongoing development, the new school provides the opportunity for the physical plant itself to play a significant role in the culture, educational approach and daily lives of students and teachers. Whether it's through monitoring wastewater, understanding the science behind passive and active solar power, or studying conservation and energy efficiency measures built into the new building, the physical plant can be used to help students learn about science, sustainability, and taking care of the environment. For example, signs and working exhibitions created by students could identify design elements that demonstrate architectural, structural, mechanical, and green building strategies. Student tour guides could be trained to introduce visitors to the building's features. Back-of-the-house spaces could be used as instructional spaces for students and staff, and could be used by town building and maintenance staff for hands-on training. The new Driscoll facility could stand as a physical demonstration of environmental stewardship and innovation, providing a local case study for sustainable school construction.

The design should also thoughtfully connect the school grounds with the natural resources on the school property and allow the school to:

- Create a richer teaching environment and enable pupils to connect the natural world to their daily experience in school;
- Create a sense of responsibility for and an awareness of nature within the school grounds;
- Encourage pupils to explore and understand biodiversity in their locality and to appreciate the need for environmental care on a global level; and
- Encourage pupils to value the school grounds as a place to play, explore and make a connection with the natural world.

Further, if possible, we would like to consider leaving some of the school grounds unfinished and allow students who ultimately attend this school to lend a hand in the final design and even construction of a portion of the school grounds.

STUDENT SERVICES & SPECIAL EDUCATION

Special education services throughout the district address the needs of learners with identified disabilities between the ages of three and twenty-two, who require specialized instruction to support access to the curriculum. A wide range of services is provided to meet the individual needs of students, from academic intervention to related services in areas such as speech therapy, occupational therapy and physical therapy. Availability of therapeutic services for students requiring special education intervention in the realm of social, emotional and adjustment areas is present at all schools and levels. Staff work closely with families in ensuring that necessary services are identified and provided to students in accordance with applicable mandates.

Inclusion is a core belief and practice in the Public Schools of Brookline. This educational model expects schools to meet the needs of all students by educating learners with disabilities alongside their non-disabled peers. The environment necessary to nurture and foster inclusion is built upon a shared belief system between general and special education, and a willingness to merge the talents and resources of teachers. An inclusive education helps prepare students with disabilities for an integrated adult life and builds understanding and acceptance within the broader community. In 2017-2018, 15.5% of students in Brookline had disabilities.

Physical environment impacts learning for all students and especially for students with disabilities. The physical structure of the new school building should support our inclusive approach, our commitment to providing all students an appropriate education in the least restrictive environment, and our system-wide special education programs. It is important that every student has an authentic sense of belonging and feels safe in their school. Clustering grade levels, integrating special education classes and spaces throughout the school, and providing services to students in close proximity to their cohort peers are examples of how the design of the school can support the academic and social-emotional learning goals for students with special needs.

The location of the classrooms allows staff to communicate and collaborate fluidly throughout the day on student needs and programming. To support teachers, special educators and families, the school based Education Team Facilitator (ETF) should have office space within one of the grade level cluster teacher work areas described in the Professional Learning and Teacher Planning section, and there should be one conference room that is primarily used for IEP meetings and Child Study Team meetings. This conference room should be able to hold at least 12 people comfortably.

Additionally, the new school should provide equitable access to high quality learning spaces and classrooms that are comparable in every way to general educations classes. Equitable access begins with being fully ADA compliant and includes equity in classroom quality, access to natural light and windows, the size of rooms as well as proper heating and ventilation. Special education classrooms need to be flexible and easily reconfigured, given that different students are served in the same space at different times. In addition, accessibility to a wide variety of technology options is essential. Assistive technology plays a critical role in supporting engagement and learning for students with special needs. Different devices and equipment for different purposes need to be available with supports for quick set-up and secure storage.

Learning Centers

Each Brookline school has Learning Center rooms that support students with special needs. Learning Centers are designed for students with varied disabilities who require a flexible level of services both inside and outside of a general education classroom. The Learning Centers are classroom spaces within which special educators conduct small group instruction, social skills groups, and collaborate with other related service providers to support students. Learning Center classes have a low staff to student ratio allowing for increased individualization. Students may receive higher levels of direct, specially designed instruction in academic areas within the Learning Centers. There should be four Learning Center rooms in the building with one located in each of the K-2, 3-5, and 6-8 areas. Within each Learning Center room there should be adequate space for academic support, social skills instruction, an area for sensory support and quiet academic work.

Specialized Programs

Language & Academic Home Base (LAHB)

The Language and Academic Home Base (LAHB) is a special education in-district program that serves students entering grades 2–12 who have been diagnosed with a specific learning disability. The program is appropriate for students who possess average to above average cognitive abilities. These students served by LAHB typically have well-developed reasoning and comprehension skills but often have weaknesses in processing speed and working memory. Students are also motivated to learn and have healthy social and emotional skills. The LAHB program is appropriate for students who are struggling in traditional classrooms because their reading, writing, computing, and organizational skills do not match their cognitive potential.

Students who are being supported through the LAHB program demonstrate a need for a specialized curriculum that builds reading and written language competencies across content areas in addition to a language-based approach to study skills and executive function. Instruction is provided in small groups at each grade level in a LAHB classroom. Students receive explicit instruction in their weaker academic skills and are taught compensatory strategies that draw on their stronger learning and cognitive areas. Students in the LAHB program participate in general education classes and are provided additional support in content areas such as social studies and science, as well as math when appropriate. Speech and language services are integral to this program. LAHB teachers consult with general education staff members and receive guidance from the Landmark Outreach Program.

Student Services

In addition to the special education services our educators provide, other essential services and support are provided by a wide range of specialists including school psychologists, social workers, speech/language pathologists, occupational therapists, physical therapists, nurses, and guidance counselors. In many cases, these positions are shared among more than one school, but together they represent a team-based approach to supporting students and families at the elementary level in Brookline. In order to provide coordinated services and promote collaboration among these professionals the Driscoll School should be organized into two “suites” – a Guidance and Therapy Suite and a Health Services Suite -- that are easily accessible to all students.

Guidance and Therapy Suite

The Guidance and Therapy Suite should have two separate but connected areas. One of these areas would include individual spaces for an occupational therapist, a physical therapist, and two speech therapists. The second area would have five small offices, two for school psychologists, and three for the guidance counselors. All offices should have ample storage for confidential files. All of these spaces should allow for privacy but include doors with windows that can be covered as necessary. The suite should have a small area where students can wait prior to receiving services and access to a conference room to be used for parent meetings and social skills groups.

Health Services Suite

The Health Services Suite houses the nurse and allows students to be checked, receive services, or wait comfortably for a parent, guardian or family member to pick them up. The Health Service Suite requires an entry or reception area where students can await services, a treatment area that includes four cots/beds, a bathroom, and a space for private meetings and confidential consultations. There should also locked storage, a sink, and a refrigeration unit in the nurse’s office.

Motor Room (Occupational and Physical Therapy)

Students require occupational and physical therapy multiple times per week. These services include physical exercise, strength building, balance skills, and fine and gross motor skills development. The occupational and physical therapists provide these services in a dedicated space called a Motor Room that has specialized equipment and sufficient space. The Motor Room should be the size of a regular classroom.

SCHOOL CULTURE AND SOCIAL EMOTIONAL LEARNING

It is the mission of the Public Schools of Brookline (PSB) to ensure that every student develops the skills and knowledge to pursue a productive and fulfilling life. To truly live this mission, it is essential that our schools are safe, welcoming, respectful and nurturing. Such a culture is created when everyone in the school is aligned to requisite beliefs, values, and behaviors. Children need to learn these beliefs, values and behaviors, and adults need to model, guide, and explicitly teach them to children using intentional strategies in order to establish a culture conducive to learning.

To support a positive, collaborative, and welcoming culture, the physical structure of the school needs to provide gathering spaces to promote social interaction and engagement among students and adults. The rebuilt and expanded Driscoll School needs to facilitate and encourage connections among grade levels and across the disciplines, be welcoming by design, and show evidence of collaboration, respect, and high expectations with student work prominently displayed throughout the school, all of which support the social emotional learning of students

Responsive Classroom (K-5) and *Developmental Design* (6-8) currently represent the core social emotional curriculum in Brookline. Our approach to social emotional curriculum requires classroom meeting areas to conduct "morning meetings" in grades K-5 and advisory groups in grades 6-8. Each classroom should have an area available for these class meetings and other similar functions that is appropriate for the age range.

OUTDOOR SPACE FOR PHYSICAL ACTIVITY

The use of outdoor spaces for physical education, athletics, recess, and curriculum-based learning will be an integral part of the learning at Brookline's new PK-8 elementary school. A play area specifically for prekindergarten and/or the PK-2 grade cluster is necessary with easy access for these grade levels, and should provide equipment and play spaces that serve all ages in PreK-2. Space for grades 3-5 and 6-8 play areas can be integrated as long as they contain a variety of spaces and structures appropriate for the broad developmental and recreational needs of this age span. All outdoor spaces should provide natural play spaces as well as traditional play structures

The large gymnasium should also have easy access to the outdoor field and play areas and be fully accessible. Space for a school garden that could be maintained by volunteers, staff, and students and integrated across the K-8 science curriculum, should be available in close proximity to an exit.

PROFESSIONAL LEARNING AND TEACHER PLANNING

The new elementary school's physical spaces will support a culture of professional learning characterized by: shared norms and values; a focus on student learning; making professional practice more visible; collaboration; and, inquiry, reflection, and analysis. We have moved past the mindset of a classroom teacher only being responsible for the general education students in his or her classroom toward a team approach that better balances the essential community of a classroom with the collective responsibility of a team of adults ensuring that every student succeeds. The physical spaces where teachers meet and collaborate need to support this shift towards a professional learning culture and teams of adults taking responsibility for the success of all of their students.

As designers of learning, teachers will spend time planning with colleagues to create the best learning experience for all students. Educators need appropriate and well-provisioned spaces to gather to discuss student learning, share instructional practices, analyze data, determine next steps for instruction, participate in webinars, review student work, vet online resources, and read and discuss the contemporary literature of the profession. Each grade level span (PK-2, 3-5, and 6-8) will require the meeting space necessary for this variety of professional collaboration and learning. The hub of each grade level cluster should be a work area for teachers that replaces individual, isolated desks within a classroom. This work area should have tables for group work, storage for materials and professional resources, and individual workspaces. Adjacent to this work area will be a small conference room for meetings for grade-level teacher teams

Professional learning also includes instructional coaching by staff members in a variety of roles including: Math Specialists, Literacy Specialists and Literacy Coaches, Educational Technology Specialists (ETS), Librarians, and Enrichment and Challenge Support (ECS) teachers. Office space for these professionals should be embedded in the grade level hubs described above so when they are not working with students, they can more easily collaborate with colleagues and be more readily integrated into the work of grade-level teams.

LUNCH PROGRAMS

The mission of Food Services is to provide healthy, tasty, high-quality, sustainable, affordable meals to the students and staff of the Public Schools of Brookline. Breakfast and lunch are served at all nine schools in the district. As part of the National School Breakfast and Lunch Program, we follow guidelines set by the USDA regulating what qualifies as a healthy breakfast and lunch. Meals are cooked from scratch, using real food, and we are continually looking for ways to improve our school meals.

The Driscoll School cafeteria should be large enough so that the entire school is able to eat lunch over the course of three lunch periods. An appropriately sized cafeteria will ensure that the Driscoll School can both start and end lunch at appropriate times.

Students typically pay for lunch using online accounts that allow families to pre-pay for student meals and provide easy access for food service workers to children's allergy information and dietary restrictions.

TRANSPORTATION POLICIES

The Massachusetts Department of Elementary and Secondary education requires that communities offer transportation to elementary school students who live more than 2.0 walking miles from their districted school. In Brookline, the public schools provides bus transportation for K-8 students residing more than 1.5 walking miles from their districted school. These students are transported at district expense. All students in Grades K-6, who live less than 1.5 miles from their school, are responsible for their own transportation. The district does make exceptions for students whose needs are "safety" related. K-6 students who live 1.5 miles or more from the school may opt to purchase a bus pass in accordance with the MBTA fee schedule. Special education transportation services are separate from regular bus transportation.

The Driscoll School will provide transportation to students with a wide variety of transport needs. In addition to vans for any specialized programs for students with disabilities and one bus for students in the METCO program, we believe two buses will be required to transport students to and from school.

SAFETY, SECURITY AND ACCESS REQUIREMENTS

As with all Brookline schools, safety and security is of the utmost importance. Students, families, and our staff need to feel safe and secure in their school community in order to take full advantage of all educational opportunities. At the same time it is essential to provide the necessary level of security without impacting the building's physical organization or sense as an inviting and open learning environment for students, teachers, parents, and visitors. There needs to be a balance between the type of open, accessible learning spaces that encourage sharing and collaboration with the need to have safe and secure classrooms when needed. It is possible and necessary to prioritize light, glass, and openness and still institute necessary safety measures. Safety and security measures should be designed and integrated in ways that allow for future enhancements. The following features should be considered as part of the school design:

- Access Control to rooms and spaces that utilizes a security access fob device by authorized staff that can also be controlled centrally
- Visual Security of entrances utilizing a video monitoring/recording system that will be monitored at the school secretary's desk
- Safe and well lit staff parking
- Safe and well lit visitor parking
- Safe pathways for pedestrians and bicyclists coming from varied directions to the school
- Safe bus and van access that does not interfere with drop off and pick up traffic
- Safe recess grounds and play areas that can be properly supervised by staff and protected from vehicular traffic
- Open and easily visible front access to the school
- Safe access for kitchen, facility and shipping/receiving separate from school traffic at the main entrance
- Safe and appropriate access to the perimeter of the building and play areas

2.2 Space Summary

Please reference the following Driscoll School Space Summary.

FINAL DRAFT
3/13/2019

Driscoll School Project - Schematic Design Space Summary

(light shading)	= Change from Feasibility Study
(yellow)	= Change from MSBA Template
(orange)	= Renovation Space at CCS

4 Section School + District-Wide SWD Program + District-Wide ELL Program	Proposed DRISCOLL 800 Students			Existing DRISCOLL			COOLIDGE CORNER (For Reference) 1,010 Students			MSBA GUIDELINES (For Reference) 758 Students		
ROOM TYPE	ROOM NFA	# OF RMS	area totals	ROOM NFA	# OF RMS	area totals	ROOM NFA	# OF RMS	area totals	ROOM NFA	# OF RMS	area totals
CORE ACADEMIC SPACES			**48,450**			26,047			**55,710**		**37**	**34,290**
Pre-Kindergarten w/ toilet	1,200	3	3,600	1,011	1	1,011	1,225	2	2,450	1,200		-
Kindergarten w/ toilet	1,200	4	4,800	*918*	3	2,754	1,174	5	5,870	1,200	4	4,800
General Classrooms - Grades 1-5	840	20	16,800	*903*	15	13,539	890	25	22,250	950	18	17,100
General Classrooms - Grades 6-8	840	12	10,080	*738*	6	4,426	891	15	13,370	950	9	8,550
Teacher Planning Grades 1-8	50	32	1,600									
Science Classroom / Lab	1,200	3	3,600	*771*	2	1,542	1,193	3	3,580	1,200	3	3,600
Prep room	80	3	240				133	3	400	80	3	240
ELE Small Classroom	450	4	1,800	410	1	410	297	3	890			
Project Areas	400	6	2,400				231	9	2,080			
Small Group Room / Literacy & MathSpecialists	250	6	1,500	*201*	4	803						
Literacy and Math Specialist												
Literacy Specialist K-2							170	1	170			
Literacy Specialist 3-5							155	2	310			
Literacy Specialist 6-8							150	2	300			
Small Group/ Math Specialists												
Math Specialist K-2							215	2	430			
Math Specialist 3-5							155	2	310			
Math Specialist 6-8							0	0	0			
Enrichment Challenge Support	250	1	250				230	1	230			
ELE Typical Classroom												
Teacher Planning ELE												
World Language Classrooms	840	2	1,680	*781*	2	1,562	850	2	1,700			
World Language Teacher Planning	50	2	100									
Small Group Rooms												
Small Group Rooms - Grades K-2							157	3	470			
Small Group Rooms - Grades 3-5							150	3	450			
Small Group Rooms - Grades 6-8							150	3	450			
SPECIAL EDUCATION			**7,420**			5,088			**10,980**			**7,560**
Learning Center PK-8	450	4	1,800							950	6	5,700
Learning Center Teacher Planning	50	4	200									
SWD Classroom PK-8 toilet										60	6	360
De-Escalation Room	50	1	50									
LAHB Classroom	840	3	2,520	*675*	6	4,052						
LAHB Teacher Planning	50	3	150									
Resource Room - LAHB	450	1	450				450	1	450			
										500	3	1,500
Speech	150	2	300	142	1	142	147	3	440			
OT / PT	950	1	950	894	1	894	1,090	1	1,090			
OT / PT Office	150	1	150									
Special Ed Team Facilitator	150	1	150				150	1	150			
BCBA	150	1	150				150	1	150			
Psychologist	150	2	300				150	1	150			
Special Education Conference	250	1	250				130	1	130			
Therapeutic Learning Center Small Group K-2							190	2	380			
Therapeutic Learning Center Chill Out K-2							90	1	90			
Therapeutic Learning Center Relax K-2							80	1	80			
Comprehensive Learning Center K-2							380	1	380			
Comprehensive Learning Center Chill Out K-2							70	1	70			
Shared CLC/ LC Office K-2							100	1	100			
Therapeutic Learning Center Large Group 3-5							360	1	360			
Therapeutic Learning Center Small Group 3-5							200	2	400			
Therapeutic Learning Center Chill Out 3-5							80	1	80			
Therapeutic Learning Center Relax 3-5							100	1	100			
Comprehensive Learning Center 3-5							410	1	410			
Comprehensive Learning Center Chill Out 3-5							70	1	70			
Shared CLC/ LC Office 3-5							110	1	110			
Self-Contained SWD - Grades 1-5 toilet												
Self-Contained SWD - Grades K-2 toilet							60	1	60			
Self-Contained SWD - Grades 3-5 toilet							60	1	60			
Self-Contained SWD - Grades 6-8												
Therapeutic Learning Center Large Group 6-8							360	1	360			
Therapeutic Learning Center Small Group 6-8							200	2	400			
Therapeutic Learning Center Chill Out 6-8							80	1	80			
Therapeutic Learning Center Relax 6-8							100	1	100			
Comprehensive Learning Center 6-8							400	1	400			
Comprehensive Learning Center Chill Out 6-8							70	1	70			
Shared CLC/ LC Office 6-8							110	1	110			
Self-Contained SWD - Grades 6-8 toilet							60	1	60			
Learning Center K-2							470	2	940			
Learning Center 3-4							400	1	400			
Learning Center 5-6							400	1	400			
Learning Center 7-8							450	1	450			
Special Education Team Clerk							100	1	100			
Special Education Records							60	1	60			
Special Education Waiting							390	1	390			
Special Education Conference							170	1	170			
TLC Social Worker							150	1	150			
Psychologist							170	1	170			
Psychologist / Social Worker Conference							280	1	280			
Psychologist / Social Worker Safe Room							70	1	70			
Psychologist / Social Worker Testing							80	1	80			
Psychologist / Social Worker Waiting							430	1	430			
Life Skills Store												
ART & MUSIC			**11,820**			5,466			**13,990**			**7,225**
Art Classroom - Grades K-5	1,000	1	1,000	630	1	630	1,020	2	2,040	1,000	1	1,000
Art Classroom - Grades 6-8	1,200	1	1,200				1,180	1	1,180	1,200	1	1,200
Art Workroom w/ Storage & kiln	150	2	300	300	1	300	160	3	480	150	2	300
Band / Chorus - 100 seats	1,500	1	1,500	790	1	790	1,810	1	1,810	1,500	1	1,500
Music Classroom / Large Group - 25-50 seats	1,200	2	2,400	866	1	866	1,185	2	2,370	1,200	1	1,200
Music Practice / Ensemble - Small	75	0	-				80	4	320	75	3	225
Music Practice / Ensemble - Large	100	2	200				280	1	280	200	1	200
Multipurpose Room	3,500	1	3,500	2,880	1	2,880	3,780	1	3,780			

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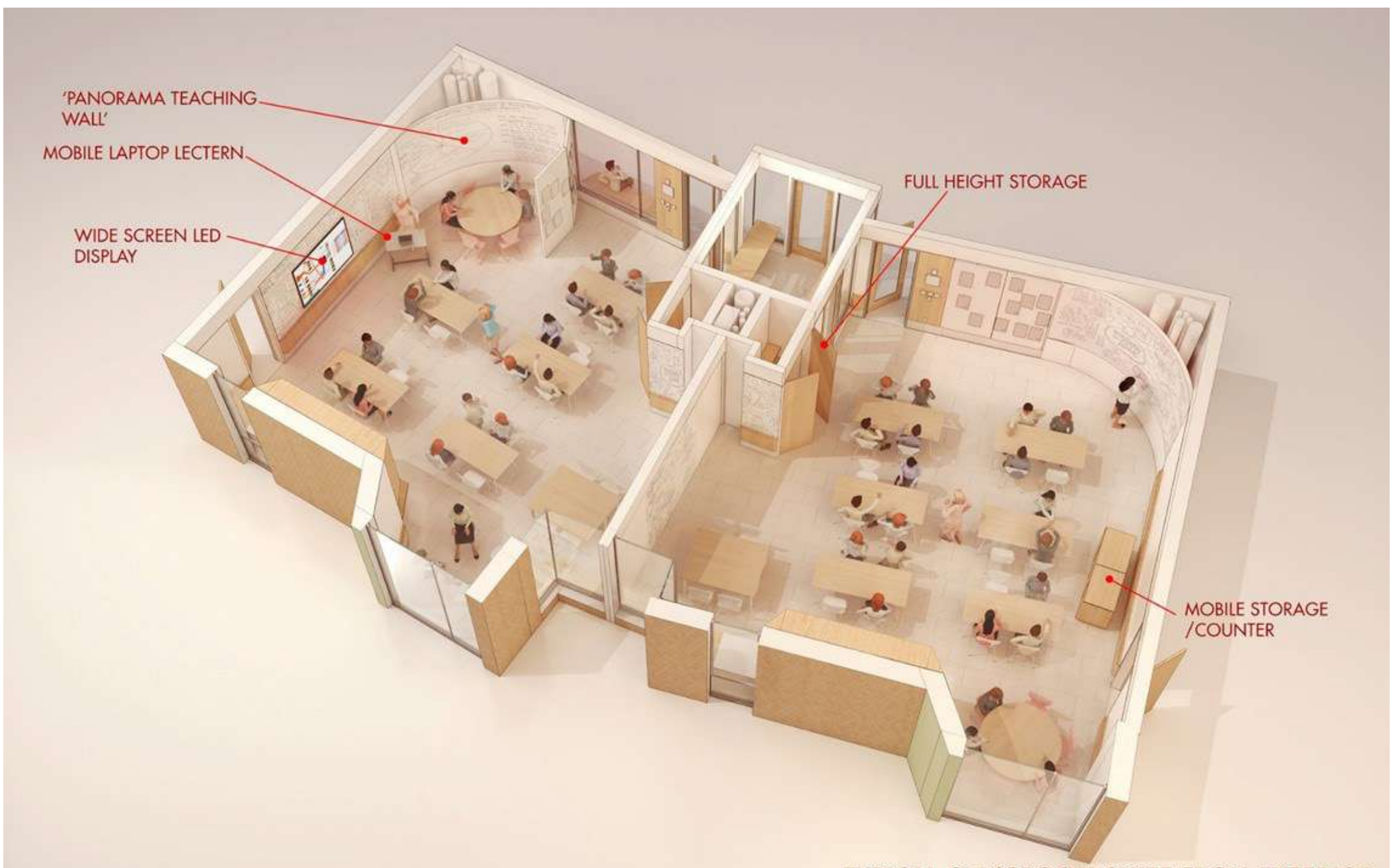
ROOM TYPE	ROOM NFA	# OF RMS	area totals	ROOM NFA	# OF RMS	area totals	ROOM NFA	# OF RMS	area totals	ROOM NFA	# OF RMS	area totals
Stage	1,600	1	1,600				1,600	1	1,600	1,600	1	1,600
Multipurpose Chair Storage	120	1	120				130	1	130			
VOCATIONS & TECHNOLOGY			**2,950**			811			**2,970**			**3,200**
Tech Clrm. - (E.G. Drafting, Business)	950	1	950	811	1	811	910	1	910	1,200	1	1,200
Tech Shop - (E.G. Consumer, Wood)	2,000	1	2,000				2,060	1	2,060	2,000	1	2,000
HEALTH & PHYSICAL EDUCATION			**11,220**			4,770			**10,680**			**8,333**
Gymnasium	6,000	1	6,000	3,840	1	3,840	6,120	1	6,120	6,000	1	6,000
Gym Storeroom	210	1	210				210	1	210	150	1	150
Gym Storeroom	80	1	80				80	1	80			
Health Instructor's Office w/ Shower & Toilet	180	1	180				220	2	440	183	1	183
Locker Rooms - Boys / Girls w/ Toilets	400	2	800				420	2	840	1,000	2	2,000
Small Gym	3,000	1	3,000	930	1	930	2,990	1	2,990			
Health/Fitness Classroom	950	1	950									
MEDIA CENTER			**4,310**			4,130			**5,170**			**4,300**
Media Center/Reading Room	4,000	1	4,000	*1,865*	2	3,730	4,860	1	4,860	4,300	1	4,300
Media Center Office	140	1	140	100	4	400	140	1	140			
Media Book Room	170	1	170				170	1	170			
DINING & FOOD SERVICE			**6,787**			5,938			**7,850**			**8,485**
Cafeteria / Dining (2 seatings)										5,685	1	5,685
Cafeteria / Dining (3 seatings) / Multi-Use	4,000	1	4,000	3,175	1	3,175	5,100	1	5,100			
Kitchen	1,800	1	1,800	1,566	1	1,566	1,790	1	1,790	2,058	1	2,058
Kitchen Office	70	1	70				70	1	70			
Kitchen Storage	60	1	60	409	1	409	60	2	120			
Kitchen Toilet	60	1	60				200	1	200			
Kitchen Custodial	30	1	30				30	1	30			
Chair / Table / Equipment Storage	467	1	467				540	1	540	453	1	453
Staff Lunch Room	300	1	300	788	1	788		0		290	1	290
MEDICAL			**710**			244			**720**			**710**
Medical Suite Toilet	60	1	60				100	1	100	60	1	60
Nurses' Office / Waiting Room	250	1	250	244	1	244	290	1	290	250	1	250
Examination Room / Resting	100	4	400				190	1	190	100	4	400
Examination Room / Resting							70	2	140			
ADMINISTRATION & GUIDANCE			**5,965**			1,798			**4,920**			**3,231**
Principal's Office w/ Conference Area	375	1	375	335	1	335	350	1	350	375	1	375
Principal's Secretary / Waiting	125	0	-					0	0	125	1	125
Assistant Principal's Office - AP1	130	1	130	280	1	280	140	2	280	130	1	130
Assistant Principal's Office - AP2	130	1	130				230	1	230	130	0	-
General Office / Waiting Room / Toilet	510	1	510	331	1	331	870	1	870	512	1	512
Conference room	285	1	285				300	1	300	283	1	283
Teachers' Mail and Time Room	100	1	100				370	1	370	100	1	100
Duplicating Room	165	1	165					0	0	167	1	167
Records Room	140	1	140				130	1	130	140	1	140
Supervisory / Spare Office	130	1	130				110	1	110	130	1	130
General Waiting Room	100	1	100	652	1	652	120	1	120	100	1	100
Guidance Office	150	3	450	100	2	200	305	2	610	150	4	600
Guidance Storeroom	40	0	-				40	2	80	40	1	40
Professional Learning and Teacher Planning												
Teachers' Work Room	500	3	1,500				1,010	1	1,010	529	1	529
Small Conference Room	250	3	750									
Specialist Collaborative Workspace	250	3	750									
World Language Office	150	2	300				310	1	310			
METCO Office	150	1	150				150	1	150			
CUSTODIAL & MAINTENANCE			**2,995**			1,408			**4,920**			**2,316**
Custodian's Office	150	1	150	200	1	200	120	1	120	150	1	150
Custodian's Toilet / Shower							90	1	90			
Custodian's Workshop	335	1	335				450	1	450	333	1	333
Custodian's Storage	375	1	375	375	1	375	470	1	470	375	1	375
Storeroom	500	2	1,000	258	1	258	668	4	2,670	505	1	505
Recycling Room / Trash	400	1	400				270	1	270	400	1	400
Receiving and General Supply	355	1	355	400	1	400	380	1	380	353	1	353
Network / Telecom Room	150	2	300	175	1	175	390	1	390	200	1	200
Outdoor Storage	80	1	80				80	1	80			
OTHER			**1,300**			409			**13,120**			**0**
Other *(specify)*												
Extended Day Storage	420	**1**	420	409	1	409	420	1	420			
Extended Day Office	320	**1**	320				320	1	320			
PTO	380	**1**	380				380	1	380			
Staff Showers	90	**2**	180				90	2	180			
Mechanical / Emer Generator							11,820	1	11,820			
Total Building Net Floor Area (NFA)			**103,927**			***56,109***	**(MSBA -**	**104,588)**	**131,030**			**79,652**
	K-5	504		K-5	400							
Proposed Student Capacity / Enrollment			**800**			***616***			**1,010**			**758**
	6-8	252		6-8	216							
Total Building Gross Floor Area (GFA)[2]			**155,890**			***98,000***	**(MSBA -**	**156,882)**	**196,979**			**119,477**
	BEEP	44										
Grossing factor (GFA/NFA)			**1.50**						**1.50**			**1.50**

2.3 Proposed Project and the District Educational Program

The design of the new Driscoll School is based on the approved space summary and educational program from the Feasibility Study. Qualities and objectives of the curriculum that played a primary role in determining the configuration of the new building include:

- Small-scale learning communities
- Collaborative learning
- Collaborative teaching
- Visible learning
- Flexible learning
- Community engagement
- Civic place making
- Community accessible performing arts and athletic facilities
- Driscoll Staff feedback
- Driscoll Parent feedback
- Driscoll music and performing arts programs



TYPICAL CLASSROOM SUITE FROM EXTERIOR

Interior view of central atrium with communicating stairs.

Small-Scale Learning Communities

The building will be arranged into three small-scale learning communities or cohorts. These are arrayed with connecting stairs, clustered around collaboration balconies. The communities are shaped by not only by the array of classrooms on each level (which are specific to their cohort) but also by the formation of a center called the project area cohort commons for each floor. Each cohort has an expanded balcony with connecting open stair between adjacent levels and is meant as a place of arrival, a place of flexible learning, of group collaboration and as a place for students to create the social bonds that eventually lead to exchange of ideas and creation. Through the creation of strong cohort identity, all the students within their groups will be known to one another and will be known individually to the associated staff.

Collaborative Learning

The configuration of the new building will foster collaborative learning on a number of different levels. First and foremost is the arrangement of the classrooms. The classrooms are sized to allow multiple centers of learning to operate simultaneously within the confines of the room. This flexibility is facilitated by the large Classroom size of 840 sf. The size will allow adequate separation for the simultaneous grouping of students working within the room.

Secondary to the Classrooms, a series of project areas are also provided in the Learning Commons. These collaborative learning spaces allow for small-scale student groupings around work or socialization and allow for mentoring of small groups of students by the faculty. The Breakout rooms are open and are positioned so students can be supervised from the adjacent Classrooms and nearby Teacher Planning Offices.

Collaboration will also occur among the students in the Learning Commons and adjacent Media Center. At the first floor level, these rooms will provide a continuous place of learning, project activity and socialization to be adapted by the students and the faculty as the needs of the curriculum evolve. These collaborative activities can take the form of anything from group work around conference tables, small group work around monitors or laptops and physical projects from the Fabrication Lab or Art space. The Fabrication Lab and Makerspace are additionally provided with direct access to an outdoor "Maker Terrace".

Collaborative Teaching

Building on the Feasibility Study proposal and input from staff, the team focused on the relationship between teachers and how team teaching could be enhanced. Each pair of classrooms can be opened up to combine the 2 rooms. When open, the two classrooms constitute a larger learning group as a basis for selecting collaborative partners in creating a greater range of project-based activities. At the same time, the pairing of classrooms allows for intimate collaboration, inspiration and mutual observation by pairs of teachers. Collaboration is further supported by the shared teacher preparation offices, which are embedded between paired classrooms while at the same time looking outward into the public space of the school. Teachers may also gather in a variety of group sizes to collaborate in the various staff collaborative workspaces, and in the dedicated central conference room.

Small scale student grouping project area

Classroom with multiple centers of learning.

Visible Learning

A core principle of 21st century education concerns the ability of students to influence and inspire one another as much as they are influenced and inspired by their teachers and mentors. To this end, the new school is arranged, unlike a conventional school with its cloistered corridors, as a largely transparent and multi-directionally interconnected interior. This occurs both in the horizontal dimension and in the vertical dimension. In the horizontal dimension, occupants are able to look across the central learning commons space to see the activities that are going on throughout the floor. This is also true of the glazed teacher preparation areas, where mentoring and specialized student work is on display.

In the vertical dimension, the balconies and open stairs allow for students and teachers to be aware of activities and work product on display from one floor to another. The Fab Lab, Maker Space, Science Labs and Art rooms are meant as demonstration platforms; the exploration and discovery that occurs within them is shared publicly due to their prominence in the learning commons area. As a corollary to visible activity, the school will also feature many locations for visible work product, including public exhibit space, display walls, galleries and the wide-open project floor areas of the cafeteria and cohort commons. Outdoor display space for on-going projects is provided outside the Maker Space and Fab Lab.

Flexible Learning

Insofar as 21st century education relies on the spontaneous initiative of the students, spaces throughout the school are conceived as highly

View of cloistered corridors as a largely transparent and multi-directionally interconnected interior.

adaptable and highly configurable according to the needs of the curriculum and the students' initiatives. This includes the combinable classrooms described above. It also relates to the commons area themselves whether on the whole school level or on the cohort level.

These spaces are intended to be built without fixed furnishings so that there can be a wide variety of use by the school community - from individual study to group learning activities, whether in class size events or dispersed among many small pairings of students. Given that pedagogy is constantly evolving and will move in directions that we cannot know today, the intent of the building over the long term is also to be adaptable. Responding to this need, the building is planned modularly using a standard spacing of walls which can accommodate a variety of changes over the decades to come.

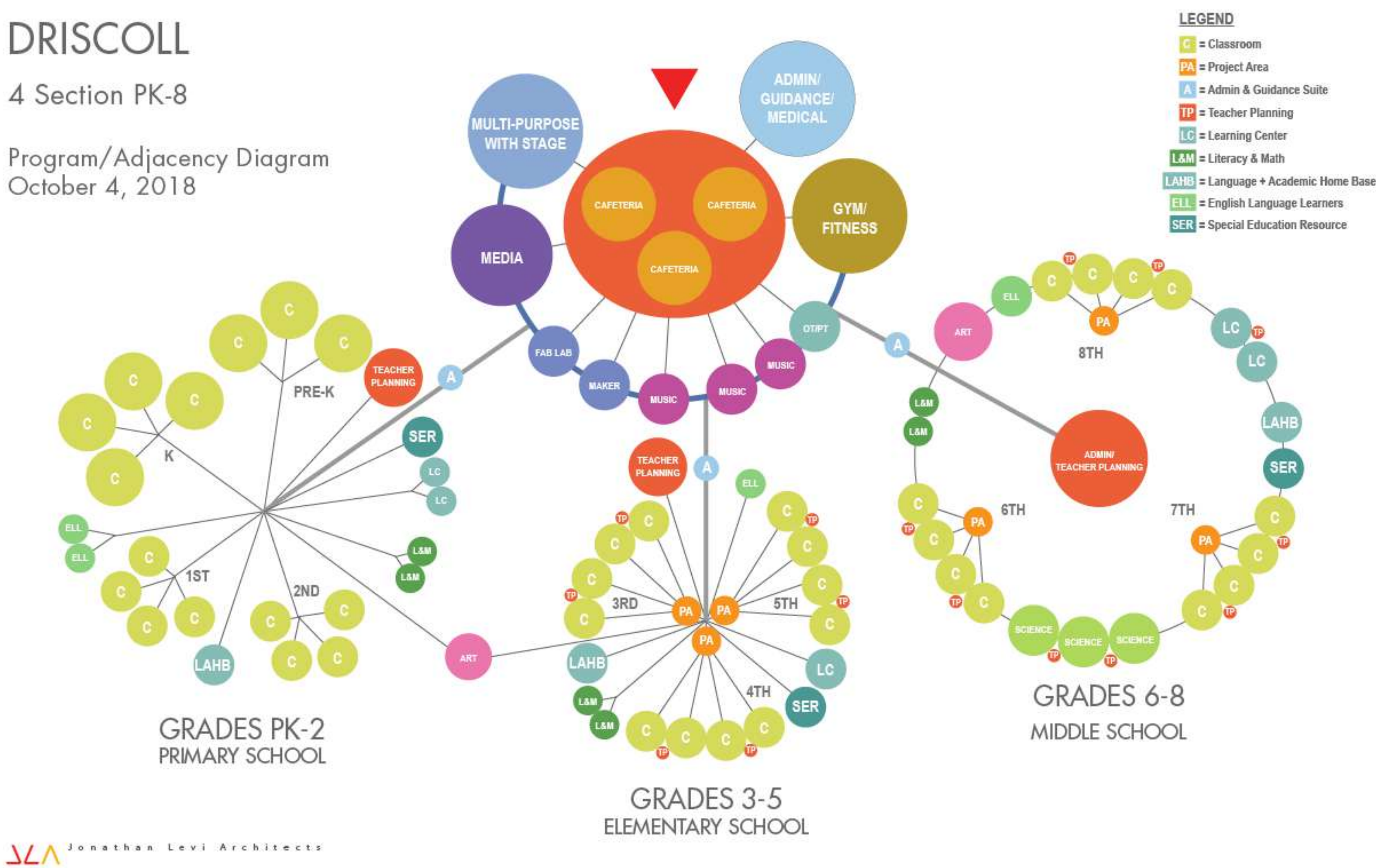
2.4 Functional Relationships and Adjacencies

Functional relationships for the new Driscoll School are best described in the program "bubble" diagram developed in the Feasibility Study submission. The highlights of which are as follows:

- Typical open balcony cohort commons form the lynchpin of each classroom wing cluster by connecting floors with open stairs and forming an active 'pass through' location which invites students and teachers to interact.
- Central learning cafeteria/learning commons placed at the heart of school life invites day-long activity and participation. The space can be partially or fully cordoned off depending on community use mode. The cafeteria/learning commons is overlooked by

balconies from each of the upper floors of the school.

- Main administration is centrally located at the middle of the first floor of the building, co-located with the entrance.
- Prominently located teacher workspace and professional development areas are part of each cohort area.
- Guidance areas are accessible from both central administration and common areas.
- Maker space is situated prominently and conjoined with the fabrication laboratory next door.
- The Media center is directly adjacent to the learning commons and is also directly opposite and visible from the main entrance in order to encourage student engagement and interactivity.
- Art classrooms are placed prominently looking into the main cafeteria/learning commons
- Music and chorus classrooms form a suite at the southeast corner of the cafeteria/learning commons and are placed in convenient proximity to the stage for use as a green room.
- Multi-Purpose Room is located with convenient community access lobby.
- Gymnasium and Cafeteria/Learning Common have convenient



access to the play fields.
- Service and storage along with shared facilities maintenance quarters are located, together with loading dock storage amenities in proximity to the existing service alley. The loading area is convenient to the Kitchen.
- Science classrooms are placed prominently looking into the main cafeteria/learning commons
- Classroom cluster pairs are grouped around glass-enclosed teacher preparation offices.
- Special Education spaces are dispersed throughout the school.
- Student bathrooms are efficiently located for easy access both from the classroom wings and from the cafeteria/learning commons.

2.5 Security and Visual Access

General Description:
The floor plan of the new school has been organized to allow for a prudent balance between the need for school security and the need for a warm and welcoming environment for the students, staff, and families. The transparency and interconnectedness, which are desirable features of the educational program, also make for a favorable scheme for internal school security. The open floor plans provide a high degree of visual access from one portion of the school to another. This has been enhanced through the fine adjustment of classroom corridors to allow sightlines to connect the far corners of the school. All the classroom corridors include passive supervision from both teacher planning spaces and Project Areas.

Regarding security for the school from the visitors' perspective, the central administration has been located adjacent to the main entrance of the school at the first floor level at Washington Street. Broad expanses of glass will allow observation of approaching visitors from the main school reception desk to the entrance approach and to the vestibule. The main entrance approach is configured with an outer covered area and an inner vestibule. The progress of an intruder can therefore be impeded at either line of doors. It is intended that the vestibule will be attended by administrative personnel facing into the vestibule from the central administration area. The administration area is safeguarded behind a glass wall partition with a locking door.

Upon arriving, visitors will follow the following procedure to be verified during the Detailed Design Phase:
1. Visitors will ring the bell located at the exterior door:
2. Through the voice intercom system, visitors will be asked to identify themselves and if they have an appointment in the building.
3. Once this information is received and verified for accuracy, visitors will be let into the vestibule.

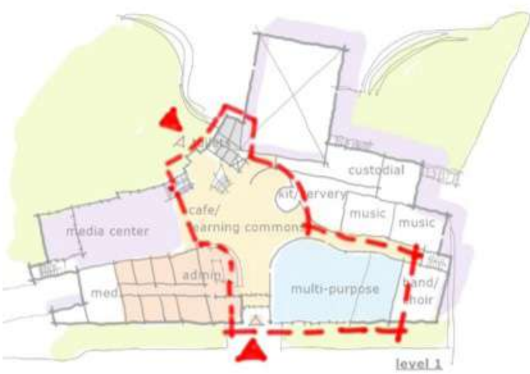
4. Visitors will need to present driver's license or other valid form of identification.
5. After passing clearance, visitors will be issued a visitor badge.
6. Visitors who do not gain clearance, may be asked to leave the building immediately.
7. Anyone given a visitor badge will have staff accompany them to the designated location.
8. No visitor can ever be left unattended.

In the instance of an intruder who has successfully passed through the outer security measures of the school, an intruder alarm system will be in place and can be triggered. Additionally, all classrooms will be provided with roll down shades at windows facing the corridor, so that an intruder could not look directly into classrooms. It should be noted that the intruder alarm strategy will not interfere with life safety issues during a fire alarm.

In order to allow for community access, the school is also compartmentalized for usage modes in addition to those used during school hours. Access will be allowed through the main entrance vestibule to allow the community to utilize the Auditorium, athletic facilities, and locker rooms. This vestibule will be outfitted with electronic door locking hardware, which may be accessed and operated remotely by the school or school security. Sliding metal fabric partitions will prevent access to the main school space.

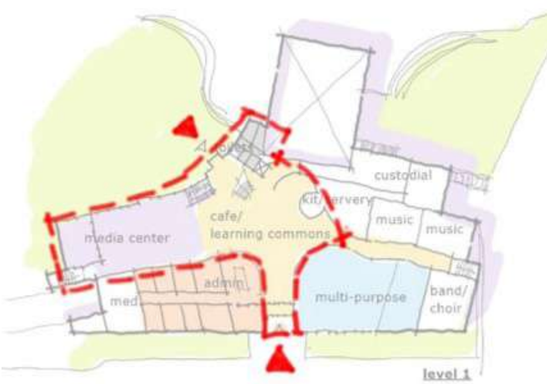
2.6 Modes of Operation

The new Driscoll School is designed so that areas may be sectioned off and provide secure access during specific events at off hours.



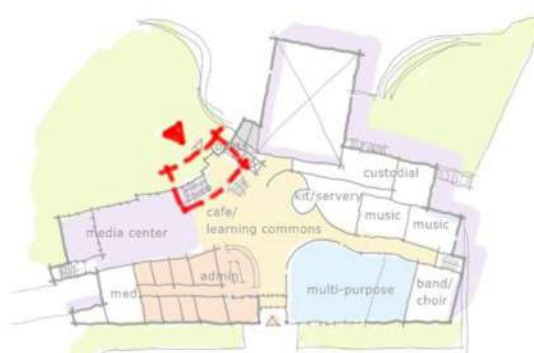
Multi Purpose Room/ Performance

Learning Commons/ Cafe



Media Center/ Learning Commons

Playfields



Athletics

2.7 Site Development

Open Space

The usable open space resulting from the new school is significantly larger than what is presently available on site. The play area, stretching out to the west, will be consolidated into a new playfield much larger than the present one. The new community open space will be in the midst of the residential neighborhood where it belongs, while shifting the bulk of the building's mass adjacent to the commercial center of Washington Square. The new open space also properly relates recess play areas to the cafeteria, creating fluid circulation between the interior

Open Space Diagram

	LOT	BUILDING		OPEN SPACE			
Concept Alternative	Total Lot Area	Building GSF	Building Footprint	Usable Play Area (with tennis)	Vehicle / Pedestrian	Unutilized Area	Total Open Area
Existing	173,000 SF	97,000 SF	39,500 SF	72,500 SF	32,000 SF	29,000 SF	133,500 SF
H Modified Star	173,000 SF	155,500 SF	42,000 SF	97,000 SF	21,500 SF	12,500 SF	131,000 SF
Lincoln	187,308 SF	87,500 SF	44,369 SF	61,851 SF	13,633 SF	67,455 SF	142,939 SF
Runkle	132,858 SF	104,800 SF	52,609 SF	40,446 SF	0 SF	39,802 SF	80,248 SF
Coolidge Corner	292,723 SF	200,000+ SF	88,880 SF	143,211 SF	6,982 SF	53,650 SF	203,843 SF

Open Space Matrix

and exterior where it is needed. The area in the northeast quadrant of the site may be used as a flexible play area for the Pre-K kids in the adjacent classrooms.

The programming and design of the open play space will take place in the next phase of work, utilizing Brookline's established DAT process in coordination with the Parks and Recreation Department and neighbors.

The storm drain which traverses the site would be relocated to swerve around the building to the south, reconnecting to the midpoint of the service way to the east.

Parking and Drop-Off

The new site plan properly separates sufficient parent drop-off on Westbourne Terrace from service vehicle movements off of the east alley and from the bus drop off along Washington Street. The rights of passage at both the east and the west will be maintained.

The school will need a maximum of approximately 120 parking spaces for teachers, which could be reduced by the implementation of a transportation demand management plan (TDM plan). Per direction from the Brookline Transportation Board, 25 spaces will be provided on-site, in a subgrade garage underneath the footprint of the school. Similar to most other schools in the district, there appears to be sufficient parking on surrounding streets for teachers and staff, based

View of entry at Washington Street.

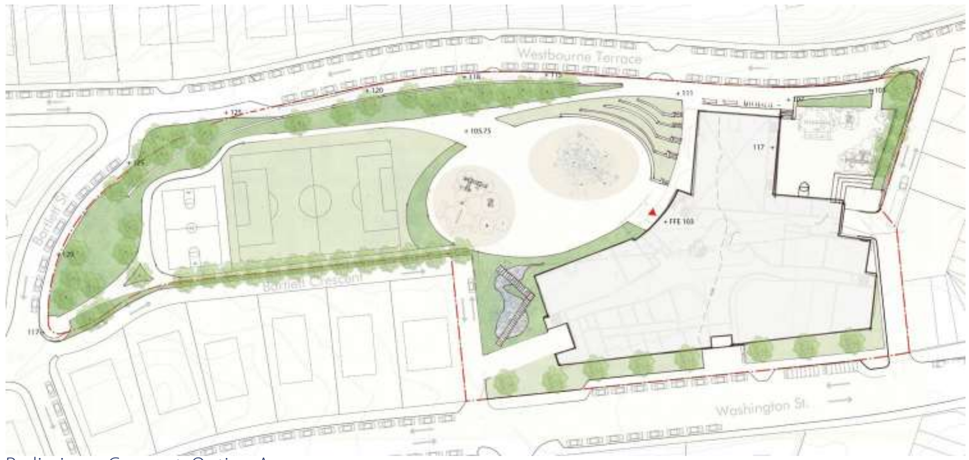
on the Transportation Board's criteria (no more than 40% of the available safe parking spaces on any street can be reserved for teachers).

Parent and visitor parking after drop-off will be accommodated on nearby Town streets comparable to all the other schools. Handicapped parking spaces will be provided in the on-site parking area on Westbourne Terrace and Washington Street. Accessible parking will also be provided for under the building..

2.8 Pricing Design - Landscape

Conceptual Landscape Design Options were prepared by Halvorson Design Partnership for pricing purposes only. Brookline Parks & Recreation Department has a rigorous design process involving the community, school and building departments that would commence in the Design Development phase.

PRELIMINARY CONCEPT DESIGN OPTIONS (FOR PRICING ONLY): ACTUAL DESIGN WILL OCCUR DURING DESIGN DEVELOPMENT PHASE.



Preliminary Concept: Option A

Preliminary Concept: Option B

Preliminary Concept: Option C

3. Traffic and Parking

Traffic

A Traffic Impact Analysis (TIA) was prepared by Vanasse & Associates, Traffic Consultant, and presented to the Brookline Transportation Board on Dec. 10, 2018. Please reference Feasibility Study dated December 10, 2018 for the full TIA Report. Follow up meetings were held on January 28, 2019 and March 18, 2019 in which the Traffic Consultant recommendations were approved by the Board, please see attached..

Parking

The Design Team with Traffic Consultant, Vanasse & Associates, met with the Transportation Board on January 28, 2019 to discuss a revision to the on-street permit parking program. The maximum number of on street permits for teachers was approved.

Proposed Driscoll Expansion Brookline, Massachusetts

Transportation Impact Assessment

Prepared by:

Vanasse & Associates, Inc.
Transportation Engineers & Planners
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1066

January 28, 2019

Traffic Agenda Items

- Area of Study
- Existing Conditions
- Traffic Generation
- Recommendations

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Site Location and Study Area Map

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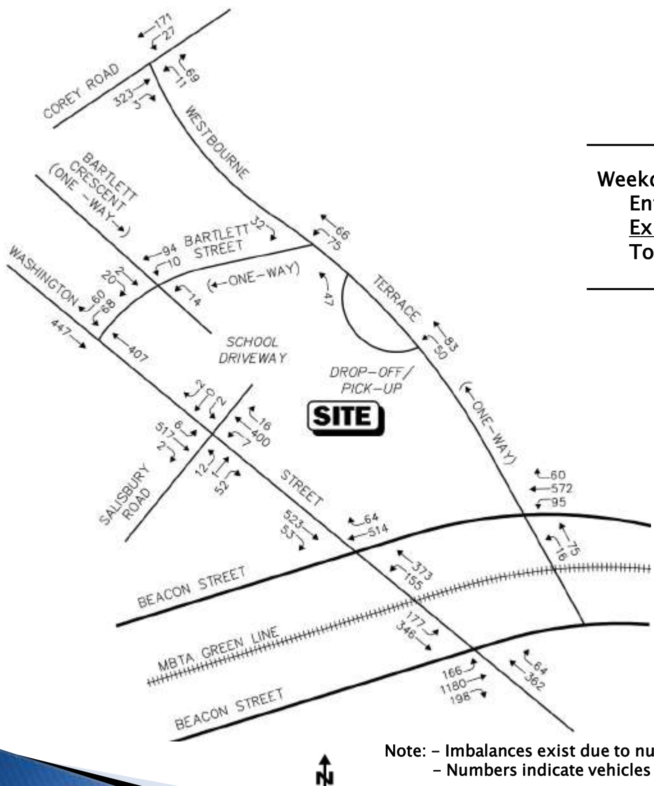
2018 Existing Conditions – Weekday Morning School Peak Hour Traffic Volumes (7:30-8:30 AM)



Time Period	School Driveways Westbourne Terrace Driveway	 Bartlett Street Driveway and Washington Street Driveway
Weekday Morning Peak Hour:		
Entering	50	33
Exiting	47	12
Total	97	45

Note: - Imbalances exist due to numerous curb cuts and side street that are not shown.
- Numbers indicate vehicles at intersections during a one hour period.

N

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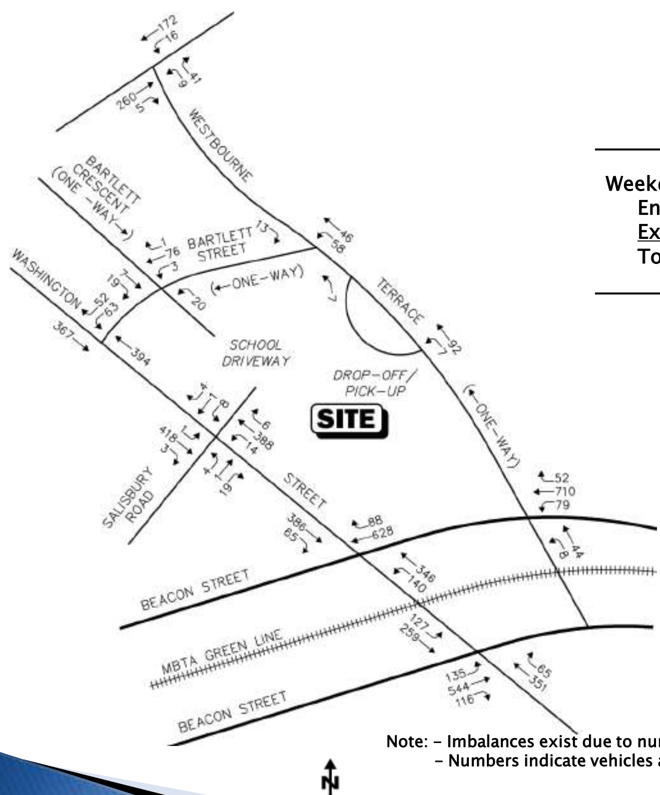
2018 Existing Conditions – Weekday Afternoon School Peak Hour Traffic Volumes (2:00-3:00 PM)



Time Period	School Driveways: Westbourne Terrace Driveway	School Driveways: Bartlett Street Driveway and Washington Street Driveway
Weekday Afternoon Peak Hour:		
Entering	7	12
Exiting	7	29
Total	14	41

Note: – Imbalances exist due to numerous curb cuts and side street that are not shown.
– Numbers indicate vehicles at intersections during a one hour period.

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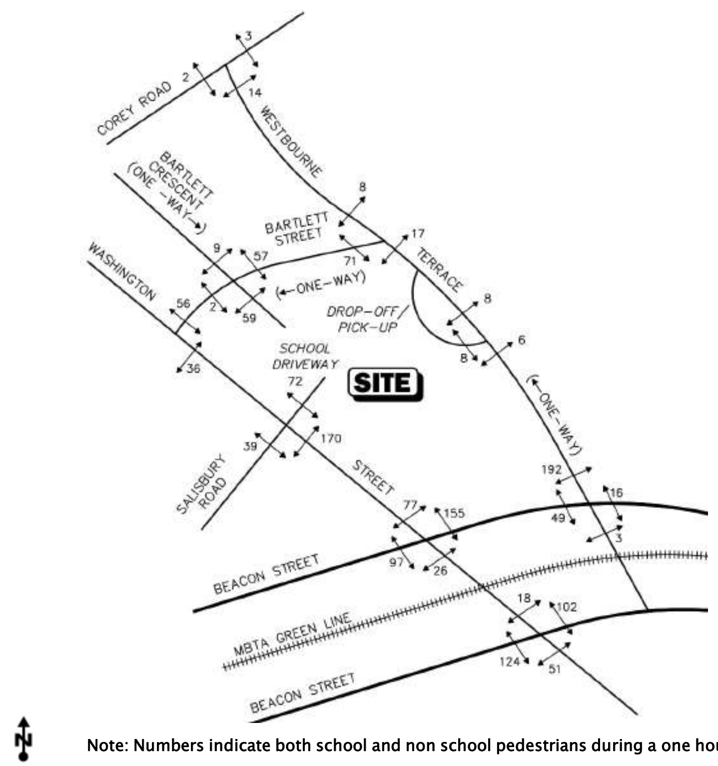
2018 Existing Conditions – Weekday Morning School Peak Hour Pedestrian Volumes (7:30-8:30 AM)



Note: Numbers indicate both school and non school pedestrians during a one hour period.

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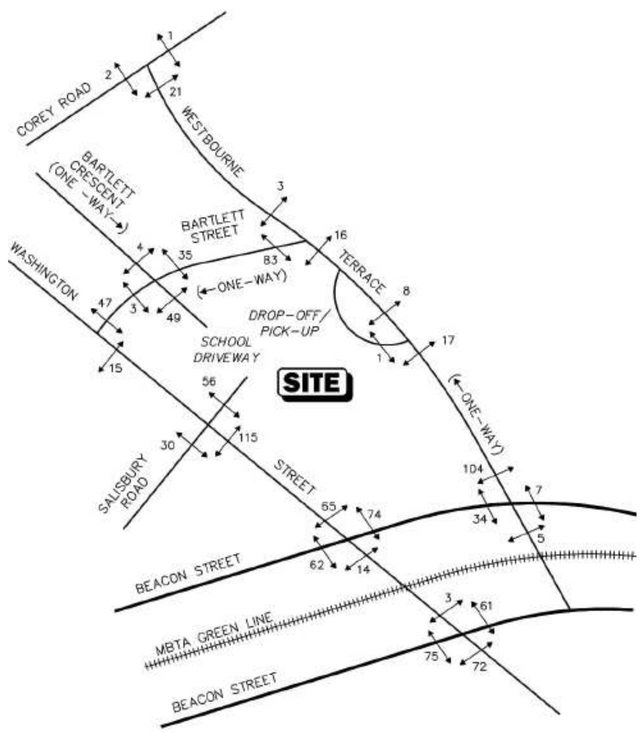
2018 Existing Conditions – Weekday Afternoon School Peak Hour Pedestrian Volumes (2:00-3:00 PM)



Note: Numbers indicate both school and non school pedestrians during a one hour period.

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Trip Generation Summary

Time Period	Existing Condition: School Driveways: Westbourne Terrace Driveway	Existing Condition: School Driveways: Bartlett Street Driveway and Washington Street Driveway	Existing Condition: On-Street Parking Drop-Off/ Pick-Up: Washington Street	Existing Condition: On-Street Parking Drop-Off/ Pick-Up: Bartlett Street	Existing Condition: On-Street Parking Drop-Off/ Pick-Up: Westbourne Terrace	Existing Condition: Staff	Existing Condition: Total Trips (632 Students) [1]	New Trips 800 Students[2]	Increase[3]
Weekday Morning Peak Hour:									
Entering	50	33	25	21	15	45	189	246	57
Exiting	47	11	25	21	15	0	120	156	36
Total	97	45	50	42	30	45	309	402	93
Weekday Afternoon Peak Hour:									
Entering	7	12	11	13	26	0	69	90	21
Exiting	7	29	11	13	26	10	96	125	29
Total	14	41	22	26	52	10	165	215	50

[1] Numbers Represent – Staff, Buses and Parent Vehicles.
[2] Note: 26% increase in Students. Assume 30% increase in Traffic.
[3] Increase includes staff and student drop-off/pick up.

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Teachers On-Street Parking - Existing

Driscoll School
7/19/2018 - Parking

Approve by
Transportation Board

52 Parking Lot Spaces

53 Approved TBoard Parking Spaces

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Recommendations

Project Area Access

- Main Driveway Off Washington Street
- A Bus Drop-off Area Off Washington Street
- Parent Drop-Off along Westbourne Terrace and Washington Street

Off-Site

Crossing Guards

- Salisbury Road

Area Sidewalk Upgrades

- Washington Street
- Westbourne Terrace

School Drop-Off and Pick-Up Traffic Management Plan

- School Staff Should Be Stationed at The Drop-off
- A Designated Drop-off/Pick-up Area
- Encourage Carpooling
- Parents and Caregivers Will Be Given Information on School Drop-off and Pick-up Times and Procedures

Recommendations

School Zone Signage

- Washington Street
- Westbourne Terrace

Bicycle Considerations

- Bicycle Racks Should Be Provided – Interior/Exterior
- Shower Facilities

Transit Usage

- Promote staff usage
- Town TDM plan

Traffic Monitoring

Within three months after school opening and annually

- Pedestrian safety
- Crossing guards

Construction Management Plan

A detailed Construction Management Plan should be prepared and reviewed by the Town

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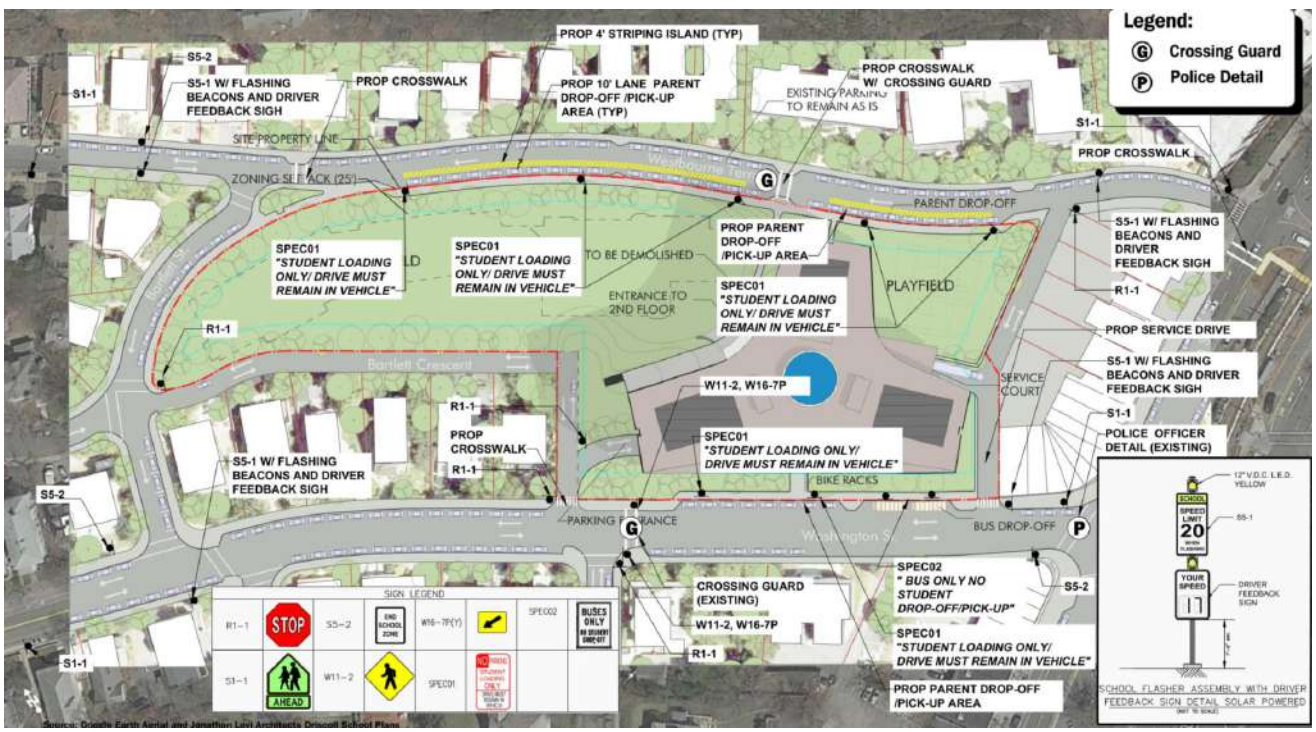
Recommendations
Pedestrian Access and School Signage Plan



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Summary

SUMMARY

- Safe Environment Can Be Maintained
- Delays and Queues – Limited to Short Periods
- Traffic Conditions Will Be Manageable

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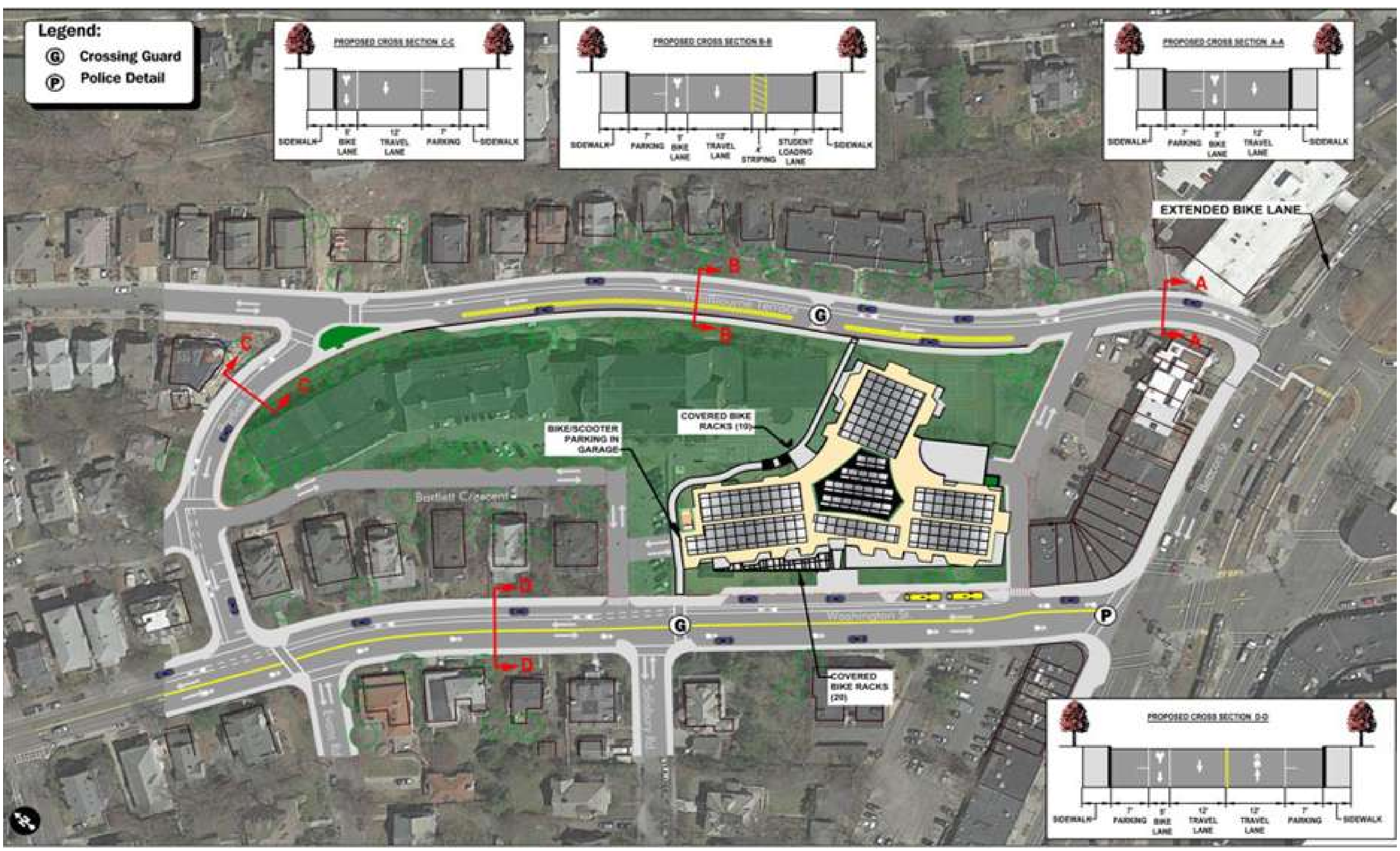
IMPROVED SAFETY FOR WALKERS

IMPROVED SAFETY FOR CYCLISTS



IMPROVED SAFETY FOR CARS

TOWN OF BROOKLINE

Driscoll School Building Project

Transportation Board Presentation
March 18, 2019

Jonathan Levi Architects

BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1

Driscoll School – Today & Tomorrow

Today, Driscoll School is a community oriented, neighborhood school that is primarily a walking school.

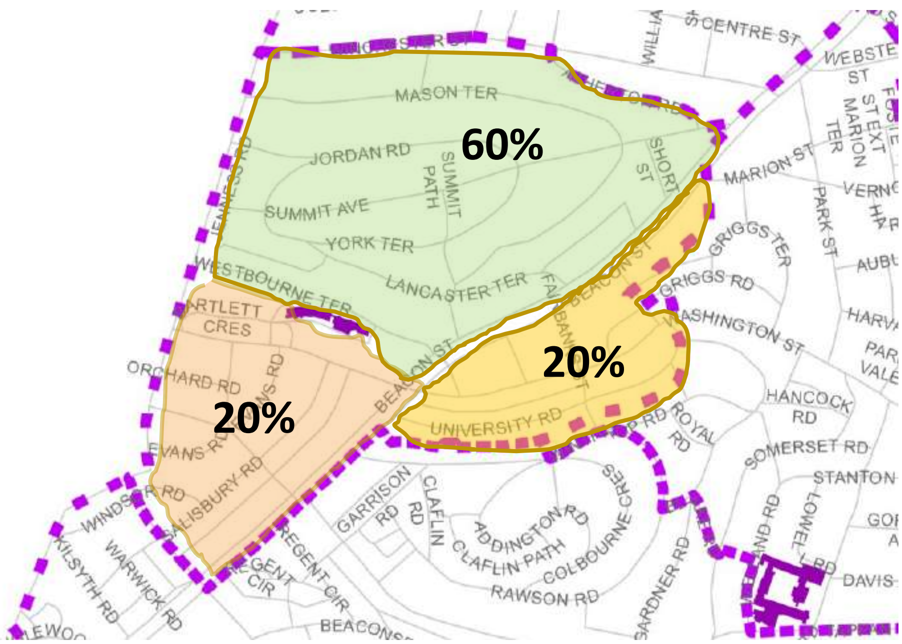
- Families who live in Driscoll School Zone live within a 0.6 mile walk of school

Tomorrow, with a newly rebuilt and expanded building, Driscoll will continue to be a community oriented, neighborhood school that is primarily a walking school.

Driscoll School Today

Where Driscoll Students Live Today

- 67% walk to school
- 28% come by car
- 3% come by public transportation
- 2% come by bus



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Driscoll School - Today

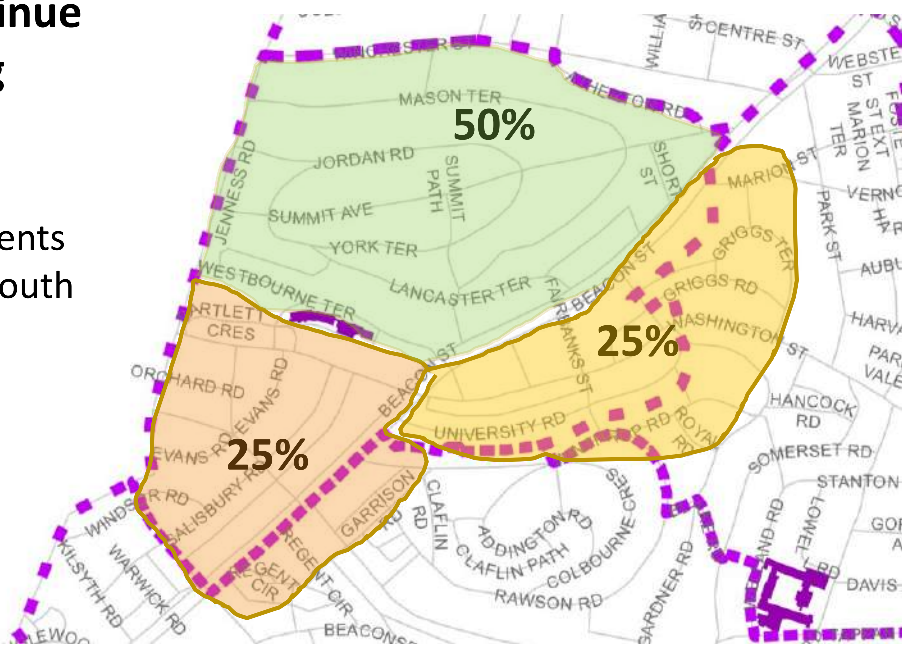
Two primary entrances –

1. Front Door –
   - Accessed by narrow sidewalks on Westbourne
   - No bike lanes on Westbourne
   - Car and bus drop off, bikers, and walkers all compete for limited sidewalk area and drop off space
   - 1 Bike Rack – not covered
2. Rear Door
   - Accessed by walkers and bikers going through active parking lots.
   - No dedicated sidewalks lead to doorway
   - Deliveries also happen in this lot
   - 1 Bike Rack – not covered

The New Driscoll School

All students will continue to live within walking distance

Anticipate that more students will arrive from east and south of the school



Graphic is illustrative. Actual future boundaries are not yet being considered. This graphic is only for Transportation Board presentation.

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The New Driscoll School

- Students increase from 631 to 800
- Because of density in surrounding neighborhood, School Assignment Zone will not increase significantly
- All students will continue to live within walking distance
- The vast majority of students will continue to get to school by walking

Necessary to improve walkability and bike-ability and to increase safety for pedestrians and cyclists

The New Driscoll School

Improving Safety for Walkers

- Widen and upgrade sidewalks on Westbourne (south side), 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 RRFB 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

The New Driscoll School
Improving Safety for Walkers

Jonathan Levi Architects

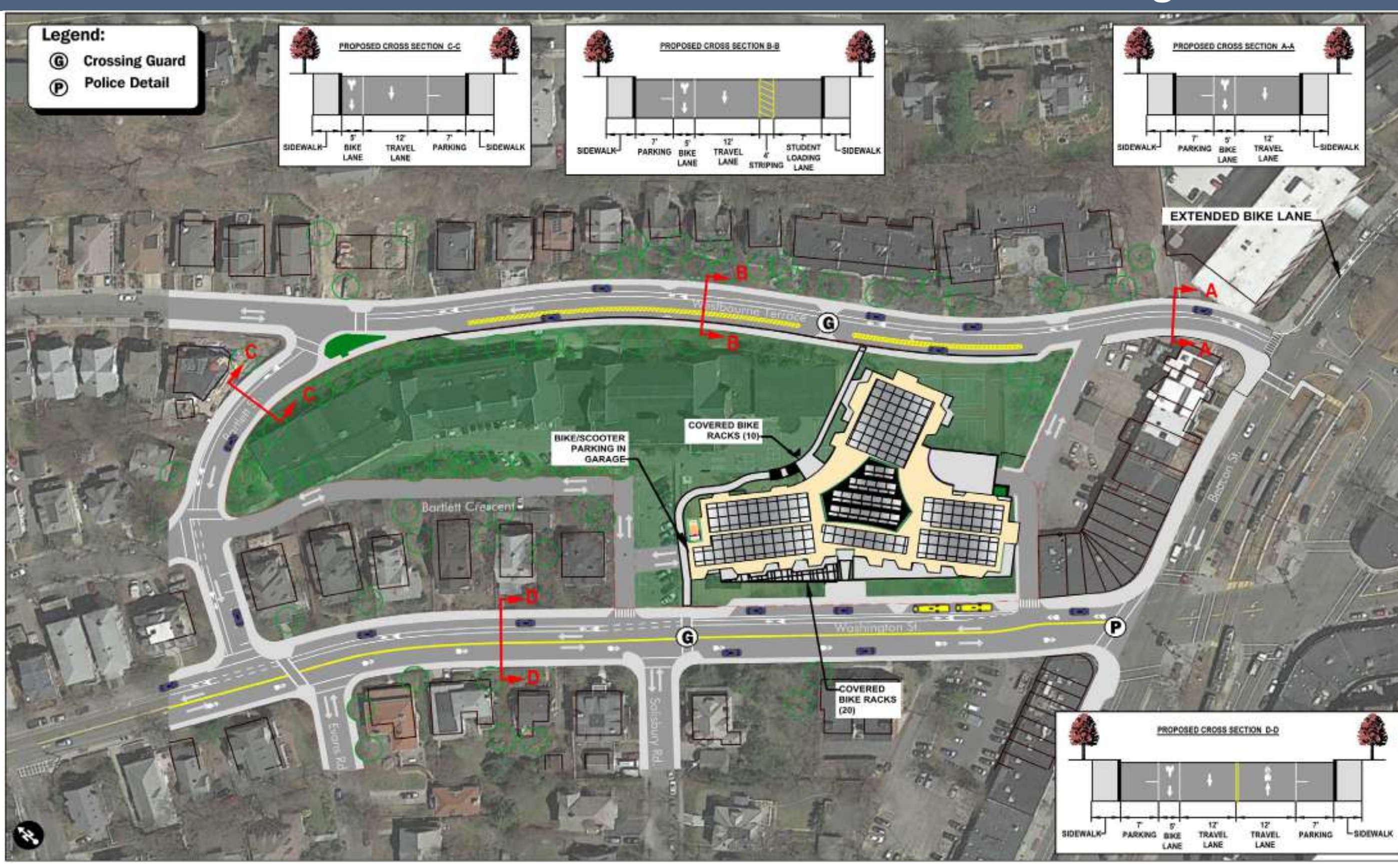
The New Driscoll School

Encouraging Biking and Improving Safety for Cyclists

All of the improvements for walkers PLUS

- Covered bike racks at both entrances *(will confirm how many during Design Development)*
- Staff will have bike and scooter parking underneath building
- Two staff showers
- Designated bike lanes
  - Option A – Westbound bike lanes on Westbourne and Washington
  - Option B – Westbound bike lanes on Westbourne and Washington PLUS eastbound bike lane on Washington

Improving Safety for Cyclists - Option A
Westbound bike lanes on Westbourne and Washington



Improving Safety for Cyclists - Option B
Westbound bike lanes on Westbourne and Washington
PLUS eastbound bike lane

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11

BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1

The New Driscoll School

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
- Parents and caregivers will be given explicit instruction and information about how drop off and pick up will work
- Staff will help enforce these guidelines
- Westbourne widened to have a full parking lane that will 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 for bus, van, and handicapped parking that is separate from the westbound travel lane

The New Driscoll School
Improving Vehicle Safety

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Next Steps

1. Further detail of design upon Transportation Board approval during Design Development Phase *(July 2019 – June 2020)*
2. Construction Management plan developed *(July 2019 – June 2020)*
3. Development of Procedures and Guidance for families for walking, biking, and drop off *(Fall 2022)*

4. Environmental and Existing Building Assessment

No update. Please reference Hazardous Materials Summary Report included in the Feasibility Study dated December 10, 2018.

5. Geotechnical and Geo-environmental Analysis

Geotechnical Analysis

Task 1 - As a follow up to geotechnical engineering scope performed during the Feasibility Phase in November 2018, an additional (8) geotechnical borings are to be performed as the design develops.

Task 2 - Soil pre-characterization and Soil Management Plan, soil samples obtained from the eight (8) geotechnical borings will be submitted to a lab for chemical testing to minimize the number of environmental borings required. A summary of the results and findings will then be issued in a separate letter/memorandum.

Please reference Geotechnical Engineering Data Report included in the Feasibility Study dated December 10, 2018.

Geoenvironmental Analysis

No update. Please reference Phase 1 Environmental Site Assessment included in the Feasibility Study dated December 10, 2018.

Fire Protection and Life Safety Code Compliance Strategy

BROOKLINE DRISCOLL SCHOOL
BROOKLINE, MA

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Document History

Schematic Design Fire Protection and Life Safety Code Compliance Strategy................................*March 26, 2019*

This document "Concept Design Fire Protection and Life Safety Code Compliance Strategy" is intended for use by the design team and code officials for understanding the building design concept for the proposed Brookline Driscoll School located in Brookline, MA. This document contains the code basis for the building design, functionality of the egress system, fire protection recommendations, the smoke control system design concept, and a comprehensive code outline.

This document is a preliminary draft based on the schematic building plans sent from Jonathan Levi Architects on March 18, 2019. This document is a work in progress, will be updated as the design progresses and discussions/agreements with the Authorities Having Jurisdiction occur.

Purpose

The purpose of this report is to document and provide the code compliance strategy, including the framework for the fire protection and life safety concept, for the proposed Brookline Driscoll School in Brookline, MA. This document will also identify design concepts that are not clearly addressed by the applicable building codes, which will require approval and or interpretation by the authorities having jurisdiction (AHJ).

Applicable Codes And Requirements

The following codes are presently adopted in the State of Massachusetts:

- **Building** Massachusetts State Building Code (MSBC), 9th Edition, which adopts and amends the 2015 International Building Code and the 2015 International Existing Building Code (IEBC).
- **Accessibility** Massachusetts Architectural Access Board (MAAB), 521-CMR. 2010 ADA Standards for Accessible Design
- **Electrical** Massachusetts Electrical Code, 527 CMR, 12.00. The Massachusetts Electrical Code is an amended version of the 2017 National Electrical Code (NFPA 70).
- **Elevators** Massachusetts Elevator Regulations, 524-CMR.
- **Energy** 2015 Edition of the International Energy Conservation Code (IECC) as amended by the State of Massachusetts; Massachusetts Stretch Code
- **Fire Prevention** 527 CMR Massachusetts Fire Prevention Code, which adopts and amends the 2015 edition of NFPA 1.
- **Mechanical** International Mechanical Code, 2015 edition, as adopted and amended by the MSBC (Chapter 28).
- **Plumbing** Massachusetts Fuel Gas and Plumbing Codes (248 CMR).
- **Other** National Fire Protection Association (NFPA) Standards, as referenced by the MSBC and the MFPR.

PROJECT DESCRIPTION

Howe Engineers has prepared this document for the proposed Brookline Driscoll School in Brookline, MA. The proposed building will be a newly constructed, four (4) story building with a footprint area of approximately 35,342 square feet. The building will contain primarily Group E, Educational spaces for students from pre-K through 8th grade, with a cafeteria (Group A-2, Assembly), accessory office and lounge spaces, and accessory storage and mechanical space. There will be two gymnasiums in the building which will be classified as Group A-3, Assembly since they will potentially host public events. The media center on the 1st floor and the roof terraces on the 2nd floor will also be considered Group A-3, Assembly. The auditorium on the 1st floor will be considered Group A-1, Assembly.

This narrative addresses the requirements contained in the 9th edition of 780 CMR, The Massachusetts State Building Code (MSBC), which is an amended version of the 2015 International Building Code (IBC).

GENERAL OPERATING ASSUMPTIONS

The following general operating assumptions serve as the basis for the Life Safety and Fire Protection design and should be incorporated into the new facility's operations plan. It is the responsibility of the Owner/Operator to ensure that these assumptions are enforced:

- Materials used will meet the interior finish requirements of the MSBC and NFPA 1.
- Hazardous materials and explosives are not permitted within the building unless protected in accordance with the MSBC and MFPC and approved by the AHJ.

NEW CONSTRUCTION- CODE COMPLIANCE APPROACH

OCCUPANCY CLASSIFICATION

The proposed Brookline Driscoll School is classified as a mixed-use occupancy in accordance with MSBC Section 508.1 with a primary occupancy of Group E, Educational. The occupancies in the building on the respective levels are as follows:

Base Floor	**USE GROUP**
Parking Garage	S-2
Gymnasium (no fixed seating)	A-3
Locker Rooms	A-3
Storage	S-1
MEP	S-2
1st Floor (Level of Exit Discharge)	**USE GROUP**
Classrooms	E
Office/Administration/Nurse	B
Media Center	A-3
Cafeteria/Kitchen	A-2
Auditorium	A-1
Storage	S-1
2nd Floor	**USE GROUP**
Classrooms /Maker Space/Lab	E
Office/Administration	B
Roof Terraces	A-3
3rd Floor	**USE GROUP**
Classrooms	E
Office/Administration	B
Teacher’s Collaboration Space	A-3
4th Floor	**USE GROUP**
Classrooms	E
Office/Administration	B

OCCUPANCY SEPARATIONS

The building contains multiple occupancy types and is classified as "mixed occupancy" in accordance with MSBC Section 508.1. Therefore, the building is required to comply with the requirements of Section 508.3 (non-separated uses) or 508.4 (separated uses), or combinations of these sections. To avoid fire-rated separations, the building will be designed to comply with the non-separated use provisions of MSBC Section 508.3. Therefore, occupancy separations are not required to be provided throughout the building. Refer to the Building Construction section below for minimum construction type necessary to achieve non-separated uses.

SPECIAL FIRE SEPARATIONS REQUIRED

Although the building does not require occupancy separations in accordance with MSBC Section 508.3 (non-separated use provisions), several reference standards applicable to this building do require fire resistance rated separations for specific use areas within the building:

Room or Area	Separation and/or Protection
MSBC Section 509 - Furnace rooms where any piece of equipment is over 400,000 BTU/hr. input	1-hour, or automatic sprinkler protection[1]
MSBC Section 509 - Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1-hour, or automatic sprinkler protection[2]
Refrigeration Machinery Rooms	1-hour, or provide sprinkler protection
MSBC Section 509 - Waste collection rooms over 100 square feet	1-hour, or automatic sprinkler protection[2]
NFPA 110 – Emergency Generator Room	2-hour and automatic sprinklers
NFPA 20 – Fire Pump Room	1-hour and automatic sprinklers
NFPA 70 – Electrical Rooms (over 112.5 kVA)	1-hour and automatic sprinklers[2]
Emergency Electrical Rooms	2-hours
Electrical Transformer/ Substation Separation	3-hours and automatic extinguishing[2]

[1] Where sprinkler protection is provided in lieu of a fire-resistance rated fire barriers, such space must be separated from the remainder of the building by construction capable of resisting the passage of smoke (smoke-tight construction). Such walls must extend from the floor surface to the underside of 2-hour fire-resistance rated construction or the roof. Doors within the wall construction must be self-closing and not provided with air-transfer openings. Walls must not be provided with air-transfer openings unless provided with a smoke damper.

[2] The design and equipment details for a substation have not been complete yet. If provided on site, it is likely that additional protection measure such as explosion venting, increased fire-resistance, redundant fire protection systems and other life safety features will be required to achieve the life safety goals for the building.

BUILDING CONSTRUCTION

BUILDING HEIGHT AND AREA

A fully sprinklered building that contains Group A-1, Group A-2, Group A-3, Group B, Group E, Group S-1, and Group S-2 occupancies and utilizes the non-separated use provisions of MSBC Section 508.3 is permitted to be constructed of Type IIA construction if it does not exceed 4 stories above grade plane or 46,500 square feet footprint area. The Brookline Driscoll School will be 4 stories above grade plane with a footprint area of 35,342 square feet and is thus permitted to consist of Type IIA construction.

CONSTRUCTION TYPE

The proposed Brookline Driscoll School will be constructed of Type IIA construction. **Note that the exit stairs serving four (4) or more stories in the building will require a 2-hour rated shaft as well as 2-hour rated supporting floor construction for the shafts. As a result, some areas of the building will more closely resemble Type IB construction compared to the Type IIA construction type of the full building.**

Refer to the table below for the fire-resistance ratings associated with Type IIA construction.

FIRE RESISTANCE RATING

The fire-resistance rating requirements for Type IIA construction can be found in MSBC Table 601. The required fire-resistance ratings for the building structural elements to achieve Type IIA construction are provided in the table on the following page:

Fire Resistance Ratings of Structural Elements for Type IIA Construction

BUILDING STRUCTURAL ELEMENT	FIRE RESISTANCE RATING – TYPE IIA
Structural Frame	
Including girders, beams and trusses (other than columns):	
Supporting a floor	1 hour
Supporting roof only	1 hour
Columns:	
Supporting a floor	1 hour
Supporting roof only	1 hour
Bearing Walls	
Exterior	1 hour
Interior Walls:	
Supporting more than one floor	1 hour
Supporting only roof	1 hour
Nonbearing Walls and Partitions	
Exterior *(not less than fire separation requirements)*	See Fire Separation (Table 602)
Interior *(not less than fire separation requirements)*	0 hours
Floor Construction	
Including supporting beams and joists	1 hour
Roof Construction	
Including supporting beams and joists:	
Less than 20 feet in height to lowest member	1 hour
20 feet or more in height to lowest member	0 hours (1 hour for Group S-1)

EXTERIOR WALLS

The MSBC regulates the fire resistance rating of exterior walls and the extent to which protected and unprotected openings are permitted in the exterior walls of facing buildings based on the fire separation distance to the lot line or to the center of the street (MSBC Table 602 and MSBC Table 705.8).

Fire Resistance Rating for Exterior Non-Loading-Bearing Walls

Based on Fire Separation Distance (MSBC Table 602)

FIRE SEPARATION DISTANCE (Building wall to property line for each side of the building)	FIRE-RESISTANCE RATING (GROUP S-1)	FIRE-RESISTANCE RATING (GROUP A, B, E, S-2)
Less than 5 feet	2 hours	1 hour
Greater than or equal to 5 feet and less than 10 feet	1 hour	1 hour
Greater than or equal to 10 feet and less than 30 feet	1 hour	1 hour
Greater than or equal to 30 feet	0 hours	0 hours

The required fire-resistance rating of exterior walls with a fire separation distance of greater than 10 feet must be rated for exposure to fire from the inside. The required fire-resistance rating of exterior walls with a fire separation distance of less than or equal to 10 feet must be rated for exposure to fire from both sides.

Maximum Area of Exterior Wall Openings

Based on MSBC Table 705.8

Fire Separation Distance to Lot Line (feet)	Allowable Area of Opening (Sprinklered)
0 to less than 3	Not Permitted
3 to less than 5	15%
5 to less than 10	25%
10 to less than 15	45%
15 to less than 20	75%
20 to less than 25	No Limit
25 to less than 30	No Limit
30 or greater	No Limit

Fire Resistant Joint Systems

Joints installed in or between fire-rated walls, floors or floor/ceiling assemblies and roofs or roof/ceiling assemblies must be protected by an approved fire-resistant joint assembly having a rating equal to the rating of the wall, floor, or roof. Joint systems shall be tested in accordance with MSBC Section 715.

Listed and approved joint assemblies must be provided for all concealed locations where fire resistance rated assemblies form a joint.

Interior Finishes and Floor Finishes

Interior finishes in the building are required to meet the requirements of MSBC Section 803 for interior finish. Refer to the following tables for details. Interior finish applies to wall and ceiling finishes. Interior floor finish applies to floor coverings.

Interior Wall & Ceiling Finish Requirements by Occupancy

Sprinklered Building (MSBC Table 803.11)

USE GROUP	VERTICAL EXITS AND PASSAGEWAYS	EXIT ACCESS CORRIDORS	ROOMS AND ENCLOSED SPACES
A-1, A-2	A or B	A or B	A, B, or C
A-3	A or B	A or B	A, B, or C
B, E	A or B	A, B, or C	A, B, or C
S-1, S-2	A, B, or C	A, B, or C	A, B, or C
Atrium	A or B	A or B	A or B

Interior Floor Finish Requirements by Occupancy

Interior floor finish and floor coverings must comply with MSBC Section 804, unless the floor finish or covering material is of traditional type, such as wood, vinyl, linoleum, or terrazzo and resilient floor covering materials not comprised of fibers.

Penetrations of Duct and Air Transfer Openings

MEP Shaft Enclosures

A shaft is required when the duct penetrates two (2) or more floor/ceiling assemblies (MSBC Section 717.6.1). A shaft is not required in occupancies other than Groups I-2 and I-3, for a duct constructed of approved materials in accordance with the International Mechanical Code that penetrates not more than one (1) fire-resistance-rated floor/ceiling assembly (connecting only 2 stories), provided a listed fire damper is installed at the floor line or the duct is protected in accordance with MSBC Section 714.4 (MSBC Section 717.6).

MSBC Section 713.4 provides that for shafts connecting less than four (4) stories, a 1-hour fire rated shaft enclosure is required. Shafts connecting four (4) or more stories require a fire-resistance rating of at least two (2) hours. Additionally, shaft enclosures must not have a fire resistance rating that is less than the rating of the floor that they are penetrating but need not exceed two (2) hours. Openings in a shaft enclosure are required to be limited to those necessary for the purpose of the shaft (MSBC Section 713.8.1). Where shafts do not extend to the top or bottom of a building, adequate protection should be provided (MSBC Section 713.11 and Section 713.12).

Further, as the building is considered Type IIA construction with 1-hour fire-resistance rated floor assemblies, duct systems constructed of approved materials are not required to be located within a shaft provided the duct does not penetrate more than two (2) stories and a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 714.4.

Fire Dampers

Fire dampers should have a fire resistance rating in accordance with the table below (MSBC Table 717.3.2.1). The actuation temperature of the actuating device should be approximately 50˚F above the normal temperature within the duct system (MSBC Section 717.3.3.1). If a fusible link is used, it should have a temperature rating not less than 160˚F (MSBC Section 717.3.3.1).

Fire Damper Rating

Type of Penetration	Minimum Fire Damper Rating
Less than 3-hour fire-resistance rated assemblies	1½ hours
3-hour or greater fire-resistance rated assemblies	3 hours

Fire dampers are required at locations where ducts or air transfer openings of an air distribution system penetrate fire resistance rated assemblies including the following:

- Fire barriers (MSBC Section 717.5.2);
- Shaft enclosures (MSBC Section 717.5.3);
- Fire partitions (MSBC Section 717.5.4);
- Horizontal assemblies (MSBC Section 717.6).

Smoke Dampers

Actuation of smoke dampers should be achieved in accordance with the table below (MSBC Section 717.3.3.2).

Smoke Damper Actuation Methods

Damper Location	Activation Method
Within a duct	Activation controlled by a smoke detector within 5 feet of the damper with no air outlets or inlets between the detector and the damper.
Above smoke barrier doors in a smoke barrier	Activation controlled by a spot type detector listed for releasing service should be installed on both sides of the smoke barrier door opening.
In an un-ducted opening in a wall	Activation controlled by a spot type detector listed for releasing service should be installed within 5 feet of the damper.
In a corridor wall	Activation controlled by smoke detector system in the corridor.
All	Where a total-coverage smoke detector system is provided within areas served by HVAC system, dampers are permitted to be controlled by the smoke detection system.

Smoke dampers are required at locations where ducts or air transfer openings of an air distribution system penetrate assemblies; including:

- Shaft enclosures (MSBC Section 717.5.3);
- Smoke barrier walls (MSBC Section 717.5.5);
- Horizontal Exits in fire walls (MSBC Section 717.5.1);
- Corridors (MSBC Section 717.5.4.1);
- Smoke Partitions (MSBC Section 717.5.7).
- Smoke-tight construction (MSBC Section 509.4.2)

The table on the following page reiterates smoke damper (SD) requirements and provides a number of exceptions in accordance with the MSBC.

Combination Smoke/Fire Dampers

Where a penetration of a smoke barrier is required to be provided with a fire damper, a combination fire and smoke damper equipped and arranged to be both smoke- and heat-responsive should be provided (MSBC 717.5). Combination smoke/fire dampers are required in the following locations:

- Shaft penetrations (MSBC 717.5.3).

The table below reiterates combination smoke/fire damper requirements and provides a number of exceptions in accordance with the MSBC.

Through Penetration Protection

Penetrations into or through fire barriers, smoke barrier walls, fire partitions, floor/ceiling assemblies, or the ceiling membrane of a roof/ceiling assembly are required to be protected with an approved through penetration or membrane penetration assembly (MSBC Section 708). See MSBC Section 708 for exceptions.

Damper Exceptions

The table below has been developed by Howe Engineers in identifying where dampers are required and where exceptions exist.

	FD	SD	MSBC	Applicable SD, FD & SD/FD Damper Exceptions
Fire Barriers (including horizontal exits)[3]	Required	Not Required (NR)	717.5.2	Penetrations tested in accordance with ASTM E119 as part of a fire-resistance rated assembly **(FD)**. **[MSBC §717.5.2 Exception 1]**
				Ducts used as part of an approved smoke control system **(FD)**. **[MSBC 717.5.2 Exception 2]**
				Where fire barriers walls have a FRR of less than 1-hour and the following conditions apply: • The Building is protected throughout by automatic sprinklers; • Penetrations are limited to a ducted HVAC system conveying supply, return or exhaust air; • HVAC ducts are minimally 26 gage; • HVAC ducts are continuous from the AHU to the air outlet and inlet terminals **(FD)**. **[MSBC 717.5.2 Exception 3]**
Smoke Barriers[4]	NR	Required	717.5.5	Smoke dampers are not required where openings in ducts are limited to a single smoke compartment and ducts are constructed of steel **(SD)**. **[MSBC 717.5.5 Exception 1]**
Floor / Ceiling Assemblies	Required	NR	717.6.1	A duct is permitted to penetrate two floors or less with a fire damper at each floor provided it meets all the requirements in 717.6.1 Exception **(FD)**. **[MSBC 717.6.1 Exception]**
Shafts	Fire / Smoke Dampers Required		717.5.3	Steel exhaust sub ducts extending at least 22-inches vertically in an exhaust shaft provided there is a continuous upward airflow to the outside **(FD)**. **[MSBC 717.5.3 Exception 1.1]**
				Penetrations tested in accordance with ASTM E119 as part of a fire-resistance rated assembly **(FD)**. **[MSBC717.5.3 Exception 1.2]**
				Ducts used as part of an approved smoke control system **(FD)**. **[MSBC 717.5.3 Exception 1.3]**
				Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the International Mechanical Code **(SD/FD)**. **[MSBC 717.5.3 Exception 5].** A duct that penetrates a fire-resistance rated floor/ceiling assembly that connects not more than 2 stories is permitted without a shaft enclosure, provided that a listed fire damper is installed at the floor line. **[MSBC 717.6.3].**
				Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust sub ducts, having a minimum wall thickness of 0.187-inch (No. 26 gage), the sub ducts extend at least 22 inches vertically, and an exhaust fan providing continuous airflow to the outside is installed at the top of the shaft terminal. The exhaust fan should be provided with an uninterruptible power system for the first 15 minutes of loss of primary power **(SD)**. **[MSBC 717.5.3 Exception 2 for Group B and R occupancies only]**
Corridors	NR	Required	717.5.4	Ductwork has a minimum wall thickness of 0.019 inches and there are not openings that serve the corridor **(SD). [MSBC 717.5.4.1 Exception 2]**
Fire Partitions	Required	NR	717.5.4	Ductwork does not exceed 100 square inches, constructed of steel a minimum of 0.0217 inch in thickness, does not have openings that communicate with the corridor, installed above the ceiling, shall not terminate at a wall register in the fire resistance rated wall, 12-inch long by 0.060-inch-thick steel sleeve centered in each duct opening and secured by rectangle angles **(SD). [MSBC 717.5.4 Exception 3]**

[3] **Fire barriers within the building will include:** Occupancy separations (if provided) and special use room enclosures.
[4] **Smoke barriers within the building will include:** Fire service elevator lobby separations.

Protected Vertical Openings

Vertical openings through floors will be protected by fire-rated assemblies in accordance with MSBC Section 707.3. Vertical openings include exit stairs, elevator shafts, and mechanical shafts. Shafts and exit enclosures, other than *exit access stairways* complying with MSBC Section 1019.3 Item 4, will be enclosed with listed and approved shaft enclosure assemblies that provide a 1-hour fire-resistant rated noncombustible shaft assembly per MSBC Section 707.3 where connecting less than four (4) stories, and a 2-hour rating where connecting four (4) stories or more. Note that the exit stairs serving four (4) or more stories in the building will require a 2-hour rated shaft as well as 2-hour rated supporting floor construction for the shafts. As a result, some areas of the building will more closely resemble Type IB construction compared to the Type IIA construction type of the full building.

The floor openings requiring shaft protection will include, but are not limited to:

- Grease Ducts, Trash chutes and linen chutes
- Elevator Shafts
- Mechanical, electrical and plumbing shafts
- Exit Stairways, other than exit access stairways complying with MSBC Section 1019.3 Item 4

Duct systems throughout the building that do not connect more than two (2) stories and are not required to be enclosed in shafts are not required to be provided with smoke dampers, provided the annular space around the shaft is sealed with an approved material (MSBC Section 714).

ATRIUM DESIGN

The current Brookline Driscoll School design includes a four (4) story opening in the center of the building connecting the 1st through 4th floors, with numerous breakout spaces within the opening. The opening also atmospherically communicates with the Base Level via an open stair and thus connects 5 stories. As the opening connects more than two (2) stories, the space is considered an atrium and must be designed in accordance with MSBC Section 404. Atriums are only permitted to be installed in buildings provided with approved automatic sprinkler protection (MSBC Section 404.3).

MSBC Section 404.5 requires a smoke control system to be installed in accordance with MSBC Section 909. The smoke control system may be designed using either natural or mechanical ventilation but will require an engineering rational analysis to ensure adequate system performance. Equipment for the smoke control system must be provided with standby power. The atrium will be provided with a mechanical exhaust system and make up air will also be provided either via mechanical means or via openings in the building.

Section 404.6 requires atrium spaces to be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707. A fire barrier is not required to enclose an atrium space when one (1) of the following arrangements are met:

- A glass wall forming a smoke partition is provided and sprinklers are provided along both sides of the separation walls and doors. Sprinklers must be located between 4 and 12 inches away from the glass at intervals along the glass not more than 6 feet. The sprinkler system must be designed to wet the entire surface of the glass upon activation. The glass wall must be installed in a gasketed frame in such a manner that the framing deflects without breaking the glass before the sprinkler operates. Where glass doors are provided, they must be self- or automatic-closing.

- A glass block wall assembly complying with MSBC Section 2110 that has a ¾-hour rating is provided.
- A fire barrier is not required when the design is accounted for in the design of the smoke control system.

Atrium interior finishes must be Class B or higher, with no reduction for sprinkler protection (MSBC Section 404.8).

It should be noted that unique egress requirements exist for atrium spaces in MSBC Section 404.9. Exit access travel distance through the atrium, not at the level of exit discharge, must not exceed 200 feet within the bounds of the atrium. Refer to the means of egress section of this report for further information.

STAGE DESIGN

The current Brookline Driscoll School design includes a stage in the auditorium space on the 1st floor. The requirements for stages are provided in MSBC Section 410. MSBC Section 410.3.1 requires stages to be constructed of materials as required for floors of the type of construction in which the stage is located. In buildings of Type IIA construction, a fire-resistance rated floor is not required, provided the space below the stage is equipped with an automatic sprinkler system or fire-extinguishing system in accordance with MSBC Section 903 or MSBC Section 904, respectively. In all types of construction, the finished floor must be constructed of wood or non-combustible materials. Openings through the stage floor must be equipped with tight-fitting, solid wood trap floors with approved safety locks.

Where the stage height is greater than 50 feet in height, all portions of the stage must be completely separated from the seating area by a proscenium wall with not less than a 2-hour fire-resistance rating extending continuously from the foundation to the roof (MSBC Section 410.3.4). Where a proscenium wall is required to have a fire-resistance rating, the stage openings must be provided with a fire curtain complying with NFPA 80, horizontal sliding doors complying with MSBC Section 716.5.2 having a fire protection rating of at least 1-hour, or an approved water curtain complying with MSBC Section 903.3.1.1.

Combustible scenery used in sets must meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 in accordance with Section 806 of the International Fire Code.

It should be noted that the current stage design was measured to be approximately 1,687 square feet. MSBC Section 410.3.7 requires emergency ventilation for stages larger than 1,000 square feet in floor area, or stages with a height greater than 50 feet. Ventilation must comply with MSBC Section 410.3.7.1 (roof vents) or MSBC Section 410.3.7.2 (smoke control). **The height and area of the current stage must be verified by JLA. It should be noted that the measured area of the stage must include all of the wing areas and backstage areas. The design of the stage requires further discussion with Howe Engineers.**

Dressing rooms are required to be separated from the stage with rated construction in accordance with MSBC Section 410.5.1. Stages must be separated from dressing rooms, scene docks, workshops, storerooms and compartments appurtenant to the stage by fire barriers or horizontal assemblies. The fire-resistance rating must be 2 hours for stage heights greater than 50 feet, and not less than 1 hour for stage heights of 50 feet or less.

Stages must be provided with automatic sprinkler protection in accordance with MSBC Section 903.3.1.1. Sprinklers must be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers must be installed in dressing rooms, performer lounges, and storerooms accessory to the stage (MSBC Section 410.7). Section 905.3.4 requires that stages greater than 1,000 square feet in area are provided with a Class III wet standpipe system with 1 ½-inch and 2 ½-inch hose connections on each side of the stage. Since the building is fully sprinklered, only a single 1 ½-inch hose connection is required.

Enclosed Parking Garage Design

The Brookline Driscoll School will contain an enclosed parking garage on the base floor. The enclosed parking garage is subject to the requirements of MSBC Section 406.6. As such, the garage must be equipped with an automatic sprinkler system in accordance with MSBC Section 903.2.10 (MSBC 406.6.3). Also, the garage must be equipped with a mechanical ventilation system designed in accordance with the International Mechanical Code (IMC), as adopted and amended by MSBC Chapter 28. Automatic operation of the system shall not reduce the ventilation airflow rate below 0.05 cfm per square foot of floor area, and the system shall be capable of producing a ventilation airflow rate of 0.75 cfm per square foot of floor area (IMC Section 404.2).

Means of Egress System Design

General Requirements

Occupant Load

The occupant load for each space within the building is determined using the occupant load factors listed in MSBC Table 1004.1.2, as shown in the table below.

Space	Occupant Load Factor Per Person
Auditorium	Number of fixed seats provided
Band/Chorus Room	Number of fixed seats provided
Stage	15 square feet (net) per person
Cafeteria	15 square feet (net) per person
Roof Terraces	Posted Maximum – 49 occupants[1]
Conference Rooms	15 square feet (net) per person
Classrooms	24 occupants per classroom[2]
Gymnasiums	50 square feet (gross) per person
Locker Rooms	50 square feet (gross) per person
Media Center	50 square feet (net) per person
Maker Space/Laboratories	50 square feet (net) per person
Offices	100 square feet (gross) per person
Lobby (50%)	15 square feet (net) per person
Lobby (50%)	100 square feet (gross) per person
Circulation	100 square feet (gross) per person
Kitchen	200 square feet (gross) per person
Parking Garage	200 square feet (gross) per person
Storage/MEP	300 square feet (gross) per person

[1]The roof terraces will use a posted maximum occupant load of 49 in accordance with MSBC Section 1004.1.2 Exception. This approach must be approved by the building official.

[2]Classrooms use a program occupant load of 24 occupants to account for expected number of students and staff in each classroom. This approach must be approved by the building official.

The following tables outline the calculated occupant load for the proposed plans.

Brookline Driscoll School – Base Floor

Room	Size (sq. ft.)	Loading Factor (sq. ft. per occupant)	Occupancy
Small Gym	3,061	50	62
Main Gym	6,289	50	126
Locker Rooms	2,388	50	48
Offices	187	100	2
Parking Garage	7,646	200	39
Storage/MEP	5,680	300	19
Circulation	4,968	100	50
		Total Occupancy	346

Brookline Driscoll School – 1st Floor

Room	Size (sq. ft.)	Loading Factor (sq. ft. per occupant)	Occupancy
Auditorium	3,575	Actual	394
Band/Chorus Room	1,396	Actual	100
Stage	1,687	15	113
Cafeteria	4,126	15	276
Classrooms	2,677	Actual	48
Media Center	3,525	50	71
Offices	5,670	100	57
Kitchen	1,975	200	10
Storage/MEP	2,771	300	10
Circulation	7,940	100	980
		Total Occupancy	1,159

Brookline Driscoll School – 2nd Floor

Room	Size (sq. ft.)	Loading Factor (sq. ft. per occupant)	Occupancy
Roof Terrace #1	2,683	Posted Maximum	49
Roof Terrace #2	1,104	Posted Maximum	49
Small Conference Room	172	15	12
Classrooms	13,328	Actual	288
Maker Space	2,250	50	45
Fab Lab	1,013	50	21
Offices	1,956	100	20
Lobby (50%)	298	15	20
Lobby (50%)	297	100	3
Circulation	9,136	100	92
		Total Occupancy	599

Brookline Driscoll School – 3rd Floor

Room	Size (sq. ft.)	Loading Factor (sq. ft. per occupant)	Occupancy
Classrooms	20,207	Actual	504
Offices	2,307	100	24
Circulation	11,860	100	119
		Total Occupancy	647

Brookline Driscoll School – 4th Floor

Room	Size (sq. ft.)	Loading Factor (sq. ft. per occupant)	Occupancy
Small Conference Room	177	15	12
Special Education Conference Room	287	15	20
Classrooms	18,627	Actual	456
Offices	3,947	100	40
Circulation	11,298	100	113
		Total Occupancy	641

Number of Exit Access Doorways

MSBC Section 1006.2.1.1 requires that four (4) or more exits be provided when a space has a calculated occupant load of greater than 1,000 occupants. Three (3) exits must be provided if the occupant load of the space exceeds 500 occupants. MSBC Section 1006.2.1 requires two exits for all areas exceeding the occupant loads shown in MSBC Table 1006.2.1. For a Group A or Group E occupancy, two exits are required if the occupant load exceeds 49 occupants or where the common path of travel exceeds 75 feet. In Group B areas, two exits are required if the occupant load exceeds 49 occupants or where the common path of travel exceeds 100 feet. Further, in Group S areas, two exits are required if the occupant load exceeds 29 occupants or where the common path of travel exceeds 100 feet.

The Basement floor of the Brookline Driscoll School has an occupant load of 346 and requires two (2) exits. Egress is provided from the locker rooms and gymnasiums via two enclosed stairs and one open stair connecting the locker area with the atrium on the 1st floor. Access to both enclosed stairs will be provided from the main gymnasium. Two (2) exit stairs are required and will be provided from the parking garage, discharging directly to the exterior at grade level.

The 1st floor exceeds 1,000 occupants and requires four (4) exits. On the 1st floor, four (4) exits are provided directly to grade level via two (2) entrance vestibules and two (2) enclosed stair discharge doors. This meets the requirement for four (4) exits from the 1st floor. The 1st floor auditorium should be provided with its own dedicated egress doors leading directly to the exterior for the Third required means of egress.

The 2nd through 4th floors each exceed 500 occupants and require three (3) exits. On the 2nd floor, four (4) exits are provided via three (3) enclosed stairs and one (1) exterior exit stairway leading from the 2nd floor lobby. This meets the requirement for three (3) exits from the 2nd floor. On the 3rd and 4th floors, three (3) exits are provided via enclosed stairs. This meets the requirement for three (3) exits from the 3rd and 4th floors.

Finally, two (2) remote means of egress will be provided from the auditorium and the band/chorus room, as these rooms each have an occupant load of greater than 50.

It should be noted that the means of egress for unique spaces such as boiler rooms, furnace rooms, and refrigeration machinery rooms is governed by MSBC Section 1006.2.2. Boiler rooms, incinerator rooms, and furnace rooms require two (2) means of egress where the area of the space is over 500 square feet and any fuel-fired equipment exceeds 400,000 BTU input capacity (MSBC Section 1006.2.2.1). Where two means of egress are required, one (1) is permitted to be a fixed ladder or an alternating tread device. The exits must be remotely located at a distance equal to one-half the length of the maximum overall diagonal dimension of the room. Refrigeration machinery rooms larger than 1,000 square feet must have at least two (2) exits (MSBC Section 1006.2.2.2). All portions of the machinery rooms must be within 150 feet of an exit or exit access doorway. Doors must swing in the direction of egress travel regardless of the occupant load served.

The current egress strategy involves occupants on the base floor egressing upwards one story to exit through the main entry doors on the 1st floor. MSBC Section 1006.3 permits the path of egress travel to pass through one (1) adjacent story to reach an exit. Occupants from the base floor would only pass through one adjacent story to reach the main entrance to the building, thus the approach complies with MSBC Section 1006.3.

Arrangement of Means of Egress (MSBC Section 1007.1.1)

Where two (2) exits or exit access doors are required from a sprinklered space, they must be placed not less than one-third the overall diagonal distance of the space, measured in a straight line between the exit doors or exit access doors.

Where there are three (3) or more exits, or exit access doors, at least two (2) of the exits or exit access doors are required to meet the remoteness as defined above. The additional exits shall be located as remotely as possible.

Exit Capacities

The exits within the building will be designed using the exit capacity factors listed in MSBC Sections 1005.3.1 and 1005.3.2. The exit capacity for stairs is calculated at 0.20 inches per occupant, while all other means of egress components are calculated at 0.15 inches per occupant as the building will be fully sprinklered and provided with emergency voice/communication capabilities (Section 1005.3). The minimum required clear width shall not be less than those outlined within other sections of this report, which have been excerpted in the table below for reference.

EGRESS COMPONENT	EGRESS CAPACITY FACTOR	MINIMUM REQUIRED CLEAR WIDTH
Stairways	0.20 inches per person	44 inches (MSBC Section 1011.2)
Doors	0.15 inches per person	32 inches (MSBC Section 1010.1.1)

The following tables outline the calculated exit capacity on each floor within the building.

Egress Capacity - Basement Floor

Area	Exit Description		Clear Width of Limiting Component (in)	Capacity Factor (in/occ.)	Limiting Component Exit Capacity (occupants)
Exits Serving Base Floor	Open Stair to 1st Floor		56	0.20	280
	Stair #1	Door	34	0.15	226
		Stair	58	0.20	290
	Stair #4	Door	34	0.15	226
		Stair	58	0.20	290
				Total	732 > 346

Note: Two (2) exit stairs are required and will be provided to serve the parking garage on the base floor.

Egress Capacity – 1st Floor

Area	Exit Description	Clear Width of Limiting Component (in)	Capacity Factor (in/occ.)	Limiting Component Exit Capacity (occupants)
Exits Serving 1st Floor	North Entrance	2 (42)	0.15	560
	South Entrance	2 (42)	0.15	560
	Stair #2	32	0.15	213
	Stair #3	32	0.15	213
			Total	1,546 > 1,159

Egress Capacity - 2nd Floor

Area	Exit Description		Clear Width of Limiting Component (in)	Capacity Factor (in/occ.)	Limiting Component Exit Capacity (occupants)
Exits Serving 2nd Floor	Stair #1	Door	32	0.15	213
		Stair	58	0.20	290
	Stair #2	Door	42	0.15	280
		Stair	58	0.20	290
	Stair #3	Door	32	0.15	213
		Stair	58	0.20	290
	Exterior Stair	Door	2 (42)	0.15	560
		Stair	118	0.20	590
				Total	1,266 > 599

Egress Capacity - 3rd Floor

Area	Exit Description		Clear Width of Limiting Component (in)	Capacity Factor (in/occ.)	Limiting Component Exit Capacity (occupants)
Exits Serving 3rd Floor	Stair #1	Door	32	0.15	213
		Stair	58	0.20	290
	Stair #2	Door	42	0.15	280
		Stair	58	0.20	290
	Stair #3	Door	32	0.15	213
		Stair	58	0.20	290
				Total	706 > 647

Egress Capacity - 4th Floor

Area	Exit Description		Clear Width of Limiting Component (in)	Capacity Factor (in/occ.)	Limiting Component Exit Capacity (occupants)
Exits Serving 4th Floor	Stair #1	Door	32	0.15	213
		Stair	58	0.20	290
	Stair #2	Door	42	0.15	280
		Stair	58	0.20	290
	Stair #3	Door	32	0.15	213
		Stair	58	0.20	290
				Total	706 > 641

As seen in the tables above, the means of egress capacity exceeds the occupant load on each floor of the building. Please note that egress through the level of discharge (1st floor) will require travel through the cafeteria in the center of the building. Easily identifiable exit signage and a clear and unobstructed egress path of sufficient width must be provided and maintained throughout the cafeteria space.

The use of unenclosed egress stairs as a means of egress requires further discussion with Howe Engineers. Examples of permitted unenclosed egress stairs are included below for reference:

- **MSBC Section 1019.3(5) permits unenclosed exit access stairs within an atrium designed in accordance with MSBC Section 404, such as the atrium in the Brookline Driscoll School.**
- **MSBC Section 1019.3(1) permits unenclosed exit access stairs that serve or atmospherically communicate between only two stories.**
- **MSBC Section 1019.3(4) permits unenclosed exit access stairs in sprinklered buildings if the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stair, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, the provisions of MSBC Section 1019.3(4) are limited to openings that do not connect more than four (4) stories.**

Exit Access Travel Distance (MSBC Section 1017)

The maximum exit access travel distance for each of the occupancies will be in accordance with the requirements contained in MSBC Section 1017.2 and Table 1017.2. Refer to the table below:

OCCUPANCY	MAXIMUM ALLOWABLE TRAVEL DISTANCE (Sprinklered)
Group A, E, S-1	250 feet
Group B	300 feet
Group S-2	400 feet
Atrium	200 feet within atrium

Exit access travel distance must be measured from the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance of an *exit* (MSBC Section 1017.3). Where an exit access stairway or ramp is used as part of the means of egress system, the travel distance along the exit access stairway or ramp must be included in the exit access travel distance measurement (MSBC Section 1017.3.1). The measurement along exit access stairways and ramps must comply with the following:

- Stairways: measurements must be made on a plane parallel and tangent to the stair tread and nosings in the center of the stair and landings.
- Ramps: measurement along ramps must be made on the walking surface in the center of the ramp and landing.

Note that an “exit” is defined by MSBC Section 202 as that portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, *interior exit stairways* and *ramps*, *exit passageways*, *exterior exit stairways* and *ramps* and *horizontal exits*.

As addressed in the atrium design section of this report, the travel distance within the atrium is governed by MSBC Section 404.9. Where the path of egress travel is not on a level of exit discharge (i.e. 1st floor), the portion of the total permitted exit access travel distance that occurs within the atrium must not exceed 200 feet (MSBC Section 404.9.3).

Egress through Intervening Spaces (MSBC Section 1016.2)

Exit access from a room or space should not pass through an adjacent room or space, except where the room or area is accessory to the area being served. Exit access is not permitted to pass through kitchens, storerooms, restrooms, closets or other similar spaces. In addition, the exit access is not permitted to pass through rooms subject to locking.

Common Path of Travel Limits (MSBC Table 1006.2.1)

Maximum common path of egress travel distance is limited based on individual occupancies as outlined below.

- Business and Storage Occupancies 100 feet
- Assembly and Educational Occupancies 75 feet

As previously discussed, the parking garage will require two (2) exit stairs, which will be provided to reduce the common path of travel in the garage to less than 100 feet.

The main gym on the base floor is only shown with access to one of the two adjacent exit stairs. Access must be provided from the main gym to the other exit stair to alleviate a common path of travel in excess of the allowable 75 feet.

There is also a common path of travel issue in the mechanical/storeroom on the base floor. This room must also be provided with a second means of egress via either an additional stair or a door into the small gym.

Dead End Corridor Limits (MSBC Section 1020.4)

Per MSBC Section 1020.4, where more than one exit or exit access doorway is required, the exit access must be arranged such that there are no dead ends longer than:

- Assembly Occupancies 20 feet
- Business Occupancies 50 feet
- Storage Occupancies 50 feet
- Educational Occupancies 50 feet

Note that a dead-end corridor is not limited where the length is less than 2.5 times the minimum width of the dead end.

Exit Access Corridors (MSBC Section 1020)

Corridors used for the exit access portion of the means of egress will be constructed in accordance with the MSBC Section 1020. The exit access corridors will provide sufficient clear width to accommodate the number of occupants exiting through the corridor, but will never be less than 44 inches unless serving an occupant load of less than 50 people, in which case they can be 36 inches.

Per MSBC Table 1020.1, as the building will be fully sprinklered, rated corridors are not required for the occupancies within the building.

It should also be noted that corridors in Group E occupancies with greater than 100 occupants are required to be 72-inches in width (MSBC Section 1020.2).

Exit Stair Discharge

The MSBC requires 50 percent of the enclosed interior exit stairways to discharge to the exterior of the building. The remainder of the enclosed interior exit stairways are permitted to discharge to interior lobbies and vestibules (MSBC Section 1028.1).

The enclosed exit stairs on the east and west sides of the building both discharge directly to the exterior on the first floor and thus meet the exit stair discharge requirements. It should be confirmed that the enclosed exit stair at the north end of the building also discharges directly to the exterior to provide a means of egress from the main gymnasium on the base floor.

Doors (MSBC Section 1010)

Doors throughout the building must comply with MSBC Section 1010.1.

1. Dimensional Requirements (MSBC 1010.1.1)

Minimum clear width:	32 inches
Maximum size of a door leaf:	48 inches
Minimum Clear Height:	6 feet – 8 inches

2. Doors shall be side-hinged swinging in all spaces except within storage areas.
3. Doors serving a space with 50 people or more are required to swing in the direction of egress travel towards the exit.
4. While opening, doors are not permitted to project more than 50 percent of the required clear width in an exit stair or exit access stairway at any moment during the swing when opening. In addition, doors, when fully open, are not permitted to project more than 7 inches into the required exit clear width.

Exit Signage (MSBC Section 1013)

1. Exit signs must be provided in each room or space that requires more than one (1) exit or exit access.
2. Exit signs must be placed such that no point within an exit access corridor is more than 100 feet or the listed viewing distance of the sign, whichever is less, from the nearest visible sign.
3. Main exterior exit doors or gates which obviously and clearly are identifiable as exits are not required to be provided with an exit sign where approved by the building official.

4. Every exit sign and directional exit sign must have plainly legible letters not less than 6 inches high with the principal strokes of the letters not less than ¾ inch wide. The word “EXIT” must be in high contrast with the background and shall be clearly discernible when the exit sign illumination means is or is not energized. When an arrow is provided as part of the exit sign, the construction shall be such that the arrow direction cannot be readily changed.
5. Exit signs and exit directional signs can be externally or internally illuminated. The level of illumination at the sign’s surface must be no less than 5-foot candles.
6. Exit signs shall be illuminated at all times and connected to an emergency power source having a duration of not less than 90 minutes. Emergency power shall conform to the National Electrical Code (NFPA 70).
7. Exit signs must be provided within 18-inches of the floor in electric rooms if the electric room has over 1,200 amperes and is more than 6 feet wide. In addition, panic hardware should be provided from these spaces.
8. **The International Symbol of Accessibility must be included on exit signs at exits to grade.**
9. Directional signage indicating the location of other means of egress and in which there are accessible means of egress must be provided at the following locations:
    a. At exits serving a required accessible space, but not providing an approved accessible means of egress.
    b. At Elevator Landings
    c. Within areas of refuge

Means of Egress Lighting (MSBC Section 1008)

MSBC Section 1008 requires the following for means of egress lighting:

- The means of egress, including the exit discharge, must be illuminated at all times the building space served by the means of egress is occupied, <u>except aisle access ways in Group A occupancies.</u>
- The means of egress illumination level must not be less than 1 foot-candle (11 lux) at the walking surface.
- The power supply for means of egress illumination must normally be provided by the premises’ electrical supply. In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:
    - Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.
    - Corridors, exit enclosures and exit passageways in buildings required to have two or more exits.
    - Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
        - All components to the access to public way must be illuminated
    - Interior exit discharge elements, as permitted in Section 1027.1 of the MSBC, in buildings required to have two or more exits.
    - Exterior landings as required by Section 1008.1.6 for exit discharge doorways in buildings required to have two or more exits.
- The emergency power system must provide power for a duration of not less than 90 minutes and must consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system must be in accordance with Chapter 27 of the MSBC.

- Emergency lighting facilities must be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels are permitted to decline to 0.6 foot-candle (6 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 must not be exceeded.

FIRE PROTECTION SYSTEMS

SUMMARY OF FIRE PROTECTION FEATURES

The following Fire Protection and Life Safety Features will be provided in the building:

1. The building will be constructed of Type IIA construction.
2. The building will be fully sprinklered and provided with standpipes as outlined in this section.
3. A manual fire alarm system will be provided in the building and will meet current NFPA 72 spacing requirements.
4. Emergency voice/alarm communication systems will be installed in accordance with Section 907.2.3.
5. Emergency Power and Standby Power for all life safety systems.
   a. At least one elevator will be available to operate on Standby power.
   b. Egress Signage and Lighting will be provided with Emergency Power.
   c. The atrium smoke control system will be provided with Standby Power.
6. Portable fire extinguishers in supervised locations in accordance with NFPA 10.

AUTOMATIC SPRINKLER PROTECTION

The Brookline Driscoll School will be provided with an automatic sprinkler system as required for Group E occupancies with fire areas larger than 12,000 square feet and as required by the M. G. L. 148 26 G. The atrium and the space below the stage are also required to be provided with sprinkler protection. The design densities of the sprinkler system will be determined by the engineer of record.

STANDPIPES

Standpipes are required throughout all buildings in which the highest occupiable floor is greater than 30 feet above the lowest level of fire department vehicle access (MSBC Section 905). As such, the proposed Brookline Driscoll School must be equipped with a standpipe system throughout. It should be noted that Class I standpipes are permitted in buildings provided with automatic sprinkler protection in lieu of a Class III standpipe.

It should also be noted that the stage will require a Class III wet standpipe system with a 1 ½-inch hose connection installed in accordance with NFPA 13 or NFPA 14 on each side of the stage (MSBC Section 905.3.4). Since the building is fully sprinklered, only a single 1 ½-inch hose connection is required. This requirement is only applicable if the stage is greater than 1,000 square feet in area. **The area of the stage must be confirmed by JLA.**

FIRE ALARM

Section 907.2.3 requires a manual fire alarm system for Group E occupancies with an occupant load greater than 50. The manual fire alarm system must initiate emergency voice/alarm communication features in the building. Where smoke detectors or automatic sprinkler systems are installed, the systems must be connected to the building fire alarm system. **It should be noted that manual fire alarm boxes are not required in Group E occupancies**

if the building is fully sprinklered, the emergency voice/alarm communication system will activate upon sprinkler waterflow, and manual activation is provided from a normally occupied location.

Manual Fire Alarm Pull Stations

Manual fire alarm devices will be located no more than 5 feet from the entrance to each exit. Additional manual fire alarm boxes will be located so that travel distance to the nearest manual pull station is no more than 200 feet. A manual pull station will also be provided in a constantly attended location to provide the capability to manually activate the fire alarm system in an emergency.

SMOKE CONTROL

As indicated in the atrium design section of this report, the atrium will require a smoke control system designed in accordance with MSBC Section 909. The system may be designed as either a natural or mechanical ventilation system, and an engineering rational analysis should be provided to document the intended design of the system function. A dedicated smoke control panel must be provided in accordance with MSBC Section 909.16. As indicated throughout this report, all components of the smoke control system must be provided with standby power.

EMERGENCY POWER

The following systems shall be provided with emergency power:

1. Emergency lighting along the means of egress in the building and along the exit discharge at a minimum level of 1-foot candle. Emergency lighting shall be provided in those rooms when the area is occupied. Subject to the approval of the Authorities Having Jurisdiction.
   a. Complete Emergency Lighting shall be provided to the exit discharge of the building exits as determined by the Authorities Having Jurisdiction.
2. Fire Alarm System and all associated equipment including, but not limited to, the following:
   a. Fire alarm control panels (including all fire alarm control equipment throughout the facility).
   b. Fire alarm controls.
   c. Fire alarm power supply booster panels.
   d. Digital fire alarm communicators and interface equipment.
   e. Dedicated telephone line from the Fire Alarm Control Panel dialer.
   f. Manual pull stations
3. Exit and Directional Exit Signs.
4. Elevators (transferable)
5. Power Operated Locks (if provided)
   a. Manual override controls for any electric locking or hardware in the entire building.

It should be noted that the atrium smoke control system will be required to be provided with standby power.

ELEVATOR PROVISIONS

An elevator is proposed at the north end of the atrium which will serve all floors of the building.

Phase I and Phase II recall equipment prescribed by the ASME 17.1 elevator code will be provided for the elevators. Accessible elevators shall be located within the travel distance required by the Accessibility Standards.

Two-way communication devices must be provided at elevator lobby areas above and below grade.

PORTABLE FIRE EXTINGUISHERS

The Massachusetts State Fire Code (MSFC) adopts and amends the 2015 edition of NFPA 1, which requires fire extinguishers in Groups A, B, and E occupancies. As such, fire extinguishers must be provided throughout all enclosed areas of the building. Portable fire extinguishers will be provided in locations where required by NFPA 10. Basic requirements are as follows.

In accordance with MSBC Section 906.1, extinguishers will be required in the following locations:

- Not more than 75 feet of travel distance to a fire extinguisher. Fire extinguishers need not be located in each room if the travel distance can be achieved and the extinguisher has the correct hazard classification for each hazard within the 75-foot travel distance.
- Portable Class BC in elevator machine rooms and kitchens (kitchens may require class K depending on contents and use)
- Shall not exceed 40 pounds capacity

Actual Mounting Locations (2013 Edition NFPA 10)

- Bottom of extinguisher at least 4 inches above the floor
- Top of extinguisher not more than 5 feet above the floor
- 1-6.6: Fire extinguishers shall not be obstructed or obscured from view.
- 1-6.5: Cabinets shall not be locked (however, if extinguishers are in locations subject to malicious use, the cabinets can be locked, but there must be a means to open them in an emergency. Example: breaking the glass).
- 1-6.3: Fire extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of a fire. Preferably they shall be located along normal paths of travel, including exits from areas.
- 1-6.11: Operating instruction shall be located on the front of the extinguisher and be clearly visible (manufacturer requirement).
- 1-6.12: Fire extinguishers mounted in cabinets or wall recesses shall be placed so that the fire extinguisher operating instructions face outward.
- The location of such fire extinguishers shall be marked conspicuously (see 1-6.6).

Fire Department Access

Per 527 CMR Section 18.2.3.2, a fire department access road must be provided and maintained in a manner that allows at least one (1) exterior door to be within 50 feet of the access road, which can be opened from the outside. Also:

- All points of the building must be within 150 feet of the fire department access road. Since the building is protected throughout by an automatic sprinkler system, this maximum distance is increased to 250 feet.
- The fire department access road must have an unobstructed width of not less than 20 feet, and an unobstructed vertical clearance of 13 feet 6 inches.
- A minimum 25-foot turning radius must be provided and maintained (must be approved by AHJ)
- The access road must be designed and maintained to support the imposed loads of fire department apparatus and must be provided with an all-weather driving surface.
- Where necessary, dead ends are permitted provided they do not exceed 150 feet in cumulative length.
- The access road plan must include an analysis and evaluation of fire apparatus maneuvers throughout the access roads created by sweep path analysis and turn simulation software.

Emergency Responder Radio Coverage

Per MSBC Section 916.1, all buildings must have approved radio coverage for emergency responders within the building based on the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section does not require improvement of the existing public safety communication systems. The emergency responder radio coverage must be in accordance with Section 510 of the International Fire Code.

The building is considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building have a minimum signal strength of -95 dBm must be receivable within the building and a minimum signal strength of -100 dBm must be received by the agency's radio system when transmitted from within the building. **A bi-directional antenna is required for the project.**

ACCESSIBILITY

As new construction, the Brookline Driscoll School will be designed in full compliance with MAAB as well as the 2010 Americans with Disabilities Act Accessibility Guidelines (ADAAG).

GENERAL REQUIREMENTS

The Brookline Driscoll School must be designed to fully comply with MAAB as well as the 2010 Americans with Disabilities Act Accessibility Guidelines (ADDAG). Both MAAB and ADAAG require all of the following components to be accessible:

- All entrances
- All restrooms
- All changing rooms and showers
- All exterior pathways
- Parking (required percentage)

The following accessible features should be provided in the building:

- All restrooms and locker rooms should be accessible. Locker rooms should include the following features:
  - 36-inch wide accessible routes around all lockers. (including between benches and lockers)
  - 5% of lockers should be accessible, with not less than one accessible locker
  - At least one accessible shower stall
  - Accessible toilet and plumbing fixtures
- The elevator will be fully accessible
- All entrances must be accessible
- All exterior walkways must be accessible
- Classrooms must be accessible including all laboratory/science classrooms. Five percent, but not less than one (1) of each type of equipment/learning station, should be accessible

Public and Common-Use Spaces

The public and common-use spaces are those spaces inside or outside the building that are used by students, staff, and/or visitors. This includes the parking garage and gymnasiums on the base floor and the assembly spaces on the 1st floor. These spaces must be accessible per the requirements of 521 CMR and the 2010 ADAAG. These spaces should be on an accessible route that is at least 36 inches wide and which connects accessible parking, accessible entrances, and public and common-use spaces. Where possible, the accessible route should be the shortest possible route (521 CMR 10.2). All doorways and openings located in common-use and public use spaces and along accessible routes should comply with 521 CMR Sections 26.2 through 26.11 and ADAAG Section 404.

Accessible Means of Egress

All spaces or elements that are required to be accessible must be provided with at least one accessible means of egress. In spaces required to be provided with multiple means of egress, each space must be served by at least two accessible means of egress. Exit access stairways are permitted to be considered part of the accessible means of egress if they provide a clear width of at least 48 inches between the handrails and two-way communication is provided at the elevator landings in accordance with MSBC Section 1009.3. Areas of refuge are not required to be provided at the exit access stairways since the building will be fully sprinklered. Two-way communication is required to be provided at the elevator landings, so that the exit access stairways in the school can be considered as part of the accessible means of egress.

Parking

Parking will be provided in accordance with the following MAAB table based on the number of parking spaces provided. **One-eighth of accessible spaces, but not less than one accessible space, must be van accessible.**

23.2.1	Total Parking in Lot	Required Minimum Number of Accessible Spaces
	15-25	1
	26-50	2
	51-75	3
	76- 100	4
	101-150	5
	151-200	6
	201-300	7
	301-400	8
	401-500	9
	501-1,000	2% of total
	1,001 and over	20 plus 1 for each 100 over 1000

Accessible Seating Requirements

In places of assembly with fixed seating, the minimum number of accessible spaces provided must be in accordance with the table below:

Total Seating	Wheelchair Spaces
4 to 25	1
26 to 50	2
51 to 300	4
301 to 500	6
over 500	6, one additional space for each total seating capacity increase of 100.

Where more than 150 seats are provided, the wheelchair seating locations must be provided in more than one (1) location and must be dispersed through the seating area. Accessible seating must be integrated with the rest of the seating (i.e. shoulder-to-shoulder). Bleachers should be ordered with cutouts where accessible seating will be provided.

In addition to wheelchair seating locations, 1% of all fixed seats must be a companion seat consisting of an aisle seat with no armrests on the aisle side.

Accessible seating positions are permitted to be clustered for bleachers, balconies and other areas having sight lights with a slope greater than 5%. Equivalent accessible viewing positions may be located on levels having accessible egress.

Ticket box offices and concession stands must be located on an accessible route, and a portion of the counter must be a maximum of 36 inches high for a length of at least 36 inches. A counter or auxiliary counter may be used to achieve this requirement.

PLUMBING FIXTURES

The Massachusetts Plumbing Code requires specific plumbing fixtures for various spaces in the building. The number of plumbing fixtures shall be determined based on the following factors, as excerpted from the Massachusetts State Plumbing Code, Section 10.10 Table 1.

The following table outlines the plumbing fixture requirements for new construction. The factors that dictate the fixture counts for the building depend on the intended and future function of the Brookline Driscoll School. It should be noted that staff and students require separate toilet facilities.

Occupancy	Subcategory	Water closets			Lavatories		Drinking Fountains
		Male	Female	Urinals	Male	Female	
Education	Kindergarten	1 per 20	1 per 20		1 per 20	1 per 20	1 per 75
Educational	Elementary	1 per 60	1 per 30	1 per 60	1 per 60	1 per 60	1 per 75
Educational	Staff	1 per 25	1 per 20	33%	1 per 40	1 per 40	--
Educational	Auditorium	1 per 600	1 per 200	1 per 200	--	--	--

It should also be noted that 248 CMR Section 10.10(18)(h)6 requires all secondary schools that conduct physical activities on the school premises to be provided with separate men's and women's shower facilities to accommodate students. Showers should be provided for the largest population expected to use them at a given time (e.g. physical education class or after-school sporting event).

The following tables outline the required plumbing fixtures for the Brookline Driscoll School based on the use of a program occupant load. A program occupant load captures the intended use of spaces, as opposed to the calculated occupant load which tends to be more conservative in nature. **The use of a program occupant load requires discussion and approval from the plumbing official**.

Brookline Driscoll School			Required							Provided*						
Occupancy	Subcategory	Total Occupant Load	Water closets			Lavatories		Drinking Fountains	Water closets				Lavatories		Drinking Fountains
			Male		Female	Male	Female		Male			Female	Male	Female	
			Toilets	Urinals					Toilets	Urinals	Total				
Educational	Kindergarten	84	2.10	--	2.10	2.10	2.10	1.12	12	8	20	20	24	24	TBD
Educational	Elementary	716	5.97	5.97	11.93	5.97	5.97	9.55							
Educational	Staff	125	2.50	--	3.13	1.56	1.56	--							
Educational	Auditorium	394	0.33	0.99	0.99	--	--	--							
	TOTALS	**1,319**	**10.90**	**6.95**	**18.14**	**9.63**	**9.63**	**10.67**	**12**	**8**	**20**	**20**	**24**	**24**	**TBD**

***The proposed layout of the Brookline Driscoll School includes 16 single-user toilet/sink units. For the purposes of plumbing fixture counts, these fixtures were divided evenly between male and female.**

Based on the table above, a sufficient number of plumbing fixtures is provided based on the proposed floor layout and program occupant load of the Brookline Driscoll School. Note that drinking fountains are not shown on the current drawings. The location of required drinking fountains must be confirmed.

CONCLUSION

The Brookline Driscoll School is to be constructed in accordance with the requirements of the applicable codes. During this process, the building will be designed to provide levels of safety at least equivalent to the provisions contained in the applicable codes. To achieve these levels of safety, the following primary features will be provided:

1. The building will be of Type IIA construction and will comply with the non-separated mixed-use provisions of MSBC Section 508.3.
2. The building will be fully sprinklered throughout and provided with standpipes as outlined herein.
3. The means of egress system will be provided as outlined in this report and will meet the requirements of the MSBC. Note that two exit stairs are required and will be provided from the parking garage.
4. The building will be provided with a manual fire alarm system and emergency voice/alarm communication capabilities as required by MSBC Section 907.2.3.
5. The atrium will be provided with a smoke control system designed in accordance with MSBC Section 909 that maintains tenability 6 feet above the highest walking surface. The smoke control system will be provided with standby power.
6. The building will be designed as fully accessible in accordance with MAAB and ADAAG.
7. Plumbing fixtures will be provided in accordance with the provisions in the tables detailed above.

Please contact our office if you have any questions regarding the items addressed in this report.

Prepared by,

Howe Engineers, Inc.

Jeremy A. Mason, P.E.(MA)
Associate Principal

7. Utility Analysis

General

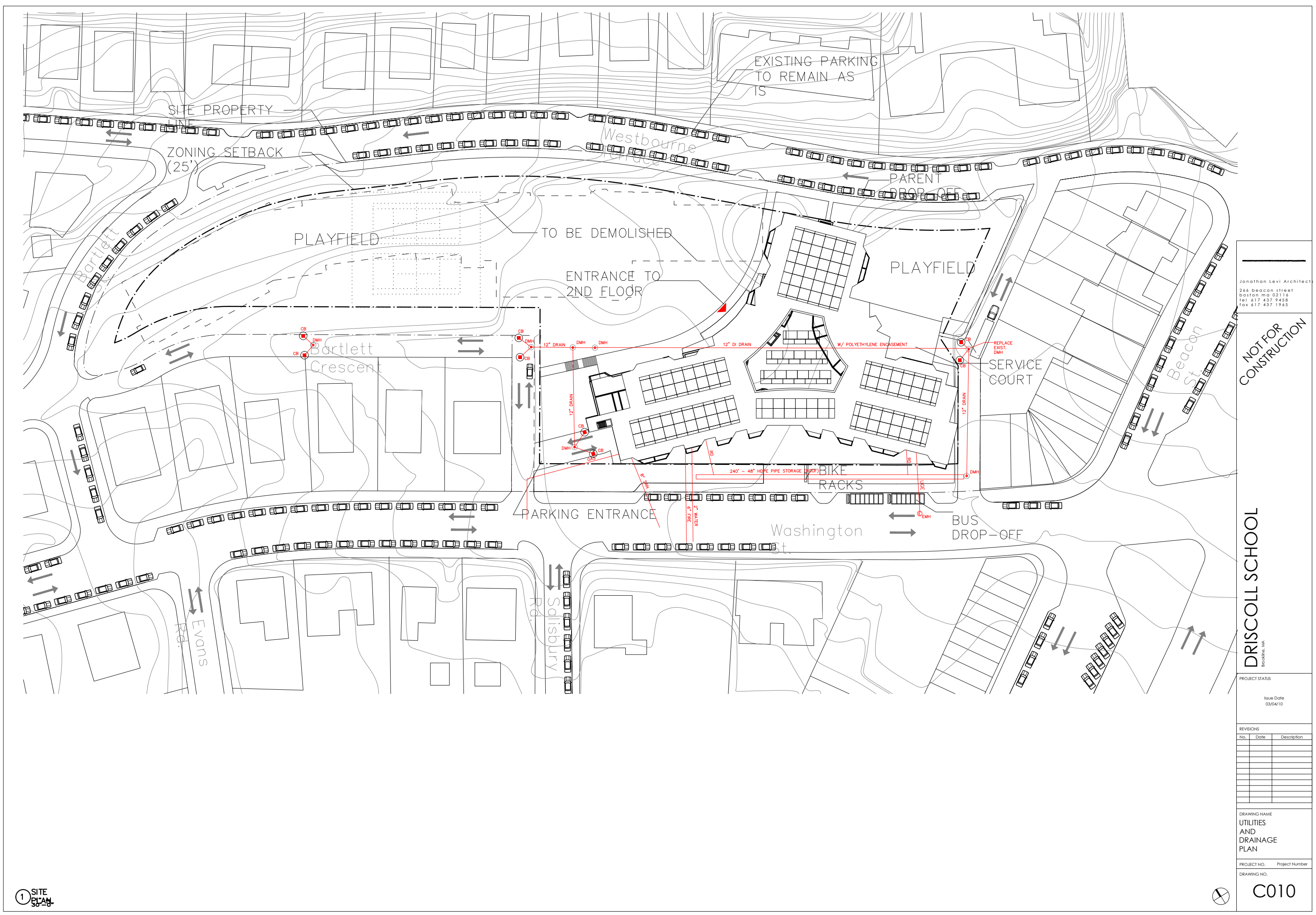
It is assumed that existing utility service levels on either Westbourne Terrace or Washington Street will be more than adequate for the new school. A flow test will be performed in Design Development, to confirm sufficient flow for the fully sprinklered new building.

Water Service

An existing water main is present along both Westbourne Terrace and Washington Street on either side of the school. The existing building appears to be connected to the service along Westbourne Terrace.

Sewer Service

An existing sewer main is present along Westbourne Terrace and Washington Street Heath Street directly in front of the school. The existing school appears to be connected to the service along Westbourne Terrace.



Gas Service
A gas main is present along Westbourne Terrace and Washington Street Heath Street directly in front of the school. The existing school appears to be connected to the service along Washington Street.

Stormwater
The on-site drainage system appears to be a simple system comprised of catch basins and manholes which connect at various points to an existing drainage main just to the south of the existing school building , which appear to connect out to the existing street drainage system on Beacon St.

Flood Plain
The site is not in a flood plain.

Potential Site Improvements:

Water Service
The existing water services will be updated, providing separate domestic and fire flow services will be provided to the new school building.

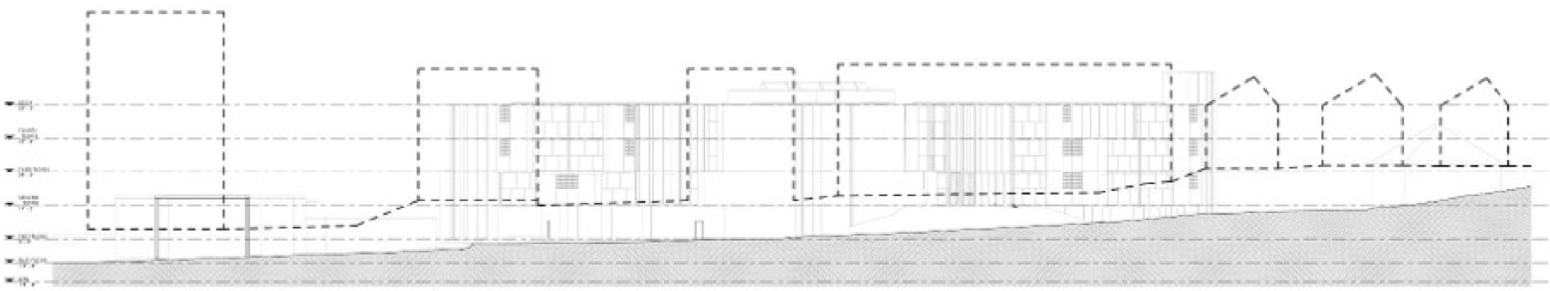
Sewer Service
The existing sewer service will be replaced.

Gas Service
The existing gas service will be replaced.

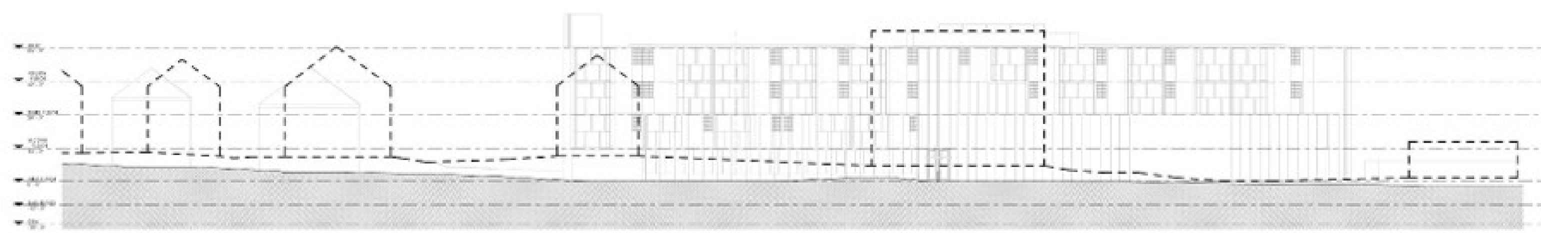
Stormwater
The existing on-site drainage system does not appear to meet current stormwater management standards. Depending on the proposed site improvements the existing system will need to be upgraded to provide mitigation to reduce stormwater runoff, increase groundwater infiltration, and increase stormwater discharge quality. These improvements could include above or below ground stormwater infiltration/detention systems, deep sump catch basins, and water quality structures.

8. Massing Study

The massing of the new Driscoll School is tailored to its neighborhood context. On the Washington Street thoroughfare, its 4 story height responds to the commercial character of the adjacent Washington Sq. and relates well to multi family buildings in the vicinity. Fronting Westbourne Terrace the building presents a narrow three story façade – sharply reduced in size and impact from the existing building. The three story height is significantly lower than the 4-5 story hillside perched buildngs opposite on Westbourne.



WESTBOURNE TERRACE ELEVATION



WASHINGTON STREET ELEVATION

9. Building Systems

9.1 Building Structure

Please reference the following Schematic Design Report prepared by LeMessurier, Structural Engineer.

I. Structural Systems Overview

The proposed new building will consist of four stories with a lower level below grade primarily for parking. The proposed building structure will be a structural steel frame with concrete floor slabs on composite steel deck. The roof will be steel roof deck except at areas where concrete is required for sound attenuation below rooftop mechanical equipment or for fire ratings. Lateral loads will be resisted by structural steel braced frames. Foundations will be cast-in-place reinforced concrete walls, slabs-on-grade, and spread footings.

II. Foundations

Based on information provided by McPhail Associates in the 27 November 2018 document titled "Preliminary Foundation Engineering Report", foundations for the project will be as follows:

A. Walls

Typical foundation walls will be 16-inch thick reinforced concrete with 8-inch wide shelves as required to support façade elements. Exterior foundation walls will extend down to a minimum of 4'-0" below finished exterior grade. A drainage system will be installed around the perimeter of the foundation to divert ground water away from the building. All foundation walls enclosing below-grade space shall be waterproofed on the exterior surface.

B. Slab-on-Grade

The lower level and first floor slab-on-grade will be a 5-inch thick slab-on-grade. A 15-mil vapor barrier and a 12-inch layer of crushed stone will be placed beneath the slab to provide an adequate substrate and to allow for an under-slab drainage system. An allowance shall be provided for depressions, and trenches, and other potential equipment requirements.

C. Footings

The foundations will be reinforced concrete spread footings and continuous wall footings bearing on compacted structural fill or undisturbed soil. The allowable bearing pressure will be per the recommendations of the geotechnical report which states a maximum uniform design force of 2 tons per square foot.

D. Pits

Elevator and other pits that may be required pits will consist of an 18-inch thick reinforced concrete base slab and 12-inch thick reinforced concrete pit walls. All pits shall receive waterproofing.

E. Foundation Requirements

Based on the geotechnical report the site is underline with fill and organics of significant thickness, up to 22 feet, which are unsuitable for building foundation support. New foundations and slabs-on-grade shall be supported on aggregate piers installed through the fill and organic layers. This method of construction is a form of ground improvement and permits the use of conventional foundations for building support once the ground improvements are complete.

III. Gravity Load System

A. Ground Floor

Slab-on-grade as described above.

B. Typical Floor Construction

Floor construction will be 3¼-inch lightweight concrete on 3-inch deep, 18-gage galvanized, composite steel deck for a total slab thickness of 6¼-inches. The floor slab will be reinforced with WWF 6x6-W4.0xW4.0 throughout. Beams and girders will be structural steel rolled shapes (typically W14, W16, & W18) made composite with the floor slabs via ¾-inch diameter, 5½-inch long welded steel shear studs. Columns will be structural steel rolled shapes (typically W12).

C. Typical Roof Construction

The roof will be 3-inch deep, 18 gage, galvanized steel roof deck. Roof beams and girders will be structural steel rolled shapes. Where it is preferred or necessary to place concrete on the roof, the construction will be similar to the typical floor construction described above. Hot-dipped galvanized steel dunnage will be provided on top of the roof if necessary to support mechanical equipment and for mechanical equipment screening.

D. Typical Façade Support

Continuous support of the building façade is expected to occur from each framed level above grade. This may likely consist of hung steel angle frames with all material outside the air and vapor barrier system to be hot-dipped galvanized.

E. Central Atrium Design

The central atrium will connect all three wings of the new building through a central opening in all floors above level one beneath a large skylight roof opening. Cantilever balconies will extend beyond the classroom walls to the edge of the central opening and will be supported by steel tension rods. Each of three upper levels will be interconnected by central stairs that traverse the central opening at various plan locations. The aesthetic solution for the hangers will result in a random placement of the hangers in a pattern that keeps the distance between adjacent hanger attachments to the balcony edge in the 20-foot to 24-foot range. Hangers will extend up to the upper floors or directly to the roof where they will attach to the main roof girders or purlins spanning between the girders with various angles of alignment that will yield a visual experience of random sloped hangers.

IV. Lateral Load System

The lateral force resisting system will consist of concentrically braced steel frames in both primary structural directions. Structural steel tubes will be oriented diagonally in vertical planes between columns to provide resistance to wind and seismic forces. Final locations of the frames will be coordinated with the architectural layout as design progresses.

V. Structural Quantities for Estimating

A. Steel wide flange framing, tube columns and tube bracing for the floor and roof construction shall be estimated at 12 pounds per square foot of framed area.

B. Headed shear studs shall be used at all new slabs that bear on steel framing and shall consist of studs that are ¾" diameter and 4 inches high and shall be estimated at 200 per every 1,000 square feet of deck slab area.

C. The mechanical duct path will require that reinforced steel web openings be placed in some steel beams which should be all shop installed with a quantity estimated at 20 reinforced penetrations per floor.

D. Façade support framing for masonry relief shall consist of hung angles and angle bracing in addition to slab-support relief with all framing outside the air and vapor barrier to be hot dipped galvanized and shall be estimated at 0.5 pounds per square foot of framed area.

E. Bay window framing shall consist of HSS sections fabricated into the bay configurations with welded joints and shall be estimated at 0.5 pounds per square foot of framed area.

F. Floor and roof slab construction shall consist of 3" high, 18 gage galvanized composite steel deck with 3½" of normal weight concrete topping for a total slab thickness of 6½" and shall be reinforced with WWF – W3.0xW3.0.

G. Atrium framing shall be added to the steel tonnage listed above and shall consist of 8 plate girders totaling 8 tons each and 50 rod hanger at 2 inch diameter approximately 30 feet long each consisting of high strength rod and clevise and pin connections with threaded ends and midspan turnbuckles for adjustment with both ends attached to custom plate brackets with an architectural finish.

H. Atrium steel stair framing shall be added to the steel tonnage listed above and shall consist of heavy HSS sections with steel plate not exposed to view and shall be estimated at 30 tons total for all three atrium stairs.

I. Steel framing for roof screening and equipment dunnage shall be hot-dipped galvanized HSS sections with bolted connections totaling 30 tons which shall be added to the steel tonnage listed above.

J. Column spread footings shall be estimated at 8 feet x 8 feet x 2 feet deep with 60 pounds of reinforcement per cubic yard of concrete and shall be counted as one footing per 700 square feet of building footprint area.

K. Perimeter wall footings shall be estimated at 4 feet by 18 inches deep with 100 pounds of reinforcement per cubic yard of concrete.

L. Foundation walls shall be estimated at 16 inches thick with 6.5 pounds of reinforcement per square foot area of wall.

M. Concrete slab on grade shall be 6 inches thick and shall be reinforced with WWF – W3.0xW3.0.

N. Pits for elevators and mechanical and plumbing systems shall have 18-inch-thick base slabs and 12 inch thick walls and shall be reinforced at 150 pounds per cubic foot of concrete.

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9.2 Plumbing

Please reference the following Plumbing Systems report prepared by Garcia, Galuska, DeSousa, Consulting Engineers.

PLUMBING SYSTEMS

NARRATIVE REPORT

The following is the Plumbing system narrative, which defines the scope of work and capacities of the Plumbing system as well as the Basis of Design. The Plumbing Systems shall be designed and constructed for ***LEED v4*** where indicated on this narrative.

1. CODES

   A. All work installed under Section 220000 shall comply with the MA Building Code, MA Plumbing Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

3. GENERAL

   A. The Plumbing Systems that will serve the project are cold water, hot water, tempered water, sanitary waste and vent system, grease waste system, special waste system, storm drain system, and natural gas.

   B. The Building will be serviced by Municipal water and Municipal sewer system.

   C. All Plumbing in the building will conform to Accessibility Codes and to Water Conserving sections of the Plumbing Code.

4. DRAINAGE SYSTEM

   A. Soil, Waste, and Vent piping system is provided to connect to all fixtures and equipment. System runs from 10 feet outside building and terminates with stack vents through the roof.

   B. A separate Grease Waste System starting with connection to an exterior concrete grease interceptor running thru the kitchen and servery area fixtures and terminating with a vent terminal through the roof. Point of use grease interceptors are to be provided at designated kitchen fixtures. The grease interceptor is provided under Division 33 scope.

   C. Storm Drainage system is provided to drain all roofs with roof drains piped through the building to a point 10 feet outside the building.

   D. Drainage system piping will be service weight cast iron piping; hub and spigot with gaskets for below grade; no hub with gaskets, bands and clamps for above grade 2 in. and larger. Waste and vent piping 1-1/2 in. and smaller will be type ‘L’ copper.

E. A separate Special Waste System shall be provided starting with a connection to an interior limestone chip acid neutralizer, running thru the building to collect science classroom fixtures and terminating with vent terminals through the roof. Special Waste and Vent piping will be Schedule 40 electric heat fused polypropylene piping, fittings and traps, flame retardant above grade and non-flame retardant below ground.

5. WATER SYSTEM

A. New 4-inch domestic water service from the municipal water system will be provided. A meter and backflow preventer will be provided.

B. Cold water distribution main is provided. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

C. Water piping will be type ‘L’ copper with wrot copper sweat fittings, silver solder or press-fit system. All piping will be insulated with 1 in. thick high density fiberglass.

D. A dedicated non-potable water system will be provided to Science Classrooms. Water system will be protected with a reduced pressure backflow preventer.

E. Tepid (70 deg. F – 90 deg. F) water will be provided to the emergency shower/eyewash fixtures in Science Classrooms as required by code.

F. Domestic hot water will be provided with electric, point-of-use, instantaneous water heaters.

6. FIXTURES ***LEED v4***

A. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.

B. Fixtures shall be the manufacturer’s guaranteed label trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer’s symbol signifying acid resisting material.

C. Vitreous china and acid resisting enameled fixtures, including stops, supplies and traps shall be of one manufacturer by Kohler, American Standard, or Eljer, or equal. Supports shall be Zurn, Smith, Josam, or equal. All fixtures shall be white. Faucets shall be Speakman, Chicago, or equal.

D. Fixtures shall be as scheduled on drawings.

1. Water Closet: High efficiency toilet, 1.28 gallon per flush, wall hung, vitreous china, siphon jet. Manually operated 1.28 gallon per flush-flush valve.

2. Urinal: High efficiency 0.13 gallon per flush urinal, wall hung, vitreous china. Manually operated 0.13 gallon per flush-flush valve.

3. Lavatory: Wall hung/countertop ADA lavatory with 0.35 GPM metering mixing faucet.

4. Sink: MAAB/ADA stainless steel countertop sink with gooseneck faucet and 0.5 GPM aerator.

5. Drinking Fountain: Barrier free hi-low wall mounted electric water cooler, stainless steel basin with bottle filling stations.

6. Janitor Sink: 24 x 24 x 10 Terrazo mop receptor Stern-Williams or equal.

7. Laboratory Sinks: Faucets with vacuum breakers and 0.74 GPM aerators.

7. DRAINS

A. Drains are cast iron, caulked outlets, nickaloy strainers, and in waterproofed areas and roofs shall have galvanized iron clamping rings with 6 lb. lead flashings to bond 9 in. in all directions. Drains shall be Smith, Zurn, Josam, or equal.

8. VALVES

A. Locate all valves so as to isolate all parts of the system. Shutoff valves 3 in. and smaller shall be ball valves, solder end or screwed, Apollo, or equal.

9. INSULATION

A. All water piping shall be insulated with snap-on fiberglass insulation Type ASJ-SSL, equal to Johns Manville Micro-Lok HP.

10. CLEANOUTS

A. Cleanouts shall be full size up to 4 in. threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes.

B. Cleanouts for Special Waste System shall be Zurn #Z9A-C04 polypropylene cleanout plug with Zurn #ZANB-1463-VP nickel bronze scoriated floor access cover.

11. ACCESS DOORS

A. Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

9.3 HVAC Systems

Please reference the following HVAC Systems report prepared by Garcia, Galuska, DeSousa, Consulting Engineers.

HVAC SYSTEMS

NARRATIVE REPORT

The following is the HVAC system narrative, which defines the scope of work and capacities of the HVAC system as well as the Basis of Design. The HVAC systems shall be designed and constructed for ***LEED for Schools v4*** where indicated on this narrative.

1. CODES

All work installed under Division 230000 shall comply with the State of Massachusetts Building Code and all local, IBC 2015, IECC 2015 and IMC 2015 with MA Amendments, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

The work of Division 230000 is described within the narrative report. The HVAC project scope of work shall consist of providing new HVAC equipment and systems as described here within. All new work shall consist of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

3. BASIS OF DESIGN: (MASS CODE)

Project weather and Code temperature values are listed herein based on weather data values as determined from ASHRAE weather data tables and the International Energy Conservation Code.

Outside: Winter 5 deg. F, Summer 91 deg. F DB 74 deg. F WB

Inside: 70 deg. F +/- 2 deg. F for heating, 75 deg. F +/- 2 deg. F (55% RH) for cooling. Unoccupied temperature setback will be provided (60 deg. F heating (adj.), 85 deg. F cooling (adj.).

Outside air is provided at the rate in accordance with ASHRAE guide 62.1-2013 and the International Mechanical Code as a minimum. All occupied areas will be designed to maintain 800 PPM carbon dioxide maximum.

4. SYSTEM DESCRIPTION

A. Central Heating and Cooling Plant: ***LEED for Schools v4 Credit Ep2 & Ec2***

Heating and cooling for the entire building will be capable of being provided through the use of a high-efficiency geothermal heating and cooling plant including (5) five water to water source simultaneous heating/cooling heat pump chillers with heat recovery with a capacity of 78 tons each. The heat pump chiller units will be located in the Mechanical Room. The heat pump heat recovery chillers will be provided with condenser water from evaporative fluid coolers.

A new supplemental boiler plant shall be provided with (3) 1,320 MBH (388 kW) output electric boilers, each will be located in the mechanical room. Boilers shall each be sized for approximately 50% of the building heating load.

The heat pump chiller plant and supplemental boiler plant will supply heating hot water to heating equipment and systems located throughout the building through a two-pipe fiberglass insulated schedule 40 black steel and copper piping system. The plant shall supply a maximum hot water temperature of 160°F on a design heating day. Primary and standby end suction base mounted pumps with a capacity of 500 gpm and will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency. In addition to new boilers and pumps, new hot water accessories including air separators and expansion tanks shall be provided.

The heat pump chiller plant will distribute between 45°F and 55°F chilled water to the roof mounted air handling units and a compensated chilled water distribution system located throughout the building will distribute between 55°F and 65°F chilled water to the terminal radiant cooling panels and induction units. The chilled water distribution piping will be of the fiberglass insulated schedule 40 type and will be completely separate from the hot water distribution piping system. Chilled water pumps with a capacity of 800 gpm and variable frequency drives (which will control down to maintain a minimum flow to the chiller) will be provided for overall variable flow chilled water system distribution. In addition to pumps, new chilled water accessories including air separators and expansion tanks shall be provided.

Primary and standby condenser water pumps with a capacity of 800 gpm and variable frequency drives (which will control down to maintain a minimum flow to the heat pumps chillers) will be provided for overall variable flow condenser water system distribution. In addition to pumps, new condenser water accessories including air separators and expansion tanks shall be provided.

<u>Net Zero Geothermal Option</u>

As an alternate option, a closed-loop geothermal well system can be utilized in lieu of the fluid cooler and supplemental electric boilers described above. The heat pump heat recovery chillers will be provided with ground-source condenser water from (56) 675’ deep closed loop type ground source geothermal quad wells.

Under this alternate, the plant shall supply a maximum hot water temperature of 130°F on a design heating day and the condenser water pumps will have a capacity of 1,000 gpm.

B. Classroom Heating, Ventilation & Air Conditioning *(General Classrooms, Art/Music/Drama Rooms, Science Classrooms, Administration Areas, Dining Commons, Gymnasiums, Locker Rooms, Multi-Purpose, Stage, Media Center, and Support Areas)* ***(Full Air Conditioning VAV Displacement System)***
LEED of Schools v4 Credit Ep2 & 4, Ec2, IEQp1, IEQc1, 2, 3, & 4

The air-conditioned areas are to be served by new air handling units of the recirculation type design providing a fully air conditioned variable volume displacement ventilation air distribution systems.

New air handling units with supply and return fan with VFDs, energy recovery wheels, hot water heating and chilled water cooling with modulating capacity control, and MERV 13 filtration will be provided to serve the new fully air conditioned displacement ventilation system. Supply air will be provided to the space through new insulated, galvanized steel supply duct distribution systems and shall be connected to wall mounted displacement ventilation diffusers located within the classrooms. Return air will be drawn back to the units by ceiling return air registers located within the classroom and will be routed back to the air handling unit by an insulated galvanized sheetmetal return air ductwork distribution system. Supplemental hot water fin tube radiation or ceiling radiant heating will be provided along exterior walls.

Each space and support area will be provided with a variable air volume terminal box and CO2 sensor for demand ventilation control.

It is estimated that the following air handling equipment will be required to serve these areas:

AHU-1: Air handling unit with a capacity of 6,000 CFM (16 tons cooling, 230 MBH heating), to serve the Gymnasium Areas

AHU-2: Air handling unit with a capacity of 4,500 CFM (12 tons cooling, 170 MBH heating), to serve the Small Gymnasium and Locker Room Areas

AHU-4: Air handling unit with a capacity of 45,000 CFM (120 tons cooling, 1700 MBH heating), to serve the Classrooms (West), Science Classrooms, Administration Areas, Media Center, and Support Areas

AHU-5: Air handling unit with a capacity of 55,000 CFM (147 tons cooling, 2100 MBH heating), to serve the Classrooms (East), Art/Music/Drama Rooms, Science Classrooms, Dining Commons, Multi-Purpose, Stage, and Support Areas

C. Kitchen, Custodial Support, Receiving:
LEED for Schools v4 Credit Ep2 & 4, Ec2, IEQp1, IEQc1, 2, 3, & 4

The kitchen areas shall be provided with a kitchen exhaust fan from a new kitchen exhaust air fan system. It is estimated that a kitchen exhaust fan system with a capacity of 5,000 CFM is required. The kitchen will be heated and provided with make-up air from a 4,500 CFM make-up air handling unit (AHU-3) and will include supply and return fans with VFDs, 170 MBH hot water heating section with modulating capacity control, 12 ton chilled water cooling coil with modulating capacity control, energy recovery wheel, and MERV 13 filtration.

A variable volume kitchen exhaust hood control system consisting of kitchen exhaust stack temperature and smoke density sensors, supply and exhaust fan variable speed drives and associated controller will be provided by the kitchen equipment vendor. This system installation shall be field installed and coordinated with the ATC and Electrical contractors.

D. Lobby, Corridor, and Entry Way Heating:

New hot water ceiling mounted radiant panels, cabinet unit heaters and/or fin tube radiation heating equipment shall be installed to provide heating to these areas. Corridors shall be ventilated from the common circulation air handling unit systems.

E. Custodial Support Areas:

Custodial support areas will be heated and ventilated. Storage areas will be heated by radiation heating equipment. Horizontal type unit heaters will heat areas adjacent to the loading dock. The loading dock and all custodial closets will be exhausted by dedicated exhaust air fan systems.

F. Utility Areas:

Utility areas will be provided with exhaust air fan systems for ventilation, and will typically be heated with horizontal type ceiling suspended unit heaters.

The Main IDF room will be air conditioned by high efficiency ductless AC cooling units approximately (2) Three Ton units.

G. Testing, Adjusting, Balancing & Commissioning:

All new HVAC systems shall be tested, adjusted, balanced, and commissioned as part of the project scope.

H. Automatic Temperature Controls – Building Energy Management System:

A new DDC (direct digital control) automatic temperature control and building energy management system shall be installed to control and monitor building HVAC systems. Energy metering shall be installed to monitor the energy usage of building HVAC systems and utilities (fuel, gas, water).

Lighting control and door access control system shall be integrated into the BMS system.

The control system shall be as manufactured by Johnson Controls (Metasys), Siemens (Apogee) or Delta Controls.

5. TESTING REQUIREMENTS:

A. The mechanical contractor shall provide testing of the following systems with the owner and owner's representative present:

1. Net Zero Option – Ground-source Heat Pump system

2. VRF (Variable Refrigerant Flow) System

3. Air handling unit systems including all indoor and rooftop air handling systems and exhaust air systems

4. Terminal heating and cooling devices

5. Automatic temperature control and building energy management system

B. Testing reports shall be submitted to the engineer for review and approval before providing to the owner.

6. OPERATION MANUALS AND MAINTENANCE MANUALS: When the project is completed, the mechanical contractor shall provide operation and maintenance manuals to the owner.

7. RECORD DRAWINGS AND CONTROL DOCUMENTS: When the project is completed, an as-built set of drawings, showing all mechanical system requirements from contract and addendum items will be provided to the owner.

8. COMMISSIONING: The project shall be commissioned per Section 018000 of the specifications.

9.4 Fire Protection

Please reference the following Fire Protection Systems report prepared by Garcia, Galuska, DeSousa, Consulting Engineers.

FIRE PROTECTION SYSTEMS

NARRATIVE REPORT

The following is the Fire Protection system narrative, which defines the scope of work and capacities of the Fire Protection system, as well as, the Basis of Design.

1. CODES

   A. All work installed under Section 210000 shall comply with the MA Building Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Fire Protection work and all items incidental thereto, including commissioning and testing.

3. GENERAL

   A. In accordance with the provisions of the Massachusetts Building Code, a school building of greater than 12,000 s.f. must be protected with an automatic sprinkler system.

4. DESCRIPTION

   A. The new building will be served by a new 8-inch fire service, double check valve assembly, wet alarm valve complete with electric bell, and fire department connection meeting local thread standards.

   B. System will be a combined standpipe/sprinkler system with control valve assemblies to limit the sprinkler area controlled to less than 52,000 s.f. as required by NFPA 13-2013.

   C. Control valve assemblies shall consist of a supervised shutoff valve, check valve, flow switch and test connection with drain. Standpipes meeting the requirements of NFPA 14-2013 shall be provided in the egress stairwells and in the Stage area.

   D. All areas of the building, including all finished and unfinished spaces, combustible concealed spaces, all electrical rooms and closets will be sprinklered.

   E. All sprinkler heads will be quick response, pendent in hung ceiling areas and upright in unfinished areas.

5. BASIS OF DESIGN

   A. The mechanical rooms, kitchen, science classrooms, and storage rooms are considered Ordinary Hazard Group 1; stage is considered Ordinary Hazard Group 2; all other areas are considered light hazard.

B. Required Design Densities:

Light Hazard Areas = 0.10 GPM over 1,500 s.f.
Ordinary Hazard Group 1 = 0.15 GPM over 1,500 s.f.
Ordinary Hazard Group 2 = 0.20 GPM over 1,500 s.f.

C. Sprinkler spacing (max.):

Light Hazard Areas = 225 s.f.
Ordinary Hazard Areas = 130 s.f.

D. A flow test will be performed to confirm the Municipal water supply capacity.

6. DOUBLE CHECK VALVE ASSEMBLY

A. Double check valve assembly shall be MA State approved, U.L./F.M. approved, with iron body bronze mounted construction complete with supervised OS & Y gate valves and test cocks. Furnish two spare sets of gaskets and repair kits.

B. Double check valve detector assembly shall be of one of the following:

1. Watts Series 757-OSY
2. Wilkins 350A-OSY
3. Conbraco Series 4S-100
4. Or equal

7. PIPING

A. Sprinkler piping 1-1/2 in. and smaller shall be ASTM A-53, Schedule 40 black steel pipe. Sprinkler/standpipe piping 2 in. and larger shall be ASTM A-135, Schedule 10 black steel pipe.

8. FITTINGS

A. Fittings on fire service piping, 2 in. and larger, shall be Victaulic Fire Lock Ductile Iron Fittings conforming to ASTM A-536 with integral grooved shoulder and back stop lugs and grooved ends for use with Style 009-EZ or Style 005 couplings. Branch line fittings shall be welded or shall be Victaulic 920/920N Mechanical Tees. Schedule 10 pipe shall be roll grooved. Schedule 40 pipe, where used with mechanical couplings, shall be roll grooved and shall be threaded where used with screwed fittings. Fittings for threaded piping shall be malleable iron screwed sprinkler fittings.

9. JOINTS

A. Threaded pipe joints shall have an approved thread compound applied on male threads only. Teflon tape shall be used for threads on sprinkler heads. Joints on piping, 2 in. and larger, shall be made up with Victaulic, or equal, Fire Lock Style 005, rigid coupling of ductile iron and pressure responsive gasket system for wet sprinkler system as recommended by manufacturer.

10. SPRINKLERS

A. All sprinklers to be used on this project shall be Quick Response type. Sprinklers shall be manufactured by Tyco, Victaulic, Viking, or equal.

B. Furnish spare heads of each type installed located in a cabinet along with special sprinkler wrenches. The number of spares and location of cabinet shall be in complete accord with NFPA 13-2013.

C. Upright sprinkler heads in areas with no ceilings shall be Tyco Model "TY-FRB" Quick Response, upright natural brass finish heads. Include heavy duty sprinkler guards in all mechanical rooms and storage rooms.

D. Sidewall heads shall be Tyco Model "TY-FRB" Quick Response with white polyester head and escutcheon.

E. Pendent wet sprinkler heads shall be Tyco Model "TY-FRB" Quick Response recessed adjustable escutcheon, white polyester finish.

F. Concealed heads shall be Tyco Model "RFII" Quick Response concealed type, 1-1/2 inch adjustment white cover plate. In special areas, as may be noted on the Drawings, provide alternate cover plate finishes.

G. Use of flexible stainless steel hose with fittings for fire protection service that connect sprinklers to branch lines in suspended ceilings is acceptable. Flexible hoses shall be UL/FM approved and shall comply with NFPA 13 standards. Hose assemblies shall be type 304 stainless steel with minimum 1-inch true-bore internal hose diameter. Ceiling bracket shall be galvanized steel and include multi-port style self-securing integrated snap-on clip ends that attach directly to the ceiling with tamper resistant screws.

9.5 Electrical

Please reference the following Electrical Systems report prepared by Garcia, Galuska, DeSousa, Consulting Engineers.

ELECTRICAL SYSTEMS

NARRATIVE REPORT

The following is the Electrical system narrative, which defines the scope of work and capacities of the Power and Lighting system as well as the Basis of Design. The electrical systems shall be designed and constructed for ***LEED for Schools v4*** where indicated on this narrative. This project shall conform to a Platinum award level and has a minimum target of a Silver award level. The project has a goal of Net Zero.

1. CODES

   All work installed under Division 26 shall comply with the Massachusetts State Building Code, IBC 2015 and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   The work of Section 260000 is indicated in this narrative report. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

3. SEQUENCE OF OPERATIONS AND INTERACTIONS

   A. Classroom and corridor lighting will be controlled via “addressable relays”, which is achieved through programming. The control of the relays shall be by automatic means such as an occupancy sensor in each classroom and corridors. The lighting controls will be part of the Building Management System.

   B. Exterior lighting will be controlled by photocell “on” and “schedule” for “off” operation. The vehicle circulation area lighting will be controlled by “zones” and will have dimming-level control.

   C. Emergency and exit lighting will be run through life safety panels to be on during normal power conditions as well as power outage conditions.

4. DESCRIPTION OF THE SYSTEMS

   A. Electrical Distribution System:

      1. New construction service ratings are designed for a demand load of 10 watts/s.f. The service capacity will be sized for 2000 amperes with 100% rating at 277/480 volt, 3Ø, 4wire. New lighting and power panels will be provided to accommodate respective loads. The service capacity will be sized for 20% spare capacity. The service will be central to main building and feed other buildings. A single meter will be used for entire site so that future PV will serve all loads on site.

B. Interior Lighting System:

1. Classroom lighting fixtures consist of indirect cove mounted LED luminaries with dimming drivers. The fixtures will be pre-wired for dimming control where natural daylight is available and also for multi-level switching. Office lighting fixtures will consist of similar fixtures to classrooms. Offices on the perimeter with windows shall have daylight dimming controls.

   In general lighting power density will be 40 percent less than IECC 2015. The power density reduction relates to ***LEED for Schools Credit EAC1.***

2. Lighting levels will be approximately 30 foot candles in classrooms and offices. The daylight dimming footcandle level will be in compliance with ***LEED for Schools IEQ 6.1.***

3. Gymnasium and multi-purpose lighting will be comprised of indirect cove mounted LED fixtures with dimming drivers. The fixtures will be provided with protective wire guards. The light level will be designed for approximately 40 foot candles.

   Daylight dimming will be provided within 15 feet of skylights or glazing. Daylight dimming controls will be similar in operation to classrooms.

4. Corridor lighting will be comprised of linear indirect lighting using LED light source. The corridor light level will be designed for approximately 20 foot candles. Corridor lighting will be on a schedule through the BMS system control and only “on” during occupied hours. The corridor lighting will have two level control.

5. Cafeteria lighting will be LED fixtures with dimming drivers. The light levels will be designed for approximately 30 foot candles.

6. Kitchen and Servery lighting will consist of recessed 1 ft. x 4 ft. lensed and gasketed LED panels. Light levels will be approximately 50 foot candles.

7. Library lighting will consist of indirect fixtures with LED dimmable drivers. Light levels will be approximately 30 foot candles.

9. Each area will be locally switched and designed for multi-level controls. Each classroom, office space and toilet rooms will have an occupancy sensor to turn lights off when unoccupied. Daylight sensors will be installed in each room where natural light is available for dimming of light fixtures. The manual controls will allow user to dim each scene.

10. The entire school will be controlled with an automatic lighting control system using the BMS control system for schedule and programming of lights controls.

C. Emergency Lighting System:

1. An interior 400 kW natural gas fuelled indoor emergency generator will be provided. Emergency light fixtures and LED exit signs will be installed to serve all egress areas such as corridors, intervening spaces, toilets, stairs and exit discharge exterior doors. The administration area lighting will be connected to the emergency generator.

2. The generator will be sized to include life safety systems, kitchen refrigeration, non-fossil fuel HVAC equipment (heating for freeze protection) and communications systems.

D. Site Lighting System

1. Fixtures for area lighting will be pole-mounted cut-off 'LED' luminaries in the drop-off areas. Pole heights will be below 12 ft. The exterior lighting will be connected to the BMS system for photocell on and timed off operation. The site lighting fixtures will be dark sky compliant. The illumination level is 0.5 foot candle minimum for parking areas in accordance with Illuminating Engineering Society.

2. Building perimeter fixtures will be wall mounted cut-off over exterior doors for exit discharge.

E. Wiring Devices:

1. Each classroom will have a minimum of (2) duplex receptacles per teaching wall and (2) double duplex receptacles on dedicated circuits at classroom computer workstations. The teacher's workstation will have a double duplex receptacle also on a dedicated circuit. Refer to drawings.

2. Office areas will generally have (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.

3. Corridors will have a cleaning receptacle at approximately 25 foot intervals.

4. Exterior weatherproof receptacles will be installed at exterior doors.

5. A system of computer grade panelboards with double neutrals and transient voltage surge suppressors will be provided for receptacle circuits.

F. Fire Alarm System:

1. A fire alarm and detection system will be provided with 60 battery back-up. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms. The control panel shall be manufactured by Notifier.

2. Smoke detectors will be provided in open areas, corridors, stairwells and other egress ways.

3. The sprinkler system will be supervised for water flow and tampering with valves.

4. Speaker/strobes will be provided in egress ways, classrooms, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms. A mass notification system shall be provided integral with fire alarm system.

5. Manual pull stations will be provided at exit discharge doors.

6. The system will be remotely connected to automatically report alarms to fire department via wireless master box (32 zones).

G. Uninterruptible Power Supply (UPS):

1. One (1) 30kw, three (3) phase centralized UPS systems will be provided with battery back-up.

2. The system will provide conditioned power to sensitive electronic loads, telecommunication systems, bridge over power interruptions of short duration and allow an orderly shutdown of servers, communication systems, etc. during a prolonged power outage.

3. The UPS systems will also be connected to the stand by generator.

H. Lightning Preventer System:

1. Lightning preventer devices will be provided to provide coverage for the entire building.

2. The lightning preventer equipment will include lightning preventers, conductors, conduits, fasteners, connectors, ground rods, etc.

5. NET ZERO OPTION – NON USE OF FOSSSIL FUELS

The following items are regarding the Net Zero Energy Design for the Electrical Systems without the use of fossil fuels.

The Electrical service will be increased in size to compensate for electric cooking and domestic hot water. The anticipated electrical load is approximately 150 KW. Presently, the service size 2,000 amps, 277/480 volt, 3 phase, 4 wire with 3,000 amp bussing to accommodate the PV System.

The additional service increase of approximately 181 amps will result in utilizing a service of 2,500 amps, 277/480 volt, 3 phase, 4 wire with 4,000 amp bussing to accommodate the PV system.

6. TESTING REQUIREMENTS

The Electrical Contractor shall provide testing of the following systems with the Owner and Owner's Representative present:

- Lighting and power panels for correct phase balance.
- Emergency generator.
- Lighting control system (interior and exterior).
- Fire alarm system.
- Security system.

Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

7. OPERATION MANUALS AND MAINTENANCE MANUALS:

When the project is completed, the Electrical Contractor shall provide operation and maintenance manuals to the Owner.

8. RECORD DRAWINGS AND CONTROL DOCUMENTS:

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

9. COMMISSIONING

The project shall be commissioned per Section 018000 of the specifications.

10. RENEWABLE ENERGY PROVISIONS

Provisions for a renewable energy system will consist of largest capacity (restricted by roof area) grid connected photovoltaic PV system intended to reduce the facilities demand for electricity and reduce carbon emissions. The photovoltaic system will be installed at a future date. The project will be PV ready.

11. SITE UTILITIES

The Electric, Telephone and Cable TV utilities will be underground for each system provided.

12. CCTV

A Closed Circuit TV system will consist of computer servers with image software, computer monitors and IP based closed circuit TV cameras. The head end server will be located in the head end (MDF) room and will be rack mounted. The system can be accessed from any PC within the facility or externally via an IP address. Each camera can be viewed independently. The network video recorders (SAN) will record all cameras and store this information for 45 days at 30 images per second (virtual real time).

The location of the cameras is generally on exterior building perimeter. The exterior cameras are fixed type.

The system will fully integrate with the access control system to allow viewing of events from a single alarm viewer. Camera images and recorded video will be linked to the access system to allow retrieval of video that is associated with an event.

13. INTRUSION SYSTEM

An intrusion system will consist of security panel, keypads, motion detectors and door contacts. The system is addressable which means that each device will be identified when an alarm occurs. The system is designed so that each perimeter classroom with grade access will have dual tech sensors along the exterior wall and corridors, door contacts at each exterior door.

The system will include a digital communicator to summons the central station in the event of an alarm condition.

The intrusion system will be connected to the automated lighting control system to automatically turn on lighting upon an alarm.

14. CARD ACCESS

A card access system includes a card access controller, door controllers and proximity readers/keypads. Proximity readers will be located at various locations. Each proximity reader will have a distinctive code to identify the user and a log will be kept in memory. The log within the panel can be accessed through a computer.

The alarm condition will also initiate real time recording on the integrated CCTV System. The system may be programmed with graphic maps allowing the end-user to quickly identify alarm conditions and lock/unlock doors.

The system is modular and may be easily expanded to accommodate any additional devices.

9.6 Information Technology

Please reference the following Information Technology Systems report prepared by Garcia, Galuska, DeSousa, Consulting Engineers.

TECHNOLOGY SYSTEMS

NARRATIVE REPORT

The following is the Technology System narrative, which defines the scope of work and capacities of the Communications system infrastructure and Security system as well as the Basis of Design.

1. CODES

   A. All work installed under Section 270000 shall comply with the Massachusetts Building Code, IBC 2015, and all local, county, and federal codes, laws, statues, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Technology and Security work and all items incidental thereto, including commissioning and testing.

3. TECHNOLOGY

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

   B. Each classroom will have 2 data outlets for student computers. Two data with video and audio connections to a wall mounted touch screen monitor will be provided at teacher's station. 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 (2) CAT6A cables.

   C. A central paging system will be provided and integrated with the telephone system. The speakers shall be IP and manufactured by Valcom with InformaCast License.

   D. A wireless GPS/LAN based master clock system will be provided with 120V wireless remote clocks that act as transceivers.

   E. 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 40 Gbps Ethernet.

4. TESTING REQUIREMENTS

A. The Technology and Security Contractors shall provide testing of the following systems with the Owner and Owner's representative present:

- Telephone and data cabling
- Fiber optic backbone cabling
- IP Paging system
- Wireless clock system
- A/V wiring for classrooms

Testing reports shall be submitted to the engineer for review and approval before providing to the Owner.

5. OPERATION MANUALS AND MAINTENANCE MANUALS:

A. When the project is completed, the Technology Contractor shall provide operation and maintenance manuals to the Owner.

6. RECORD DRAWINGS AND CONTROL DOCUMENTS:

A. When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

7. COMMISSIONING

A. The project shall be commissioned per Commissioning Section of the specifications.

9.7 Energy Analysis

Please reference the following Information Engineering Economic Report prepared by Garcia, Galuska, & DeSousa, Consulting Engineers.

Engineering Economic Analysis
for
Driscoll School Energy Model

Brookline, MA

April 24, 2019
(Update)

Prepared for: Driscoll School
We find joy in thinking together

Prepared by: Garcia, Galuska & DeSousa
Consulting Engineers, Inc.

Driscoll School Engineering Economic Analysis

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EXECUTIVE SUMMARY

Section 1.0: Executive Summary

The Driscoll School is a new four-story school with an approximate gross area of 155,140 s.f. The building has been simulated with the school's anticipated hours of operation including evening and summer programming.

The goal of the mechanical system lifecycle engineering economic analysis is to assess the performance of various mechanical systems in comparison to a baseline mechanical system.

Each option is compared to the baseline system to determine the lowest combined savings over a 30 year cycle to determine the most advantageous system considering anticipated hours of operation, electrical costs, gas costs, maintenance costs, and initial construction costs.

The conditioned spaces of the building are simulated to maintain indoor air temperature conditions of 70ºF DB for heating and 75°F DB with 55% RH for cooling for all options. Unoccupied temperature setback of 60°F DB heating and 85ºF DB cooling is provided for all options.

By comparison of each option to the baseline system, the option with the greatest total life-cycle savings is generally recommended. To further enhance controllability and overall system performance, additional options should be considered that will enhance year round temperature control and comfort at a possible marginal increase in capital cost.

Upon completion of the mechanical system lifecycle engineering economic analysis, the design building is simulated with the recommended mechanical system in comparison to an ASHRAE Standard 90.1-2010 baseline building to project the anticipated energy cost percentage savings for LEED V4 EAc2 – Optimize Energy Performance.

Section 1.1: Mechanical System Analysis

1.1.A: Baseline Mechanical System – ASHRAE/IECC Baseline Fan-Powered Electric Resistance Heat Mixed-Air Chilled/Electric Resistance Coil Variable Air Volume Systems

- Electric coil heating/chilled water coil cooling indoor air handling units with energy recovery wheels and terminal fan-powered variable air volume boxes with electric reheat coils serving the administration, classrooms, multi-purpose/stage, dining, gymnasium, locker room, media center, small gym, and support areas

- Electric coil heating/chilled water coil indoor make-up air handling unit and variable air volume exhaust air fan system serving the kitchen

- Overhead fiberglass insulated supply and return air ductwork distribution systems

- Limited use of electric heating radiation and unit heaters serving non-academic areas

- (2) 155 ton code high-efficiency water-cooled chillers and cooling tower chilled water plant (310 ton total capacity)

- Two-pipe cooling piping system serving air handling units

- Chilled and condenser water primary pumping with variable frequency drives

- Direct digital controls throughout

1.1.B: Mechanical System Option One – Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Water-Source Heat Pump Chiller Plant with Supplemental Electric Boiler Plant

- Multiple low wall-mounted displacement diffusers at approximately 600-800 CFM each (1 per classroom) for each classroom and support area
- Multiple low wall-mounted displacement diffusers located throughout the administration, multi-purpose/stage, dining, gymnasium, locker room, media center, small gym, and support areas
- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy and space heating/cooling demand for each zone
- Dedicated overhead galvanized ventilation distribution system feeding each displacement diffuser
- Radiant heating panels located along exterior walls
- Variable air volume hot water coil heating/chilled water coil cooling indoor air handling units with demand control ventilation and energy recovery wheels providing fully air conditioned displacement ventilation to the terminal variable air volume boxes serving the administration, classrooms, multi-purpose/stage, dining, gymnasium, locker room, media center, small gym, and support areas
- Chilled water cooling/hot water coil indoor make-up air handling unit and variable air volume exhaust air fan system serving the kitchen
- Limited use of radiant heating panels and unit heaters serving non-academic areas
- (2) 175 ton high-efficiency water-to-water source modular heat pump chiller plant with fluid cooler providing chilled and hot water throughout the building (350 ton total capacity)
- (3) 1,320 MBH supplemental electric boiler power plant
- Four-pipe heating/cooling piping system serving air handling units
- Two-pipe hot water distribution system serving radiant heating panels and unit heaters
- Chilled, condenser, and hot water primary pumping with variable frequency drives
- Direct digital controls throughout

1.1.C: Mechanical System Option Two – Variable Refrigerant Flow (VRF) Heat Pump System with Split-System Heat Pump Air Handling Units

- Multiple split system variable refrigerant flow (VRF) terminal heat pump units serving the administration, classrooms, media center, and support areas
- Electric radiant heating panels located along exterior walls
- Insulated refrigerant piping and condensate piping system serving VRF units

- Outdoor air-cooled variable refrigerant heat pump condensing units (190 ton total capacity)

- Primary air ducted to the administration, classrooms, media center, and support areas

- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy demand for each space

- Variable air volume 100% outside air split-system heat pump heating/cooling indoor air handling units with air-cooled condensing unit, supplemental electric heating coil, energy recovery wheels, and demand control ventilation providing ventilation to the VRF units of the administration, classrooms, media center, and support areas

- Multiple low wall-mounted displacement diffusers located throughout the administration, multi-purpose/stage, dining, gymnasium, locker room, media center, small gym, and support areas

- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy and space heating/cooling demand for each zone

- Dedicated overhead galvanized ventilation distribution system feeding each displacement diffuser

- Electric radiant heating panels located along exterior walls

- Variable air volume split-system heat pump heating/cooling indoor air handling units with air-cooled condensing unit, supplemental electric heating coil, energy recovery wheels, and demand control ventilation providing fully air conditioned displacement ventilation to the terminal variable air volume boxes serving the multi-purpose/stage, dining, gymnasium, locker room, small gym, and support areas

- Perimeter electric heating radiation located along exterior walls

- 100% outside air split-system heat pump heating/cooling indoor ventilating make-up air handling unit with air-cooled condensing unit and supplemental electric heating coil and variable air volume exhaust air fan system serving the kitchen

- Limited use of electric heating radiation and unit heaters serving non-academic areas

- Direct digital controls throughout

1.1.E: Mechanical System Option Three – Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Geothermal Water-Source Heat Pump Chiller Plant

- Multiple low wall-mounted displacement diffusers at approximately 600-800 CFM each (1 per classroom) for each classroom and support area

- Multiple low wall-mounted displacement diffusers located throughout the administration, multi-purpose/stage, dining, gymnasium, locker room, media center, small gym, and support areas

- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy and space heating/cooling demand for each zone

- Dedicated overhead galvanized ventilation distribution system feeding each displacement diffuser

- Radiant heating panels located along exterior walls

- Variable air volume hot water coil heating/chilled water coil cooling indoor air handling units with demand control ventilation and Tempeff energy recovery coils providing fully air conditioned displacement ventilation to the terminal variable air volume boxes serving the administration, classrooms, multi-purpose/stage, dining, gymnasium, locker room, media center, small gym, and support areas

- Chilled water cooling/hot water coil indoor make-up air handling unit and variable air volume exhaust air fan system serving the kitchen

- Limited use of radiant heating panels and unit heaters serving non-academic areas

- (55) 675' deep geothermal closed loop quad wells (390 tons total capacity)

- 380 ton total capacity high-efficiency water-to-water source geothermal modular heat pump chiller plant providing chilled and hot water throughout the building

- Four-pipe heating/cooling piping system serving air handling units

- Two-pipe hot water distribution system serving radiant heating panels and unit heaters

- Chilled, condenser, geothermal well, and hot water primary pumping with variable frequency drives

- Direct digital controls throughout

1.1.F: Mechanical System Option Four - Fan-Powered Hot Water Coil Heat Mixed-Air Chilled/Hot Water Coil Variable Air Volume Systems

- Variable air volume hot water coil heating/chilled water coil cooling indoor air handling units with energy recovery wheels and terminal fan-powered variable air volume boxes with hot water reheat coils serving the administration, classrooms, multi-purpose/stage, dining, gymnasium, locker room, media center, small gym, and support areas

- Chilled water cooling/hot water coil indoor make-up air handling unit and variable air volume exhaust air fan system serving the kitchen

- Overhead fiberglass insulated supply and return air ductwork distribution systems

- Limited use of radiant heating panels and unit heaters serving non-academic areas

- (2) 155 ton code high-efficiency water-cooled chillers and cooling tower chilled water plant (310 ton total capacity)

- (3) 2,300 MBH supplemental electric boiler power plant

- Four-pipe heating/cooling piping system serving air handling units

- Two-pipe hot water distribution system serving radiant heating panels and unit heaters

- Chilled, condenser, and hot water primary pumping with variable frequency drives
- Direct digital controls throughout

Section 1.2: Mechanical System Analysis Conclusion

The variable air volume air handling unit system is selected as the baseline system since it is an ASHRAE Standard 90.1/IECC baseline system that results in a low installed cost and relatively energy efficient system. Unfortunately, the selection results in overall ownership costs that in some cases are higher when compared to the alterative systems primarily relating to increased annual operating costs while potentially compromising the thermal comfort conditions of the building. The option comparison of each alternative system to the baseline assesses the benefits of improved systems with potentially reduced combined operating costs and improved thermal comfort with the goal of selecting the system with the highest ownership savings over the 30 year study period.

Utility cost data for electricity was obtained from utility bills of the existing school provided by the town at an average of $0.1579/kWh.

The building envelope reflects Jonathan Levi Architects' high-efficiency design. The roof has R-42 continuous insulation and the walls have R-18 continuous insulation. Curtainwall and operable window assemblies will have a U-Value of 0.30 and a SHGC of 0.27. The building will utilize louvered shading for the South, East and West exposures. Skylights will have a U-Value of 0.38 and a SHGC of 0.40.

The "Building Life-Cycle" analysis was performed in BLCC v5.3-18 and includes future worth of each system option considered using the DOE rates for discount (4.7%), escalation (for each utility type based on region), inflation (2.0%), and interest (2.0%). The analysis includes replacement costs for cooling tower and fluid coolers every 10 years and every 20 years for VRF air-cooled condensing units.

Our observations of the Mechanical System Payback Summary suggest that Option 1, Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Water-Source Heat Pump Chiller Plant with Supplemental Electric Boiler Plant, represents the lowest life cycle by yielding an approximate $3,182,845 savings over the 30 year study period with an instant payback as it has a lower installed cost than the code baseline system.

The Mechanical System Payback Summary also indicates that Option 3, Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Geothermal Water-Source Heat Pump Chiller Plant, represents the lowest Energy Usage Intensity (EUI) of 20.9 kBTU/s.f./year of the options studied with a 5 year discounted payback while yielding an approximate $1,922,366 savings over the 30 year study period. A geothermal system additionally provides further benefits that should be considered such as the longevity, reduced maintenance, reduced downtime, and improved controllability of equipment.

Section 2.0: LEED Energy Savings Summary

To confirm that the design building meets the MSBA requirements of 16% energy cost savings for LEED V4 EAc2 – Optimize Energy Performance, updated energy model simulations have been performed comparing the design building in comparison to a baseline ASHRAE Standard 90.1-2010 building.

1. The ASHRAE Standard 90.1-2010 baseline building is as follows:

- Envelope:
    - Wall: R-13 + R-7.5 c.i.
    - Roof: R-20 c.i.
    - Underslab: R-10 c.i.
    - Windows: 0.55 U-Value, 0.40 SHGC
    - Curtainwall: 0.45 U-Value, 0.40 SHGC
- Mechanical System:
    - Electric heating/chilled water coil cooling VAV AHU systems with energy recovery serving terminal fan-powered VAV boxes with electric reheat coils
    - (2) 0.68 kW/ton high-efficiency water-cooled chillers with associated cooling tower
- Domestic Hot Water System:
    - Electric domestic hot water system
- Lighting System:
    - 0.99 w/s.f.

2. The design building with Mechanical System Option 1 is as follows:

- Envelope:
    - Walls: R-18 c.i.
    - Roof: R-42 c.i.
    - Underslab: R-10 c.i.
    - Windows: 0.30 U-Value, 0.27 SHGC
    - Curtainwall: 0.30 U-Value, 0.27 SHGC
    - Skylights: 0.38 U-Value, 0.40 SHGC
- Mechanical System:
    - Hot water coil heating/chilled water coil displacement ventilation AHU systems with energy recovery serving terminal VAV boxes with demand ventilation controls
    - (2) 175 ton high-efficiency water-to-water source modular heat pump chiller plant with fluid cooler providing chilled and hot water throughout the building
    - (3) 1,320 MBH supplemental electric boiler power plant
- Domestic Hot Water System:
    - Electric domestic hot water system
- Lighting System:
    - 0.40 w/s.f.

3. The design building with Mechanical System Option 3 is as follows:

- Envelope:
    - Walls: R-18 c.i.
    - Roof: R-42 c.i.
    - Underslab: R-10 c.i.
    - Windows: 0.30 U-Value, 0.27 SHGC
    - Curtainwall: 0.30 U-Value, 0.27 SHGC

- Skylights: 0.38 U-Value, 0.40 SHGC
- Mechanical System:
  - Hot water coil heating/chilled water coil displacement ventilation AHU systems with energy recovery serving terminal VAV boxes with demand ventilation controls
  - (5) 76 ton high-efficiency geothermal water-to-water source modular heat pump chiller plant with (55) 675' deep geothermal closed loop quad wells (380 tons total capacity) providing chilled and hot water throughout the building
- Domestic Hot Water System:
  - Electric domestic hot water system
- Lighting System:
  - 0.40 w/s.f.

Each proposed design system was also studied with a 192 kW Photovoltaic System to indicate the additional energy cost and CO_2 emission savings as well as LEED points that could be achieved as indicated on the LEED Energy Savings Summary Chart.

Section 2.1: LEED Energy Savings Analysis Conclusion

A comparison of the Design Building with Mechanical System Option 1, against the ASHRAE Standard 90.1-2010 Baseline Building results in an energy cost savings of 37.0% achieving 14 LEED points. Exceeding the MSBA required 16% energy cost savings for LEED V4 EAc2 – Optimize Energy Performance.

A comparison of the Design Building with Mechanical System Option 3, against the ASHRAE Standard 90.1-2010 Baseline Building results in an energy cost savings of 46.7% achieving 16 LEED points. Exceeding the MSBA required 16% energy cost savings for LEED V4 EAc2 – Optimize Energy Performance.

Note:

The values indicated above are based on energy modelling performed for system comparison purposes only. Our office strongly recommends adding a 30% safety factor to the calculated values of this report for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1-2010:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

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Driscoll School - Mechanical System Payback Summary

Baseline	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual CO2 Emissions (kg)	Annual CO2 Emissions Reduction (kg)	Annual Maint. Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****	LEED EAc2 Points
-	1. Electric heating/chilled water cooling VAV air handling units with energy recovery wheels with terminal fan-powered VAV boxes with electric reheat coils 2. High efficiency (code) water-cooled chiller plant with cooling tower	$9,701,980	1,423,400	$224,748	$1.45	31.3	876,598.8	-	$32,125	$256,873	-	-	-	-

Option	System	Gross Capital Investment*	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual CO2 Emissions (kg)	Annual CO2 Emissions Reduction (kg)	Annual Maint. Cost	Combined Annual Expense	Combined Expense Savings**	Total Life-Cycle Savings***	Discounted Payback (Years)****	LEED EAc2 Points
1	1. Full air-conditioning displacement ventilation diffusers with passive heating radiation 2. Hot water coil heating/chilled water cooling VAV air handling units with energy recovery with terminal VAV boxes with CO2 controls providing displacement ventilation 3. High efficiency water-to-water source heat pump chiller plant with fluid cooler 4. Supplemental electric hot water boiler plant	$7,818,915	1,122,100	$177,176	$1.14	24.7	690,980.5	185,618.3	$23,150	$200,326	$56,547	$3,182,845	Instant*****	14
2	1. Variable refrigerant flow (VRF) terminal evaporator units with air-cooled condensing units serving the administration, classroom media center, and support areas 2. Split system air-cooled heat pump heating/cooling VAV dedicated outside air handling units with energy recovery with terminal VAV boxes with CO2 controls providing ventilation to the VRF units 3. Full air-conditioning displacement ventilation diffusers with passive heating radiation 4. Split system air-cooled heat pump heating/cooling VAV air handling units with energy recovery with terminal VAV boxes with CO2 controls providing displacement ventilation to the dining, gymnasium, multi-purpose/stage, and small gymnasium areas	$8,334,430	1,222,000	$192,959	$1.24	26.9	752,498.2	124,100.6	$50,750	$243,709	$13,164	$1,744,635	Instant*****	12
3	1. Full air-conditioning displacement ventilation diffusers with passive heating radiation 2. Hot water coil heating/chilled water cooling VAV air handling units with Tempeff energy recovery with terminal VAV boxes with CO2 controls providing displacement ventilation 3. High efficiency water-to-water source heat pump chiller plant with closed-loop geothermal wells	$10,044,815	949,250	$149,887	$0.97	20.9	593,291.3	283,307.6	$18,150	$168,037	$88,836	$1,922,366	5	16
4	1. Hot water heating/chilled water cooling coil VAV air handling units with energy recovery wheels with terminal fan-powered VAV boxes with hot water reheat coils 2. High efficiency (code) water-cooled chiller plant with cooling tower 3. Electric hot water boiler plant	$9,745,335	1,435,000	$226,588	$1.46	31.6	883,662.0	-7,063.1	$33,125	$259,713	-$2,840	-$107,059	N/A******	7

* Gross capital investment based upon in-house cost estimate utilizing cost data from similar past projects and industry standard estimating references. Costs have been estimated for system comparison purposes only and do not incorporate all supplemental/independent HVAC system costs which would be required for all systems studied (i.e. kitchen exhaust, supplemental cooling systems for tel/data rooms, radiation heating for unoccupied areas, overhead and profit, etc.).
** Combined expense savings is the difference between the combined annual expense of the baseline and system in comparison.
*** Total life-cycle savings is based on a 30 year study period.
**** Discounted payback years is based upon BLCC5 Life Cycle Analysis.
***** Discounted payback never reached because system is more efficient and/or less expensive than baseline system.
****** Discounted payback never reached within 30 year study period.

Note: Please note that we recommend adding a 30% safety factor to the calculated values for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1-2010:

Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.

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Driscoll School - LEED Energy Savings Summary

Baseline	System	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual CO2 Emissions (kg)	Annual CO2 Emissions Reduction (kg)	Combined Expense Savings*	Energy Cost Savings Percentage	LEED EAc2 Points
LEED Baseline	**1. ASHRAE Standard 90.1-2010 Envelope (Wall Insulation R-13 + R-7.5 c.i., Roof Insulation R-20 c.i., Windows 0.55 U-Value/0.40 SHGC, Curtainwall 0.45 U-Value/0.40 SHGC) 2. ASHRAE Standard 90.1-2010 Mechanical Systems (System 8 - Electric Heating/Chilled Water Cooling VAV System with Terminal Fan-Powered VAV Boxes w/ Electric Reheat Coils with Water-Cooled Chiller Plant) 3. ASHRAE Standard 90.1-2010 Lighting Systems (0.99 w/s.f.) 4. ASHRAE Standard 90.1-2010 Electric Domestic Hot Water Systems**	1,780,900	$281,207	$1.81	39.17	1,096,664.5	-	-	-	-

Option	System	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	Annual CO2 Emissions (kg)	Annual CO2 Emissions Reduction (kg)	Combined Expense Savings*	Energy Cost Savings Percentage	LEED EAc2 Points
Option 1	**1. Design Envelope (Wall Insulation R-18 c.i., Roof Insulation R-42 c.i., Windows 0.30 U-Value/0.27 SHGC, Curtainwall 0.30 U-Value/0.27 SHGC) 2. Design Mechanical Systems (Option 1 - VAV Displacement Ventilation Systems with High-Efficiency Water-to-Water Source Heat Pump Chiller Plant w/ Fluid Cooler and Supplemental Electric Boiler Plant) 3. Design High-Efficiency Lighting Systems (0.4 w/s.f.) 4. Electric Domestic Hot Water Systems**	1,122,100	$177,180	$1.14	24.7	690,980.5	405,684.0	$104,027	**37.0%**	14
Option 1a	**1. Design Envelope (Wall Insulation R-18 c.i., Roof Insulation R-42 c.i., Windows 0.30 U-Value/0.27 SHGC, Curtainwall 0.30 U-Value/0.27 SHGC) 2. Design Mechanical Systems (Option 1 - VAV Displacement Ventilation Systems with High-Efficiency Water-to-Water Source Heat Pump Chiller Plant w/ Fluid Cooler and Supplemental Electric Boiler Plant) 3. Design High-Efficiency Lighting Systems (0.4 w/s.f.) 4. Electric Domestic Hot Water Systems 5. 192 kW Photovoltaic System**	901,531	$142,352	$0.92	19.8	555,155.9	541,508.7	$138,855	**49.4%**	17
Option 3	**1. Design Envelope (Wall Insulation R-18 c.i., Roof Insulation R-42 c.i., Windows 0.30 U-Value/0.27 SHGC, Curtainwall 0.30 U-Value/0.27 SHGC) 2. Design Mechanical Systems (VAV Displacement Ventilation Systems with High-Efficiency Water-to-Water Source Heat Pump Chiller Plant) 3. Design High-Efficiency Lighting Systems (0.4 w/s.f.) 4. Electric Domestic Hot Water Systems**	949,250	$149,887	$0.97	20.9	593,291.3	503,373.3	$131,320	**46.7%**	16
Option 3a	**1. Design Envelope (Wall Insulation R-18 c.i., Roof Insulation R-42 c.i., Windows 0.30 U-Value/0.27 SHGC, Curtainwall 0.30 U-Value/0.27 SHGC) 2. Design Mechanical Systems (VAV Displacement Ventilation Systems with High-Efficiency Water-to-Water Source Heat Pump Chiller Plant) 3. Design High-Efficiency Lighting Systems (0.4 w/s.f.) 4. Electric Domestic Hot Water Systems 5. 192 kW Photovoltaic System**	728,681	$115,059	$0.74	16.0	448,716.2	647,948.4	$166,148	**59.1%**	18

*Combined expense savings is the difference between the combined annual expense of the baseline and building in comparison.

LIFE CYCLE ANALYSES

NIST BLCC 5.3-18: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - VAV System

Alternative: Option 1 - Displacement System

General Information

File Name:	C:\Program Files\BLCC 5.3-2018\projects\Driscoll School.xml
Date of Study:	Wed Apr 17 13:36:41 EDT 2019
Project Name:	Driscoll School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	Keith Lane
Base Date:	September 1, 2020
Service Date:	September 1, 2020
Study Period:	30 years 0 months(September 1, 2020 through August 31, 2050)
Discount Rate:	4.3%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$9,701,980	$7,818,915	$1,883,065
Future Costs:			
Energy Consumption Costs	$5,221,415	$4,115,790	$1,105,626
Energy Demand Charges	$0	$0	$0
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$586,790	$392,636	$194,155
Capital Replacements	$223,255	$223,255	$0
Residual Value at End of Study Period	$0	$0	$0
	------------	------------	------------
Subtotal (for Future Cost Items)	$6,031,460	$4,731,680	$1,299,780
	------------	------------	------------
Total PV Life-Cycle Cost	$15,733,440	$12,550,595	$3,182,845

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings $1,299,780

- Increased Total Investment	-$1,883,065

Net Savings	$3,182,845

NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	1,423,530.0 kWh	1,122,100.0 kWh	301,430.0 kWh	9,041,662.1 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	4,857.3 MBtu	3,828.8 MBtu	1,028.5 MBtu	30,851.4 MBtu

Emissions Reduction Summary

Energy	-----Average	Annual	Emissions-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Reduction**	**Reduction**
Electricity				
CO_2	876,598.81 kg	690,980.54 kg	185,618.27 kg	5,567,785.87 kg
SO_2	2,434.57 kg	1,919.05 kg	515.52 kg	15,463.36 kg
NO_x	763.69 kg	601.98 kg	161.71 kg	4,850.61 kg
Total:				
CO_2	876,598.81 kg	690,980.54 kg	185,618.27 kg	5,567,785.87 kg
SO_2	2,434.57 kg	1,919.05 kg	515.52 kg	15,463.36 kg
NO_x	763.69 kg	601.98 kg	161.71 kg	4,850.61 kg

NIST BLCC 5.3-18: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - VAV System

Alternative: Option 2 - VRF System

General Information

File Name:	C:\Program Files\BLCC 5.3-2018\projects\Driscoll School.xml
Date of Study:	Wed Apr 17 13:37:07 EDT 2019
Project Name:	Driscoll School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	Keith Lane
Base Date:	September 1, 2020
Service Date:	September 1, 2020
Study Period:	30 years 0 months(September 1, 2020 through August 31, 2050)
Discount Rate:	4.3%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$9,701,980	$8,334,430	$1,367,550
Future Costs:			
Energy Consumption Costs	$5,221,415	$4,482,216	$739,199
Energy Demand Charges	$0	$0	$0
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$586,790	$1,097,866	-$511,075
Capital Replacements	$223,255	$182,458	$40,797
Residual Value at End of Study Period	$0	$0	$0
	------------	------------	------------
Subtotal (for Future Cost Items)	$6,031,460	$5,762,539	$268,921
	------------	------------	------------
Total PV Life-Cycle Cost	$15,733,440	$14,096,969	$1,636,471

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$228,124

- Increased Total Investment	-$1,408,347

Net Savings	$1,636,471

NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	1,423,530.0 kWh	1,222,000.0 kWh	201,530.0 kWh	6,045,072.4 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	4,857.3 MBtu	4,169.6 MBtu	687.6 MBtu	20,626.6 MBtu

Emissions Reduction Summary

Energy	-----Average	Annual	Emissions-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Reduction**	**Reduction**
Electricity				
CO_2	876,598.81 kg	752,498.19 kg	124,100.62 kg	3,722,509.00 kg
SO_2	2,434.57 kg	2,089.91 kg	344.66 kg	10,338.49 kg
NO_x	763.69 kg	655.57 kg	108.12 kg	3,243.02 kg
Total:				
CO_2	876,598.81 kg	752,498.19 kg	124,100.62 kg	3,722,509.00 kg
SO_2	2,434.57 kg	2,089.91 kg	344.66 kg	10,338.49 kg
NO_x	763.69 kg	655.57 kg	108.12 kg	3,243.02 kg

NIST BLCC 5.3-18: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - VAV System

Alternative: Option 3 - Geothermal Displacement System

General Information

File Name:	C:\Program Files\BLCC 5.3-2018\projects\Driscoll School.xml
Date of Study:	Wed Apr 24 13:41:38 EDT 2019
Project Name:	Driscoll School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	Keith Lane
Base Date:	September 1, 2020
Service Date:	September 1, 2020
Study Period:	30 years 0 months(September 1, 2020 through August 31, 2050)
Discount Rate:	4.3%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$9,701,980	$10,044,815	-$342,835
Future Costs:			
Energy Consumption Costs	$5,221,415	$3,481,787	$1,739,628
Energy Demand Charges	$0	$0	$0
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$694,954	$392,636	$302,319
Capital Replacements	$223,255	$0	$223,255
Residual Value at End of Study Period	$0	$0	$0
	------------	------------	------------
Subtotal (for Future Cost Items)	$6,139,624	$3,874,423	$2,265,201
	------------	------------	------------
Total PV Life-Cycle Cost	$15,841,604	$13,919,238	$1,922,366

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings $2,041,947

- Increased Total Investment	$119,580

Net Savings	$1,922,366

Savings-to-Investment Ratio (SIR)

SIR = 17.08

Adjusted Internal Rate of Return

AIRR = 14.65%

Payback Period

Estimated Years to Payback (from beginning of Service Period)

Simple Payback occurs in year	4
Discounted Payback occurs in year	5

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	1,423,530.0 kWh	949,250.0 kWh	474,280.0 kWh	14,226,452.2 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	4,857.3 MBtu	3,239.0 MBtu	1,618.3 MBtu	48,542.7 MBtu

Emissions Reduction Summary

Energy	-----Average	Annual	Emissions-----	Life-Cycle
Type	**Base Case**	**Alternative**	**Reduction**	**Reduction**
Electricity				
CO2	876,598.81 kg	584,540.84 kg	292,057.97 kg	8,760,539.71 kg
SO2	2,434.57 kg	1,623.44 kg	811.13 kg	24,330.56 kg
NOx	763.69 kg	509.25 kg	254.44 kg	7,632.11 kg
Total:				
CO2	876,598.81 kg	584,540.84 kg	292,057.97 kg	8,760,539.71 kg
SO2	2,434.57 kg	1,623.44 kg	811.13 kg	24,330.56 kg
NOx	763.69 kg	509.25 kg	254.44 kg	7,632.11 kg

NIST BLCC 5.3-18: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - VAV System

Alternative: Option 4 - CHW/HHW VAV System

General Information

File Name:	C:\Program Files\BLCC 5.3-2018\projects\Driscoll School.xml
Date of Study:	Wed Apr 17 13:37:56 EDT 2019
Project Name:	Driscoll School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	Keith Lane
Base Date:	September 1, 2020
Service Date:	September 1, 2020
Study Period:	30 years 0 months(September 1, 2020 through August 31, 2050)
Discount Rate:	4.3%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$9,701,980	$9,745,335	-$43,355
Future Costs:			
Energy Consumption Costs	$5,221,415	$5,263,486	-$42,071
Energy Demand Charges	$0	$0	$0
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$586,790	$608,423	-$21,633
Capital Replacements	$223,255	$223,255	$0
Residual Value at End of Study Period	$0	$0	$0
	------------	------------	------------
Subtotal (for Future Cost Items)	$6,031,460	$6,095,164	-$63,704
	------------	------------	------------
Total PV Life-Cycle Cost	$15,733,440	$15,840,499	-$107,059

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings -$63,704

- Increased Total Investment	$43,355

Net Savings	-$107,059

NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	**-----Average**	**Annual**	**Consumption-----**	**Life-Cycle**
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	1,423,530.0 kWh	1,435,000.0 kWh	-11,470.0 kWh	-344,052.9 kWh

Energy Savings Summary (in MBtu)

Energy	**-----Average**	**Annual**	**Consumption-----**	**Life-Cycle**
Type	**Base Case**	**Alternative**	**Savings**	**Savings**
Electricity	4,857.3 MBtu	4,896.4 MBtu	-39.1 MBtu	-1,174.0 MBtu

Emissions Reduction Summary

Energy	**-----Average**	**Annual**	**Emissions-----**	**Life-Cycle**
Type	**Base Case**	**Alternative**	**Reduction**	**Reduction**
Electricity				
CO2	876,598.81 kg	883,661.95 kg	-7,063.14 kg	-211,865.12 kg
SO2	2,434.57 kg	2,454.19 kg	-19.62 kg	-588.41 kg
NOx	763.69 kg	769.84 kg	-6.15 kg	-184.58 kg
Total:				
CO2	876,598.81 kg	883,661.95 kg	-7,063.14 kg	-211,865.12 kg
SO2	2,434.57 kg	2,454.19 kg	-19.62 kg	-588.41 kg
NOx	763.69 kg	769.84 kg	-6.15 kg	-184.58 kg

COST ESTIMATES

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PROJECT:	Driscoll School
JOB NO:	68001800
CLIENT:	Jonathan Levi Architects, Inc.
DATE:	4/17/2019
BY:	KL

Baseline - ASHRAE Std. 90.1-2010 CHW/Electric Heat Coil VAV Air Handling Unit System

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Fan Powered VAV Boxes with Electric Reheat Coils	129	$5,000			$ 645,000
AHU-1: Gym Full AC Overhead CHW/Electric Heat Coil VAV w/ ERV & DCV	7,500 CFM	$15.5/CFM			$ 116,250
AHU-2: Small Gym/Lockers Full AC Overhead CHW/Electric Heat Coil VAV w/ ERV & DCV	5,500 CFM	$15.5/CFM			$ 85,250
AHU-3: Kitchen MAU	4,500 CFM	$13/CFM			$ 58,500
AHU-4: Classrooms, Admin., Media Full AC Overhead CHW/Electric Heat Coil VAV w/ ERV & DCV	60,000 CFM	$15.5/CFM			$ 930,000
AHU-5: Classrooms, Cafeteria, Multi-Purpose Full AC Overhead CHW/Electric Heat Coil VAV w/ ERV & DCV	75,000 CFM	$15.5/CFM			$ 1,162,500
(2) 155 Ton (Code) High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers*	310 tons	$1,500/ton			$ 465,000
RO Water System					$ 150,000
Pumps (CHW) including VFD's	2	$22,500			$ 45,000
CHW Piping & Insulation and Condensate Piping			155,140	$3.25	$ 504,205
Cooling Tower Pumps and VFDs	2	$22,500			$ 45,000
Cooling Tower CW Piping	1	$30,000			$ 30,000
Electric Terminal Heating Units			155,140	$2.50	$ 387,850
Electric Circuitry for VAV & Electric Terminal Heating Units			155,140	$2.50	$ 387,850
Ductwork including GRD's, Dampers, & General Exhaust Systems			155,140	$16.00	$ 2,482,240
ATC/DDC Controls			155,140	$5.25	$ 814,485
Split System Ductless Cooling Units	6	$7,500			$ 45,000
Exhaust Fans (Misc. Areas)					$ 20,000
Additional Mechanical Room Space to House Larger Air Handling Units			1,000	$500	$ 500,000.00
Electrical Service Increase Requirements					$ 90,000
750 kW Generator Size Increase Requirements (additional 350 kW)					$ 350,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)			155,140	$2.5	$ 387,850
				TOTAL	$ 9,701,980
				TOTAL ($/FT²)	$ 62.54

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

* Cooling Tower replacement cost of $155,000 after 10 year equipment life expectancy carried in Life-Cycle Analysis calculations.

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PROJECT:	Driscoll School		
JOB NO:	68001800		
CLIENT:	Jonathan Levi Architects, Inc.		
DATE:	4/17/2019	**BY:**	KL

Option 1 - VAV Full AC Displacement Ventilation Systems with Water-Source Heat Pump Chiller Plant with Fluid Cooler and Supplemental Electric Boilers

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Large AC Displacement Diffuser Assemblies	162	$1,150			$ 186,300
Small Displacement Diffuser Assemblies (Admin.)	45	$850			$ 38,250
VAV Box with Demand Ventilation Controls	123	$1,200			$ 147,600
AHU-1: Gym Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	6,000 CFM	$14.5/CFM			$ 87,000
AHU-2: Small Gym/Lockers Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	4,500 CFM	$14.5/CFM			$ 65,250
AHU-3: Kitchen MAU	4,500 CFM	$12/CFM			$ 54,000
AHU-4: Classrooms, Admin., Media Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	45,000 CFM	$14.5/CFM			$ 652,500
AHU-5: Classrooms, Cafeteria, Multi-Purpose Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	55,000 CFM	$14.5/CFM			$ 797,500
(3) 1,320 MBH (387 kW) Electric Boilers	3	$39,700			$ 119,100
Pumps (HHW) including VFD's	2	$18,000			$ 36,000
(2) 155 Ton High-Efficiency Water-Cooled Heat Recovery Heat Pump Chillers and Fluid Cooler Plant*	310 tons	$1,500/ton			$ 465,000
RO Water System					$ 150,000
Pumps (CHW) including VFD's	2	$22,500			$ 45,000
Fluid Cooler Pumps and VFDs	2	$22,500			$ 45,000
Fluid Cooler CW Piping	1	$30,000			$ 30,000
HHW Piping & Insulation including Terminal Heating Units			155,140	$5.50	$ 853,270
CHW Piping & Insulation and Condensate Piping			155,140	$3.25	$ 504,205
Ductwork including GRD's, Dampers, & General Exhaust Systems			155,140	$13.00	$ 2,016,820
ATC/DDC Controls			155,140	$5.50	$ 853,270
Split System Ductless Cooling Units	6	$7,500			$ 45,000
Exhaust Fans (Misc. Areas)					$ 20,000
Electrical Service Increase Requirements					$ 45,000
375 kW Generator Size Increase Requirements (additional 175 kW)					$ 175,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)			155,140	$2.5	$ 387,850
				TOTAL	$ 7,818,915
				TOTAL ($/FT²)	$ 50.40

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

* Fluid Cooler replacement cost of $155,000 after 10 year equipment life expectancy carried in Life-Cycle Analysis calculations.

	PROJECT:	Driscoll School	
	JOB NO:	68001800	
Option 2 - Variable Refrigerant Flow (VRF) Systems with Split-System Air-Source Heat Pump Cooling/Heating Air Handling Units	CLIENT:	Jonathan Levi Architects, Inc.	
	DATE:	4/17/2019	BY: KL

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Indoor VRF Evaporator Units	114	$3,300			$ 376,200.00
Outdoor Air Cooled VRF Condensing Units (190 Ton Total Capacity)*	190	$1,500/ton			$ 285,000.00
Large AC Displacement Diffuser Assemblies	32	$1,150			$ 36,800
VAV Box with Demand Ventilation Controls	123	$1,500			$ 184,500.00
AHU-1: Gym Full AC Displacement DX Heat Pump VAV w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	6,000 CFM	$18/CFM			$ 108,000
AHU-2: Small Gym/Lockers Full AC DisplacementDX Heat Pump VAV w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	4,500 CFM	$18/CFM			$ 81,000
AHU-3: Kitchen DX Heat Pump MAU and Outdoor Condensing Unit including interconnecting refrigerant piping	4,500 CFM	$15/CFM			$ 127,500
AHU-4: Cafeteria/Lobby Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-5: Multi-Purpose/Stage Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	5,500 CFM	$18/CFM			$ 99,000
AHU-6: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-7: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-8: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-9: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-10: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-11: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-12: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
AHU-13: Classrooms, Admin., Media 100% OA DX Heat Pump VAV DOAS w/ ERV & DCV and Outdoor Condensing Unit including interconnecting refrigerant piping	8,000 CFM	$18/CFM			$ 144,000
Electric Terminal Heating Units			155,140	$2.50	$ 387,850
Electric Circuitry for VRF & Electric Terminal Heating Units			155,140	$2.50	$ 387,850
Refrigeration Piping & Insulation and Condensate Piping & Pumps			119,000	$5.5	$ 654,500.00
Ductwork including GRD's, Dampers, & General Exhaust Systems			155,140	$11.00	$ 1,706,540.00
Controls			155,140	$6.00	$ 930,840.00
Split System Ductless Cooling Units	6	$7,500			$ 45,000.00
Exhaust Fans (Misc. Areas)					$ 20,000.00
Additional Mechanical Room Space to House Additional Air Handling Units			2,000	$500	$ 1,000,000.00
Electrical Service Increase Requirements					$ 45,000
375 kW Generator Size Increase Requirements (additional 175 kW)					$ 175,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)			155,140	$2.5	$ 387,850.00
				TOTAL	$ 8,334,430.00
				TOTAL ($/FT²)	$ 53.72

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules, etc. Estimates do not include all project general system costs; example: demolition, rigging, etc.

* Outdoor Air Cooled VRF Condensing Units replacement cost of $285,000 after 20 year equipment life expectancy carried in Life-Cycle Analysis calculations.

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		PROJECT: Driscoll School			
		JOB NO: 68001800			
Option 3 - VAV Full AC Displacement Ventilation Systems with Geothermal Water-Source Heat Pump Chiller Plant with Closed-Loop Wells		CLIENT: Jonathan Levi Architects, Inc.			
		DATE: 4/22/2019		BY: KL	
ITEM OF WORK	**NO.**	**UNIT PRICE**	**AREA**	**PRICE/S.F.**	**TOTAL**
Large AC Displacement Diffuser Assemblies	162	$1,150			$ 186,300
Small Displacement Diffuser Assemblies (Admin.)	45	$850			$ 38,250
VAV Box with Demand Ventilation Controls	123	$1,200			$ 147,600
AHU-1: Gym Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	6,000 CFM	$14.5/CFM			$ 87,000
AHU-2: Small Gym/Lockers Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	4,500 CFM	$14.5/CFM			$ 65,250
AHU-3: Kitchen CHW/HHW Coil MAU	4,500 CFM	$12/CFM			$ 54,000
AHU-4: Classrooms, Admin., Media Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	45,000 CFM	$14.5/CFM			$ 652,500
AHU-5: Classrooms, Cafeteria, Multi-Purpose Full AC Displacement CHW/HHW Coil VAV w/ ERV & DCV	55,000 CFM	$14.5/CFM			$ 797,500
(5) 76 Ton High-Efficiency Water-to-Water Source Heat Recovery Heat Pump Chillers	380 tons	$1,000/ton			$ 380,000
Geothermal System Glycol Feed & Water Treatment System	1	$30,000			$ 30,000
Pumps (HHW) including VFD's	2	$18,000			$ 36,000
Pumps (CHW) including VFD's	2	$22,500			$ 45,000
Pumps (Geo) including VFD's	2	$22,500			$ 45,000
Geothermal CW Piping Mains	1	$50,000			$ 50,000
675' Deep Closed Loop Geothermal Quad Wells (380 Tons total capacity) including Underground Piping, Coring, Sleeves, etc	55	$50,000			$ 2,750,000
HHW Piping & Insulation including Terminal Heating Units			155,140	$5.50	$ 853,270
CHW Piping & Insulation and Condensate Piping			155,140	$3.25	$ 504,205
Ductwork including GRD's, Dampers, & General Exhaust Systems			155,140	$13.00	$ 2,016,820
ATC/DDC Controls			155,140	$5.50	$ 853,270
Split System Ductless Cooling Units	6	$7,500			$ 45,000
Exhaust Fans (Misc. Areas)					$ 20,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)			155,140	$2.5	$ 387,850
				TOTAL	$ 10,044,815
				TOTAL ($/FT²)	$ 64.75

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PROJECT:	Driscoll School
JOB NO:	68001800
CLIENT:	Jonathan Levi Architects, Inc.
DATE:	4/17/2019
BY:	KL

Option 4 - CHW/HHW Coil VAV Air Handling Unit System

ITEM OF WORK	NO.	UNIT PRICE	AREA	PRICE/S.F.	TOTAL
Fan Powered VAV Boxes with Hot Water Reheat Coils	129	$4,200			$ 541,800
AHU-1: Gym Full AC Overhead CHW/HHW Coil VAV w/ ERV & DCV	7,500 CFM	$14.5/CFM			$ 108,750
AHU-2: Small Gym/Lockers Full AC Overhead CHW/HHW Coil VAV w/ ERV & DCV	5,500 CFM	$14.5/CFM			$ 79,750
AHU-3: Kitchen MAU	4,500 CFM	$12/CFM			$ 54,000
AHU-4: Classrooms, Admin., Media Full AC Overhead CHW/HHW Coil VAV w/ ERV & DCV	60,000 CFM	$14.5/CFM			$ 870,000
AHU-5: Classrooms, Cafeteria, Multi-Purpose Full AC Overhead CHW/HHW Coil VAV w/ ERV & DCV	75,000 CFM	$14.5/CFM			$ 1,087,500
(3) 2,300 MBH (674 kW) Electric Boilers	3	$48,900			$ 146,700
Pumps (HHW) including VFD's	2	$18,000			$ 36,000
(2) 155 Ton (Code) High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers*	310 tons	$1,500/ton			$ 465,000
RO Water System					$ 150,000
Pumps (CHW) including VFD's	2	$22,500			$ 45,000
HHW Piping & Insulation including Terminal Heating Units			155,140	$5.50	$ 853,270
CHW Piping & Insulation and Condensate Piping			155,140	$3.25	$ 504,205
Cooling Tower Pumps and VFDs	2	$22,500			$ 45,000
Cooling Tower CW Piping	1	$30,000			$ 30,000
Ductwork including GRD's, Dampers, & General Exhaust Systems			155,140	$16.00	$ 2,482,240
ATC/DDC Controls			155,140	$5.50	$ 853,270
Split System Ductless Cooling Units	6	$7,500			$ 45,000
Exhaust Fans (Misc. Areas)					$ 20,000
Additional Mechanical Room Space to House Larger Air Handling Units			1,000	$500	$ 500,000.00
Electrical Service Increase Requirements					$ 90,000
750 kW Generator Size Increase Requirements (additional 350 kW)					$ 350,000
HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management)			155,140	$2.5	$ 387,850
				TOTAL	$ 9,745,335
				TOTAL ($/FT²)	$ 62.82

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

* Cooling Tower replacement cost of $155,000 after 10 year equipment life expectancy carried in Life-Cycle Analysis calculations.

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Driscoll School - Annual Maintenance Costs

Baseline - VAV

UNIT TYPE	QUANTITY	COST/UNIT	ANNUAL COST
Fan Powered VAV Box w/ Reheat Coil	129	$125	$16,125
Large CHW AHU's	2	$2,000	$4,000
Small CHW AHU's	3	$1,500	$4,500
Chiller Plant w/ Cooling Tower	1	$2,500	$2,500
RO Water System Maintenance	1	$5,000	$5,000
		TOTAL	**$32,125**

Option 1 - Displacement Systems w/ Air-Cooled Heat Pump Plant

UNIT TYPE	QUANTITY	COST/UNIT	ANNUAL COST
VAV Box	123	$50	$6,150
Large CHW AHU's	2	$2,000	$4,000
Small CHW AHU's	3	$1,500	$4,500
Chiller Plant w/ Fluid Cooler	1	$2,500	$2,500
RO Water System Maintenance	1	$5,000	$5,000
Boiler Plant	1	$1,000	$1,000
		TOTAL	**$23,150**

Option 2 - VRF Units w/ Split System Air-Cooled Air Handling Units

UNIT TYPE	QUANTITY	COST/UNIT	ANNUAL COST
Indoor VRF Evaporators	114	$150	$17,100
VAV Box	123	$50	$6,150
Small DX AHU's & Condensing Units	13	$2,000	$26,000
VRF Condenser Plant	1	$1,500	$1,500
		TOTAL	**$50,750**

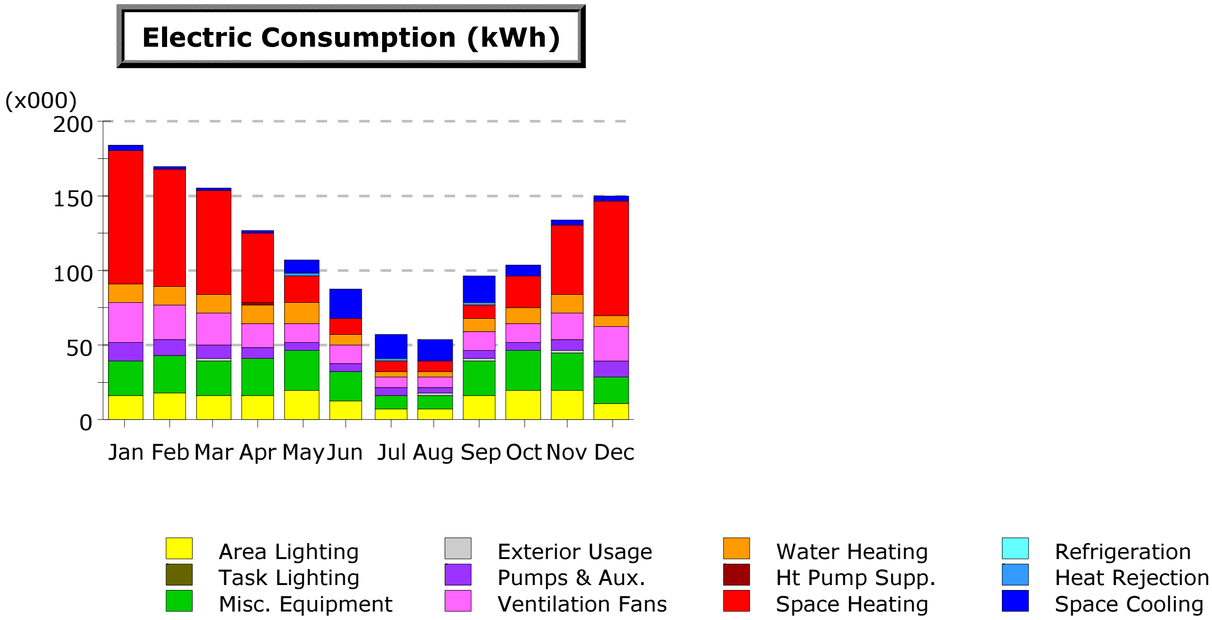
Option 3 - Displacement Systems w/ Geothermal Heat Pump Plant

UNIT TYPE	QUANTITY	COST/UNIT	ANNUAL COST
VAV Box	123	$50	$6,150
Large CHW AHU's	2	$2,000	$4,000
Small CHW AHU's	3	$1,500	$4,500
Geothermal Plant	1	$3,500	$3,500
		TOTAL	**$18,150**

Option 4 - CHW/HHW VAV

UNIT TYPE	QUANTITY	COST/UNIT	ANNUAL COST
Fan Powered VAV Box w/ Reheat Coil	129	$125	$16,125
Large CHW AHU's	2	$2,000	$4,000
Small CHW AHU's	3	$1,500	$4,500
Chiller Plant w/ Cooling Tower	1	$2,500	$2,500
RO Water System Maintenance	1	$5,000	$5,000
Boiler Plant	1	$1,000	$1,000
		TOTAL	**$33,125**

ENERGY PROFILES



Electric Consumption (kWh x000)

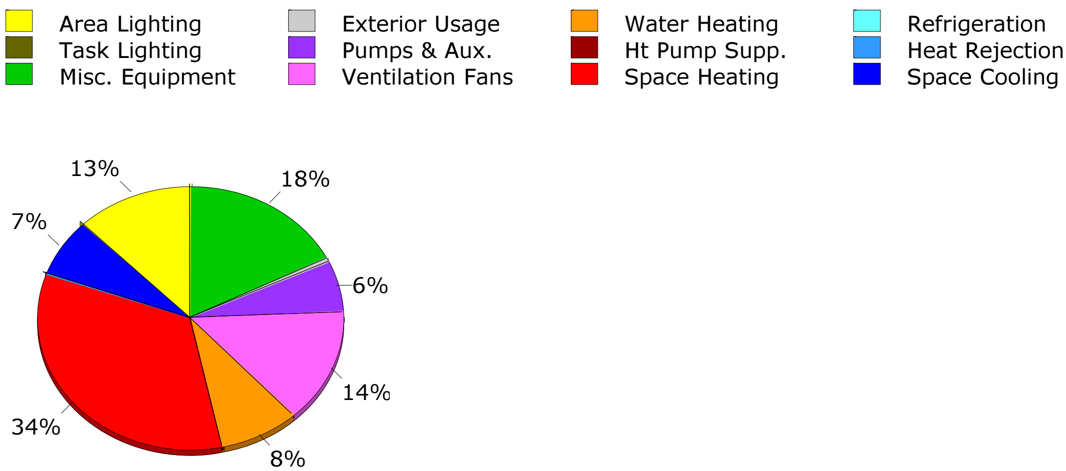
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	3.4	2.6	2.4	2.2	10.1	19.6	16.8	13.3	17.5	5.9	3.0	3.0	99.8
Heat Reject.	0.0	0.0	-	0.0	0.3	0.9	0.8	0.5	0.5	0.1	0.0	0.0	3.2
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	89.1	77.4	69.0	47.6	19.4	9.6	6.8	6.5	10.0	21.2	46.8	76.1	479.5
HP Supp.	0.3	0.8	0.4	0.0	-	-	-	-	-	0.0	0.1	0.1	1.8
Hot Water	11.4	13.1	12.5	12.6	12.8	8.1	3.7	3.7	9.2	10.9	11.7	8.1	117.7
Vent. Fans	27.5	22.6	21.4	16.7	12.9	12.3	8.4	8.1	12.5	12.5	17.8	23.2	196.1
Pumps & Aux.	11.9	10.1	9.9	7.2	5.8	5.3	3.7	3.4	5.8	5.6	8.0	10.3	87.0
Ext. Usage	0.8	0.6	0.7	0.7	0.5	0.5	0.5	0.8	0.7	0.8	0.8	0.8	8.0
Misc. Equip.	22.5	24.7	23.3	23.8	26.4	18.0	9.3	9.4	22.8	26.4	26.0	16.7	249.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.3	18.0	16.3	16.8	19.4	13.3	7.2	7.4	16.6	19.4	18.9	11.2	181.0
Total	183.3	169.9	156.0	127.5	107.6	87.5	57.2	53.2	95.7	102.8	133.1	149.5	1,423.4

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

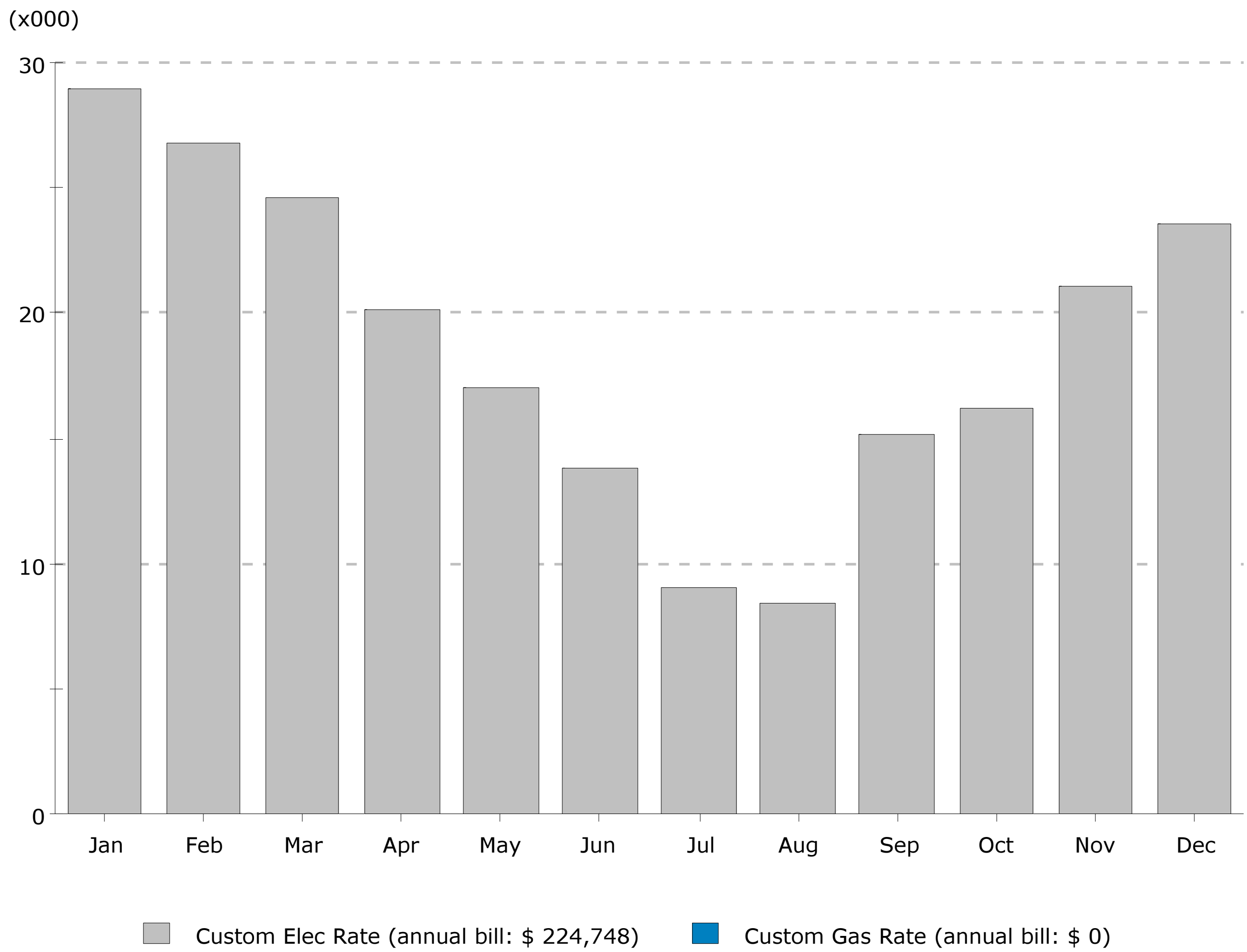
Annual Energy Consumption by Enduse

	Electricity kWh (x000)	Natural Gas Btu	Steam Btu	Chilled Water Btu
Space Cool	99.8	-	-	-
Heat Reject.	3.2	-	-	-
Refrigeration	-	-	-	-
Space Heat	479.5	-	-	-
HP Supp.	1.8	-	-	-
Hot Water	117.7	-	-	-
Vent. Fans	196.1	-	-	-
Pumps & Aux.	87.0	-	-	-
Ext. Usage	8.0	-	-	-
Misc. Equip.	249.5	-	-	-
Task Lights	-	-	-	-
Area Lights	181.0	-	-	-
Total	1,423.4	-	-	-

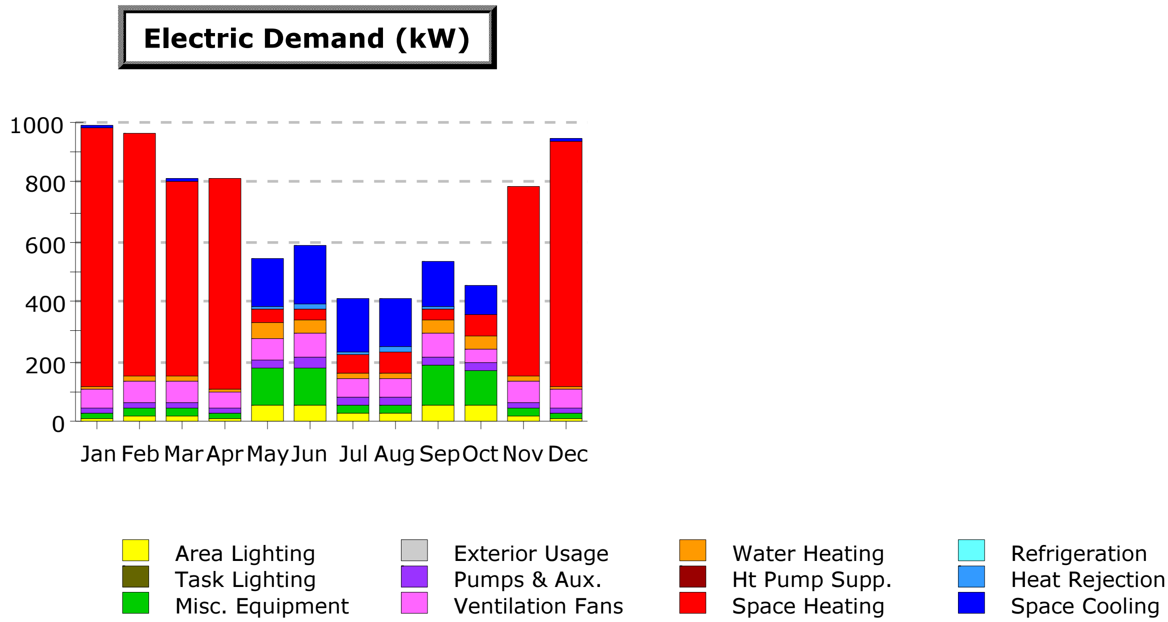


Electricity

Monthly Utility Bills ($)



Total Annual Bill Across All Rates: $ 224,748



Electric Demand (kW)

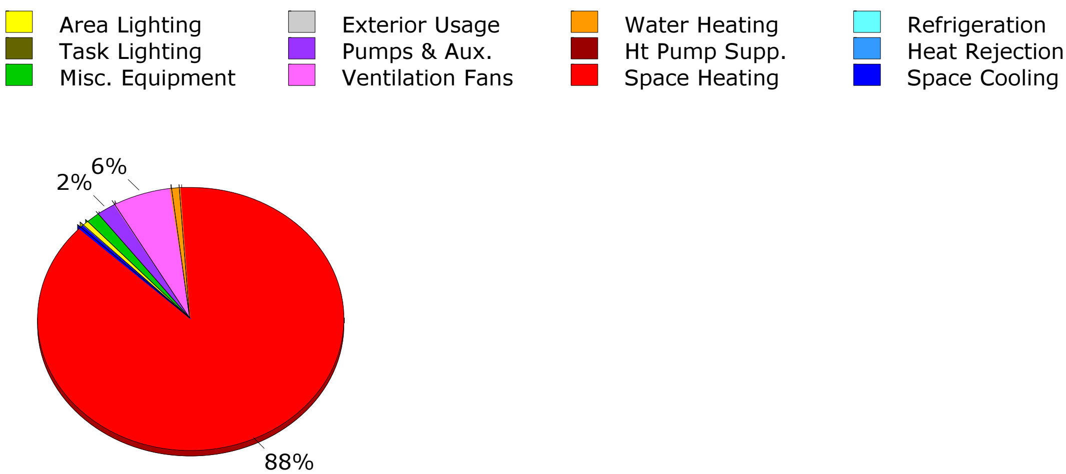
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	4.4	3.4	3.3	3.8	161.9	189.0	176.9	164.1	157.9	95.7	3.2	4.1	967.8
Heat Reject.	-	-	-	-	9.1	17.8	15.9	14.6	7.7	3.0	-	-	68.0
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	871.0	808.7	652.5	698.7	48.1	40.1	58.2	73.4	38.2	72.0	631.4	824.0	4,816.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.3	22.7	22.8	10.5	48.2	44.7	15.1	14.8	39.7	41.2	19.1	9.7	298.8
Vent. Fans	62.5	64.4	64.4	58.3	71.5	84.1	64.9	61.3	80.0	47.3	64.4	62.5	785.5
Pumps & Aux.	19.8	20.1	20.1	19.8	28.5	29.3	28.5	28.2	28.6	22.9	20.1	19.8	285.9
Ext. Usage	-	0.4	0.4	-	-	-	-	-	-	-	1.0	-	1.8
Misc. Equip.	14.6	25.4	25.4	14.6	122.9	122.9	29.3	30.0	129.5	113.8	25.4	14.6	668.4
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.8	20.4	20.4	7.8	57.9	57.9	24.5	25.1	57.9	57.9	20.4	7.8	365.7
Total	990.4	965.4	809.2	813.5	548.1	585.8	413.4	411.5	539.6	453.8	785.0	942.5	8,258.1

Gas Demand (Btu/h)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

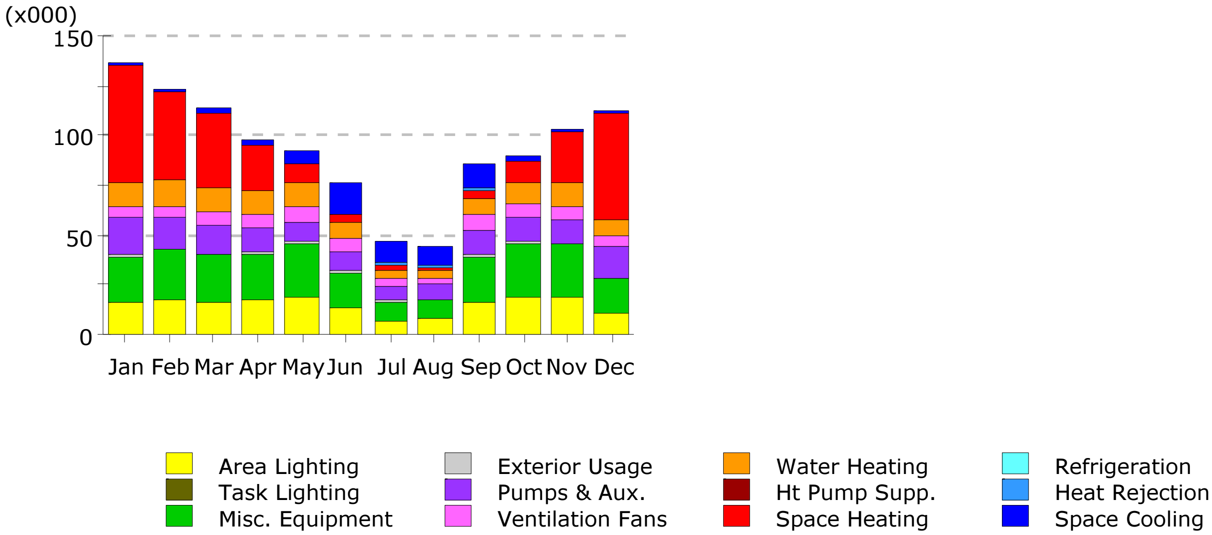
Annual Peak Demand by Enduse

	Electricity kW	Natural Gas Btu/h	Steam Btu/h	Chilled Water Btu/h
Space Cool	4.39	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	871.02	-	-	-
HP Supp.	-	-	-	-
Hot Water	10.28	-	-	-
Vent. Fans	62.45	-	-	-
Pumps & Aux.	19.80	-	-	-
Ext. Usage	-	-	-	-
Misc. Equip.	14.62	-	-	-
Task Lights	-	-	-	-
Area Lights	7.80	-	-	-
Total	990.36	-	-	-



Electricity

Electric Consumption (kWh)



Electric Consumption (kWh x000)

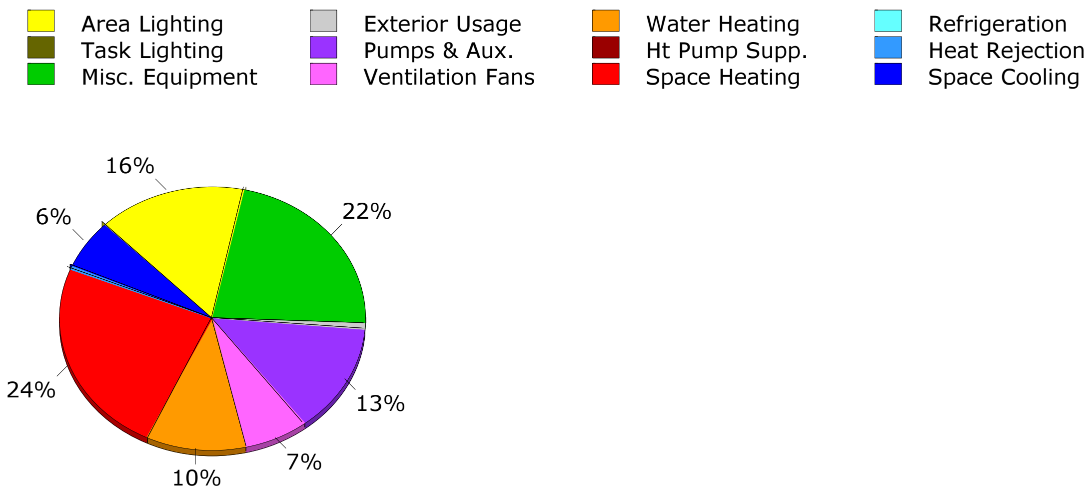
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	1.4	1.3	1.6	2.3	6.4	14.8	11.2	9.6	12.5	3.2	1.9	1.4	67.7
Heat Reject.	-	-	-	-	0.1	0.9	1.3	1.1	1.4	0.4	0.1	-	5.3
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	59.6	44.1	37.8	22.5	9.2	3.2	2.2	1.6	3.1	9.7	25.1	53.3	271.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.4	13.1	12.5	12.6	12.8	8.1	3.7	3.7	9.2	10.9	11.7	8.1	117.7
Vent. Fans	6.2	5.8	5.8	6.5	7.8	7.7	4.2	3.7	7.9	7.7	6.7	4.9	74.8
Pumps & Aux.	18.6	15.4	15.2	12.5	10.1	9.2	7.3	7.1	11.6	11.8	12.3	15.6	146.7
Ext. Usage	0.8	0.6	0.7	0.7	0.5	0.5	0.5	0.8	0.7	0.8	0.8	0.8	8.0
Misc. Equip.	22.5	24.7	23.3	23.8	26.4	18.0	9.3	9.4	22.8	26.4	26.0	16.7	249.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.3	18.0	16.3	16.8	19.4	13.3	7.2	7.4	16.6	19.4	18.9	11.2	181.0
Total	136.8	123.0	113.2	97.5	92.7	75.7	46.9	44.4	86.0	90.3	103.5	112.0	1,122.1

Gas Consumption (Btu)

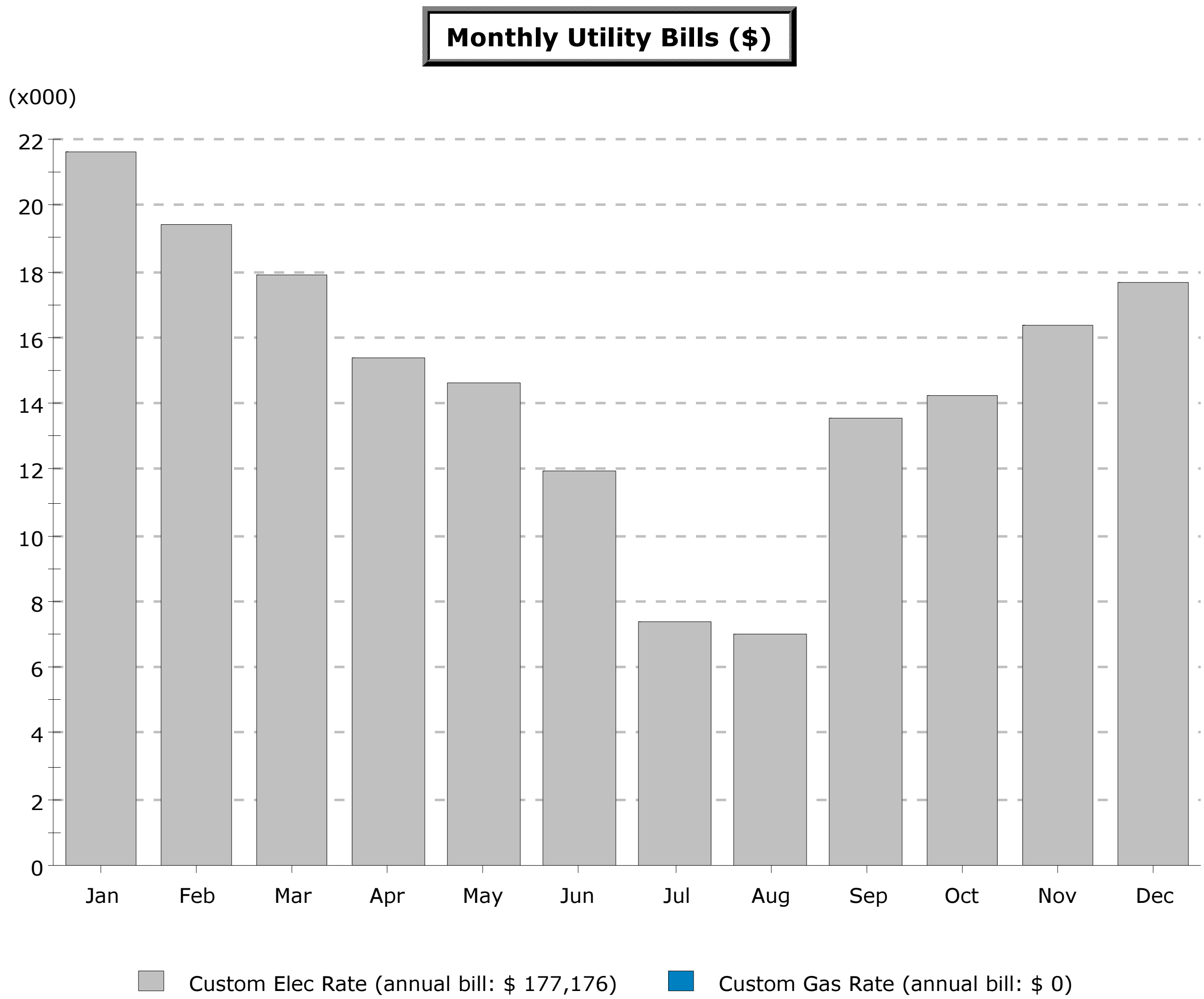
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Annual Energy Consumption by Enduse

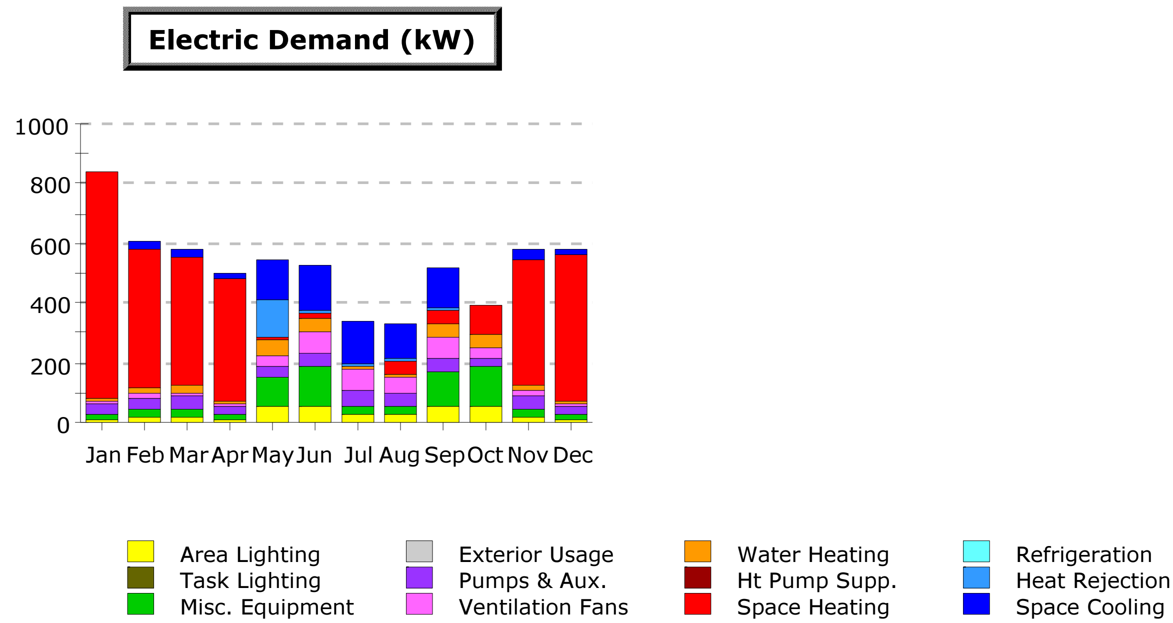
	Electricity kWh (x000)	Natural Gas Btu	Steam Btu	Chilled Water Btu
Space Cool	67.7	-	-	-
Heat Reject.	5.3	-	-	-
Refrigeration	-	-	-	-
Space Heat	271.4	-	-	-
HP Supp.	-	-	-	-
Hot Water	117.7	-	-	-
Vent. Fans	74.8	-	-	-
Pumps & Aux.	146.7	-	-	-
Ext. Usage	8.0	-	-	-
Misc. Equip.	249.5	-	-	-
Task Lights	-	-	-	-
Area Lights	181.0	-	-	-
Total	1,122.1	-	-	-



Electricity



Total Annual Bill Across All Rates: $ 177,176



Electric Demand (kW)

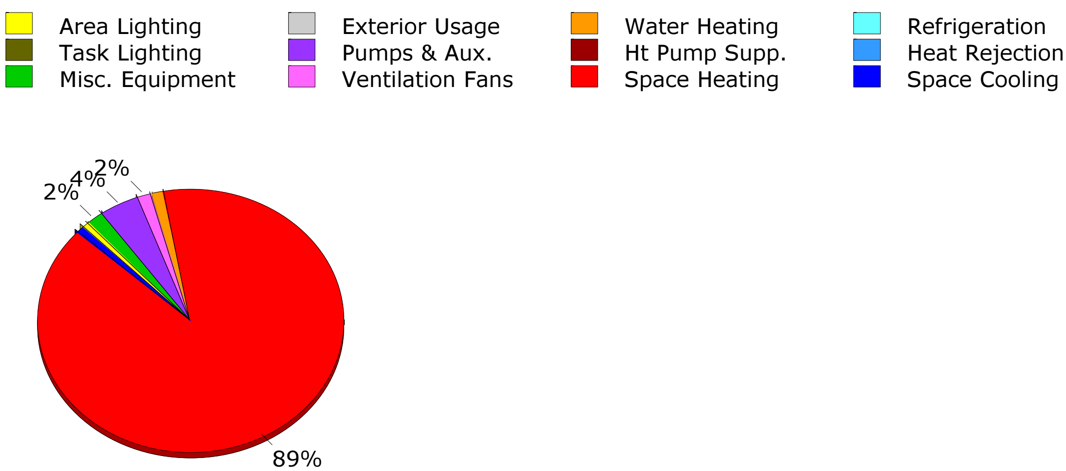
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	7.0	29.9	32.8	16.8	135.1	149.6	138.8	111.7	135.3	1.6	35.4	15.6	809.7
Heat Reject.	-	-	-	-	124.8	10.6	9.6	8.8	9.2	-	-	-	163.0
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	752.9	459.4	425.8	407.6	14.6	15.7	-	45.1	47.2	102.8	421.4	490.9	3,183.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.3	22.7	22.8	10.5	48.2	44.7	15.0	14.4	39.7	41.2	19.1	9.7	298.2
Vent. Fans	13.3	17.6	16.2	14.1	34.3	72.4	72.8	49.9	69.2	34.9	16.2	13.6	424.4
Pumps & Aux.	36.0	33.1	40.1	27.2	41.1	46.9	46.2	45.1	45.8	28.1	40.4	30.0	460.1
Ext. Usage	-	0.4	0.4	-	-	-	-	-	-	-	1.0	-	1.8
Misc. Equip.	14.6	25.4	25.4	14.6	92.6	129.5	30.0	29.3	114.0	129.7	25.4	14.6	645.2
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.8	20.4	20.4	7.8	57.9	57.9	26.5	25.9	57.9	57.9	20.4	7.8	368.5
Total	841.9	608.8	583.8	498.6	548.6	527.2	338.9	330.3	518.3	396.3	579.3	582.2	6,354.1

Gas Demand (Btu/h)

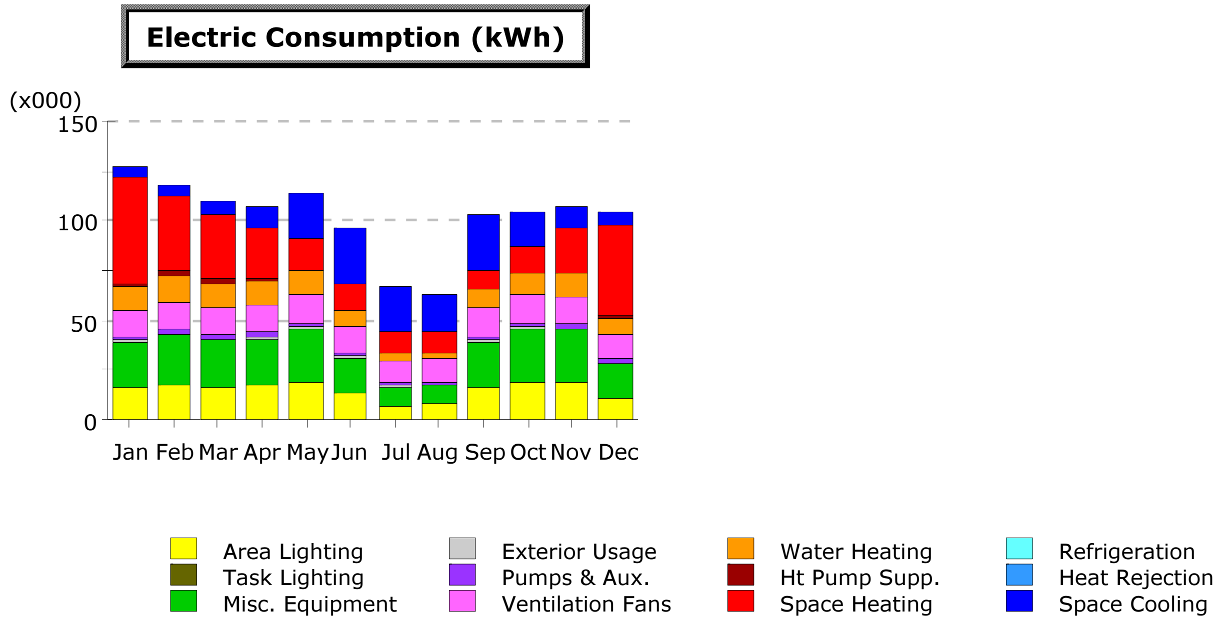
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Annual Peak Demand by Enduse

	Electricity kW	Natural Gas Btu/h	Steam Btu/h	Chilled Water Btu/h
Space Cool	7.05	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	752.90	-	-	-
HP Supp.	-	-	-	-
Hot Water	10.28	-	-	-
Vent. Fans	13.31	-	-	-
Pumps & Aux.	35.95	-	-	-
Ext. Usage	-	-	-	-
Misc. Equip.	14.62	-	-	-
Task Lights	-	-	-	-
Area Lights	7.80	-	-	-
Total	841.91	-	-	-



Electricity



Electric Consumption (kWh x000)

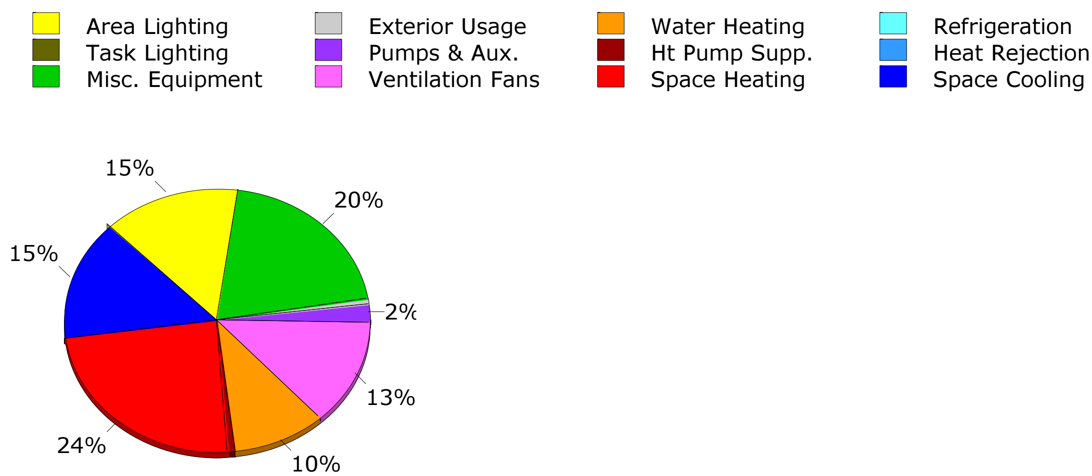
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	5.0	5.6	6.1	10.6	22.6	29.1	22.8	19.7	27.2	17.9	10.9	5.6	183.2
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	53.7	37.7	33.1	26.5	15.5	12.8	10.2	9.7	10.3	13.3	22.9	46.0	291.8
HP Supp.	1.8	3.1	1.7	0.3	-	-	-	-	-	0.0	0.5	1.0	8.4
Hot Water	11.4	13.1	12.5	12.6	12.8	8.1	3.7	3.7	9.2	10.9	11.7	8.1	117.8
Vent. Fans	13.0	12.7	13.4	13.8	14.2	13.5	11.6	11.5	13.8	14.0	13.6	12.3	157.2
Pumps & Aux.	2.5	2.5	2.7	2.5	2.0	1.6	1.2	1.2	1.8	2.2	2.5	2.3	25.1
Ext. Usage	0.8	0.6	0.7	0.7	0.5	0.5	0.5	0.8	0.7	0.8	0.8	0.8	8.0
Misc. Equip.	22.5	24.7	23.3	23.8	26.4	18.0	9.3	9.4	22.8	26.4	26.0	16.7	249.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.3	18.0	16.3	16.8	19.4	13.3	7.2	7.4	16.6	19.4	18.9	11.2	181.0
Total	127.0	118.0	109.9	107.6	113.4	96.9	66.5	63.4	102.5	105.0	107.8	103.9	1,222.0

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

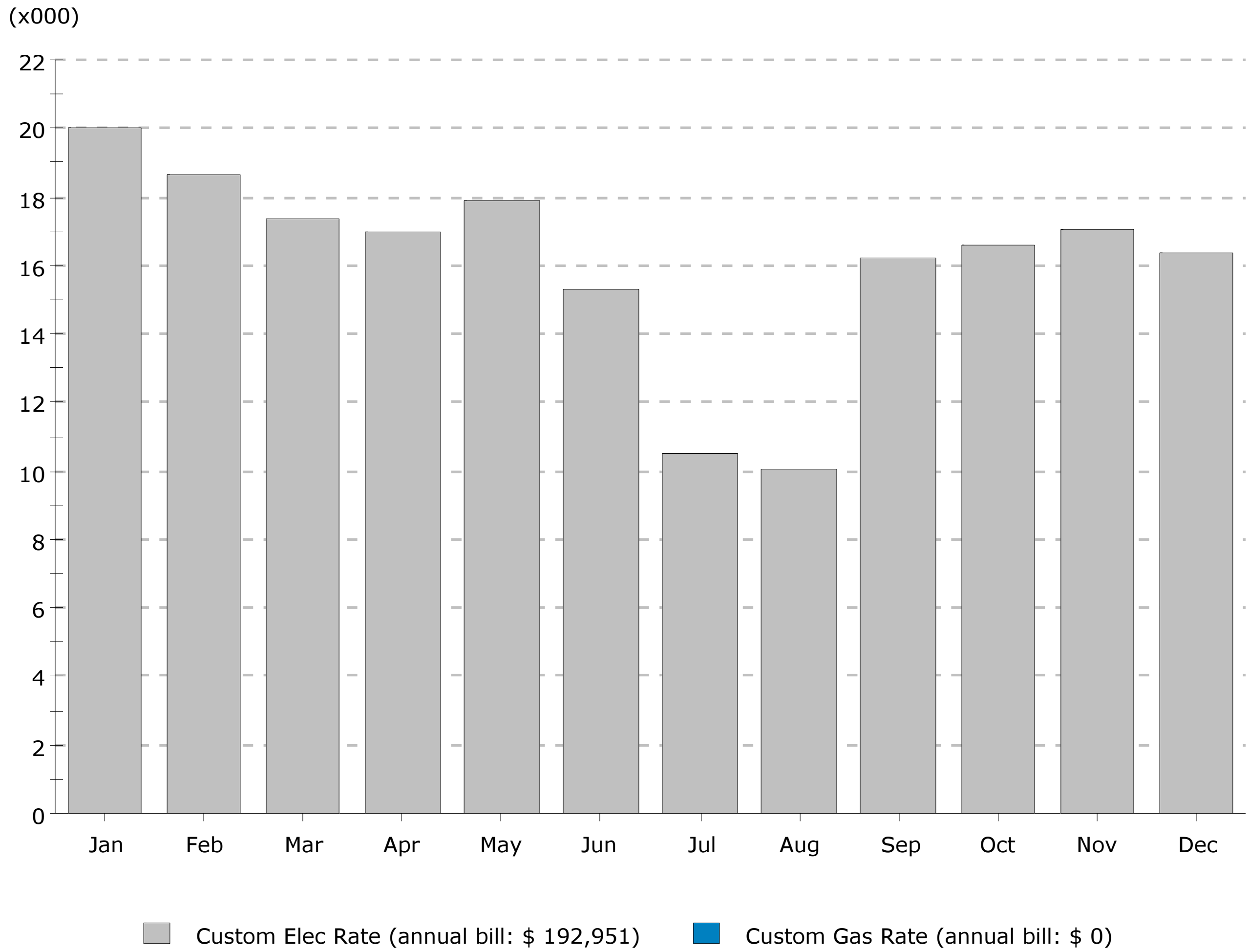
Annual Energy Consumption by Enduse

	Electricity kWh (x000)	Natural Gas Btu	Steam Btu	Chilled Water Btu
Space Cool	183.2	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	291.8	-	-	-
HP Supp.	8.4	-	-	-
Hot Water	117.8	-	-	-
Vent. Fans	157.2	-	-	-
Pumps & Aux.	25.1	-	-	-
Ext. Usage	8.0	-	-	-
Misc. Equip.	249.5	-	-	-
Task Lights	-	-	-	-
Area Lights	181.0	-	-	-
Total	1,222.0	-	-	-

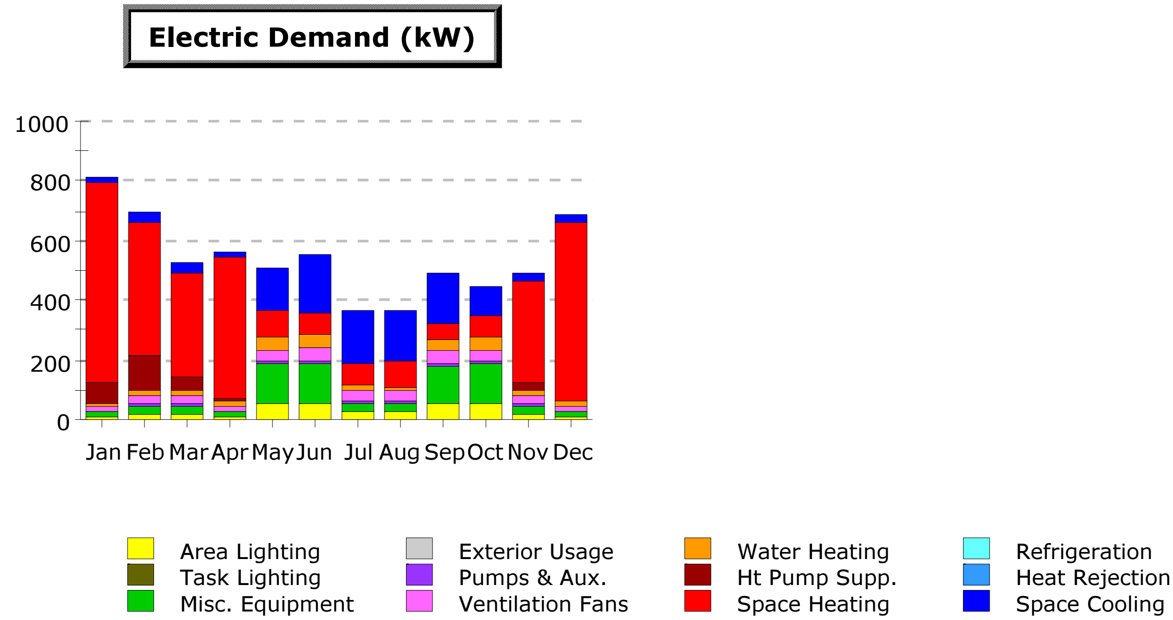


Electricity

Monthly Utility Bills ($)



Total Annual Bill Across All Rates: $ 192,951



Electric Demand (kW)

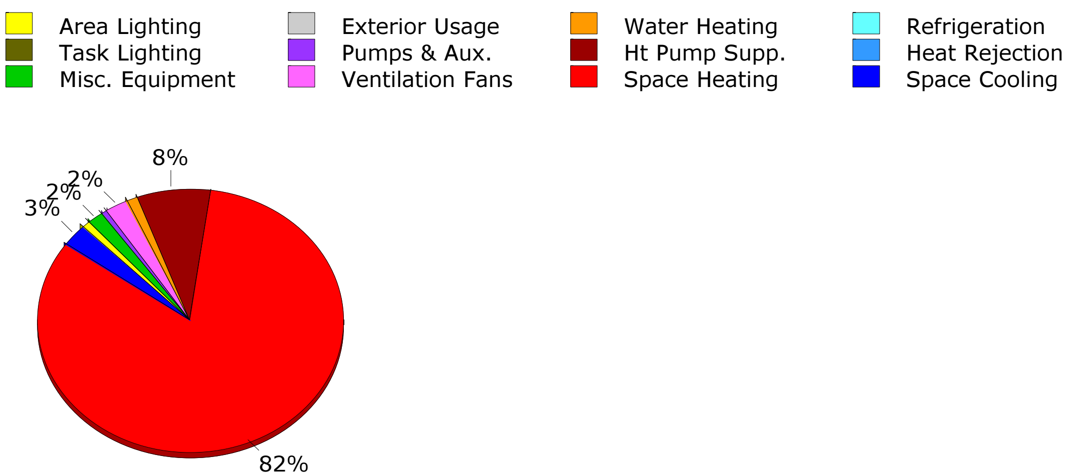
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	21.7	33.4	33.1	18.0	148.8	191.2	176.4	162.1	171.6	95.9	31.3	27.6	1,111.1
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	672.6	445.0	346.2	476.3	84.8	77.7	73.0	89.0	53.9	72.9	332.7	600.2	3,324.2
HP Supp.	64.3	119.2	43.1	13.2	-	-	-	-	-	-	33.4	-	273.3
Hot Water	10.3	22.7	22.8	10.5	48.2	44.8	15.5	14.4	39.7	41.3	19.1	9.7	299.0
Vent. Fans	19.4	24.1	27.3	20.2	39.1	44.7	34.7	36.0	43.5	42.8	24.1	21.6	377.5
Pumps & Aux.	4.6	5.9	5.9	5.0	4.8	5.7	5.7	5.7	5.7	5.0	6.0	4.6	64.4
Ext. Usage	-	0.4	0.4	-	-	-	-	-	-	-	1.0	-	1.8
Misc. Equip.	14.6	25.4	25.4	14.6	129.5	129.5	30.0	29.3	123.1	129.5	25.4	14.6	691.0
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.8	20.4	20.4	7.8	57.9	57.9	26.5	25.9	57.9	57.9	20.4	7.8	368.5
Total	815.3	696.5	524.5	565.6	513.1	551.5	361.8	362.4	495.4	445.3	493.3	686.0	6,510.6

Gas Demand (Btu/h)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

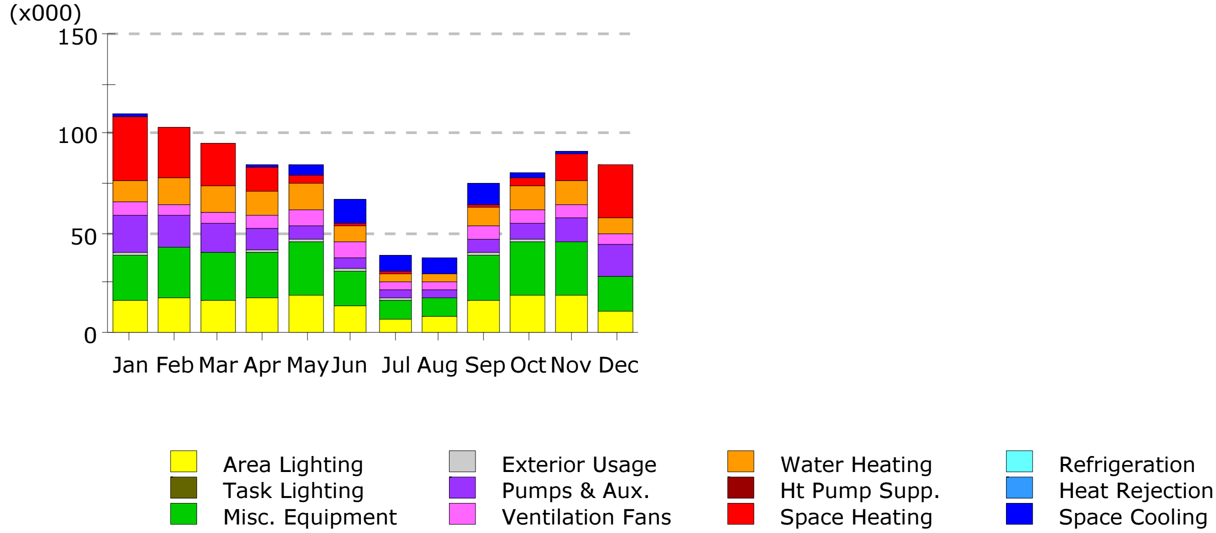
Annual Peak Demand by Enduse

	Electricity kW	Natural Gas Btu/h	Steam Btu/h	Chilled Water Btu/h
Space Cool	21.67	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	672.55	-	-	-
HP Supp.	64.32	-	-	-
Hot Water	10.28	-	-	-
Vent. Fans	19.43	-	-	-
Pumps & Aux.	4.61	-	-	-
Ext. Usage	-	-	-	-
Misc. Equip.	14.62	-	-	-
Task Lights	-	-	-	-
Area Lights	7.80	-	-	-
Total	815.28	-	-	-



Electricity

Electric Consumption (kWh)



Electric Consumption (kWh x000)

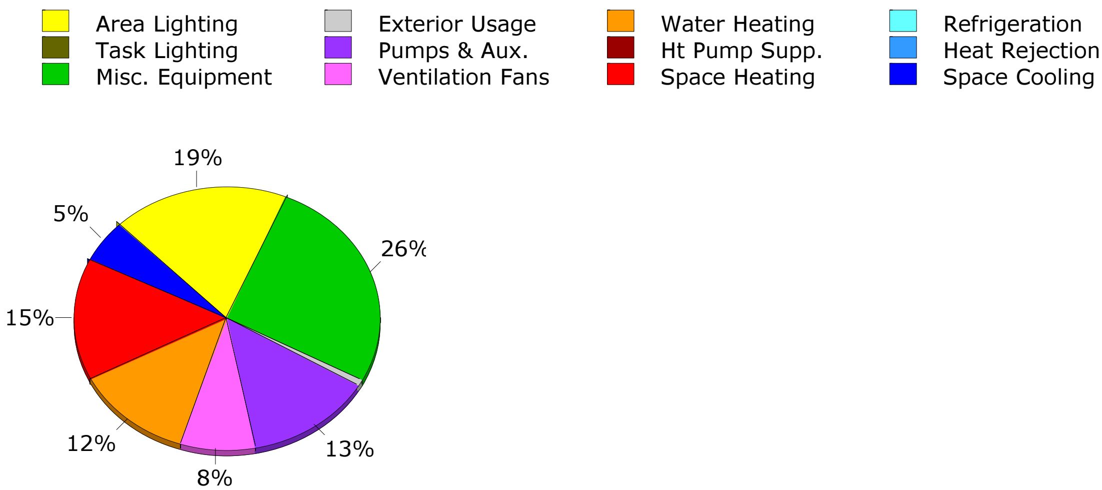
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.44	0.39	0.63	1.34	4.93	11.52	8.67	7.45	9.80	2.45	1.16	0.58	49.36
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	32.12	25.00	21.72	11.65	4.34	1.43	0.93	0.53	1.37	4.68	13.64	26.43	143.84
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.42	13.11	12.51	12.57	12.76	8.09	3.72	3.68	9.19	10.92	11.66	8.05	117.69
Vent. Fans	6.12	5.80	5.80	6.49	7.84	7.68	4.20	3.67	7.94	7.67	6.70	4.89	74.79
Pumps & Aux.	19.45	15.34	14.59	11.00	7.87	6.16	4.66	4.11	6.04	7.89	11.97	16.04	125.13
Ext. Usage	0.80	0.61	0.68	0.66	0.47	0.45	0.47	0.77	0.74	0.77	0.77	0.80	7.99
Misc. Equip.	22.54	24.73	23.33	23.79	26.41	17.96	9.30	9.45	22.82	26.41	26.03	16.69	249.46
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.32	18.00	16.34	16.80	19.39	13.34	7.18	7.43	16.64	19.39	18.91	11.25	180.99
Total	109.20	103.00	95.61	84.30	84.01	66.64	39.13	37.08	74.53	80.17	90.84	84.73	949.25

Gas Consumption (Btu)

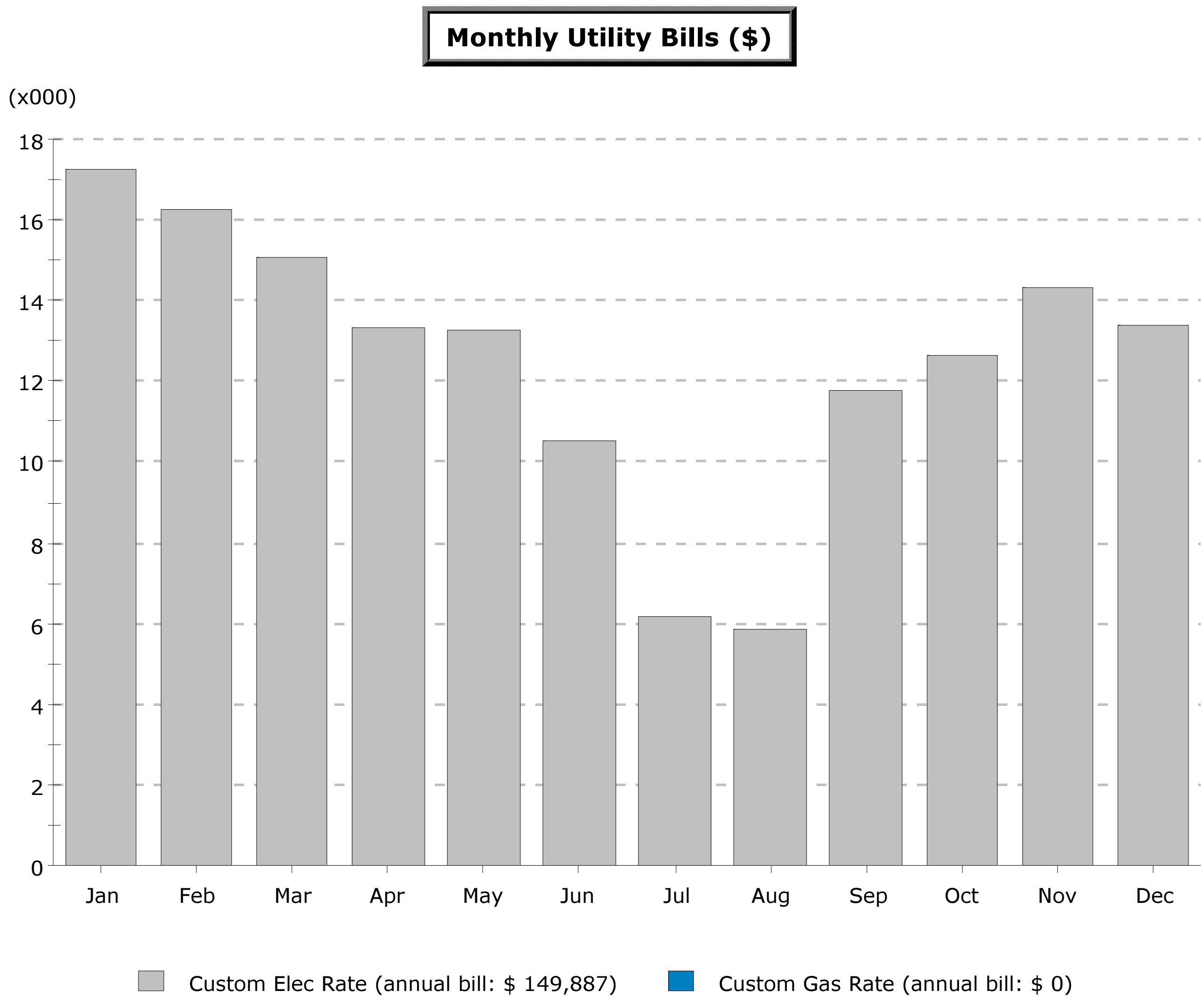
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Annual Energy Consumption by Enduse

	Electricity kWh (x000)	Natural Gas Btu	Steam Btu	Chilled Water Btu
Space Cool	49.36	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	143.84	-	-	-
HP Supp.	-	-	-	-
Hot Water	117.69	-	-	-
Vent. Fans	74.79	-	-	-
Pumps & Aux.	125.13	-	-	-
Ext. Usage	7.99	-	-	-
Misc. Equip.	249.46	-	-	-
Task Lights	-	-	-	-
Area Lights	180.99	-	-	-
Total	949.25	-	-	-

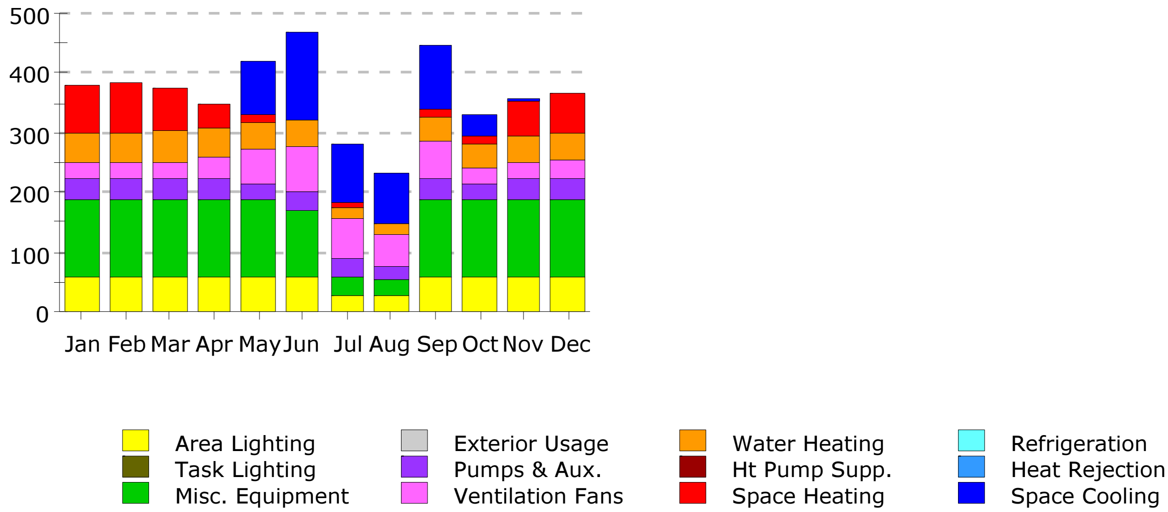


Electricity



Total Annual Bill Across All Rates: $ 149,887

Electric Demand (kW)



Electric Demand (kW)

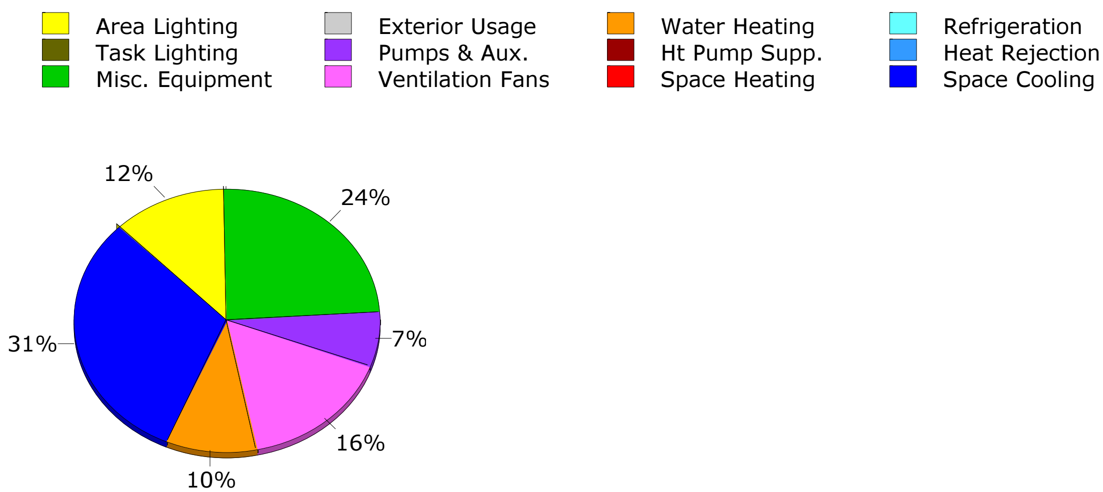
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.8	0.8	90.5	146.1	100.5	88.2	107.4	33.9	0.8	0.8	569.9
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	82.3	84.4	71.0	38.9	11.8	-	9.5	0.2	10.6	12.0	58.2	64.3	443.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	50.5	52.3	52.5	51.6	48.2	44.7	15.5	14.4	39.7	41.2	44.1	47.5	502.3
Vent. Fans	26.0	26.5	28.6	35.0	57.1	73.9	67.8	53.7	65.3	25.2	28.7	29.6	517.4
Pumps & Aux.	34.3	34.4	35.8	35.8	26.1	30.9	33.0	22.0	34.6	28.5	35.8	35.8	387.1
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	129.7	129.7	129.7	129.7	129.5	113.8	30.0	29.3	129.5	129.7	129.7	129.5	1,340.1
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	57.9	57.9	57.9	57.9	57.9	57.9	26.5	25.9	57.9	57.9	57.9	57.9	631.4
Total	380.8	385.3	376.4	349.8	421.0	467.4	282.9	233.8	444.9	328.5	355.3	365.4	4,391.5

Gas Demand (Btu/h)

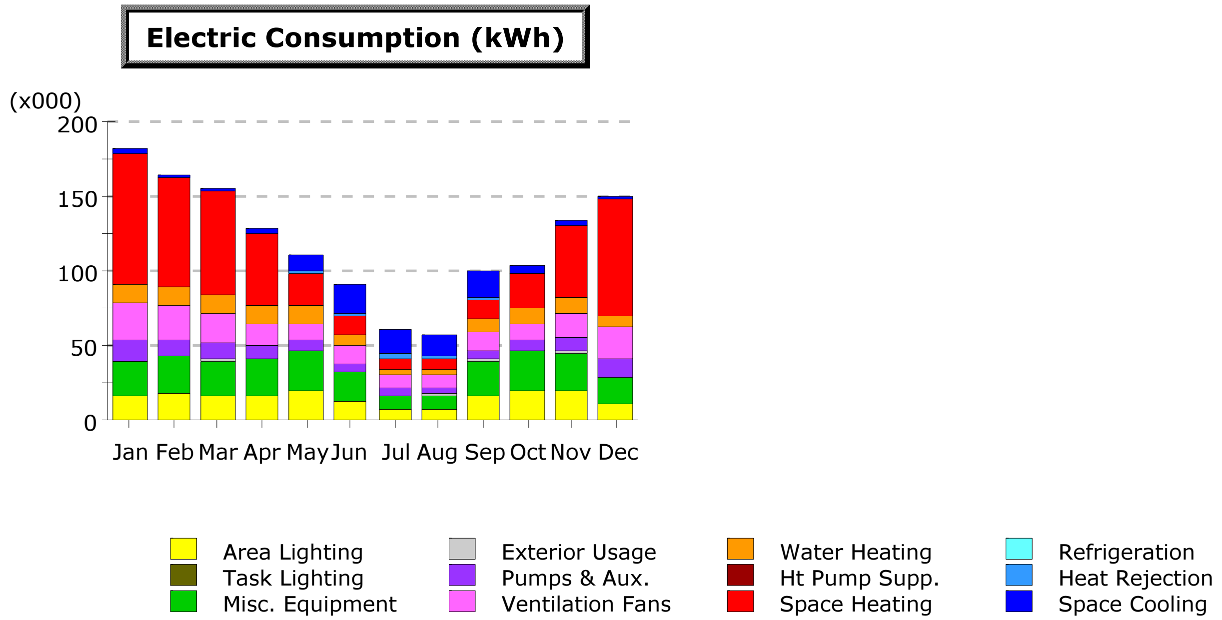
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Annual Peak Demand by Enduse

	Electricity kW	Natural Gas Btu/h	Steam Btu/h	Chilled Water Btu/h
Space Cool	146.12	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	-	-	-	-
HP Supp.	-	-	-	-
Hot Water	44.72	-	-	-
Vent. Fans	73.88	-	-	-
Pumps & Aux.	30.93	-	-	-
Ext. Usage	-	-	-	-
Misc. Equip.	113.79	-	-	-
Task Lights	-	-	-	-
Area Lights	57.91	-	-	-
Total	467.36	-	-	-



Electricity



Electric Consumption (kWh x000)

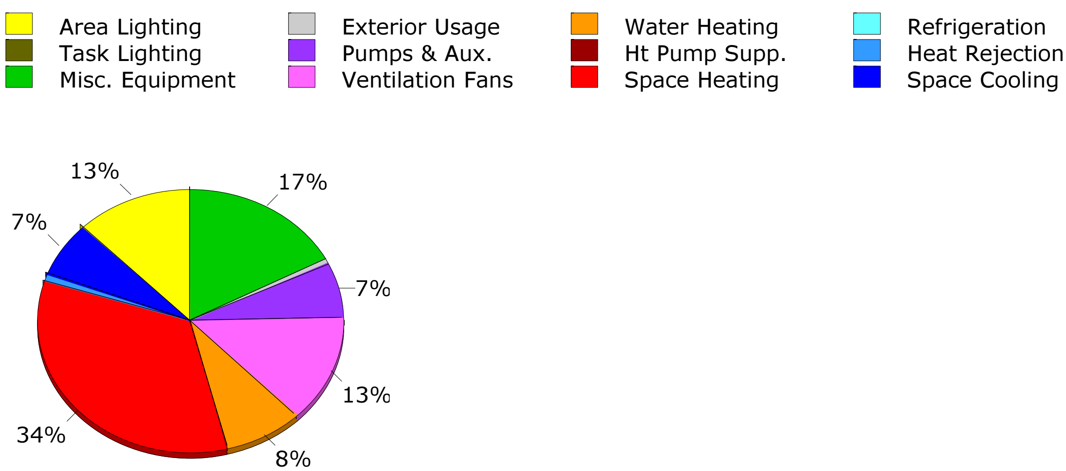
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	3.5	2.7	2.5	2.4	10.2	19.1	15.9	12.9	17.2	5.9	3.1	3.1	98.3
Heat Reject.	0.0	0.0	-	0.1	1.3	2.8	2.6	2.0	2.4	0.7	0.2	0.0	12.2
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	87.3	72.7	68.6	48.3	21.0	11.9	8.2	8.1	12.5	22.0	46.9	77.1	484.5
HP Supp.	0.2	0.4	0.2	0.0	-	-	-	-	-	-	0.0	0.0	0.9
Hot Water	11.4	13.1	12.5	12.6	12.8	8.1	3.7	3.7	9.2	10.9	11.7	8.1	117.7
Vent. Fans	26.4	21.7	20.3	15.4	11.9	11.7	8.2	7.9	11.8	11.4	16.5	22.0	185.4
Pumps & Aux.	13.0	11.1	11.0	8.1	6.6	6.0	4.3	4.1	6.5	6.4	9.0	11.4	97.7
Ext. Usage	0.8	0.6	0.7	0.7	0.5	0.5	0.5	0.8	0.7	0.8	0.8	0.8	8.0
Misc. Equip.	22.5	24.7	23.3	23.8	26.4	18.0	9.3	9.4	22.8	26.4	26.0	16.7	249.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.3	18.0	16.3	16.8	19.4	13.3	7.2	7.4	16.6	19.4	18.9	11.2	181.0
Total	181.5	165.0	155.5	128.1	110.1	91.4	59.9	56.3	99.9	103.9	133.1	150.5	1,435.0

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

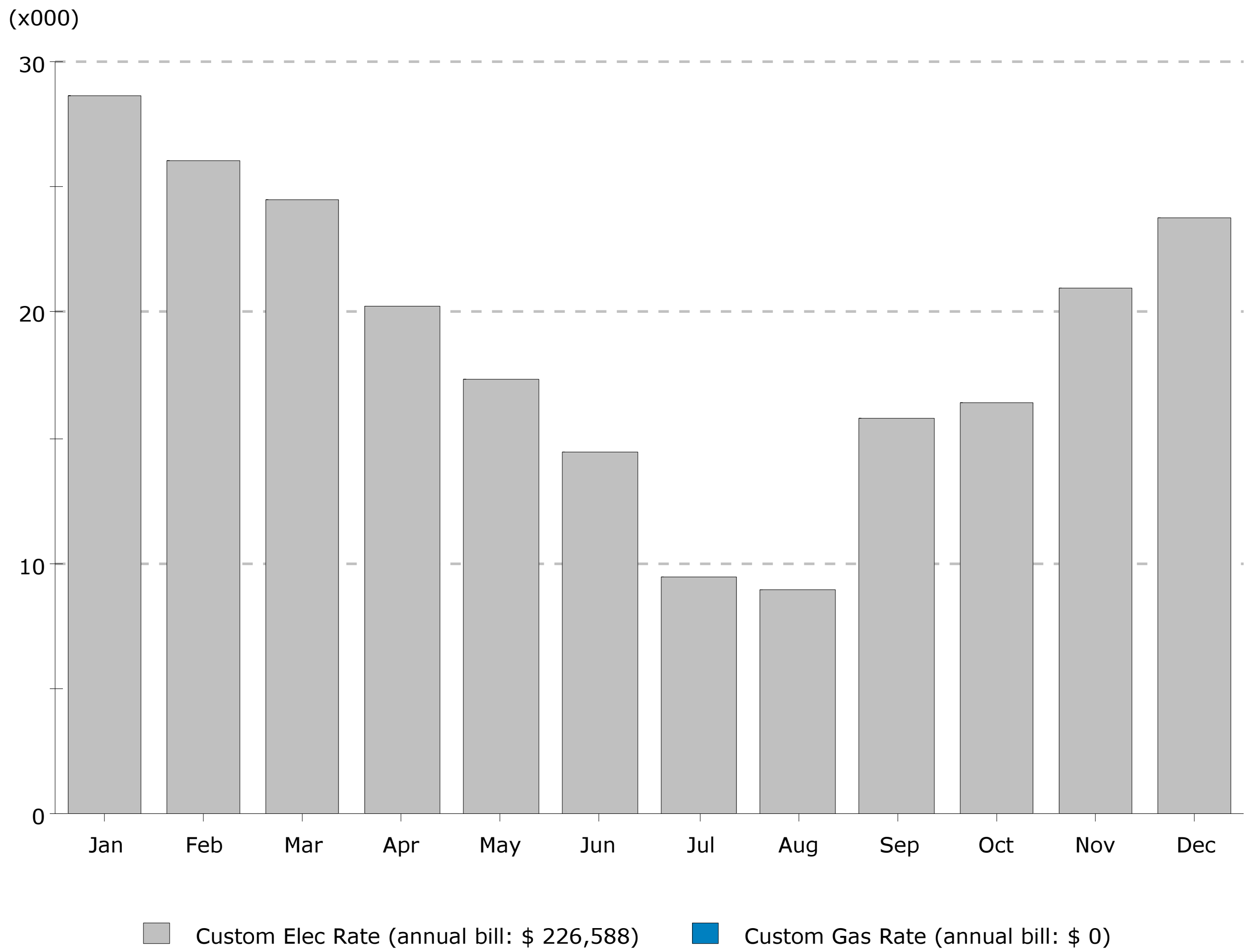
Annual Energy Consumption by Enduse

	Electricity kWh (x000)	Natural Gas Btu	Steam Btu	Chilled Water Btu
Space Cool	98.3	-	-	-
Heat Reject.	12.2	-	-	-
Refrigeration	-	-	-	-
Space Heat	484.5	-	-	-
HP Supp.	0.9	-	-	-
Hot Water	117.7	-	-	-
Vent. Fans	185.4	-	-	-
Pumps & Aux.	97.7	-	-	-
Ext. Usage	8.0	-	-	-
Misc. Equip.	249.5	-	-	-
Task Lights	-	-	-	-
Area Lights	181.0	-	-	-
Total	1,435.0	-	-	-



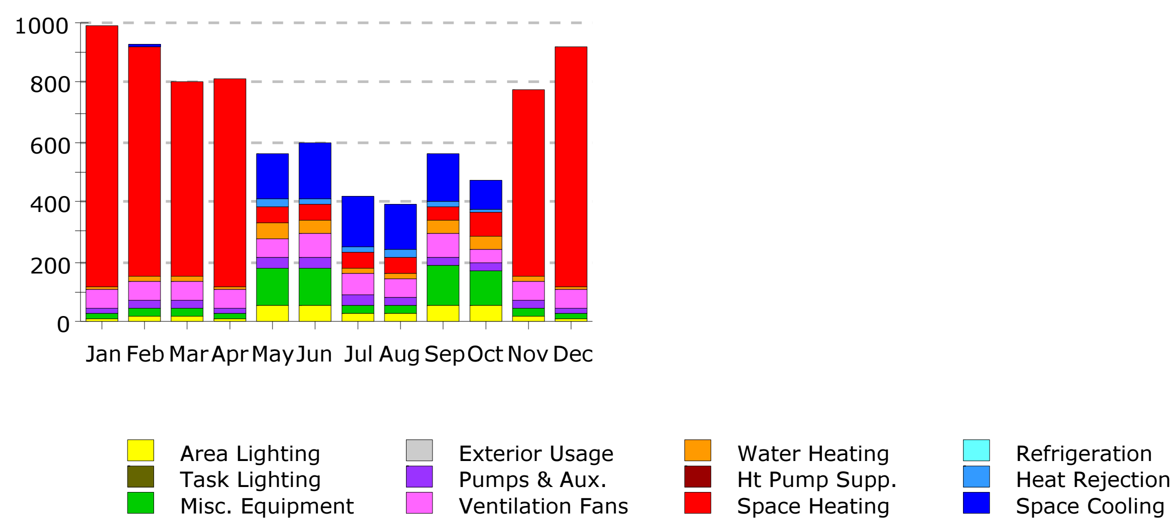
Electricity

Monthly Utility Bills ($)



Total Annual Bill Across All Rates: $ 226,588

Electric Demand (kW)



Electric Demand (kW)

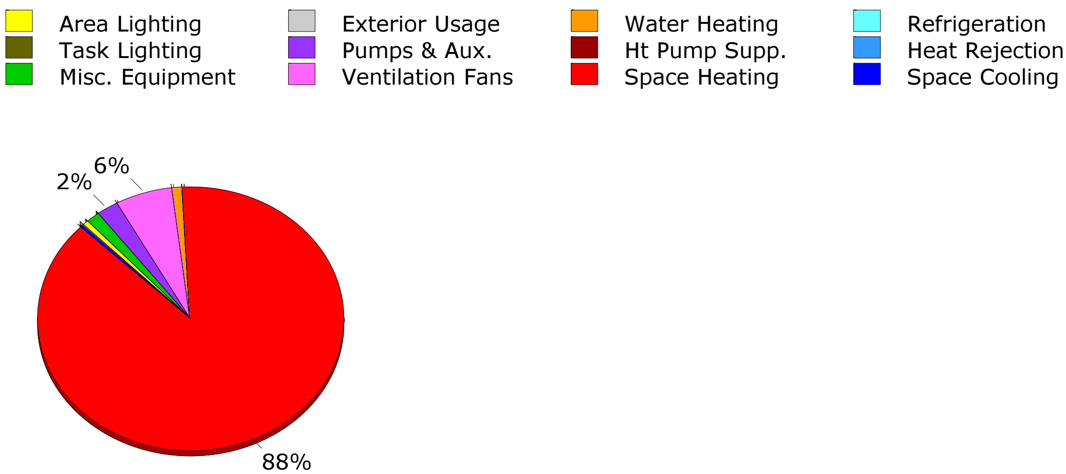
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	2.9	3.0	3.0	3.0	160.1	183.6	166.4	151.8	156.0	93.8	3.1	3.3	930.0
Heat Reject.	-	-	-	-	21.2	25.0	23.3	23.5	20.5	15.7	-	-	129.1
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	872.4	765.6	647.8	697.7	56.5	50.0	48.1	55.1	47.5	79.8	623.0	802.0	4,745.5
HP Supp.	0.3	0.1	-	0.1	-	-	-	-	-	-	-	0.1	0.5
Hot Water	10.3	22.7	22.8	10.5	48.2	44.7	15.0	14.8	39.7	41.2	19.1	9.7	298.6
Vent. Fans	61.4	63.3	63.3	57.4	70.1	82.9	78.6	59.4	79.7	46.2	63.3	61.4	787.0
Pumps & Aux.	23.3	23.8	23.8	23.1	29.8	30.4	29.5	29.4	29.8	24.6	23.5	23.3	314.2
Ext. Usage	-	0.4	0.4	-	-	-	-	-	-	-	1.0	-	1.8
Misc. Equip.	14.6	25.4	25.4	14.6	122.9	122.9	30.0	30.0	129.5	113.8	25.4	14.6	669.1
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.8	20.4	20.4	7.8	57.9	57.9	26.5	25.1	57.9	57.9	20.4	7.8	367.7
Total	993.0	924.6	806.7	814.2	566.6	597.3	417.4	389.3	560.5	473.1	778.8	922.2	8,243.5

Gas Demand (Btu/h)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

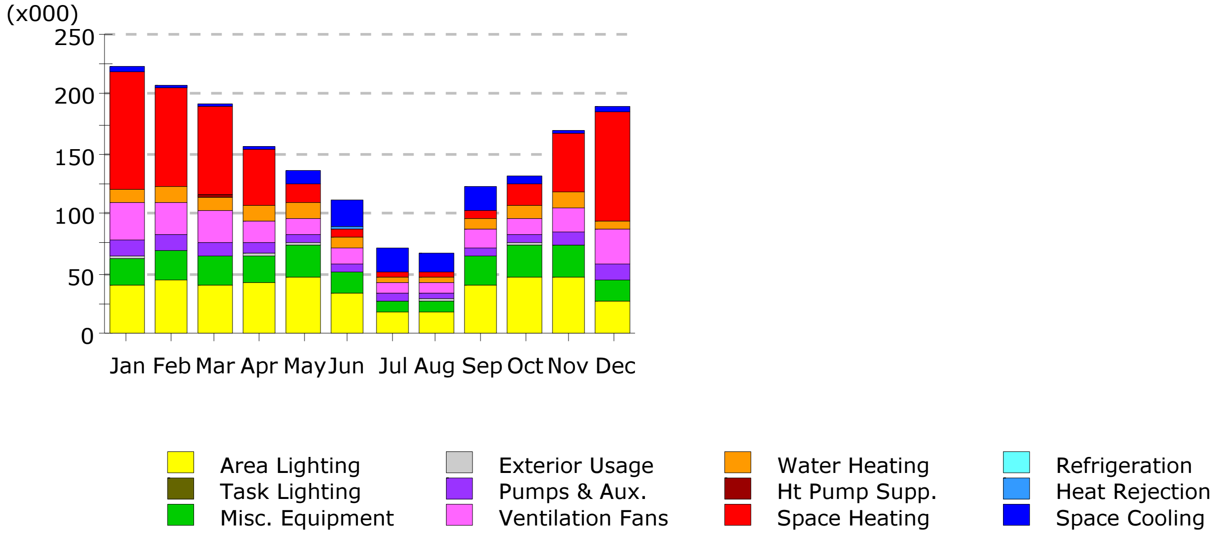
Annual Peak Demand by Enduse

	Electricity kW	Natural Gas Btu/h	Steam Btu/h	Chilled Water Btu/h
Space Cool	2.94	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	872.43	-	-	-
HP Supp.	0.27	-	-	-
Hot Water	10.28	-	-	-
Vent. Fans	61.43	-	-	-
Pumps & Aux.	23.26	-	-	-
Ext. Usage	-	-	-	-
Misc. Equip.	14.62	-	-	-
Task Lights	-	-	-	-
Area Lights	7.80	-	-	-
Total	993.03	-	-	-



Electricity

Electric Consumption (kWh)



Electric Consumption (kWh x000)

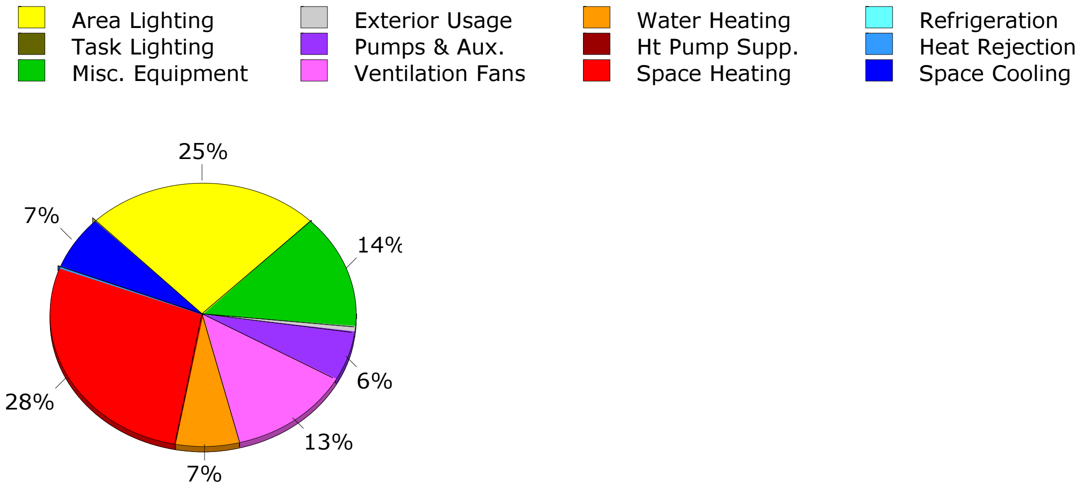
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	4.1	3.4	3.2	2.9	12.4	22.7	19.4	15.5	20.2	6.8	3.9	3.7	118.2
Heat Reject.	0.0	0.0	0.0	0.0	0.3	1.1	0.9	0.6	0.6	0.2	0.0	0.0	3.7
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	97.9	81.7	73.8	47.3	14.9	6.9	5.0	4.6	6.9	17.7	49.3	90.6	496.4
HP Supp.	0.3	0.7	0.3	0.0	-	-	-	-	-	0.0	0.1	0.1	1.5
Hot Water	11.4	13.1	12.5	12.6	12.8	8.1	3.7	3.7	9.2	10.9	11.7	8.1	117.7
Vent. Fans	32.0	26.8	25.7	19.1	14.3	14.2	9.7	9.3	14.0	13.7	21.4	28.3	228.7
Pumps & Aux.	13.8	12.1	11.9	8.9	7.3	6.3	5.2	4.6	7.0	6.7	10.4	12.4	106.6
Ext. Usage	1.1	0.8	0.9	0.9	0.6	0.6	0.6	1.0	1.0	1.0	1.0	1.1	10.7
Misc. Equip.	22.5	24.7	23.3	23.8	26.4	18.0	9.3	9.4	22.8	26.4	26.0	16.7	249.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	40.4	44.6	40.4	41.6	48.0	33.0	17.8	18.4	41.2	48.0	46.8	27.8	447.9
Total	223.5	207.9	192.2	157.0	137.1	111.0	71.6	67.2	122.9	131.3	170.6	188.7	1,780.9

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

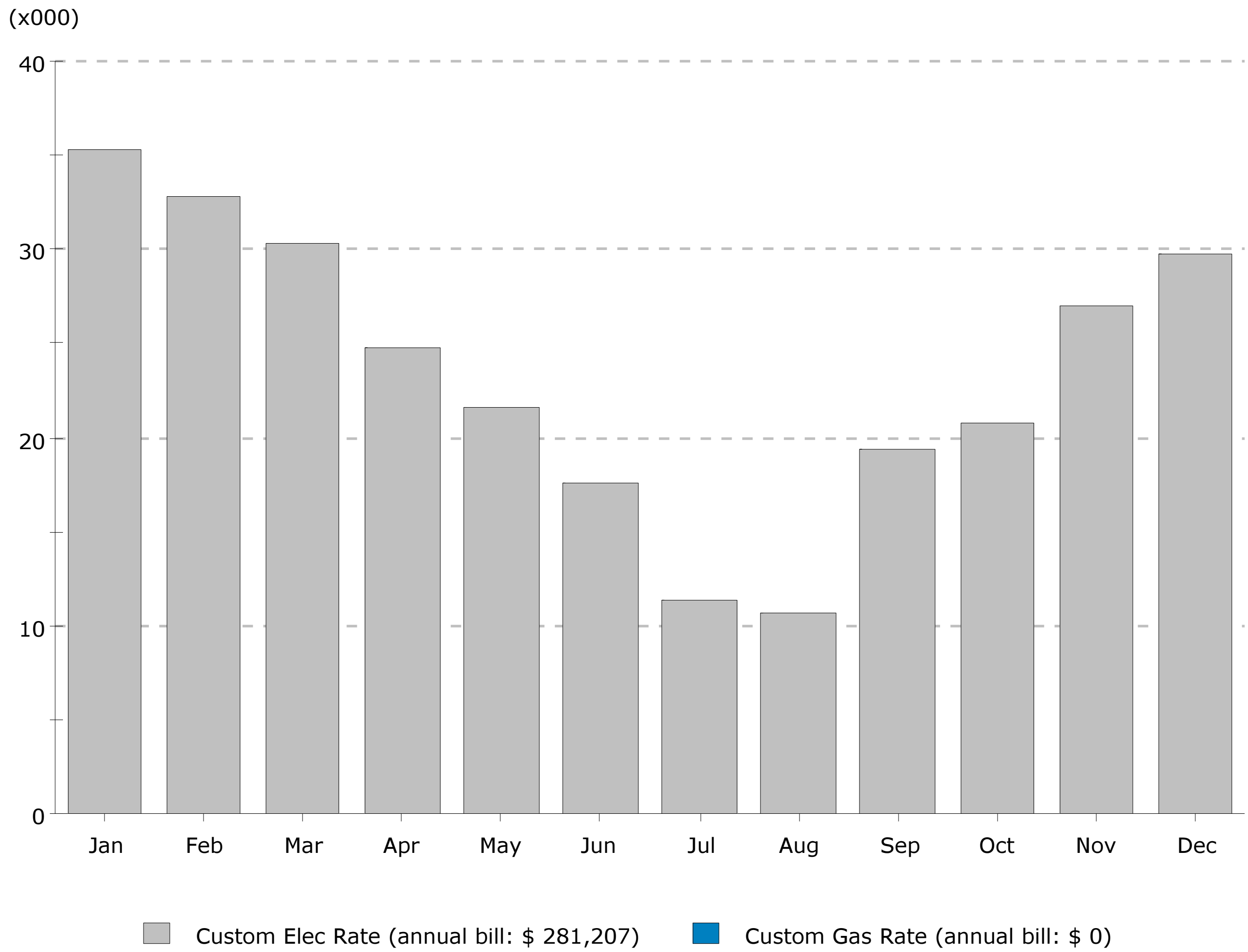
Annual Energy Consumption by Enduse

	Electricity kWh (x000)	Natural Gas Btu	Steam Btu	Chilled Water Btu
Space Cool	118.2	-	-	-
Heat Reject.	3.7	-	-	-
Refrigeration	-	-	-	-
Space Heat	496.4	-	-	-
HP Supp.	1.5	-	-	-
Hot Water	117.7	-	-	-
Vent. Fans	228.7	-	-	-
Pumps & Aux.	106.6	-	-	-
Ext. Usage	10.7	-	-	-
Misc. Equip.	249.5	-	-	-
Task Lights	-	-	-	-
Area Lights	447.9	-	-	-
Total	1,780.9	-	-	-

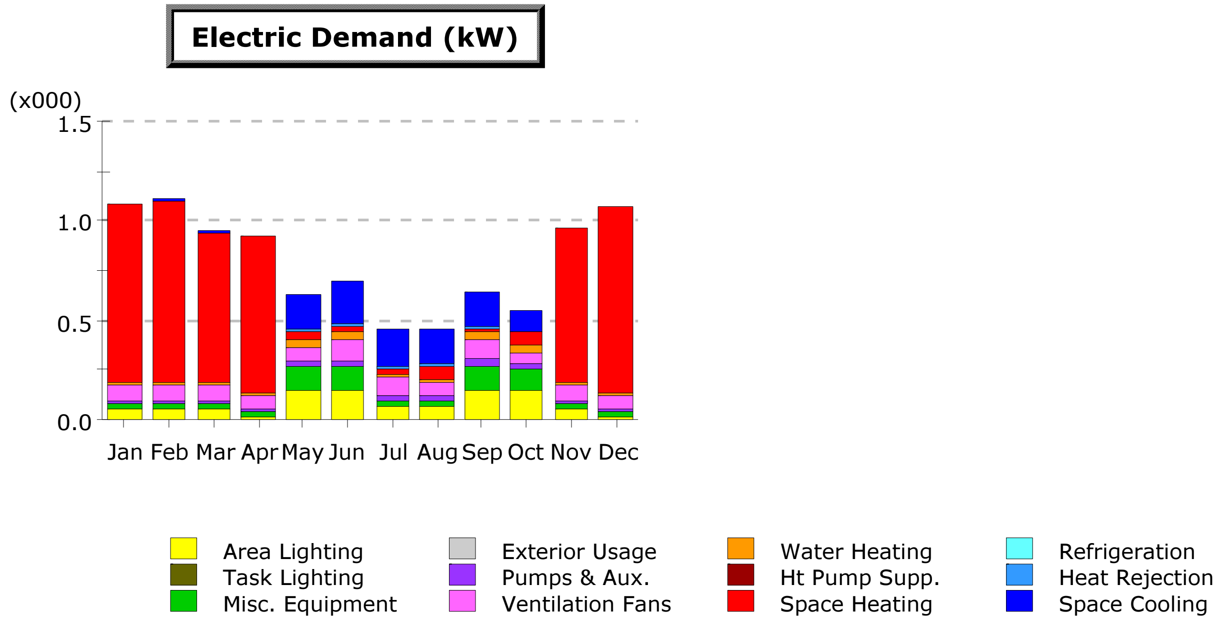


Electricity

Monthly Utility Bills ($)



Total Annual Bill Across All Rates: $ 281,207



Electric Demand (kW x000)

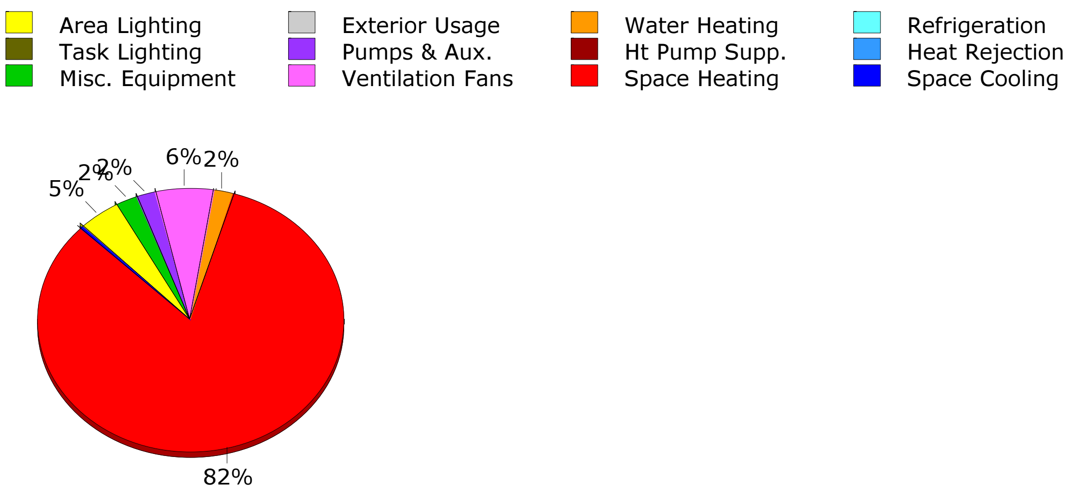
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	0.00	0.00	0.00	0.18	0.21	0.19	0.17	0.18	0.11	0.00	0.00	1.06
Heat Reject.	-	-	-	-	0.01	0.02	0.02	0.01	0.01	0.00	-	-	0.07
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.89	0.91	0.75	0.79	0.04	0.02	0.03	0.06	0.02	0.06	0.78	0.94	5.29
HP Supp.	-	0.00	-	-	-	-	-	-	-	-	-	-	0.00
Hot Water	0.02	0.02	0.02	0.01	0.05	0.04	0.01	0.01	0.04	0.04	0.02	0.01	0.31
Vent. Fans	0.07	0.07	0.07	0.07	0.06	0.10	0.09	0.07	0.09	0.05	0.07	0.07	0.88
Pumps & Aux.	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.32
Ext. Usage	0.00	0.00	0.00	-	-	-	-	-	-	-	0.00	-	0.00
Misc. Equip.	0.03	0.03	0.03	0.01	0.12	0.12	0.03	0.03	0.13	0.11	0.03	0.01	0.68
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.05	0.05	0.05	0.02	0.14	0.14	0.07	0.06	0.14	0.14	0.05	0.02	0.94
Total	1.08	1.10	0.95	0.93	0.63	0.70	0.46	0.45	0.65	0.55	0.97	1.08	9.55

Gas Demand (Btu/h)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Annual Peak Demand by Enduse

	Electricity kW	Natural Gas Btu/h	Steam Btu/h	Chilled Water Btu/h
Space Cool	3.2	-	-	-
Heat Reject.	-	-	-	-
Refrigeration	-	-	-	-
Space Heat	910.5	-	-	-
HP Supp.	0.0	-	-	-
Hot Water	22.7	-	-	-
Vent. Fans	69.8	-	-	-
Pumps & Aux.	22.3	-	-	-
Ext. Usage	0.5	-	-	-
Misc. Equip.	25.4	-	-	-
Task Lights	-	-	-	-
Area Lights	50.4	-	-	-
Total	1,105.0	-	-	-



Electricity

9.8 Photovoltaic Array System Report

Please reference the attached PV report prepared by Garcia, Galuska, & DeSousa.

Photovoltaic Array System Report
for

Michael Driscoll School
64 Westbourne Terrace
Brookline, MA

April 24, 2019

Prepared for:

Jonathan Levi Architects
266 Beacon Street
Boston MA 02116

Prepared by:

Garcia, Galuska & DeSousa, Inc.
370 Faunce Corner Road
Dartmouth, MA 02747
Ph: 508-998-5700
Fax: 508-998-0883

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

The Driscoll School has a potential photovoltaic layout consisting of 3 groups of panels totaling a quantity of 525 panels (365W each) providing approximately 192KW DC power. This would produce an estimated annual production of 220,569 kilowatt hours (kWH) per year or approximately 23% of the yearly building consumption.

This report includes two options for solar procurement, a Direct Ownership and a Power Purchase Agreement (PPA) model. Under Direct Ownership the Town's cost for the PV System is approximately $574,875 or $3/Watt. Over a 20-year period an estimated $774,494 in electrical energy cost savings would be produced. The payback analysis indicates an 8-year simple payback and a 9-year discounted payback which includes Solar Massachusetts Renewable Target (SMART) Program.

In the PPA model the system would be owned by a 3rd party developer, at no cost to the Town. Under such agreement the Town would receive a discounted rate on all energy created. This generally results in a 5-15% discounted kWH utility rate for kWH created by the PV system. For the purpose of this study we have used a 15% fixed rate reduction ($0.1343/kWH), with 220,569kWH annual production equating to an estimated $291,594 savings over a 20 year period.

A direct ownership system is estimated to save approximately $774,494 vs $291,594 savings with a PPA model a difference of $482,900. We recommend the direct ownership option.

II. TECHNICAL

The buildings potential system size and production were estimated using CAD to layout potential panels and PV Watts which is provided by the National Renewable Energy Laboratory (NREL) and a shading study provided by Jonathan Levi Architects. LG 365W panels were used in this model as they have a high efficiency and the smaller size allows more panels to be used in a relative space, refer to Appendix E for panel cutsheet. A set back of 8-10 feet was used as this is best practice utilizing Unirac's recommendations. As this is a flat roof a self-ballasted racking system would be suggested limiting the penetration to the new roof. PV Watts is utilized to estimate kWh, and value per month and year based on system size, location, orientation, system losses and array tilt, this information has been extracted, see tables below. A panel layout can be found in Appendix B and PV Watts Calculations in Appendix D.

	Group 1	Group 2	Group 3	Total	Building Annual kWH usage
Panel QTY	140	169	216	525	N/A
kW	51.1	61.685	78.84	191.625	N/A
kWh/year	58,257	71,088	91,224	220,569	963,460
Energy Value					$152,222
Usage %					23%
CO2 reduction (kg/year)				135,806	

Table 1.1 Energy Breakdown

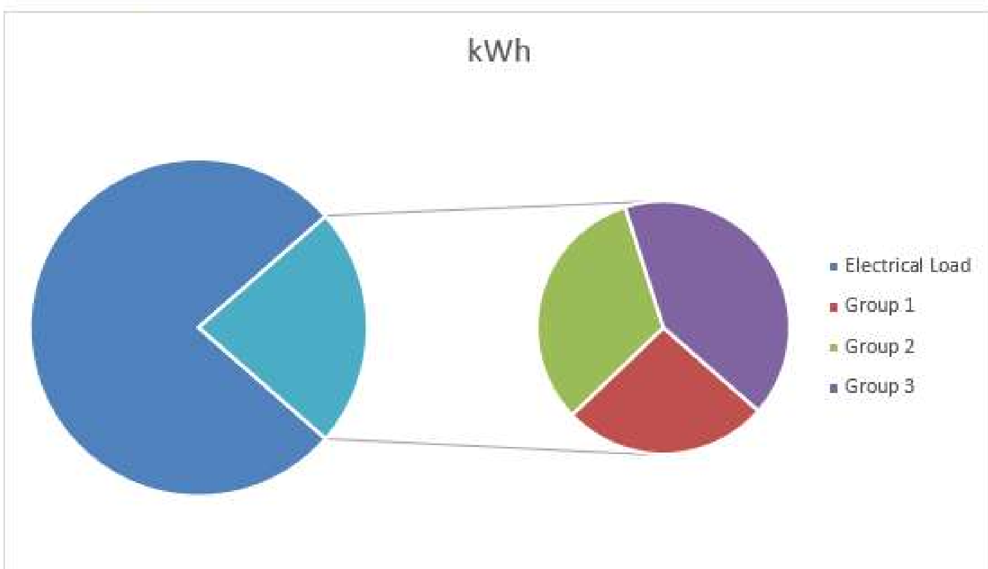
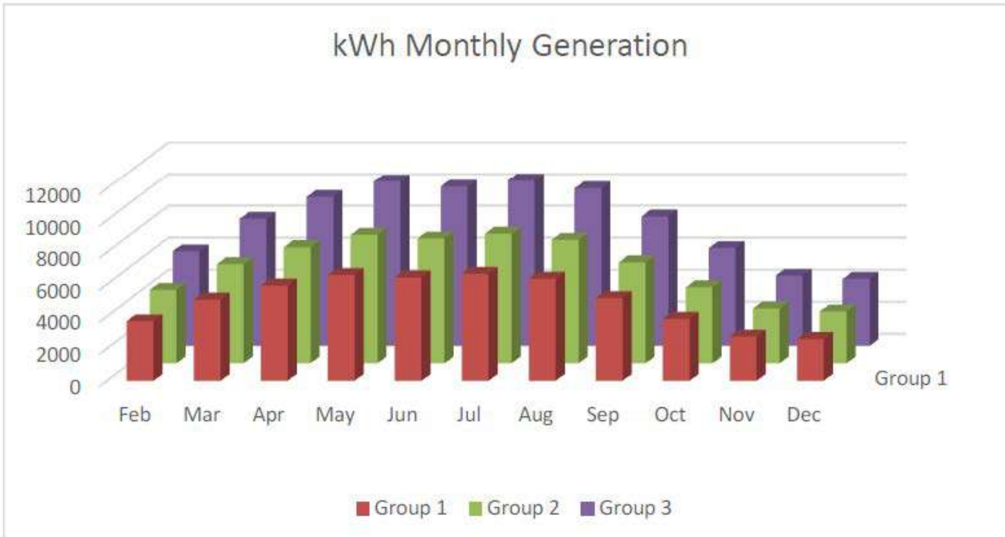


Figure 1.1 Visual Percentage Breakdown



III. ECONOMIC EVALUATION

Under direct ownership the Town would pay for the design and installation of the photovoltaic system at an approximate cost of $3/watt. Under direct ownership the system would be eligible to apply for the SMART program compensation, which replaced the SREC program in Massachusetts for solar incentives. The SMART program utilizes a declining block system, as such the compensation rate decreases as other systems are added. For the purposes of this report Block 1 values are used to show the maximum payback potential. The projected annual incentive rate for the kWh generated is approximately $0.137/kWh that equates to $30,217/year during the 20-year SMART program term amounting to an estimated $604,340. The direct ownership option analysis indicates approximately an 8-year simple payback and a 9-year discounted payback taking into account initial investment, operation, maintenance and repair costs, Energy savings and the SMART incentive program benefits, see Table 1 and Appendix A for full life cycle analysis. Note that the SMART program is a declining block system so payback may be longer depending on the block it falls under. The entire capital cost per watt was derived from recent bid cost for projects in this area.

Table 1

System Size	Investment Cost	Discounted Payback
191.625 KW dc	$574,875	9 years

Under a PPA model a solar developer would design and install the solar array at no cost to the Town. In this method the system would be owned by the developer and the developer would also own all rights to the SMART compensation. We contacted several developers to estimate the discounted rate per kWh, we have used the best-case scenario (15% savings) for the purposes of this study. A discounted kWh rate for energy production would be provided at an estimated 0.134./kWh to the site. This would save approximately $291,594 over a 20-year period. See Appendix C for the life PPA savings analysis.

The approximate savings over a 20-year period for a direct owned system is estimated to be $774,494 vs. a PPA model which has an approximate savings of $291,594.

IV. APPENDIX

Appendix A

NIST BLCC 5.3-17: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - No Photovoltaic System

Alternative: Option 1 - Photvoltaic Array

General Information

File Name:	C:\Users\jeffrey_bagdasarian.GGDMAIL\Desktop\Driscoll School.xml
Date of Study:	Mon Apr 22 17:28:54 EDT 2019
Project Name:	Driscoll School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	Jeff Bagdasarian
Base Date:	September 1, 2021
Service Date:	September 1, 2021
Study Period:	20 years 0 months (September 1, 2021 through August 31, 2041)
Discount Rate:	2.5%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$0	$574,875	-$574,875
Future Costs:			
Energy Consumption Costs	$3,290,984	$2,537,565	$753,419
Energy Demand Charges	$0	$0	$0
Energy Utility Rebates	$0	-$653,261	$653,261
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$0	$57,310	-$57,310
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	------------	------------	------------
Subtotal (for Future Cost Items)	$3,290,984	$1,941,615	$1,349,369
	------------	------------	------------
Total PV Life-Cycle Cost	$3,290,984	$2,516,490	$774,494

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$1,349,369
- Increased Total Investment	$574,875

Net Savings $774,494

Savings-to-Investment Ratio (SIR)

SIR = 2.35

Adjusted Internal Rate of Return

AIRR = 6.97%

Payback Period

Estimated Years to Payback (from beginning of Service Period)

Simple Payback occurs in year 8

Discounted Payback occurs in year 9

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy Type	-----Average Base Case	Annual Alternative	Consumption----- Savings	Life-Cycle Savings
Electricity	963,460.0 kWh	742,891.0 kWh	220,569.0 kWh	4,410,776.1 kWh

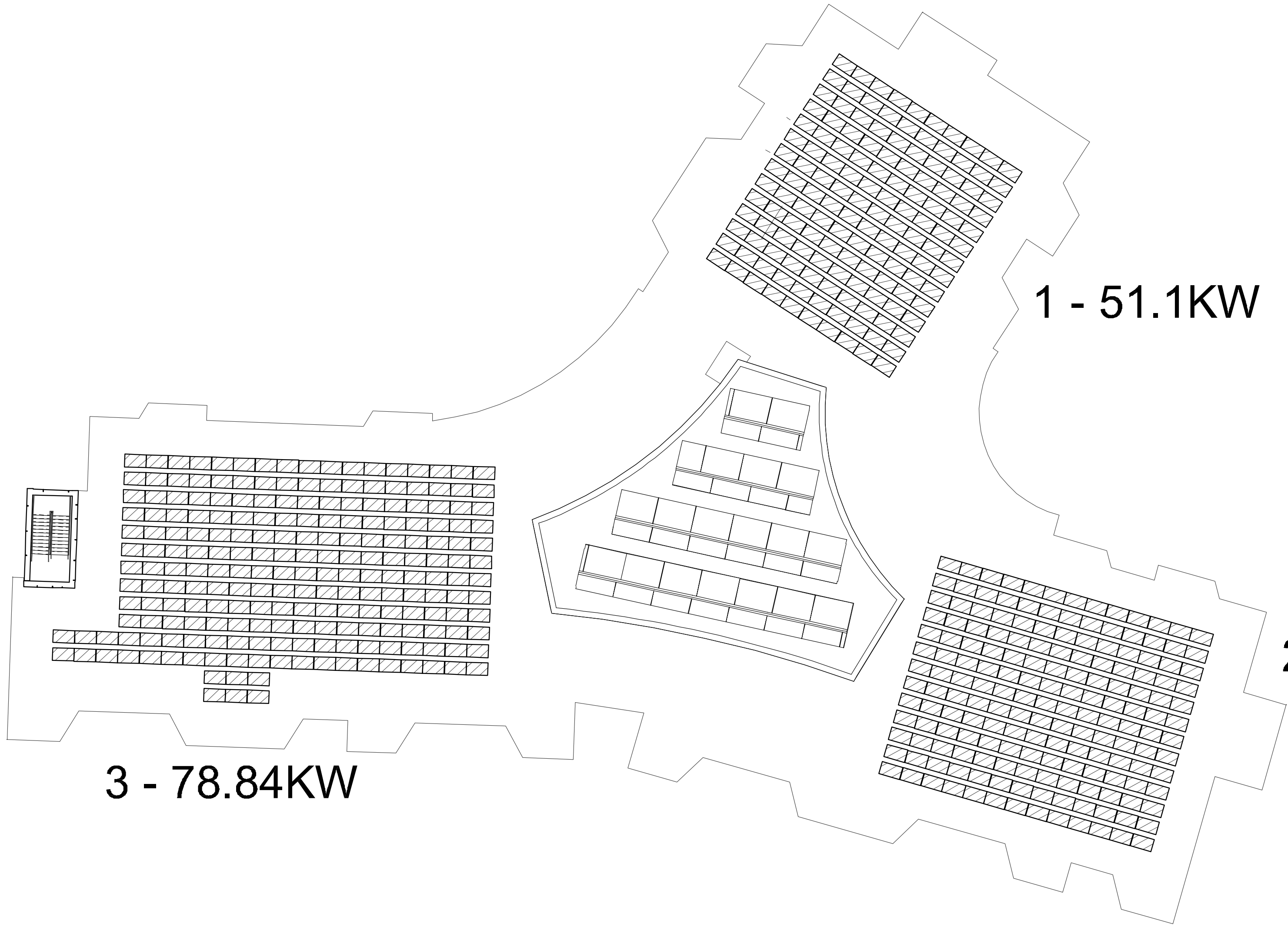
Energy Savings Summary (in MBtu)

Energy Type	-----Average Base Case	Annual Alternative	Consumption----- Savings	Life-Cycle Savings
Electricity	3,287.5 MBtu	2,534.8 MBtu	752.6 MBtu	15,050.2 MBtu

Emissions Reduction Summary

Energy Type	-----Average Base Case	Annual Alternative	Emissions----- Reduction	Life-Cycle Reduction
Electricity				
CO_2	593,291.25 kg	457,466.56 kg	135,824.69 kg	2,716,121.96 kg
SO_2	1,647.74 kg	1,270.52 kg	377.22 kg	7,543.46 kg
NO_x	516.87 kg	398.54 kg	118.33 kg	2,366.26 kg
Total:				
CO_2	593,291.25 kg	457,466.56 kg	135,824.69 kg	2,716,121.96 kg
SO_2	1,647.74 kg	1,270.52 kg	377.22 kg	7,543.46 kg
NO_x	516.87 kg	398.54 kg	118.33 kg	2,366.26 kg

Appendix B



Driscoll School
Potential system size 191.625KW DC
Estimated Cost: $574,875

Appendix C

NIST BLCC 5.3-17: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94

Base Case: Baseline - No Photovoltaic System

Alternative: Option 1 - Photvoltaic PPA

General Information

File Name:	C:\Users\jeffrey_bagdasarian.GGDMAIL\Desktop\Driscoll School PPA.xml
Date of Study:	Mon Apr 22 17:36:07 EDT 2019
Project Name:	Driscoll School
Project Location:	Massachusetts
Analysis Type:	OMB Analysis, Non-Energy Project
Analysis Purpose:	Public Investment or Regulatory Analysis
Analyst:	Jeff Bagdasarian
Base Date:	September 1, 2021
Service Date:	September 1, 2021
Study Period:	20 years 0 months (September 1, 2021 through August 31, 2041)
Discount Rate:	2.5%
Discounting Convention:	End-of-Year

Comparison of Present-Value Costs

PV Life-Cycle Cost

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs:			
Capital Requirements as of Base Date	$0	$0	$0
Future Costs:			
Energy Consumption Costs	$3,290,984	$2,999,391	$291,594
Energy Demand Charges	$0	$0	$0
Energy Utility Rebates	$0	$0	$0
Water Costs	$0	$0	$0
Recurring and Non-Recurring OM&R Costs	$0	$0	$0
Capital Replacements	$0	$0	$0
Residual Value at End of Study Period	$0	$0	$0
	------------	------------	------------
Subtotal (for Future Cost Items)	$3,290,984	$2,999,391	$291,594
	------------	------------	------------
Total PV Life-Cycle Cost	$3,290,984	$2,999,391	$291,594

Net Savings from Alternative Compared with Base Case

PV of Non-Investment Savings	$291,594
- Increased Total Investment	$0

Net Savings $291,594

Savings-to-Investment Ratio (SIR)

SIR = ∞

Adjusted Internal Rate of Return

AIRR = ∞%

Payback Period

Estimated Years to Payback (from beginning of Service Period)

No difference in required initial capital investment between Base Case and Alternative Case. Computation of Payback Period not applicable.

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	963,460.0 kWh	963,460.0 kWh	0.0 kWh	0.0 kWh

Energy Savings Summary (in MBtu)

Energy	-----Average	Annual	Consumption-----	Life-Cycle
Type	Base Case	Alternative	Savings	Savings
Electricity	3,287.5 MBtu	3,287.5 MBtu	0.0 MBtu	0.0 MBtu

Emissions Reduction Summary

Energy	-----Average	Annual	Emissions-----	Life-Cycle
Type	Base Case	Alternative	Reduction	Reduction
Electricity				
CO_2	593,291.25 kg	593,291.25 kg	0.00 kg	0.00 kg
SO_2	1,647.74 kg	1,647.74 kg	-0.00 kg	-0.00 kg
NO_x	516.87 kg	516.87 kg	0.00 kg	0.00 kg
Total:				
CO_2	593,291.25 kg	593,291.25 kg	0.00 kg	0.00 kg
SO_2	1,647.74 kg	1,647.74 kg	0.00 kg	0.00 kg
NO_x	516.87 kg	516.87 kg	0.00 kg	0.00 kg

Appendix D

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at https://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

71,088 kWh/Year*

System output may range from 68,230 to 73,676 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	2.56	3,829	605
February	3.41	4,581	724
March	4.23	6,177	976
April	5.41	7,236	1,143
May	5.91	8,014	1,266
June	6.10	7,793	1,231
July	6.24	8,076	1,276
August	5.88	7,697	1,216
September	4.87	6,300	995
October	3.42	4,741	749
November	2.44	3,411	539
December	2.18	3,233	511
Annual	4.39	71,088	$ 11,231

Location and Station Identification

Requested Location	brookline, MA
Weather Data Source	Lat, Lon: 42.33, -71.14 1.0 mi
Latitude	42.33° N
Longitude	71.14° W

PV System Specifications *(Commercial)*

DC System Size	61.685 kW
Module Type	Standard
Array Type	Fixed (roof mount)
Array Tilt	10°
Array Azimuth	196°
System Losses	18.37%
Inverter Efficiency	98%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.158 $/kWh

Performance Metrics

Capacity Factor	13.2%

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at https://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

91,225 kWh/Year*

System output may range from 87,558 to 94,546 kWh per year near this location.

Month	Solar Radiation (kWh / m² / day)	AC Energy (kWh)	Value ($)
January	2.58	4,954	783
February	3.43	5,899	932
March	4.25	7,920	1,251
April	5.44	9,295	1,469
May	5.93	10,276	1,624
June	6.10	9,957	1,573
July	6.25	10,340	1,634
August	5.89	9,845	1,556
September	4.89	8,082	1,277
October	3.44	6,094	963
November	2.45	4,384	693
December	2.20	4,178	660
Annual	4.40	91,224	$ 14,415

Location and Station Identification

Requested Location	brookline, MA
Weather Data Source	Lat, Lon: 42.33, -71.14 1.0 mi
Latitude	42.33° N
Longitude	71.14° W

PV System Specifications *(Commercial)*

DC System Size	78.84 kW
Module Type	Standard
Array Type	Fixed (roof mount)
Array Tilt	10°
Array Azimuth	182°
System Losses	18.37%
Inverter Efficiency	98%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.158 $/kWh

Performance Metrics

Capacity Factor	13.2%

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at https://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

58,257 kWh/Year*

System output may range from 55,915 to 60,377 kWh per year near this location.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	2.48	3,073	486
February	3.34	3,717	587
March	4.18	5,062	800
April	5.36	5,940	939
May	5.87	6,605	1,044
June	6.09	6,452	1,019
July	6.22	6,669	1,054
August	5.86	6,354	1,004
September	4.82	5,165	816
October	3.36	3,861	610
November	2.38	2,763	436
December	2.11	2,596	410
Annual	4.34	58,257	$ 9,205

Location and Station Identification

Requested Location	brookline, MA
Weather Data Source	Lat, Lon: 42.33, -71.14 1.0 mi
Latitude	42.33° N
Longitude	71.14° W

PV System Specifications *(Commercial)*

DC System Size	51.1 kW
Module Type	Standard
Array Type	Fixed (roof mount)
Array Tilt	10°
Array Azimuth	212°
System Losses	18.37%
Inverter Efficiency	98%
DC to AC Size Ratio	1.2

Economics

Average Retail Electricity Rate	0.158 $/kWh

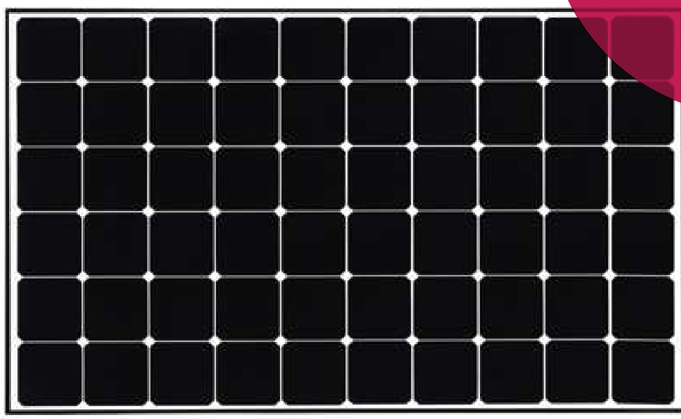
Performance Metrics

Capacity Factor	13.0%

Appendix E

LG
Life's Good

Innovation for a Better Life



LG NeON® R

LG365Q1C-A5

60 cell

LG NeON® R is new powerful product with global top level performance. Applied new cell structure without electrodes on the front, LG NeON® R maximized the utilization of light and enhanced its reliability. LG NeON® R demonstrates LG's efforts to increase customer's values beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.

Enhanced Warranty

LG now offer 25 years product warranty to accommodate performance warranty as well. LG NeON® R has an enhanced performance warranty. After 25 years, LG NeON® R is guaranteed at least 87.0% of initial performance.

Aesthetic Roof

LG NeON® R has been designed with aesthetics in mind: no electrode on the front that makes new product more aesthetic. LG NeON® R can increase the value of a property with its modern design.

Better Performance on a Sunny Day

LG NeON® R now performs better on a sunny days thanks to its improved temperature coefficient.

High Power Output

The LG NeON® R has been designed to significantly enhance its output making it efficient even in limited space.

Outstanding Durability

With its newly reinforced frame design, LG NeON® R can endure a front load up to 6000 Pa, and a rear load up to 5400 Pa.

Near Zero LID (Light Induced Degradation)

The n-type cells used in LG NeON® R have almost no boron, which may cause the initial performance degradation, leading to less LID.

About LG Electronics

LG Electronics is a global player who has been committed to expanding its capacity, based on solar energy business as its future growth engine. We embarked on a solar energy source research program in 1985, supported by LG Group's rich experience in semi-conductor, LCD, chemistry, and materials industry. We successfully released first Mono X® series to the market in 2010, which were exported to 32 countries in the following 2 years, thereafter. In 2013, NeON™ (previously known as Mono X® NeON) & 2015 NeON2 with CELLO technology won "Intersolar Award", which proved LG is the leader of innovation in the industry.

LG NeON® R LG365Q1C-A5

Mechanical Properties

Cells	6 x 10
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	161.7 x 161.7 mm / 6 inches
Dimensions (L x W x H)	1700 x 1016 x 40 mm
	66.93 x 40.0 x 1.57 inch
Front Load	6,000Pa / 125 psf
Rear Load	5,400Pa / 113 psf
Weight	18.5 kg / 40.79 lb
Connector Type	MC4
Junction Box	IP68 with 3 Bypass Diodes
Length of Cables	1000 mm x 2 ea
Glass	High Transmission Tempered Glass
Frame	Anodized Aluminium

Certifications and Warranty

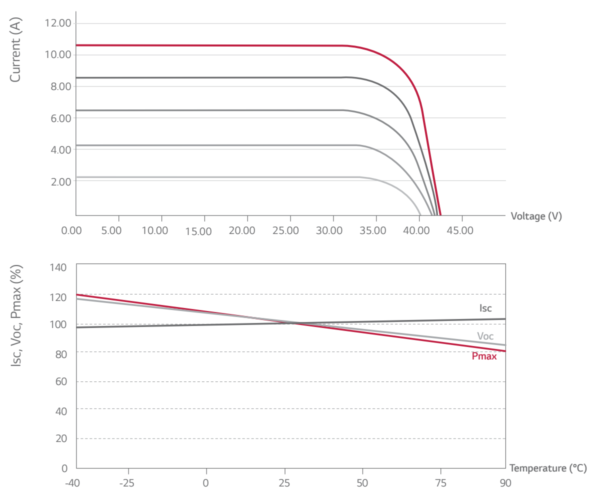
Certifications	IEC 61215, IEC 61730-1/-2
	UL 1703
	IEC 61701 (Salt mist corrosion test)
	IEC 62716 (Ammonia corrosion test)
	ISO 9001
Module Fire Performance (USA)	Type 1
Fire Resistance Class (CANADA)	Class C (ULC / ORD C1703)
Product Warranty	25 years
Output Warranty of Pmax	Linear warranty**

**1) First 5 years : 95%, 2) After 5th year : 0.4% annual degradation, 3) 25 years : 87.0%

Temperature Characteristics

NOCT	44 ± 3 °C
Pmpp	-0.30 %/°C
Voc	-0.24 %/°C
Isc	0.04 %/°C

Characteristic Curves



Electrical Properties (STC *)

Module	**365**
Maximum Power (Pmax)	365
MPP Voltage (Vmpp)	36.7
MPP Current (Impp)	9.95
Open Circuit Voltage (Voc)	42.8
Short Circuit Current (Isc)	10.80
Module Efficiency	21.1
Operating Temperature	-40 ~ +90
Maximum System Voltage	1000
Maximum Series Fuse Rating	20
Power Tolerance (%)	0 ~ +3

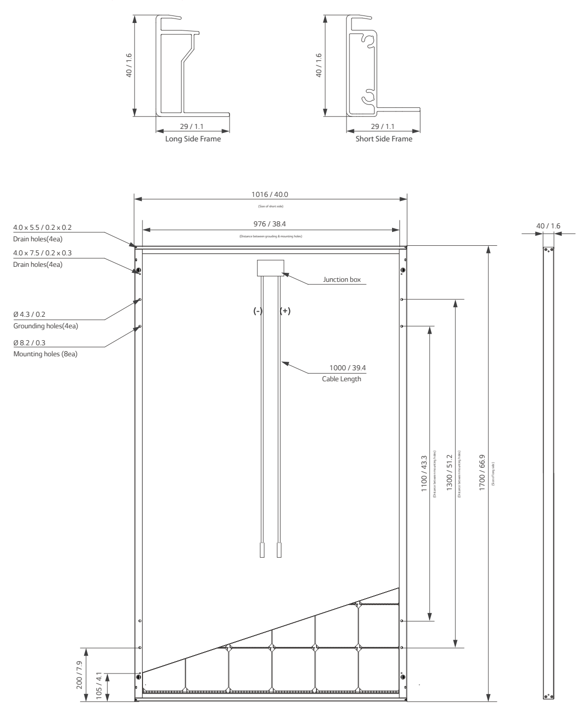
* STC (Standard Test Condition): Irradiance 1,000 W/m², Ambient Temperature 25 °C, AM 1.5
* The nameplate power output is measured and determined by LG Electronics at its sole and absolute discretion.
* The typical change in module efficiency at 200 W/m² in relation to 1000 W/m² is -2.0%.

Electrical Properties (NOCT*)

Module	**365**
Maximum Power (Pmax)	275
MPP Voltage (Vmpp)	36.6
MPP Current (Impp)	7.51
Open Circuit Voltage (Voc)	40.2
Short Circuit Current (Isc)	8.70

* NOCT (Nominal Operating Cell Temperature): Irradiance 800 W/m², ambient temperature 20 °C, wind speed 1 m/s

Dimensions (mm/in)



* The distance between the center of the mounting/grounding holes.

LG Life's Good

North America Solar Business Team
LG Electronics U.S.A. Inc
1000 Sylvan Ave, Englewood Cliffs, NJ 07632

Contact: lg.solar@lge.com
www.lgsolarusa.com

Product specifications are subject to change without notice.
DS-T1-72-W-G-P-EN-60630

10. Sustainable Building Design

The new Driscoll School aims to incorporate the following sustainability features:

1. Site:

- 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:

- "Fossil Free" Systems
- Photovoltaics on Roof
- 3rd Party Verification of Mechanical Systems and Envelope Performance
- High Efficiency Heat and Hot Water Systems
- Excellent Thermal Insulation

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

Driscoll School: LEED Schools v4 Preliminary Project Checklist

L	P	LL	NV	Total		Possible Points:	110
52	19	23	15	Total		Possible Points:	110

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

Likely (L)	Possible (P)	Less Likely (LL)	Not Viable (NV)			Points	Comments
		1		**Integrative Process**	Possible Points:	1	Requires simple energy modeling and water system analyses prior to SD completion
4	2	5	4	**Location and Transportation**	Possible Points:	15	**Comments**
			15	Credit 1	LEED for Neighborhood Development Location	16	Project is not located in an ND location
1				Credit 2	Sensitive Land Protection	1	Site is previously developed
		2		Credit 3	High Priority Site	2	
2			3	Credit 4	Surrounding Density and Diverse Uses	5	Neighborhood will determine viability
	1	3		Credit 5	Access to Quality Transit	4	Dependent on frequency of service in area or number of student walkers
1				Credit 6	Bicycle Facilities	1	Neighborhood, bike lanes on Beacon St appear compliant
			1	Credit 7	Reduced Parking Footprint	1	
	1			Credit 8	Green Vehicles	1	Spaces designated for green vehicles/electric charging stations required
7	2		2	**Sustainable Sites**	Possible Points:	12	**Comments**
Y				Prereq 1	Construction Activity Pollution Prevention	RQD	
Y				Prereq 2	Environmental Site Assessment	RQD	
	1			Credit 1	Site Assessment	1	Existing conditions to be evaluated
			2	Credit 2	Site Development--Protect or Restore Habitat	2	30% restoration unlikely
1				Credit 3	Open Space	1	Courtyards, playground, landscaped areas appear sufficient to earn credit
2	1			Credit 4	Rainwater Management	3	Onsite infiltration appears with large playfields, some structual measures
2				Credit 5	Heat Island Reduction	2	Achievable through Roofing and paving material selection, covered parking
1				Credit 6	Light Pollution Reduction	1	Design can be developed to meet criteria for uplight and light trespass
			1	Credit 7	Site Master Plan	1	
1				Credit 8	Joint Use of Facilities	1	Achievable if spaces are shared with community group after school hours
5	2	1	4	**Water Efficiency**	Possible Points:	12	**Comments**
Y				Prereq 1	Outdoor Water Use Reduction	RQD	
Y				Prereq 2	Indoor Water Use Reduction	RQD	
Y				Prereq 3	Building-Level Water Metering	RQD	
2				Credit 1	Outdoor Water Use Reduction	2	Achievable through native/adaptive plantings
2		1	4	Credit 2	Indoor Water Use Reduction	7	Achievable through fixture selection
	2			Credit 3	Cooling Tower Water Use	2	Design will determine viability
1				Credit 4	Water Metering	1	

Driscoll School: LEED Schools v4 Preliminary Project Checklist

17	9	4	1	Energy and Atmosphere		Possible Points: 31	Comments
Y				Prereq 1	Fundamental Commissioning and Verification	RQD	
Y				Prereq 2	Minimum Energy Performance	RQD	Requires 5% improvement over ASHRAE 90.1-2010
Y				Prereq 3	Building-Level Energy Metering	RQD	
Y				Prereq 4	Fundamental Refrigerant Management	RQD	
3	2		1	Credit 1	Enhanced Commissioning	6	School to determine viability
13	3			Credit 2	Optimize Energy Performance	16	EEMs, fossil fuel reduction evaluated with whole building energy modeling
		1		Credit 3	Advanced Energy Metering	1	Additional hard and soft costs
		2		Credit 4	Demand Response	2	Availability of program will determine viability
1	1	1		Credit 5	Renewable Energy Production	3	PV array shown on roof
	1			Credit 6	Enhanced Refrigerant Management	1	
	2			Credit 7	Green Power and Carbon Offsets	2	School to determine viability

4		5	4	Materials and Resources		Possible Points: 13	Comments
Y				Prereq 1	Storage and Collection of Recyclables	RQD	
Y				Prereq 2	Construction and Demolition Waste Management Planning	RQD	
		3	2	Credit 1	Building Life-Cycle Impact Reduction	5	Requires whole building life cycle analysis
1			1	Credit 2	Building Product Disclosure and Optimization - EPDs	2	Achievable through product selection
1			1	Credit 3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2	Achievable through product selection
1		1		Credit 4	Building Product Disclosure and Optimization - Material Ingredients	2	Achievable through product selection
1		1		Credit 5	Construction and Demolition Waste Management	2	

8	3	5		Indoor Environmental Quality		Possible Points: 16	Comments
Y				Prereq 1	Minimum Indoor Air Quality Performance	RQD	Based on ASHRAE 62.1- 2010
Y				Prereq 2	Environmental Tobacco Smoke Control	RQD	
Y				Prereq 3	Minimum Acoustic Performance	RQD	
1	1			Credit 1	Enhanced Indoor Air Quality Strategies	2	
3				Credit 2	Low-Emitting Materials	3	Achievable through product selection
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 or IAQ testing
		1		Credit 5	Thermal Comfort	1	Individual controllability unlikely
1	1			Credit 6	Interior Lighting	2	Lighting control option is achievable, Lighting Quality to be evaluated
		3		Credit 7	Daylight	3	Floorplate depth, basement spaces may make achievement difficult
1				Credit 8	Quality Views	1	
		1		Credit 9	Acoustic Performance	1	May be achievable through design measures

Driscoll School: LEED Schools v4 Preliminary Project Checklist

							Comments
6				**Innovation**		Possible Points: 6	
1				Credit 1	Green Cleaning Program	1	Based on LEED Existing Building criteria
1				Credit 2	Integrated Pest Management Plan	1	Based on LEED Existing Building criteria
1				Credit 3	Occupant Comfort Survey	1	
1				Credit 4	School as a Teaching Tool / Green Education	1	Integrate sustainable features into curriculum
1				Credit 5	Assessment and Planning for Resiliency	1	Address long-term building performance in changing climate conditions
1				Credit 6	LEED Accredited Professional	1	

							Comments
1	1	2		**Regional Priority**		Possible Points: 4	
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	

52	19	23	15	**Total**	Possible Points: 110

Certified 40 to 49 points **Silver 50 to 59 points** **Gold 60 to 79 points** **Platinum 80 to 110**

VIDARIS

April 10, 2019

Vidaris has prepared a preliminary LEED assessment of the Baldwin and Driscoll School projects, based on documents provided by the team. The attached LEED scorecards shows a path to LEED for Schools v4 certification. The LEED target for the Baldwin and Driscoll School projects is Silver Certification, at minimum. Certification requires achievement of all prerequisites plus a minimum of 50 points for Silver. Vidaris recommends project teams pursue at least 3-5 points above the minimum certification threshold.

Credits have been sorted into Likely, Possible, Less Likely, and Not Viable categories based upon information in the project documents and by Vidaris' experience with similar buildings. Likely credits are considered achievable with the building design as described and with some effort from the design team. Credits is the Possible category may require more detailed calculations (i.e. Daylight requires computer modeling) or other information that is not known at this time. Less Likely and Not Viable credits are considered unlikely due to higher cost (i.e. Advanced Energy Metering) or may be unachievable based on the building design or location (i.e. Demand Response program may not be available from local utility).

It is assumed that the project will pursue LEED certification under the current version (v4). For some credits, the revised v4.1 approach (currently in pilot) may be more achievable, particularly for Low Emitting Materials. Projects that pursue v4 certification may utilize v4.1 requirements on a credit by credit basis.

In addition to LEED for Schools certification, the new Schools will pursue a Fossil Fuel Free approach to building systems. The design intention is a building that does not utilize fossil fuels, with the exception of emergency backup. Priority will be given to achieving at least 13 Optimize Energy Performance credits, requiring a minimum energy cost reduction of 32% against the baseline. Energy Performance is a comparison of the design against baseline building performance in accordance with ASHRAE 90.1-2010.

Sustainability measures to be investigated and developed include the following:

Locations and Transportation

- Alternative Transportation- bicycle, green vehicles and buses, electric charging stations

Sustainable Sites

- Open Space for pedestrian oriented, recreation, gardens, and landscaped areas
- Onsite infiltration of rainwater

Water Efficiency:

- Most efficient plumbing fixtures
- Possible use of collected/recycled stormwater for irrigation

Energy Efficiency

- Investigate the viability of a Fossil Fuel Free building including:
    - Renewable energy systems (photovoltaics, solar thermal)
    - High efficiency, adaptable envelope, daylighting, and HVAC design

  - Geothermal HVAC systems
  - Integrated occupancy sensors for lighting and HVAC

Materials and Resources:

- Advanced materials transparency data including EPDs, HPDs, Cradle to Cradle
- Construction Waste management
- Collection of Recyclables, waste reduction as part of school operations

Indoor Environmental Quality

- Access to daylight and views, connection to the natural environment (courtyards, gardens, native/adapted landscape plantings)
- Lighting system quality and control, including color index at working surfaces
- Use of low-emitting and low toxicity materials
- Quality Acoustics at classrooms

Innovation Credits

- School as Teaching Tool/Green Education: Real-time monitoring of building energy use, water use, stormwater storage and/or renewable energy production, signage
- Resiliency: Facilities (backup power, water reserves, shelter-in-place) for students and the wider community

10.3 Building Commission Bylaw Requirements

As documentation of compliance with Brookline Article 3.7 Building Commission, please see below for the following::

Feasibility Study – Submitted. Please see 12/10/18 final draft for Driscoll.

Schematic Design Studies – Submitted. Please see 3/26/19 draft Schematic Design Report and 5/22/19 Schematic Design Report for Driscoll.

Cost Estimate – Submitted. Please see Schematic Design Reports Sections 9, 13, and 14 for life-cycle costs, estimated construction costs and estimated total project budget. Cost estimates also included in the Feasibility Study Reports.

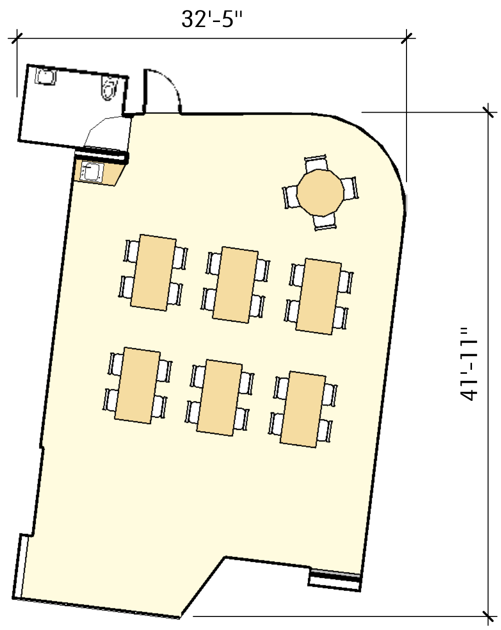
Cost-benefit analysis addressing environmental and sustainability goals – Submitted. Please see Schematic Design Reports Section 9 for cost benefit analysis of mechanical systems, and Section 10 for sustainability goals. Sustainability goals and documents also included in section 2.4.5 of the Baldwin Feasibility Study and section 2.3.3 of the Driscoll Feasibility Study. Sustainability goals include all items listed in paragraph 3.2.7.a.

Reference excerpts from Article 3.7:

> 3.7.2.a
> Environmental and sustainability goals and objectives include design and construction practices that explicitly consider Green technologies, site selection, waste minimization, energy efficiency, water conservation, indoor environmental quality, and other environmental and health factors that may provide financial, environmental, and occupant health and productivity benefits
>
> 3.7.2.b
> The Using Agency shall request that the town meeting appropriate funds for the purpose of compensating a consultant for the preparation of a feasibility study for the project, schematic design studies for the project, a cost estimate for the project (including life-cycle costs), and any special studies which the Commission and the Using Agency jointly recommend. The work of the consultant shall consider the investigation, cost-benefit analysis, and recommendation of appropriate options that address the environmental and sustainability goals and objectives outlined in paragraph (a) above.

11. Room Data Sheets

1.1 CLASSROOM - PRE-KINDERGARTEN



FUNCTIONAL CRITERIA

Description: pre-kindergarten with toilet

Area: 1,200 sf

Quantity: 3

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surfaces

Ceiling: exposed deck / ACT / GWB

Acoustical: partial acoustical

Doors: wood full-lite with sidelite, wood no-lite to bathroom

Windows: required, operable

Mechanical: low volume displacement ventilation

Plumbing/FP: child sized sink, toilet, classroom sink

Lighting: indirect LED cove

Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

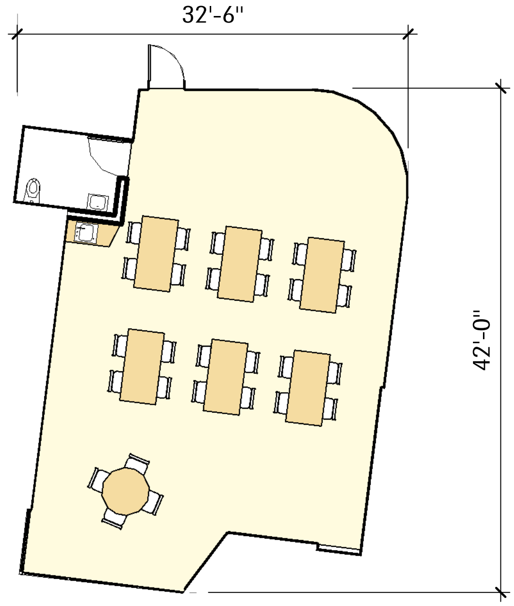
Casework/Specialties: magnetic writable wall surface w/ marker bumper rail system, cantilevered counter, folding screen, panorama wall

Furnishings: 1 teacher desk, 6 moveable student desks with

Equipment: 1 telephone (wall-mounted), sound lift system, 1 wireless access point, 1 LED touch screen monitor

OTHER INFORMATION

1.2 CLASSROOM - KINDERGARTEN



FUNCTIONAL CRITERIA

Description: kindergarten with toilet

Area: 1,200 sf

Quantity: 4

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surfaces

Ceiling: exposed deck / ACT / GWB

Acoustical: partial acoustical

Doors: wood full-lite, wood no-lite to bathroom

Windows: required, operable

Mechanical: low volume displacement ventilation

Plumbing/FP: sink, toilet, classroom sink

Lighting: indirect LED cove

Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

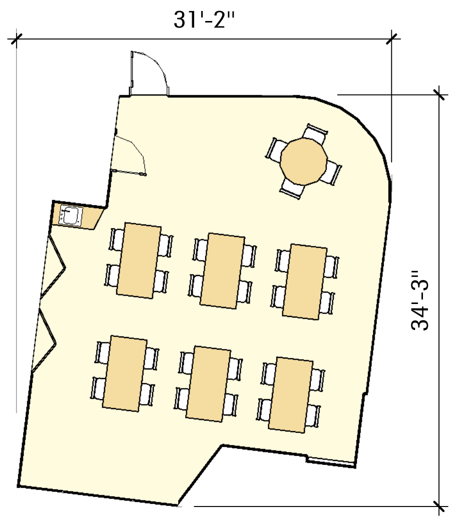
Casework/Specialties: magnetic writable wall surface w/ marker bumper rail system, cantilevered counter, folding screen, panorama wall

Furnishings:

Equipment: 1 telephone (wall-mounted), sound lift system, 1 wireless access point, 1 LED touch screen monitor

OTHER INFORMATION

1.3 CLASSROOM - GENERAL - GRADES 1-5



FUNCTIONAL CRITERIA

Description: general instructional classroom

Area: 840 sf

Quantity: 20

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: ,agnetic / writable sufaces

Ceiling: exposed deck / ACT / GWB

Acoustical: partial acoustical

Doors: wood full-lite and sidelite

Windows: required, operable

Mechanical: low volume displacement ventilation

Plumbing/FP: sinks, fire protection

Lighting: indirect LED cove

Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

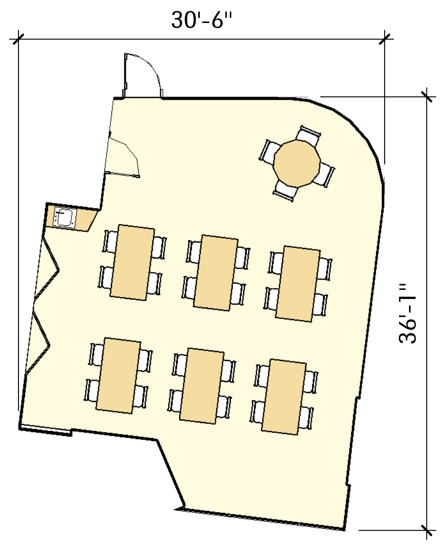
Casework/Specialties: magnetic writable wall surfaces w/ marker bumper rail system, cantilevered counter, folding screen, operable partition, panorama wall

Furnishings:

Equipment: 1 telephone (wall mounted), sound lift system, 1 wireless access point, 1 LED touch screen monitor

OTHER INFORMATION

1.4 CLASSROOM - GENERAL - GRADES 6-8



FUNCTIONAL CRITERIA

Description: general instructional classroom

Area: 840 sf

Quantity: 12

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surfaces

Ceiling: exposed deck / ACT / GWB

Acoustical: partial acoustical

Doors: wood full-lite

Windows: required, operable

Mechanical: low volume displacement ventilation

Plumbing/FP: sinks, fire protection

Lighting: indirect LED cove

Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

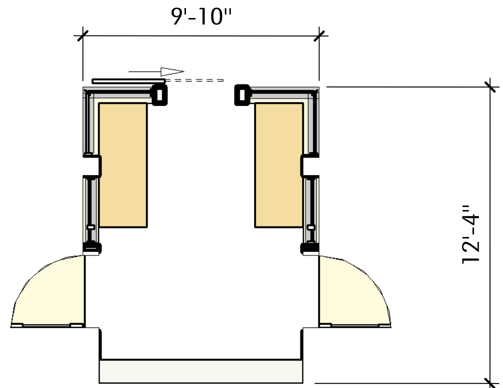
Casework/Specialties: magnetic writable wall surfaces w/ marker bumper rail system, cantilevered counter, folding screen, operable partition, panorama wall

Furnishings: 6 student tables, 1 meeting table, 28 chairs all with wheels

Equipment: 1 telephone (wall mounted), sound lift system, 1 wireless access point, 1 LED touch screen monitor

OTHER INFORMATION

1.5 TEACHER PLANNING GRADES 1-8



FUNCTIONAL CRITERIA

Description: office for teacher; coupled and attached to set of two classrooms

Area: 100 sf (2 shared at 50 sf)

Quantity: 32

Occupant Load: 2 teachers

LOCATIONAL CRITERIA

Users: teachers (shared)

TECHNICAL CRITERIA

Floor: VCT

Walls: glazed-visual access

Ceiling: ACT

Acoustical: .

Doors: wood full-lite, sliding @ corridor

Windows: .

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED cove

Electrical: general outlets on (3) walls, (1) d-duplex at workstation

Communication: telephone, data

FIXTURES/ FURNISHINGS

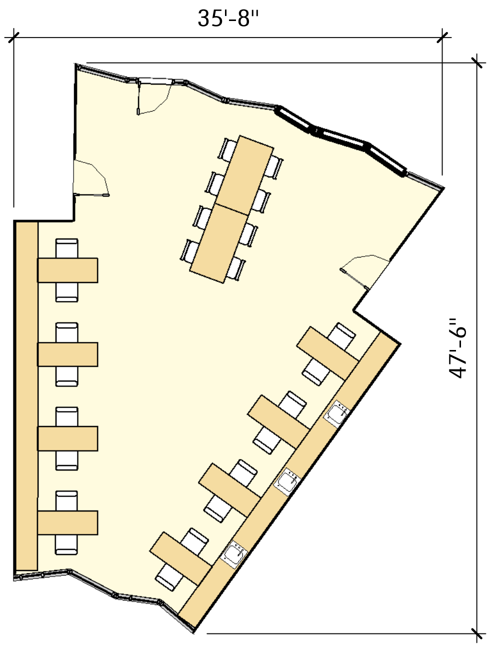
Casework/Specialties: work counters, full wall shelving

Furnishings: 2 desk chairs

Equipment: .

OTHER INFORMATION Shared space between Classrooms

1.6 SCIENCE CLASSROOM / LAB



FUNCTIONAL CRITERIA

Description: science instruction classroom

Area: 1200 sf

Quantity: 3

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teacher, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: exposed deck / ACT / GWB

Acoustical: partial acoustical / GWB

Doors: wood w/ full side-lite

Windows: required, operable

Mechanical: low volume displacement ventilation

Plumbing/FP: sink, eye wash w/ floor drain

Lighting: indirect LED cove

Electrical: power to equipment, GFCI at counter

Communication: paging speaker, clock, telephone, data

FIXTURES/ FURNISHINGS

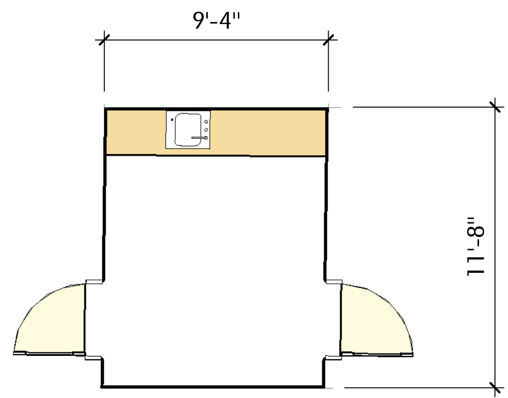
Casework/Specialties: counter w/ backsplash, upper cabinets w/ lock, mobile undercounter storage unit w/ lock

Furnishings:

Equipment: 1 LED touch screen monitor

OTHER INFORMATION

1.7 PREP ROOM



FUNCTIONAL CRITERIA
Description: science instruction

Area: 80 sf
Quantity: 3
Occupant Load: 1 teacher

LOCATIONAL CRITERIA
Users: teacher, students

TECHNICAL CRITERIA
Floor: VCT
Walls:
Ceiling: ACT
Acoustical:
Doors: wood doors with full-lite and sidelite
Windows:
Mechanical: low volume displacement entilation, chem exhaust
Plumbing/FP: sink, eye wash w/ floor drain
Lighting: indirect LED cove
Electrical: power to equipment, GFCI at counter

Communication: paging speaker, clock, telephone, data

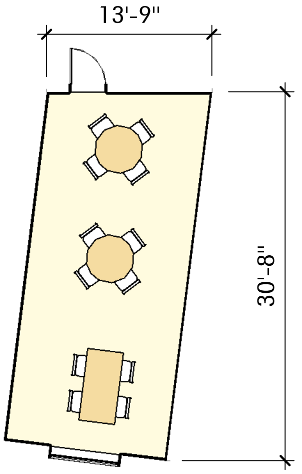
FIXTURES/ FURNISHINGS
Casework/Specialties: counter w/ backsplash, upper cabinets w/ lock, mobile unercounter storage unit w/ lock

Furnishings: 2 chairs

Equipment: chemical storage cabinet, refrigerator

OTHER INFORMATION adjacent prep room areas between science classrooms combined for larger shared prep space

1.8 ELE SMALL CLASSROOM



FUNCTIONAL CRITERIA

Description: general instructional classroom

Area: 450 sf
Quantity: 4
Occupant Load: 1 teacher, 10 students

LOCATIONAL CRITERIA

Users: teacher, students

TECHNICAL CRITERIA

Floor: VCT
Walls: magnetic / writable surfaces
Ceiling: exposed deck / ACT / GWB
Acoustical: partial acoustical
Doors: wood full-lite and sidelite
Windows: required, operable
Mechanical: low volume displacement ventilation
Plumbing/FP: fire protection only
Lighting: indirect LED cove
Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

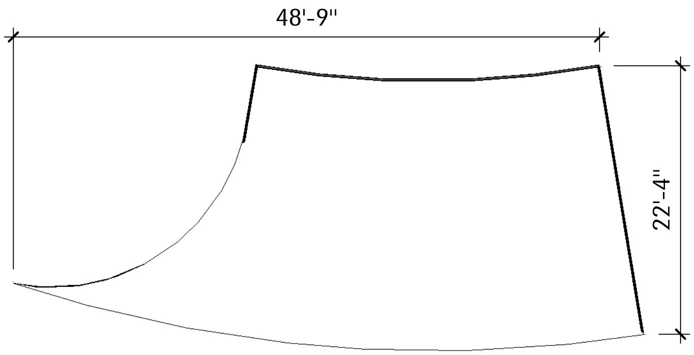
Casework/Specialties: bumper rail

Furnishings: three tables, twelve chairs

Equipment:

OTHER INFORMATION

1.9 PROJECT AREAS



FUNCTIONAL CRITERIA

Description: breakout space, project space

Area: 900

Quantity: 2

Occupant Load:

LOCATIONAL CRITERIA

Users: teacher, students

TECHNICAL CRITERIA

Floor: VCT

Walls: acoustical surfaces

Ceiling:

Acoustical:

Doors:

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED cove

Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

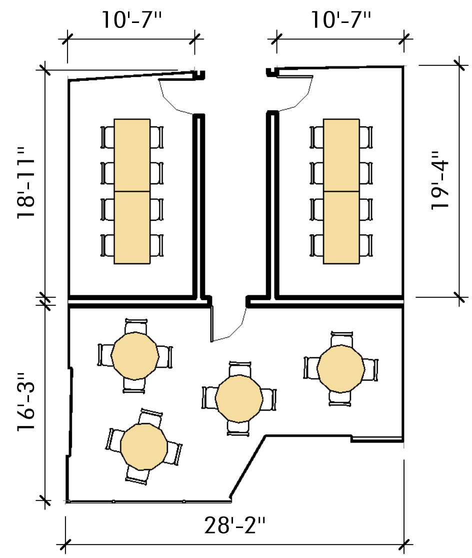
Casework/Specialties: bumper rail

Furnishings:

Equipment:

OTHER INFORMATION

1.10 SMALL GROUP ROOMS



FUNCTIONAL CRITERIA

Description: literacy & math specialists

Area: 250 sf

Quantity: 6

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: writable surfaces

Ceiling: exposed deck / ACT / GWB

Acoustical: partial acoustical

Doors: wood full-lite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED cove

Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

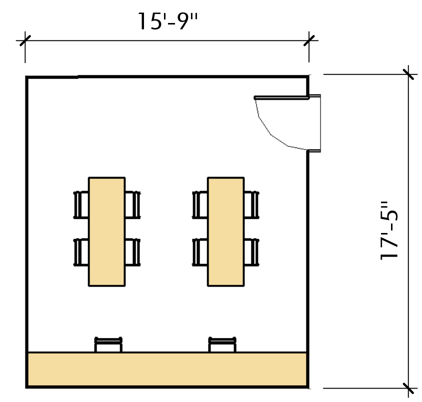
Casework/Specialties:

Furnishings: student tables, chairs

Equipment: 1 telephone (wall-mounted), sound lift system, 1 wireless access point, 1 LED touch screen monitor

OTHER INFORMATION

1.11 ENRICHMENT CHALLENGE SUPPORT



FUNCTIONAL CRITERIA

Description:

Area: 250 sf

Quantity: 1

Occupant Load: 1 teacher 10 students

LOCATIONAL CRITERIA

Users: teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT

Acoustical:

Doors: wood door with full lite and side lite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED cove

Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

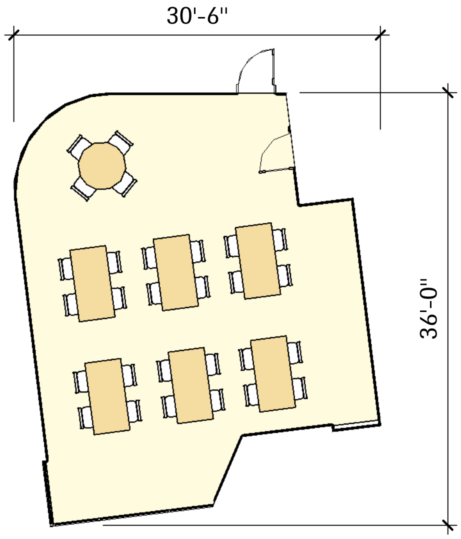
Casework/Specialties: bumper rail,casework countertops

Furnishings: 2 moveable tables, 10 chairs with wheels

Equipment:

OTHER INFORMATION

1.12 WORLD LANGUAGE CLASSROOMS



FUNCTIONAL CRITERIA

Description: general instructional classroom

Area: 840 sf
Quantity: 2
Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT
Walls: magnetic / writable surfaces
Ceiling: exposed deck / ACT / GWB
Acoustical: partial acoustical
Doors: wood full-lite
Windows: required, operable
Mechanical: low volume displacement ventilation
Plumbing/FP: sinks, fire protection
Lighting: indirect LED cove
Electrical: wall receptacles & data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

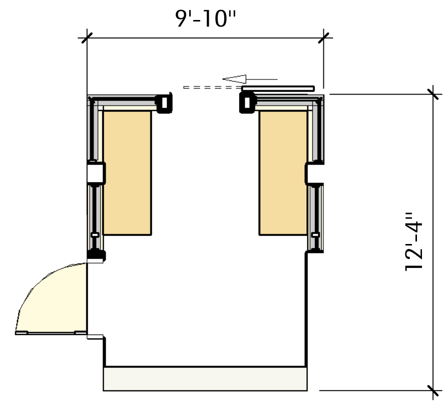
Casework/Specialties: magnetic writable wall surface w/ marker bumper rail system, cantilevered couter, folding screen, panorama wall

Furnishings: 6 student tables, 1 round table, 28 chairs all with wheels

Equipment: 1 telephone (wall-mounted), sould lift system, 1 wireless access point, 1 LED touch screen monitor

OTHER INFORMATION

1.13 WORLD LANGUAGE TEACHER PLANNING



FUNCTIONAL CRITERIA

Description: office for teacher; attached to wold language classroom

Area: 50 sf

Quantity: 2

Occupant Load: 1 teacher

LOCATIONAL CRITERIA

Users: teachers (shared)

TECHNICAL CRITERIA

Floor: VCT

Walls: glazed-visual access

Ceiling: ACT

Acoustical: .

Doors: wood full-lite, sliding at corridor

Windows: .

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED cove

Electrical: general outlets on (3) walls, (1) d-duplex at workstation

Communication: telephone, data

FIXTURES/ FURNISHINGS

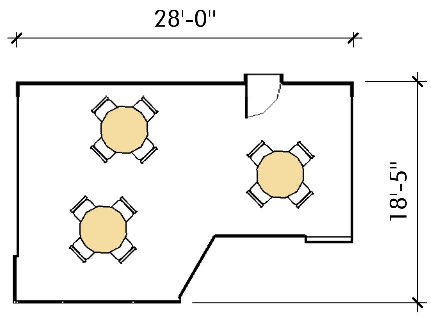
Casework/Specialties: work counter, full wall shelving

Furnishings: mobile under counter storage, 2 desk chairs

Equipment: .

OTHER INFORMATION visual connection to world language classroom and ELE small classroom

2.1 LEARNING CENTER PK-8



FUNCTIONAL CRITERIA

Description:

Area: 450 sf

Quantity: 4

Occupant Load: 1 teacher, 10 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surfaces

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protectioin only

Lighting: indirect LED cove

Electrical: general recpetacles, data outlets

Communication: paging system, wireless data intercom, clock system, wall phone jacks

FIXTURES/ FURNISHINGS

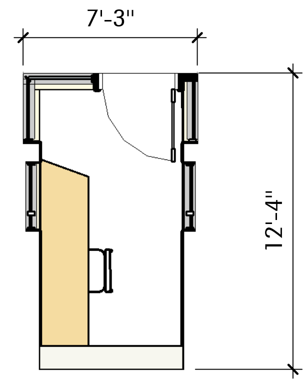
Casework/Specialties: bumper rail

Furnishings: 3 moveable tables, 12 chairs with wheels

Equipment: 1 telephone, sound lift system, wireless access point, 1 LED, touch screen monitor

OTHER INFORMATION

2.2 LEARNING CENTER TEACHER PLANNING



FUNCTIONAL CRITERIA

Description: office for teacher

Area: 50 sf

Quantity: 4

Occupant Load: 1

LOCATIONAL CRITERIA

Users: teacher

TECHNICAL CRITERIA

Floor: VCT

Walls: glazing, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data jacks

FIXTURES/ FURNISHINGS

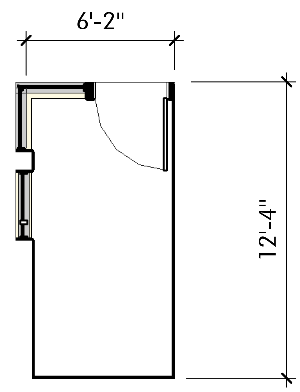
Casework/Specialties: wall hung shelving

Furnishings: 1 teachers desk, 1 desk chair

Equipment:

OTHER INFORMATION

2.3 DE-ESCALATION ROOM



FUNCTIONAL CRITERIA
Description:

Area: 50 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor: VCT
Walls: painted GWB
Ceiling: ACT
Acoustical:
Doors: wood door
Windows:
Mechanical: displacement through floor diffuser
Plumbing/FP: fire protection only
Lighting: indirect LED
Electrical: general recptacles

Communication:

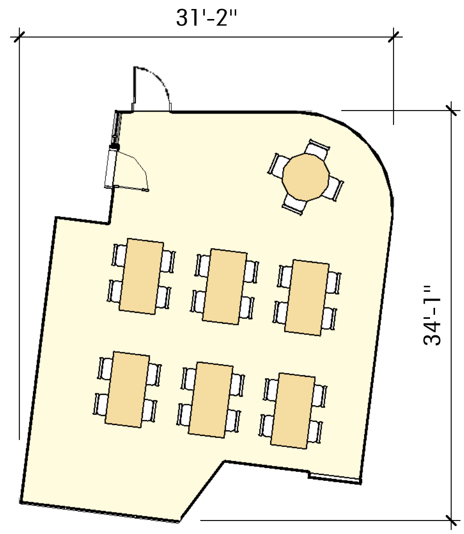
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

2.4 LAHB CLASSROOM



FUNCTIONAL CRITERIA

Description:

Area: 840 sf
Quantity: 3
Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teacahers, students

TECHNICAL CRITERIA

Floor: VCT
Walls: magnetic / writable surface
Ceiling: ACT
Acoustical:
Doors: wood door with full-lte and sidelite
Windows: required
Mechanical: low displacement diffuser ventilation
Plumbing/FP: sinks, fire protection
Lighting: indirect LED cove
Electrical: general receptacles, data outlets

Communication: paging system,wireless data intercom, clocksystem, wall phone jacks

FIXTURES/ FURNISHINGS

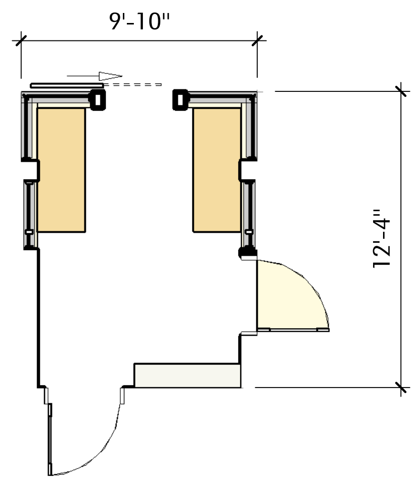
Casework/Specialties: bumper rail

Furnishings: 1 teacher desk, 1 desk chair, 6 moveable student tables, 24 chairs with wheels

Equipment: 1 telephone (wall-mounted) sound lift system, 1 wireless access point, 1 LED touch screen monitor

OTHER INFORMATION

2.5 LAHB TEACHER PLANNING



FUNCTIONAL CRITERIA

Description: LAHB teacher office

Area: 50 sf

Quantity: 3

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite, wood sliding barn door with full-lite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone data

FIXTURES/ FURNISHINGS

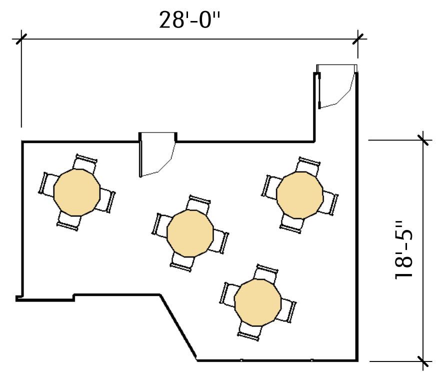
Casework/Specialties: wall hung shelving

Furnishings: 2 teachers desks, 2 desk chairs

Equipment:

OTHER INFORMATION visual access to corridor and academic spaces

2.6 RESOURCE ROOM - LAHB



FUNCTIONAL CRITERIA
Description: LAHB group and individual instruction

Area: 450 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: teachers, students

TECHNICAL CRITERIA
Floor: VCT
Walls: magnetic / writable surfaces
Ceiling: ACT
Acoustical:
Doors: wood door with full-lite and sidelite
Windows: required
Mechanical: low volume displacement ventilation
Plumbing/FP: fire protection only
Lighting: indirect LED cove
Electrical: wall receptacles, teaching station outlets

Communication: paging system, data wireless intercom, clock system, interactive LED screen

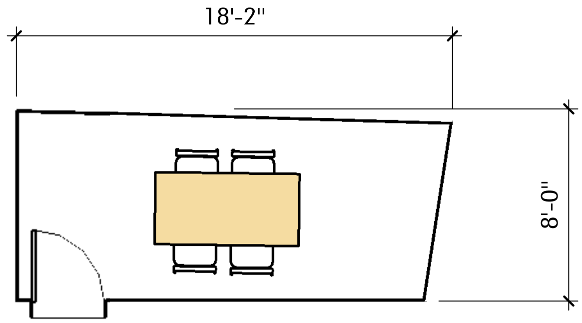
FIXTURES/ FURNISHINGS
Casework/Specialties: bumper rail

Furnishings: 4 movable tables, 16 stacking chairs

Equipment: 1 telephone (wall-mounted), 1 wireless access point

OTHER INFORMATION

2.7 SPEECH



FUNCTIONAL CRITERIA

Description: office for speech therapist

Area: 150 sf
Quantity: 2
Occupant Load: 1 staff

LOCATIONAL CRITERIA

Users: staff

TECHNICAL CRITERIA

Floor: VCT
Walls: magnetic / writable surface, paint GWB
Ceiling: ACT
Acoustical:
Doors: wood door with full-lite and sidelite
Windows:
Mechanical: low volume displacement ventilation
Plumbing/FP: fire protection only
Lighting: indirect LED
Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data

FIXTURES/ FURNISHINGS

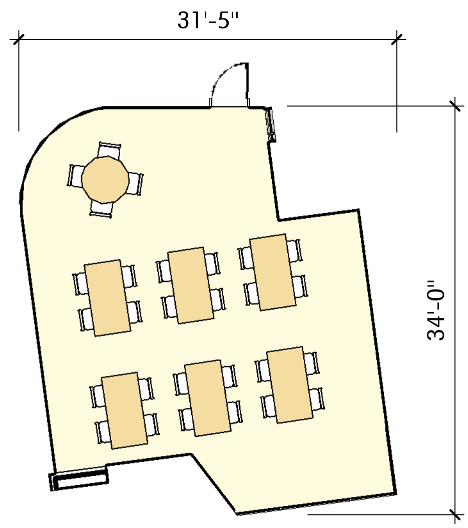
Casework/Specialties: bumper rail, teacher's storage, open shelving

Furnishings: 1 desk, 1 desk chair, 1 side chair, locking cabinets

Equipment:

OTHER INFORMATION

2.8 OT / PT



FUNCTIONAL CRITERIA

Description: occupational and physical therapy room

Area: 950 sf

Quantity: 1

Occupant Load: 2 staff, 21 students

LOCATIONAL CRITERIA

Users: staff, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT / GWB / deck

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: sinks, fire protection

Lighting: indirect LED

Electrical: wall receptacles, data outlets

Communication: paging system, data wireless interco, clock system, interactive LED screen

FIXTURES/ FURNISHINGS

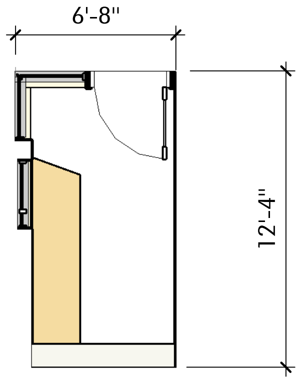
Casework/Specialties: bumper rail

Furnishings:

Equipment:

OTHER INFORMATION

2.9 OT / PT OFFICE



FUNCTIONAL CRITERIA

Description:

Area: 150 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: staff

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: low volue displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data jacks

FIXTURES/ FURNISHINGS

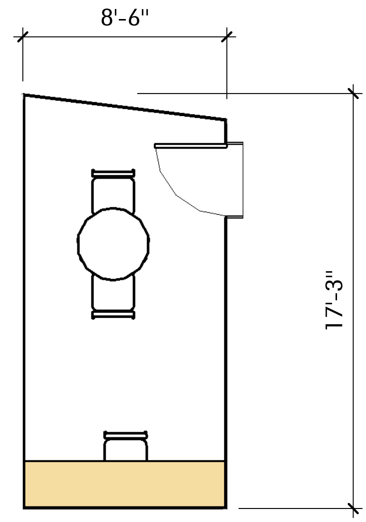
Casework/Specialties: wall mounted shelving

Furnishings: 1 teacher desk, 1 desk chair

Equipment:

OTHER INFORMATION visual access to corridor and acadmeic space

2.10 SPECIAL ED TEAM FACILITATOR



FUNCTIONAL CRITERIA
Description:

Area: 150 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: teachers

TECHNICAL CRITERIA
Floor: VCT
Walls: magnetic / writable surfaces
Ceiling: ACT
Acoustical:
Doors: wood door with full-lite and sidelite
Windows:
Mechanical: displacement through floor diffuser
Plumbing/FP: fire protection only
Lighting: indirect LEd
Electrical: general outlets on 3 walls, duple at workstation

Communication: telephone, data

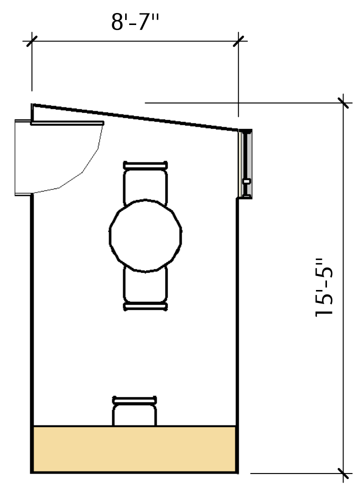
FIXTURES/ FURNISHINGS
Casework/Specialties: countertop

Furnishings: 1 small table, 3 desk chairs

Equipment:

OTHER INFORMATION

2.11 BCBA



FUNCTIONAL CRITERIA

Description:

Area: 150 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data

FIXTURES/ FURNISHINGS

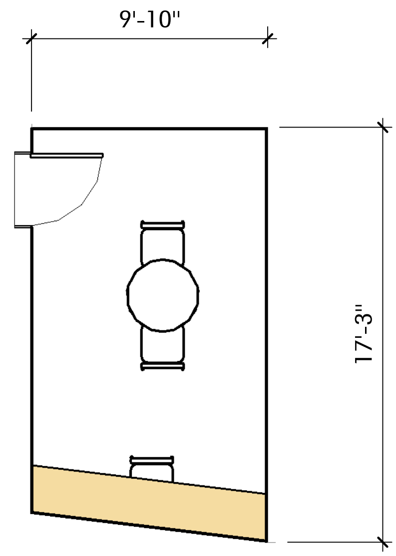
Casework/Specialties: countertop

Furnishings: 2 table, 3 desk chairs

Equipment:

OTHER INFORMATION

2.12 PSYCHOLOGIST



FUNCTIONAL CRITERIA

Description:

Area: 150 sf

Quantity: 2

Occupant Load:

LOCATIONAL CRITERIA

Users: staff

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, duplex at workstation

Communication: telephone, data jack

FIXTURES/ FURNISHINGS

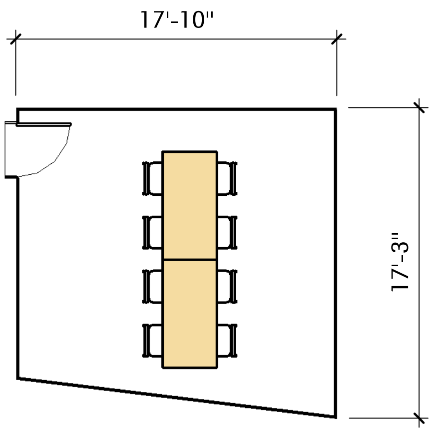
Casework/Specialties: countertop

Furnishings: 1 desk chair

Equipment:

OTHER INFORMATION

2.13 SPECIAL EDUCATION CONFERENCE



FUNCTIONAL CRITERIA

Description:

Area: 250 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: teacher, staff

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles

Communication: telephone, data jacks

FIXTURES/ FURNISHINGS

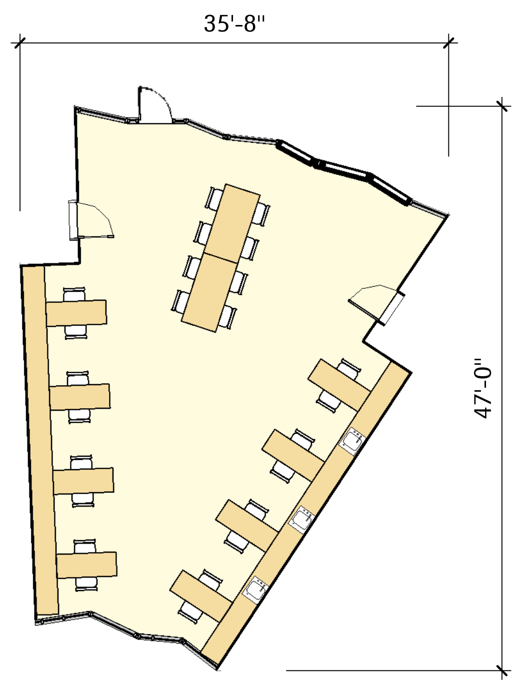
Casework/Specialties: bumper rail

Furnishings: 1 conference table, 8 chairs

Equipment: data wireless intercom, clock system, interactive LED screen

OTHER INFORMATION

3.1 ART CLASSROOM - GRADES K-5



FUNCTIONAL CRITERIA

Description: instructional space for visual arts and crafts

Area: 1000 sf

Quantity: 1

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT / GWB / deck

Acoustical:

Doors: wood door with full-lite and sidelite

Windows: required

Mechanical: low volume displacement ventilation

Plumbing/FP: work sinks, fire protection

Lighting: indirect LED cove

Electrical: wall receptacles, teaching station outlets

Communication: paging system, data wireless intercom, clock system, interactive LED screen

FIXTURES/ FURNISHINGS

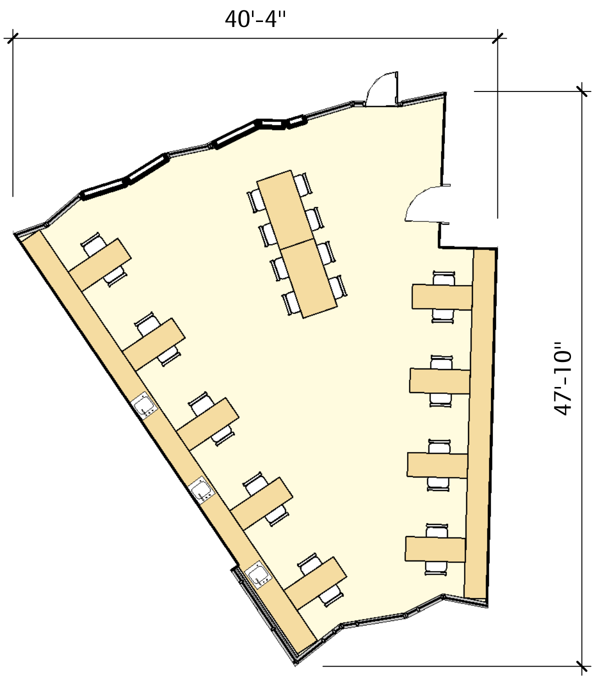
Casework/Specialties: bumper rail, work counter, base cabinets, teacher's storage, open storage

Furnishings: 1 teacher's desk, 1 desk chair, demonstration table, art storage cabinets

Equipment: telephone (wallmounted), LED touch screen display, 1 wireless access point

OTHER INFORMATION ample storage

3.2 ART CLASSROOM - GRADES 6-8



FUNCTIONAL CRITERIA

Description:

Area: 1200 sf

Quantity: 1

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT / GWB / deck

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: work sinks, fire protection

Lighting: indirect LED cove

Electrical: general receptacles, teaching station outlets

Communication: paging system, data wireless intercom, clock system, interactive LED screen

FIXTURES/ FURNISHINGS

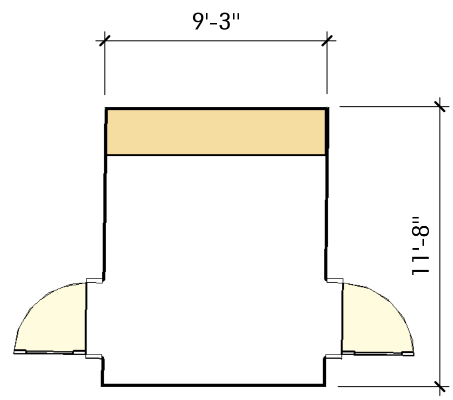
Casework/Specialties: bumper rails, work counter, base cabinets, teacher's storage, open storage

Furnishings: teacher desk, desk chair, demonstration table, art storage cabinets,

Equipment: telephone (wall-mounted) LEd touch screen display, 1 wireless access point

OTHER INFORMATION

3.3 ART WORKROOM W/ STORAGE & KILN



FUNCTIONAL CRITERIA
Description: space for kiln and material equipment storage

Area: 150 sf
Quantity: 2
Occupant Load:

LOCATIONAL CRITERIA
Users: art teachers

TECHNICAL CRITERIA
Floor: VCT
Walls: magnetic / writable surface, painted GWB
Ceiling: ACT
Acoustical:
Doors: wood door with full-lite and sidelite
Windows:
Mechanical: kiln exhaust, baseboard heating
Plumbing/FP: fire protection only
Lighting: ambient and task level
Electrical: power to kiln, general outlets per wall

Communication: paging system

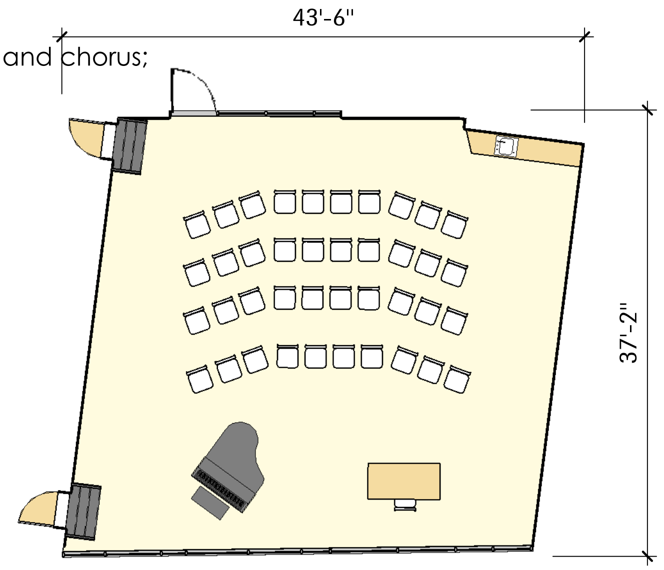
FIXTURES/ FURNISHINGS
Casework/Specialties: work counter and base cabinets, teacher's storage, open shelving

Furnishings: ware shelves, flat art shelving

Equipment: kiln

OTHER INFORMATION

3.4 BAND / CHORUS



FUNCTIONAL CRITERIA

Description: instructional/practice space for band and chorus; storage for music equipment

Area: 1,500 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: music teacher, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic writable surface

Ceiling: ACT

Acoustical: reverberance noise control

Doors: wood doors with full-lite and side lite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: sink with bubbler

Lighting: indirect LED cove

Electrical: wall receptacles, teaching station outlets

Communication: paging system, data wireless intercom, clock system, interactive LED screen

FIXTURES/ FURNISHINGS

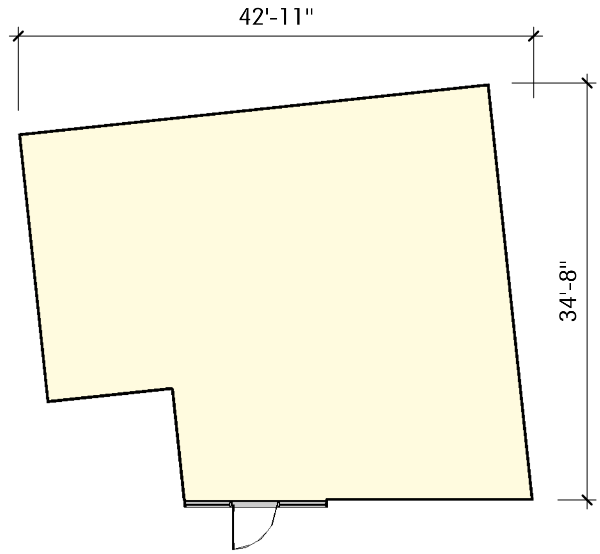
Casework/Specialties: bumper rail, teacher's storage, open shelving, locking cabinets, instrumental storage

Furnishings: chairs, teachers desk, desk chair, music stands

Equipment: LED touch screen display, 1 wireless access point, portable risers, piano music stands

OTHER INFORMATION

3.5 MUSIC CLASSROOM / LARGE GROUP



FUNCTIONAL CRITERIA
Description:

Area: 1,200 sf
Quantity: 2
Occupant Load:

LOCATIONAL CRITERIA
Users: music teachers, students

TECHNICAL CRITERIA
Floor: VCT
Walls: magnetic / writable surface
Ceiling: ACT
Acoustical: reverberance noise control
Doors: wood door with full-lite and sidelite
Windows:
Mechanical: low volume displacement ventilation
Plumbing/FP: sink with bubbler, fire protection
Lighting: indirect LED cove
Electrical: wall receptacles, teaching station outlets

Communication: paging system, data wireless intercom, clock system, interactive LED screen

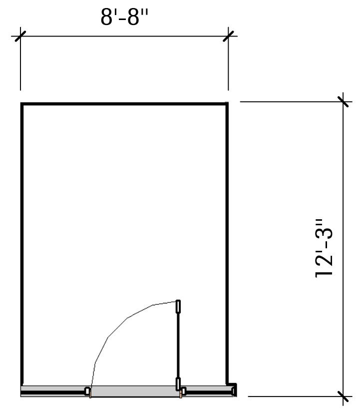
FIXTURES/ FURNISHINGS
Casework/Specialties: bumper rail, teachers storage, open shelving, locking cabinets, instrumental storage

Furnishings: chairs teachers desk, desk chair, music stands

Equipment: LEd touch screen display, 1 wireless access point, piano, music stands

OTHER INFORMATION

3.6 MUSIC PRACTICE / ENSEMBLE - LARGE



FUNCTIONAL CRITERIA

Description: space for small group practice

Area: 100 sf

Quantity: 2

Occupant Load:

LOCATIONAL CRITERIA

Users: music teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: acoustical surfaces

Ceiling: ACT

Acoustical: insulation at walls, reverberant sound control

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets

Communication: telephone, data

FIXTURES/ FURNISHINGS

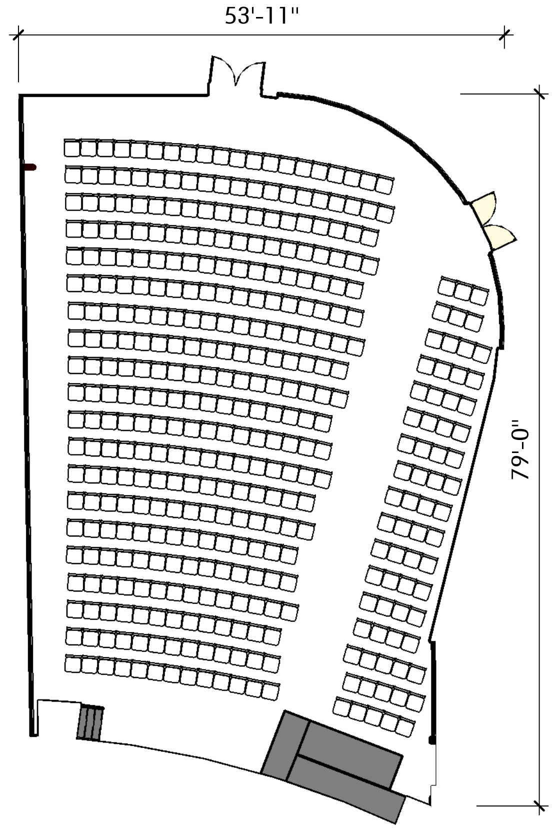
Casework/Specialties:

Furnishings: chairs, music stands

Equipment: piano, keyboard

OTHER INFORMATION

3.7 MULTIPURPOSE ROOM



FUNCTIONAL CRITERIA

Description: general purpose auditorium/multipurpose room

Area: 3,500 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers, students, community

TECHNICAL CRITERIA

Floor: carpet at aisles

Walls: acoustic

Ceiling:

Acoustical:

Doors:

Windows:

Mechanical: low volume displacement

Plumbing/FP:

Lighting: LED indirect, theater

Electrical:

Communication: data wireless intercom, clock system, local sound system, mobile theater lighting

FIXTURES/ FURNISHINGS

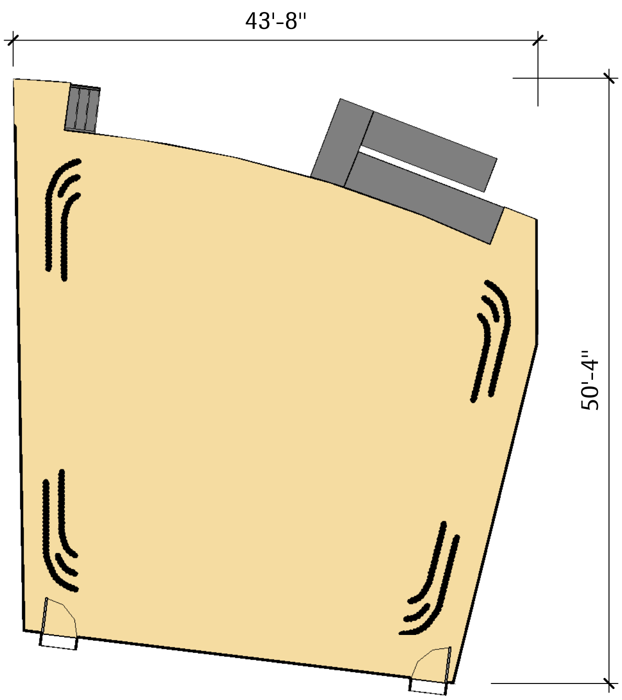
Casework/Specialties:

Furnishings: fixed assembly seating

Equipment: projector, sound system with floor jacks, 2 wireless accesss points, projection screen, stage curtains

OTHER INFORMATION

3.8 STAGE



FUNCTIONAL CRITERIA
Description:

Area: 1,600 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor: wood
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

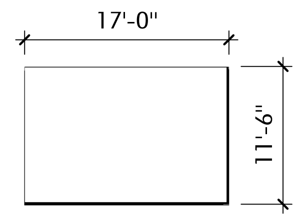
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment: stage curtains

OTHER INFORMATION

3.9 MULTIPURPOSE CHAIR STORAGE



FUNCTIONAL CRITERIA

Description: storage for chairs

Area: 120 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users:

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors

Windows:

Mechanical:

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles

Communication:

FIXTURES/ FURNISHINGS

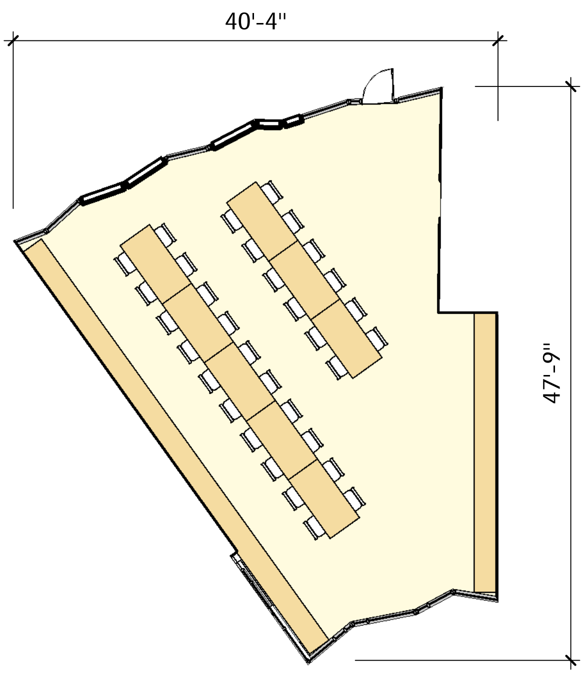
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

4.1 FABRICATION LAB



FUNCTIONAL CRITERIA

Description: digital fabrication

Area: 950 sf

Quantity: 1

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT/GWB/deck

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows: required, equipment exhaust

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: wall receptacles, teaching station outlets, power for equipment

Communication: paging system, data wireless intercom, clock system, interactive LED screen

FIXTURES/ FURNISHINGS

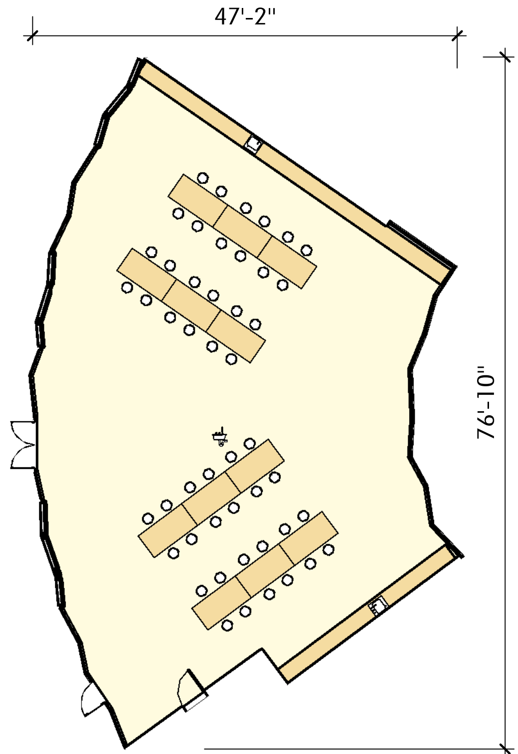
Casework/Specialties: bumper rail, teacher storage, open shelving, work benches

Furnishings: 1 teacher's table, 1 desk chair, 8 moveable tables, 32 chairs with wheels

Equipment: 3d printer, vinyl cutter, laser cutter, milling machine, didgital fabrication, equipment

OTHER INFORMATION

4.2 MAKER SPACE



FUNCTIONAL CRITERIA

Description:

Area: 2,000 sf

Quantity: 1

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: acoustic, magnetic / writable surface

Ceiling: ACT / GWB / deck

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows: required, high volume equipment exhaust

Mechanical: low volume displacement ventilation

Plumbing/FP: 2 sinks with bubbler, fire protection

Lighting: indirect LED cove

Electrical: wall receptacles, teaching station outlets, power for equipment

Communication: paging systme, data wireless intercom, clock system, interactive LED screen

FIXTURES/ FURNISHINGS

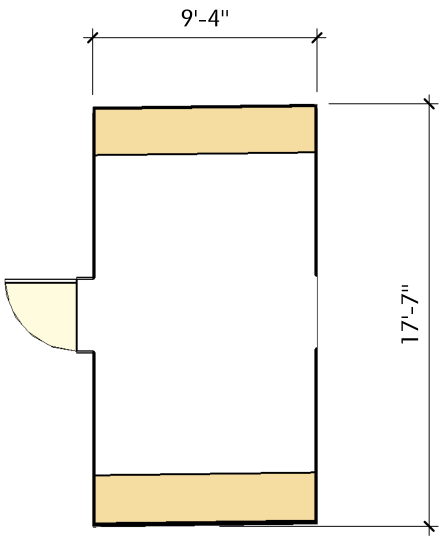
Casework/Specialties: teacher's storage, open shelving, work benches, bumper rail

Furnishings: teacher's desk, 1 desk chair

Equipment: digital and other fabrication equipment

OTHER INFORMATION

4.3 IT



FUNCTIONAL CRITERIA
Description:

Area: 150 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor:
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

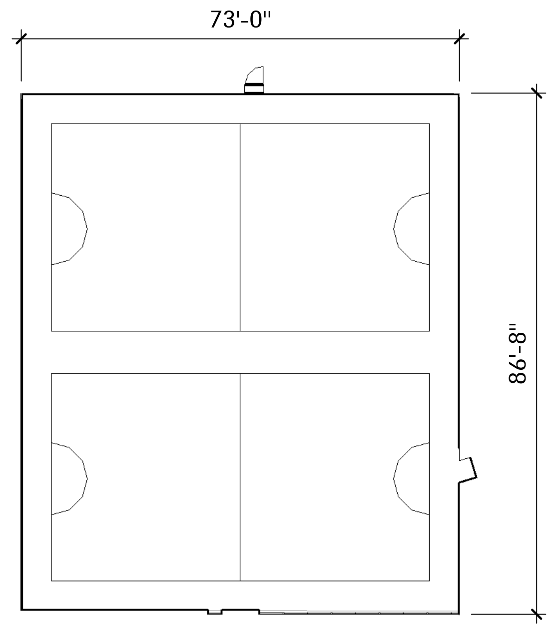
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

5.1 GYMNASIUM



FUNCTIONAL CRITERIA

Description: physical education, sports, activities space, occasional assemblies, community use

Area: 6,000 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: gym teachers, students, community

TECHNICAL CRITERIA

Floor: wood

Walls: acoustic surfaces, mats

Ceiling:

Acoustical:

Doors:

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: drinking fountains, fire protection

Lighting: LED

Electrical:

Communication: paging system, telephone, data wireless interco, clock system, local sound system

FIXTURES/ FURNISHINGS

Casework/Specialties: pull-out bleachers

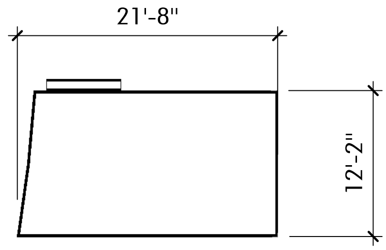
Furnishings:

Equipment: retractable and adjustable height basketball backboards, divider curtains, scoreboard, bleachers

OTHER INFORMATION

5.1

5.2 GYM STOREROOM



FUNCTIONAL CRITERIA
Description: gym storage

Area: 210 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor:
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

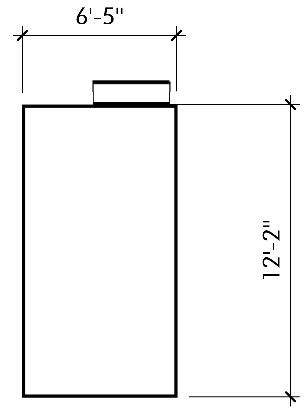
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

5.3 GYM STOREROOM



FUNCTIONAL CRITERIA
Description: gym storage

Area: 80 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor:
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

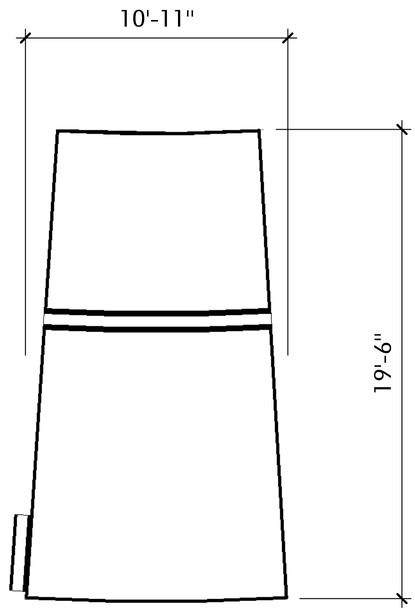
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

5.4 HEALTH INSTRUCTOR'S OFFICE W/ SHOWER & TOILET



FUNCTIONAL CRITERIA

Description: office for gym teachers

Area: 180 sf
Quantity: 1
Occupant Load: 1 teacher

LOCATIONAL CRITERIA

Users: gym teacher

TECHNICAL CRITERIA

Floor: VCT, porcelain tile
Walls: magnetic / writable surface, ceramic wall tile
Ceiling: ACT
Acoustical:
Doors: wood doors
Windows:
Mechanical: venilation only
Plumbing/FP: toilet, shower, sink, fire protection
Lighting: indirect LED
Electrical: general outlets, 1 duplex at workstation

Communication: telephone, data

FIXTURES/ FURNISHINGS

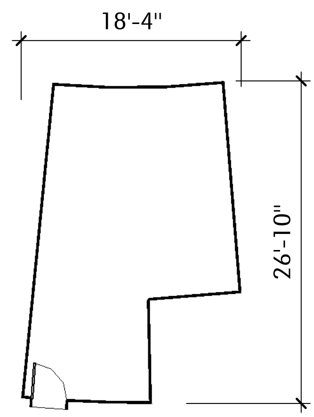
Casework/Specialties: bumper rail,shelving for equipment

Furnishings: lockers, 1 teach desk, 1 desk chair

Equipment: computer telephone

OTHER INFORMATION

5.5 LOCKER ROOMS - BOYS / GIRLS W/ TOILET



FUNCTIONAL CRITERIA

Description: locker rooms for athletic use

Area: 350 sf

Quantity: 2

Occupant Load:

LOCATIONAL CRITERIA

Users: students

TECHNICAL CRITERIA

Floor: porcelain floor tile

Walls: ceramic wall tile

Ceiling: GWB

Acoustical:

Doors: wood doors

Windows:

Mechanical: ventilation only

Plumbing/FP: showers, sinks, toilets, urinals, fire protection

Lighting: indirect LEd

Electrical: GCFI outlets

Communication: paging system, data wireless intercom, clock system

FIXTURES/ FURNISHINGS

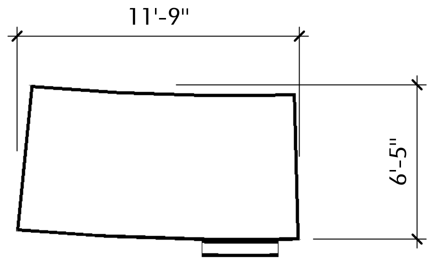
Casework/Specialties: lockers, benches

Furnishings:

Equipment:

OTHER INFORMATION

5.6 LOCKER ROOM - UNISEX



FUNCTIONAL CRITERIA
Description: unisec locker room for athletic use

Area: 100 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: students

TECHNICAL CRITERIA
Floor: porcelain floor tile
Walls: ceramic wall tile
Ceiling: GWB
Acoustical:
Doors: wood door
Windows:
Mechanical: venilation only
Plumbing/FP: shower, toilet, sink
Lighting: indirect LED
Electrical: GCFI outlets

Communication: paging system, data wireless intercom, clock system

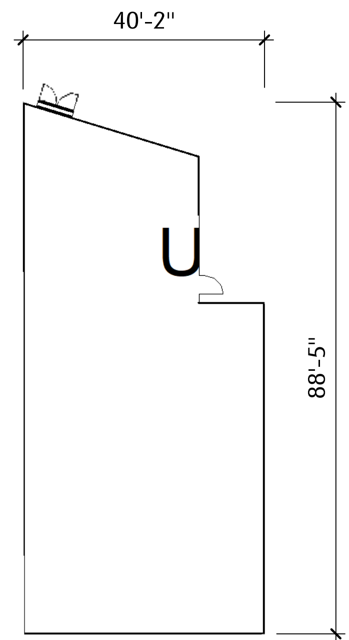
FIXTURES/ FURNISHINGS
Casework/Specialties: lockers, benches

Furnishings:

Equipment:

OTHER INFORMATION

5.7 SMALL GYM



FUNCTIONAL CRITERIA

Description:

Area: 3,000 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users:

TECHNICAL CRITERIA

Floor: wood

Walls: acoustic surfaces, mats

Ceiling:

Acoustical:

Doors:

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: drinking fountains, fire protection

Lighting: LED

Electrical:

Communication: paging systems, telephone, data wireless intercom, clock system, local sound system

FIXTURES/ FURNISHINGS

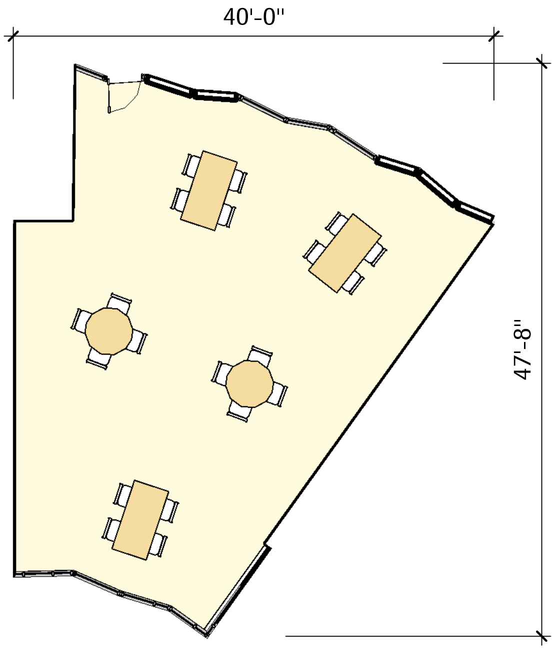
Casework/Specialties:

Furnishings:

Equipment: retractable and adjustable height basketball backboards, scoreboard, bleachers

OTHER INFORMATION

5.8 HEALTH / FITNESS CLASSROOM



FUNCTIONAL CRITERIA

Description: instructional space for health classes

Area: 950 sf

Quantity: 1

Occupant Load: 1 teacher, 21 students

LOCATIONAL CRITERIA

Users: teachers, students

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT / GWB / deck

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: sinks, fire protection

Lighting: indirect LED

Electrical: general outlets, data

Communication: paging system, telephone, data wireless intercom, clock system,

FIXTURES/ FURNISHINGS

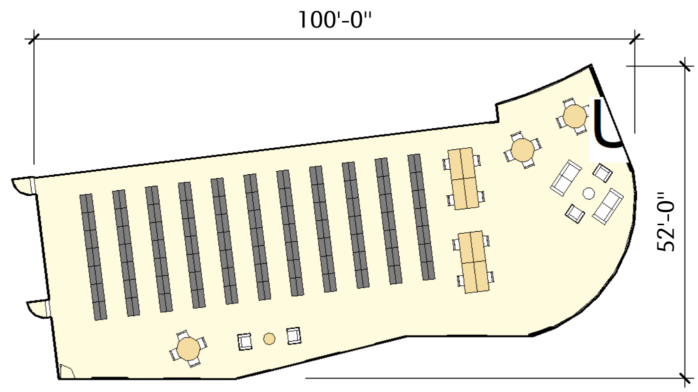
Casework/Specialties: bumper rail

Furnishings: 1 teacher desk, 1 desk chair, 4 movable tables, 24 chairs with wheels

Equipment:

OTHER INFORMATION

6.1 MEDIA CENTER / READING ROOM



FUNCTIONAL CRITERIA
Description: information and media center

Area: 4,000 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: media staff, teachers, students

TECHNICAL CRITERIA
Floor: VCT
Walls: magnetic / writable surface, acoustical surfaces
Ceiling: ACT / GWB / deck
Acoustical: reverberany sound control
Doors: wood doors with full-lite and sidelite
Windows:
Mechanical: displacement
Plumbing/FP: fire protection only
Lighting: LED indirect lighting
Electrical: receptacles for charging portable devices

Communication: wireless mic, amplification system, paging system, clock system

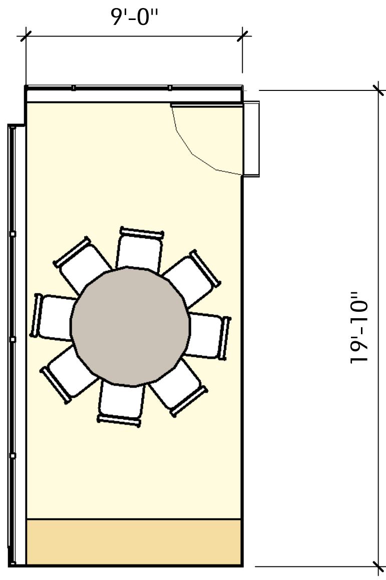
FIXTURES/ FURNISHINGS
Casework/Specialties: built-in bookshelves, teacher's storage, open shelving

Furnishings: reading tables, stacking chairs, computer tables, desk chairs, work tables, moveable bookshelves, soft seating, marker / magnetic system

Equipment: research computer stations, printer station, 1 staff computer, 1 staff printer, copier, LED touch screen display, 1 wireless access point

OTHER INFORMATION accomodates multiple classes at once, supports large and small group learning, quiet and collaborative work, flexible furniture, furniture to comfortable read without being disturbed,

6.2 MEDIA CENTER OFFICE



FUNCTIONAL CRITERIA
Description:

Area: 140 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor:
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

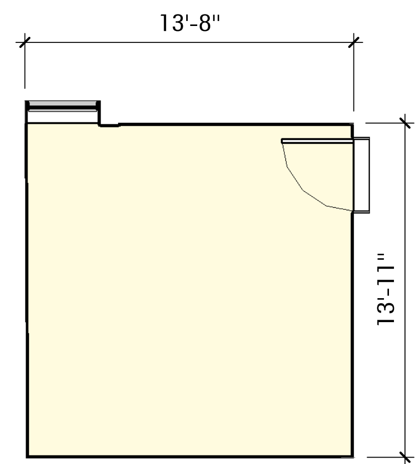
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

6.3 MEDIA BOOK ROOM



FUNCTIONAL CRITERIA
Description:

Area: 170 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor:
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

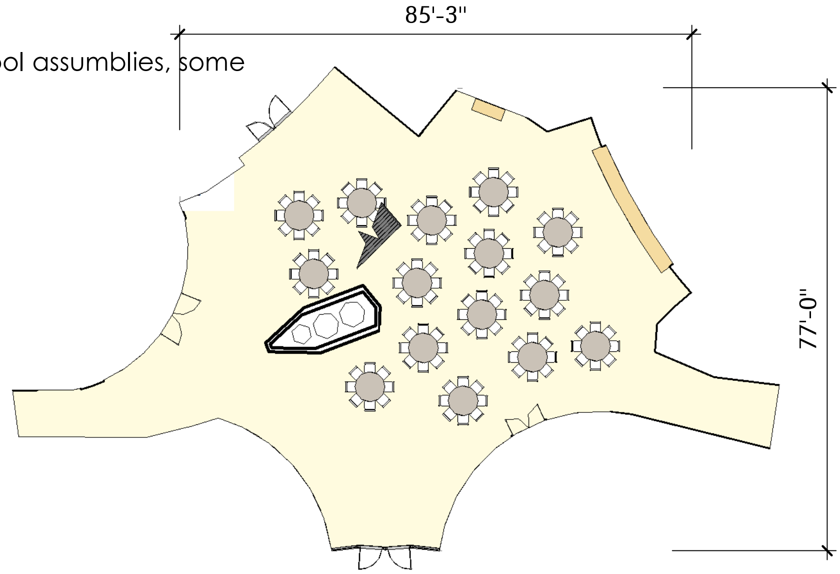
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

7.1 CAFETERIA / DINING (3 SEATINGS) / MULTI-USE



FUNCTIONAL CRITERIA

Description: lunch space, whole school assumblies, some community use

Area: 4,000 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: students, teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling:

Acoustical: reverberant noise control

Doors:

Windows: required

Mechanical: low volume displacement ventilation

Plumbing/FP: drinking fountain, fire protection

Lighting: LED indirect, zoned controls

Electrical:

Communication: paging system, telephone, data wireless intercom, clock system, local sound system

FIXTURES/ FURNISHINGS

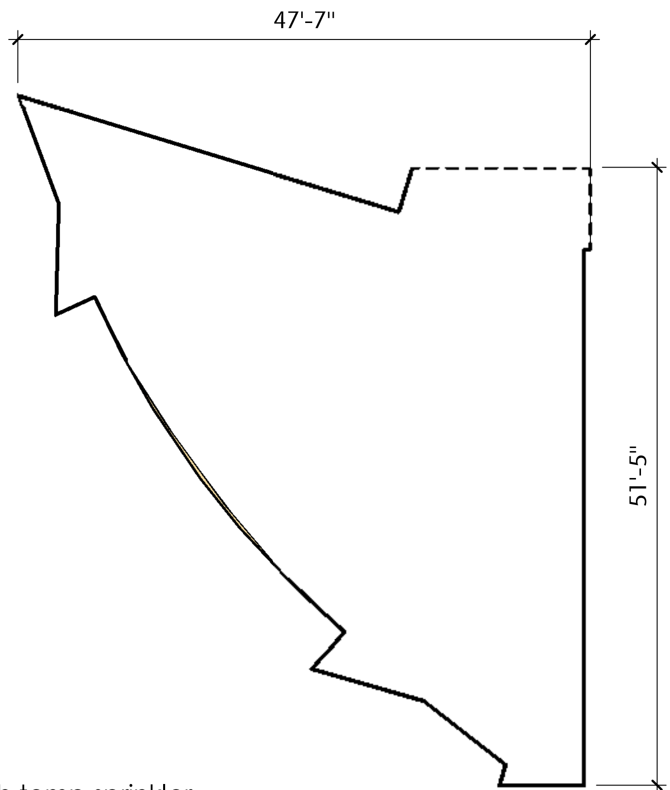
Casework/Specialties: recycling and trash enclosures

Furnishings: 20 flip-top tables, 160 stacking chairs

Equipment: LED touch screen display, wireless access point

OTHER INFORMATION accomodate all students over 3 lunch periods

7.2 KITCHEN



FUNCTIONAL CRITERIA
Description: food preparation area

Area: 1,800 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: kitchen staff

TECHNICAL CRITERIA
Floor: easy to clean
Walls: easy to clean
Ceiling: easy to clean
Acoustical:
Doors:
Windows:
Mechanical: exhaust hoods and makeup
Plumbing/FP: plumbing to floor drains, sinks, high temp sprinkler heads
Lighting: direct flourescent

Electrical:

Communication: paging system, telephone, data interco, clock

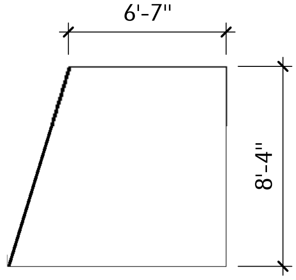
FIXTURES/ FURNISHINGS
Casework/Specialties: serving counter, food storage; dry goods, cold storage

Furnishings:

Equipment: food prep equipment

OTHER INFORMATION

7.3 KITCHEN OFFICE



FUNCTIONAL CRITERIA

Description: office for kitchen staff

Area: 70 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: kitchen staff

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data jacks

FIXTURES/ FURNISHINGS

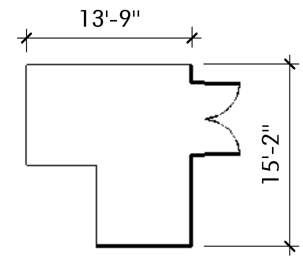
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

7.4 KITCHEN STORAGE



FUNCTIONAL CRITERIA
Description: storage area for kitchen use

Area: 60 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor: easy to clean
Walls: easy to clean
Ceiling: easy to clean
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

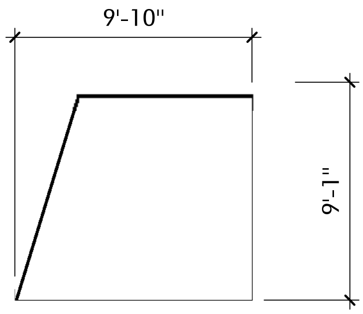
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

7.5 KITCHEN TOILET



FUNCTIONAL CRITERIA
Description: toilet for kitchen staff

Area: 60 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: kitchen staff

TECHNICAL CRITERIA
Floor: porcelain floor tile
Walls: ceramic wall tile
Ceiling: GWB
Acoustical:
Doors: wood door
Windows:
Mechanical: ventilation only
Plumbing/FP: sink, toilet
Lighting: indirect LED
Electrical: GCFI receptacles

Communication:

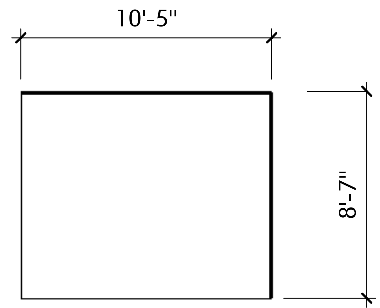
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

7.6 KITCHEN CUSTODIAL



FUNCTIONAL CRITERIA
Description: custodial area for kitchen staff

Area: 30 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: custodial, kitchen staff

TECHNICAL CRITERIA
Floor: easy to clean
Walls: easy to clean
Ceiling: easy to clean
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

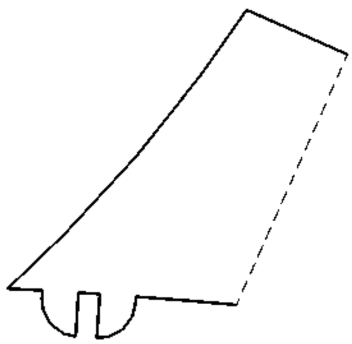
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

7.7 CHAIR / TABLE / EQUIPMENT STORAGE



FUNCTIONAL CRITERIA

Description: general storage for chairs, tables, and equipment

Area: 467 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users:

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles

Communication:

FIXTURES/ FURNISHINGS

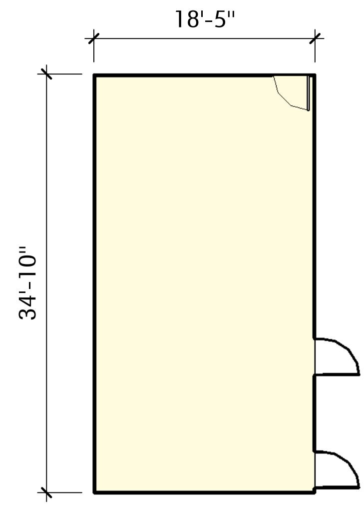
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

8.1 MEDICAL SUITE



FUNCTIONAL CRITERIA

Description: clinical treatment, observation and testing of students; private office for nurses; health record storage

Area: 710

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: students, nurses

TECHNICAL CRITERIA

Floor: hard, easy to clean

Walls: easy to clean

Ceiling:

Acoustical:

Doors:

Windows: required

Mechanical: high air exchange

Plumbing/FP: sinks, toilets, fire protection

Lighting: indirect LED

Electrical: general outlets, on 3 walls, 1 duplex at workstion, CO detection

Communication: telephone, data

FIXTURES/ FURNISHINGS

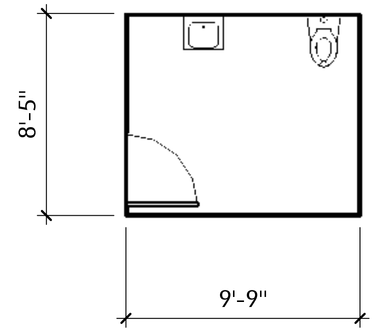
Casework/Specialties: secure closet, wall mounted or freestanding shelving unit, locking cabinets

Furnishings: 2 or 3 cots/beds, nurse's desk and file storage, soft waiting seating, recovery beds, privacy curtains

Equipment: refrigerator, wireless access point

OTHER INFORMATION space for private meetings and confidential consultation

8.2 MEDICAL SUITE TOILET



FUNCTIONAL CRITERIA

Description: restroom for medical suite

Area: 60 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users:

TECHNICAL CRITERIA

Floor: porcelain floor tile

Walls: ceramic wall tile

Ceiling: GWB

Acoustical:

Doors: wood door

Windows:

Mechanical: ventilation only

Plumbing/FP: sink, toilet, fire protection

Lighting: indirect LED

Electrical: GCFI receptacles

Communication:

FIXTURES/ FURNISHINGS

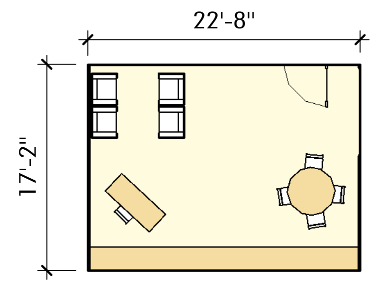
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

9.1 PRICIPAL'S OFFICE W/ CONFERENCE AREA



FUNCTIONAL CRITERIA

Description: office of the school principal with area for private small conferences

Area: 375 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: principal

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite

Windows: required

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data, clock, paging system

FIXTURES/ FURNISHINGS

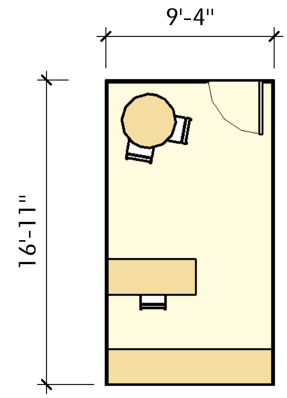
Casework/Specialties: bumper rail, built in bookshelves, lockable, cabinet or closet

Furnishings: 1 desk, 1 office chair, 1 medium conference table, filing cabinets

Equipment: 1 computer, 1 printer, 1 telephone, paging system, data wireless intercom, clock system, interactive LED screen

OTHER INFORMATION access to admin toilet room and coat closet

9.2 ASSISTANT PRINCIPAL'S OFFICE - AP1



FUNCTIONAL CRITERIA

Description: office for assistant principal's office

Area: 130 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: assistant principal

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data, clock system, paging system

FIXTURES/ FURNISHINGS

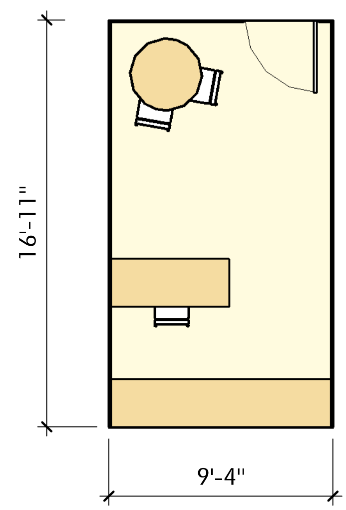
Casework/Specialties: bumper rail, built-in bookshelves

Furnishings: 1 desk, 1 office chair, 1 side chair

Equipment: 1 computer, 1 printer, 1 telephone, paging system, data wireless intercom, clock system

OTHER INFORMATION access to admin toilet room and coat closet

9.3 ASSISTANT PRINCIPAL'S OFFICE - AP2



FUNCTIONAL CRITERIA

Description: office for assistant principal's office

Area: 130 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: assistant principal

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full-lilte and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data, clock, paging system

FIXTURES/ FURNISHINGS

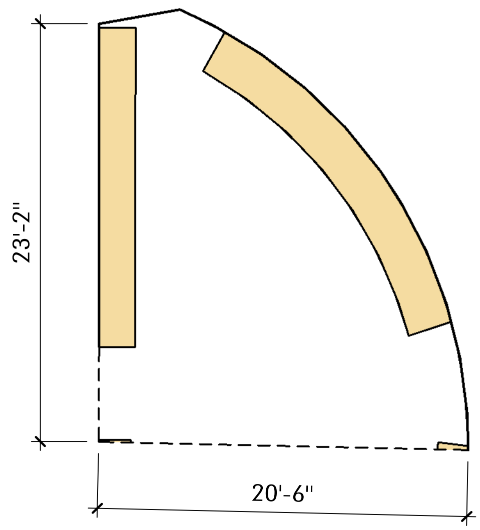
Casework/Specialties: bumper rail, built-in bookshelves

Furnishings: 1 desk, 1 office chair, 1 side chair

Equipment: 1 computer, 1 printer, 1 telephone, paging system, data wireless intercom, clock system

OTHER INFORMATION access to admin toilet room and coat closet

9.4 GENERAL OFFICE / WAITING ROOM / TOILET



FUNCTIONAL CRITERIA
Description: general office and waiting area

Area: 510 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: teachers, staff

TECHNICAL CRITERIA
Floor: VCT
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP: fire protection only
Lighting: indirect LED
Electrical: general receptacles

Communication:

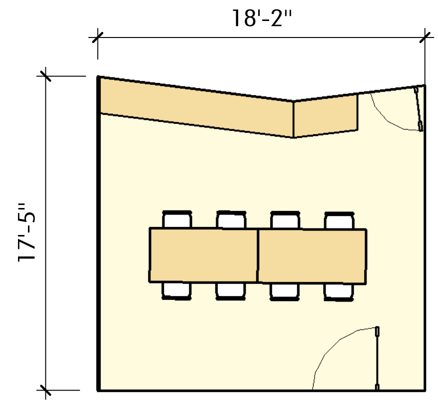
FIXTURES/ FURNISHINGS
Casework/Specialties: admin desk

Furnishings:

Equipment:

OTHER INFORMATION

9.5 CONFERENCE ROOM



FUNCTIONAL CRITERIA

Description: meeting room for administration

Area: 285 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers, staff

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surfacea, glazing, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles

Communication: telephone, data jacks

FIXTURES/ FURNISHINGS

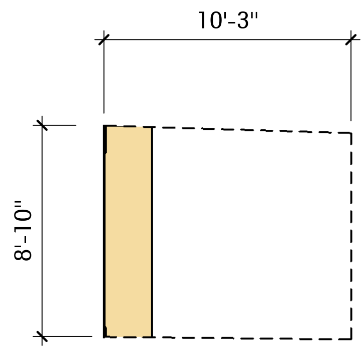
Casework/Specialties: bumper rail

Furnishings: 1 conference table, 8 conference chairs

Equipment: data wireless intercom, clock system, interactive LED screen

OTHER INFORMATION

9.6 TEACHERS' MAIL AND TIME ROOM



FUNCTIONAL CRITERIA

Description: mail room for teachers

Area: 100 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling:

Acoustical:

Doors:

Windows:

Mechanical:

Plumbing/FP:

Lighting: indirect LED

Electrical: general receptacles, data outlets

Communication: telephone,data jacks

FIXTURES/ FURNISHINGS

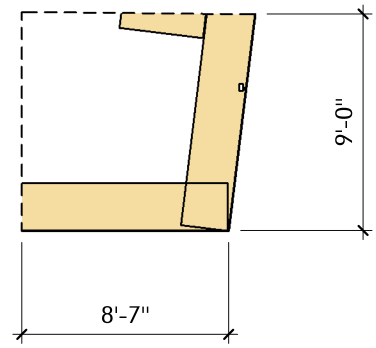
Casework/Specialties: countertop, mailboxes

Furnishings:

Equipment:

OTHER INFORMATION

9.7 DUPLICATING ROOM



FUNCTIONAL CRITERIA

Description: copy area for teachers and staff

Area: 165 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers, staff

TECHNICAL CRITERIA

Floor: VCT

Walls:

Ceiling:

Acoustical:

Doors:

Windows:

Mechanical:

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets

Communication:

FIXTURES/ FURNISHINGS

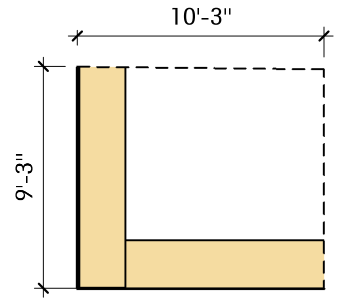
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

9.8 RECORDS ROOM



FUNCTIONAL CRITERIA

Description: storage room for student records

Area: 140 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: administration

TECHNICAL CRITERIA

Floor: VCT

Walls: painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles

Communication:

FIXTURES/ FURNISHINGS

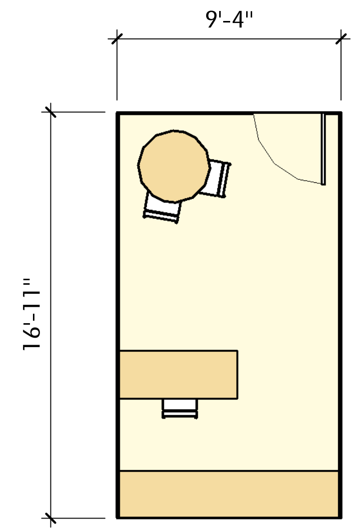
Casework/Specialties:

Furnishings: file storage

Equipment:

OTHER INFORMATION

9.9 SUPERVISORY / SPARE OFFICE



FUNCTIONAL CRITERIA

Description: administrative office

Area: 130 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers, administration

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, duplex at workstation

Communication: telephone, data, clock, paging system

FIXTURES/ FURNISHINGS

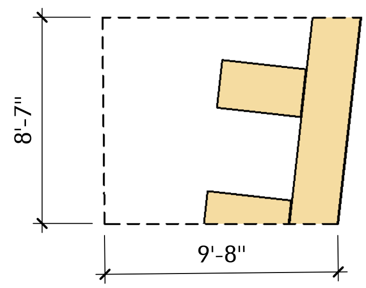
Casework/Specialties: bumper rail, wall mounted or freestanding shelving units

Furnishings: 1 desk, 1 office chair, side chairs, small conference table

Equipment: 1 computer, 1 printer, 1 telephone

OTHER INFORMATION

9.10 GENERAL WAITING ROOM



FUNCTIONAL CRITERIA
Description: general waiting area

Area: 100 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users: visitors

TECHNICAL CRITERIA
Floor:
Walls:
Ceiling:
Acoustical:
Doors:
Windows:
Mechanical:
Plumbing/FP:
Lighting:
Electrical:

Communication:

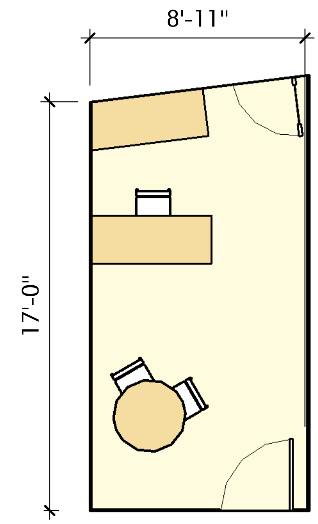
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

9.11 GUIDANCE OFFICE



FUNCTIONAL CRITERIA

Description: office for guidance counselors

Area: 250 sf

Quantity: 3

Occupant Load:

LOCATIONAL CRITERIA

Users: guidance couselors

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls 1 duplex at workstation

Communication: telephone, data, clock

FIXTURES/ FURNISHINGS

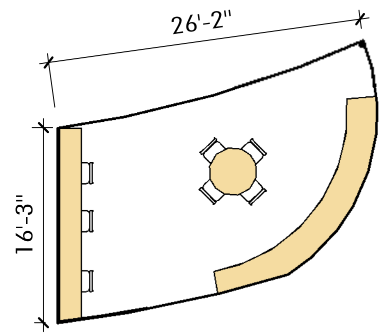
Casework/Specialties: bumper rail, wall mounted or freestanding shelving

Furnishings: 1 desk, 1 office chair, 2 side chairs, 1 small conference table

Equipment: 1 computer, 1 printer, 1 telephone

OTHER INFORMATION

9.12 TEACHERS' WORK ROOM



FUNCTIONAL CRITERIA

Description: work room for teachers

Area: 500 sf

Quantity: 3

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT

Acoustical:

Doors:

Windows:

Mechanical: low volume displacement ventilation

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles

Communication: telephone, data jacks

FIXTURES/ FURNISHINGS

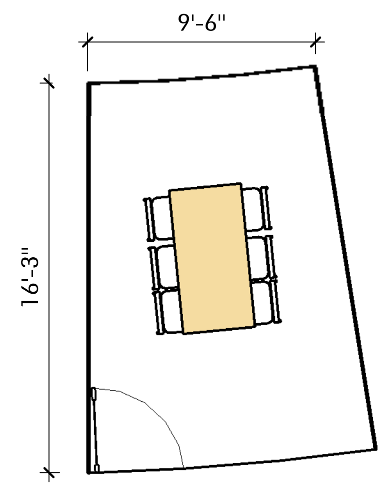
Casework/Specialties: bumper rail

Furnishings: moveable tables, chairs with wheels

Equipment: wireless access point, interactive LED touch screen

OTHER INFORMATION

9.13 SMALL CONFERENCE ROOM



FUNCTIONAL CRITERIA

Description: small meeting space for teachers

Area: 250 sf

Quantity: 3

Occupant Load:

LOCATIONAL CRITERIA

Users: teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone (with speakerphone), data, clock system, data wireless intercom

FIXTURES/ FURNISHINGS

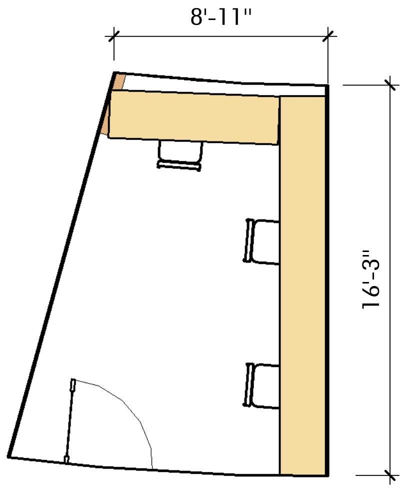
Casework/Specialties: bumper rail

Furnishings: teacher's storage, open shelving, conference table, chairs

Equipment: interactive LED screen, wireless access point

OTHER INFORMATION

9.14 SPECIALIST COLLABORATIVE WORKSPACE



FUNCTIONAL CRITERIA
Description: specialist instruction area

Area: 250 sf
Quantity: 3
Occupant Load:

LOCATIONAL CRITERIA
Users: teachers

TECHNICAL CRITERIA
Floor: VCT
Walls: magnetic / writable surface, painted GWB
Ceiling: ACT
Acoustical:
Doors: wood door with full-lite and sidelite
Windows:
Mechanical: displacement through floor diffuser
Plumbing/FP: fire protection only
Lighting: indirect LED
Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, data jack

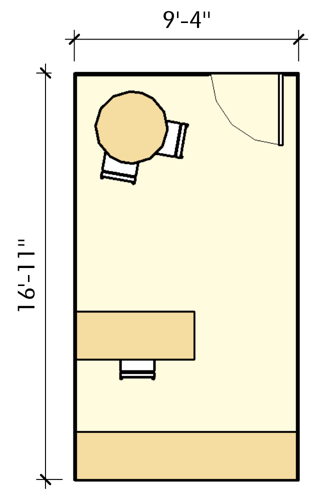
FIXTURES/ FURNISHINGS
Casework/Specialties: bumper rail, counters

Furnishings: desk chairs

Equipment:

OTHER INFORMATION

9.15 WORLD LANGUAGE OFFICE



FUNCTIONAL CRITERIA

Description: office for world language instructor

Area: 150 sf

Quantity: 2

Occupant Load:

LOCATIONAL CRITERIA

Users: world language teachers

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles on 3 walls, 1 duplex at workstation

Communication: telephone, data, clock

FIXTURES/ FURNISHINGS

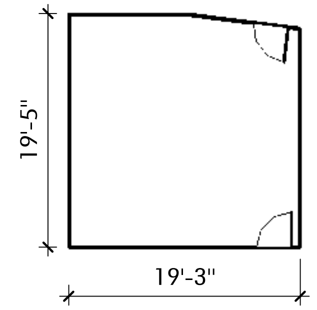
Casework/Specialties: bumper rail, wall mounted or freestanding shelving units

Furnishings: 1 desk, 1 office chair, side chair, filing cabinets

Equipment: 1 computer, 1 printer, 1 telephone

OTHER INFORMATION

10.1 EXTEDED DAY STORAGE



FUNCTIONAL CRITERIA
Description: exteded day storage

Area: 420 sf
Quantity: 1
Occupant Load:

LOCATIONAL CRITERIA
Users:

TECHNICAL CRITERIA
Floor: VCT
Walls: painted GWB
Ceiling: ACT
Acoustical:
Doors: wood door
Windows:
Mechanical: low volume displacement diffuser
Plumbing/FP: fire protection only
Lighting: indirect LED
Electrical: general receptacles

Communication:

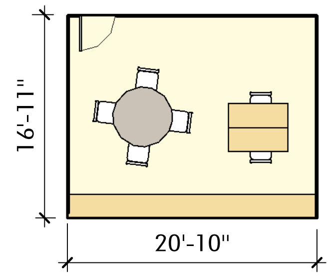
FIXTURES/ FURNISHINGS
Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

10.2 EXTENDED DAY OFFICE



FUNCTIONAL CRITERIA

Description: office for extended day programs

Area: 320 sf

Quantity: 1

Occupant Load:

LOCATIONAL CRITERIA

Users:

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood doors with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general outlets on 3 walls, 1 duplex at workstation

Communication: telephone, clock system, data

FIXTURES/ FURNISHINGS

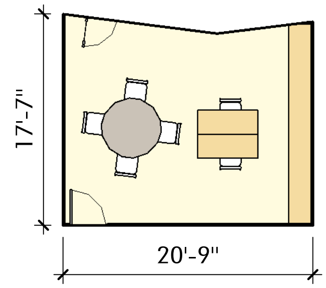
Casework/Specialties: bumper rail, counter

Furnishings: 2 desks, 2 desk chairs, 2 small conference table, 4 side chairs

Equipment:

OTHER INFORMATION

10.3 PTO



FUNCTIONAL CRITERIA

Description:

Area: 380 SF

Quantity:

Occupant Load:

LOCATIONAL CRITERIA

Users:

TECHNICAL CRITERIA

Floor: VCT

Walls: magnetic / writable surface, painted GWB

Ceiling: ACT

Acoustical:

Doors: wood door with full-lite and sidelite

Windows:

Mechanical: displacement through floor diffuser

Plumbing/FP: fire protection only

Lighting: indirect LED

Electrical: general receptacles, duplex at workstation

Communication: telephone, data jacks

FIXTURES/ FURNISHINGS

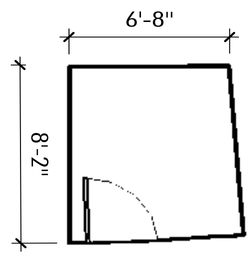
Casework/Specialties: bumper rail

Furnishings: 2 desks, 2 desk chairs, 1 small conference table, 4 guest chairs

Equipment:

OTHER INFORMATION

10.4 STAFF SHOWERS



FUNCTIONAL CRITERIA

Description: showers for staff use

Area: 90 sf

Quantity: 2

Occupant Load:

LOCATIONAL CRITERIA

Users: staff

TECHNICAL CRITERIA

Floor: porcelain floor tile

Walls: ceramic wall tile

Ceiling: GWB

Acoustical:

Doors: wood door

Windows:

Mechanical: ventilation only

Plumbing/FP: sink, toilet, shower

Lighting: indirect LED

Electrical: GCFI outlets

Communication:

FIXTURES/ FURNISHINGS

Casework/Specialties:

Furnishings:

Equipment:

OTHER INFORMATION

10.4

12. Proposed Construction Methodology

The project will be constructed under the Construction Management at Risk methodology in accordance with M.G.L. Chapter 149A.

13. Total Project Budget

The Project Budget for the Fuller Middle School is $108,848,218 as defined in the completed Project Budget Form, dated March 21, 2019. The budget represents the District's not to exceed Total Project Budget.

Driscoll Elementary School - Brookline Public Schools

LEFTFIELD
THE RIGHT CHOICE IN PROJECT MANAGEMENT

As of March 21, 2019

Current Budget

Project Budget Status Report	Original Budget [A]	Budget Changes [B]	Rev. Budget [C]=[A]+[B]	Committed Costs [D]	Total Expended + Pending [E]	Unspent [F]=[D]-[E]	Remaining Budget [G]=[C]-[D]	% Complete (against committ'd) [H]=[E]/[D]	CTC (beyond committed) [I]	Anticipated C @ C [J]=[D]+[I]	Variance (Under) / Over [K]=[J]-[C]
CAPITAL COSTS	**$108,848,218**	**$0**	**$108,848,218**	**$0**	**$0**	**$0**	**$108,848,218**	**$0**	**$0**	**$0**	**($108,848,218)**
Construction	**$87,600,254**	**$0**	**$87,600,254**	**$0**	**$0**	**$0**	**$87,600,254**		**$0**	**$0**	**($87,600,254)**
Construction	$87,200,254	$0	$87,200,254	$0	$0	$0	$87,200,254		$0	$0	($87,200,254)
Change Orders	$0	$0	$0	$0	$0	$0	$0		$0	$0	$0
Preconstruction	$300,000	$0	$300,000	$0	$0	$0	$300,000		$0	$0	($300,000)
Utility Fees	$100,000	$0	$100,000	$0	$0	$0	$100,000		$0	$0	($100,000)
Design Services	**$8,720,025**	**$0**	**$8,720,025**	**$0**	**$0**	**$0**	**$8,720,025**		**$0**	**$0**	**($8,720,025)**
A/E Base Contract	$8,720,025	$0	$8,720,025	$0	$0	$0	$8,720,025		$0	$0	($8,720,025)
A/E Schematic Design (incl above)	$0	$0	$0	$0	$0	$0	$0		$0	$0	$0
A/E Design Development (incl above)	$0	$0	$0	$0	$0	$0	$0		$0	$0	$0
A/E Construction Documents (incl above)	$0	$0	$0	$0	$0	$0	$0		$0	$0	$0
A/E Construction Administration (incl above)	$0	$0	$0	$0	$0	$0	$0		$0	$0	$0
Additional Services	$0	$0	$0	$0	$0	$0	$0		$0	$0	$0
Project Management	**$3,052,009**	**$0**	**$3,052,009**	**$0**	**$0**	**$0**	**$3,052,009**		**$0**	**$0**	**($3,052,009)**
Owner's Project Management Services	$3,052,009	$0	$3,052,009	$0	$0	$0	$3,052,009		$0	$0	($3,052,009)
Miscellaneous Project Costs	**$564,712**	**$0**	**$564,712**	**$0**	**$0**	**$0**	**$564,712**	**$0**	**$0**	**$0**	**($564,712)**
Legal Fees	$100,000	$0	$100,000	$0	$0	$0	$100,000		$0	$0	($100,000)
Commissioning	$124,712	$0	$124,712	$0	$0	$0	$124,712		$0	$0	($124,712)
Testing and Inspections	$120,000	$0	$120,000	$0	$0	$0	$120,000		$0	$0	($120,000)
Moving	$90,000	$0	$90,000	$0	$0	$0	$90,000		$0	$0	($90,000)
Security	$100,000	$0	$100,000	$0	$0	$0	$100,000		$0	$0	($100,000)
Advertisement	$30,000	$0	$30,000	$0	$0	$0	$30,000		$0	$0	($30,000)
Furnishings & Equipment	**$2,720,000**	**$0**	**$2,720,000**	**$0**	**$0**	**$0**	**$2,720,000**	**$0**	**$0**	**$0**	**($2,720,000)**
Technology	$1,120,000	$0	$1,120,000	$0	$0	$0	$1,120,000		$0	$0	($1,120,000)
Furniture Fixtures & Equipment	$1,600,000	$0	$1,600,000	$0	$0	$0	$1,600,000		$0	$0	($1,600,000)
Contingency	**$6,191,218**	**$0**	**$6,191,218**	**$0**	**$0**	**$0**	**$6,191,218**		**$0**	**$0**	**($6,191,218)**
Construction Contingency	$4,185,612	$0	$4,185,612	$0	$0	$0	$4,185,612		$0	$0	($4,185,612)
Owner's Contingency	$2,005,606	$0	$2,005,606	$0	$0	$0	$2,005,606		$0	$0	($2,005,606)
TOTAL PROJECT BUDGET	**$108,848,218**	**$0**	**$108,848,218**	**$0**	**$0**	**$0**	**$108,848,218**	**0%**	**$0**	**$0**	**($108,848,218)**

Approved Amount (CA)	**$108,848,218**
Forecasted Cost At Completion (CAC)	**$0**
Variance	**$108,848,218**

14. Construction Cost Estimates

14.1 Cost Estimate - Designer

Please reference the attached Cost Estimate prepared by Daedalus.

DAEDALUS

Driscoll Elementary School
New Construction
Brookline, MA

February 28, 2019

Schematic Design Estimate

Architect:
JLA
Jonathan Levi Architects
266 Beacon Street
Boston, MA 02116
(617) 437 9458

Cost Consultant:
Daedalus Projects, Inc.
1 Faneuil Hall Marketplace
South Market Bldg, Suite 4195
Boston, MA 02109
(617) 451 2717

INTRODUCTION

Project Description:

The project consists of new construction of Driscoll Elementary School in Brookline, MA

New Construction (155,632gsf) 4-story steel framed, masonry façade, asphalt roofing. New elementary school program including small gym, Gymnasium and Cafeteria

parking structure (9,977gsf) below building for 25 parking spaces

entire hazmat abatement and building structure demolition

Project Particulars:

Schematic Design - Pricing Documents dated March 9, 2019 prepared by Jonathan Levi Architects

Detailed quantity takeoffs where possible from design documents and reports

Daedalus Projects, Inc. site visits

Daedalus Projects, Inc. experience with similar projects of this nature

Project Assumptions:

The project will be managed and built by a Construction Manager

Our costs assume that there will be at least three subcontractors submitting unrestricted bids in each trade bid category

Unit rates are escalated to mid-point of construction duration and utilize prevailing wage labor rates

Lay-down/storage area, jobsite shed and trailers, and construction site entrance will be located adjacent to Project area

Noise and vibration disturbances are anticipated and will be minimized or avoided during normal business hours

Temporary electrical and water site utility connections will be available. General Conditions value includes utility connections and consumption costs

Existing water pressure is adequate

Subcontractor's markups are included in each unit rate. These markups cover field and home office overhead and subcontractor's profit

Design and Pricing Contingency markup is an allowance for unforeseen design issues, design detail development and specification clarifications during the design period

General Conditions covers facilities to support project, and site office overhead that is not attributable to the direct trade costs

Project Requirements value covers winter conditions, scaffolding, staging and access, temporary protection, and cleaning

Fee is calculated on a percentage of direct construction costs

Anticipated start of construction Spring 2020

Escalation allowance from now to Bid Date has been carried at a rate of 5% per year in the Main Summary

INTRODUCTION

Construction Cost Estimate Exclusions:

- Work beyond the boundary of the site
- Architectural/Engineering; Designer and other Professional fees, testing, printing, surveying
- Owner's administration; legal fees, advertising, permitting, Owner's insurance, administration, interest expense
- Project costs; utility company back charges prior to construction, construction of swing space and temporary facilities, program related phasing, relocation
- Owner furnished and installed products; computer networking, desks, chairs, furnishings, equipment, artwork, loose case goods and other similar items
- Utility company back charges
- Third Party testing & commissioning
- Wetlands protection or restoration
- Building permit fees

MAIN SUMMARY

ELEMENT		New Construction 155,632 GSF COST	COST/GSF
Building Trade Costs Details	155,632 GSF	$53,605,844	$344.44
Parking Structure Below Building	9,977 GSF	$2,194,879	$219.99
Hazardous Material Abatement		$400,000	$3.13
Building Demolition		$952,575	$7.45
Sitework Trade Costs Details		$4,581,956	$29.44
Direct Trade Details SubTotal		**$61,735,254**	**$396.67**
Design and Pricing Contingency	10.00%	$6,174,000	$39.67
Direct Trade Cost Total		**$67,909,254**	**$436.35**
General Conditions, Project Requirements, Overhead		$4,754,000	$30.55
General Liability Insurance	1.50%	$1,090,000	$7.00
Performance and Payment Bonds	1.40%	$951,000	$6.11
GMP Contingency	3.00%	$2,038,000	$13.09
Fee	2.50%	$1,698,000	$10.91
Estimated Construction Cost Total		**$78,440,254**	**$504.01**
Escalation from now to bid opening	6.07%	$4,760,000	$30.58
Estimated Construction Cost at Bid Opening		**$83,200,254**	**$534.60**
Additional Fossil-Free Measures to be determined		$4,000,000	$25.70
Estimated Construction Cost Total		**$87,200,254**	**$560.30**

DIRECT TRADE COST SUMMARY

ELEMENT	New Construction 155,632 GSF	
	COST	COST/GSF
A1010 Standard Foundations	$4,606,541	$29.60
A1030 Slab on Grade	$346,832	$2.23
A10 Foundations	**$4,953,373**	**$31.83**
B1010 Floor Construction	$6,209,088	$39.90
B1020 Roof Construction	$946,698	$6.08
B10 Superstructure	**$7,155,785**	**$45.98**
B2010 Exterior Walls	$5,378,845	$34.56
B2020 Exterior Windows	$4,119,750	$26.47
B2030 Exterior Doors	$70,000	$0.45
B20 Exterior Enclosure	**$9,568,595**	**$61.48**
B3010 Roof Covering	$1,006,650	$6.47
B3020 Roof Opening	$97,500	$0.63
B30 Roofing	**$1,104,150**	**$7.09**
C1010 Partitions	$3,640,728	$23.39
C1020 Interior Doors	$505,300	$3.25
C1030 Fittings	$1,086,498	$6.98
C10 Interior Construction	**$5,232,526**	**$33.62**
C2010 Stair Construction	$655,000	$4.21
C2020 Stair Finishes	$133,000	$0.85
C20 Stairs	**$788,000**	**$5.06**
C3010 Wall Finishes	$1,395,800	$8.97
C3020 Floor Finishes	$1,347,383	$8.66
C3030 Ceiling Finishes	$1,435,053	$9.22
C30 Interior Finishes	**$4,178,236**	**$26.85**
D10 Conveying	$225,000	$1.45
D20 Plumbing	$2,334,480	$15.00
D30 HVAC	$8,003,440	$51.43
D40 Fire Protection	$1,089,424	$7.00
D50 Electrical	$6,225,280	$40.00
D Services	**$17,877,624**	**$114.87**

DIRECT TRADE COST SUMMARY

ELEMENT	New Construction 155,632 GSF	
	COST	COST/GSF
E1010 Commercial Equipment	$275,000	$1.77
E1020 Institutional Equipment	$265,000	$1.70
E10 Equipment	**$540,000**	**$3.47**
E2010 Fixed Furnishings	$2,194,080	$14.10
E2020 Movable Furnishings	$13,475	$0.09
E20 Furnishings	**$2,207,555**	**$14.18**
F1010 Parking Structures	$2,194,879	$14.10
F10 Special Construction	**$2,194,879**	**$14.10**
F2000 Building Demolition	$952,575	$6.12
F2020 Hazardous Components Abatement	$400,000	$2.57
F20 Selective Building Demolition	**$1,352,575**	**$8.69**
G1010 Site Clearing	$161,600	$1.04
G1020 Site Demolition and Relocations	$159,500	$1.02
G1030 Site Earthwork	$157,514	$1.01
G10 Site Preparation	**$478,614**	**$3.08**
G2000 Paving and Surfacing	$1,757,057	$11.29
G2040 Site Development	$996,175	$6.40
G2050 Landscaping	$707,175	$4.54
G20 Site Improvements	**$3,460,407**	**$22.23**
G3010 Water Supply	$43,225	$0.28
G3020 Sanitary Sewer	$41,780	$0.27
G3030 Storm Sewer	$365,604	$2.35
G3060 Fuel Distribution	$3,500	$0.02
G30 Site Mechanical Utilities	**$454,109**	**$2.92**
G40 Site Electrical Utilities	$188,825	$1.21
G40 Site Electrical Utilities	**$188,825**	**$1.21**
Direct Trade Details SubTotal	**$61,735,254**	**$396.67**

DIRECT TRADE COST DETAILS

ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
A10 FOUNDATIONS				
A1010 Standard Foundations				
31 00 00 Earthwork				
Building platform bulk earthwork				
Excavation, disposal	**32,151**	CY	$67.50	$2,170,212
Imported backfill at foundation wall	**10,414**	CY	$31.50	$328,055
Strip footings:				
Excavation, stockpile	**1,014**	CY	$15.75	$15,974
Backfill with selective stockpile material	**815**	CY	$16.50	$13,445
Perimeter foundation drain system	**1,800**	LF	$20.00	$36,000
Spread footings				
Excavation, stockpile	**1,458**	CY	$17.25	$25,149
Backfill with stockpile material	**875**	CY	$17.50	$15,308
03 00 00 Concrete				
Strip footing; assume 24-36" wide x12" deep	***1,630***	*LF*		
formwork	**3,260**	SF	$12.00	$39,120
rebar; assume 25#/lf	**40,750**	LBS	$1.30	$52,975
concrete	**199**	CY	$230.00	$45,821
Foundation wall; 14-16" thick	***25,260***	*SF*		
formwork	**50,520**	SF	$12.00	$606,240
rebar; assume 5#/sf	**126,300**	LBS	$1.30	$164,190
concrete	**1,369**	CY	$240.00	$328,492
brick shelf	**1,630**	LF	$5.00	$8,150
Exterior isolated footing	***65***	*EA*		
formwork	**4,160**	SF	$12.50	$52,000
rebar; assume 100#/cy	**33,896**	LBS	$1.35	$45,760
concrete	**339**	CY	$235.00	$79,656
Interior isolated footing	***37***	*EA*		
formwork	**2,664**	SF	$12.50	$33,300
rebar; assume 75#/cy	**18,315**	LBS	$1.35	$24,725
concrete	**244**	CY	$235.00	$57,387
Integrated/isolated pier	**102**	EA	$800.00	$81,600
07 00 00 Thermal and Moisture Protection				
Waterproofing; base level foundation walls	**24,100**	SF	$12.75	$307,275
Dampproofing; foundation wall, footing	**2,790**	SF	$4.50	$12,555
Rigid insulation; foundation wall	**25,260**	SF	$2.50	$63,150
A1010 Standard Foundations Total				**$4,606,541**

DIRECT TRADE COST DETAILS

ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
A1030 Slab on Grade				
31 00 00 Earthwork				
Slab on grade; 8" structural fill, 8" gravel base	**1,215**	CY	$42.00	$51,029
Elevator pit earthwork	**1**	EA	$6,500.00	$6,500
03 00 00 Concrete				
Slab on grade; 5" thick	***23,315***	*SF*		
WWF mesh, 15% laps	**26,812**	SF	$1.25	$33,515
concrete material, water vapor reducing admixture	**399**	CY	$200.00	$79,789
concrete place, screed, protect	**23,315**	SF	$3.25	$75,774
Elevator pit concrete	**1**	EA	$8,500.00	$8,500
07 00 00 Thermal and Moisture Protection				
Slab on grade; vapor barrier, 15% laps	**26,812**	SF	$0.75	$20,109
2" rigid insulation	**23,315**	SF	$2.75	$64,116
Elevator pit; waterproofing	**1**	EA	$7,500.00	$7,500
A1030 Slab on Grade Total				**$346,832**
B10 SUPERSTRUCTURE				
B1010 Floor Construction				
03 00 00 Concrete				
Slab topping on metal deck; 4½" thick	***132,317***	*SF*		
WWF mesh, 15% laps	**152,165**	SF	$1.40	$212,270
concrete LWT material, water vapor reducing admixture	**2,922**	CY	$205.00	$598,960
concrete place, screed, protect	**132,317**	SF	$3.25	$430,030
05 00 00 Metals				
Structural steel beams, girders, columns; 13#/gsf	**860**	TNS	$4,500.00	$3,870,272
premium for HSS shapes; columns, braced frames	**331**	TNS	$300.00	$99,238
premium for AESS; exterior façade	**5**	TNS	$750.00	$3,750
shear studs; assume 1ea/7sf	**18,900**	EA	$6.50	$122,850
metal floor deck; assume 2"x18g	**132,317**	SF	$3.25	$430,030
07 00 00 Thermal and Moisture Protection				
Spray fireproofing	**132,317**	SF	$2.75	$363,872
Firestopping	**155,632**	GSF	$0.50	$77,816
B1010 Floor Construction Total				**$6,209,088**

DIRECT TRADE COST DETAILS

ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
B1020 Roof Construction				
03 00 00 Concrete				
Slab topping on metal deck; assume 4½" thick	***1,170***	*SF*		
WWF mesh, 15% laps	**1,346**	SF	$1.40	$1,877
concrete LWT material, water vapor reducing admixture	**30**	CY	$205.00	$6,107
concrete place, screed, protect	**1,170**	SF	$3.25	$3,803
05 00 00 Metals				
Structural steel beams, girders, columns; 13#/gsf	**160**	TNS	$4,500.00	$720,000
mechanical zone; assume +2#/sf	**1**	TNS	$4,500.00	$5,265
premium for HSS shapes; columns, braced frames	**3**	TNS	$300.00	$878
shear studs; assume 1ea/7sf	**170**	EA	$6.50	$1,105
metal roof deck; galv. corrugated 3" Type N	**18,199**	SF	$3.75	$68,246
Type NA acoustic metal roof deck; Gym	**6,280**	SF	$7.50	$47,100
Roof screen - assume 100lf	**5**	TNS	$5,000.00	$25,000
07 00 00 Thermal and Moisture Protection				
Spray fireproofing	**24,479**	SF	$2.75	$67,317
B1020 Roof Construction Total				**$946,698**
B20 EXTERIOR ENCLOSURE				
B2010 Exterior Walls				
Scaffolding	**100,150**	SF	$3.50	$350,525
Exterior façade; 75% brick of 65%, 25% phenolic of 65%, 35% glazed	*92,000*	*SF*		
Masonry wall system w/backup wall, incl's precast band	**44,850**	SF	$65.00	$2,915,250
Phenolic wall panel system w/backup wall	**14,950**	SF	$115.00	$1,719,250
Clerestory wall 6'-6" h	**1,275**	SF	$80.00	$102,000
Mechanical zone and screen; allow	**1,000**	SF	$100.00	$100,000
Misc metals to exterior closure	**92,000**	SF	$1.50	$138,000
Caulking and sealant, exterior closure	**59,800**	SF	$0.90	$53,820
B2010 Exterior Walls Total				**$5,378,845**
B2020 Exterior Windows	*32,000*	*SF*		
Exterior fiberglass windows w/operable; 50% of glazed area	**16,000**	SF	$90.00	$1,440,000
Curtain wall & storefront	**16,000**	SF	$130.00	$2,080,000
premium for custom applied graphics, curved	**6,000**	SF	$40.00	$240,000
extension to vertical CW as sloping roof	**1,365**	SF	$150.00	$204,750
Aluminum sunshade; attached to CW system	**150**	LF	$500.00	$75,000
Rough carpentry/wood blocking at openings	**32,000**	SF	$2.50	$80,000
B2020 Exterior Windows Total				**$4,119,750**

DIRECT TRADE COST DETAILS

ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
B2030 Exterior Doors				
Exterior fiberglass glazed door; pair	**4**	PR	$7,500.00	$30,000
Egress stairs	**4**	PR	$7,500.00	$30,000
HM doors; pair, Gym, assumed qty	**2**	PR	$5,000.00	$10,000
B2030 Exterior Doors Total				**$70,000**
B30 ROOFING				
B3010 Roof Covering				
Rough carpentry/wood blocking to roof	**2,445**	LF	$15.00	$36,675
PVC roofing, white, R-42 insul.	**30,100**	SF	$18.50	$556,850
Roof canopy; main entrance	**1,065**	SF	$150.00	$159,750
add canopy, other entrances	**600**	SF	$100.00	$60,000
Prefinished aluminum fascia	**2,445**	LF	$75.00	$183,375
Walkway pads; allow	**2,000**	SF	$5.00	$10,000
B3010 Roof Covering Total				**$1,006,650**
B3020 Roof Opening				
Elevator vent	**1**	LS	$3,000.00	$3,000
Roof hatch, ladder, allow	**1**	LS	$4,500.00	$4,500
Skylight	**450**	SF	$200.00	$90,000
B3020 Roof Opening Total				**$97,500**
C10 INTERIOR CONSTRUCTION				
C1010 Partitions				
CMU walls at elevator/stairs and mech room	**12,595**	SF	$22.50	$283,388
Gym	**3,930**	SF	$24.50	$96,285
Misc metals to interior	**155,632**	GSF	$2.75	$427,988
Wood blocking	**121,160**	SF	$0.35	$42,406
Sealants & caulking	**155,632**	GSF	$0.50	$77,816
Interior storefront	**10,085**	SF	$85.00	$857,225
windows	**1,500**	SF	$85.00	$127,500
Interior partitions; assume 6" metal stud, 2x ⅝" GWB, sound insulation	**104,635**	SF	$13.15	$1,375,427
double height @multi purpose room	**1,330**	SF	$18.15	$24,133
curved segments	**9,470**	SF	$14.50	$137,310
Movable partitions	**2,250**	SF	$85.00	$191,250
C1010 Partitions Total				**$3,640,728**

DIRECT TRADE COST DETAILS

ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
C1020 Interior Doors				
Misc metals; framing support to OH door/grille	**1**	LS	$5,000.00	$5,000
Install doors	**235**	LEAF	$200.00	$47,000
Interior doors with frame & hardware; single	**150**	LEAF	$1,600.00	$240,000
pair of doors	**15**	PR	$3,200.00	$48,000
door sidelight assume at classrooms and offices	**55**	EA	$1,560.00	$85,800
OH rolling grille at Servery; assumed	**1**	EA	$6,000.00	$6,000
Aluminum door part of storefront; single, allow	**5**	LEAF	$3,500.00	$17,500
pair of doors, vestibule, media, admin	**8**	PR	$7,000.00	$56,000
C1020 Interior Doors Total				**$505,300**
C1030 Fittings				
Metal railing w/glazed panel at openings to below	**545**	LF	$500.00	$272,500
Miscellaneous metals associated with interior fit-out	**155,632**	GSF	$0.50	$77,816
Rough carpentry/blocking	**155,632**	GSF	$0.25	$38,908
New markerboards, tackboards @ Classrooms	**52**	EA	$3,000.00	$156,000
other rooms, offices, conference rooms, allow	**25**	RMS	$500.00	$12,500
Signage	**155,632**	GSF	$0.75	$116,724
New interior graphics at dining; allow	**1**	AL	$50,000.00	$50,000
Toilet compartments	**14**	EA	$1,200.00	$16,800
ADA	**14**	EA	$1,500.00	$21,000
Urinal screen	**7**	EA	$500.00	$3,500
Toilet accessories, gangs	**14**	RMS	$1,750.00	$24,500
single-user toilet	**41**	RMS	$1,250.00	$51,250
Fire extinguisher and cabinet	**35**	EA	$500.00	$17,500
New specialty student lockers; assumed qty	**650**	EA	$350.00	$227,500
C1030 Fittings Total				**$1,086,498**
C20 STAIRS				
C2010 Stair Construction				
Ramp; Base level	**1**	LOC	$25,000.00	$25,000
Central core stairs; including railing	**4**	FLT	$75,000.00	$300,000
New egress stairs; including railing	**11**	FLT	$30,000.00	$330,000
C2010 Stair Construction Total				**$655,000**
C2020 Stair Finishes				
Central core	**4**	FLT	$25,000.00	$100,000
Egress stairs	**11**	FLT	$3,000.00	$33,000
C2020 Stair Finishes Total				**$133,000**

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
218	**C30 INTERIOR FINISHES**				
219					
220	**C3010 Wall Finishes**				
221	Academic Areas: Classrooms, Science, Media, Art, Music, Vocational, Sped				
222	-Lower Wall(30"-104") - Magnetic Writable Surface Wall Covering	**8,640**	LF	$95.00	$820,800
223	-Upper Wall(104"-128') - Painted GWB	**8,640**	LF	$2.20	$19,008
224	-Curved Wall- Magnetic Writable Surface Wall Covering Over Curb GW	**575**	LF	$105.00	$60,375
225	Corridors and Public Areas				
226	-PLAM Panel w/ Finished Edges 12"-106" High on 1/4" Substrate over (	**6,535**	SF	$20.00	$130,700
227	Auditorium				
228	-50% Acoustic Wood Wall System[Armstrong Woodworks], 50% Grour	**310**	SF	$75.00	$23,250
229	Gym				
230	-Gym Wall Pads to be 8'8" A.F.F	**565**	SF	$20.00	$11,300
231	Toilet Rooms				
232	-Walls to 98" - Ceramic Tile, w/Accent Color. PTD GWB above w/High	**815**	SF	$25.00	$20,375
233	Kitchen; Ceramic full-height tile walls	**2,400**	SF	$18.00	$43,200
234	Acoustic wall paneling; allow @ Music	**2,000**	SF	$25.00	$50,000
235	Paint CMU wall	**33,050**	SF	$1.25	$41,313
236	Paint GWB wall	**175,480**	SF	$1.00	$175,480
237	**C3010 Wall Finishes Total**				**$1,395,800**
238					
239	**C3020 Floor Finishes**				
240	*Academic Areas: Classrooms, Science, Media, Art, Music, Vocational, Sped*				
241	-12" x 12" 1/3 Running Bond VCT	**61,115**	SF	$7.90	$482,503
242	*Teacher Planning*				
243	-12" x 12" 1/3 Running Bond VCT	**2,900**	SF	$7.90	$22,896
244	*Corridors and Public Areas*				
245	-12" x 12" 1/3 Running Bond VCT, Accent Colors at Cohort Commons	**36,115**	SF	$8.40	$303,185
246	*Administration Areas, Offices, Medical*				
247	-12" x 12" 1/3 Running Bond VCT	**5,685**	SF	$7.90	$44,883
248	*Gym*				
249	-Wood Athletic Flooring	**9,240**	SF	$18.00	$166,320
250	*Auditorium*				
251	-Carpet at Aisles, Slab on Grade Power Troweled Concrete at seats	**5,170**	SF	$9.50	$49,115
252	*Toilet Rooms*				
253	-Porcelain Tile	**3,395**	SF	$25.00	$84,875
254	Kitchen; Quarry tile floor	**2,575**	SF	$25.00	$64,375
255	Stage; wood flooring, allow	**1,500**	SF	$20.00	$30,000
256	Mech, elec room; sealed concrete	**4,720**	SF	$2.50	$11,800
257	Vapor mitigation system at lower level slab-on-grade	**23,315**	SF	$3.75	$87,431
258	**C3020 Floor Finishes Total**				**$1,347,383**
259					

DIRECT TRADE COST DETAILS

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
260	**C3030 Ceiling Finishes**				
261	*Academic Areas: Classrooms, Science, Media, Art, Music, Vocational, Sped*				
262	-Exposed Deck, Painted 2/3 of room; 1/3 - ACT lay-in Tile with	**61,115**	SF	$7.25	$443,084
263	1/3 Running Bond Grid Pattern and GWBB Angled Soffit				
264	*Teacher Planning*				
265	-ACT lay in Tile in 1/3 Running Bond Grid Pattern	**2,900**	SF	$8.00	$23,200
266	*Music Area*				
267	-ACT lay-in Tile 1/3 Running Bond, 3-D Metal Panel Ceiling	**3,985**	SF	$25.00	$99,625
268	*Corridors and Public Areas*				
269	-Suspended ACT lay-in 1/3 Running Bond Grid Pattern	**36,115**	SF	$8.00	$288,920
270	*Administration Areas, Offices, Medical*				
271	-Suspended ACT lay-in 1/3 Running Bond Grid Pattern	**5,680**	SF	$8.00	$45,440
272	*Auditorium*				
273	-PTD. Exposed Metal Deck with 50% Suspended Wood Panel Ceiling	**5,170**	SF	$30.00	$155,100
274	*Gym*				
275	-Suspended Lay-in Pre-painted Tegular Edge Tectum Plank,	**9,240**	SF	$9.10	$84,084
276	exposed Deck PTD.				
277	*Toilet Rooms*				
278	-PTD w/High Performance Coating	**3,395**	SF	$1.50	$5,093
279	Kitchen; washable ceiling tile system	**2,575**	SF	$7.50	$19,313
280	Soffits, fascia and bulkheads, paint, allow	**5,000**	SF	$20.00	$100,000
281	Interior finishes generally	**155,632**	GSF	$1.10	$171,195
282	**C3030 Ceiling Finishes Total**				**$1,435,053**
283					
284					
285	**D SERVICES**				
286					
287	**D10 Conveying**				
288	***D1010 Elevators and Lifts***				
289	Elevator; 5-stop	**1**	EA	$225,000.00	$225,000
290	**D1010 Elevators and Lifts Total**				**$225,000**
291					
292	**D20 Plumbing**				
293	Plumbing	**155,632**	GSF	$15.00	$2,334,480
294	**D20 Plumbing Total**				**$2,334,480**
295					
296	**D30 HVAC**				
297	Displacement air system, full a/c	**155,632**	GSF	$45.00	$7,003,440
298	Premium for fossil fuel free	**1**	ADJ	$1,000,000.00	$1,000,000
299	**D30 HVAC Total**				**$8,003,440**
300					
301					

DIRECT TRADE COST DETAILS

ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
D40 Fire Protection				
Sprinkler coverage, fire pump	**155,632**	GSF	$7.00	$1,089,424
D40 Fire Protection Total				**$1,089,424**
D50 Electrical				
Electrical	**155,632**	GSF	$40.00	$6,225,280
D50 Electrical Total				**$6,225,280**
E10 EQUIPMENT				
E1010 Commercial Equipment				
Food Service Equipment; allowance	**1**	AL	$275,000.00	$275,000
E1010 Commercial Equipment Total				**$275,000**
E1020 Institutional Equipment				
Projection screen	**1**	AL	$15,000.00	$15,000
Auditorium; Theatrical and rigging equipment	**1**	AL	$75,000.00	$75,000
Gym equipment	**1**	AL	$150,000.00	$150,000
Bleacher seating; allow	**200**	SEAT	$125.00	$25,000
E1020 Institutional Equipment Total				**$265,000**
E20 FURNISHINGS				
E2010 Fixed Furnishings				
Specialties/millwork				
Classroom; base cabinets w/countertop, tall storage cabinets,	**54**	RMS	$20,000.00	$1,080,000
open storage area/student cubbies				
premium for epoxy countertop @ Art and Science	**2**	RMS	$3,000.00	$6,000
Music; base cabinets w/countertop, tall storage cabinets	**2**	RMS	$15,000.00	$30,000
Kitchen; allow	**1**	RMS	$20,000.00	$20,000
Admin area	**2**	LOC	$15,000.00	$30,000
Sped Open Offices, Reading Teacher, Guidance	**20**	RMS	$15,000.00	$300,000
Nurse & Exam; casework	**4**	RMS	$10,000.00	$40,000
Media	**3**	RMS	$20,000.00	$60,000
Maker Space	**1**	RMS	$15,000.00	$15,000
Miscellaneous standing and running trim	**155,632**	GSF	$2.50	$389,080
Window shades	**32,000**	SF	$7.00	$224,000
E2010 Fixed Furnishings Total				**$2,194,080**

DIRECT TRADE COST DETAILS

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
344	**E2020 Movable Furnishings**				
345	Recessed grille/ Walk-off mat	**385**	SF	$35.00	$13,475
346	**E2020 Movable Furnishings Total**				**$13,475**
347					
348					
349	**F10 SPECIAL CONSTRUCTION**				
350					
351	**F1010 Parking Structures**				
352	Bulk earthwork	**6,833**	CY	$70.00	$478,339
353	Vehicle access ramp	**1,480**	SF	$30.00	$44,387
354	Retaining wall at open air ramp	**400**	SF	$60.00	$24,000
355	Foundations	**9,977**	GSF	$20.00	$199,540
356	Slab on grade, traffic coating	**8,497**	SF	$30.00	$254,923
357	Basement walls	**5,480**	SF	$75.00	$411,000
358	Columns supporting upper floor plate, paint u/side structure only	**9,977**	GSF	$40.00	$399,080
359	Parking space	**25**	SPACE	$35.00	$875
360	Parking space, ADA hatching, sign	**1**	SPACE	$350.00	$350
361	FP, P, M, E	**8,497**	GSF	$45.00	$382,385
362	**F1010 Parking Structures Total**				**$2,194,879**
363					
364					
365	**F20 SELECTIVE BUILDING DEMOLITION**				
366					
367	**F2000 Building Demolition**				
368	Removal & disposal of existing building in its entirety	**1,465,500**	CFT	$0.65	$952,575
369	**F2000 Building Demolition Total**				**$952,575**
370					
371	**F2020 Hazardous Components Abatement**				
372	Removal / remediation of hazmat	**1**	AL	$400,000.00	$400,000
373	**F2020 Hazardous Components Abatement Total**				**$400,000**
374					
375					
376	**G10 SITE PREPARATION**				
377					
378	**G1010 Site Clearing**				
379	Clearing & grubbing	**3**	ACRE	$5,000.00	$15,000
380	R & D trees (Included stump)	**1**	AL	$5,000.00	$5,000
381	Construction fence installation and maintenance	**2,400**	LF	$16.00	$38,400
382	Double construction gate	**2**	EA	$2,500.00	$5,000
383	Temporary construction entrance	**2**	LS	$7,500.00	$15,000
384	Temporary signs	**1**	LS	$3,000.00	$3,000
385	Wash down/re-fueling/parking	**3,000**	SF	$1.50	$4,500

DIRECT TRADE COST DETAILS

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
386	Tree to protect	1	AL	$2,500.00	$2,500
387	*Erosion and Sedimentation Controls:*				
388	Erosion control barrier install and maintenance	3,600	LF	$12.00	$43,200
389	Erosion control barrier at temp construction period soil stockpile	1	AL	$5,000.00	$5,000
390	Silt sacks in all ex. drainage structures	1	AL	$5,000.00	$5,000
391	Environmental protection	1	AL	$20,000.00	$20,000
392	**G1010 Site Clearing Total**				**$161,600**
393					
394	**G1020 Site Demolition and Relocations**				
395	Saw cut existing pavement	200	LF	$10.00	$2,000
396	Remove asphalt pavement	50,000	SF	$0.85	$42,500
397	Remove existing sidewalk	10,000	SF	$1.50	$15,000
398	Curbing	5,000	LF	$7.00	$35,000
399	Utilities	1	AL	$50,000.00	$50,000
400	Demolition other than above	1	AL	$15,000.00	$15,000
401	**G1020 Site Demolition and Relocations Total**				**$159,500**
402					
403	**G1030 Site Earthwork**				
404	Strip and stockpile existing topsoil; assume 6" thick ave.	2,414	CY	$8.00	$19,311
405	Pavement cut and fill	5,101	CY	$11.00	$56,110
406	Site grading cut and fill	1,171	CY	$9.00	$10,536
407	Rough and fine grading	68,742	SF	$0.75	$51,557
408	Dewatering	4	MTH	$5,000.00	$20,000
409	**G1030 Site Earthwork Total**				**$157,514**
410					
411					
412	**G20 SITE IMPROVEMENTS**				
413					
414	**G2000 Paving and Surfacing**				
415	***G2010 Roadways***				
416	***G2020 Parking Lots***				
417	***G2030 Pedestrian Paving***				
418	New asphalt vehicular driveway and parking	22,044	SF	$3.15	$69,439
419	Gravel base to asphalt pavement	898	CY	$32.00	$28,736
420	Patch existing pavement at street	300	SF	$8.00	$2,400
421	Paint crosswalk	1	AL	$2,500.00	$2,500
422	Color seal surfacing	10,967	SF	$2.00	$21,934
423	Basketball court paint	6,560	SF	$2.00	$13,120
424	Granite curbing	1,235	LF	$42.00	$51,870
425	*Pedestrian Paving*				
426	Concrete sidewalk	27,168	SF	$6.50	$176,592
427	New entrance allowance	3,200	SF	$15.00	$48,000

DIRECT TRADE COST DETAILS

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
428	Curb cut	**12**	EA	$380.00	$4,560
429	Gravel base to concrete pavement	**684**	CY	$32.00	$21,888
430	Integral coloring at concrete paving premium	**3,575**	SF	$5.00	$17,875
431	Cantilevered access ramp	**2,300**	SF	$200.00	$460,000
432	*Stairs and ramps*				
433	C1 cast in place concrete stairs	**185**	LRF	$125.00	$23,125
434	C2 precast concrete stairs	**305**	LRF	$125.00	$38,125
435	C3 cast in place concrete ramp	**790**	GSF	$200.00	$158,000
436	stainless steel handrail	**310**	LF	$450.00	$139,500
437	*Isolated concrete pavement/pads*				
438	Concrete pad	**1**	AL	$5,000.00	$5,000
439	Generator pad	**1**	EA	$2,500.00	$2,500
440	Dumpster pad	**1**	EA	$2,500.00	$2,500
441	*Play area; Rubber play surface*	*16,330*	*SF*		
442	Rough/fine grading	**16,330**	SF	$0.75	Included
443	Cut and fill	**665**	CY	$10.00	$6,650
444	8" Stone base	**446**	CY	$30.00	$13,372
445	UD	**1**	AL	$24,500.00	$24,500
446	Rubber playground safety surface	**16,330**	SF	$16.00	$261,280
447	*Synthetic turf: soccer field and play areas*	*26,275*	*SF*		
448	Rough/fine grading	**26,275**	SF	$0.75	Included
449	Cut and fill	**1,070**	CY	$10.00	$10,700
450	8" Stone base	**717**	CY	$30.00	$21,516
451	Synthetic turf surface	**26,275**	SF	$5.00	$131,375
452	**G2000 Paving and Surfacing Total**				**$1,757,057**
453					
454	**G2040 Site Development**				
455	D1 Cast in place concrete retaining wall form liner finish	**580**	LF	$660.00	$382,800
456	D2 Precast conc retaining seat walls	**425**	LF	$250.00	$106,250
457	D3 precast concrete terraced seating feature	**150**	LF	$750.00	$112,500
458	Bench	**2**	EA	$1,500.00	$3,000
459	Bike rack	**2**	LOC	$1,500.00	$3,000
460	Exterior trash receptacle	**5**	EA	$500.00	$2,500
461	Exterior recycling receptacle	**5**	EA	$750.00	$3,750
462	School sign	**1**	EA	$25,000.00	$25,000
463	Flag pole w/ foundation	**1**	EA	$7,500.00	$7,500
464	Traffic signs	**1**	AL	$15,000.00	$15,000
465	Dumpster enclosure	**45**	LF	$75.00	$3,375
466	Double gate	**1**	PR	$1,500.00	$1,500
467	New playground equipment	**1**	AL	$250,000.00	$250,000
468	Vehicle gate; assume traffic control arm	**2**	EA	$15,000.00	$30,000
469					

DIRECT TRADE COST DETAILS

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
470	Misc. site improvement other than above	1	LS	$50,000.00	$50,000
471	**G2040 Site Development Total**				**$996,175**
472					
473	**G2050 Landscaping**				
474	F1 tree planting	57	EA	$5,000.00	$285,000
475	F4 rain garden	1,410	SF	$20.00	$28,200
476	E5 rain garden boardwalk	570	SF	$20.00	$11,400
477	Respread top soil	2,414	CY	$9.00	$21,725
478	Topsoil for planting beds, shrubs and perennials	1	AL	$7,000.00	$7,000
479	F3 planting bed	35,770	SF	$5.00	$178,850
480	Plantings	1	AL	$175,000.00	$175,000
481	**G2050 Landscaping Total**				**$707,175**
482					
483					
484	**G30 SITE MECHANICAL UTILITIES**				
485					
486	**G3010 Water Supply**				
487	8" T, S,& G in street, Street logistics	1	LOC	$15,000.00	$15,000
488	8" gate	1	EA	$1,000.00	$1,000
489	6" gate	2	EA	$1,000.00	$2,000
490	4" gate	1	EA	$800.00	$800
491	6" CLDI fire protection service	85	LF	$75.00	$6,375
492	2" CLDI domestic water service	90	LF	$65.00	$5,850
493	Hydrant and gate allowance	4	EA	$2,800.00	$11,200
494	Thrust blocks	1	LS	$1,000.00	$1,000
495	**G3010 Water Supply Total**				**$43,225**
496					
497	**G3020 Sanitary Sewer**				
498	Kitchen grease tank	1	EA	$15,000.00	$15,000
499	Sewer MH	2	EA	$4,000.00	$8,000
500	New sanitary sewer service connect to the 8" sewer main	70	LF	$54.00	$3,780
501	Connect to existing sewer pipe, street logistics	1	EA	$15,000.00	$15,000
502	**G3020 Sanitary Sewer Total**				**$41,780**
503					
504	**G3030 Storm Sewer**				
505	Catch basin CB	8	EA	$2,500.00	$20,000
506	Demo existing DMH	1	EA	$1,000.00	$1,000
507	Drain Manhole DMH	6	EA	$4,000.00	$24,000
508	12" Drain pipe	810	LF	$75.00	$60,750
509	48" HDPE pipe storage (roof)	240	LF	$100.00	$24,000
510	New storm drain - base on hard surfacing area	52,412	SF	$4.50	$235,854
511	**G3030 Storm Sewer Total**				**$365,604**

	ELEMENT	QUANTITY	UNIT	UNIT RATE	COST
512					
513	**G3060 Fuel Distribution**				
514	Gas pipe cut and fill - allow from street	**100**	LF	$35.00	$3,500
515	**G3060 Fuel Distribution Total**				**$3,500**
516					
517					
518	**G40 SITE ELECTRICAL UTILITIES**				
519					
520	**G40 Site Electrical Utilities**				
521	***G4010 Electrical Distribution***				
522	***G4020 Site Lighting***				
523	***G4030 Site Communications & Security***				
524	*Utilities*				
525	Electric manhole	**1**	EA	$5,000.00	$5,000
526	Power riser (1-5")	**1**	EA	$1,800.00	$1,800
527	Primary ductbank	**55**	LF	$80.00	$4,400
528	Handhole	**1**	EA	$1,500.00	$1,500
529	Pad mount transformer, By Utility Co, pad only	**1**	EA	$2,200.00	$2,200
530	Secondary ductbank	**40**	LF	$545.00	$21,800
531	Generator ductbank 300A, 60A feed, control wiring and circuitry	**55**	LF	$135.00	$7,425
532	*Communications*				
533	Pole Riser	**1**	LS	$1,200.00	$1,200
534	4-4" PVC conduits concrete encased (allow)	**55**	LF	$100.00	$5,500
535	Handhole	**1**	EA	$1,500.00	$1,500
536	*Site Lighting*				
537	Single head pole light fixture, allow	**25**	EA	$2,000.00	$50,000
538	Double head pole light fixture, allow	**5**	EA	$2,650.00	$13,250
539	Pole base	**30**	EA	$350.00	$10,500
540	Lighting circuitry	**1,850**	LF	$15.00	$27,750
541	*Security System*				
542	Site security system with cameras and cabling (allow)	**1**	LS	$35,000.00	$35,000
543	**G4010 Electrical Distribution Total**				**$188,825**
544					
545					
546					

14.2 Cost Estimate - OPM

Please reference the attached Cost Estimate prepared by Fennessey Consulting Services

Fennessy Consulting Services

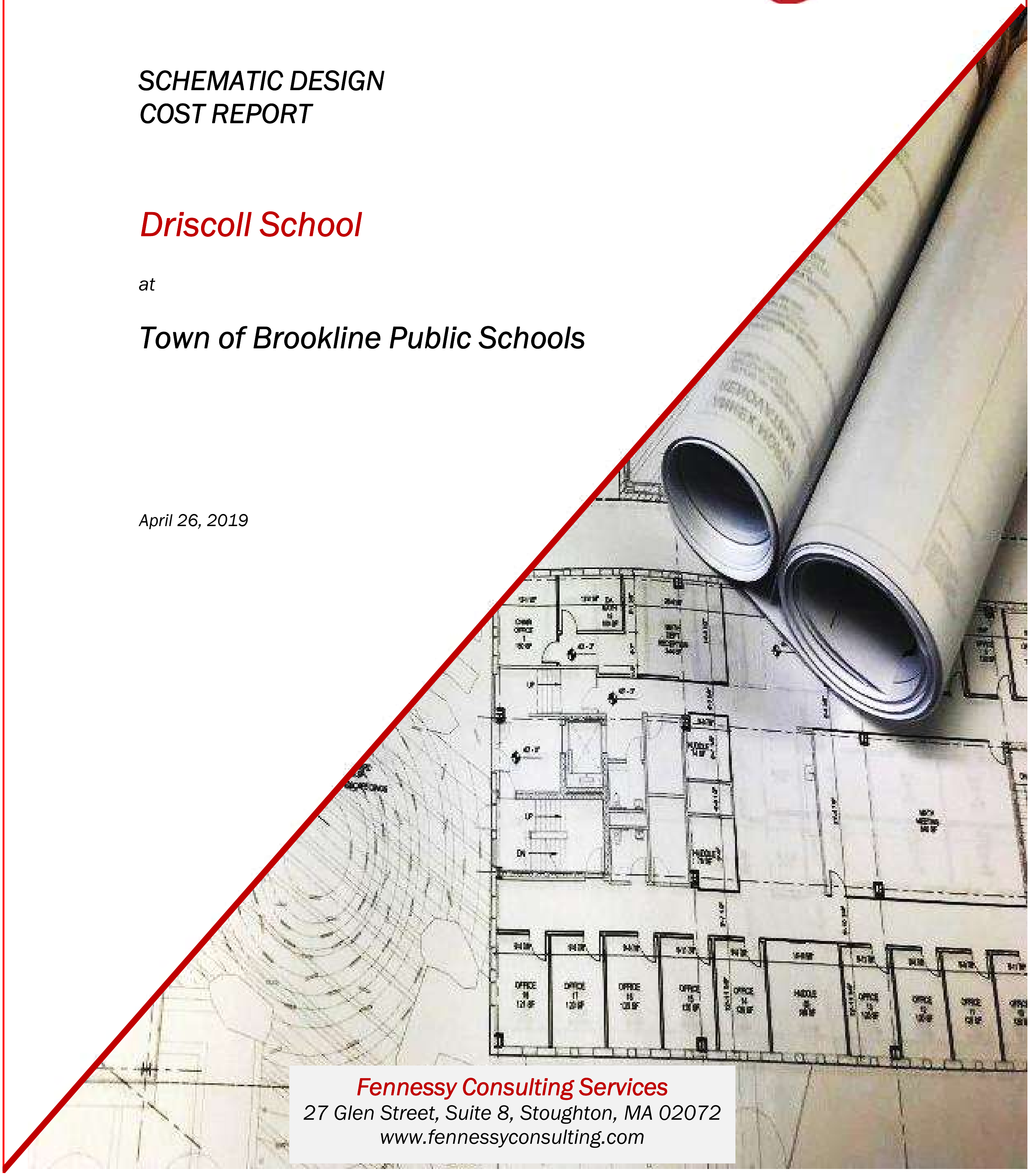
SCHEMATIC DESIGN
COST REPORT

Driscoll School

at

Town of Brookline Public Schools

April 26, 2019



Fennessy Consulting Services
27 Glen Street, Suite 8, Stoughton, MA 02072
www.fennessyconsulting.com

April 26, 2019

Jim Rogers
Leftfield
225 Franklin Street
26th Floor
Boston, MA 02110

TOWN OF BROOKLINE PUBLIC SCHOOLS - Driscoll School, Brookline, MA

Dear Jim:

Please find enclosed our Construction Cost Model for the above referenced project based on schematic design information prepared by Jonathan Levi Architects and their design team, dated February 19,

The financial summary of this cost model is outlined below, however we recommend you review the Executive Summary to fully understand the basis of this report and the included and excluded financial impacts contained therein.

	Const. Start	Gross Floor Area	$/sf	Estimated Cost
Building	Mar-20	163,109	$413.03	$67,368,539
Site Work	Mar-20			$8,792,599
Photovoltaic system				$1,387,080
Geothermal system				$2,000,000
Other non-fossil fuel measures				$2,000,000
ESTIMATED CONTRACT AWARD		**163,109**	**$499.96**	**$81,548,218**

Alternates
None considered at this time

Bidding conditions are expected to reflect one construction manager, open bidding to prequalified sub-contractors, open specifications for materials and manufactures.

This estimate includes all direct construction costs, construction manager's overhead and profit and design contingency. Cost escalation impacts have been included in this report.

Excluded from the estimate are: construction contingency, hazardous waste removal, loose furnishings and equipment, architect's and engineer's fees, moving, administrative and financing costs. Please refer to Exclusions section of the attached report for further information.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

If you have any questions or require further analysis please do not hesitate to contact us.

Sincerely,

Seamus Fennessy

Seamus Fennessy MRICS
Principal/Owner

Enclosures

Contents

The Project

This project in Brookline, Massachusetts comprises the construction of a new elementary school facility of approximately 163,100 gsf together with associated site work.

The program includes, 3# pre-kindergarten classrooms; 4# kindergarten classrooms; 32# classrooms; 3# science classroom; 1# health classroom; 2# language classroom; 3# music/band room; 2# art room; 1# makerspace; 1# fab lab; 3# learning centers; 3# language and academic home base rooms; 1# gymnasium; 1# media center; 1# cafeteria; 1# OP/PT room, and all associated teacher, special ed, small group, planning,and workrooms .

Parking below the building will accommodate 26 vehicles.

Site work includes service and parking access roadways, pedestrian walkways, terraces, plazas, play spaces and ball courts together with all associated hard and soft landscaping.

This cost report also includes additional monies for photovoltaic, geothermal and other non-fossil fuel energy measures to be defined.

Financial Status

Our construction cost model for the entire project is in the order of ***$81.55MM*** *. Within this total we are including $12.18MM of contingencies and escalation.*

Risk

A formal risk analysis has not been performed for this project. Some risk factors to be considered at this time include:

- *Design Contingency*
- *Escalation/Market risk*
- *Approvals process/Funding*

Design Contingency

This construction cost model is based on schematic drawings and specification. Due to this incomplete nature of the design we have utilized historic data and personal experience to complete this cost model. To help alleviate possible cost increases as a result of design completion we recommend a ***design contingency of 10%.*** *We have included this contingency in our cost model. As design progresses this contingency will reduce.*

Escalation/Market Risk

Despite the robust construction market there is still a risk that contractors and material suppliers could cease to exist for a variety of reasons that include bidding below cost. We highly recommend that each project has adequate protection in the form of sub guard (preferred) or bonding for both performance and payment. The current estimate includes for subcontractor bonding.

Due to booming construction industry, labor and material costs and profit margins will increase and are likely to do so for some time. We are anticipating that these cost increases will be relatively significant. Delays in the awarding of a construction contract will have a significant cost impact . To help account for the cost increase between now and the start of construction we have added a ***5.1% escalation factor*** *to the bottom line of this cost report. This escalation factor is currently calculated at 5% per annum (accumulative). As we move closer to design completion, unit rates will become more current and as such the escalation contingency will reduce.*

Approvals Process/Funding.

For the purpose of this report we have included both of these categories together. The risk here is that the funding and approvals process will take significantly longer than expected and hence subject this project to increases in price escalation. We have not included any such pressures in this cost model.

Peer/Comparable Projects

Fennessy Consulting Services does not like to compare individual projects against some perceived cost/sf. Our reasoning for this is based on the fact that no two projects are the same and as such a typical cost/sf is not all that applicable or reliable.

That been said, as a quality control measure we do make comparisons of the various building systems and components that make up this estimate with others to verify that nothing is out of the ordinary. When and if we come across an abnormal system cost we double check this system cost to ensure its accuracy. If it remains abnormal then we draw attention to it as it may become a value engineering target.

Basis of Cost Estimate

Cost Estimate Prepared From	*Dated*	*Received*
Drawings issued for		
Schematic Design	*02/19/19*	*03/07/19*
Outline Specification	*02/19/19*	*03/07/19*
Discussions with the Project Architect and Engineers		

Conditions of Construction

The pricing is based on the following general conditions of construction

A start date of March 2020
A construction period of 32 months
The general contract will be awarded to one construction manager and competitively bid to qualified subcontractors
There will not be small business set aside requirements
The contractor will be required to pay prevailing wages
There are no phasing requirementsother than building demolition
The construction manager will have full access to the site during normal business hours

The Cost Plan is based on the following conditions:

The costs in this report covers construction costs only calculated at current bidding price level (reflecting the current projected construction schedule) with a separate allowance for cost escalation.

Cost escalation is included to the mid point of the construction schedule. Unit rates in the body of the report include appropriate escalation allowances to deliver specific trades within the prescribed schedule if the project were to commence today.

Cost associated with additional escalation required for future start date are included as a below the line markup. This report has included this additional escalation to the scheduled start date of construction noted in this report.

Bidding Process - Market Conditions

This document is based on the measurement and pricing of quantities wherever information is provided and/or reasonable assumptions for other work not covered in the drawings or specifications, as stated within this document. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. All unit rates relevant to subcontractor work include the subcontractors overhead and profit unless otherwise stated. The mark-ups cover the costs of field overhead, home office overhead and profit and range from 15% to 25% of the cost for a particular item of work.

Pricing reflects probable construction costs obtainable in the project locality on the date of this statement of probable costs. This estimate is a determination of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors, with a minimum of 5 bidders for all items of work. Experience and research indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Exclusions

The following cost items have been excluded from this report. Many of these will in fact be required and should be budgeted within the "Soft Cost" component of the project budget

- *Owner supplied and installed furniture, fixtures and equipment*
- *Loose furniture and equipment except as specifically identified*
- *Security equipment and devices*
- *Audio visual head-end equipment*
- *Compression of schedule, premium or shift work, and restrictions on the contractor's working hours*
- *Design, testing, inspection or construction management fees*
- *Architectural and design fees*
- *Scope change and post contract contingencies*
- *Assessments, taxes, finance, legal and development charges*
- *Environmental impact mitigation*
- *Builder's risk, project wrap-up and other owner provided insurance program*
- *Land and easement acquisition*
- *Cost escalation beyond a start date of March 2020*

Areas Calculation

	SF	SF
BUILDING		
Garage	9,393	
Base	20,239	
Level 1	34,332	
Level 2	31,856	
Level 3	33,773	
Level 4	33,431	
Roof	85	
TOTAL GROSS FLOOR AREA		163,109
SITE AREAS		
Site Preparation	177,133	
Site Development		133,817

Overall Summary

		Building	Site Work	Total
A10 FOUNDATIONS		$1,854,011	$0	$1,854,011
A20 BASEMENT CONSTRUCTION		$1,668,976	$0	$1,668,976
B10 SUPERSTRUCTURE		$7,748,826	$0	$7,748,826
B20 EXTERIOR CLOSURE		$7,667,314	$0	$7,667,314
B30 ROOFING		$1,529,275	$0	$1,529,275
C10 INTERIOR CONSTRUCTION		$6,078,620	$0	$6,078,620
C20 STAIRCASES		$647,450	$0	$647,450
C30 FINISHES		$4,207,885	$0	$4,207,885
D10 CONVEYING SYSTEMS		$228,170	$0	$228,170
D20 PLUMBING		$2,587,065	$0	$2,587,065
D30 HVAC		$8,029,819	$0	$8,029,819
D40 FIRE PROTECTION		$931,322	$0	$931,322
D50 ELECTRICAL		$5,684,501	$0	$5,684,501
E10 EQUIPMENT		$689,454	$0	$689,454
E20 FURNISHINGS		$1,170,772	$0	$1,170,772
F10 SPECIAL CONSTRUCTION		$50,000	$0	$50,000
F20 SELECTIVE BUILDING DEMOLITION		$0	$0	$0
Total Building Construction		**$50,773,460**	**$0**	**$50,773,460**
G10 SITE PREPARATION		$0	$1,824,688	$1,824,688
G20 SITE IMPROVEMENTS		$0	$3,771,220	$3,771,220
G30 SITE MECHANICAL UTILITIES		$0	$439,581	$439,581
G40 SITE ELECTRICAL		$0	$149,735	$149,735
G90 OTHER SITE CONSTRUCTION		$0	$0	$0
Total Site Construction		**$0**	**$6,185,224**	**$6,185,224**
TOTAL BUILDING & SITE		**$50,773,460**	**$6,185,224**	**$56,958,684**
MARKUPS		**$5,823,072**	**$1,201,467**	**$7,024,539**
General conditions and project requirements	6.6%	$3,360,000	$880,000	$4,240,000
Bond and insurance	2.0%	$1,082,669	$141,304	$1,223,973
Building permit	0.0%	$0	$0	$0
General contractor's head office overhead and profit	2.5%	$1,380,403	$180,163	$1,560,566
PLANNED CONSTRUCTION COST	**Apr-19**	**$56,596,532**	**$7,386,691**	**$63,983,223**
CONTINGENCIES/ESCALATION		**$10,772,007**	**$1,405,908**	**$12,177,915**
Design and pricing contingency	10.0%	$5,659,653	$738,669	$6,398,322
Gmp contingency	3.0%	$1,867,686	$243,761	$2,111,447
Escalation to start date (March 2020)	5.1%	$3,244,668	$423,478	$3,668,146
ESTIMATED CONTRACT AWARD	**Mar-20**	**$67,368,539**	**$8,792,599**	**$76,161,138**
	GFA	163,109		163,109
	$/sf	$413.03		$466.93
OTHER COSTS				
Photovoltaic system				$1,387,080
Geothermal system				$2,000,000
Other non-fossil fuel measures				$2,000,000
ALTERNATIVE ESTIMATED CONTRACT AWARD				**$81,548,218**

Building - Summary

	Total	$/sf	%	Daedalus Total	Delta	Comments
		GFA	163,109			
A10 Foundations	**$1,854,011**	**$11.37**	**3.28%**	**$4,953,373**	**3,099,362**	
A1010 Foundations	$1,196,688	$7.34	2.11%	$4,606,541	3,409,853	Daedalus has included basement construction here. Unit rate for bulk excavation and disposal carried by Daedalus is unrealistic at $67.50/cy. It is a simple excavation from the side (little to no double handling) with the option for large excavators and easy truck loading. We typically see less when we are removing unsuitable soils and have to bring in and include the price of structural backfill. Daedalus has more basement in special construction. Total basement excavation appears excessive in Daedalus estimate. 38,984 cy v ours at 11,754 and bear in mind they are carrying $65/cy.
A1020 Special Foundations	$0	$0.00	0.00%	$0	0	
A1020 Slab on Grade	$657,323	$4.03	1.16%	$346,832	(310,491)	Daedalus has more slab on grade in special construction. Rates carried by Daedalus not consistent with other projects. Using FCS rates the area discrepency equates to $204K. FCS also including $148k of below slab drainage
A20 Basement Construction	**$1,668,976**	**$10.23**	**2.95%**	**$0**		
A2010 Basement Earthwork	$620,796	$3.81	1.10%	$0		
A2020 Basement Walls	$1,048,180	$6.43	1.85%	$0		
B10 Superstructure	**$7,748,826**	**$47.51**	**13.69%**	**$7,155,786**	**(593,040)**	
B1010 Floor Construction	$6,036,431	$37.01	10.67%	$6,209,088	172,657	Rates utilized by Daedalus are not consistent with other school projects and track high for even complex city projects. We have already adjusted for the Boston influence but we are not close on rates. Daedalus have over measures the quantity of upper floor construction. Steel averaging $4500/tn will have enough in it to cover the tube and AESS premiums. Shear studs - we have never seen a rate for steel studs from any contractor even close to $6.50/sf. Daedalus are including light weight concrete with a vapour reducing admixture (we assume Barrier One). Vapor reducing admixtures do not work with lightweight concrete. In fact most resilient flooring manufacturing have a suitable adhesive and as such will not warrantly their flooring if an admixture is used.
B1020 Roof Construction	$1,712,395	$10.50	3.03%	$946,698	(765,697)	Same comments on unit rates applies here. Again, Daedalus appears to have under-measured the quantity of roof. The largest floor plate alone has over 34300 gsf and we have roofs at multipe levels. The difference is in the quantity of concrete topping. FCS included concrete topping on all lower roofs (fire rating?) This may not be required. Designers to advise.
B20 Exterior Closure	**$7,667,314**	**$47.01**	**13.55%**	**$9,568,595**	**1,901,281**	
B2010 Exterior Walls	$3,451,166	$21.16	6.10%	$5,378,845	1,927,679	Daedalus has the brick wall with stud backup system at $65/sf. JLA architects is in agreement with our birk pricing which equates to a compisit rate of $58/sf. Daedalus rate for phenolic composite wall is very high at $115/sf. We are including the composite wall at $95/sf, Daedalus including $100k for roof screens - not shown, We are including $35K

Fennessy consulting Services

Building - Summary

	Total	$/sf (GFA)	% (163,109)	Daedalus Total	Delta	Comments
B2020 Windows	$4,127,078	$25.30	7.29%	$4,119,750	(7,328)	We do not have an issue with the unit rates carried by Daedalus. Daedalus is adding a custom appied graphic that we are not including ($240,000 - architect to advise) Daedalus has a line item titled "extension to vertical cw as sloping roof. What is this?. Daedalus does not appear to understand the solar shading system and other applied metalwork to the facade. We have horizontal and vertical elements that are similar to window construction. In addition we have a heavier alumiinum fram that sites outboard of the building that has a configuration similar to the windows behind. Our total for all three is $1.24MM. Daedalus is carrying $75k for sunshade.
B2030 Exterior Doors	$89,070	$0.55	0.16%	$70,000	(19,070)	We are including an overhead door at the garage and a premium for bullet resistant glazing at main entrance.
B30 Roofing	**$1,529,275**	**$9.38**	**2.70%**	**$1,104,150**	**(425,125)**	
B3010 Roof Covering	$1,135,275	$6.96	2.01%	$1,006,650	(128,625)	Daedalus quantity appears low. Refer to comments on roof constructiion. They are also including $60,000 for secondary canopies not in our estimate
B3020 Roof Openings	$394,000	$2.42	0.70%	$97,500	(296,500)	Daedalus quantity appears low. We measured from civil drawings not isometrics.
C10 Interior Construction	**$6,078,620**	**$37.27**	**10.74%**	**$5,232,526**	**(846,094)**	
C1010 Partitions	$4,368,618	$26.78	7.72%	$3,640,728	(727,890)	Daedalus has a line item for "movable partitions". We assume this is between the classrooms. Our quantity is much higher and we are carring a higher rate for both the acoutic requirment and the magnetic writable surface (Daedalus -$240k). Deadalus is including mis metals in this section, We have it in Specialties (Daedalus +427K). We are including railings in this section ($274k) Daedalus including in specialties. Daedalus rate for cmu is too low but their rate for glass partitions is very high. Also they have a higher quantity of glass partitions. We measuted anything that looked like a glass partition on the plans and included at 9' tall.
C1020 Interior Doors	$703,015	$4.31	1.24%	$505,300	(197,715)	Daedalus composite rate for doors is low ($1,600 ea).
C1030 Specialties	$1,006,987	$6.17	1.78%	$1,086,498	79,511	Daedalas is including $272k for railings in this section carried in Partitions by us. Daedalus signage allowance is twice as high as normal - Architect to advise on appropriateness of this amount, including an allowance for interior graphics. Daedalus has an allowance of $3,000 per classroom for tackboards. We are carrying 6' per room as the rooms are basically all writing surface.
C20 Staircases	**$647,450**	**$3.97**	**1.14%**	**$788,000**	**140,550**	
C2010 Stair Construction	$548,350	$3.36	0.97%	$655,000	106,650	Daedalus rate for feature stairs a little higher than us - architect to advise. $30k for a flight of egress stairs is excessive (assuming standard picket rails). Daedalus has one flight of feature staircase too many
C2020 Stair Finishes	$99,100	$0.61	0.18%	$133,000	33,900	Same extra flight issue

TOWN OF BROOKLINE PUBLIC SCHOOLS
Driscoll School
Brookline, MA
SCHEMATIC DESIGN COST REPORT
April 26, 2019

	Total	$/sf	%	Daedalus Total	Delta	Comments
		GFA	163,109			
C30 Finishes	**$4,207,885**	**$25.80**	**7.43%**	**$4,178,236**	**(29,649)**	
C3010 Wall Finishes	$1,825,850	$11.19	3.23%	$1,395,800	(430,050)	Daedalus quantity of tile in restrooms appears low. (Difference -
C3020 Floor Finishes	$970,354	$5.95	1.71%	$1,347,383	377,029	Daedalus appears to have priced LVT not vct. Architect conformed that it is vct (Difference +$343k) Daedalus has inclued moisture mitigation not included in ours for reasons already stated. This also happens to be a duplication in pricing ($87k)
C3030 Ceiling Finishes	$1,411,681	$8.65	2.49%	$1,435,053	23,372	
D10 Conveying Systems	**$228,170**	**$1.40**	**0.40%**	**$225,000**	**(3,170)**	
D1010 Elevators and Lifts	$228,170	$1.40	0.40%	$225,000	(3,170)	
D1020 Escalators and Moving Walkways	$0	$0.00	0.00%	$0	0	
D1030 Other Conveying Systems	$0	$0.00	0.00%	$0	0	
D20 Plumbing	**$2,587,065**	**$15.86**	**4.57%**	**$2,334,480**	**(252,585)**	
D2010 Plumbing Complete	$2,587,065	$15.86	4.57%	$2,334,480	(252,585)	Our rates based on an elementary school project in Wareham of similar size
D30 Heating, Ventilation and Air Conditioning	**$8,029,819**	**$49.23**	**14.19%**	**$8,003,440**	**(26,379)**	
D3010 HVAC, Complete	$8,029,819	$49.23	14.19%	$8,003,440	(26,379)	We are carrying $1.3MM for a wood chip burning system based on Athol Elementary School $650,000 system bid Sept 2014 for a 96,000 gsf school. Daedalus carrying $1MM. Remainder of our estimate based on Wareham project Daedalus remainder priced high.
D40 Fire Protection	**$931,322**	**$5.71**	**1.65%**	**$1,089,424**	**158,102**	
D4010 Fire Protection, Complete	$931,322	$5.71	1.65%	$1,089,424	158,102	The $7/sf carried by Daedalus would be high in a building with small rooms. It is simply not consistent with other school projects, even after including a fire pump..
D50 Electrical	**$5,684,501**	**$34.85**	**10.04%**	**$6,225,280**	**540,779**	
D5010 Electrical, Complete	$5,684,501	$34.85	10.04%	$6,225,280	540,779	Dedalus rate/sf high for schools. We have a more detailed breakdown for design team comment. This is based on Wareham
E10 Equipment	**$689,454**	**$4.23**	**1.22%**	**$540,000**	**(149,454)**	
E1010 Commercial Equipment	$414,090	$2.54	0.73%	$275,000	(139,090)	Daedalus kitchen equipment appears low ($275k). There is no way a full service kitchen that serves this many students could be provided for Daedalus amount (if Brookline operates a commissary then Daedalus total is acceptable)
E1020 Institutional Equipment	$111,500	$0.68	0.20%			
E1030 Vehicular Equipment	$7,500	$0.05	0.01%	$265,000	317,364	Daedalus is including $150k for gym equipment. We have $128k.
E1090 Other Equipment	$156,364	$0.96	0.28%			
					0	
E20 Furnishings	**$1,170,772**	**$7.18**	**2.07%**	**$2,207,555**	**1,036,783**	
E2010 Fixed Furnishings	$1,170,772	$7.18	2.07%	$2,194,080	1,023,308	Architect to confirm if we have the appropriate allowances based on measurements for casework or if Daedalus's allowance per room are more appropriate
E2020 Loose Furnishings	$0	$0.00	0.00%	$13,475	13,475	
F10 Special Construction	**$50,000**	**$0.31**	**0.09%**	**$2,194,879**	**2,144,879**	
F1010 Special Structures	$50,000	$0.31	0.09%	$2,194,879	2,144,879	All of the garage costs are included in the remainder of our estimate. We do not understand why we have additional superstructure at garage when they already appear to be high already. $45/sf for MEPFP systems in the parking garage is high.
F1020 Integrated Construction	$0	$0.00	0.00%	$0	0	
F1030 Special Construction Systems and Facilities	$0	$0.00	0.00%	$0	0	

Hennessy consulting services

TOWN OF BROOKLINE PUBLIC SCHOOLS
Driscoll School
Brookline, MA
SCHEMATIC DESIGN COST REPORT
April 26, 2019

		Total	$/sf	%	Daedalus Total	Delta	Comments
			GFA	163,109			
F20 Selective Building Demolition		**$0**	**$0.00**	**0.00%**	**$1,352,575**	**1,352,575**	
F2010 Building Elements Demolition		$0	$0.00	0.00%	$952,575	952,575	Included in our site preparation
F2020 Hazardous Components Abatement		$0	$0.00	0.00%	$400,000	400,000	Included in our site preparation
TOTAL BUILDING CONSTRUCTION		**$50,773,460**	**$311.29**	**89.71%**	**$57,153,299**	**6,379,839**	
G10 Site Preparation		**$0**	**$0.00**	**0.00%**	**$0**	**0**	
G1010 Site Clearing and Demolition		$0	$0.00	0.00%	$0	0	
G1030 Site Earthwork		$0	$0.00	0.00%	$0	0	
G1040 Hazardous Waste Remediation		$0	$0.00	0.00%	$0	0	
G20 Site Improvement		**$0**	**$0.00**	**0.00%**	**$0**	**0**	
G2010 Roadways and Parking Lots		$0	$0.00	0.00%	$0	0	
G2030 Pedestrian Paving		$0	$0.00	0.00%	$0	0	
G2040 Site Development		$0	$0.00	0.00%	$0	0	
G2050 Landscaping		$0	$0.00	0.00%	$0	0	
G30 Site Mechanical		**$0**	**$0.00**	**0.00%**	**$0**	**0**	
G3010 Mechanical Utilities		$0	$0.00	0.00%	$0	0	
G40 Site Electrical		**$0**	**$0.00**	**0.00%**	**$0**	**0**	
G4010 Electrical Utilities and Site Lighting		$0	$0.00	0.00%	$0	0	
G90 Other Site Construction		**$0**	**$0.00**	**0.00%**	**$0**	**0**	
G9010 Service and Pedestrian Tunnels		$0	$0.00	0.00%	$0	0	
G9090 Other Site Systems		$0	$0.00	0.00%	$0	0	
Total Site Construction		**$0**	**$0.00**	**0.00%**	**$0**	**0**	
TOTAL BUILDING & SITE		**$50,773,460**	**$311.29**	**89.71%**	**$57,153,299**	**6,379,839**	
Markups		**$5,823,072**	**$35.70**	**10.29%**	**$8,493,000**	**2,669,928**	
General Conditions							
General conditions and project requirements	6.62%	$3,360,000	$20.60	5.94%	$4,754,000	514,000	Ours general conditions total $4.2MM or $160,000 per month (1/2 of that for site). In a non GMP situation gcs on school projects typically run at $120k/month
Bond and insurance	2.00%	$1,082,669	$6.64	1.91%	$2,041,000	817,027	2% verses 3%
Building permit	0.00%	$0	$0.00	0.00%	$0	0	
Overhead and profit							
General contractor's head office overhead and profit	2.50%	$1,380,403	$8.46	2.44%	$1,698,000	137,434	
PLANNED CONSTRUCTION COST	**Apr-19**	**$56,596,532**	**$346.99**	**100.00%**	**$65,646,299**	**9,049,767**	
Contingencies/Escalation		**$10,772,007**	**$66.04**		**$12,972,000**	**2,199,993**	
Contingencies							
Design and pricing contingency	10.00%	$5,659,653	$34.70		$6,174,000	(224,322)	
Gmp contingency	3.00%	$1,867,686	$11.45		$2,038,000	(73,447)	
Escalation							
Escalation to start date (March 2020)	5.06%	$3,244,668	$19.89		$4,760,000	1,091,854	4.6% verses 6.07%
ESTIMATED CONTRACT AWARD	**Mar-20**	**$67,368,539**	**$413.03**		**$78,618,299**	**11,249,760**	

Fennessy Consulting Services

	Quantity	Unit	Rate	Total
A1010 FOUNDATIONS				
Strip footings at exterior				
Excavation	1,017	CY	11.50	11,696
Remove off site	1,017	CY	23.50	23,900
Backfill with gravel	826	CY	38.00	31,388
Formwork	2,575	SF	11.75	30,256
Reinforcement	19,100	LB	1.40	26,740
Concrete	191	CY	190.50	36,386
Strip footings at interior				
Excavation	74	CY	11.50	851
Remove off site	74	CY	23.50	1,739
Backfill with gravel	47	CY	38.00	1,786
Formwork	368	SF	11.75	4,324
Reinforcement	2,700	LB	1.40	3,780
Concrete	27	CY	190.50	5,144
Strip footings at elevation changes at stage				
Excavation	144	CY	11.50	1,656
Remove off site	144	CY	23.50	3,384
Backfill with gravel	91	CY	38.00	3,458
Formwork	720	SF	11.75	8,460
Reinforcement	5,300	LB	1.40	7,420
Concrete	53	CY	190.50	10,097
Strip footings at elevation changes at ramp				
Excavation	48	CY	11.50	552
Remove off site	48	CY	23.50	1,128
Backfill with gravel	30	CY	38.00	1,140
Formwork	237	SF	11.75	2,785
Reinforcement	1,800	LB	1.40	2,520
Concrete	18	CY	190.50	3,429
Strip footings at basement				
Excavation	894	CY	11.50	10,281
Remove off site	894	CY	23.50	21,009
Backfill with gravel	522	CY	38.00	19,836
Formwork	3,829	SF	11.75	44,991
Reinforcement	37,200	LB	1.40	52,080
Concrete	372	CY	190.50	70,866
Strip footings at areaway				
Excavation	308	CY	11.50	3,542
Remove off site	308	CY	23.50	7,238
Backfill with gravel	250	CY	38.00	9,500
Formwork	780	SF	11.75	9,165
Reinforcement	5,800	LB	1.40	8,120
Concrete	58	CY	190.50	11,049
Column footings at basement level				
Excavation	874	CY	13.00	11,362
Remove excavated material off site	874	CY	23.50	20,539

	Quantity	Unit	Rate	Total
Backfill with gravel	566	CY	38.00	21,508
Formwork	4,160	SF	11.75	48,880
Reinforcement	18,480	LB	1.40	25,872
Concrete	308	CY	190.50	58,674
Column footings at exterior				
Excavation	917	CY	13.00	11,921
Remove excavated material off site	917	CY	23.50	21,550
Backfill with gravel	713	CY	38.00	27,094
Formwork	2,752	SF	11.75	32,336
Reinforcement	12,240	LB	1.40	17,136
Concrete	204	CY	190.50	38,862
Column footings at interior				
Excavation	108	CY	13.00	1,404
Remove excavated material off site	108	CY	23.50	2,538
Backfill with gravel	70	CY	38.00	2,660
Formwork	512	SF	11.75	6,016
Reinforcement	2,280	LB	1.40	3,192
Concrete	38	CY	185.25	7,040
Column footings at canopy				
Excavation	116	CY	13.00	1,508
Remove excavated material off site	116	CY	23.50	2,726
Backfill with gravel	111	CY	38.00	4,218
Formwork	192	SF	11.75	2,256
Reinforcement	375	LB	1.40	525
Concrete	5	CY	190.50	953
Foundation walls				
Formwork	6,867	SF	11.75	80,687
Reinforcement	22,318	LB	1.40	31,245
Concrete	169	CY	196.50	33,209
Waterproofing, mastic	3,434	SF	2.75	9,444
Insulation	3,434	SF	3.00	10,302
Walls at elevation changes at stage				
Formwork	1,440	SF	12.50	18,000
Reinforcement	4,680	LB	1.40	6,552
Concrete	35	CY	196.50	6,878
Waterproofing, mastic	720	SF	2.75	1,980
Insulation	720	SF	3.00	2,160
Miscellaneous				
Allowance for piers/pilasters	132	EA	575.00	75,900
Set base plates	132	EA	100.00	13,200
Miscellaneous concrete costs - premium for pump grade concrete mix and pump	1,522	CY	17.50	26,635
Perimeter foundation drainage, including gravel and filter fabric	1,202	LF	15.00	18,030
Subtotal				**$1,196,688**

	Quantity	Unit	Rate	Total
A1030 SLAB ON GRADE				
Standard slab on grade				
Gravel fill	1,604	CY	38.00	60,952
Rigid insulation under slab on grade	43,316	SF	2.50	108,290
Vapor barrier	43,316	SF	0.40	17,326
Mesh reinforcing 15% lap	49,813	SF	0.90	44,832
Concrete in slab, complete	802	CY	184.50	147,969
Finishing and curing	43,316	SF	1.60	69,306
Control and construction joints	43,316	SF	0.50	21,658
Isolation joints at columns	408	LF	3.50	1,428
Perimeter joints	3,076	LF	3.00	9,228
Standard slab on grade, at areaway				
Gravel fill	6	CY	38.00	228
Vapor barrier	164	SF	0.40	66
Mesh reinforcing 15% lap	189	SF	0.90	170
Concrete in slab, complete	3	CY	184.50	554
Finishing and curing	164	SF	1.60	262
Control and construction joints	164	SF	0.50	82
Perimeter joints	26	LF	3.00	78
Elevator/Escalator pit				
Excavation	36	CY	15.00	540
Remove excavated material off site	36	CY	23.50	846
Backfill with gravel	17	CY	38.00	646
Formwork to slab edge	54	SF	11.75	635
Reinforcement in slab	450	LB	1.40	630
Concrete in slab	5	CY	190.50	953
Formwork to pit walls	180	SF	12.00	2,160
Reinforcement	450	LB	1.40	630
Concrete in pit walls	7	CY	196.50	1,376
Cementitious waterproofing to elevator pit	261	SF	15.00	3,915
Miscellaneous				
Miscellaneous concrete costs - premium for pump grade concrete mix and pump	823	CY	17.50	14,403
Below slab drainage system	29,632	SF	5.00	148,160
Subtotal				**$657,323**
A2010 BASEMENT EARTHWORK				
Basement earthwork				
Excavation	6,307	CY	12.00	75,684
Excavate for working space	5,248	CY	12.00	62,976
Remove excavated material off site	11,555	CY	23.50	271,543
Backfill around basement walls with gravel	5,248	CY	38.00	199,424
Areaway earthwork				
Excavation	91	CY	12.00	1,092
Excavate for working space	108	CY	12.00	1,296

	Quantity	Unit	Rate	Total
Remove excavated material off site	199	CY	23.50	4,677
Backfill around areaway walls with gravel	108	CY	38.00	4,104
Subtotal				**$620,796**

A2020 BASEMENT WALLS

	Quantity	Unit	Rate	Total
Basement walls				
Formwork to walls	35,735	SF	13.50	482,423
Reinforcement	116,139	LB	1.40	162,595
Concrete in walls	880	CY	196.50	172,920
Waterproofing, membrane, including protection board	17,868	SF	7.00	125,076
Insulation	17,868	SF	3.00	53,604
Areaway walls				
Formwork to walls	786	SF	13.50	10,611
Reinforcement	2,555	LB	1.40	3,577
Concrete in walls	19	CY	191.25	3,634
Waterproofing, membrane, including protection board	393	SF	7.00	2,751
Miscellaneous				
Water stops	1,176	LF	6.00	7,056
Miscellaneous concrete costs - premium for pump grade concrete mix and pump	899	CY	17.50	15,733
Areaway grating	164	SF	50.00	8,200
Subtotal				**$1,048,180**

B1010 FLOOR CONSTRUCTION

	Quantity	Unit	Rate	Total
Steel construction				
Columns				
Tube/pipe	120	T	4,400.00	528,000
Shear/brace frames				
W sections	30	T	4,100.00	123,000
Tube/pipe	30	T	4,400.00	132,000
Floor framing				
W sections	539	T	4,100.00	2,209,900
Other steel framing	74	T	4,400.00	325,600
Shear studs	23,959	EA	3.85	92,242
Bent plate in pour stop	5,190	LF	25.00	129,750
Metal decking, standard	107,663	SF	4.00	430,652
Metal decking, acoustic	12,130	SF	8.25	100,073
Concrete construction				
Concrete topping to floors				
Mesh reinforcing 15% lap	137,762	SF	0.90	123,986
Concrete topping	1,863	CY	184.50	343,724
Finishing and curing	119,793	SF	1.60	191,669
Control and construction joints	119,793	SF	0.50	59,897
Miscellaneous concrete costs				
Premium for pump grade concrete mix and pump	1,863	CY	17.50	32,603
Added cost for lightweight concrete	1,863	CY	27.00	50,301

	Quantity	Unit	Rate	Total
Acoustic treatment				
Acoustic mat and cemnentitious topping	119,793	SF	7.00	838,551
Masonry wall - load bearing				
Included in Partitions				
Miscellaneous				
Fireproofing steel	119,793	SF	2.20	263,545
Fire stopping	119,793	SF	0.30	35,938
Equipment pads	1,000	SF	25.00	25,000
Subtotal				**$6,036,431**
B1020 ROOF CONSTRUCTION				
Steel construction				
Columns				
Tube/pipe	48	T	4,400.00	211,200
Shear/brace frames				
W sections	12	T	4,400.00	52,800
Tube/pipe	12	T	4,400.00	52,800
Steel members in roof framing				
W sections	216	T	4,100.00	885,600
Tubes in canopy framing, galvanized	5	T	4,700.00	23,500
Steel dunnage and roof screen framing, galvanized	30	T	4,400.00	132,000
Bent plate in pour stop	464	LF	25.00	11,600
Metal decking, standard	48,014	SF	4.00	192,056
Concrete construction				
Concrete topping to roof				
Mesh reinforcing 15% lap	7,763	SF	0.90	6,987
Concrete topping	105	CY	184.50	19,373
Finishing and curing	6,750	SF	1.60	10,800
Control and construction joints	6,750	SF	0.50	3,375
Miscellaneous concrete costs				
Premium for pump grade concrete mix and pump	105	CY	17.50	1,838
Added cost for lightweight concrete	105	CY	27.00	2,835
Masonry wall - load bearing				
Included in partitions				
Miscellaneous				
Fireproofing steel	48,014	SF	2.20	105,631
Subtotal				**$1,712,395**
B2010 EXTERIOR WALL				
Interior backup - metal stud				
Metal stud framing	39,677	SF	8.00	317,416
Denshield or similar to exterior face of stud backup	39,677	SF	3.85	152,756
Insulation	39,677	SF	4.00	158,708
Air barrier	39,677	SF	5.00	198,385
Drywall lining to interior face of stud backup	39,677	SF	4.00	158,708

	Quantity	Unit	Rate	Total
Interior backup - CMU				
CMU 8" thick	2,433	SF	30.00	72,990
Rigid insulation	2,433	SF	4.00	9,732
Air barrier	2,433	SF	5.00	12,165
Exterior skin - brick				
Brick	31,583	SF	32.00	1,010,656
Decoration premium - allowance	31,583	SF	1.50	47,375
Exterior skin - phenolic				
General areas (Trespa)	10,528	SF	70.00	736,960
Soffits @ building overhang	452	SF	70.00	31,640
Light gauge metal support to soffit	452	SF	8.00	3,616
Plywood sheathing at eaves	452	SF	3.00	1,356
Insulation at soffit	452	SF	4.00	1,808
Air barrier	452	SF	5.00	2,260
Exterior skin - metal panel				
Roof screen (allowance)	640	SF	55.00	35,200
Miscellaneous				
Lintels - steel (allowance)	900	LF	32.00	28,800
Relieving angles to brickwork - allowance	3,000	LF	22.00	66,000
Scaffolding to exterior wall	64,784	SF	5.00	323,920
Flashings at sills and lintels	1	LS	12,250.00	12,250
Flashing, thru wall, at parapet/roof edge	2,067	LF	15.00	31,005
Control joints in exterior wall (1#/30LF)	2,098	LF	5.00	10,490
Wood blocking	8,990	LF	3.00	26,970
Subtotal				**$3,451,166**

B2020 WINDOWS

	Quantity	Unit	Rate	Total
Aluminum storefront				
Storefront/window system, glazed				
Complete	3,401	SF	90.00	306,090
Aluminum curtain wall				
Curtain wall	19,273	SF	130.00	2,505,490
Other systems				
Louvers	200	SF	65.00	13,000
Ancillaries				
Backer rod and double sealant	6,802	LF	6.00	40,812
Wood blocking at openings	6,802	LF	3.00	20,406
Solar shading				
Horizontal translucent panels	1,419	SF	150.00	212,850
Vertical translucent panels	2,250	SF	170.00	382,500
Open grid	7,177	SF	90.00	645,930
Subtotal				**$4,127,078**

Building - Estimate Detail

	Quantity	Unit	Rate	Total
B2030 EXTERIOR DOORS				
Hollow metal doors, frame and hardware				
Double leaf				
Complete	2	PR	4,200.00	8,400
Aluminum doors				
Double leaf				
Complete	4	PR	8,000.00	32,000
Specialty doors				
Overhead doors at garage	1	EA	16,250.00	16,250
Added cost for bullet resistant glazing	180	SF	120.00	21,600
Miscellaneous				
Added cost for door operators	2	EA	5,000.00	10,000
Paint to door and frame	4	EA	120.00	480
Backer rod and double sealant	2	EA	90.00	180
Wood blocking at openings	2	EA	80.00	160
Subtotal				**$89,070**
B3010 ROOF COVERING				
PVC roof membrane fully adhered	48,014	SF	10.25	492,144
Abutment of flat roof with adjacent walls	2,963	LF	10.50	31,112
Allowance for working membrane roofing around pipe and duct penetrations	1	LS	73,821.60	73,822
Insulation tapered	48,014	SF	4.00	192,056
Roof sheathing	48,014	SF	2.50	120,035
Rough blocking	8,889	LF	3.00	26,667
Miscellaneous roofing				
Walkway pads	1,848	SF	8.00	14,784
Flashings	2,963	LF	10.00	29,630
Edge trim/stop	1,618	LF	75.00	121,350
Parapet coping	449	LF	75.00	33,675
Subtotal				**$1,135,275**
B3020 ROOF OPENINGS				
Skylight	2,175	SF	180.00	391,500
Roof hatch/ vents	1	LS	2,500.00	2,500
Subtotal				**$394,000**
C1010 PARTITIONS				
Partitions, drywall				
Typical	64,609	SF	13.70	885,143
Typical, 6"	24,870	SF	15.20	378,024
Typical, set to curve	2,229	SF	17.13	38,183
Typical, over glass	1,429	SF	17.13	24,479
Typical, over operable partition	2,586	SF	17.13	44,298
Plumbing chase	3,180	SF	9.99	31,768
Curved shaft at classrooms	8,240	SF	9.93	81,823

	Quantity	Unit	Rate	Total
Mechanical shaft	11,019	SF	12.94	142,586
Type half wall at overlook	167	SF	10.60	1,770
Furring at masonry walls	10,448	SF	5.80	60,598
GWB column covers	486	EA	900.00	437,400
Partitions masonry				
8" CMU, reinforced	10,448	SF	30.00	313,440
Typical @ gym and storeroom areas	6,476	SF	30.00	194,280
Typical @ stairs and elevator	10,448	SF	30.00	313,440
Window walls and borrowed lights				
Glass partition, aluminum, complete	9,590	SF	70.00	671,300
Folding partitions				
Wood, acoustic	3,447	SF	100.00	344,700
Rails and handrails, stainless steel and glass				
Rail at areas open to below	548	LF	500.00	274,000
Miscellaneous				
Sealants and caulking at partitions	163,109	SF	0.45	73,399
Rough blocking	19,329	LF	3.00	57,987
Subtotal				**$4,368,618**

C1020 INTERIOR DOORS

	Quantity	Unit	Rate	Total
Hollow metal doors				
Double leaf				
Complete	4	PR	4,000.00	16,000
Wood doors				
Single leaf				
Complete	60	EA	2,200.00	132,000
Single leaf				
Complete, full lite solid core	90	EA	2,300.00	207,000
Single leaf door				
Complete, birch full lite solid core at small rooms with sliding barn door hardware	50	EA	2,400.00	120,000
Double leaf				
Complete	5	PR	3,800.00	19,000
Aluminum doors				
Single leaf door				
Complete,	8	EA	4,200.00	33,600
Double leaf door				
Complete	14	EA	8,000.00	112,000
Specialty doors				
Overhead door - Allowance	1	LS	10,000.00	10,000
Allowance for miscellaneous access doors	47	EA	475.00	22,325
Miscellaneous				
Added cost for door operators	2	EA	5,000.00	10,000
Paint to door and frame	78	EA	120.00	9,360

	Quantity	Unit	Rate	Total
Sealants and caulking	69	EA	90.00	6,210
Wood blocking at openings	69	EA	80.00	5,520
Subtotal				**$703,015**
C1030 SPECIALTIES				
Specialties				
Toilet partitions, phenolic, handicapped	8	EA	1,500.00	12,000
Toilet partitions, phenolic, regular	24	EA	1,200.00	28,800
Toilet partitions, phenolic, urinal screens	8	EA	500.00	4,000
Miscellaneous metal to ceiling supported toilet partitior	32	EA	250.00	8,000
Vanity counters				
Solid surface	158	LF	250.00	39,500
Toilet accessories				
Large toilet	8	EA	2,500.00	20,000
Medium toilet	2	EA	2,000.00	4,000
Small toilet	13	EA	1,500.00	19,500
Mop and broom holder	5	EA	120.00	600
Hanging rod assumed at nurse	60	LF	30.00	1,800
Marker boards and tack boards	126	LF	100.00	12,600
Lockers, double tier	840	OPE	300.00	252,000
Signage/Directories	163,109	SF	0.45	73,399
Fire extinguishers and cabinets	47	EA	450.00	21,150
Miscellaneous				
Miscellaneous shelving	1	LS	2,500.00	2,500
Backer panels in electrical closets	5	LS	300.00	1,500
Allowance for miscellaneous metals not identifiable at this stage	163,109	SF	2.75	448,550
Miscellaneous sealants throughout building	163,109	SF	0.35	57,088
Subtotal				**$1,006,987**
C2010 STAIR CONSTRUCTION				
Feature staircase				
Feature stair	108	RSR	2,200.00	237,600
Rail/balustrade to feature staircase	124	LF	500.00	62,000
Egress/Internal circulation staircases				
Egress staircase, including rails and handrails	11	FLT	22,000.00	242,000
Miscellaneous steps and ladders				
Steps at mechanical room	1	LS	3,000.00	3,000
Steps at stage	1	LS	3,000.00	3,000
Access ladder to roof	1	EA	750.00	750
Subtotal				**$548,350**

	Quantity	Unit	Rate	Total
C2020 STAIR FINISHES				
Stair finishes				
To feature staircase	108	RSR	500.00	54,000
Vct	11	FLT	1,600.00	17,600
Paint and sealer to egress staircases	11	FLT	2,500.00	27,500
Subtotal				***$99,100***
C3010 WALL FINISHES				
Paint				
To cmu	30,839	SF	1.20	37,007
To gwb or plaster	148,144	SF	1.00	148,144
Tile				
Ceramic tile	10,366	SF	22.00	228,052
Wood				
Paneling to walls	3,170	SF	55.00	174,350
Paint/Stain to wood paneling	3,170	SF	2.00	6,340
Wall covering				
Fabric wrapped acoustic panel	6,454	SF	35.00	225,890
FRP at kitchen	2,125	SF	15.00	31,875
Magnetic writable surface	60,887	SF	16.00	974,192
Subtotal				***$1,825,850***
C3020 FLOOR FINISHES				
Resilient flooring				
Vinyl composition tile	102,086	SF	5.00	510,430
Rubber at ot/pt	868	SF	12.00	10,416
Carpet				
Carpet tile at media center	455	SY	50.00	22,750
Floor tile				
Porcelain tile at community bathrooms	1,863	SF	25.00	46,575
Porcelain tile at small bathrooms	972	SF	25.00	24,300
Porcelain tile at staff shower	183	SF	25.00	4,575
Quarry tile	2,377	SF	22.00	52,294
Marble thresholds @ bathrooms	23	EA	100.00	2,300
Wood flooring				
Athletic wood	9,313	SF	16.00	149,008
Theatrical wood and 3/4" plywood sub-floor	1,687	SF	24.00	40,488
Resins/sealers				
Concrete sealer	7,930	SF	0.75	5,948
Epoxy flooring at locker rooms	823	SF	8.00	6,584
Traffic coating @ ramps only	1,324	SF	3.00	3,972
Parking markings	25	SPCES	100.00	2,500
Bases to walls				
Allowance	1	LS	88,214.00	88,214
Subtotal				***$970,354***

Building - Estimate Detail

	Quantity	Unit	Rate	Total
C3030 CEILING FINISHES				
Drywall				
On light gauge framing support system	4,000	SF	12.50	50,000
On suspension system	3,018	SF	9.50	28,671
Vertical drywall soffits	7,000	LF	30.00	210,000
Acoustical ceiling tile				
Generally 2' x 2'	78,633	SF	7.00	550,431
Suspended lay-in pre-painted tegular edge tectum plan	9,764	SF	9.00	87,876
Wood				
Type ?	2,701	SF	45.00	121,545
Metal				
Type 3d metal panel	1,373	SF	40.00	54,920
Paint				
Exposed structure	41,350	SF	1.50	62,025
Drywall or plaster ceiling	14,018	SF	1.10	15,420
Miscellaneous				
Thermal and vapor barrier under building within parking garage	8,815	SF	7.00	61,705
Miscellaneous premium ceilings	153,716	SF	1.10	169,088
Subtotal				**$1,411,681**
D1010 ELEVATORS AND LIFTS				
Passenger elevators				
Passenger elevator, 5 stop, holeless hydraulic	1	EA	215,000.00	215,000
Elevator cab finish	1	EA	12,000.00	12,000
Pit ladders	1	EA	750.00	750
Sill angles	12	LF	35.00	420
Subtotal				**$228,170**
D2010 PLUMBING				
Equipment				
Complete	153,716	SF	0.40	61,486
Fixtures				
Complete	153,716	SF	4.95	760,894
Domestic water piping				
Complete	153,716	SF	4.15	637,921
Sanitary waste and vent piping				
Complete	153,716	SF	3.90	599,492
Storm water piping				
Complete	153,716	SF	2.20	338,175
Gas piping				
Complete	153,716	SF	0.25	38,429
Within parking garage, including oil separator	9,393	SF	4.50	42,269

	Quantity	Unit	Rate	Total
Miscellaneous				
Kitchen connections	1	LS	35,000.00	35,000
Testing, shop drawings, permits, etc.	163,109	SF	0.45	73,399
Subtotal				**$2,587,065**

D3010 HVAC

	Quantity	Unit	Rate	Total
Equipment				
Wood chip boiler system, complete or other non-fossil fuel measures	153,716	SF	8.43	1,295,826
Boiler, pumps, chillers, air handling units, terminal boxes, heaters, etc.	153,716	SF	10.40	1,598,646
Hot and chiller water piping				
Complete	153,716	SF	8.42	1,294,289
Sheet metal				
Ductwork	150,000	LBS	12.00	1,800,000
Boiler combustion air and vent (condensing boilers)	1	LS	25,000.00	25,000
Grilles, registers and diffusers	615	EA	250.00	153,750
Sound attenuator allowance)	8	EA	1,200.00	9,600
Duct accessories	1	LS	40,000.00	40,000
Insulation				
Piping insulation	153,716	SF	1.30	199,831
Duct insulation	90,000	SF	4.50	405,000
Balancing				
Balancing	153,716	SF	1.00	153,716
Direct digital controls				
Automatic temperature control system, DDC	153,716	SF	5.00	768,580
Garage systems				
Complete	9,393	SF	6.00	56,358
Miscellaneous				
Firestopping	1	LS	40,000.00	40,000
Core Drilling / Corong	2	LS	30,000.00	60,000
Pipe and duct identification, equipment tagging	1	LS	10,000.00	10,000
Shop drawings	1	LS	64,223.00	64,223
Rigging & equipment rental	1	LS	30,000.00	30,000
Vibration / Seismic	1	LS	25,000.00	25,000
Subtotal				**$8,029,819**

D4010 FIRE PROTECTION

	Quantity	Unit	Rate	Total
Sprinkler installation				
Complete	163,109	SF	5.25	856,322
Fire pump	1	LS	75,000.00	75,000
Subtotal				**$931,322**

	Quantity	Unit	Rate	Total
D5010 ELECTRICAL				
Service and distribution				
Switchboard, transformers, panelbords, feeders, etc.	163,109	SF	3.90	636,125
Generator power distribution				
Generator, transfer switches, panelboards, transformers and feeders	163,109	SF	2.65	432,239
Equipment wiring				
Complete	163,109	SF	2.25	366,995
Lighting and branch power				
Fixtures, including handing	1,875	EA	550.00	1,031,250
Lighting control system including daylight harvesting	153,716	SF	1.15	176,773
Power devices	1,230	EA	45.00	55,350
Branch wiring point; including device box & plate	3,105	EA	280.00	869,400
Communications				
Rough-in to MDF	1	LS	15,000.00	15,000
Rough-in to IDF's	4	EA	8,000.00	32,000
PABX		Excluded		
Cable tray, allow		Not required		
Cabling and devices				
Tele/data outlets	1,025	DRPS	50.00	51,250
Cat6 UTP wiring point	1,025	PTS	235.00	240,875
Safety and security				
Fire alarm system				
Fire alarm control panel	1	EA	45,000.00	45,000
Fire alarm remote annunciator	2	EA	1,650.00	3,300
Fire alarm devices	512	EA	200.00	102,400
Fire alarm wiring point; including device box	512	EA	450.00	230,400
Testing and programming	1	LS	10,000.00	10,000
Security				
Complete	163,109	SF	2.50	407,773
Audiovisual systems				
A/V system equipment and installation				
Projector outlet including wiring	6	EA	250.00	1,500
Allowance for media distribution system	1	LS	150,000.00	150,000
Clock System				
Master clock	1	LS	2,500.00	2,500
Slave clocks incl. wiring - allowance	80	EA	235.00	18,800
Sound/PA Systems				
Complete	163,109	SF	0.40	65,244
Speech Reinforcement				
Wireless speaker/IR sensor	66	EA	2,250.00	148,500
Café Sound				
Café sound system	1	LS	50,000.00	50,000
Gym sound				
Gym sound system	1	LS	20,000.00	20,000

	Quantity	Unit	Rate	Total
Stage/Theatre				
Performance center sound system	1	EA	60,000.00	60,000
Performance center dimming, lighting & rough-in	1	EA	70,000.00	70,000
Gymnasium				
Scoreboard	1	EA	15,000.00	15,000
Shot clock	2	EA	1,500.00	3,000
Sound system	1	LS	10,000.00	10,000
Motorized back boards	6	EA	1,500.00	9,000
Divider curtain	1	EA	1,200.00	1,200
Garage systems				
Allow for lighting, fire alarm, co2 detection and security	9,393	SF	10.50	98,627
Miscellaneous				
Temporary power and lighting	1	LS	75,000.00	75,000
Lightning protection system	1	LS	70,000.00	70,000
Commissioning	1	LS	60,000.00	60,000
Fee's and permits	1	LS	50,000.00	50,000
Subtotal				**$5,684,501**
E1010 COMMERCIAL EQUIPMENT				
Security and vault equipment				
Book security equipment	1	LS	10,000.00	10,000
Food service equipment				
Complete	1	LS	404,090.00	404,090
Subtotal				**$414,090**
E1020 INSTITUTIONAL EQUIPMENT				
Theater and stage equipment				
Stage curtains and all associated miscellaneous metals for prop supports	1	LS	100,000.00	100,000
Audio-visual equipment				
Projection screen , electrical	5	EA	1,800.00	9,000
Projection screen , electrical at auditorium	1	EA	2,500.00	2,500
Interactive video boards		In FF&E		
Subtotal				**$111,500**
E1030 VEHICULAR EQUIPMENT				
Parking control equipment				
Complete	1	LS	7,500.00	7,500
Subtotal				**$7,500**
E1090 OTHER EQUIPMENT				
Kiln				
Complete	1	LS	18,000.00	18,000
Residential equipment				
Allowance	1	EA	10,000.00	10,000

	Quantity	Unit	Rate	Total
Athletic equipment				
Scoreboard		In Electrical		
Motorized basketball backboard	6	EA	10,000.00	60,000
Safety padding	3,872	SF	12.00	46,464
Gym divider net/curtain	1,460	SF	15.00	21,900
Subtotal				**$156,364**

E2010 FIXED FURNISHINGS

	Quantity	Unit	Rate	Total
Kitchen casework				
Base storage units	20	LF	350.00	7,000
Counter top	20	LF	140.00	2,800
End panel	2	EA	490.00	980
Classroom casework typical				
Base storage units	342	LF	350.00	119,700
Counter top	456	LF	140.00	63,840
Shelves at walls	342	LF	270.00	92,340
Adjustable shelves at closet	190	LF	150.00	28,500
PLAM moveable, partiton	3,150	SF	65.00	204,750
General office casework				
Base storage units	23	LF	350.00	8,050
Counter top	23	LF	140.00	3,220
End panel	2	EA	490.00	980
Back panel	23	LF	210.00	4,830
Teacher work room casework				
Base storage units	69	LF	350.00	24,150
Work counters	69	LF	140.00	9,660
End panel	6	EA	490.00	2,940
Back panel	69	LF	210.00	14,490
Teacher planning casework				
Wall storage units	238	LF	350.00	83,300
Work counters	351	LF	140.00	49,140
Corridor casework				
Bench at corridor	280	LF	500.00	140,000
Miscellaneous casework				
Allowance	153,716	SF	0.75	115,287
Entry mat				
Entry mat and frame	626	SF	50.00	31,300
Window treatment				
Mecho shades	3,401	SF	15.00	51,015
Seating				
Telescoping bleachers	750	EA	150.00	112,500
Auditorium seating		In FF&E		
Subtotal				**$1,170,772**

Building - Estimate Detail

	Quantity	Unit	Rate	Total
E2020 LOOSE FURNISHINGS				
Loose furnishings				
By owner				
Subtotal				**$0**
F1010 SPECIAL STRUCTURES				
Mockups				
Exterior mockups	1	LS	50,000.00	50,000
Subtotal				**$50,000**
MARKUPS				
General conditions and project requirements				
General conditions and requirements	21.0	MTH	160,000	3,360,000
Bond and Insurance	2.00%		54,133,460	1,082,669
Building permit	0.00%		55,216,129	
Overhead and Profit				
Contractors overhead and profit (Fee)	2.50%		55,216,129	1,380,403
Subtotal				**$5,823,072**
CONTINGENCIES/ESCALATION				
Contingencies				
Design contingency	10.00%		56,596,532	5,659,653
GMP contingency	3.00%		62,256,185	1,867,686
Escalation				
Escalation to Start Date (March 2020)	5.06%		64,123,871	3,244,668
Subtotal				**$10,772,007**

TOWN OF BROOKLINE PUBLIC SCHOOLS
Driscoll School
Brookline, MA
SCHEMATIC DESIGN COST REPORT
April 26, 2019

		Total	SITE AREA $/sf	133,817 %	Daedalus Total	Delta	Comments
TOTAL BUILDING CONSTRUCTION		**$0**	**$0.00**	**0.00%**	**$0**		
G10 Site Preparation		**$1,824,688**	**$13.64**	**24.70%**	**$478,614**	**($1,346,074)**	
G1010 Site Clearing and Demolition		$1,110,559	$8.30	15.03%	$321,100	($789,459)	We have more demolition in section G1040 for a total site prep number of $1.99MM Daedalus has building demolition in building estimate for a total of $1.67MM - difference in hazadrous abatement allowance
G1030 Site Earthwork		$420,129	$3.14	5.69%	$157,514	($262,615)	We have more excavation in site whereas Daedalus has mor ein building. We have carried some shoring along the tp edge adjacent the sidewalk Daedalus does not have any.
G1040 Hazardous Waste Remediation		$294,000	$2.20	3.98%	$0		
G20 Site Improvement		**$3,771,220**	**$28.18**	**51.05%**	**$3,460,407**	**($310,813)**	Daedalus has twice the area of roadway paving and a little higher on pedestrian paving. Daedalus cost for synthetic ball field is low we are at $400k Daedalus is at $160K. Ours is included in site improvements. We have also included a "trellis structure" of similar construction as the metal work applied to the facade. This is located on the south side of the building. ($334k). Daedalus has included a high rate for trees, commensurate with a 6" cal tree. Is this the intended size. They are also including $174k for additional plantings not carried by us.
G2010 Roadways and Parking Lots		$137,465	$1.03	1.86%	$1,757,057		
G2030 Pedestrian Paving		$1,290,859	$9.65	17.48%	$0		
G2040 Site Development		$2,186,031	$16.34	29.59%	$996,175		
G2050 Landscaping		$156,865	$1.17	2.12%	$707,175		
G30 Site Mechanical		**$439,581**	**$3.28**	**5.95%**	**$454,109**	**$14,528**	
G3010 Mechanical Utilities		$439,581	$3.28	5.95%	$454,109	$14,528	We have included for a steel grease trap which is much more expensive - size issue.
G40 Site Electrical		**$149,735**	**$1.12**	**2.03%**	**$188,825**	**$39,090**	
G4010 Electrical Utilities and Site Lighting		$149,735	$1.12	2.03%	$188,825	$39,090	
G90 Other Site Construction		**$0**	**$0.00**	**0.00%**	**$0**	$0	
G9010 Service and Pedestrian Tunnels		$0	$0.00	0.00%	$0	$0	
G9090 Other Site Systems		$0	$0.00	0.00%	$0	$0	
Total Site Construction		**$6,185,224**	**$46.22**	**83.73%**	**$4,581,955**	**($1,603,269)**	
TOTAL ~~BUILDING &~~ SITE		**$6,185,224**	**$46.22**	**83.73%**	**$4,581,955**	**($1,603,269)**	
Markups		**$1,201,467**	**$8.98**	**16.27%**		**($1,201,467)**	
General Conditions							
General conditions and project requirement	14.23%	$880,000	$6.58	11.91%			
Bond and insurance	2.00%	$141,304	$1.06	1.91%			
Building permit	0.00%	$0	$0.00	0.00%			
Overhead and profit				0.00%			
General contractor's head office overhead and profit	2.50%	$180,163	$1.35	2.44%			
PLANNED CONSTRUCTION COST	**Apr-19**	**$7,386,691**	**$55.20**	**100.00%**			
Contingencies/Escalation		**$1,405,908**	**$10.51**				
Contingencies							
Design and pricing contingency	10.00%	$738,669	$5.52				
Gmp contingency	3.00%	$243,761	$1.82				
Escalation							
Escalation to start date (March 2020)	5.06%	$423,478	$3.16				
ESTIMATED CONTRACT AWARD	**Mar-20**	**$8,792,599**	**$65.71**				

Fennessy consulting Services

Site Work - Estimate Detail

	Quantity	Unit	Rate	Total
G1010 SITE CLEARING AND DEMOLITION				
Site set up				
Site construction fence/barricades	2,226	LF	12.00	26,712
Tree protection fence	100	LF	15.00	1,500
Erosion control fence	2,226	LF	15.00	33,390
Construction entrance	1	LS	7,500.00	7,500
Silt fence/protection at utliity structures	6	LOC	150.00	900
Environmental protection	1	LS	20,000.00	20,000
Clearing and grubbing				
Allowance for site clearance	4	ACRE	4,000.00	16,000
General building demolition				
Demolish existing building, including foundations	98,000	SF	8.00	784,000
Site demolition				
Pavement demolition				
Bituminous concrete	59,855	SF	1.10	65,841
Concrete paving	11,869	SF	1.25	14,836
Play space	3,360	SF	1.25	4,200
Remove granite or concrete curbs	960	LF	8.00	7,680
Saw cut existing paving	500	LF	6.00	3,000
Demolition of miscellaneous site components	1	LS	35,000.00	35,000
Existing retaining walls and the like	1	EA	50,000.00	50,000
Existing utilities	1	EA	40,000.00	40,000
Subtotal				**$1,110,559**
G1030 SITE EARTHWORK				
Site earthwork				
Strip topsoil, store	1,740	CY	8.00	13,920
Site cut to fill	19,681	CY	8.00	157,448
Fine grading	19,681	SY	0.75	14,761
Rock excavation		EXCLUDED		
Earthwork support				
Support of earthwork along Westbourne Terrace	3,600	SF	65.00	234,000
Subtotal				**$420,129**
G1040 HAZARDOUS WASTE REMEDIATION				
Hazardous waste remediation				
Remove hazardous materials from within existing buildi	98,000	SF	3.00	294,000
Subtotal				**$294,000**
G2010 ROADWAYS AND PARKING LOTS				
Bituminous concrete paving				
Excavation to reduce levels	394	CY	10.00	3,940
Remove off site	394	CY	23.50	9,259
Gravel base	394	CY	37.00	14,578
Bituminous concrete	238	T	110.00	26,180

	Quantity	Unit	Rate	Total
Curbing				
Vertical granite curb	1,496	LF	48.00	71,808
Pavement markings				
Allowance	1	LS	7,500.00	7,500
Road signage	6	EA	700.00	4,200
Subtotal				**$137,465**
G2030 PEDESTRIAN PAVING				
Concrete paving				
Excavation to reduce levels	790	CY	12.00	9,480
Remove off site	790	CY	20.00	15,800
Gravel base	790	CY	37.00	29,230
Concrete paving, ? thick	21,330	SF	6.00	127,980
Concrete paving, w integral coloring				
Excavation to reduce levels	130	CY	12.00	1,560
Remove off site	130	CY	23.50	3,055
Gravel base	130	CY	37.00	4,810
Concrete paving, ? thick	3,510	SF	8.00	28,080
Bituminous concrete paving at basketball court				
Excavation to reduce levels	138	CY	10.00	1,380
Remove off site	138	CY	23.50	3,243
Gravel base	138	CY	37.00	5,106
Bituminous concrete	71	T	120.00	8,520
Bituminous concrete paving with colorseal surfacing				
Excavation to reduce levels	438	CY	10.00	4,380
Remove off site	438	CY	23.50	10,293
Gravel base	438	CY	37.00	16,206
Bituminous concrete	226	T	125.00	28,250
Safety surfacing				
Excavation to reduce levels	588	CY	10.00	5,880
Remove off site	588	CY	23.50	13,818
Gravel base	588	CY	37.00	21,756
Bituminous concrete	203	T	110.00	22,330
Safety surfacing - poured in place	15,868	SF	18.00	285,624
Boardwalk				
Complete	650	SF	65.00	42,250
Cantilevered walkway				
Complete	2,300	SF	200.00	460,000
Concrete stair and steps				
Footing				
Excavate for footing	195	CY	12.00	2,340
Remove excavated material off site	195	CY	23.50	4,583
Backfill with gravel	156	CY	38.00	5,928
Formwork to footing	2,101	SF	11.75	24,687
Reinforcement in footing	1,950	LB	1.40	2,730
Concrete in footing	39	CY	190.50	7,430

Site Work - Estimate Detail

	Quantity	Unit	Rate	Total
Treads and risers				
Gravel base at treads and risers	81	CY	37.00	2,997
Formwork to risers	721	LF	30.00	21,630
Reinforcement in treads and risers	4,050	LB	1.40	5,670
Concrete in treads and risers	81	CY	190.50	15,431
Finishing				
Rubbing exposed concrete	1,451	SF	2.00	2,902
Ancillaries				
Rails @ steps and the like	182	LF	250.00	45,500
Subtotal				**$1,290,859**
G2040 SITE DEVELOPMENT				
Concrete retaining walls				
Footing				
Excavation for footing	869	CY	12.00	10,428
Remove off site	869	CY	23.50	20,422
Backfill with gravel	652	CY	35.00	22,820
Formwork to footing	11,733	SF	11.00	129,063
Reinforcement in footing	15,190	LB	1.30	19,747
Concrete in footing	217	CY	190.50	41,339
Wall				
Formwork to wall	15,057	SF	12.00	180,684
Reinforcement in wall	37,643	LB	1.40	52,700
Concrete in wall	371	CY	196.50	72,902
Finishing				
Facing to retaining walls, brick	4,595	SF	32.00	147,040
Cap to retaining wall, precast	733	LF	50.00	36,650
Foundation drainage	733	LF	15.00	10,995
Precast concrete retaining seat wall				
Footing				
Excavate for footing	405	CY	12.00	4,860
Backfill with selected excavated material	362	CY	12.00	4,344
Remove off site	362	CY	23.50	8,507
Formwork to footing	782	SF	11.75	9,189
Reinforcement in footing	3,010	LB	1.40	4,214
Concrete in footing	43	CY	190.50	8,192
Wall				
Formwork to wall	5,738	SF	12.00	68,856
Reinforcement in wall	14,345	LB	1.40	20,083
Concrete in wall	141	CY	196.50	27,707
Finishing				
Facing to retaining walls, brick	1,307	SF	32.00	41,824
Cap to wall, precast	391	LF	50.00	19,550
Fencing				
Chain link fence	509	LF	35.00	17,815
Chain link double gate	2	EA	1,000.00	2,000

	Quantity	Unit	Rate	Total
Site furnishings				
Miscellaneous rails and fences	1	EA	20,000.00	20,000
Flagpole including base	1	EA	2,500.00	2,500
Bench, 6' length	2	EA	2,500.00	5,000
Trash receptacles	5	EA	750.00	3,750
Playground equipment	1	LS	400,000.00	400,000
Bike racks	22	EA	800.00	17,600
Bollards	10	EA	500.00	5,000
Site sign	1	EA	10,000.00	10,000
Playing fields				
Sythetic playing field	1	LS	400,000.00	400,000
Basketball backstops	2	EA	3,000.00	6,000
Trellis				
Complete with glass roof	1	LS	334,250.00	334,250
Subtotal				**$2,186,031**
G2050 LANDSCAPING				
Topsoil/planting medium				
Spread existing topsoil, 6" thick	1,740	CY	10.00	17,400
Trees				
Type ?	62	EA	1,700.00	105,400
Shrubs				
Type ?	200	EA	80.00	16,000
Grass/lawn				
Seeding to lawn areas	36,130	SF	0.50	18,065
Subtotal				**$156,865**
G3010 MECHANICAL UTILITIES				
Water supply				
DI piping	250	LF	65.00	16,250
Water hydrant	2	EA	2,500.00	5,000
Connect to existing	2	EA	3,000.00	6,000
Excavation/trenching	148	CY	12.00	1,776
Remove from site	148	CY	23.50	3,478
Bedding	37	CY	38.00	1,406
Backfill	111	CY	38.00	4,218
Sanitary sewer				
Sewer piping	100	LF	30.00	3,000
Manhole	2	EA	5,000.00	10,000
Grease trap, - steel	1	EA	55,000.00	55,000
Connect to existing	1	EA	2,500.00	2,500
Excavation/trenching	44	CY	12.00	528
Remove from site	44	CY	23.50	1,034
Bedding	11	CY	38.00	418
Backfill	33	CY	38.00	1,254

	Quantity	Unit	Rate	Total
Storm drainage				
Piping	945	LF	30.00	28,350
Perforated field drainage pipe		With field cost		
Manhole	7	EA	5,000.00	35,000
Catch basin	8	EA	3,500.00	28,000
Water quantility structure	1	EA	12,000.00	12,000
Excavation and trenching	2,100	CY	12.00	25,200
Remove from site	2,100	CY	23.50	49,350
Bedding	140	CY	38.00	5,320
Backfill	1,960	CY	38.00	74,480
Underground storm water detention				
Pipe storage	250	LF	85.00	21,250
Excavation and trenching	444	CY	10.00	4,440
Remove from site	444	CY	23.50	10,434
Bedding	111	CY	38.00	4,218
Backfill	333	CY	38.00	12,654
Filter fabric	4,600	SF	1.00	4,600
Miscellaneous hardware	1	LS	2,500.00	2,500
Gas distribution				
Gas connection piping		By Utilities Company		
Connect to existing		By Utilities Company		
Excavation/trenching	135	CY	12.00	1,620
Remove from site	135	CY	23.50	3,173
Bedding	14	CY	38.00	532
Backfill	121	CY	38.00	4,598
Subtotal				**$439,581**

G4010 ELECTRICAL UTILITIES AND SITE LIGHTING

	Quantity	Unit	Rate	Total
Electrical service				
Primary electrical service duct bank	75	LF	125.00	9,375
Secondary electrical service duct bank	75	LF	500.00	37,500
Manhole	1	EA	4,000.00	4,000
Transformer pad	1	EA	1,500.00	1,500
Site lighting				
20' Light poles @ parking lots	4	EA	3,000.00	12,000
12' Light poles @ walkways lots	12	EA	3,500.00	42,000
Pole base	16	EA	750.00	12,000
Circuitry	960	LF	16.00	15,360
Site communication				
Communication service duct bank	100	LF	120.00	12,000
Manhole	1	EA	4,000.00	4,000
Subtotal				**$149,735**

Site Work - Estimate Detail

	Quantity	Unit	Rate	Total
MARKUPS				
General conditions and project requirements				
General conditions and requirements	11.0	MTH	80,000	880,000
Bond and Insurance	2.00%		7,065,224	141,304
Building permit	0.00%		7,206,528	
Overhead and Profit				
Contractors overhead and profit (Fee)	2.50%		7,206,528	180,163
Subtotal				**$1,201,467**
CONTINGENCIES/ESCALATION				
Contingencies				
Design contingency	10.00%		7,386,691	738,669
GMP contingency	3.00%		8,125,360	243,761
Escalation				
Escalation to Start Date (March 2020)	5.06%		8,369,121	423,478
Subtotal				**$1,405,908**

CSI Summary

		Building	Site work	Total Estimate	Contractor	+/-
	Gross Area:	163,109 SF		163,109 SF		
DIVISION 1 - GENERAL REQUIRMENTS						
01-00-00	General Conditions	See Below	See Below	See Below		
DIVISION 2 - EXISTING CONDITIONS		**0**	**294,000**	**294,000**	**0**	
DIVISION 3 - CONCRETE		**3,752,716**	**771,356**	**4,524,072**	**0**	
03-05-00	Concrete sealers	5,948	0	5,948		
03-10-00	Concrete Forming	783,985	412,479	1,196,464		
03-20-00	Concrete Reinforcing	528,589	121,104	649,693		
03-30-00	Cast-in-Place Concrete	2,434,194	181,573	2,615,767		
03-45-00	Architectural Precast Concrete	0	56,200	56,200		
DIVISION 4 - MASONRY		**1,952,181**	**188,864**	**2,141,045**	**0**	
04-21-00	Brick Masonry	1,058,031	188,864	1,246,895		
04-22-00	Concrete Masonry Units	894,150	0	894,150		
DIVISION 5 - METAL		**7,982,805**	**65,500**	**8,048,305**	**0**	
05-10-00	Structural Metal Framing	4,909,992	0	4,909,992		
05-30-00	Metal Decking	722,781	0	722,781		
05-40-00	Cold-Formed Metal Framing	321,032	0	321,032		
05-50-00	Metal Fabrications	1,207,400	0	1,207,400		
05-55-00	Metal Staircases	485,600	0	485,600		
05-60-00	Metal Rails and Handrails	336,000	65,500	401,500		
DIVISION 6 - WOOD & PLASTICS		**1,360,483**	**0**	**1,360,483**	**0**	
06-10-00	Rough Carpentry	140,566	0	140,566		
06-20-00	Finish Carpentry	174,350	0	174,350		
06-40-00	Architectural Woodwork	39,500	0	39,500		
06-80-00	Composite Fabrications	1,006,067	0	1,006,067		
DIVISION 7 - THERMAL & MOISTURE PROTECTION		**3,221,832**	**0**	**3,221,832**	**0**	
07-10-00	Damp proofing and Waterproofing	373,368	0	373,368		
07-20-00	Thermal Protection	406,309	0	406,309		
07-40-00	Metal Siding Panels	35,200	0	35,200		
07-42-00	Phenolic Siding	768,600	0	768,600		
07-50-00	Membrane Roofing	803,918	0	803,918		
07-60-00	Flashing and Sheet Metal	215,660	0	215,660		
07-70-00	Roofing and Wall Specialties and Accessories	14,750	0	14,750		
07-81-00	Applied Fireproofing	369,176	0	369,176		
07-84-00	Firestopping	35,938	0	35,938		
07-90-00	Joint Sealants	198,913	0	198,913		
DIVISION 8 - DOORS & WINDOWS		**4,657,555**	**0**	**4,657,555**	**0**	
08-10-00	Metal Doors and Frames	24,400	0	24,400		
08-20-00	Wood Doors and Frames	478,000	0	478,000		
08-30-00	Specialty Doors and Frames	22,325	0	22,325		
08-32-00	Overhead Doors	26,250	0	26,250		
08-40-00	Entrances, Storefronts	1,154,990	0	1,154,990		
08-45-00	Curtain wall	2,527,090	0	2,527,090		
08-60-00	Roof Windows and Skylights	391,500	0	391,500		
08-70-00	Hardware	20,000	0	20,000		
08-90-00	Louvers and Vents	13,000	0	13,000		
DIVISION 9 - FINISHES		**5,626,326**	**0**	**5,626,326**	**0**	
09-20-00	Gypsum Wallboard Assemblies	2,846,242	0	2,846,242		
09-30-00	Tiling	412,096	0	412,096		
09-51-00	Acoustical Ceilings	638,307	0	638,307		
09-52-00	Wood Ceilings	121,545	0	121,545		

		Building	Site work	Total Estimate	Contractor	+/-
	Gross Area:	163,109 SF		163,109 SF		
09-53-00	Metal Ceilings	54,920	0	54,920		
09-63-00	Wood Flooring	189,496	0	189,496		
09-65-00	Resilient Flooring	538,446	0	538,446		
09-67-00	Resin Flooring	3,972	0	3,972		
09-68-00	Carpeting	22,750	0	22,750		
09-70-00	Epoxy Flooring	6,584	0	6,584		
09-80-00	Acoustic Treatment	225,890	0	225,890		
09-90-00	Painting and Coating	308,776	0	308,776		
09-95-00	Unassigned	257,302	0	257,302		
DIVISION 10 - SPECIALTIES		**1,392,399**	**0**	**1,392,399**	**0**	
10-10-00	Marker board and Tack boards	12,600	0	12,600		
10-15-00	Signage	73,399	0	73,399		
10-21-00	Toilet and Shower Partitions	44,800	0	44,800		
10-28-00	Toilet & Bathroom Accessories	45,900	0	45,900		
10-44-00	Fire Extinguishers	21,150	0	21,150		
10-51-00	Lockers	252,000	0	252,000		
10-53-00	Storage Shelving	2,500	0	2,500		
10-71-00	Sun Control Devices (Exterior)	595,350	0	595,350		
10-81-00	Operable/Folding Partitions	344,700	0	344,700		
DIVISION 11 - EQUIPMENT		**689,454**	**6,000**	**695,454**	**0**	
11-10-00	Vehicle and Pedestrian Equipment	7,500	0	7,500		
11-15-00	Security, Detention and Banking Equipment	10,000	0	10,000		
11-30-00	Residential Equipment	10,000	0	10,000		
11-40-00	Foodservice Equipment	404,090	0	404,090		
11-52-00	Audiovisual Equipment	11,500	0	11,500		
11-53-00	Theatrical Equipment	100,000	0	100,000		
11-65-00	Athletic and Recreational Equipment	128,364	6,000	134,364		
11-90-00	Other Equipment	18,000	0	18,000		
DIVISION 12 - FURNISHINGS		**1,170,772**	**0**	**1,170,772**	**0**	
12-20-00	Window Treatment	51,015	0	51,015		
12-30-00	Casework	975,957	0	975,957		
12-41-00	Entrance mats	31,300	0	31,300		
12-61-00	Auditorium Seating	0	0	0		
12-62-00	Stadium Seating	112,500	0	112,500		
DIVISION 13 - SPECIAL CONSTRUCTION		**50,000**	**0**	**50,000**	**0**	
13-90-00	Unassigned	50,000	0	50,000		
DIVISION 14 - CONVEYING SYSTEMS		**550,920**	**0**	**550,920**	**0**	
14-20-00	Elevators	227,000	0	227,000		
14-80-00	Scaffolding	323,920	0	323,920		
DIVISION 21 - FIRE SUPPRESSION		**931,322**	**0**	**931,322**	**0**	
21-00-00	Fire Protection	931,322	0	931,322		
DIVISION 22 - PLUMBING		**2,587,065**	**0**	**2,587,065**	**0**	
22-00-00	Plumbing	2,587,065	0	2,587,065		
DIVISION 23 - HVAC		**8,029,819**	**0**	**8,029,819**	**0**	
23-00-00	HVAC	7,204,881	0	7,204,881		
23-10-00	Building Controls	824,938	0	824,938		
DIVISION 26 - ELECTRICAL		**5,684,501**	**0**	**5,684,501**	**0**	
26-00-00	Electrical	4,395,003	0	4,395,003		
27-00-00	Communications	339,125	0	339,125		

		Building	Site work	Total Estimate	Contractor	+/-
	Gross Area:	163,109 SF		163,109 SF		
28-10-00	Fire Alarm	391,100	0	391,100		
28-15-00	Security & Duress	407,773	0	407,773		
28-20-00	Audiovisual	151,500	0	151,500		
DIVISION 31 -EARTHWORK		**967,120**	**2,191,691**	**3,158,811**	**0**	
31-10-00	Site Clearing	0	1,048,769	1,048,769		
31-20-00	Earth Moving	967,120	847,132	1,814,252		
31-21-00	Erosion and Sedimentation Control	0	61,790	61,790		
31-50-00	Excavation Support and Protection	0	234,000	234,000		
31-60-00	Special Foundations	0	0	0		
31-70-00	Tunneling and Mining	0	0	0		
31-90-00	Unassigned	0	0	0		
DIVISION 32 -EXTERIOR IMPROVEMENTS		**0**	**2,067,502**	**2,067,502**	**0**	
32-11-00	Concrete paving	0	156,060	156,060		
32-12-00	Bituminous Concrete Paving	0	62,950	62,950		
32-15-00	Playground Safety Surfacing	0	307,954	307,954		
32-17-00	Boardwalk	0	42,250	42,250		
32-20-00	Curbing	0	71,808	71,808		
32-25-00	Pavement Markings	0	11,700	11,700		
32-30-00	Site Improvements	0	1,238,100	1,238,100		
32-35-00	Fences and Gate	0	19,815	19,815		
32-92-00	Soil Preparation	0	17,400	17,400		
32-93-00	Turf and Grasses	0	18,065	18,065		
32-95-00	Planting	0	121,400	121,400		
DIVISION 33 -UTILITIES		**166,190**	**600,311**	**766,501**	**0**	
33-10-00	Water Utilities	0	102,119	102,119		
33-30-00	Sewerage Utilities	0	72,700	72,700		
33-40-00	Storm Drainage Utilities	166,190	269,007	435,197		
33-50-00	Fuel Distribution Utilities	0	6,750	6,750		
33-70-00	Electrical Utilities	0	52,375	52,375		
33-75-00	Site Lighting	0	81,360	81,360		
33-80-00	Communication Utilities	0	16,000	16,000		
TOTAL DIRECT WORK		**$50,773,460**	**$6,185,224**	**$56,958,684**	**$0**	**$0**
MARKUPS		**5,823,072**	**1,201,467**	**7,024,539**	**0**	
01-10-00	General Conditions andProject Requirements	3,360,000	880,000	4,240,000		
01-20-00	Insurance, Bond	1,082,669	141,304	1,223,973		
01-30-00	Permits	0	0	0		
01-40-00	Home Office Overhead & Fee	1,380,403	180,163	1,560,566		
PLANNED CONSTRUCTION COST (April 2019)		**$56,596,532**	**$7,386,691**	**$63,983,223**	**$0**	**$0**
CONTINGENCIES/ESCALATION		**10,772,007**	**1,405,908**	**12,177,915**	**0**	
50-10-00	Design Contingency	5,659,653	738,669	6,398,322		
50-20-00	Construction Contingency	1,867,686	243,761	2,111,447		
50-30-00	Escalation	3,244,668	423,478	3,668,146		
ESTIMATED CONTRACT AWARD (March 2020)		**$67,368,539**	**$8,792,599**	**$76,161,138**	**$0**	**$0**

Filed Sub-Bid Summary

		Building	Sitework	Total Estimate
	Gross Area:	163,109 SF		163,109 SF
04-10-00	**Masonry**	**1,952,181**	**188,864**	**2,141,045**
04-21-00	Brick Masonry	1,058,031	188,864	1,246,895
04-22-00	Concrete Masonry Units	894,150	0	894,150
05-50-00	**Miscellaneous Metals**	**2,029,000**	**65,500**	**2,094,500**
05-50-00	Metal Fabrications	1,207,400	0	1,207,400
05-55-00	Metal Staircases	485,600	0	485,600
05-60-00	Metal Rails and Handrails	336,000	65,500	401,500
07-10-00	**Waterproofing, Dampproofing & Caulking**	**572,281**	**0**	**572,281**
07-10-00	Dampproofing and Waterproofing	373,368	0	373,368
07-90-00	Joint Sealants	198,913	0	198,913
07-50-00	**Roofing**	**1,019,578**	**0**	**1,019,578**
07-50-00	Membrane Roofing	803,918	0	803,918
07-60-00	Flashing and Sheet Metal	215,660	0	215,660
08-10-00	**Windows**	**3,682,080**	**0**	**3,682,080**
08-40-00	Entrances, Storefronts	1,154,990	0	1,154,990
08-45-00	Curtain wall	2,527,090	0	2,527,090
08-80-00	**Glass and Glazing**	**0**	**0**	**0**
09-10-00	**Plaster**	**0**	**0**	**0**
09-30-00	**Tile**	**412,096**	**0**	**412,096**
09-30-00	Tiling	412,096	0	412,096
09-66-00	**Terrazzo**	**0**	**0**	**0**
09-51-00	**Acoustic Ceilings**	**638,307**	**0**	**638,307**
09-51-00	Acoustical Ceilings	638,307	0	638,307
09-65-00	**Resilient Flooring**	**538,446**	**0**	**538,446**
09-65-00	Resilient Flooring	538,446	0	538,446
09-68-00	**Carpet**	**22,750**	**0**	**22,750**
09-68-00	Carpeting	22,750	0	22,750
09-90-00	**Painting**	**308,776**	**0**	**308,776**
09-90-00	Painting and Coating	308,776	0	308,776
14-20-00	**Conveying**	**227,000**	**0**	**227,000**
14-20-00	Elevators	227,000	0	227,000

Filed Sub-Bid Summary

		Building	Sitework	Total Estimate
	Gross Area:	163,109 SF		163,109 SF
21-00-00	**Fire Protection**	**931,322**	**0**	**931,322**
21-00-00	Fire Protection	931,322	0	931,322
22-00-00	**Plumbing**	**2,587,065**	**0**	**2,587,065**
22-00-00	Plumbing	2,587,065	0	2,587,065
23-00-00	**Hvac**	**8,029,819**	**0**	**8,029,819**
08-90-00	Louvers and Vents	13,000	0	13,000
23-00-00	HVAC	7,204,881	0	7,204,881
23-10-00	Building Controls	824,938	0	824,938
26-00-00	**Electrical**	**5,684,501**	**149,735**	**5,834,236**
26-00-00	Electrical	4,395,003	0	4,395,003
27-00-00	Communications	339,125	0	339,125
28-10-00	Fire Alarm	391,100	0	391,100
28-15-00	Security & Duress	407,773	0	407,773
28-20-00	Audiovisual	151,500	0	151,500
33-70-00	Electrical Utilities	0	52,375	52,375
33-75-00	Site Lighting	0	81,360	81,360
33-80-00	Communication Utilities	0	16,000	16,000
TOTAL FILED SUB-BID WORK		$28,635,202	$404,099	$29,039,301

14.3 Construction Cost Comparison

Please reference the attached Construction Cost Comparison prepared by Leftfield.

Michael Driscoll School: Brookline, MA

Schematic Design Cost Estimate Comparison 4/26/2019

		ARCH Estimator (Daedalus)		OPM Estimator (Fennessy Consulting)		Variance (Daedalus - Fennessy)	
		GSF 155,632		GSF 163,109			
		Total Amount	Cost/SF	Total Amount	Cost/SF	Total Amount	Cost/SF
A10	FOUNDATIONS	$ 4,953,373	$ 31.83	$ 1,854,011	$ 11.37	$ 3,099,362	$ 20.46
A20	BASEMENT CONSTRUCTION	$ -	$ -	$ 1,668,976	$ 10.23	$ (1,668,976)	$ (10.23)
B10	STRUCTURE	$ 7,155,785	$ 45.98	$ 7,748,826	$ 47.51	$ (593,041)	$ (1.53)
B20	EXTERIOR CLOSURE	$ 9,568,595	$ 61.48	$ 7,667,314	$ 47.01	$ 1,901,281	$ 14.47
B30	ROOFING	$ 1,104,150	$ 7.09	$ 1,529,275	$ 9.38	$ (425,125)	$ (2.28)
C10	INTERIOR CONSTRUCTION	$ 5,232,526	$ 33.62	$ 6,078,620	$ 37.27	$ (846,094)	$ (3.65)
C20	STAIRCASES	$ 788,000	$ 5.06	$ 647,450	$ 3.97	$ 140,550	$ 1.09
C30	INTERIOR FINISHES	$ 4,178,236	$ 26.85	$ 4,207,885	$ 25.80	$ (29,649)	$ 1.05
D10	VERTICAL MOVEMENT	$ 225,000	$ 1.45	$ 228,170	$ 1.40	$ (3,170)	$ 0.05
D20	PLUMBING	$ 2,334,480	$ 15.00	$ 2,587,065	$ 15.86	$ (252,585)	$ (0.86)
D30	HVAC	$ 8,003,440	$ 51.43	$ 8,029,819	$ 49.23	$ (26,379)	$ 2.20
D40	FIRE PROTECTION	$ 1,089,424	$ 7.00	$ 931,322	$ 5.71	$ 158,102	$ 1.29
D50	ELECTRICAL	$ 6,225,280	$ 40.00	$ 5,684,501	$ 34.85	$ 540,779	$ 5.15
E10	EQUIPMENT	$ 540,000	$ 3.47	$ 689,454	$ 4.23	$ (149,454)	$ (0.76)
E20	FURNISHINGS	$ 2,207,555	$ 14.18	$ 1,170,772	$ 7.18	$ 1,036,783	$ 7.01
F10	SPECIAL CONSTRUCTION	$ 2,194,879	$ 14.10	$ 50,000	$ 0.31	$ 2,144,879	$ 13.80
F20	DEMOLITION/SELECTIVE DEMOLITION/HAZMAT	$ 1,352,575	$ 8.69	$ -	$ -	$ 1,352,575	$ 8.69
G10	SITE PREPARATION	$ 478,614	$ 3.08	$ 1,824,688	$ 11.19	$ (1,346,074)	$ (8.11)
G20	SITE IMPROVEMENTS	$ 3,460,407	$ 22.23	$ 3,771,220	$ 23.12	$ (310,813)	$ (0.89)
G30	SITE MECHANICAL UTILITIES	$ 454,109	$ 2.92	$ 439,581	$ 2.70	$ 14,528	$ 0.22
G40	SITE ELECTRICAL UTILITIES	$ 188,825	$ 1.21	$ 149,735	$ 0.92	$ 39,090	$ 0.30
TOTAL CONSTRUCTION COSTS	**7.7%**	**$ 61,735,254**	**$ 396.67**	**$ 56,958,684**	**$ 349.21**	**$ 4,776,570**	**$ 47.47**
	Design & Estimating Contingency (10% - 10%)	$ 6,174,000	$ 39.67	$ 6,398,322	$ 39.23	$ (224,322)	$ 0.44
	General Conditions & General Requirements (7% - 6.9%)	$ 4,754,000	$ 30.55	$ 4,240,000	$ 25.99	$ 514,000	$ 4.55
	Insurances (1.5% - 2%)	$ 1,090,000	$ 7.00	$ 1,223,973	$ 7.50	$ (133,973)	$ (0.50)
	Bonds (1.4%)	$ 951,000	$ 6.11	$ -	$ -	$ 951,000	$ 6.11
	CM Fee (Overhead & Profit) (2.5% - 2.5%)	$ 1,698,000	$ 10.91	$ 1,560,566	$ 9.57	$ 137,434	$ 1.34
	CM GMP Contingency (3% - 3%)	$ 2,038,000	$ 13.09	$ 2,111,447	$ 12.95	$ (73,447)	$ 0.15
	Escalation (6% - 4.6%)	$ 4,760,000	$ 30.58	$ 3,668,146	$ 22.49	$ 1,091,854	$ 8.10
TOTAL ESTIMATED COSTS	**8%**	**$ 83,200,254**	**$ 534.60**	**$ 76,161,138**	**$ 466.93**	**$ 7,039,116**	**$ 67.66**
ADDITIONAL ITEMS							
Photovoltaic System		$ -	$ -	$ 1,387,080	$ 8.50	$ (1,387,080)	$ (8.50)
Geothermal System		$ -	$ -	$ 2,000,000	$ 12.26	$ (2,000,000)	$ (12.26)
Other Non-Fossil Fuel Measures		$ 4,000,000	$ 25.70	$ 2,000,000	$ 12.26	$ 2,000,000	$ 13.44
TOTAL W/ ADDITIONAL ITEMS		**$ 87,200,254**	**$ 560.30**	**$ 81,548,218**	**$ 499.96**	**$ (23,041,389)**	**$ (207.48)**

15. Project Directory

Please find attached the updated Project Directory

DRISCOLL - Project Directory

Board of Selectmen:	**Neil Wishinsky**	*Chair*
	Ben Franco	
	Nancy Heller	
	Bernard Greene	
	Heather Hamilton	
School Building Committee:	**Neil Wishinsky**	*Co Chair, Select Board Member*
	Susan Wolf Ditkoff	*Co Chair, School Committee Member*
	Karen Breslawski	*Building Commission*
	David Lescohier	*Advisory Committee, TMM*
	Nancy O'Connor	*Parks and Recreation Commission*
	Dan Deutsch	*Community Representative, Driscoll Site Council*
	Victor Kusmin	*Community Representative*
	Val Frias	*Community Representative/ Special Education Parent Advisory Council*
	Arjun Mande	*Community Representative*
	Lakia Rutherford	*Community Representative/ METCO*
	Sara Stoutland	*Community Representative*
	Mel Kleckner	*Town Administrator*
	Andrew Bott	*Superindendent of Schools*
	Dr. Nicole Gittens	*Deputy Superintendent of Schools for Teaching and Learning*
	Mary Ellen Dunn	*Deputy Superintendent of Schools for Administration and Finance*
	Dr. Suzie Talukdar	*School Principal*
	Ben Lummis	*Project Manager, School Department*
	Ray Masak	*Project Manager, Building Department*
	Daniel Bennett	*Building Commissioner*

DRISCOLL - Project Directory

School Committee:	**David Pollak**	*Chairman*	
	Julie Schreiner-Oldham	*Vice Chairman*	
	Helen Charlupski	Member	
	Susan Wolf Ditkoff	*Member*	
	Suzanne Federspiel	*Member*	
	Michael Glover	*Member*	
	Jennifer Monopoli	*Member*	
	David Pearlman	*Member*	
	Barbara Scotto	*Member*	
Designer - Architect:	**Jonathan Levi Architects** 266 Beacon Street Boston, MA 02138		617-437-9458
	Jonathan Levi, FAIA jlevi@leviarc.com	*Principal in charge*	
	Carol Harris, AIA charris@leviarc.com	*Project Manager*	
	Philip Gray, AIA pgray@leviarc.com	*Associate Principal in Charge*	
	Mark Warner, AIA mwarner@leviarc.com	*Technical Director*	
	Elizabeth Bugbee, AIA ebugbee@leviarc.com	*BIM & Building Systems Coordinator*	
	Alexander Shaw, RA ashaw@leviarc.com	*Project Architect & Exterior Envelope*	
Educational Planner:	**New Vista Design** 32 Sheridan Street, Suite #2 Jamaica Plain, MA 02130		617-733-0847
	David Stephen, President david@newvistadesign.net		
Designer - Landscape Architect:	**Halvorson Design Partnership, Inc** 25 Kingston Street 5th Floor Boston, MA 02111		617-536-0380
	Bryan Jereb, ASLA bryan@halvorsondesign.com	*Associate Principal*	

Traffic Consultant:	**Vanasse & Associates** 35 New England Business Center Drive, Suite 140 Andover, MA 01810		978-474-8800
	Giles Ham, PE gham@rdva.com	*Principal*	
Civil Engineer:	**CDW Consultants, Inc.** 6 Huron Drive Natick, MA 01760		508-875-2657
	Eric Wilhelmsen ewilhelmsen@cdwconsultants.com		
Structural Engineer:	**LeMessurier** 1380 Soldiers Field Road Boston, MA 02135		617-868-1200
	William Lovallo, PE wlovallo@lemessurier.com	*Vice President*	617-868-1200
	Garcia Galuska & DeSousa 370 Furnace corner Road North Dartmouth, MA 02747		508-998-5700
Fire Protection Engineer/ Plumbing Engineer:	**Christopher Garcia, PE** christopher_garcia@g-g-d.com	*Principal*	
HVAC Engineer:	**Dominick Puniello, PE, CEM, LEED** dominick_puniello@g-g-d.com	*Principal, HVAC Engineer*	
Electrical Engineer/ Lighting:	**Carlos DeSousa, PE** carlos_desousa@g-g-d.com	*Principal, Electrical Engineering and Lighting*	
Data/Communications:	**David Pereira, PE** david_pereira@g-g-d.com	*Principal, Data/Communications and Security*	
Geotechnical/ Geoenvironmental:	**McPhail Associates, LLC**		617-868-1420
	Chris Erikson, PE cme@mcphailgeo.com		
Environmental/ Hazmat:	**CDW Consultants, Inc** 6 Huron Drive Natick, MA 01760		508-875-2657
	Susan Cahalan, PG, ISSP-SA scahalan@cdwconsultants.com	*Senior environmental Scientist*	

DRISCOLL - Project Directory

Code & Accessibility:	**Howe Engineers, Inc.** 101 Longwater Circle, Suite 203 Norwell, MA 02061 **Jeremy Mason, PE** jmason@howeengineers.com	*Project Director*	781-878-3500
Historic Preservation:	**Building Conservation Associates** 10 Langley Road, Suite 202 Newton Centre, MA 02459 **Lisa Howe** lhowe@bcausa.com		617-916-5661
Cost Estimating:	**Daedalus Projects, Inc** 1 Faneuil Hall Marketplace South Market Building, Suite 4195 Boston, MA 02109 **Richard Marks** rmarks@dpi-boston.com		617-451-2717

16. Project Schedule

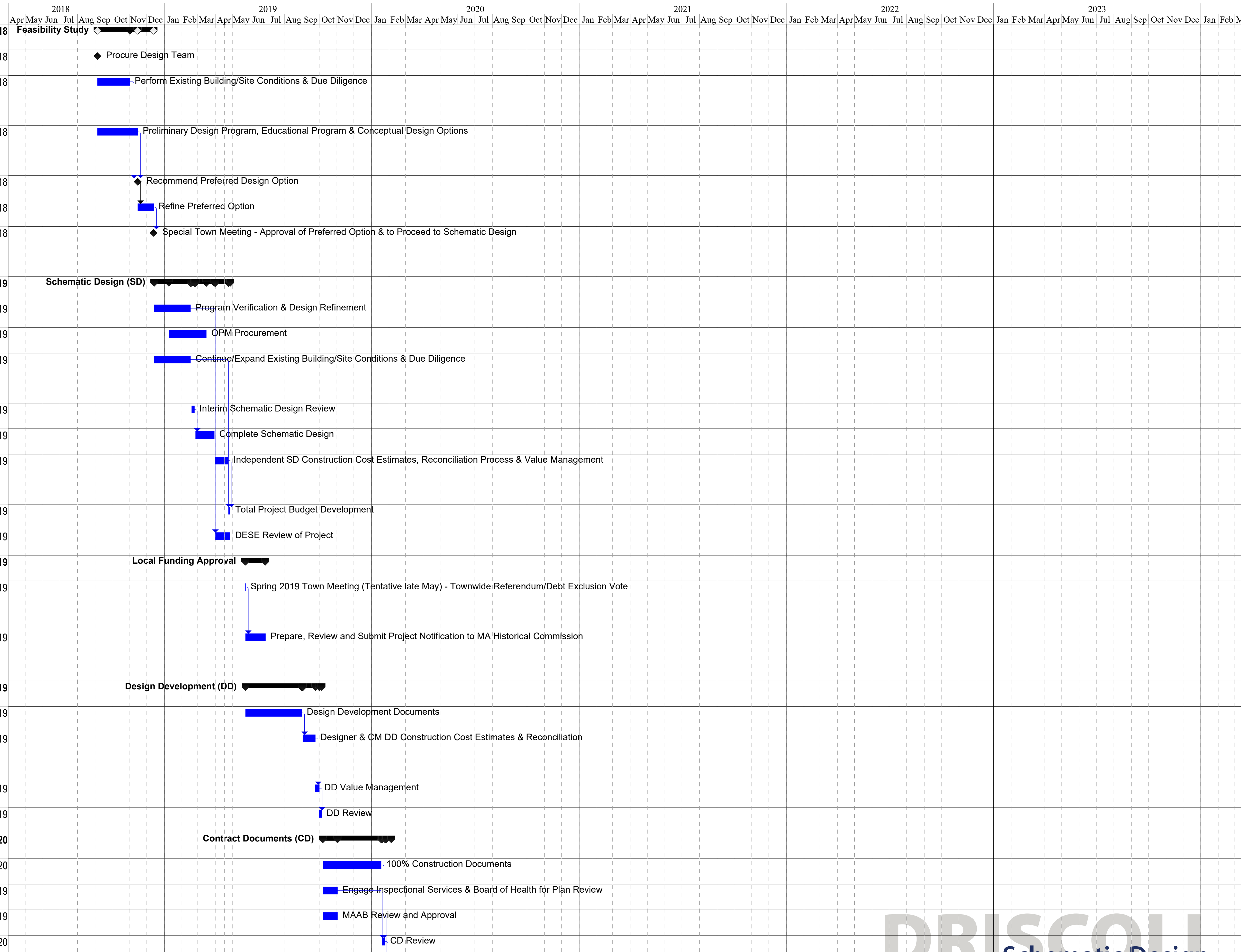
Following local appropriation voting, the Design Documents will be developed, leading to construction commencement in the early fall of 2020, with a student move-in date of September 2022. The existing school building will then be demolished and final site work will be completed by summer 2023.

Please find attached Project Schedule prepare by Leftfield.

LEFTFIELD
THE RIGHT CHOICE IN PROJECT MANAGEMENT

DRISCOLL PreK-8 SCHOOL
PRELIMINARY PROJECT SCHEDULE

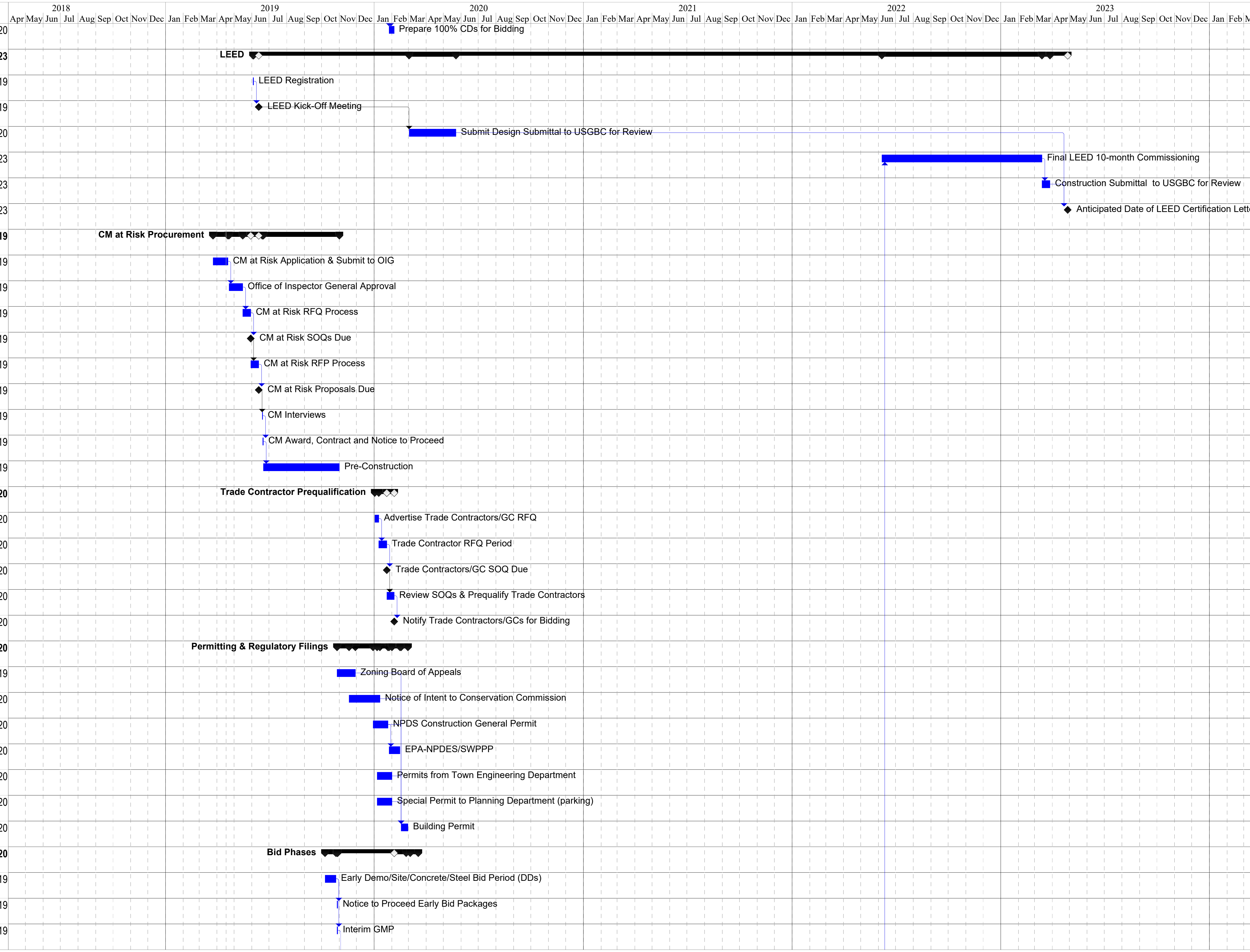
ID	Task Name	Start	Finish
1	**Feasibility Study**	**Tue 9/4/18**	**Thu 12/13/18**
2	Procure Design Team	Tue 9/4/18	Tue 9/4/18
3	Perform Existing Building/Site Conditions & Due Diligence	Wed 9/5/18	Wed 10/31/18
4	Preliminary Design Program, Educational Program & Conceptual Design Options	Wed 9/5/18	Wed 11/14/18
5	Recommend Preferred Design Option	Thu 11/15/18	Thu 11/15/18
6	Refine Preferred Option	Thu 11/15/18	Wed 12/12/18
7	Special Town Meeting - Approval of Preferred Option & to Proceed to Schematic Design	Thu 12/13/18	Thu 12/13/18
8	**Schematic Design (SD)**	**Fri 12/14/18**	**Fri 4/26/19**
9	Program Verification & Design Refinement	Fri 12/14/18	Fri 2/15/19
10	OPM Procurement	Wed 1/9/19	Fri 3/15/19
11	Continue/Expand Existing Building/Site Conditions & Due Diligence	Fri 12/14/18	Fri 2/15/19
12	Interim Schematic Design Review	Mon 2/18/19	Fri 2/22/19
13	Complete Schematic Design	Mon 2/25/19	Fri 3/29/19
14	Independent SD Construction Cost Estimates, Reconciliation Process & Value Management	Mon 4/1/19	Tue 4/23/19
15	Total Project Budget Development	Wed 4/24/19	Fri 4/26/19
16	DESE Review of Project	Mon 4/1/19	Fri 4/26/19
17	**Local Funding Approval**	**Thu 5/23/19**	**Thu 6/27/19**
18	Spring 2019 Town Meeting (Tentative late May) - Townwide Referendum/Debt Exclusion Vote	Thu 5/23/19	Thu 5/23/19
19	Prepare, Review and Submit Project Notification to MA Historical Commission	Fri 5/24/19	Thu 6/27/19
20	**Design Development (DD)**	**Fri 5/24/19**	**Fri 10/4/19**
21	Design Development Documents	Fri 5/24/19	Fri 8/30/19
22	Designer & CM DD Construction Cost Estimates & Reconciliation	Mon 9/2/19	Mon 9/23/19
23	DD Value Management	Tue 9/24/19	Mon 9/30/19
24	DD Review	Tue 10/1/19	Fri 10/4/19
25	**Contract Documents (CD)**	**Mon 10/7/19**	**Tue 2/4/20**
26	100% Construction Documents	Mon 10/7/19	Fri 1/17/20
27	Engage Inspectional Services & Board of Health for Pla	Mon 10/7/19	Fri 11/1/19
28	MAAB Review and Approval	Mon 10/7/19	Fri 11/1/19
29	CD Review	Mon 1/20/20	Fri 1/24/20



LEFTFIELD
THE RIGHT CHOICE IN PROJECT MANAGEMENT

DRISCOLL PreK-8 SCHOOL
PRELIMINARY PROJECT SCHEDULE

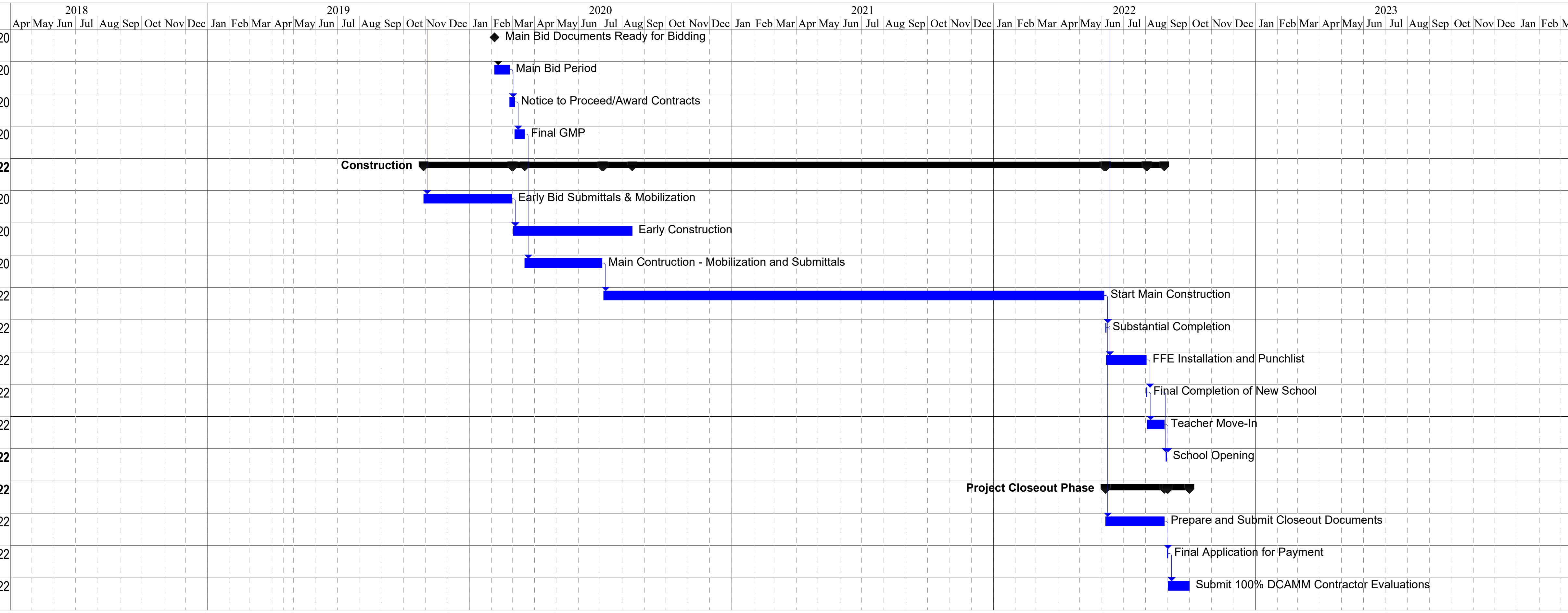
ID	Task Name	Start	Finish
30	Prepare 100% CDs for Bidding	Mon 1/27/20	Tue 2/4/20
31	**LEED**	**Mon 6/3/19**	**Fri 4/28/23**
32	LEED Registration	Mon 6/3/19	Mon 6/3/19
33	LEED Kick-Off Meeting	Thu 6/13/19	Thu 6/13/19
34	Submit Design Submittal to USGBC for Review	Mon 3/2/20	Fri 5/22/20
35	Final LEED 10-month Commissioning	Tue 6/7/22	Mon 3/13/23
36	Construction Submittal to USGBC for Review	Tue 3/14/23	Mon 3/27/23
37	Anticipated Date of LEED Certification Letter	Fri 4/28/23	Fri 4/28/23
38	**CM at Risk Procurement**	**Mon 3/25/19**	**Thu 10/31/19**
39	CM at Risk Application & Submit to OIG	Mon 3/25/19	Fri 4/19/19
40	Office of Inspector General Approval	Mon 4/22/19	Wed 5/15/19
41	CM at Risk RFQ Process	Thu 5/16/19	Wed 5/29/19
42	CM at Risk SOQs Due	Wed 5/29/19	Wed 5/29/19
43	CM at Risk RFP Process	Thu 5/30/19	Wed 6/12/19
44	CM at Risk Proposals Due	Wed 6/12/19	Wed 6/12/19
45	CM Interviews	Wed 6/19/19	Wed 6/19/19
46	CM Award, Contract and Notice to Proceed	Thu 6/20/19	Thu 6/20/19
47	Pre-Construction	Fri 6/21/19	Thu 10/31/19
48	**Trade Contractor Prequalification**	**Thu 1/2/20**	**Wed 2/5/20**
49	Advertise Trade Contractors/GC RFQ	Thu 1/2/20	Wed 1/8/20
50	Trade Contractor RFQ Period	Thu 1/9/20	Wed 1/22/20
51	Trade Contractors/GC SOQ Due	Thu 1/23/20	Thu 1/23/20
52	Review SOQs & Prequalify Trade Contractors	Thu 1/23/20	Tue 2/4/20
53	Notify Trade Contractors/GCs for Bidding	Wed 2/5/20	Wed 2/5/20
54	**Permitting & Regulatory Filings**	**Mon 10/28/19**	**Fri 2/28/20**
55	Zoning Board of Appeals	Mon 10/28/19	Thu 11/28/19
56	Notice of Intent to Conservation Commission	Mon 11/18/19	Fri 1/10/20
57	NPDS Construction General Permit	Mon 12/30/19	Fri 1/24/20
58	EPA-NPDES/SWPPP	Mon 1/27/20	Fri 2/14/20
59	Permits from Town Engineering Department	Mon 1/6/20	Fri 1/31/20
60	Special Permit to Planning Department (parking)	Mon 1/6/20	Fri 1/31/20
61	Building Permit	Mon 2/17/20	Fri 2/28/20
62	**Bid Phases**	**Mon 10/7/19**	**Tue 3/17/20**
63	Early Demo/Site/Concrete/Steel Bid Period (DDs)	Mon 10/7/19	Fri 10/25/19
64	Notice to Proceed Early Bid Packages	Mon 10/28/19	Mon 10/28/19
65	Interim GMP	Mon 10/28/19	Mon 10/28/19



LEFTFIELD
THE RIGHT CHOICE IN PROJECT MANAGEMENT

DRISCOLL PreK-8 SCHOOL
PRELIMINARY PROJECT SCHEDULE

ID	Task Name	Start	Finish
66	Main Bid Documents Ready for Bidding	Wed 2/5/20	Wed 2/5/20
67	Main Bid Period	Wed 2/5/20	Tue 2/25/20
68	Notice to Proceed/Award Contracts	Wed 2/26/20	Tue 3/3/20
69	Final GMP	Wed 3/4/20	Tue 3/17/20
70	**Construction**	**Tue 10/29/19**	**Fri 8/26/22**
71	Early Bid Submittals & Mobilization	Tue 10/29/19	Fri 2/28/20
72	Early Construction	Mon 3/2/20	Fri 8/14/20
73	Main Contruction - Mobilization and Submittals	Wed 3/18/20	Fri 7/3/20
74	Start Main Construction	Mon 7/6/20	Fri 6/3/22
75	Substantial Completion	Mon 6/6/22	Mon 6/6/22
76	FFE Installation and Punchlist	Tue 6/7/22	Mon 8/1/22
77	Final Completion of New School	Tue 8/2/22	Tue 8/2/22
78	Teacher Move-In	Wed 8/3/22	Fri 8/26/22
79	**School Opening**	**Mon 8/29/22**	**Mon 8/29/22**
80	**Project Closeout Phase**	**Mon 6/6/22**	**Fri 9/30/22**
81	Prepare and Submit Closeout Documents	Mon 6/6/22	Fri 8/26/22
82	Final Application for Payment	Wed 8/31/22	Wed 8/31/22
83	Submit 100% DCAMM Contractor Evaluations	Thu 9/1/22	Fri 9/30/22



17. Local Actions and Approvals

Jonathan Levi Architects
266 beacon street boston ma 02116 tel 617.437.9458 www.leviarc.com

NOTES OF MEETING

project	**Driscoll School**	project no.	1823
date	1/15/19, 7:30 am	location	Brookline Town Hall
re	**School Building Committee #6** Schematic Design Initiation		

present
Neil Wishinsky, Co-Chair, Select Board
Susan Wolf Ditkoff, Co-Chair, School Committee
Karen Breslawski, Building Commission
David Lescohier, Advisory Committee (by phone)
Nancy O'Connor, Parks and Recreation Commission
Victor Kusmin, Community Representative
Lakia Rutherford, Community Representative/METCO
Sara Stoutland, Community Representative
Val Frias, Community Representative/ Special Education Parent Advisory Council
Arjun Mande, Community Representative
Dr. Nicole Gittens, Deputy Superintendent of Schools for Teaching and Learning
Ali Tali, Public Works, Engineering and Transportation
Mel Kleckner, Town Administrator
Andrew Bott, Superintendent of Schools
Mary Ellen Dunn, Deputy Superintendent of Schools for Administration and Finance
Dr. Suzie Talukdar, School Principal Representative
Ben Lummis, Project Manager, School Department
Ray Masak, Project Manager, Building Department
Daniel Bennett, Building Commissioner
Jonathan Levi, JLA
Philip Gray, JLA

Distribution:
attendees; project file
Dan Deutsch, Community Representative
Heather Hamilton, alternate Select Board
Carol Harris, JLA

1) 11/28/18 SBC meeting minutes approved unanimously.
2) Driscoll Feasibility Study approved unanimously.
3) Schedule. Ben Lummis provided an overview of the Schematic Design Schedule. Primary milestones include an interim design package with cost estimate by March 1, 2019. There will be a town-wide vote to proceed with design through construction on May 7, 2019. A meeting with the transportation board to discuss parking will take place January 28. Planning board and Zoning Board of Appeals meetings would be expected to take place in the next design phase.
4) Parking. 3 options for on-site teacher parking are to be considered for recommendation – 0 spaces, 25 spaces and 50 spaces. Each has an effect on street teacher permit parking, with 0 on site parking translating to a maximum walking distance for the teachers of 0.6 miles, with the 50 space option reducing the walk to 0.3 miles. There are currently 52 teacher parking spaces on site and 53 on street parking permits.

   Discussion:

- Public transportation is more difficult for Driscoll teachers because there is no "park and ride" option for the C line. The transportation management plan assumes 10% of teachers will use public transportation. PSB to investigate current utilization percentage, but to allow for indeterminate future use, the 10% figure is a responsible placeholder.
- Concern about overcrowding of public streets. Enforcement would be expected and needed.
- Cost was estimated in SD of $160,00 per space in feasibility study. JLA to update estimates based on more developed design.
- At least 2 permanent handicapped parking spaces will be provided near the main entrance on Washington Street.
- Len Wholey presented a petition from neighbors asking to allow parking on their streets for teachers in order to reduce the quantity and cost of on-site parking.
- Parking spaces are put under building rather than at grade to provide more open space available to the students and community. This underground parking would also have the potential to be repurposed to address changing space needs, and continue to preserve available open space in the future by providing an alternative to expanding the building or hardscape footprint.
- What happens for event parking?
- Teacher parking closer to the site allows teachers to better prepare for the day.

A vote was taken. There were 3 votes for 25 spaces and 12 votes for 50 spaces.

5) Schematic Design Deliverables. Jonathan Levi presented images describing the difference between feasibility study and schematic design deliverables. See attached.

6) Design Update. JL presented revised site plan, floor plans, and a “fly through” of the current design. See attached. The building footprint has been adjusted to avoid the existing gymnasium by moving a portion of the building over the existing tennis courts. This eliminates the need for a temporary gym swing space. A bus drop-off area will be located on a widened portion of Washington Street, and parent drop off is designed to occur on a widened area of Westbourne Terrace.

   Classrooms typically paired with movable adjustable partition between for flexibility to combine. Classrooms share a small teacher planning space, similar to those at Coolidge corner which have proven very popular with the teachers.

   <u>Discussion:</u>

- Arjun M. noted that the scale of building, grain and texture looks appropriate
- Suggest open media center more to outside, which will also activate the learning commons.
- Look at adjusting bathroom locations to be less prominent
- Add crosswalk at Bartlett Crescent / Bartlett
- Thought should be given to deter parents from using the service alley along the east side.
- Outdoor classrooms should be made available – for further discussion
- Tennis courts are not excluded from the project.
- The amount of open space indicated in current design is to be maintained moving forward (not the amount of existing open space).
- More cost effective to build out full basement for potential future uses even if not used for parking.

7) Staff focus groups. JLA will meet with Driscoll staff in small groups to get their input over the next 2 weeks.

END OF MEETING NOTES
Addressees believing these notes are in error or are inaccurate should contact the writer within five business days, otherwise these notes will be considered accurate.

by Philip Gray, JLA

BROOKLINE
DRISCOLL SCHOOL EXPANSION

School Building Committee
Jan. 15, 2019

Agenda

1. Feasibility Study Review/Approval
2. Schematic Design Schedule and Deliverables
3. Design Update
4. Fossil Free Design Criteria
5. Upcoming Meetings

Agenda

1. Feasibility Study Review/Approval

Agenda

1. Feasibility Study Review/Approval
2. Schematic Design Schedule and Deliverables

Agenda

1. Feasibility Study Review/Approval
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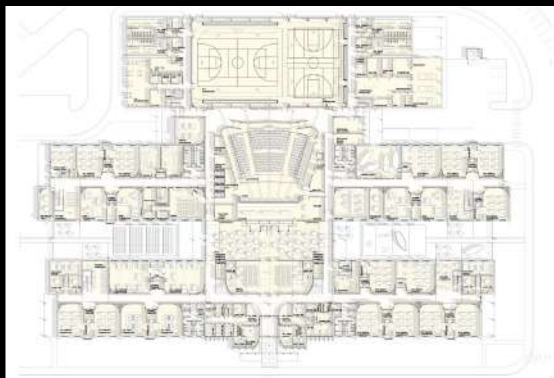
Design Iteration and Development Process

Sample – Schematic Design

Design Iteration and Development Process
Design Development



Sample – Design Development

Design Iteration and Development Process
Design Development

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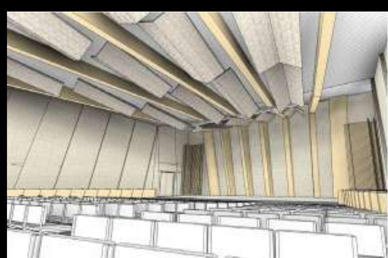
Design Iteration and Development Process
Design Development



Sample – Design Development

Site Plan

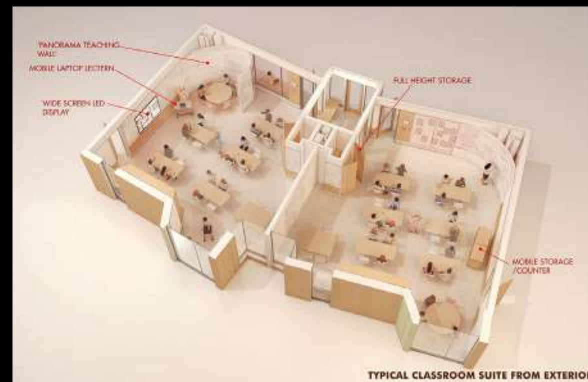
Open Space Diagram

Total Lot Area	Building Footprint	Usable Play Area (with Tennis)	Vehicle / Pedestrian	Unutilized Area	Total Open Area
173,000 sf	42,000 sf	97,000 sf	21,500 sf	12,500 sf	131,000 sf

Floor Plans

Floor Plans

Anatomy of a Classroom



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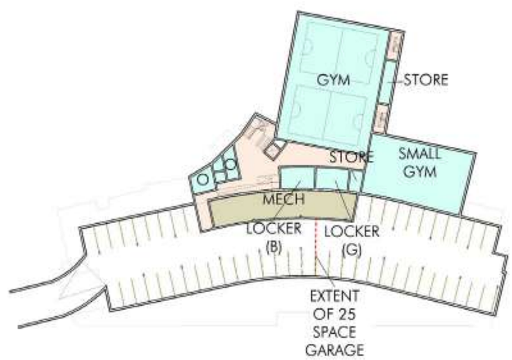

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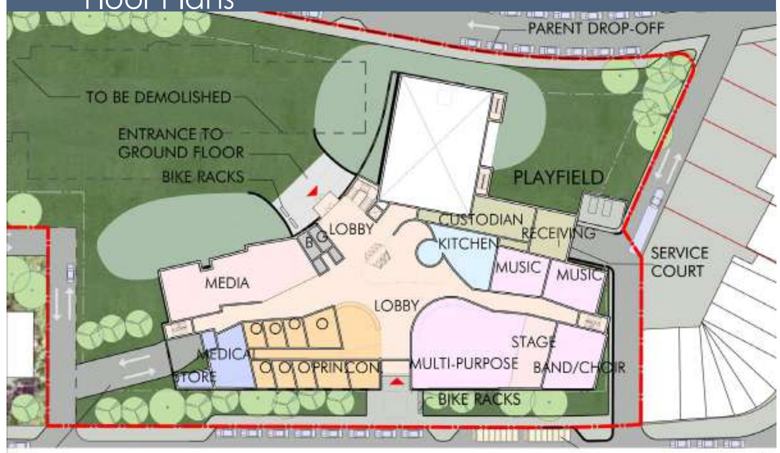

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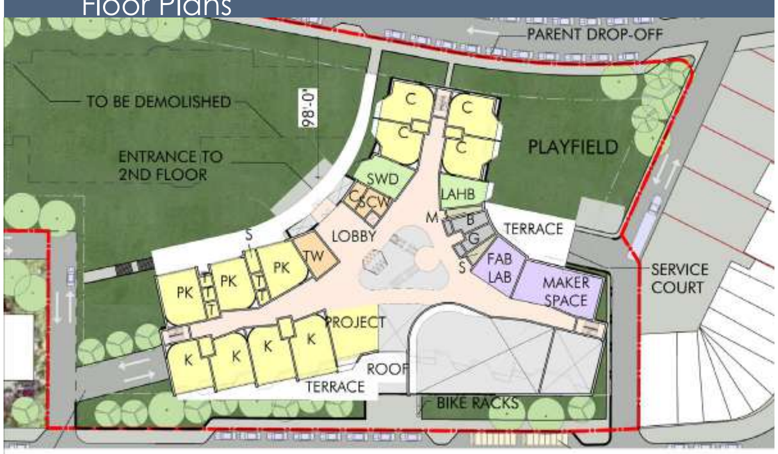

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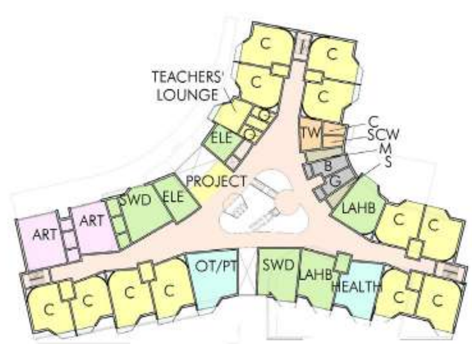

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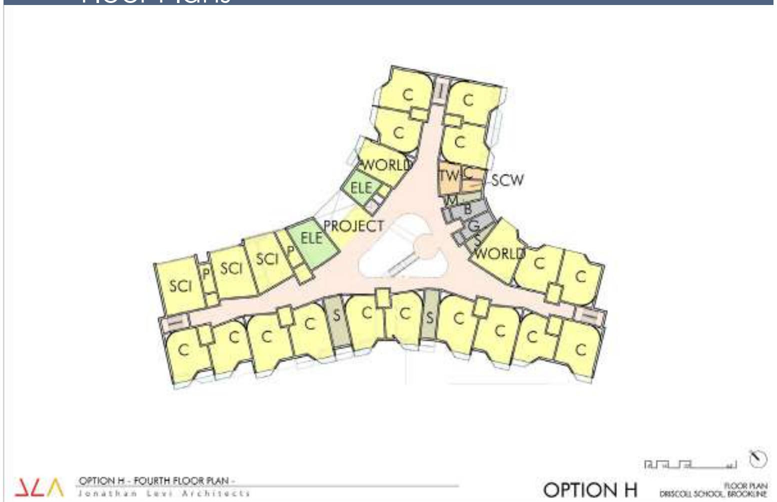

3 D Fly-Through Interior and Exterior Views

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DRISCOLL SCHOOL, BROOKLINE

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DRISCOLL SCHOOL, BROOKLINE

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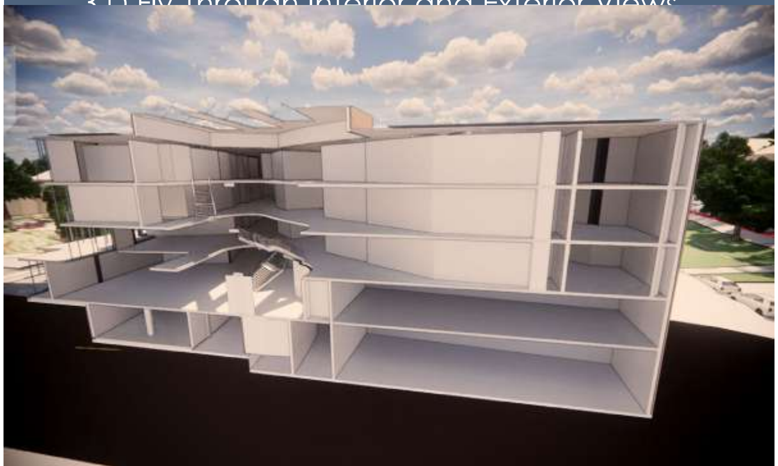

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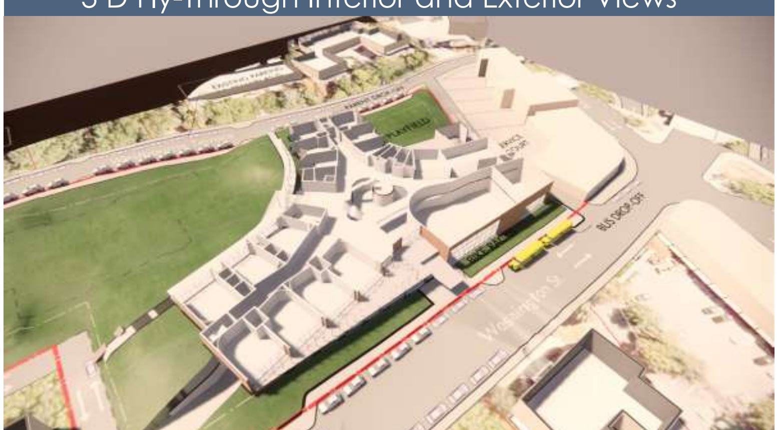

Agenda

1. Feasibility Study Review/Approval
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5. Upcoming Meetings

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Meeting Notes- Driscoll Staff

Project	Driscoll School
Date and time	1/16/19, 7:30 am – 3:30 pm 1/17/19, 10:30 am – 3:30 pm 1/24/19, 12:30 – 2:30
Location	Driscoll School
Prepared by	Philip Gray

All Staff Discussions: PG Introduced project, space summary program, current phase of work, and 3 cohort concept– looking for "Big Decision" input, with finer and finer grain decisions to be made in future meetings as design moves forward. Reviewed potential locations of spaces within building. Typical classroom pairing design with teacher planning area and movable partition, curved magnetic white board teaching wall, movable furniture, classroom acoustics and storage discussed with all general classroom teachers.

Wednesday 1/16/19

1. Kindergarten, Deana Shea, Laura Stillman, Kayte Cenahan

- Cubbies should be inside classrooms
- Display into hallway
- Lots of bookshelves

2. MS Science, Eric Adrians

- No need for movable wall between science classrooms
- 4 deep sinks in each CR
- Shower / eyewash in each CR
- EA to confirm if fume hood required
- Dishwasher, stove in shared prep room
- Sink in both prep rooms
- Take kids to fab lab
- Sample photovoltaic would be good

- Raised beds for planting
- Hooks above windows to potentially hang glass shelves

3. Nurse, Marianne Dewing

- No separate exam room
- Direct Access to central admin would be nice
- 3 cots
- Storage closet, fridge and sink with counter in central area
- Bathroom with storage next to cots
- Minimal waiting area
- Cots separated with curtains, not walls. from desk and each other
- Assume 2 staff

4. Media Center, Annie Reid

- 1 book room at 250 sf
- Lockable workspace with 300 sf storage needed
- Office for 2
- Open area to accommodate multifunctions: meetings / 2 teaching stations / lectures
- No space required to be singularly devoted to youngest kids

5. IT, Fab Lab, Maker Space, Jesse Kirdahy

- IT repair room needed with office, ideally near Maker Space, Fab Lab.
- Should allow check out of equipment by staff
- Office between fab lab and the maker space
    - Glass on either side to see through to lab and the maker space
    - Teacher desk(s)
    - Work benches
    - Secure storage (not to be accessed by students/staff)
        - Laptops, cables, robots, software, carts
- Passage space for students to move between lab and maker space without entering the office area. They'll probably be doing this pretty regularly. The

passage should be large enough to move rolling carts through it, and for students to move large projects through it.

- Lockable self checkout area accessible by students and staff, and visible from the lab and maker space
    - Staff area should probably not be accessible to students
    - Shelving
    - Electrical outlets for charging devices
    - Space for carts
    - Enough space for a self checkout computer

6. Art, Olivia Reyelt

- Each art room should have 3 sinks trough style and 1 HC sink
- De-Escalation area would be nice
- Sloped seating would be nice
- 3rd floor location is good – close to classrooms
- No need for group of 4 potters wheels or desktop computers
- Room for a laptop cart

7. Performing arts, Music, Lilly Meisel, Lauren Cecchini

- Storage for costumes
- Sound and light lock vestibule
- Adjacency to music is good
- Raised stage – not portable
- Sinks in music rooms
- Not clear if movable partition behind stage would be useful
- Concern about seating capacity

8. ELE, Jodie Curran

- Kids come to ELE, not ELE to classrooms
- 4 rooms: 1 near PK-K, 1 near 1-2, 2 in 6-8
- Grades 3-5 can go to 6-8 area

9. Grade 3-5, Alice Kuniholm, Christine Sevigny

- Paired classroom configuration looks good.
- Bathrooms should be centrally located
- Pumping room should be in school

10. 1st Grade, Danielle Trimarchi, McKenzie Snow, Sarah Cuddihy

- Cubbies in hall
- Bathrooms shared, direct to classrooms
- Close to playground
- De-escalation area outside classroom

11. Math and Lit Specialist, Jen Doublet, Jenna Laib, Allison Lenk

- Add 250 sf central office – take space evenly out of other 6 spaces
- 2 rooms for each cohort: 2 lit for K-2, 1 each math and lit for other 2 cohorts

12. 2nd grade, Erika Sullivan, Angela Harvey, Suzie Defcocolita

- Should be identical to first grade
- Small toilet only room with sink in classroom
- Cubbies in hall

13. Grade 6-8, Courtney Pelletier, Courtney Hart, Heather Crossen

- Very positive to basic classroom configuration
- Air Conditioning

<u>Thursday 1/17/19</u>

14. MS Spanish, Cecilia Costanzo

- World language classroom should have teacher planning
- Very positive to basic classroom configuration
- Very positive to teacher collaboration spaces

15. Special Education, 6-8 Learning Center, Rick Cass, Maureen Doherti, Tara Kelly, Michelle Plourde, Cindy Elies

- Want more space
- More separable areas for privacy
- Need clarification from PSB as to which spaces are for LC and which for LAHB

16. Grades 3-5, Alice Kuniholm

- Magnetic writable surface good for personalizing classrooms
- Save artifact from existing Driscoll for display? What might that be?

17. Special Education OT/PT, S_LP, BCBA, Guidance, Cora Finley, Marty Paul

- OT and Speech collaborate
- Majority OT/PT with grades K-4
- Offices should have proximity. Direct connection between offices not required
- No need to be adjacent to Guidance
- Need private bathroom, regular size
- Medical bathroom would be larger
- OT/PT office does testing prefer larger office - 250 sf - and smaller OT/PT space 850 sf – would be preferred
- Strong desire for small de-escalation nooks on each floor. More useful that one 50 sf centralized room

18. Pre-K, Melissa Lyons

- Good location in plans, adjacent to K
- Window at small child level desired, with window seat
- 1 adult sink with counter, 1 trough sink without counter
- Bathroom – adult size toilet similar to what they use at home
- Lots of bookshelves – adjustable
- Cubbies in classroom – slate flooring good
- Art closet near sink
- Central closet – 2 door

- Flexible furniture - no fixed desk

19. Music and Drama, Erin Murphy

- Concern about flat floor instead of sloped floor
- 350 seats too small
- Existing sloped floor auditorium constantly in use
- Need stage support rooms – storage, scenery construction, Audio Visual
- Stage large enough to support 80 MS students dancing
- Pass through stage left – right
- Sound and light locks
- Adjacent music rooms could be dressing rooms
- Coolidge Corner stage too wide, not deep enough
- Permanently station piano in front of stage
- Need 1 more music classroom in addition to current space summary program to maintain current programs. [Suzie Talukdar to coordinate with Benn Lummis regarding Ed Plan utilization.]
- Need music instrument storage, chairs, music stands

20. Guidance and Psychology, Stephanie Hughes, Hillary McConnell, Julie Young, Kerry Hibard

- Strong desire for small de-escalation nooks on each floor. No outlets or switches, easy to clean, soft mat on floor
- Interns need space
- Guidance does not need to be adjacent to central admin, 1 floor above ok
- One 50 sf de-escalation room with door and window needed
- Common storage – double door closet with adjustable shelves
- No waiting room
- No dedicated guidance records room – can use central admin records room
- All offices need lockable cabinets, files

21. LAHB, Jenny Singer, Renna Shultz, Sarah Wishner

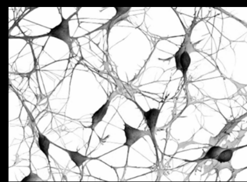
- Up to 11 students in classroom
- At least 1 room per cohort
- Need bathroom / sink direct to room for K-2 cohort

22. Grade 4, Josephine Bouquet, Elizabeth Sullivan, Bianca Medina

- Want option to use desk in classroom and teacher planning
- Love teacher collaboration workspace
- Sink in each classroom?

PLACES FOR THE MIND

Learning Spaces for Brookline's 21rst Century



Joint Session of the

Town of Brookline School Committee

Baldwin School Building Committee

Driscoll School Building Committee

January 22, 2019

JLA Jonathan Levi Architects

Outline of Topics

1. Sustainability and Fossil Free Energy Systems
2. Introduction to Educational Places
3. How Young People Think
4. Virtual and Physical
5. Why Places Matter
6. Topics in Evidence-Based Design
7. A Look Into the Future at Baldwin and Driscoll

JLA Jonathan Levi Architects

Outline of Topics

1. Sustainability and Fossil Free Energy Systems

- All-electric heating and cooling
- Geothermal
- Photovoltaics

JLA Jonathan Levi Architects

HVAC ZERO COMBUSTION ENERGY SYSTEM TYPES

Baldwin School and Driscoll School
Brookline, MA

GGD

HVAC ZERO COMBUSTION ENERGY CONSUMPTION SUMMARY

	SYSTEM TYPES (Based upon previous school projects)	Annual Elec. Cons. (kWh)	Annual Electric Cost	Annual Utility $/s.f.	Annual kBTU/s.f. (EUI)	COEFFICIENT OF PERFORMANCE (COP)
1*	Full air-conditioning displacement ventilation diffusers and perimeter electric radiant panel Air-source heat pump heating/cooling VAV ventilating units with energy recovery with terminal VAV boxes with CO2 controls	1,028,800	$108,020	$1.87	60.8	** 3.6
2	Variable refrigerant flow (VRF) terminal evaporator units or indoor air handling units with air-cooled condensing units and perimeter electric radiant panel Air-source VRF heating/cooling VAV ventilating units with energy recovery with terminal VAV boxes with CO2 controls	897,320	$97,200	$1.09	35.2	4.4
3	Geothermal central heat pump plant which provides chilled water and hot water to air handling units with energy recovery sized for ventilation only Perimeter chilled beam/radiant panel for trim heating and cooling VAV boxes with CO2 controls to displacement diffusers	1.711,928	$267,060	$1.15	25.1	7.0

* *Building is multiple use which includes classroom spaces, artist studios and auditorium.*

***$COP_{heating}$ of 3.5 provides 3.5 units of heat for each unit of energy consumed (i.e. 1 kWh consumed would provide 3.5 kWh of output heat).*

GGD

SYSTEM #1: ROOFTOP UNITS HIGH-EFFICIENCY HEAT PUMP

Heat Pump Rooftop Unit (12-30 Ton)

Variable Air Volume Box

Heating Performance

Electric Radiant Panel

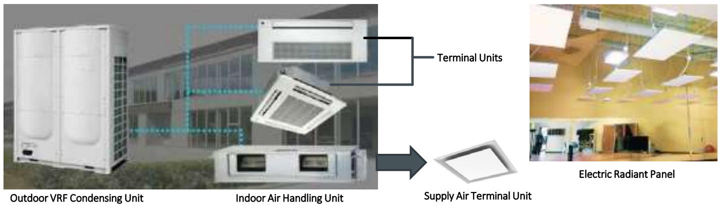
DESCRIPTION:
- Full air-conditioning displacement ventilation diffusers and perimeter electric radiant panel
- Air-source heat pump heating/cooling VAV ventilating units with energy recovery with terminal VAV boxes with CO2 controls

PRO:
- Lowest Installation Costs, Does Not Use Fossil Fuels for Heating, Uses Conventional Distribution and Terminal Equipment, Projected EUI Range of 50-60

Displacement Diffuser

GGD

SYSTEM #2: AIR-SOURCE ELECTRIC VRF (VARIABLE REFRIGERANT FLOW)

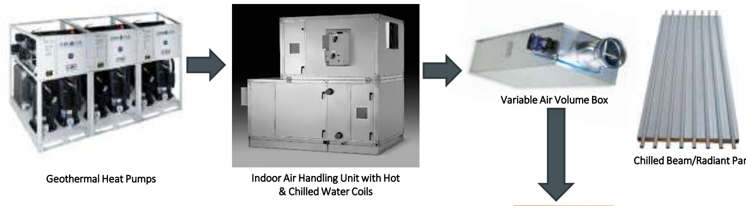


DESCRIPTION:
- Variable refrigerant flow (VRF) terminal evaporator units or indoor air handling units with air-cooled condensing units and perimeter electric radiant panel
- Air-source VRF heating/cooling VAV ventilating units with energy recovery with terminal VAV boxes with CO2 controls

Heating Performance
Outdoor units can operate up to 4.41 COP to reduce energy consumption.

PRO:
- Lower Energy Use, Moderate Installation Costs, Does Not Use Fossil Fuels for Heating, Terminal Units located in Ceiling, Projected EUI Range of 25-35

SYSTEM #3: GEOTHERMAL HEAT PUMP



DESCRIPTION:
- Geothermal central heat pump plant which provides chilled water and hot water to air handling units with energy recovery sized for ventilation only
- Perimeter chilled beam/radiant panel for trim heating and cooling
- VAV boxes with CO2 controls to displacement diffusers


Displacement Diffuser

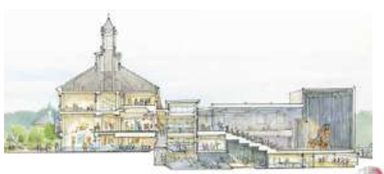
Heating Performance
COP can exceed 7.0 by leveraging combined chilled and hot water efficiency — more efficient than a gas-fired boiler at 0.95 COP

PRO:
- Lowest Energy Use, Highest Installation Costs, Does Not Use Fossil Fuels for Heating, Terminal Units located in Walls, Projected EUI Range of 20-25

HVAC ZERO COMBUSTION BUILDINGS

KING OPEN CAMBRIDGE UPPER SCHOOL, CAMBRIDGE, MA
Plumbing, Fire Protection, HVAC, Electrical, Security and Technology design and construction services for the new construction of the new King Open Elementary School, Cambridge Street Upper School, a new Valente Branch Library, Gold Star Pool, Human Services space including preschool and afterschool programs, Cambridge Public Schools Administrative offices, and Parking. Estimated square footage for the purposes of preparing our fee is based on building area of 238,000 square feet and garage area of 20,000 square feet. This project is projected to become a Net Zero Energy Building achieve LEED Silver certification. This project has a geothermal well, solar water heater and photovoltaic system.

EMERSON UMBRELLA CENTER OF THE ARTS, CONCORD, MA
Plumbing, Fire Protection, HVAC, Electrical and Technology schematic design through construction administration services for the renovation/addition to the existing approx. 48,000 s.f. Emerson Umbrella Center for the Arts and 27,000 s.f. addition. The previously renovated Gallery Space will remain and will only require HVAC modifications. The modifications include an all-electric HVAC system. The project is projected to meet LEED certification.



HVAC ZERO COMBUSTION BUILDINGS

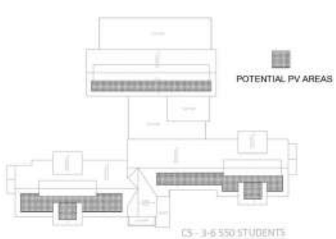
859 MASSACHUSETTS AVE FAMILY SHELTER CAMBRIDGE, MA
Fire Protection, Plumbing, Mechanical and Electrical study, design and construction administration services for the design of 10 single room occupancy units located on the first, second and third floors and a common space at 859 Mass Ave. Our scope also included storage tank, photovoltaic array design and solar hot water collector. This project is anticipated to achieve LEED certification.

DCR WALDEN POND VISITOR'S CENTER, CONCORD, MA
MEP/FP design for new high-efficiency (beyond Net Zero) 6,500 SF visitors center including exhibits, public & staff restrooms, administrative spaces, conference spaces, lunch room, kitchenette, gift shop/bookstore and storage areas. Sustainability features include solar parking canopy and electric vehicle charging stations. LEED Commissioning was part of this project.
This project was the first DCR project if be awarded LEED certification.

PHOTOVOLTAIC ARRAY SYSTEM FOR SCHOOLS

ROOF MOUNTED SYSTEM

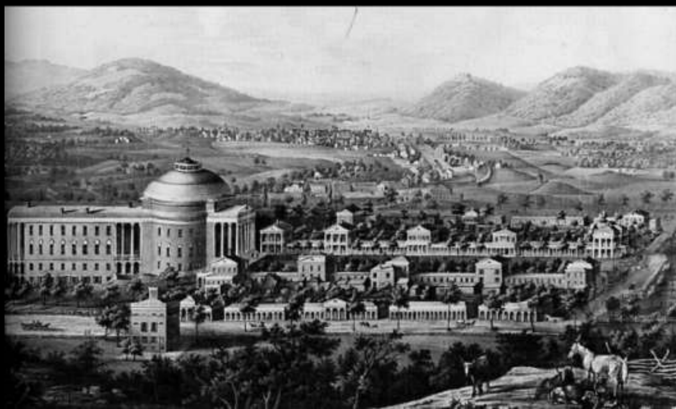
- Estimated Size: 95KW
- Estimated kWH generated: 123,461
- Estimated Construction Cost: $285,000
- Estimated SMART Compensation: $16,475/yr
- Estimated Discounted Payback: 9 years

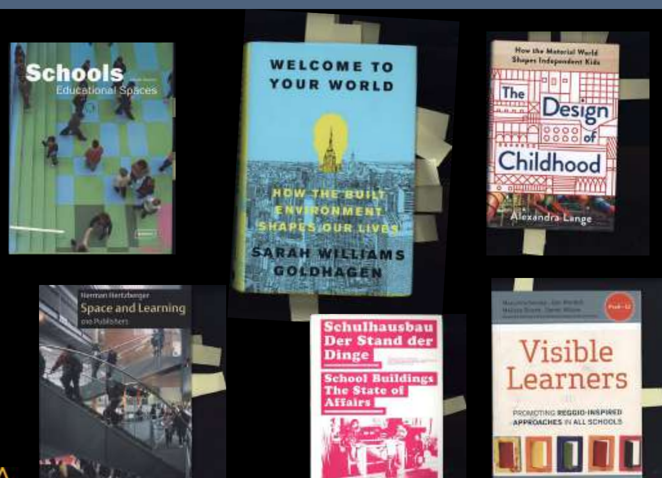


Outline of Topics

1. Sustainability and Fossil Free Energy Systems
2. Introduction to Educational Places
   - The revolution in education
   - Multiple intelligences to individuated instruction
   - Technology and collaboration
   - Reference literature

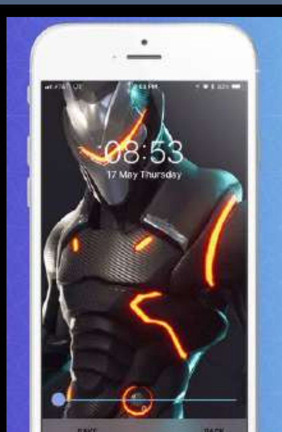
Jonathan Levi Architects





Outline of Topics

1. Sustainability and Fossil Free Energy Systems
2. Introduction to Educational Places
3. How Young People Think
   - Simultaneous consciousness
   - The end of ‘depth’ and conclusiveness
   - Group think and openness
   - Graphical and spatial ideation

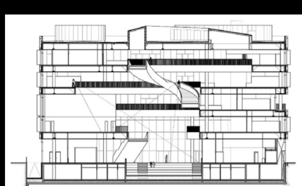


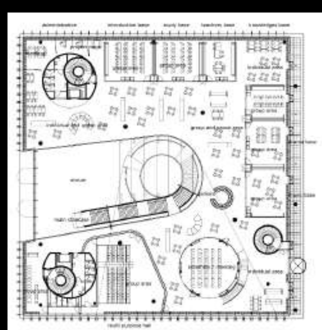
Outline of Topics

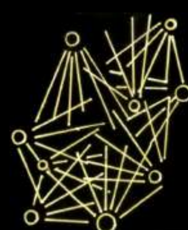
1. Sustainability and Fossil Free Energy Systems
2. Introduction to Educational Places
3. How Young People Think
4. Virtual and Physical
    - Bricks and mortar value-added
    - Complementing the virtual
    - Ordering knowledge in 3 dimensions
    - Browsing and Studying

"No ideas but in things."

-William Carlos Williams

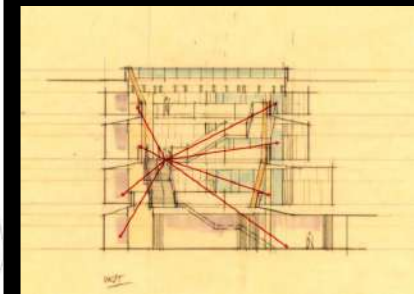






Outline of Topics

1. Sustainability and Fossil Free Energy Systems
2. Introduction to Educational Places
3. How Young People Think
4. Virtual and Physical
5. Why Places Matter
    - Wonderstanding!
    - Visible learning
    - The ideational spectacle
    - Randomness and invention
    - Socialization

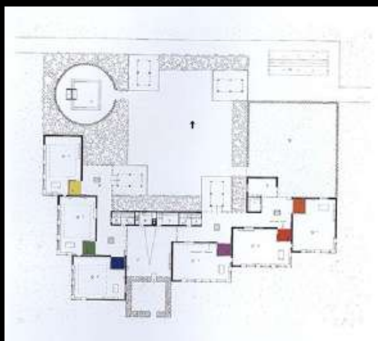


"To marvel is the beginning of all knowledge"

- ancient greek proverb

Outline of Topics

1. Sustainability and Fossil Free Energy Systems
2. Introduction to Educational Places
3. How Young People Think
4. Virtual and Physical
5. Why Places Matter
6. Topics in Evidence-Based Design
   - Domesticity and institutions
   - Daylight
   - Small spaces and collaboration
   - Big spaces and big ideas
   - Curvature and material welcome



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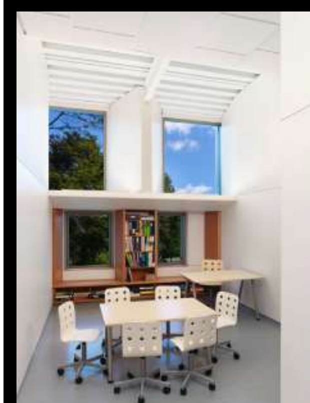

Jonathan Levi Architects

Jonathan Levi Architects

Jonathan Levi Architects

Outline of Topics

1. Sustainability and Fossil Free Energy Systems
2. Introduction to Educational Places
3. How Young People Think
4. Virtual and Physical
5. Why Places Matter
6. Topics in Evidence-Based Design
7. A Look Into the Future at Baldwin and Driscoll
    - Baldwin and nature
    - Driscoll and the city

Jonathan Levi Architects
266 beacon street boston ma 02116 tel 617.437.9458 www.leviarc.com

NOTES OF MEETING

project	**Driscoll School**	project no.	1823
date	1/24/19, 7:30 am	location	Brookline Town Hall
re	**School Building Committee #7** Schematic Design- design review, sustainability		

present
Neil Wishinsky, Co-Chair, Select Board
Susan Wolf Ditkoff, Co-Chair, School Committee
Karen Breslawski, Building Commission
David Lescohier, Advisory Committee (by phone)
Nancy O'Connor, Parks and Recreation Commission
Dan Deutsch, Community Representative
Victor Kusmin, Community Representative
Arjun Mande, Community Representative
Lakia Rutherford, Community Representative/METCO
Dr. Nicole Gittens, Deputy Superintendent of Schools for Teaching and Learning
Mary Ellen Dunn, Deputy Superintendent of Schools for Administration and Finance
Dr. Suzie Talukdar, School Principal Representative
Ben Lummis, Project Manager, School Department
Ray Masak, Project Manager, Building Department
Daniel Bennett, Building Commissioner
Heather Hamilton, alternate Select Board
Jonathan Levi, JLA
Carol Harris, JLA
Philip Gray, JLA

Distribution:
attendees; project file
Sara Stoutland, Community Representative
Val Frias, Community Representative/ Special Education Parent Advisory Council
Mel Kleckner, Town Administrator
Andrew Bott, Superintendent of Schools
Ali Tali, Public Works, Engineering and Transportation

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1) 1/15/19 SBC meeting minutes approved with the following revisions:

- Tennis courts are not excluded from the project.
- More cost effective to build out full basement now for potential future uses even if not used for parking.
- The amount of open space indicated in current design is to be maintained moving forward (not the amount of existing open space).

Timeline, Deliverables, Project Management. Ben Lummis summarizes meetings held with Superintendent staff, Parks & Rec, BEEP, RISE. A meeting with the transportation board to discuss parking will take place Jan. 28. A meeting with Parks & Rec and design team will take place Jan. 30.

Ben Lummis provided handouts of Brookline Articles 2 and 21 regarding Town sustainability approaches for reference and review:

- Article 2, documents the Advisory Committee's recommendation to approve Design Services for the Driscoll School with the condition that no funding be used for the design of non-emergency fossil fuel-operated building systems.
- Article 21, a resolution regarding the pursuit of Net Zero Energy in Brookline Schools.

Project Management: Ray Masak updates that an Owners Project Manager [OPM] search is underway with applications due today. A Committee of 7 has been formed. The OPM's tasks include a cost estimate and reconciliation with the Designer's cost estimate.

Select Board: Neil Wishinsky notified the Committee the Select board has been having discussions about Newbury College and implications to the proposed Override in May. This was discussion only and no decisions have been made.

2) Design Update - Programming: Philip Gray provided an overview of the 2 days of meetings with Driscoll Staff. Noted very few concerns since will be providing a new school that is a better facility and will feel less crowded than today.

Dr. Suzie Talukdar, Principal, summarized her faculty meeting afterwards. Faculty wanted to see how their feedback was being addressed and requested JLA's raw meeting notes. JLA forwarded meeting notes.

Design Update – Building Design: Jonathan Levi provided plan updates. The overall concept and shape remained the same with some room re-shuffling:

- Moved toilet rooms to a less prominent location.
- Moved MakerSpace, FabLab, and Science to a more prominent location.
- Removed earthwork outside Media center to have full views to the field and for Learning Common to have sweeping views to the park/field.

- Pre-K moved to 2nd floor north wing creating their own area with direct access to Westbourne Terrace and outdoor space. Superintendent Bott noted Pre-K and K were not together at Coolidge Corner School and prefers for K and 1st grade together (as shown).
- Toilet core location on west side allows for potential field use/community access during off hours.
- Parking- 25 spaces shown, final number still in reviews – votes required.
- Terracing on either side of the north wing from Westbourne Terrace down to the fields on the west and to Pre-K playground on east.
- Art stacked above MakerSpace and Fab Lab creating a specialized core.
- Project Area and a satellite Administration area on each floor.

Comments included:

- Liked rooftop terraces – could there be planting beds? JL response: Yes, could have raised beds and could be student project areas.
- Liked Media Center being opened up, better for the community.
- Confirmed the new building not interfering with existing gym.
- Liked how program working with the levels.
- Suggested there be a stair/ramp down from the exterior 2nd floor entry from Westbourne Terrace down to the Field level.
- Suggested the stairs at ends of corridors be turned to the side so that there could be windows with unencumbered views out to fields.
- Some feedback from teachers noted that it may be difficult to manage multiple stairs.
- School garden – the ramp/terrace at the east side of the north wing from 2nd floor down to 1st may be great location for garden terraces.
- Learning Common – most of area will be lunch tables; will be a discussion during Furnishings. Will likely be 3 seating lunch.
- Could the Media Center be switched with the Learning Commons so that the front entry focuses on books not food? JL Response: locations are governed by the Service Areas and access.

  Philip Gray noted from faculty discussions there is a desire for multipurpose space with some sound secure areas, like a reading room. Desire for flexibility to accommodate future needs.

- Central Admin location - Discussion of pros and cons to the Central Admin. on the 1st floor at the Washington St entry rather than the 2nd floor. Comments included:
  - Noted that students will be coming from all directions.
  - Since so open can see all floors, all connected.
  - Consider how the Satellite Admin on each floor could be used.
  - Main office location dictates main entrance.
  - David Lescohier likes Washington Street as the main entrance as it is impressive, Westbourne entrance more like a back yard.

Design Update – Operation Mode diagrams: Jonathan Levi presented diagrams that indicated how to section off and provide secure access during specific events at off hours. Options included:

- 1) Multi-purpose/ Performance; 2) Learning Commons/ Café; 3) Media Center/ Learning Commons; 4) Athletics; 5) Playfield/ Toilets

Comments included:

- Include options for: 6) extended day and after care; 7) music area

Design Update - Parking: School Committee voted on Jan. 22 for 25 parking spaces determining the teacher permit area as .4 miles. This is in line with Coolidge Corner and Baker, other schools are .5 miles. Transportation Board will vote on Monday Jan. 28. Comments included:

- More efficient and cost effective to build out full basement now regardless of parking count for flexibility of future use.
- Dan Bennett will talk with Planning Dept. regarding parking and permitting to get input from Town perspective.
- Not all teachers live in area and do not have access to public transportation.
- Need to accommodate for parking at community events.
- If provide 25 spaces then about 25 spaces less than what is on site now.
- More drop off spaces will be provided on Westbourne Terrace and may be used for afterschool and event parking.
- If no underground parking provided, how much surface parking could be provided between Bartlett Crescent passageway and the west wing? JL Responds: about 10-20 spaces.

3) Fossil Fuel Free School: Jonathan Levi summarized sustainability approach options that will be used in the development of the energy model and Life Cycle Cost analysis. All options outlined would include an electric source.

   - Option 1: Displacement Ventilation System provided by Chilled/Hot Water Air Handling Units with Water-Cooled Heat Pump Plant and Cooling Towers
   - Option 2: Air-Source Terminal VRF Heat Pump Units with Air-Source Heat Pump Air Handling Units for Ventilation
   - Option 3: Displacement Ventilation System provided by Chilled/Hot Water Air Handling Units with Geothermal Heat Pump Plant

   Driscoll site is large enough for geothermal. Net Zero is not achievable since need to generate own energy to meet requirements. The amount of PVs required to meet this requirement is more extensive than site provides.

   Fossil Fuel Free requires not providing non-emergency fossil fuel-operated building systems.

   Comments included:

   - Neil Wishinsky questioned if other parts of town be available for additional PV array space.
   - LEED Silver minimum will be provided
   - Full Driscoll roof will be PV array.
   - David Lescohier notes Fossil Fuel Free is essentially Net Zero ready.
   - Emergency systems exempt from fossil fuel free requirements.
   - Questioned if could put PV on walls? JL response: not efficient angle for PV installation.

4) Next Meeting: Friday, Feb. 8, 7:30am.

END OF MEETING NOTES
Addressees believing these notes are in error or are inaccurate should contact the writer within five business days, otherwise these notes will be considered accurate.

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by Carol Harris, JLA

BROOKLINE

DRISCOLL SCHOOL EXPANSION

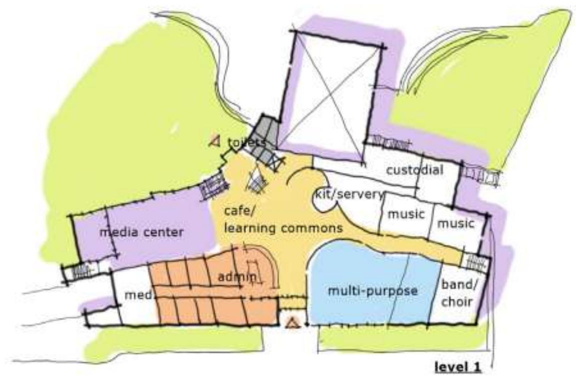
School Building Committee
Jan. 24, 2019

Design Update

1. Joint Session Recap
2. Revised Plans
3. Operation Modes
4. Staff Meetings Update

Floor Plan Revisions

Floor Plan Revisions



Floor Plan Revisions

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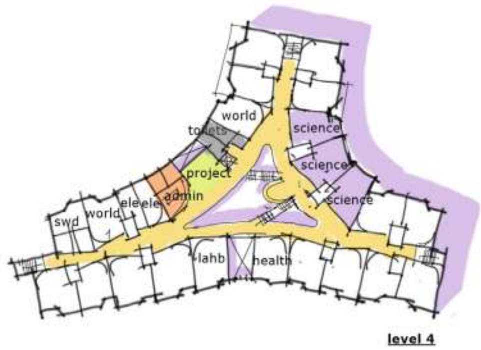
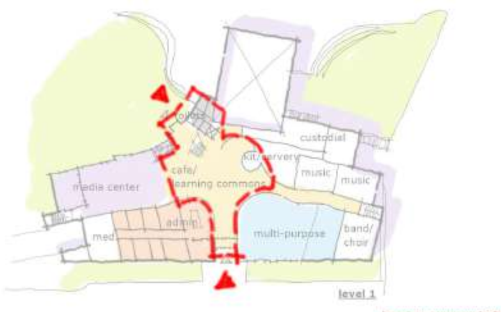
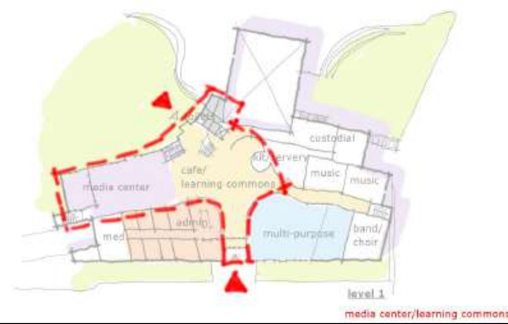


Operation Modes

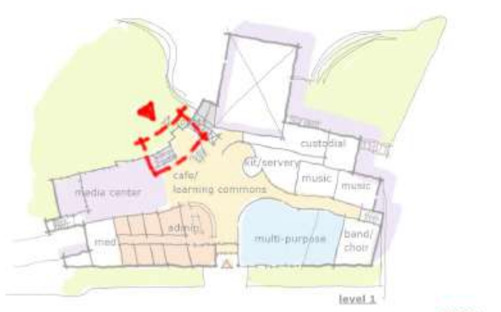
Operation Modes



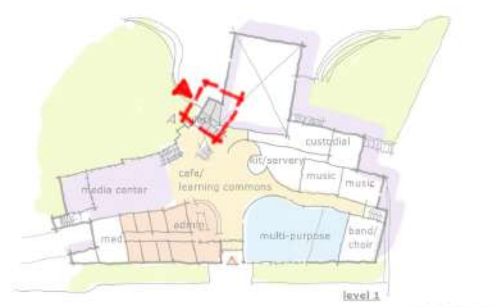
Operation Modes



Operation Modes



Operation Modes



TRANSPORTATION BOARD MEETING
Monday, January 28, 2019 @ 7:00 PM
Select Board Hearing Room, Brookline Town Hall
333 Washington Street

Meeting was called to order. Present was:

Transportation Board:
Christopher Dempsey, Chairman
Jonathan Kapust, PE Vice Chair
Ashley Haire, PE
Cynthia Lee
Nancy Moore
Ali Tali, PE

Town Staff:
Todd M. Kirrane, Transportation Administrator
Peter M. Ditto, PE Director of Engineering & Transportation
Daniel Martin, Transportation Engineer
Priscilla Ayati, Administrative Assistant
Deputy Superintendent Myles Murphy, Police Department
Deputy Chief Daniel Carroll, Fire Department
Ben Lummis, Special Assistant to the Superintendent for Strategy and Performance for Brookline Public Schools

PUBLIC COMMENT PERIOD FOR ISSUES NOT ON THE AGENDA

- John Bowman, Chair of the Bicycle Advisory Committee read a statement from the Bicycle Advisory Committee that they are disappointed that the temporary markings done on Babcock Street for the winter did not include markings for the bike lane. They requested that the Board encourage the Department of Public Works to developed a policy that when temporary markings are done on a project that they include bicycle markings as well.
  - Staff stated that this discussion already took place with the Department and future contracts will include this bid item.
- Jane Ross, a member of the Pedestrian Advisory Committee stated that the PedAC, at the request of a resident, is looking into the lack of pedestrian crosswalks around Putterham Circle after Massachusetts DCR paved West Roxbury Parkway. She wanted to encourage anyone who had feedback to contact the committee.

MEMBER UPDATE

- Ms. Lee stated that the Commission for the Disabled reviewed BHS Expansion plans relating to ADA access
- Ms. Moore stated that the Public Transportation Advisory Committee will be coming before the Board to present the results of their updated Bus

Stop Amenities Survey and will seek support for installation of new benches and shelters

- Ms. Haire stated that the Bicycle Advisory Committee completed a process to identify 10 priority bike racks for snow removal by the DPW, upcoming requests for CIP projects, and safe routes to the Baldwin School.

DPW UPDATE

- Director Ditto stated that the Babcock Street is on hold for the winter and staff is developing plans and specifications for the reconstruction of Pearl Street.

DISCUSSION AND ACTION ON REQUEST BY JOSEPH GELLER FOR INSTALLATION OF A CURBSIDE HANDICAP PASSENGER LOADING ZONE 7:30 – 8:30 AM 2:30 – 3:30 PM IN FRONT OF 221-223 WINCHESTER STREET

- Transportation Administrator Kirrane stated that
    - Joseph Geller, a resident of 223 Winchester Street has requested the installation of a Handicap Loading Zone in front of his residence for the hours of 7:30 to 8:30am and 2:30 to 3:30pm to ensure that the handicap van picking up his disabled sister daily can access the curb for passenger loading and unloading purposes.
    - According to the request the passenger van which picks up the petitioner's sister often cannot find space available in front of the house because of the public parking supply usage and has to pull over away from the house.
    - The effect of the request is that it will allow access when the resident needs it but not remove the space from the two hour public parking supply like a normal curbside handicap parking space would.
    - Staff's knowledge of this portion of Winchester Street is that the parking supply in this area has a high utilization rate given a combination of its proximity to the Boston border, parking only being allowed on one side, and most properties having tandem driveways. Therefore we recommend favorable action on this request as it will allow the curbside to be available when needed for the resident but not remove the space entirely from the two hour parking supply.
- Ms. Moore sought and received confirmation that a passenger loading zone request did not require the same application and documentation needed for a designated on-street handicap parking space.

Ms. Haire made a motion to install a Designated Curbside Handicap Passenger Loading Zone 7:30 to 8:30am and 2:30 to 3:30pm in front of 221-223 Winchester Street. The motion was seconded by Ms. Lee and passed by a vote of 5 to 0 (Kapust absent).

<u>DISCUSSION AND ACTION ON REQUEST BY MAUREEN CARTER FOR INSTALLATION OF A CURBSIDE HANDICAP PARKING SPACE ON ASPINWALL AVENUE IN THE VICINITY OF ST. PAUL'S CHURCH</u>

- Transportation Administrator Kirrane stated that
  - Maureen Carter, a parishioner of St. Paul's Episcopal Church located at northeast corner of St. Paul Street and Aspinwall Avenue has requested the installation of a designated curbside handicap parking space on Aspinwall Avenue to provide improved parking options for disabled parishioners of the church who must drive to services.
  - While the space is not reserved for any one person, the petitioner has indicated in her request that both she and her husband are disabled and would greatly benefit from the designated parking space which is close to the entrance of the church.
  - The preferred location is in the last legal parking space on Aspinwall Avenue, immediately before the crosswalk, because St. Paul Street does not allow parking on the church side.
  - This location will also allow a disabled driver the benefit of the use of the ramp at the crosswalk to access the sidewalk. Staff is recommending favorable action.
- Ms. Moore sought and received confirmation that a request for the creation of an on-street handicap space to provide access to a public amentity such as a park or playground, a house of worship, a commercial district, etc. does not require the submittal of the application and supporting documents as a residential request for a space outside their home.

Ms. Haire made a motion to install a Designated Curbside Handicap Parking Space on Aspinwall Avenue westbound in the last legal parking space before its intersection with St. Paul Street. The motion was seconded by Ms. Moore and passed by a vote of 5 to 0 (Kapust absent).

<u>PRESENTATION BY THE DRISCOLL SCHOOL BUILDING COMMITTEE OF THE TRAFFIC IMPACT ASSESSMENT FOR THE DRISCOLL SCHOOL COMPLETED BY VANASSE & ASSOCIATES, INC.</u>

- Giles Ham of Vanasse & Associates and Mr. Lummis from the School Department presented the attached presentation.
- Mr. Tali
  - Inquired into the location of bicycle rack locations for staff and student use and requested that they be shown on the presentation for the next meeting – Mr. Ham noted the request
  - Inquired into the possibility for bicycle accommodations on Westbourne Terrace and other streets feeding into the site – Mr. Ham noted the request
- Ms. Lee

    - Inquired into the location of disabled parking and drop off/pick up location and wanted to make sure that they are included in the closest appropriate location
        - Phillip Gray of JLA indicated that drop off will be on Washington Street in front of the main entrance and HP parking will also be present in the garage with elevator access into the school
    - Inquired into if the School Department has an educational program for safe walking and biking for students – Susan Wolf Ditkoff of the School Committee indicated they participate in Safe Routes to School and send out notification to parents on this
- Vice Chair Kapust
    - Inquired into the sidewalk width on Westbourne Terrace and wanted to ensure it was not narrower than existing conditions – Mr. Ham noted the comment and confirmed widths will be the same or wider
    - Inquired into whether or not Westbourne Terrace was wide enough to accommodate the proposed pick up/drop off zone and parking on the opposite side
        - Staff indicated that the plan was similar to the Coolidge Corner School which pushed the sidewalk into the existing park in order to accommodate this safe loading area
    - Inquired if public parking would be allowed during non-school hours – staff indicated up to the Board
    - Confirmed that there are two entrances for the school – rear and front – for student access and why two entrances can be accommodated here but not at the Baldwin location?
        - Mr. Gray stated that the rear entrance is only for morning arrival and afternoon dismissal and can be accommodated at grade at this location. The site of the Baldwin location makes this more difficult by the building committee is looking at a second entrance for the same purpose at Baldwin based on the December request of this board.
    - Inquired into the ownership of the alley way and whether the Town has jurisdiction over this and will they take measures to discourage parent drop off in this location – Mr. Gray & staff confirmed the alley way is shared ownership with abutters and the School Department is seeking ways to minimize parent activity there
    - Confirmed that a RRFB is included in the Washington Street at Salisbury Rd
- Chair Dempsey
    - Requested a clear ADA compliant access way from the crosswalk on Salisbury Rd to the park/playground – Mr. Gray noted the request

    - Requested good pedestrian connections from all directions into the park/playground
    - Requested covered bike racks for students and teachers
    - Concerned that the drop off & pick up zone is encouraging parents to drive to the site for this purpose and he does not support compelling parents to drive. He understands the desire to provide a safe location for this purpose, but he would like to see more attention to pedestrian and bicycle oriented infrastructure more than arrival by cars.
- Ms. Haire
    - Inquired into a network of pedestrian walkways throughout the parks/playground and the school site – Mr. Gray stated that this would be driven by Parks & Recreation Commission and he will rely the Board's request to them during conversations in the subject
    - Inquired into the bike counts for students
    - Inquired into the coordination of this project with the Green Routes Master Network Plan and asked for them to review
- Daniel Martelly, a resident of Winthrop Road inquired into the number of bike racks being provided and encouraged as many as possible for both the school and the park/playground users
- John Bowman stated that he would like to see more focus on a detailed plans for safe routes to school for both pedestrians and cyclists
- A resident of Salisbury Rd stated inquired into whether or not the School department has given thought to bus routes and wanted to state that Salisbury Rd is too narrow so he hopes they will discourage use of that street
- Marsha Armstrong, a resident of Bartlett Crescent stated inquired into whether or not the school department can communicate use of the routes down the hill for students so they know of these routes from Corey Hill and encourage pedestrian access

DISCUSSION AND ACTION ON THE REQUEST BY THE SCHOOL DEPARTMENT FOR A REVISED DRISCOLL SCHOOL ON-STREET PERMIT PARKING PROGRAM FOR THE RECONSTRUCTED SCHOOL (proposed parking plans posted at https://www.brooklinema.gov/140/Transportation-Division-of-DPW by 5pm Wednesday, January 23, 2019. Impacted streets may include Bartlett Cr, Bartlett St, Beacon St, Downing Rd, Evans Rd, Griggs Rd, Lancaster Tr, Mason Tr, Orchard Rd, Salisbury Rd, University Rd, Washington St, Westbourne Tr, Williston Rd, Windsor Rd, Winthrop Rd, York Tr):

- Transportation Administrator Kirrane stated that 3 options for a combination of on-site garage parking and on-street teacher permit parking have been developed by the Driscoll Building Committee, their architects, and traffic consultants that they believe are feasible given the overall school needs and the projected parking need which does take into account the Town's development of a Parking & Transportation

Demand Management program for employees. The three plans are included in the memo provided to the Board by the School Department.

- Mr. Lummis discussed the 3 options (option A, B, C) as outlined in the attached presentation to the Transportation Board
- Vice Chair Kapust
    - Inquired into the possibility of whether the garage could be constructed in a manner that will allow it to be retrofitted at a later date for other used by the school given that future means of transportation like autonomous vehicles may significantly reduce the need for the parking garage. He encouraged that this be done.
        - Mr. Lummis and Mr. Gray stated that this was discussed by the School Committee and the Building Committee and while it may have some use, it will most likely not be teaching space given the lack of windows, etc.
    - Inquired into whether or not a trip generation for the reduced onsite amounts of option A or B has a positive impact on Washington Street?
        - Mr. Ham stated that the teachers arrive before the am peak hour and before the drop off so there is no real change to the peak hour traffic on Washington Street between the 3 different options
    - Inquired into if the spaces are used by full time staff for the Driscoll School or are they used by town-wide staff that travels between buildings throughout the school day?
        - Mr. Lummis stated that these spaces are for staff who are at the Driscoll School for the entire day
    - Inquired into the amount of steps staff will have to walk down/up if they have parking spaces on Lancaster Terrace since all 3 plans require that
        - School Committee Pollack stated that it is at least 4 stories worth of steps and noted that most school kids who walk from that neighborhood to the school use that route daily
- Ms. Moore
    - Inquired into the impact on the neighborhood during non-school hours for evening activities if you provide less parking than there is today which is option C? She is concerned about the impact of the parking on the neighborhood and the commercial area customers
        - Mr. Lummis indicated that the benefit of the design is that the drop off/pick up lane could be used to offset the impact of events during non-school events
        - A school committee member indicated that access to the garage is under consideration for use by non-school related uses of the building to reduce the impact as well for those types of events

    - Inquired into what the difference in consideration was between the recommendation by the Building Committee and the School Committee
        - Sara Stoutland, a member of the Building Committee stated that the discussion centered around the costs and the fact that if the excavation is already taking place to construct the school then they should at least provide as much on-site parking as currently exists. That the added cost to construct option C was not a lot considering the project as a whole and this is the only opportunity to do it.
        - David Pollack, School Committee Chair stated that the School Committee stated that the concern for the school committee centered around the attempt to be cost effective and weight the cost and benefits of providing more on-site parking that may not been needed in future years given P&TDM, etc. and do what is feasible given the total project cost
        - Mr. Lummis stated that another discussion at the School Committee was the added costs of 3 to 5 million dollar cost added by Town Meeting to build a carbon neutral school and choosing Option B which was lower in cost
    - Sought and received confirmation that the DPW clears the snow from the public pathways
        - Staff also added that on-street permit programs are placing a larger burden on the limited capacity of DPW during the winter months as principals ask not only for snow plowing but snow removal in all permit locations within a day of the storm. These growing requests have not come with any budget increase to the winter operations of the department. This is part of the reason why staff is concurring with the Building Committee and seeking support for Option C which meets the current on-site capacity and places the least burden on-street
    - Inquired into the possibility of not giving the direction to the school committee and letting them make decisions based on feedback, but with no vote?
        - The project is at a point where they need the board to indicate how many spaces they can receive on-street so they can move the project forward and design the garage and prepare cost estimates. If the Board provides no answer than the project development stops as it waits for the board to decide.
- Ms. Haire
    - Sought and received confirmation that the vote tonight will be what the Board is willing to provide for on-street permits so the Building Committee knows what size garage must be budgeted for

    in response. The Building Committee could choose to construct a larger garage and accommodate more parking on-site, but they would not be able to construct a smaller garage and push more people to the street.
    - Inquired into the process to determine who gets on-site vs on-street spaces – staff answered that it is determined by the Principal of the school
    - Inquired into how the P&TDM would incentivize staff to participate if they have an on-site space – staff indicated that the P&TDM is being designed to charge for parking while providing a benefit for non-vehicle mode. But even with P&TDM you would need to greatly reduce the number of staff arriving by alternative modes before you could reach a level where all on-street or all on-site would not be needed. It is unlikely to happen even with the most robust P&TDM plan.
    - Inquired into why staff did not look to the streets west of the site which does not have the same issues with grade changes and hills as Lancaster Terrace does?
        - Staff stated that the streets to the west are already at 40% with the teacher permits and the commercial permits and therefore cannot be expanded. The same goes for those streets to the southwest of the site like University Ave.
    - Inquired into who has the ultimate decision making authority the Building Committee or the School Committee? Answer was the School Committee.
- Chair Dempsey
    - Stated that there is no evidence to date that usage of the on-site garage spaces are ever allowed in other school buildings and as such he doubts that this will be allowed here. They are never just opened to the public during non-school hours. So he does not think the garage spaces will benefit the community as a whole and add to the parking supply for the nearby commercial district – Mr. Lummis stated that it is under consideration for the Coolidge Corner School, but acknowledges that it is not the case right now. He clarified that he was speaking of usage for non-school events at the building itself.
    - Inquired of the Beacon Street on-site spaces and the impacts of the metered parking supply and revenue for the Town
        - Transportation Administrator Kirrane stated that the existing on-street spaces are along the westbound curb which is not metered. Any expansion option that includes Beacon Street positions them at metered spaces in the median away from Washington Square which have a low daytime utilization rate during the week days

    - Inquired into any evidence of Lawrence or Runkle School employees leaving or not accepting job offers because they have to park on-street?
        - School Committee Pollack & Mr. Lummis said that he has not heard of any challenges of that nature with staff retention or impacts on the school children
- Mr. Tali
    - Stated that the Board should be consistent in their application. Runkle and Lawrence has 100% on-site parking and saying they can have it but other like Driscoll cannot is inconsistent. – Staff stated that the difference is that Runkle and Lawrence were expansions of existing buildings and not new construction. Those that have been new construction, most recently Coolidge Corner School and the Lincoln School have increased on-site parking so the Board and the Town has more options with new construction and retrofitting existing buildings.
- Len Wholey, a resident of Lancaster Terrace stated that he submitted two petitions that encourage the Board and the School Department to provide as much on-street parking as possible instead of building costly on-site parking and instead divert that money to education related uses
- A resident of Lancaster Terrace stated that while she signed the previously mentioned petition, she now supports on-site parking construction because changes to the community will increase traffic on Lancaster Terrace and she wants to limit the number of vehicles driving and parking on this street. In fact she would like on-site parking and no on-street parking on Lancaster Terrace.
- Mitch Heineman, a resident of Beals Street stated that he thinks the Board and the School Department should seriously explore the possibility of using the parking during non-school hours for support of the park/playground and nearby commercial district.
- Daniel Martelly, a resident of Winthrop Rd said the garage should be designed to accommodate scooters and motorcycles to accommodate even more vehicles
- Lynne Jadd, a resident of Griggs Rd stated that she is a retired teacher in the Boston School system and they had to use public transportation and she does not believe that providing on-street spaces in residential and commercial neighborhoods where parking is a premium is a good, idea. She supports building as many on-site spaces as feasible and making those without permits utilize other alternative modes of transportation like they do in Boston.
- A resident of Westbourne Terrace stated that Westbourne Terrace is a narrow street and an impact study of providing parking on these streets to staff should be studied. She also inquired into any private developments which allowed 50 on-site spaces to be removed as presented in some of these options.

    - Staff clarified that none of these plans add spaces to Westbourne Terrace
- Marsha Armstrong, a resident of Bartlett Crescent stated that when the Board first proposed permits on Bartlett Crescent she was concerned and opposed the plan, but it has been OK with the 4 spaces assigned there even though they receive a lot of traffic for drop off and pick up.
- A resident at the corner of Bartlett Street and Washington Street stated that he supports teachers parking on his street and he agrees that the Town should explore allowing cars to park in the garage off hours to support local businesses if it can be done safely
- A resident of 193 Lancaster Terrace stated that these streets do not provide good access to the school site for teacher and does not support teacher parking on the street
- Albert Santoro, a resident of 151 Lancaster Terrace stated that geographically it is a tough area and that this neighborhood should not be burdened with providing the majority of paring for the school in order to save costs that the whole town should pay for
- A resident of Westbourne Terrace who resides across from the school stated that the cost to provide the on-site parking is too expensive and he favors letting them park on the street during the day
- John Bowman requested that the Transportation Board provide the following conditions for both Baldwin and Driscoll: that the school department consultants develop plans and construct bicycle improvements to access the new school sites. He acknowledges that this is not directly related to the parking plan, but believes that the parking is the best place that the Board can leverage their control to ensure this takes place.
- An unidentified resident, who previously spoke, stated that Option C was the best because the cost is less than previously shown to Town Meeting in December and the space could be used for other purposes if the need for parking is reduced by autonomous vehicles or for other reasons.
- Jules Milner Brage, a Town Meeting member stated that if the intent is to build underground parking than it should be done in a manner that will allow usage of the garage during non-school hours without compromising the security of the school during those hours. It is closer to the heart of Washington Square than the Coolidge Corner School is to Coolidge Corner and it can meet the demand of patrons Thursday, Friday, and Saturday nights.
- Mr. Tali prefers option A because he has seen no evidence that spreading out the cars throughout the neighborhood detrimentally damages access to the public parking supply in the Runkle and Lawrence neighborhoods where 100% are on-street or anywhere else the Board has assigned staff permits. He prefers giving the flexibility to the school committee to make the best decision for the project as a whole.

- Ms. Moore does not support option A, even considering that P&TDM wll reduce the number of permits needed in the future to some degree and prefers option C because
    - it meets the current demand,
    - is favored by staff, the Building Committee and a sizable minority of the School Committee all of whom have been discussing this far more than the Board and she believes they are in a better position to make that decision
- Ms. Haire understands the arguments by Mr. Tali for option A, but she concurs with Ms. Moore in supporting option C and likes the idea to build the parking in a way that allows it to be used for other purposes in the future and notes that the margin in the cost estimates are not that much different for the options.
    - Mr. Gray stated that the budgets were for parking spaces and not for future proofing
- Chair Dempsey prefers option A because it would not preclude other decision makers to build more on-site parking, but he prefers giving them the flexibility they need to make the best overall decision for the community. He does prefer future proofing construction. He inquired into how the proposals compare to existing schools
    - Based on the presentation option C (44% on-street), which equals the existing amount onsite, it will be average as compared to the other schools while option B (78% on-street) would be the 3rd highest K-8 school on-street and option A (100% on-street) would make it tied for the highest equal to the Runkle and Lawrence schools.
    - He wants to delay choosing the street now because by the time the school opens the Town will have a P&TDM plan in place and the number of spaces may be less than estimated today.
- Vice Chair Kapust prefers option A for the same reasons as Chair Dempsey and Mr. Tali and noted that having teachers share the on-street spaces in dense neighborhoods, like they do in Lawrence and Runkle, for only 180 days a year and to save the cost to construct a garage that may not be needed in 20 years is a good decision for the community. He would support option B or C if he could be guaranteed that the space could be used in the future for educational space. But without that he does not support building a larger garage when transportation trends and P&TDM are pointing toward reduced automobiles coming to the site in 15 to 20 years.
- Ms. Lee prefers option C based on the impact to the neighborhood parking supply, the DPW budget, etc. and the fact that it is the same on-site that exists today. This is the only opportunity to build the underground garage and therefore the Town should build the maximum number possible as needed today, given the smaller additional costs, so we do not need to add even more on-street spaces if the school staffing

increases further in the future. She also likes the idea of off-peak usage for commercial customers if security of the building can be maintained.

- Chair Dempsey suggested that the Board consider compromising and supporting option B to allow the project to move forward.
- Staff requested that the Board impose the conditions outlined in the staff memo to ensure the building is constructed in a manner that promotes P&TDM and the Town's Climate Action Plan goals.

Mr. Tali made a motion to alter the Driscoll School On-street Permit Parking Program to allow for a maximum of 88 on-street permits, locations to be determined at a later date on the condition that the on-site parking be made available for the public during non-school events at the school building or adjacent sports fields and that the building project include a minimum of 2 Level 2 EV Charging Stations, an additional 4 spaces be made EVSE ready with empty conduit, enclosed bike corrals for staff use, and staff showers. Furthermore the Board notes that 3 members had concerns about placing too large a burden on neighborhood streets to accommodate staff parking and therefore requests that the School Committee, Select Board, and Building Commission take this into consideration when determining the final size of an on-site parking. Said changes to be effective August 1, 2022. The motion was seconded by Vice Chair Kapust and passed by a vote of 6 to 0.

DISCUSSION AND ACTION ON THE REQUEST BY THE SCHOOL DEPARTMENT FOR A BALDWIN SCHOOL ON-STREET PERMIT PARKING PROGRAM FOR THE NEWLY CONSTRUCTED SCHOOL (proposed parking plans posted at https://www.brooklinema.gov/140/Transportation-Division-of-DPW by 5pm Wednesday, January 23, 2019. Impacted streets may include Woodland Rd, Randolph Rd, Pine Rd, Glenoe Rd, Jefferson Rd, Cary Rd):

- Transportation Administrator Kirrane stated that 3 options for a combination of on-site garage parking and on-street teacher permit parking have been developed by the Baldwin Building Committee, their architects, and traffic consultants that they believe are feasible given the overall school needs and the projected parking need which does take into account the Town's development of a Parking & Transportation Demand Management program for employees. The three plans are included in the memo provided to the Board by the School Department. It should be noted that all 3 options propose less on-street spaces than the October 2018 plan.
  - Chair Dempsey confirmed that this is pre-P&TDM and with P&TDM we can expect even further reductions
- Mr. Lummis discussed the 3 options (option 1, 2, 3) as outlined in the attached presentation to the Transportation Board.
  - He noted that the Building Committee and the School Committee recommend option 2. They took into consideration the fact that the neighborhood wanted to reduce the number of on-street

    spaces as feasible based on the comments in October and balancing that against the costs to construct.

- Mr. Ham noted that the streets where teacher parking is proposed has legal parking today that is generally used by the neighborhood, their guests, tradesmen, etc. and that it would operate in the same manner as streets in other schools in the district with similar curb to curb widths
- Ms. Moore
    - Inquired into why the Committees did not support option # 3 as compared to the decision for the Driscoll School?
        - Transportation Administrator Kirrane stated that he supported option C for Driscoll because it maintained the existing on-site parking. For Baldwin the starting point in October was 100% on-street and option 2 is 68% on-street which is an improvement and places it within range of other K-8 schools
        - Mr. Lummis stated that the committee’s discussion mirrored the reasons made by staff. They also discussed event parking and believed that option 2 combined with the Oak St lot and Heath Street bus & HP spaces will help with event parking related and unrelated to the school.
        - Julie Schreiner-Oldham, Vice Chair of the School Committee and Chair of the Baldwin Building Committee stated that the School Committee also took into account the proximity to the MBTA stop and the lack of significant grade changes for staff walking to the Baldwin site from on-street spaces compared to the cost of the on-site garage spaces and the percentage of on-street spaces compared to other schools and chose option 2.
    - Sought and received confirmation that the project will be constructing ADA compliant sidewalks on all streets where staff will be parking if it does not already exist today
    - Sought and received confirmation that the Town Transportation office has the jurisdiction to disperse the vehicles by block or address to ensure no one section of roadway bears an undue burden. Examples of other schools were provided for this.
- Ms. Lee
    - Inquired into how well staff at other schools abide by the permit program and staff stated that they adhere well because they received citations that they are responsible for if they do not
- Mr. Tali
    - Inquired into whether or not the proposed parking spaces will cause a new safety hazard to the neighborhood
        - Staff stated that the propose areas are legal parking spaces per today’s regulations and are already being used by residents, tradesmen for the residents, guests of the residents, etc.

- Ms. Haire
    - Inquired into the use of the 15 spaces from the Oak St lot and the 25 garage spaces and if those could be used by the general public for access to events in the building and the park/playground and if staff staying later can relocate their car from the on-street space to the garage to increase safety for those staying later
        - Vice Chair Schreiner-Oldham & Mr. Lummis stated that this is all a possibility along with the bus drop off/pick up on Heath Street
- Kathleen Thurmond, a resident of 23 Circuit Rd stated that she does not have an opinion on the parking, but as a doctor she does not support this location as a K-8 school given the traffic congestion because of emergency vehicle access and the roadway widths on Heath Street do not allow for continuous sidewalks on both sides and bike lanes.
- Brad Stoesser, a resident of 300 Woodland Road stated that there is an on-going traffic calming study on Woodland Road and that this needs to be completed and the proposed traffic signal on Hammond @ Woodland needs to be completed before any of this is implemented to make it safer because doing this now and putting 25 parked cars on Woodland without those being in place is making it more dangerous
- Amy Barken, a resident of 20 Glenoe Rd
    - stated that what is missing in the analysis is the date that the other schools were founded. Comparing schools built today to those sited in the late 1800's is not a fair comparison.
    - Stated that in 2015 the Tab published an article about the teacher on-street permits having a negative effect on the public ways and the article talks about encouraging staff to arrive via other modes of transportation. With a new school this issue can be advanced and Baldwin is a TDM opportunity to force the staff to not drive by not giving them a permit. Giving them the permit and trying to take it away at a later date will not work.
    - She works in Brookline and her colleagues make the same as the teachers and they have to use car share, or bike, or take public transportation and the teachers should as well
    - Her street will be unsafe for parking because when it snows the street is narrowed and narrowing it more is a safety hazard
    - Glenoe is shorter than Pine but has the same number of permits assigned under the plans and she believes Glenoe should have less
    - Parking near the intersection of Hammond is dangerous for vehicles trying to turn onto Glenoe because of the speed on Hammond Street
    - The permit parking regulations require that the school department exhaust all reasonable efforts to limit demand for on-street spaces by creating on-site spaces, looking for other off-site locations, encouraging use of public transit and other modes before getting a permit. She does not believe that they have done

this so the Board should not give them any on-street permits. They should think outside the box and lease another parking lot and run shuttles or take Uber or other means and say no to any on-street permits

- Stephen Wald, an attorney for several neighbors stated that the Board is not following their regulations because it is feasible to have all parking on—site and the only hindrance was cost and that is not a relevant factor, in his opinion, to the regulations. The constraints that apply to other existing school sites do not apply here so there is not a reason to offer on-street permits. When the site was chosen it was done with the indications that it would house all staff in underground garages so it is clearly feasible.
- Wendy Murphy, a neighbor stated that when the Baldwin site was chosen staff parking was supposed to be all on-site so it must be feasible. She wanted to know in addition to the staff permits how many more parking spaces would be taken by parents parking and walking to the school? She also wanted to know where people will park for school related evening events? All of this must be determined before the on-street spaces are decided upon.
    - Chair Dempsey stated that at a minimum 60% of legal parking will be available for use by non-staff vehicles and that includes parents and residents
- Janice Kahn, a Town Meeting Member and resident of Craftsland Rd stated that the neighborhood has been pursuing traffic calming on Woodland and a proposed signal at Hammond & Woodland with staff and every time a consensus is reached the Town throws in a curveball. She is concerned that by placing the parking on Woodland Road will make it less safe and because it will narrow it down and although it is one way cars do travel the wrong way sometimes and this will lead to head on collisions. She is also concerned about double parking on Heath Street. She supports using 100% on-site parking, P&TDM, and forced public transport for staff so their vehicles do not make the neighborhood less safe once parents arrive and operate in an unsafe manner.
- A Town Meeting Member stated that the Board needs to think about the impact on traffic operations on Heath Street and the neighborhood when it comes to school traffic adding to the already congested roads.
- An unidentified Heath Street resident inquired into a plan to construct sidewalks to facilitate staff and students walking to the site from these streets because there are missing links. Doing so will narrow the streets further, add more traffic, and make it less safe.
    - Chair Dempsey stated that at there is a traffic mitigation plan that was initially presented in December that included sidewalk construction
- David Bohn, a transportation engineer hired by residents to peer review the school plans. He stated that there is no estimates provided to the Board on those coming and going to this site which are not staff who are

accounted for in the request and he believes it is a significant number and absent that information he does not believe the Board should act on this issue tonight. He believes that the staff will park in the closest spaces possible which will push parents and others to the farther extremes of the map which is a disservice and inconvenience to them. The original Baldwin proposal included a large on-site parking lot and not having a sizeable parking lot at this location does not make sense to accommodate staff onsite. If a private developer attempted to propose a development at this site with only 10 on-site spaces it would not be allowed and this should not be allowed. If the school is going to be built on this site then it needs more parking. If you are worried about garage space being needed in 20 years than construct it in a manner that will allow it to be used for other uses in the future. Submitted a memo with photos of the condition of the streets today and with the snow the streets are narrowed to one lane with parking and certainly cannot accommodate 2 travel lanes and parking without placing a burden on the neighborhood.

- An unidentified neighbor referenced the drop off and pick up lane being created for the Driscoll School and the metered parking that supports other schools during school events and noted it is unfair that the residential streets in this neighborhood will have to support it all.
- An unidentified neighbor stated that this will not be a neighborhood school where people arrive by walking or biking. It will be a school where everyone arrives by car so there will increased traffic and the all-day parking will negatively affect it even more.
- An unidentified neighbor stated that Woodland Rd is a cut though from Hammond Street to Rte. 9 via Woodland, Randolph, and Jefferson and allowing on-street parking will cause a safety hazard because there are a large number of town trucks that make this route in the morning and parking will narrow it too much.
- Chair Dempsey stated that he would prefer voting upto a maximum number and decide on street locations at a later date. He supports option 1 but would also support option 2.
- Ms. Moore stated that she would not support option 1, prefers option 3 which provides the maximum number on-site of the 3 options. However she would support option 2 as a compromise with the language asking the School Committee to consider constructing more parking
- Mr. Tali stated that he prefers option 1 but will support option 2 as a compromise
- Ms. Lee stated that she concurred with Ms. Moore
- Ms. Haire stated that she plans to abstain because there are too many unanswered questions on the impact of directionality of the roadways to accommodate the parking lane and two lanes of travel and outstanding questions on the traffic analysis from the previous meeting with respect to emergency vehicle access to and through these streets, etc. that she cannot vote on this issue at this time

Mr. Tali made a motion to alter the Baldwin School On-street Permit Parking Program to allow for a maximum of 53 on-street permits, locations to be determined at a later date on the condition that the on-site parking be made available for the public during non-school events at the school building or adjacent sports fields and that the building project include a minimum of 2 Level 2 EV Charging Stations, an additional 4 spaces be made EVSE ready with empty conduit, enclosed bike corrals for staff use, and staff showers. Furthermore the Board notes that 3 members had concerns about placing too large a burden on neighborhood streets to accommodate staff parking and therefore requests that the School Committee, Select Board, and Building Commission take this into consideration when determining the final size of an on-site parking. Said changes to be effective August 1, 2022. The motion was seconded by Ms. Moore and passed by a vote of 4 to 0 to 1 (Haire abstain, Kapust absent).

MEETING ADJOURNED

Proposed Driscoll Expansion
Brookline, Massachusetts

Transportation Impact Assessment

Prepared by:

Vanasse & Associates, Inc.
Transportation Engineers & Planners
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1066

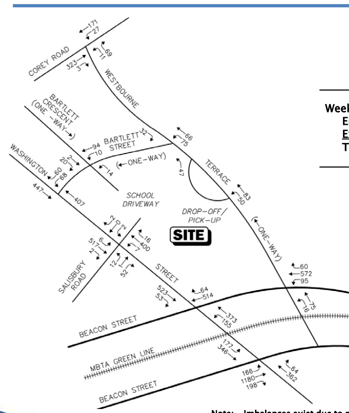
January 28, 2019

Traffic Agenda Items

- Area of Study
- Existing Conditions
- Traffic Generation
- Recommendations

Site Location and Study Area Map

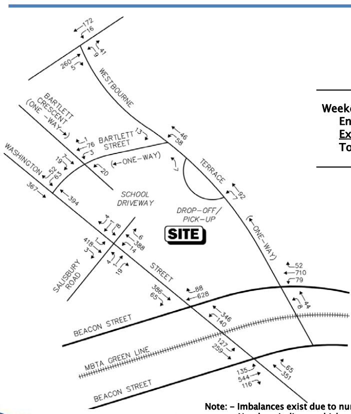
2018 Existing Conditions – Weekday Morning School Peak Hour Traffic Volumes (7:30-8:30 AM)



Time Period	Westbourne Terrace Driveway	Bartlett Street Driveway and Washington Street Driveway
	School Driveways	
Weekday Morning Peak Hour:		
Entering	50	33
Exiting	47	12
Total	97	45

Note: – Imbalances exist due to numerous curb cuts and side street that are not shown.
– Numbers indicate vehicles at intersections during a one hour period.

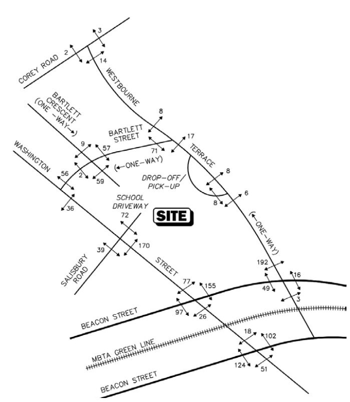
2018 Existing Conditions – Weekday Afternoon School Peak Hour Traffic Volumes (2:00-3:00 PM)



Time Period	Westbourne Terrace Driveway	Bartlett Street Driveway and Washington Street Driveway
	School Driveways	
Weekday Afternoon Peak Hour:		
Entering	7	12
Exiting	7	29
Total	14	41

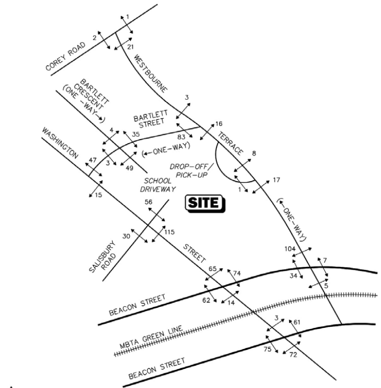
Note: – Imbalances exist due to numerous curb cuts and side street that are not shown.
– Numbers indicate vehicles at intersections during a one hour period.

2018 Existing Conditions – Weekday Morning School Peak Hour Pedestrian Volumes (7:30-8:30 AM)



Note: Numbers indicate both school and non school pedestrians during a one hour period.

2018 Existing Conditions – Weekday Afternoon School Peak Hour Pedestrian Volumes (2:00-3:00 PM)



Note: Numbers indicate both school and non school pedestrians during a one hour period.

Trip Generation Summary

	Existing Condition								
	School Driveways		On-Street Parking Drop-Off/ Pick-Up						
Time Period	Westbourne Terrace Driveway	Bartlett Street Driveway and Washington Street Driveway	Washington Street	Bartlett Street	Westbourne Terrace	Staff	**Total Trips (632 Students)** [1]	**New Trips 800 Students**[2]	Increase[3]
Weekday Morning Peak Hour:									
Entering	50	33	25	21	15	45	**189**	**246**	57
Exiting	47	11	25	21	15	0	**120**	**156**	36
Total	97	45	50	42	30	45	**309**	**402**	93
Weekday Afternoon Peak Hour:									
Entering	7	12	11	13	26	0	**69**	**90**	21
Exiting	7	29	11	13	26	10	**96**	**125**	29
Total	14	41	22	26	52	10	**165**	**215**	50

[1] Numbers Represent – Staff, Buses and Parent Vehicles.
[2] Note: 26% increase in Students. Assume 30% increase in Traffic.
[3] Increase includes staff and student drop-off/pick up.

Vanasse & Associates, Inc.
Transportation Engineers & Planners
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1098

Teachers On-Street Parking - Existing

Driscoll School
7/19/2018 - Parking

Approve by
Transportation Board

52 Parking Lot Spaces

53 Approved TBoard Parking Spaces

Vanasse & Associates, Inc.
Transportation Engineers & Planners
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1098

Recommendations

Project Area Access
- Main Driveway Off Washington Street
- A Bus Drop-off Area Off Washington Street
- Parent Drop-Off along Westbourne Terrace and Washington Street

Off-Site
Crossing Guards
- Salisbury Road

Area Sidewalk Upgrades
- Washington Street
- Westbourne Terrace

School Drop-Off and Pick-Up Traffic Management Plan
- School Staff Should Be Stationed at The Drop-off
- A Designated Drop-off/Pick-up Area
- Encourage Carpooling
- Parents and Caregivers Will Be Given Information on School Drop-off and Pick-up Times and Procedures

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Andover, MA 01810-1098

Recommendations

School Zone Signage
- Washington Street
- Westbourne Terrace

Bicycle Considerations
- Bicycle Racks Should Be Provided – Interior/Exterior
- Shower Facilities

Transit Usage
- Promote staff usage
- Town TDM plan

Traffic Monitoring
Within three months after school opening and annually
- Pedestrian safety
- Crossing guards

Construction Management Plan
A detailed Construction Management Plan should be prepared and reviewed by the Town

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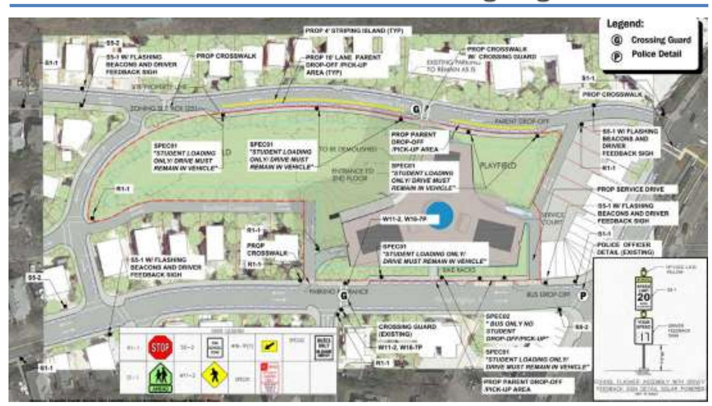
Transportation Engineers & Planners
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1098

Recommendations
Pedestrian Access and School Signage Plan



Vanasse & Associates, Inc.
Transportation Engineers & Planners
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1098

Summary

SUMMARY

- Safe Environment Can Be Maintained
- Delays and Queues – Limited to Short Periods
- Traffic Conditions Will Be Manageable

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Driscoll School Building Project

Staff Parking Plan Options

Presented to the Transportation Board - 1/28/2019
Presented to the Driscoll School Building Committee – 1/15/2019
Presented to the School Committee – 1/17/2019

Site Plan

Jonathan Levi Architects

OPTION H

SITE PLAN DRISCOLL SCHOOL, BROOKLINE

DRISCOLL SCHOOL, BROOKLINE

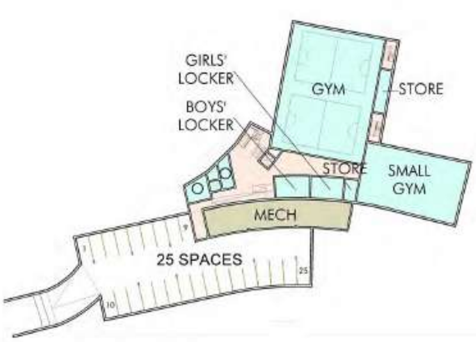
Driscoll Parking Plan Options

PUBLIC SCHOOLS of BROOKLINE

	Staff	# of Staff Parking Spaces
Current	107	105 (52 on site)
Projected	125	113 (90% of staff)

	Total # of Staff Parking Spaces Needed	# of Staff Parking Spaces on School Property (change)	# of Staff Parking Spaces on Town Streets (change)	Estimated Longest Walk for staff (mi)
Option A	113	0 (-52)	113 (+60)	0.5
Option B	113	25 (-27)	88 (+35)	0.4
Option C	113	50 (-2)	63 (+10)	0.3
Current	105	52	53	0.3

Parking Design Option – 25 Spaces

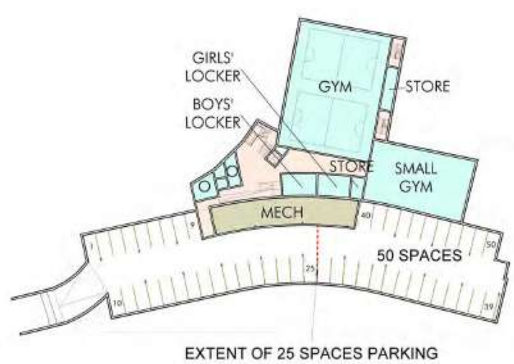


OPTION H - BASE FLOOR PLAN - 25 PARKING SPACES
Jonathan Levi Architects

OPTION B

FLOOR PLAN DRISCOLL SCHOOL, BROOKLINE

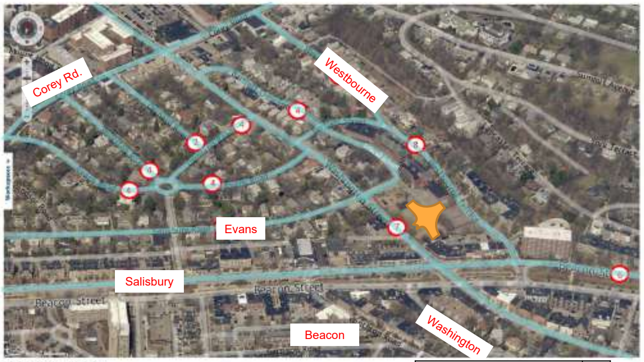
Parking Design Option – 50 Spaces



OPTION H - BASE FLOOR PLAN - 50 PARKING SPACES
Jonathan Levi Architects

OPTION C

FLOOR PLAN DRISCOLL SCHOOL, BROOKLINE



Driscoll School
7/19/2018 - Parking

Approve by
Transportation Board

52 Parking Lot Spaces

53 Approved TBoard Parking Spaces

Currently Existing Employee Parking Plan

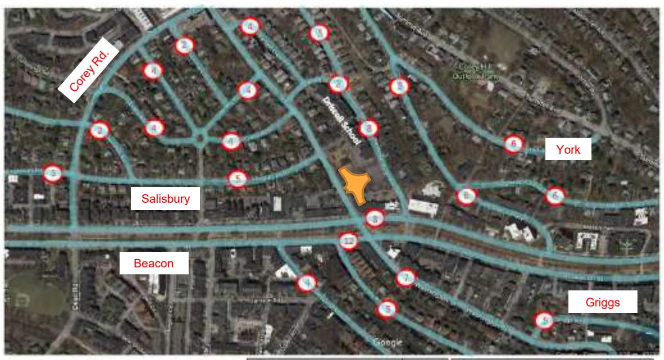
Bartlett Crescent	4
Beacon St. – Westbound	6
Downing Rd	4
Evans Rd - east of Williston	4
Evans Rd – west of Williston	4
Orchard Rd	2
Salisbury Rd - east of Corey	5
Washington St meters	7
Westbourne – north of Bartlett	5
Westbourne – south of Bartlett	8
Williston Rd – north of Evans	4

Option A - 113 spaces on Street Plus 60 spaces

PUBLIC SCHOOLS of BROOKLINE

Existing Staff Parking Permits
Bartlett Cr – 4
Beacon St WB Curbside – 6
Downing Rd – 4
Evans Rd East of Williston – 4
Evans Rd West of Williston – 4
Orchard Rd – 2
Salisbury Rd East of Corey – 5
Washington St Meters – 7
Westbourne Tr North of Bartlett – 5
Westbourne Tr South of Bartlett – 8
Williston Rd North of Evans – 4

New Staff Parking Permits
Bartlett St – 2
Beacon St EB Median Meters – 12
Beacon St WB Curbside – 2 new
Griggs Rd – 5
Lancaster Tr North – 5
Lancaster Tr South – 6
Mason Tr – 6
Salisbury Rd West of Corey – 5
University Rd – 5
Windsor Rd – 2
Winthrop Rd – 4
York Tr – 6



Proposed New Driscoll
1/15/2019 - Parking Update

Option A

Review by Transportation Board

Projected staff	125
Spots needed	113
% of staff parking	90%
Spaces breakdown	
On school property	0
On street parking	113
Currently approved spaces	53

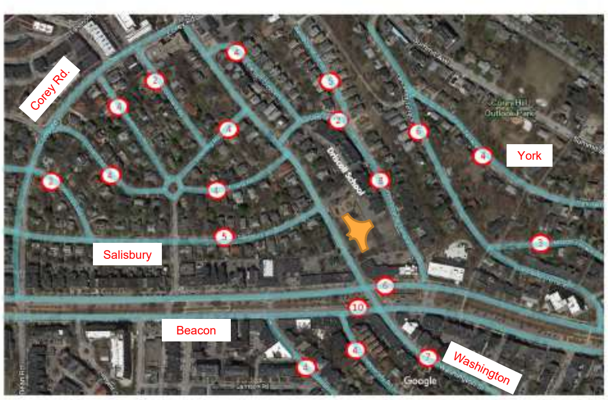
Proposed new spaces	
Bartlett Street	2
Beacon Street EB	12
Beacon Street WB	2
Griggs Road	5
Lancaster Terrace North	5
Lancaster Terrace South	6
Mason Terrace	6
Salisbury Road West	5
University Road	5
Windsor Road	2
Winthrop Road	4
York Terrace	6

Option B - 88 spaces on Street Plus 35 spaces

PUBLIC SCHOOLS of BROOKLINE

Existing Staff Parking Permits
Bartlett Cr – 4
Beacon St WB Curbside – 6
Downing Rd – 4
Evans Rd East of Williston – 4
Evans Rd West of Williston – 4
Orchard Rd – 2
Salisbury Rd East of Corey – 5
Washington St Meters – 7
Westbourne Tr North of Bartlett – 5
Westbourne Tr South of Bartlett – 8
Williston Rd North of Evans – 4

New Staff Parking Permits
Bartlett St – 2
Beacon St EB Median Meters – 10
Lancaster Tr – 6
Mason Tr – 3
University Rd – 4
Windsor Rd – 2
Winthrop Rd – 4
York Tr – 4



Proposed New Driscoll
1/15/2019 - Parking Update

Option B

Recommended by School Committee

Projected staff	125
Spots needed	113
% of staff parking	90%
Spaces breakdown	
On school property	25
On street parking	88
Currently approved spaces	53

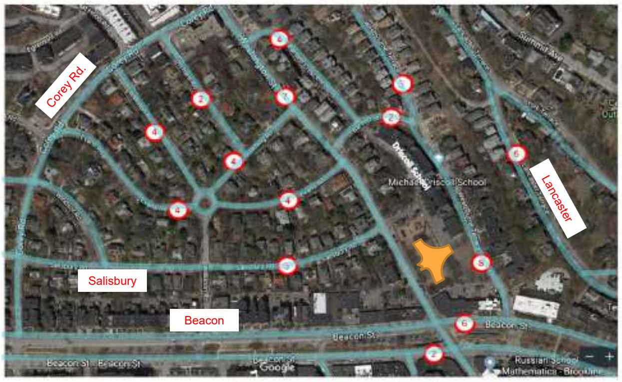
Proposed new spaces	
Bartlett Street	2
Beacon Street EB	10
Lancaster Terrace	6
Mason Terrace	3
University Road	4
Windsor Road	2
Winthrop Road	4
York Terrace	4

Option C - 63 spaces on street Adding 10 spaces on street

PUBLIC SCHOOLS of BROOKLINE

Existing Staff Parking Permits
Bartlett Cr – 4
Beacon St WB Curbside – 6
Downing Rd – 4
Evans Rd East of Williston – 4
Evans Rd West of Williston – 4
Orchard Rd – 2
Salisbury Rd East of Corey – 5
Washington St Meters – 7
Westbourne Tr North of Bartlett – 5
Westbourne Tr South of Bartlett – 8
Williston Rd North of Evans – 4

New Staff Parking Permits
Bartlett St – 2
Beacon St EB Median Meters – 2
Lancaster Tr – 6



Proposed New Driscoll

1/15/2019 - Parking Update

Option C

Review by Transportation Board

Projected staff	125
Spots needed	113
% of staff parking	90%
Spaces breakdown	
On school property	50
On street parking	63
Currently approved spaces	53

Proposed new spaces	
Bartlett Street	2
Beacon Street EB	2
Lancaster Terrace	6

Driscoll Parking Plan Options

	Design Presented at Town Meeting – December 2018			Updated and Refined Design – January 2019		
	# of Below Grade Parking Spaces	Total Project Cost Estimate	Marginal Cost	# of Below Grade Parking Spaces	Schematic Design – Revised Project Cost Estimate	Marginal Cost
Option A	0 spaces	$93-97 M	$0	0	$93 – 97 M	$ 0
Option B	N/A	N/A	N/A	25 spaces	$96.3 – 100.3 M	$3.3 M
Option C	50 spaces	$101-105 M	$8 M	50 spaces	$99.1– 103.1 M	$6.1 M

	Total # of Staff Parking Spaces Needed	# of Staff Parking Spaces on School Property	# of Staff Parking Spaces on Town Streets	Estimated Longest Walk for staff (mi)
Option A	113	0	113 (+60)	0.5
Option B	113	25	88 (+35)	0.4
Option C	113	50	63 (+10)	0.3
Current	105	52	53	0.3

PSB Staff Parking Plans

	Total # of Staff Parking Spaces	# of Staff Parking Spaces on School Property	# of Staff Parking Spaces on Town Streets	Estimated Longest Walk for staff (mi)	% of Staff Parking On School Property	% of Staff Parking on Town Streets
Brookline High	225	25	200	0.6	11%	89%
Baker	132	64	68	0.5	48%	52%
Coolidge Corner	175	65	110	0.5	37%	63%
Driscoll	105	52	53	0.3	50%	50%
Heath	68	32	36	0.3	47%	53%
Lawrence	102	0	102	0.3	0%	100%
Lincoln	102	69	33	0.2	68%	32%
Pierce	135	85*	50	0.2	63%	37%
Runkle	120	0	120	0.3	0%	100%
BEEP @ Lynch	26	20	6	N/A	77%	23%
Driscoll - Option A	113	0	113 (+60)	0.5	0%	100%
Driscoll - Option B	113	25	88 (+35)	0.4	22%	78%
Driscoll - Option C	113	50	63 (+10)	0.3	44%	56%

On-site Parking at PSB Schools

	Staff	Families	Visitors
Baker	On Site + Street	None	Limited to Circle
Coolidge Corner	On Site + Street	None	Limited to Circle
Driscoll	On Site + Street	None	None
Heath	On Site + Street	None	Limited to small off street lot
Lawrence	Street	None	None
Lincoln	On Site + Street	None	Limited to Circle
Pierce	On Site + Street	None	None
Runkle	Street	None	None
Brookline High	On Site + Street	None	None
BEEP	On Site + Street	None	None
Baldwin (Proposed)	**On Site + Street**	**15 spaces available on-site during drop off**	**15 spaces On-Site**

Brookline

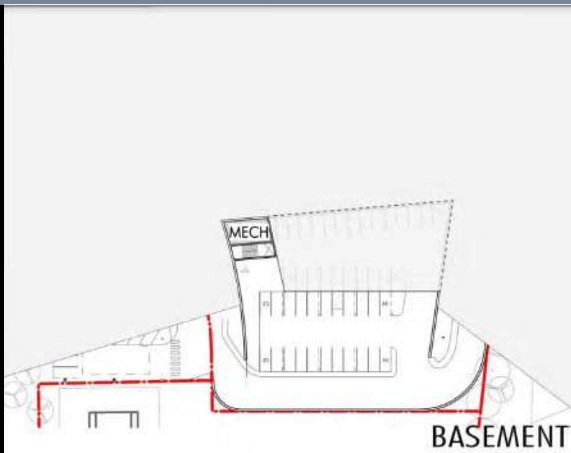
BALDWIN SCHOOL EXPANSION

School Building Committee
January 17, 2019

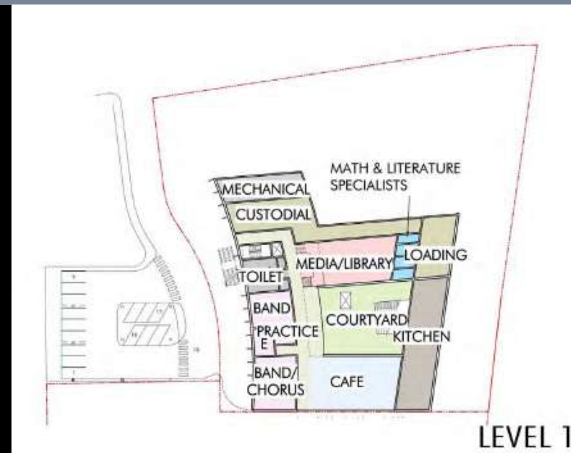
Agenda

1. Approval of Minutes
2. Schematic Design Schedule Review
3. Design Recap and Activity Update
4. Fossil Free Design Update
5. Parking Options
6. Upcoming Meetings

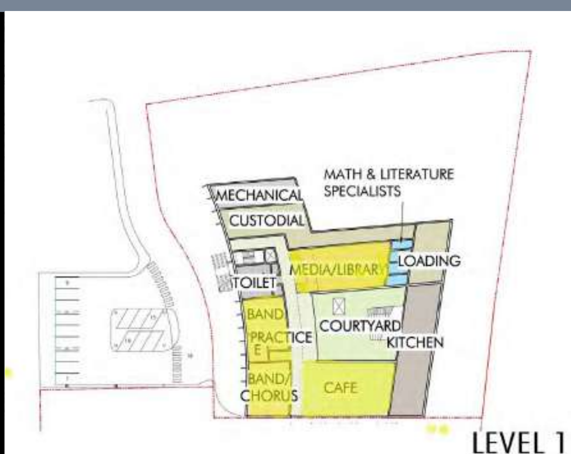
Floor Plans



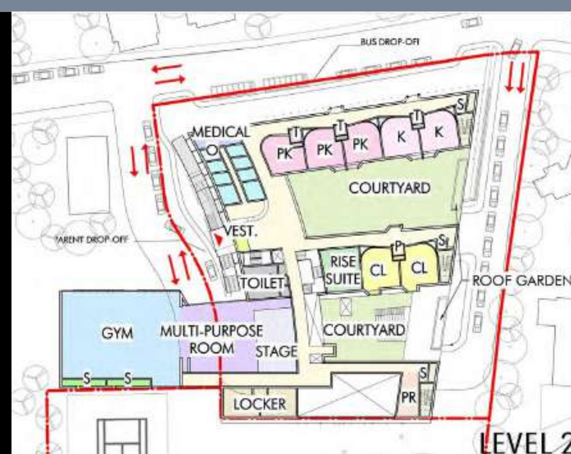
Floor Plans



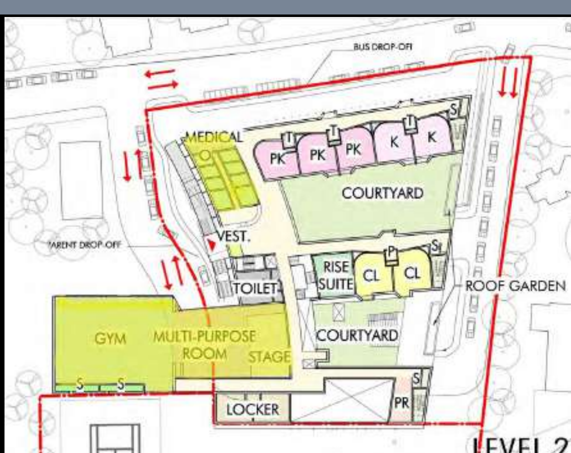
Floor Plans



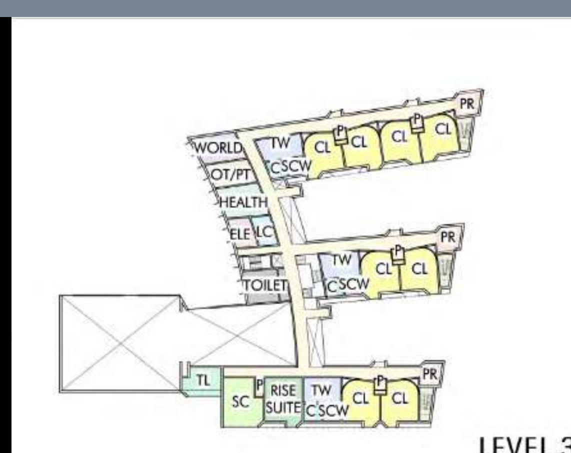
Floor Plans



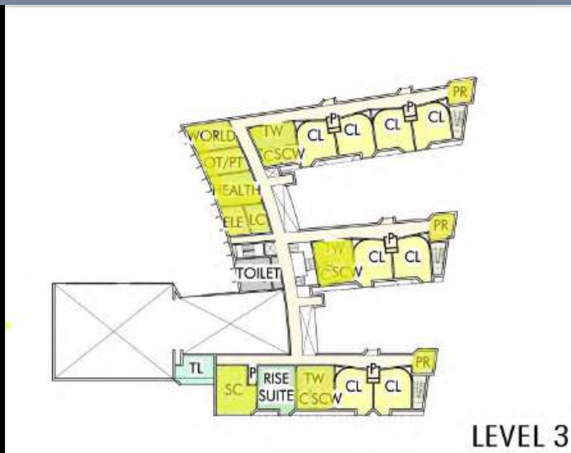
Floor Plans



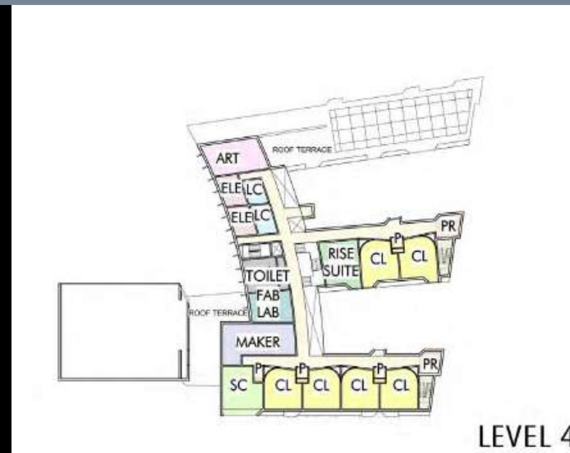
Floor Plans



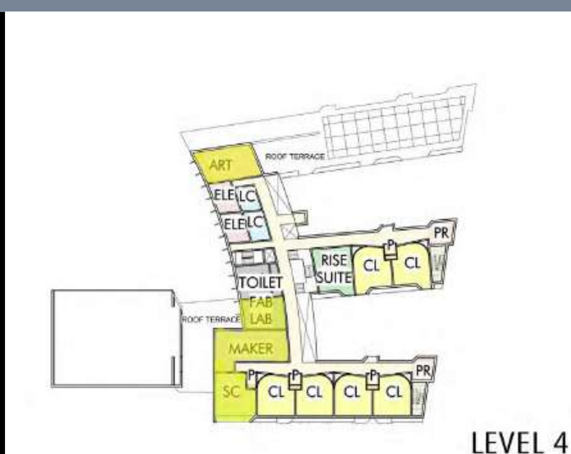
Floor Plans



Floor Plans



Floor Plans

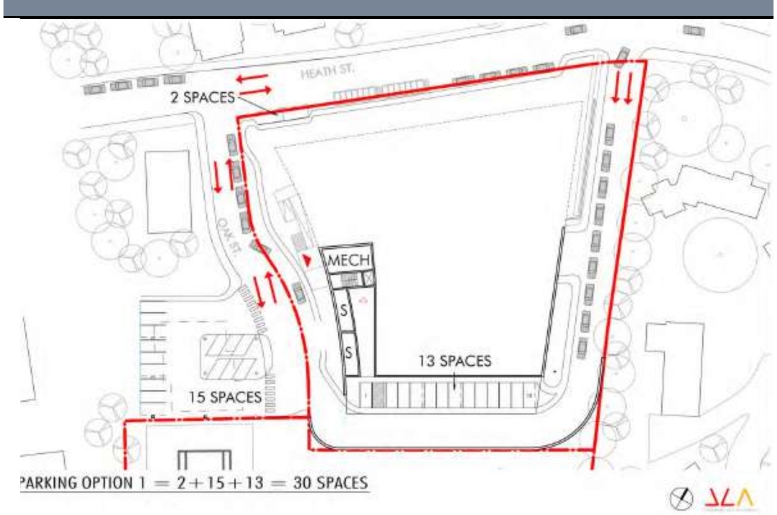


Baldwin Parking Plan Options

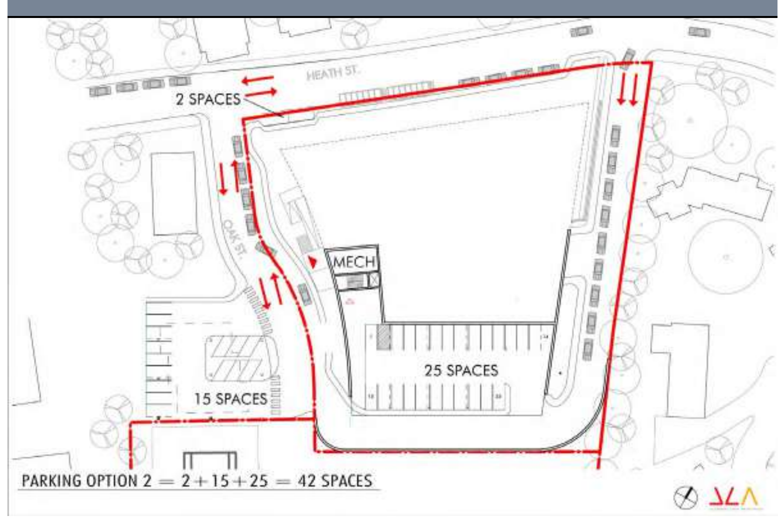
	Staff	# of Staff Parking Spaces to Plan For
Planned	86	78 (90% of staff)

	Total # of Staff Parking Spaces Needed	# of Staff Parking Spaces on School Property	# of Staff Parking Spaces on Town Streets	Visitor Parking on School Property	Estimated Longest Walk for staff (mi)
Option 1	78	13	65	15	0.6
Option 2	78	25	53	15	0.5
Option 3	78	45	33	15	0.4

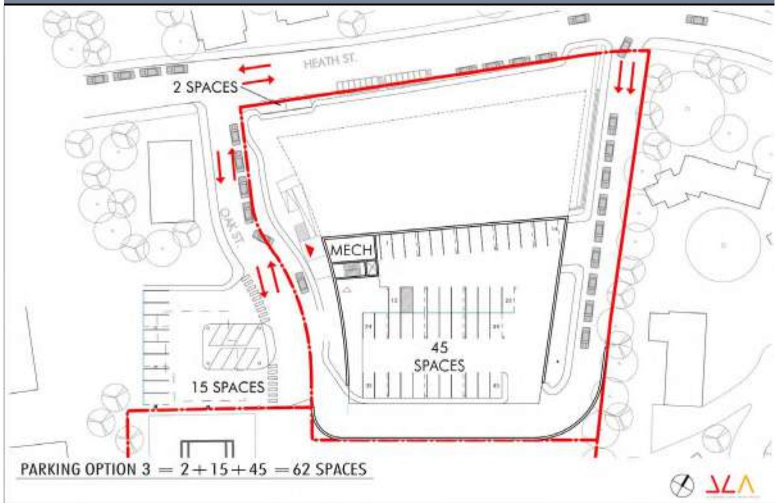
Parking Options



Parking Options



Parking Options



Baldwin School

1/16/19 – Parking

Proposed for School Committee and Transportation Board

Option 1

86 Staff Projected
78 Parking Spaces Needed
(90% of staff)

13 Parking Lots Spaces
65 On Street Spaces Requested

65 on-street spaces

25 Woodland Rd
11 Randolph Rd
11 Pine Rd
11 Glenoe Rd
4 Jefferson Rd
3 Cary Rd

1/16/2019 – Parking

Proposed for School Committee and Transportation Board

Option 2

78 Parking Spaces Needed

25 Parking Lots Spaces
53 On Street Spaces Requested

53 on-street spaces

23 Woodland Rd
8 Randolph Rd
10 Pine Rd
10 Glenoe Rd
2 Jefferson Rd

1/16/19 – Parking

Proposed for School Committee and Transportation Board

Option 3

86 Staff Projected
78 Parking Spaces Needed
(90%of staff)

45 Parking Lots Spaces
33 On Street Spaces Requested

33 on-street spaces

15 Woodland Rd
2 Randolph Rd
7 Pine Rd
7 Glenoe Rd
2 Jefferson Rd

Baldwin Parking Plan Options

PUBLIC SCHOOLS of BROOKLINE

	Design Presented at Town Meeting – December 2018			Updated and Refined Design – January 2019		
	# of Below Grade Parking Spaces	Total Project Cost Estimate	Marginal Cost	# of Below Grade Parking Spaces	Schematic Design – Revised Project Cost Estimate	Marginal Cost
Option 1	10 spaces	$72 – 76 M	$0	13	$72 - 76 M	$ 0
Option 2	N/A	N/A	N/A	25 spaces	$75.3 – 79.3 M	$3.3 M
Option 3	40 spaces	$78 – 82 M	$6 M	45 spaces	$77.6 – 81.6 M	$5.6 M

	Total # of Staff Parking Spaces Needed	# of Staff Parking Spaces on School Property	# of Staff Parking Spaces on Town Streets	Estimated Longest Walk for staff (mi)
Option 1	78	13	65	0.6
Option 2	78	25	53	0.5
Option 3	78	45	33	0.5

Option 2 Recommended by School Building Committee and School Committee

PSB Staff Parking Plans

	Total # of Staff Parking Spaces	# of Staff Parking Spaces on School Property	# of Staff Parking Spaces on Town Streets	Estimated Longest Walk for staff (mi)	% of Staff Parking On-Site	% of Staff Parking on Town Streets
Brookline High	225	25	200	0.6	11%	89%
Baker	132	64	68	0.5	48%	52%
Coolidge Corner	175	65	110	0.5	37%	63%
Driscoll	105	52	53	0.3	50%	50%
Heath	68	32	36	0.3	47%	53%
Lawrence	102	0	102	0.3	0%	100%
Lincoln	102	69	33	0.2	68%	32%
Pierce	135	85*	50	0.2	63%	37%
Runkle	120	0	120	0.3	0%	100%
BEEP @ Lynch	26	20	6	N/A	77%	23%
BEEP @ Putterham	40	0	40	0.4	0%	100%
Baldwin - Option 1	**78**	**13**	**65**	**0.6**	**17%**	**83%**
Baldwin - Option 2	**78**	**25**	**53**	**0.5**	**32%**	**68%**
Baldwin - Option 3	**78**	**45**	**33**	**0.5**	**58%**	**42%**

On-site Parking at PSB Schools

	Staff	Families	School Day Visitors
Baker	On Site + Street	None	Limited to Circle
Coolidge Corner	On Site + Street	None	Limited to Circle
Driscoll	On Site + Street	None	None
Heath	On Site + Street	None	Limited to small off street lot
Lawrence	Street	None	None
Lincoln	On Site + Street	None	Limited to Circle
Pierce	On Site + Street	None	None
Runkle	Street	None	None
Brookline High	On Site + Street	None	None
BEEP	On Site + Street	None	None
Baldwin (Proposed)	**On Site + Street**	**17 spaces available on-site during drop off**	**17 spaces On-Site**

Jonathan Levi Architects
266 beacon street boston ma 02116 tel 617.437.9458 www.leviarc.com

NOTES OF MEETING

project	**Driscoll School**	project no.	1823
date	2/08/19, 7:30 am	location	Brookline Town Hall
re	**School Building Committee #8** design review, site design, sustainability		

present
Susan Wolf Ditkoff, Co-Chair, School Committee
Karen Breslawski, Building Commission
David Lescohier, Advisory Committee (by phone)
Nancy O'Connor, Parks and Recreation Commission
Sara Stoutland, Community Representative
Dan Deutsch, Community Representative
Victor Kusmin, Community Representative
Arjun Mande, Community Representative (by phone)
Lakia Rutherford, Community Representative/METCO
Andrew Bott, Superintendent of Schools
Dr. Nicole Gittens, Deputy Superintendent of Schools for Teaching and Learning
Mary Ellen Dunn, Deputy Superintendent of Schools for Administration and Finance
Dr. Suzie Talukdar, School Principal Representative
Ben Lummis, Project Manager, School Department
Ray Masak, Project Manager, Building Department
Daniel Bennett, Building Commissioner
Heather Hamilton, alternate Select Board
Jonathan Levi, JLA
Carol Harris, JLA
Philip Gray, JLA

Distribution:
attendees; project file
Neil Wishinsky, Co-Chair, Select Board
Val Frias, Community Representative/ Special Education Parent Advisory Council
Mel Kleckner, Town Administrator
Ali Tali, Public Works, Engineering and Transportation

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1) 1/24/19 SBC meeting minutes approved.

Traffic and Parking Update - A summary of the Transportation Board meeting on 1/28/19 was provided by Ben Lummis. The Board was very divided and discussed for nearly 90 minutes. The Board approved the maximum number of parking permits in order to provide the most design flexibility. The design team will meet with Safe Routes and incorporate their comments.

Ben Lummis provided an update on the Driscoll Education Plan. Input from the many faculty and department meetings is being incorporated including comments from: Pre-K, extended day, gym, parks & rec, administration, special education, custodial & kitchen. Faculty and Department input will continue though the Design Development phase.

2) Site Design – Jonathan Levi introduced Bryan Jareb of Halvorson Design, the Landscape Architect. JLA and Halvorson met with Brookline Parks and Rec staff on 1/30/19 and discussed potential program features. Parks and Rec is heavily involved in the design process and acknowledged this phase is to develop designs for pricing only. Bryan reviewed the existing exterior areas and noted the site has a significant 20' grade change from one end to the other. Images were shown of potential types of outdoor features such as: splash pads, play areas, and seat walls. Three options were presented:

- Option A: Bi-Nuclear. Includes separate Pre-K play area, playspace, playfields, amphitheater with terracing, and multiple access points to the building.
- Option B: Fountain Plaza. Includes splash pad as a central focus that can alternatively act as a paved play area when water not on.
- Option C: Diagonal Axis. Terraced to provide more gradual grade change.

Comments included:

- Nancy O'Connor reiterated the outdoor programming is not resolved and at this time just looking to find agreement on a budget. The tennis courts are still an option and will get more input from the neighbors.
- Turf vs. grass field- Turf can be used in early spring when natural grass areas are closed (this can be about half of the time). Historically, the Driscoll community asked for a turf field to Parks & Rec. Superintendent Bott noted that turf is a good option for students on wet days as a safer option to wet playground equipment. Recommend to carry turf option as a line item in the pricing.
- Potential for community gardens.
- The outdoor space is school grounds but also a neighborhood park.

- Splash pad may be used a water feature in summer and weekends, but can also double a paved play area during the days. Recommended keep splash pad for pricing.
- Like Pre-K play area separated from middle school student play area.
- Basketball Court- court looks to be far away from school in Options A and B. Questioned if could swap the basketball court and soccer field. Responded that court and field locations fit best in the shape of the site. It was noted that kids will flock to the court no matter where it is and it will be supervised. The Coolidge Corner courts are further away from the school. The court location needs review with neighbors. Court size, middle school vs. high school size, to be verified.
- All entrances will be accessible (a code requirement). Options will include ramps and sloped walkways to the entrances.
- Perimeter walk- reduces the areas available for play space since a berm or large retaining wall needed to negotiate grade change from Westbourne Terrace. Suggested to keep perimeter walk in for pricing and design the retaining wall as a feature.
- Number of play structures needed, 2 or 3. Superintenent Bott suggested 3 play structures as it is appropriate for the size of school. Recommended to include 3 play structures for pricing.
- Bird Sanctuary- existing area is not a formal designation. A pocket park is not a required feature of final design.
- Outdoor Classroom- not a part of the Education Plan. A program for this has not been defined.
- Outdoor Storage- needed for P.E. teachers. Questioned if should be an out building or basement space. Determined separate building is not preferable.
- Access to toilet rooms from exterior preferred.
- Provide shade – from trees.

3) Budget – Philip Gray, JLA, summarized what is included in Total Construction Cost and Total Project Cost (see slide). Total Project Cost is how much the Town has to pay and includes the construction costs plus items like design fees, legal fees, furniture, technology, contingencies, etc.

   Cost escalation- an 8%/year escalation is included in the pricing; this escalation number is used by the MSBA. When look at escalation graph (see slide) can see that three is a cost to delay a project - it can be estimated at 200-300K per month.

Cost Comparisons- The new Driscoll School was compared to other recent school projects by Total Project Cost, cost per student, and cost per square foot (see slides). Costs of the other schools were adjusted with the same escalation for a more accurate comparison. It is evident that larger schools in enrollment and size are less expensive per student. The new Driscoll school numbers include the Fossil Fuel Free cost, the other schools do not include this.

- Questioned if elementary schools more or less expensive. Responded that they are less because they do not include full Science Labs. Comparative schools used were middle schools because they are more expensive than elementary schools as they include Maker Space, Sciences, Multi-Purpose, and more SPED spaces.
- Questioned if there were other K-8 schools that could be included for comparison that were non MSBA. Suggested investigating King Open in Cambridge (this is 2 schools), Lexington, and Newton.

4) Sustainability – The architectural model has been issued to the engineers for energy modeling. Brookline has aggressive performance requirements, including a EUI 30 (Energy Use Intensity) that affects how heavily the building is insulated and amount of glazing area. A feature of this design is that a large portion of the gymnasium is buried which helps with minimizing heat loss.
5) Upcoming Meetings-
   - Tuesday, Feb 26, 7:30am. Review plans, project costs, safe access to site.
   - Thursday, Mar 7, 7:30am. Wrap up meeting. Clarify what/who needs to meet. Vote.

END OF MEETING NOTES
Addressees believing these notes are in error or are inaccurate should contact the writer within five business days, otherwise these notes will be considered accurate.

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by Carol Harris, JLA

BROOKLINE

DRISCOLL SCHOOL EXPANSION

School Building Committee
February 8, 2019

Agenda

1. Traffic and Parking Update
2. Site Design
3. Budget
4. Sustainability
5. Upcoming Meetings

Agenda

1. Traffic and Parking Update

1/28 Transportation Board Summary

Presented Traffic Study and Parking Options

1. Board very divided – Discussion and Stalemate for nearly 90 minutes
   - 3 members advocating for 50 spots on site citing teachers, marginal cost, lessen impact on neighbors - Option C
   - 3 members advocating for the most parking permits so School Committee, Select Board have most flexibility to decide design – Option A
2. Discussion
   - Important to prioritize and encourage walking and biking over cars for students
   - Design appears to be making it easier for cars and encouraging parent drop off
   - Must build for future of fewer cars not for current car use
   - Should support teachers by replacing the existing parking
   - Concern for teachers who need to park up the hill
   - Community members expressed the range of views

Agenda

1. Traffic and Parking Update
2. Site Design

Listening to Driscoll Staff

Four sessions at Driscoll including more than 25 hours of discussions with faculty and staff plus additional meetings with Principal Talukdar

1. Feasibility Phase
   - September 11 – Full Staff Meeting
   - September 18 – Staff Small Group Meetings 10 meetings, 12 groups
2. Education Plan
   - January 8 - Full Faculty Meeting – Faculty spent entire meeting reading specific sections of Education Plan and providing comments and suggestions
3. Schematic Design
   - January 16, 17 & 24 – 23 meetings with 22 different groups of staff to get input on classroom layout, adjacencies, learning and collaborative spaces, and offices

Listening to Driscoll Staff – Education Plan

Summary of Staff Input Incorporated into Education Plan

Overall
- Included additional language related to growth mindset
- Highlighted further the collegial and collaborative culture among staff
- Clarified need to locate centrally the maker space, fab lab, and art rooms

Math
- More fully defined "well rounded, mathematical learners"
- More explicit that all students can become mathematical learners
- Clarified Math Specialists' role in supporting students

Performing Arts
- Made explicit the need for wings on the stage, storage for props and costumes, and for the small gym to have fitness-dance studio style flooring

Visual Arts
- Added personal expression and artistic voice as a primary goal of the visual arts program

Listening to Driscoll Staff – Education Plan

Summary of Staff Input Incorporated into Education Plan (continued)

English Language Arts
- Reading nooks with shelving in each homeroom or ELA classroo
- Quiet spaces nearby that can be used for one-on-one reading assessments.

Library/Media Center/Education Technology/Maker Space/Fab Lab
- The scale and organization of the library must take into consideration the library is typically staffed by one person
- Added digital citizenship, media literacy, and the need to demonstrate learning across multiple disciplines
- Added need for tiered or angled seating for read alouds

World Language
- Clarified the space needed for students to work independently when recording, listening, and reading independently

Wellness, Outdoor Spaces
- Play areas must be appropriate for a range of ages and be fully accessible

DRISCOLL SCHOOL, BROOKLINE

Listening to Driscoll Staff – Classroom Design

2 Days, 22 Meetings – January 16 & 17

What we heard from Driscoll Staff

- Classrooms need to be flexible, multipurpose learning spaces
- Liked basic classroom configuration as it was shown including the paired classrooms
- Lots of bookshelves and storage in classrooms
- Raised beds for planting
- Very positive about teacher collaboration spaces and workrooms
- Younger grades should have easy access to playground
- Guidance Suite and Health Suite should be centrally located
- Fab Lab and Art rooms should be centrally located
- Special education, guidance, nurse need locking storage to safeguard records
- Multipurpose room – raised stage and near music rooms, stage left/right

DRISCOLL SCHOOL, BROOKLINE

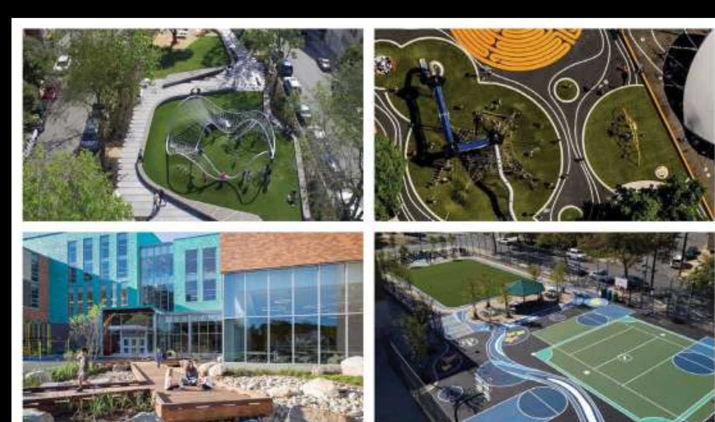
Existing Aerial

DRISCOLL SCHOOL, BROOKLINE

Splash Pads, Terraces, and Slopes

DRISCOLL SCHOOL, BROOKLINE

Spatial Definition

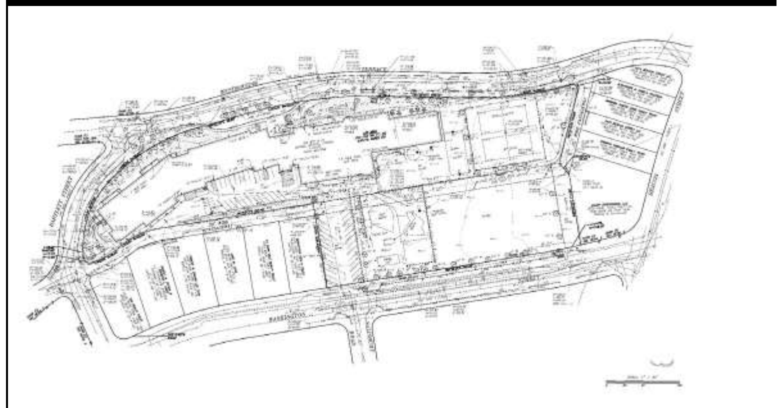


DRISCOLL SCHOOL, BROOKLINE

Program List

- 3 PLAYGROUNDS - PRE K - 1, GRADES 2 - 5, GRADES 5-8
- SOCCER FIELD
- BASKETBALL COURT
- SPLASH PAD
- PERIMETER PATH
- RAIN GARDEN
- HARDSCAPE PLAY SPACE
- BIKE AND SCOOTER PARKING
- OUTDOOR CLASSROOMS AND GARDENS
- EQUIPMENT STORAGE
- DRINKING FOUNTAIN

Survey



Option A: Bi-Nuclear

Option B: Fountain Plaza

Option C: Diagonal Axis

Agenda

1. Traffic and Parking Update
2. Site Design
3. Budget

Construction Costs

Total Construction Cost
Estimated Bid or Guaranteed Maximum Price (GMP) Includes:

Trade Costs:

- Hazmat Abatement
- Demolition
- Earthwork
- Utilities
- Landscaping
- Road and Sidewalk
- The Building

Markups:

- Design Contingency (reduces over time during design)
- General Conditions
- Bonds and Insurance
- Escalation (reduces over time during design)
- CMR (if applicable)

Total Project Costs

Total Project Costs include:

- Construction Costs
- Architectural / Engineering Fees
- Owner's Project Manager Fee
- CMR Pre-Construction Fee (if applicable)
- Legal Fees
- Commissioning
- Testing and Inspections
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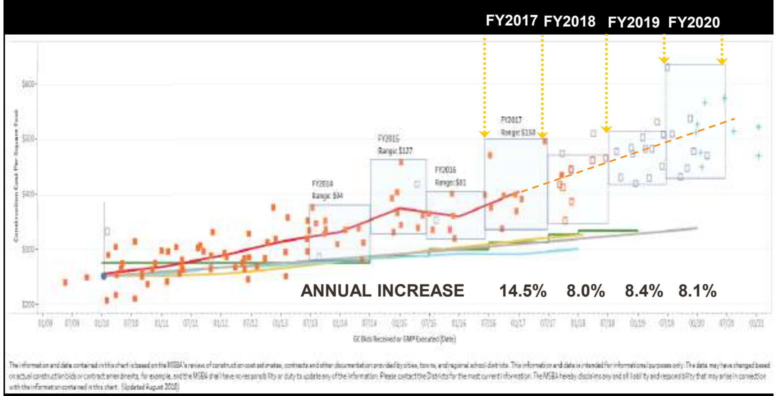
- Moving Expenses
- Hard Cost Contingency
- Soft Cost Contingency

ESCALATION - RECENT SCHOOL PROJECTS



RECENT SCHOOL PROJECTS

(Sorted by Total Project Cost)

Project Name	Students	Cost Escalated to Driscoll ($M)
Lynn Middle Schools	1,660	$213
Saugus Middle/High School	1,360	$186
Beverly Middle School	1,395	$136
Holyoke Lawrence Middle School	1,100	$132
Abington Middle/High School	1,115	$129
Natick Kennedy Middle School	1,000	$116
Dennis-Yarmouth Mattacheese Middle School	940	$113
Westport Middle/High School	860	$112
New Driscoll	**800**	**$104.5 – 110.3**
Boston Dearborn STEM Academy	600	$94
Quincy Sterling Middle School	430	$70

RECENT SCHOOL PROJECTS?

(Sorted by Cost per Student)

Project Name	Students	Cost/Student ($K)
Quincy Sterling Middle School	430	$162
Boston Dearborn STEM Academy	600	$156
Saugus Middle/High School	1,360	$137
New Driscoll	**800**	**$131- $138**
Westport Middle/High School	860	$130
Lynn Middle Schools	1,660	$129
Dennis-Yarmouth Mattacheese Middle School	940	$120
Holyoke Lawrence Middle School	1,100	$120
Natick Kennedy Middle School	1,000	$116
Abington Middle/High School	1,115	$115
Beverly Middle School	1,395	$97

RECENT SCHOOL PROJECTS?

(Sorted by Cost per Square Feet)

Project Name	Students	Cost/SF
Boston Dearborn STEM Academy	600	$730
Quincy Sterling Middle School	430	$727
Saugus Middle/High School	1,360	$693
New Driscoll	**800**	**$671 - $708**
Lynn Middle Schools	1,660	$674
Natick Kennedy Middle School	1,000	$638
Holyoke Lawrence Middle School	1,100	$617
Dennis-Yarmouth Mattacheese Middle School	940	$614
Westport Middle/High School	860	$597
Beverly Middle School	1,395	$586
Abington Middle/High School	1,115	$546

Agenda

1. Traffic and Parking Update
2. Site Design
3. Budget
4. Sustainability

Agenda

1. Traffic and Parking Update
2. Site Design
3. Budget
4. Sustainability
5. Upcoming Meetings

Jonathan Levi Architects
266 beacon street boston ma 02116 tel 617.437.9458 www.leviarc.com

NOTES OF MEETING

project	**Driscoll School**	project no.	1823
date	2/26/19, 7:30 am	location	Brookline Town Hall
re	**School Building Committee #9** Design Update, Budget		

present
Neil Wishinsky, Co-Chair, Select Board
Susan Wolf Ditkoff, Co-Chair, School Committee
Mel Kleckner, Town Administrator
Karen Breslawski, Building Commission
David Lescohier, Advisory Committee (by phone)
Nancy O'Connor, Parks and Recreation Commission
Victor Kusmin, Community Representative
Andrew Bott, Superintendent of Schools
Dr. Nicole Gittens, Deputy Superintendent of Schools for Teaching and Learning
Mary Ellen Dunn, Deputy Superintendent of Schools for Administration and Finance
Dr. Suzie Talukdar, School Principal Representative
Ben Lummis, Project Manager, School Department
Ray Masak, Project Manager, Building Department
Daniel Bennett, Building Commissioner
Heather Hamilton, alternate Select Board
Jonathan Levi, JLA
Philip Gray, JLA

Distribution:
attendees; project file
Ali Tali, Public Works, Engineering and Transportation
Val Frias, Community Representative/ Special Education Parent Advisory Council
Sara Stoutland, Community Representative
Dan Deutsch, Community Representative
Arjun Mande, Community Representative (by phone)
Lakia Rutherford, Community Representative/METCO
Carol Harris, JLA

JLA

1) Design Update. Jonathan Levi presented updated schematic design floor plans and building elevations (see attached). In the following Design Development phase, each room will be treated as a separate design project for review. To save excavation, the garage floor level will be higher than the adjacent gym floor elevation, with an interior HC ramp to connect the floor levels. JL presented site sections illustrating that the proposed building height compares favorably to neighboring buildings.

   Discussion:

   - Each floor should have one unisex toilet room for students and 2 for staff.
   - Cafeteria should allow for 2 rows of 30 students each to the serving area.
   - It was noted that the approved space summary calls for Middle School grades to have more classrooms per student then grades K-5 due to rotating schedule and the need for specialized science classrooms.

2) Budget. Philip Gray provided overview of the construction cost estimate and the total project cost estimate, including Building, Site, Parking, and Fossil Free design (see attached). Project is within the cost range projected during the Feasibility Study. Total project costs are projected at just below $109M.

3) Upcoming Meetings.

- 2/28/19 @ 8:30 pm – School Committee
- 3/5/19 @7:30 PM – Select Board
- 3/7/19 @7:30 am – SBC
- 3/12/19 @7:30 PM – Select Board

END OF MEETING NOTES
Addressees believing these notes are in error or are inaccurate should contact the writer within five business days, otherwise these notes will be considered accurate.

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by Philip Gray, JLA

BROOKLINE
DRISCOLL SCHOOL EXPANSION

School Building Committee
February 26, 2019

Agenda

1. Design Updates
2. Budget
3. Upcoming Meetings

Agenda

1. Design Updates

Site Plan

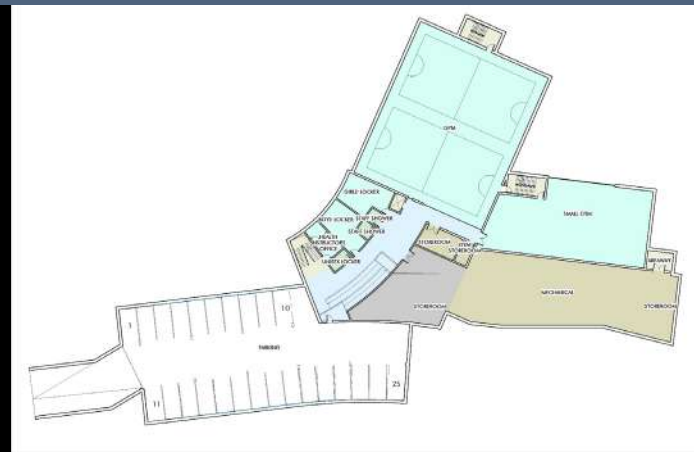
Open Space Metrics

	LOT	BUILDING		OPEN SPACE			
Concept Alternative	Total Lot Area	Building GSF	Building Footprint	Usable Play Area (with tennis)	Vehicle / Pedestrian	Unutilized Area	Total Open Area
Existing	173,000 SF	97,000 SF	39,500 SF	72,500 SF	32,000 SF	29,000 SF	133,500 SF
H Modified Star	173,000 SF	155,500 SF	42,000 SF	97,000 SF	21,500 SF	12,500 SF	131,000 SF
Lincoln	187,308 SF	87,500 SF	44,369 SF	61,851 SF	13,633 SF	67,455 SF	142,939 SF
Runkle	132,858 SF	104,800 SF	52,609 SF	40,446 SF	0 SF	39,802 SF	80,248 SF
Coolidge Corner	292,723 SF	200,000+ SF	88,880 SF	143,211 SF	6,982 SF	53,650 SF	203,843 SF

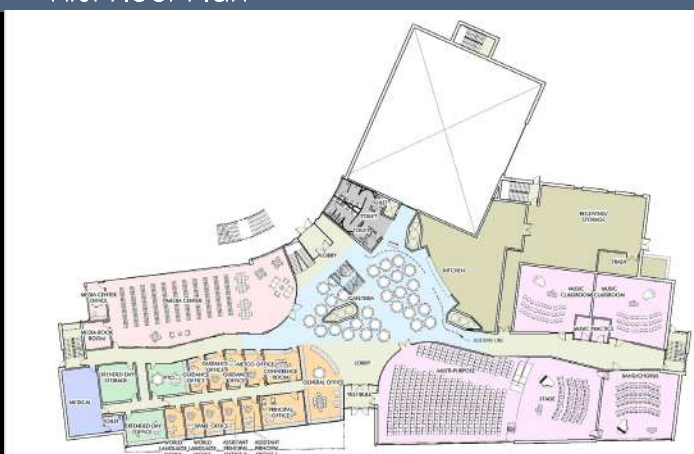
Anatomy of a Classroom

Anatomy of a Classroom

Basement Floor Plan



First Floor Plan



Second Floor Plan

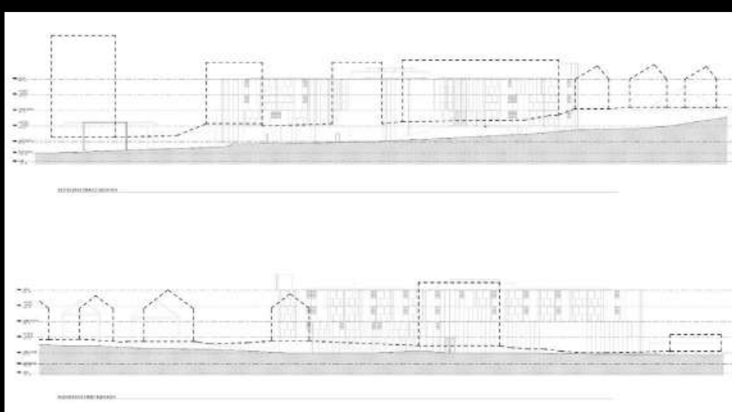
Third Floor Plan

Fourth Floor Plan

Elevations

Elevations

Street Massing Diagram



Agenda

1. Design Updates
2. Budget

Construction Costs

<u>Total Construction Cost</u>
Estimated Bid or Guaranteed Maximum Price (GMP) Includes:

<u>Trade Costs:</u>

- Hazmat Abatement
- Demolition
- Earthwork
- Utilities
- Landscaping
- Road and Sidewalk
- The Building

<u>Markups:</u>

- Design Contingency (% reduces over time during design)
- General Conditions
- Bonds and Insurance
- Escalation (% reduces over time during design)
- CMR

Total Project Costs - Driscoll

<u>Total Project Costs</u> include:

- Construction Costs: $87.2M
- Architectural / Engineering Fees: $8.7M
- Owner's Project Manager Fee: $3M
- CMR Pre-Construction Fee: $300k
- Legal Fees: $100k
- Commissioning: $125k
- Testing and Inspections: $120k
- Utility Fees: $100k
- Furniture, Fixtures, and Equipment: $1.6M
- Technology: $1.1M
- Moving Expenses: $90k
- Security: $100k
- Advertisement and Printing: $30k
- Construction Contingency (Hard Cost): $4.2M
- Owner's Contingency (Soft Cost): $2.0M

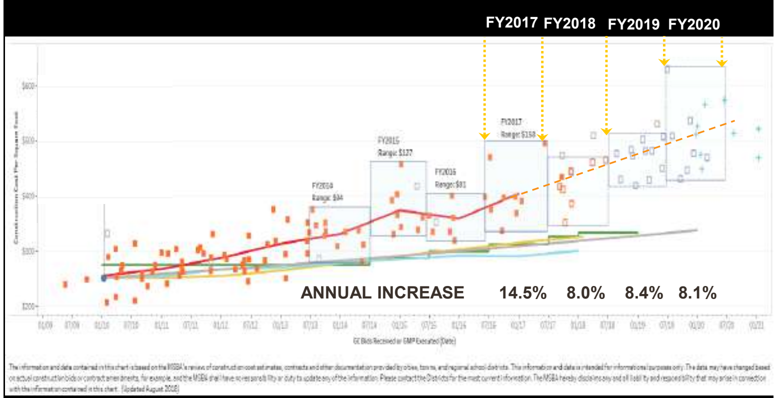
Projected Total Costs - Driscoll

	Construction Cost	Total Project Cost
Building and Site:	$77.4M	$96.6M
Play Area:	$2.0M	$2.5M
Structured Parking:	$2.8M	$3.4M
Fossil Free Allowance:	$5.0M	$6.3M
Total	$87.2M	$108.8M

Cost Comparison to Feasibility Study - Driscoll

	Construction Cost	Total Project Cost
Feasibility Study:	$84.3M - $89M	$104.5M - $110.3M
Schematic Design:	$87.2M	$108.8M

ESCALATION - RECENT SCHOOL PROJECTS



RECENT MIDDLE SCHOOL PROJECTS
(Sorted by Total Project Cost)

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Agenda

1. Design Updates
2. Budget
3. Upcoming Meetings

BROOKLINE
DRISCOLL SCHOOL EXPANSION

School Building Committee
February 28, 2019

Agenda

1. Design Updates
2. Budget

Agenda

1. Design Updates

Site Plan

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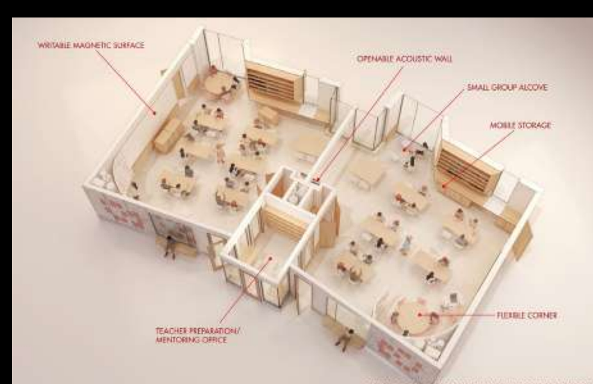

Anatomy of a Classroom

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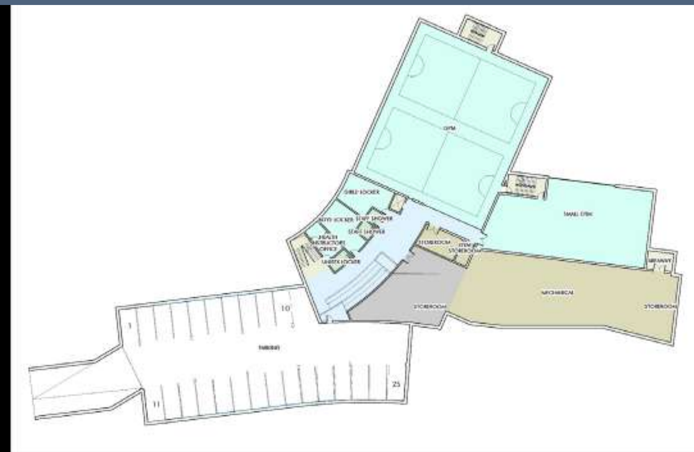

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Fourth Floor Plan

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Elevations

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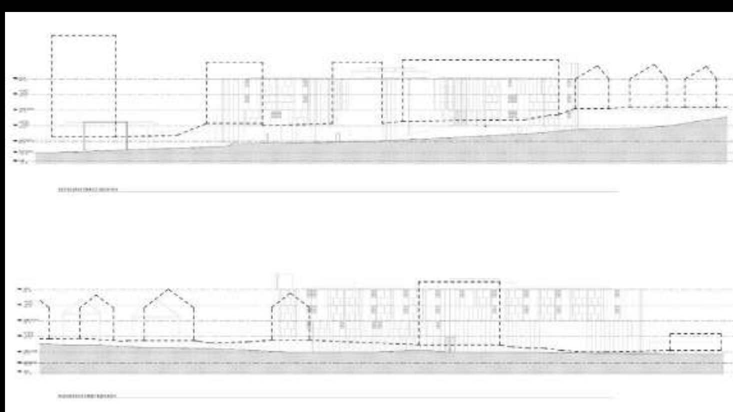

Agenda

1. Design Updates
2. Budget

Construction Costs Drivers

Construction estimate includes several cost drivers not found in typical MSBA projects including:

- Boston Metro Area cost index – Construction costs approximately 20% above less developed areas in Massachusetts
- Structured Parking
- Fossil fuel free systems
- Brookline K-8 standard Multipurpose Room – adds additional sf, double height

Construction Costs

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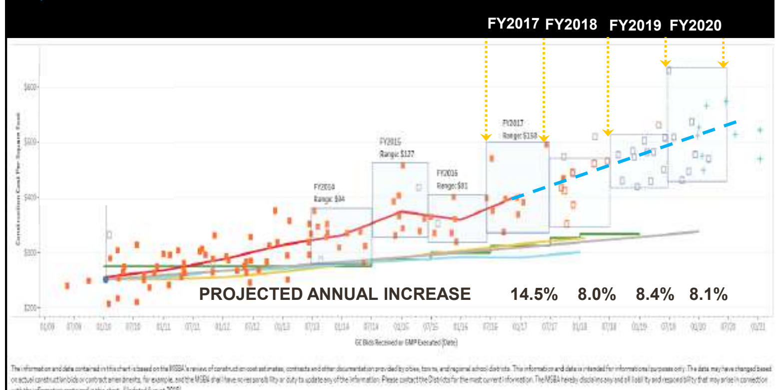
ESCALATION - RECENT MSBA SCHOOL PROJECTS

= Projected average school cost increase based on MSBA pipeline



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Lynn Middle Schools	1,660	$674
Natick Kennedy Middle School	1,000	$638
New Driscoll - Base Building and Landscape	800	$636
Holyoke Lawrence Middle School	1,100	$617
Dennis-Yarmouth Mattacheese Middle School	940	$614
Westport Middle/High School	860	$597
Beverly Middle School	1,395	$586

Crabtree McGrath
Associates, Inc.

MEETING MINUTES

DATE OF MEETING: March 1, 2019

PROJECT NO.: TBD

SUBJECT: Foodservice Equipment Kick-off Meeting

ATTENDING:	Tim McDonald	Crabtree McGrath Associates, Inc.
	Phillip Gray	Jonathan Levi Architects
	Matt Gillis	Public Schools of Brookline
	Mary Ellen Dunn	Public Schools of Brookline

Please contact Crabtree McGrath with any additional comments or corrections.

1. Baldwin School - Student population of 450 with 1,753 square feet of kitchen space.
2. Driscoll School - Student population of 800 with 1,800 square feet of kitchen space.
3. Driscoll School population is currently 600 students and will be expanding to 800 total.
4. Both schools will have three lunch periods.
5. Seating/space planning layout must incorporate space for future expansion.
6. Both schools are Pre-K to 8th grade.
7. The schools are to be fully independent full-service kitchens.
8. Deliveries are currently 2-3 times a week and it's expected that schedule will remain the same.
9. Crabtree-McGrath to investigate providing a larger walk-in freezer for the Baldwin school for district support on that side of town.
10. Both kitchens shall have a small office for a manager with 1 desk. The office should be approximately 90-110 square feet.
11. Dry storage rooms must have the ability to be locked.
12. Matt Gillis will provide desired square footage numbers for walk-in cooler/freezer and dry storage.
13. Kitchen equipment layout shall be similar to the Coolidge Corner school in Brookline, MA. A site visit between Crabtree-McGrath and Brookline Public schools to be set up at a later date.
14. Brookline schools to provide Crabtree-McGrath and equipment list and sample menu.
15. No trays will be used at either school. The programs are setup for disposables.

161 West Main Street, Georgetown, Massachusetts 01833 phone: 978.352.8500 fax: 978.352.8588
mail@crabtree-mcgrath.com

16. The trash room will not be required to be refrigerated. Discussions on trash and recycling programs to continue throughout the design process. Lockable containers for trash and composting to be provided.
17. Both schools will have grab and go refrigerators for pre-packaged sandwiches, salads, beverages and fruit to be provided.
18. Both schools should be designed with two serving lines with space available for an alternate featured serving option. The alternate serving line to be provided with a holding device capable of both refrigeration and hot holding.
19. The cafeteria is required to have a water bottle filling station for students.
20. Wall space to be provided for menu and ingredient lists specific to Allergens.
21. Garbage disposal to be provided in the dishroom.
22. A mechanical dishwasher (door type) to be provided for pot and pan washing in addition to the required three compartment sink.
23. Kitchen to be provided with a designed restroom for staff.
24. Kitchen to include lockers for staff.
25. A washer and dryer will be provided in the kitchen equipment layout.
26. Equipment to be selected with energy star certifications where possible.
27. The exhaust system will be provided with demand control technology for energy savings in the future.
28. Crabtree-McGrath to provide Brookline schools with a list of local projects that Brookline schools can review and tour.
29. Provide a milk dump sink in the servery.
30. POS stations to be double sided
31. Mobile condiment counters to be provided in the servery.
32. Ala Carte options prior to the POS stations to be incorporated in the layout
33. Each kitchen will be staffed with 3-6 employees.
34. Crabtree-McGrath to develop a schematic kitchen equipment layout for review with Brookline Public Schools.

This concludes our notes for the 3/1/19 foodservice equipment meeting.

Tim McDonald

Crabtree-McGrath Associates

TOWN OF BROOKLINE

Driscoll School

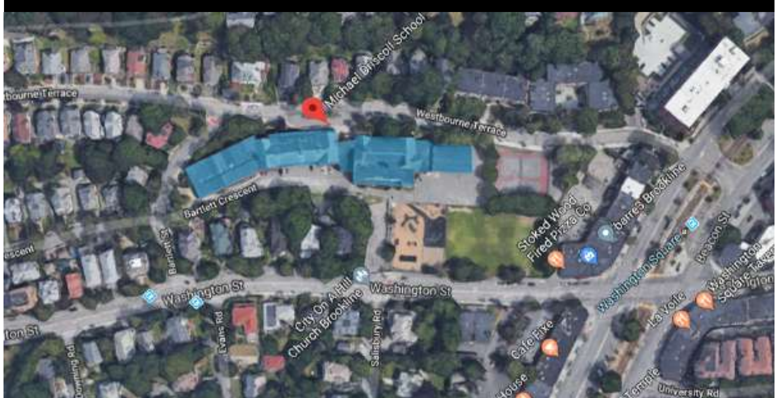
School Building Committee
March 7, 2019

TOWN OF BROOKLINE

Public Schools Classroom Expansion Program

PHASE 1	Net Added Classrooms	Classrooms Online
Baldwin School, PK – 8 w RISE	27	Sept. 2022
Driscoll School, PK - 8	10	Sept. 2022
PHASE 2		
Pierce School, PK - 8	TBD	Sept. 2024

Driscoll Neighborhood

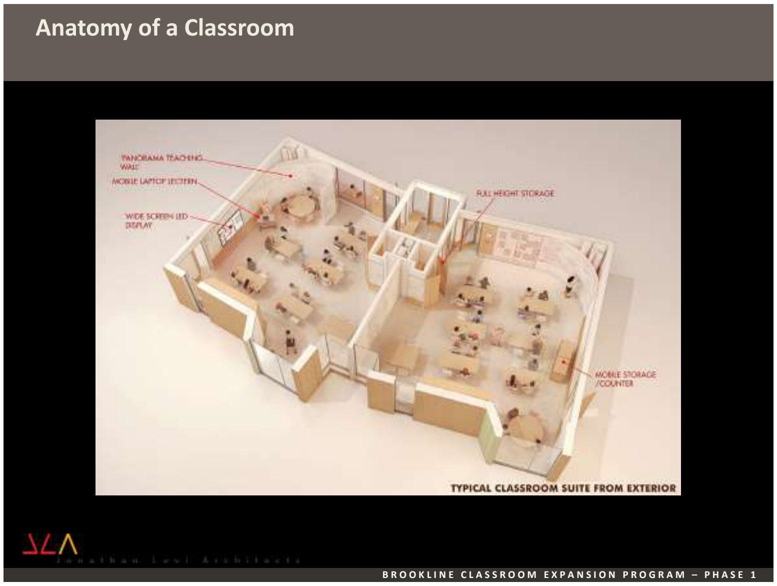


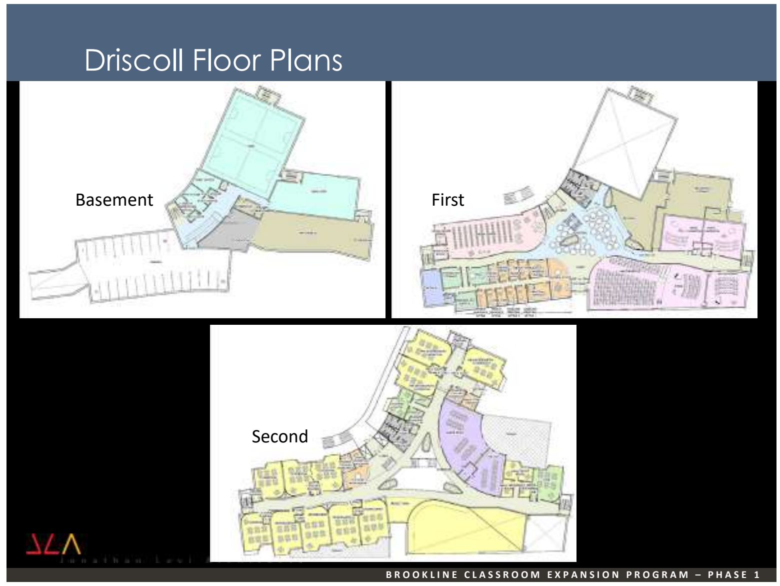
Driscoll Site Plan

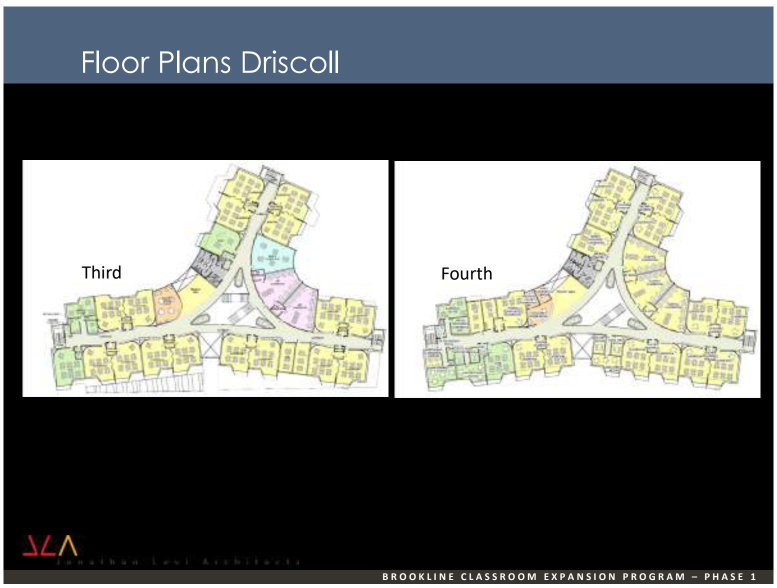
Driscoll Open Space Metrics

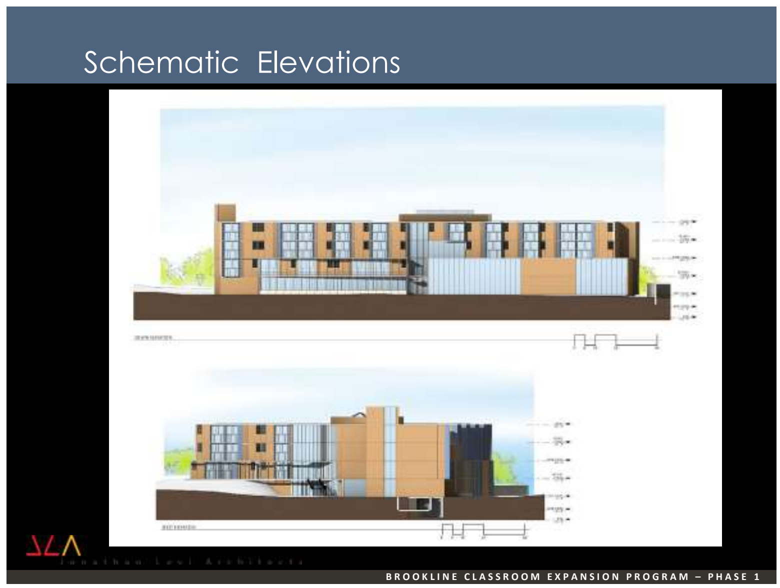
	LOT	BUILDING		OPEN SPACE			
Concept Alternative	Total Lot Area	Building GSF	Building Footprint	Usable Play Area (with tennis)	Vehicle / Pedestrian	Unutilized Area	Total Open Area
Existing	173,000 SF	97,000 SF	39,500 SF	72,500 SF	32,000 SF	29,000 SF	133,500 SF
H Modified Star	173,000 SF	155,500 SF	42,000 SF	97,000 SF	21,500 SF	12,500 SF	131,000 SF
Lincoln	187,308 SF	87,500 SF	44,369 SF	61,851 SF	13,633 SF	67,455 SF	142,939 SF
Runkle	132,858 SF	104,800 SF	52,609 SF	40,446 SF	0 SF	39,802 SF	80,248 SF
Coolidge Corner	292,723 SF	200,000+ SF	88,880 SF	143,211 SF	6,982 SF	53,650 SF	203,843 SF

Driscoll Pedestrian Safety Improvements

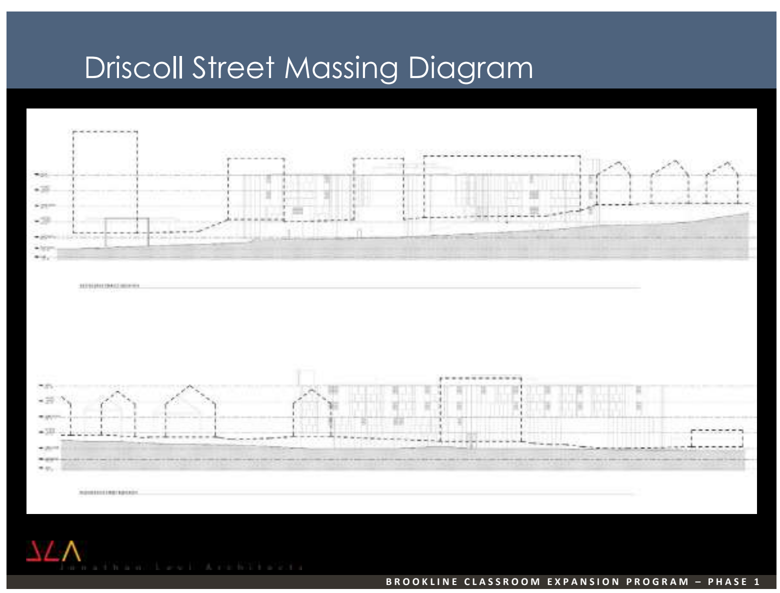

Anatomy of a Classroom
PANORAMA TEACHING WALL
MOBILE LAPTOP LECTERN
WIDE SCREEN LED DISPLAY
FULL HEIGHT STORAGE
MOBILE STORAGE /COUNTER
TYPICAL CLASSROOM SUITE FROM EXTERIOR
Jonathan Levi Architects
BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1


Driscoll Floor Plans
Basement
First
Second
BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1


Floor Plans Driscoll
Third
Fourth
Jonathan Levi Architects
BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1


Schematic Elevations
BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1


Schematic Elevations
Jonathan Levi Architects
BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1


Driscoll Street Massing Diagram
BROOKLINE CLASSROOM EXPANSION PROGRAM – PHASE 1

Driscoll Video Tour

Construction Costs Drivers - Driscoll

Construction estimate includes several cost drivers not found in typical MSBA projects including:

- Boston Metro Area cost index – Construction costs approximately 20% above less developed areas in Massachusetts
- Structured Parking
- Fossil fuel free systems
- Pre-K program – requires additional sf per student and increased staff to student ratio
- Brookline K-8 standard Multipurpose Room – adds additional sf, double height

Construction Costs

<u>Total Construction Cost</u>
Estimated Bid or Guaranteed Maximum Price (GMP) Includes:

<u>Trade Costs:</u>
- Hazmat Abatement
- Demolition
- Earthwork
- Utilities
- Landscaping
- Road and Sidewalk
- The Building

<u>Markups:</u>
- Design Contingency (% reduces over time during design)
- General Conditions
- Bonds and Insurance
- Escalation (% reduces over time during design)
- CMR

Total Project Costs - Driscoll

<u>Total Project Costs</u> include:
- Construction Costs: $87.2M
- Architectural / Engineering Fees: $8.7M
- Owner's Project Manager Fee: $3M
- CMR Pre-Construction Fee: $300k
- Legal Fees: $100k
- Commissioning: $125k
- Testing and Inspections: $120k
- Utility Fees: $100k
- Furniture, Fixtures, and Equipment: $1.6M
- Technology: $1.1M
- Moving Expenses: $90k
- Security: $100k
- Advertisement and Printing: $30k
- Construction Contingency (Hard Cost): $4.2M
- Owner's Contingency (Soft Cost): $2.0M

Projected Total Costs - Driscoll

	Construction Cost	Total Project Cost
Building and Site:	$77.4M	$96.6M
Play Area:	$2.0M	$2.5M
Structured Parking:	$2.8M	$3.4M
Fossil Free Allowance:	$5.0M	$6.3M
Total	$87.2M	$108.8M

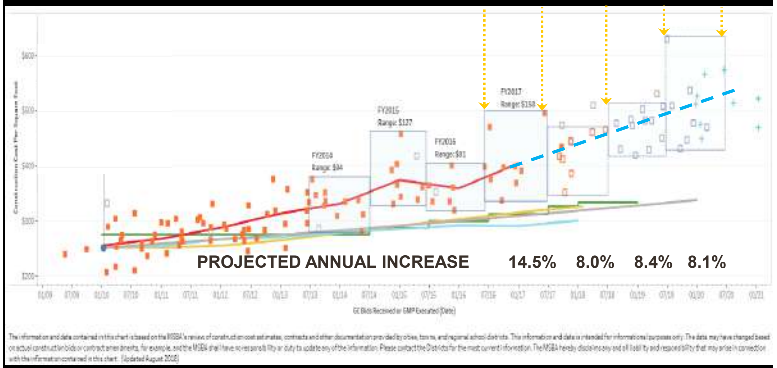
Cost Comparison to Feasibility Study - Driscoll

	Construction Cost	Total Project Cost
Feasibility Study:	$84.3M - $89M	$104.5M - $110.3M
Schematic Design:	$87.2M	$108.8M

ESCALATION - RECENT MSBA SCHOOL PROJECTS

= Projected average school cost increase based on MSBA pipeline

FY2017 FY2018 FY2019 FY2020



RECENT MIDDLE SCHOOL PROJECTS

(Sorted by Total Project Cost, adjusted for escalation)

Project Name	Students	Cost Escalated to 2020 Start ($M)
Lynn Middle Schools	1,660	$213
Saugus Middle/High School	1,360	$186
Coolidge Corner School	1,010	$154
Beverly Middle School	1,395	$136
Holyoke Lawrence Middle School	1,100	$132
Abington Middle/High School	1,115	$129
Natick Kennedy Middle School	1,000	$116
Dennis-Yarmouth Mattacheese Middle School	940	$113
Westport Middle/High School	860	$112
New Driscoll	800	$109
Boston Dearborn STEM Academy	600	$94
New Baldwin	450	$83
Quincy Sterling Middle School	430	$70

RECENT MIDDLE SCHOOL PROJECTS

(Sorted by Cost per Square Feet, adjusted for escalation)

Project Name	Students	Cost/SF
Coolidge Corner School	1,010	$783
Baldwin Including Parking and Fossil Free	450	$764
Boston Dearborn STEM Academy	600	$730
Quincy Sterling Middle School	430	$727
Baldwin Base Building, Landscape, and Pedestrian Improvements	450	$703
New Driscoll Including Parking and Fossil Free	800	$698
Saugus Middle/High School	1,360	$693
Lynn Middle Schools	1,660	$674
Natick Kennedy Middle School	1,000	$638
New Driscoll - Base Building and Landscape	800	$636
Holyoke Lawrence Middle School	1,100	$617
Dennis-Yarmouth Mattacheese Middle School	940	$614
Westport Middle/High School	860	$597
Beverly Middle School	1,395	$586

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NOTES OF MEETING

project	**Driscoll School Expansion Project**	Project #	1823
date	4/3/19	location	BrooklineTown Hall
re	**Energy Charrette**		
present	Ray Masak – Project Manager, Brookline Building Department Zoe Lynn Sustainability Program Admin, Brookline Magda Lelek, ALE Kim Cullinane, Eversource Dominic Puniello, GGD Keith Lane, GGD Carlos DeSousa, GGD Philip Gray (JLA)		
distribution	attendees; project file		

1. Background: The new Baldwin and Driscoll schools are two parts of an overall initiative to increase the number of Brookline classrooms. A single ballot measure to fund both projects will be held on May 7, 2019. The Pierce school expansion, which is in the MSBA pipeline, is also needed for additional classrooms and will have a separate ballot vote at a later date. Brookline wants very high standards for sustainability.

2. Brookline Town Meeting voted that Driscoll shall not include non-emergency fossil fuel systems, so gas is not an option at all from day 1.

3. The new Driscoll School will not be funded in partnership with the MSBA.

4. If the Town approves Driscoll funding, DD would start in May. Detailed design would continue through December of 2019 with a Summer 2020 Construction start with a fall 2022 opening.

5. The roof will be solar ready or include PV panels in the design. EUI target - max is 30 with 24 as desirable.

6. Driscoll is designed to be a new 5 story 156,000 gsf PreK – 8 school for 800 students, to be built alongside the existing PreK – 8 Driscoll School. Once the new school is finished, the old school would be demolished. It's a fairly urban(ish) site.

7. Driscoll will have a cooking kitchen with electric cooking equipment and cafeteria.

8. Decision not yet made on choice of HVAC system, and will need to be voted on by the Driscoll School Building Committee. GGD presented 3 fossil fuel free options plus a baseline. One alternative is heat pumps with electric resistance heat as primary heat source in heating season. Magda indicated concern about using electric resistance as the primary heat source. Ray Masak suggested consideration of a hydronic system as a baseline. Other options include VRF and geothermal system, which has a significant incremental cost. If the SBC votes to include a geothermal system, there would be likely be approximately 56 wells.

9. The building envelope will exceed energy code requirements. Window to Wall Ratio (WWR) is projected 30% with walls around R18 and roof around R42. Curtainwall and windows at 0.3 U value. JLA does substantial daylighting. Driscoll will have skylights.

10. Lighting - GGD doing lighting and they usually go low on Lighting Power Density (LPD). Brookline doesn't want overcomplicated lighting controls. Lighting controls will be off the temperature controls.

11. Driscoll to have 25 underground parking spaces. Brookline is interested in the Eversource EV Make Ready program.

12. It is assumed that this project will apply for a permit under IECC 2018 and so that will generally be Eversource's baseline for Mass Save. Brookline and team will need to advise Eversource if this is not the case.

13. Next step – wait for May 7 town vote to see if projects move ahead. Magda to provide proposals after that. Town must complete separate Mass Save Large Building Program MOUS for Driscoll and Baldwin.

END OF MEETING NOTES

Addressees believing these notes are in error or are inaccurate should contact the writer within five business days, otherwise these notes will be considered accurate.

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by Philip Gray

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